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HEAT EXCHANGER AND VENT PIPE TEST KIT

INSTALLATION INSTRUCTIONS FOR HEAT EXCHANGER AND VENT PIPE TEST KIT (LB-91053 / 74K96) TO BE USED WITH G14/G21/GSR14/GSR21 SERIES UNITS

Shipping and Packing List

Package 1 of 1 contains:

- 2 - 1/2" test plugs (73K57)
- 1 - 3/4" test plug (12L83)*
- 1 - 7/8" test plug (12L84)*
- 1 - 1" test plug (12L85)*
- 1 - 1-1/4" test plug (73K56)*
- 1 - 1-3/8" test plug (73K55)
- 1 - 1-1/2" test plug (73K54)
- 1 - 2" test plug (73K53)
- 1 - Patch plate
- 2 - Self-tapping screws
- 1 - Grommet
- 1 - Pressure gauge (73K59)

*Additional sets of these four test plugs may be ordered under Lennox part no. 16L00.

Application

Heat exchanger and vent pipe test kit (LB-91053/ 74K96) seals the heat exchanger and vent pipe assemblies on Pulse furnaces to allow pressurized leak testing of these systems.

General

This kit can be applied to furnaces installed in the upflow, downflow or horizontal configurations.

When the test kit is used with a 40, 60, or 80,000 btu upflow furnace with left-hand exhaust piping exit or a 100,000 btu upflow furnace with right-hand exhaust piping exit, it may be necessary to remove the condensate trap assembly to access the heat exchanger exhaust pipe. If the condensate trap assembly must be replaced, order the appropriate replacement from Lennox customer service.

Installation - Testing - Evaluation

The test plugs are rated at 170°F (Cherne plugs) or 225°F (Shaw plugs), so the furnace should be cool when the pressure test is conducted.

NOTE - False readings may be obtained if air is warmed by residual heat from the heat exchanger.

WARNING - Safety glasses should be worn during pressure testing.

NOTE - Before beginning the inspection, verify the integrity of all test equipment and test kit components. Visually check for cracks in hoses and check all other connectors that may leak.

Follow the steps below when testing the heat exchanger and/or the exhaust pipe for leakage. Test the isolated heat exchanger first and then the heat exchanger/exhaust pipe combination.

A -Pressure Test of the Isolated Heat Exchanger

- 1 - Cool the unit by running the indoor blower on high speed with the burner off.
- 2 - Turn off electrical power to the furnace.
- 3 - Remove the unit front access panel.
- 4 - Neatly and carefully cut a slot in cabinet side as shown in figure 1.
- 5 - Disconnect the exhaust pipe's PVC compression fitting at the heat exchanger. See figure 1. Slide the exhaust pipe through the previously created slot and move aside.
- 6 - Use a 1-1/4" or 1-3/8" plug to close the heat exchanger exhaust port.
- 7 - Remove the air intake box cover. Un-tighten, then remove the air diaphragm valve body from the heat exchanger air pipe, or alternatively, remove the air flapper from hub body.
- 8 - Use table 1 to select the appropriate test plug. Clean any rust or other residue from the inside of the air pipe. Insert the test plug into the air pipe and hand-tighten the plug until it makes a good seal.
- 9 - Undo the gas union connection below the expansion tank. Remove elbow, nipple and gas diaphragm assembly from the heat exchanger gas intake pipe. Install test gauge assembly into gas intake pipe and tighten until O-ring seats. See detail in figure 3.
- 10 - Connect a hand-operated air pump at the tee to pressurize the heat exchanger to a **maximum** of 4 psig . Remove hand-pump from 1/4" inflation fitting and replace the plastic cap over the fitting. Carefully check for air leakage at any of the fittings or test plugs.

WARNING - Test plugs are only rated for 5 psig.

- 11 - Even when there are no detectable leaks, test plugs will leak slightly (especially after continued usage). Assuming no detectable leakage of the test plugs, pressurize the unit to 4 psig and observe the rate of pressure loss. ANSI standard Z21.47-1993 allows all

new furnace installations to vent no more than 2 percent of the total volume of flue gases into the living space. A leak rate of 4 psi in 10 minutes or longer on all models of the Pulse furnace exceeds this national standard. All Lennox Pulse furnaces should exceed this national standard. Any heat exchanger that reaches a pressure of 0 psig before 10 minutes has elapsed should be replaced.

- 12 - If the pressure loss rate is unacceptable, check for leakage around test plugs. Also check for leaks around spark plug and flame sensor. Retorque spark plug or sensor, if necessary. If pressure loss rate is still unacceptable, the heat exchanger must be replaced.

B - Pressure test of the Heat Exchanger and the Exhaust Piping

The test in this section is performed after the isolated heat exchanger test in section A. It is used to test the exhaust piping. (The heat exchanger provides the connection means for the pressure test gauge and the hand-operated air pump.)

