

# GAS UNITS KITS & ACCESSORIES

508088-02  
10/ 2021  
Supersedes 508088-01

## MANIFOLD AND SIGNAL PRESSURE CHECK

### INSTRUCTIONS FOR MANIFOLD, COMBUSTION AND SIGNAL PRESSURE CHECK FOR ULTRA LOW NOX 80% EFFICIENCY UNITS

#### **⚠ WARNING**

Improper installation, adjustment, alteration, service or maintenance can cause property damage, personal injury or loss of life. Installation and service must be performed by a licensed professional HVAC installer or equivalent, service agency, or the gas supplier

#### Incoming Voltage and Gas Supply Pressure Check

If the furnace will not light check voltage to the furnace. Voltage should be between 108VAC and 132VAC. If voltage is not within this range contact a license electrician or the electric company. Gas line pressure coming into the house should be between 5" W.C. And 14" W.C.

Check under the following conditions:

- 1 - With the furnace off.
- 2 - With all other gas appliances in the home on. (includes gas logs, oven, drier and hot water).
- 3 - While attempting to light the furnace and the line pressure drops more than 1" or below 5" W.C. then consult either a licensed plumber or the gas company to correct.

#### Gas Orifice and Flue Shield Check

If both line voltage and gas line pressure are within the acceptable limits, then check the units serial number to see if the **gas orifice** should be replace. If the unit serial number indicates it was built prior to May 2021 (5921EXXXXX) where "21" is the year built and "E" is the month built and there is no sticker indicating the gas orifice has already been replaced, then see table 3 for correct kit and replace the gas orifice.

The inner flue shield can deform and short out the flame sensor. See figure 1. If flame sensor is shorted to ground, or if unit lights but shuts down after a short run time, check the inner flue shield. Follow kit instructions to replace flue shield if needed. If the flue shield does not need replacing, re-install, but make note of the numbered sequence to re-install screws on the air fuel plenum. See figure 2.

#### Manifold and Signal Pressure Check

- 1 - Turn off the electrical power and gas supply to the furnace.
- 2 - Remove the threaded plug from the outlet side of the gas valve and install a field-provided barbed fitting. Connect measuring device positive "+" to barbed fitting to measure manifold pressure. See figure 3 for manifold location.
- 3 - Install hoses and meter as shown in figure 5 for signal pressure measurement.
- 4 - After allowing unit to stabilize for 8 minutes, record manifold pressure and compare to value in table 1. If manifold pressure is within range, rate check is complete move to step 6. If manifold pressure is not within range continue.

**Valve is not adjustable. Do not adjust manifold pressure.**

- 5 - Record signal pressure and compare to value in table 1. If signal pressure is within range continue. If the signal is not within range go to "Troubleshooting".
- 6 - Shut off unit and remove manometer and signal meter after accurate readings has been obtained.
- 7 - Restart unit and check for gas leaks. Seal any leaks found.

**If the unit has difficulty igniting or ignites with loud resonance the air orifice must be checked and replaced if necessary.**

**TABLE 1**

**Manifold and Signal Pressure (inches w.c.)**

| Model        | Manifold  |           | Signal Pressure |             |
|--------------|-----------|-----------|-----------------|-------------|
|              | High Fire | Low Fire  | High Fire       | Low Fire    |
| Two Stage    |           |           |                 |             |
| 060          | 3.0 - 3.8 | 1.3 - .17 | 0.77 - 0.85     | 0.34 - 0.42 |
| 080          |           |           | 0.78 - 0.86     | 0.35 - 0.43 |
| 100          |           |           | 0.62 - 0.70     | 0.29 - 0.37 |
| Single Stage | High Fire | Low Fire  | High Fire       | Low Fire    |
| 040          | 1.6 - 2.2 | N/A       | 0.40 - 0.50     | N/A         |
| 060          | 3.0 - 3.8 |           | 0.77 - 0.85     |             |
| 080          |           |           | 0.78 - 0.86     |             |
| 100          |           |           | 0.62 - 0.70     |             |

