

Printed in U.S.A.



## INSTALLATION AND OPERATION INSTRUCTIONS

### *RSTP Series* **INFRARED RADIANT TUBE HEATER**

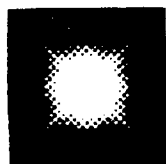
#### MODELS

**RSTP 10**

**RSTP 15C**

**RSTP 17C**

VENTED OR UNVENTED



**SPACE-RAY**<sup>®</sup>

Division of Gas-Fired Products, Inc.  
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INSTALLATION, OPERATION, & CLEANING INSTRUCTIONS  
Infrared Radiant Tube Heater  
VENTED OR UNVENTED

1. General Information

This heater is a self-contained infrared radiant tube heater for use in locations where flammable gases or vapors are not generally present and is intended for the heating of nonresidential spaces.

It can be used in either a **Vented or unvented mode.**

Application for various industrial processes is not covered in this manual.

Installation of this heater must be in accordance with all applicable codes shown in the instructions and/or the local codes and authorities having jurisdiction. Heaters shall be installed by a licensed contractor or licensed installer.

Although these heaters may find use for many applications other than space heating, the American Gas Association has not tested and does not certify these heaters for any use other than space heating as defined in this manual. For this reason, Gas-Fired Products, Inc. will not recognize the warranty for any use other than space heating.

The term Unvented actually means Indirect Vented. While the products of combustion are expelled into the building, national codes require ventilation in the building to dilute these products of combustion. This ventilation may be provided by gravity or mechanical means.

Copies of the National Fuel Gas Code (ANSI Z223.1-latest edition) are available from American Gas Association, 8501 E. Pleasant Valley Rd., Cleveland, OH 44131. All NFPA codes are available from National Fire Protection Association, Batterymarch Park, Quincy, MA 02269.

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

## 2. Specifications

Model No.	Btu/Hr	Orifice Size		Weight	
		Natural Gas	Propane Gas	Shipping	Unit
RSTP10-N5A & L5A (Indoor only)	100,000	#14 (.1820)	#35 (.1100)	190	170
RSTP15C-N5D (Indoor or Outdoor)	150,000	#1 (.220)	-----	256	216
RSTP17C-N5D & L5D (Indoor or Outdoor)	175,000	"D" (.246)	#26 (.147)	256	216

Gas Pipe Connection: 1/2 NPT Female  
 Type Ignition: Direct Spark (Honeywell)  
 Electrical Supply: 120 Volt 60 Hz 1Ph  
 Current Rating: 2.4 Amp  
 Fuse Rating: 3 Amp (Spark Module)

## 3. Assembly - Model RSTP10

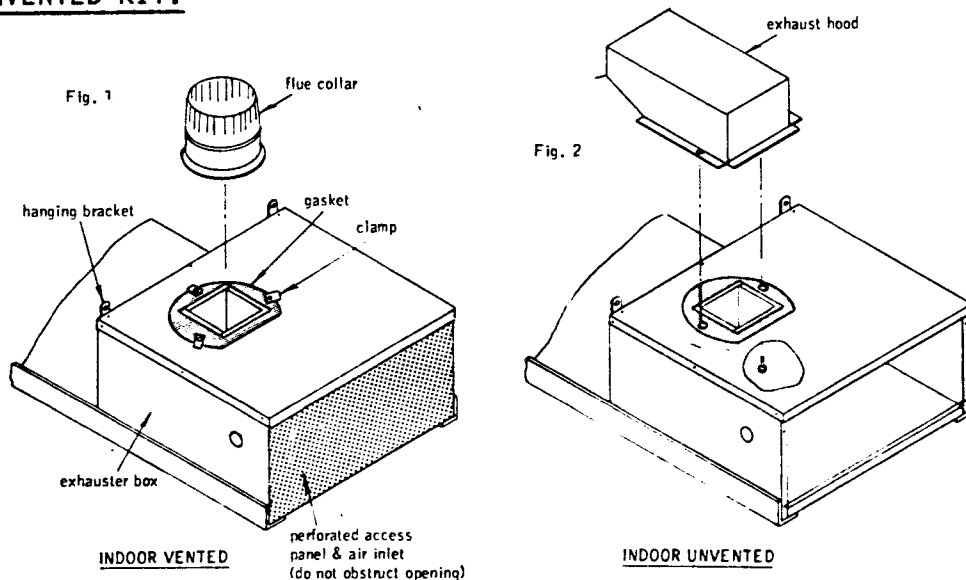
If the heater is to be used Indoor & Vented to outside, install flue collar supplied with heater. Place collar directly over gasket. Secure collar flange with clamps. See fig. 1.

Attach a 6" dia. flue pipe to flue collar. Place a vent cap (not supplied) to outside end of flue pipe. See page 4 for the flue vent requirements.

If the heater is to be used Indoor & Unvented, follow instructions below:

1. Remove existing clamps (3) from top of control. See fig. 1.
2. Remove access panel. See fig. 1.
3. Place exhaust hood directly over gasket in position shown. See fig. 2.
4. Punch holes through gasket for screws.
5. Insert 10-24 x 3/8 screws from inside of cabinet & into weld nuts of exhaust hood  
See fig. 2.
6. Re-install access panel.

Note: Exhauster hood supplied as accessory only. Order part number 4240600  
INDOOR UNVENTED KIT.



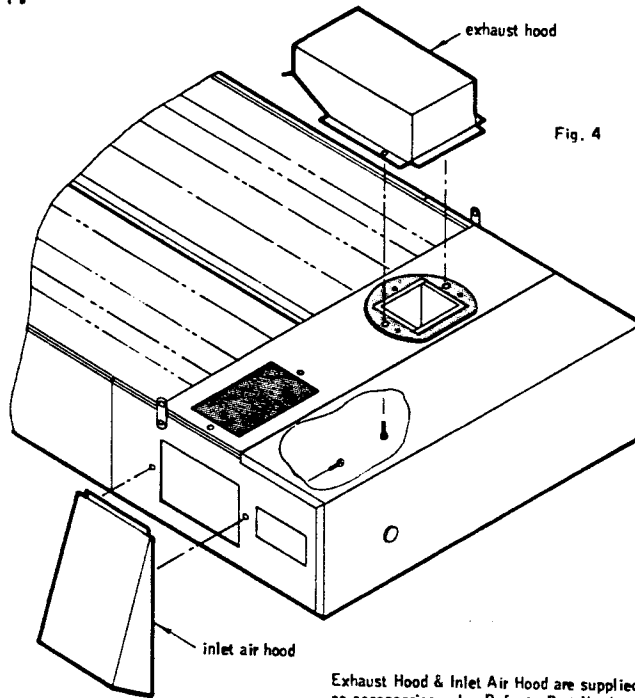
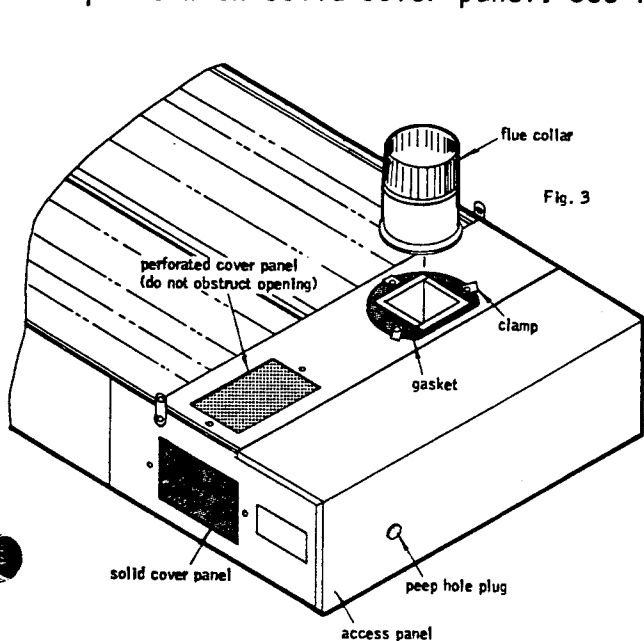
#### 4. Assembly - Model RSTP15C & RSTP17C

