

GAS FURNACE USERS INFORMATION MANUAL

FOR YOUR SAFETY

Do not store or use gasoline or other flammable vapors and liquids in the vicinity of this or any other appliance.

WARNING: Improper installation, adjustment, alteration, service or maintenance can cause injury or property damage. Refer to this manual. For assistance or additional information consult a qualified installer, service agency or the gas supplier.

FOR YOUR SAFETY

WHAT TO DO IF YOU SMELL GAS

- Do not try to light any appliance.
- Do not touch any electrical switch; do not use any phone in your building.
- Immediately call your gas supplier from a neighbor's phone. Follow the gas supplier's instructions.
- If you cannot reach your gas supplier, call the fire department.

GENERAL

The warnings shown on the cover of this manual and the information on the following pages are very important and should be fully read and understood by the operator of this equipment. Please take the few minutes necessary to completely read this booklet, and if there are any questions when you are through, ask your installer to review them with you. Please retain this booklet for future reference.

CLEARANCES

There are certain minimum installation clearances from the furnace cabinet and sheet metal plenum attached to the top of the furnace to any combustible materials. These clearances for each model of furnace are shown on the furnace rating plate (located in the burner compartment) and are the responsibility of the furnace installer during the installation of the appliance.

It is the owner's responsibility to make sure these clearances are always maintained thereafter. Additionally, a minimum of 24 inches for serviceability of furnace is required from the front side of all models.

A furnace installed in an attic or other insulated space must be kept free and clear of insulating material. The furnace area should be examined when the furnace is installed or when any additional insulation is added. Some insulating materials may be combustible.

BE SURE TO OBSERVE THE FOLLOWING RULES:

- DO NOT** allow any cardboard, newspapers, or any other combustible material (this includes wood, 2x4's, etc.) within the above specified minimum clearances. This includes placing any combustibles on or against the sheet metal plenum attached to the top of the furnace.
- DO NOT** use this furnace if any part has been under water. Immediately call a qualified service technician to inspect the furnace and to replace any part of the control system and any gas control which has been under water.
- The furnace area is to be kept clear and free of combustible materials, solvents, painting supplies, and any other flammable vapors or liquids.

COMBUSTION AND VENTILATING AIR

Whether your furnace is installed in a closet, basement, garage or other location as dictated by the particular application, an adequate source of fresh outside air has been provided by the installer to allow proper combustion and venting of the products of combustion to the outside of the building.

It is again the responsibility of the owner to assure that this important flow of combustion and ventilating air is not obstructed from reaching the furnace.

Do not block or obstruct air openings on the furnace, air openings communicating with the area in which the furnace is installed, and the spacings around the furnace.

LIGHTING AND SHUTDOWN INSTRUCTIONS

Reference should be made to Figures 1 and 2 for general location of components referenced in the following "Lighting Instructions".

WARNING

Should overheating occur, or the gas supply fail to shut off, shut off the manual gas valve to the furnace before shutting off the electrical supply.

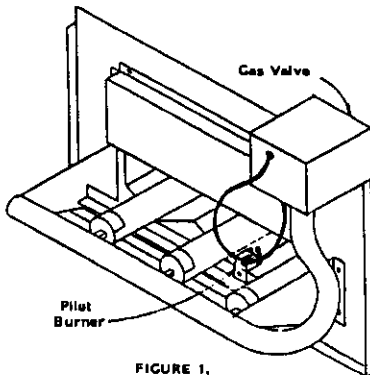


FIGURE 1.

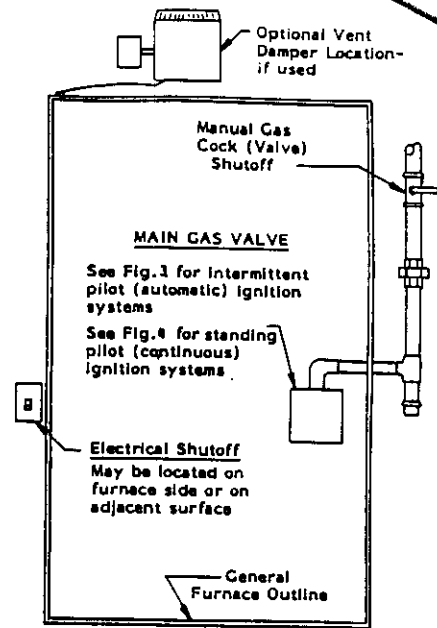


FIGURE 2.

