

Assembly and Running Instruction for Steam engine

Alex vertical/horizontal

Order-No. 22300/22301



Victor vertical/horizontal

Order-No. 22302/22303



Summary of this instruction book:

1. What else you need?
2. Technical Basics
3. Installation in your ship model
4. Assembly of each component
5. Filling of all components
6. Start of operation
7. Sailing on the water
8. After run and maintenance

Congratulations for purchasing this high quality steam plant. With this product you have done a really good choice. The steam engine Victor is able to run ship models up to 15 kg weight, Alex up to 10 kg without any problem. You have full steering possibilities forward and reverse and sliding speed up and down. You will see: there is nothing nicer then sailing a ship model with live steam.

1. What else you need?



For Installation and running of this steam engine in your ship model you will need following items:

For Running

- Gas tank (Order No. 22312)
- Gas cartridge Propane/Butane with valve (Order-Nr. 60105)
- Gas fill adapter, (Order No. 22316)
- Steam oil, (Order No. 60100)
- Fuel bottle for filling the water (Order No. 802054)
- Distilled water

For Installation

- Varnish for the boiler planking (Order No. 80121 Spray matt)
- Superglue thin (Order No. 80491)
- screw locking (Order No. 80474)
- Coupling for shaft (Order No. 63704 for 4 mm shaft,
Order No. 63705 for 5 mm shaft)

Screws for fixing the steam plant on the wooden base

2. Technical Basics

If you know the use of steam engines you can go directly to the next chapter.

This steam plant contains several components, which all together help your ship model run efficiently, powerful, clean and good to its surrounding. The piston engine helps to make a powerful turn to your shaft of the ship via a coupling (accessory) which combines engine and prop shaft. This is an oscillating two cylinder engine which can be easily regulated forward, reverse, stop as well as sliding speed slower or faster in each direction by one lever on top of the engine. This lever should be combined to the servo of your radio control.

The steam which is moving these pistons up and down is supplied by the boiler. In the line between boiler and engine there is also a lubricator placed, which supplies steadily some drops of steam oil into the steam, that the pistons of the engine are always well lubricated.

The exceeding steam, which comes out of the engine, will be leaded into the condenser tank, where a rest mix of oil and water will remain. The very last dry steam will be leaded from the condenser tank to the funnel

For supplying steam the boiler has to be filled with water and heated up with fire. This will be done by a very high efficient gas burner underneath or inside the boiler. The gas will come from a gas tank. With a hand valve on top of the gas tank the amount of gas and so the fire can be adjusted.

Now each component of your steam engine is shortly explained. So we can go on with installation, running and other details regarding your engine.

3. Installation in your ship model

Generally we recommend making first running tests on a wooden board outside of your ship model. But at this stage we want to explain some details which have to be done when installing the engine in your model, as some points should be prepared at an early stage of the building of your boat.

Installation of your steam plant in the model is not difficult. Engine and boiler are fixed on a massive brass plate. For this base you should have a wooden base plate on the bottom of your hull glued in. Before finishing this, you should measure the height from this bottom plate up to the centre of the prop shaft to reach as good as possible the same height (or higher) as the engine (13 mm). Smaller adjustments of the base plate can be done later with ply wood or some strip wood pieces underneath. The engine should be well screwed down to the wooden base, that nothing can move in case of vibration.

For combining the engine shaft and prop shaft you should use a coupling (mostly Order No. 63704, not included). The diameter of the engine shaft is 4 mm, mostly also the prop shaft. Please make the correct choice of coupling.

Please check also the length of the coupling, which can influence the position of the engine. If you want you can also place the engine angled parallel to the prop shaft. In that case you should place some distance pieces underneath the front of the engine only. The boiler should always stand vertical to the waterline.

If your model has a superstructure over the engine the boiler must stand at a place, where the funnel will match the funnel of the model. Also often the superstructure needs to be insulated. Please check well that the burner can get enough oxygen. The easiest way to do so, is to leave all windows, hatches and openings open to let air into the inside of the model. This is a very important point which can strongly influence the burning of the flame or the power of your engine.

The condenser tank can be placed at nearly any place you want. Short lines will help always let the engine run effectively.

For the installation of the gas tank you should permit two important points:

1. The filling of the gas tank should be done best and safest outside the model, because gas could be collected at the bottom inside your hull and could produce a detonation when lighting the burner. For this reason the gas tank should be easily taken out. Also the nut to fix the gas tube to the gas tank should be easily reached with a spanner. The gas tank always needs to be installed in upright position that never fluid gas can come to the burner.
2. Furthermore the gas tank should be placed nearest to the boiler, because when spending gas it cools down strongly and the gas pressure will go down and the fire will reduce. If the gas tank gets some heat from the boiler, it can hold the gas pressure and the flame remains well.

