KGAPN3901ALL

Gas Conversion Kit Propane to Natural for Hot Surface Ignition Fixed Speed, Two−Speed, and Variable Speed Furnaces

Installation Instructions

NOTE: Read the entire instruction manual before starting the installation.

SAFETY CONSIDERATIONS

⚠ WARNING

FIRE, EXPLOSION, ELECTRICAL SHOCK, AND CARBON MONOXIDE POISONING HAZARD

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, 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.

⚠ AVERTISSEMENT

AVERTISSEMENT: LE FEU, L'EXPLOSION, CHOC ELECTRIQUE,ET MONOXYDE DE CARBONE EMPOISONNER

Cette trousse de conversion doit être installée par un servie d'entretien qualifié, selon les instructions du fabricant 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'entretien qualifié est responsable de l'installation de cette trousse. L'installation n'est pas adéquate ni complète tant que le bon fonctionnement de l'appareil converti n'a pas été vérifié selon les instructions du fabricant fournies avec la trousse.

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 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 unit, 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) NFPA No. 54-2006/ANSI Z223.1-2006. In Canada, refer to the National Standard of Canada, Natural Gas and Propane Installation Codes (NSCNGPIC), CAN/CSA-B149.1-05.

Wear safety glasses and work gloves. Have a fire extinguisher available during start-up, adjustment procedures, and service calls.

Recognize safety information. This is the safety-alert symbol ⚠. When you see this symbol on the furnace and in instructions or manuals, be alert to the potential for personal injury.

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

INTRODUCTION

This instruction covers the installation of gas conversion kit Part No. KGAPN3901ALL to convert the following furnaces from propane gas usage to natural gas usage. See the appropriate section for your furnace type.

Section 1 - Fixed-Speed, Condensing Furnace Models 58MCA, 58MCB, 58MEB, 58MSA, 58MXA, 58MXB, 340MAV, 340AAV, 345MAV, 350MAV, 350AAV, 353AAV, PG9MAA, and PG9MAB. This kit is designed for use in furnaces with 40,000 through 138,000 Btuh gas input rates.

Section 2 - 2-Stage Condensing Furnace Models 58MTA, 58MTB, 352MAV, 352AAV and PG9MXA; Variable-Speed, Condensing Models 58MVP, 58MVB, 58UVB, 355MAV, 355AAV, and 355BAV. This kit is designed for use in furnaces with 040 through 120 size furnaces equipped with a dual-fuel electric switch gas valve. Do not use this kit on furnaces equipped with a RED knob gas valve, P/N EF33CZ201.

Section 3 - 2-Stage, Non-Condensing Furnace Models 312AAV, 312JAV, 58CTA, and 58CTX; Variable-Speed Non-Condensing

Furnace Models 315AAV, 315JAV, 58CVA, and 58CVX. This kit is designed for use in furnaces with 44,000 through 154,000 Btuh input rates. The gas valve will be a White-Rodgers 36F with electric control switch.

Section 4 - Fixed-Speed Non-Condensing Furnace Models 310AAV, 311AAV, 313AAV, 310JAV, 311JAV, 313JAV, 58STA, 58DLA, 58PHA, 58STX, 58DLX, 58PHX, PG8MAA, PG8MEA, PG8JAA, and PG8JEA. This kit is designed for use in furnaces with 44,000 through 154,000 Btuh input rates.

⚠ WARNING

FIRE, EXPLOSION, ELECTRICAL SHOCK AND CARBON MONOXIDE POISONING HAZARD

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

Improper installation, adjustment, alteration, service, maintenance, or use can cause carbon monoxide poisoning, explosion, fire, electrical shock, or other conditions which could result in personal injury or death. Consult your distributor or branch for information or assistance. The qualified installer or agency must use only factory-authorized kits or accessories when servicing this product.

⚠ WARNING

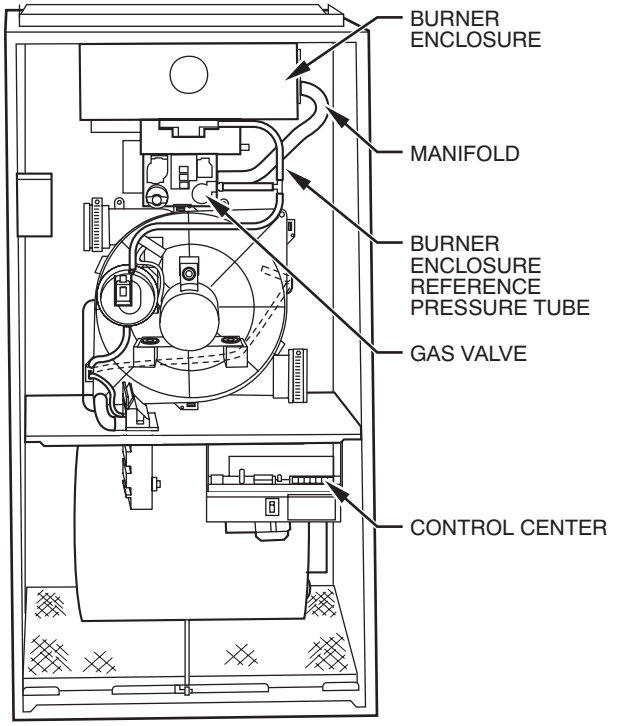
FIRE, EXPLOSION, ELECTRICAL SHOCK HAZARD

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

Gas supply MUST be shut off before disconnecting electrical power and proceeding with conversion.

DESCRIPTION AND USAGE

This kit is designed for use in the furnaces listed above. See Table 1 for kit contents. To accommodate many different furnace models, more parts are shipped in the kit than will be needed to complete conversion. When installation is complete, discard extra parts.



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Fig. 1 – Multipoise, Fixed-Speed, Condensing Furnace Component Location (Upflow Orientation Shown)

INSTALLATION

SECTION 1 - FIXED-SPEED CONDENSING FURNACE MODELS 58MCA, 58MCB, 58MEB, 58MSA, 58MXA, 58MXB, 340MAV, 340AAV, 345MAV, 350MAV, 350AAV, 353AAV, PG9MAA, and PG9MAB

Step 1 —Install Main Burner Orifices

NOTE: See Fig. 1 for component location in upflow furnaces. Re-orient component arrangement when furnace is installed in other orientations.

1. Turn off gas and electrical supplies to furnace.
2. Remove main furnace door.
3. Turn furnace gas valve control switch/knob to OFF position.
4. Remove burner enclosure cover.

TABLE 1 - KIT CONTENTS

DESCRIPTION	PART NO.	QUANTITY
Regulator Spring Kit (Natural, Silver) for White–Rodgers 36E, 36F, or 36G Valve	EF39ZW037	2
Main Burner Orifice (Drill Size No. 42)	LH32DB207	7
Main Burner Orifice (Drill Size No. 43)	LH32DB202	7
Main Burner Orifice (Drill Size No. 44)	LH32DB200	7
Main Burner Orifice (Drill Size No. 45)	LH32DB205	7
Conversion Rating Plate Label	334409–204	1
Conversion Responsibility Label	334409–205	1
Gas Control Conversion Label (converted)	334409–203	1
Installation Instructions	AG–KGAPN–03	1
Conversion Rating Plate Label	334409–201	1
Gas Control Conversion Label (adjusted)	334409–202	1
Pipe Plug (1/8 in)	CA64AS001	1

⚠ CAUTION

UNIT OPERATION HAZARD

Failure to follow this caution may result in unit damage or improper operation.

Label all wires prior to disconnection when servicing controls.

⚠ CAUTION

ATTENTION: D'EQUIPEMENT DANGER D'OPERATION
Lors des opérations d'entretien des commandes, étiqueter tous les fils avant de les déconnecter. Toute erreur de câblage peut être une source de danger et de panne.

5. Remove gas supply piping from gas valve.
6. Remove wires from gas valve and low gas pressure switch (LGPS), if used. Note location for reassembly.
7. Remove burner enclosure pressure tube from gas valve regulator fitting. (See Fig. 1 and 2, 3, 4 or 5.)
8. Remove screws that secure manifold to burner enclosure and remove manifold, orifices, and gas valve as 1 assembly.
9. Remove and discard orifices from manifold.
10. Determine natural gas orifice size for correct input at installed altitude by using Table 2 or 3.

Furnace gas input rate on rating plate is for installations at altitudes up to 2000 ft. (610M).

In the USA, the input rating for altitudes above 2000 ft. (610M) must be reduced by 2 percent for each 1000 ft. (305M) above sea level.

In Canada, the input rating must be derated by 5 percent for altitudes of 2000 ft. (610M) to 4500 ft. (1372M) ft above sea level.

a. Obtain yearly heat value average (at installed altitude) for local gas supply.
b. Obtain yearly specific gravity average for local gas supply.
c. Verify furnace model and size. Table 2 can only be used for 40-in. (1016mm) tall, multipoise, hot-surface ignition, fixed- speed condensing furnaces with heating sizes of 040 through 120. Table 3 can only be used for 40-in. (1016mm) tall, multipoise, hot-surface ignition, fixed-speed condensing furnaces with a 140 heating size.
d. Find installation altitude in Table 2 or 3.

NOTE: For Canada altitudes of 2000 to 4500 ft. (610 to 1372M), use USA altitudes of 2001 to 3000 ft. (610 to 914M) in Table 2 or 3.

EXAMPLE: (Using Table 2 at 0-2000 ft. (610M) altitude)
Heat value - 1050 Btu/cu ft
Specific gravity=0.62
Therefore: Orifice No. 45 is required.

e. Find closest natural gas heat value and specific gravity in Table 2 or 3.
f. Follow heat value line and specific gravity line to point of intersection to find orifice size and manifold pressure settings for proper operation at given natural gas condition.

11. Install properly sized orifices in manifold. DO NOT use Teflon tape. Finger-tighten each orifice one complete turn to prevent cross threading, then tighten with wrench. There are sufficient orifices for the largest size furnace. Discard extra orifices. Orifices of other sizes must be field-supplied and are available through your local distributor.
12. Reinstall manifold, orifice, and gas valve assembly in burner box. Ensure manifold seal is installed properly and burners fit over orifices.
13. Reconnect wires to gas valve. Refer to furnace wire schematic for proper wire location.
14. Reinstall burner box pressure tube to gas valve regulator fitting.

NOTE: DO NOT reconnect gas supply or reinstall burner box cover at this time.

Step 2 —Convert Gas Valve

1. Be sure main gas and electrical supplies to furnace are off.
2. Remove regulator seal cap. (See Fig. 2, 3, 4 and 5.)
3. Remove adjustment screw and propane gas regulator spring (white).

⚠ CAUTION

UNIT DAMAGE HAZARD

Failure to follow this caution may result excessive burner noise and misdirection of burner flames.

DO NOT redrill burner orifices. Improper drilling may result in burrs, out-of-round holes, etc. Obtain new orifices if orifice size must be changed. (See Fig. 6.)

4. Install natural gas regulator spring (silver) in gas valve. Turn regulator adjustment screw clockwise (inwards) 10 turns for gas valve as shown in Fig. 2, 3 and 4 or 8.5 turns for Fig. 5.

NOTE: Discard labels and instructions packaged with White-Rodgers regulator spring conversion kit.

NOTE: DO NOT reinstall regulator seal cap at this time.

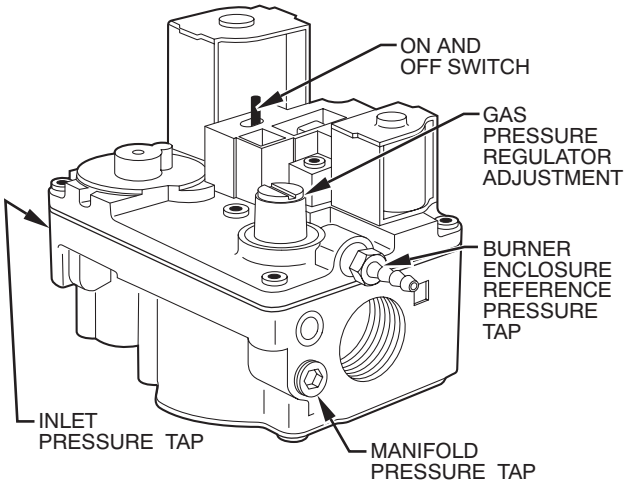
Step 3 —Remove Low Gas Pressure Switch (LGPS)

NOTE: Early model furnaces may not have been equipped with a Low Gas Pressure Switch (LGPS). If LGPS is not installed, go to Step 4.

1. Remove low gas pressure switch (LGPS), street elbow, and 1/8-in. female x female x male brass tee from gas valve inlet pressure tap. (See Fig. 7.)

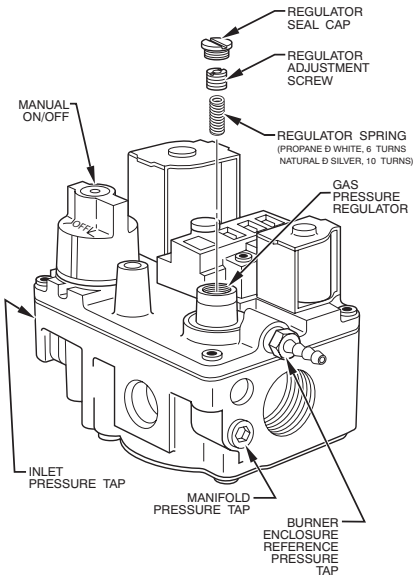
NOTE: Use propane gas resistant pipe dope on all connections to prevent gas leaks. DO NOT use Teflon tape.

2. Apply pipe dope sparingly to 1/8-in. pipe plug (provided in kit) and install in 1/8-in. tapped inlet pressure tap opening in gas valve.
3. Re-wire unit pressure switch PRS as follows:
   a. Trace yellow wires previously disconnected from the N.O. terminal of the LGPS back to C terminal of the PRS. Disconnect this wire from the PRS and discard.
   b. Connect yellow wire of furnace wire harness to the C terminal of the LGPS.
   c. Refer to wiring label on furnace to ensure proper wiring location.



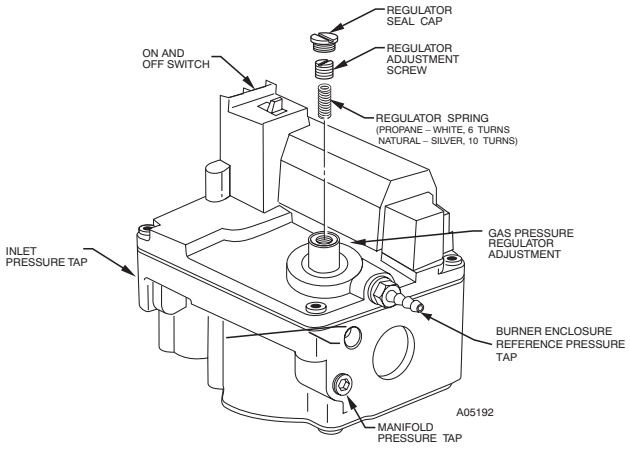
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Fig. 2 – Single Stage Gas Valve (With Electric Control Switch), Series E



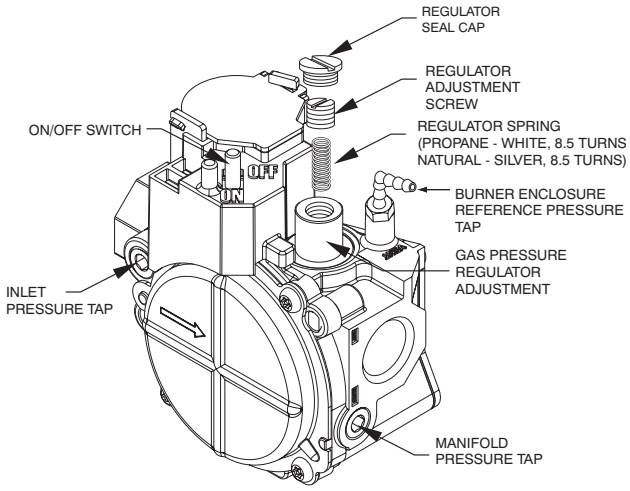
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Fig. 3 – Single Stage Gas Valve (With Manual Control Knob), Series E



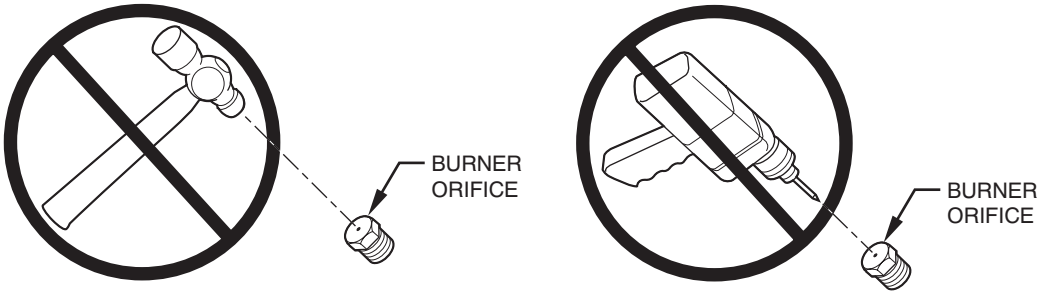
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Fig. 4 – Single Stage Gas Valve, Series F



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Fig. 5 – Single Stage Gas Valve, Series G



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Fig. 6 – Burner Orifice

Step 4 —Check Inlet Gas Pressure

NOTE: This kit is to be used only when inlet gas pressure is between 4.5-in. wc and 13.6-in. wc.

1. Be sure gas and electric supplies to furnace are off.

⚠ CAUTION

UNIT DAMAGE HAZARD

Failure to follow this caution may result in unit damage.

DO NOT operate furnace more than one minute to check inlet gas pressure as conversion is not complete at this time.

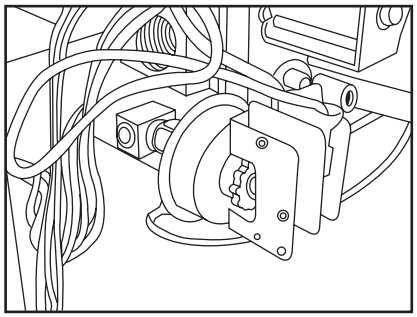
2. Remove 1/8-in. pipe plug from inlet pressure tap on gas valve. (See Fig. 2, 3, 4 and 5.)
3. Attach manometer to inlet pressure tap on furnace gas valve. (See Fig. 2, 3, 4 and 5.)
4. Turn gas supply manual shutoff valve to ON position.
5. Turn furnace gas valve control switch/knob to ON position.
6. Turn on furnace power supply.

⚠ WARNING

FIRE AND EXPLOSION HAZARD

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

NEVER test for gas leaks with an open flame. Use a commercially available soap solution made specifically for the detection of leaks to check connections.



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Fig. 7 – LGPS Installed

7. Jumper R and W thermostat connections to call for heat.
8. When main burners ignite, confirm inlet gas pressure is between 4.5-in. wc and 13.6-in. wc.
9. Remove jumper across R and W thermostat connections to terminate call for heat.
10. Turn furnace gas valve control switch/knob to OFF position.
11. Turn gas supply manual shutoff valve to OFF position.
12. Turn off furnace power supply.
13. Remove manometer and reinstall gas valve inlet pressure tap plug.

NOTE: Use propane-gas-resistant pipe dope to prevent gas leaks. DO NOT use Teflon tape.

Step 5 —Check Furnace Operation and Make Necessary Adjustments

1. Be sure main gas and electric supplies to furnace are off.
2. Remove 1/8-in. pipe plug from manifold pressure tap on gas valve. (See Fig. 2, 3, 4, or 5.)
3. Attach manometer to manifold pressure tap on gas valve. (See Fig. 2, 3, 4, or 5.)
4. Turn gas supply manual shutoff valve to ON position.
5. Turn furnace gas valve control switch/knob to ON position.
6. Check all threaded pipe connections for gas leaks.
7. Turn on furnace power supply.
8. Jumper R and W thermostat connections to call for heat.
9. When main burners ignite, check manifold orifices for gas leaks.

Step 6 —Set Gas Input Rate

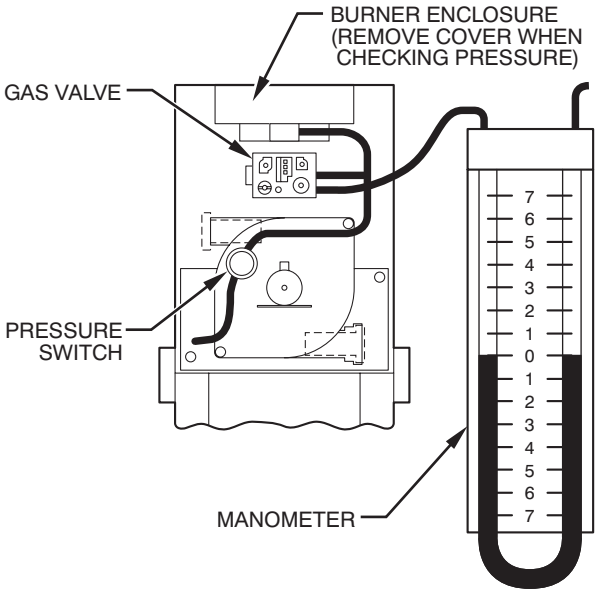
Furnace gas input rate on rating plate is for installations at altitudes up to 2000 ft. (610M). (See conversion kit rating plate, Fig. 9.)

In the USA, the input rating for altitudes above 2000 ft. (610M) must be reduced by 2 percent for each 1000 ft. (305M) above sea level.

In Canada, the input rating must be derated by 5 percent for altitudes of 2000 ft. (610M) to 4500 ft. (1372M) above sea level.

Furnace input rate must be within +/-2 percent of input on furnace rating plate.

1. Determine natural gas orifice size and manifold pressure for correct input.
   a. Obtain yearly heat value average (at installed altitude) from local gas supplier.
   b. Obtain yearly specific gravity average from local gas supplier.
   c. Verify furnace model and size. Table 2 can only be used for 40-in. (1016mm) tall, multipoise, hot-surface ignition, condensing furnaces with heating sizes of 040 through 120. Table 3 can only be used for 40-in. (1016mm) tall, multipoise, hot-surface ignition, condensing furnaces with a 140 heating size.
   d. Find installation altitude in Table 2 or 3.



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Fig. 8 – Manometer Connection for Pressure Measurement (Component Location May Vary Depending on Model)

TABLE 2 - ORIFICE SIZE* AND MANIFOLD PRESSURE FOR GAS INPUT RATE

(TABULATED DATA BASED ON 20,000 BTUH PER BURNER, DERATED 2%/1000 FT (305M) ABOVE SEA LEVEL)

ALTITUDE RANGE ft (m)		AVG. GAS HEAT VALUE AT ALTITUDE (Btu/cu ft)	SPECIFIC GRAVITY OF NATURAL GAS							
			0.58		0.60		0.62		0.64	
			Orifice No.	Manifold Pressure	Orifice No.	Manifold Pressure	Orifice No.	Manifold Pressure	Orifice No.	Manifold Pressure
U.S.A. and Canada		900	43	3.5	43	3.6	43	3.8	42	3.2
	0	925	44	3.8	43	3.5	43	3.6	43	3.7
	(0)	950	44	3.6	44	3.8	43	3.4	43	3.5
		975	44	3.4	44	3.6	44	3.7	44	3.8
	to	1000	44	3.3	44	3.4	44	3.5	44	3.6
		1025	**45**	**3.8**	44	3.2	44	3.3	44	3.4
	2000	1050	**45**	**3.6**	**45**	**3.7**	**45**	**3.8**	44	3.3
	(610)	1075	**45**	**3.4**	**45**	**3.5**	**45**	**3.7**	**45**	**3.8**
		1100	**45**	**3.3**	**45**	**3.4**	**45**	**3.5**	**45**	**3.6**
U.S.A. and Canada	U.S.A.	800	43	3.8	42	3.2	42	3.3	42	3.5
	2001 (611)	825	43	3.6	43	3.7	43	3.8	42	3.2
	to	850	43	3.4	43	3.5	43	3.6	43	3.7
	3000 (914)	875	44	3.7	44	3.8	43	3.4	43	3.5
		900	44	3.5	44	3.6	44	3.7	44	3.8
	Canada	925	44	3.3	44	3.4	44	3.5	44	3.6
	2001 (611)	950	**45**	**3.7**	44	3.2	44	3.3	44	3.4
	to	975	**45**	**3.6**	**45**	**3.7**	**45**	**3.8**	44	3.2
	4500 (1372)	1000	**45**	**3.4**	**45**	**3.5**	**45**	**3.6**	**45**	**3.7**
U.S.A. Only		775	43	3.7	42	3.2	42	3.3	42	3.4
	3001	800	43	3.5	43	3.6	43	3.8	42	3.2
	(915)	825	44	3.8	43	3.4	43	3.5	43	3.7
	to	850	44	3.6	44	3.7	44	3.8	43	3.4
		875	44	3.4	44	3.5	44	3.6	44	3.7
	4000	900	44	3.2	44	3.3	44	3.4	44	3.5
	(1219)	925	**45**	**3.7**	**45**	**3.8**	44	3.2	44	3.3
		950	**45**	**3.5**	**45**	**3.6**	**45**	**3.7**	**45**	**3.8**
U.S.A. Only		750	43	3.7	43	3.8	42	3.2	42	3.3
	4001	775	43	3.5	43	3.6	43	3.7	43	3.8
	(1220)	800	44	3.7	43	3.4	43	3.5	43	3.6
	to	825	44	3.5	44	3.6	44	3.7	43	3.4
		850	44	3.3	44	3.4	44	3.5	44	3.6
	5000	875	**45**	**3.8**	44	3.2	44	3.3	44	3.4
	(1524)	900	**45**	**3.6**	**45**	**3.7**	**45**	**3.8**	44	3.2
		925	**45**	**3.4**	**45**	**3.5**	**45**	**3.6**	**45**	**3.7**
U.S.A. Only		725	43	3.6	43	3.8	42	3.2	42	3.3
	5001	750	43	3.4	43	3.5	43	3.6	43	3.8
	(1525)	775	44	3.7	44	3.8	43	3.4	43	3.5
	to	800	44	3.4	44	3.6	44	3.7	44	3.8
		825	44	3.2	44	3.3	44	3.4	44	3.6
	6000	850	**45**	**3.7**	**45**	**3.8**	44	3.2	44	3.4
	(1829)	875	**45**	**3.5**	**45**	**3.6**	**45**	**3.7**	**45**	**3.8**
		900	**45**	**3.3**	**45**	**3.4**	**45**	**3.5**	**45**	**3.6**
U.S.A. Only		675	42	3.2	42	3.3	42	3.4	42	3.5
	6001	700	43	3.6	43	3.7	43	3.8	42	3.3
	(1830)	725	44	3.8	43	3.5	43	3.6	43	3.7
	to	750	44	3.6	44	3.7	44	3.8	43	3.5
		775	44	3.4	44	3.5	44	3.6	44	3.7
	7000	800	**45**	**3.8**	44	3.3	44	3.4	44	3.5
	(2133)	825	**45**	**3.6**	**45**	**3.7**	**45**	**3.8**	44	3.3
		850	**45**	**3.4**	**45**	**3.5**	**45**	**3.6**	**45**	**3.7**

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TABLE 2 - ORIFICE SIZE* AND MANIFOLD PRESSURE FOR GAS INPUT RATE

(TABULATED DATA BASED ON 20,000 BTUH PER BURNER, DERATED 2%/1000 FT (305M) ABOVE SEA LEVEL)

ALTITUDE RANGE ft (m)		AVG. GAS HEAT VALUE AT ALTITUDE (Btu/cu ft)	SPECIFIC GRAVITY OF NATURAL GAS							
			0.58		0.60		0.62		0.64	
			Orifice No.	Manifold Pressure	Orifice No.	Manifold Pressure	Orifice No.	Manifold Pressure	Orifice No.	Manifold Pressure
U.S.A. Only		**650**	43	3.8	42	3.2	42	3.4	42	3.5
	7001	**675**	43	3.5	43	3.7	43	3.8	42	3.2
	(2134)	**700**	44	3.8	43	3.4	43	3.5	43	3.6
	to	**725**	44	3.5	44	3.6	44	3.8	43	3.4
		750	44	3.3	44	3.4	44	3.5	44	3.6
	8000	**775**	**45**	**3.7**	44	3.2	44	3.3	44	3.4
	(2438)	**800**	**45**	**3.5**	**45**	**3.6**	**45**	**3.7**	44	3.2
		825	**45**	**3.3**	**45**	**3.4**	**45**	**3.5**	**45**	**3.6**
U.S.A. Only		**625**	43	3.8	42	3.2	42	3.3	42	3.4
	8001	**650**	43	3.5	43	3.6	43	3.8	42	3.2
	(2439)	**675**	44	3.7	43	3.4	43	3.5	43	3.6
	to	**700**	44	3.5	44	3.6	44	3.7	44	3.8
		725	44	3.2	44	3.4	44	3.5	44	3.6
	9000	**750**	**45**	**3.7**	**45**	**3.8**	44	3.2	44	3.3
	(2743)	**775**	**45**	**3.4**	**45**	**3.6**	**45**	**3.7**	**45**	**3.8**
U.S.A. Only	**9001**	**600**	43	3.8	42	3.2	42	3.3	42	3.4
	(2744)	**625**	43	3.5	43	3.6	43	3.7	43	3.8
	to	**650**	44	3.7	44	3.8	43	3.4	43	3.6
		675	44	3.4	44	3.5	44	3.7	44	3.8
	10000	**700**	44	3.2	44	3.3	44	3.4	44	3.5
	(3048)	**725**	**45**	**3.6**	**45**	**3.7**	**45**	**3.8**	44	3.3

* Orifice numbers shown in **BOLD** are factory-installed.

