

# Installation Instructions For Propane Gas Conversion

## (Kit Part No. 1173855)

**This kit is designed for conversion to Propane Gas**

Table 1	LP Gas Orifice Kits and Sizes									
	Elevation Above Sea Level									
	0 to 2000 ft		2001 to 4000 ft		4001 to 7000 ft		7001 to 9000 ft		9001 to 10000 ft	
Model Number	Orifice Drill #	Kit Number	Orifice Drill #	Kit Number	Orifice Drill #	Kit Number	Orifice Drill #	Kit Number	Orifice Drill #	Kit Number
PGAA, PGMD (All Sizes)	55	1173857	55	1173857	56	1173859	56	1173859	57	1173861
PGAD, PGME (All Sizes)	55	1173857	55	1173857	56	1173859	56	1173859	57	1173861
PGX3, PDX3 (All Sizes)	55	1173857	55	1173857	56	1173859	56	1173859	57	1173861
PGC***K040F, GPCM**K040	55	1173857	55	1173857	56	1173859	56	1173859	57	1173861
PGC***K060F, GPCM**K060	55	1173857	55	1173857	56	1173859	56	1173859	57	1173861
PGC***K080F, GPCM**K080	55	1173857	55	1173857	56	1173859	56	1173859	57	1173861
PGC***K100F, GPCM**K100	54	1173855	55	1173857	55	1173857	56	1173859	56	1173859
PGC***K120F, GPCM**K120	54	1173855	55	1173857	55	1173857	56	1173859	56	1173859
PGC***K140F, GPCM**K140	54	1173855	55	1173857	55	1173857	56	1173859	56	1173859
PGF***K040F, GPFM**K040	55	1173857	55	1173857	56	1173859	56	1173859	57	1173861
PGF***K060F, GPFM**K060	55	1173857	55	1173857	56	1173859	56	1173859	57	1173861
PGF***K080F, GPFM**K080	55	1173857	55	1173857	56	1173859	56	1173859	57	1173861
PGF***K100F, GPFM**K100	54	1173855	55	1173857	55	1173857	56	1173859	56	1173859
PGF***K120F, GPFM**K120	54	1173855	55	1173857	55	1173857	56	1173859	56	1173859
PGF***K140F, GPFM**K140	54	1173855	55	1173857	55	1173857	56	1173859	56	1173859
PGS***K040F, GPSM**K040	55	1173857	55	1173857	56	1173859	56	1173859	57	1173861
PGS***K060F, GPSM**K060	55	1173857	55	1173857	56	1173859	56	1173859	57	1173861
PGS***K080F, GPSM**K080	55	1173857	55	1173857	56	1173859	56	1173859	57	1173861
PGS***K100F, GPSM**K100	54	1173855	55	1173857	55	1173857	56	1173859	56	1173859
PGS***K120F, GPSM**K120	54	1173855	55	1173857	55	1173857	56	1173859	56	1173859
PGS***K140F, GPSM**K140	54	1173855	55	1173857	55	1173857	56	1173859	56	1173859
PGF3**040	55	1173857	55	1173857	56	1173859	56	1173859	57	1173861
PGF3**060	55	1173857	55	1173857	56	1173859	56	1173859	57	1173861
PGF3**080	55	1173857	55	1173857	56	1173859	56	1173859	57	1173861
PGF3**100	54	1173855	55	1173857	55	1173857	56	1173859	56	1173859
PGF3**120	54	1173855	55	1173857	55	1173857	56	1173859	56	1173859
PGF3**140	54	1173855	55	1173857	55	1173857	56	1173859	56	1173859

Note: \*\*\* or \*\*\*\* may be any combination of numbers and/or letters in the model number.

Note: The orifice sizes in the chart above derate the input rate at 4% per 1000 feet above sea level for altitudes above 2000 feet.

LP gas data is based on 1.52 specific gravity, a heating value of 2500 Btu/cubic foot, and 10 "W.C. manifold pressure.

For fuels with different specific gravity and/or different heating values, consult the National Fuel Gas Code ANSI Z223.1 - 2002/NFPA 54-2002 or

National Standard of Canada, Natural Gas and Propane Installation Code CSA B149.1-00.

