



Owner's Manual and Instructions

Tradesman® Construction Heater



MODELS	OUTPUT (Btuh)	FUEL
CP100	100,000	Propane Vapor Withdrawal

Certification by:



Congratulations!

You have purchased the finest construction heater available.

Your new L.B. White heater incorporates the benefits from the most experienced manufacturer of heating products using state-of-the-art technology.

We, at L.B. White, **thank you** for your confidence in our products and welcome any suggestions or comments you may have...call us, toll-free, at 1-800-345-7200.

ATTENTION ALL USERS

This heater has been tested and evaluated by CSA International in accordance with Standard ANSI Z83.7• CSA 2.14 and is listed and approved as a direct gas-fired forced-air construction heater for the heating of buildings under construction, alteration or repair. If you are considering using this product for any application other than its intended use, then please contact your fuel gas supplier, or the L.B. White Co., Inc.



Quality heaters you can count on.

W6636 L.B. White Rd., Onalaska, WI 54650 ■ (800) 345-7200 ■ (608) 783-5691 ■ (608) 783-6115, fax ■ info@lbwhite.com

150-21834-C

 GENERAL HAZARD WARNING

- Failure to comply with the precautions and instructions provided with this heater, can result in:
 - Death
 - Serious bodily injury or burns
 - Property damage or loss from fire or explosion
 - Asphyxiation due to lack of adequate air supply or carbon monoxide poisoning
 - Electrical shock
- Read this Owner's Manual before installing or using this product.
- Only properly-trained service people should repair or install this heater.
- Save this Owner's Manual for future use and reference.
- Owner's Manuals and replacement labels are available at no charge. For assistance, contact L.B. White at 800-345-7200.

 WARNING

- Proper gas supply pressure must be provided to the inlet of the heater.
- Refer to dataplate for proper gas supply pressure.
- Gas pressure in excess of the maximum inlet pressure specified at the heater inlet can cause fires or explosions.
- Fires or explosions can lead to serious injury, death, and building damage.
- Gas pressure below the minimum inlet pressure specified at the heater inlet may cause improper combustion.
- Improper combustion can lead to asphyxiation, carbon monoxide poisoning, serious injury or death.

 WARNING

Fire and Explosion Hazard

- Not for home or recreational vehicle use.
- Installation of this heater in a home or recreational vehicle may result in a fire or explosion.
- Fire or explosions can cause property damage or loss of life.

FOR YOUR SAFETY

Do not store or use gasoline or other flammable vapors and liquids in the vicinity of this or any other heater.

FOR YOUR SAFETY

- If you smell gas:
1. Open windows.
 2. Don't touch electrical switches.
 3. Extinguish any open flame.
 4. Immediately call your gas supplier.

 WARNING

Fire and Explosion Hazard

- Keep solid combustibles a safe distance away from the heater.
- Solid combustibles include building materials or paper products, cardboard, and dust.
- Do not use the heater in spaces which contain or may contain volatile or airborne combustibles.
- Volatile or airborne combustibles include gasoline, solvents, paint thinner, dust particles or unknown chemicals.
- Failure to follow these instructions may result in a fire or explosion.
- Fire or explosions can lead to property damage, personal injury or loss of life.



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General Information

This Owner's Manual includes all options and accessories commonly used on this heater.

When calling for technical service assistance, or for other specific information, always have model number, configuration number and serial number available. This information is contained on the dataplate. The dataplate is located on the side panel of the heater.

This manual will instruct you in the operation and care of your unit. Completely review this manual so that you fully understand the heater and how it functions.

The repair and servicing of the heater requires continuing expert training and knowledge of gas heaters and should not be attempted by anyone who is not so qualified. See page 6 for definition of the necessary qualifications.

Contact your local L.B. White distributor or the L.B. White Co., Inc. for assistance, or if you have any questions about the use of the equipment or its application.

The L.B. White Co., Inc. has a policy of continuous product improvement. It reserves the right to change specifications and design without notice.

