



By

**EconoHeat** Inc.

## **WASTE OIL FIRED MOBILE RADIANT HEATER Operation and Service Instructions**

# **Manual**



**MODEL OWR-150**

Thank you and congratulations on your purchase of an Omni Waste Oil Fired Mobile Radiant Heater. You have selected a high quality, precision-engineered piece of equipment, designed to give you many benefits as well as years of outstanding performance.

## **PRECAUTIONS**

Waste oil may contain many foreign materials. Waste oil may also contain gasoline. Therefore, specific precautions on the handling and storage of waste oils are to be observed when using, cleaning and maintaining this heater. **Use a screen in a funnel when pouring oil into storage tank to catch foreign material, i.e., gasket material and sealant fibers, etc.** **WARNING: This appliance is not designated for use in hazardous atmospheres containing flammable vapors or combustible dust, or atmospheres containing chlorinated or halogenated hydrocarbons. Do not expose this unit to rain or moisture. If installed in high moisture atmosphere, a special cover for the integrated air compressor must be obtained from factory to avoid rusting of internal raw metals. If this occurs, see trouble-shooting guide for remedy.** Uses only Fuel oils, Motor oils up to 90wt, Kerosene, Hydraulic fluid, Diesel, Mineral oil, Vegetable oil, Transmission fluid, Synthetic oil (*after it's been used*). Do not use old, contaminated oils that have been stored in underground tanks or outside barrels for long periods of time. Excessive water and sludge may be present, causing quick filter plugging.

**NOTES:** The instructions contained in this manual apply to the operation and service of Omni Waste oil fired mobile radiant heaters. The following instructions should be carefully followed for obtaining the best possible installation, operation and service conditions. Specifications are subject to change without notice. This heater was designed to be an auxiliary heat source and provide economical disposal of waste oil. Proper operation depends on the consistency of the oil. Any water or foreign material in the oil may cause the unit to shut down. If a continuous stream of oil cannot be guaranteed at the heater, the main heating system should be set above freezing which will prevent any building damage if the waste oil heater were to overcome inoperative during subfreezing weather, i.e. supply tank empty, filter plugged, etc.

**UNCRATING:** Immediately upon uncrating units, check the unit for any damage that may have been incurred in shipment, if any damage is found, file a claim with the transporting agency. The unit has been tested and inspected at the factory prior to crating and was in perfect condition at that time. If anything is missing check packing slip for indications of possible backorder of those parts or components. Otherwise a claim must be for those missing parts.

# IMPORTANT

## NOTICE TO OWNER AND INSTALLER

To enjoy the long term benefits of burning your used oil in an Omni Waste Oil Burning appliance, it is necessary to become familiar with the correct operation and maintenance of your new heater. Before operating this appliance, make sure you read and understand this manual.

### IMPROPER OR LACK OF MAINTENANCE WILL VOID THE WARRANTY

The most critical sections of this manual are in order of importance as follows:

- **Basic Operation Knowledge**
- **Oil Suction Line**
- **Correct Draft Over Fire**
- **General Maintenance Requirements**

**Identical to any gas or oil furnace, without adequate draft over the fire, the combustion gases cannot escape the furnaces. The flame will lengthen resulting in an overheated combustion chamber.** Burning used oil is similar to burning wood. A fine gray ash accumulates in the combustion chamber. This accumulation of ash will eventually affect the performance of the heater and must be removed.

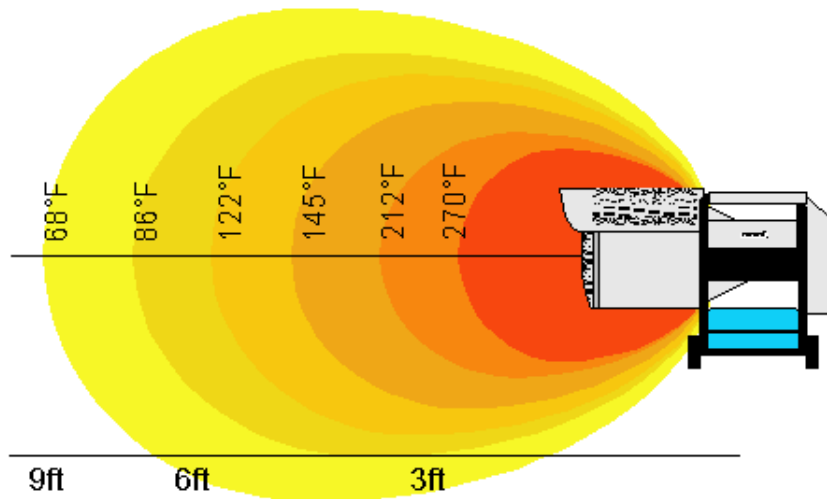
These topics are discussed in detail on the following pages. Please familiarize yourself with these sections of your manual. Spending a few minutes to review this material will assure that you receive the return on investment that you expect from your Omni Radiant heater.

## SPECIFICATIONS

BTU'S/HR OUTPUT	150,000
GALLONS PER HOUR	1.0
VOLTAGE REQUIREMENTS	240 V 60Hz Single Phase
AMPS FULL LOAD	8.4 A
WEIGHT	180 LBS
TANK CAPACITY	10.6 Gallons
DIMENSIONS L/W/H	50"x28"x34"

### Notes:

1. All illustrations and specifications contained herein are based on the latest information available at the time of publication approval. Econo Heat reserves the right to make changes at any time without notice, in materials, specifications, and models or to discontinue models.
2. Output depends on BTU content of oil used.
3. Atomizing Air Pressure for all fuels 10 P.S.I.