INTERMITTENT PILOT MODELS

LIGHTING INSTRUCTIONS

This unit is equipped with an automatic ignition system that will light the pilot when gas and electric power is supplied to unit and the thermostat calls for heat. After the pilot is proven the main burner will light.

CAUTION: Do not attempt to manually light the pilot.

- Turn gas cock knob on main gas valve within unit to "off" position. If external gas cock is used, turn to "off" position. Turn "off" main electrical supply and set thermostat to lowest setting.
Allow five minutes for any gas in unit to escape. L.P. gas being heavier than air may require forced ventilation.
- If furnace has a vent damper, it must be open during the 5 minute "off" cycle. It should automatically open when its switch is turned "off". Check instructions located at the shaft end of the damper (end opposite of control box).
- Turn gas cock knob on main gas valve and external gas cock to "on" position.
- Turn "on" main electrical supply to unit, and set the thermostat above the indicated temperature. Set "system" switch to "heat" or "auto" when combination heating and cooling thermostat is provided. Observe that pilot and main burner are operating properly.
- Set thermostat to desired temperature.
- If burner fails to ignite, repeat steps 1 through 4. If burner still fails to ignite, shut down the furnace and have qualified service personnel investigate the problem.

TO SHUT DOWN UNIT

- Turn thermostat to lowest setting.
- Turn "off" manual gas valve external to unit.
- Turn gas cock on main gas valve to "off" position.
- Turn "off" main electrical supply to unit.

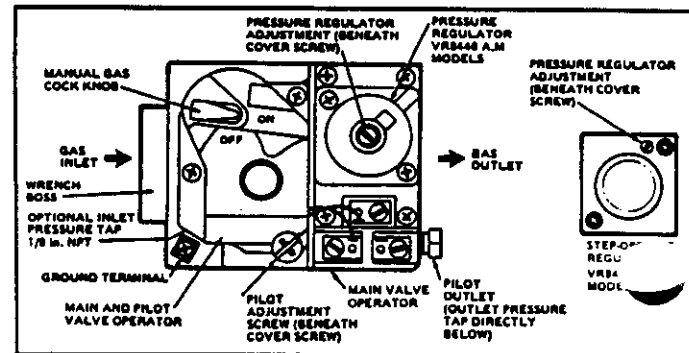


FIG. 3. TOP VIEW OF VR8440 GAS CONTROL

STANDING PILOT MODELS

LIGHTING INSTRUCTIONS

This unit is equipped with a continuous burning pilot system. Once the pilot is lit and the safety circuit proven, the thermostat will automatically turn on and off the main burners.

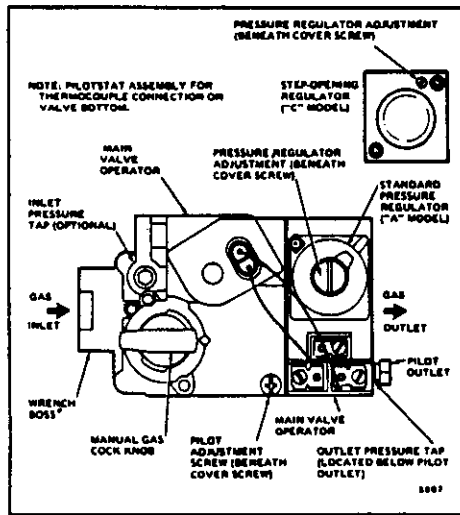
1. Turn gas cock knob on main gas valve within unit to "off" position. If external gas cock is used, turn to "off" position. Turn "off" main electrical supply and set thermostat to lowest setting.

Allow five minutes for any gas in unit to escape.
L.P. gas being heavier than air may require forced ventilation.