Heater Specifications

		Model
SPECIFICATIONS	CP100	
Fuel Type	Propane Gas	
Maximum Input (BTUH)	100,000	
Minimum Input (BTUH)	50,000	
Ventilation Air Required to Support Combustion	350 CFM	
Inlet Gas Supply Pressure Acceptable at the Inlet of the Heater for Purpose of Input Adjustment	MAX.	11 in. W.C.
	MIN.	11 in. W.C.
Fuel Consumption Per Hour	MAX.	4.63 lbs.
	MIN.	2.32 lbs.
Motor Characteristics	Ball Bearing	
	1/15 H.P. 3200 RPM	
Electrical Supply (Volts/Hz/Phase)	115/60/1	
Amp Draw	STARTING	4.7
	CONTINUOUS OPERATION	2
Dimensions (Inches) L x W x H	25 1/4 x 9 3/4 x 14	
Minimum Safe Distances From Nearest Combustible Materials	TOP	6 ft.
	SIDES	2 ft.
	BACK	2 ft.
	BLOWER OUTLET GAS SUPPLY	6 ft.
		6 ft. (1.83m)
Minimum Ambient Temperature In Which Heater May Be Operated	-20° F	
Net Weight (lbs.)	22	
Shipping Weight (lbs.)	28	

Safety Precautions



WARNING

Asphyxiation Hazard

- Do not use this heater for heating human living quarters.
- Do not use in unventilated areas.
- The flow of combustion and ventilation air must not be obstructed.
- Proper ventilation air must be provided to support the combustion air requirements of the heater being used.
- Refer to the specification section of the heater's Owner's Manual, heater dataplate, or contact the L.B. White Company to determine combustion air ventilation requirements of the heater.
- Lack of proper ventilation air will lead to improper combustion.
- Improper combustion can lead to carbon monoxide poisoning leading to serious injury or death. Symptoms of carbon monoxide poisoning can include headaches, dizziness and difficulty in breathing.

FUEL GAS ODOR

Propane gas and natural gas have man-made odorants added specifically for detection of fuel gas leaks.

If a gas leak occurs, you should be able to smell the fuel gas.

THAT'S YOUR SIGNAL TO GO INTO IMMEDIATE ACTION!

- Do not take any action that could ignite the fuel gas. Do not operate any electrical switches. Do not pull any power supply or extension cords. Do not light matches or any other source of flame. Do not use your telephone.
- Get everyone out of the building and away from the area immediately.
- Close all propane gas tank or cylinder fuel supply valves.
- Propane gas is heavier than air and may settle in low areas. When you have reason to suspect a propane leak, keep out of all low areas.
- Use your neighbor's phone and call your fuel gas supplier and your fire department. Do not re-enter the building or area.
- Stay out of the building and away from the area until declared safe by the firefighters and your fuel gas supplier.
- **FINALLY**, let the fuel gas service person and the firefighters check for escaped gas. Have them air out the building and area before you return. Properly trained service people must repair the leak, check for further leakages, and then relight the appliance for you.

ODOR FADING – NO ODOR DETECTED

- **Some people cannot smell well. Some people cannot smell the odor of the man-made chemical added to propane. You must determine if you can smell the odorant in these fuel gases.**
- Learn to recognize the odor of propane gas. Local propane gas dealers will be more than happy to give you a "scratch and sniff" pamphlet. Use it to become familiar with the fuel gas odor.
- Smoking can decrease your ability to smell. Being around an odor for a period of time can affect your sensitivity to that particular odor.
- **The odorant in propane gas is colorless and the intensity of its odor can fade under some circumstances.**
- If there is an underground leak, the movement of gas through the soil can filter the odorant.
- Propane gas odor may differ in intensity at different levels. Since propane gas is heavier than air, there may be more odor at lower levels.
- **Always be sensitive to the slightest gas odor.** If you continue to detect any gas odor, no matter how small, treat it as a serious leak. Immediately go into action as discussed previously.

ATTENTION – CRITICAL POINTS TO REMEMBER!

- Propane gas has a distinctive odor. Learn to recognize these odors. (Reference Fuel Gas Odor and Odor Fading sections above.)
- If you have not been properly trained in repair and service of propane gas fueled heaters, then do not attempt to light heater, perform service or repairs, or make any adjustments to the heater on propane gas.
- Even if you are not properly trained in the service and repair of the heater, ALWAYS be consciously aware of the odors of propane gas.
- A periodic "sniff test" around the heater or at the heater's joints; i.e. hose, connections, etc., is a good safety practice under any conditions. If you smell even a small amount of gas, CONTACT YOUR FUEL GAS SUPPLIER IMMEDIATELY. DO NOT WAIT!

1. Do not attempt to install, repair, or service this heater unless you have continuing expert training and knowledge of gas heaters.