A08215a

TABLE 3 - ORIFICE SIZE* AND MANIFOLD PRESSURE FOR GAS INPUT RATE

(TABULATED DATA BASED ON 23,000 BTUH PER BURNER, DERATED 2%/1000 FT (305M) ABOVE SEA LEVEL)

ALTITUDE RANGE ft (m)		AVG. GAS HEAT VALUE AT ALTITUDE (Btu/cu ft)	SPECIFIC GRAVITY OF NATURAL GAS							
			0.58		0.60		0.62		0.64	
			Orifice No.	Manifold Pressure	Orifice No.	Manifold Pressure	Orifice No.	Manifold Pressure	Orifice No.	Manifold Pressure
U.S.A. and Canada		900	42	3.8	41	3.6	41	3.7	41	3.8
	0	925	42	3.6	42	3.7	41	3.5	41	3.6
	(0)	950	42	3.4	42	3.6	42	3.7	42	3.8
		975	42	3.3	42	3.4	42	3.5	42	3.6
	to	1000	**43**	**3.8**	42	3.2	42	3.3	42	3.4
		1025	**43**	**3.6**	**43**	**3.7**	**43**	**3.8**	42	3.3
	2000	1050	**43**	**3.4**	**43**	**3.5**	**43**	**3.7**	**43**	**3.8**
	(610)	1075	**43**	**3.3**	**43**	**3.4**	**43**	**3.5**	**43**	**3.6**
		1100	44	3.6	**43**	**3.2**	**43**	**3.3**	**43**	**3.4**
U.S.A. and Canada	U.S.A.	800	41	3.7	40	3.5	40	3.7	40	3.8
	2001 (611)	825	41	3.5	41	3.6	41	3.7	40	3.6
	to	850	42	3.7	42	3.8	41	3.5	41	3.6
	3000 (914)	875	42	3.5	42	3.6	42	3.7	42	3.8
		900	42	3.3	42	3.4	42	3.5	42	3.6
	Canada	925	**43**	**3.8**	42	3.2	42	3.3	42	3.4
	2001 (611)	950	**43**	**3.6**	**43**	**3.7**	**43**	**3.8**	42	3.2
	to	975	**43**	**3.4**	**43**	**3.5**	**43**	**3.6**	**43**	**3.7**
	4500 (1372)	1000	**43**	**3.2**	**43**	**3.3**	**43**	**3.4**	**43**	**3.6**
U.S.A. Only		775	41	3.7	41	3.8	40	3.6	40	3.7
	3001	800	42	3.8	41	3.6	41	3.7	41	3.8
	(915)	825	42	3.6	42	3.7	42	3.8	41	3.6
	to	850	42	3.4	42	3.5	42	3.6	42	3.7
		875	42	3.2	42	3.3	42	3.4	42	3.5
	4000	900	**43**	**3.7**	**43**	**3.8**	42	3.2	42	3.3
	(1219)	925	**43**	**3.5**	**43**	**3.6**	**43**	**3.7**	**43**	**3.8**
		950	**43**	**3.3**	**43**	**3.4**	**43**	**3.5**	**43**	**3.6**
U.S.A. Only		750	41	3.6	41	3.7	40	3.6	40	3.7
	4001	775	42	3.8	41	3.5	41	3.6	41	3.7
	(1220)	800	42	3.5	42	3.6	42	3.8	41	3.5
	to	825	42	3.3	42	3.4	42	3.5	42	3.7
		850	**43**	**3.8**	42	3.2	42	3.3	42	3.4
	5000	875	**43**	**3.6**	**43**	**3.7**	**43**	**3.8**	42	3.3
	(1524)	900	**43**	**3.4**	**43**	**3.5**	**43**	**3.6**	**43**	**3.7**
		925	**43**	**3.2**	**43**	**3.3**	**43**	**3.4**	**43**	**3.5**
U.S.A. Only		725	41	3.6	41	3.7	41	3.8	40	3.6
	5001	750	42	3.7	42	3.8	41	3.6	41	3.7
	(1525)	775	42	3.5	42	3.6	42	3.7	42	3.8
	to	800	42	3.2	42	3.4	42	3.5	42	3.6
		825	**43**	**3.7**	**43**	**3.8**	42	3.3	42	3.4
	6000	850	**43**	**3.5**	**43**	**3.6**	**43**	**3.7**	42	3.2
	(1829)	875	**43**	**3.3**	**43**	**3.4**	**43**	**3.5**	**43**	**3.6**
		900	**43**	**3.1**	**43**	**3.2**	**43**	**3.3**	**43**	**3.5**
U.S.A. Only		675	41	3.8	40	3.6	40	3.7	40	3.8
	6001	700	41	3.5	41	3.6	41	3.8	40	3.6
	(1830)	725	42	3.6	42	3.8	41	3.5	41	3.6
	to	750	42	3.4	42	3.5	42	3.6	42	3.7
		775	42	3.2	42	3.3	42	3.4	42	3.5
	7000	800	**43**	**3.6**	**43**	**3.8**	42	3.2	42	3.3
	(2133)	825	**43**	**3.4**	**43**	**3.5**	**43**	**3.7**	**43**	**3.8**
		850	**43**	**3.2**	**43**	**3.3**	**43**	**3.4**	**43**	**3.6**

A08218

TABLE 3 - ORIFICE SIZE* AND MANIFOLD PRESSURE FOR GAS INPUT RATE

(TABULATED DATA BASED ON 23,000 BTUH PER BURNER, DERATED 2%/1000 FT (305M) ABOVE SEA LEVEL)

ALTITUDE RANGE ft (m)		AVG. GAS HEAT VALUE AT ALTITUDE (Btu/cu ft)	SPECIFIC GRAVITY OF NATURAL GAS							
			0.58		0.60		0.62		0.64	
			Orifice No.	Manifold Pressure	Orifice No.	Manifold Pressure	Orifice No.	Manifold Pressure	Orifice No.	Manifold Pressure
U.S.A. Only		**650**	41	3.7	40	3.6	40	3.7	40	3.8
	7001	**675**	41	3.5	41	3.6	41	3.7	41	3.8
	(2134)	**700**	42	3.6	42	3.7	42	3.8	41	3.6
	to	**725**	42	3.3	42	3.5	42	3.6	42	3.7
		750	**43**	**3.8**	42	3.2	42	3.3	42	3.4
	8000	**775**	**43**	**3.6**	**43**	**3.7**	**43**	**3.8**	42	3.2
	(2438)	**800**	**43**	**3.3**	**43**	**3.5**	**43**	**3.6**	**43**	**3.7**
		825	**43**	**3.1**	**43**	**3.2**	**43**	**3.4**	**43**	**3.5**
U.S.A. Only		**625**	41	3.7	41	3.8	40	3.7	40	3.8
	8001	**650**	42	3.8	41	3.6	41	3.7	41	3.8
	(2439)	**675**	42	3.5	42	3.7	42	3.8	41	3.5
	to	**700**	42	3.3	42	3.4	42	3.5	42	3.6
		725	**43**	**3.7**	42	3.2	42	3.3	42	3.4
	9000	**750**	**43**	**3.5**	**43**	**3.6**	**43**	**3.7**	42	3.2
	(2743)	**775**	**43**	**3.3**	**43**	**3.4**	**43**	**3.5**	**43**	**3.6**
U.S.A. Only	**9001**	**600**	41	3.7	41	3.8	40	3.6	40	3.8
	(2744)	**625**	42	3.8	41	3.5	41	3.6	41	3.8
	to	**650**	42	3.5	42	3.6	42	3.7	41	3.5
		675	42	3.2	42	3.4	42	3.5	42	3.6
	10000	**700**	**43**	**3.7**	**43**	**3.8**	42	3.2	42	3.3
	(3048)	**725**	**43**	**3.4**	**43**	**3.5**	**43**	**3.7**	**43**	**3.8**

* Orifice numbers shown in **BOLD** are factory-installed.

A08218a

CONVERSION KIT RATING PLATE - CARRIER CORP.

THIS APPLIANCE HAS BEEN CONVERTED TO USE NATURAL GAS FOR FUEL. REFER TO KIT INSTRUCTIONS FOR CONVERSION PROCEDURES. USE PARTS SUPPLIED BY CARRIER CORPORATION AND INSTALLED BY QUALIFIED PERSONNEL. SEE EXISTING RATING PLATE FOR APPLIANCE MODEL NO. AND INPUT RATING.

NOTE: Furnace gas input rate on rating plate is for installations up to 2000 ft. above sea level. In U.S.A. the input rating for altitudes above 2000 ft. must be derated (per chart below) for each 1000 ft above sea level. In Canada the input rating must be derated (per chart below) for altitudes of 2000 ft. to 4500 ft. above sea level.

KIT NO. KGAPN3901ALL (SUPERSEDES: KGAPN3501ALL, KGAPN3401ALL, KGAPN1601ALL, KGAPN21012SP, KGAPN2201ALL, KGAPN3301ALL) **FUEL USED: NATURAL GAS**

APPLIANCE MODELS	USA % DERATE PER 1000 FT	CANADA % DERATE FOR 2000-4500 FT
340AAV, 340MAV, 345MAV, 350AAV, 350MAV, 353AAV, 58MCA, 58MCB, 58MEB, 58MSA, 58MXA, 58MXB, PG9MAA, PG9MAB	2%	5%
310AAV, 310JAV, 311AAV, 311JAV, 313AAV, 313JAV, 58PHA, 58PHX, 58DLA, 58DLX, 58STA, 58STX, PG8MAA, PG8JAA, PG8MEA, PG8JEA	4%	10%

NATURAL GAS PRESSURE		IN. W.C. (PO C.E.)	Pa
Max. Inlet Gas Pressure (Press. Max. D'Admission De Gaz)		13.6	3,386
Min. Inlet Gas Pressure (Press. Min. D'Admission De Gaz)		4.5	1,121
(For Purpose of Input Adjustment)		(Pour L'Adjustment D'Entree)	
	Altitude		
Manifold Pressure	0-2,000 ft. (0 - 610 m)	3.2 - 3.8	797 - 946
Pression Tubulure	2,000 - 10,000 ft (610 - 3050 m)	Refer to installation manual Respecter les instruction D'Installation	

334409-204 REV. B

A08189

Fig. 9 – Conversion Rating Plate Label - 334409-204

NOTE: For Canada altitudes of 2000 to 4500 ft. (610 to 1372M), use USA altitudes of 2001 to 3000 ft. (610 to 914M) in Table 2 or 3.

e. Find closest natural gas heat value and specific gravity in Table 2 or 3.

f. Follow heat value and specific gravity lines to point of intersection to find orifice size and manifold pressure settings for proper operation.

EXAMPLE: (Using Table 2 at 0-2000 ft. (610M) altitude)
Heating value = 1050 Btu/cu ft
Specific gravity = 0.62
Therefore: Orifice No. 45, Manifold pressure 3.8-in. wc

g. Check and verify burner orifice size in furnace. NEVER ASSUME ORIFICE SIZE. ALWAYS CHECK AND VERIFY.

2. Adjust manifold pressure to obtain input rate.

NOTE: Manifold pressure must always be measured with burner enclosure front REMOVED. Gas meter must always be clocked with burner enclosure front INSTALLED.

a. Remove burner enclosure front.

b. Remove cap that conceals adjustment screw for gas valve regulator. (See Fig. 2, 3, 4 and 5.)

c. Turn adjusting screw, counterclockwise (out) to decrease manifold pressure or clockwise (in) to increase manifold pressure.

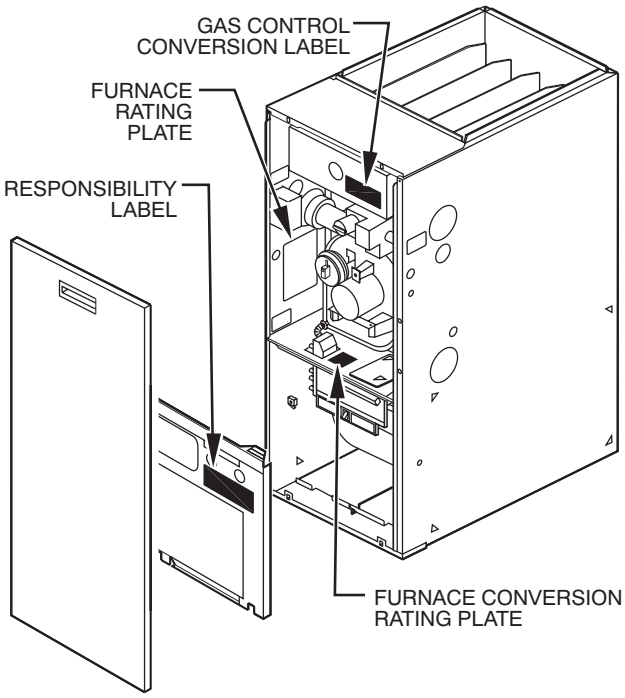
NOTE: This furnace has been approved for a manifold pressure of 3.2-in. wc to 3.8-in. wc when installed at altitudes up to 2000 ft. (610M). For altitudes above 2000 ft. (610M), the manifold pressure can be adjusted from 2.0-in. wc to 3.8-in. wc.

⚠ CAUTION

FURNACE RELIABILITY HAZARD

Failure to follow this caution may result in unit damage.

DO NOT bottom out gas valve regulator adjusting screw.



A95025

Fig. 10 – Multipoise, Fixed-Speed, Condensing Furnace Conversion Label Location (Upflow Orientation Shown)

NOTE: If orifice hole appears damaged or it is suspected to have been redrilled, check orifice hole with a numbered drill bit of correct size. Never redrill an orifice. A burr-free and squarely aligned orifice hole is essential for proper flame characteristics.

⚠ CAUTION

UNIT DAMAGE HAZARD

Failure to follow this caution may result excessive burner noise and misdirection of burner flames.

DO NOT redrill burner orifices. Improper drilling may result in burrs, out-of-round holes, etc. Obtain new orifices if orifice size must be changed. (See Fig. 6.)

d. Replace gas valve regulator adjustment screw cap.

e. Replace burner enclosure front and verify adjusted gas input rate using method outlined in item 3.

f. Look through sight glass in burner enclosure and check burner flame. Burner flame should be clear blue, almost transparent. (See Fig. 11.)

3. Verify natural gas input rate by clocking gas meter.

NOTE: Be sure all pressure tubing, combustion-air and vent pipes, and burner enclosure front are in place when checking input by clocking gas meter.

a. Calculate high-altitude adjustment (if required).

UNITED STATES

At installation altitudes above 2000 ft. (610M), the input rate must be reduced by 2 percent for each 1000 ft. (305M) above sea level. See Table 4 for derate multiplier factor and example.

CANADA

At installation altitudes from 2000 to 4500 ft. (610 to 1372M), this furnace must be derated 5 percent by an authorized Gas Conversion Station or Dealer.

To determine correct input rate for altitude, see example and use 0.95 as derate multiplier factor.

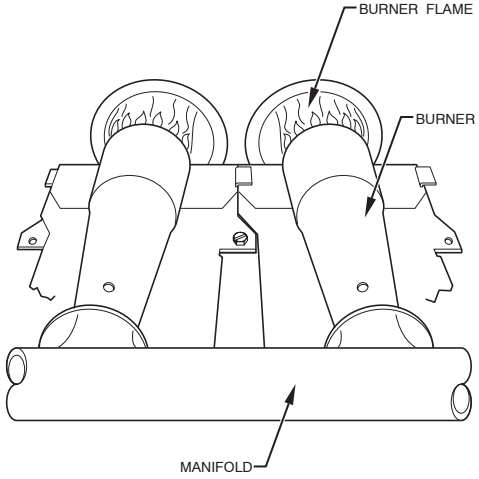
EXAMPLE:
100,000 Btuh input furnace installed at 4300 ft.
Furnace Input Rate at Sea Level X Derate Multiplier Factor = Furnace Input Rate at Installation Altitude
100,000 X 0.91 = 91,000

b. Turn off all other gas appliances and pilots.

c. Start furnace and let operate for 3 minutes.

d. Measure time (in sec) for gas meter test dial to complete one revolution.

e. Refer to Table 5 for cu ft of gas per hr.



A05219

Fig. 11 – Burner Flame

TABLE 4 - ALTITUDE DERATE MULTIPLIER FOR USA

ALTITUDE FT (M)	PERCENT OF DERATE	DERATE MULTIPLIER FACTOR FOR USA*
0–2000 (0–610)	0	1.00
2001—3000 (610–914)	4—6	0.95
3001—4000 (914–1219)	6—8	0.93
4001—5000 (1219–1524)	8—10	0.91
5001—6000 (1524–1829)	10—12	0.89
6001—7000 (1829–2134)	12—14	0.87
7001—8000 (2134–2438)	14—16	0.85
8001—9000 (2438–2743)	16—18	0.83
9001—10,000 (2743–3048)	18—20	0.81

*Derate multiplier factor based on midpoint altitude for altitude range.

f. Multiply gas rate (cu ft/hr) X heating value (Btu/cu ft) using natural gas heating value from local gas utility/supplier.

EXAMPLE: (For all models at 0–2000 ft. (610M) altitude)
Btu heating input = Btu/cu ft X cu ft/hr
Heating value of gas = 975 Btu/cu ft
Time for 1 revolution of 2–cu ft dial = 70 sec
Gas rate = 103 cu ft/hr (from Table 5)
Btu hearing input = 103 X 975 = 100,425 Btuh
In this example, the orifice size and manifold pressure adjustment is within +/– 2 percent of the furnace input rate.

NOTE: Measured gas input must be within +/-2 percent of that stated on furnace rating plate when installed at sea level or derated per that stated above when installed at higher altitudes.

4. Remove jumper across R and W thermostat connections to terminate call for heat.
5. Turn furnace gas valve control switch/knob to OFF position.
6. Remove manometer and reinstall gas valve manifold pressure tap plug. (See Fig. 2, 3, 4, or 5.)

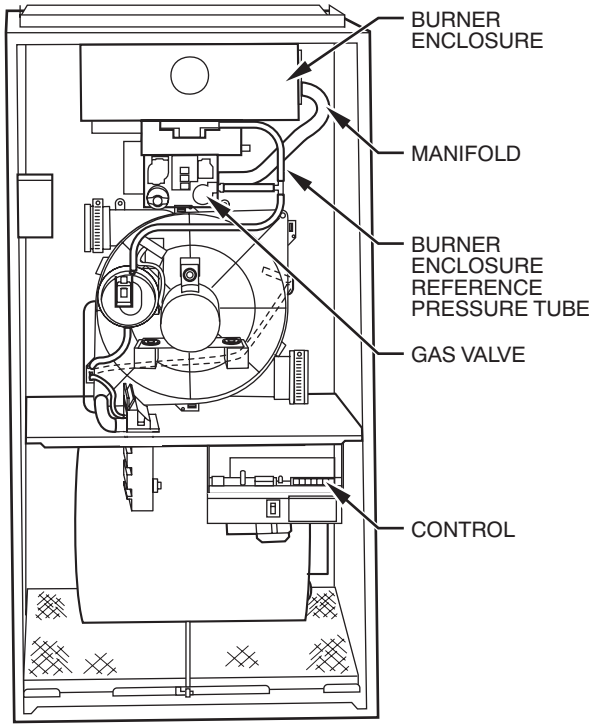
NOTE: Use propane-gas-resistant pipe dope to prevent gas leaks. DO NOT use Teflon tape.

7. Turn furnace gas valve control switch/knob to ON position.
8. Set room thermostat to call for heat.
9. Check inlet and manifold pressure tap plugs for gas leaks when main burners ignite.
10. Check for correct burner flame. (See Fig. 11.)
11. Observe unit through two complete heating cycles. See sequence of operation in furnace Installation, Start-Up, and Operating Instructions.
12. Set room thermostat to desired temperature.

Step 7 —Label Application

NOTE: See Fig. 10 for label location and Table 1 for part numbers.

1. Fill in Conversion Responsibility Label (334409-205) and apply to blower access panel as shown. Date, name, and address of organization making conversion are required.
2. Apply Gas Control Conversion Label (334409-203) to burner enclosure cover as shown.
3. Apply Furnace Conversion Rating Plate (334409-204) to blower shelf as shown.
4. Reinstall main furnace door.



A01081

Fig. 12 – Multipoise, 2-Stage and Variable Speed Condensing Furnace Component Location-Component Location May Vary Slightly Depending on Models (Upflow Orientation Shown)

TABLE 5 - GAS RATE (CU FT / HR)

SECONDS FOR 1 REVOLUTION	SIZE OF TEST DIAL			SECONDS FOR 1 REVOLUTION	SIZE OF TEST DIAL		
	1 Cu Ft	2 Cu Ft	5 Cu Ft		1 Cu Ft	2 Cu Ft	5 Cu Ft
10	360	720	1800	50	72	144	360
11	327	655	1636	51	71	141	355
12	300	600	1500	52	69	138	346
13	277	555	1385	53	68	136	340
14	257	514	1286	54	67	133	333
15	240	480	1200	55	65	131	327
16	225	450	1125	56	64	129	321
17	212	424	1059	57	63	126	316
18	200	400	1000	58	62	124	310
19	189	379	947	59	61	122	305
20	180	360	900	60	60	120	300
21	171	343	857	62	58	116	290
22	164	327	818	64	56	112	281
23	157	313	783	66	54	109	273
24	150	300	750	68	53	106	265
25	144	288	720	70	51	103	257
26	138	277	692	72	50	100	250
27	133	267	667	74	48	97	243
28	129	257	643	76	47	95	237
29	124	248	621	78	46	92	231
30	120	240	600	80	45	90	225
31	116	232	581	82	44	88	220
32	113	225	563	84	43	86	214
33	109	218	545	86	42	84	209
34	106	212	529	88	41	82	205
35	103	206	514	90	40	80	200
36	100	200	500	92	39	78	196
37	97	195	486	94	38	76	192
38	95	189	474	96	38	75	188
39	92	185	462	98	37	74	184
40	90	180	450	100	36	72	180
41	88	176	439	102	35	71	178
42	86	172	429	104	35	69	173
43	84	167	419	106	34	68	170
44	82	164	409	108	33	67	167
45	80	160	400	110	33	65	164
46	78	157	391	112	32	64	161
47	76	153	383	116	31	62	155
48	75	150	375	120	30	60	150
49	73	147	367				

SECTION 2 - 2 STAGE CONDENSING FURNACE MODELS 58MTA, 58MTB, 352MAV, 352AAV, PG9MXA; VARIABLE-SPEED, CONDENSING FURNACE MODELS 58MVP, 58MVB, 58UVB, 355MAV, 355AAV, AND 355BAV

⚠ WARNING

CARBON MONOXIDE POISONING HAZARD

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

This kit is not to be used with furnaces equipped with a gas valve and that have a RED On/Off knob, P/N EF33CZ201. The RED On/Off valves are not dual-fuel gas valves and must be replaced with a new two-stage gas valve, not included with this kit. The new dual-fuel, two-stage gas valve for this furnace is available from your local distributor.