**Figure 1 – Temperature Diagram**

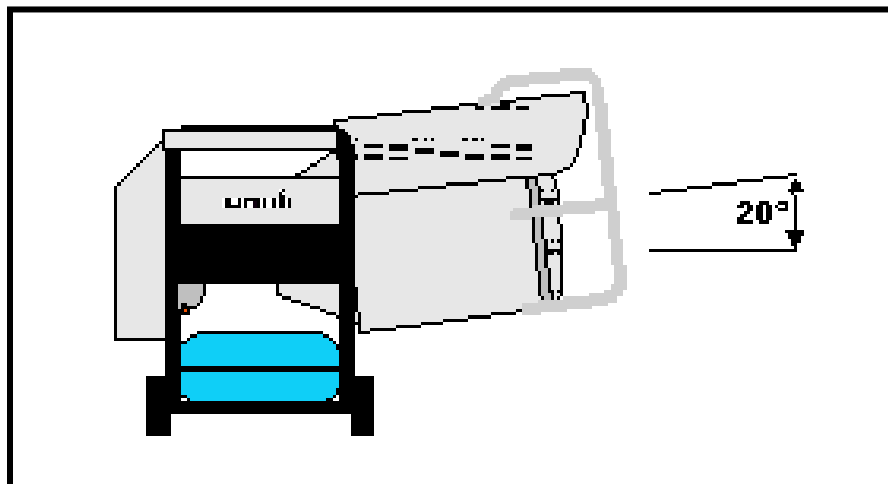


Figure 2 – Inclination

