

INSTALLATION INSTRUCTIONS

For Natural Gas to Propane and High Altitude Conversion Kit No: 1011789

This kit is designed to convert the NTP6, TNE, NDP6, TDE, NTPM, TNK, NCPM, TCK, NTVM, VNK, *9MPV, *9MPT, *8MPV and *8MPT Series Furnaces equipped with Honeywell SV9540 Series gas valves and Honeywell Q3450 igniters from Natural Gas to Propane Gas.

* Denotes Brand (T, H or C)

This conversion kit shall be installed by a qualified service agency. Please read these instructions completely before attempting installation. Consult gas supplier and tables in National Fuel Gas Code NFPA 54/ANSI Z223.1, 1992 or latest edition. In Canada, the National Standard CAN/CGA B149-1 and B149-2.

Parts List

Description	Part#	Qty
Burner Orifice #54	1011376	5
Pilot Orifice, LP (0.011)	1009136	1
Honeywell Conv. Kit #396021	1011828	1
Switch, Low Pressure	1008801	1
Fitting Asy.	1009775	1
Inlet Fitting	1147904	1
Wire Asy.	1009516	1
Label, Field Conversion	1009678	1
Label, LP Conversion	1011832	1
Label, Derate	2505235	1
Instructions	44106101507	1

Parts for High Altitude Conversion

Burner Orifice #55 (2000' - 7000')	1011354 as required
Burner Orifice #56 (7000' - 8000')	1011355 as required

Orifices required, but not included in kits.

⚠ WARNING

This conversion kit shall be installed by a qualified service technician in accordance with the Manufacturer's instructions and all applicable codes and requirements of the authority having jurisdiction. The qualified service agency performing this work assumes responsibility for the proper conversion of this furnace with this kit.

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

AVERTISSEMENT

Cet ensemble de conversion ne doit être installé que par le représentant d'un organisme qualifié et conformément aux instructions du fabricant et à tous les codes et exigences applicables de l'autorité compétente. L'organisme qualifié qui effectue les travaux est responsable de la conversion correcte de ce générateur d'air chaud à l'aide de cet ensemble. Quiconque ne respecte pas à la lettre les instructions dans le présent manuel risque de déclencher un incendie ou une explosion entraînant des dommages matériels, des lésions corporelles ou la perte de vies humaines.

General Information

This kit is for conversion of furnaces equipped with Honeywell SV9540 Series 2-stage 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. Before the furnace can be operated with LP Gas, the LP low pressure must be installed (90+ models ONLY). A gas valve conversion kit must be installed and main burner orifices and pilot burner orifice must be replaced with orifices in this kit or with properly sized orifices for high altitude ordered separately.

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 gas, or at elevations above 2000'. 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.

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.

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

Gas Pressure

- D Refer to the furnace rating plate for the approved gas input ratings.
- D Gas input to burners MUST NOT exceed the rated input shown on rating plate.
- D Do NOT allow minimum gas supply pressure to vary downward. Doing so will decrease input to furnace. Refer to Table 1 for gas supply and manifold pressures.

Table 1 Gas Pressures					
Gas Type	Supply Pressure			Manifold Pressure	
	Recommended	Max.	Min.	Hi Fire	Lo Fire
Nat.	7" (1.7kPa)	14" (3.5kPa)	4.5" (1.1kPa)	3.5" (0.9kPa)	1.7" (0.5kPa)
LP	11" (2.7kPa)	14" (3.5kPa)	11" (2.7kPa)	10" (2.5kPa)	4.9" (1.3kPa)

Important Notes

- With Propane gas, the rated input is obtained when the BTU content is 2,500 BTU per cubic foot and manifold pressure set at 10 inches W.C.
- If Propane gas has a different BTU content, orifices **MUST** be changed by licensed Propane installer.
- Measured input can **NOT** exceed rated input.
- Combustion Air Box Cover **MUST** be removed when adjusting manifold pressure.
- Any major change in gas flow requires changing burner orifice size.

Installation

⚠ WARNING

Electric shock hazard/Fire and/or explosion hazard.

Turn OFF gas supply at manual gas valve before turning OFF electric power supply and starting installation.