Qualifications for service and installation of this equipment are as follows:

- a. To be a qualified gas heater service person, you must have sufficient training and experience to handle all aspects of gas-fired heater installation, service and repair. This includes the task of installation, troubleshooting, replacement of defective parts and testing of the heater. You must be able to place the heater into a continuing safe and normal operating condition. You must completely familiarize yourself with each model heater by reading and complying with the safety instructions, labels, Owner's Manual, etc., that is provided with each heater.
 - b. To be a qualified gas installation person, you must have sufficient training and experience to handle all aspects of installing, repairing and altering gas lines, including selecting and installing the proper equipment, and selecting proper pipe and tank size to be used. This must be done in accordance with all local, state and national codes as well as the manufacturer's requirements.
 - c. In the Commonwealth of Massachusetts, this product must be installed by a gas fitter licensed by the Commonwealth of Massachusetts.
2. All installations and applications of L.B. White heaters must meet all relevant local, state and national codes. Included are propane gas, natural gas, electrical, and safety codes. Your local fuel gas supplier, a local licensed electrician, the local fire department or similar government agencies, or your insurance agent can help you determine code requirements.

Also refer to:

- ANSI/NFPA 58, latest edition, Standard for Storage and Handling of Liquefied Petroleum Gas and/or
 - ANSI Z223.1/NFPA 54, National Fuel Gas Code
 - ANSI/NFPA 70, National Electrical Code.
3. We cannot anticipate every use which may be made of our heaters. Check with your local fire safety authority if you have questions about applications.
 4. Other standards govern the use of fuel gases and heat producing products in specific applications. Your local authority can advise you about these.
 5. Do not move, handle, or perform maintenance on the heater while in operation or connected to a power or fuel supply.
 6. For safety, this heater is equipped with a backflash switch. Never operate this heater with any safety device that has been bypassed. Do not operate this heater unless all of these features are fully functioning.

7. Do not operate the heater with its cover or panels removed.
8. Do not locate fuel gas containers or fuel supply hoses anywhere near the blower outlet of the heater.
9. Do not block air intakes or discharge outlets of the heater. Doing so may cause improper combustion or damage to heater components leading to property damage.
10. The blower outlet of the heater shall not be directed towards any propane gas container within 20 ft. (6.10 meters) of the heater.
11. The gas supply system must be arranged to provide for vapor withdrawal from the operating cylinder. For continuous operation, the minimum gas cylinder size should be a 100 pound cylinder or larger. Vaporization of LP gas occurs at a slower rate as the temperature falls. Therefore, it may be necessary to manifold more than one cylinder together to provide a consistent fuel supply for the heater. When using a manifolded cylinder supply system inside a building, the total number of cylinders manifolded together shall not be greater than three 100 pound cylinders.
12. The hose assembly shall be visually inspected on an annual basis. If it is evident there is excessive abrasion or wear, or if the hose is cut, it must be replaced prior to the heater being put into operation. The hose assembly shall be protected from animals, building materials, and contact with hot surfaces during use. The hose assembly shall be that specified by the manufacturer. See parts list.
13. Check for gas leaks and proper function upon heater installation or after relocation.
14. This heater should be inspected for proper operation before each use and at least annually by a qualified service person.
15. Always turn off the gas supply to the heater if it is not going to be immediately used in the heating of the construction area.
16. This heater is equipped with a three-prong (grounding) plug for your protection against shock hazard and must be plugged directly into a properly grounded three-prong receptacle. Failure to use a properly grounded receptacle can result in electrical shock, personal injury, or death.
17. When the heater is to be stored indoors, the connection between the propane gas cylinder(s) and the heater must be disconnected, the cylinders moved from the heater and stored in accordance with the standard for the storage and handling of liquefied petroleum gases, ANSI/NFPA 58.

Set-Up Instructions

GENERAL



WARNING

Fire or explosion hazard.

Can cause property damage, severe injury or death.

1. To avoid dangerous accumulation of fuel gas, turn off gas supply at the heater's service valve before starting installation, and perform gas leak test after completion of installation.
2. Do not force the safety control button. Use only normal hand pressure to depress the safety control button. Never use any tools. If the button will not operate by hand, the control should be replaced by a qualified service technician. Force or attempted repair may result in fire or explosion.

