bubble PRODUCTS

O.C.I. SHIPS VALVE ISSUE 2 ©

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1. INTRODUCTION

The O.C.I. ships valve is one of three different types of valves fitted to Bubble stoves.

It is a special oil control valve designed as its name implies for use on ships.

The main criteria for ships valves are that they don't spill oil out should the vessel rock and roll.

To do this the valve is designed with a low oil content chamber and a semi sealed top plate.

2. SAFETY

Should oil splash about inside the valve there is a central standpipe to allow splashing oil to overflow out of the valve via a ¼ inch B.S.P. outlet.

Obviously this outlet should be connected to a suitable catchment vessel located below and at a safe distance from the burner.

The catchment vessel should be vented and spill proof.

The valve also uses a special hollow, centrally mounted float to minimise the effects of splashing oil on it.

Because the valve can be used in a situation where the contents can be splashing around, normal safety cut off systems would not be suitable and so the overflow standpipe is used to accommodate excess oil.

Because the valve has to have an oil tight top plate it would be difficult to use a tracer pin and aqua stat therefore no automatic control is available on the valve.

Its primary job is to control the flow of oil into the appliance and it does this as follows.

Ships valves should always have an isolation valve near by.

The isolation valve should always be turned off when the valve is turned off.

The on off switch is the plastic oil flow control knob shown in fig 1.

When this switch is turned on oil is allowed to flow into the float chamber to a predetermined level.

When this level is reached the action of the rising float closes off the oil supply via a rubber tipped, mechanical lever actuated needle valve.

Oil is allowed to leave the valve through the metering stem, (FIG 5) which is a hollow piston in a cylinder, with a precise slot machined into its vertical side.

The hollow piston is normally called the **metering stem. FIG 5**

The cylinder (SEE IN FIG 5) in which the piston is housed has a hole drilled into the side of it and the oil level is set so as to allow oil to rise up and be exposed to the side of the cylinder via the cross drilled hole.

When the oil flow control knob (FIG 1) is rotated this rotational movement allows the piston to rise up in the cylinder and expose the slot to the oil.

The piston is sprung loaded against a rotary cam, as the knob is rotated the cam allows the sprung loaded piston to rise up in the cylinder allowing more of the machined slot to be exposed to the oil, this vertical movement of the piston allows more or less oil to flow through it depending upon its position.

3. PROBLEMS

The pressure of oil applied to the metering stem in these valves is miniscule as the head is only millimetres.

The precision machined slot in the metering stem is extremely small and coupled with the fact that the pressure applied to it is so low, it is not hard to understand that sometimes oil is reluctant to flow through it because of the back pressure created by the meniscus effect on the slot.

It is sometimes necessary to turn the valve on to full flow and tap the valve body to try and break the meniscus lock on the metering stem.

4. WATER CONTAMINATION.

If water contaminated fuel is used it will obviously build up in the float chamber of the valve and eventually cause a problem.

Drain the valve off via the filter in FIG 4

5. DIRT IN OIL.

If dirt contaminated fuel is used it will obviously build up in the float chamber filter of the valve and eventually cause a problem.

Remove the filter and clean it out. FIG 3 – 4.

6. LET BY

All valves can suffer let by which is generally caused by dirt on the seat.

Let by will be evident by the burner not extinguishing when the valve is turned off.

The burner will hold a small dirty flame in the oil inlet pipe to the pot, which will not go out and cause a heavy carbon build up.

7. CALIBRATION

O.C.I. Valves are calibrated at the factory.

They are set up to the requirement of the burner and measured by high fire flow rate and low fire flow rate.

Generally valves are calibrated for two types of fuel

Which are normally kerosene or diesel, which have a different viscosity

Kerosene is 1.8 cm3/min (Viscosity)

Diesel is 4.0 cm3/min. (Viscosity)

The rating details FIG 4 on the valve will have details relevant to the type of oil and the flow rate in ccs per minute.

An example would be say 4 and 13 x 4.0.