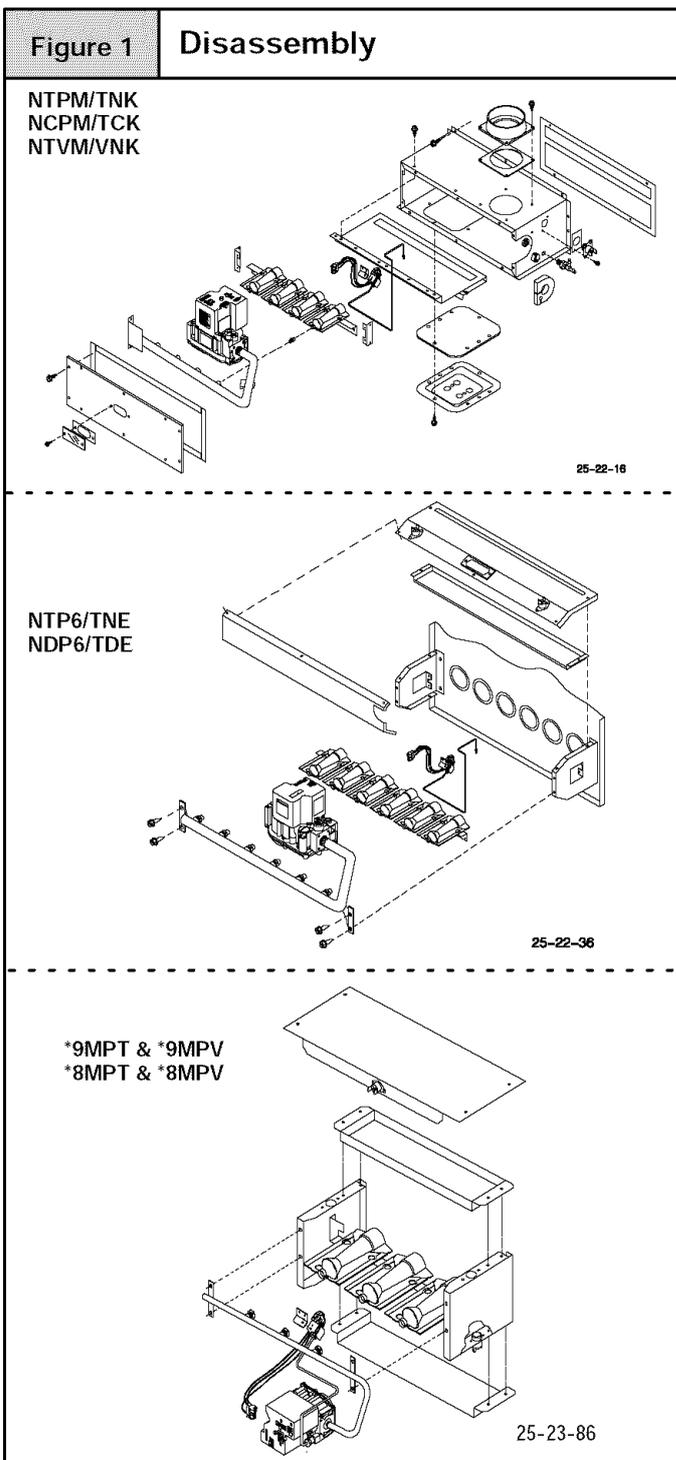
Turn OFF electric power supply at disconnect switch or service panel before starting installation.

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

Disassembly

Refer to Figure 1 and the following steps.

1. After disconnecting power and gas supply to the furnace, remove the access door, exposing gas valve and burner compartment.
2. Disconnect gas line from gas valve so manifold assembly can be removed.
3. Remove screws securing burner compartment cover and remove cover. Use care to avoid damage to gasket. (if used)
4. Disconnect wiring at gas valve. Be sure to note the proper location of any and all electrical wiring disconnected.
5. Remove the pilot supply line from the gas valve.
6. Remove the screws holding the manifold and gas valve to the manifold supports. Do Not discard any screws.



