

INTRODUCTION

Thank you for purchasing one of our products. Whether you make your living from the sea or simply choose to sail or cruise upon it, you have joined the growing worldwide fraternity of "Dickinson" users.

Although our products are not complicated, there are a number of fundamental principles involved in their operation which must be clearly understood in order to maximize their performance.

I therefore urge you to read this manual carefully prior to installing and operating your stove. Please do not rely on second-hand advice.

Our company has grown at a very rapid rate over the past several years and we no longer have the close personal contact with our customers which we once had. However, our philosophy has not changed. Every "Dickinson" owner is our most important customer. For this reason, wherever you are in the world, I welcome either your constructive criticism or your compliments. Please feel free to write to me directly.

Welcome to the Dickinson world of Cruising comfort.


D. J. Bain,
President

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PRINCIPLES OF OPERATION

This heater is equipped with a Dickinson "R" burner designed to burn diesel oil vapour by natural draft. Oil metering valves to burn stove oil (diesel No 1) or kerosene (paraffin) are also available.

The principles involved have remained unchanged for nearly forty years, although modifications to improve efficiency and performance have been made. A vapourizing oil burner, as its name implies, is designed to transform raw oil from its natural state (i.e. liquid) to a vapourous state and then burn the vapour. When this transformation is accomplished properly a clean burning, efficient flame results.

In the Dickinson "R" oil is contained in the centre vertical tube. Priming fluid is burned in the bottom of the burner and the fuel inside the tube vapourizes at a temperature of 465 degrees F. The vapour expands and is pushed into the burner by means of the "R" downtube and efficient combustion results. This minimum temperature of 465 degrees must be maintained if the heater is to continue to burn efficiently.

To create efficient combustion three factors must be in balanced proportion.

- (a) Draft - Volume of air rising through the flue stack.
- (b) Oxygen - Fresh air.
- (c) Oil - Input in proportion to the availability of (a) and (b).

(See Section IV OPERATION)

WARNING - DO NOT OPERATE THIS HEATER UNATTENDED

I - INSTALLATION

Location

The heater is normally mounted on a bulkhead, as low as possible in order to obtain the best results from the radiant heat. Consideration should be given to such aspects as flue stack position, fuel supply and the availability of fresh air for combustion.

Caution - The heater should not be located in any area where gasoline vapour is present.

In all boats, other than sailboats, the heel and pitch will not effect the flow of oil from the oil metering valve or the burning characteristics.

NOTE: As oil is gravity fed from the oil metering valve into the burner the location of the heater in a sailboat is important to ensure that the position of the valve in relation to the burner is such that it allows for continuous operation of the heater under heel.

The heater is designed to operate mounted on the bulkhead of your sailboat facing the bow or the stern. IF MOUNTED IN A FORE AND AFT POSITION, WITH THE FRONT OF THE HEATER FACING PORT OR STARBOARD, the oil metering valve will require to be RE-LOCATED ON THE LEFT OR RIGHT SIDE OF THE HEATER. A SPECIAL VALVE MOUNTING BRACKET and RE-LOCATION INSTRUCTIONS are available from your Dealer or Dickinson Marine.

Area Preparation and Securing

Using the four wood screws and 1/2" spacers provided the heater can be hung by means of the key-hole slots in the back panel. The air space provided by the spacers will provide sufficient insulation directly behind the heater.

Note - The FLUE STACK will become HOT and it is advisable to protect all vulnerable surfaces directly behind. This can be achieved by lining the area with hard rock asbestos or similar insulation and covering with stainless steel or brass to provide a pleasing finish.

During medium to high fire operation a considerable amount of heat is reflected to the sides and downwards. Care should be taken not to locate the heater within 2' ins. of surfaces that may be effected by this heat.

Deck Iron

The deck iron should be fitted as directly above the heater as possible. Ideally it should allow the flue cap, when installed externally, to be clear of any deck obstruction that may effect the natural draft operation of the heater.

Cut a hole the diameter of the deck iron flange in the cabin top or deck. If the cabin top or deck is not flat a shaped wooden block can be fitted to ensure that the deck iron is horizontal and the above deck flue stack vertical. The cut hole should be insulated prior to installation to eliminate the possibility of scorching. The deck iron should be bedded with sealant to prevent leakage. A dress ring can be installed on the inside to provide a neat finish.