## ⚠ WARNING

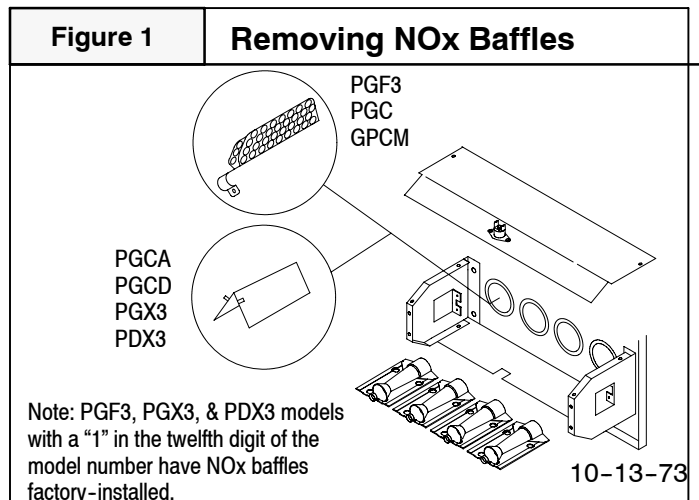
### CARBON MONOXIDE HAZARD.

**Failure to follow this warning could result in property damage, personal injury and/or death.**


**NOx inserts for use with Natural Gas units ONLY. If LP Gas is required, NOx inserts must be removed. Before converting to LP, remove the burner assembly and inspect the heat exchanger tubes. If there are NOx baffles in the firing tubes, see Fig. 1, THEY MUST BE REMOVED PRIOR TO CONVERTING THIS UNIT TO LP. Discard baffles after removal.**

### Parts List, Kit # 1173855

Description	Part #	Qty
Burner Orifice #54	1011376	7
Pilot Orifice (0.011)	1009136	1
Honeywell Conv. Kit #396221	1172953	1
Label, Field Conversion	1009678	1
LP Conversion Label	1173856	1
Instructions	462 06 1213 00	1



## SAFETY REQUIREMENTS

Recognize safety information. This is the safety-alert symbol . When you see this symbol in instruction manuals be alert to the potential for personal injury.

Understand the signal words DANGER, WARNING, or CAUTION. These words are used with the safety-alert symbol. DANGER identifies the most serious hazards, those that will result in severe personal injury or death. WARNING signifies a hazard that could result in personal injury or death. CAUTION is used to identify unsafe practices that may result in minor personal injury or product and property damage. NOTE is used to highlight suggestions that will result in enhanced installation, reliability, or operation.

Installing and servicing heating equipment can be hazardous due to gas and electrical components. Only trained and qualified personnel should install, repair, or service heating equipment. Untrained service personnel can perform basic maintenance functions such as cleaning and replacing air filters. All other operations must be performed by trained service personnel. When working on heating equipment, observe precautions in the literature, on tags, and on labels attached to or shipped with the appliance and other safety precautions that may apply.

Follow all safety codes. In the United States, follow all safety codes including the National Fuel Gas Code (NFPA) ANSI Z223.1-2006/NFPA 54-2006. In Canada, refer to the of the National Standard of Canada Natural Gas and Propane Installation Code (NSCNGPIC) CSA B149.1-05. Wear safety glasses and work gloves. Have fire extinguisher available during start-up and adjustment procedures and service calls.

These instructions cover minimum requirements and conform to existing national standards and safety codes. In some instances, these instructions exceed certain local codes and ordinances, especially those that may not have kept up with changing residential construction practices. We require these instructions as a minimum for a safe installation.

### Important Information

This kit is for conversion of furnaces equipped with Honeywell VR8200, VR8205S, SV9500, SV9501 or VR8204M gas valves certified for use with Natural Gas (and so marked) to units functionally the same as the certified furnace for use with Propane Gas. A gas valve conversion kit must be installed and main burner orifices and pilot burner orifice must be replaced with orifices in this kit.

