



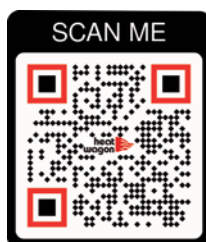
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Valparaiso, IN 46383  
219-464-8818 • Fax 219-462-7985  
[www.heatwagon.com](http://www.heatwagon.com)

## Installation and Maintenance Manual

Please retain this manual for future reference.

# VG500

## Construction Heater



*For your safety: Do not use this heater in a space where gasoline or other liquids having flammable vapors are stored.*

# **IMPORTANT INFORMATION! READ FIRST**

The heater is designed for use as a construction heater under ANSI Z83.7a-2000. Heater is not intended for use in pest remediation. The primary purpose of construction heaters is to provide temporary heating of buildings under construction, alteration, or repair and to provide emergency heat. Properly used, the heater provides safe, economical heating. Products of combustion are vented outside the area being heated.

The heater **IS NOT** designed as an Unvented Gas Fired Room Heater under ANSI-Z21.11.2 and **SHOULD NOT** be used in the home.

ANSI A119.2(NFPA 501C)-1987 Recreational Vehicle Standard prohibits the installation or storage of LP-gas containers even temporarily inside any recreational vehicle. The standard also prohibits the use of Unvented Heaters in such vehicles.

## **NFPA-58 1989 STANDARD FOR THE STORAGE AND HANDLING OF LIQUEFIED PETROLEUM GASES**

Use of the heater must be in accordance with this Standard and in compliance with all governing state and local codes. Storage and handling of propane gas and propane cylinders must be in accordance with NFPA 58 and all local governing codes.

We cannot anticipate every use which may be made for our heaters. **CHECK WITH YOUR LOCAL FIRE SAFETY AUTHORITY IF YOU HAVE QUESTIONS ABOUT LOCAL REGULATIONS.**

Other standards govern the use of fuel gases and heat producing products in specific applications. Your local authority can advise you about these.

## **FOR YOUR SAFETY**

**DO NOT USE THIS HEATER IN A SPACE WHERE GASOLINE OR OTHER LIQUIDS HAVING FLAMMABLE VAPORS ARE STORED OR USED.**

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## **CONSTRUCTION HEATER GENERAL HAZARD WARNING:**

Failure to comply with the precautions and instructions provided with this heater, can result in death, serious bodily injury and property loss or damage from hazards of fire, explosion, burn, asphyxiation, carbon monoxide poisoning, and/or electrical shock.

Only persons who can understand and follow the instructions should use or service this heater.

If you need assistance or heater information such as an instruction manual, labels, etc., contact your local Heat Wagon dealer or the manufacturer.

## **W A R N I N G**

Fire, burn, inhalation, and explosion hazard. Keep solid combustibles, such as building materials, paper or cardboard, a safe distance away from the heater as recommended by the instructions. Never use the heater in spaces which do or may contain volatile or airborne combustibles, or products such as gasoline, solvents, paint thinner, dust particles or unknown chemicals.

**Not for home or recreational vehicle use!**

**If you have read this entire manual and you still have questions, please call us at 219-464-8818**

# **Installation and Maintenance Manual**

## **Model VG500**

### **Construction Heater**

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#### WARRANTY

This heater is guaranteed against defective materials and workmanship for one (1) year from Heat Wagon invoice date.

Warranty repairs may be made only by an authorized, trained and certified Heat Wagon dealer. Warranty repairs by other entities will not be considered. Warranty claims must include model number and serial number. Components are guaranteed to the extent of the component manufacturer's warranty.

#### LIMITATIONS

Warranty claims for service parts (wear parts) such as spark plugs, igniters, and flame rods will not be allowed. Diagnostic parts such as voltage meters and pressure gauges are not warrantable. Evidence of improper fuel usage, fuel pressures outside of manufacturer's specification, poor fuel quality, improper electric power, misapplication and/or evidence of abuse may be cause for rejection of warranty claims.

Labor, travel time, mileage and shipping charges will not be allowed. Minor adjustments to heaters are the responsibility of the dealer. Defective parts must be tagged and held for possible return to the factory for 60 days from date of repair. The factory will provide a return goods authorization, (RGA) for defective parts to be returned. No warranty will be allowed for parts not purchased from Heat Wagon.



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## SAFETY & CAUTION

- Instructions given in this manual and the applicable regulations of the local authorities must be followed.
- The unit may be operated only by those persons who have been instructed in its proper use.
- The unit is to be installed and operated in such a way as to ensure the safety of employees and surroundings.
- Never cover the unit's air openings.
- Always ensure adequate fresh air supply to the unit.
- Never stand in front of the discharge end of the heater.
- Keep a minimum clearance of 10 feet from the fuel source. Storing and use of liquid fuel must comply with the regulations and instructions given by the local authorities.
- Unit's emitted noise level at the range of 3 feet: 74 dBA.
- Do not introduce foreign objects into the unit.
- Do not expose the unit to direct water jets.
- All electric cables outside the unit are to be protected against damage.
- Always disconnect the unit from power supply and turn off the gas supply when maintenance or service is being performed.
- IF NOT OPERATED WITHIN GUIDELINES OF THESE OPERATING INSTRUCTIONS, MANUFACTURER WILL NOT BE HELD RESPONSIBLE AND WARRANTY WILL BECOME VOID.

## SPECIFICATIONS

### Model No. VG500

|                       |                                                          |
|-----------------------|----------------------------------------------------------|
| Fuels:                | Vapor Propane or Natural Gas                             |
| Capacity:             | 500,000 BTU/HR                                           |
| Blower:               | 6,475 CFM          2.05" W.C. SP                         |
| Electrical Rating:    | 240 Volts, 15 Amps                                       |
| Fuel Consumption:     | NG-500 CFH / Propane-5.5 GPH, 1" FNPT Connection         |
| Remote Thermostat:    | On/Off                                                   |
| Max. Discharge Temp.: | 72°F @ 0°F Ambient                                       |
| Duct Size:            | 21" Dia., 200 ft. max (straight), temp rating 300°F min. |
| Shp. Dimensions:      | 90"L x 40"W x 60"H                                       |
| Weight (approximate): | 650 lbs.                                                 |

| Gas Supply:   | Inlet Pressure |          | Manifold Pressure |
|---------------|----------------|----------|-------------------|
|               | Max W.C.       | Min W.C. | W.C.              |
| Vapor Propane | 14 W.C.        | 9" W.C.  | 3.6"              |
| Natural Gas   | 14 W.C.        | 9" W.C.  | 6.1"              |

# OPERATING INSTRUCTIONS

## INSTALLATION

- When transporting, use both lifting eyes located on sides of heater.
- Place the unit on a level and non-combustible surface.
- Minimum clearances from combustibles:
  - outlet, minimum 10 feet
  - sides, minimum 3 feet
  - top, minimum 3 feet
  - flue pipe exhaust, gas discharge minimum 2 feet
- Manufacturer recommends a free zone of 5 feet around the unit and a minimum distance of 10 feet at the unit's flue gas openings are to be maintained.
- If the unit is placed indoors, secure an adequate fresh air opening for the burner combustion air.
- The unit may not be installed and operated in premises where explosive or combustible fumes or dust are present. Always check the regulations of local authorities.
- Be certain that neither the air inlet nor the air outlet is obstructed.

## FUEL SUPPLY

- This heater is shipped as either natural gas or vapor propane. Check for proper burner manifold pressure.