If the heater is to be used Indoor & Vented to outside, install flue collar supplied with heater. Place collar directly over gasket. Secure collar flange with clamps. See fig. 3

Attach a 6" dia. flue pipe to flue collar. Place an approved vent cap to outside end of flue pipe. See page 6 for flue vent requirements.

If the heater is to be used Indoor & Unvented, remove clamps & install exhaust hood directly over gasket. See fig. 4.

If the heater is to be used Outdoor, install exhaust hood. Remove solid cover panel from side & install inlet air hood. Remove perforated cover panel from top & replace with solid cover panel. See fig. 4.



Exhaust Hood & Inlet Air Hood are supplied as accessories only. Refer to Part Numbers below for required kits.

4240600	Indoor Unvented Kit (includes exhaust hood)
4241100	Outdoor Kit (includes exhaust hood & inlet air hood)

#### 5. Installation Requirements

Every heater shall be located with respect to building construction and other equipment so as to permit access to the heater. Each installer shall use good installation practices when locating the heater and must give consideration to service accessibility.

The heater, when installed in aircraft hangars and public garages, must be installed in accordance with the latest edition of ANSI/NFPA 409 (Standard for Aircraft Hangars), ANSI/NFPA 88a (Standard for Parking Structures), and ANSI/NFPA 88b (Standard for Repair Garages) with the following clearances:

At least 10 feet above the upper surfaces of wings or engine enclosures of the highest aircraft which may be housed in the hangar.

At least 8 feet above the floor in shops, offices and other sections of hangars communicating with aircraft storage or service areas.

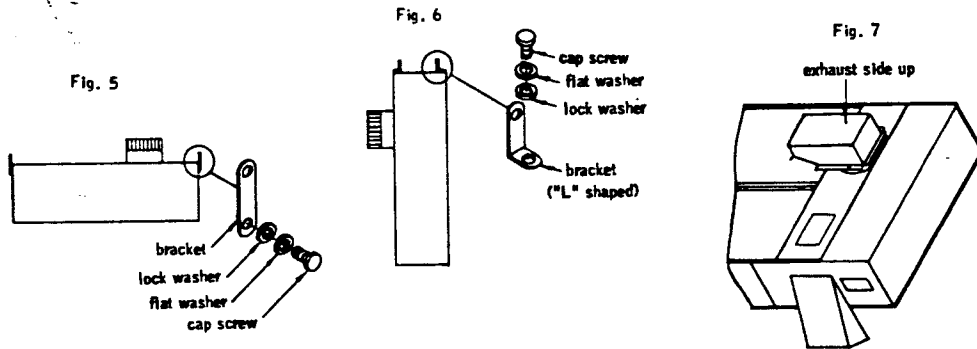
At least 8 feet above the floor in public garages. **WARNING...** Minimum clearances marked on the heater must be maintained from vehicles parked below the heater.

The heater can be mounted horizontally or at angles of 30°, 60° or 90° indoors. The maximum mounting angle for the RSTP15C and RSTP17C is 45° when installed outdoors. Number 3/0 double loop coil chain minimum size or rigid supports may be used to mount the heater. The long axis of the heater should be level whether it is mounted horizontally or angled.

If heater is to be mounted horizontally or at an angle up to 60°, use hanging brackets installed on heater. See fig. 5.

If heater is to be mounted at a 90° angle, remove existing brackets from each end of heater. Replace with "L" shaped brackets. See fig. 6 (Note: Brackets are supplied as an accessory only. Order Kit No. 4292900.)

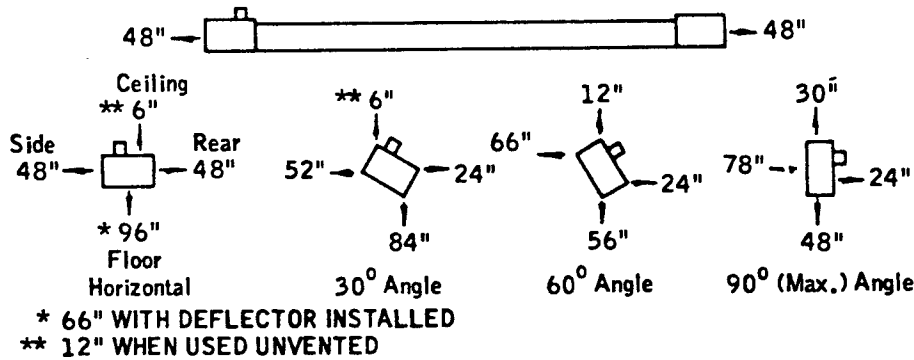
When heater is angle mounted, the exhaust side should be up. See fig. 7.



(RSTP15C & 17C shown for reference)

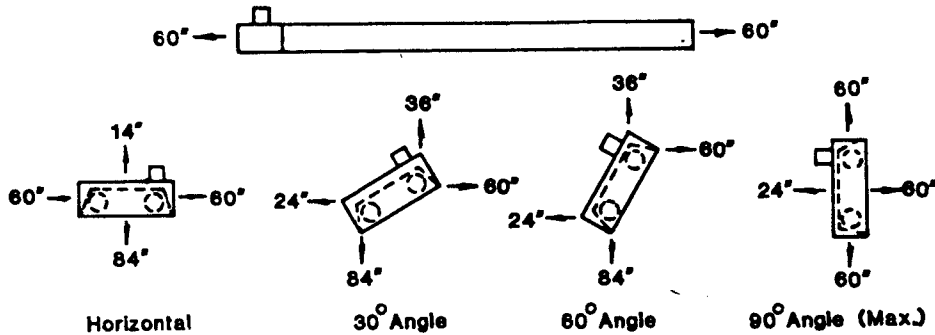
### 6. Minimum Clearances to Combustibles

Minimum clearances to combustibles shall be measured from the outer surfaces as shown in the following diagrams.



### RSTP10

Note: The maximum mounting angle is 45° when used outdoors.