Flue Pipe

The flue pipe should slip over the flue collar on the heater and into the deck iron.

Note - The longer and straighter the flue pipe the better the natural draft operation. Also it is recommended that an above deck extension be installed of at least 12" to assist in avoiding above deck air turbulence in windy conditions or when underway. (See Section Combustion Air)

Flue Cap

The purpose of the cap is to prevent rainwater from entering the flue and to allow the hot products of combustion to escape unrestricted. The cap should be slipped over the end of the flue pipe and secured with sheet metal screws.

II FUEL SUPPLY

Method

There are two methods of supplying fuel to the heater

- 1) Gravity from a storage tank situated at least 12" (30cm) above the oil metering valve.
- 2) Impulse pressure pump direct from the main fuel tank.

1) Gravity

This is the recommended and most common method as no electrical power is needed and there can be no mechanical breakdown.

The capacity of the tank is normally 3/5 gallons depending on the space available and the fuel consumption of the heater. (See Fuel Consumption) The tank should be installed to provide a head of fuel at least 12" (30cm) above the oil metering valve. A head in excess of 15 ft (4.5m) will require the installation of a 3 p.s.i. pressure regulator.

Note - It is essential that the gravity feed tank be adequately ventilated.

The tank can be filled :

- (a) Manually - the tank filler should be located externally or in such a position to ensure that any oil spill is not adjacent to the heater.
- (b) By hand or electrically operated fuel pump from the main tank - A hand operated "wobble" pump is preferable. It is useful to install a tank fuel gauge to indicate when the tank is full to minimize spillage.
- (c) By the engine return line - This method is not recommended as the pressure in such a line can be considerable. If you must use this method great care must be taken to adequately vent the tank. This vent should be at least the same diameter as the fuel inlet line to the tank.

All gravity lines should be as straight as possible to avoid air locks. Copper tubing or approved fuel-line hose 1/4" (6.3mm) diameter is commonly used.

WARNING NOTE - THE FUEL LINE PRESSURE AT THE OIL METERING VALVE MUST NOT EXCEED 3 P.S.I. OR DANGEROUS FLOODING MAY RESULT.

2) Impulse Pressure Pump

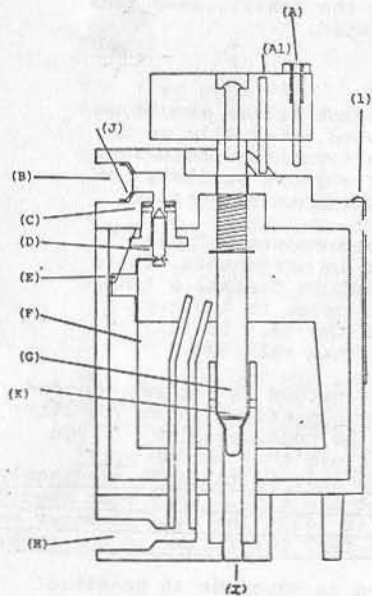
This pump will take fuel directly from your main tank to the oil metering valve.

WARNING NOTE - THE PUMP MUST NOT PRODUCE A PRESSURE IN EXCESS OF 3 P.S.I. OR DANGEROUS FLOODING MAY RESULT. If there is any doubt a pressure regulator should be installed.

This is the simplest method of installation however, the disadvantages are that the pump draws about 2 amps of electricity and is often noisy. There is also the possibility of mechanical breakdown.

Regardless of the method used a FUEL-SHUT OFF VALVE and a replacement cartridge FUEL FILTER should be located in the fuel line prior to the oil metering valve.

Oil Metering Valve



- (A1) Set Screw - 1/16th"
- (A) Set Screw - 5/64th"
- (B) Fuel Inlet
- (C) Needle Seat (rubber)
- (D) Needle
- (E) Float Pin
- (F) Float
- (G) Metering Stem
- (H) Overflow Outlet
- (I) Fuel Outlet To Burner
- (J) Inlet Screen
- (K) "O" Ring

Identification No. 1

- D - Diesel Oil (No.2)
- S - Stove Oil (No.1)
- K - Kerosene

Number and fuel identification stamped on the base of the valve adjacent to the overflow (H)

Less fuel or more fuel entering the burner may result in inefficient combustion, carboning and smoking. Factors such as air supply and draft will influence the quantities of fuel your burner will burn efficiently. If your burner flame does not have the proper characteristics at high and low settings (See Lightin Procedure) an adjustment can be made to the oil metering valve to increase or decrease the oil flow.