2. If furnace has a vent damper, it must be open during the 5 minute "off" cycle. It should automatically open when its switch is turned "off". Check instructions located at the shaft end of the damper (end opposite of control box).
3. Turn "on" external gas cock. Depress main gas valve control knob slightly and turn to "pilot" position, then depress fully and light pilot with a match or candle.
4. Hold the control knob down for about one minute, and then release. If pilot flame does not continue to burn, repeat steps 1 through 3. Turn control knob to "on" position.
5. Turn "on" main electrical supply to unit, and set the thermostat above the indicated temperature. Set "system" switch to "heat" or "auto" when combination heating and cooling thermostat is provided. Observe that main burner is operating properly.
6. Set thermostat to desired temperature.
7. If pilot fails to stay lit, or burner does not ignite properly, shut down the furnace and have qualified service personnel investigate the problem.

TO SHUT DOWN UNIT

1. Turn thermostat to lowest setting.
2. Turn "off" manual gas valve external to unit.
3. Turn gas cock on main gas valve to "off" position.
4. Turn "off" main electrical supply to unit.



Top view of VR800 gas control.

FIGURE 4.

AIR FILTERS

It is the owner's responsibility to check the condition of the air filters on at least a monthly basis when the furnace is in use and to clean or replace whenever it is necessary.

Permanent Type Filter (usually foam type) are washable. Use a solution of soapy water, followed by a rinse in clear water and then dried by tapping the frame against a solid object.

NEVER OPERATE A FURNACE WITHOUT A FILTER

**NEVER SUBSTITUTE A THROWAWAY (FIBERGLASS)
FOR A PERMANENT (FOAM) TYPE**

FILTER SIZES FOR GAS FURNACES			
Model		Size	
60,000 80,000 105,000 120,000 140,000 160,000	HI-Boy	(1)	16x25x1 P
200,000	HI-Boy	(2)	16x25x1 P
60,000 80,000	Counterflow	(1)	15x20 P
105,000 120,000	Counterflow	(2)	10x20 P
140,000 160,000	Counterflow	(1)	15x20 P
		(1)	10x20 P

P = Permanent Filter

FIGURE 5.

FILTER LOCATIONS--REMOVAL AND REPLACEMENT PROCEDURES - ALL HI-BOY FURNACES

To remove filters from ALL sectional HI-Boys, first remove the upper burner door and then the lower blower compartment door by grasping top of door and pull up and away from the furnace. Then, remove the "S" clip and spring by pulling the clip towards the front of the furnace.

For right hand side filter location, replace filter and retaining spring assembly to right side filter brackets.

For right hand side filter location on 60,000 and 80,000 model furnaces, the optional filter rack is required because there is no room between the blower motor and right side of furnace to remove or install filter.

The filter may now be removed simply by pulling it towards the center of the furnace and outward.

The location may vary, depending on which side the installer located the return air duct.

This filter is the permanent high velocity type foam filter which may be washed and used over and over. DO NOT replace it with a fiberglass filter of the same size.

To replace filter, reverse the above process.

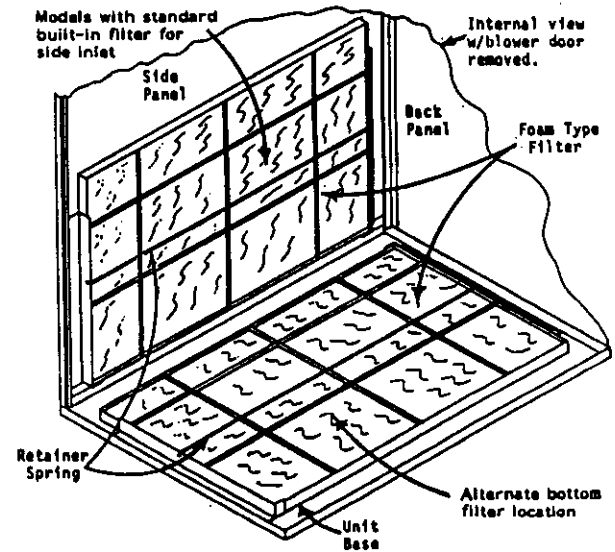


FIGURE 6.

ALTERNATE BOTTOM FILTER LOCATION

Some HI-Boy (upflow) installations may be set up for a bottom filter location rather than right or left side.

To remove filter, simply release the retainer spring in same manner as described for side installations.

OPTIONAL EXTERNAL FILTER RACK

To remove filter from the optional external filter rack, grasp the exposed end of the filter and pull from the filter rack. Reference Figure 7.