Natural Gas                      6.1" W.C.

Vapor Propane                3.6" W.C.

- Be certain to use adequate hose or pipe size to ensure proper volume and pressure.

See Chart Below.

### **NATURAL GAS QUICK REFERENCE HOSE**

| Hose<br>Length<br>in Feet | BTU<br>500,000 |      |      |
|---------------------------|----------------|------|------|
|                           | <1PSI          | 2PSI | 5PSI |
| 10                        | 3/4            | 3/4  | 3/4  |
| 25                        | 1-1/4          | 3/4  | 3/4  |
| 35                        | 1-1/4          | 3/4  | 3/4  |
| 50                        | 1-1/4          | 3/4  | 3/4  |
| 75                        | -              | 3/4  | 3/4  |
| 100                       | -              | 3/4  | 3/4  |
| 125                       | -              | 3/4  | 3/4  |
| 150                       | -              | 3/4  | 3/4  |
| 175                       | -              | 3/4  | 3/4  |
| 200                       | -              | 3/4  | 3/4  |

### **VAPOR PROPANE QUICK REFERENCE HOSE**

| Hose<br>Length<br>in Feet | BTU<br>500,000 |       |
|---------------------------|----------------|-------|
|                           | 1/2PSI         | 10PSI |
| 10                        | 3/4            | 3/4   |
| 25                        | 3/4            | 3/4   |
| 35                        | 1-1/4          | 3/4   |
| 50                        | 1-1/4          | 3/4   |
| 75                        | 1-1/4          | 3/4   |
| 100                       | 1-1/4          | 3/4   |
| 125                       | 1-1/4          | 3/4   |
| 150                       | 1-1/4          | 3/4   |
| 175                       | 1-1/4          | 3/4   |
| 200                       | 1-1/4          | 3/4   |

—  
For supply pressures greater than 1/2psi

- A regulator must be installed on the heater to ensure that the pressure to the heater does not exceed 1/2 psi inlet pressure. Excessive pressures over 1/2 psi (14" W.C.) will damage controls and void warranty.

## FUEL SUPPLY (CONTINUED)

- Ensure that for the surrounding temperature, size and capacity of the propane supply cylinder is adequate to provide the rated Btu/hr input to the heater.
- Visually inspect the hose assembly and ensure that it is protected from traffic, building materials, and contact with hot surfaces. If it is evident that there is excessive abrasion or wear, or the hose is cut, replace it immediately.
- Purge air from line and wait 10 minutes for gas to dissipate.
- After installation, check the hose assembly for gas leaks by applying a water and soap solution to each connection.
- Fuel hose must be UL approved.
- The installation of this heater to a natural gas supply must confirm with all applicable local codes or, in the absence of local codes, with the *National Fuel Gas Code ANSI Z223.1/NFPA 54*. For vapor propane, refer to standard for *Storage and Handling of Liquefied Petroleum Gases ANSI/NFPA 58*.

## ELECTRICAL

- Electric cable extensions must be connected based on the unit capacity and cable length.
- Confirm voltage at heater connection (105V min.) to ensure proper operation.

## EXHAUST FLUE PIPE

- The unit is to be connected to a flue pipe with adequate draft, to ensure the proper start and operation of the unit. Refer to page 19.
- The flue pipe is to be made of non-combustible material and clearances from combustible materials must be a minimum 8 inches (temperature of flue gases is approximately 410° F).
- The flue pipe and its installation must comply with the regulations and instructions given by the local authorities.

## START UP

- Only people trained in the operation and supervision of this heater should operate and maintain the unit.
- Check the unit to make sure that there are no visible defects on the control and safety devices and that the unit has been installed correctly.
  1. Check that the control switch on the control box is in position "0" (STOP).
  2. Pre-select desired room temperature on the room thermostat. The temperature must be set higher than the ambient temperature.
  3. Open all possible shut-off devices of the fuel supply lines.

## **START UP (CONTINUED)**

4. Turn the control switch on the control box to position "1" (HEATING).
  5. When the ambient temperature level is low, the burner switches on automatically. The fan does not switch on until the set temperature (104°F) of the heat-exchanger has been reached (will take approximately 1-5 minutes).
- After startup, the heater is operated automatically by the room thermostat and governed by all control devices, including the safety limit controls.
  - The room thermostat (TSTAT) and burner sensor control the running sequences of the burner and the fan sensor controls the fan function.
  - Overheat limit reset (STB) controls and shuts off the heater (burner) in the case of overheating.
  - The unit can also be used for ventilation purposes only, if needed.
    1. Turn the control switch on the control box to position FAN.
    2. The unit is now in the continuous ventilating mode.
    3. Heating is not possible in this mode.

## **DUCTING (Warm Air)**

- Minimum clearance from combustible materials is 4 inches.
- Use steel ducting or fabric ducting capable of withstanding maximum temperature of 300°F.
- Maximum length of duct: 200' (straight).
- Duct diameter: 21".
- Make sure that the duct is safely and properly fastened to the outlet.
- Avoid sharp bends and corners to ensure maximum air flow and avoid back pressure/heat accumulation in heater.
- FAILURE TO COMPLY WITH THESE RECOMMENDATIONS COULD RESULT IN SHUTDOWN OF THE HEATER.

## **SHUT DOWN**

- Turn control switch to the right, heat position (\*).
- Close fuel supply.

### **Important!**

The air supply fan continues running to cool down the combustion chamber/heat exchanger and then stops later. The fan can restart for several times before finally switching off!

### **WARNING!**

UNIT MAY BE UNPLUGGED IN EMERGENCY SITUATIONS ONLY. OTHERWISE, DO NOT STOP THE UNIT BY UNPLUGGING IT. UNIT NEEDS TO COOL DOWN USING ITS OWN FAN. FAILURE TO COMPLY WITH PROPER SHUT-DOWN PROCEDURES CAN CAUSE DAMAGE TO THE COMBUSTION CHAMBER, HEAT EXCHANGER, SAFETY FEATURES AND VOID WARRANTY.

## MAINTENANCE

Prior to starting any maintenance work be sure to disconnect unit from power supply until unit cools down fully and fan shuts off! (Shut Down Procedures page 7)

To ensure the proper function of the unit, it must be serviced on regular basis. Maintenance can be performed, excluding the control devices and safety limit controls, by an authorized trained & certified Heat Wagon dealer. The control devices and safety limit controls do not need routine maintenance. If these items fail they must be replaced.

- Do not use any aggressive cleaning agents, which are harmful or environmentally unfriendly, when cleaning the unit.
- Do not use water jet when cleaning the unit.
- Pressurized air may be used for maintenance. Be careful not to damage the fan blower wheel with too much pressure.
- - Check whether the unit is free from mechanical damage, replace faulty parts as necessary.
- Check fan blower wheel of the fan at regular intervals and clean it when needed.
- Check functionality of control and safety devices regularly.
- Have the flue gas values of the burner checked regularly by authorized agents.
- Be sure to store the unit in a dust free and dry place when it is not used for a long period of time. Cover the exhaust flue to prevent entry of foreign objects.



## SERVICE

- The complete unit, including heat exchanger, combustion chamber and burner should be cleaned from dust and dirt after every heating period, at a minimum of once per year.

### -Removal of combustion chamber/heat exchanger:

For proper cleaning of the unit, manufacturer recommends removal of the complete combustion chamber with heat exchanger. Clean combustion chamber and exchanger tube with brush. Vacuum all loose ash and soot. Close all cleaning flanges carefully to avoid damage to gasket material.