Oil Flow Adjustment

- Low Fire - Insert a 1/16th" allen wrench in set screw (A1)
DECREASE Fuel - Turn COUNTERCLOCKWISE
INCREASE Fuel - Turn CLOCKWISE
- High Fire - Insert a 5/64th" allen wrench in set screw (A)
DECREASE Fuel - Turn COUNTERCLOCKWISE
INCREASE Fuel - Turn CLOCKWISE

Note - All adjustments should be made GRADUALLY and the heater allowed to burn for at least 20 minutes at the new setting to establish the burning characteristics before any further adjustments are made.

The adjusting screws on the underside of the knob must be clear of the body when the valve is closed to permit shut-off.

Cleaning Oil Metering Valve

(Refer to Diagram Page 6) Remove the screws (1) and lift the top of the valve straight up by the knob. Remove the float pin (E). Remove the needle (D) using a 5/16th" wrench and remove the needle and seat (C).

Using the float pin (E) push up through the needle housing removing the rubber needle seat. Clean the needle seat, replace in the brass housing, grooved side up. Tighten the brass needle seat in the valve top tightly and replace the needle. Replace the float (F) and the float pin (E). Replace the top and tighten the screws (1).

Safety Features - Oil Metering Valve

Overflow - This outlet is indicated on the valve diagram (H). The overflow is designed to prevent excess fuel from entering the burner should the valve malfunction. Under normal operating conditions no fuel comes out of the overflow. A few drops may be evident when boat movement is exceptional.

Therefore, fuel coming out of the overflow is an indication that the oil metering valve is not operating correctly.

A line should be taken from this outlet to a one quart vented container situated BELOW the oil valve. This line should be 1/4" (6.3mm) and, to eliminate the possibility of air locks, should be straight and proceed downwards at all times.

IMPORTANT SAFETY NOTICE: Under no circumstances should the overflow be plugged as DANGEROUS FLOODING MAY RESULT.

Flame-Out - Should the flame be extinguished with the metering valve in the open position, the float mechanism in the valve will shut-off the flow of fuel to the burner.

WARNING : DO NOT OPERATE YOUR HEATER UNATTENDED

Fuel Consumption

The oil metering valve is graduated to provide fuel flow quantities between low and high fire settings. All oil metering valves have been pre-set and calibrated at 2 p.s.i. pressure to provide the required low and high fire.

NOTE: For the calibration of diesel oil valves the oil used is - typical Shell Dieseline No. 2.

<u>Low Fire</u>				<u>High Fire</u>			
c.c's p.min.	c.c's p.hr	lit.p. 24 hrs	gals.p. 24 hrs	c.c's p.min.	c.c's p.hr	lit.p. 24 hrs	gals.p. 24 hrs
2	120	2.93	.64	6	360	7.27	1.60

Fuel Variations

As a general rule Kerosene is 50% thinner than Diesel (No.2) and Stove Oil is 25% thinner than Diesel (No.2). Should you meter Kerosene or Stove Oil through a valve metered for Diesel Oil you will allow excess fuel to the burner causing the heater to overheat.

It is IMPORTANT to burn the fuel for which your oil metering valve was calibrated. (See Page 6 - Oil Metering Valve - Identification.)

It is unlikely that the fuel oil available to you will have the same viscosity (thickness) as the oil used for calibrating the oil metering valve at the time of manufacture. Each brand of oil is manufactured to different specifications.

In colder climates the oil will be sold thinner than in warmer climates. This also applies to seasonal variations and fuel oil sold in winter is thinner than summer oil.

The differences in viscosity can result in as much as 25% more or less oil flowing through the oil metering valve into the burner.

By studying the burning characteristics you will be able to determine whether your fire is excessively high or low, and adjust the oil metering valve accordingly. (See Oil Flow Adjustment) In addition warm fuel is thinner than cold fuel. When air temperatures are very high or low, there will be a considerable difference in the amount of oil flowing through the oil metering valve into the burner.