- 1 - Reconnect the exhaust pipe's PVC compression fitting at the heat exchanger.
- 2 - Locate the exhaust pipe termination and insert the 1-1/2" test plug. Insert test plug in pipe and tighten wingnut until plug is secure.

NOTE - If the exhaust piping termination is not accessible, cut the 2" exhaust pipe as close to the termination as possible and use the 2" test plug to seal this end of the piping. Remember, piping beyond the test plug will not be tested.

- 3 - Insert one of the 1/2" test plugs in the condensate stand pipe. Remove or cut the condensate drain line at the bottom of the condensate trap assembly and insert the other 1/2" test plug in the condensate line connection stub.

NOTE - When testing later model GSR14/21 units equipped with a float ball-type condensate trap, remove the 1/2" PVC male adapter and use either the 3/4" test plug or a 1/2" PVC male plug to seal the condensate drain.

- 4 - Remove the pressure switch plastic elbow from the exhaust PVC and insert the 1/8" pipe plug.
NOTE - On GSR14/21 units, remove the screws on the center mullion and slide it forward on the vent pipe in order to insert the 1/8" pipe plug.
- 5 - Repeat the pressure testing described in steps 10 and 11 above. If the pressure loss rate is unacceptable, exhaust piping must be checked thoroughly for cracks or leaks and then repaired.

When testing has been completed and the exhaust piping has been reconnected at the compression fitting, install the patch plate as shown in figure 2. If the unit has a screw securing the cabinet side to the blower deck, remove that screw, position the patch plate, and then secure the patch plate to the cabinet using one existing screw and one field-provided self-tapping screw. If the side of the cabinet is secured to the blower deck with a spot weld, it will be necessary to use two field-provided self-tapping screws to secure the patch plate to the cabinet. See detail in figure 2.

Additional patch plates may be ordered in packages of 5 plates using Lennox part no. 16L98.

**TABLE 1
Plug Sizes**

| Model No. | Pipe I.D. | Plug Size | Part No. |
|---|-----------------|-----------|----------|
| G14-40-19/23, G21-40, GSR14/21-50 | 0.75 0.8125 | 3/4" | 12L83 |
| G14-60-19/23, G14-Q3/4-80-18/22, G14Q5-80-8 & -9 G21-60, G14-40-1/15, G14-60-1/15, G21/GSR14/21-80 | 0.875 0.9375 | 7/8" | 12L84 |
| G14Q3/4-80-1/14 G14Q5-80-1/5 G14-100-5 & -6, G21-100, GSR14/21-100 | 1.067 1.125 | 1" | 12L85 |
| G14-100-1, -2 G14-130-1, -2 | 1.218 1.1875 | 1-1/4" | 73K56 |

