

Ignition Conversion Kits to Convert Models XL, CXL, XLB, and CXLB with Standing Pilot to Spark-Ignited, Intermittent Safety Pilot System with Lockout

Description/Application

The ignition conversion kits in this form are for Models XL, CXL, XLB and CXLB unit heaters equipped with standing pilot and single stage gas valve. Do not use with any other product. Before beginning conversion, determine that your kit is compatible with your heater. All kits convert to spark-ignited, intermittent safety pilot systems with lockout.

NOTE: These are ignition conversion kits only; not gas conversion kits.

| Ignition Conversion Kit Selection Chart | | |
|---|---------|---------|
| XL, CXL, XLB, CXLB | Gas | Kit P/N |
| 30 - 105 | Natural | 98340 |
| 30 - 105 | Propane | 98341 |
| 125 - 250 | Natural | 98554 |
| 300 - 400 | Natural | 98555 |
| 125 - 400 | Propane | 98556 |

NOTE: See component listings on page 4.

WARNING: Improper installation, adjustment, alteration, service or maintenance can cause property damage, injury, or death. Read the installation, operation, and maintenance instructions thoroughly before installing or servicing this equipment.

Instructions

DANGER: This ignition conversion kit is to be installed by a qualified service agency in accordance with these instructions and in compliance with all codes and requirements of authorities having jurisdiction. Failure to follow instructions could result in death, serious injury, and/or property damage. The qualified agency performing this work assumes responsibility for this installation.

1. Turn off the gas supply at a shutoff valve upstream of the combination valve and disconnect the electrical supply.

2. Remove Valve

Disconnect the wiring and the supply piping from the valve.
Sizes 30-105 – The burner rack and manifold are part of the bottom panel assembly. At the rear corners of the heater, remove the screws that hold the bottom panel to the heater. While supporting both the valve/manifold assembly and the bottom panel, slowly pull down on the rear of the hinged bottom panel assembly. The bottom panel will pivot on tabs that are inserted into the front panel of the heater. After the bottom is hinged down about 30°, slide the assembly forward and unhinge from the front panel. The bottom panel/burner rack assembly is now completely removed from the heater.

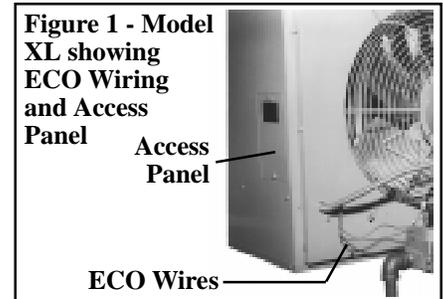
Sizes 125-400 – On the bottom rear of the heater, locate and remove the small pilot access cover. Remove the four screws holding the bottom rear panel to the heater. Disconnect the pilot tubing and the thermocouple connections at the valve. Pull the

bottom rear panel of the heater loose and away from the heater. The slide-out type burner rack and manifold assembly is now in view.

All Sizes – Remove the gas valve.

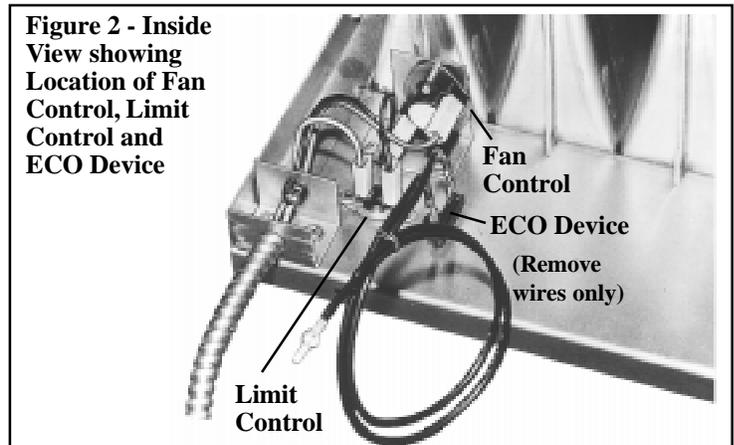
3. Remove ECO Wires

Determine whether or not the heater is equipped with an ECO device (See Figures 1 and 2). If the unit has an ECO device, remove the access panel on the side of the heater. (On blower models, the access panel may be on the blower adapter.) Locate the ECO device and disconnect the wires. Remove the wires only. **IMPORTANT: Do not remove the ECO device. Disconnect and remove wires only.**



Plug the wire entry hole in the heater cabinet. Replace the access panel.