The location may vary, depending on which side the installer located the return air duct.

This filter is the permanent high velocity type foam filter which may be washed and used over and over. DO NOT replace it with a fiberglass filter of the same size.

To replace filter, reverse the process.

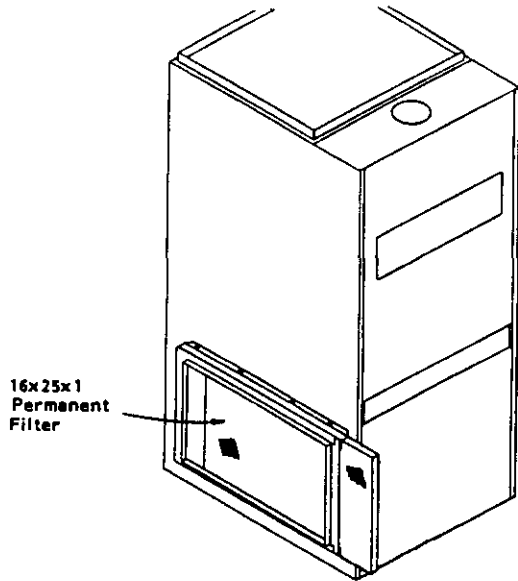
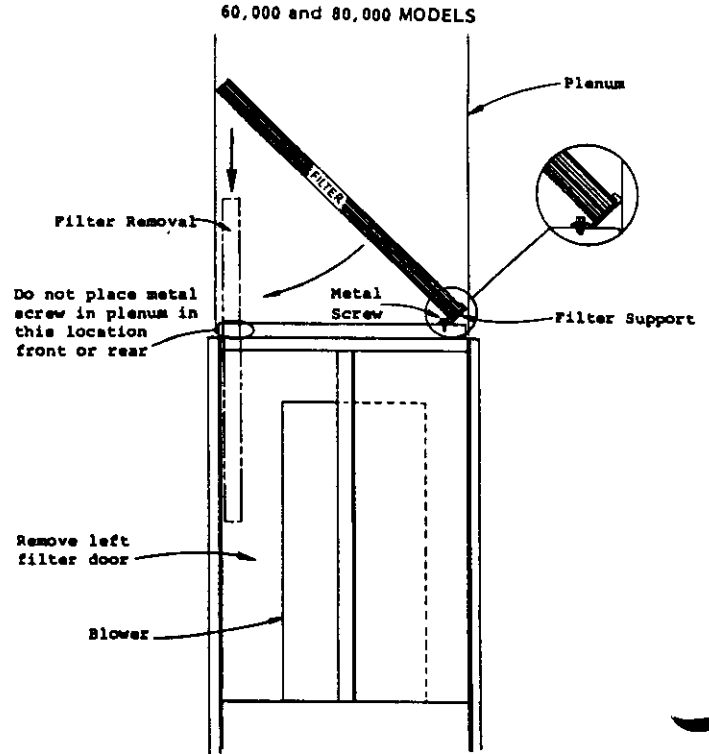


FIGURE 7.

FILTER LOCATIONS -- COUNTERFLOW MODELS

Counterflow models normally have filters installed in the return air plenum above the furnace unless a common return air/filter grille is used.

The electrical switch should be turned "off" before the front door to furnace is removed. After removing the front door remove the left side filter door in the upper section of the furnace. Refer to the illustrations below for proper filter locations.



Attach filter support to furnace as shown with two sheet metal screws. The filter can be installed and removed through the left filter door.

FIGURE 8.

105, 120, 140, 160, 000 MODELS

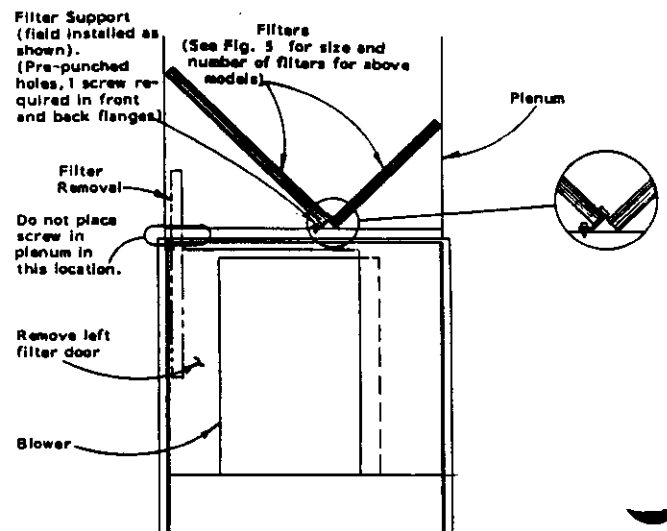


FIGURE 9.