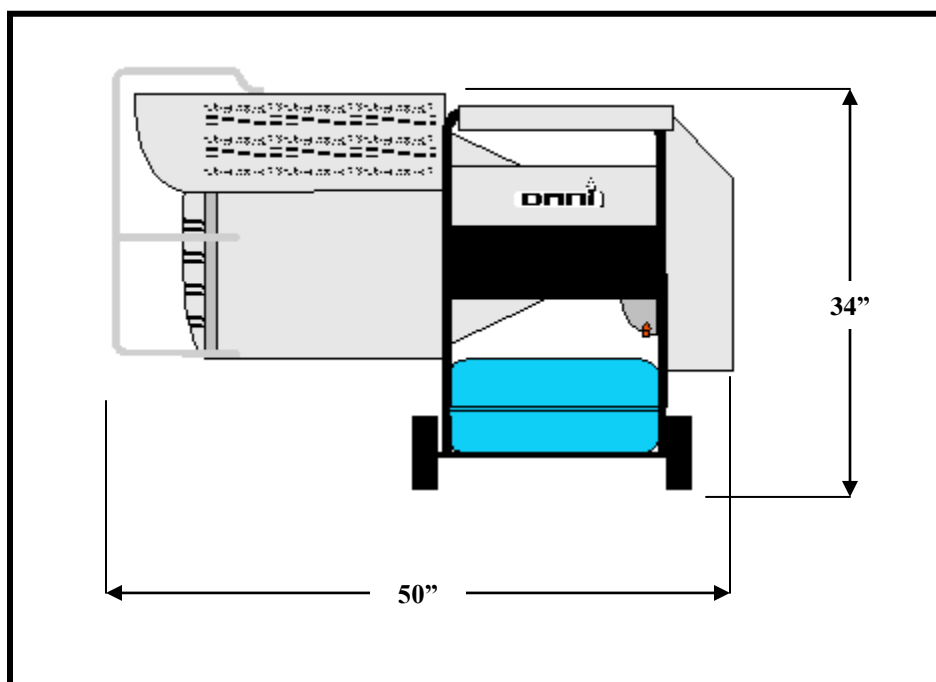
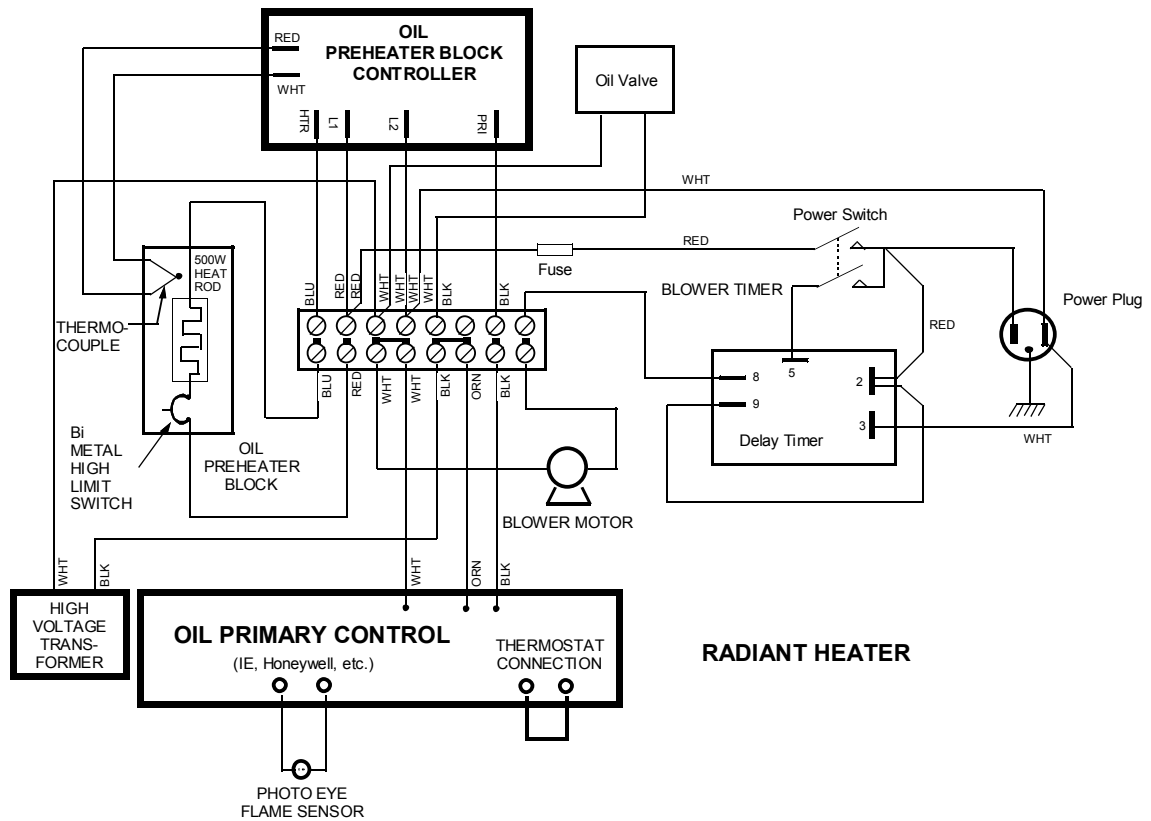
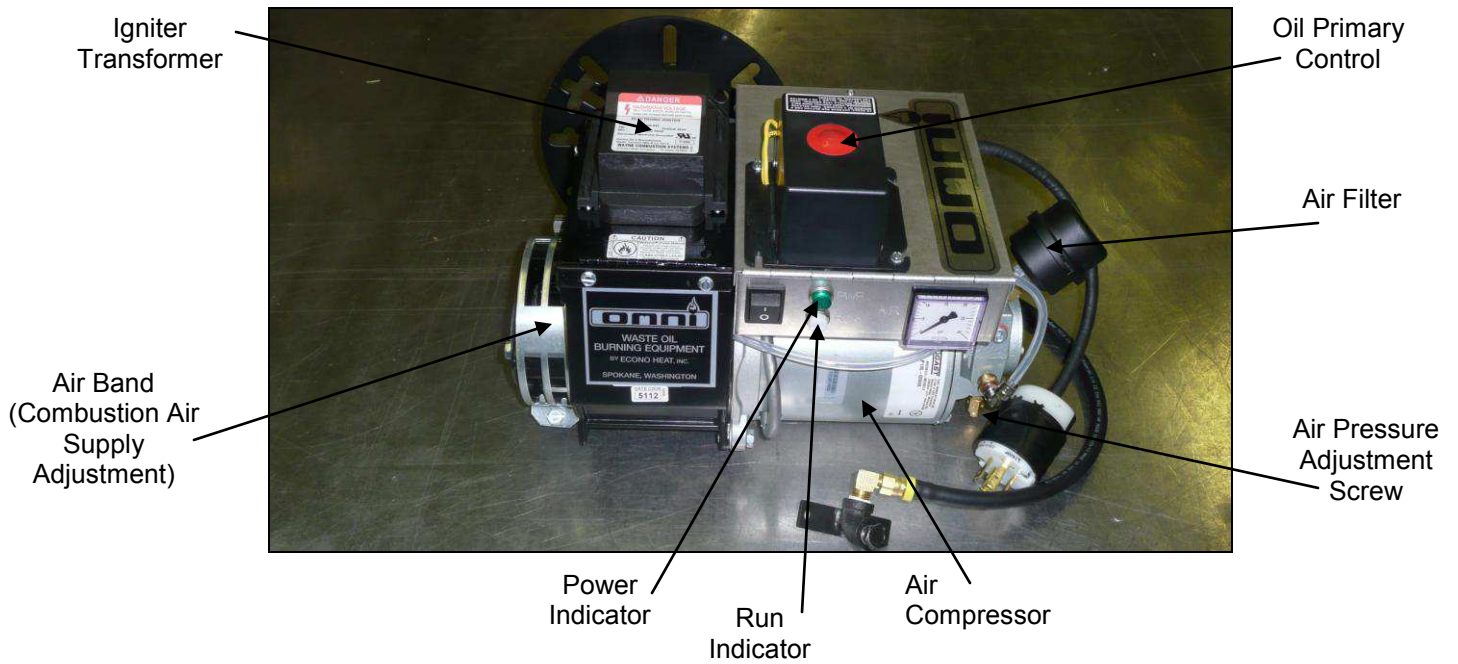