Figure 2 - Inside View showing Location of Fan Control, Limit Control and ECO Device



4. Install the Valve and Ignition Controller

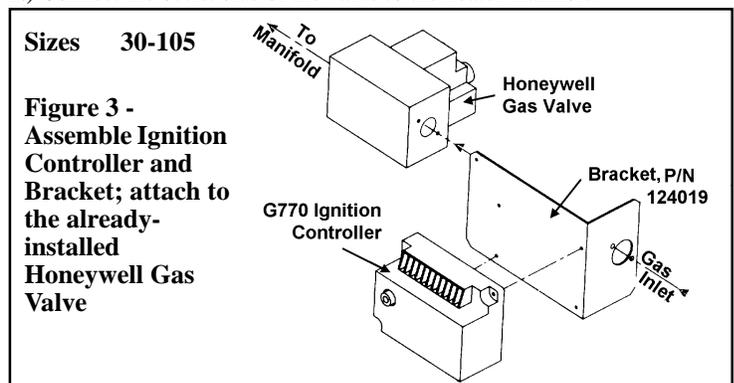
When the conversion is complete, the installed gas valve acts as the “support” for the ignition controller. Depending on the valve in the kit, there are either one or two brackets and either four or six screws required to create the valve/ignition controller assembly.

Instructions are identified by the P/N of the kit; follow the instructions for the kit being installed.

Kit P/N 98340 and P/N 98341 for Sizes 30-105

Parts Required: Valve, Ignition Controller, Bracket, two 5/8" lg #6 Screws, and two 1/4" lg #8-32 Screws

1.) Connect the outlet side of the valve to the heater manifold.



Instructions (cont'd)

2.) **Sub-Assemble Bracket and Ignition Controller** (See Figure 3) – Position the controller on the large flat surface of the “outside” of the bracket **with the spike terminal for the ignitor wire toward the end of the bracket without the flange**. Align the Model G770NGC-4 controller with the holes and attach with two 5/8" long screws. (The bracket which is designed to fit more than one type of controller has several sets of holes.)

3.) **Attach Assembly to Valve** (See Figure 3) – Position the assembled bracket and ignition controller running parallel on the left side of the valve. Attach the bracket to the inlet side of the gas valve using the two 1/4" long #8-32 screws.

Kit P/N 98554 for Sizes 125-250 and P/N 98556 for Sizes 125-400

Parts Required: Valve, Ignition Controller, Bracket, two 5/8" lg #6 Screws, and two 1/4" lg #8-32 Screws.

1.) Connect the outlet side of the valve to the heater manifold.

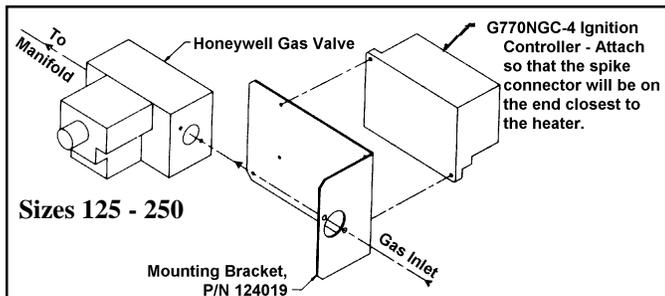


Figure 4 - Assemble Ignition Controller and Bracket; attach to the already-installed Honeywell Gas Valve

2.) **Sub-Assemble Bracket and Ignition Controller** (See Figure 4) – Position the controller on the large flat surface of the “outside” of the bracket **with the spike terminal for the ignitor wire toward the end of the bracket without the flange**. Align the Model G770NGC-4 controller with the holes and attach with two 5/8" long screws. (The bracket which is designed to fit more than one type of controller has several sets of holes.)