The orifices provided in this kit are stamped to indicate the size (twist drill number) and are sized for commercially pure propane gas ONLY. Do NOT use them with butane or a mixture of butane and propane. The parts list specifies the size orifices supplied in the kit. Compare the size marking on the orifices with the sizes as listed in the parts list. Make sure you have the correct main burner orifices. Refer to Table 1 for proper orifice size for specific model number, input capacity, and installation altitude.

Extreme care is used to assure that this kit contains the proper orifices. **Oversized orifices could result in hazardous conditions, especially if the venting is inadequate.** For that reason, we recommend that the installer check the size of the orifice with a new twist drill of the correct size. This procedure assures that the orifices provided are the correct size.

- Shut off gas supply to furnace at manual shut-off valve before starting installation.

## WARNING

### EXPLOSION HAZARD

**Failure to follow this warning could result in personal injury, death and/or property damage.**

**If unit is still running, allow 3 minutes after gas shut off before turning off power, Shut Off electric power at unit disconnect and service panel.**

- Disconnect electric power supply to the furnace before starting installation.
- Check for gas leaks after installation of kit and before attempting to start furnace.
- Locate the LP Gas Conversion Label next to the furnace rating plate.
- Fill out and attach the Field Conversion Label to the front exterior of the furnace.

## WARNING

### FIRE, EXPLOSION, CARBON MONOXIDE POISONING HAZARD.

**Failure to follow these instructions exactly could result in personal injury, death and/or property damage.**

**This conversion kit shall be installed by a qualified service agency in accordance with the manufacturer's instructions and all applicable codes and requirements of the authority having jurisdiction. If the information in these instructions is not followed exactly, a fire, an explosion or production of carbon monoxide may result causing property damage, personal injury or loss of life. The qualified service agency is responsible for the proper installation of this kit. The installation is not proper and complete until the operation of the converted appliance is checked as specified in the manufacturer's instructions supplied with the kit.**

### Gas Pressure

- Refer to the furnace rating plate for the approved gas input rating.
- Gas input to burners MUST NOT exceed the rated input shown on rating plate.
- **Do NOT** allow minimum gas supply pressure to vary downward. Doing so will decrease input to furnace. Refer to **Table 2** for gas supply and manifold pressures.

Table 2		Gas Pressures		
Gas Type	Supply Pressure			Manifold Pressure
	Recommended	Max.	Min.	
LP	11" (2.7kPa)	14" (3.5kPa)	11" (2.7kPa)	10" (2.5kPa)

## Installation

### **⚠ WARNING**

**ELECTRIC SHOCK HAZARD/FIRE AND/OR EXPLOSION HAZARD.**

Failure to follow this warning could result in equipment damage, personal injury, death and/or property damage.

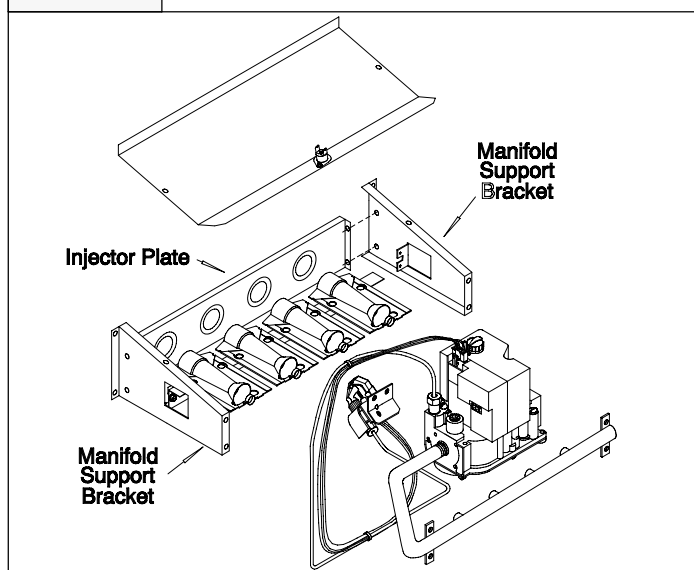
The gas supply shall be shut OFF prior to disconnecting the electrical power, before proceeding with the conversion.

Turn OFF electric power supply at disconnect switch or service panel before starting installation.

## Disassembly

Refer to **Figure 2** and the following steps.