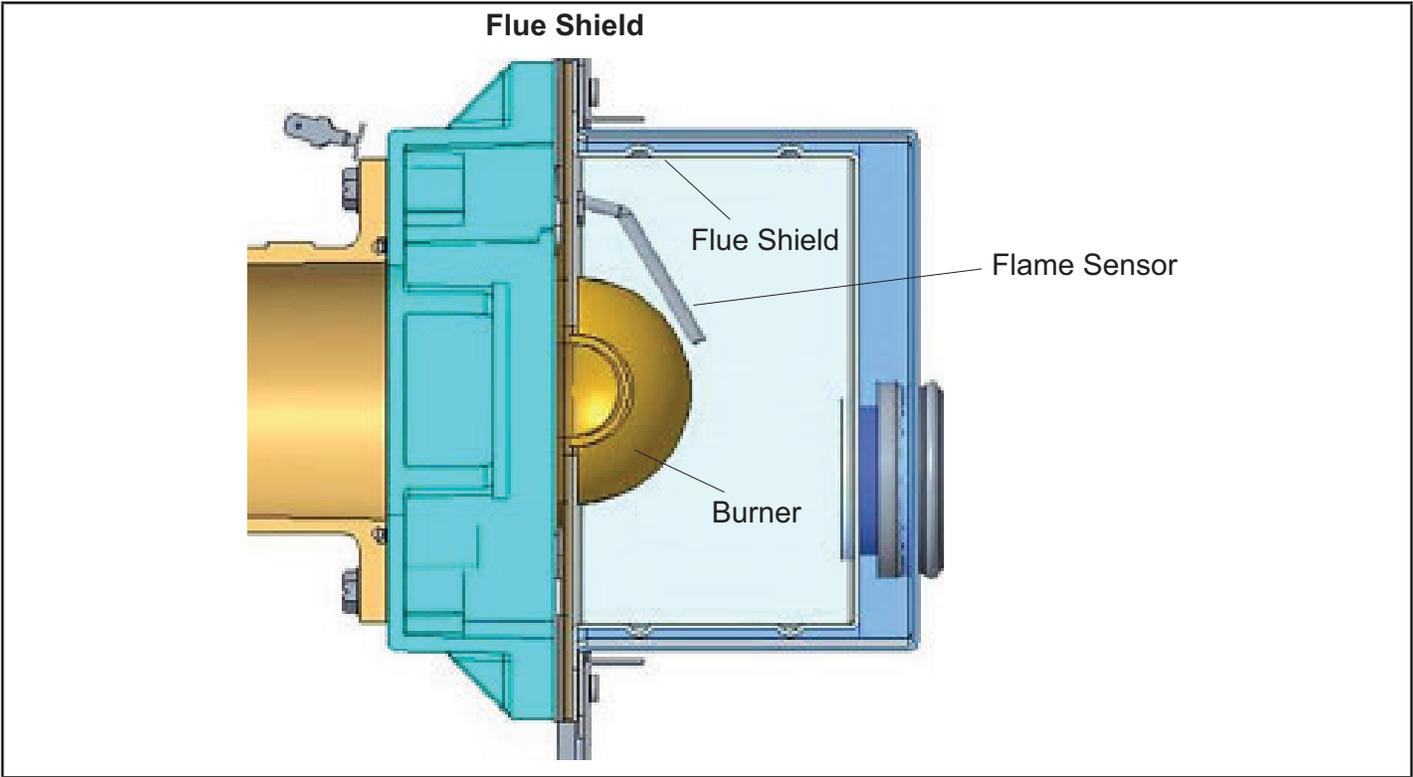


FIGURE 1

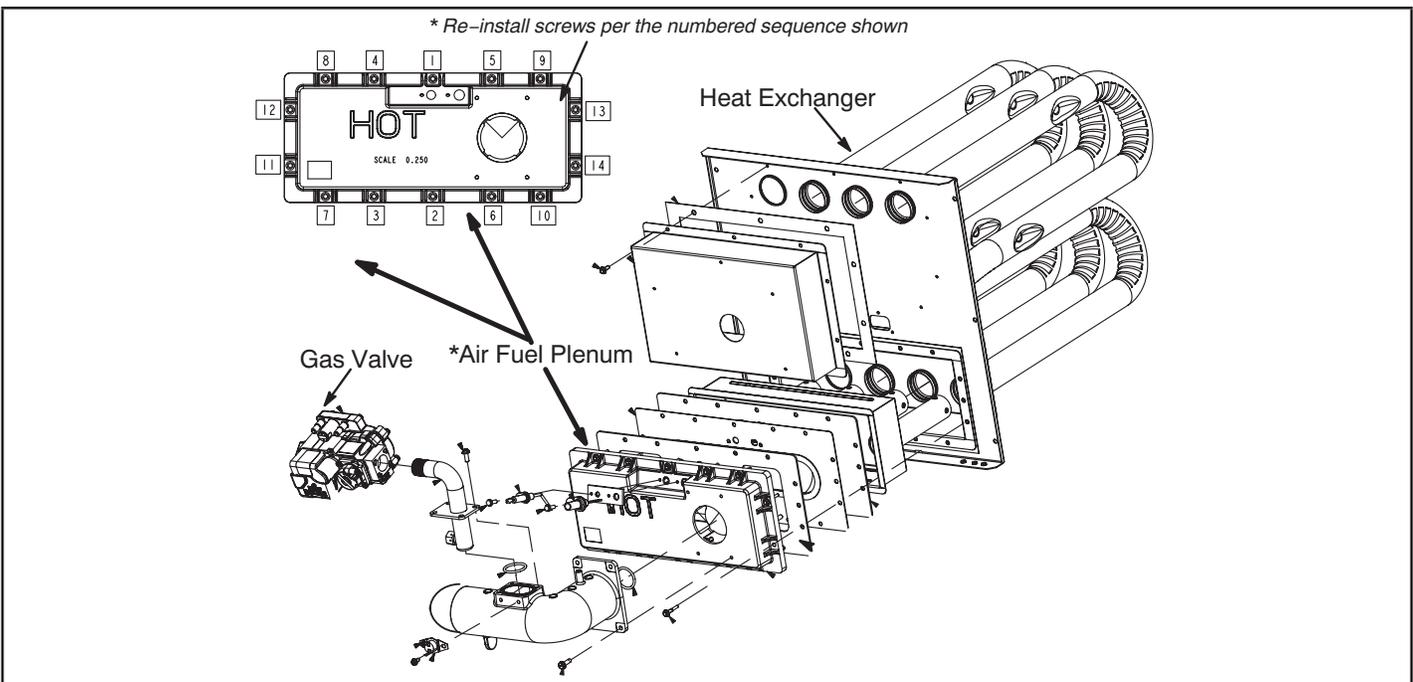


FIGURE 2

## Air Orifice Replacement

Do not replace the air orifice until the problem has been determined. If the unit has difficulty igniting the air orifice is oversized and brings in too much combustion air. If the unit ignites but with loud resonance the air orifice is too small and needs more combustion air. The air orifice is located inside the gray coupling between the clamps. Figure 4 shows corresponding steps with the steps below.

- 1 - Turn off the electrical power and gas supply to the furnace.
- 2 - Remove the air hose fitting from the brass fitting on the air inlet screen.
- 3 - Use a 5/16" nut driver to loosen the clamps on the gray coupling.
- 4 - Remove the air inlet screen housing and coupling.
- 5 - Remove the air orifice. Check the "Part" number stamped on the air orifice. See table 2. If incorrect replace with proper air orifice. Repeat manifold check. If air orifice is correct then it must be replaced. See table 2 for replacement.
- 6 - Reinstall the air orifice on the right side of the coupling and push firmly into place.

- 7 - Reinstall air inlet housing and coupling making sure the coupling is fully seated against the air inlet elbow. Tighten clamps to secure the coupling.
- 8 - Reconnect the air pressure tubing.
- 9 - Repeat manifold and signal pressure check. If unit ignites and manifold and signal pressure are correct, move on to combustion check. If unit still does not ignite or ignites with loud resonance go to Troubleshooting.