3.) **Attach Sub-Assembly to Valve** (See Figure 4) – Position the assembled bracket and ignition controller with the bracket flange at the inlet side of the gas valve and the controller running parallel on the right side of the valve. Attach the bracket to the inlet side of the gas valve using the two 1/4" long #8-32 screws.

Kit P/N 98555 for Sizes 300-400

Parts Required: Valve, Ignition Controller, two Brackets, two 5/8" lg #6 Screws, two 3/8" lg Screws, and two 1/2" lg Screws

1.) Connect the outlet side of the valve to the heater manifold.

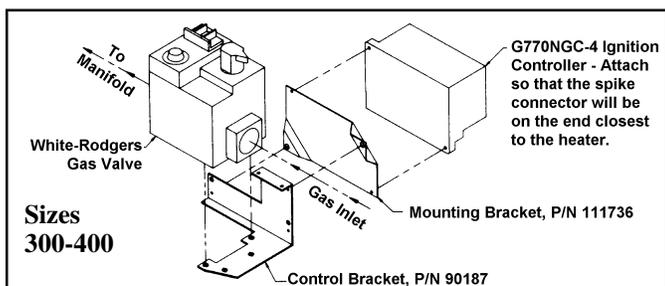


Figure 5 - Assemble Ignition Controller and Bracket; Attach to the already-installed White-Rodgers Gas Valve

2.) **Sub-Assemble Brackets and Ignition Controller** (See Figure 5) –
 (a) Assemble the two brackets using two 5/8" long screws.
 (b) Position the ignition controller on the “flat” bracket so that the **spike terminal will be at the end closest to the heater**. Attach using two 5/8" long screws.

3.) **Attach Sub-Assembly to Valve** (See Figure 5) – Position the ignition controller/bracket assembly so that the bracket extends underneath the valve.

Attach the bracket to the bottom of the valve using the two 3/8" long #10 screws.

5. Change Pilot Assembly

Remove the standing pilot from the burner rack. Install the spark pilot using the same screws and holes.

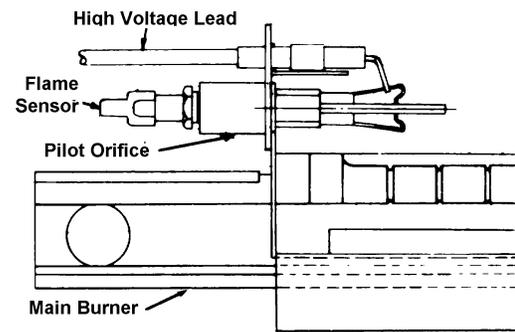
Position the pilot tubing at its connections to the pilot and to the valve. Keep in mind the location of the entrance hole in the cabinet when routing the tubing. If the tubing is too long, it may be cut to fit. Connect the pilot tubing to the pilot and to the gas valve using the nuts and ferrules provided.

If the flame probe is not installed in the pilot assembly, install the flame probe on the pilot. Attach the flame sensor wire (150° C red wire with nylon insulation on one end) with the insulated end at the flame probe. Attach the other end to Terminal No. 4 on the ignition controller.

The free end of the high tension spark wire (wire attached to the ignitor on the pilot assembly) will attach to the spike terminal on the ignition controller. **Sizes 30-105** – The replacement pilot has an ignitor wire with a metal terminal. Push back the rubber boot, cut off the metal terminal with no more than 1" of wire, remove the rubber boot, and push the end of the wire onto the spike terminal on the ignition controller. Be sure spike is fully inserted and the wire secure. **Sizes 125-400** – Push the end of the ignitor wire on to the spike terminal on the ignition controller. Be sure that the spike is fully inserted and the wire secure.

Route the high tension spark wire and the sensor wire along the path of the pilot tubing. If the kit includes nylon wire ties, loosely “tie” the wires and the tubing. Be careful not to “wrap” the high tension wire and the flame sensor wire.

