INSTALLATION INSTRUCTIONS

For Burner Kit replacement of 553010021 Burners in GUI, GDI & GNI Gas Furnaces Using Natural Gas

Please read these instructions completely before attempting installation.

SAFETY REQUIREMENTS

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 furnace 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 (NFGC) ANSI Z223.1-2006/NFPA 54-2006. In Canada, refer to the National Standard of Canada Natural Gas and Propane Installation Code (NSCNGPIC) CAN/CGA-B149.1 and .2-05.

Wear safety glasses and work gloves. Have fire extinguisher available during Start-up, Adjustment steps, and service calls.

Recognize safety information. This is the safety-alert symbol ⚠. When you see this symbol on the furnace and 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.

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 Z223.1-2006 or latest edition. In Canada, the National Standard CAN/CGA B149-1 and B149-2.

Parts List

Propane Gas 2 Burner Kit # 1170744

Description	Part #	Qty.
Burner Asy 2 Sect	1009178	1
Rollout Shield	1009794	1
Burner Support Bracket	1009919	1
Igniter	1009980	1
Igniter Bracket	1009441	1
Burner Orifice # 42	1007819	2
Burner Orifice # 43	1007880	2
Burner Orifice # 45	1009936	2
Burner Orifice # 47	1009935	2
Instructions	44106103001	1

Propane Gas 3 Burner Kit # 1170745

Description	Part #	Qty.
Burner Asy 3 Sect	1008724	1
Rollout Shield	1009795	1
Burner Support Bracket	1009920	1
Igniter	1009980	1
Igniter Bracket	1009441	1
Burner Orifice # 42	1007819	3
Burner Orifice # 44	1008642	3
Burner Orifice # 45	1009936	3
Burner Orifice # 49	1009934	3
Instructions	44106103001	1

Propane Gas 4 Burner Kit # 1170746

Description	Part #	Qty.
Burner Asy 4 Sect	1008725	1
Rollout Shield	1009796	1
Burner Support Bracket	1009921	1
Igniter	1009980	1
Igniter Bracket	1009441	1
Burner Orifice # 42	1007819	4
Burner Orifice # 44	1008642	4
Burner Orifice # 45	1009936	4
Burner Orifice # 49	1009934	4
Instructions	44106103001	1

Propane Gas 5 Burner Kit # 1170747

Description	Part #	Qty.
Burner Asy 5 Sect	1008726	1
Rollout Shield	1009797	1
Burner Support Bracket	1009922	1
Igniter	1009980	1
Igniter Bracket	1009441	1
Burner Orifice # 42	1007819	5
Burner Orifice # 44	1008642	5
Burner Orifice # 45	1009936	5
Burner Orifice # 49	1009934	5
Instructions	44106103001	1

Propane Gas 6 Burner Kit # 1170748

Description	Part #	Qty.
Burner Asy 6 Sect	1009179	1
Rollout Shield	1009798	1
Burner Support Bracket	1009923	1
Igniter	1009980	1
Igniter Bracket	1009441	1
Burner Orifice # 42	1007819	6
Burner Orifice # 44	1008642	6
Burner Orifice # 45	1009936	6
Burner Orifice # 49	1009934	6
Instructions	44106103001	1

⚠ WARNING

FIRE, EXPLOSION, ELECTRIC SHOCK, AND CARBON MONOXIDE HAZARD.

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. If the information in these instructions is not followed exactly, a fire, an explosion or production of carbon monoxide could 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.

AVERTISSMENT

Cette trousse de conversion doit être installée par un service d'entretien, selon les instructions du fabricqualifiéant et selon toutes les exigences et tous les codes pertinents de l'autorité compétente. Assurezvous de bien suivre les instructions dans cette notice pour réduire au minimum le risque d'incendie, d'explosion ou la production de monoxyde de carbone pouvant causer des dommages matériels, des blessures ou la mort. Le service d'entreien qualifié estresponsable de l'installation de cette trousse. L'installation n'est pas adéquate ni compléte tant que le bon fonctionnement de l'appareil convertin'a pas été vérifié selon les instructions du fabricant fournies avec la trousse.

