

INSTALLATION INSTRUCTIONS

Replacement Hot-Surface Ignition Parts Package

New Wiring Diagram is required; do not install without wiring diagram.

Applies to Reznor RDF Models Manufactured Prior to 3/96

DANGER: Service work on this system should only be done by a qualified gas service person. Installation must be done 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 the work assumes responsibility for this installation.

Description/Application

This kit is designed to replace the spark ignition system on a Reznor Model RDF direct-fired furnace with a hot surface ignition system. The hot surface ignition system has a prepurge time delay and flame sensor with 100% lockout. This kit is designed to replace either type of original spark ignition system

- spark ignition with a rectification type flame sensor, standard on RDF Models manufactured prior to 9/88 (Serial No. Codes 58 and 60), *and*
- spark ignition with an ultraviolet flame sensor (Serial No. Codes 59 and 61), standard on RDF Models beginning 9/88 (optional on prior models)



Figure 1 - Hot Surface Ignition Module, P/N 157953, in all Replacement Kits

Replaces rectification flame sensor or ultraviolet flame sensor system.
Follow instructions carefully.

Components

The complete replacement kit includes two parts: (1) one of the four packages listed below and (2) a "custom" wiring diagram. Due to the variety of optional controls available on the original system, the appropriate wiring diagram can only be determined when the replacement parts order is placed. The Model No., Serial No., and Wiring Diagram No. were provided with the Parts Order. Do not install this kit without a new "custom" wiring diagram; verify wiring diagram number before beginning installation.

There are four replacement parts packages:

- P/N 146268 is designed for units *already equipped with a 200VA transformer*
- P/N 146318 is for a 115V unit that is *factory-equipped with an 80VA transformer*
- P/N 146319 is for a 208V unit that is *factory-equipped with an 80VA transformer*
- P/N 146320 is for a 240V, 480V, or 575V unit that is *factory-equipped with an 80VA transformer*.

All four kits include the same components except for the transformer. All components are listed in the tables below. Verify that all parts are available before beginning conversion.

To be Installed in the Electrical Compartment - in kits as listed		
Qty	P/N	Description
In all Kits		
1	157953	Hot surface ignition module, RAM #H4MC4-02 (See Figure 1)
5	103183	Sheetmetal screws, #6 x 1" lg for attaching module
1	179294	Main Valve Contactor Assembly (Main Valve Contactor with 2 factory installed black jumpers)
2	110656	Pilot valve SP-DT Relays (2 in series), 24 volt, White Rodgers #91-102006-13088
1	103317	Safety lockout SP-DT Relay, 24 volt, RBM #134-20103-301 (used with Honeywell #R7795 only)
In Kit P/N 146318 for 115 volt requiring a 200VA transformer		
1	38634	Transformer, 115-24V, 200VA, #2223018T00
1	38635	Fuseholder, #257A.574G01
1	38636	Fusetron 1 x 1-1/4, 3AG-8 Amps
In Kit P/N 146319 for 208 volt requiring a 200VA transformer		
1	39094	Transformer 208-24V, 200VA, #2223034T00
1	38635	Fuseholder, #257A.574G01
1	38636	Fusetron 1 x 1-1/4, 3AG-8 Amps
In Kit P/N 146320 for 240, 480, 575 volt requiring a 200VA transformer		
1	39095	Transformer 240/480/575-24V, 200VA, #2223033T00
1	38635	Fuseholder, #257A.574G01
1	38636	Fusetron 1 x 1-1/4, 3AG-8 Amps

To be installed at the Burner - All Kits		
Qty	P/N	Description
1	95473	Stainless steel burner end plate
1	123449	Cast iron burner inlet flange
1	146269	Key graphite paste (.5 oz) and bag
2	1438	Hex head nut 3/8"-16
2	5095	Hex head shoulder bolt 3/8" x 1-1/2" lg
1	120048	Pilot Assembly
<i>pilot assembly includes:</i>		
1	122840	Pilot (with ignitor tube)
1	134706	Flame Sensor, J/C
1	38529	Screw, #8 - 1/2" lg
1	121730	Pilot Bushing
1	90167	Hex head cap screw, #10-32 x 3/8" lg
1	121865	Ignitor, Norton #401E

*List of wire assemblies
continued on page 2.*

Components (cont'd)