It is advisable to try several brands of oil in order to find out which burns most satisfactorily.

III - AIR SUPPLY

Combustion Air

Keeping in mind the Principles of Operation at the front of this manual, a balanced relationship between the fuel and oxygen entering the burner is essential for efficient combustion. To guarantee that sufficient oxygen (fresh air) is available, good ventilation is required. As most boats are relatively air tight this involves either the provision of a separate vent with outside air ducted directly to the heater or open vents, hatches or portlights. Ducted air is most satisfactory as it ensures sufficient air no matter how much fuel is entering the burner. Partially open hatches etc. may provide insufficient air as the fuel supply is increased.

It is important that a positive air pressure is maintained within the boat. It is possible that vents open on the leeward side of the vessel will result in air being siphoned from the boat starving the heater. This is particularly true when the wind is strong and when the heater has a short flue stack providing minimum draft. (See Common Operating Problems)

When first operating the heater it is advisable to open all vents, hatches etc. to maximize the available fresh air supply. By systematically closing these openings you will conclude how much ventilation your heater requires.

Combustion Fan

This is optional equipment and available in 12v, 24v or 32v DC. Your heater will operate under natural draft provided the requirements for flue pipe length and ventilation are adhered to.

The installation of a combustion fan is recommended for the following reasons:-

- 1) It will speed start-up and pre-heating.
- 2) It will allow you to increase the fuel supply quickly while ensuring complete combustion.
- 3) It will assist in counteracting backdraft during windy conditions.
- 4) It will enable you to operate the heater at high fire settings without the possibility of smoking or carboning.

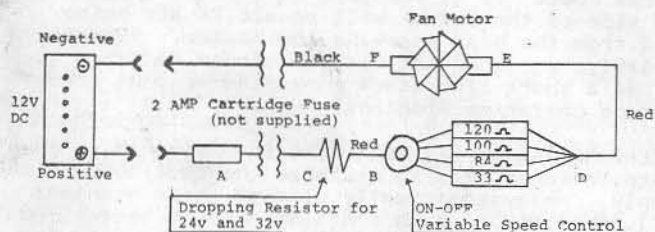
Combustion fans are available in kit form and, if not installed in your original purchase, can easily be installed later.

In all cases a 12vDc fan motor is installed. 24v and 32v power supplies are reduced to 12v by the use of a drop resistor. The 12v motor is heavy duty and rated for 8000 hours of continuous use, with a power draw of 1/10th amp. The rotary speed control provides an "OFF" position and four motor speeds.

NOTE: Poor combustion is evident when carbon is produced or the fire smokes. To operate the fan correctly the speed control should be turned to the lowest setting. If this proves insufficient the fan speed should be increased until the burner stops smoking.

CAUTION: Too high a fan speed will cause the flame to be drawn into the burner i.e. below the burner ring, and will result in heavy carbon build-up inside the burner within a few hours. (See Common Operating Problems)

The assembly should be wired as follows:-

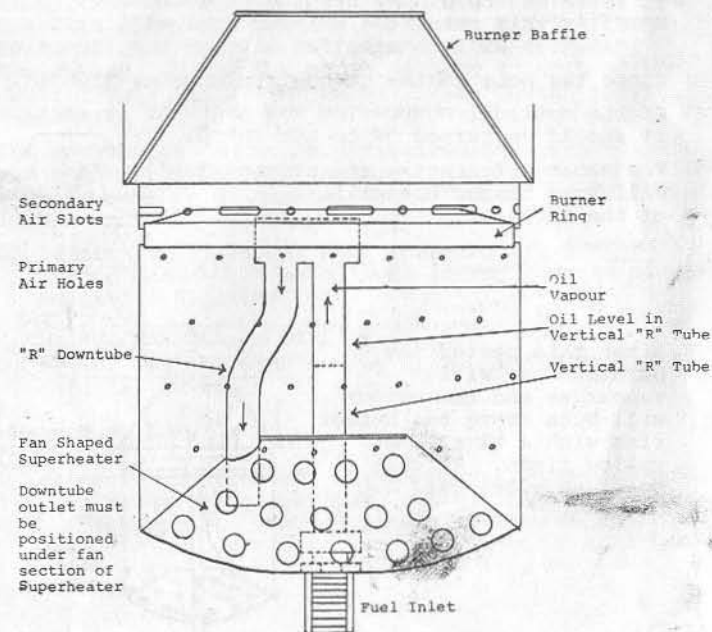


The fan motor c/w mounting bracket is attached directly under the heater with two sheet metal screws. The speed control and stainless steel housing fits around the motor and is also attached to the base. All holes are pre-punched.