Figure 3 – Dimension

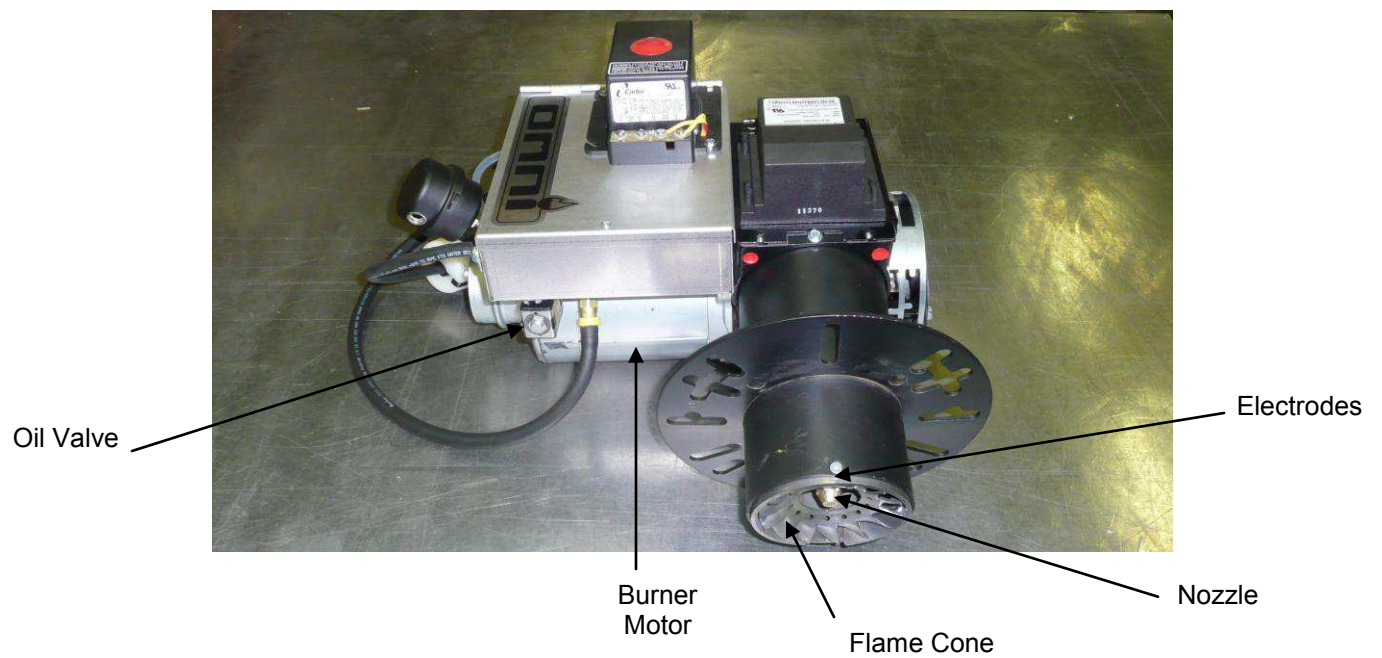
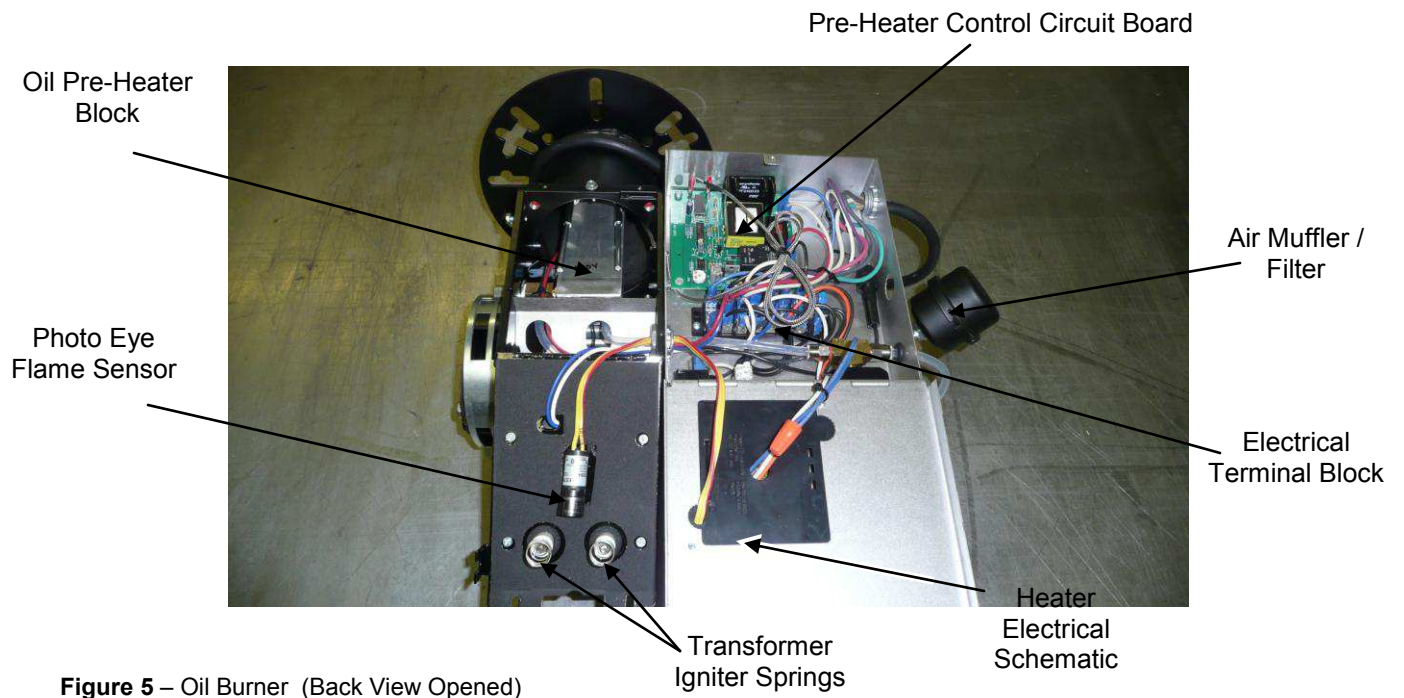
## WIRING DIAGRAM