Check the spark gap of the pilot. See Figures 6 or 7 for proper installation of pilot and measurement of spark gap. The spark gap is set by the manufacturer and should be correct, but it is wise to re-check before startup. If adjustment is required, hold the ceramic base with a pair of pliers while adjusting the rod.



Pilot Location Side View - Sizes 30-105

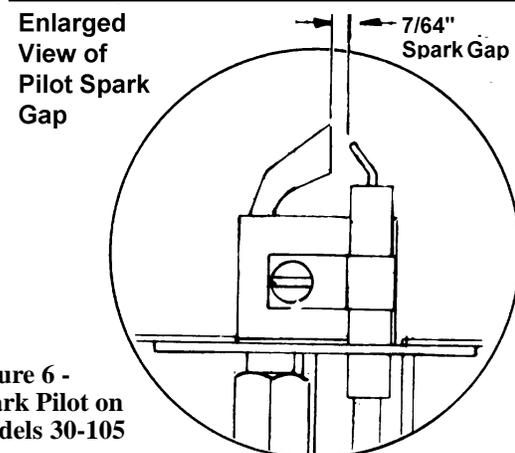


Figure 6 - Spark Pilot on Models 30-105

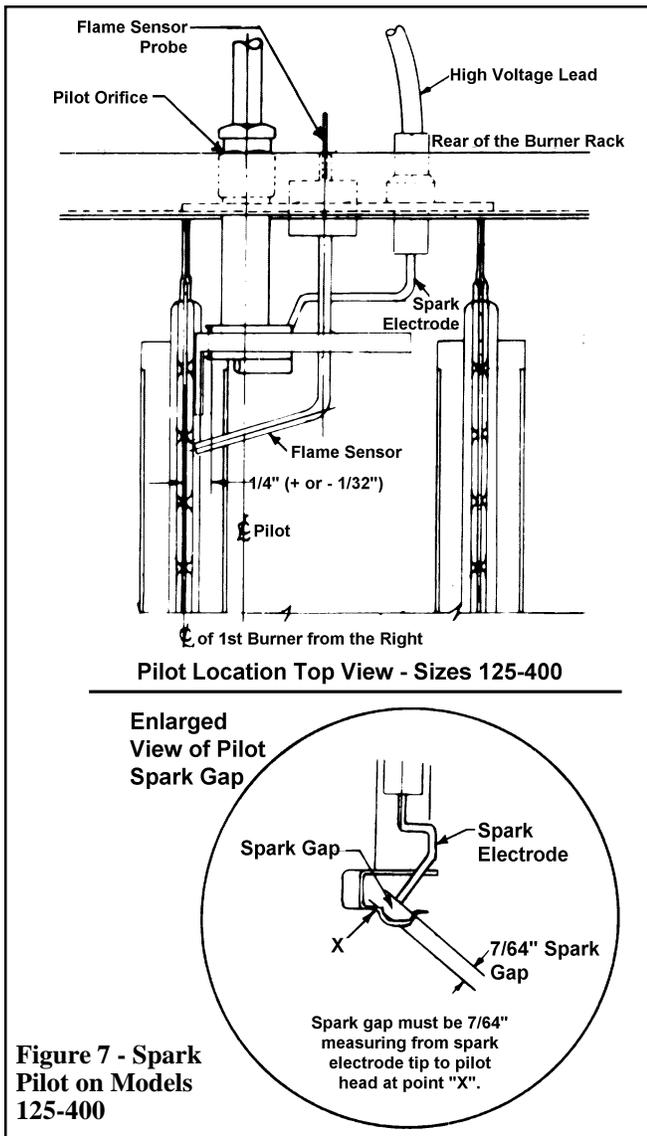


Figure 7 - Spark Pilot on Models 125-400

6. Wiring (Follow the Wire Table and the Wiring Diagram)

Ignition Controller – Attach the black wire disconnected from the original gas valve to Terminal No.2 on the ignition controller. Attach the brown wire to the ground strip on the ignition controller. In the kit, there are three wire assemblies. Attach the blue wire to Terminal No. 1, the black wire to Terminal No. 3, and the brown wire to the ground strip.