IV - OPERATION

Check List

- (a) Ensure that all plastic protective coating has been removed.
- (b) Check all fuel line connections.
- (c) Switch "ON" pressure pump if one is used.
- (d) Check that gravity feed tank contains oil and open shut-off valve to allow fuel to flow to the oil metering valve. Re-check all fuel line fittings.
- (e) Check that the burner is assembled correctly. (See diagram) Ensure that the "R" vertical tube is securely tightened. Ensure that the superheater (fan shaped stool) is installed in the base of the burner. The fan part should be towards the front of the heater to facilitate lighting. Ensure that the "R" down tube is in place. The outlet end of this tube MUST be positioned through the notch in the top of the superheater and under the fanned area. Ensure that the burner ring is firmly seated with the LIP DOWN and all slotted holes are showing above the ring. Ensure that the burner baffle is sitting evenly above the burner.



Lighting Procedure

- 1) Remove the front of the heater by springing outwards at the top and inwards at the bottom or slide upwards. Open the door to gain access to the combustion chamber.
- 2) Turn the oil metering valve to a setting of #1. On first firing it will take approximately FIVE MINUTES for the valve and the fuel lines to fill and the oil to reach operating level in the "R" vertical tube. (See Diagram)

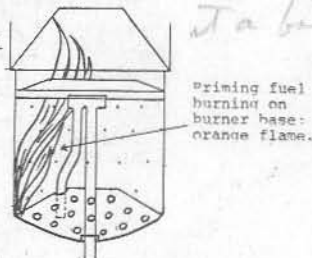
NOTE: NO OIL WILL ENTER THE BURNER WHEN THE OIL METERING VALVE IS TURNED "ON". OIL IS CONTAINED INSIDE THE "R" VERTICAL TUBE AT A LEVEL EQUAL TO THE OIL LEVEL IN THE OIL METERING VALVE.

The oil metering valve can remain at a setting of #1 throughout the lighting procedure.

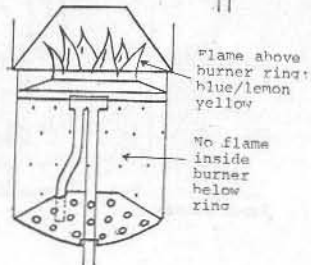
- 3) The burner must be primed. 4oz of priming fluid (i.e. diesel, stove oil, kerosene, barbeque starter etc.) should be poured through the centre of the burner ring and onto the bottom of the burner.
NOTE: DO NOT OVER PRIME.
- 4) Soak a SMALL piece of tissue (1" square) in the priming fuel, light and place quickly on the top of the burner baffle. With a probe (a straightened piece of wire clothes hanger is ideal) push the lighted tissue off the baffle onto the bottom of the burner ensuring that it rests on top of the priming fuel.

NOTE: At this point the priming fuel will emit smoke which will be expelled through the flue pipe.

- 5) Close the door to the combustion chamber TIGHTLY.
- 6) If the optional COMBUSTION FAN ASSEMBLY is installed it should be turned ON to LOW SPEED.
- 7) For about 3/4 minutes the priming fuel will burn at the bottom of the burner.



- 8) After this period the priming fuel will vapourize and the vapour will burn above the burner ring with a blue/lemon yellow flame. At this point no smoke will be emitted.



- 9) The burner and "R" vertical tube will now be sufficiently hot to vapourize the oil inside the "R" vertical tube and vapour will be emitted through the "R" down tube and onto the base of the burner. The flame will now continue to burn above the burner ring with a blue/lemon yellow flame. Oil is now flowing into the "R" vertical tube through the oil metering valve at a rate relative to the #1 setting.

WITHOUT the optional combustion fan the lighting procedure will take a few minutes longer. Also it will take about 30 minutes for the system to become thoroughly pre-heated and for the burning characteristics to settle (longer if the weather conditions are cold.) During this period the inconsistent airflow will tend to cause the flame to surge. This is normal. After this 30 minute period the oil supply can be increased gradually and a high fire setting should be achieved in about 60 minutes.