1. Read all safety precautions and follow L.B. White recommendations when using this heater. If during the set-up or relocating of heater, you suspect that a part is damaged or defective, call a qualified service agency for repair or replacement.
2. Make sure the heater is properly positioned before use. Observe and obey all minimum safe distances of the heater to the nearest combustible materials. Minimum safe distances are given on the heater nameplate and on page 4 of this manual.
3. This heater is approved for indoor use only.
4. The heater is not for use with ductwork.
5. Heaters used in the vicinity of combustible tarpaulins, canvas, plastic wind barriers, or similar coverings shall be located at least 10 feet from the coverings. The coverings shall be securely fastened to prevent ignition or upsetting of the heater due to wind action on the covering or other material.
6. Check all connections for gas leaks using approved leak detectors. Gas leak testing is performed as follows:



WARNING

Fire and Explosion Hazard

- Do not use open flame (matches, torches, candles, etc.) in checking for gas leaks.
- Use only approved leak detectors.
- Failure to follow this warning can lead to fires or explosions.
- Fires or explosions can lead to property damage, personal injury or loss of life.

- Check all pipe connections, hose connections, fittings and adapters upstream of the gas control with approved gas leak detectors.
- In the event a gas leak is detected, check the components involved for cleanliness and proper application of pipe compound before further tightening.
- Tighten the gas connections as necessary to stop the leak.

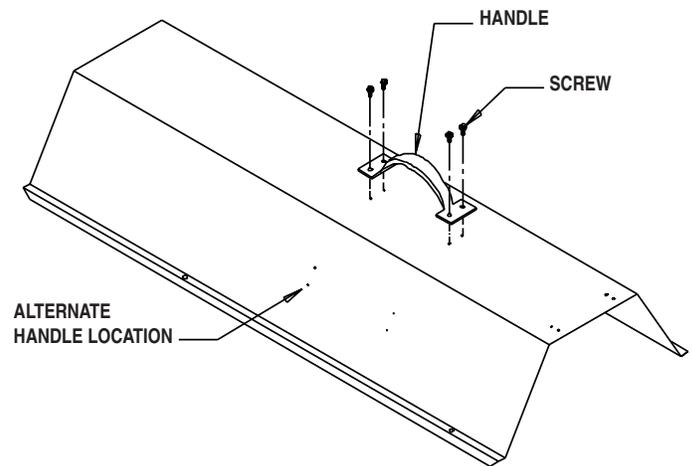
- After all connections are checked and any leaks are stopped, turn on the main burner.
- Stand clear while the main burner ignites to prevent injury caused from hidden leaks that could cause flashback.
- With the main burner in operation, check all connections, hose connections, fittings and joints as well as the gas control valve inlet and outlet connections with approved gas leak detectors.
- If a leak is detected, check the components involved for cleanliness in the thread areas and proper application of pipe compound before further tightening.
- Tighten the gas connection as necessary to stop the leak.
- If necessary, replace the parts or components involved if the leak cannot be stopped.
- Ensure all gas leaks have been identified and repaired before proceeding.

7. Light according to instructions on heater or within owner's manual.
8. This heater is provided with a pre-set single-stage regulator and a gas hose, as specified by L.B. White Co., of proper length, diameter, and construction. Ensure these critical components are installed to allow proper operation.
9. Take time to understand how to operate and maintain the heater by using this Owner's Manual. Make sure you know how to shut off the gas supply to the individual heater. Contact your fuel gas supplier if you have any questions.
10. Any defects found in performing any of the service or maintenance procedures must be eliminated and defective parts replaced immediately. The heater must be retested by properly qualified service personnel before placing the heater back into use.
11. The heater must be installed so as not to interfere with or obstruct normal exits, emergency exits, door, and walkways.
12. As necessary, non-combustible railing, fencing, or other suitable materials may be used surrounding the heater to create a safe work environment for people working in the structure and to maintain proper clearances from combustible materials.
13. Locate the heater to protect it from tipover or accidental movement.
14. The heater must be located on a flat, stable, and horizontal surface.
15. The heater must be located so that it is not directly exposed to water spray, rain, or dripping water.
16. Ensure that proper voltage is supplied to the heater.

CARRYING HANDLE ASSEMBLY

1. Fasten the carrying handle to the heater case top using the four (4) sheet metal screws provided. See Fig.1.
2. The handle may also be fastened to the side of the case top for stacking during storage. Do not stack more than two high.

