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## GAS KITS & ACCESSORIES

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## HIGH ALTITUDE KIT

### INSTALLATION INSTRUCTIONS FOR HIGH ALTITUDE KIT (59M17) USED WITH ALL G40DF, G40UH, G43UF, G50DF, G50UH, G51MP, G60 & G61 UNITS FUELED BY NATURAL GAS

### **⚠ WARNING**

This conversion kit is to be installed by a qualified Lennox service technician or other qualified agency in accordance with the manufacturer's instructions, all codes and requirements of the authority having jurisdiction in the USA, and the requirements of the CSA B149 installation codes in Canada. If the information in these instructions is not followed exactly, a fire or explosion may result causing property damage, personal injury or loss of life. The qualified agency performing this work assumes responsibility for this conversion.

### Shipping & Packing List

Package 1 of 1 contains the following:

- 7 - Main burner orifices (0.086)
- 1 - Gas converter sticker
- 1 - Nameplate conversion sticker

### Application

High altitude kit (59M17) is used to convert all G40DF, G40UH, G43UF, G50DF, G50UH, G51MP, G60UH(V), G60DF(V) and G61MP(V) units which are fueled by natural gas for operation at altitudes higher than 7500 feet (2286 m) above sea level. Units installed in these applications may also require installation of a replacement pressure switch, which is ordered separately. Refer to table 1 for pressure switch requirements. All pressure switches are factory-set and require no adjustment. **G51MP and G61MP(V) units require two pressure switches.**

**TABLE 1**  
**Pressure Switch Requirements**

Model Number	Pressure Switch Requirements at Altitudes of 7501-10,000 ft. (2287 - 3048 m)
G40DF G50DF	No Change
G40UH G50UH	56L32
G43UF-045 & -070 G51MP-045 & -070	56M06
G43UF-090 & -110 G51MP-090 & -110	56M07
G43UF-135 G51MP-135	60M35

**TABLE 1 (Continued)**  
**Pressure Switch Requirements**

Model Number	Pressure Switch Requirements at Altitudes of 7501-10,000 ft. (2287 - 3048 m)
G60UH/DF(V)-070 & 090	18M64
G60UH/DF(V)-110 G60UH/DF(V)-135	18M61
G61MP(V)-045	No Change
G61MP-070	56M06
G61MPV-070	56M23
G61MPV-071	26W84
G61MP(V)-090	56M21
G61MPV-091	26W86
G61MP(V)-110	75M22
G61MPV-111	56M23
G61MP(V)-135	56M93

### Installation

### **⚠ CAUTION**

**As with any mechanical equipment, personal injury can result from contact with sharp sheet metal edges. Be careful when you handle this equipment.**

- 1 - Set the thermostat to the lowest setting. Shut off the gas supply to the furnace, then disconnect the electrical power.
- 2 - Remove the heating compartment access panel. Remove burner box cover, if necessary. Turn the automatic gas valve knob, or switch the gas valve lever, to the **OFF** position (figures 3, 4, 5 and 6).
- 3 - Disconnect the gas supply from the gas valve. Mark the wires for identification and disconnect the wiring at the gas valve.
- 4 - Remove the four manifold securing screws. Remove the manifold/gas valve assembly. Replace the main burner orifices with the provided orifices (.086). See figure 1.
- 5 - Re-install the manifold/valve assembly. Reconnect wiring to the gas valve.
- 6 - Units installed at altitudes higher than 7500 feet above sea level may require a replacement pressure switch assembly. See table 1 for the proper switch assembly. Refer to figure 2 for pressure switch location.

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- a - Remove the tubing from the barbed fitting on the pressure switch(es).
- b - Remove screw(s) which secure pressure switch assembly(ies). Install replacement pressure switch(es) using existing screw(s).
- c - Securely attach flexible tubing to fitting on replacement pressure switch assembly(ies). See figure 2.

**⚠ WARNING**  
**The pressure switch tubing must be installed properly to ensure operation of the differential pressure switch.**

- 7 - Reconnect the gas supply to the manifold and turn on gas supply to unit.