### -Disassembling of burner:

1. Disassemble four tightening bolts on the combustion chamber flange and remove burner's mounting flange. Take care not to damage the flange seal.
2. Pull out the burner. Take care not to damage the burner head and power cable. Clean blower wheel, ignitor electrodes, and photocell. Replace fuel nozzle and fuel filter.

*Refer to separate burner manual for adjustment of burner.*

## VG500 TROUBLESHOOTING

| <u>Symptom</u>                                                                                                | <u>Possible Causes</u>                                                                                                                                                                                                                                            | <u>Possible Solutions</u>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
|---------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 1. Turn the heater to position #1 and nothing happens.                                                        | <ul style="list-style-type: none"> <li>• Power supply cord</li> <li>• Burner lock out on the burner flame safeguard control box is engaged</li> <li>• Overheat limit switch is tripped</li> <li>• 24 volt transformer</li> <li>• Burner control switch</li> </ul> | <ul style="list-style-type: none"> <li>• Test for 240 volts between terminal #4 and #5 on the main terminal block.</li> <li>• Turn thermostat off for 50 seconds. Turn thermostat on</li> <li>• Reset switch, located on the main control box under the black screw cap .</li> <li>• Using a volt meter, check for 24 volts AC between ground and one of the “T” terminals on the burner control box. If less than 24 replace transformer.</li> <li>• On the main terminal block, check for 120 volts between terminal 6 and the “C” terminal on the burner switch and then between terminal 6 and the “1” terminal on the burner. If there is power on terminal “C” and not on terminal “1” replace the burner switch.</li> </ul>                                                                                                                                                                                                                                                                                        |
| 2. The heater runs for a little while, but shuts down. It won't come on again until I reset the limit switch. | <ul style="list-style-type: none"> <li>• Incorrect burner manifold pressure</li> <li>• Restricted airflow</li> <li>• Overheat limit switch faulty due to loss of power</li> </ul>                                                                                 | <ul style="list-style-type: none"> <li>• Use a low pressure gauge (0-15 inches of water column) with a 1/8" NPT inlet. Install gauge in the pressure tap port located on the output side of the gas valve. Run the heater. Adjust the pressure by turning the pressure adjusting screw (located on the input side top of the gas valve) counter clockwise until the gauge reads 3.6" W.C. for propane or 6.1" for natural gas.</li> <li>• Check for dirt or ice buildup on the air inlet or blower wheel. If using duct on the air outlet, insure the back pressure does not exceed a static pressure of 2" W.C. Check with low pressure gauge if necessary (0-15 inches of water column).</li> <li>• Adhere to the proper shut down procedures.<br/>Power must remain at the unit until it cools down fully. Blower will shut down on its own when cool. Test overheat limit switch for continuity between the two male terminals (C and 2) at room temperature. Replace if overheat limit switch fails test.</li> </ul> |

## VG500 TROUBLESHOOTING

### Symptom

### Possible Causes

3. The heater has a loud rumbling sound.

- Air damper setting
- Dirt on burner blower wheel
- Flue pipe setup or flue pipe restrictions
- Gas manifold pressure

### Possible Solutions

- Rough setting at 3 or 1/2 open. Minor adjustments from the rough settings can be made to achieve a smooth sounding burner with no soot from the flue pipe.
- Clean the burner blower wheel with a small brush.
- Refer to the flue pipe chart in this manual. Check flue for restriction.
- Use a low pressure gauge (0-15 inches of water column) with 1/8" NPT inlet. Install gauge in the pressure tap port located on the output side of the gas valve. Run the heater. Adjust the pressure by turning the pressure adjusting screw (located on the input side top of the gas valve) counter clockwise until the gauge reads 3.6" W.C. for propane or 6.1" for natural gas. Refer to pipe sizing charts in the Heat Wagon Engineering guide. Heater requires 9-14" W.C. inlet pressure. Ensure proper purge procedure (see fuel supply installation).
- Remove flue pipe and use a flashlight to inspect the inside of the heat exchanger. The access panel is located on the flue pipe end of the heat exchanger. Clean the inside of the heat exchanger.

- Restrict heat exchanger

4. Burner motor comes on, but the heater won't ignite.

- Fuel pressure or volume

- Use a low pressure gauge (0-15 inches of water column) with 1/8" NPT inlet. Install gauge in the pressure tap port located on the output side of the gas valve. Run the heater. Adjust the pressure by turning the pressure adjusting screw (located on the input side top of the gas valve) counter clockwise until the gauge reads 3.6" W.C. for propane or 6.1" for natural gas. Refer to pipe sizing charts in the Heat Wagon Engineering Guide. Heater requires 9-14" W.C. inlet pressure.

- Air inlet damper adjustment

- Rough setting at 3 or 1/2 open. Minor adjustments from the rough settings can be made to achieve a smooth sounding burner with no soot from the flue pipe.
- Clean with fine sandpaper. Make sure it is free from buildup or cracks.

- Ignition electrode
- Electronic igniter

- Turn off the gas valve, turn on the burner. Use insulated pliers to hold the ignition wire and short it to ground. Pull the wire away from ground slowly. A rainbow colored arc should travel between the wire and the ground at a distance of 3/8 of an inch for a duration of 4-5 seconds.

**VG500 TROUBLESHOOTING****Symptom**      **Possible Causes**

4. Continued
- Burner airflow switch

- Gas valve

- Air in pilot line

- Flame safeguard control in lockout

5. The heater blows black smoke out of the vent stack.

- Air damper setting

- Dirt on burner blower wheel

- Improper flue pipe setup or flue pipe restrictions

- Gas manifold pressure

- Restricted heat exchanger

**Possible Solutions**

- The burner airflow switch will not allow power to the flame safeguard control when it is open. Check the tubes supplying air to the switch for any restrictions. ONLY AS A TEST, wire around the air switch. If this test solves the problem, adjust or replace the switch.

- If there is power at the flame safeguard control and no power out to the solenoid valve, replace the flame safeguard control. Check for continuity between the terminals on the solenoid valve coil.

- Bleed all air from line wait 5 minutes, restart the heater.

- Turn off the thermostat wait 50 sec. to reset the control.

- Rough setting at 3 or 1/2 open. Minor adjustments from the rough settings can be made to achieve a smooth sounding burner with no soot from the flue pipe.

- Clean the burner blower wheel with a small brush.

- Refer to the flue pipe chart in this manual. Check flue for restriction.

- Use a low pressure gauge (0-15 inches of water column) with 1/8" NPT inlet. Install gauge in the pressure tap port located on the output side of the gas valve. Run the heater. Adjust the pressure by turning the pressure adjusting screw (located on the input side top of the gas valve) until the gauge reads 3.6" W.C. for propane or 6.1" for natural gas. Refer to pipe sizing charts in the Heat Wagon Engineering Guide. Heater requires 9-14" W.C. inlet pressure.

- Remove flue pipe and use a flashlight to inspect the inside of the heat exchanger. The access panel is located on the flue pipe end of the heat exchanger. Remove and clean the heat exchanger.

## VG500 TROUBLESHOOTING

### Symptom

### Possible Causes

- 6. The burner seems to cycle on and off more than it should.