## OIL BURNER



**Figure 4** – Oil Burner (Back View Closed)





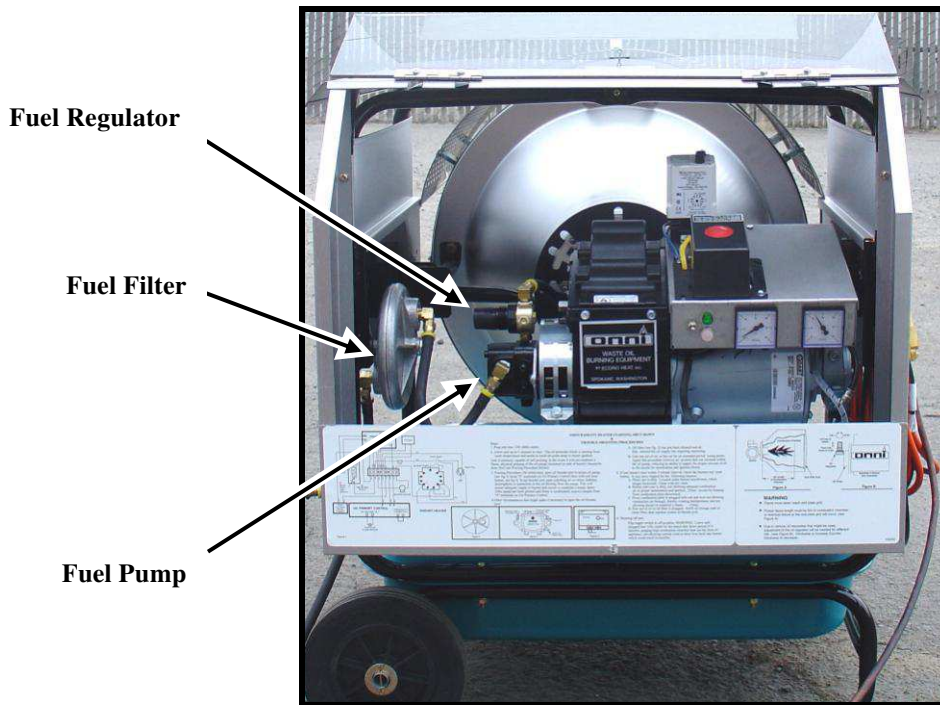


Figure 7 – Radiant Heater (Back View)

## OIL BURNER TECHNOLOGY

Omni's patented burner technology improves the efficiency of the oil burn process by continuous stabilization of the oil viscosity. Optimum atomization (spray) is accomplished by precisely pre-heating the oil and air prior to introduction to the combustion chamber. The waste oil enters into the Oil Pre-Heater Block (figure 5) and is pre-heated to operating thermo setpoint, then compressed air from the air compressor (figure 4) is mixed with the oil prior to spraying out the nozzle similar to fuel injection, by breaking up the oil droplets into a finer mist or spray (atomization). Electrodes mounted just above the nozzle (figure 6) provides continuous electrical arc across electrode to electrode igniting the fine oil mist as it sprays out of the nozzle. Once ignited the flame is forced into a swirl caused by the burners blower and specially designed flame cone (figure 6) providing a very efficient and thorough burn of the waste oil.

### Burner Components

- **Igniter Transformer:** (figure 4) Supplies high voltage to the electrodes generating electrical arc igniting the oil.
- **Oil Valve:** (figure 6) energizes when burner is running and de-energizes when burner is not running eliminating bleed back of oil out of the Pre-heater block.
- **Air Band:** (figure 4) Adjusts amount of air introduced into the combustion chamber. Air band is adjusted at the factory for optimum performance  $\frac{1}{2}$  to  $\frac{3}{4}$  inch. **NO FIELD ADJUSTMENT REQUIRED** unless in high altitudes application where minor adjustment may be required.

- **Oil Primary Control:** (figure 4) Controls the oil burner ignition. Checks for flame in the combustion chamber, if no flame is detected within 45 seconds, the oil primary will shutdown the oil burner. To restart the unit, reset the red button on the oil primary.
- **Oil Pre-Heater Block:** (figure 5) Pre-heats the oil and air before entering combustion chamber.
- **Photo Eye:** (figure 5) Senses flame in combustion chamber and signals oil primary when no flame is present.
- **Igniter Springs:** (figure 5) Transfers the high voltage from the igniter transformer to the electrodes (when door is closed)
- **Air Pressure Gauge:** (figure 4) Displays air pressure supplied by onboard air compressor.
- **Air Compressor:** (figure 4) Supplies air used within pre-heater block to aid in atomization of the oil.
- **Air Muffler/Filter:** (figure 5) Filters air and muffles the sound generated by the compressor.
- **Pre-Heater Control Circuit Board:** (figure 5) Precisely controls temperature of the Oil Pre-Heater Block and controls safety feature of not allowing burner to energize until oil has established operating thermo setpoint or shutdown burner if Pre-Heater Block temperature falls below shutdown thermo setpoint.
- **Electrodes:** (figure 6) Provides continuous high voltage electrical arc from electrode to electrode igniting the waste oil as it is being sprayed out of the nozzle.
- **Nozzle:** (figure 6) Low pressure nozzle for oil spray pattern.
- **Flame Cone:** (figure 6) Specially engineered flame cone forces the flame into a swirl pattern improving the burn thoroughness.
- **Burner Motor:** (figure 6) Multitask motor turns the burner blower and integrated air compressor.
- **Air Pressure Adjuster:** (figure 4) Adjusts the air pressure going to the pre-heater block. Should be adjusted between 12 PSI and 13PSI as indicated on the Air Pressure Gauge on the burner for thorough burn of the waste oil.

***Note: In order to insure proper air adjustment, air gauge must read 0 when burner is cycled off or powered down.***

- **Oil Pressure Gauge:** (figure 4) Displays oil pressure at the burner. Adjust flame to 3/4 length of combustion chamber (figure 8) by increasing CW or decreasing CCW the adjuster located on the left side of burner (figure 9). The fuel regulator increases or decreases delivery of fuel to the burner. When you increase or decrease the fuel to the burner you will notice the flame length will increase or decrease.

