508205-01
08/ 2021

GAS ORIFICE KIT

INSTALLATION INSTRUCTIONS FOR NATURAL GAS ORIFICE KITS (22P38, 22P39, 22P40 & 20P41) USED WITH 80% AND 90% EFFICIENCY ULTRA LOW NOX UNITS

⚠ WARNING

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

⚠ CAUTION

As with any mechanical equipment, contact with sharp sheet metal edges can result in personal injury. Take care while handling this equipment and wear gloves and protective clothing.

Shipping and Packing List

Package 1 of 1 contains:

1 - Gas orifice

1 - Instruction

1 - Label

Application

Confirm the kit received is correct for the Ultra Low NOx furnace being serviced, based on the information provided in Table 1.

TABLE 1

Unit Capacity	Gas Orifice	
	80%	90%
-040	22P39	22P38
-060	22P39	
-080	22P40	
-100	22P41	

Installation Figure 1

1 - Set the thermostat to the lowest setting. Shut off the gas supply to the furnace, then turn off the electrical power at the unit disconnect switch.

2 - Remove the access panel. Move the automatic gas valve switch to the OFF position.

3 - Disconnect the gas supply from the gas valve. Disconnect the two-wire plug at the gas valve.

4 - Remove the four screws that hold the gas-air elbow to the gas-air collector hot box.

5 - Loosen the clamp attaching the intake to the gas-air elbow. Remove the intake from the gas-air elbow.

6 - Use a socket wrench to remove the gas orifice from inside of the manifold pipe. Replace with provided gas orifice. DO NOT USE sealant on orifice.

7 - Reconnect two-wire plug to the gas vale.

8 - Reconnect electrical power to the unit.

9 - Inspect all sides of assembly. Turn on gas supply.

10 - Immediately check the entire fitting surface andassembly joints for gas leaks.

11 - Follow the steps given in the start-up and adjustment section.

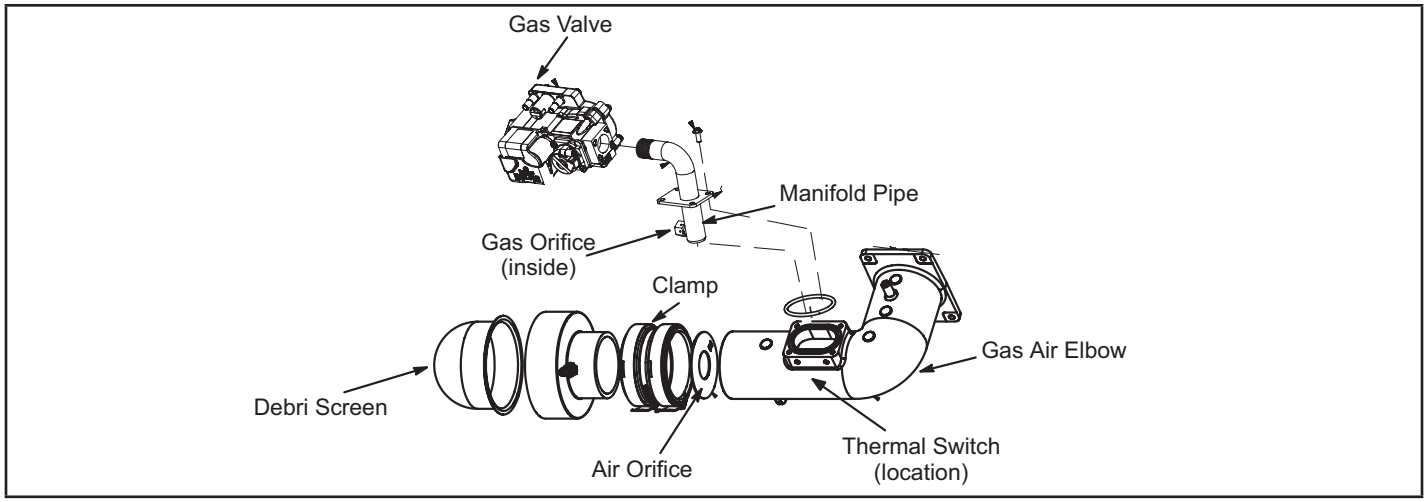

FIGURE 1

Start-Up & Adjustment

BEFORE PLACING THE UNIT INTO OPERATION -

Smell all around the appliance area for gas. Use only your hand to move the gas control switch. Never use tools. If the switch will not move by hand, do not try to repair it. Force or attempted repair may result in a fire or explosion.