- Use a low pressure gauge (0-15 inches of water column) with 1/8" NPT inlet. Install gauge in the pressure tap port located on the output side of the gas valve. Run the heater. Adjust the pressure by turning the pressure adjusting screw (located on the input side top of the gas valve) counter clockwise until the gauge reads 3.6" W.C. for propane or 6.1" for natural gas. Refer to pipe sizing charts in the Heat Wagon Engineering Guide. Heater requires 9-14" W.C. inlet pressure.

- Dirt on main air blower or improper setup of outlet air duct

- Burner Control Switch

- Check for dirt or ice buildup on the air inlet or blower wheel. If using duct on the air outlet, insure the back pressure does not exceed a static pressure of 2" W.C. Check with low pressure gauge (0-15 inches of water column).
- On the main terminal block, check for 120 volts between terminals 6 and the "C" terminal on the burner switch, when the 3-position switch is in the Heat position. Then between terminal 6 and the "1" terminal on the burner switch. If there is power on the "C" terminal and not at the "1" terminal, replace the switch.

- 7. The burner starts, but the main fan never comes on.

- Blower motor relay

- Current overload on blower motor

- Blower motor

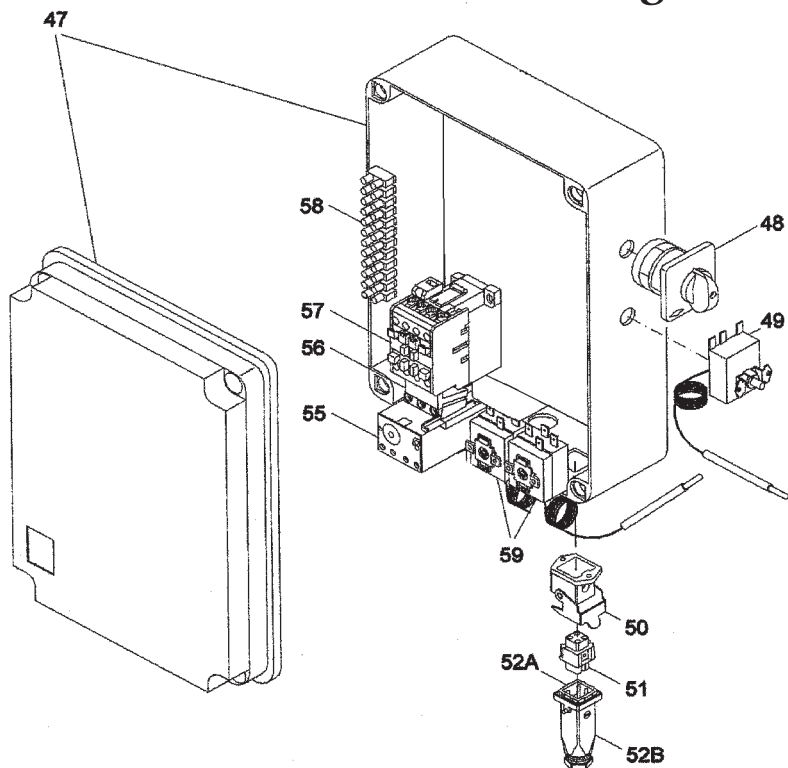
- Fan switch

- Turn the 3-position main switch to the fan position. If the relay pulls in, check for voltage between the L1 and L2 terminals. Then check the voltage between terminals T1 and T2. The voltage should be the same. If it is much lower, replace the relay.
- Turn the 3-position main switch to the fan position. Check for voltage between the 2 solenoid coil terminals on the relay. If there is no voltage, the overload is bad. Push the reset on the overload.
- Turn the 3-position main switch to the fan position. Check for voltage between terminals T1 and T2 on the motor relay. If the voltage is good, replace the motor.
- If the blower works with the 3-position switch in the fan position. Replace the fan switch.

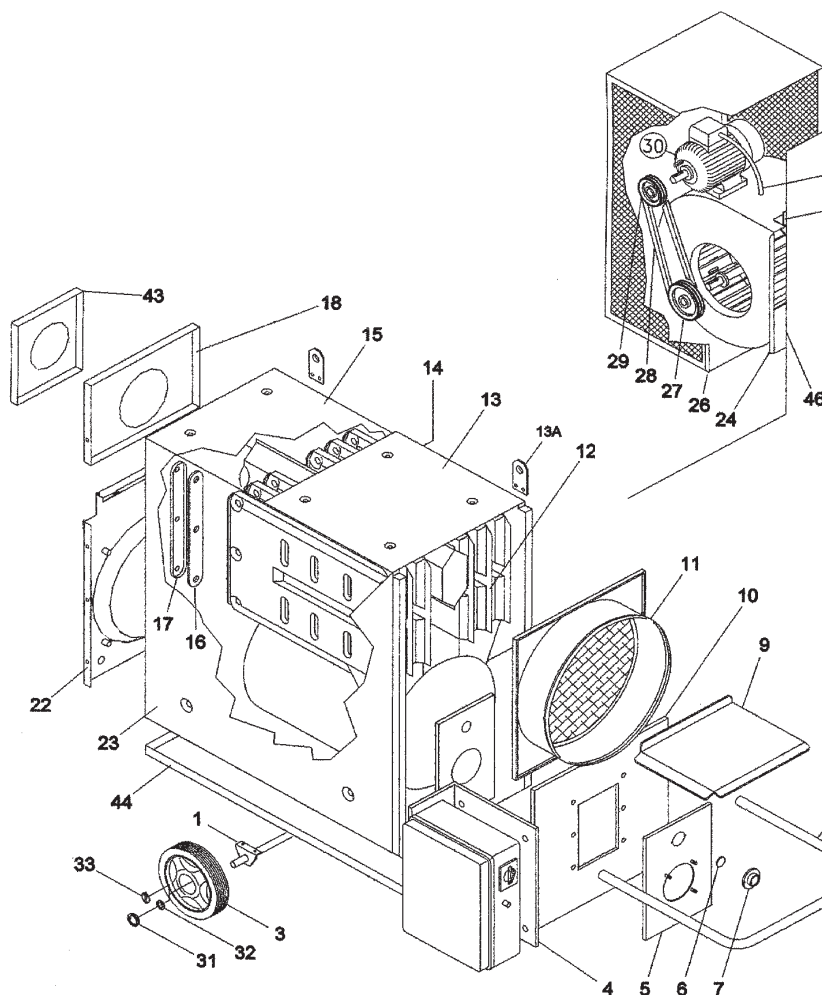
## VG500 TROUBLESHOOTING

| <u>Symptom</u>                                                 | <u>Possible Causes</u>                                                            | <u>Possible Solutions</u>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
|----------------------------------------------------------------|-----------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 9. The burner continues to run, but the fan cycles on and off. | <ul style="list-style-type: none"> <li>Gas manifold pressure</li> </ul>           | <ul style="list-style-type: none"> <li>Use a low pressure gauge (0-15 inches of water column) with 1/8" NPT inlet. Install gauge in the pressure tap port located on the output side of the gas valve. Run the heater. Adjust the pressure by turning the pressure adjusting screw (located on the input side top of the gas valve) until the gauge reads 3.6" W.C. for propane, 6.1" W.C. for natural gas. Refer to pipe sizing charts in the Heat Wagon Engineering Guide. Heater requires 9-14" W.C. inlet pressure.</li> </ul> |
|                                                                | <ul style="list-style-type: none"> <li>Fuel supply pressure and volume</li> </ul> | <ul style="list-style-type: none"> <li>Use a low pressure gauge (0-15 inches of water column) with 1/8" NPT inlet. Install gauge in the pressure tap port located on the output side of the gas valve. Run the heater. Adjust the pressure by turning the pressure adjusting screw (located on the input side top of the gas valve) until the gauge reads 3.6" W.C. for propane, 6.1" W.C. Refer to pipe sizing charts in the Heat Wagon Engineering Guide. Heater requires 9-14" W.C. inlet pressure.</li> </ul>                  |
|                                                                | <ul style="list-style-type: none"> <li>Fan switch</li> </ul>                      | <ul style="list-style-type: none"> <li>If the blower works with the 3-position switch in the fan position, replace the fan switch.</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                      |