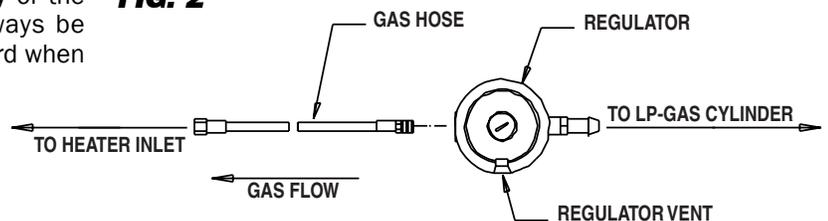
FIG. 1



HOSE AND REGULATOR ASSEMBLY

1. Always use approved pipe thread compound suitable for use with propane gas on the threaded connections.
2. Assemble the components together as shown in Fig.2. This view is to show general assembly of the components only. The regulator must always be installed so its vent is always pointed downward when attached to the propane gas supply.
3. Tighten all connections securely.
4. **Check all connections for gas leaks using approved gas leak detectors.**

FIG. 2

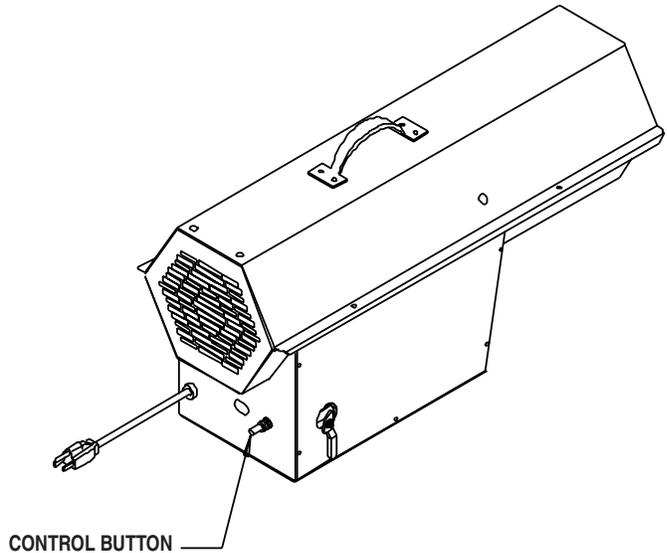


Start-Up Instructions

Refer to Fig.3 and follow steps 1 - 5 on initial start-up. For normal start-up, follow steps 2 and 3.

FIG. 3

1. Open all manual fuel supply valves and check for gas leaks using approved leak detectors.
2. Connect the heater's electrical cord to an approved electrical supply. The fan motor will start and the igniter will spark.
3. Fully depress the button on the safety control valve. The burner will light. Keep the button depressed for about 30 seconds or until the thermocouple has warmed up. Release the button. The burner will stay lit.
4. Turn the adjustment valve on the heater to either high or low heat positions as desired.
5. Do not exceed the input rating stamped on the dataplate of the heater. Do not use an orifice size different than specified for the input rating of this heater, fuel type configuration and altitude.



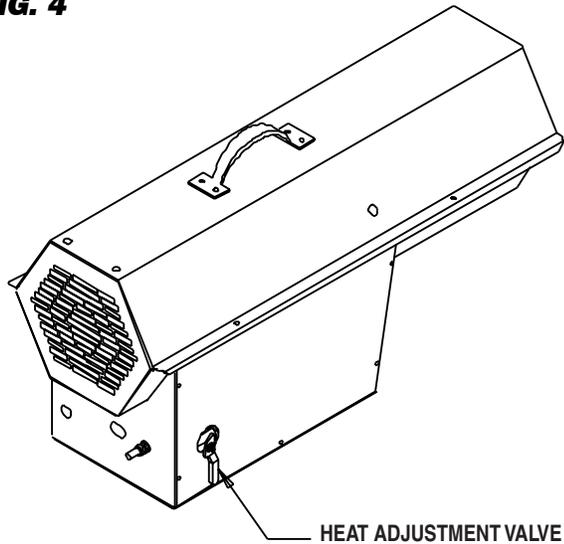
Shut-Down Instructions

- If the heater is to be shut down after normal use, and further use is anticipated, disconnect the heater from its electrical supply.
- If the heater will not be used until later, disconnect the electrical supply and close all fuel supply valves to the heater's gas inlet.

Variable Heat Output

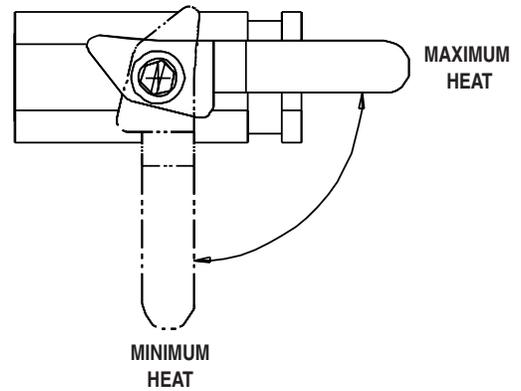
1. This heater has a heat adjustment valve for varying heat output located on the side of the heater. See Fig.4. THIS IS NOT A MANUAL GAS SHUT OFF VALVE.