7. Carefully remove the manifold assembly.
8. NDP6/TDE & NTP6/TNE series furnaces ONLY. Remove the four (4) screws holding the manifold supports to the front partition and remove the NOx inserts. Replace the screws that secure the NOx inserts and discard the NOx inserts. (Figure 2)

Note: Step 8 applies to exposed or enclosed burner models with NOx inserts.

⚠ WARNING

Carbon Monoxide hazard.

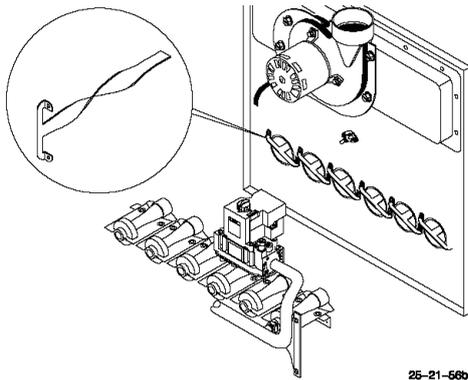
NOx inserts for use with Natural Gas units ONLY. If LP Gas is required, NOx inserts must be removed.

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

Figure 2

Removing NOx inserts

NTP6/TNE & NDP6/TDE SERIES FURNACES ONLY



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Main Burner Orifices

1. Remove the Natural gas (brass) burner orifices from the manifold assembly and replace them with the appropriate Propane (silver) orifices furnished in the conversion kit.
2. Tighten orifices so they are seated and gas tight (Figure 3). Make sure orifice is installed straight so that it forms a right angle (90°) to the manifold bracket.

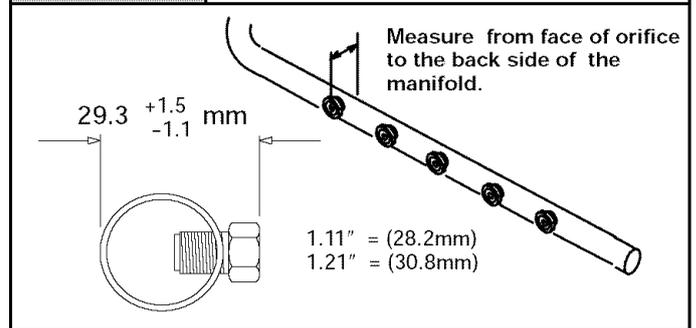
High Altitude Installation

These units may be installed at full input rating when installed at altitudes up to 2000'. The #54 burner orifices supplied in this kit are sized for commercially pure propane gas only, for use between 0-2000' elevation. Do not use them with butane or a mixture of butane and propane, or at elevations above 2000'.

When installed above 2000', the input MUST be derated by 4% for each 1000 feet above 2000'. Orifices for conversion at high altitude (2000' - 8000') must be ordered from Service Parts. A #55 orifice is indicated for use between 2000' and 7000', and a #56 orifice is indicated for altitudes in the 7000' - 8000' range. Refer to the parts list provided to determine the proper orifice part number for ordering purposes.

Figure 3

Changing Orifices

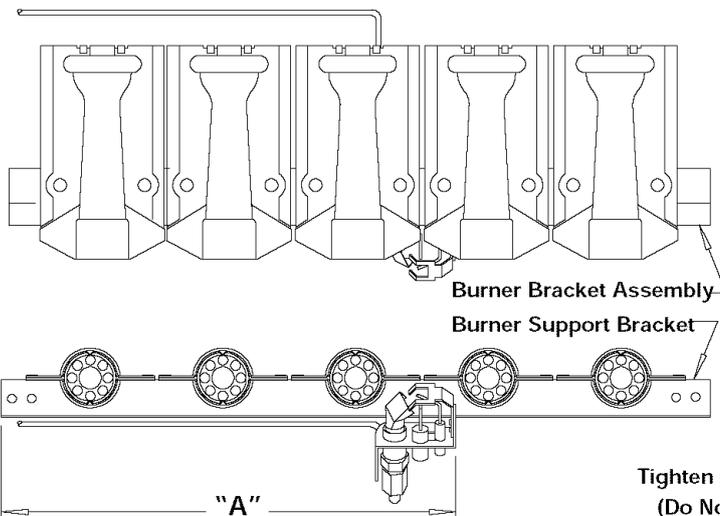


Changing Pilot Burner Orifice

1. Remove two (2) screws securing pilot assembly to burner bracket.
2. Disconnect the pilot supply from pilot igniter.
3. Remove pilot orifice and replace with propane orifice (marked with a red dot) supplied in kit.
4. Reconnect pilot tubing securely to the pilot.
5. Verify proper relationship of pilot burner assembly per Figure 4.