# Heat Wagon VG500 Parts List



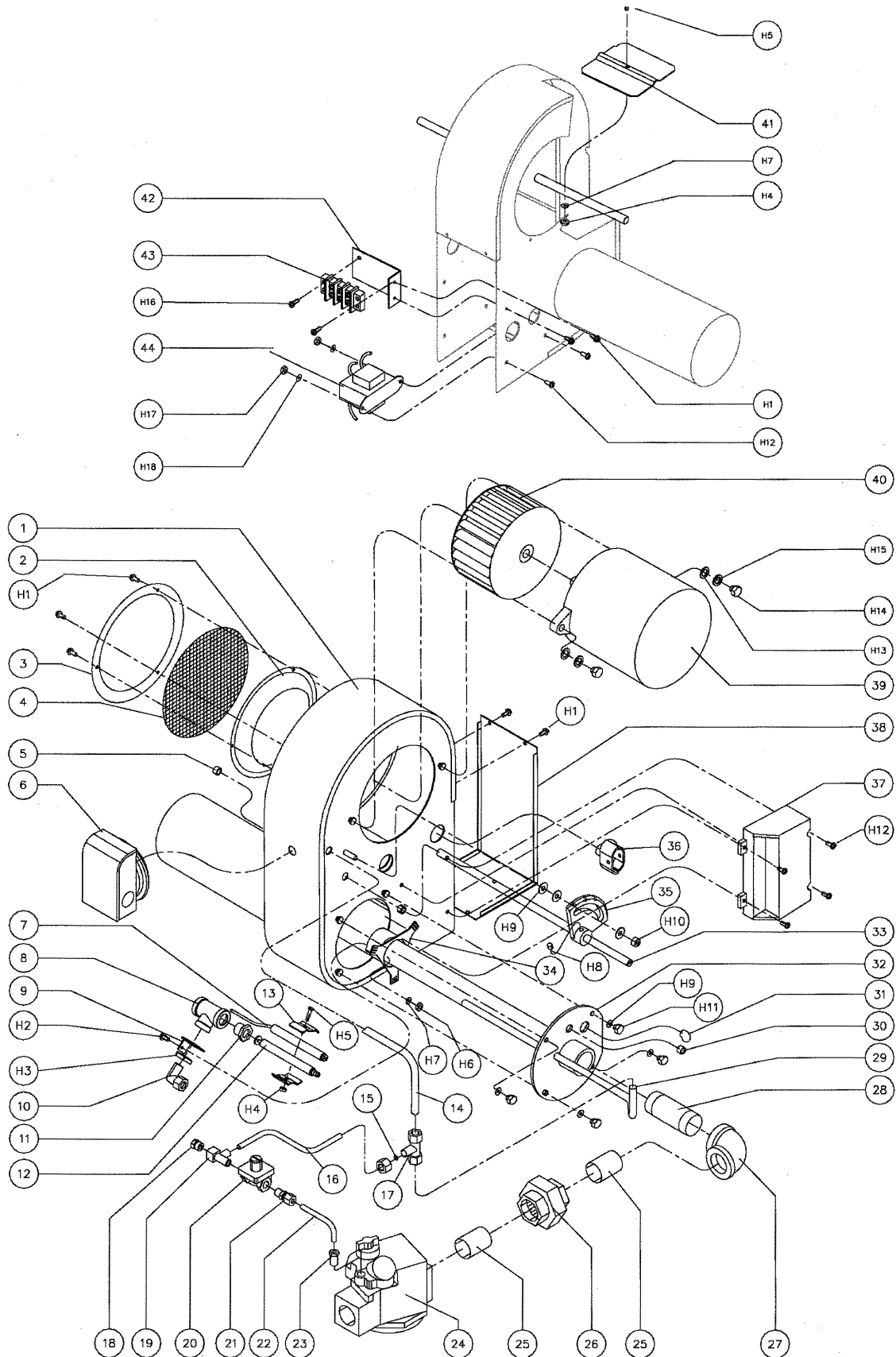
| ITEM | PART#      | DESCRIPTION                 |
|------|------------|-----------------------------|
| 47   | 1048001035 | ELECTRICAL BOX              |
| 48   | 1032003035 | 3-POSITION SWITCH           |
| 49   | 1036001500 | OVERHEAT LIMIT SWITCH       |
| 50   | 1043000600 | THERMOSTAT SOCKET           |
| 51   | 1043000400 | THERMOSTAT SOCKET           |
| 52A  | 1043000500 | THERMOSTAT PLUG             |
| 52B  | 1043000700 | THERMOSTAT PLUG             |
| 55   | 1032006135 | THERMAL OVERLOAD RELAY      |
| 56   | 1052007400 | CONNECTOR                   |
| 57   | 1037001500 | MOTOR RELAY                 |
| 58   | 1034000635 | TERMINAL BOARD              |
| 59   | 1036001335 | FAN/BLOWER                  |
|      | 1105015355 | RESET BUTTON LABEL          |
|      | 1105015355 | HOT SURFACE LABEL           |
|      | 1105015600 | FAN ROTATION LABEL          |
|      | 1105055955 | OIL PREHEAT COIL (OIL ONLY) |



| ITEM | PART#             | DESCRIPTION          |
|------|-------------------|----------------------|
| 1    | ASSALEG#HELM3     | AXLE                 |
| 2    | PIEGEG#HELG1      | FOOT                 |
| 3    | 1004001680        | WHEEL                |
| 4    | 1094148035        | SUPPORT PANEL        |
| 5    | PANNELLO#FBR40236 | BURNER PANEL         |
| 6    | D001806011        | INSPECTION GLASS     |
| 7    | -                 | BURNER               |
| 8    | MANT#HELM120      | HANDLE               |
| 9    | PANNELLO#RBR40220 | BURNER COVER         |
| 10   | PANEST#FIN14536   | FRONT LOWER PANEL    |
| 11   | 1094096135        | AIR OUTLET PANEL     |
| 12   | CAMERHE#145       | HEAT EXCHANGER ASMY. |
| 13   | PANEST#SAN14536   | UPPER FRONT PANEL    |
| 14   | PANEST#LSX14336   | LEFT SIDE PANEL      |
| 15   | PANEST#SPO14536   | UPPER REAR PANEL     |
| 16   | 1051001735        | GASKET               |
| 17   | 1094018435        | INSPECTION COVER     |
| 18   | PANEST#USF14536   | EXHAUST PANEL        |
| 23   | PANEST#LDX14336   | RIGHT SIDE PANEL     |
| 24   | 1087003035        | CENTRIFUGAL FAN      |
| 25   | 1039044800        | MOTOR SUPPLY CABLE   |
| 26   | 1094177035        | CAGE                 |
| 27   | 1099003235        | DRIVING PULLEY       |
| 28   | 1002003335        | BELT                 |
| 29   | 1099001035        | DRIVEN PULLEY        |
| 30   | 1040014535        | MOTOR                |
| 31   | 1005002280        | WHEEL CAP            |
| 32   | 1022000200        | SEEGER RING          |
| 43   | PANNELLO#COC10536 | FLUE PANEL           |
| 44   | PANINF#143        | LOWER BASE PANEL     |
| 45   | 1094036835        | CORNER PLATE         |
| 46   | 1099002235        | FLANGE               |