Preliminary Information

This kit is for replacement of the 553010021 gas burners used in **GUI, GDI** and **GN**I series furnaces. The gas burners and burner orifices must be replaced with parts in this kit. The correct orifice sizes to be used from this kit can be selected from the tables included in these instructions.

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.
- Disconnect electric power supply to the furnace before starting installation.
- Check for gas leaks after installation of kit and before attempting to start furnace.

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 1** for gas supply and manifold pressures.

Table 1	**Gas Pressures below 2000′**			
Gas Type	Supply Pressure			Manifold Pressure
	Recommended	Max.	Min.	
Propane	7″ (1.7kPa)	14″ (3.5kPa)	4.5″ (1.1kPa)	3.5″ (0.9kPa)

Installation

⚠ WARNING

ELECTRIC SHOCK, FIRE AND EXPLOSION HAZARD.

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

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

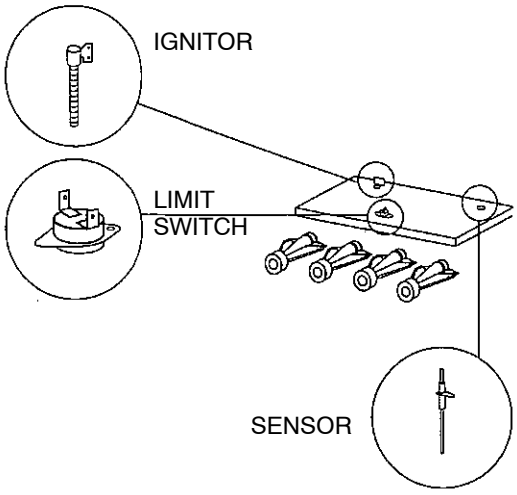
Turn OFF electric power supply at disconnect switch or service panel before starting conversion.

Disassembly

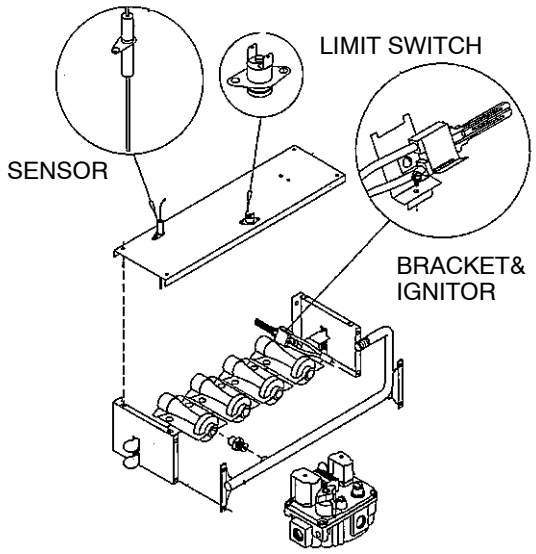
Refer to **Figure 1** and the following steps.

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. Disconnect wiring at gas valve ignitor & sensor. Be sure to note the proper location of any and all electrical wiring disconnected.
4. Remove the four(4) screws holding the manifold and gas valve to the manifold supports. Do Not discard any screws.
5. Carefully remove the manifold assembly, rollout shield, burners and burner support bracket.
6. Remove the flame sensor and limit switch from the rollout shield to be reassembled on the new rollout shield which is provided in the kit.

Figure 1 **Ignitor/Sensor Location**

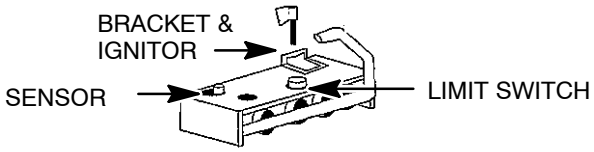


GDI BURNER BOX/IGNITOR LOCATION



GUI BURNER BOX/IGNITOR LOCATION

Figure 1 Cont. **Ignitor/Sensor Location**

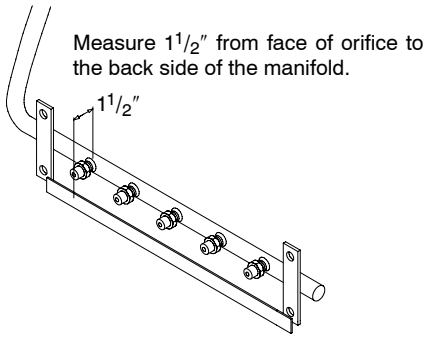


GNI BURNER BOX/IGNITOR LOCATION

Main Burner Orifices

Remove the burner orifices from the manifold assembly and replace the removed orifice with the orifice size determined from **Table 2**, **Table 3** or **Table 4** for your altitude and furnace model. Tighten the orifices so they are $1^1/_2$″ from the face of the orifice to the back side of the manifold pipe **(Figure 2**). Make sure the orifice is installed straight so that it forms a right angle to the manifold bracket.