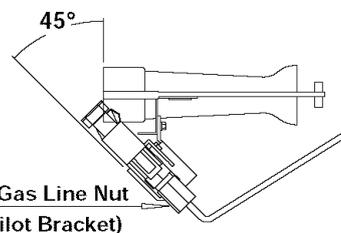
Figure 4

Pilot Burner Location Dimensions for NTP6/TNE, NDP6/TDE, NTPM/TNK, NCPM/TCK, NTVM/VNK, **9MPT, *9MPV, *8MPT and *8MPV Series Furnaces ONLY

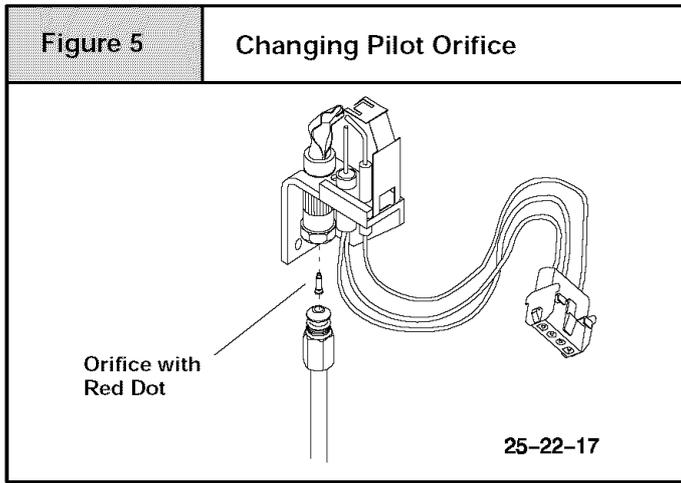


DIMENSIONS

"A" (End of burner bracket to edge of pilot bracket)	Furnace Size (Number of Burners)
4.2" (107mm)	2
7.2" (126mm)	3,4
10.2" (126mm)	5,6



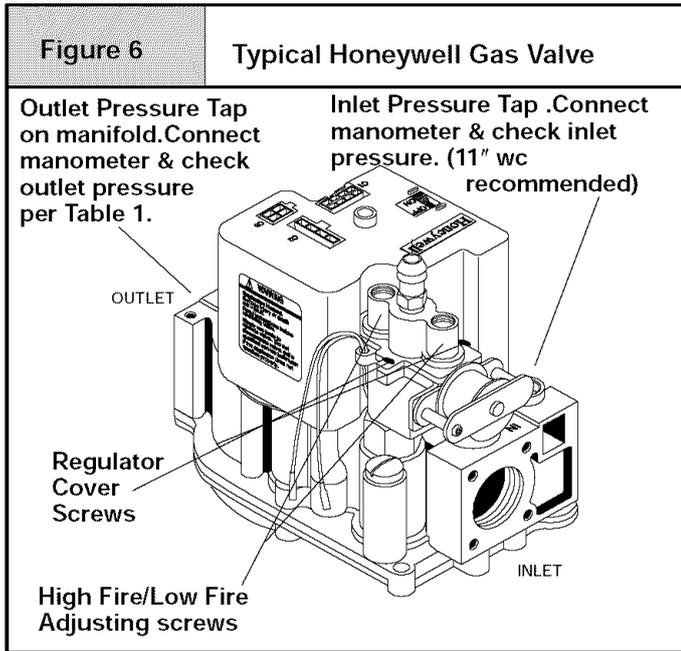
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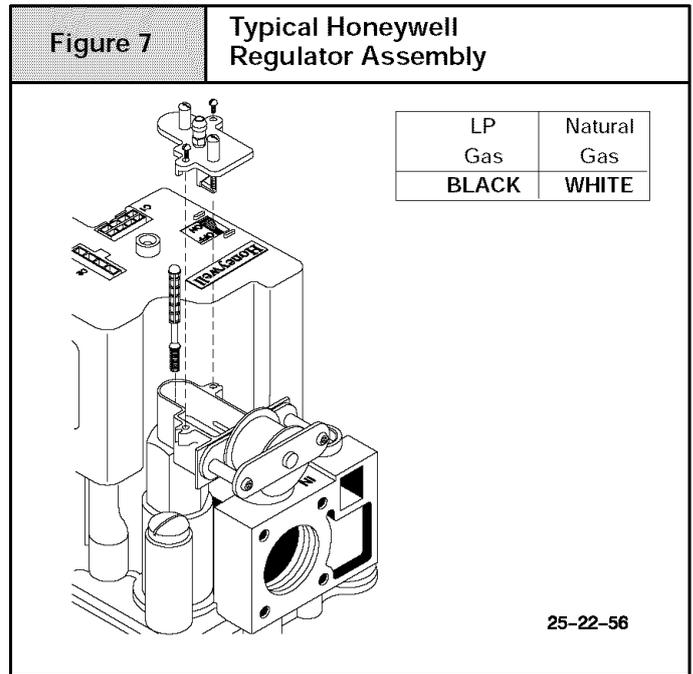
Gas Valve Conversion

