

# High Altitude, Natural Gas Conversion Kit Instructions

- For use with natural gas at altitudes above 4500 ft.
- For use on the following gas heat units when equipped with the White-Rogers 36J24 series gas control:
  - **FPG\*N8** – First-Pak Non-Condensing Gas Heat Units
- This kit is not intended for use in Canada.
- This conversion kit must be installed by a qualified service agency.

! WARNING !

FIRE OR EXPLOSION HAZARD

Failure to follow safety warnings exactly could result in dangerous operation, serious injury, death or property damage.

Improper servicing could result in dangerous operation, serious injury, death or property damage.

- Before servicing, disconnect all electrical power to furnace.
- When servicing controls, label all wires prior to disconnecting. Reconnect wires correctly.

Verify proper operation after servicing.

The following tools and supplies are required to convert from "standard altitude" natural gas orifices and pressure switch assembly (as shipped from the factory) to "high altitude" natural gas orifices and pressure switch assembly:

- 1 – 7/16" box wrench
- 1 – 1/4" nut driver
- 1 – 3/16" Allen wrench
- 1 – ¼" flat blade screwdriver
- 1 – Manometer to read inlet and outlet pressure of the gas valve (min range: 0" – 20" W.C.)
- Gas leak detection solution like soap and water solution. Remember to wipe the solution from the joints when testing is completed.

## DESCRIPTION

1. Proper gas orifices and pressure switch are included in this kit for use with non-condensing furnaces in installations above their maximum (as shipped) rated altitudes. This kit is not appropriate for use in Canada. The parts must be used in the order specified in the table below.

| CONVERSION KIT COMPONENTS |                 |
|---------------------------|-----------------|
| Natural Gas Orifices      | Pressure Switch |
| GS-O-54 (#54)             | GS-PS-5 (-0.1)  |
| Table 1                   |                 |

2. Above 4500 feet, the appliance must be de-rated since the CFM moved by the induced draft blower keeps about constant, while the pounds of oxygen in the air decreases

as altitude increases. If this technique is not followed as well as the fuel supply is not lowered, the combustion will be inefficient, incomplete, and could result in heat exchanger failure owing to excessive temperature rise. The burner orifices in the high altitude kits were chosen to provide proper reliable operation. If the Btu content of your gas supply has been artificially changed to account for altitude, contact your gas supplier for orifice sizing (orifice may not require change)

3. Avoid de-rating by adjusting the manifold pressure to a lower pressure setting than what is specified on the rating plate. Reduced air density combined with lower manifold pressure at the burner orifice will prohibit the orifice from supplying the correct amount of air to the burner for complete combustion.
4. A separate pressure switch must be used above the maximum (as shipped) rated altitude, in addition to employing smaller orifices to limit the fuel intake. Because of the decrease in air density, a high altitude pressure switch is required, independent of the Btu content of the fuel utilized.

| ORIFICE SIZE   |                                   |
|----------------|-----------------------------------|
| Altitude (ft.) | Burner Orifice Size (Natural Gas) |
| 0 - 4500 ft    | # 1.55 mm                         |
| 4501 – 8000 ft | # 54                              |
| Table 2        |                                   |

## ORIFICE AND PRESSURE SWITCH ASSEMBLY INSTALLATION

1. Shut OFF gas supply at manual shutoff and turn OFF power to the unit.
2. Remove access door.
3. Disconnect wiring from the gas valve.
4. Remove the screws that hold the gas manifold and valve to the burner bracket. Separate the burner bracket from the gas manifold and valve.
5. ORIFICE REPLACEMENT FOR NATURAL GAS BURNER
  - a. Using a box end wrench, remove the standard-altitude natural gas orifices from the gas manifold.
  - b. Before installation, visually inspect Natural gas high altitude orifices (GS-O-54) for damage and drill size (marked on face with #54). Remove all existing #1.55mm natural gas orifices with a 7/16" box-end wrench and replace with the #54 natural gas high-altitude orifices provided in the kit, refer to figure 1. Use a box-end wrench to tighten orifices; do not cross-thread or over-tighten. The orifice size is determined by the amount of gas used in the installation as well as the altitude.
  - c. Replace the existing pressure switch with the GS-PS-5 pressure switch provided in the kit, refer Figure 2