Figure 2 **Changing Orifices**



High Altitude Installation

These units may be installed at full input rating when installed at altitudes up to 2000′. When installed above 2000′, the input MUST be derated by 4% for each 1000′ above sea level. The burner orifices supplied in the kit are sized for Natural Gas ONLY, for use from 0 – 8000′ elevations, ONLY when the heating value of gas does not exceed 900 or 800 BTU/cu. ft. For other heating values and altitudes, refer to **Table 2**, Table **Table 3** or **Table 4** to determine if an orifice change is required. Refer to **Table 2**, **Table 3** or **Table 4** for correct orifice size and manifold pressure for the installation.

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

Table 2 **MANIFOLD PRESSURE AND ORIFICE SIZE FOR HIGH ALTITUDE APPLICATIONS**

NATURAL GAS

		MEAN ELEVATION ABOVE SEA LEVEL					
HEATING VALUE 2500 BTU/CU. FT.		**2000′ to 2999′**	**3000′ to 3999′**	**4000′ to 4999′**	**5000′ to 5999′**	**6000′ to 6999′**	**7000′ to 8000′**
800		3.5 in wc	3.5 in wc	3.5 in wc	3.5 in wc	3.2 in wc	2.9 in wc
850		3.5 in wc	3.5 in wc	3.4 in wc	3.1 in wc	2.8 in wc	2.5 in wc
900		3.5 in wc	3.4 in wc	3.1 in wc	2.8 in wc	2.5 in wc	2.3 in wc
950		3.3 in wc	3.0 in wc	2.8 in wc	2.5 in wc	2.3 in wc	3.3 in wc
1000		3.0 in wc	2.7 in wc	2.5 in wc	2.3 in wc	3.4 in wc	3.0 in wc
1050		2.7 in wc	2.5 in wc	2.3 in wc	3.4 in wc	3.0 in wc	2.7 in wc
1100		2.5 in wc	2.3 in wc	3.5 in wc	3.1 in wc	2.8 in wc	2.5 in wc
GNI045	ORIFICE SIZE #43	STANDARD FACTORY ORIFICE #43		#47	#47	#47	#47

SHADED AREA REQUIRES ORIFICE CHANGE. NO SHADING INDICATES MANIFOLD CHANGE ONLY.

NOTE: PROPANE DATA BASED ON 1.53 SPECIFIC GRAVITY. FOR FUELS WITH DIFFERENT SPECIFIC GRAVITY CONSULT THE LATEST EDITION OF NATIONAL FUEL GAS CODE NFPA 54/ANSI Z223 1.

Table 3	MANIFOLD PRESSURE AND ORIFICE SIZE FOR HIGH ALTITUDE APPLICATIONS					
NATURAL GAS						
	MEAN ELEVATION ABOVE SEA LEVEL					
HEATING VALUE 2500 BTU/CU. FT.	**2000′ to 2999′**	**3000′ to 3999′**	**4000′ to 4999′**	**5000′ to 5999′**	**6000′ to 6999′**	**7000′ to 8000′**
800	3.5 in wc	3.5 in wc	3.5 in wc	3.2 in wc	2.9 in wc	2.6 in wc
850	3.5 in wc	3.4 in wc	3.1 in wc	2.8 in wc	2.6 in wc	3.5 in wc
900	3.3 in wc	3.1 in wc	2.8 in wc	2.5 in wc	3.5 in wc	3.5 in wc
950	3.0 in wc	2.7 in wc	2.5 in wc	3.5 in wc	3.5 in wc	3.5 in wc
1000	2.7 in wc	2.5 in wc	3.5 in wc	3.5 in wc	3.5 in wc	3.2 in wc
1050	2.4 in wc	3.5 in wc	3.5 in wc	3.5 in wc	3.2 in wc	2.9 in wc
1100	3.5 in wc	3.5 in wc	3.5 in wc	3.2 in wc	2.9 in wc	2.6 in wc
GNI060 - 120 ORIFICE SIZE #44	STANDARD FACTORY ORIFICE #44		#49	#49	#49	#49

SHADED AREA REQUIRES ORIFICE CHANGE. NO SHADING INDICATES MANIFOLD CHANGE ONLY.