**Figure 2 Disassembly**



1. After shutting off gas supply and electric power to the unit remove the access door, exposing gas valve and burner compartment.
2. Disconnect gas line from gas valve so manifold assembly can be removed.
3. Disconnect wiring at gas valve. Be sure to note the proper location of any and all electrical wiring disconnected.
4. Remove the pilot supply line from the gas valve.
5. Remove the four (4) screws holding the manifold and gas valve to the manifold supports. Do Not discard any screws.
6. Carefully remove the manifold assembly.
7. If unit has v-shaped NOx baffles installed in firing tubes, they must be removed. Some baffles may be attached by screws. Replace screws after removing NOx baffles (**figure 3**).

### **⚠ WARNING**

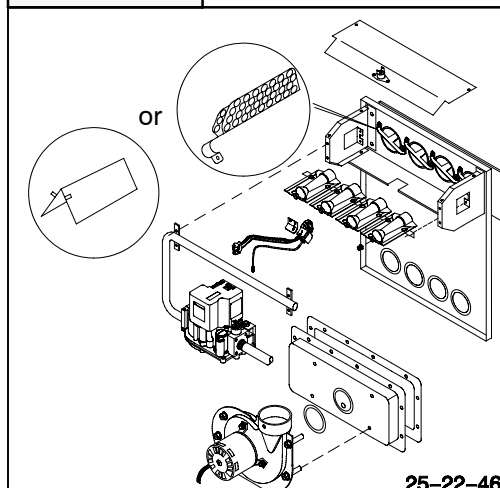
**CARBON MONOXIDE HAZARD.**

Failure to follow this warning could result in personal injury, death and/or property damage.

NOx baffles for use with Natural Gas units ONLY. If LP Gas is required, NOx inserts must be removed.

**Figure 3**

## Removing NOx Baffles

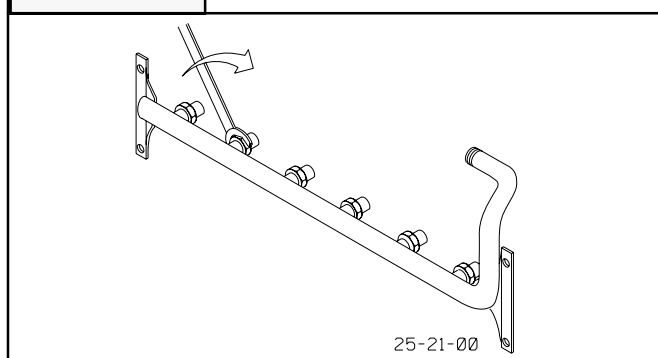


## Changing Main Burner Orifices

1. Remove the Natural gas (brass) burner orifices from the manifold assembly using a box end wrench or socket wrench, and replace them with the (silver) orifices furnished in the conversion kit (**Figure 4**).

**Figure 4**

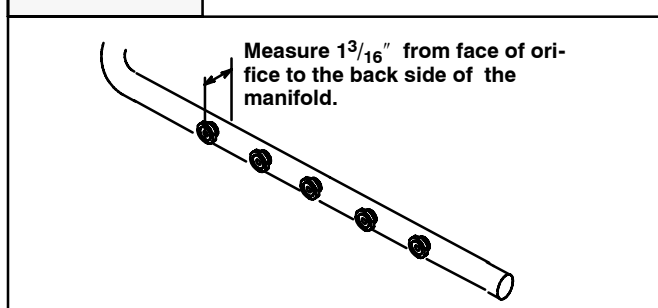
## Changing Orifices



2. Tighten the orifices so they are  $1\frac{3}{16}$ " from the face of the orifice to the backside of the manifold (See **Figure 5**). Make sure orifice is installed straight so that it forms a right angle ( $90^\circ$ ) to the manifold.

