REZNOR®

Hot-Surface Ignition Conversion Kit

Applies to Reznor® RDF Models with Spark Ignition Manufactured Prior to 3/96

New Wiring Diagram is required; DO NOT install without wiring diagram.

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

FIGURE 1 - Hot Surface Ignition Module, P/N 204376, in all Replacement Kits

Replaces either ultraviolet flame sensor or rectification flame sensor system.

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)

Each replacement kit includes two parts: (1) one of the three 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.**

Kits and Components

There are three 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, 240V, 480V, or 575V unit** that is *factory-equipped with an 80VA transformer.*

Components are listed in the tables below. Verify that all parts are available before beginning conversion.

Parts to be installed in the electrical compartment; follow instructions on page 2.

Kit P/N 146268			Kit P/N 146318			Kit P/N 146319		
P/N	**Description**	**Qty**	**P/N**	**Description**	**Qty**	**P/N**	**Description**	**Qty**
103183	#6 x 1" lg Screws	5	**38634**	Transformer 250VA,115/24V	1	**39095**	Tranformer 200VA, 208/240/480/575	1
110656	Contactor SPDT	2	**38635**	Fuse Holder	1	**38635**	Fuse Holder	1
216386	Contactor SPST	1	**38636**	Fuse 1/4x1-1/4 Mdl-8 Amps	1	**38636**	Fuse 1/4x1-1/4 Mdl-8 Amps	1
204376	Ignition Control	1						
211411	Safety Lockout	1	**103183**	#6 x 1" lg Screws	5	**103183**	#6 x 1" lg Screws	5
211415	Relay and Base	1	**216386**	Contactor SPST	1	**216386**	Contactor SPST	1
			110656	Contactor SPDT	2	**110656**	Contactor SPDT	2
			204376	Ignition Control	1	**204376**	Ignition Control	1
			211411	Safety Lockout	1	**211411**	Safety Lockout	1
			211415	Relay and Base	1	**211415**	Relay and Base	1

Parts in All Kits for Installation at the Burner

P/N	Description	Qty	P/N	Description	Qty
1438	Hex Nut 3/8 In.-16	2	**120048**	Complete Pilot Assy	1
5095	Hxhd Cap Screw 3/8x1-1/2	2	**123449**	Burner Inlet Flange	1
95473	End Plate	1	**146269**	Graphite Paste Bag Assy	1

Wire Assemblies in All Kits

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	2	**44719**	Black	22"	105	Terminal B to Main Valve Contactor Contacts: Terminal B to #1 Pilot Valve Relay Terminal 1
2	**37217**	Yellow	12"	105	APS to Terminal N; TH to Terminal G						
1	**145722**	Black	15"	105	THH to Terminal 11	1	**145753**	Black	10"	105	Jumper #1 Pilot Valve Relay to #2 Pilot Valve Relay
1	**145749**	Orange	22"	105	L1 to Terminal 55						
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	**45154**	Blue	20"	105	PV to terminal 58	1	**145732**	Purple	12"	105	Terminal 57 to Main Valve Contactor Coil
1	**145743**	Red	60"	150	FS to Flame Sensor						
1	**37261**	Brown	22"	105	GND to Terminal 7	3	**37216**	Brown	12"	105	Terminal 7 to Main Valve Contactor Coil & Pilot Valve Relay Coils
1	**145751**	White	64"	105	IGN to Ignitor						
1	**145752**	White	72"	105	Terminal 7 to Ignitor	1	**145742**	Blue	26"	105	Terminal E to #2 Pilot Valve Relay Terminal 3
1	**145729**	Red	48"	150	ECO or Flame Safety Limit to Terminal 55	2	**37215**	Blue	12"	105	Terminal 58 to Pilot Valve Relay Coils

Installation Instructions

<u>FIELD-SUPPLIED:</u> 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 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 line voltage transformer, remove it. In the same location, attach the 200VA or 250VA transformer from the conversion kit.

3) Attach the three 24-volt main and pilot valve relays (Contactor **P/N's 110656 and 216386**).

If the unit has a flame rectification type flame sensor Honeywell #R7795, attach the relay base, **P/N 211415**, and install the plugin relay, **P/N 211411**.

(**NOTE:** The relay and base, P/N's 211411 and 211415, are in all kits but are not used on units with Honeywell #R890 or an ultraviolet type flame sensor).