LUBRICATION REQUIREMENTS

- A. **DIRECT DRIVE MODELS** - Motors are permanently lubricated, no maintenance required.
- B. **BELT DRIVE MODELS**- Oil the blower and motor bearings twice per heating season (every two months if CAC (constant air circulation) is used, with 5-6 drops of SAE20 motor oil. DO NOT USE a light lubricating oil such as 3-in-1 oil or sewing machine oil.

FAN BELT ADJUSTMENT

On belt drive models, check the fan belt for cracks or breaks each time the motor and bearings are lubricated, and replace with same type and length if necessary.

Belt tension is adjusted by loosening locking nut on adjuster bolt and turning bolt in or out as required. Proper tension will allow approximately one inch deflection with light finger pressure.

FURNACE EXAMINATION

The furnace and the vent system (commonly called flue pipe, smoke pipe, chimney, etc.) should be inspected yearly by a qualified service agency, generally prior to the heating season. Detailed procedures for this inspection are contained in the instructions booklet and should be handled by the qualified service agency only.

A general inspection of the furnace, the furnace area, and the venting system should be conducted on a regular basis by the owner/occupant. This review should include:

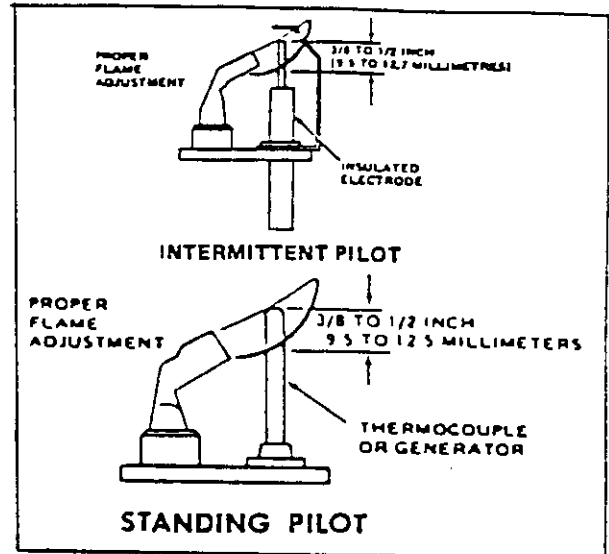
1. Assure that all flue product carrying areas external to the furnace (chimney, metal vent pipe, etc.) are clear and free of obstructions.
2. Make sure the furnace always has the minimum clearances as detailed in Figure 10. Special attention must be given to these items if any remodeling is done.
3. Make sure the vent connector (system) is in place, slopes upward and is physically sound without holes or excessive corrosion.
4. Reviewing that the return-air duct connection(s) is physically sound, is sealed to the furnace casing, and terminates outside the space containing the furnace.
5. The physical support of the furnace is sound without sagging, cracks, gaps, etc. around the base.
6. Inspect for any obvious signs of deterioration of the furnace.

Periodic examinations of the combustion area and vent system should also be conducted by the owner on a regular basis.

The following procedure should be followed for the periodic inspection as conducted by the owner:

1. Set the wall thermostat to the OFF position or lower the set point lever to a temperature well below the existing room temperature. Shut off electric power to the furnace. A switch should be mounted either on the outside of the furnace or adjacent to the furnace for this purpose.
2. Remove the furnace door exposing the burner compartment.
3. Using a flashlight or trouble light, observe the burner compartment and where the burner(s) extend into the heat exchanger. There should be very minimal scaling or sooting in this area. Some loose debris may have fallen down on to the floor of the heat exchanger from the upper flue passageways, and this may be vacuumed out. Also observe the sides of the heat exchanger for "hot spots" due to improper burner alignment or overfiring and give particular attention to any area where it looks like there may be any deterioration from corrosion or rusting. Observe for any corrosion on the burners themselves. Should anything appear questionable, contact your service agency.
4. If your furnace is a standing pilot model (burns all the time), observe the pilot flame. The pilot flame should be a "soft blue flame" enveloping or covering approximately 1/2 inch of the tip of the thermocouple.