Gas Valve – Connect the blue, black, and brown wires from the ignition controller. Attach the blue wire either to the P, TH-TR, or PV terminal depending on the gas valve. Attach the brown wire to the terminal marked either C, TR or PV-MV.

Point-to-Point Wire Table

| FROM Ignition Controller Terminal | Wire Color | TO |
|-----------------------------------|------------|-----------------------------|
| 1 | Blue | P,TH/T or PV on Gas Valve |
| 2 | Black | Thermostat |
| 3 | Black | M, TH or MV on Gas Valve |
| 4 | Red | Pilot Flame Sensor |
| Ground Strip | Brown | C, TR or PV-MV on Gas Valve |
| Ground Strip | Brown | Transformer 24V Ground Side |

7. Re-assemble the Heater

Sizes 30-105 – Install the bottom panel/burner rack assembly on the heater by reversing the procedures in Step 2. Be careful not to pinch the wires or pilot tubing.

Sizes 125-400 – Install the bottom rear panel on the heater by revers-

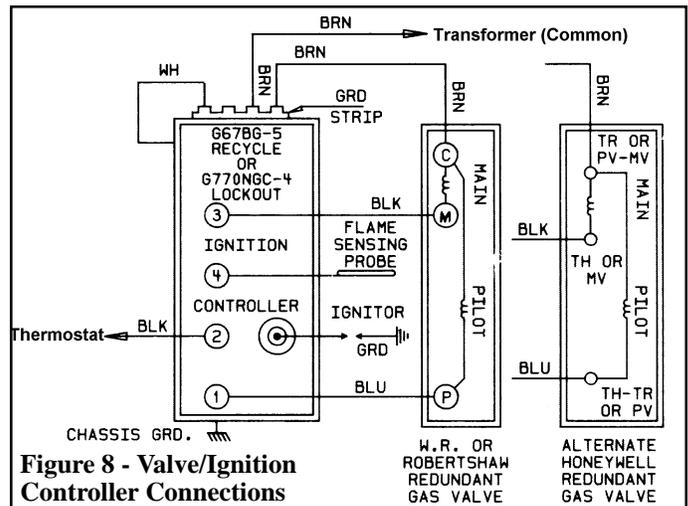


Figure 8 - Valve/Ignition Controller Connections

Operating Sequence

1. Set thermostat at lowest setting.
2. Turn on main and pilot manual gas valve.
3. Turn on power to the unit.
4. Set thermostat at desired setting.
5. Thermostat calls for heat, firing unit at full rate after pilot proving sequence.
6. Fan control senses heat exchanger temperature, energizing the fan motor.
7. If the flame is extinguished during main burner operation, the safety switch closes the main valve and recycles the spark gap. On units equipped with the G770NGC-4 lockout control, if the pilot is not established within 120 seconds, the unit will lockout and must be reset by interrupting power to the control circuit (See Lighting Instructions plate.).

CAUTION: If any of the original wire as supplied with the appliance must be replaced, it must be replaced with wiring material having a temperature rating of at least 105°C, except energy cutoff and sensor lead wires which must be 150°C.

ing the procedures in Step 2. Be careful not to pinch the wires or pilot tubing. Re-install the pilot access plate.

All Sizes – The original metal lighting instruction plate is attached to the rear of the heater with screws. Remove this plate and plug the holes. Position the new lighting instruction plate in a visible location on the cabinet. Be sure the surface is dry and clean. Adhere the new instruction plate.

8. If a thermostat with a heat anticipator is used, reset it to approximately .8 amperes.
9. Connect the supply gas line. Check the main gas line for leaks using a commercial leak-detecting fluid or a rich soap and water solution. Leaks are indicated by the presence of bubbles.

WARNING: All components of gas supply system must be leak tested prior to placing equipment in service. NEVER TEST FOR LEAKS WITH AN OPEN FLAME. Failure to comply could result in severe personal injury, property damage, or death.