FIGURE 2 - General Control Location Drawing of a Model RDF1 Electrical Compartment

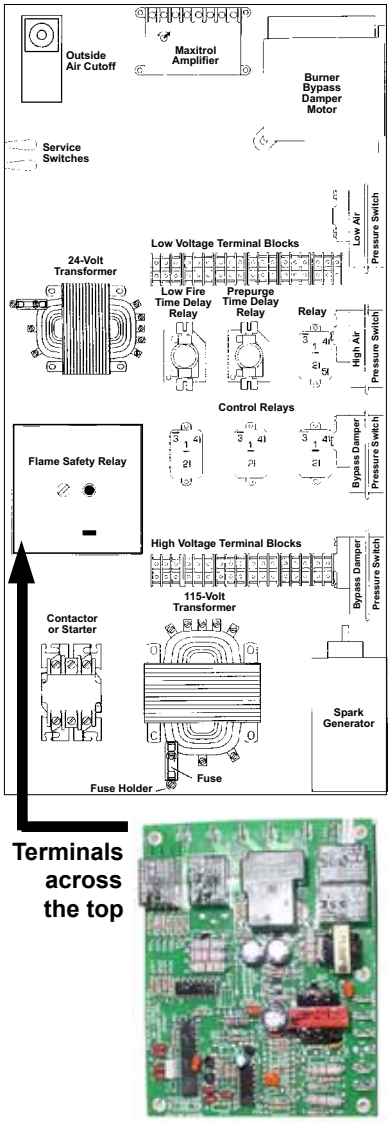
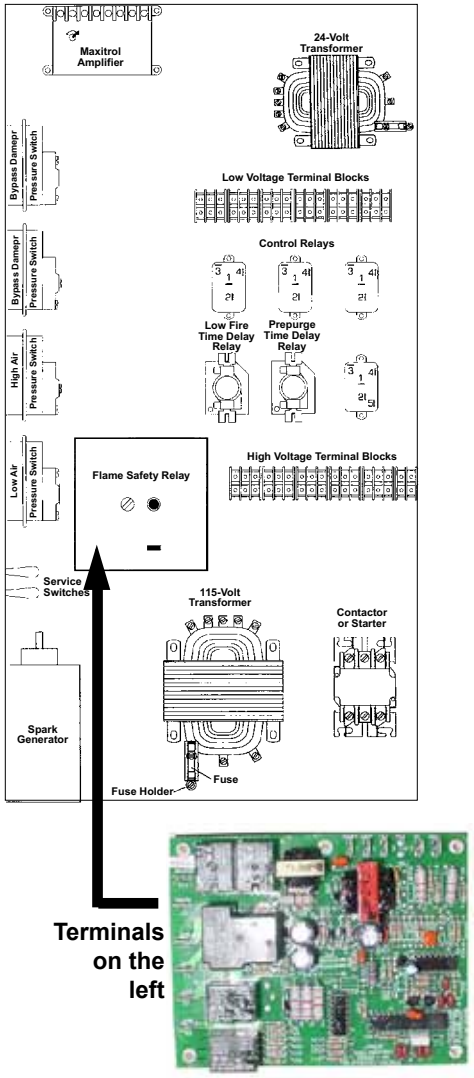


FIGURE 3 - General Control Location Drawing of a Model RDF2 or RDF3 Electrical Compartment



3B. <u>Install New Parts in the Burner Compartment</u> See FIGURE 4 and follow instructions in Steps 1), 2), 3) and 4) on page 3. 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 mois-

FIGURE 4 - Burner Access

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

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

Pilot Valve

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

View of Burner through the end of the unit.

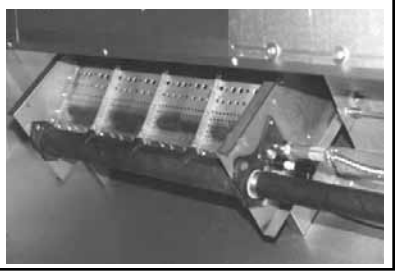


FIGURE 5 - Pilot Needle Valve

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

ture eliminators in the air hood and/or the filters to access the burner through the end of the unit.

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.

2) Disconnect the manifold from the burner end plate (at the coupling). 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.

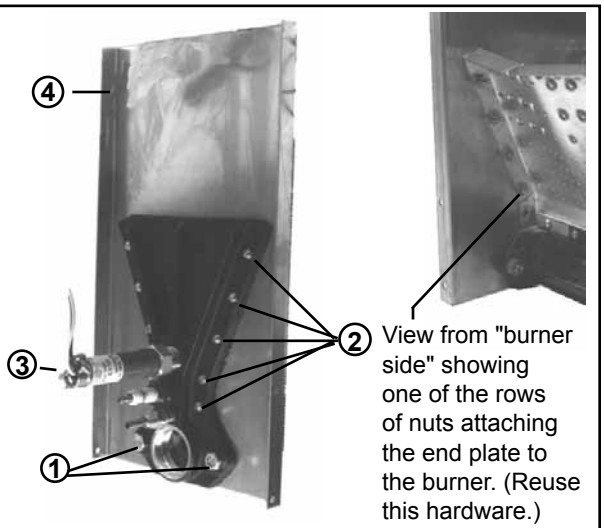
FIGURE 6 - Pilot End of Burner with Ultraviolet Flame Sensor System Being Removed

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.



