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## HotBand Cylinder Heating System

### INSTALLATION INSTRUCTIONS

Failure to follow these instructions may result in product failure.  
If any of these instructions are unclear, please call for clarification before beginning.

1. Test the band heaters before installing by plugging in each one for 2-3 seconds until it begins to get warm, but do not allow them to get hot. Do not cut or damage the red heating elements.
2. Remove the cowling and anything else needed to gain access to the cylinder bases. The inter-cylinder baffles do not need to be removed.
3. Using care not to pull on the wire leads, install a HotBand cylinder heater P/N CH38-XXX around the base of each cylinder, on the unfinned section. The leads must face the crankcase and be positioned on top of the cylinder. Bands with part numbers ending in "R" and "L" are interchangeable – the only difference is the screw orientation preferred for best access. Installation can usually be done easily by prebending the cylinder heater to about a 5 inch diameter, then feeding it from the top while holding the screw end. The prebend will allow the end to follow the curvature of the cylinder all the way around the bottom and back up to the top. It is usually easy to push the band between the cylinder and the baffles. While pushing the heater from the top place your free hand under the cylinder to help feed the end around the cylinder if necessary. Hand tighten the clamp with a screwdriver so it's **just snug - do not over tighten**. Over tightening will crush the silicone heating element.
4. **Safety wire the clamp screws**, or place a dab of RTV on the screw. If they vibrate loose the heating elements will burn out. See photo showing how to do this in our web page "Installation Instructions".
5. Install the wire harness P/N CH4 or CH6 longitudinally along the top center of the engine crankcase, using cable ties or clamps to secure it to the crankcase bolts as shown in photos. The AC plug should be located so it will be easily accessible with an extension cord, such as through the front air inlet (as shown at right) or oil check door. Avoid interference with any moving parts or controls, and heat sources such as exhaust pipes. If you must go through the rear baffle, insert the connector end of the harness rather than the AC plug end so that a smaller hole and grommet are needed.



- Attach the green ground wire to the engine (photo at right), and test the connection by checking for continuity between the engine and the ground pin on the plug.

Photo also shows one way to secure the harness to the crankcase bolts with wire ties.



- Plug each cylinder heater into a harness connector. Extra connectors are provided for the heaters for the oil sump and oil cooler, if installed. 6" extensions are available (\$5 each) if any of the heater leads will not reach the harness. **The heater leads must be well supported** by clamping them to the pushrod tubes (Lycomings) or bonding to the crankcase (Continental) with a dab of silicone adhesive.
- Test the system by plugging it in and feeling by hand to ensure each cylinder heater gets warm.
- Before re-cowling the engine, have someone get in the cockpit and move all controls while you watch to see if there is any interference with any part of the heater system.
- Installation of these FAA-PMA parts is a minor alteration and does not require an STC or Form 337. For type certificated aircraft an A&P is required to install them (or supervise owner installation) and document the engine logbook and W&B. The weight of the system is .8 lb for 4 cylinder engines, 1 lb for 6 cylinder engines. Add the weight of the oil and oil cooler heating system, if installed (see their instructions for weights). The arm is the same as the engine's arm.

## Operating Instructions

Place a blanket over the engine cowling and plug all cowl openings to retain heat in the engine compartment. Plug in the heater at least 3-5 hours before engine start, 10-12 hours for maximum heating. We suggest using a WI-FI or cellular remote control to make it convenient for you to turn the preheater on prior to a flight. Continuous use during long periods of aircraft inactivity is not recommended, nor do we advocate continuous preheater use as a means to prevent corrosion in inactive engines. Corrosion can occur in engines that are not flown frequently, whether they are warm or not. Always use a grounded outlet for safety. For the best protection against shock, use a ground fault type outlet or extension cord. During each annual inspection the heaters and harnesses should be checked to make sure they are secure and undamaged.