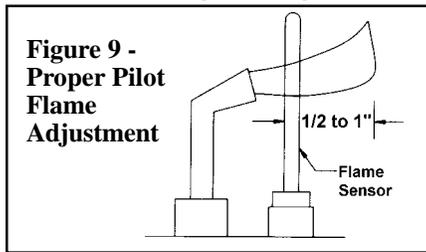
Turn on the electric and the gas. Relight following the instructions on the new lighting instruction plate.

WARNING: In the event of improper ignition, wait at least five minutes before attempting to relight the heater.

Check all gas connections including the pilot connections for leaks. If a leak cannot be stopped by tightening, replace the part.

Observe the pilot flame through the pilot lighting hole. The flame should extend 1/2" to 1" past the flame sensing device (See Figure 9).

Instructions (cont'd)



To adjust the pilot flame, remove the pilot adjustment cover screw from the combination valve. Turn the inner adjustment screw clockwise to decrease or counterclockwise to increase the pilot flame. Replace the cover screw after adjustment to prevent gas leakage.

10. Adjust Manifold Pressure

Follow these requirements and instructions to adjust manifold gas pressure:

For Natural Gas – The regulator in the valve must be adjusted to provide a manifold pressure of 3.5" w.c. Inlet pressure to the valve must be a minimum of 5" w.c. or as noted on the rating plate and a maximum of 14" w.c.

For Propane Gas – The regulator in the valve must be adjusted to provide a manifold pressure of 10" w.c. Inlet pressure to the valve must be a minimum of 11" w.c., and a maximum of 14" w.c.

WARNING: Manifold gas pressure must never exceed 3.5" w.c. for natural gas or 10" w.c. for propane gas.

Instructions – Before attempting to measure or adjust the manifold gas pressure, be certain that the inlet (supply) pressure is within the specified range for the gas being used both when the heater is in operation and on standby.

Incorrect inlet pressure could cause excessive gas pressure immediately or at some future time.

With the manual valve (on the combination valve) positioned to prevent flow to the main burners, connect a manometer to the 1/8" pipe outlet pressure tap in the valve. Open the valve and operate the heater to measure the manifold gas pressure.

NOTE: A manometer (fluid filled gauge) is recommended rather than a spring type gauge.

If the manometer indicates that the manifold pressure needs adjusting, set the correct pressure by turning the regulator screws on the valve IN (clockwise) to increase pressure. Turn regulator screw OUT (counterclockwise) to decrease the pressure.

11. Check for reliable and safe operation by operating the heater for several complete cycles.

Retain this instruction sheet for future reference.

Kit Components

| Ignition Conversion Kits for Models (C) XL(B) 30-105 | | |
|--|--------|---|
| Qty | P/N | Description |
| Kit P/N 98340 for Size 30-105 NATURAL GAS Units includes: | | |
| 1 | 96307 | Gas valve, Natural, 1/2" M/H VR8204M1000 |
| 1 | 93971 | Pilot assy, Natural, Johnson 983HKW7715 |
| Kit P/N 98341 for Size 30-105 PROPANE GAS Units includes: | | |
| 1 | 96310 | Gas valve, Propane, 1/2", M/H VR8204M1018 |
| 1 | 93972 | Pilot assy, Propane, Johnson 983HKW4709 |
| Both Kit P/N 98340 and P/N 98341 include: | | |
| 1 | 97547 | Ignition controller, Johnson #G770NGC-4 |
| 2 | 110076 | Screws, #6 x 5/8" lg (for mounting controller on bracket) |
| 1 | 124019 | Bracket (to attach ignition controller to the valve) |
| 2 | 124023 | Screws (to attach valve to bracket), #8-32x1/4" lg |
| 1 | 50450 | Red wire assy (flame probe to ignition controller), 18 ga. x 16", 150° C SEF with 2 terminals |
| 1 | 5145 | Pilot Tubing 1/4" x 22" |
| 2 | 9664 | Nut with breakaway ferrule for pilot tubing |
| 1 | 43594 | Flame probe |
| 1 | 43998 | Blue wire assy (ignition controller to valve), 18 ga. x 12", 105°C with 2 terminals |
| 1 | 43997 | Black wire assy (ignition controller to valve), 18 ga. x 12", 105°C with 2 terminals |
| 1 | 60150 | Brown wire assy (ignition controller to valve), 18 ga. x 12", 105°C with 2 terminals |
| 2 | 20913 | Nylon ties (for wires) |
| 1 | 96101 | Lighting instruction plate |
| 1 | 171735 | Instruction sheet CP-11D |