Conversion of Honeywell SV9540 & SV9541 Gas Valves using Natural Gas Conversion Kit #396021.

1. Remove the two screws securing the Hi/Lo regulator cover to the valve. (See Figure 6 & Figure 7)



2. Remove the existing regulator spring plunger (white color) from the regulator housing.
3. Insert the replacement spring plunger (black color) contained in this kit into regulator housing with the spring end down.



4. Replace the Hi/Lo regulator cover and secure with the two screws.
5. Attach the Caution Label contained in the kit to the Gas Valve where it can be readily seen.

LP Low Pressure Switch (Required for 90+ and recommended for 80+)

1. Install the inlet fitting adapter #1147904 to the inlet of the gas valve using the O-ring and the four screws provided with the kit. Tighten securely.
2. Using pipe joint compound that is resistant to LP gas, tighten the fitting assembly into the inlet side of the gas valve. (Figure 8). Position fitting assembly as shown.
3. Screw the LP pressure switch into the bushing. Use pipe dope on connection. Tighten securely.

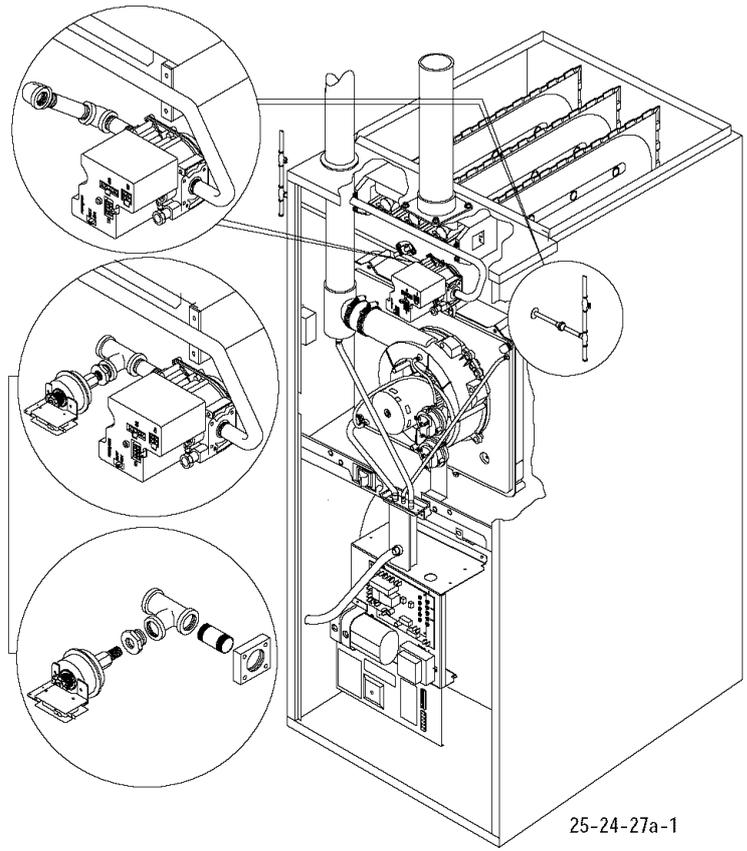
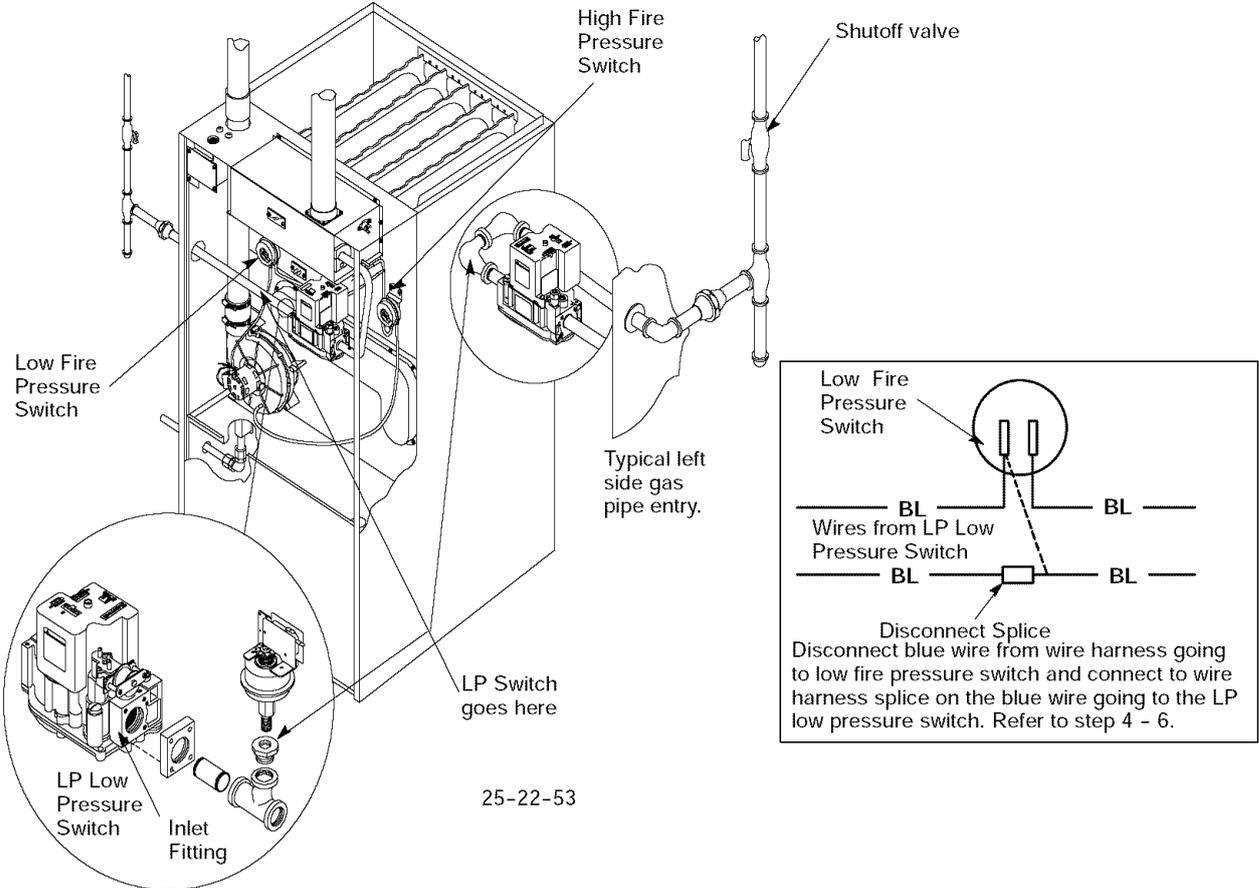
Note: Do not block inlet port of pressure switch with pipe dope. Switch will not operate if inlet port is blocked.

4. Remove one blue wire from the low fire pressure switch. Connect this wire to the male insulated blue wire in the wire harness provided. (See Figure 8).
5. Connect the other blue wire in the harness to the open termination on the Low Fire pressure switch.
6. Connect the other end of the wire harness to the two terminals on the LP switch.