These were the most important basics of the installation of the steam plant in your ship model. Please remember that when trimming your model the boiler and gas tank should be filled up.

4. Assembly of each component

The steam plant contains following accessories:

- 3 boiler bands with screws and nuts
- Wooden strips for the boiler planking
- One gas tube thin with soldered ends and nuts
- One steam tube thick with one soldered end
- 1 end for steam tube
- 2 nuts for steam tube
- 1 condenser tank
- 1 piece of silicon tube
- 1 funnel with steam tube

Fixing of the wood planking

The planking strips are cut to the correct length. They should be sanded now at their edges and painted with varnish. Tip: fit the strips on a piece of adhesive tape, which has been fixed before to a piece of wood with gluing side up. The down side of the strip should not be varnished as it has direct contact to the hot boiler. Then you can varnish all strips together with clear spray dope (e.g. Order No. 80121 Lord Nelson Klarlack).

When dry you can glue the strips step by step onto the boiler with 2 small drops of thin super glue (Order No. 80491 Ruck-Zuck) vertically. Please check that the strips are always vertical, as otherwise your boiler will look leaning. Cut out the strips at all boiler exits and glue.

After that you can fix the boiler bands with supplied nuts and bolts.

Connection of the condenser to the engine



The condenser tank will be connected by the thicker tube to the engine. For this there is a free thread at the vertical base of the engine. Connect here the soldered end of the tube with a nut. Now the tube needs to be shortened and angled, depending where the condenser should be placed in your model. Always bend an angle only around a piece of dowel of minimum 12 mm diameter and never free in your hands, as this can cause a buckling, which would reduce the cross section of the tube and will cause smaller exit or cut.

After cutting the tube, slide a nut and the small loose end over it and screw it to the thread on the condenser tank. At this place the connection does not need to be soldered as there is no pressure on the tube.

Connecting the gas tank to the burner



The tube of the burner looks out under the boiler at the front side. Connect the thin gas tube with two nuts to this thread. For tightening of the thread please use thread lock (Order No. 80474). Before that the tube must be bent to the gas tank fitting. If the tube is too long you can bend the tube like a coil around a round material of minimum 20 mm diameter. The longer tube helps that the boiler will not receive fluid gas.

Please bend also other curves only around a dowel. Copper tube becomes hard during bending. If you like to bend back, you need to heat it up until red glowing to make it soft again. So please think about every bend carefully. At the end screw the tube to

the gas tank.

5. Filling of all components

Before each run there must be filled up 3 components and one should be emptied:

a. Water into the boiler



For producing steam you need water. That the water will not calcify your boiler, you should use distilled water only, which should be combined with 3-5% normal water to make it less aggressive. You can also use filtered rain water or water from the condenser of your tumble dryer.

Open the nut at the top of the boiler and fill the water with a special fuel bottle into the boiler. The maximum water level should be just under the end of the upper brass fitting of the water gauge. Never fill in more water, so the boiler has some space to produce real steam. Otherwise water will be pressed through the engine and the safety valve.

b. Steam oil into the lubricator



Before oil can be filled into the lubricator, the condensed water of the former running inside the lubricator has to be let out. For this reason open both screws of the lubricator and put some paper towel underneath. Now some drops of condensed water will come out. Now you can fill up the lubricator with special steam oil (Order No. 60100). Close the lower nut when oil is intending to come out at the bottom.

During the running in process the hand wheel should be opened about 2 turns. After running in process of about 10 boilers the hand wheel can be closed to about one

turn open.

You can place a little amount of cotton wool into the oil cups at the bottom of the engine base. Then the oil will not be soaked so fast out of the cup. Fill up with steam oil or clean machine oil.

c. Gas filling



Safety Instruction, please read necessarily:

Please consider there is no open flame around in minimum 2 meter distance. Smoking is strictly forbidden if there is any use of gas. If the gas tank is installed inside the ship model you have to tract attention that as few gas as possible is leaking out when filling. Gas is heavier then air and it will drop down to the floor of the hull. When lighting your burner this can cause a small detonation which could influence your health or can damage your model. Because of these reasons it is strongly recommended to take the gas tank out of your model for filling or blow out your hull with air strongly after the filling process and wait some time before lighting the burner.

If the gas tank is still warm after the run of your engine, it is nearly impossible to fill it up at once. Please let it cool down first.