#### **IMPORTANT:**

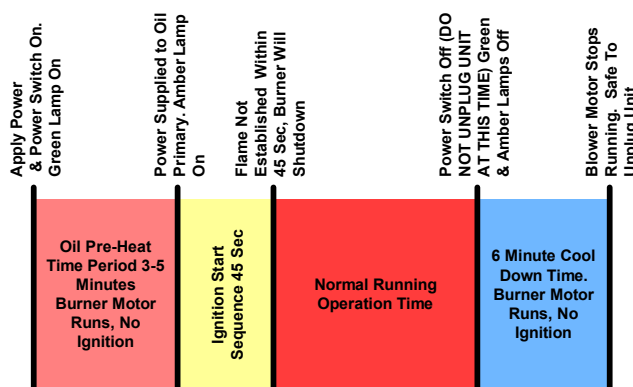
Once adjusted for correct flame length, take note of oil gauge setting for bench mark pressure reading needed when burning the specific fuel mixture generated by the owner. PLEASE NOTE- Once flame is set the oil pressure gauge can read various pressures when different viscosities of oils are used. The oil pressure gauge is an indicator of where the PSI reading will be when that oil viscosity is being burned. The oil gauge is used for servicing diagnostics assistance.

- **Power Indicator:** (figure 4) Indicates when power is present at the burner.

- **Run Indicator:** (figure 4) Indicates that the burner is ready for operation after the initial pre-heat time of approx. 5 minutes from initial power up.
- **Fuel Pump:** (figure 7, 13) pumps fuel from fuel tank to burner.
- **Fuel Filter:** (figure 7, 14) filters fuel prior to entering pump.
- **Fuel Regulator:** (figure 7, 12) The fuel regulator increases or decreases delivery of fuel to the burner. When you increase or decrease the fuel to the burner you will notice the flame length will increase or decrease. Adjust flame to 3/4 length of combustion chamber (figure 8) by increasing CW or decreasing CCW the fuel regulator located on the left side of burner (figure 9).

## INITIAL START PROCEDURE

1. During the initial power up process the burner is locked out from energizing until the oil has been properly pre-heated to operating thermo setpoint, approx 3 to 5 minute duration. Once the oil has been pre-heated, power is then applied to burner componenets and oil pump.
2. Apply power to the heater. Switch heater main power switch to ON position. Burner motor will start to run but will not attempt to ignite. After allowing the oil pre-heater time to establish temperature setpoint, approximately 5 minutes, heater will start to establish flame. Once the burner is running, temporarily jump the "F" terminals on the Oil Primary. This will allow the burner to run during the pump priming process.
3. Priming the oil pump: Open bleeder valve one turn until all air is expelled. This may need to be done twice to insure all air is removed. **IMPORTANT:** When fully purged and flame is established remove temporarily jumpers on "F" terminals of the Oil Primary to allow safety features of the unit to operate properly.
4. Adjust air supply of integrated air compressor to 8-12 P.S.I. This is factory preset, however, due to freight handling settings may be compromised.
5. Combustion air band (figure 4) should be open approximately 1/2" or until flame is clear yellow, not orange. Opening the air band too far may cause delayed in starting or even prevent the flame from starting.



Operational Sequence Chart

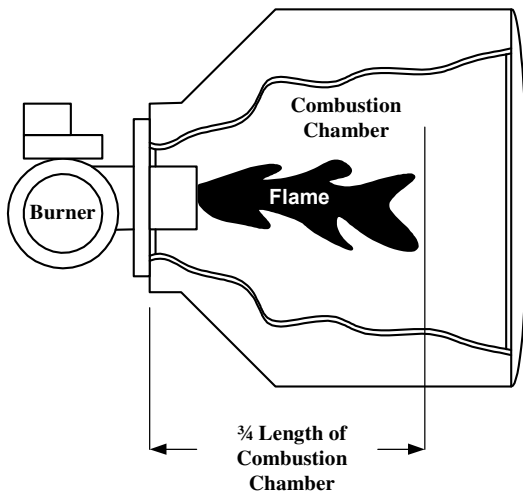


Figure 8 – Flame Adjustment

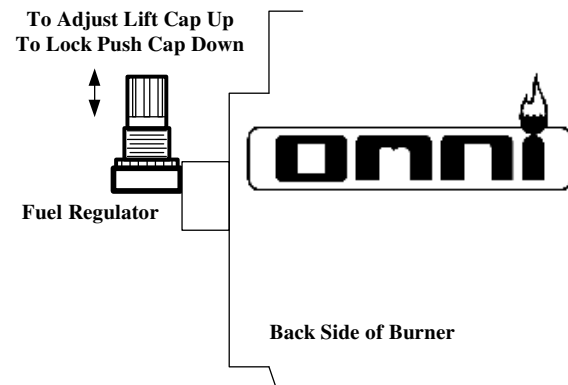


Figure 9 – Fuel Regulator

## MAINTENANCE SCHEDULE

### WEEKLY

--- Drain water from storage tank.

### MONTHLY

--- Replace Spin-On Filter or Clean stainless filter screen located in the pancake housing **as needed**. (*depending on usage*) Monitor : every application is different and may vary depending on contamination of oils being used.

### ONCE EACH SEASON

(MORE or LESS DEPENDING UPON USAGE OR CONTAMINATION OF OILS).

--- Clean flame cone. (figure 6).

--- Remove ash deposits from combustion chamber by opening front panel to gain access to ash/drip pan inside combustion chamber. (figure 15).

--- Clean pump strainer. Remove pump cover for access. (figure 13). CAUTION!-Be careful of gasket.

--- Clean air compressor filter element (figure 5).

### YEARLY

--- Inspect electrode adjustment. (figure 11). Due to erosion, adjustment may change.

--- Replace nozzle every 3-5 years depending on usage (figure 6, 10). Will lose efficiency due to erosion.