### RSTP15C & RSTP17C

## 7. Gas Connections and Regulation

1. Connect to the supply tank or manifold in accordance with the latest edition of National Fuel Gas Code (ANSI No. Z223.1), and local building codes. Authorities having jurisdiction should be consulted before the installation is made.
2. Pipe joint compounds must be resistant to the action of liquefied petroleum gases.
3. Where local codes do not prohibit, an A.G.A., C.S.A. or U.L. approved flexible connection is recommended between the rigid piping and the heater. A union and an approved shut off valve should be installed before the control valve inlet. The shut off valve should be installed within 6 feet of the union.
4. After all gas connections have been made, make sure the heater and all gas outlets are turned off before the main gas supply is turned on. Turn the gas pressure on and check for leaks. To check for leaks, apply a soap suds solution to all connections and joints or check by one of the methods listed in Appendix D of ANSI Z223.1 (latest edition) National Fuel Gas Code. DO NOT USE AN OPEN FLAME OF ANY KIND TO TEST FOR LEAKS.

## 8. Instructions for Pressure Test Gauge Connection

(Supply Pressure)

1. Installer to provide a 1/8" N.P.T. plugged tapping, accessible for test gauge connection immediately upstream of the gas supply connection to the heater.

(Manifold Pressure)

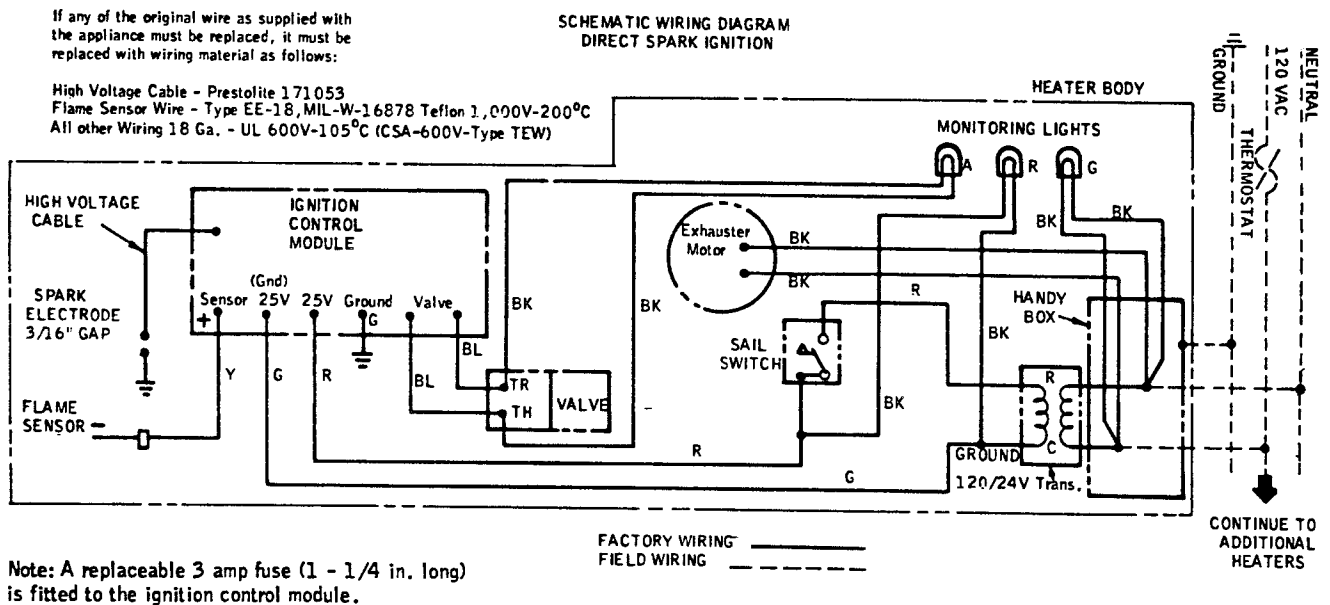
1. Turn gas valve to off position. Remove 1/8" plug from manifold downstream from the valve and connect 1/8" nipple to the tapped hold. Connect gauge to nipple. Turn on the gas supply.
2. With main burner operating, check burner manifold pressure using water manometer. Gauges which measure in pounds per square inch are not accurate enough to measure or set the manifold pressure. The combination gas valve is factory set and should not be adjusted. The gas pressures are shown below.

Gas Type	Manifold Pressure	Supply Pressure	
		* Minimum	Maximum
Natural Gas	3.5" W.C.	4.5" W.C.	14" W.C.
Propane Gas	10.0" W.C.	11.0" W.C.	14" W.C.

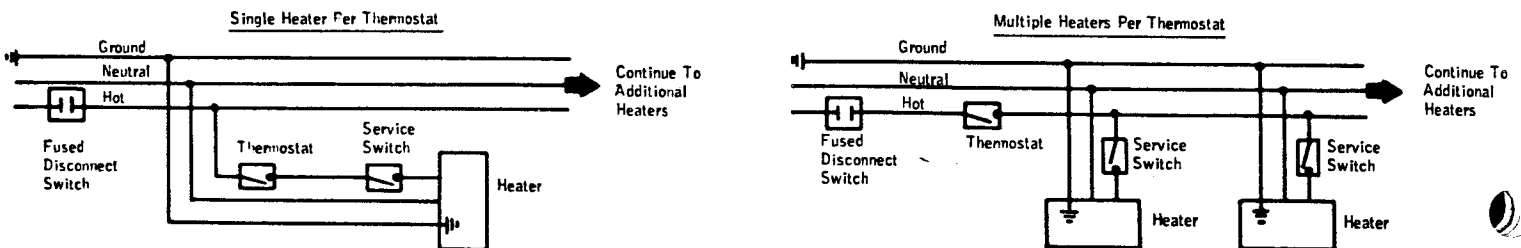
\* Minimum permissible gas supply pressure for purpose of input adjustment.

## 9. Electrical Connections

1. All electric wiring shall conform with the latest edition of the National Electrical Code (ANSI/NFPA No. 70) and/or the code legally authorized in the locality where the installation is made.
2. The unit must be electrically grounded in accordance with the National Electrical Code.
3. The wiring providing power to the heater shall be connected to a permanently live electrical circuit, one that is not controlled by a light switch.
4. The electrical power to the heater shall be through an approved fused disconnect switch. The switch shall be located in the vicinity of the heater (check local codes for allowable distances) and should be identified as the heater control switch.
5. In the absence of local codes, multiple conductor cable for the supply circuit to the heater should be no lighter than No. 18 AWG having Type T insulation or equivalent.
6. The installer must provide strain relief for the power supply wires to the heater upon installation.



### TYPICAL WIRING & THERMOSTAT CONNECTIONS



## 10. Single Heater Venting (Vertical Through Roof)

Venting must be in compliance with the latest edition of the National Fuel Gas Code (ANSI/No. Z223.1), or the authority having jurisdiction. Other venting references can be found in equipment volume of the ASHRAE Handbook.