# Burner Parts List

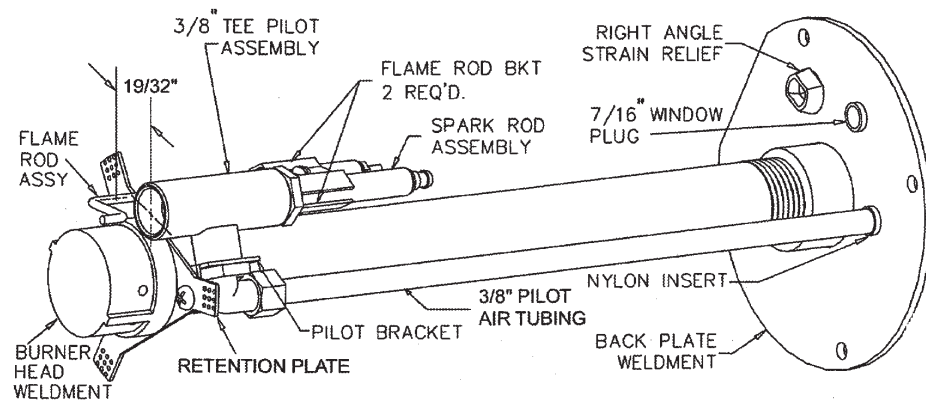
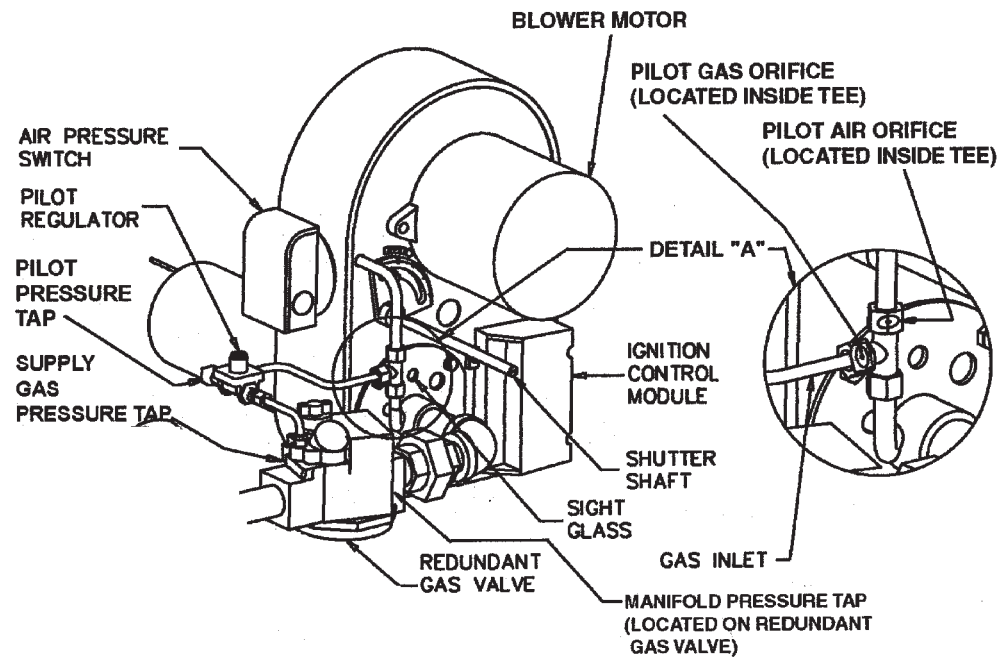




## Burner Parts List

| Ref # | Part #  | Description                           | Qty | Ref #   | Hardware                                   | Qty |
|-------|---------|---------------------------------------|-----|---------|--------------------------------------------|-----|
| 1     | 5230-90 | Blower Housing Weldment               | 1   | H1      | #8 x 3/8" Slotted Washer Head Hex Screw    | 9   |
| 2     | 5230-58 | Air Inlet Collar                      | 1   | H2      | #10-24 x 3/8" Phillips Screw S.S.          | 1   |
| 3     | 5230-57 | Front Ring                            | 1   | H3      | Lock Nut (Pal Nut)                         | 1   |
| 4     | 5230-59 | Air Screen                            | 1   | H4      | #10-24 Hex Nut                             | 2   |
| 5     | 8450-19 | Nylon Ins.                            | 1   | H5      | #10-24 x 3/4" Slotted Round Screw          | 2   |
| 6     | 8425-19 | Air Switch                            | 1   | H6      | #10-24 Hex Nut S.S                         | 1   |
| 7     | 5230-84 | Flame Rod Assembly                    | 1   | H7      | #10 Lock Washer                            | 3   |
| 8     | 8494-44 | 3/8" x 3/8" x 1/4" Blk Malleable Tee  | 1   | H8      | 1/4"-20 x 1/4" Socket Set Screw            | 1   |
| 9     | 5230-82 | Pilot Bracket                         | 1   | H9      | 1/4" Flat Washer                           | 7   |
| 10    | 8483-55 | 1/4"M x 3/8"T-Elbow                   | 1   | H10     | 1/4"-20 Hex nut                            | 1   |
|       |         | Brass Tube Fitting                    | 1   | H11     | 1/4"-20 x 3/8" Hex Head Screw              | 4   |
| 11    | 5230-79 | 3/8" x 1/4" Blk Malleable Hex Bushing | 1   | H12     | #8-32 x 1/2" Slotted Pan Head Screw        | 6   |
| 12    | 5230-80 | Spark Electrode Assembly              | 1   | H13     | 5/16" Flat Washer                          | 2   |
| 13    | 5230-86 | Flame Rod Bracket                     | 2   | H14     | 5/16"-18" x 1" Hex Bolt                    | 2   |
| 14    | 5231-53 | 3/8" Air Inlet Pilot Tubing           | 1   | H15     | 5/16" Lock Washer                          | 2   |
| 15    | 5231-54 | Pilot Gas Orifice                     | 1   | H16     | #8-32 x 1/2" Slotted Washer Head Hex Screw | 2   |
| 16    | 5231-51 | 1/4" Gas Inlet Tubing                 | 1   | H17     | #8-32 Hex Nut                              | 6   |
| 17    | 8483-54 | 3/8" x 3/8" x 1/4" Brass Tee          | 1   | H18     | #8 Lock Washer                             | 6   |
| 18    | 8496-00 | 1/8" Sq. Pipe Plug                    | 1   |         |                                            |     |
| 19    | 8483-18 | 1/8"M x 1/8"F x 1/4"T Brass Tee       | 1   |         |                                            |     |
| 20    | 8400-06 | 1/8" Pilot Regulator                  | 1   |         |                                            |     |
| 21    | 8483-14 | 1/8"M x 1/4"T Straight Conn. Brass    | 1   |         |                                            |     |
| 22    | 5231-52 | 1/4" Regulator Tubing                 | 1   | 8480-15 | Reducing Washer                            |     |
| 23    | 8483-27 | 1/4"T Pilot Line Control Nut          | 1   | 8484-80 | Snap Bush                                  |     |
| 24    | 8419-50 | 1" Redundent Comb/Pilot Valve         | 1   | 8484-79 | Universal Bush                             |     |
|       |         | (Robert Shaw #7000 DERHC 5R8-501-948) |     | 8457-36 | Dome Plug                                  |     |
| 25    | 8488-51 | 1" Close Nipple                       | 2   | 8457-37 | Plastic Plug for 1.1" Dia Hole             |     |
| 26    | 8493-06 | 1" Union                              | 1   | 8457-38 | Plastic Plug for .875" Dia Hole            |     |
| 27    | 8495-24 | 1" 90 Degree Elbow Blk Malleable      | 1   | 8480-01 | 3/8" BX, 9" long                           |     |
| 28    | 8488-61 | 1"x 3" Nipple                         | 1   | 8504-46 | 19" Flame Rod Wire Assy.                   |     |
| 29    | 5230-83 | 3/8" Pilot Air Tubing                 | 1   | 8504-50 | Spark Wire Assy.                           |     |
| 30    | 8452-32 | 7/16" Window Plug                     | 1   | 7400-01 | Grounding Wire 2" Yellow                   |     |
| 31    | 8484-75 | Strain Relief 90 Degree               | 1   | 3252-00 | Open Label                                 |     |
| 32    | 5230-88 | Back Plate Weldment                   | 1   | 5205-30 | 3 Term Black Label                         |     |
| 33    | 5230-61 | Shutter Shaft                         | 1   |         |                                            |     |
| 34    | 5230-85 | Burner Head Weldment                  | 1   |         |                                            |     |
| 35    | 3152-01 | Quadrant                              | 1   |         |                                            |     |
| 36    | 8480-11 | 3/8" BX Duplex Conn                   | 1   |         |                                            |     |
| 37    | 8429-26 | Electronic Control                    | 1   | 8471-14 | Installation & Service Manual              |     |
|       |         | (M-H S8680J 1004)                     |     |         |                                            |     |
| 38    | 5230-56 | Blower Housing Door                   | 1   |         |                                            |     |
| 39    | 8437-51 | 1/6 HP Motor 115/60                   | 1   |         |                                            |     |
| 40    | 8437-52 | Blower Wheel                          | 1   |         |                                            |     |
| 41    | 5230-55 | Air Shutter                           | 1   |         |                                            |     |
| 42    | 5231-56 | Terminal Strip Bracket                | 1   | 5230-71 | Cartridge Assembly, Propane                |     |
| 43    | 8408-78 | 3 Position Barrier Terminal Strip     | 1   | 5230-78 | Pilot Assembly                             |     |
| 44    | 5231-57 | Transformer Assembly                  | 1   |         |                                            |     |