**Figure 5**

## Orifices Clearances



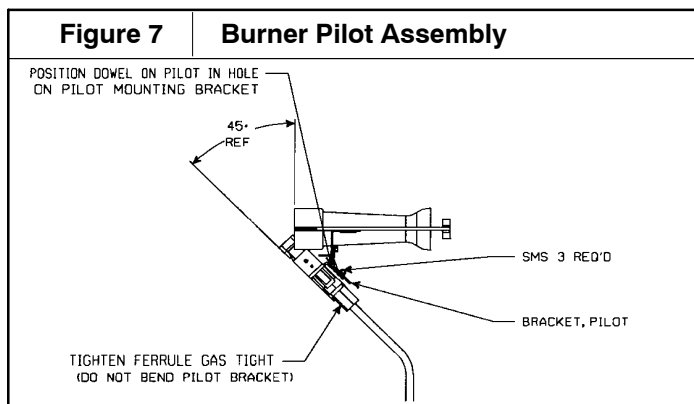
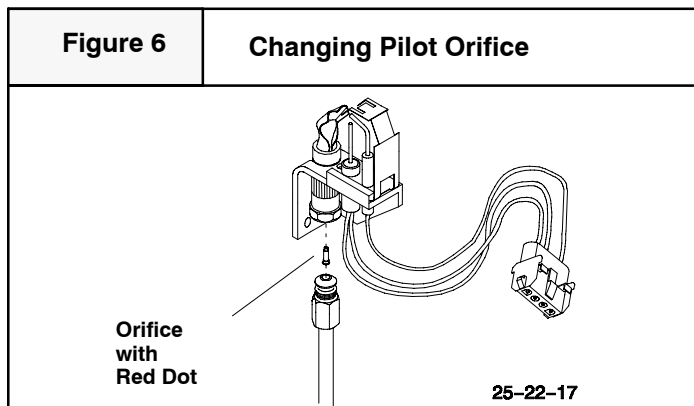
## Changing Pilot Burner Orifice (All models except PGF3, PGX3, and PDX3.)

1. Disconnect the pilot supply line from the pilot burner.
2. Remove pilot orifice from pilot burner. Replace with propane gas orifice stamped BBR11 which is

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provided in kit. See **Figure 6**.

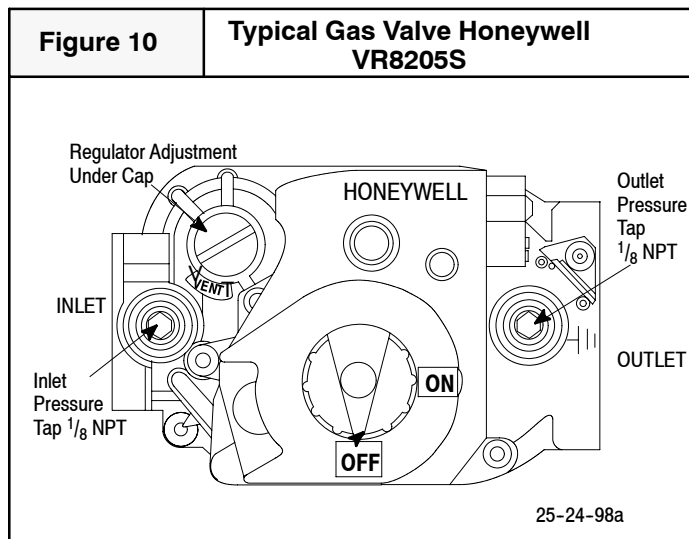
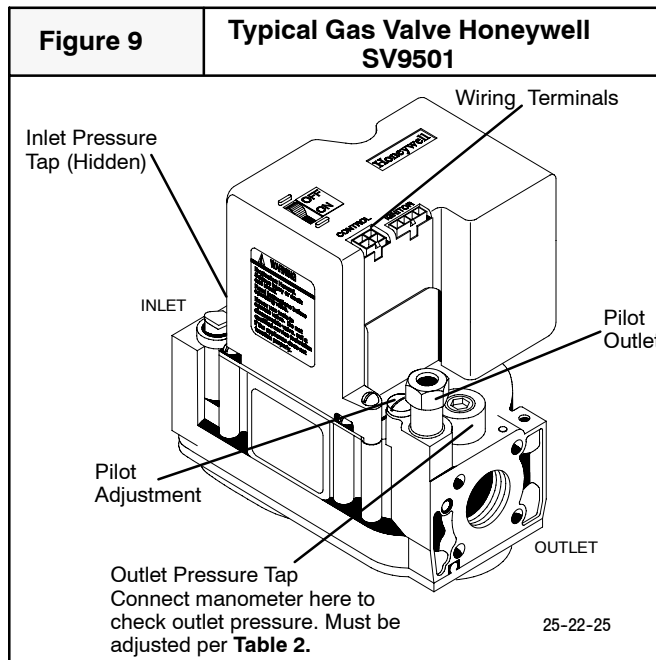
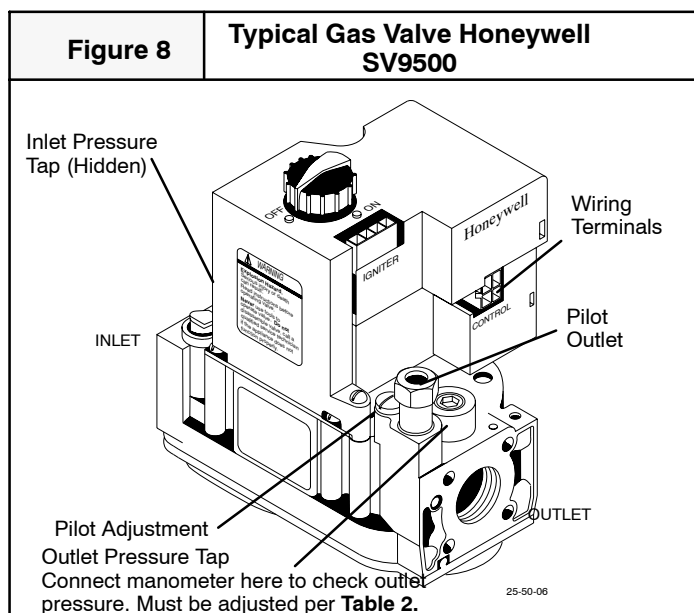
- 3.. Reconnect the pilot tubing securely to the pilot burner.
4. Verify proper relationship of pilot burner assembly **per Figure 7** prior to completing the conversion.



