

WAGGONER CRUISING GUIDE

SELECTING A DIESEL HEATING SYSTEM: Part 2

Like everything else on a boat, heating presents some challenges that can be difficult and expensive to overcome; available space for equipment and ducting, access to outside air, multiple cabins to heat. The old cliché that there's more than one way to skin a cat is spot on when it comes to marine diesel heaters. There are many different systems that can warm your cabin on a cool day or cold night. They range from the simple “drip-pot” bulkhead-mounted heaters pioneered by Scandinavian fishermen to the sophisticated, electronically controlled, multi-zone, hot-water systems.

In this installment we will discuss the different types of diesel heaters:

- Bulkhead
- Free Standing
- Galley Range
- Forced-air
- Hydronic

MORE POPULAR MARINE DIESEL HEATER MANUFACTURES:

- Dickinson Marine - <http://www.dickinsonmarine.com>
- Espar - <http://www.espar.com>
- ITR/Hurricane Heaters - <http://itrheat.com>
- Kabola - <http://kabilaheaters.nl/en/home-english>
- Wallas - <http://www.wallas.fi>
- Webasto - <http://marine.webasto.us>

BULKHEAD & FREE STANDING HEATERS

Bulkhead and Free Standing heaters are available in a number of sizes and styles. Dickinson and others make these units. These heaters have the advantage of no moving parts on their side. They're also economically priced. Depending on how they are installed, they may be rigged to operate without using any electricity at all. A “day tank” placed above the level of the heater will supply fuel without the need for a pump. If this isn't practical, a small electric fuel pump can be used to supply the heater. In either case, these heaters offer the greatest bang for the buck.

The drawback of this type of heater is that they're designed for smaller boats (30 to 40-feet) and their output is centralized to the compartment in which it is installed, usually the main salon. Leave this area and the cabin temperature can drop significantly. It's also suggested that they not be used when underway due to the potential for a back-draft which can blow soot and smoke into the cabin.

Perhaps the greatest challenge faced by this type of heater is installation of the flue or exhaust. Because the flame in these units is passive, there's typically no forced draft, which means they

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are especially sensitive to flue or chimney arrangements and back drafts. Many chimneys incorporate an elaborate anti-backdraft device. The device has to be strategically placed on deck so the heater's exhaust doesn't cause heat or soot damage to surrounding gear or structures.

Ensuring that the cabin is well ventilated will dramatically improve performance.

GALLEY RANGE

Perhaps one of the most innovative choices in the market is from a Finnish company called Wallas. While Wallas produces a range of products, they offer a diesel fueled cooktop for the galley, that doubles as a heating system. What makes this so innovative is that it can be operated in the closed position with a 12V blower to circulate the heat around the cabin.

Like the bulkhead and freestanding units, it too is designed for smaller boats and their output is centralized to the compartment in which it is installed.

FORCED-AIR HEATER

Forced-air heaters are popular because they offer an attractive combination of fast warm-up, thermostatic temperature control and reasonably quiet operation. Webasto, Espar, and Wallas are probably the best known forced-air heaters on the market. These compact units are sophisticated and reliable. They work much like the heating system used in many homes. Air is drawn in, then passed through a chamber or heat exchanger that is heated, in this case with a forced-draft diesel-fired flame, (this is what gives these systems that turbine or "jet engine" sound). Once the air is heated, it's then distributed throughout the boat using ducts that are typically 4 to 5-inches in diameter, making for a true central heating system. These ducts can be directed into each cabin.

These systems, unlike the previously discussed heaters, are not designed to operate continuously; they cycle on and off using an electronically controlled central thermostat, and they may be operated at varying output levels. While this is especially convenient, providing heat very much like that found in homes, it usually cannot be zoned. Therefore, while these systems typically work very well, the temperature in the salon and galley, where the thermostat is located, may vary widely from that in the staterooms or head.

Additionally, running 4- or 5-inch ducts throughout a boat may be challenging and take up valuable storage space. Directional registers are typically installed at the terminus of each run, providing directable, warm blown air at each location.

One drawback to consider is the length of the run through which you're trying to push the warm air. With only one air pump, the amount of heated air that reaches the far end of the boat is drastically reduced.

HYDRONIC HEATING

Although more expensive than forced-air, hydronic heating is the most efficient operating and versatile system, thereby making better use of the diesel fuel and the preferred system for live-aboards and extended cruising. The system uses a diesel-fired furnace to heat a water and antifreeze solution that is then pumped throughout the boat through hoses, usually on larger than one inch in diameter. These hoses are arranged throughout the vessel in series. This method is a more efficient way to transfer heat from the furnace to the terminus without heat loss, thereby requiring the furnace to cycle less. Also, the fluid in the system retains heat so the furnace doesn't need to fire-up every time there is a demand for cabin heat. Because of the hydronic

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heaters efficiency, it doesn't require servicing as often, another plus for live-a-boards and extended cruising.

The fluid circulates through the entire run before returning to the furnace. The source of heat at each selected location is a fan-assisted "radiator." The radiator is enclosed in a small box, usually smaller than a shoe box, through which the hot water is passed. Within the box is a small heater core, similar to those found in automobiles, over which air is blown using a low amperage electric fan. One or more short ducts are attached to the box and are then "plumbed" to a nearby cabin bulkhead. A thermostat installed in the system prevents the fans from turning on and blowing cold air, eliminating that initial blast of cold air. The heat available from or produced by each fan unit is approximately 7,000 to 10,000 Btu, roughly the same of as a 1,500-watt electric space heater. For areas that don't require the output of a full unit, the output may be split, one duct running to the head, for instance, and the other to an engine compartment.

Finally, although hydronic systems tend to be slightly more complex than forced-air systems and considerably more complex than bulkhead and range heaters they do possess a number of advantages over other systems. They can be easily zoned: a thermostat can be installed in each cabin if desired. The systems may also be integrated with the vessel's domestic water system, providing an almost limitless supply of instant hot water, allowing hot water to be produced virtually silently because it does not require that the engine or generator be started and doesn't drain the house batteries via the use of an inverter. A hydronic system may also be used to preheat an engine or keep it warm, eliminating those cold startups. If you opt for this capability, use a heat exchanger, which avoids the need to intermingle engine coolant and pressure with the heating system.

Many novel things can be done, such as changing the section of the heater hose to copper tubing and then passing it through the foul weather gear locker so it's heated at a low level when the heater is running.

The downside to a hydronic system is that there is a delay between turning the heater on and receiving hot air because of the additional time it takes to heat the water and circulate it to the head exchangers. They're also a more expensive option than forced-air systems.

On our boat *Easy Goin'*, we installed a Webasto Thermo 90ST hydronic system, which provides more than enough heat at maximum output, and it has served us well for the past twelve years. We ran the heater hose through the forward berth lock and under the berth before terminating it in the forward stateroom with a second zone thermostat. Not only does this keep the stateroom comfortable but warms the locker and clothes in it but also supplies a low level heat source under the berth to fend off mildew, a problem common in boats. We also plumbed the system through the hot water tank to take advantage of the instant hot water aspect.

We have friends that when their boat was being built, the floors in the two heads were plumbed to heat the floor. On the chilly mornings in Alaska the warm floor is especially nice.

~ Deane Hislop

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