18 gauge Wire Assemblies in all Kits (Follow the wiring diagram to make connections.)											
Qty	P/N	Color	Length	°C	For Connections	Qty	P/N	Color	Length	°C	For Connections
1	145747	Black	40"	105	MV2 To Terminal 8	1	145752	White	72"	105	Terminal 7 to Ignitor
2	37217	Yellow	12"	105	APS to Terminal N; TH to Terminal G	1	145729	Red	48"	150	ECO or Flame Safety Limit to Terminal 55
1	145722	Black	15"	105	THH to Terminal 11	2	44719	Black	22"	105	Terminal B to Main Valve Contactor Contacts: Terminal B to #1 Pilot Valve Relay
1	145749	Orange	22"	105	L1 to Terminal 55	1	145753	Black	10"	105	Jumper #1 Pilot Valve Relay to #2 Pilot Valve Relay
1	51797	Red	20"	105	ALRM to Terminal 56	1	145755	Orange	24"	105	Terminal C to Main Valve Contactor Contacts
1	145724	Purple	20"	105	MV1 to Terminal 57	1	145732	Purple	12"	105	Terminal 57 to Main Valve Contactor Coil
1	45154	Blue	20"	105	PV to terminal 58	3	37216	Brown	12"	105	Terminal 7 to Main Valve Contactor Coil & Pilot Valve Relay Coils
1	145743	Red	60"	150	FS to Flame Sensor	1	145742	Blue	26"	105	Terminal E to #2 Pilot Valve Relay Terminal 3
1	37261	Brown	22"	105	GND to Terminal 7	2	37215	Blue	12"	105	Terminal 58 to Pilot Valve Relay Coils
1	145751	White	64"	105	IGN to Ignitor						

Installation Instructions

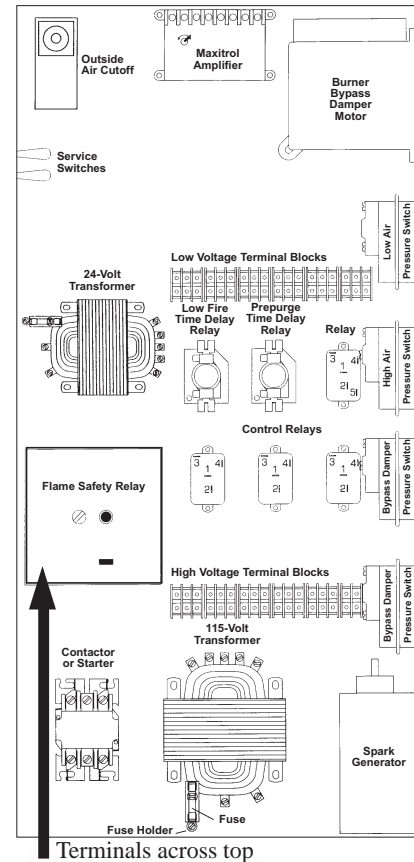
FIELD-SUPPLIED: New pilot tubing and fittings may be required. These are not included and must be supplied locally.

1. Turn off the gas and the electric.

2. Remove the burner compartment and the electrical compartment doors.

3A. **Install New Components in the Electrical Compartment** See Figure 2 or 3 and follow procedures in 1), 2), and 3) on the right.

Figure 2 - General Location Drawing of a Model RDF1 Electrical Compartment



Terminals across top

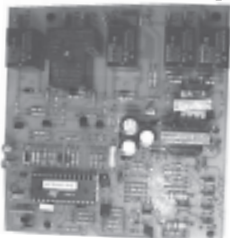
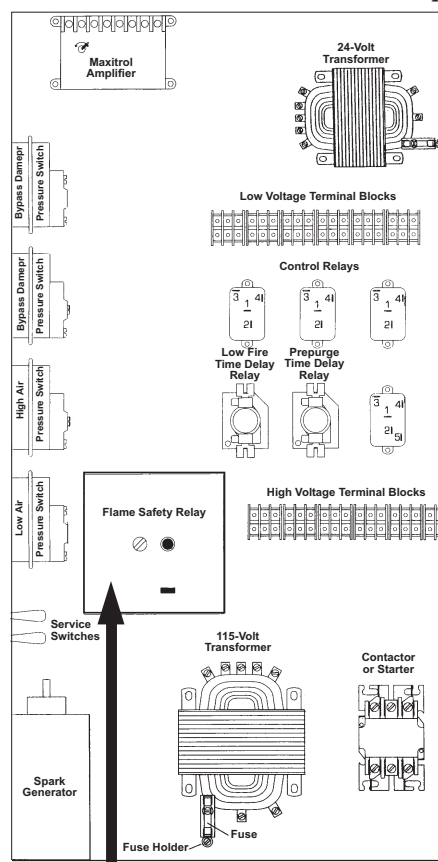


Figure 3 - General Location Drawing of a Model RDF2 or RDF3 Electrical Compartment



Terminals on the left



1) Locate the flame safety relay. Disconnect the wires, remove the relay and subbase, and discard. In the same general location as the flame safety relay, position the hot surface ignition module.

