



Marine **Heater**

Installation Instructions - For the following HEATER model numbers: 200, 300, 400, 500 Series Hydronic Heaters

Approximate Installation Time: 3-5 Hours

Tools Required:

#2 Phillips Screw Driver; Power Drill; 7/64" Drill Bit; 1"-4" Hole Saw; Hose Cutter; Wire Crimper; Teflon Plumbers Tape; Marine Sealant; Pencil.

Guidelines and Definitions

These instructions contain information that is important for you to know and understand. The information provided relates to safety issues for the installation and use of our products. To help you identify important information, we use the following system.

Warning

Important safety information – A hazard that may cause an injury, serious injury, or loss of life.

Caution

Information for preventing improper operation of, or damage to equipment.

Note

Information pertaining to the installation, operation, and/or maintenance of this product that should pay special attention to.

Heater Craft will not be held liable for an accidental damage to persons and/or property resulting from any installation not completed within the specified guidelines started herein.

Operation Warning

Carbon Monoxide (CO) is emitted from the engines' exhaust. Do not run the engine without proper ventilation. Do not run the engine in a confined space or where back drafting may occur. For more information about carbon monoxide refer to ABYC standards: A-7, T-22(1), and TH-23; or contact one of the following agencies.

American Boat and Yacht Council, Inc
(410)956-1050

United States Coast Guard
(754)441-3287
www.uscgboating.org

National Marine Manufacturers Association
(313)946-6200

Boat U.S.
(703)823-9550
www.boatus.com

Heater System

1. Layout the heater system in the boat before installation and make sure the mounting location of the heater unit and routing of all the hoses will work.

Warning – Do not mount the heater unit into the bilge area or any compartment that may draw air away from the bilge.

Types of Heater Installation:

Ducted units typically mount under the helm or in a storage area that will allow routing of the vent hoses to desired vent locations.

Grill Mounted units typically mount into a stairwell or into a storage area.

Note – Our heater units are equipped with 5/8" heater core outlets. Please make sure that you have the proper size of heater hose and fittings for your installation. If the hoses and heater core outlets are not the same size, it is necessary to install a hose coupling with the proper hose sizes to prevent coolant leakage.

2. Determine your source for the hot water supply.

Main engine – This installation is like your automobile; engine coolant will circulate from the engine to the heater unit and return to the engine.

Caution – If your engine application has a freshwater closed cooling system the heater unit should be mounted below the level of the radiator cap. If the heater is mounted above this level it is possible for air to become trapped in-line. If there is air trapped in-line it will not allow the water to circulate efficiently and may cause the engine to overheat. If the heater unit is mounted above the radiator cap it may be necessary to install an in-line air bleed valve at the highest point or an in-line circulation pump.

Main engine with separate coolant loop for the heater – This installation will require additional components. You will utilize a water exchanger to transfer heat from the engine's cooling system to the heater loop. A pump is needed to circulate the water in the heater loop. Basic instructions are outlined on **page 7**.

Boiler-type system – Refer to the manufacturer's instructions for hook-up information.

Note – Be sure the hoses are not kinked or pinched in any way, and do not contact any moving parts, sharp objects, or edges. They can be secured with a plastic tie.

3. Route and secure the heater water/coolant hoses between the heater unit location and the hot water source.

Engine

Warning- Hot engine coolant can cause severe burn! Never open the cap on a hot radiator. Some vehicles are equipped with electric fans that may start without warning even with the engine shut off. Wait until the engine has cooled completely before installation.

Note- Due to the wide variety of engine applications, the following are general instructions for a gasoline-powered engine hook-up. Please call technical support at (208)687-4400 with your questions regarding your specific engine application.

Always use silicone sealant or Teflon tape on the threads of all fittings before installing to prevent water/coolant leakage.

1. The standard thermostat on a carbureted marine engine is 142F. This heater system will operate more effectively using a 160F thermostat- this change only applies to CARBURETED ENGINES ONLY. Do not change the thermostat on a fuel injected engine, as catastrophic engine failure can occur. When installing a new thermostat, a new gasket must be used to seal the housing to the intake manifold.
2. Locate and remove the cooling system plug on the intake manifold. This would be located at the front of the engine near the thermostat housing or on the thermostat housing itself (On some applications it may be necessary to remove the temperature sending unit and install a brass tee). Install the proper size hose barb, 5/8" hose barb x 1/2" MPT.