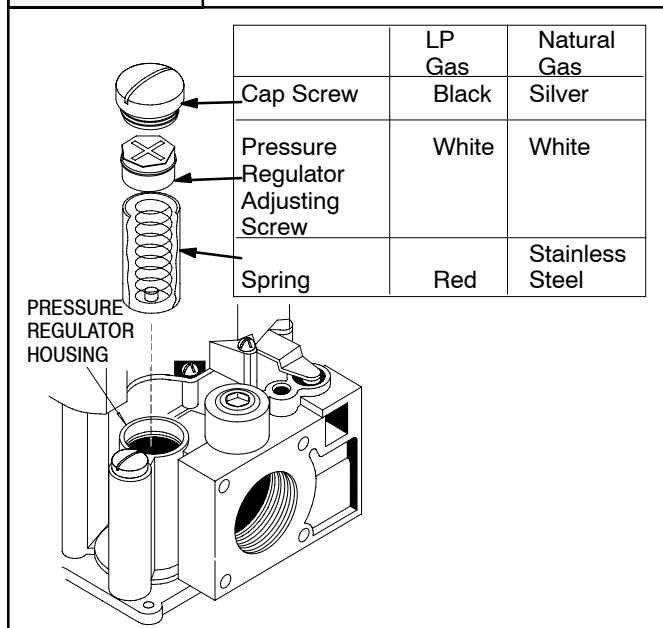
## Gas Valve Conversion

Conversion of Honeywell VR8200, VR8205S, SV9500, SV9501 and VR8204M Gas Valves using Propane Gas Conversion Kit #396621.

1. Remove the regulator cap screw and pressure regulator adjusting screw. (See **Figure 11**.)



2. Remove the existing regulator spring from the regulator housing.
3. Insert the replacement spring (red color) contained in this kit into regulator housing.

**Figure 11****Typical Honeywell  
Regulator Assembly**

4. Install the pressure regulator adjusting screw and give it eight (8) full turns. This will set the manifold pressure close to required setting for normal operation.
5. Replace the regulator cap screw.
6. Attach gas valve conversion label (found in Honeywell conversion kit) to gas valve.