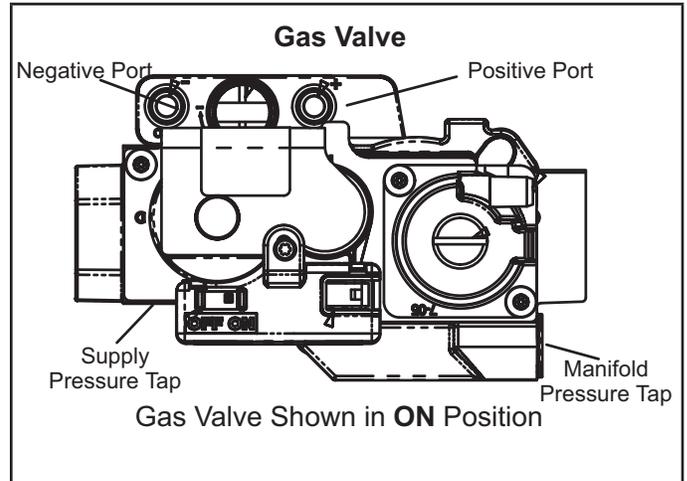
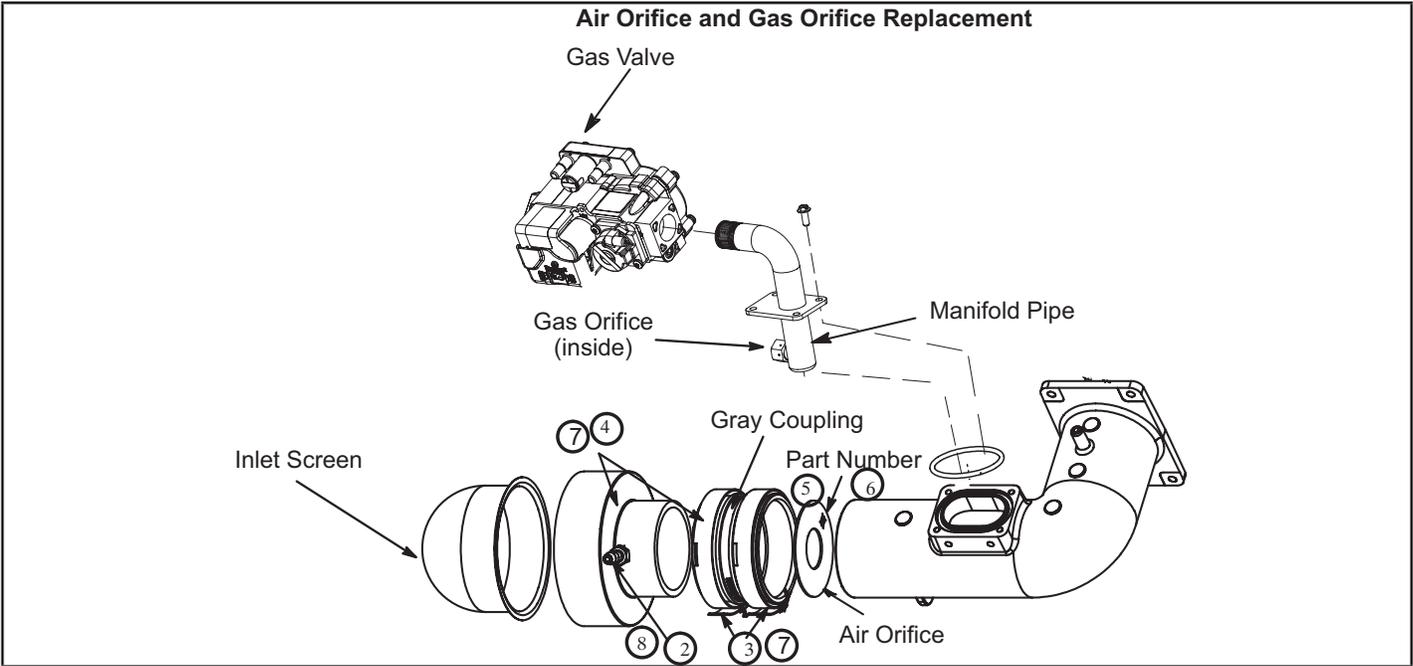
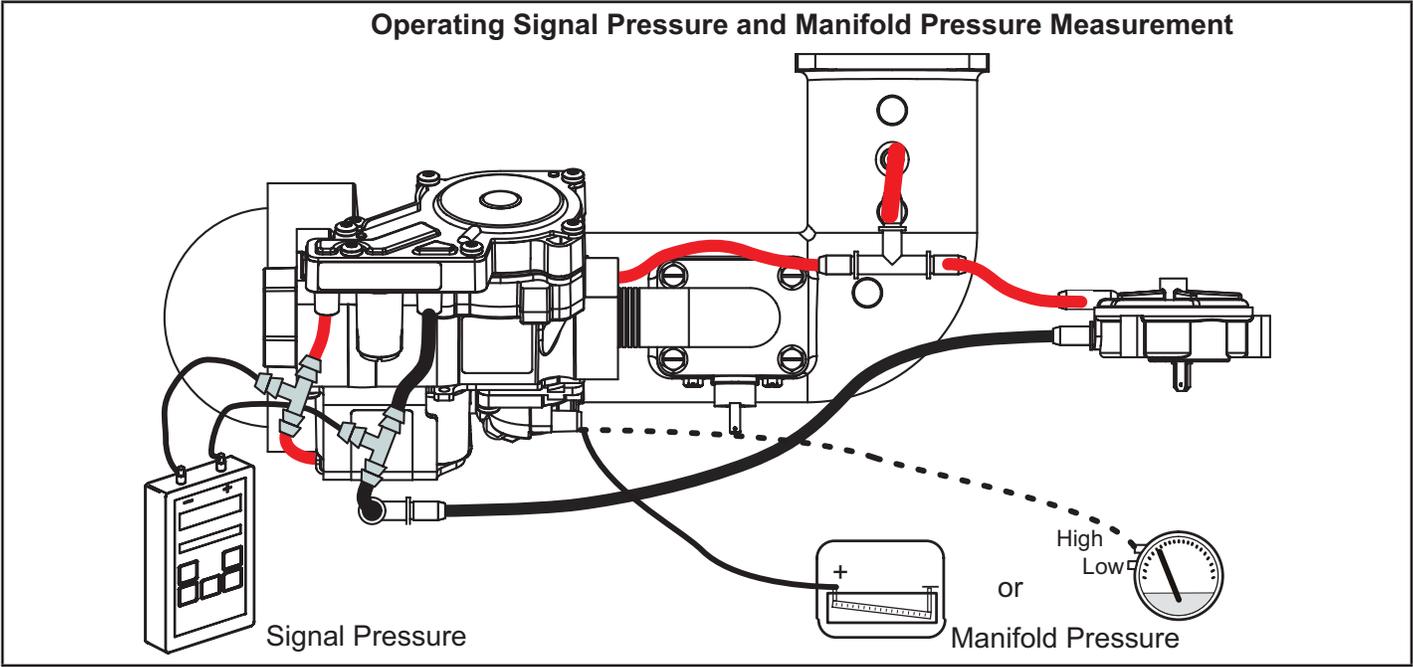