ISOLATE EXHAUST PIPING

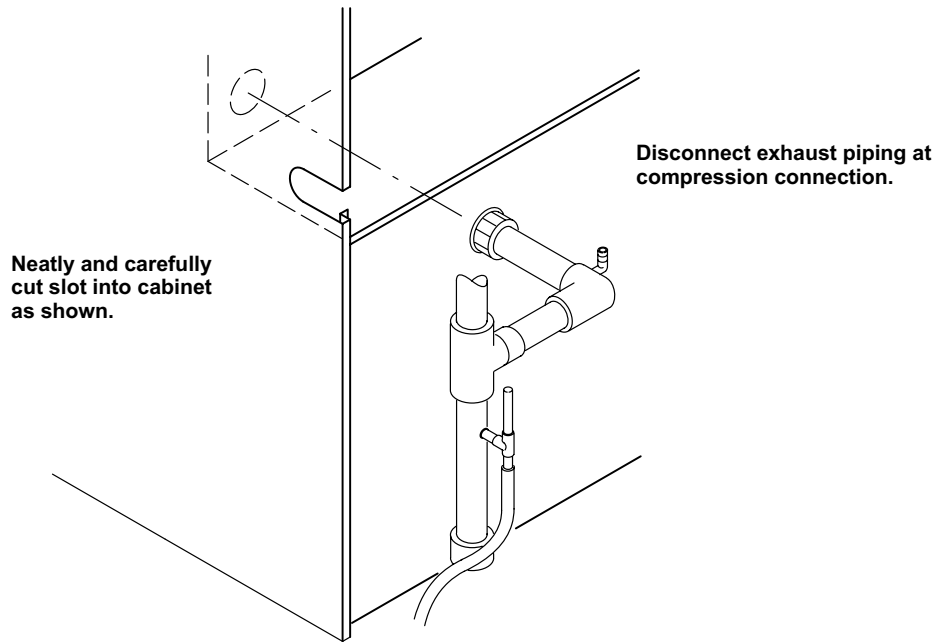


FIGURE 1

PATCH PLATE INSTALLATION

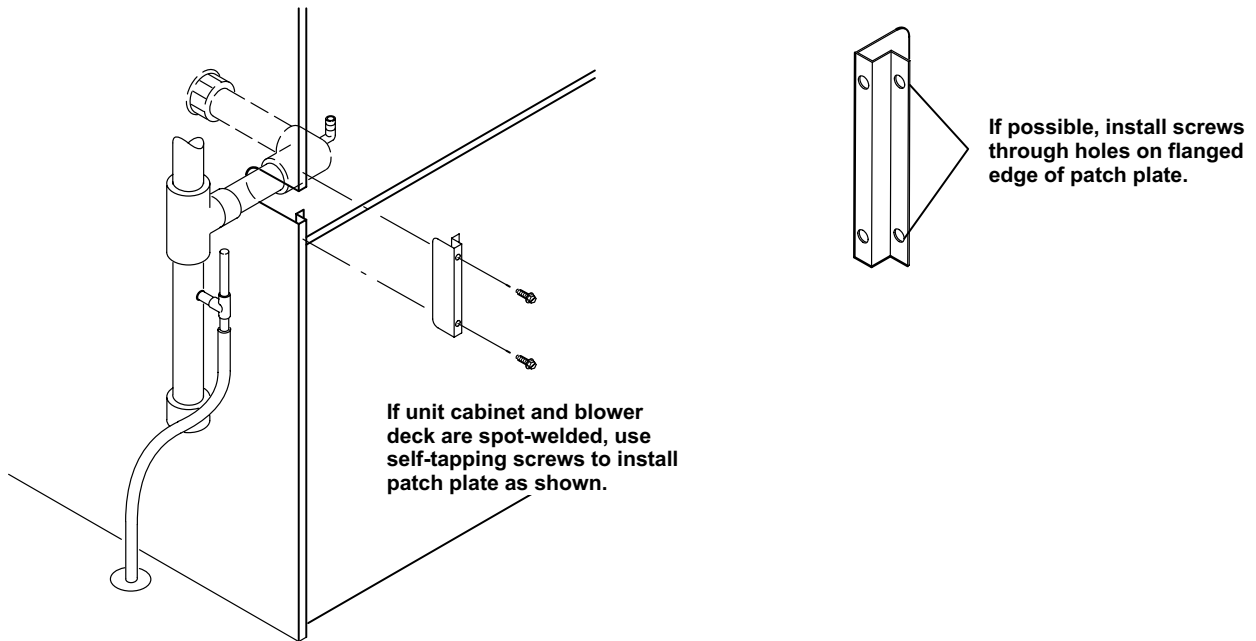
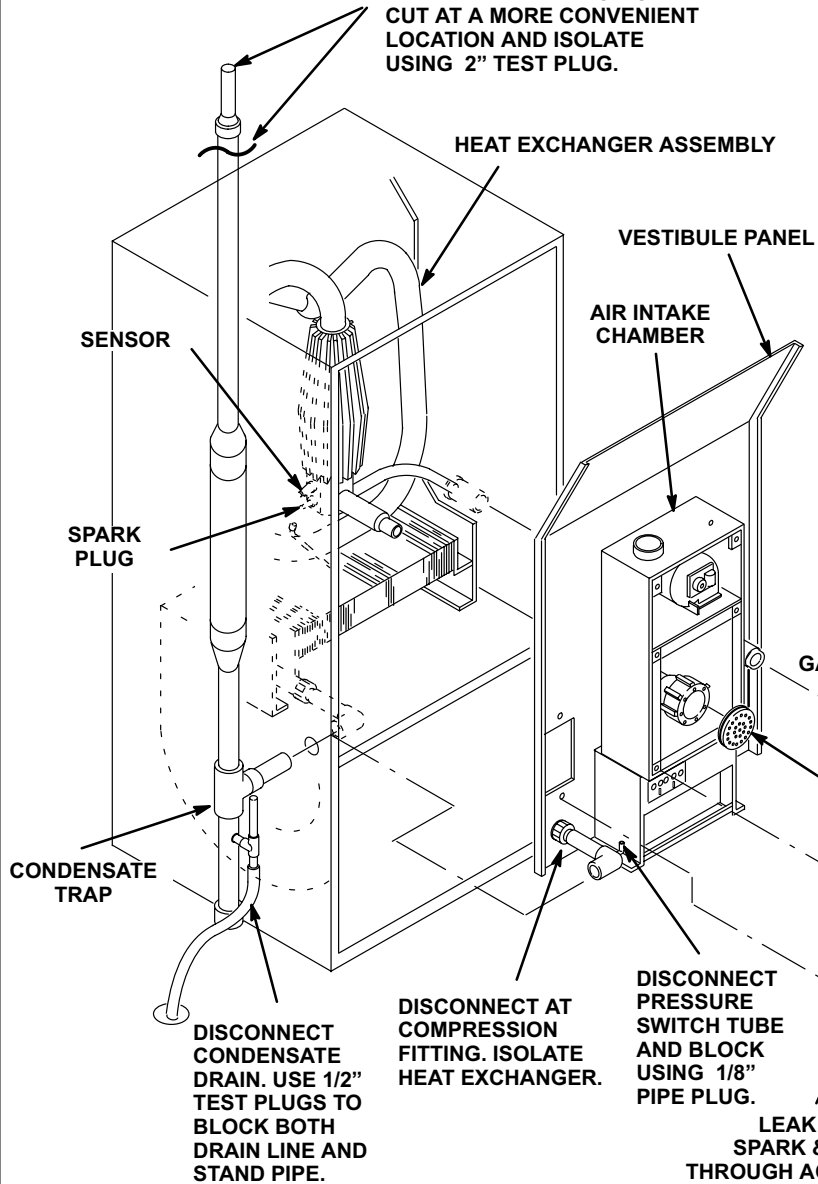