8. ADJUSTMENT

The valve has been flow rated before leaving the factory and it should not need adjusting, if it does proceed as follows-:

Turn the appliance on and light it.

When the burner has established good blue flame combustion turn it up to half output. (Setting 3 on the fuel flow control knob) and let it stabilize.

Allow at least half an hour for the chimney to warm up thoroughly before making any adjustments to the high or low fire screws.

Turn the stove down onto minimum firing rate and let it stabilize.

After stabilization there should be a dull red glow in the bottom of the lower catalyser with wispy blue flames flicking in to the glowing edge of it.

If the flame falls into a dirty rolling yellow flame and the lower catalyser is not dull red then the low fire will need to be increased until it can support the required blue flame combustion.

LOW FIRE ADJUSTMENT

Before adjusting the low fire remove the plastic cap which is held in place by a single fastener as detailed in FIG 1

To increase the low fire oil flow, screw the adjusting screw out by quarter turn increments. FIG2

When you are happy with the low fire, set the high fire. FIG 3

HIGH FIRE ADJUSTMENT.

Turn the oil flow control knob up to setting 4, (FIG 1) let the flame stabilize, and look at it, if it is stable and blue, turn it up slowly using the control knob, letting it stabilize after each movement, if the flame starts to go yellow with long flame combustion, it is running fuel rich and the high fire screw needs adjusting to reduce the flow of oil. (Screw the adjuster screw in to reduce the high fire oil flow.)

Before adjusting the high fire screw, (FIG 3) turn the flame down with the oil flow control knob and let it stabilize in blue flame combustion, adjust the high fire screw by half a turn in and try turning the fuel flow up, if it is still fuel rich repeat the process until the hire fire flame is running blue with flicks of yellow in the tips.

If the burner does not run well check that the seals in the stove are good and that there is no ingress of air into the appliance flue ways.

Seals in stove mean:

The pot to closure plate seal

The door seal

Check that the correct fuel oil is being used.

Always refer to the oil stove makers notes on chimney vacuum.

9. THERMOSTATIC CONTROL

There is no built in thermostatic control on O.C.I. ship valves.

Servicing mainly consists of a strip down and clean.