**Reassembly**

Reassemble all parts in reverse order as removed. Attach LP Gas Conversion Label next to the unit rating plate. Fill out and attach the Field conversion Label to the front exterior of the furnace.

- **Manifold Assembly** – Be sure to engage the main burner orifices in the proper openings in the burners.
- **Testing for leaks** – After reassembly, turn the gas on and check all joints for gas leaks using a soapy solution. All leaks must be repaired immediately.

**Start-up and Check-out**

1. Remove the plug from the Inlet Pressure Tap on gas valve and install a manometer. (See **Figure 8**, **Figure 9**, **Figure 10** & **Figure 11**)
2. Open manual gas line valve to unit. Check for gas leaks and correct as necessary. Check supply pressure. Refer to **Table 2** for proper supply pressure values. If not within these limitations **DO NOT OPERATE UNIT**, contact gas supplier.
3. Close manual gas line valve to unit, remove manometer and replace inlet pressure tap plug.

**Gas Valve Adjustment**

4. With the gas valve knob in the OFF position, remove the pressure tap plug from the outlet end of the valve, and connect a "U" tube manometer to the pressure port. (See **Figure 8**, **Figure 9**, **Figure 10** & **Figure 11**).
5. Turn the gas valve knob to the ON position and restore electrical power to unit. Cycle the main burner on and off several times to stabilize the pressure regulator diaphragm. This **MUST** be done before an accurate pressure reading can be obtained.

6. With the main burner on, read the pressure gauge. Manifold pressure should be adjusted to values from **Table 2**. Turn pressure regulator adjusting screw clockwise to increase or counterclockwise to decrease manifold pressure. Burner Input must not exceed nameplate rating. Refer to **Section "Heating Input Rate Check"**.
7. Turn gas valve to OFF. Remove the pressure gauge and replace the pressure tap plug and pressure regulator cap screw.
8. With gas valve on, observe furnace through two or more complete cycles to be sure all controls are operating.

**⚠ WARNING****FIRE AND/OR EXPLOSION HAZARD**

Failure to follow this warning could result in personal injury, death, and/or property damage.

Do NOT attempt to light the burner with a match or flame of any kind.

**Heating Input Rate Check**

The gas input to the unit is determined by measuring the gas flow at the meter. Measuring gas flow at the meter is recommended for all units. To measure the heating input, perform the following steps:

1. Turn off all other gas appliances that use the same meter.
2. Turn off gas supply to unit and attach manifold pressure gauge as instructed in the "Gas Valve Adjustment" section.
3. With gas **ON** to the unit and the unit operating, record the number of seconds for the gas meter dial to make one revolution.
4. Divide number of seconds in Step 3 into 3600 (number of seconds in 1 hour).
5. Multiply result of Step 4 by the number of cubic feet shown for one revolution of the meter dial to obtain the cubic feet of gas flow per hour.
6. Multiply result of Step 5 by Btu heating value of gas to obtain total measured input in Btu/hr. Compare this input rate with the Required Input Rate for the installation altitude, as shown in **Table 3**. Consult with local gas supplier if the heating value of gas is not known.

Example: Assume the installation of a PGF348120 at an altitude of 3500 feet. Assume that the size of the meter dial is 1 cu. ft., one revolution takes 91 seconds, and the heating value of propane gas is 2500 Btu/ft<sup>3</sup>. Proceed as follows:

1. 91 sec. To complete 1 revolution
2.  $3600/91 = 39.6$
3.  $39.6 \times 1 = 39.6$
4.  $39.6 \times 2500 = 98,901 \text{ Btu/hr}$

For this example, the nameplate input is 100,800 Btu/hr, so only a minor change in manifold pressure is required. In no case should the final manifold pressure vary more than  $\pm .3$ " water column from the values in **Table 2**. Never exceed the required input rate (**Table 3**).