On a Model RDF1, position the module with the terminals across the top. On a Model RDF2 or RDF3, position the terminals to the left.

Using the five 1"-screws provided, attach the module.

2) If the unit is equipped with an 80VA transformer, remove it. Attach the 200VA transformer included in the kit.

3) Attach the four 24-volt main and pilot valve relays. If required, attach the safety lock-out relay (required on units with rectification type flame sensor Honeywell #R7795; not required on units with Honeywell #R890 or an ultra-violet type flame sensor).

3B. Install New Parts in the Burner Compartment See Figure 4 and follow instructions in steps 1), 2), 3) and 4) below.

Access to the burner can be obtained either through the burner access panel in the burner compartment or through the end of the system. First, remove the burner access panel. If the burner cannot be reached easily, remove the moisture eliminators in the air hood and/or the filters to access the burner through the end of the unit.

Figure 4 - Burner Access

Burner Access Panel (in the Burner compartment) -- Remove panel to service burner

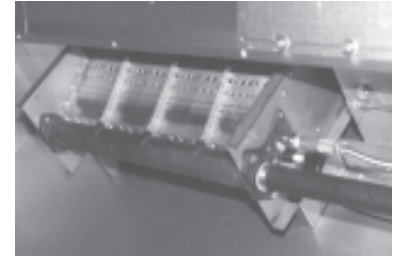
(NOTE: Controls may not be the same as those illustrated.)

Pilot Valve



View of Burner through the end of the unit.

OR, burner may be reached through the outside air hood and/or filter cabinet



- 1) Check for a pilot needle valve (factory installed on units manufactured beginning 1/91; could be field-installed on units manufactured before 1/91). See Figure 5. If there is a pilot needle valve, disconnect and remove it.

Figure 5 - Pilot Needle Valve



If unit is equipped with a pilot needle valve, disconnect and remove it.

- 2) Disconnect the manifold from the burner end plate (at the coupling). If not already disconnected, disconnect the pilot tubing from the pilot.
- 3) On the pilot end of the burner (See Figure 6), remove the cast iron end plate, the stainless steel end plate (burners larger than 48" do not have a stainless steel end plate), the flame sensor, and the pilot assembly. Save the screws and nuts that held the end plate(s) to the burner. Discard all other removed parts.

Figure 6 - Pilot End of Burner with Ultraviolet Flame Sensor System Being Removed

- 1) Remove and discard the two screws holding the cast iron end plate to the manifold
- 2) Remove and **save** the ten screws (five on each side) attaching the end plate(s) to the burner
- 3) Remove and discard the flame sensor (either the ultraviolet with wire illustrated or the flame sensor rod and spark plug).
- 4) Slide the complete end plate assembly (burners larger than 48" have only the cast iron end plate), including the pilot, away from the burner. Discard the assembly including pilot wires.

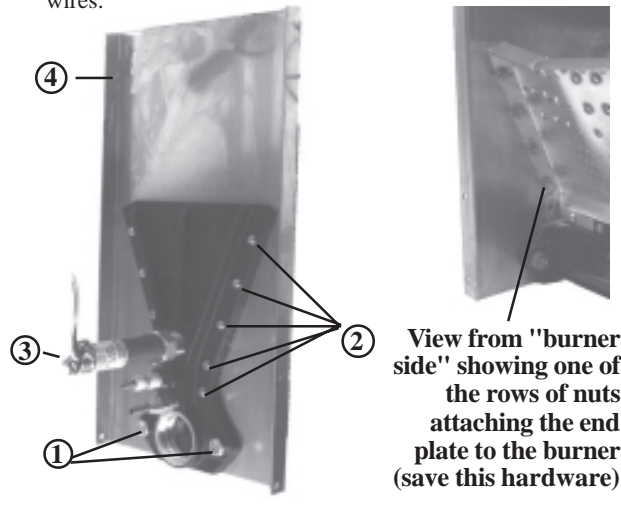
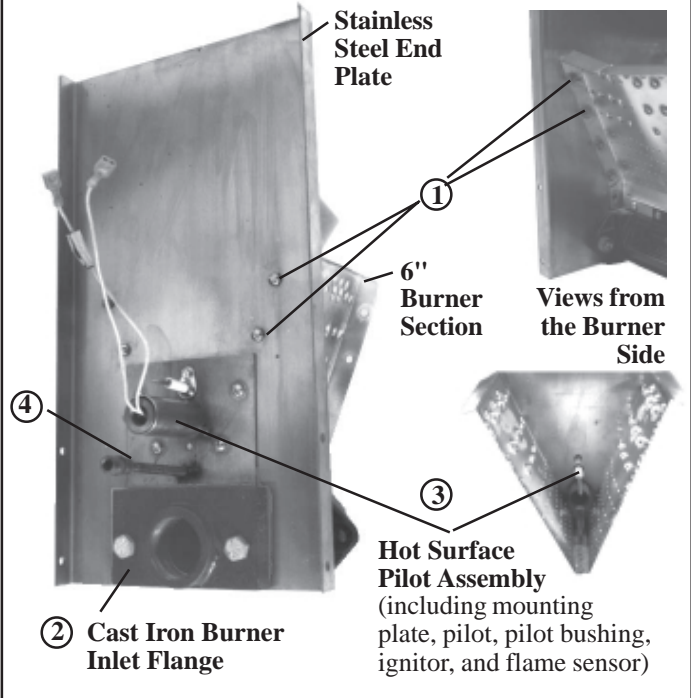