## ELECTRODE ADJUSTMENTS

Electrodes are adjusted at time of manufacture. However, they should be checked periodically and at time of installation to be sure they are set as noted in the following dimensional drawing. Swing burner door back for inspection. (figure 5, 10, 11)

**CAUTION: UNPLUG HEATER BEFORE CHECKING OR ADJUSTING ELECTRODE SETTING.**

### NOZZLE POSITION IN RELATION TO ENDCONE/BURNER TUBE

Tip of nozzle must be  $\frac{1}{4}$ " ahead of inside radius of end-cone. If nozzle is behind inside radius of end-cone, coking will occur and end cone can become clogged. (figure 11). **IMPORTANT NOTE:** be sure nozzle is centered, if nozzle is higher than center, press nozzle down to bottom out pre-heater stand.

To adjust, loosen Preheat Sink securing nut and set screw, push fore or aft as needed.

**WARNING:** This adjustment is done at the factory and should not be moved unless Fig 10 dimensions have been altered.

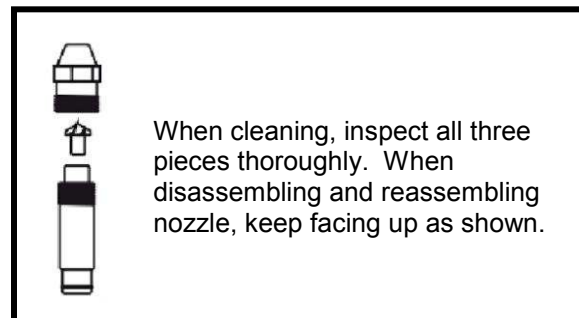


Figure 10 – Nozzle Assembly Detail

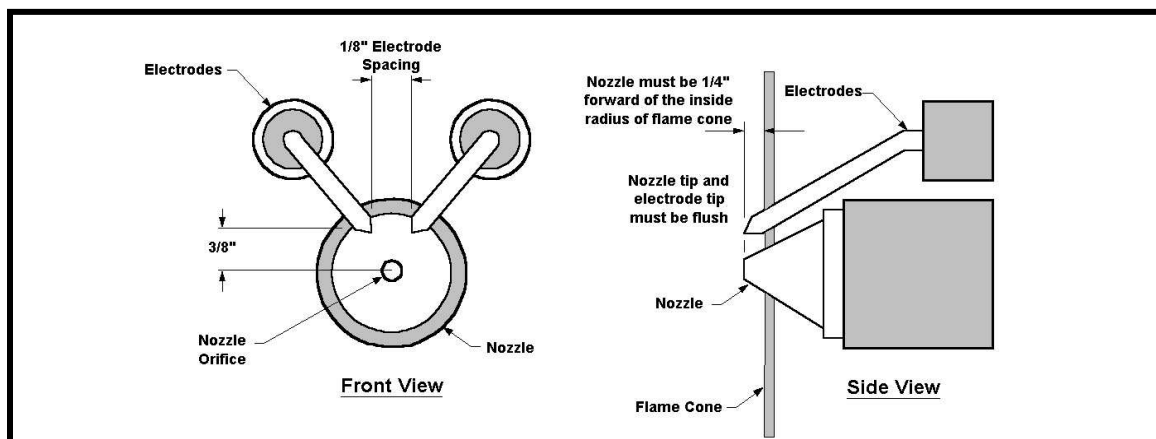
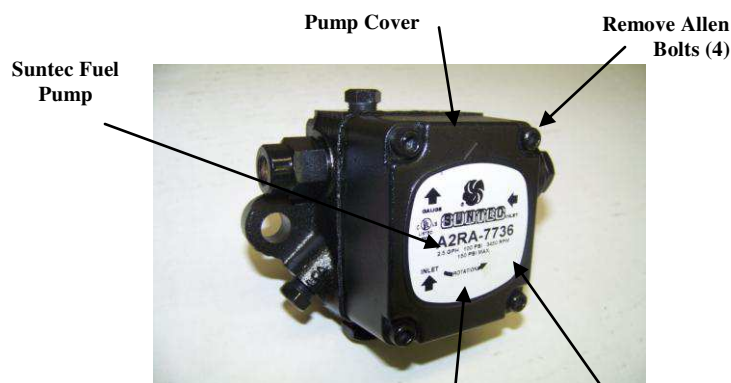