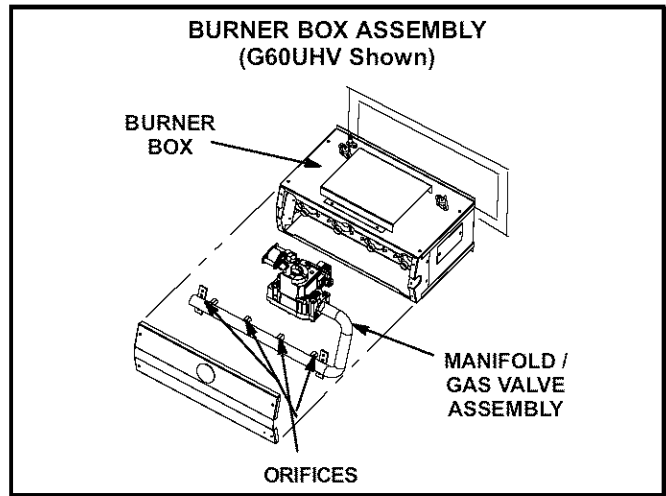


Figure 1

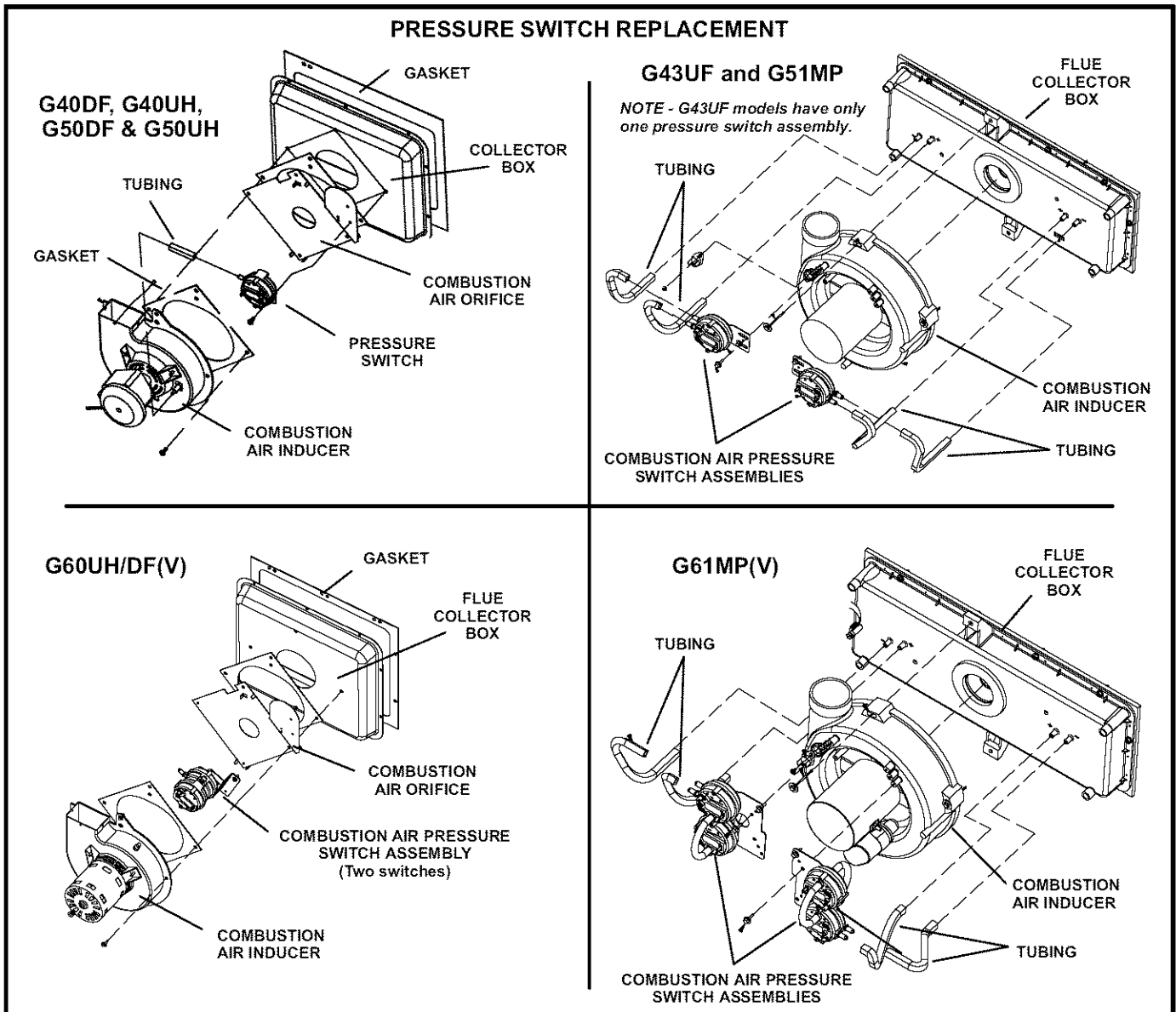


Figure 2

## ⚠ IMPORTANT

Carefully check all piping connections for gas leaks. **DO NOT** use matches, candles, open flames or other means of ignition to check for gas leaks. Use a soap solution or other preferred means.

## ⚠ CAUTION

Some soaps used for leak detection are corrosive to certain metals. Carefully rinse piping thoroughly after leak test has been completed. Do not use matches, candles, flame or other sources of ignition to check for gas leaks.