| Ignition Conversion Kits for Models (C)XL(B) 125-250, Natural Gas, and 125-400, Propane Gas | | |
|---|--------|--|
| Qty | P/N | Description |
| Kit P/N 98554 for size 125-250 NATURAL GAS Units includes: | | |
| 1 | 121598 | Gas valve, Natural, 1/2", M/H VR8304M2808 |
| 1 | 61145 | Pilot assy, Natural, Johnson 992HXW7223 |
| Kit P/N 98556 for Size 125-400 PROPANE GAS Units includes: | | |
| 1 | 121600 | Gas valve, Propane, 1/2" M/H VR8304H3802 |
| 1 | 61146 | Pilot assy, Propane, Johnson J992HXW-4209 |
| Both Kit P/N 98554 and P/N 98556 include: | | |
| 1 | 97547 | Ignition controller, Johnson #G770NGC-4 |
| 2 | 110076 | Screws, #6 x 5/8" lg (for mounting controller on bracket) |
| 1 | 124019 | Bracket (to attach ignition controller to the valve) |
| 2 | 124023 | Screws (to attach valve to bracket), #8-32x1/4" lg |
| 1 | 50450 | Red wire assy (flame probe to ignition controller), 18 ga x 16", 150° C SEF with 2 terminals |
| 1 | 5145 | Pilot tubing 1/4" x 22" |
| 2 | 9664 | Nut with breakaway ferrule for pilot tubing |
| 1 | 90186 | Blue wire assy (ignition controller to valve), 18 ga. x 8", 105°C with 2 terminals |
| 1 | 90184 | Black wire assy (ignition controller to valve), 18 ga. x 8", 105°C with 2 terminals |
| 1 | 90185 | Brown wire assy (ignition controller to valve), 18 ga. x 8", 105°C with 2 terminals |
| 1 | 96101 | Lighting instruction plate |
| 1 | 171735 | Instruction sheet CP-11D |

| Ignition Conversion Kit for Models (C)XL(B) 300-400, Natural Gas | | |
|--|--------|--|
| Qty | P/N | Description |
| Kit P/N 98555 for NATURAL GAS Units includes: | | |
| 1 | 89397 | Gas valve, Natural, 3/4", W/R 38C68-441 |
| 1 | 97547 | Ignition controller, Johnson #G770NGC-4 |
| 1 | 111736 | Bracket (to be attached to the ignition controller) |
| 4 | 110076 | Screws, #6 x 5/8" lg (for mounting controller on bracket) and bracket to bracket) |
| 1 | 90187 | Bracket (to attach valve and ignition controller) |
| 2 | 90167 | Screws, #10 x 3/8" lg (to attach valve to bracket) |
| 1 | 50450 | Red wire assy (flame probe to ignition controller), 18 ga x 16", 150° C SEF with 2 terminals |
| 1 | 61145 | Pilot assy, Natural, Johnson #992HXW-7223 |
| 1 | 5145 | Pilot tubing 1/4" x 22" |
| 2 | 9664 | Nut with breakaway ferrule for pilot tubing |
| 1 | 90186 | Blue wire assy (ignition controller to valve), 18 ga. X 8", 105°C with 2 terminals |
| 1 | 90184 | Black wire assy (ignition controller to valve), 18 ga. X 8", 105°C with 2 terminals |
| 1 | 90185 | Brown wire assy (ignition controller to valve) 18 ga. X 8", 105°C with 2 terminals |
| 1 | 96101 | Lighting instruction plate |
| 1 | 171735 | Instruction sheet CP-11D |

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