WITH the optional combustion fan the lighting procedure is faster and although the pre-heating time of about 30 minutes remains the same, the fuel supply can be increased more quickly by using the following fan operation guidelines.

Low Fire	-	Low Fan Speed
Medium Fire	-	Medium Fan Speed
High Fire	-	High Fan Speed

NOTE: THE FLAME MUST BURN ABOVE THE BURNER RING AT ALL TIMES. REGARDLESS OF THE OIL METERING VALVE SETTING, IF THE FLAME IS DRAWN BELOW THE RING BY THE FAN, THE FAN SPEED MUST BE REDUCED UNTIL THE FLAME RISES ABOVE THE BURNER. OTHERWISE THERE WILL BE A RAPID BUILD-UP OF CARBON INSIDE THE BURNER. (See Common Operating Problems)

NOTE: The combustion fan is only required as a draft assist and can be switched off at any time provided the flue pipe is capable of maintaining efficient natural draft operation.

CAUTION; If the fire goes out when starting after step(9) the heater should be allowed to cool for 15 minutes before re-lighting.

DO NOT ATTEMPT TO LIGHT A HOT BURNER

CAUTION: DO NOT USE GASOLINE or any other highly flammable material to start the burner.

Dickinson "R" Burner

This burner cannot be flooded, except by over priming, as no fuel is entering the burner only vapour. It is extremely responsive to changes in the oil metering valve setting.

However, it will SMOKE AND CARBON if the fuel supply is increased too quickly without the use of the optional combustion fan assembly. If smoking and carboning should occur the fuel supply should be reduced until the smoking and carboning stops.

V - SERVICE AND MAINTENANCE

"R" Burner

Carbon will accumulate in the "R" vertical tube and should be cleaned every 30 days of continuous operation. It is advisable to make this routine to eliminate the possibility of the tube becoming blocked.

Servicing the burner is not a clean job and requires a screw driver, "R" burner wrench (supplied), reamer, paper bag or vacuum cleaner. Gloves are also recommended.

It is necessary to remove the burner and valve assembly as follows:-

- 1) Detach the fuel inlet line to the oil metering valve.
- 2) Detach the fuel overflow line if connected.
- 3) Disconnect the wiring to the combustion fan assembly if installed.
- 4) Loosen the screw on the stainless steel sleeve positioned immediately below the heater window and remove the screws on the bottom right and bottom left which secure the burner to the outer shell.
- 5) The complete burner and valve assembly can be removed at the sleeve.
- 6) Remove the burner baffle, burner ring, "R" down tube and superheater. (See burner diagram)
- 7) With the wrench supplied unscrew the centre "R" vertical tube and remove.
- 8) Clean out any hard carbon deposits from inside this tube with the reamer, screw driver or the like.
NOTE: This cleaning of the "R" vertical tube should not be done when installed as carbon will be forced into the fuel line under the burner.
If carbon is hard to remove it may require to be drilled out.
NOTE: A spare "R" vertical tube is supplied for convenience.
- 9) The sides of the burner should be scraped with a wire brush and the primary airholes, (four rows) down the side of the burner, cleared if necessary.

- 10) In addition it is advisable to detach the stainless steel plate under the burner (also the combustion fan assembly if attached) and remove the copper fuel line and fittings for cleaning.
- 11) The burner can now be re-assembled and attached to the combustion chamber. Before start-up refer to the Check List on page 11)

Combustion Chamber

Should you require to gain access to the cylindrical combustion chamber above the burner for cleaning purposes the circular top of the heater and flue collar assembly is press fitted and can be pulled off. In doing so care should be taken that the large deflector baffle inside the combustion chamber does not become detached.

It can however, be easily replaced by suspending on the side hook provided.