Caution- The intake manifold also has vacuum ports. If you connect to a vacuum port, water/coolant will be drawn into your engine and may cause internal damage.

Note- If you remove a sending unit, it is necessary to test the gauge operation after reinstalling to be sure it is properly grounded.

The hot water pressure will increase with engine RPM. This means on some applications the heater will cool down during periods of extending idling. If your engine is normally operated at low engine RPM's it may be necessary to install an in-line circulation pump. Please contact technical support (208)687-4400 for options.

3. Locate and remove the plug on the water pump housing and install the proper size hose barb.

Note- If your particular engine does not have a plug to remove, it is necessary to install a hose tee into the large hose connecting the thermostat housing to the water pump. Please contact technical support (208)687-4400 for options.

4. Cut the water/coolant hoses to length, attach with hose clamps and secure in place.

Note- Fasten the hose clamps near the end of the hose to prevent the hose end from "mushrooming" and to prevent coolant leakage.

Heater Installation

1. Locate the area(s) for mounting the hot air vents.

Note- Vents should be located so the heat will blow out in a desirable direction and allow easy access for adjustments. Install them in areas that are protected from damage from gear or persons.

2. Drill or cut the proper size hole to match the vents that you are using.

Heater Craft Vents:

H5041B Directional Euro Vent – use 3" hole saw.

H509 Hot Tube Extendible Vent – Use 4" hole saw.

Grilled/surface mount units:

400 Series (Sport, Pro, Elite and COM), cut out a 6 3/4" x 16" rectangle.

500 Series (Sport, Pro, Elite and COM), cut out a 6 3/4" x 9 3/4" rectangle.

3. Mark the location of the mounting holes and pre-drill.
4. Mount the heater unit in the area chosen with the heater core in a horizontal position when possible.

Note- It may be easier to make the hose and wiring connections before mounting the heater unit.

5. Cut the water/coolant hoses to length, attach them with hose clamps, and secure in place.

Note- Fasten the hose clamps near the end of the hose to prevent the hose end from "mushrooming" and to prevent coolant leakage.

6. Connect the hoses to either barb on the heater core.
7. Install the vents in place and attach the vent hose.

Secure the vent hose with a plastic wire tie or hose clamp.

8. Route the vent hose to the heater unit.

Note- Route the vent hose in a way that prevents damage from gear or persons.

9. Cut the vent hose to length, attach with a plastic wire tie or hose clamp to secure in place.

Wiring the Fan Motor

The wire leads from the blower are color coded and correspond as follows:

YELLOW- Low Speed

RED- Medium Speed

ORANGE- High Speed

BLACK- Ground

E-112 3-Speed Rotary Switch connection instructions

Terminal 1 or A- Yellow blower wire

Terminal 2 or B- Red blower wire

Terminal 3 or C- Orange blower wire

Terminal 4 or D- Fused 16g POWER 12V wire- red

2-6069 2-Speed Rocker Switch connection instructions

Terminal 1- Yellow blower wire

Terminal 2- Fused 16g POWER 12V wire- red

Terminal 3- Orange blower wire

ELITE 2-Speed Rocker Switch connection instructions

Snap the 2-6069 Rocker Switch into the ELITE switch plate and locate a FLAT- suitable location to clear all four sides of the panel.

Mark the area on the panel or gunnel directly behind the switch and check for clearance on the back side-avoid cutting/drilling into wires, cables, etc. Using a 1.50" Hole Saw bit- drill the hole to clear the switch back. Place the panel over the cut-out and mark the mounting holes with a pencil, Pre-Drill and mount the panel using the screws provided.

Note- The 2-6069 Two-Speed switches can be wired to accept any two of the three speed wires on Terminal 1 and Terminal 3. Call Technical Service with any questions regarding mounting, wiring, etc.

Testing the Installation

Warning: Carbon Monoxide (CO) is emitted from the engine's exhaust. Do not run the engine without proper ventilation. Do not run the engine in a confined space or where back drafting may occur.