Step 1 —Install Main Burner Orifices

NOTE: See Fig. 12 for component location in upflow furnaces. Re-orient component arrangement when furnace is installed in other positions.

1. Turn off furnace gas and electrical supplies to furnace.
2. Remove main furnace door.
3. Turn furnace gas-valve switch to OFF position.
4. Remove burner enclosure front.
5. Remove gas-supply pipe from gas valve.
6. Remove wires from gas valve. Note location for reassembly.
7. Remove two wires to low-gas-pressure switch (LGPS), located on gas valve.
8. Remove burner-box pressure tube from gas-valve enclosure reference-pressure tap fitting. (See Fig. 12.)
9. Remove screws that secure manifold to burner box and remove manifold, orifices, and gas valve as one assembly.
10. Remove and discard orifices from manifold.
11. Determine natural gas orifice size for correct input at installed altitude by using Table 6. Furnace gas-input rate

on rating plate is for installations at altitudes up to 2000 ft. (610M). In the USA, the input rating for altitudes above 2000 ft. (610M) must be reduced by 2 percent for each 1000 ft. (305M) above sea level. In Canada, the input rating must be derated by 5 percent for altitudes of 2000 ft. (610M) to 4500 ft. (1372M) above sea level.

⚠ CAUTION

UNIT OPERATION HAZARD

Failure to follow this caution may result in unit damage or improper operation.

Label all wires prior to disconnection when servicing controls.

⚠ CAUTION

D'EQUIPEMENT DANGER D'OPERATION

D Lors des opérations d'entretien des commandes, étiqueter tous les fils avant de les déconnecter.

Toute erreur de câblage peut être une source de danger et de panne.

a. Obtain yearly heat-value average (at installed altitude) for local gas supply.

b. Obtain yearly specific-gravity average for local gas supply.

c. Verify furnace model. Table 6 can only be used for 40-in. (1016mm) tall, multipoise, hot-surface ignition, 2-speed and variable speed condensing furnaces.

d. Find installation altitude in Table 6.

NOTE: For Canada altitudes of 2000 to 4500 ft. (610 to 1372M), use USA altitudes of 2001 to 3000 ft. (610 to 914M) in Table 6.

e. Find closest natural gas heat value and specific gravity in Table 6.

f. Follow heat-value line and specific-gravity line to point of intersection to find orifice size and low- and high-heat manifold pressure settings.

EXAMPLE: (Using Table 6 at 0-2000 ft. (610M) altitude)
Heat value = 1050 Btu/cu ft
Specific gravity = 0.62
Therefore: orifice No. 45 is required.

12. Install main burner orifices. Do not use Teflon tape. Finger-tighten orifices at least one full turn to prevent cross-threading, then tighten with wrench. There are enough orifices in each kit for the largest furnace. Discard extra orifices. Orifices of other sizes must be field supplied and are available through your local distributor.

NOTE: DO NOT reinstall the manifold, orifices, gas-valve assembly, or burner-enclosure front at this time.

⚠ CAUTION

UNIT DAMAGE HAZARD

Failure to follow this caution may result in unit damage.

DO NOT redrill burner orifices. Obtain new orifices if orifice size must be changed. (See Fig. 6.)

Step 2 —Reposition Air Shutter (Variable) Speed All Sizes of 58UVB and 355BAV; 58MVP120-20 and 355MAV060120 ONLY; 58MVB120-20 and 355AAV060120 ONLY

1. Remove two screws holding air shutter in propane-gas usage (PROP) position.
2. Reposition air shutter to natural-gas usage (NAT) position. (See Fig. 13.) Screws will now be located in the shutter next to the NAT stamp.

NOTE: Air opening above burners will now be unobstructed by air shutter.

Step 3 —Remove Low Gas Pressure Switch and Diverter Plate

1. Be sure gas and electrical supplies to furnace are off.
2. Remove low-gas-pressure switch (LGPS), street elbow, and 1/8-in. pipe nipple from gas-valve inlet-pressure tap. (See Fig. 7.)

NOTE: Use propane-gas-resistant pipe dope on all connections to prevent gas leaks. DO NOT use Teflon tape.

3. Apply pipe dope sparingly to 1/8-in. pipe plug (provided in kit) and install in 1/8-in. tapped inlet-pressure tap opening in gas valve.
4. If unit has a diverter plate installed above combustion air-intake box, remove diverter plate as follows:
   a. Remove front two screws on combustion air-intake box. (See Fig. 14.)
   b. Remove combustion air-intake box and set aside. (See Fig. 14.)
   c. Remove diverter plate. (See Fig. 15.)
   d. Reinstall combustion air-intake box and replace two screws. (See Fig. 14.)
5. Reinstall manifold, orifice, and gas-valve assembly in burner box. Ensure manifold seal grommet is installed properly and burners fit over orifices. (See Fig. 16 - 19 for igniter position and verify igniter position before completing conversion.)
6. Reconnect wires to gas valve. See wiring label on furnace to ensure proper location of wires.
7. Rewire unit low-pressure switch as follows:
   a. Trace one of the orange wires previously disconnected from the LGPS back to the NO terminal of the LPS. Disconnect this orange wire from the LPS and discard.
   b. Trace the other orange wire previously disconnected from the LGPS back to its splice connection with the yellow wire of the furnace wire harness. Disconnect and discard this orange wire and the splice connector.
   c. Connect the yellow wire of the furnace wire harness (see 'b' above) to the NO terminal of the LPS.
   d. Refer to wiring label on the furnace to ensure proper location of wires.
8. Reinstall gas-supply pipe to gas valve using backup wrench on gas valve to prevent rotation and improper orientation.

NOTE: Use propane-gas-resistant pipe dope to prevent gas leaks. DO NOT use Teflon tape.

9. DO NOT reinstall burner-box pressure tube to gas valve-regulator fitting or burner-enclosure front at this time.

TABLE 6 - ORIFICE SIZE* AND MANIFOLD PRESSURES FOR GAS INPUT RATE

(TABULATED DATA BASED ON 20,000 BTUH HIGH-HEAT / 13,000 BTUH LOW-HEAT PER BURNER, DERATED 2%/1000 FT (305M) ABOVE SEA LEVEL)

ALTITUDE RANGE ft (m)		AVG. GAS HEAT VALUE AT ALTITUDE (Btu/cu ft)	SPECIFIC GRAVITY OF NATURAL GAS							
			0.58		0.60		0.62		0.64	
			Orifice No.	Mnfld Press High/Low	Orifice No.	Mnfld Press High/Low	Orifice No.	Mnfld Press High/Low	Orifice No.	Mnfld Press High/Low
U.S.A. and Canada	0 (0) to 2000 (610)	900	43	3.5 / 1.5	43	3.6 / 1.5	43	3.8 / 1.6	42	3.2 / 1.3
		925	44	3.8 / 1.6	43	3.5 / 1.5	43	3.6 / 1.5	43	3.7 / 1.6
		950	44	3.6 / 1.5	44	3.8 / 1.6	43	3.4 / 1.4	43	3.5 / 1.5
		975	44	3.4 / 1.5	44	3.6 / 1.5	44	3.7 / 1.6	44	3.8 / 1.6
		1000	44	3.3 / 1.4	44	3.4 / 1.4	44	3.5 / 1.5	44	3.6 / 1.5
		1025	**45**	**3.8 / 1.6**	44	3.2 / 1.4	44	3.3 / 1.4	44	3.4 / 1.5
		1050	**45**	**3.6 / 1.5**	**45**	**3.7 / 1.6**	**45**	**3.8 / 1.6**	44	3.3 / 1.4
		1075	**45**	**3.4 / 1.4**	**45**	**3.5 / 1.5**	**45**	**3.7 / 1.5**	**45**	**3.8 / 1.6**
		1100	**45**	**3.3 / 1.4**	**45**	**3.4 / 1.4**	**45**	**3.5 / 1.5**	**45**	**3.6 / 1.5**
U.S.A. and Canada	U.S.A. 2001 (611) to 3000 (914) Canada 2001 (611) to 4500 (1372)	800	43	3.8 / 1.6	42	3.2 / 1.4	42	3.3 / 1.4	42	3.5 / 1.5
		825	43	3.6 / 1.5	43	3.7 / 1.6	43	3.8 / 1.6	42	3.2 / 1.4
		850	43	3.4 / 1.4	43	3.5 / 1.5	43	3.6 / 1.5	43	3.7 / 1.6
		875	44	3.7 / 1.5	44	3.8 / 1.6	43	3.4 / 1.4	43	3.5 / 1.5
		900	44	3.5 / 1.5	44	3.6 / 1.5	44	3.7 / 1.6	44	3.8 / 1.6
		925	44	3.3 / 1.4	44	3.4 / 1.4	44	3.5 / 1.5	44	3.6 / 1.5
		950	**45**	**3.7 / 1.6**	44	3.2 / 1.4	44	3.3 / 1.4	44	3.4 / 1.4
		975	**45**	**3.6 / 1.5**	**45**	**3.7 / 1.6**	**45**	**3.8 / 1.6**	44	3.2 / 1.4
		1000	**45**	**3.4 / 1.4**	**45**	**3.5 / 1.5**	**45**	**3.6 / 1.5**	**45**	**3.7 / 1.6**
U.S.A. Only	3001 (915) to 4000 (1219)	775	43	3.7 / 1.6	42	3.2 / 1.3	42	3.3 / 1.4	42	3.4 / 1.4
		800	43	3.5 / 1.5	43	3.6 / 1.5	43	3.8 / 1.6	42	3.2 / 1.3
		825	44	3.8 / 1.6	43	3.4 / 1.4	43	3.5 / 1.5	43	3.7 / 1.5
		850	44	3.6 / 1.5	44	3.7 / 1.6	44	3.8 / 1.6	43	3.4 / 1.5
		875	44	3.4 / 1.4	44	3.5 / 1.5	44	3.6 / 1.5	44	3.7 / 1.6
		900	44	3.2 / 1.3	44	3.3 / 1.4	44	3.4 / 1.4	44	3.5 / 1.5
		925	**45**	**3.7 / 1.5**	**45**	**3.8 / 1.6**	44	3.2 / 1.4	44	3.3 / 1.4
		950	**45**	**3.5 / 1.5**	**45**	**3.6 / 1.5**	**45**	**3.7 / 1.6**	**45**	**3.8 / 1.6**
U.S.A. Only	4001 (1220) to 5000 (1524)	750	43	3.7 / 1.6	43	3.8 / 1.6	42	3.2 / 1.4	42	3.3 / 1.4
		775	43	3.5 / 1.5	43	3.6 / 1.5	43	3.7 / 1.6	43	3.8 / 1.6
		800	44	3.7 / 1.6	43	3.4 / 1.4	43	3.5 / 1.5	43	3.6 / 1.5
		825	44	3.5 / 1.5	44	3.6 / 1.5	44	3.7 / 1.6	43	3.4 / 1.4
		850	44	3.3 / 1.4	44	3.4 / 1.4	44	3.5 / 1.5	44	3.6 / 1.5
		875	**45**	**3.8 / 1.6**	44	3.2 / 1.4	44	3.3 / 1.4	44	3.4 / 1.5
		900	**45**	**3.6 / 1.5**	**45**	**3.7 / 1.6**	**45**	**3.8 / 1.6**	44	3.2 / 1.4
		925	**45**	**3.4 / 1.4**	**45**	**3.5 / 1.5**	**45**	**3.6 / 1.5**	**45**	**3.7 / 1.6**
U.S.A. Only	5001 (1525) to 6000 (1829)	725	43	3.6 / 1.5	43	3.8 / 1.6	42	3.2 / 1.4	42	3.3 / 1.4
		750	43	3.4 / 1.4	43	3.5 / 1.5	43	3.6 / 1.5	43	3.8 / 1.6
		775	44	3.7 / 1.5	44	3.8 / 1.6	43	3.4 / 1.4	43	3.5 / 1.5
		800	44	3.4 / 1.5	44	3.6 / 1.5	44	3.7 / 1.6	44	3.8 / 1.6
		825	44	3.2 / 1.4	44	3.3 / 1.4	44	3.4 / 1.5	44	3.6 / 1.5
		850	**45**	**3.7 / 1.6**	**45**	**3.8 / 1.6**	44	3.2 / 1.4	44	3.4 / 1.4
		875	**45**	**3.5 / 1.5**	**45**	**3.6 / 1.5**	**45**	**3.7 / 1.6**	**45**	**3.8 / 1.6**
		900	**45**	**3.3 / 1.4**	**45**	**3.4 / 1.4**	**45**	**3.5 / 1.5**	**45**	**3.6 / 1.5**
U.S.A. Only	6001 (1830) to 7000 (2133)	675	42	3.2 / 1.3	42	3.3 / 1.4	42	3.4 / 1.4	42	3.5 / 1.5
		700	43	3.6 / 1.5	43	3.7 / 1.6	43	3.8 / 1.6	42	3.3 / 1.4
		725	44	3.8 / 1.6	43	3.5 / 1.5	43	3.6 / 1.5	43	3.7 / 1.6
		750	44	3.6 / 1.5	44	3.7 / 1.6	44	3.8 / 1.6	43	3.5 / 1.5
		775	44	3.4 / 1.4	44	3.5 / 1.5	44	3.6 / 1.5	44	3.7 / 1.6
		800	**45**	**3.8 / 1.6**	44	3.3 / 1.4	44	3.4 / 1.4	44	3.5 / 1.5
		825	**45**	**3.6 / 1.5**	**45**	**3.7 / 1.6**	**45**	**3.8 / 1.6**	44	3.3 / 1.4
		850	**45**	**3.4 / 1.4**	**45**	**3.5 / 1.5**	**45**	**3.6 / 1.5**	**45**	**3.7 / 1.6**

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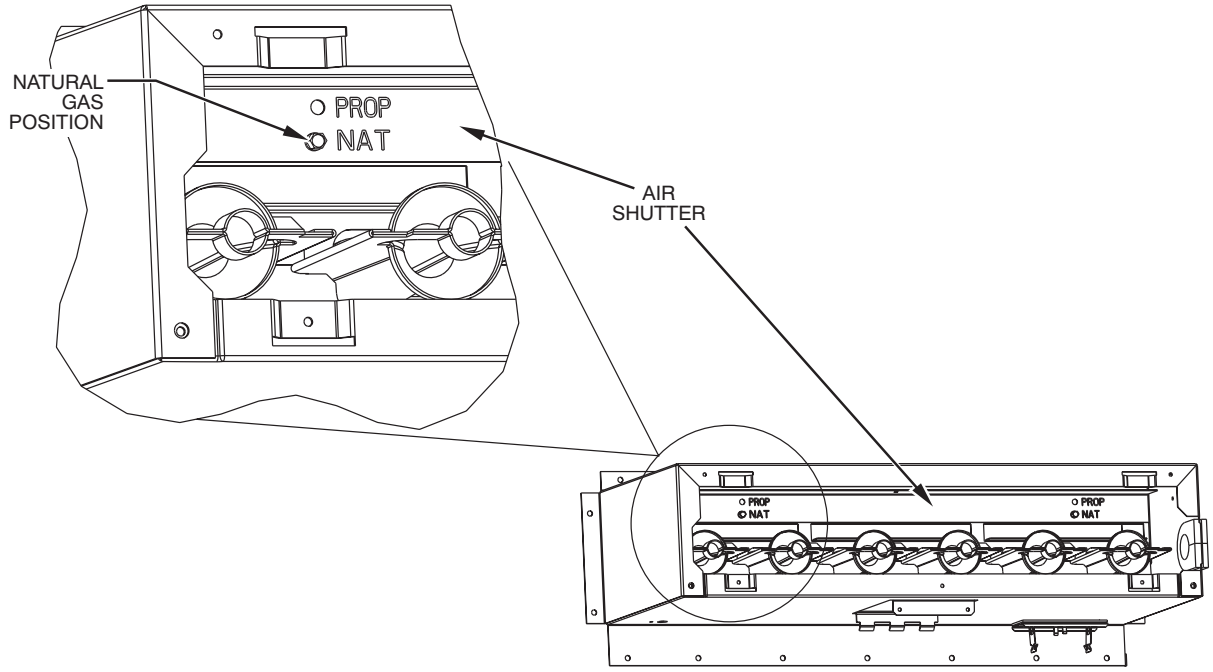
TABLE 6 - ORIFICE SIZE* AND MANIFOLD PRESSURES FOR GAS INPUT RATE

(TABULATED DATA BASED ON 20,000 BTUH HIGH-HEAT / 13,000 BTUH LOW-HEAT PER BURNER, DERATED 2%/1000 FT (305M) ABOVE SEA LEVEL)

ALTITUDE RANGE ft (m)		AVG. GAS HEAT VALUE AT ALTITUDE (Btu/cu ft)	SPECIFIC GRAVITY OF NATURAL GAS							
			0.58		0.60		0.62		0.64	
			Orifice No.	Mnfld Press High/Low	Orifice No.	Mnfld Press High/Low	Orifice No.	Mnfld Press High/Low	Orifice No.	Mnfld Press High/Low
U.S.A. Only		**650**	43	3.8 / 1.6	42	3.2 / 1.4	42	3.4 / 1.4	42	3.5 / 1.5
	7001	**675**	43	3.5 / 1.5	43	3.7 / 1.6	43	3.8 / 1.6	42	3.2 / 1.4
	(2134)	**700**	44	3.8 / 1.6	43	3.4 / 1.4	43	3.5 / 1.5	43	3.6 / 1.5
	to	**725**	44	3.5 / 1.5	44	3.6 / 1.5	44	3.8 / 1.6	43	3.4 / 1.4
		750	44	3.3 / 1.4	44	3.4 / 1.4	44	3.5 / 1.5	44	3.6 / 1.5
	8000	**775**	**45**	**3.7 / 1.6**	44	3.2 / 1.3	44	3.3 / 1.4	44	3.4 / 1.4
	(2438)	**800**	**45**	**3.5 / 1.5**	**45**	**3.6 / 1.5**	**45**	**3.7 / 1.6**	44	3.2 / 1.4
		825	**45**	**3.3 / 1.4**	**45**	**3.4 / 1.4**	**45**	**3.5 / 1.5**	**45**	**3.6 / 1.5**
U.S.A. Only		**625**	43	3.8 / 1.6	42	3.2 / 1.4	42	3.3 / 1.4	42	3.4 / 1.5
	8001	**650**	43	3.5 / 1.5	43	3.6 / 1.5	43	3.8 / 1.6	42	3.2 / 1.3
	(2439)	**675**	44	3.7 / 1.6	43	3.4 / 1.4	43	3.5 / 1.5	43	3.6 / 1.5
	to	**700**	44	3.5 / 1.5	44	3.6 / 1.5	44	3.7 / 1.6	44	3.8 / 1.6
		725	44	3.2 / 1.4	44	3.4 / 1.4	44	3.5 / 1.5	44	3.6 / 1.5
	9000	**750**	**45**	**3.7 / 1.5**	**45**	**3.8 / 1.6**	44	3.2 / 1.4	44	3.3 / 1.4
	(2743)	**775**	**45**	**3.4 / 1.5**	**45**	**3.6 / 1.5**	**45**	**3.7 / 1.6**	**45**	**3.8 / 1.6**
U.S.A. Only	**9001**	**600**	43	3.8 / 1.6	42	3.2 / 1.4	42	3.3 / 1.4	42	3.4 / 1.4
	(2744)	**625**	43	3.5 / 1.5	43	3.6 / 1.5	43	3.7 / 1.6	43	3.8 / 1.6
	to	**650**	44	3.7 / 1.6	44	3.8 / 1.6	43	3.4 / 1.5	43	3.6 / 1.5
		675	44	3.4 / 1.4	44	3.5 / 1.5	44	3.7 / 1.5	44	3.8 / 1.6
	10000	**700**	44	3.2 / 1.3	44	3.3 / 1.4	44	3.4 / 1.4	44	3.5 / 1.5
	(3048)	**725**	**45**	**3.6 / 1.5**	**45**	**3.7 / 1.6**	**45**	**3.8 / 1.6**	44	3.3 / 1.4

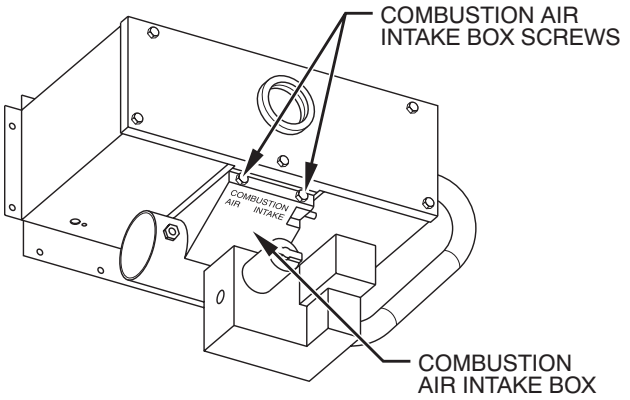
* Orifice numbers shown in **BOLD** are factory-installed.

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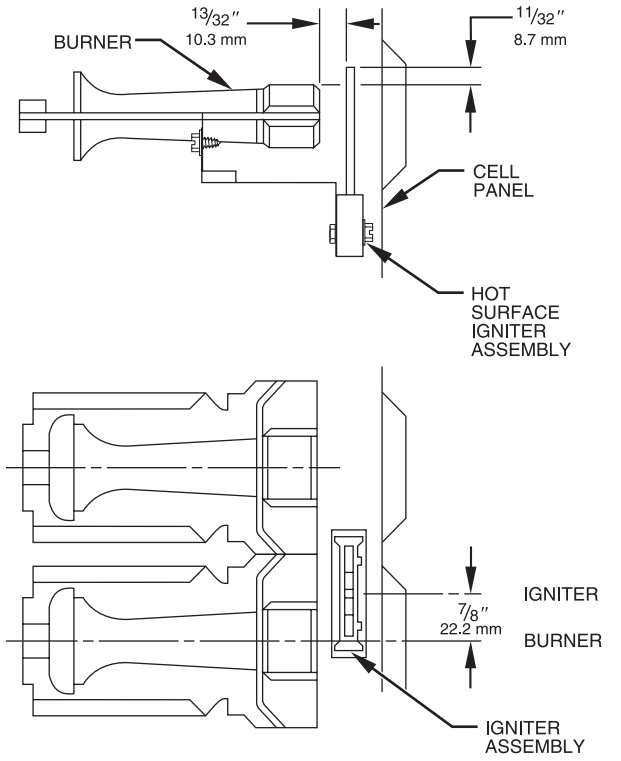
A96271

Fig. 13 – Air Shutter in Natural Gas Usage (NAT) Position - All Sizes of 58UVB and 355BAV; 58MVP120-20 and 355MAV060120 ONLY; 58MVB120-20 and 355AAV060120 ONLY



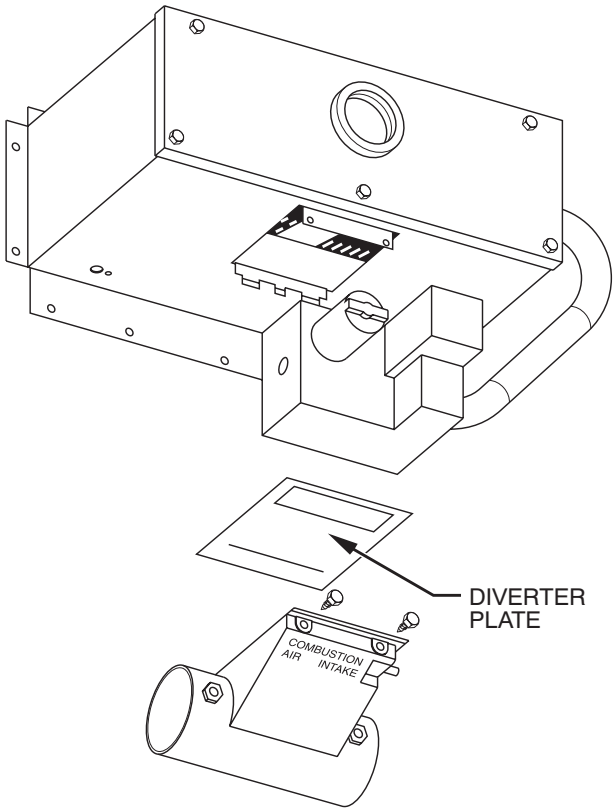
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Fig. 14 – Removing Combustion Air Intake Box



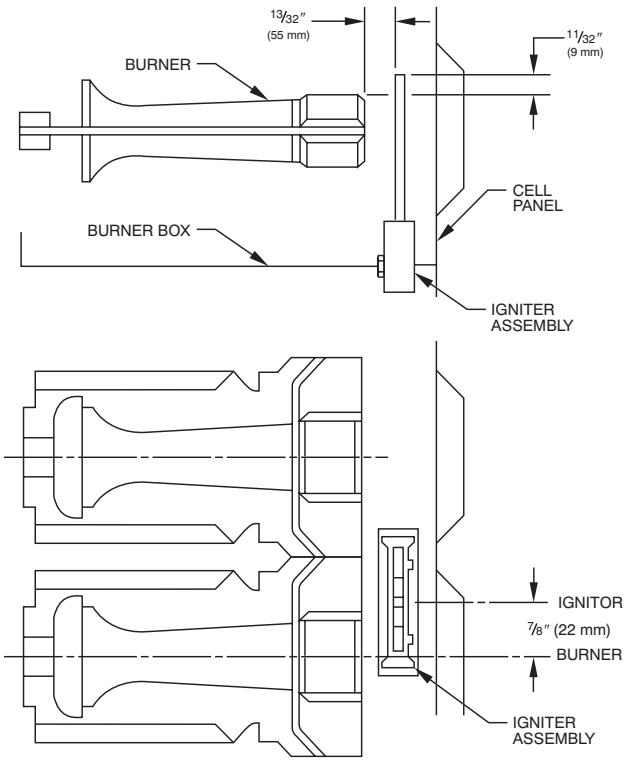
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Fig. 16 – Igniter to Burner Silicon Carbide Type