VI - COMMON OPERATING PROBLEMS

	Cause	Remedy
(a) <u>Insufficient fuel to the burner</u>	Carbon build up in the "R" vertical tube.	Clean and service the burner.
	Carbon build up in the "R" vertical tube caused by excess draft or by burning the heater at too low a setting i.e. allowing the flame to burn too low and inside the burner.	Clean and service the burner. Increase the low fire setting or decrease the draft in order to ensure that the flame burns above the burner. (See diagram under Lighting Procedure.)
	Dirt or water inside oil metering valve.	Clean oil metering valve. (See Page 7 and valve diagram)
	Fuel line blockage	Systematically check the fuel line to establish how far along the line the fuel has reached. Start at the burner and work back to the fuel tank. Flush the line when the blockage is found.
	Air lock in the fuel line. No fuel to the burner even though the fuel tank is full.	Systematically check all fittings. The fuel line to the oil metering valve should be straight and without any dips which would allow

fuel to accumulate if the fuel tank is ever run dry.

Reduce pump pressure

Adequately ventilate tank.

Ensure that the diameter of the overflow pipe from the gravity feed tank to the main tank is the same or greater in diameter than the fuel inlet line from the engine.

Fuel pump pressure in excess of 3 p.s.i.

Fuel gravity feed tank inadequately ventilated.

Pressure build up in fuel tank when it is filled by engine return line.

NOTE: If any of the above should occur the excess fuel will escape through the valve overflow.

CAUTION: THE OVERFLOW SHOULD NOT BE PLUGGED.

Poor ventilation in the cabin area. See section on Air Supply.

Flue pipe less than 36". Increase length of pipe or install combustion fan.

Flue pipe less than required diameter. Increase diameter.

Negative cabin pressure caused when air is drawn from the boat in high winds or when the boat is underway. Provide adequate ventilation and install combustion fan.

Negative cabin pressure caused when engine is inadequately ventilated and pulls air from cabin. Provide adequate ventilation.

Burner holes are plugged with carbon. Clean burner.

"R" vertical tube is plugged. Clean burner.

Excess draft caused by a long flue pipe. Reduce flue pipe length or turn up fuel supply.

Flue pipe greater in diameter than required. Reduce diameter.

NOTE: Poor draft will result in carbon build up ABOVE THE BURNER in the combustion chamber and the flue pipe.

Too much draft will result in carbon build up INSIDE THE BURNER.

TO THE PURCHASER:

Please read the material appearing below, fill in the requested information, sign your name where indicated, and place the card in the mail. This will enable Dickinson Marine Products Ltd., or its Distributors to provide you with any consumer bulletins which may be issued with regard to your Dickinson oil stove.

DISCLAIMER OF WARRANTIES AND EXCLUSION OF REMEDIES

A. DISCLAIMER OF WARRANTIES: Except where prohibited by state law, there is NO IMPLIED WARRANTY OF MERCHANTABILITY, NOR AN IMPLIED WARRANTY THAT THE PRODUCT SOLD IS FIT FOR A PARTICULAR PURPOSE, nor any other warranty, expressed or implied, made by Dickinson Marine Products Ltd., or its distributors in connection with the sale or service of this product.

Without limiting the Disclaimer of Warranties to the following, Dickinson Marine Products Ltd., or its distributors calls to the purchasers attention the fact that the following particular qualities, characteristics and levels of performance are not warranted:

1. Dickinson Marine Products Ltd., or its distributors does not warrant that the product will not produce smoke and/or soot which could damage the interior and exterior of the vessel in which it is installed or its contents.
2. Dickinson Marine Products Ltd., or its distributors does not warrant that the product will not leak fuel.
3. Dickinson Marine Products Ltd., or its distributors does not warrant that the cast aluminum top of some of its products will not melt or warp if exposed to extreme heat.

The events described could cause personal injury and/or other damage to the vessel and its contents.

B. EXCLUSION OF REMEDIES: In the event that the above-stated Disclaimer of Warranties is held to be invalid, CONSEQUENTIAL DAMAGES SHALL NOT BE AWARDED for the violation of any warranty held to apply.

C. EXCLUSIVE REMEDY: In the event that the above-stated Disclaimer of Warranties is held to be invalid, the EXCLUSIVE REMEDY for a breach of any express or implied warranty held to have been in effect and breached, shall be repair or replacement of non-conforming goods or parts, or re-payment of the purchase price upon return of the goods. The choice between these two alternative exclusive remedies shall be in the sole discretion of Dickinson Marine Products Ltd., or its distributors.

(b) Excess fuel to the burner

(c) Carbon build up/Sooting, Smoking