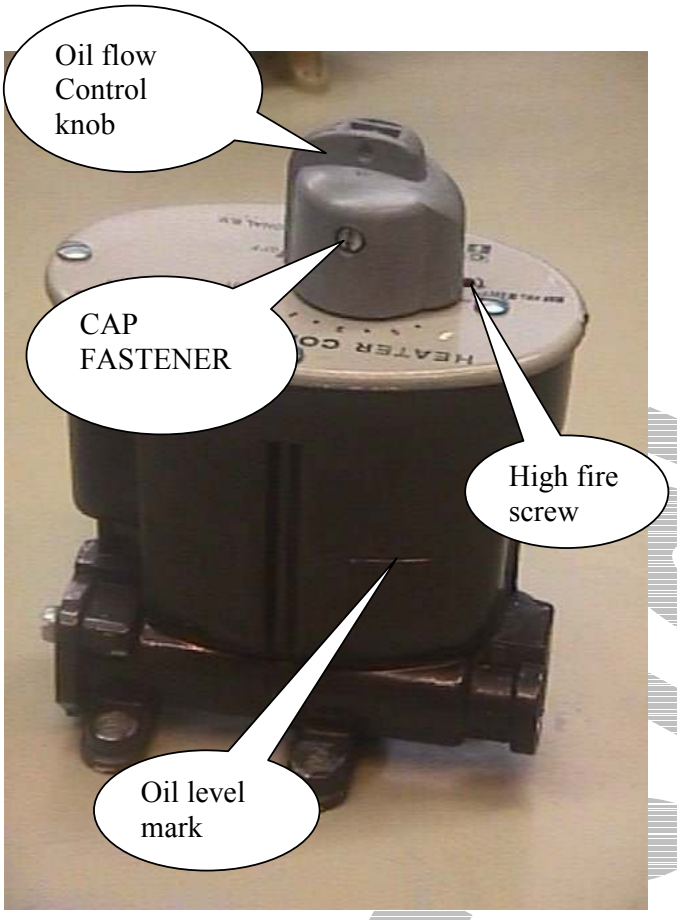

FIG 1 HIGH FIRE SCREW

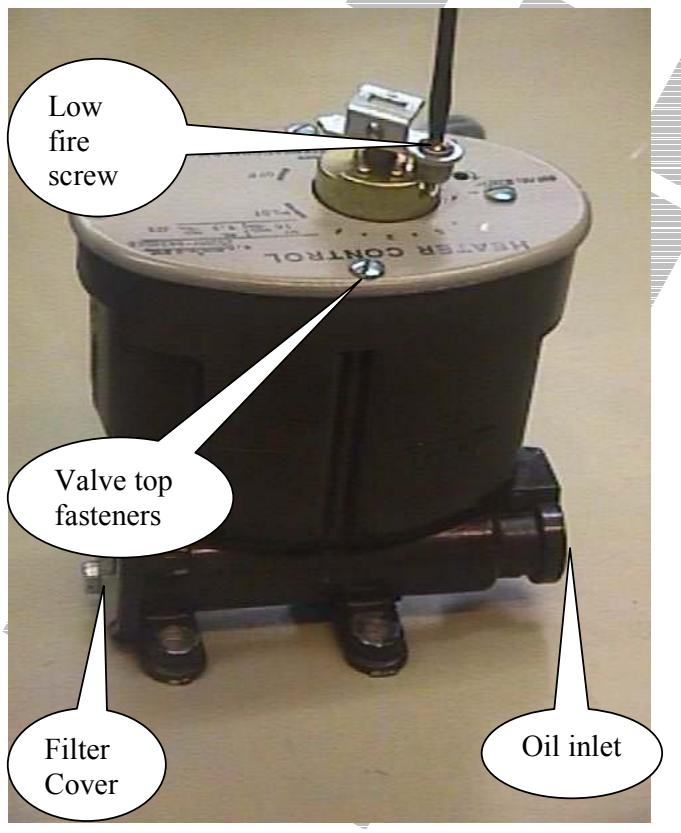

FIG 2 LOW FIRE SCREW

FIG 3 FILTER COVER

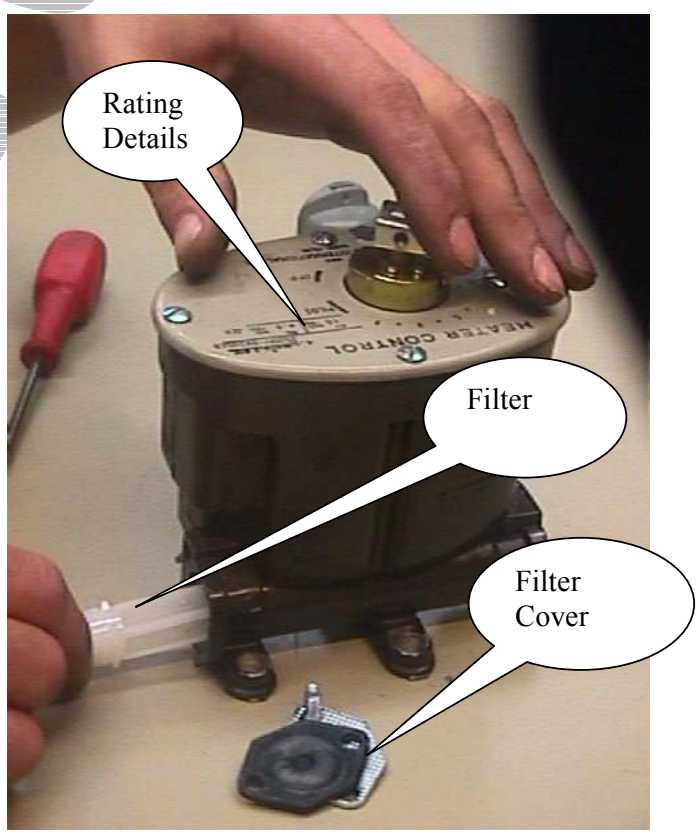

FIG 4 REMOVE FILTER