1. When venting the heater to outside of building through a roof, use single-wall metal pipe. This is to be constructed of galvanized sheet metal not less than 20 ga. or other approved noncombustible corrosion-resistant material.
2. A vent passing through a roof shall extend through a 2 in. clearance roof thimble. Double-wall, Type B vent must be used for the portion of the vent system which passes through the roof. An approved vent cap (Leslie "VersaCap" - Type B) must be attached to end of the flue.
3. The maximum equivalent length of vent pipe should be carefully observed. A safety switch in the heater is designed to shut the heater off before excessive flue restriction causes bad combustion.

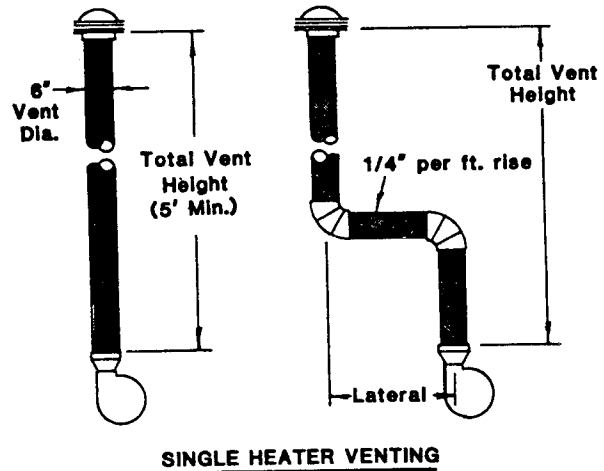
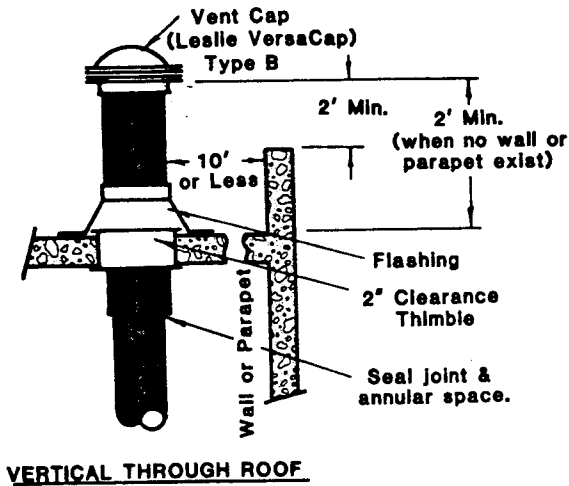
Minimum Equivalent Length = 5 Ft. of 6" dia. pipe

Maximum Equivalent Length = 100 Ft. of 6" dia. pipe

Use the following correction factors to obtain the equivalent length:

- a. Subtract 15 ft if the run is horizontal
  - b. Subtract 10 ft for an approved vent cap
  - c. Subtract 10 ft for each elbow beyond 15 ft from the heater
  - d. Subtract 15 ft for each elbow within 15 ft of the heater
4. Avoid locating elbows in the first 5 ft. of vent pipe whenever possible. Limit to (2) 90° elbows. When vent pipe is in a horizontal run, it must have 1/4 inch per foot rise.
  5. Joints between sections of piping shall be fastened by sheet metal screws or other approved means and should be sealed to prevent leakage of flue gas into building. Aluminum or teflon tape suitable for 550° F is recommended. (3M Company tapes 433 or 363)
  6. All portions of the vent pipe shall be supported to prevent sagging.
  7. When the vent pipe passes through areas where the ambient temperature is likely to induce condensation of the flue gases, the vent pipe should be insulated and a condensation drain should be provided.
  8. Minimum clearance for single-wall flue pipe to combustible material shall be 6 in. This may be reduced when the combustible material is protected as specified in the National Fuel Gas Code or the authority having jurisdiction.
  9. Single-wall metal pipe shall not originate in any unoccupied attic or concealed space and shall not pass through any attic, inside wall or concealed space, or through any floor. For the installation of a single-wall metal pipe through an exterior combustible wall, refer to latest edition of the National Fuel Gas Code or the authority having jurisdiction.

10. A venting system shall terminate at least 3 ft. above any forced air inlet located within 10 ft.



### Venting (Unvented Heaters)

This heater requires ventilation in the building to dilute the products of combustion and provide fresh air for efficient combustion.

Where unvented heaters are used, gravity or mechanical means shall be provided to supply and exhaust at least 4 CFM per 1,000 Btu per hour input of installed heaters. Exhaust vents must be located at the highest point above and in the vicinity of the heaters and the inlet vents must be located below the level of the heaters. Exhaust hood kit (Part No. 4240600) must be used as described on pages 2 and 3.

### 11. Air For Combustion

If indoor combustion air is to be supplied for a tightly enclosed area, one square inch of free area opening shall be provided below the heater for each 1,000 Btu per hour of heater input.

When outside air is used, the opening below the heater shall be one square inch of free area for each 4,000 Btu per hour of heater input.

In larger open areas of buildings, infiltration normally is adequate to provide air for combustion.

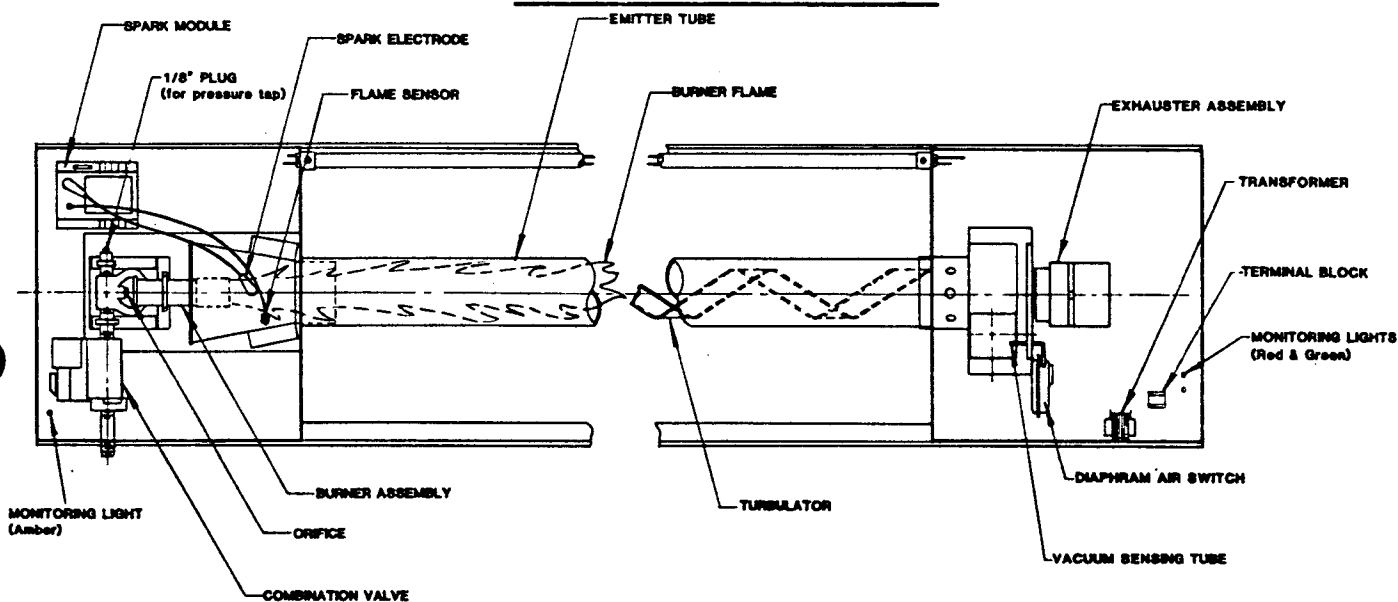
There must be no obstructions within 48" of the perforated access panel on the control box.