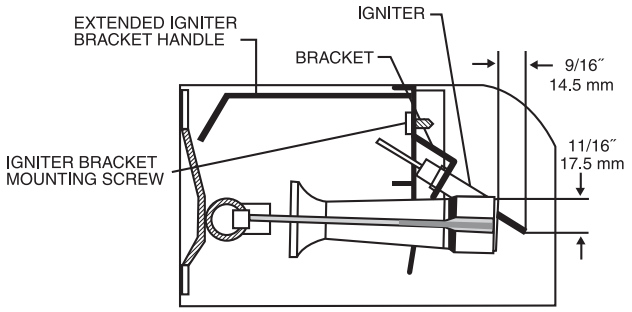
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Fig. 15 – Removing Diverter Plate



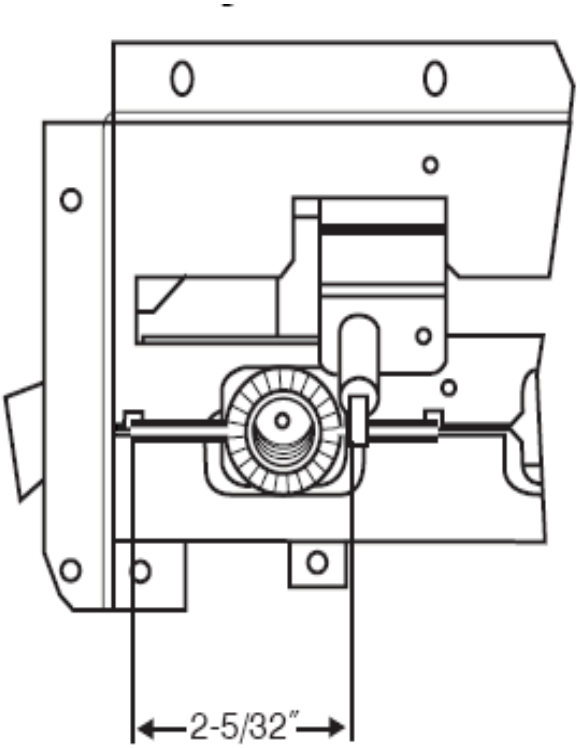
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Fig. 17 – Igniter to Burner Silicon Carbide Type



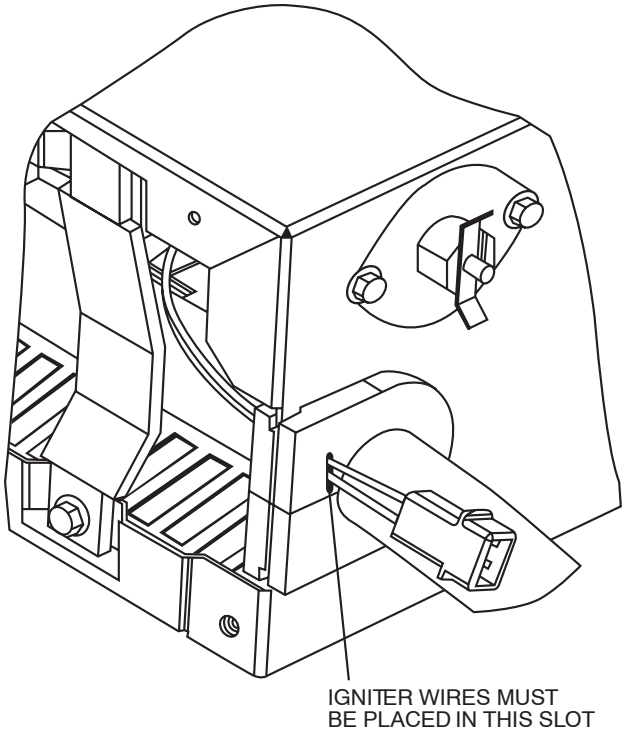
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Fig. 18 – Igniter to Burner Silicon Nitride Type



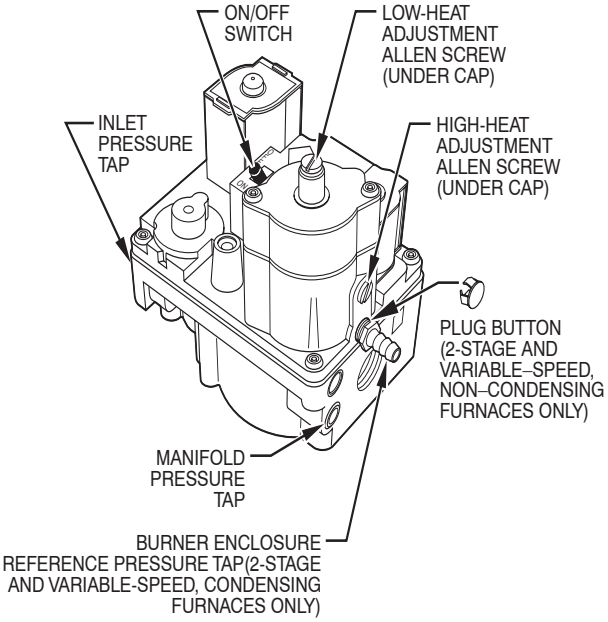
A06662

Fig. 19 – Igniter to Burner Silicon Nitride Type



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Fig. 20 – Igniter Wire Placement Silicon Nitride Only



A01069

Fig. 21 – Two-Stage Gas Valve, Series E

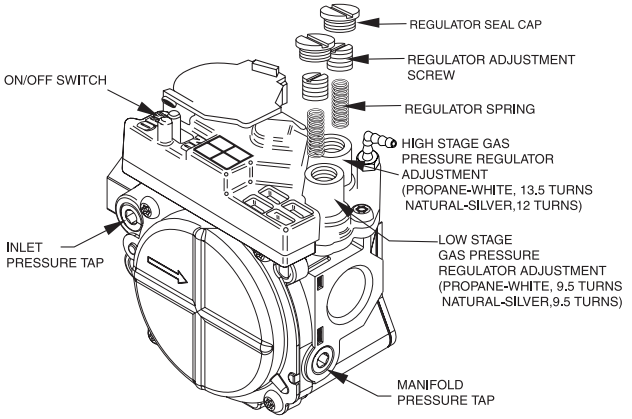


Fig. 22 – Variable and Two Two-Stage Gas Valve, Series G / J

Step 4 —Pre-adjust Gas Valve

NOTE: For furnaces with Fig. 21 type valves, the regulator springs inside the gas valves do not need to be replaced, but pre-adjustment must be made for natural gas operation.

NOTE: For furnaces with Fig. 22 type gas valves, both the regulator springs must be replaced and pre-adjustment must be made for natural gas operation.

⚠ WARNING

CARBON MONOXIDE POISONING, FIRE HAZARD

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

This kit is not to be used with furnaces equipped with a gas valve that has a RED On/Off knob, P/N EF33CZ201. The RED On/Off valves are not dual-fuel gas valves and must be replaced with a new two-stage gas valve, not included with this kit. The new dual-fuel two-stage gas valve for this furnace is available from your local distributor.

⚠ WARNING

FURNACE RELIABILITY HAZARD

Failure to follow this warning could result in personal injury or death.

The gas valve must be pre-adjusted or converted before operating on natural gas.

For furnaces with Fig. 21 type gas valves:

1. Be sure gas and electric supplies are OFF.
2. Remove the caps that conceal the regulator adjustment screws for low-heat and high-heat stage gas valve regulators. (See Fig. 21.)
3. Turn low-heat stage adjustment screw (using a 3/32 allen wrench) counterclockwise (outwards) for one full turn. This will reduce manifold pressure closer to the natural gas high-heat set point.
4. Turn high-heat stage adjustment screw (using 3/32 allen wrench) counterclockwise (outwards) for two full turns. This will reduce manifold pressure closer to natural gas high-heat set point.
5. Replace the regulator seal caps.
6. Go to Step 5.

For furnaces with Fig. 22 type gas valves:

1. Be sure the gas and electric supplies are turned OFF.
2. Remove the caps that conceal the regulator adjustment screws for low-heat and high-heat stage gas valve regulators. (See Fig. 22.)
3. Remove the adjustment screws for both low-heat and high-heat stage gas valve regulators.
4. Remove the propane gas regulator springs (white) and discard.
5. Install a natural gas regulator spring (silver) in each gas valve regulator. The springs are identical for both heat stages.
6. Install regulator adjustment screws.
7. Turn low-heat stage adjusting screw clockwise (inwards) for 9.5 turns. This will reduce the manifold pressure closer to the natural gas low-heat set point.
8. Turn high-heat stage adjusting screw clockwise (inwards) for 12 turns. This will reduce the manifold pressure closer to the natural gas high-heat set point.
9. Go to Step 5.

Step 5 —Check Inlet Gas Pressure

NOTE: This kit is to be used only when inlet-gas pressure is between 4.5-in. wc and 13.6-in. wc.

1. Be sure main gas and electrical supplies to furnace are off.
2. Remove 1/8-in. pipe plug from inlet pressure tap on gas valve. (See Fig. 21 or 22.)
3. Attach manometer to inlet pressure tap on gas valve. (See Fig. 8 and 21 or 22.)

⚠ CAUTION

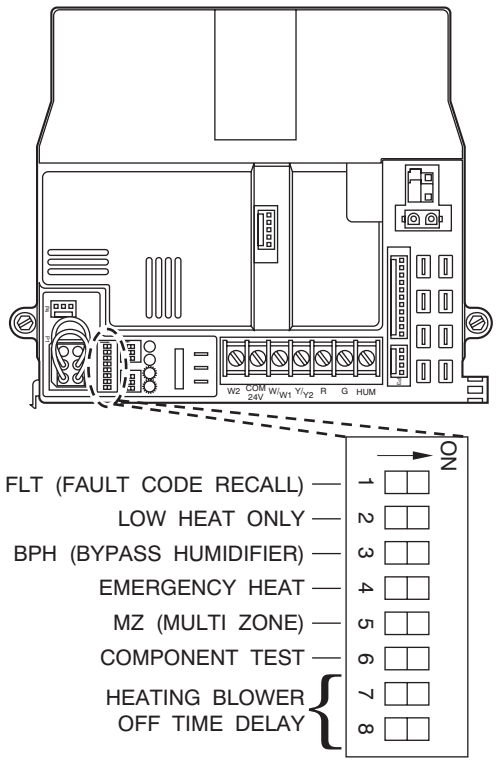
UNIT DAMAGE HAZARD

Failure to follow this caution may result in unit damage.

DO NOT operate furnace more than 1 minute to check inlet gas pressure as conversion is not complete at this time.

4. Turn on furnace power supply.
5. Turn gas-supply manual-shutoff valve to ON position.
6. Turn furnace gas-valve switch to ON position.
7. Jumper R-W/W1 and R-W2 thermostat connections on control center. (See Fig. 23 or 30.) This runs the furnace in high-heat.
8. When main burners ignite, confirm inlet gas pressure is between 4.5-in. wc and 13.6-in. wc.
9. Remove jumper across R-W/W1 and R-W2 thermostat connections to terminate call for heat.
10. Turn furnace gas-valve switch to OFF position.
11. Turn gas-supply manual-shutoff valve to OFF position.
12. Turn off furnace power supply.
13. Remove manometer and reinstall gas-valve inlet-pressure tap plug. (See Fig. 21 or 22.)

NOTE: Use propane-gas-resistant pipe dope to prevent gas leaks. DO NOT use Teflon tape.



A94299

Fig. 23 – Variable-Speed Condensing Furnace Control

⚠ WARNING

FIRE AND EXPLOSION HAZARD

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

NEVER test for gas leaks with an open flame. Use a commercially available soap solution made specifically for the detection of leaks to check all connections.

Step 6 —Check Furnace Operation and Make Necessary Adjustments

1. Be sure main gas and electrical supplies to furnace are off.
2. Remove 1/8-in. pipe plug from manifold-pressure tap on downstream side of gas valve. (See Fig. 21 or 22.)
3. Attach manometer to manifold-pressure tap on gas valve. (See Fig. 8 and 21 or 22.)
4. Turn gas-supply manual-shutoff valve to ON position.
5. Turn furnace gas-valve control switch/knob to ON position.
6. Check all threaded pipe connections for gas leaks.
7. Turn on furnace power supply.
8. Turn setup switch SW-2 (See Fig. 23) or switch SW1-2 (See Fig. 30) on control center to ON position. This keeps furnace in low-heat.
9. Jumper R and W/W1 thermostat connections to call for heat.
10. When main burners ignite, check manifold orifices for gas leaks.

Step 7 —Set Gas Input Rate

Furnace gas-input rate on rating plate is for installations at altitudes up to 2000 ft. (610M). In the USA, the input rating for altitudes above 2000 ft. (610M) must be reduced by 2 percent for each 1000 ft. (305M) above sea level. In Canada, the input rating must be derated by 5 percent for altitudes of 2000 ft. (610M) to 4500 ft. (1372M) above sea level. Furnace-input rate must be within +/-2 percent of input on furnace-rating plate.

1. Determine natural-gas orifice size and manifold pressure for correct input.
   a. Obtain yearly heat-value average (at installed altitude) from local gas supplier.
   b. Obtain yearly specific-gravity average from local gas supplier.
   c. Verify furnace model. Table 6 can only be used for 40 in tall; multipoise, hot-surface ignition, 2-speed and variable speed condensing furnaces.
   d. Find installation altitude in Table 6.

NOTE: For Canada altitudes of 2000 to 4500 ft. (610 to 1372M), use USA altitudes of 2001 to 3000 ft. (610 to 914M) in Table 6.

   e. Find closest natural gas heat value and specific gravity in Table 6.
   f. Follow heat value and specific gravity lines to point of intersection to find orifice size and low- and high-heat manifold pressure settings for proper operation.

EXAMPLE: (Using Table 6 at 0–2000 ft. (610M) altitude)
Heating value = 1050 Btu/cu ft
Specific gravity = 0.62
Therefore: Orifice No. 45, Manifold pressure 3.8–in. wc for high heat and 1.6–in. wc for low heat.

⚠ CAUTION

UNIT DAMAGE HAZARD

Failure to follow this caution may result in unit damage. DO NOT redrill burner orifices. Obtain new orifices if orifice size must be changed. (See Fig. 6.)

   g. Check and verify burner orifice size in furnace. NEVER ASSUME ORIFICE SIZE. ALWAYS CHECK AND VERIFY.

2. Adjust manifold pressure to obtain input rate.

NOTE: Manifold pressure MUST always be measured with the burner enclosure front REMOVED.

NOTE: Low heat must be adjusted before high heat.

   a. Remove caps that conceal adjustment screws for low- and high-heat gas-valve regulators. (See Fig. 20 and 21.)
   b. Turn low-heat adjusting screw (3/32 hex Allen wrench) counterclockwise (out) to decrease input rate or clockwise (in) to increase input rate.

NOTE: DO NOT set low-heat manifold pressure less than 1.3-in. wc or more than 1.7-in. wc for natural gas. If manifold pressure is outside this range, change main-burner orifices.

⚠ CAUTION

FURNACE RELIABILITY HAZARD

Failure to follow this caution may result in unit damage.

DO NOT bottom out gas-valve regulator-adjusting screw.

NOTE: If orifice hole appears damaged or it is suspected to have been redrilled, check orifice hole with a numbered drill bit of

correct size. Never redrill an orifice. A burr-free and squarely aligned orifice hole is essential for proper flame characteristics.

c. Turn high-heat adjusting screw (3/32 hex Allen wrench) counterclockwise (out) to decrease input rate or clockwise (in) to increase rate.

d. Jumper R and W2 thermostat connections on control. (See Fig. 22, 29 or 30.) This keeps furnace in high-heat.

NOTE: DO NOT set high-heat manifold pressure less than 3.2-in. wc or more than 3.8-in. wc for natural gas. If manifold pressure is outside this range, change main-burner orifices.

e. When correct input is obtained, replace caps that conceal gas-valve regulator-adjustment screws. Main-burner flame should be clear blue, almost transparent (Fig. 11).

f. Remove jumper across R-W/W1 and R-W2 after high-heat stage adjustments.

g. Turn setup switch SW-2 (Fig. 23) or switch SW1-2 (Fig. 30) on control board to OFF position.

3. Verify natural-gas-input rate by clocking gas meter.

a. Calculate high-altitude adjustment (if required).

UNITED STATES

At installation altitudes above 2000 ft. (610M), input rate must be reduced by 2 percent for each 1000 ft. (305M) above sea level. See Table 7 for derate multiplier factor and example.

CANADA

At installation altitudes from 2000 to 4500 ft. (610 to 1372M), this furnace must be derated 5 percent by an authorized Gas Conversion Station or Dealer. To determine correct input rate for altitude, see example and use 0.95 as derate multiplier factor.

EXAMPLE: (For upflow furnace)
100,000 Btuh input furnace installed at 4300 ft.
Furnace Input Rate at Sea Level X Derate Multiplier Factor = Furnace Input Rate at Installation Altitude
100,000 X 0.91 = 91,000

b. Reinstall burner enclosure front.

NOTE: Clocking gas input rate MUST always be performed with the burner enclosure front INSTALLED.

c. Check that gas-valve adjustment caps are in place for proper input to be clocked.

d. Obtain average yearly heat value for local gas supply.

NOTE: Be sure heating value of gas used for calculations is correct for your altitude. Consult local gas utility for altitude adjustment of gas heating value.

e. Check and verify orifice size in furnace. NEVER ASSUME THE ORIFICE SIZE. ALWAYS CHECK AND VERIFY.

f. Turn off all other gas appliances and pilots.

NOTE: Low heat must be adjusted before high heat.

g. Turn setup switch SW-2 (Fig. 23) or switch SW1-2 (Fig. 30) on control board to ON position. This runs furnace in low heat.

h. Jumper R and W/W1 thermostat connections.

i. Let furnace run for three minutes in low-heat operation.

j. Measure time (in sec) for gas-meter test dial to complete one revolution. Note reading.

k. Refer to Table 5 for cu ft of gas per hr.

l. Multiply gas rate (cu ft/hr) X heating value (Btu/cu ft).

EXAMPLE: (Low-heat operation for all models at 0-2000 ft. (610M) altitude
Furnace input for low heat from rating plate is 65,000 Btuh
Btu heating input = Btu/cu ft X cu ft/hr
Heating value of gas = 975 Btu/cu ft
Time for one revolution of 2-cu ft dial = 108 sec
Gas rate = 67 cu ft/hr (from Table 5)
Btu heating input = 67 X 975 = 65,325 Btuh
In this example, the orifice size and manifold-pressure adjustment is within +/-2 percent of the furnace input rate.

NOTE: Measured gas input must be within +/-2 percent of that stated on furnace rating plate when installed at sea level or derated per that stated above when installed at higher altitudes.

m. Jumper R and W2 thermostat connections and repeat items i through l for high-heat operation.

4. Remove jumper across R, W/W1, and W2 thermostat connections to terminate call for heat.
5. Turn setup switch SW-2 (Fig. 23) or switch SW1-2 (Fig. 30) on control board to OFF position.
6. Turn furnace gas-valve-control switch to OFF position.
7. Turn off furnace power supply.
8. Remove manometer and reinstall manifold pressure tap plug. (See Fig. 21 or 22.)
9. Turn furnace gas-valve-control switch to ON position.
10. Turn on furnace power supply.
11. Set room thermostat to call for heat.
12. Check pressure-tap plug for gas leaks when main burners ignite.
13. Check for correct burner flame. (See Fig. 11.)
14. Observe unit through two complete heating cycles. See sequence of operation in furnace Installation, Start-Up, and Operating Instructions.
15. Set room thermostat to desired temperature.

Step 8 —Label Application

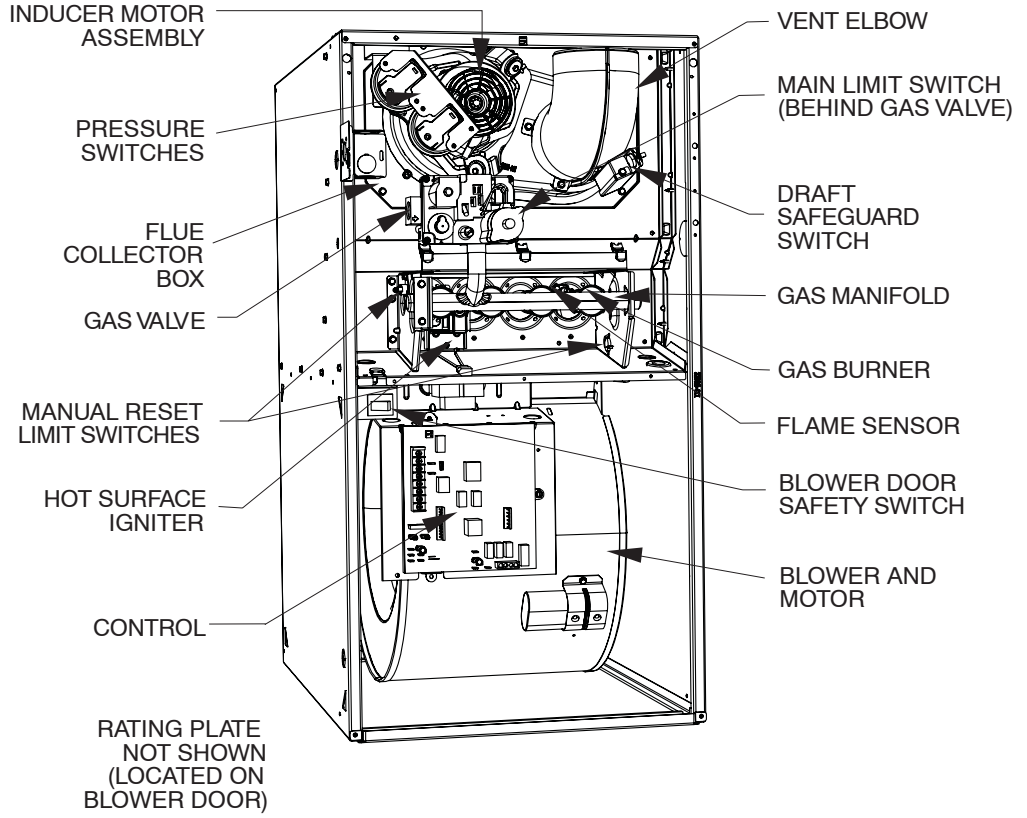
NOTE: See Fig. 10 for label location and Table 1 for part numbers.

1. Fill in Conversion Responsibility Label (334409-205) and apply inside furnace as shown. Date, name, and address of organization making this conversion are required.
2. Attach Furnace Conversion Rating Plate (334409-201) on blower shelf as shown.
3. Apply Gas Control Conversion Label:
   a. For 2-Stage gas valve that was converted by replacing regulator springs (Fig. 22), apply label 334409-203.
   b. For 2-Stage gas valve that was adjusted without replacing regulator springs (Fig. 21), apply label 334409-202.
4. Check for correct normal-operating sequence of ignition system as described in furnace Installation, Start-Up, and Operating Instructions.
5. Reinstall main furnace door.

TABLE 7 - ALTITUDE DERATE MULTIPLIER FOR USA

ALTITUDE FT (M)	PERCENT OF DERATE	DERATE MULTIPLIER FACTOR FOR USA*
0–2000 (0–610)	0	1.00
2001—3000 (610–914)	4—6	0.95
3001—4000 (914–1219)	6—8	0.93
4001—5000 (1219–1524)	8—10	0.91
5001—6000 (1524–1829)	10—12	0.89
6001—7000 (1829–2134)	12—14	0.87
7001—8000 (2134–2438)	14—16	0.85
8001—9000 (2438–2743)	16—18	0.83
9001—10,000 (2743–3048)	18—20	0.81

*Derate multiplier factor is based on midpoint altitude for altitude range.



A03070

Fig. 24 – Component Location

SECTION 3 - TWO-STAGE AND VARIABLE-SPEED INDUCED COMBUSTION, NON-CONDENSING FURNACE MODELS 312AAV, 315AAV, 312JAV, 315JAV, 58CTA, 58CVA, 58CTX AND 58CVX

Step 1 —Install Main Burner Orifices

NOTE: See Fig. 24 for component location in upflow orientation. Re-orient component arrangement when furnace is installed in other orientations.

1. Turn off furnace gas and electrical supplies to furnace.
2. Remove main furnace door.
3. Turn furnace gas valve switch to OFF position.
4. Remove gas supply pipe to valve.
5. Remove wires from gas valve. Note location for re-assembly.
6. Remove two wires from low gas pressure switch (LGPS) located on gas valve.
7. Remove the two screws on the left side that secure the gas manifold to the burner box. Note the location of the green ground wire for reassembly.
8. Swing manifold and orifices out from burners.
9. Slide right side of manifold out of burner box.
10. Remove and discard orifices from manifold.

⚠ CAUTION

UNIT OPERATION HAZARD

Failure to follow this caution may result in unit damage or improper operation.

Label all wires prior to disconnection when servicing controls.

⚠ AVERTISSEMENT

D'EQUIPEMENT DANGER D'OPERATION

Lors des operations d'fentretien des commandes, etiqueter tous les fils avant de les deconnecter. Toute erreur de cablage peut etre une source de danger et de panne.

11. Determine natural gas orifice size for correct input at installed altitude by using Table 8 (non Low NOx models

in any position, and Low NOx models in upflow position) or Table 9 (Low NOx models only when in downflow or horizontal position) and Fig. 33.

Furnace gas-input rate on rating plate is for installations at altitudes up to 2000 ft. (610M). In the USA, the input rating for altitudes above 2000 ft. (610M) must be reduced by 4 percent for each 1000 ft. (305M) above sea level. In Canada, the input rating must be derated by 10 percent for altitudes of 2000 ft. (610M) to 4500 ft. (1372M) above sea level.

a. Obtain yearly heat-value average (at installed altitude) for local gas supply.

b. Obtain yearly specific-gravity average for local gas supply.

c. Verify furnace model. Table 8 or 9 can only be used for 33-in. (838mm) tall, multipoise, hot-surface ignition, two-stage and variable speed, non-condensing furnaces.

d. Find installation altitude in Table 8 or 9.

NOTE: For Canada altitudes of 2000 to 4500 ft. (610 to 1372M), use USA altitudes of 2001 to 3000 ft. (610 to 914M) in Table 8 or 9.

e. Find closest natural gas heat value and specific gravity in Table 8 or 9.

f. Follow heat-value line and specific-gravity line to point of intersection to find orifice size and low- and high-heat manifold pressure settings.