Note: LP switch is factory set to open if LP gas supply pressure falls below 6" w.c.

Figure 8

Typical Gas Piping and Adding LP Low Pressure Switch (Required for 90+ and recommended for 80+)



Reassembly

Reassemble all parts in reverse order as removed except leave the burner compartment cover off (90+ONLY) until after the manifold pressure has been adjusted. Attach LP Conversion Label to the front exterior of the furnace.

- D **Manifold Assembly** - Be sure to engage the main burner orifices in the proper openings in the burners.
- D **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

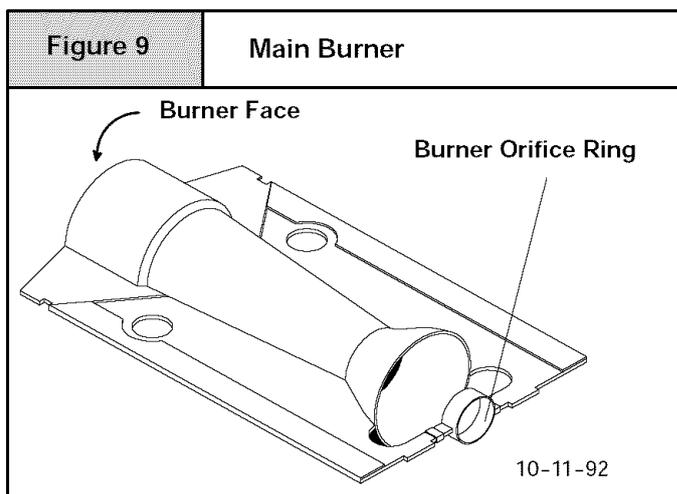
1. Remove the plug from the Inlet Pressure Tap on gas valve and install a manometer. (See Figure 5)
2. Open manual gas line valve to unit. Check for gas leaks and correct as necessary. Check supply pressure, 11" WC recommended, (11" WC minimum, 14" maximum). If not within these limitations DO NOT OPERATE FURNACE, contact gas supplier.
3. Close manual gas line valve to unit, remove manometer and replace inlet pressure tap plug.

Manifold Gas Pressure Adjustments (Hi & Lo Fire)

NOTE: Gas supply pressure **MUST** be within minimum and maximum values listed on rating plate. Pressures are usually set by gas suppliers.

Make adjustment to manifold pressure with burners operating and combustion air box cover removed.

1. Remove combustion air box cover. (90+ ONLY)
2. Connect U-Tube manometer to the tapped opening on the outlet side of gas valve on the manifold pipe. Use a manometer with a 0 to 12" minimum water column range.
3. Turn gas **ON**. Operate the furnace on high fire by using a jumper wire on the R to W1 & W2 thermostat connections on the fan board.
4. Remove the adjustment screw covers on the gas valve. Turn counterclockwise to decrease the manifold pressure and clockwise to increase.
5. Set the manifold pressure to value shown in **Table 1**.
6. Operate the furnace on low fire by using a jumper wire on the R to W1 thermostat connections on the fan board.
Note: The fourth (4th) DIP switch should be in the on position to set the low fire manifold pressure. (See wiring diagram)
7. Repeat steps 4 and 5 for low fire operation.
8. When the manifold pressures are properly set, replace the adjustment screw covers on the gas valve. Remove manometer and replace plug.
9. Remove the jumper wires from the thermostat connections on the fan board.
10. Return fourth (4th) DIP switch to correct setting.
11. Start the main burners and check pressure tap plug for gas leaks.
12. With gas valve on, observe furnace through two or more complete cycles to be sure all controls are operating.
13. With furnace operating, observe pilot connections for gas leaks. Turn gas off and tighten connections if required.
14. Check and adjust pilot flame if necessary. Flame should envelope $\frac{3}{8}$ " to $\frac{1}{2}$ " of end of igniter sensor. To adjust; remove pilot adjustment cap on gas valve and adjust, then replace cap. (See Figure 10)



14. Turn gas valve to OFF. Remove the pressure gauge and replace the pressure tap plug and pressure regulator cap screw.
15. Replace burner compartment cover.