General characteristics of gas:

Butane and Propane are highly sensitive but nontoxic hydrocarbon compounds. As they are heavier than air they don't evaporate fast, but concentrate somewhere at the bottom. Therefore the filling should be done outside.

Butane gas has got a boiling temperature of -0.5°C , Propan of -42°C . To stock these gases compact and fluid we have to bring them under pressure into bottles or tanks. At the physical transfer from fluid into gaseous condition it deprives Energy from its surrounding. The Follow is the cooling down or icing of the gas tank.

Because of this reason the gas tank should be installed in short distance to the boiler to avoid icing of the gas tank. The follow of this can be that the gas tank becomes warmer when becoming emptier. So it will need a correction of the regulation valve. During the first running you will learn very fast how the burner will need to be regulated.

Which gas should be used?

For gas burners in model steam engines there is only used a mixture of 65-70% butane und 30-35% propane. So you can buy gas cartridges of companies like Rothenberger, CFH, Coleman, Camping Gas and many others. For the use with our gas fill adapter (Order No. 22316) the cartridges need a valve and thread on top. Cartridges, which are grooved in by a burner system are useless.

Screw the adapter (Order No. 22316) on your gas cartridge. For filling the cartridge will be placed upside down onto the valve on the gas tank. Now the gas is flowing in liquid condition into the gas tank.

When is the gas tank full?

To check if the gas tank is full, press the pin of the inlet valve down with your finger nail. If fluid gas is coming out the gas tank is full. If not, go on filling.

6. Start of Operation

After all necessary preparations have been done the engine now can be started. First the gas valve will be opened very shortly to check whether fluid or gas comes out of the jet. If fluid gas comes out, you will hear a spitting at the gas jet. The follow would be an uncontrolled fire at the funnel top. If the burner makes a constant quiet noise, it burns ok.

Then a ignited lighter can be hold to the funnel top and the gas valve can be opened carefully. The gas will be lighted and the flame moves back to the burner.

If the burner does not light or the flame is not stable you can move the pipe clip which is fixed over the air intake holes at the burner tube. Normally the air intake holes have to be made smaller. Let the boiler become warm first with a smaller flame. After half a minute you can open the gas to a higher level. After about 3 minutes the pressure gauge should show about 2 to 3 bar (30 to 45 psi) pressure. Now you can open the steam valve at the boiler. It only needs short time until the cold condensate is pressed out of the cylinders and the cylinders are warmed up. Then the engine will start running itself. You can ease this start by moving the forward-reverse regulator back and forth. Turning the flywheel for start is not recommended.

After the engine has started to run powerful you should check if the condenser is empty. For this the plug on the end of the drain hose of the condenser must be opened and the tube to the funnel must be pressed with pliers. So the running engine will press the condensate and oil out of the condenser. Place the end of the drain hose into an adequate container.

Now your engine is ready for sailing.

7. Sailing on the water

Sailing of your steam boat on the water will now be the easiest stage. During the test of your engine you have realized how the engine is controlled forward and back. During the sailing you should check consistently following points:

- is the burner still alight? (Hold your hand over the funnel and watch the noise)
- is the pressure ok? (Watch pressure gauge and turn gas higher or lower)
- does the engine run free and quiet?
- does the condenser tube at the funnel spit water or dry steam? (Possibly the condenser is not empty)

The more you work with your engine, the more you will see outside on the water whether your engine is running correct or you have to adjust something. Only at the beginning you should be more careful that your engine will not stop outside on the water.

8. After Run and Maintenance

When sailing is finished, please check, if there is a rest of pressure on the boiler. This you can use to empty the condenser before cooling down the engine.

As long as the engine is warm, it is easier to clean it with a tissue from oil, so your engine looks clean and bright. When the boiler cools down, there develops a vacuum inside the boiler, which causes a suction of water and oil out of the steam tube and lubricator. As we don't want oil in the boiler, we should open a plug on the boiler, as soon as there is no more pressure on it to avoid this suction.

**We wish you a lot fun and always happy sailing.
Krick-Modelltechnik**



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Boiler Test Certificate

We certify that this boiler has been hydraulically tested to a pressure of 90 psi (6 bar)

Construction: Brass Tube CuZn37,
Silver Solder AgZnCuCd42

Water capacity: less than 1 Liter

Working pressure: 45 psi (3 bar)

The producer guarantees, that all boilers out of the production are produced and tested according to the above dates. This certificate states that this boiler has satisfactorily passed a hydraulic test. It is not a certificate of or for insurance cover.

Matthias Krick
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