EXAMPLE: (Using Table 8 at 0–2000 ft. (610M) altitude)
Heat value = 1050 Btu/cu ft
Specific gravity = 0.62
Therefore: Orifice No. 43 is required

12. Install main burner orifices. Do not use Teflon tape. Finger-tighten orifices at least one full turn to prevent cross-threading, then tighten with wrench. There are enough orifices in each kit for the largest furnace. Discard extra orifices. Orifices of other sizes must be field supplied and are available through your local distributor.

NOTE: DO NOT reinstall the manifold, orifices, and gas-valve assembly at this time.

A. Remove the Spoiler Screws from the burners

1. Disconnect the hot surface igniter from the harness.
2. Disconnect flame sensor from harness.
3. Slide burner assembly out of burner enclosure.
4. Remove 1/4” spoiler screws from burners.

⚠ CAUTION

UNIT DAMAGE HAZARD

Failure to follow this caution may result excessive burner noise and misdirection of burner flames.

DO NOT redrill burner orifices. Obtain new orifices if orifice size must be changed. (See Fig. 6.)

NOTE: It is not necessary to plug the hole in the burner when screws are removed.

5. Slide burner assembly into slot on burner enclosure, making sure it is fully seated forward in the enclosure.
6. Reconnect igniter and flame sensor.

B. Install NOx Baffles (where required)

The following Low NOx models must have NOx baffles installed. NOx baffles are not included in this kit and must be ordered separately or reused if retained from original conversion to propane.

58CTX	312JAV
58CVX	315JAV

1. Remove the 1/4-in. screw from the hole in the heat exchanger cell panel directly below each heat exchanger inlet.
2. Insert the NOx baffle into each heat exchanger inlet.
3. Align the baffle mounting tab with the hole in the cell panel.
4. Insert the 1/4-in. screw through the NOx baffle mounting tab and into the hole in the heat exchanger cell panel.
5. Tighten the screw securely.
6. Repeat the procedure for each heat exchanger inlet. (See Fig. 27.)
7. Remove low-gas-pressure switch (LGPS), street elbow, and 1/8-in. tee from gas-valve inlet-pressure tap. (See Fig. 28.)

NOTE: Use propane-gas-resistant pipe dope on all connections to prevent gas leaks. DO NOT use Teflon tape.

8. Apply pipe dope sparingly to 1/8-in. pipe plug (provided in kit) and install in 1/8-in. tapped inlet-pressure tap opening in gas valve.
9. Insert right end of manifold in right side of burner box. Swing manifold into burners and insert orifices into burners. Ensure that manifold orifices are fully inserted and the burners fit over each orifice.
10. Secure manifold to left side of burner rack with the two previously removed screws. Verify that the green ground wire is attached between the top screw and the manifold in the correct location.

NOTE: Failure to connect green ground wire will result in the loss of flame signal and result in a No Heat condition.

11. Reconnect wires to gas valve. See wiring label on furnace to ensure proper location of wires.
12. Rewire unit low-pressure switch LPS as follows:
    a. Trace one of the yellow wires previously disconnected from the LGPS back to the NO terminal of the LPS. Disconnect this wire from the LPS and discard.
    b. Trace the other yellow wire previously disconnected from the LGPS back to the furnace wire harness.
    c. Connect the yellow wire of the furnace wire harness (see item’b’) to the NO terminal of the LPS.
    d. Refer to wiring label on the furnace to ensure proper location of wires.
13. Reinstall gas-supply pipe to gas valve using backup wrench on gas valve to prevent rotation and improper orientation.

NOTE: Use propane-gas-resistant pipe dope to prevent gas leaks. DO NOT use Teflon tape.

Step 2 —Pre-adjust Gas Valve

NOTE: For furnaces with Fig. 25-type valves, the regulator springs do not need to be replaced, but pre-adjustment must be made for natural gas operation.

TABLE 8 - ORIFICE SIZE* AND MANIFOLD PRESSURES FOR GAS INPUT RATE

(TABULATED DATA BASED ON 22,000 BTUH HIGH-HEAT / 14,500 BTUH LOW-HEAT PER BURNER, DERATED 4%/1000 FT (305M) ABOVE SEA LEVEL)

ALTITUDE RANGE ft (m)		AVG. GAS HEAT VALUE AT ALTITUDE (Btu/cu ft)	SPECIFIC GRAVITY OF NATURAL GAS							
			0.58		0.60		0.62		0.64	
			Orifice No.	Mnfld Press High/Low	Orifice No.	Mnfld Press High/Low	Orifice No.	Mnfld Press High/Low	Orifice No.	Mnfld Press High/Low
U.S.A. and Canada	0 (0) to 2000 (610)	900	42	3.5 / 1.5	42	3.6 / 1.6	42	3.7 / 1.6	41	3.5 / 1.5
		925	42	3.3 / 1.4	42	3.4 / 1.5	42	3.5 / 1.5	42	3.7 / 1.6
		950	**43**	**3.8 / 1.7**	42	3.3 / 1.4	42	3.4 / 1.5	42	3.5 / 1.5
		975	**43**	**3.6 / 1.6**	**43**	**3.8 / 1.6**	42	3.2 / 1.4	42	3.3 / 1.4
		1000	**43**	**3.5 / 1.5**	**43**	**3.6 / 1.6**	**43**	**3.7 / 1.6**	**43**	**3.8 / 1.7**
		1025	**43**	**3.3 / 1.4**	**43**	**3.4 / 1.5**	**43**	**3.5 / 1.5**	**43**	**3.6 / 1.6**
		1050	44	3.6 / 1.6	**43**	**3.2 / 1.4**	**43**	**3.4 / 1.5**	**43**	**3.5 / 1.5**
		1075	44	3.4 / 1.5	44	3.5 / 1.5	**43**	**3.2 / 1.4**	**43**	**3.3 / 1.4**
		1100	44	3.3 / 1.4	44	3.4 / 1.5	44	3.5 / 1.5	**43**	**3.2 / 1.4**
U.S.A. and Canada	U.S.A. 2001 (611) to 3000 (914) Canada 2001 (611) to 4500 (1372)	800	42	3.4 / 1.5	42	3.5 / 1.5	42	3.6 / 1.6	42	3.7 / 1.6
		825	42	3.2 / 1.4	42	3.3 / 1.4	42	3.4 / 1.5	42	3.5 / 1.5
		850	**43**	**3.7 / 1.6**	**43**	**3.8 / 1.6**	42	3.2 / 1.4	42	3.3 / 1.4
		875	**43**	**3.5 / 1.5**	**43**	**3.6 / 1.6**	**43**	**3.7 / 1.6**	**43**	**3.8 / 1.7**
		900	**43**	**3.3 / 1.4**	**43**	**3.4 / 1.5**	**43**	**3.5 / 1.5**	**43**	**3.6 / 1.6**
		925	44	3.5 / 1.5	**43**	**3.2 / 1.4**	**43**	**3.3 / 1.4**	**43**	**3.4 / 1.5**
		950	44	3.4 / 1.5	44	3.5 / 1.5	44	3.6 / 1.6	**43**	**3.2 / 1.4**
		975	44	3.2 / 1.4	44	3.3 / 1.4	44	3.4 / 1.5	44	3.5 / 1.5
		1000	45	3.7 / 1.6	45	3.8 / 1.7	44	3.2 / 1.4	44	3.4 / 1.5
U.S.A. Only	3001 (915) to 4000 (1219)	775	42	3.2 / 1.4	42	3.3 / 1.4	42	3.4 / 1.5	42	3.5 / 1.5
		800	**43**	**3.6 / 1.6**	**43**	**3.8 / 1.6**	42	3.2 / 1.4	42	3.3 / 1.4
		825	**43**	**3.4 / 1.5**	**43**	**3.5 / 1.5**	**43**	**3.7 / 1.6**	**43**	**3.8 / 1.6**
		850	**43**	**3.2 / 1.4**	**43**	**3.3 / 1.4**	**43**	**3.4 / 1.5**	**43**	**3.6 / 1.5**
		875	44	3.5 / 1.5	44	3.6 / 1.6	**43**	**3.3 / 1.4**	**43**	**3.4 / 1.5**
		900	44	3.3 / 1.4	44	3.4 / 1.5	44	3.5 / 1.5	**43**	**3.2 / 1.4**
		925	45	3.8 / 1.6	44	3.2 / 1.4	44	3.3 / 1.5	44	3.4 / 1.5
		950	46	3.8 / 1.6	45	3.7 / 1.6	45	3.8 / 1.7	44	3.3 / 1.4
U.S.A. Only	4001 (1220) to 5000 (1524)	750	**43**	**3.6 / 1.6**	**43**	**3.8 / 1.6**	42	3.2 / 1.4	42	3.3 / 1.4
		775	**43**	**3.4 / 1.5**	**43**	**3.5 / 1.5**	**43**	**3.6 / 1.6**	**43**	**3.8 / 1.6**
		800	**43**	**3.2 / 1.4**	**43**	**3.3 / 1.4**	**43**	**3.4 / 1.5**	**43**	**3.5 / 1.5**
		825	44	3.4 / 1.5	44	3.6 / 1.5	**43**	**3.2 / 1.4**	**43**	**3.3 / 1.4**
		850	44	3.2 / 1.4	44	3.4 / 1.5	44	3.5 / 1.5	44	3.6 / 1.6
		875	45	3.7 / 1.6	45	3.8 / 1.7	44	3.3 / 1.4	44	3.4 / 1.5
		900	46	3.7 / 1.6	46	3.8 / 1.7	45	3.7 / 1.6	44	3.2 / 1.4
		925	46	3.5 / 1.5	46	3.6 / 1.6	46	3.7 / 1.6	46	3.8 / 1.7
U.S.A. Only	5001 (1525) to 6000 (1829)	725	**43**	**3.4 / 1.5**	**43**	**3.5 / 1.5**	**43**	**3.6 / 1.6**	**43**	**3.7 / 1.6**
		750	**43**	**3.2 / 1.4**	**43**	**3.3 / 1.4**	**43**	**3.4 / 1.5**	**43**	**3.5 / 1.5**
		775	44	3.4 / 1.5	44	3.5 / 1.5	**43**	**3.2 / 1.4**	**43**	**3.3 / 1.4**
		800	44	3.2 / 1.4	44	3.3 / 1.4	44	3.4 / 1.5	44	3.5 / 1.5
		825	46	3.8 / 1.7	45	3.8 / 1.6	44	3.2 / 1.4	44	3.3 / 1.4
		850	46	3.6 / 1.6	46	3.7 / 1.6	46	3.8 / 1.7	45	3.8 / 1.6
		875	47	3.8 / 1.7	46	3.5 / 1.5	46	3.6 / 1.6	46	3.7 / 1.6
		900	47	3.6 / 1.6	47	3.8 / 1.6	46	3.4 / 1.5	46	3.5 / 1.5
U.S.A. Only	6001 (1830) to 7000 (2133)	675	**43**	**3.4 / 1.5**	**43**	**3.5 / 1.5**	**43**	**3.6 / 1.6**	**43**	**3.7 / 1.6**
		700	44	3.6 / 1.6	**43**	**3.3 / 1.4**	**43**	**3.4 / 1.5**	**43**	**3.5 / 1.5**
		725	44	3.4 / 1.5	44	3.5 / 1.5	44	3.6 / 1.6	**43**	**3.2 / 1.4**
		750	45	3.8 / 1.7	44	3.3 / 1.4	44	3.4 / 1.5	44	3.5 / 1.5
		775	46	3.7 / 1.6	45	3.7 / 1.6	45	3.8 / 1.7	44	3.2 / 1.4
		800	46	3.5 / 1.5	46	3.6 / 1.6	46	3.8 / 1.6	45	3.7 / 1.6
		825	47	3.7 / 1.6	46	3.4 / 1.5	46	3.5 / 1.5	46	3.6 / 1.6
		850	47	3.5 / 1.5	47	3.6 / 1.6	47	3.8 / 1.6	46	3.4 / 1.5

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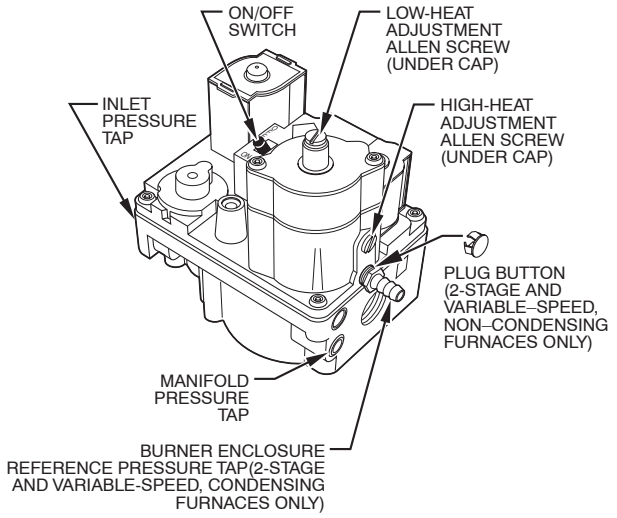
TABLE 8 - ORIFICE SIZE* AND MANIFOLD PRESSURES FOR GAS INPUT RATE

(TABULATED DATA BASED ON 22,000 BTUH HIGH-HEAT / 14,500 BTUH LOW-HEAT PER BURNER, DERATED 4%/1000 FT (305M) ABOVE SEA LEVEL)

ALTITUDE RANGE ft (m)		AVG. GAS HEAT VALUE AT ALTITUDE (Btu/cu ft)	SPECIFIC GRAVITY OF NATURAL GAS							
			0.58		0.60		0.62		0.64	
			Orifice No.	Mnfld Press High/Low	Orifice No.	Mnfld Press High/Low	Orifice No.	Mnfld Press High/Low	Orifice No.	Mnfld Press High/Low
U.S.A. Only		**650**	44	3.6 / 1.6	**43**	**3.2 / 1.4**	**43**	**3.4 / 1.5**	**43**	**3.5 / 1.5**
	7001	**675**	44	3.3 / 1.5	44	3.5 / 1.5	44	3.6 / 1.6	**43**	**3.2 / 1.4**
	(2134)	**700**	45	3.8 / 1.6	44	3.2 / 1.4	44	3.3 / 1.4	44	3.4 / 1.5
	to	**725**	46	3.7 / 1.6	46	3.8 / 1.7	45	3.7 / 1.6	44	3.2 / 1.4
		750	46	3.4 / 1.5	46	3.6 / 1.5	46	3.7 / 1.6	46	3.8 / 1.6
	8000	**775**	47	3.6 / 1.6	47	3.8 / 1.6	46	3.4 / 1.5	46	3.6 / 1.5
	(2438)	**800**	47	3.4 / 1.5	47	3.5 / 1.5	47	3.7 / 1.6	47	3.8 / 1.6
		825	48	3.7 / 1.6	48	3.8 / 1.6	47	3.4 / 1.5	47	3.6 / 1.5
U.S.A. Only		**625**	44	3.3 / 1.5	44	3.5 / 1.5	44	3.6 / 1.6	**43**	**3.2 / 1.4**
	8001	**650**	45	3.7 / 1.6	44	3.2 / 1.4	44	3.3 / 1.4	44	3.4 / 1.5
	(2439)	**675**	46	3.6 / 1.6	46	3.8 / 1.6	45	3.7 / 1.6	45	3.8 / 1.7
	to	**700**	47	3.8 / 1.7	46	3.5 / 1.5	46	3.6 / 1.6	46	3.7 / 1.6
		725	47	3.6 / 1.6	47	3.7 / 1.6	47	3.8 / 1.7	46	3.5 / 1.5
	9000	**750**	48	3.8 / 1.7	47	3.5 / 1.5	47	3.6 / 1.6	47	3.7 / 1.6
	(2743)	**775**	48	3.6 / 1.5	48	3.7 / 1.6	48	3.8 / 1.7	47	3.5 / 1.5
U.S.A. Only	**9001**	**600**	45	3.7 / 1.6	45	3.8 / 1.7	44	3.3 / 1.4	44	3.4 / 1.5
	(2744)	**625**	46	3.6 / 1.6	46	3.7 / 1.6	46	3.8 / 1.7	45	3.8 / 1.6
	to	**650**	47	3.8 / 1.6	46	3.4 / 1.5	46	3.6 / 1.5	46	3.7 / 1.6
		675	47	3.5 / 1.5	47	3.6 / 1.6	47	3.7 / 1.6	46	3.4 / 1.5
	10000	**700**	48	3.7 / 1.6	48	3.8 / 1.7	47	3.5 / 1.5	47	3.6 / 1.6
	(3048)	**725**	48	3.5 / 1.5	48	3.6 / 1.6	48	3.7 / 1.6	48	3.8 / 1.7

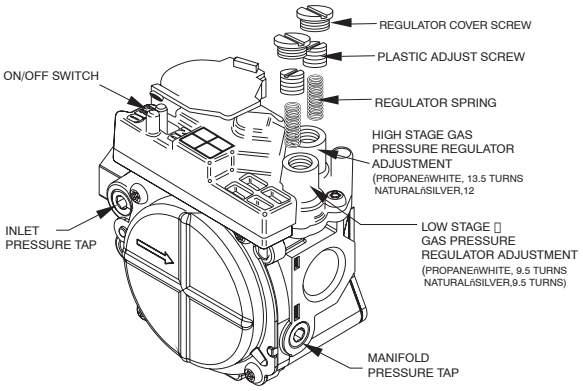
* Orifice numbers shown in **BOLD** are factory-installed.

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A01069

Fig. 25 – Two-Stage Gas Valve, Series E



A04048

Fig. 26 – Two-Stage Gas Valve, Series G / J

NOTE: For furnaces with Fig. 26-type gas valves, both the regulator springs must be replaced and pre-adjustment must be made for natural gas operation.

⚠ WARNING

CARBON MONOXIDE POISONING HAZARD

Failure to follow this warning could result in personal injury or death.

The gas valve must be pre-adjusted or converted before operating in Natural Gas.

For furnaces with Fig. 25-type gas valves:

1. Be sure gas and electric supplies are OFF.
2. Remove the caps that conceal the regulator adjustment screws for low-heat and high-heat stage gas valve regulators. (See Fig. 25.)
3. Turn low-heat stage adjustment screw (using a 3/32 allen wrench) counterclockwise (outwards) for one full turn. This will reduce manifold pressure closer to the natural gas low-heat set point.
4. Turn high-heat stage adjustment screw (using 3/32 allen wrench) counterclockwise (outwards) for two full turns. This will reduce manifold pressure closer to natural gas high-heat set point.
5. Replace the regulator seal caps for both the regulator adjustment screws.
6. Go to Step 3.

For furnaces with Fig. 26 type gas valves:

1. Be sure the gas and electric supplies are turned OFF.
2. Remove the caps that conceal the regulator adjustment screws for low-heat and high-heat stage gas valve regulators. (See Fig. 26.)
3. Install a natural gas regulator spring (silver) in each gas valve regulator. The springs are identical for both heat stages.
4. Remove the adjustment screws for both low-heat and high-heat stage gas valve regulators.
5. Remove the propane gas regulator springs (white).
6. Install low-heat regulator adjustment screw and turn clockwise (inward) for 9.5 turns. This will reduce the manifold pressure closer to the natural gas low-heat set point.
7. Install the high-heat regulator adjustment screw and turn clockwise (inward) for 12 turns. This will reduce the manifold pressure closer to the natural gas high-heat set point.
8. Replace the regulator seal caps.
9. Go to Step 3.

TABLE 9 - ORIFICE SIZE* AND MANIFOLD PRESSURES FOR GAS INPUT RATE

(TABULATED DATA BASED ON 21,000 BTUH HIGH-HEAT / 14,500 BTUH LOW-HEAT PER BURNER, DERATED 4%/1000 FT (305M) ABOVE SEA LEVEL)

ALTITUDE RANGE ft (m)		AVG. GAS HEAT VALUE AT ALTITUDE (Btu/cu ft)	SPECIFIC GRAVITY OF NATURAL GAS							
			0.58		0.60		0.62		0.64	
			Orifice No.	Mnfld Press High/Low	Orifice No.	Mnfld Press High/Low	Orifice No.	Mnfld Press High/Low	Orifice No.	Mnfld Press High/Low
U.S.A. and Canada		900	42	3.2 / 1.5	42	3.3 / 1.6	42	3.4 / 1.6	42	3.5 / 1.7
	0	925	**43**	**3.7 / 1.8**	**43**	**3.8 / 1.8**	42	3.2 / 1.5	42	3.3 / 1.6
	(0)	950	**43**	**3.5 / 1.7**	**43**	**3.6 / 1.7**	**43**	**3.7 / 1.8**	**43**	**3.8 / 1.8**
		975	**43**	**3.3 / 1.6**	**43**	**3.4 / 1.6**	**43**	**3.5 / 1.7**	**43**	**3.7 / 1.7**
	to	1000	44	3.6 / 1.7	**43**	**3.3 / 1.6**	**43**	**3.4 / 1.6**	**43**	**3.5 / 1.7**
		1025	44	3.4 / 1.6	44	3.6 / 1.7	**43**	**3.2 / 1.5**	**43**	**3.3 / 1.6**
	2000	1050	44	3.3 / 1.6	44	3.4 / 1.6	44	3.5 / 1.7	**43**	**3.2 / 1.5**
	(610)	1075	45	3.8 / 1.8	44	3.2 / 1.5	44	3.3 / 1.6	44	3.4 / 1.6
		1100	46	3.8 / 1.8	45	3.7 / 1.8	44	3.2 / 1.5	44	3.3 / 1.6
U.S.A. and Canada	U.S.A.	800	**43**	**3.8 / 1.8**	42	3.2 / 1.5	42	3.3 / 1.6	42	3.4 / 1.6
	2001 (611)	825	**43**	**3.5 / 1.7**	**43**	**3.7 / 1.7**	**43**	**3.8 / 1.8**	42	3.2 / 1.5
	to	850	**43**	**3.3 / 1.6**	**43**	**3.5 / 1.6**	**43**	**3.6 / 1.7**	**43**	**3.7 / 1.8**
	3000 (914)	875	**43**	**3.2 / 1.5**	**43**	**3.3 / 1.6**	**43**	**3.4 / 1.6**	**43**	**3.5 / 1.7**
		900	44	3.4 / 1.6	44	3.5 / 1.7	**43**	**3.2 / 1.5**	**43**	**3.3 / 1.6**
	Canada	925	44	3.2 / 1.5	44	3.3 / 1.6	44	3.5 / 1.6	44	3.6 / 1.7
	2001 (611)	950	45	3.7 / 1.8	45	3.8 / 1.8	44	3.3 / 1.6	44	3.4 / 1.6
	to	975	46	3.7 / 1.8	46	3.8 / 1.8	45	3.8 / 1.8	44	3.2 / 1.5
	4500 (1372)	1000	46	3.5 / 1.7	46	3.6 / 1.7	46	3.8 / 1.8	45	3.7 / 1.8
U.S.A. Only		775	**43**	**3.5 / 1.7**	**43**	**3.7 / 1.7**	**43**	**3.8 / 1.8**	42	3.2 / 1.5
	3001	800	**43**	**3.3 / 1.6**	**43**	**3.4 / 1.6**	**43**	**3.5 / 1.7**	**43**	**3.7 / 1.7**
	(915)	825	44	3.6 / 1.7	**43**	**3.2 / 1.5**	**43**	**3.3 / 1.6**	**43**	**3.4 / 1.6**
	to	850	44	3.4 / 1.6	44	3.5 / 1.7	44	3.6 / 1.7	**43**	**3.2 / 1.5**
		875	45	3.8 / 1.8	44	3.3 / 1.6	44	3.4 / 1.6	44	3.5 / 1.7
	4000	900	46	3.8 / 1.8	45	3.8 / 1.8	44	3.2 / 1.5	44	3.3 / 1.6
	(1219)	925	46	3.6 / 1.7	46	3.7 / 1.8	45	3.7 / 1.8	45	3.8 / 1.8
		950	46	3.4 / 1.6	46	3.5 / 1.7	46	3.7 / 1.7	46	3.8 / 1.8
U.S.A. Only		750	**43**	**3.3 / 1.6**	**43**	**3.4 / 1.6**	**43**	**3.5 / 1.7**	**43**	**3.6 / 1.7**
	4001	775	44	3.6 / 1.7	**43**	**3.2 / 1.5**	**43**	**3.3 / 1.6**	**43**	**3.4 / 1.6**
	(1220)	800	44	3.3 / 1.6	44	3.4 / 1.6	44	3.6 / 1.7	**43**	**3.2 / 1.5**
	to	825	45	3.8 / 1.8	44	3.2 / 1.5	44	3.4 / 1.6	44	3.5 / 1.6
		850	46	3.8 / 1.8	45	3.7 / 1.8	45	3.8 / 1.8	44	3.3 / 1.6
	5000	875	46	3.5 / 1.7	46	3.7 / 1.7	46	3.8 / 1.8	45	3.7 / 1.8
	(1524)	900	47	3.8 / 1.8	46	3.5 / 1.7	46	3.6 / 1.7	46	3.7 / 1.8
		925	47	3.6 / 1.7	47	3.7 / 1.8	47	3.8 / 1.8	46	3.5 / 1.7
U.S.A. Only		725	44	3.5 / 1.7	**43**	**3.2 / 1.5**	**43**	**3.3 / 1.6**	**43**	**3.4 / 1.6**
	5001	750	44	3.3 / 1.6	44	3.4 / 1.6	44	3.5 / 1.7	**43**	**3.2 / 1.5**
	(1525)	775	45	3.7 / 1.8	44	3.2 / 1.5	44	3.3 / 1.6	44	3.4 / 1.6
	to	800	46	3.7 / 1.8	46	3.8 / 1.8	45	3.8 / 1.8	44	3.2 / 1.5
		825	46	3.5 / 1.7	46	3.6 / 1.7	46	3.7 / 1.8	46	3.8 / 1.8
	6000	850	47	3.7 / 1.8	47	3.8 / 1.8	46	3.5 / 1.7	46	3.6 / 1.7
	(1829)	875	47	3.5 / 1.7	47	3.6 / 1.7	47	3.7 / 1.8	46	3.4 / 1.6
		900	48	3.8 / 1.8	47	3.4 / 1.6	47	3.5 / 1.7	47	3.7 / 1.7
U.S.A. Only		675	44	3.5 / 1.7	**43**	**3.2 / 1.5**	**43**	**3.3 / 1.6**	**43**	**3.4 / 1.6**
	6001	700	44	3.3 / 1.6	44	3.4 / 1.6	44	3.5 / 1.7	**43**	**3.2 / 1.5**
	(1830)	725	45	3.7 / 1.8	45	3.8 / 1.8	44	3.3 / 1.6	44	3.4 / 1.6
	to	750	46	3.6 / 1.7	46	3.8 / 1.8	45	3.7 / 1.8	45	3.8 / 1.8
		775	46	3.4 / 1.6	46	3.5 / 1.7	46	3.6 / 1.7	46	3.8 / 1.8
	7000	800	47	3.6 / 1.7	47	3.8 / 1.8	46	3.4 / 1.6	46	3.5 / 1.7
	(2133)	825	47	3.4 / 1.6	47	3.5 / 1.7	47	3.6 / 1.7	47	3.8 / 1.8
		850	48	3.7 / 1.7	48	3.8 / 1.8	47	3.4 / 1.6	47	3.5 / 1.7