FIGURE 3



**FIGURE 4**



**FIGURE 5**

**TABLE 2**

| Capacity | Production                   | Resonance (more air)      |          | Difficult Igniting (less air) |          |
|----------|------------------------------|---------------------------|----------|-------------------------------|----------|
|          | Air Production Size (Part #) | Air Orifice Size (Part #) | Cat No # | Air Orifice Size (Part # No)  | Cat No # |
| 040      | 0.969 (08)                   | 1.000 (02)                | 19X30    | 0.937 (15)                    | 19X37    |
| 060      | 0.969 (08)                   | 1.000 (02)                | 19X30    | 0.937 (15)                    | 19X37    |
| 080      | 1.094 (07)                   | 1.125 (03)                | 19X31    | 1.062 (17)                    | 22J56    |
| 100      | 1.250 (06)                   | 1.281 (19)                | 19X39    | 1.219 (04)                    | 19X32    |

**TABLE 3**

| Capacity | Gas Orifice Kit # |
|----------|-------------------|
| 040      | 22P39             |
| 060      | 22P39             |
| 080      | 22P40             |
| 100      | 22P41             |

**TABLE 4**

| Two-stage    | High Fire CO2 | Low Fire CO2 |
|--------------|---------------|--------------|
| 060          | 6.0 - 7.8     | 6.0 - 7.8    |
| 080          |               |              |
| 100          |               |              |
| Single-Stage | 6.5 - 7.5     | N/A          |
| 040          |               |              |
| 060          |               |              |
| 080          |               |              |
| 100          |               |              |

**Proper Combustion**

Furnace should operate minimum 15 minutes with correct manifold and signal pressure before checking combustion. Table 4 shows acceptable combustion for all single-stage and two-stage models. The maximum carbon monoxide reading should not exceed 100ppm.

# Troubleshooting

## Troubleshooting Poor Ignition or Combustion Resonance Issues