A - Placing the Unit into Operation

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

Units are equipped with an integrated ignition system. The integrated ignition control automatically lights the burners each time the thermostat calls for heat.

1 - **STOP!** Read the safety information at the beginning of this section.
2 - Set the thermostat to its lowest setting.
3 - Turn off all electrical power to the furnace.
4 - Do not try to light the burners by hand.
5 - Remove the unit access panel.
6 - Move the switch on the gas valve to OFF. Do not force the switch. See figure 2.
7 - Wait five (5) minutes for any gas to clear out. If you then smell gas, STOP! Immediately call your gas supplier from a neighbor's phone. Follow the gas supplier's instructions. If you do not smell gas, go to the next step.
8 - Move the switch on the gas valve to ON.
9 - Replace the unit compartment access panel.
10 - Turn on all electrical power to the unit.
11 - Set the thermostat to desired setting.
12 - If the furnace will not operate, see section E- "Turning Gas Off to the Unit" and call the gas supplier.

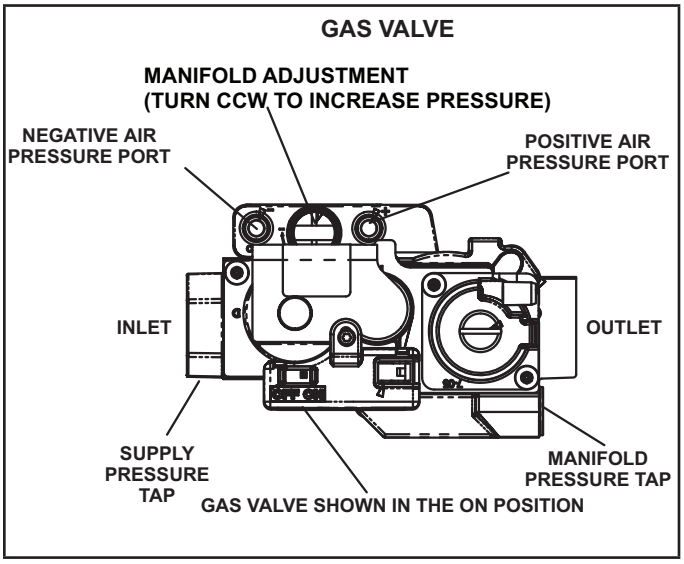

FIGURE 2

Gas Pressure Measurement

A - Gas Flow (Approximate)

NOTE - *To obtain accurate reading, shut off all other gas appliances connected to meter.*

Furnace should operate at least 5 minutes before checking gas flow. Determine time in seconds for **two** revolutions of gas through the meter. (Two revolutions assures a more accurate time.) **Divide by two** and compare to time in table provided in the unit installation instruction.If manifold pressure matches the manifold table in the unit installation instructions and rate is incorrect, check gas orifices for proper size and restriction. Remove temporary gas meter if installed.

B - Measuring Manifold Pressure

The gas valve is factory set and should not require adjustment. All gas valves are factory regulated. To correctly measure manifold pressure, follow the steps below:

1 - Remove the threaded plug from the outlet side of the gas valve and install a field-provided barbed fitting. Connect measuring device "+" connection to barbed fitting to measure manifold pressure.

2 - Start unit on low heat (two stage furnace) and allow 5 minutes for unit to reach steady state.

3 - After allowing unit to stabilize for 5 minutes, record manifold pressure and compare to value given in the unit installation instruction.

4 - Repeat on high heat (two stage furnace)

5 - Shut unit off and remove manometer as soon as an accurate reading has been obtained. Take care to remove barbed fitting and replace threaded plug.

6 - Start unit and perform leak check. Seal leaks if found.

C - Supply Pressure Measurement

A threaded plug on the inlet side of the gas valve provides access to the supply pressure tap. Remove the threaded plug, install a field-provided barbed fitting and connect a manometer to measure supply pressure. See unit installation instruction for correct supply pressure measurement. Replace the threaded plug after measurements have been taken.

D- Proper Combustion

Furnace should operate minimum 15 minutes with correct manifold pressure and gas flow rate before checking combustion. Take combustion sample beyond the flue outlet. See unit installation instruction for correct combustion. **The maximum carbon monoxide reading should not exceed 100 ppm.**

NOTE - *Shut unit off and remove manometer as soon as supply line pressure, manifold pressure and combustion sample have been obtained. Take care to replace pressure tap plug.*