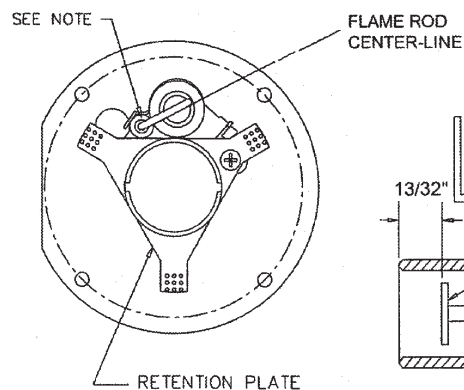
## Piping Connections



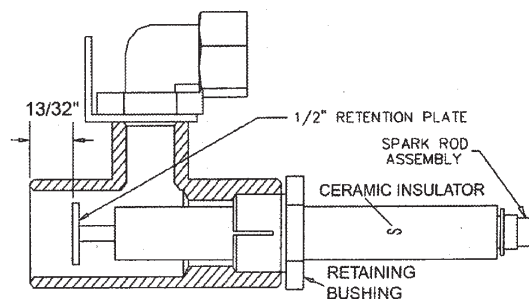
## Cartridge Assembly

NOTE:  
MAKE SURE THAT THE FLAME ROD CENTER-LINE COINCIDES WITH THE 1/2" RETENTION PLATE CENTER-LINE. VERIFY THAT THE FLAME ROD RECESSED INSULATOR TOUCHES THE RETENTION PLATE.

\*NOTE: SPARK ROD SHOULD BE CENTERED IN THE TEE & HELD SECURELY BY THE RETAINING BUSHING. OVER TIGHTENING OF THE RETAINING BUSHING MAY CRACK THE CERAMIC INSULATOR.

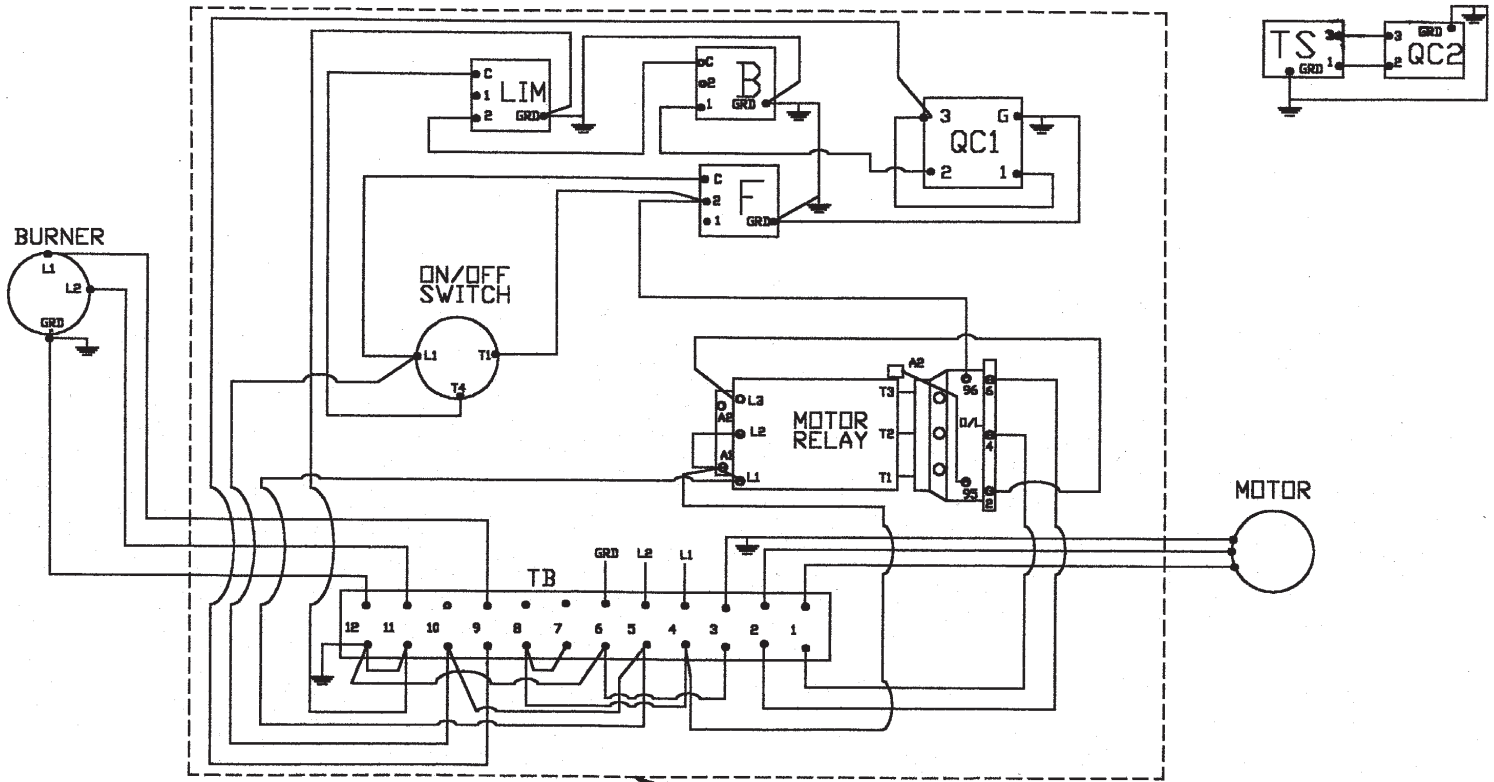


END VIEW OF CARTRIDGE



3/8" TEE PILOT ASSEMBLY \*  
(PARTIAL CUT-A-WAY VIEW)