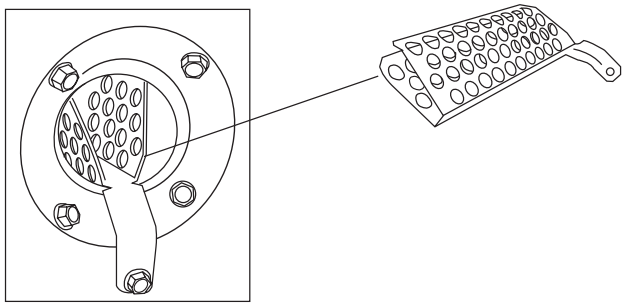
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TABLE 9 - ORIFICE SIZE* AND MANIFOLD PRESSURES FOR GAS INPUT RATE

(TABULATED DATA BASED ON 21,000 BTUH HIGH-HEAT / 14,500 BTUH LOW-HEAT PER BURNER, DERATED 4%/1000 FT (305M) ABOVE SEA LEVEL)

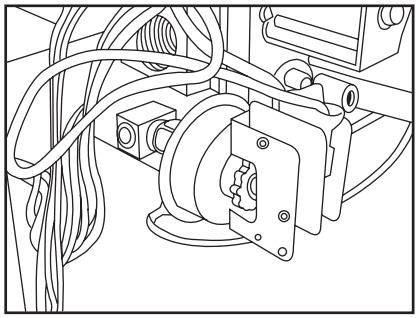
ALTITUDE RANGE ft (m)		AVG. GAS HEAT VALUE AT ALTITUDE (Btu/cu ft)	SPECIFIC GRAVITY OF NATURAL GAS							
			0.58		0.60		0.62		0.64	
			Orifice No.	Mnfld Press High/Low	Orifice No.	Mnfld Press High/Low	Orifice No.	Mnfld Press High/Low	Orifice No.	Mnfld Press High/Low
U.S.A. Only	7001 (2134) to 8000 (2438)	**650**	44	3.3 / 1.6	44	3.4 / 1.6	44	3.5 / 1.7	**43**	**3.2 / 1.5**
		675	45	3.7 / 1.8	45	3.8 / 1.8	44	3.3 / 1.6	44	3.4 / 1.6
		700	46	3.6 / 1.7	46	3.7 / 1.8	46	3.8 / 1.8	45	3.8 / 1.8
		725	47	3.8 / 1.8	46	3.5 / 1.7	46	3.6 / 1.7	46	3.7 / 1.8
		750	47	3.5 / 1.7	47	3.7 / 1.8	47	3.8 / 1.8	46	3.5 / 1.6
		775	48	3.8 / 1.8	47	3.4 / 1.6	47	3.6 / 1.7	47	3.7 / 1.7
		800	48	3.6 / 1.7	48	3.7 / 1.8	48	3.8 / 1.8	47	3.4 / 1.6
		825	48	3.3 / 1.6	48	3.5 / 1.6	48	3.6 / 1.7	48	3.7 / 1.8
U.S.A. Only	8001 (2439) to 9000 (2743)	**625**	45	3.7 / 1.8	45	3.8 / 1.8	44	3.3 / 1.6	44	3.4 / 1.6
		650	46	3.6 / 1.7	46	3.7 / 1.8	46	3.8 / 1.8	45	3.8 / 1.8
		675	47	3.8 / 1.8	46	3.4 / 1.6	46	3.5 / 1.7	46	3.7 / 1.7
		700	47	3.5 / 1.7	47	3.6 / 1.7	47	3.7 / 1.8	46	3.4 / 1.6
		725	48	3.7 / 1.8	48	3.8 / 1.8	47	3.5 / 1.7	47	3.6 / 1.7
		750	48	3.5 / 1.7	48	3.6 / 1.7	48	3.7 / 1.8	48	3.8 / 1.8
		775	49	3.8 / 1.8	48	3.4 / 1.6	48	3.5 / 1.7	48	3.6 / 1.7
U.S.A. Only	9001 (2744) to 10000 (3048)	**600**	46	3.6 / 1.7	46	3.7 / 1.8	46	3.8 / 1.8	45	3.7 / 1.8
		625	47	3.7 / 1.8	47	3.8 / 1.8	46	3.5 / 1.7	46	3.6 / 1.7
		650	47	3.4 / 1.6	47	3.6 / 1.7	47	3.7 / 1.8	47	3.8 / 1.8
		675	48	3.6 / 1.7	48	3.8 / 1.8	47	3.4 / 1.6	47	3.5 / 1.7
		700	48	3.4 / 1.6	48	3.5 / 1.7	48	3.6 / 1.7	48	3.7 / 1.8
		725	49	3.7 / 1.8	49	3.8 / 1.8	48	3.4 / 1.6	48	3.5 / 1.7

* Orifice numbers shown in **BOLD** are factory-installed.



A02195

Fig. 27 – NOx Baffle Installation



A02211

Fig. 28 – LGPS Installed

Step 3 —Check Inlet Gas Pressure

NOTE: This kit is to be used only when inlet-gas pressure is between 4.5-in. wc and 13.6-in. wc.

1. Be sure main gas and electrical supplies to furnace are off.

A08219a

2. Remove 1/8-in. pipe plug from inlet pressure tap on gas valve. (See Fig. 25 or 26.)
3. Attach manometer to inlet pressure tap on gas valve. (See Fig. 25 or 26.)

⚠ CAUTION

UNIT DAMAGE HAZARD

Failure to follow this caution may result in flame rollout, overheating the heat exchangers, etc. and reduce unit life.

DO NOT operate furnace more than one minute to check inlet gas pressure as conversion is not complete at this time.

4. Turn on furnace power supply.
5. Turn gas-supply manual-shutoff valve to ON position.
6. Turn furnace gas-valve switch to ON position.
7. Jumper R-W/W1 and R-W2 thermostat connections on control center. (See Fig. 29 or 30.) This runs the furnace in high-heat.
8. When main burners ignite, confirm inlet gas pressure is between 4.5-in. wc and 13.6-in. wc.
9. Remove jumper across R-W/W1 and R-W2 thermostat connections to terminate call for heat.
10. Turn furnace gas-valve switch to OFF position.
11. Turn gas-supply manual-shutoff valve to OFF position.
12. Turn off furnace power supply.
13. Remove manometer and reinstall gas-valve inlet-pressure tap plug. (See Fig. 25 or 26.)

NOTE: Use propane-gas-resistant pipe dope to prevent gas leaks. DO NOT use Teflon tape.

Step 4 —Check Furnace Operation and Make Necessary Adjustments

1. Be sure main gas and electrical supplies to furnace are off.
2. Remove 1/8-in. pipe plug from manifold-pressure tap on downstream side of gas valve. (See Fig. 25 or 26.)
3. Attach manometer to manifold-pressure tap on gas valve. (See Fig. 8 and 25 or 26.)
4. Turn gas-supply manual-shutoff valve to ON position.
5. Turn furnace gas-valve control switch to ON position.
6. Check all threaded pipe connections for gas leaks.
7. Turn on furnace power supply.
8. Turn the appropriate set-up switch on control center to the ON position, This will lock the furnace in low heat. (See Fig. 29 or 30.)
   a. For furnaces with PSC blower motors, turn LHT switch ON to lock the furnace in low-heat. (See Fig. 29.)
   b. For furnaces with ECM blower motors, turn switch SW1-2 ON to lock the furnace in low-heat. (See Fig. 30.)
9. Jumper R and W/W1 thermostat connections to call for heat.
10. When main burners ignite, check manifold orifices for gas leaks.

⚠ WARNING

FIRE AND EXPLOSION HAZARD

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

NEVER use matches, candles, flame, or other sources of ignition to check for gas leakage. Use a soap-and-water solution to check for leaks.

Step 5 —Set Gas Input Rate

Furnace gas-input rate on rating plate is for installations at altitudes up to 2000 ft. (610M). In the USA, the input rating for altitudes above 2000 ft. (610M) must be reduced by 4 percent for each 1000 ft. (305M) above sea level. In Canada, the input rating must be derated by 10 percent for altitudes of 2000 ft. (610M) to 4500 ft. (1372M) above sea level. Furnace-input rate must be within +/- 2 percent of input on furnace-rating plate.

The gas input rate must be set for both high-and-low-heat stage. Each adjustment is made independently at the gas control regulators.

1. Determine natural-gas orifice size and manifold pressure for correct input using Table 8 or 9.
   a. Obtain yearly heat-value average (at installed altitude) from local gas supplier.
   b. Obtain yearly specific-gravity average from local gas supplier.
   c. Verify furnace model. Table 8 or 9 can only be used for 33-in tall; multipoise, hot-surface ignition, two-stage and variable speed, non-condensing furnaces.
   d. Find installation altitude in Table 8 or 9.

NOTE: For Canada altitudes of 2000 to 4500 ft. (610 to 1372M), use USA altitudes of 2001 to 3000 ft. (610 to 914M) in Table 8 or 9.

   e. Find closest natural gas heat value and specific gravity in Table 8 or 9.
   f. Follow heat value and specific gravity lines to point of intersection to find orifice size and low- and high-heat manifold pressure settings for proper operation.
   g. Check and verify burner orifice size in furnace.

EXAMPLE: (Using Table 8 at 0–2000 ft. (610M) altitude)
Heating value = 1050 Btu/cu ft
Specific gravity = 0.62
Therefore: Orifice No. 43, Manifold pressure 3.4–in. wc for high heat and 1.5–in. wc for low heat.

NEVER ASSUME ORIFICE SIZE. ALWAYS CHECK AND VERIFY.

2. Adjust manifold pressure to obtain input rate.

NOTE: Low-heat must be adjusted before high-heat.

   a. Remove caps that conceal adjustment screws for low- and high-heat gas-valve regulators. (See Fig. 25 or 26.)
   b. Turn low-heat adjusting screw (3/32 hex Allen wrench) counterclockwise (out) to decrease input rate or clockwise (in) to increase input rate.

NOTE: DO NOT set low-heat manifold pressure less than 1.3-in. wc or more than 1.7-in. wc for natural gas. If manifold pressure is outside this range, change main-burner orifices.

   c. Jumper R and W2 thermostat connections on control. (See Fig. 29 or 30.) This keeps furnace in high-heat.
   d. Turn high-heat adjusting screw (3/32 hex Allen wrench) counterclockwise (out) to decrease input rate or clockwise (in) to increase rate.

NOTE: DO NOT set high-heat manifold pressure less than 3.2-in. wc or more than 3.8-in. wc for natural gas. If manifold pressure is outside this range, change main-burner orifices.

   e. When correct input is obtained, replace caps that conceal gas-valve regulator-adjustment screws. Main-burner flame should be clear blue, almost transparent. (See Fig. 11.)
   f. Remove jumper across R-W/W1 and R-W2 after high-heat stage adjustments.
   g. Turn setup switch LHT or SW1-2 on control center to OFF position. (See Fig. 29 or 30.)

3. Verify natural-gas-input rate by clocking gas meter.
   a. Calculate high-altitude adjustment (if required).

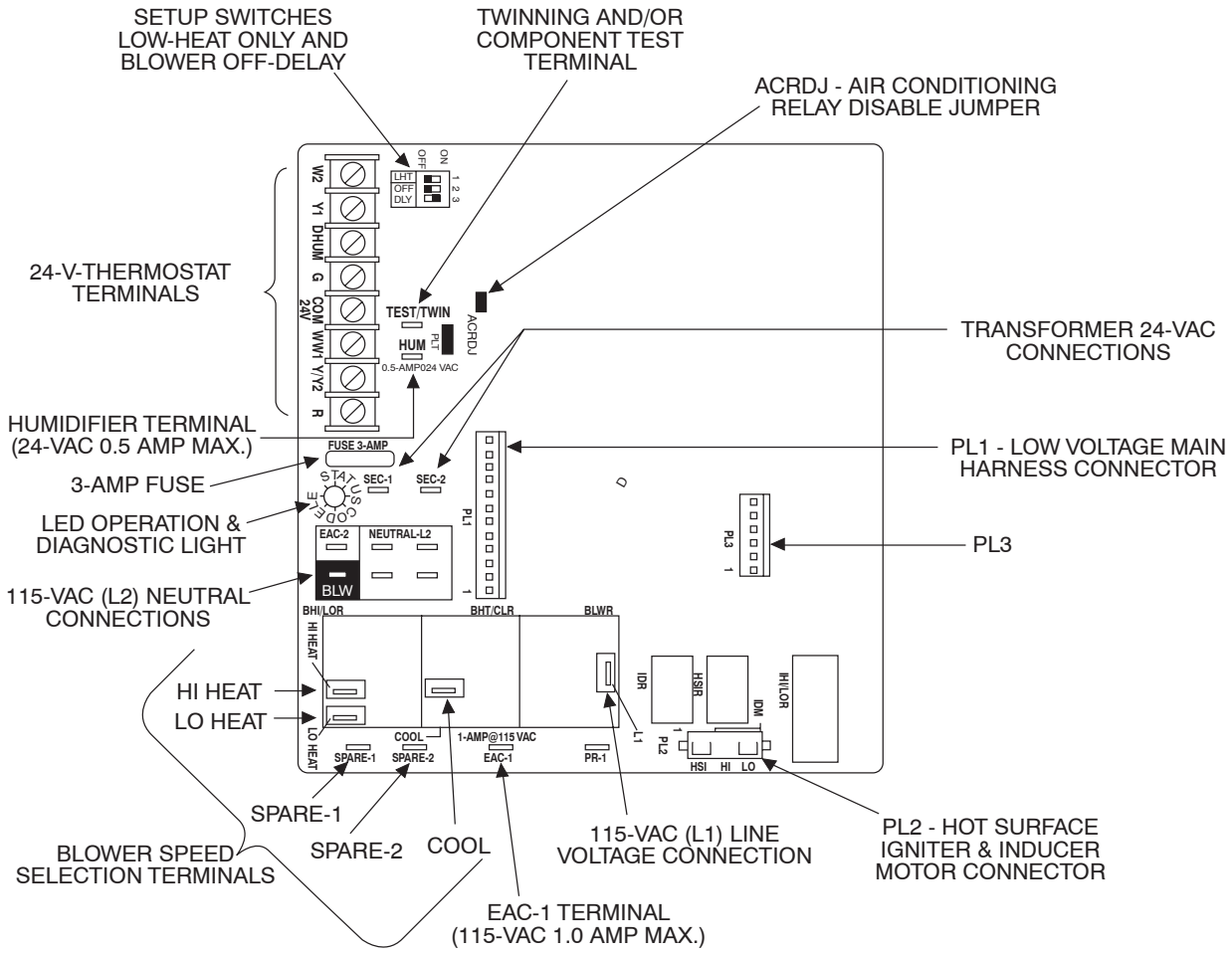
⚠ CAUTION

FURNACE RELIABILITY HAZARD

Failure to follow this caution may result in unregulated manifold pressure and excess overfire and heat exchanger failures.

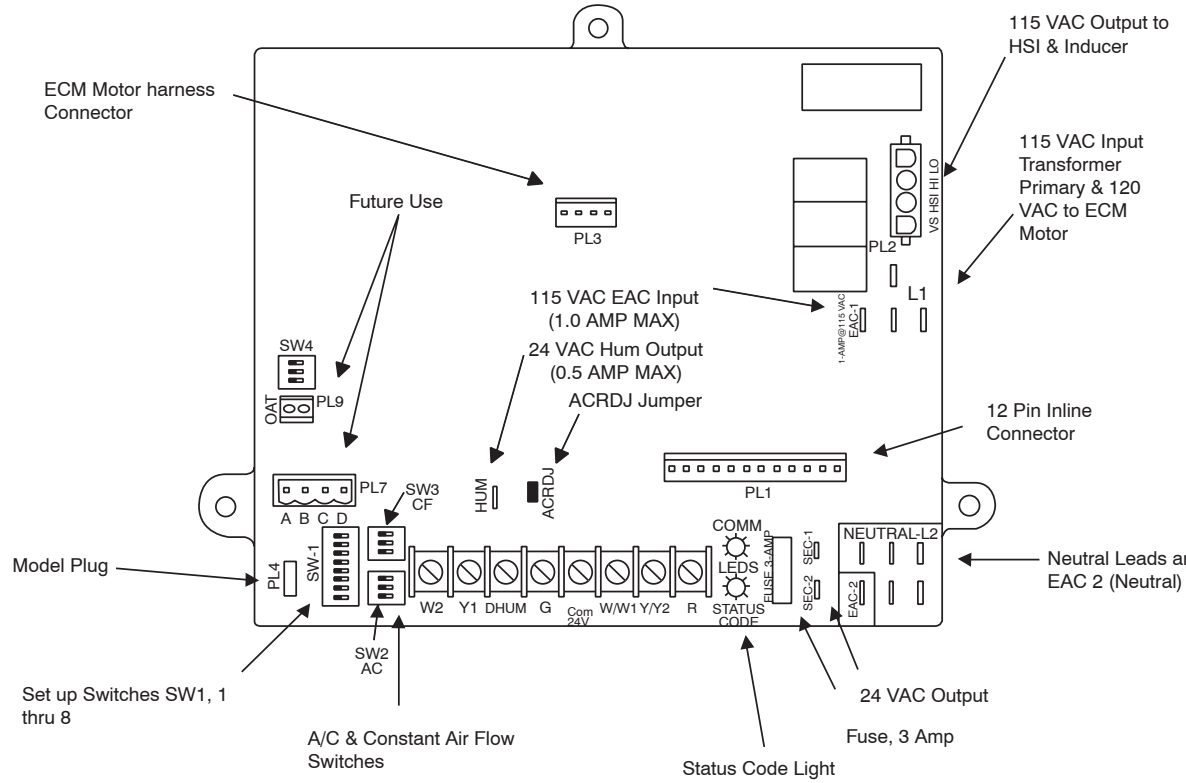
DO NOT bottom out gas-valve regulator-adjusting screw.

NOTE: If orifice hole appears damaged or it is suspected to have been redrilled, check orifice hole with a numbered drill bit of correct size. Never redrill an orifice. A burr-free and squarely aligned orifice hole is essential for proper flame characteristics.



A02017

Fig. 29 – 2-Stage Furnace Control-PSC Blower Motor



A02018

Fig. 30 – Variable Speed Furnace Control-ECM Blower Motor

⚠ CAUTION

UNIT DAMAGE HAZARD

Failure to follow this caution may result excessive burner noise and misdirection of burner flames.

DO NOT redrill burner orifices. Obtain new orifices if orifice size must be changed. (See Fig. 6.)

UNITED STATES

At installation altitudes above 2000 ft. (610M), input must be reduced by 4 percent for each 1000 ft. (305M) above sea level. See Table 10 for derate multiplier factor and example.

CANADA

At installation altitudes from 2000 to 4500 ft. (610 to 1372M), this furnace must be derated 10 percent by an authorized Gas Conversion Station or Dealer. To determine correct input rate for altitude, see example and use 0.90 as derate multiplier factor.

EXAMPLE: (For upflow furnace USA)
100,000 Btuh input furnace installed at 4300 ft.
Furnace Input Rate at Sea Level X Derate Multiplier Factor = Furnace Input Rate at Installation Altitude
100,000 X 0.82 = 82,000

b. Check that gas-valve adjustment caps are in place for proper input to be clocked.

c. Obtain average yearly heat value for local gas supply.

NOTE: Be sure heating value of gas used for calculations is correct for your altitude. Consult local gas utility for altitude adjustment of gas heating value.

d. Check and verify orifice size in furnace. NEVER ASSUME THE ORIFICE SIZE. ALWAYS CHECK AND VERIFY.

e. Turn off all other gas appliances and pilots.

NOTE: Low heat must be adjusted before high heat.

f. Turn the appropriate set-up switch on control center to the ON position. This will lock the furnace in low-heat. (See Fig. 29 or 30.)

(1.) For furnaces with PSC blower motors, turn LHT switch ON to lock the furnace in low heat. (See Fig. 29.)

(2.) For furnaces with ECM blower motors, turn switch SW1-2 ON to lock the furnace in low heat. (See Fig. 30.)

g. Jumper R and W/W1 thermostat connections.

h. Let furnace run for three minutes in low-heat operation.

i. Measure time (in sec) for gas-meter test dial to complete one revolution. Note reading.

j. Refer to Table 5 for cu ft of gas per hr.

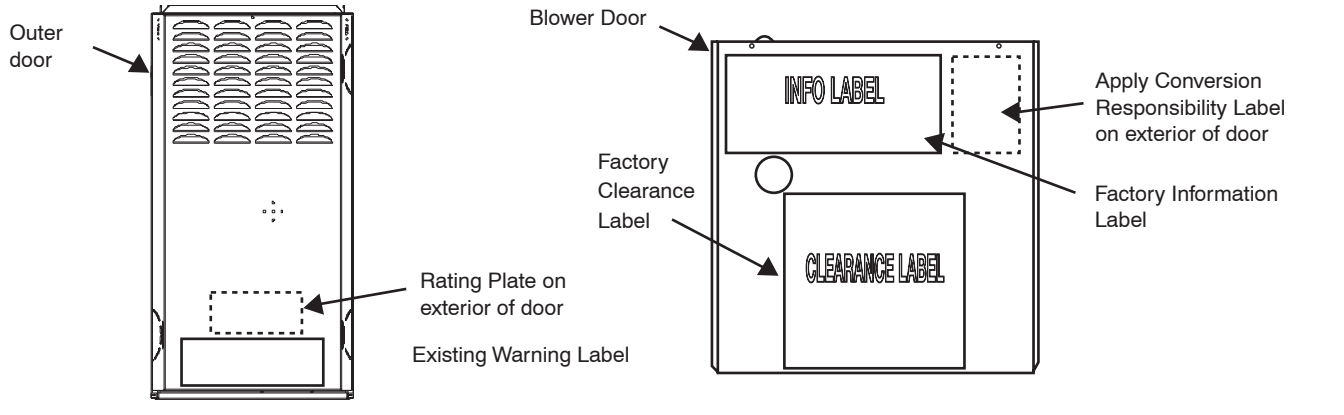
k. Multiply gas rate (cu ft/hr) X heating value (Btu/cu ft).

NOTE: Measured gas input must be within +/- 2 percent of that stated on furnace-rating plate when installed at sea level or derated per that stated above when installed at higher altitudes.

TABLE 10 - ALTITUDE DERATE MULTIPLIER FOR USA

ALTITUDE FT (M)	PERCENT OF DERATE	DERATE MULTIPLIER FACTOR FOR USA*
0–2000 (0–610)	0	1.00
2001–3000 (610–914)	8–12	0.90
3001–4000 (914–1219)	12–16	0.86
4001–5000 (1219–1524)	16–20	0.82
5001–6000 (1524–1829)	20–24	0.78
6001–7000 (1829–2134)	24–28	0.74
7001–8000 (2134–2438)	28–32	0.70
8001–9000 (2438–2743)	32–36	0.66
9001–10,000 (2743–3048)	36–40	0.62

*Derate multiplier factor based on midpoint altitude for altitude range.



A02203

Fig. 31 – Label Application

EXAMPLE: (Low-heat operation for all models at 0-2000 ft. (610M) altitude)
Furnace input for low heat from rating plate is 65,000 Btuh
Btu heating input = Btu/cu ft X cu ft/hr
Heating value of gas = 975 Btu/cu ft
Time for 1 revolution of 2-cu ft dial = 108 sec
Gas rate = 67 cu ft/hr (from Table 5)
Btu heating input = 67 X 975 = 65.325 Btuh
In this example, the orifice size and manifold-pressure adjustment is within +/-2 percent of the furnace

l. l. Jumper R and W2 thermostat connections and repeat items i through l for high-heat operation.

4. Remove jumper across R, W/W1,and W2 thermostat connections to terminate call for heat.
5. Turn setup switch LHT or SW1-2 to OFF position. (See Fig. 29 or 30.)
6. Turn furnace gas-valve-control switch to OFF position.
7. Turn off furnace power supply.
8. Remove manometer and reinstall manifold-pressure tap plug. (See Fig. 25 or 26.)
9. Turn furnace gas-valve-control switch to ON position.
10. Turn on furnace power supply.
11. Set room thermostat to call for heat.
12. Check pressure-tap plug for gas leaks when main burners ignite.
13. Check for correct burner flame. (See Fig. 11.)
14. Observe unit through two complete heating cycles. See sequence of operation in furnace Installation, Start-Up, and Operating Instructions.
15. Set room thermostat to desired temperature.

Step 6 —Label Application

NOTE: See Fig. 31 for label locations and Table 1 for part numbers.

1. Fill in Conversion Responsibility Label (334409-205) and apply inside furnace as shown (Fig. 31). Date, name, and address of organization making this conversion are required.
2. Attach Furnace Conversion Rating Plate (334409-201) on blower shelf.
3. Apply Gas Control Conversion Label:
   a. For 2-Stage gas valve that was converted by replacing regulator springs (Fig. 26), apply label 334409-203.
   b. For 2-Stage gas valve that was adjusted without replacing regulator springs (Fig. 25), apply label 334409-202.
4. Check for correct normal-operating sequence of ignition system as described in furnace Installation, Start-Up, and Operating Instructions.
5. Reinstall main furnace door.