View from "burner side" showing one of the rows of nuts attaching the end plate to the burner. (Reuse this hardware.)

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

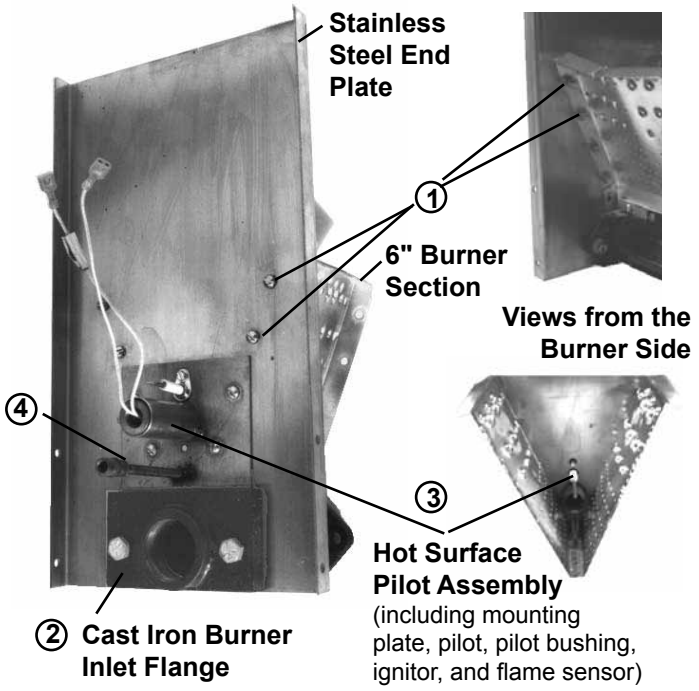
FIGURE 7 - Burner with the New End Plates and Hot Surface Pilot

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 in the kit 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.

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. Immediately upstream from the main burner, close the manual shutoff valve

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.

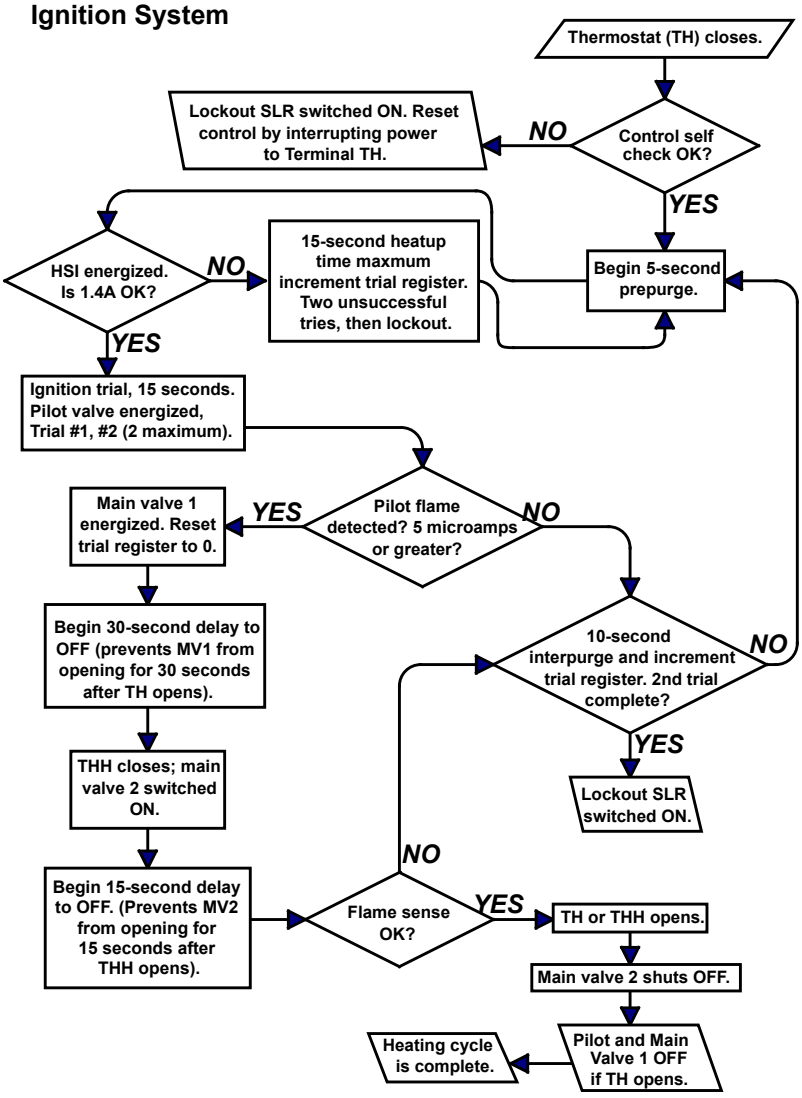
d. Set the blower and burner service switches to "run" position.

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



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