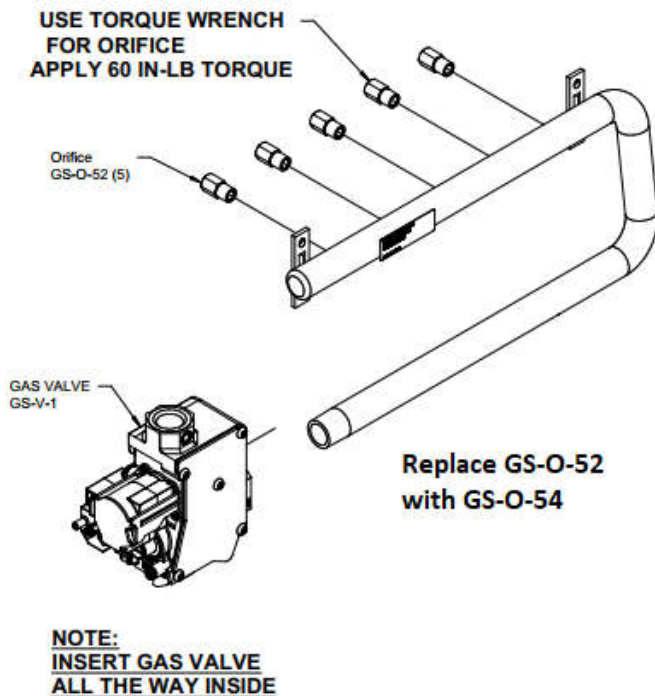


FIGURE 1

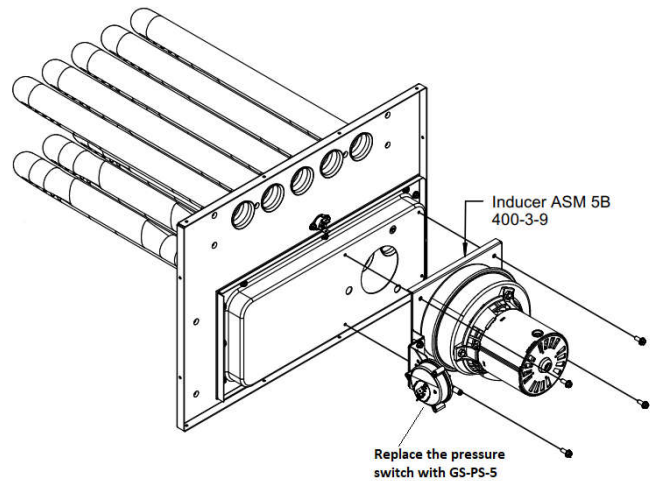


FIGURE 2

## CHECKS AND ADJUSTMENTS

This conversion necessitates the following changes and inspections.

- Leak checking orifices are among the adjustments and checks.
  - Checking and adjusting the gas pressures in the lines and manifolds.
  - Confirming the unit's correct operation (input rate, operational sequence, burner flame, temperature rise, etc.).
1. At the gas valve inlet pressure tap or the gas piping drip leg, connect a calibrated water manometer or an equivalent gas pressure gauge. A gas pressure test transducer or manometer shall be used to verify the gas supply and manifold pressure on White-Rodgers 36J24 gas valves used on single stage heating appliances.
  2. Turn on the power and gas, then set the unit to the heating cycle and turn on all other gas-fired appliances.
  3. Check for leaks in the burner orifice threads with a soap solution.
  4. With the burners lit, check the gas supply pressure. Natural gas inlet pressure should be between 5.0 and 10.0 inches W.C. Make any necessary adjustments to the pressure regulator(s), gas pipework, and so on if the supply pressure differs from what is required.
  5. Disconnect the manometer and turn off the gas to the unit at the manual shutoff valve. Reinstall line pressure tap plug. Turn off any appliances activated in step 2 that aren't in use.

## MANIFOLD PRESSURE ADJUSTMENT

Adjusting the gas valve pressure regulator should only be used to make minor changes in gas flow. The required natural gas manifold pressure between 3.2" to 3.5" W.C.

1. At the manual gas shutoff valve, turn off the gas to the unit.
2. At the gas valve outlet pressure tap, connect a calibrated water manometer or an equivalent gas pressure gauge. Verify the gas supply and manifold pressure on White-Rodgers 36J24 gas valve.
3. Turn on the gas supply and operate the appliance.
4. Remove the cap screw from the pressure regulator adjustment port on the manifold.
5. Adjust the manifold regulator to the desired manifold pressure with an Allen wrench (3.2" to 3.5" W.C Manifold Pressure for Natural Gas).
6. Replace the cap screw on the manifold pressure regulator. Confirm the manifold pressure.
7. Turn off the unit's gas supply. Reinstall the manifold pressure tap plug after disconnecting the manometer.

## INSPECT THE FLAME OF THE BURNER

The flames on the burner should be steady, gentle, and blue (dust may cause orange tips but they must not be yellow). Without curling, floating, or lifting off, they should stretch directly outward from the burners.

## CHECK AND ADJUST THE TEMPERATURE RISE IN THE UNIT

As indicated in the installation manual, check and adjust the unit temperature rise(s).

The temperature must rise within the range indicated on the furnace rating plate.