SECTION 4 - FIXED SPEED, INDUCED COMBUSTION NON-CONDENSING FURNACE MODELS 310AAV, 310JAV, 311AAV, 311JAV, 313AAV, 313JAV, 58DLA, 58DLX, 58PHA, 58PHX, 58STA, 58STX, PG8MAA, AND PG8JAA, PG8MEA, PG8JEA

Step 1 —Install Main Burner Orifices

NOTE: See Fig. 32 for component location in upflow orientation. Re-orient component arrangement when furnace is installed in other orientations.

1. Turn off furnace gas and electrical supplies to furnace.
2. Remove main furnace door.
3. Turn furnace gas valve switch to OFF position.
4. Remove gas supply pipe to valve.

⚠ CAUTION

UNIT OPERATION HAZARD

Failure to follow this caution may result in unit damage or improper operation.

Label all wires prior to disconnection when servicing controls.

⚠ CAUTION

ATTENTION: D'EQUIPEMENT DANGER D'OPERATION

Lors des operations d'fentretien des commandes, etiqueter tous les fils avant de les deconnecter. Toute erreur de cablage peut etre une source de danger et de panne.

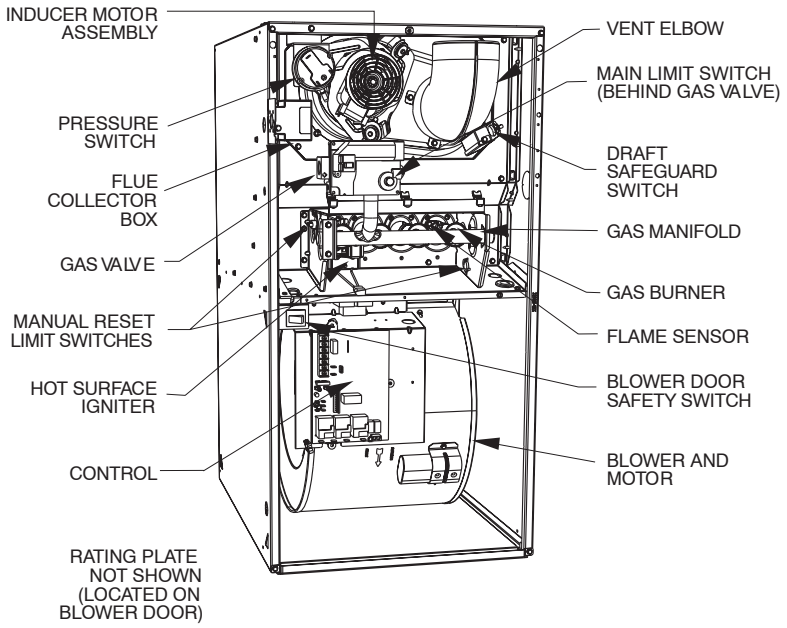
5. Remove wires from gas valve. Note location for re-assembly.
6. Remove two wires from low gas pressure switch (LGPS) located on gas valve.
7. Remove the two screws on the left side that secure the gas manifold to the burner box. Note the location of the green ground wire for reassembly.
8. Swing manifold and orifices out from burners.
9. Slide right side of manifold out of burner box.
10. Remove and discard orifices from manifold.
11. Determine natural gas orifice size for correct input at installed altitude by using Table 11 (non Low NOx models in any position, and Low NOx models in upflow position) or Table 12 (Low NOx models only when in downflow or horizontal position).

Furnace gas-input rate on rating plate is for installations at altitudes up to 2000 ft. (610M). In the USA, the input rating for altitudes above 2000 ft. (610M) must be reduced by 4 percent for each 1000 ft. (305M) above sea level. In Canada, the input rating must be derated by 10 percent for altitudes of 2000 ft. (610M) to 4500 ft. (1372M) above sea level.

a. Obtain yearly heat-value average (at installed altitude) for local gas supply.
b. Obtain yearly specific-gravity average for local gas supply.
c. Verify furnace model. Table 11 or 12 can only be used for 33-in. (838mm) tall, multipoise, fixed-speed, hot-surface ignition, non-condensing furnaces.
d. Find installation altitude in Table 11 or 12.

NOTE: For Canada altitudes of 2000 to 4500 ft. (610 to 1372M), use USA altitudes of 2001 to 3000 ft. (610 to 914M) in Table 11 or 12.

e. Find closest natural gas heat value and specific gravity in Table 11 or 12.
f. Follow heat-value line and specific-gravity line to point of intersection to find orifice size and manifold pressure settings.



A03059

Fig. 32 – Component Location

CONVERSION KIT RATING PLATE - CARRIER CORP.

THIS APPLIANCE HAS BEEN CONVERTED TO USE NATURAL GAS FOR FUEL. REFER TO KIT INSTRUCTIONS FOR CONVERSION PROCEDURES. USE PARTS SUPPLIED BY CARRIER CORPORATION AND INSTALLED BY QUALIFIED PERSONNEL. SEE EXISTING RATING PLATE FOR APPLIANCE MODEL NO. AND INPUT RATING.

NOTE: Furnace gas input rate on rating plate is for installations up to 2000 ft. above sea level. In U.S.A. the input rating for altitudes above 2000 ft. must be derated (per chart below) for each 1000 ft above sea level. In Canada the input rating must be derated (per chart below) for altitudes of 2000 ft. to 4500 ft. above sea level.

KIT NO. KGAPN3901ALL (SUPERSEDES: KGAPN3501ALL, KGAPN3401ALL, KGAPN1601ALL, KGAPN21012SP, KGAPN2201ALL, KGAPN3301ALL) **FUEL USED: NATURAL GAS**

APPLIANCE MODELS	USA % DERATE PER 1000 FT	CANADA % DERATE FOR 2000-4500 FT
352AAV, 352MAV, 355AAV, 355BAV, 355MAV, 58MTA, 58MTB, 58MVB, 58MVP, 58UVB, PG9MXA	2%	5%
312AAV, 312JAV, 315AAV, 315JAV, 58CTA, 58CTX, 58CVQ, 58CVX	4%	10%

NATURAL GAS PRESSURE	IN. W.C. (PO C.E.)	Pa
Max. Inlet Gas Pressure (Press. Max. D'Admission De Gaz)	13.6	3,386
Min. Inlet Gas Pressure (Press. Min. D'Admission De Gaz)	4.5	1,121

(For Purpose of Input Adjustment) (Pour L'Adjustment D'Entree)

	Altitude			
Manifold	0-2,000 ft. (0 - 610 m)	High Heat	3.2 - 3.8	797 - 946
		Low Heat	1.4 - 1.8	349 - 448
Pression Tubulure	2,000 - 10,000 ft (610 - 3050 m)	Refer to installation manual Respecter les instruction D'Installation		

334409-201 REV. A

A08190

Fig. 33 – Conversion Kit Rating Plate - 334409-201

CONVERSION KIT RATING PLATE - CARRIER CORP.

THIS APPLIANCE HAS BEEN CONVERTED TO USE NATURAL GAS FOR FUEL. REFER TO KIT INSTRUCTIONS FOR CONVERSION PROCEDURES. USE PARTS SUPPLIED BY CARRIER CORPORATION AND INSTALLED BY QUALIFIED PERSONNEL. SEE EXISTING RATING PLATE FOR APPLIANCE MODEL NO. AND INPUT RATING.

NOTE: Furnace gas input rate on rating plate is for installations up to 2000 ft. above sea level. In U.S.A. the input rating for altitudes above 2000 ft. must be derated (per chart below) for each 1000 ft above sea level. In Canada the input rating must be derated (per chart below) for altitudes of 2000 ft. to 4500 ft. above sea level.

KIT NO. KGAPN3901ALL (SUPERSEDES: KGAPN3501ALL, KGAPN3401ALL, KGAPN1601ALL, KGAPN21012SP, KGAPN2201ALL, KGAPN3301ALL) **FUEL USED: NATURAL GAS**

APPLIANCE MODELS	USA % DERATE PER 1000 FT	CANADA % DERATE FOR 2000-4500 FT
340AAV, 340MAV, 345MAV, 350AAV, 350MAV, 353AAV, 58MCA, 58MCB, 58MEB, 58MSA, 58MXA, 58MXB, PG9MAA, PG9MAB	2%	5%
310AAV, 310JAV, 311AAV, 311JAV, 313AAV, 313JAV, 58PHA, 58PHX, 58DLA, 58DLX, 58STA, 58STX, PG8MAA, PG8JAA, PG8MEA, PG8JEA	4%	10%

NATURAL GAS PRESSURE	IN. W.C. (PO C.E.)	Pa
Max. Inlet Gas Pressure (Press. Max. D'Admission De Gaz)	13.6	3,386
Min. Inlet Gas Pressure (Press. Min. D'Admission De Gaz)	4.5	1,121

(For Purpose of Input Adjustment) (Pour L'Adjustment D'Entree)

	Altitude		
Manifold Pressure	0-2,000 ft. (0 - 610 m)	3.2 - 3.8	797 - 946
Pression Tubulure	2,000 - 10,000 ft (610 - 3050 m)	Refer to installation manual Respecter les instruction D'Installation	

334409-204 REV. B

A08189

Fig. 34 – Conversion Kit Rating Plate - 334409-204

TABLE 11 - ORIFICE SIZE* AND MANIFOLD PRESSURE FOR GAS INPUT RATE

(TABULATED DATA BASED ON 22,000 BTUH PER BURNER, DERATED 4%/1000 FT (305M) ABOVE SEA LEVEL)

ALTITUDE RANGE ft (m)		AVG. GAS HEAT VALUE AT ALTITUDE (Btu/cu ft)	SPECIFIC GRAVITY OF NATURAL GAS							
			0.58		0.60		0.62		0.64	
			Orifice No.	Manifold Pressure	Orifice No.	Manifold Pressure	Orifice No.	Manifold Pressure	Orifice No.	Manifold Pressure
U.S.A. and Canada		900	42	3.5	42	3.6	42	3.7	41	3.5
	0	925	42	3.3	42	3.4	42	3.5	42	3.7
	(0)	950	**43**	**3.8**	42	3.3	42	3.4	42	3.5
		975	**43**	**3.6**	**43**	**3.8**	42	3.2	42	3.3
	to	1000	**43**	**3.5**	**43**	**3.6**	**43**	**3.7**	**43**	**3.8**
		1025	**43**	**3.3**	**43**	**3.4**	**43**	**3.5**	**43**	**3.6**
	2000	1050	44	3.6	**43**	**3.2**	**43**	**3.4**	**43**	**3.5**
	(610)	1075	44	3.4	44	3.5	**43**	**3.2**	**43**	**3.3**
		1100	44	3.3	44	3.4	44	3.5	**43**	**3.2**
U.S.A. and Canada	U.S.A.	800	42	3.4	42	3.5	42	3.6	42	3.7
	2001 (611)	825	42	3.2	42	3.3	42	3.4	42	3.5
	to	850	**43**	**3.7**	**43**	**3.8**	42	3.2	42	3.3
	3000 (914)	875	**43**	**3.5**	**43**	**3.6**	**43**	**3.7**	**43**	**3.8**
		900	**43**	**3.3**	**43**	**3.4**	**43**	**3.5**	**43**	**3.6**
	Canada	925	**43**	**3.1**	**43**	**3.2**	**43**	**3.3**	**43**	**3.4**
	2001 (611)	950	**43**	**2.9**	**43**	**3.0**	**43**	**3.1**	**43**	**3.2**
	to	975	**43**	**2.8**	**43**	**2.9**	**43**	**3.0**	**43**	**3.1**
	4500 (1372)	1000	**43**	**2.6**	**43**	**2.7**	**43**	**2.8**	**43**	**2.9**
U.S.A. Only		775	42	3.2	42	3.3	42	3.4	42	3.5
	3001	800	**43**	**3.6**	**43**	**3.8**	42	3.2	42	3.3
	(915)	825	**43**	**3.4**	**43**	**3.5**	**43**	**3.7**	**43**	**3.8**
	to	850	**43**	**3.2**	**43**	**3.3**	**43**	**3.4**	**43**	**3.6**
		875	**43**	**3.0**	**43**	**3.1**	**43**	**3.3**	**43**	**3.4**
	4000	900	**43**	**2.9**	**43**	**3.0**	**43**	**3.1**	**43**	**3.2**
	(1219)	925	**43**	**2.7**	**43**	**2.8**	**43**	**2.9**	**43**	**3.0**
		950	**43**	**2.6**	**43**	**2.7**	**43**	**2.8**	**43**	**2.8**
U.S.A. Only		750	**43**	**3.6**	**43**	**3.8**	42	3.2	42	3.3
	4001	775	**43**	**3.4**	**43**	**3.5**	**43**	**3.6**	**43**	**3.8**
	(1220)	800	**43**	**3.2**	**43**	**3.3**	**43**	**3.4**	**43**	**3.5**
	to	825	**43**	**3.0**	**43**	**3.1**	**43**	**3.2**	**43**	**3.3**
		850	**43**	**2.8**	**43**	**2.9**	**43**	**3.0**	**43**	**3.1**
	5000	875	**43**	**2.7**	**43**	**2.8**	**43**	**2.9**	**43**	**2.9**
	(1524)	900	**43**	**2.5**	**43**	**2.6**	**43**	**2.7**	**43**	**2.8**
		925	**43**	**2.4**	**43**	**2.5**	**43**	**2.6**	**43**	**2.6**
U.S.A. Only		725	**43**	**3.4**	**43**	**3.5**	**43**	**3.6**	**43**	**3.7**
	5001	750	**43**	**3.2**	**43**	**3.3**	**43**	**3.4**	**43**	**3.5**
	(1525)	775	**43**	**3.0**	**43**	**3.1**	**43**	**3.2**	**43**	**3.3**
	to	800	**43**	**2.8**	**43**	**2.9**	**43**	**3.0**	**43**	**3.1**
		825	**43**	**2.6**	**43**	**2.7**	**43**	**2.8**	**43**	**2.9**
	6000	850	**43**	**2.5**	**43**	**2.5**	**43**	**2.6**	**43**	**2.7**
	(1829)	875	**43**	**2.3**	**43**	**2.4**	**43**	**2.5**	**43**	**2.6**
		900	**43**	**2.2**	**43**	**2.3**	**43**	**2.3**	**43**	**2.4**
U.S.A. Only		675	**43**	**3.4**	**43**	**3.5**	**43**	**3.6**	**43**	**3.7**
	6001	700	**43**	**3.1**	**43**	**3.3**	**43**	**3.4**	**43**	**3.5**
	(1830)	725	**43**	**2.9**	**43**	**3.0**	**43**	**3.1**	**43**	**3.2**
	to	750	**43**	**2.7**	**43**	**2.8**	**43**	**2.9**	**43**	**3.0**
		775	**43**	**2.6**	**43**	**2.7**	**43**	**2.7**	**43**	**2.8**
	7000	800	**43**	**2.4**	**43**	**2.5**	**43**	**2.6**	**43**	**2.7**
	(2133)	825	**43**	**2.3**	**43**	**2.3**	**43**	**2.4**	**43**	**2.5**
		850	**43**	**2.1**	**43**	**2.2**	**43**	**2.3**	**43**	**2.4**

A08220

TABLE 11 - ORIFICE SIZE* AND MANIFOLD PRESSURE FOR GAS INPUT RATE

(TABULATED DATA BASED ON 22,000 BTUH PER BURNER, DERATED 4%/1000 FT (305M) ABOVE SEA LEVEL)

ALTITUDE RANGE ft (m)		AVG. GAS HEAT VALUE AT ALTITUDE (Btu/cu ft)	SPECIFIC GRAVITY OF NATURAL GAS							
			0.58		0.60		0.62		0.64	
			Orifice No.	Manifold Pressure	Orifice No.	Manifold Pressure	Orifice No.	Manifold Pressure	Orifice No.	Manifold Pressure
U.S.A. Only	7001 (2134) to 8000 (2438)	650	**43**	**3.1**	**43**	**3.2**	**43**	**3.4**	**43**	**3.5**
		675	**43**	**2.9**	**43**	**3.0**	**43**	**3.1**	**43**	**3.2**
		700	**43**	**2.7**	**43**	**2.8**	**43**	**2.9**	**43**	**3.0**
		725	**43**	**2.5**	**43**	**2.6**	**43**	**2.7**	**43**	**2.8**
		750	**43**	**2.4**	**43**	**2.4**	**43**	**2.5**	**43**	**2.6**
		775	**43**	**2.2**	**43**	**2.3**	**43**	**2.4**	**43**	**2.4**
		800	**43**	**2.1**	**43**	**2.1**	**43**	**2.2**	**43**	**2.3**
		825	48	3.7	**43**	**2.0**	**43**	**2.1**	**43**	**2.2**
U.S.A. Only	8001 (2439) to 9000 (2743)	625	**43**	**2.9**	**43**	**3.0**	**43**	**3.1**	**43**	**3.2**
		650	**43**	**2.7**	**43**	**2.8**	**43**	**2.9**	**43**	**3.0**
		675	**43**	**2.5**	**43**	**2.6**	**43**	**2.7**	**43**	**2.8**
		700	**43**	**2.3**	**43**	**2.4**	**43**	**2.5**	**43**	**2.6**
		725	**43**	**2.2**	**43**	**2.2**	**43**	**2.3**	**43**	**2.4**
		750	**43**	**2.0**	**43**	**2.1**	**43**	**2.2**	**43**	**2.2**
		775	48	3.6	48	3.7	**43**	**2.0**	**43**	**2.1**
U.S.A. Only	9001 (2744) to 10000 (3048)	600	**43**	**2.7**	**43**	**2.8**	**43**	**2.9**	**43**	**3.0**
		625	**43**	**2.5**	**43**	**2.6**	**43**	**2.6**	**43**	**2.7**
		650	**43**	**2.3**	**43**	**2.4**	**43**	**2.4**	**43**	**2.5**
		675	**43**	**2.1**	**43**	**2.2**	**43**	**2.3**	**43**	**2.3**
		700	48	3.7	**43**	**2.0**	**43**	**2.1**	**43**	**2.2**
		725	48	3.5	48	3.6	48	3.7	**43**	**2.0**

* Orifice numbers shown in **BOLD** are factory-installed.

A08220a

EXAMPLE: (Using Table 11 at 0–2000 ft. (610M) altitude)
Heat value = 1050 Btu/cu ft
Specific gravity = 0.62
Therefore: Orifice No. 43 is required

12. Install main burner orifices. Do not use Teflon tape. Finger-tighten orifices at least one full turn to prevent cross-threading, then tighten with wrench. There are enough orifices in each kit for the largest furnace. Discard extra orifices. Orifices of other sizes must be field supplied and are available through your local distributor.

⚠ CAUTION

UNIT DAMAGE HAZARD

Failure to follow this caution may result excessive burner noise and misdirection of burner flames.

DO NOT redrill burner orifices. Improper drilling may result in burrs, out-of-round holes, etc. Obtain new orifices if orifice size must be changed. (See Fig. 6.)

NOTE: DO NOT reinstall the manifold, orifices, and gas-valve assembly at this time.

A. Remove the Spoiler Screws from the Burners

1. Disconnect the hot surface igniter from harness.
2. Disconnect flame sensor from harness.
3. Slide burner assembly out of burner enclosure.
4. Remove 1/4-in. spoiler screws from burners.

NOTE: It is not necessary to plug the hole in the burner when screws are removed.

5. Slide burner assembly into slot on burner enclosure, making sure it is fully seated forward in the enclosure.
6. Reconnect igniter and flame sensor.

B. Install NOx Baffles (where required)

The following models must have NOx baffles installed. NOx baffles are not included in this kit and must be ordered separately or reused if retained from original conversion to propane.

58STX	310JAV	PG8JAA
58DLX	311JAV	– –
58PHX	313JAV	PG8JEA

1. Remove the 1/4-in. screw from the hole in the heat exchanger cell panel directly below each heat exchanger inlet.
2. Insert the NOx baffle into each heat exchanger inlet. (Fig. 27.)
3. Align the baffle mounting tab with the hole in the cell panel.
4. Insert the 1/4-in. screw through the NOx baffle mounting tab and into the hole in the heat exchanger cell panel.
5. Tighten the screw securely.
6. Repeat the procedure for each heat exchanger inlet. (See Fig. 27.)
7. Remove low-gas-pressure switch (LGPS), street elbow, and 1/8-in. tee from gas-valve inlet-pressure tap. (See Fig. 35.)

NOTE: Use propane-gas-resistant pipe dope on all connections to prevent gas leaks. DO NOT use Teflon tape.

8. Apply pipe dope sparingly to 1/8-in. pipe plug (provided in kit) and install in 1/8-in. tapped inlet-pressure tap opening in gas valve.
9. Insert right end of manifold in right side of burner box. Swing manifold into burners and insert orifices into burners. Ensure that manifold orifices are fully inserted and the burners fit over each orifice.

TABLE 12 - ORIFICE SIZE* AND MANIFOLD PRESSURE FOR GAS INPUT RATE

(TABULATED DATA BASED ON 21,000 BTUH PER BURNER, DERATED 4%/1000 FT (305M) ABOVE SEA LEVEL)

ALTITUDE RANGE ft (m)		AVG. GAS HEAT VALUE AT ALTITUDE (Btu/cu ft)	SPECIFIC GRAVITY OF NATURAL GAS							
			0.58		0.60		0.62		0.64	
			Orifice No.	Manifold Pressure	Orifice No.	Manifold Pressure	Orifice No.	Manifold Pressure	Orifice No.	Manifold Pressure
U.S.A. and Canada		900	42	3.2	42	3.3	42	3.4	42	3.5
	0	925	**43**	**3.7**	**43**	**3.8**	42	3.2	42	3.3
	(0)	950	**43**	**3.5**	**43**	**3.6**	**43**	**3.7**	**43**	**3.8**
		975	**43**	**3.3**	**43**	**3.4**	**43**	**3.5**	**43**	**3.7**
	to	1000	44	3.6	**43**	**3.3**	**43**	**3.4**	**43**	**3.5**
		1025	44	3.4	44	3.6	**43**	**3.2**	**43**	**3.3**
	2000	1050	44	3.3	44	3.4	44	3.5	**43**	**3.2**
	(610)	1075	45	3.8	44	3.2	44	3.3	44	3.4
		1100	46	3.8	45	3.7	44	3.2	44	3.3
U.S.A. and Canada	U.S.A.	800	**43**	**3.8**	42	3.2	42	3.3	42	3.4
	2001 (611)	825	**43**	**3.5**	**43**	**3.7**	**43**	**3.8**	42	3.2
	to	850	**43**	**3.3**	**43**	**3.5**	**43**	**3.6**	**43**	**3.7**
	3000 (914)	875	**43**	**3.2**	**43**	**3.3**	**43**	**3.4**	**43**	**3.5**
		900	**43**	**3.0**	**43**	**3.1**	**43**	**3.2**	**43**	**3.3**
	Canada	925	**43**	**2.8**	**43**	**2.9**	**43**	**3.0**	**43**	**3.1**
	2001 (611)	950	**43**	**2.7**	**43**	**2.8**	**43**	**2.9**	**43**	**2.9**
	to	975	**43**	**2.5**	**43**	**2.6**	**43**	**2.7**	**43**	**2.8**
	4500 (1372)	1000	**43**	**2.4**	**43**	**2.5**	**43**	**2.6**	**43**	**2.7**
U.S.A. Only		775	**43**	**3.5**	**43**	**3.7**	**43**	**3.8**	42	3.2
	3001	800	**43**	**3.3**	**43**	**3.4**	**43**	**3.5**	**43**	**3.7**
	(915)	825	**43**	**3.1**	**43**	**3.2**	**43**	**3.3**	**43**	**3.4**
	to	850	**43**	**2.9**	**43**	**3.0**	**43**	**3.1**	**43**	**3.2**
		875	**43**	**2.8**	**43**	**2.9**	**43**	**3.0**	**43**	**3.1**
	4000	900	**43**	**2.6**	**43**	**2.7**	**43**	**2.8**	**43**	**2.9**
	(1219)	925	**43**	**2.5**	**43**	**2.6**	**43**	**2.7**	**43**	**2.7**
		950	**43**	**2.4**	**43**	**2.4**	**43**	**2.5**	**43**	**2.6**
U.S.A. Only		750	**43**	**3.3**	**43**	**3.4**	**43**	**3.5**	**43**	**3.6**
	4001	775	**43**	**3.1**	**43**	**3.2**	**43**	**3.3**	**43**	**3.4**
	(1220)	800	**43**	**2.9**	**43**	**3.0**	**43**	**3.1**	**43**	**3.2**
	to	825	**43**	**2.7**	**43**	**2.8**	**43**	**2.9**	**43**	**3.0**
		850	**43**	**2.6**	**43**	**2.7**	**43**	**2.8**	**43**	**2.8**
	5000	875	**43**	**2.4**	**43**	**2.5**	**43**	**2.6**	**43**	**2.7**
	(1524)	900	**43**	**2.3**	**43**	**2.4**	**43**	**2.5**	**43**	**2.5**
		925	**43**	**2.2**	**43**	**2.2**	**43**	**2.3**	**43**	**2.4**
U.S.A. Only		725	**43**	**3.1**	**43**	**3.2**	**43**	**3.3**	**43**	**3.4**
	5001	750	**43**	**2.9**	**43**	**3.0**	**43**	**3.1**	**43**	**3.2**
	(1525)	775	**43**	**2.7**	**43**	**2.8**	**43**	**2.9**	**43**	**3.0**
	to	800	**43**	**2.5**	**43**	**2.6**	**43**	**2.7**	**43**	**2.8**
		825	**43**	**2.4**	**43**	**2.5**	**43**	**2.5**	**43**	**2.6**
	6000	850	**43**	**2.2**	**43**	**2.3**	**43**	**2.4**	**43**	**2.5**
	(1829)	875	**43**	**2.1**	**43**	**2.2**	**43**	**2.3**	**43**	**2.3**
		900	**43**	**2.0**	**43**	**2.1**	**43**	**2.1**	**43**	**2.2**
U.S.A. Only		675	**43**	**3.1**	**43**	**3.2**	**43**	**3.3**	**43**	**3.4**
	6001	700	**43**	**2.9**	**43**	**3.0**	**43**	**3.1**	**43**	**3.2**
	(1830)	725	**43**	**2.7**	**43**	**2.8**	**43**	**2.9**	**43**	**2.9**
	to	750	**43**	**2.5**	**43**	**2.6**	**43**	**2.7**	**43**	**2.8**
		775	**43**	**2.3**	**43**	**2.4**	**43**	**2.5**	**43**	**2.6**
	7000	800	**43**	**2.2**	**43**	**2.3**	**43**	**2.3**	**43**	**2.4**
	(2133)	825	**43**	**2.1**	**43**	**2.1**	**43**	**2.2**	**43**	**2.3**
		850	48	3.7	**43**	**2.0**	**43**	**2.1**	**43**	**2.1**

A08221

TABLE 12 - ORIFICE SIZE* AND MANIFOLD PRESSURE FOR GAS INPUT RATE

(TABULATED DATA BASED ON 21,000 BTUH PER BURNER, DERATED 4%/1000 FT (305M) ABOVE SEA LEVEL)

ALTITUDE RANGE ft (m)		AVG. GAS HEAT VALUE AT ALTITUDE (Btu/cu ft)	SPECIFIC GRAVITY OF NATURAL GAS							
			0.58		0.60		0.62		0.64	
			Orifice No.	Manifold Pressure	Orifice No.	Manifold Pressure	Orifice No.	Manifold Pressure	Orifice No.	Manifold Pressure
U.S.A. Only		**650**	**43**	**2.9**	**43**	**3.0**	**43**	**3.1**	**43**	**3.2**
	7001	**675**	**43**	**2.7**	**43**	**2.7**	**43**	**2.8**	**43**	**2.9**
	(2134)	**700**	**43**	**2.5**	**43**	**2.6**	**43**	**2.6**	**43**	**2.7**
	to	**725**	**43**	**2.3**	**43**	**2.4**	**43**	**2.5**	**43**	**2.5**
		750	**43**	**2.1**	**43**	**2.2**	**43**	**2.3**	**43**	**2.4**
	8000	**775**	**43**	**2.0**	**43**	**2.1**	**43**	**2.2**	**43**	**2.2**
	(2438)	**800**	48	3.6	48	3.7	**43**	**2.0**	**43**	**2.1**
		825	48	3.3	48	3.5	48	3.6	48	3.7
U.S.A. Only		**625**	**43**	**2.7**	**43**	**2.7**	**43**	**2.8**	**43**	**2.9**
	8001	**650**	**43**	**2.5**	**43**	**2.5**	**43**	**2.6**	**43**	**2.7**
	(2439)	**675**	**43**	**2.3**	**43**	**2.4**	**43**	**2.4**	**43**	**2.5**
	to	**700**	**43**	**2.1**	**43**	**2.2**	**43**	**2.3**	**43**	**2.3**
		725	48	3.7	**43**	**2.0**	**43**	**2.1**	**43**	**2.2**
	9000	**750**	48	3.5	48	3.6	48	3.7	**43**	**2.0**
	(2743)	**775**	49	3.8	48	3.4	48	3.5	48	3.6
U.S.A. Only		**600**	**43**	**2.4**	**43**	**2.5**	**43**	**2.6**	**43**	**2.7**
	9001	**625**	**43**	**2.3**	**43**	**2.3**	**43**	**2.4**	**43**	**2.5**
	(2744)	**650**	**43**	**2.1**	**43**	**2.2**	**43**	**2.2**	**43**	**2.3**
	to	**675**	48	3.6	48	3.8	**43**	**2.1**	**43**	**2.1**
		700	48	3.4	48	3.5	48	3.6	48	3.7
	10000	**725**	49	3.7	49	3.8	48	3.4	48	3.5
	(3048)									

* Orifice numbers shown in **BOLD** are factory-installed.