## 12. Lighting and Shutdown Instructions

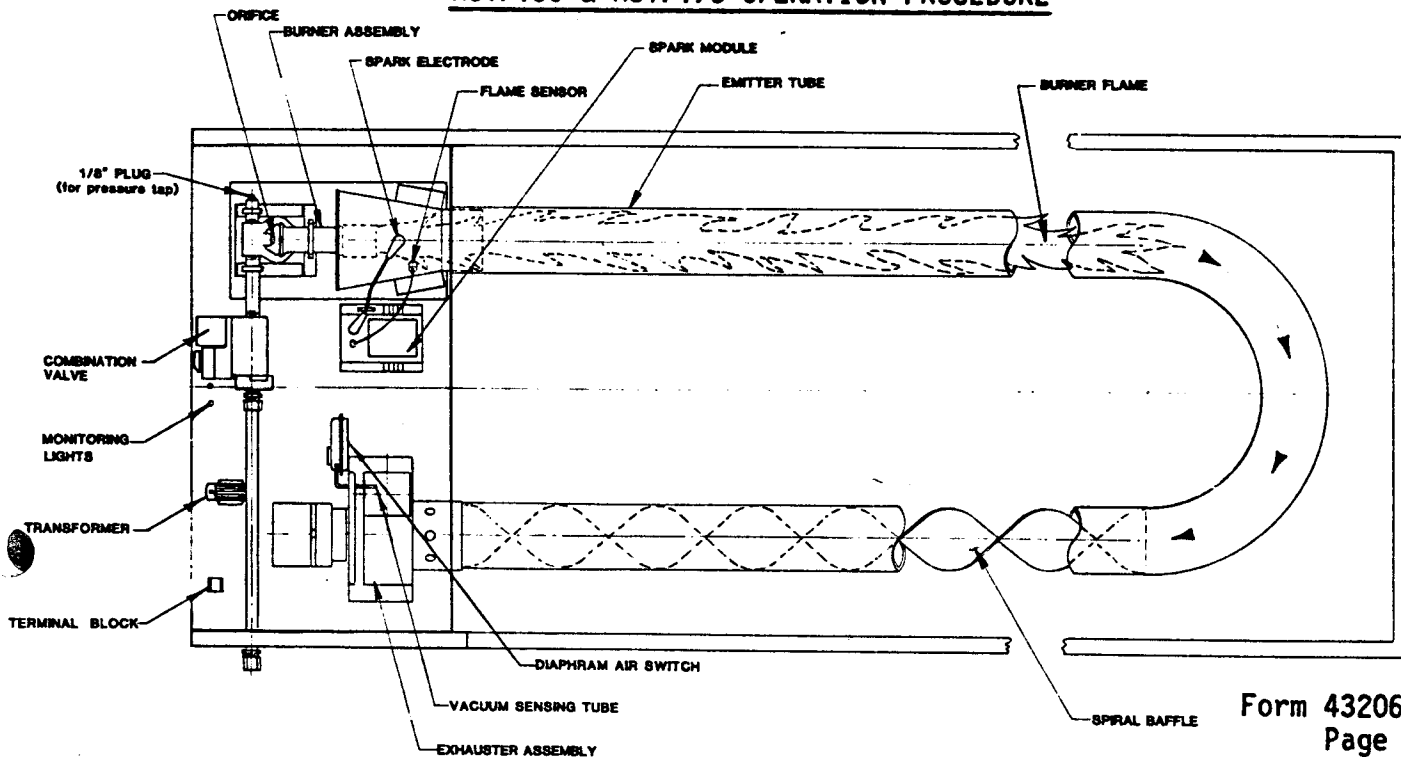
1. Turn on gas supply.
2. Set thermostat to call for heat.
3. Ignition should occur immediately.
4. If ignition fails, the unit will spark for approximately 21 seconds and go into safety lockout. Turn thermostat (or power) off for 60 seconds to take out of lockout.
5. If heater does not light, shut off gas completely for 5 minutes before attempting to relight.
6. CAUTION: Heater must be grounded. Poor grounding will give nuisance lockouts, particularly during momentary power interruptions.
7. To shut down the heater, turn off the gas and the electrical supply.

NOTE: The lighting and shutdown instructions are also shown on the permanent nameplate attached to the heater control box.