HEATING TIME						
In hangar with cowl plugs and blanket						
	Turbo XP System 100w per cyl 200w on oil		Standard System 50w per cyl 100w on oil		HotStrip System 200w on oil	
ELAPSED HOURS	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

**No Fault Warranty** Install it, try it, and if you are unsatisfied for any reason, send it back within 30 days of purchase. Up to 5 years after your purchase we will replace or repair any part that fails for any reason. Inst CH 2017-10.doc



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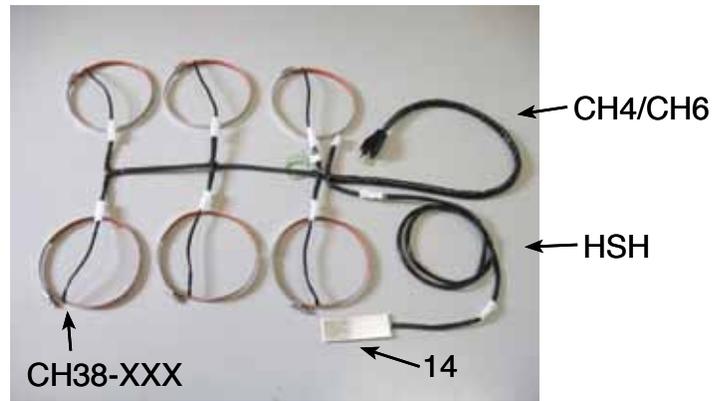
## HotStrip Oil Sump Heater INSTALLATION & OPERATING INSTRUCTIONS

Failure to follow these instructions WILL result in product failure.  
If any of these instructions are unclear, please call for clarification before beginning.

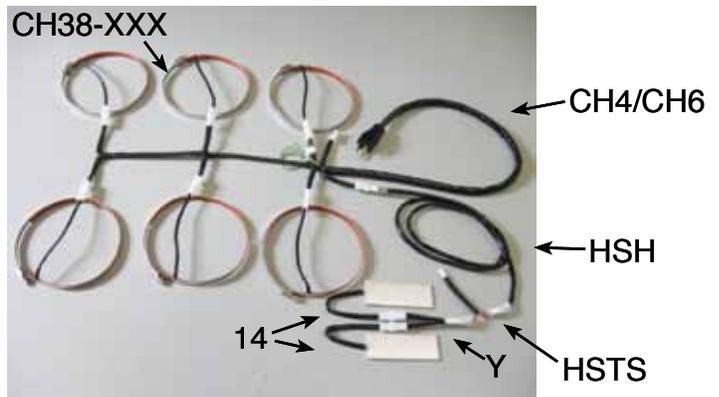
- 1)** Test each heating element before installation by plugging it in just long enough to verify that it gets warm (a few seconds).
- 2)** See photos on page 2 showing how the parts plug together, and do a trial fit. Pick a spot to install the heater(s) that is a flat, smooth area on the bottom or side of the oil sump below the oil level. Do not install on a surface that is not flat, or over raised letters, gaps, dents, etc. Continental 360, 470, 520, 550: heater must go on the side, the bottom is not flat. Lycoming IO-360: for locations see photos in our web site "Installation Instructions". Locate parts away from controls like the throttle and mixture arms, to avoid interference with them. Do not bond to composite (non-metallic) sumps.
- 3) Surface preparation is critical.** Paint and anodizing MUST be removed and both of the surfaces (sump and heater) must be scuffed (use Scotchbrite pad), cleaned with alcohol, lacquer thinner, or acetone, and dry.
- 4) Thorough mixing of epoxy is critical.** Place the Aremco epoxy bag in your pocket for a while to soften it and make it easier to mix, then follow the instructions on the package. Remove the divider clip and lay the bag on a table and roll the two parts back and forth in the bag **for several minutes** with a large socket. Simply kneading the bag a few times with your fingers is NOT sufficient. Apply a coating of epoxy onto the **unprinted side** of the heater (the side with flaps), P/N 14. Position the heater onto the sump and apply firm pressure to squeeze out excess epoxy. Ideal epoxy thickness is 0.010" (like 3 sheets of paper). Use duct tape to hold the heater tightly to the sump while the epoxy cures. Place unused epoxy in the freezer and save it for final touch up in step 5. J-B Weld epoxy #8265 (available in most hardware stores) is a suitable substitute epoxy but **do not substitute any other adhesive including other J-B WELD products**.
- 5) Proper curing is critical.** Aremco epoxy cures in 48 hrs at 75° F. Temps cooler than that will inhibit curing. For cold weather installations, it is not necessary to have the hangar at 75°. Tent the engine with a blanket and use the cylinder heaters, a heat lamp, or space heater to warm the sump to 75°. After the epoxy is fully cured (when it's hard), power up the heating elements (with sump full of oil) and watch them closely as they heat up. Probe the epoxy as it heats up and if it gets goeey, unplug it and allow it to cure longer. If using JB Weld follow the curing instructions on their package, except that 75°F is required to be fully cured in the 24 hrs stated in their instructions. Curing of either epoxy is complete when the epoxy is solid. Use epoxy to form a generous bead around and over the heater edges to "lock" the heater in place, and to seal the openings in the corners and the lead wire exit hole to keep out oil, water, or other foreign matter which can short out the heater. Allow this edge bead to cure before running the engine. **IMPORTANT:** Place a gob of epoxy or RTV over the lead wires for strain relief.
- 6)** If your system includes a thermostat (P/N HSTS) bond it to the oil sump using the same procedure and epoxy as for the heater. The sensor is the small white box, bond it to the sump below the oil level a few inches from the heating elements.
- 7)** Install the oil sump heater harness (P/N HSH or HSPC). P/N HSH plugs into a connector on the cylinder heater harness (P/N CH4, CH6, CH7, or CH9). On 4 & 6 cylinder engines route HSH through the rear baffle and down to the sump heater. Cut a 3/8" hole in the baffle, debur it, and insert the provided snap bushing to protect the harness. For P/N HSPC locate the AC plug so it will be accessible with an extension cord, typically through the cooling air exit or oil access door. Secure the harnesses using cable ties, clamps, or by bonding to the sump with epoxy or RTV. Avoid interference with any moving parts such as throttle linkage and heat sources such as exhaust pipes. Attach the green ground wire to the engine.
- 8)** Installation of these FAA-PMA parts is a minor alteration and does not require an STC or Form 337. For certificated aircraft an A&P is required to install them or to supervise owner installation and document the engine logbook and W&B. The weight of the oil sump heater portion of each of our systems is as follows: HotStrip Oil Sump Heater System 0.44 lb, Standard System 0.18 lb, and the Turbo & Turbo XP Systems 0.3 lb. Note if you are installing the Standard, Turbo, or Turbo XP System you will also need to add to the above the weight of the cylinder heat system which is indicated in the cylinder heating system installation instructions.