# 240 Volt 1 PH

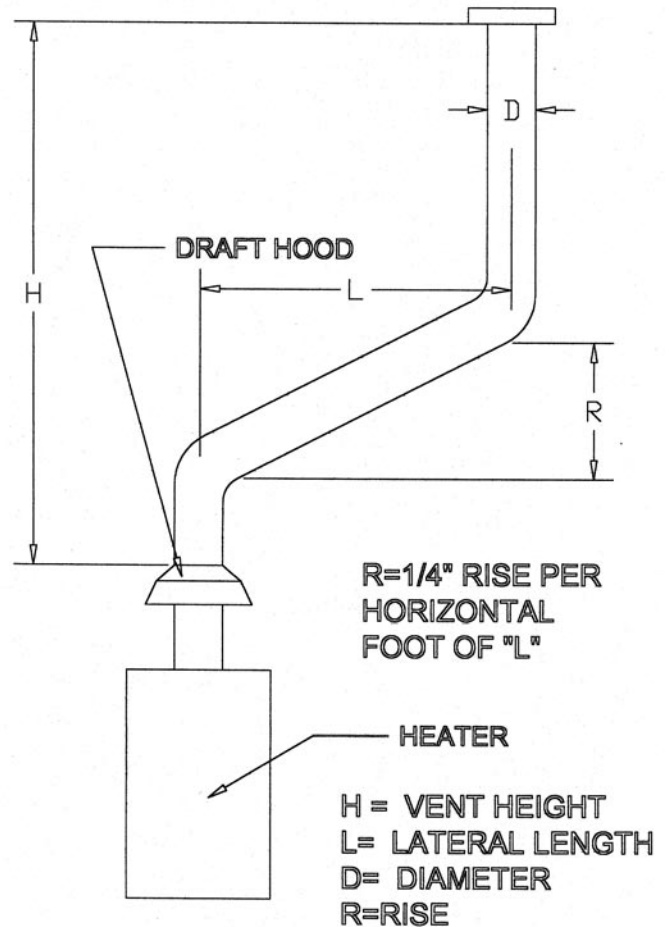
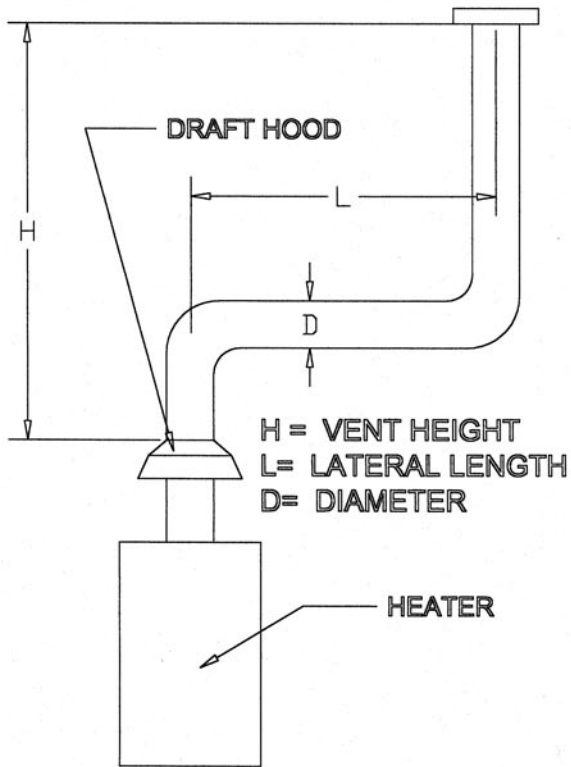


## NOTE:

- B = BURNER SWITCH
- F = FAN SWITCH
- LIM = LIMIT SWITCH
- O/L = OVER LOAD
- QC1 = THERMOSTAT QUICK CONNECT  
(CONTROL BOX)
- QC2 = THERMOSTAT QUICK CONNECT  
(THERMOSTAT CORD)
- TB = TERMINAL BLOCK
- TS = THERMOSTAT

CONTROL BOX

## EXHAUST FLUE PIPE GUIDELINES



### CAPACITY OF TYPE B DOUBLE-WALL VENTS SERVING A SINGLE DRAFT HOOD-HEATER x 1000 BTU'S

### FOR INDOOR APPLICATIONS



342 N. Co. Rd. 400 East

Valparaiso, IN 46383

219-464-8818 • Fax 219-462-7985

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|                           |                         | VENT DIAMETER (D) INCHES |      |      |      |
|---------------------------|-------------------------|--------------------------|------|------|------|
| TOTAL VENT HEIGHT(H) FEET | LATERAL LENGTH (L) FEET | 8                        | 10   | 12   | 14   |
|                           |                         |                          |      |      |      |
| 6                         | 0                       | 370                      | 570  | 850  | 1170 |
|                           | 2                       | 285                      | 455  | 650  | 890  |
|                           | 6                       | 273                      | 435  | 630  | 870  |
|                           | 12                      | 255                      | 406  | 610  | 840  |
| 8                         | 0                       | 415                      | 660  | 970  | 1320 |
|                           | 2                       | 322                      | 515  | 745  | 1020 |
|                           | 8                       | 303                      | 490  | 720  | 1000 |
|                           | 16                      | 281                      | 458  | 685  | 950  |
| 10                        | 0                       | 450                      | 720  | 1060 | 1450 |
|                           | 2                       | 355                      | 560  | 850  | 1130 |
|                           | 10                      | 330                      | 525  | 795  | 1080 |
|                           | 20                      | 300                      | 486  | 735  | 1030 |
| 15                        | 0                       | 525                      | 840  | 1240 | 1720 |
|                           | 2                       | 414                      | 675  | 985  | 1350 |
|                           | 15                      | 373                      | 610  | 905  | 1250 |
|                           | 30                      | 328                      | 553  | 845  | 1180 |
| 20                        | 0                       | 575                      | 930  | 1350 | 1900 |
|                           | 2                       | 470                      | 755  | 1100 | 1520 |
|                           | 10                      | 443                      | 710  | 1045 | 1460 |
|                           | 20                      | 410                      | 665  | 990  | 1390 |
| 30                        | 0                       | 380                      | 626  | 945  | 1270 |
|                           | 2                       | 650                      | 1060 | 1550 | 2170 |
|                           | 2                       | 535                      | 865  | 1310 | 1800 |
|                           | 20                      | 473                      | 784  | 1185 | 1650 |
| 40                        | 0                       | 415                      | 705  | 1075 | 1520 |
|                           | 2                       | 415                      | 705  | 1075 | 1520 |