1. Test the fan motor on all settings.

Note- If the airflow does not correspond to the switch setting, the wires are not on the proper terminal. Refer to the wiring instructions and recheck the switch wiring.

2. Check all hot-air outlets to make sure there are no air restrictions.

3. Prepare to run the engine.

Warning – Keep hands, hair, loose clothing and tools away from all moving parts.

Caution- Make sure the water source is properly connected to the engine.

Raw-Water Cooled Engine

1. Run the engine and check for leaks at the hose barbs, hose connections, heater hose, and heater core.

Closed Cooled Engine

1. Refill engine-cooling system to the required level. Operate engine until normal operating temperature is reached.

2. Shut off the engine and check the heater core, hose connections, and all hoses for coolant leaks.

3. After engine has cooled, recheck the coolant level.

Note- On an, engine application it is necessary to increase the engine RPM to create effective hot water flow. Shop testing will not provide adequate water temperature or flow to test the maximum air temperature output. Most engine applications require a water test to achieve actual heater output.

Winterizing

Raw-Water Open Cooled Engine

The heater unit and hoses should be drained of water to prevent freeze damage. This can be done by removing the hoses at the engine and blowing the water out of the heater unit and hoses. An RV anti-freeze or water/anti-freeze solution can be added for extra protection and to prevent rust or corrosion.

Caution- Do not exceed 35 psi when blowing out the heater core.

Note- The wires should be routed away from moving parts, high heat sources such as engine exhaust manifolds and sharp edges or objects.

Freshwater Closed Cooling

It is not necessary to winterize as long as you are using a sufficient water/anti-freeze solution as needed for the climate conditions in your area.

Optional Equipment

H415 In-line Circulation Pump

1. Locate and mount the pump.

Note- Do not mount the pump into the bilge or any location where it may become submerged. The warranty for the pump will be void if, upon disassembly, we determine that the pump has been submerged in water for any length of time.

2. Cut the return water hose from the heater unit.

Note- The output hose is connected to the intake manifold or thermostat (most V-8 gasoline engines). The return is connected to the water pump or the large hose between the thermostat housing and the water pump (most V-8 gasoline engines).

3. Attach the hoses to the corresponding ports on the pump.

Note- Fasten the hose clamps near the end of the hose to prevent the hose end from "mushrooming" and to prevent coolant leakage.

4. Wire the pump to the switch or use 2-7061 Auxiliary Pump harness to power the pump and heater unit using standard four position switch. (The pump and switch should be protected with a 10-amp in-line fuse.) The pump wires should be routed with the factory wiring harness whenever possible.

Frequently Asked Questions

Why does my heater cool down when I'm idling?

Open cooling system- The majority of applications have an open cooling system. This means that there is no pressure in the system. The water pressure is created by the engines' circulation pump. The engine must be at 1200 to 1500 RPM to create enough pressure for the circulation pump to circulate water to the heater.

Location of the heater unit – In your automobile, the heater is located close behind and below the engine. This allows optimum circulation. In your boat, the heater may be above the level of the engine and may have a greater distance between the engine and heater unit.

In-line circulation pump – If your engine is normally operated at low RPM's it may be necessary to install an in-line circulation pump or low idle wye.

Does it matter which way the hoses hook up to the heater core outlets?

No, it does not. The water/coolant will flow through the core in either direction.

I have luke warm air coming out of the heater.

The hot water pressure will increase with engine RPM. This means on some applications the heater will cool down during periods of extended idling. If you operate your engine at low engine RPM's, it may be necessary to install an in-line circulation pump.

On an, engine application it is necessary to increase the engine RPM to create effective hot water flow. Shop testing will not provide adequate water temperature or flow to test the maximum air temperature output. Most engine applications require a water test to achieve actual heater output.

Hose routing – Check the routing of the hoses between the engine and heater unit for any kinks or restrictions.

In-line circulation pump – If your installation has more than 15 feet of hose between the unit and the engine or if the heater unit is mounted more than 18" above the level of the engine, it may be necessary to install an in-line circulation pump.