- 8 - Replace burner box cover, if necessary.
- 9 - Restore the electrical power to the unit.
- 10 - Affix nameplate conversion sticker next to unit nameplate.
- 11 - Complete the information required on the converter sticker: date, name, and address. Affix sticker to the exterior of the unit in a visible area.
- 12 - Follow the steps given in the start-up and adjustment section.
- 13 - Energize the thermostat several times to ensure the ignition control is operating and that the hot surface ignitor glows.
- 14 - Replace the heating compartment access panel.

### Start-Up & Adjustment

**BEFORE LIGHTING** - Smell all around the appliance area for gas. Be sure to smell next to the floor because some gas is heavier than air and will settle on the floor.

Use only your hand to turn the gas control knob or the control lever. Never use tools. If the knob or lever will not turn by hand, do not try to repair it. Call a qualified service technician. Force or attempted repair may result in a fire or explosion.



#### A - Placing the Unit into Operation

## ⚠ IMPORTANT

Follow the lighting instructions provided on the unit. If lighting instructions are not available, refer to the following section.

These units are equipped with an automatic hot surface ignition system. This ignition system automatically lights the burners each time the thermostat calls for heat.

- 1 - **STOP!** Read the safety information at the beginning of this section.

- 2 - Set the thermostat to its lowest setting.
- 3 - Turn off all electrical power to the furnace.
- 4 - Do **not** try to light the burners by hand.
- 5 - Remove the unit access panel.
- 6 - Turn the knob on the gas valve clockwise  (or move the lever) to the **OFF** position. Do not force. See figures 3, 4, 5 and 6.
- 7 - Wait five (5) minutes for any gas to clear out. If you then smell gas, **STOP!** Immediately call your gas supplier from a neighbor's phone. Follow the gas supplier's instructions. If you do not smell gas, go to the next step.
- 8 - Turn the knob on the gas valve counterclockwise  (or move the lever) to the **ON** position.