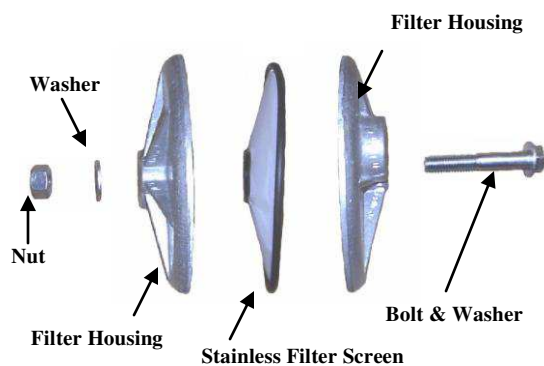
Figure 11 – Electrode Adjustment Detail



**Figure 12** – Pre-Heater Block Detail (Removed From Burner for Clarity)



**Figure 13** – Fuel Pump



**Figure 14** – Old Style Pancake Fuel Filter



**New Style Spin-On Filter With Housing**





**Figure 15** – Combustion Chamber Cleanout Door

## TROUBLE SHOOTING

	◆ Most Likely	● Less Likely	♣ Least Likely
Symptom	Cause	Remedy	
1. Heater shuts off	◆ Manual reset	◆ Requiring manual restart by reset button on.	
2. Loss of prime overnight Won't hold vacuum	◆ Vacuum air leak in fuel line ♣ Plugged pump screen	◆ Check all fuel connections. Tighten fittings. ♣ Check pump screen, may need cleaning—to access, remove pump cover	
IS TANK EMPTY?	● Plugged filter or tank oil empty	● Clean filter. Using vent port, reprime pump (See Figure 6 & 7).	
3. Fails to start.	◆ Vacuum Leak ◆ Inadequate Fuel Supply ● No Pressure  ● No Pre-heat  ● Auto start circuit not functioning  ● No Arc  ● No Air Pressure	◆ Open bleeder port if air present. Check and tighten fittings. ◆ Clean filter. Check all fuel connections. Tighten fittings. ● Check, may need cleaning—to access, remove pump cover. ● Using vent port, reprime pump (See Figure 6 & 7) ● Be sure all wiring to pre-heater is tight—no loose connections.  ● Bad firerod—Replace. Continuity at terminals. ● Check circuit control board and replace if necessary.(Call Factory) ● Check continuity at terminals of firerod limit snap switch. Replace if needed. ● Check springs to electrode rod adjustment (under transformer) make sure they make good contact. Open burner door and make sure electrode tips aren't touching flame cone. Readjust. ● Check pressure regulator and adjust. Check air supply line for restrictions or leaks. Pull compressor cover and inspect carbon vanes. May need to replace. Check filter, clean if needed.	
4. Reduced air pressure, cannot increase.	◆ Gauge may be bad. ◆ Intake filter muffler is plugged with dust or dirt. ♣ Compressor vanes may be worn. ● Exposed to water.	◆ Replace gauge. ◆ Remove & Clean with carburetor cleaner, dry thoroughly. Do Not Use. ♣ Replace carbon canes. ● Remove cover, clean rust with emery cloth.	
5. Hard starting diminished flame.	◆ Partially plugged filter. ♣ Out of fuel ♣ No oil to burner  ● Restriction in nozzle usually only when initially installed. New lines may have foreign material in them.  ● Air band open too far	◆ Clean filter. Using vent port—reprime pump (See Figure 6 & 7) ♣ Refill Storage. ♣ Clean pump screen—Remove pump cover. Using vent port, reprime pump. (See figure 6 & 7) ● Remove nozzle and check for foreign objects. (See Figure 9 and 11) ● Aluminum Block Pre-heater inside burner should not build up carbon. If carbon is present, pre-heat circuit is malfunctioning. Thermocouple heat sensor wire could have open circuit. Heat control board may have blown circuit and circuit board fuse. Inspect both and replace either if needed. (See Figure 11). ● Close air band—while viewing flame; open air band slowly until combustion chamber is clear, not orange.	
6. Heater cycles frequently, without thermostat	◆ Heater over firing.	◆ Investigate and locate reason for over firing. I.e., nozzle eroded, pump not functioning properly, decrease pump motor speed.	



7. Heater rumbles and excessive heat blow back from flame vision port.	♦ Pump setting wrong	♦ Pump not functioning properly—over firing. May need RPM readjust. Reset flame slightly less than ½ way down tube combustion chamber. Use adjustment knob on pump motor. (See Figure 7).
8. Heater establishes flame but locks out or shuts off. Need to reset primary.	♦ Photo eye cant see flame. • Flame too small	♦ Clean photo eye which is smoked up by back draft smoke. • Increase pump motor speed (See Figure 7).
9. Poor or reduced heat production.	♦ Flame too small ♣ Entire fuel supply may be plugged.	♦ Nozzle may be plugged with debris—usually after filter is cleaned. ♣ Clean filter both, oil strainer and oil pump screen.



## Omni Radiant Heater Limited Warranty

Econo Heat (manufacturer) warrants to the purchaser of the Radiant Heater listed above will be free from defects in materials and workmanship for the durations specified below, which duration begins on the date of delivery to the customer. Customer is responsible for maintaining proof of date of delivery.

If return is deemed necessary for warranty evaluation and determination of repair or replacement, radiant heater is to be sent to the factory with freight prepaid. Econo Heat Inc. reserves the right to determine appropriate action for repair or replacement.

*No parts will be accepted by Econo Heat without RA# (return authorization number) clearly marked on outside of shipping package. Obtaining RA# requires model and serial numbers, description of part being replaced and nature of defect. Call factory to receive RA#.*

### Warranty Covers:

1. Combustion Chamber, one (1) year. (Parts Only)
2. Oil Heater Block, twenty (20) years. (Parts Only)
3. Oil Heater Block Controller PCB, three (3) years. (Parts Only)
4. All other components, one (1) year. (Parts Only)

This warranty is void if:

1. Warranty registration card is not returned within thirty (30) days of purchase.
2. Any part or component subject to abuse or altered from original manufactures specifications.
3. Has not been properly maintained, operated or has been misused.
4. Radiant heater is operated in the presence of chlorinated vapors.

The above warranty is in lieu of all other warranties expressed or implied. Econo Heat does not authorize any person or representative to make or assume any other obligation or liability that is not in accordance with above warranty. **Econo Heat Inc. is not responsible for any labor cost unless prior authorization in writing has been obtained.**

---

## WARRANTY CARD

*Please fill out, tear off and return to manufacturer*

*Return following warranty information to manufacturer within thirty (30) days of purchase or warranty will not be valid. (Please print or type).*

Date of Purchase \_\_\_\_\_

Serial # \_\_\_\_\_ Model \_\_\_\_\_

Customer Name \_\_\_\_\_

Address \_\_\_\_\_

City \_\_\_\_\_ State \_\_\_\_\_ Zip Code \_\_\_\_\_

Dealer \_\_\_\_\_

Address \_\_\_\_\_

City \_\_\_\_\_ State \_\_\_\_\_ Zip Code \_\_\_\_\_

Installed at \_\_\_\_\_