Checking Input Rate

Checking Burner Input Using A Meter. To check the BTU input rate, the test hand on the meter should be timed for at least one revolution and the input determined from this timing. Refer to Section 8, Table XIII of the National Fuel Gas Code for converting test hand readings to cubic feet per hour.

Example			
Propane Gas BTU Content	Time Per Cubic Foot in Seconds	Cubic Feet Per Hour	BTU Per Hour
2,500	120	30	75,000

Example:

$$2500 \text{ BTU/ft}^3 \times 30 \text{ ft}^3/\text{hr} = 75,000 \text{ BTU/hour}$$

Checking Burner Input Not Using a Meter. The fixed orifice size for each burner may be used to determine the burner input in accordance with Table F-2 of the National Fuel Gas code for liquefied petroleum gas. Excerpt of Table F-2 is listed below.

Table F - Excerpt			
Orifice #	# 53	# 54	# 55
BTUH/hr at Sea Level	28,769	24,630	21,939

For Altitudes above 5,000 feet, refer to Section, **High Altitude Installation**.

Main Burner Flame Check

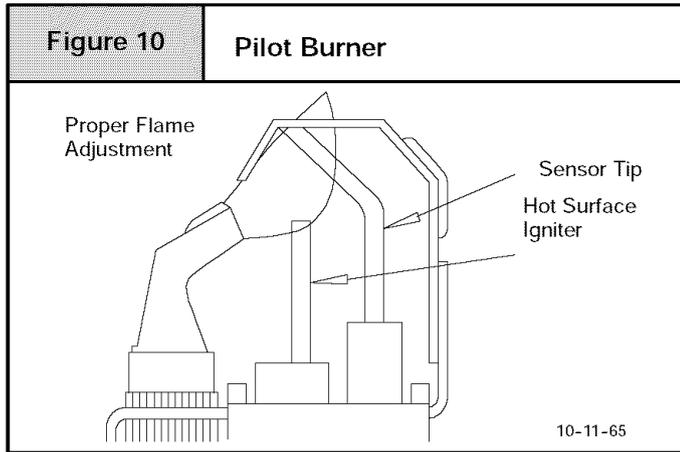
Check for the following:

- D Stable and blue flames
- D Flames extending directly from burner into heat exchanger.
- D Flames DO NOT touch sides of heat exchanger.

NOTE: Dust may cause orange tips or wisps of yellow, but flames **MUST NOT** have solid, yellow tips.

Pilot Burner Flame Check

Pilot flame should envelope end of the igniter sensor $\frac{3}{8}$ " to $\frac{1}{2}$ ".



High Altitude Derate Label

The derate label supplied with the orifice kit must be completed and affixed to the furnace near the rating plate. Fill in the manifold pressure, orifice size and revised input rate. The revised input rate is determined in the following manner:

Refer to the parts list provided to determine the proper orifice part numbers for ordering purposes.

High Altitude Input Rate = Nameplate Input x (Multiplier)

Example:

For a furnace with a input of 100,000 BTU/hr installed at an altitude of 5280', the revised high altitude input is:

High Altitude Input Rate = 100,000 x 0.80 = 80,000 BTU/hr.

Table 2		Altitude Vs Rating Multiplier Chart					
		Sea Level - 8000' (Natural Gas)					
Heat Value	Elevation Above Sea Level						
Btu/Cu.Ft.	0-1999	2000-2999	3000-3999	4000-4999	5000-5999	6000-6999	7000-8000
2,500	1	.92	.88	.84	.80	.76	.72

Verify System Operation

Upon completion of all conversion procedures, perform the following steps to verify the system operation.

1. Turn the thermostat to its lowest temperature setting or to OFF if equipped with a System Select Switch.
2. Turn the gas valve control knob to ON.
3. Reinstall all access panels.
4. Turn ON all electrical power to the unit.
5. Set the thermostat to the desired temperature and the System Select Switch to HEAT.
6. Upon call for HEAT from the thermostat, the Ignitor will ignite the pilot flame. Upon ignition of pilot flame, the main valve will open, providing gas for ignition of the main burners.