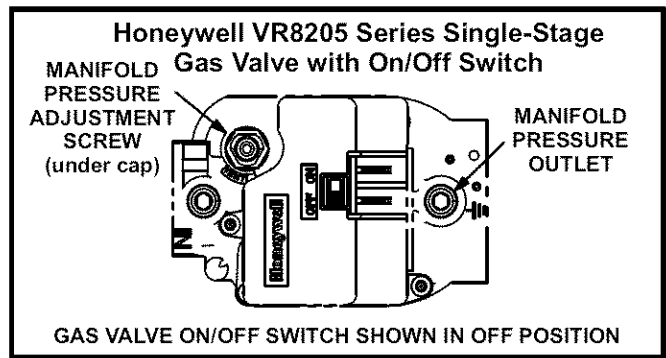


FIGURE 3

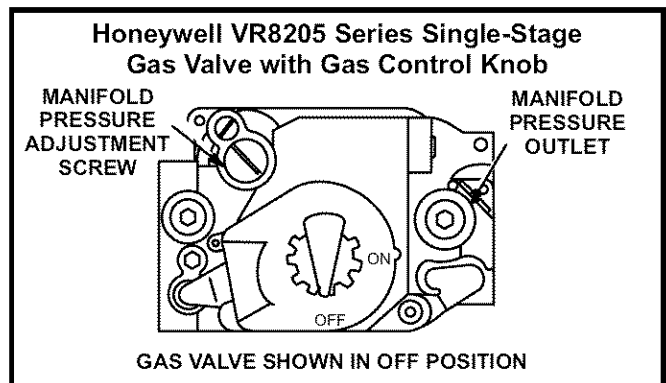


FIGURE 4

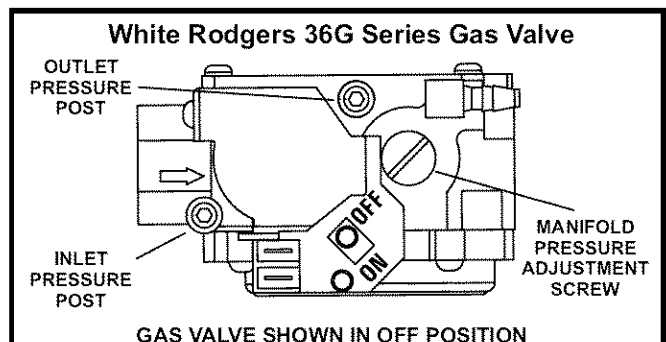


FIGURE 5

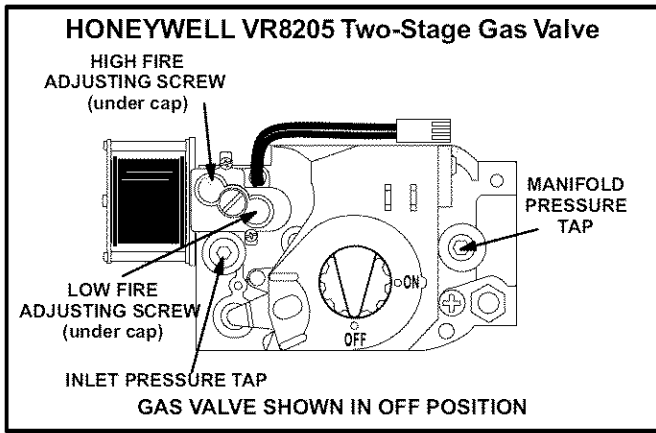


Figure 6

- 9 - Replace the unit access panel.
- 10 - Turn on all electrical power to the unit.
- 11 - Set the thermostat to desired setting.
- 12 - If the furnace will not operate, see the section "Turning Off Gas to the Unit" and call your service technician or gas supplier.

**B - Turning Off Gas To the Unit**

- 1 - Set the thermostat to its lowest setting.
- 2 - Turn off all the electrical power to the unit.
- 3 - Remove the heat section access panel.
- 4 - Turn the knob on the gas valve clockwise (or move the lever) to the **OFF** position. Do not force.

**C - Verifying the Gas Line Pressure**

Check the gas line pressure while the unit is operating. Maintain a minimum of 4.5" w.c. (1.12 kPa) and a maximum of 10.5" w.c. (2.61 kPa). See figures 3, 4, 5 and 6 for the location of the inlet pressure tap on the gas valve.

**D - Measuring & Adjusting the Manifold Pressure**

*NOTE - Pressure test adapter kit (10L34) is available from Lennox to facilitate manifold pressure measurement.*

- 1 - Connect test gauge to outlet tap on gas valve.
- 2 - **G43UF, G51MP and G61MP(V) Units Only --** Disconnect pressure sensing hose from gas valve.
- 3 - Start unit on low heat (two-stage units only) and allow 5 minutes for unit to reach steady state.
- 4 - While waiting for the unit to stabilize, notice the flame. Flame should be stable and should not lift from burner. Natural gas should burn blue.
- 5 - After allowing unit to stabilize for 5 minutes, record manifold pressure and compare to values given in low-fire columns in table 2.
- 6 - Repeat steps 3, 4 and 5 on high heat (single-stage and two stage units). Compare with values given in high fire columns in table 2.

Table 2

Manifold Pressure (Outlet) in. w.c. (kPa) for Natural Gas

Manifold Pressure at All Altitudes			
Low Fire		High Fire	
in. w.g.	kPa	in. w.g.	kPa
1.7	.42	3.5	.87

*NOTE - Shut unit off and remove manometer as soon as an accurate reading has been obtained. Take care to replace pressure tap plug.*

*G43UF, G51MP and G61MP(V) Units Only - During this test procedure, the unit will be overfiring:*

- Operate unit only long enough to obtain accurate reading to prevent overheating heat exchanger.
- Attempts to clock gas meter during this procedure will be inaccurate. Measure gas flow rate only during normal unit operation.

7 - **G43UF, G51MP and G61MP(V) Units Only --** When test is complete, return hose to gas valve barbed fitting.

**▲ IMPORTANT**

**The White Rodgers 36G gas valve (figure 5) is equipped with pressure posts for measuring supply and manifold pressures. The posts provide built-in hose connections and have an integral 3/32" Allen-head screw. Rotate the screw counter-clockwise one full turn to permit pressure measurement. Reseat the screw (rotate one full turn clockwise) after measurements have been taken to prevent gas leakage.**

**E - Verifying the Gas Rate**

The gas input must not exceed the amount shown on the unit's rating plate. In cases where gas is not metered, the service technician who is performing the conversion will need to install a temporary meter to perform this procedure. Check the input by the following method:

Contact the utility company for the heating value of the gas. Shut off all other appliances during the input check. Locate the meter just upstream in regulated pressure [4.5" w.c. to 10.5" w.c. (1.12kPa to 2.61kPa)]. To check the Btu input rate, time the dial hand on the gas meter for at least one revolution, using the one cubic foot dial.

To assure accurate measurements, use temperature and pressure correction factors for the meter.

To determine the number of seconds required for the flow of one cubic foot of gas, use the following formula:

$$\frac{\text{(BTU Content)} \\ \text{Heating Value Of Gas X 3600}}{\text{Furnace Btuh Input}}$$

Example: 1000 BTU gas  
Furnace input 100,000 BTUH

Seconds for one cubic foot =

$$\frac{1000 \times 3600}{100,000} = 36 \text{ seconds}$$