NOTE: PROPANE DATA BASED ON 1.53 SPECIFIC GRAVITY. FOR FUELS WITH DIFFERENT SPECIFIC GRAVITY CONSULT THE LATEST EDITION OF NATIONAL FUEL GAS CODE NFPA 54/ANSI Z223 1.

Table 4	MANIFOLD PRESSURE AND ORIFICE SIZE FOR HIGH ALTITUDE APPLICATIONS					
NATURAL GAS						
	MEAN ELEVATION ABOVE SEA LEVEL					
HEATING VALUE 2500 BTU/CU. FT.	**2000′ to 2999′**	**3000′ to 3999′**	**4000′ to 4999′**	**5000′ to 5999′**	**6000′ to 6999′**	**7000′ to 8000′**
800	3.5 in wc	3.5 in wc	3.5 in wc	3.2 in wc	3.3 in wc	3.0 in wc
850	3.5 in wc	3.5 in wc	3.1 in wc	3.2 in wc	2.9 in wc	2.6 in wc
900	3.5 in wc	3.5 in wc	2.8 in wc	2.9 in wc	2.6 in wc	2.3 in wc
950	3.4 in wc	3.1 in wc	2.5 in wc	2.6 in wc	2.3 in wc	3.3 in wc
1000	3.1 in wc	2.8 in wc	3.5 in wc	2.3 in wc	3.3 in wc	2.9 in wc
1050	2.8 in wc	2.6 in wc	3.5 in wc	3.3 in wc	2.3 in wc	2.7 in wc
1100	2.6 in wc	2.3 in wc	3.5 in wc	3.0 in wc	2.7 in wc	2.4 in wc
GUI/GDI050 - 150	STANDARD FACTORY ORIFICE #42		#45	#45	#45	#49

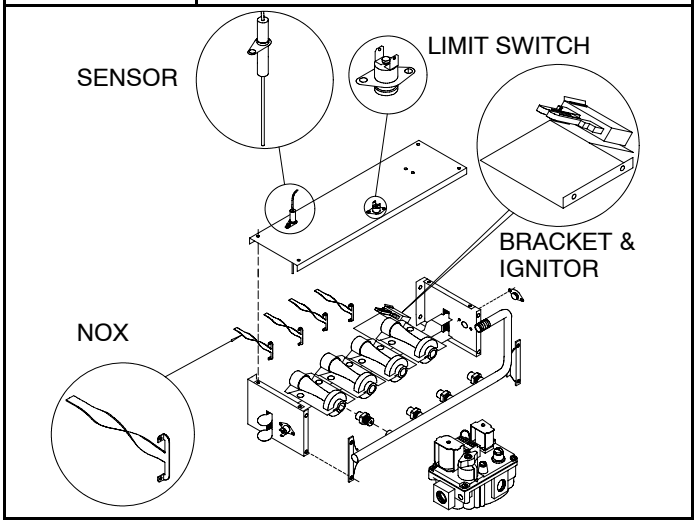
SHADED AREA REQUIRES ORIFICE CHANGE. NO SHADING INDICATES MANIFOLD CHANGE ONLY.

NOTE: PROPANE DATA BASED ON 1.53 SPECIFIC GRAVITY. FOR FUELS WITH DIFFERENT SPECIFIC GRAVITY CONSULT THE LATEST EDITION OF NATIONAL FUEL GAS CODE NFPA 54/ANSI Z223 1.

Reassembly (Figure 3)

1. Assemble the burner support bracket, burner assembly igniter bracket and igniter.
   NOTE: Depending on which kit is being applied, the mounting of the ignitor bracket may be located in a different location than original design (see **Figure 1**).
2. Position this assembly in the existing slots of the manifold support brackets, being careful not to damage the igniter.
3. Install the manifold assembly, making sure to engage the main burner orifices in the proper openings in the burner.
4. Reassemble the limit switch and flame sensor to the new rollout shield and install it in place. Reconnect wiring.
5. After reassembly of all gas connections, turn the gas on and check all joints for gas leaks using a soapy solution. All leaks must be repaired immediately.