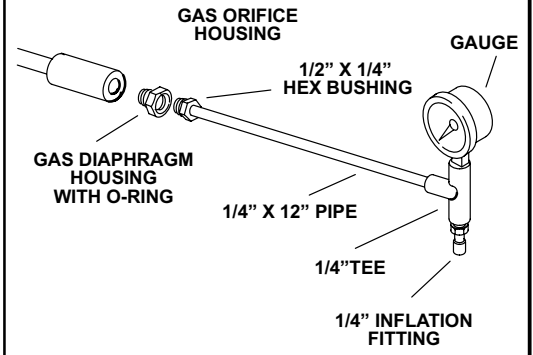
FIGURE 2

G14 AND G21 UNITS

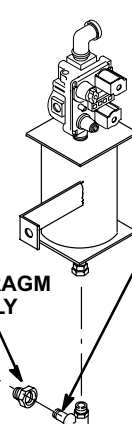
INSTALL 1-1/2" TEST PLUG AT VENT TERMINATION OR CUT AT A MORE CONVENIENT LOCATION AND ISOLATE USING 2" TEST PLUG.



TEST GAUGE ASSEMBLY



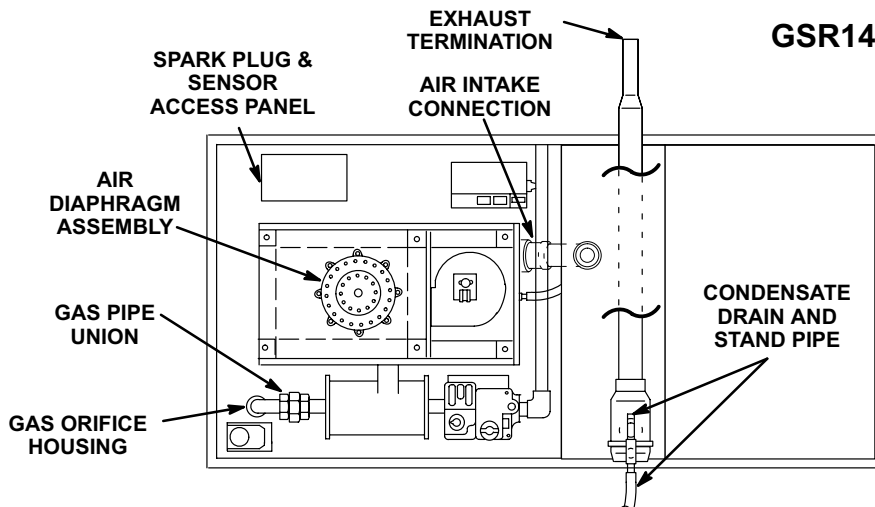
DISCONNECT GAS PIPE AT UNION. REMOVE ELBOW, NIPPLE AND GAS DIAPHRAGM ASSEMBLY FROM GAS PIPE. INSTALL TEST GAUGE ASSEMBLY (See detail above).



REMOVE AIR DIAPHRAGM ASSEMBLY AND GASKET. INSERT APPROPRIATE TEST PLUG AND BLOCK AT TOP OF AIR PIPE.

REMOVE AIR DECOUPLER BOX COVER, GASKET AND AIR DIAPHRAGM ASSEMBLY CHAMBER INSULATION.

GSR14 AND GSR21 UNITS



DISCONNECT PRESSURE SWITCH TUBE (BEHIND MULLION AND CONDENSATE TRAP) AND BLOCK USING 1/8" PIPE PLUG.

FIGURE 3