<b>Table 3 Required Input Rate for PGF3, PGF, PGS, PGS, GPFM, GPCM, and GPSM Models</b>									
Heating Model Size <sup>1</sup>	Required Input Rate of Furnace Converted to Propane Gas (Btu/hr)								
	Elevation Above Sea Level (feet)								
	0-2000	2001-3000	3001-4000	4001-5000	5001-6000	6001-7000	7001-8000	8001-9000	9001-10000
"040"	40,000	35200	33600	32000	30400	28800	27200	25600	24000
"060"	60,000	52800	50400	48000	45600	43200	40800	38400	36000
"080"	80,000	70400	67200	64000	60800	57600	54400	51200	48000
"100"	94,000	82720	78960	75200	71440	67680	63920	60160	56400
"120"	117,000	102960	98280	93600	88920	84240	79560	74880	70200
"140"	140,000	123200	117600	112000	106400	100800	95200	89600	84000

<sup>1</sup>Note:

For PGF3 models, heating model size is indicated by the numbers in the 5<sup>th</sup>, 6<sup>th</sup>, and 7<sup>th</sup> characters in the model number.

For PGF, PGC, PGS models, heating model size is indicated by the numbers in the 8<sup>th</sup>, 9<sup>th</sup>, and 10<sup>th</sup> characters in the model number.

For GPFM, GPCM, and GPSM models, heating model size is indicated by the numbers in the 8<sup>th</sup>, 9<sup>th</sup>, and 10<sup>th</sup> characters in the model number.

<b>Required Input Rate for PGX3, PDX3, PGAA, PGAD, PGCA, PGCD, PGMD, and PGME Models</b>									
Heating Model Size <sup>1</sup>	Required Input Rate of Furnace Converted to Propane Gas (Btu/hr)								
	Elevation Above Sea Level (feet)								
	0-2000	2001-3000	3001-4000	4001-5000	5001-6000	6001-7000	7001-8000	8001-9000	9001-10000
"040" or "B"	40,000	35200	33600	32000	30400	28800	27200	25600	24000
"060" or "C"	60,000	52800	50400	48000	45600	43200	40800	38400	36000
"080" or "D"	80,000	70400	67200	64000	60800	57600	54400	51200	48000
"100" or "E"	100,000	88000	84000	80000	76000	72000	68000	64000	60000
"120" or "F"	120,000	105600	100800	96000	91200	86400	81600	76800	72000
"140" or "G"	140,000	123200	117600	112000	106400	100800	95200	89600	84000

<sup>1</sup>Note:

For PGX3 and PDX3 models, heating model size is indicated by the numbers in the 5<sup>th</sup>, 6<sup>th</sup>, and 7<sup>th</sup> characters in the model number.

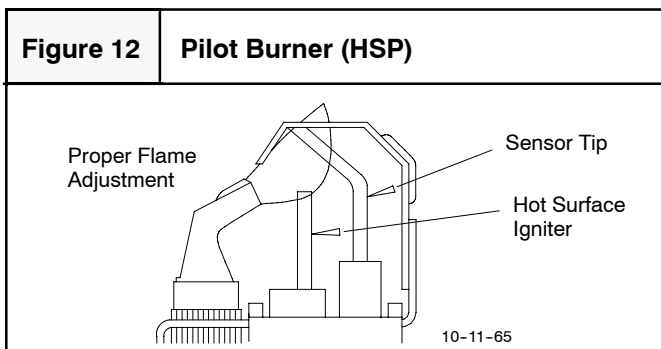
For PGAA, PGAD, PGCA, and PGCD models, heating model size is indicated by the letter in the 7<sup>th</sup> character in the model number.

For PGMD and PGME models, heating model size is indicated by the letter in the 7<sup>th</sup> character in the model number.

## Pilot Burner Flame Check (All models except PGF3, PGX3, and PDX3).

Adjust flames so they surround  $\frac{3}{8}$ " (9 mm) to  $\frac{1}{2}$ " (13 mm) of the thermocouple/sensor tip (See **Figure 12**).

1. Remove the cap from the pilot adjusting screw (See **Figures 8 & 9**).
2. Turn pilot adjusting screw counterclockwise to increase, clockwise to decrease.
3. Replace the cap on the pilot adjusting screw.



## Main Burner Flame Check

Check for the following:

- Stable and blue flames (See **Figure 13**). Dust may cause orange tips or wisps of yellow, but flames MUST NOT have solid, yellow tips.
- Flames extending directly from burner into heat exchanger.
- Flames DO NOT touch sides of heat exchanger

