

# PHP - Technical Bulletin



**Bulletin Number:** TB-210802

**Subject:** Engine Heater Maintenance

**Issue Date:** Aug. 16, 2021

**Scope:** 5kW Engine Heaters

## **Complaint:**

Provide additional tools for customers to perform their own engine heater maintenance.

## **Resolution:**

This Technical Bulletin covers general, annual maintenance procedures recommended for most 5kW engine heaters. Webasto heaters use a different atomization technique and therefore require slightly different replacement parts than shown here.

Here are some simple tips on how to keep your bunk heater running safely and reliably.

## **Monthly Maintenance**

### **Regular Operation (Run your heater):**

- Run your heater at least once a month during the year (for a minimum of 15 minutes). This will keep the fuel fresh, dry out any moisture, loosen bearings and get rid of any light dust that may have collected in the system.
- Check & clean the openings of the combustion air supply and the exhaust system after longer standstill periods. Ensure that no water has been trapped inside or other blockages. Your heater may or may not be equipped with a combustion air intake tube. If equipped, make sure it has not been crushed. It is made from a light aluminum foil which can easily be crushed and cause combustion problems in a hurry.
- For seasonal applications, conduct a preseason checkup and cleaning.
- If you detect an unburned fuel smell develop or if electric /electronic parts heats up, the heater shall be switched OFF immediately and inspected.

### **Plumbing & Coolant System:**

- Be aware that coolant leaks, corrosion, coolant quality problems are amplified when you incorporate a fuel fired heater. The simple explanation for this is that there are additional components that can fail, additional connections and seals for leak points, a source for extreme heat to cause scaling and opportunity for over-heating conditions. **Be extra diligent about maintaining your engine coolant system.**
- Check and re-tighten coolant hoses, clamps.
- Maintain coolant to the engine manufacturer's recommendations.
- It is a good idea to have shut-off valves to be able to isolate your heater when not in use but make sure all flow valves are open when you plan to operate the heater.
- Check and adjust coolant level and ensure that the heater is properly bled after service to the coolant system.
- Clean the magnetic drives of coolant pumps to remove metal particles that accumulated in the system.

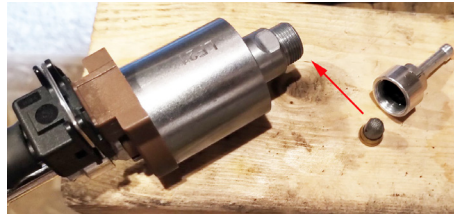
## Annual (Fall) Maintenance:

### Electrical System:

- Maintain the vehicle batteries and overall integrity of your electrical system.
- Check wires for cuts or abrasions.
- Inspect and clean all electrical connections and apply dielectric grease.
- Remember that as the batteries get colder, their performance is diminished significantly.



Fuel



System

- Visual check of all fuel lines for leaks, kinks, abrasions, etc. and replace as required.
- Re-tighten all fuel line clamps.
- If the heater is equipped with an external, in-line fuel filter, replace it annually.
- In addition to in-line fuel filters, some fuel pumps may also have a fuel screen on the inlet side of the pump. These do not normally need to be replaced but if the heater is having difficulty starting or has excessive smoking, it would be a good idea to inspect and or replace this.
- Use fuel suitable for the climate (see engine manufacturers recommendations).
- Fuel fired heaters are not generally designed for use with bio-diesel mixtures beyond 10%.
- Blending used engine oil with diesel fuel should also be avoided.

### Combustion Process:

- A minimal amount of smoke is expected upon start up and shut down processes.
- If the heater emits persistent extreme smoke or unusual burning noises the heater should be disassembled and cleaned.
- Annual combustion chamber cleaning and service is not absolutely necessary but provides an extra level of operational security.

### **Combustion Chamber Cleaning:**

- Service manuals or videos may be available online to assist you with your specific heater.
- Ensure you have proper replacement parts before disassembly of the heater.
- If you disassemble a heater, you should replace any seals and gaskets for broken connections.
- Remove and inspect the glow pin, clean with a non-abrasive cloth or replace if necessary.
  - The glow pin is used to ignite the fuel / air mixture on initial startup.
  - This is an electrical resistor with a ceramic body. You apply 12 volts and it gets red hot. Due to significant thermal stresses, these do wear out.
  - Generally speaking, it either works or it doesn't. However, sometimes it is possible that only part of this tip gets hot which leads to inconsistent ignition.
  - Annual replacement can provide extra layer of operational security.
  - Note: In the Webasto heaters, the glow pin also serves as a flame sensor.
  - Be very careful not to damage this top portion of the glow pin when removing or reinstalling the glow pin and do not over tighten.



### **Atomizer Screen:**

- The atomizer screen sits just inside the glow pin chamber. It plays an important role of helping to atomize the fuel as it enters the combustion chamber and is critical in the ignition phase.
- The atomizer screen should be replaced annually and should not be reused once removed.
- Remove the atomizer screen with a hook-pick and needle nose pliers.
- Inspect the glow pin chamber for soot buildup and clean with a small brass wire brush and blow out debris as necessary.
- If your heater has a vent hole, ensure that it is clear. It can be cleaned using a simple paper clip.
- Note the seam on the atomizer screen. This should be positioned away from the fuel and air inlets when installing.
- Use the insert tool to assist in proper height positioning of the new screen.
- If there is excessive soot build up or for additional peace of mind, the entire combustion chamber can be cleaned out.
- Use a brass brush, carburetor cleaner or a varsol bath and some compressed air to assist with this process.
- After disassembly, replace both the burner and blower motor gaskets upon reassembly.

## Improving Combustion:

Fuel fired heaters do not typically have mechanical adjustments to adjust fuel / air ratios or flame. If there is poor combustion it will result in poor starting and soot build up inside your heater. Poor combustion is caused by either a failed component or an operating environment deficiency (fuel, air or electrical power). Here are some things you can do that may improve combustion in your heater;

- Fuel type and quality. Heaters are generally tolerant on what fuel they use, however, using a clean, water and bacteria free diesel or kerosene does help with combustion and keep the combustion chamber clean.
- Adjusting fuel system parameters (lengths, heights, vacuum or head pressure)
- Lengths of combustion air intake and exhaust tubes (This can have some affect on the harmonic balance of the flame)
- Source of combustion air intake or exhaust discharge (Cleanliness and pressure)

## PHP Maintenance Kits

Consider purchasing a complete PHP Maintenance Kit for your annual pre-season tune up.



**PHP Gen I - PH51WA 12V  
Snugger - SS4200**

"O" Ring Kit (Heat Exchanger, Water Pump, Temperature Sensor, Purge Screw)	P51W-X801
Maintenance Kit: Glow pin, Atomizer screen w. "O" Rings Gaskets (Blower & Burner), External Fuel filter	P51W-T810

**Espar Hydronic D5 12V**

Maintenance Kit: Glow pin, Atomizer screen w. "O" Rings Gaskets (Blower & Burner)	E50W-T801
--	-----------

**Webasto TSL17 / Thermo Top 12V**

Burner Kit (Glow Pin, Burner Assembly, Gaskets & Hardware)	W50W-T102
---	-----------