On intermittent pilot models, the pilot lights only when the thermostat calls for heat and the main burner lights within a few seconds thereafter. It is recommended that any observation of pilot or main burner operation be done only with the burner compartment door in place and viewing through the combustion air slots. Any adjustments to the pilot flame should be done by a competent service agency.



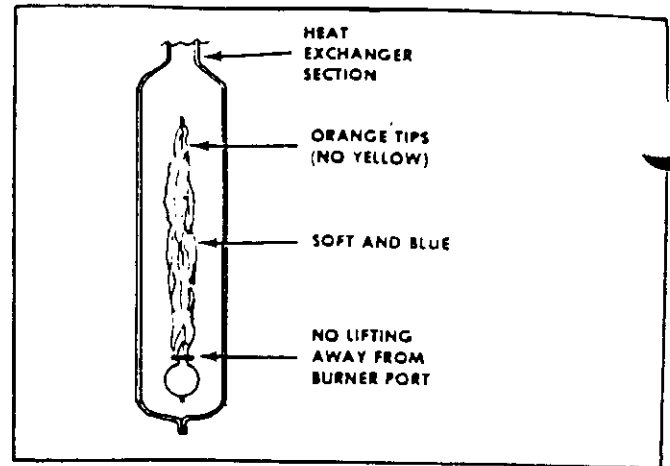
5. With the use of flashlight and possibly with the aid of a small mirror, look into the upper flue passageways and outlet of the heat exchanger, viewing through what is called the "draft diverter." This is the upper air opening on the furnace, not too far below the point where the external flue pipe connects on to the furnace. Proper main burner adjustment should result in no soot accumulation in this area, but there may be some scaling due to oxidation. It is not uncommon to experience some loose scale laying in the bottom area of the draft diverter opening. This usually comes from the flue pipe above the furnace and can be easily wiped out. Sooting of any degree in this area will require the attention of the service agency for evaluation.
6. Inspect the flue pipe the full distance from furnace to chimney or to exit point from the building, observing for corrosion and possible leakage that might result in products of combustion entering the living area.

WARNING

LEAKAGE OF PRODUCTS OF COMBUSTION INTO THE LIVING AREA MAY RESULT IN ASPHYXIATION.

- Any questionable flue pipe should be replaced. Considering its importance, it is relatively cheap insurance to protect your family. Consult your service agency.
7. Replace the burner compartment access doors by reversing the procedure as outlined under step 2 above.
 8. Restore the electrical power to the furnace by turning the switch back on. Adjust the thermostat to call for heating operation.

9. Observe the main burners in operation viewing through the combustion air slots. The flame should be mostly "blue" with possibly a little "yellow" at the tips of the flames. The flames should be in the center of the heat exchanger compartments and not impinging on the heat exchanger surfaces themselves.
10. Observe the fire until the blower starts (there is a normal delay period until the heat exchanger warms up). There should be no change in the size or shape of the flame. If there is any wavering or blowing of the flame on blower start-up, it is an indication of a possible leak in the heat exchanger. Turn off the main electrical switch to the furnace and the gas valve in the gas line leading to the furnace, and call your service agency.



VENT SAFETY SHUTOFF SYSTEM

This furnace is equipped with a Vent Safety Shutoff System. The purpose of this control is to shut off the flow of gas to the burners in the event of a blockage in the vent/chimney system. The control is a manual reset switch and is located on the draft hood. It is accessible by removing the furnace service door, and can be reset by pushing in the button located in the center of the switch.

CAUTION: The draft hood surface and adjacent areas may be HOT. The switch itself is in the 24V low-voltage control circuit and there is no danger of electrical shock.

If the Vent Safety Shutoff System operates a second time, it should not be reset again. A qualified service agency should be contacted immediately to properly evaluate the cause for lockout.