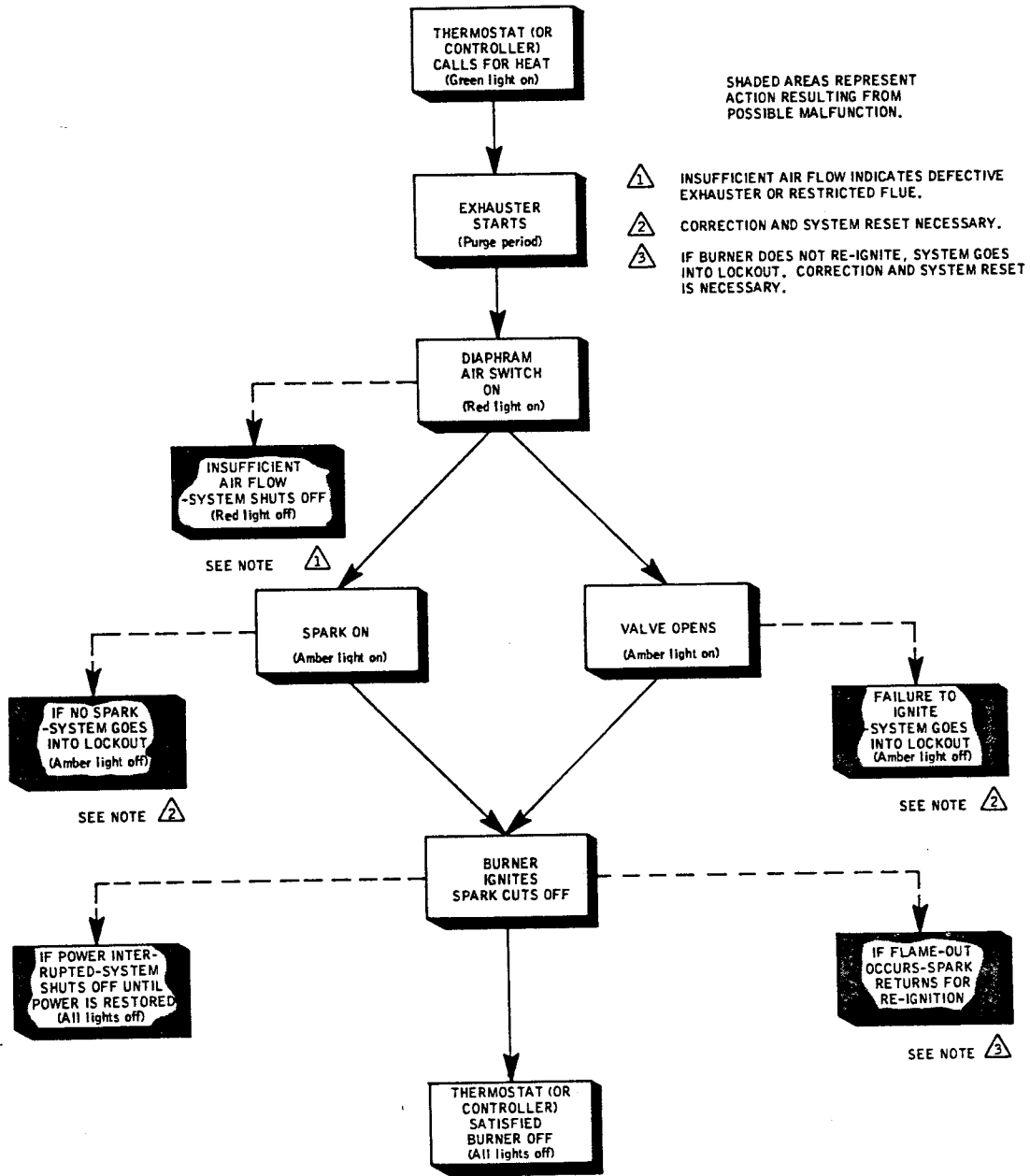
### RSTP10 OPERATION PROCEDURE



### RSTP15C & RSTP17C OPERATION PROCEDURE



# 13. Sequence of Operation (with monitoring lights)



#### 14. Cleaning and Annual Maintenance

This heater must be cleaned and serviced at least once before the start of each heating season or at any time excessive accumulation of dust and dirt is observed. Maximum heating efficiency and clean combustion will be maintained by keeping the heater clean.

To clean the heater follow these instructions.

1. Turn off any electrical and gas supply to the heater.
2. Remove the access panel from the control box. (On RSTP10, remove access panel from exhauster end also.)
3. Clean the access panel(s), the inside of the control box, the exhauster compartment for RSTP10, and the reflector. (Dirty reflectors will reduce output).
4. Visually inspect the spark electrode by viewing through the entrance cone at the burner. Remove any foreign objects from the electrode tips. Set the spark gap to the proper value.

Spark Gap = 3/16"

**CAUTION!** The ceramic portion of the electrode is very fragile so any cleaning or adjustments must be done with care.

5. Disconnect the vent stack and remove any foreign material which may have collected on the blower wheel.

#### 15. Replacing Parts

At all times when parts are being replaced, ensure that both gas and electrical supplies are disconnected.

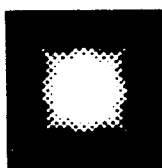
Various parts are available for replacement by a licensed person. Refer to separate exploded parts guide for all replaceable parts.

#### 16. Installation Data

Date of Installation \_\_\_\_\_ Number of Heaters in System \_\_\_\_\_

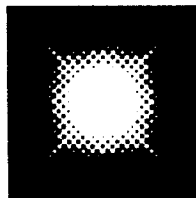
Heater Model Number-RSTP  -    N=Natural Gas  
L=Propane Gas

Heater Serial Number \_\_\_\_\_ Code Date \_\_\_\_\_



**SPACE-RAY**®

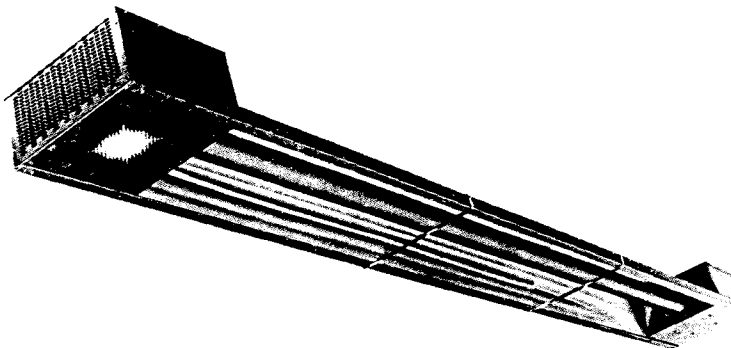
Division of Gas-Fired Products, Inc.  
P.O. Box 36485-305 Doggett St.  
CHARLOTTE, N.C. 28203  
Phone: (Area 704) 372-3485.