10. Secure manifold to left side of burner rack with the two previously removed screws. Verify that the green ground wire is attached between the top screw and the manifold in the correct location.

NOTE: Failure to connect green ground wire will result in the loss of flame signal and result in a NO Heat condition.

11. Reconnect wires to gas valve. See wiring label on furnace to ensure proper location of wires.
12. Rewire unit low pressure switch LPS as follows:
    a. Trace one of the yellow wires previously disconnected from the LGPS back to the NO terminal of the LPS. Disconnect this wire from the LPS and discard.
    b. Trace the other yellow wire previously disconnected from the LGPS back to the furnace wire harness.
    c. Connect the yellow wire of the furnace wire harness (see "b" above) to the NO terminal of the LPS.
    d. Refer to wiring label on the furnace to ensure proper location of wires.
13. Reinstall gas-supply pipe to gas valve using backup wrench on gas valve to prevent rotation and improper orientation.

NOTE: Use propane-gas-resistant pipe dope to prevent gas leaks. DO NOT use Teflon tape.

Step 2 —Convert Gas Valve

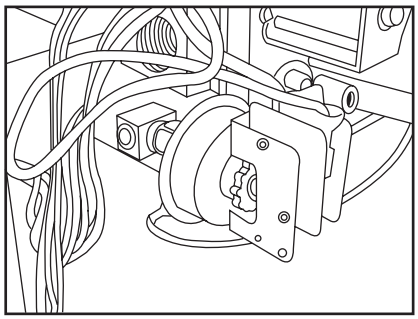
1. Be sure main gas and electrical supplies to furnace are off.
2. Remove regulator seal cap. (See Fig 36, 37, or 38.)
3. Remove adjustment screw and propane gas regulator spring (white).
4. Install natural gas regulator spring (silver-10 turns) into gas valve.

NOTE: DO NOT reinstall regulator seal cap at this time.

Step 3 —Check Inlet Gas Pressure

A08221a

NOTE: This kit is to be used only when inlet gas pressure is between 4.5-in. wc and 13.6-in. wc.



A02211

Fig. 35 – LGPS Installed

⚠ CAUTION

UNIT DAMAGE HAZARD

Failure to follow this caution may result in flame rollout, overheating the heat exchangers, etc. and reduce unit life.

DO NOT operate furnace more than one minute to check inlet gas pressure as conversion is not complete at this time.

1. Be sure gas and electric supplies to furnace are off.
2. Remove 1/8-in. pipe plug from inlet pressure tap on gas valve. (See Fig. 36, 37, or 38.)
3. Attach manometer to inlet pressure tap on furnace gas valve.
4. Turn gas supply manual shutoff valve to ON position.

5. Turn furnace gas valve control switch/knob to ON position.
6. Turn on furnace power supply.
7. Jumper R and W thermostat connections to call for heat.
8. When main burners ignite, confirm inlet gas pressure is between 4.5-in. wc and 13.6-in. wc.
9. Remove jumper across R and W thermostat connections to terminate call for heat.
10. Turn furnace gas valve control switch to OFF position.
11. Turn gas supply manual shutoff valve to OFF position.
12. Turn off furnace power supply.
13. Remove manometer and reinstall gas valve inlet pressure tap plug.

NOTE: Use propane-gas-resistant pipe dope to prevent gas leaks. DO NOT use Teflon tape.

Step 4 —Check Furnace Operation and Make Necessary Adjustments

1. Be sure main gas and electrical supplies to furnace are off.
2. Remove 1/8-in. pipe plug from manifold pressure tap on gas valve. (See Fig. 36, 37, or 38.)
3. Attach manometer to manifold pressure tap on gas valve (See Fig. 36, 37, or 38.)
4. Turn gas supply manual shutoff valve to ON position.
5. Turn furnace gas valve control switch to ON position.

⚠ WARNING

FIRE AND EXPLOSION HAZARD

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

Never test for gas leaks with an open flame. Use a commercially available soap solution made specifically for the detection of leaks to check all connections.

6. Check all threaded pipe connections for gas leaks.
7. Turn on furnace power supply.
8. Jumper R and W thermostat connections to call for heat.
9. When main burners ignite, check manifold orifices for gas leaks.

Step 5 —Set Gas Input Rate

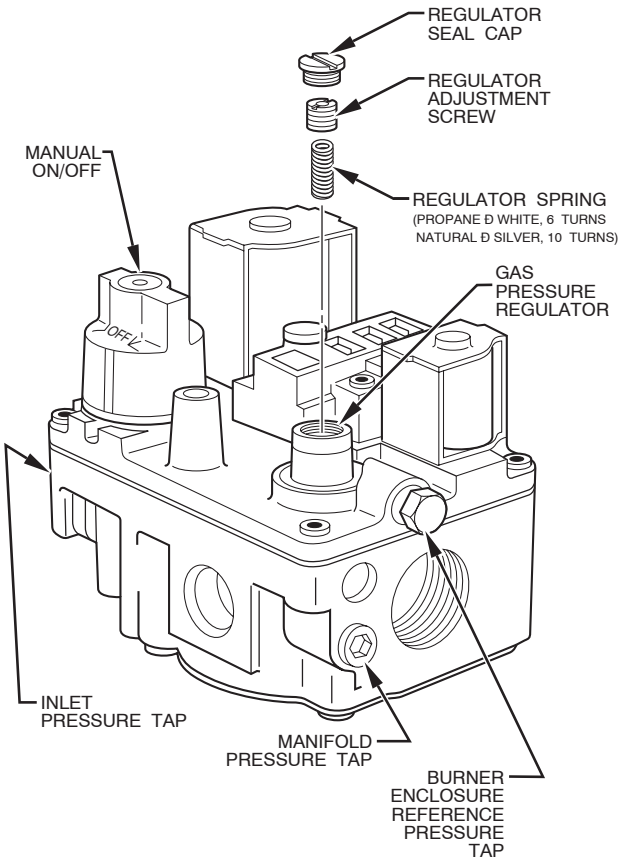
Furnace gas input rate on rating plate is for installations at altitudes up to 2000 ft. (610M). (See Fig. 34.) In the USA, the input rating for altitudes above 2000 ft. (610M) must be reduced by 4 percent for each 1000 ft. (305M) above sea level. In Canada, the input rating must be derated by 10 percent for altitudes of 2000 ft. (610M) to 4500 ft. (1372M) above sea level. Furnace input rate must be within +/-2 percent of input on furnace rating plate.

1. Determine natural gas orifice size and manifold pressure for correct input using Table 11 or 12.
   a. Obtain yearly heat value average (at installed altitude) from local gas supplier.
   b. Obtain yearly specific gravity average from local gas supplier.
   c. Verify furnace model. Table 11 or 12 can only be used for 33-in tall; multipoise, fixed-speed, hot-surface ignition, non-condensing furnaces.
   d. Find installation altitude in Table 11 or 12.

NOTE: For Canada altitudes of 2000 to 4500 ft. (610 to 1372M), use USA altitudes of 2001 to 3000 ft. (610 to 914M) in Table 11 or 12.

EXAMPLE: (Using Table 11 at 0-2000 ft. (610M) altitude)
Heat value = 1050 Btu/cu ft
Specific gravity = 0.62
Therefore: Orifice No. 43 is required, Manifold pressure 3.4-in. wc

   e. Find closest natural gas heat value and specific gravity in Table 11 or 12.



A05221

Fig. 36 – Single Stage Gas Valve (With Manual Control Knob), Series E

   f. Follow heat value and specific gravity lines to point of intersection to find orifice size and manifold pressure settings for proper operation.
   g. Check and verify burner orifice size in furnace. NEVER ASSUME ORIFICE SIZE. ALWAYS CHECK AND VERIFY.

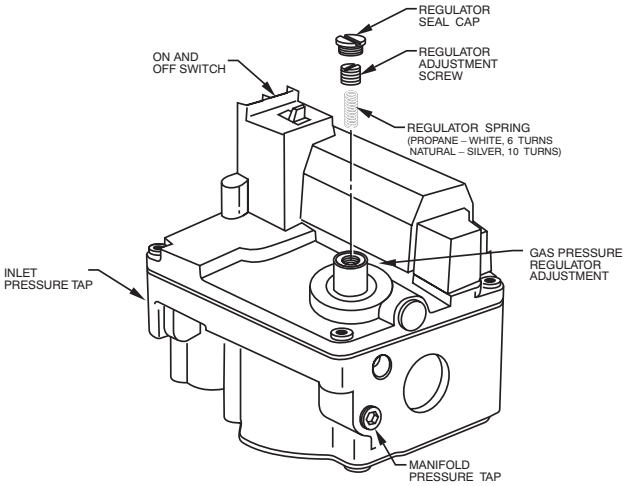
⚠ CAUTION

UNIT DAMAGE HAZARD

Failure to follow this caution may result in excessive burner noise and misdirection of burner flames.

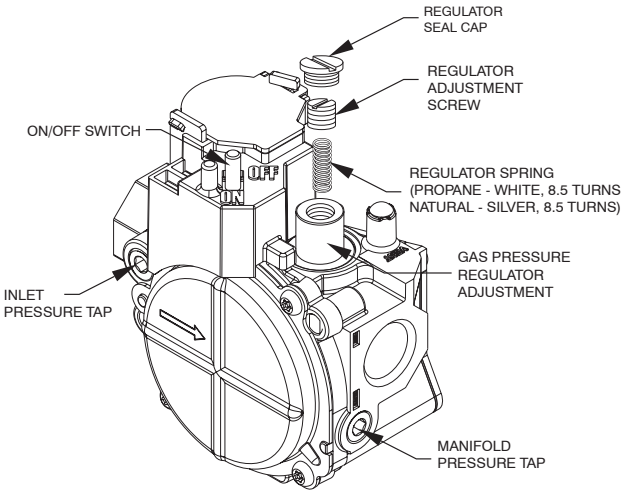
DO NOT redrill burner orifices. Obtain new orifices if orifice size must be changed. (See Fig. 6.)

2. Adjust manifold pressure to obtain input rate.
   a. Remove regulator adjustment seal cap. (See Fig. 36, 37, or 38.)
   b. Turn adjusting screw counterclockwise (out) to decrease input rate or clockwise (in) to increase input rate.



A01073

Fig. 37 – Single Stage Gas Valve, Series F



A04112

Fig. 38 – Single Stage Gas Valve, Series G/J

⚠ CAUTION

FURNACE RELIABILITY HAZARD

Failure to follow this caution may result in unregulated manifold pressure and excess overfire and heat exchanger failures.

DO NOT bottom out gas-valve regulator-adjusting screw.

NOTE: If orifice hole appears damaged or it is suspected to have been redrilled, check orifice hole with a numbered drill bit of correct size. Never redrill an orifice. A burr-free and squarely aligned orifice hole is essential for proper flame characteristics.

NOTE: DO NOT set manifold pressure less than 3.2-in. wc or more than 3.8-in. wc for natural gas. If manifold pressure is outside this range, change main-burner orifices.

c. When correct input is obtained, replace valve regulator adjustment caps and verify adjusted gas input using method outlined in item 3. below.

d. Main-burner flame should be clear blue, almost transparent. (See Fig. 11.)

e. Remove jumper across R-W thermostat connections.

3. Verify natural-gas-input rate by clocking gas meter.

a. Calculate high-altitude adjustment (if required).

UNITED STATES

At installation altitudes above 2000 ft. (610M), the input rate must be reduced by 4 percent for each 1000 ft. (305M) above sea level. See Table 11 for derate multiplier factor and example.

CANADA

At installation altitudes from 2000 to 4500 ft. (610 to 1372M), this furnace must be derated 10 percent by an authorized Gas Conversion Station or Dealer. To determine correct input rate for altitude, see example and use 0.90 as derate multiplier factor.

EXAMPLE: (For upflow furnace) USA
100,000 Btuh input furnace installed at 4300 ft.
Furnace Input Rate at Sea Level X Derate Multiplier Factor = Furnace Input Rate at Installation Altitude
100,000 X 0.82 = 82,000

b. Check that gas-valve adjustment caps are in place for proper input to be clocked.

c. Obtain average yearly heat value for local gas supply.

NOTE: Be sure heating value of gas used for calculations is correct for your altitude. Consult local gas utility for altitude adjustment of gas heating value.

d. Check and verify orifice size in furnace. NEVER ASSUME THE ORIFICE SIZE. ALWAYS CHECK AND VERIFY.

e. Turn off all other gas appliances and pilots.

f. Jumper R and W thermostat connections. (See Fig. 39 or 40.)

g. Let furnace run for three minutes.

h. Measure time (in sec) for gas-meter test dial to complete one revolution. Note reading.

i. Refer to Table 5 for cu ft of gas per hr.

j. Multiply gas rate (cu ft/hr) X heating value (Btu/cu ft).

EXAMPLE: Operation for all models at 0-2000 ft. (610M) altitude)
Furnace input from rating plate is 66,000 Btuh
Btu heating input = Btu/cu ft X cu ft/hr
Heating value of gas = 975 Btu/cu ft
Time for 1 revolution of 2-cu ft dial = 108 sec
Gas rate = 67 cu ft/hr (from Table 15)
Btu heating input = 67 x 975 = 65,325 Btuh
In this example, the orifice size and manifold-pressure is within +/- 2 percent of the furnace input rate.

NOTE: Measured gas input must be within +/- 2 percent of that stated on furnace-rating plate when installed at sea level or derated per that stated above when installed at higher altitudes.

4. Remove jumper across R, W thermostat connections to terminate call for heat.

5. Turn off furnace power supply.

6. Remove manometer and reinstall manifold-pressure tap plug. (See Fig. 36, 37, or 38.)

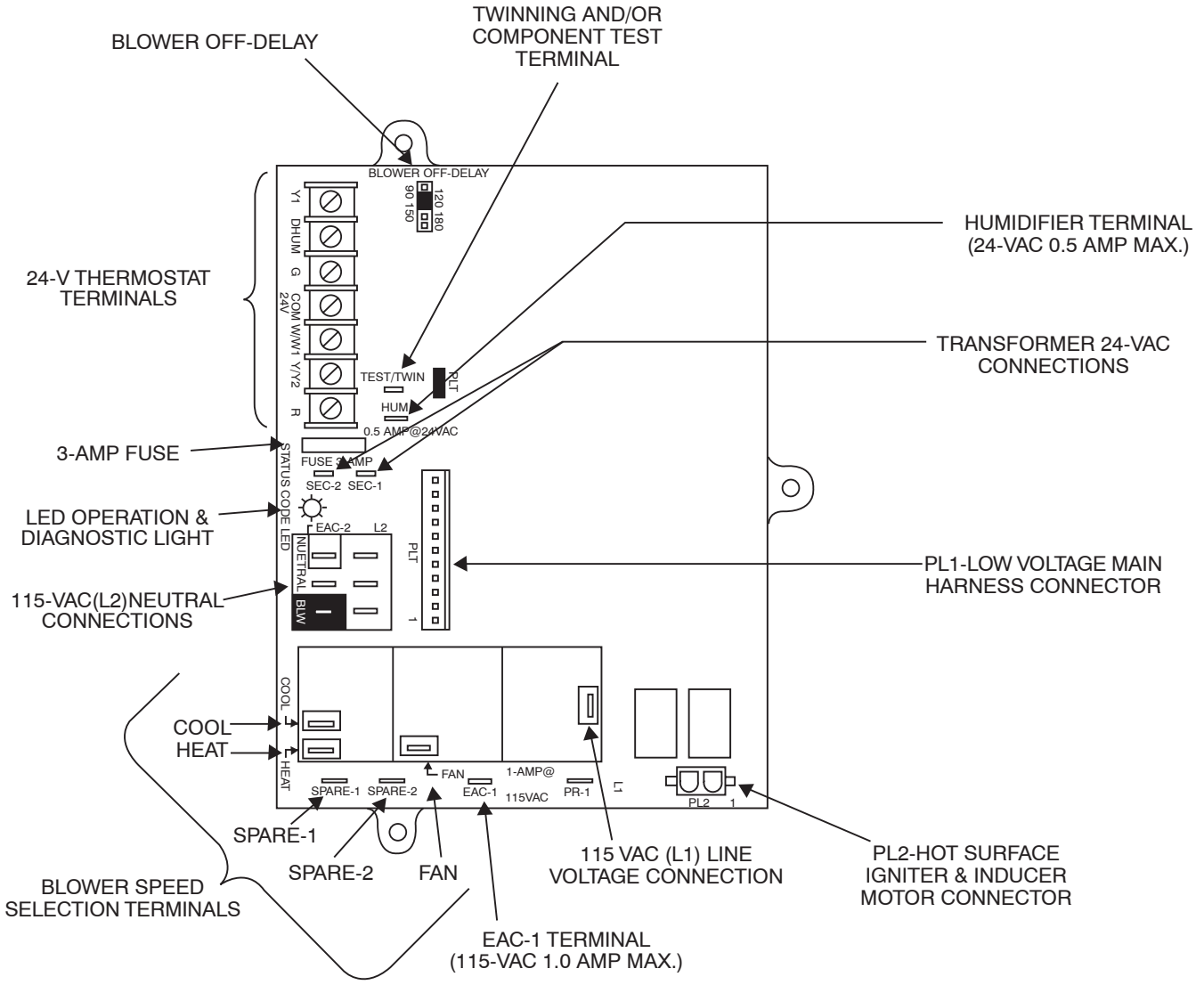
7. Turn furnace gas-valve-control switch to ON position.

8. Turn on furnace power supply.
9. Set room thermostat to call for heat.
10. Check pressure-tap plug for gas leaks when main burners ignite.
11. Check for correct burner flame. (See Fig. 11.)
12. Observe unit through two complete heating cycles. See sequence of operation in furnace Installation, Start-Up, and Operating Instructions.
13. Set room thermostat to desired temperature.

Step 6 —Label Application

NOTE: See Fig. 31 for label location and Table 1 for part numbers.

1. Fill in Conversion Responsibility Label (334409-205) and apply inside furnace as shown. Date, name, and address of organization making this conversion are required.
2. Attach Furnace Conversion Rating Plate (334409-204) as shown.
3. Apply Gas Control Conversion Label (334409-203) to gas valve.
4. Check for correct normal-operating sequence of ignition system as described in furnace Installation, Start-Up, and Operating Instructions.
5. Reinstall main furnace door.



A02142

Fig. 39 – Deluxe Single Stage Control

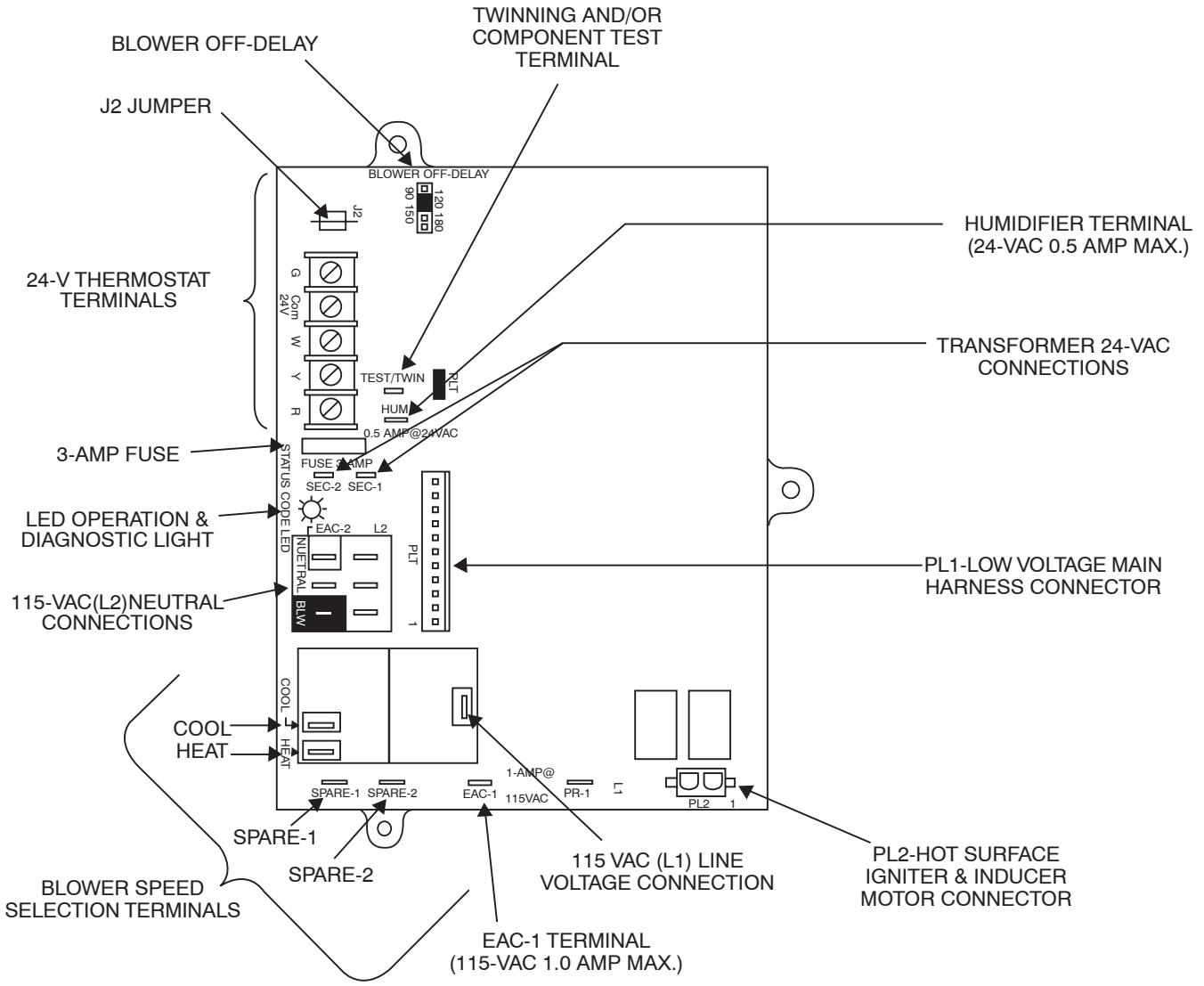


Fig. 40 – Standard Single Stage Control

TABLE 13 - ALTITUDE DERATE MULTIPLIER FOR USA

ALTITUDE FT (M)	PERCENT OF DERATE	DERATE MULTIPLIER FACTOR FOR USA*
0–2000 (0–610)	0	1.00
2001–3000 (610–914)	8–12	0.90
3001–4000 (914–1219)	12–16	0.86
4001–5000 (1219–1524)	16–20	0.82
5001–6000 (1524–1829)	20–24	0.78
6001–7000 (1829–2134)	24–28	0.74
7001–8000 (2134–2438)	28–32	0.70
8001–9000 (2438–2743)	32–36	0.66
9001–10,000 (2743–3048)	36–40	0.62

*Derate multiplier factor based on midpoint altitude for altitude range.

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