Figure 3 **Burner Box Components**



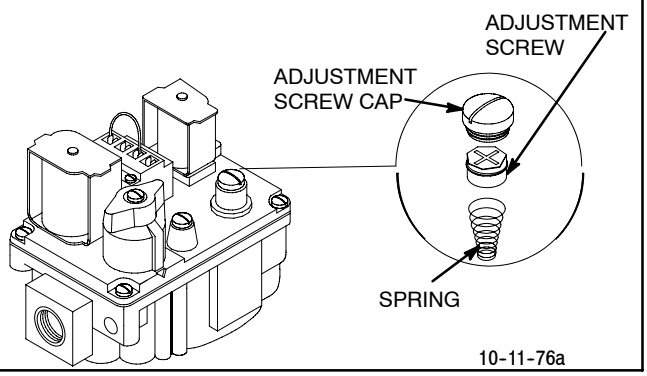
Start-up and Check-out

1. Remove the plug from the Inlet Pressure Tap on gas valve and install a manometer. (See **Figure 4**)
2. Open manual gas line valve to unit. Check for gas leaks and correct as necessary. Check supply pressure, 7 in wc recommended, (4.5 in wc minimum, 14 in wc 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.

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 4**).
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**, **Table 3** or **Table 4**. Turn pressure regulator adjusting screw clockwise to increase or counterclockwise to decrease manifold pressure. Burner Input must not exceed nameplate rating. Refer to Section *"Checking Input Rate"*.

Figure 4 **Typical Regulator Assembly**



7. Turn gas valve to OFF. Remove the pressure gauge and replace the pressure tap plug and pressure regulator cap screw.
8. Start the main burners and check pressure tap plug for gas leaks
9. With gas valve on, observe furnace through two or more complete cycles to be sure all controls are operating.

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	**No. of Seconds Per Cubic Foot**	**Cubic Feet Per Hour**	**BTU Per Hour**
2,500	120	30	75,000

Example:

1000 BTU/ft^3 x 75 ft^3/hr = 75,000 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-1 of the National Fuel Gas code for natural gas. Refer to **Table 2**, **Table 3** or **Table 4** for adjusting manifold pressure for various gas heating values.

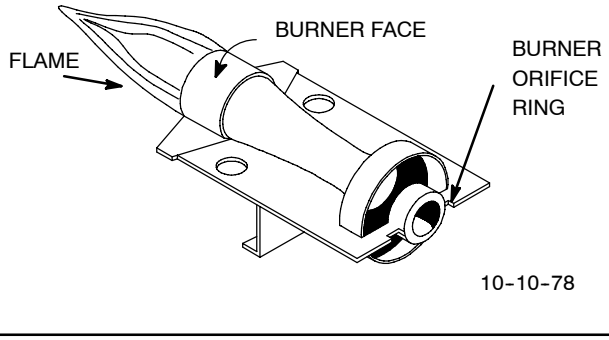
Main Burner Flame Check

Check for the following:

- Stable and blue flames. Dust may cause orange tips or wisps of yellow, but flames **MUST NOT** have solid, yellow tips (see **Figure 5**).
- Flames extending directly from burner into heat exchanger.
- 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.

Figure 5 **Main Burner**



High Altitude Derate

The revised input rate is determined in the following manner:

High Altitude Input Rate = Nameplate Input x (Multiplier).See **Table 5** for multiplier value.

Example:

For a furnace with a input of 100,00 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 5	ALTITUDE Vs RATING MULTIPLIER CHART SEA LEVEL -- 8000′ (Natural Gas)						
HEAT VALUE BTU/CU. FT.	**Elevation Above Sea Level**						
	0 - 1999′	2000′ - 2999′	3000′ - 3999′	4000′ - 4999′	5000′ - 5999′	6000′ - 6999′	7000′ -- 8000′
1000	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 switch 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 start to glow. Upon ignitor reaching ignition temperature, the main valve will open, providing gas for ignition of the main burners.