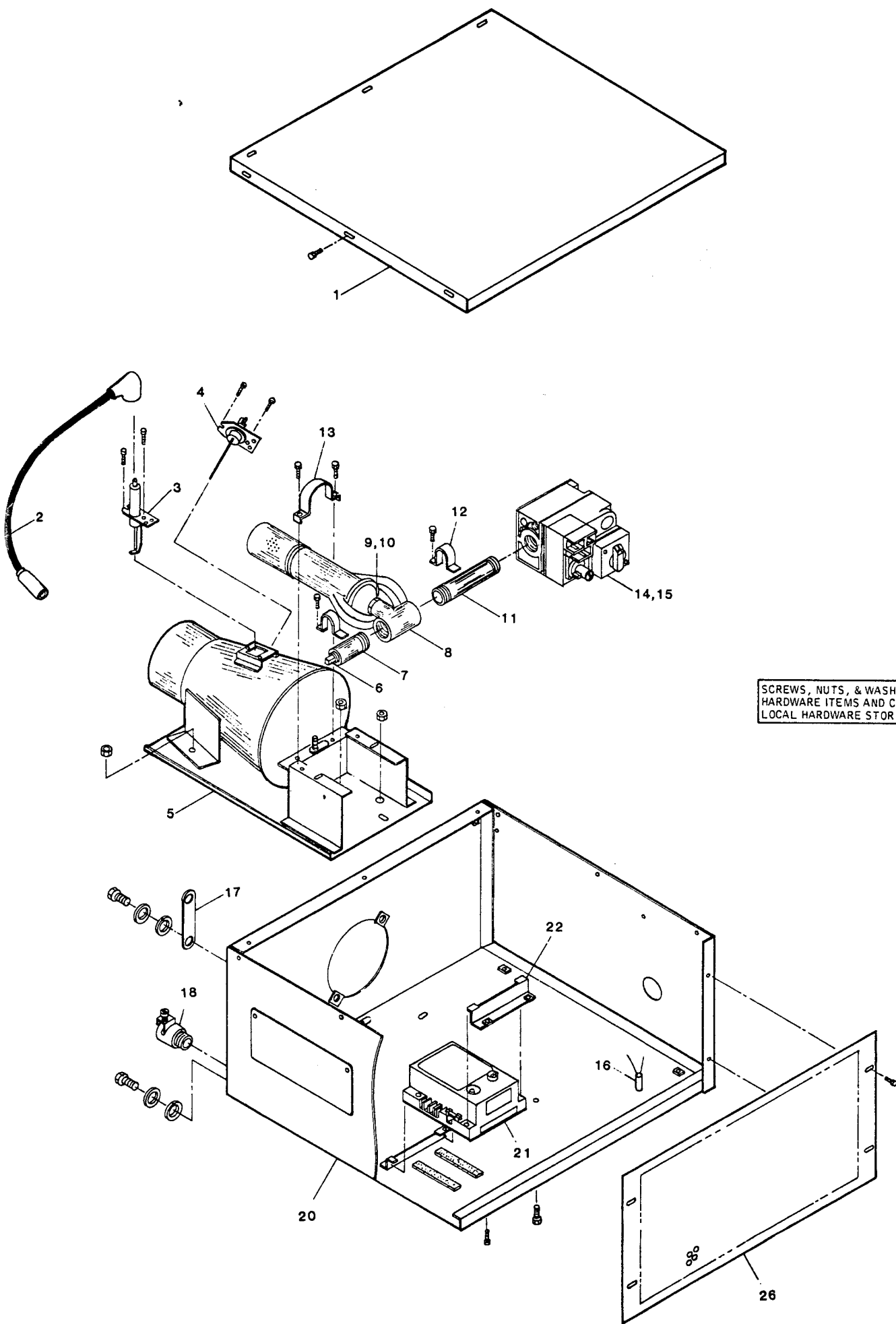
**SPACE-RAY**  
RADIANT GAS HEATERS

## REPLACEMENT PARTS GUIDE

Tube Heater Model  
RSTP10

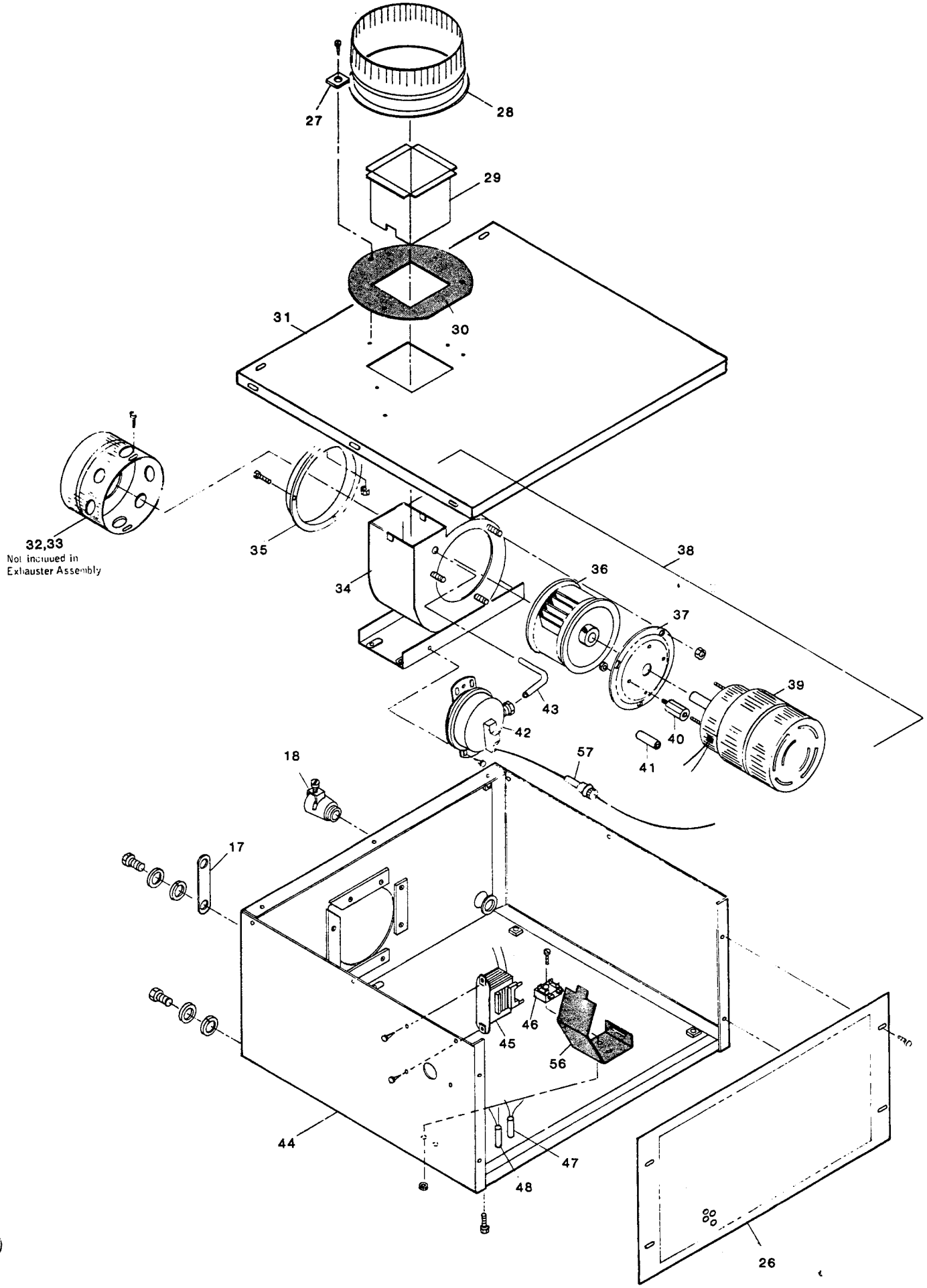


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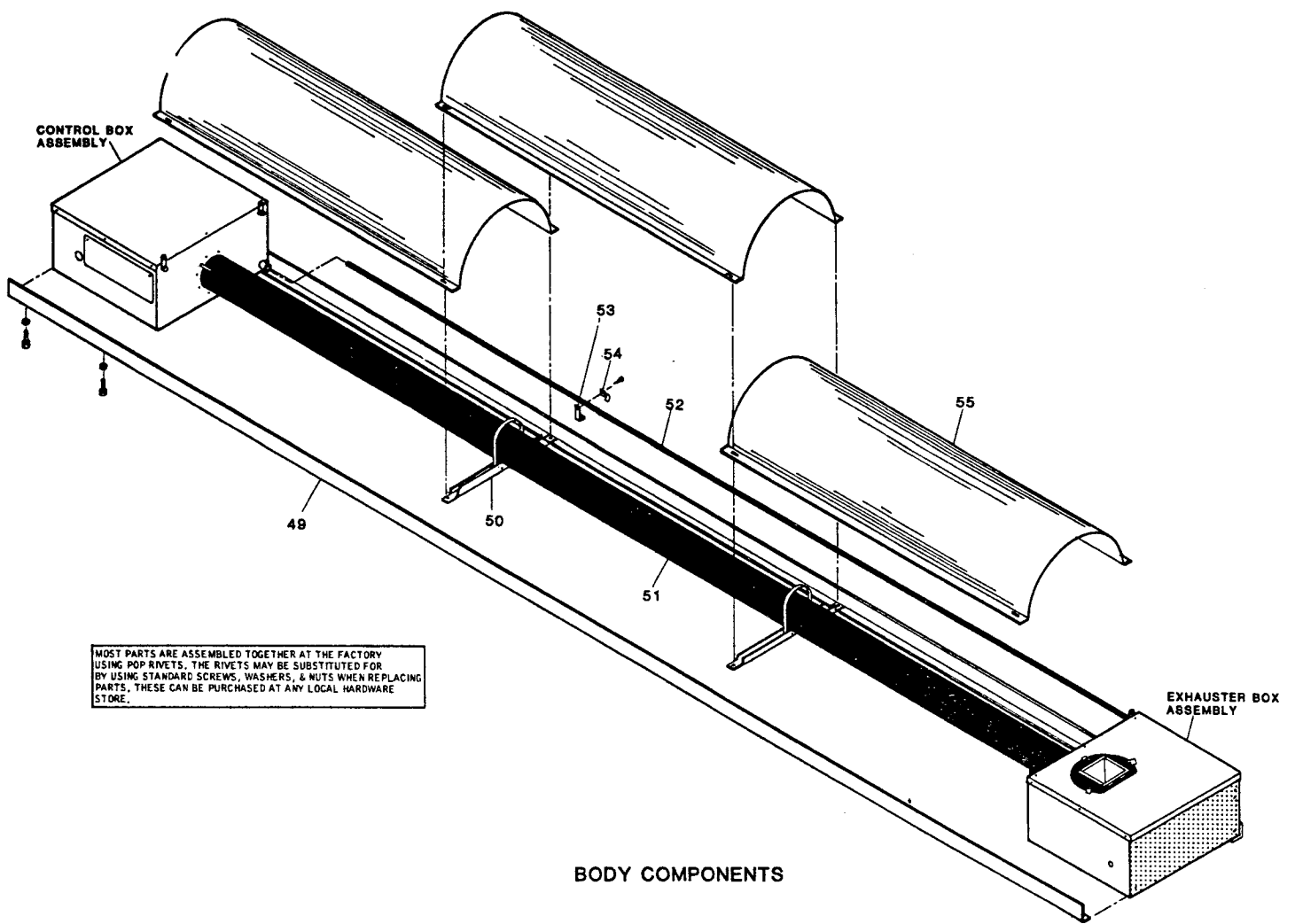


SCREWS, NUTS, & WASHERS ARE STANDARD  
 HARDWARE ITEMS AND CAN BE PURCHASED AT  
 LOCAL HARDWARE STORE.

CONTROL BOX COMPONENTS



EXHAUSTER BOX COMPONENTS



MOST PARTS ARE ASSEMBLED TOGETHER AT THE FACTORY USING POP RIVETS. THE RIVETS MAY BE SUBSTITUTED FOR BY USING STANDARD SCREWS, WASHERS, & NUTS WHEN REPLACING PARTS. THESE CAN BE PURCHASED AT ANY LOCAL HARDWARE STORE.

**BODY COMPONENTS**

**REPLACEMENT PARTS LIST  
MODEL RSTP10 U.S.A.**

**CONTROL BOX COMPONENTS**

ITEM NO.	PART NO.	DESCRIPTION
1	4190902	Top Panel
2	3031418	Ignition Cable Assembly
3	3021600	Spark Electrode - Q347A
4	0376300	Flame Sensor - Q354A
5	4238700	Entrance Cone & Support Assembly
6	0333902	Plug 1/8
7	3017500	Brass Nipple 1/2
8	4197100	Burner Assembly
9	0325914	Main Burner Orifice (Nat.) #14
10	0325935	Main Burner Orifice (Prop.) #35
11	0333314	Nipple 1/2x4
12	0470700	Clamp-Manifold
13	4239300	Clamp-Burner
14	0376002	Gas Valve @ 10" W.C. (Prop.)
15	0376601	Gas Valve @ 3-1/2" W.C. (Nat.)
16	3022003	Monitoring Light - Amber
17	4048100	Suspension Bracket
18	0356701	Straight Connector - 3/8
19		
20	4191000	Control Box Cabinet
21	3019804	Spark Module S87C
22	4206800	Spark Module Bracket
23	4236000	Wire Diagram (not shown)
24	4205700	Wire Diagram (not shown) Canada
25		
26	4190100	Access Panel

**EXHAUSTER BOX COMPONENTS**

ITEM NO.	PART NO.	DESCRIPTION