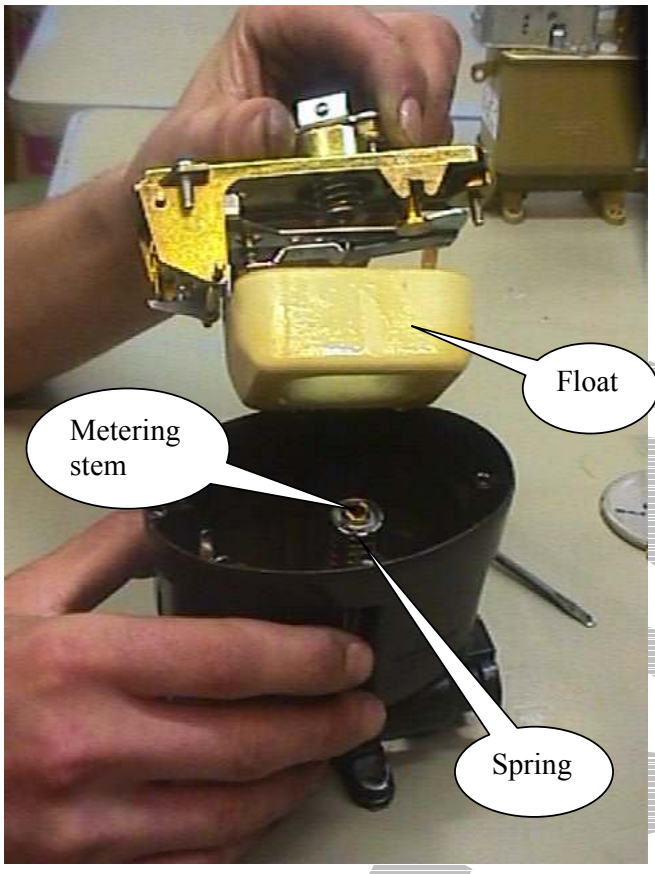

FIG 5 REMOVE FLOAT MECHANISM SCREW

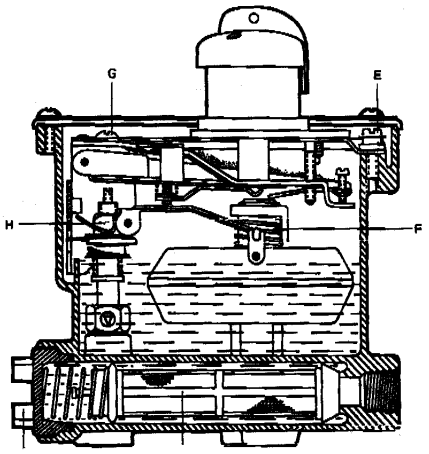

FIG 6

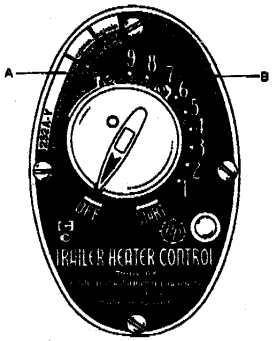

FIG 7

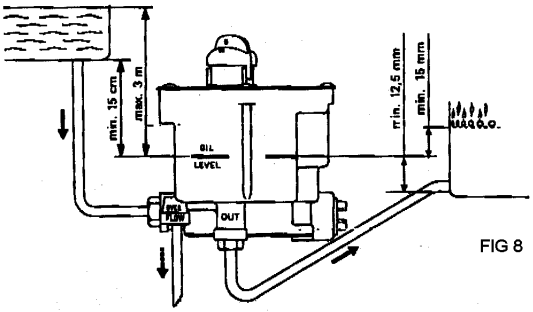

FIG 8