## ASSEMBLY PHOTOS

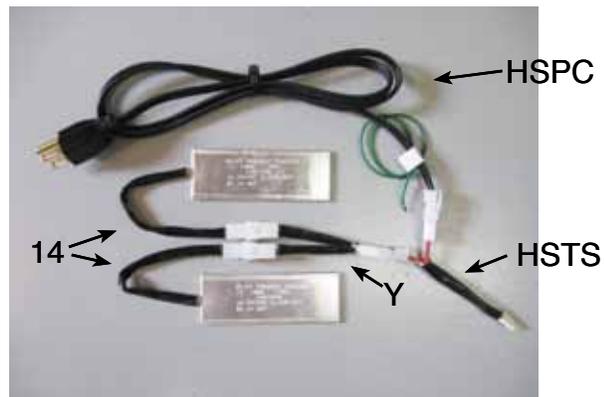
Standard System



Turbo & Turbo XP System



HotStrip  
Oil Sump Heater System



## OPERATING INSTRUCTIONS

Place a blanket over the engine cowl and plug all cowl openings to retain heat in the engine compartment. Plug in the heater at least 4-5 hours before engine start, 10-12 hours for maximum heating. A cellular remote control can be used for convenience. Continuous use during long periods of aircraft inactivity is not recommended, nor do we advocate continuous preheater use as a means to prevent corrosion in inactive engines. Corrosion can occur in engines that are not flown frequently, whether they are warm or not. Always use a grounded outlet for safety. For the best protection against shock, use a ground fault type outlet or extension cord. During each annual inspection the heaters and harnesses should be checked to make sure they are secure and undamaged.

For improved performance our **HotBand Cylinder Heater System** may be added to your engine at any time. When this system is used along with the HotStrip oil heater, engine heating will be faster, warmer, and more uniform.

## No Fault Warranty

Install it, try it, and if you are unsatisfied for any reason, send it back within 30 days of purchase. Up to 5 years after your purchase date we will replace or repair any part that fails for any reason.