Figure 7 - Burner with the New End Plates and Hot Surface Pilot

- 1) Position the stainless steel end plate on the end of the burner. On **both sides** of the "V", insert and **attach the top two screws**
- 2) Use the graphite paste, the bolts, and nuts from the kit to attach the cast iron burner inlet flange. **Be sure to put graphite paste between the metal plates around the entire burner inlet opening.** Fasten tightly. Wipe off any excess paste.
- 3) Position the complete pilot assembly as shown in the illustration. Put graphite paste between the metal plates. Attach the pilot assembly to the stainless steel end plate and the burner. Fasten tightly. Wipe off any excess paste.
- 4) Attach the pilot tubing to the pilot solenoid valve (See Figure 4) and to the pilot assembly. If the old tubing and/or connections are too short or damaged, supply and install new pilot tubing and connections.



4. Wiring

Follow the new wiring diagram and make the necessary connections at the burner and in the electrical compartment. The wire lengths are determined for the smallest burner sizes and may seem excessively long on some systems. Individually wrap and tie the excess wire length and "store" neatly in the electrical compartment.

A new wiring diagram label is provided. Clean and dry the inside surface of the electrical compartment door panel. Position the label on the door. Carefully peel the backing and adhere the wiring diagram label to the inside of the door panel.

- 4) Install the new burner end plates and pilot assembly; follow the procedure in Figure 7.

Installation Instructions (cont'd)

WARNING: Do not turn on the electric or the gas before reading Section 5, below. Complete all of the start-up/operation procedures in Section 5 before attempting to operate the system.

5. Start-up and Operation Instructions

1) Close all service panels except the electrical and burner control compartment doors. If removed, reinstall the moisture eliminators and/or filters.

2) Check for pilot line leaks.

a. Set the blower and burner switches to "test" position (switches are in the electrical compartment; see service switches in Figure 2 or 3, page 2).

NOTE: This is a **necessary** safety procedure in order to override control from the remote console when electrical power is on at the disconnect switch.

b. Turn on the electrical power to the system.

c. Close the manual shutoff valve immediately upstream from the main burner.

d. Turn on the gas supply to the unit; open pilot manual shutoff and solenoid valve.

e. Using a leak detecting solution, check all connections in the pilot line. Correct any leaks.

WARNING: Never test for gas leaks with an open flame. Failure to comply could result in severe personal injury, property damage or death.

3) Verify pilot gas pressure.

a. Connect a "U" tube manometer to the pressure tap on the downstream side of the pilot solenoid valve.

b. With blower in operation, measure pilot supply pressure. Pilot pressure for natural gas should be 3.5" w.c.; pilot pressure for propane gas should be 6" w.c. Pilot pressure should already be correct; but if the pressure is not correct, adjust at the pilot regulator. Remove the cap from the pilot regulator and turn the adjustment clockwise to increase gas pressure or counterclockwise to decrease pressure.

c. When pressure is correct, shut off the gas, remove the manometer, and replace the pressure test cap on the pilot solenoid valve.

d. Turn on the gas supply.

4) Check the pilot lockout feature.

Turn the manual pilot shutoff valve "off". After two trials for ignition, the pilot system should lockout. To reset the unit, open the gas valve and cycle the main disconnect switch.

5) Restore the system to normal operation.

a. Set the blower and burner service switches to "off" position.

b. Turn off the electrical power and the gas supply.

c. Open the manual shutoff valve immediately upstream from the main burner.

d. Set the blower and burner service switches to "run" position.

e. Close the electrical and burner compartment doors.

f. Turn on the electrical power and the gas supply.

g. Installation of the replacement ignition system is complete and the unit is restored to normal control. Test the unit from the remote console to verify proper operation.

6. Troubleshooting the Hot Surface Ignition System