17	4048100	Suspension Bracket
18	0356701	Straight Connector - 3/8
26	4190100	Access Panel
27	4239200	Clamp - Flue Collar
28	4237700	Flue Collar - Outlet
29	4285100	Vent Collar Assembly
30	4239500	Gasket - Flue Collar
31	4247200	Top Panel
32	4192700	Flue Restrictor
33	4314000	Flue Restrictor (alternate)
34	4314200	Blower Housing Assembly
35	3021500	Inlet Collar (used with item 32)
36	0372300	Blower Wheel - Large
37	4274000	Motor Plate
38	4314300	Exhauster Assembly (with air switch)
39	0372100	Exhauster Motor
40	4292700	Spacer - 1/2 hex x 1" lg
41	3034700	Spacer - 5/16 od x 1" lg (alternate)
42	3018602	Diaphragm Air Switch
43	4314400	Tube - Air Switch
44	4192300	Exhauster Box Cabinet
45	3027900	Transformer - AT120B1051
46	3028100	Terminal Block - EK-204
47	3022001	Monitoring Light - Green
48	3022002	Monitoring Light - Red
56	4270900	Terminal Block Shield
57	4204800	Fuseholder Assembly (Canada)

**BODY COMPONENTS**

ITEM NO.	PART NO.	DESCRIPTION
49	4193700	Angle Side Rail
50	4202600	Tube Support Assembly
51	4193100	Tube Assembly
52	4193500	Wire Tube - Conduit
53	4193900	Conduit Support Bracket
54	4194000	Conduit Support Clamp
55	4193600	Reflector

**MODEL NUMBER SUFFIXES**

N - Natural Gas  
L - Propane Gas

5A - 120 Volt Direct Spark Ignition of Main Burner

**IMPORTANT**

PLEASE ORDER BY PART NUMBER - NOT BY ITEM NUMBER  
ALSO REFER TO COMPLETE MODEL NUMBER WHEN ORDERING

ALL ILLUSTRATIONS ARE INTENDED TO GIVE THE GENERAL IMPRESSION OF UNITS ONLY. WE RESERVE THE RIGHT TO ALTER ANY SPECIFICATION WITHOUT NOTICE.

Form 4216100  
Rev. 6/89

ALL REPLACEMENT PART PRICES GIVEN ON APPLICATION

