

Moving the hot air heating

Old Situation

The Barkas 1100, which we bought at the end of 2020, had its hot air / diesel heater of the brand "Eberspächer" type "Le Grand" mounted against the stern in the back of the ship.

The air heated there, was carried through a long pipe through the engine room, and the tank room in front of it, to the salon.

Disadvantage

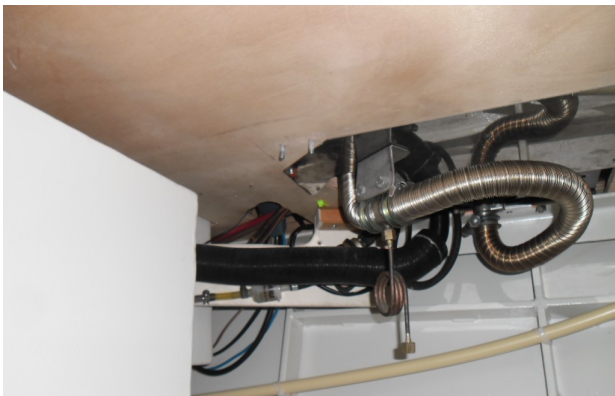
The placement of a heater at this distance from the living area causes a substantial heat loss and extra air resistance. In addition, to determine whether the heater should run at full power or slowly, this heater measures the difference in temperature between the input and output. In our case, the temperature difference always remained high and the heater therefore continued to run at the maximum (noisy) speed.

New location

It was decided to place the stove under the counter, in the salon. The air to be heated is sucked in from the salon via a cupboard. The stove is also at floor level and can now directly blow the heated air into the existing duct. The pipe through, which the heated air flows to the salon, now only has one right-angled bend and is 5 meters shorter.

Support

The heater is mounted on an L-shaped metal support. After removing part of the wooden floor, the support was secured on a longitudinal steel floor beam. The vertical part of the "L" is, with a newly made steel support, attached to a hull frame. The stove is therefore attached directly to the steel with bolts, without wood in between.



Combustion air and fuel

At the bottom of the stove, the combustion air is sucked in from near the air intake of the engine room (photo: black pipe) The combustion gases exhaust (r.v.s.) runs from the bottom, with a bend first to deck level and then directly underneath the steel rubbing stroke to the outside. The fuel is also supplied from the bottom. (Copper tubing and in-line filter and pump)



In order to be able to secure the black pipe and the oil pipe with pump and filter, a vertical wooden support against the underside of the floor is made. The pump is mounted with rubber to dampen the ticking sound it produces while running.



The required diesel fuel is drained from the first fuel filter in the engine room. The tubing runs along the bulkhead (which is also part of the fuel tank) to the spacious passage on the Port side. Because I don't want to drill in the fuel tank to secure the pipe, nor like to weld on it at this stage, a long support of stainless steel was first placed. The support is bolted on at the Port side, near the passage where there is no tank. In two other places, the support is attached to two wooden supports that are fixed with screws to the ceiling and glued to the tank / bulkhead with sealant. (photo: On the same support there is also a sensor to keep an eye on the MK temperature) At a later date the level of the tubing is raised near the opening to get rid of air bubbles easier. Also the fuel pump is now placed in the engine compartment.

Size

The work for such a relocation is quite drastic. In addition to removing wood and insulation, not only the fuel line, but also many cables have been moved. Also making the hole in the hull for the exhaust, with the corresponding masking of the insulation and the very meticulous collection and suction of steel particles, is very time-consuming. The small workspace, which you have to share with your tools and vacuum cleaner, does not make this a job for large people! Placing the heater at the right spot while building the boat would have saved many hours of work.



Fitting and measuring during work. The cables have been diverted via a different route. Only the copper hydraulic pipes are currently running in front of the stove foundation.
(The temporarily yellow/green taped sink drain is now on a suitable hose pillar)

Cooling of the heater room and air supply

The stove is in a fairly small space behind the kitchen cabinets. To prevent that this area gets too hot, I let the air in through the middle kitchen cabinet and run it through the stove room. On the supply side of the stove there is therefore only an upward-facing elbow piece and upward facing pipe instead of a direct pipe to the salon. This way, the air in the stove room is flushed with cooler air from the salon.



With the drawer above the middle cabinet open, the stove recirculates the air of the salon.



For control purposes, there is a temperature transmitter above the heater, in close proximity to the combustion gases exhaust.
In the salon there is also a smoke detector and a CO detector.
photo in January with heater off - the external sensor (red arrow) sits at the exhaust.

Result

There is now less heat loss and the heater runs in a quieter mode after some time. The fuel pump was audible with a ticking sound. In terms of noise level, this does not exceed a normal playing radio. In the updated situation, with the pump in the engine room, it isn't audible any more.

Updates: The temperature measurement has been replaced by a temperature sensor with a relay that controls a buzzer. The buzzer sounds when the temperature reaches 50°. Also the air to the heater is extracted from the top near the exhaust. This keeps the temperature approx. 15° lower and improves the efficiency of the heating system.



*Sensor above black pipe
Black pipe: Intake heater
Shiny tubing: Exhaust
(Note that the exhaust should be gas tight)*

Stove choice dilemma

This type of heater produces more noise due to the ventilation system and the fuel pump than a freestanding pot stove.

In addition to fuel, they also use electricity for the fan and fuel pump.

The advantage of this stove is that it is not in the way, it is easy to turn on and quickly produces a stream of warm air.

These heaters are therefore very practical for short-term use to, for example, to heat up the boat for a few hours in the morning or evening.

You can also place the heater above fuel level as the pump is able to suck somewhat.

For long-term use, for example, if you want to live on board in the winter, I might prefer a freestanding heater (Reflex type), which is quietly burning and doesn't use electricity.

The disadvantage of this heater type is the way of starting (lighting with a match) and more space is taken up. For the greatest efficiency, such a heater should actually be in the middle of the living space.

In addition, there is a level issue: Do you put it on salon or sleeping room level and are you going to make a separate fuel tank above the level of the (gravity-fed) heater regulator?

Also, the chimney, which usually comes through the deck with this type of stove, may possibly come into conflict with a winter tarp.