FIG. 4



2. The valve can be adjusted to deliver either minimum heat or maximum heat. When the valve handle is parallel to the gas flow, the valve is completely open to deliver maximum heat output. See Fig. 5.
3. The throttle valve may be adjusted to minimum heat output by turning the handle 90° to gas flow or any position between maximum and minimum settings. See Fig. 5.

FIG. 5



Cleaning Instructions



WARNING Fire, Burn, and Explosion Hazard

- This heater contains electrical and mechanical components in the gas management, safety and airflow systems.
- Such components may become inoperative or fail due to dust, dirt, wear, or aging.
- Periodic cleaning and inspection as well as proper maintenance are essential to avoid serious injury or property damage.

1. Before cleaning, shut off all gas supply valves and disconnect electrical supply.
2. Review the overall condition of the heater before each use to determine if a general cleaning is necessary:
 - a. Use compressed air or a soft brush to clean interior and exterior surfaces and component parts of dust and dirt.
 - b. Observe and obey the Warning within these cleaning instructions.



WARNING

This heater must not be washed. Use of a pressure washer, water or liquid cleaning solution on this heater can cause severe personal injury or property damage due to water and/or cleaning solution:

1. In electrical components, connections and wires causing electrical shock or component failure.
2. On gas control components causing corrosion which can result in gas leaks and fire or explosion from the leak.

The heater must be cleaned in accordance with the manufacturer's instructions without being subjected to liquid spray or wetting.

Maintenance Instructions

1. Check the heater's gas hose after each use for cuts, cracks, and worn fittings. Replace the hose assembly if it is suspect. Do not attempt to repair the gas hose.
2. **The appliance area shall be kept clear and free from combustible materials, gasoline, and other flammable vapors and liquids.**
3. Review all heater markings prior to use. Markings constitute information relating to warnings start-up, shut down, etc. Make sure the markings are legible and not cut, torn, covered with plaster, or otherwise damaged. Any damaged markings should be replaced immediately. Markings are available at no cost by contacting the L.B. White Co.
4. Regulators must be inspected before each use to make sure the regulator vent is not blocked. Dirt, mud, snow, ice, tar, etc. can block the vent and cause excess pressure at the heater. Any regulator that is suspected of having been submerged in water must be replaced.



WARNING **Burn Hazard**

- Heater surfaces are hot for a period of time after the heater has been shut down.
- Allow the heater to cool before performing service, maintenance, or cleaning.
- Failure to follow this warning will result in burns causing injury.



WARNING **Fire and Explosion Hazard**

- Do not disassemble or attempt to repair any heater component or gas train component.
- All component parts must be replaced if defects are found.
- Failure to follow this warning will result in fire or explosions, causing property damage, injury, or death.

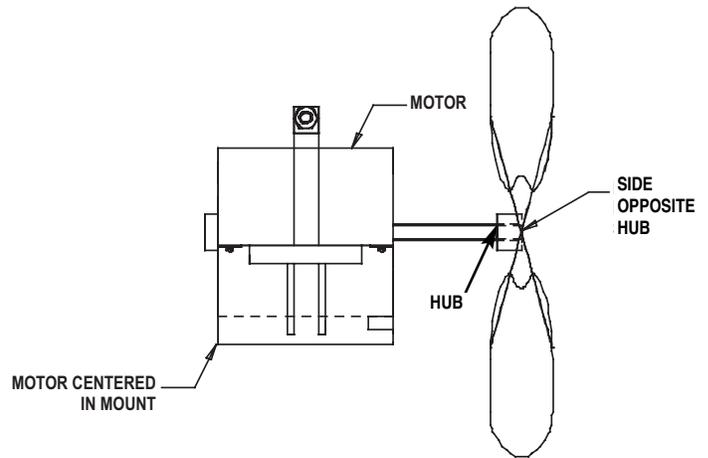
1. Close the fuel supply valve to the heater and disconnect the electrical supply before servicing unless necessary for your service procedure.
2. Remove the heater top or the side panels for access to heater components.
3. Disconnect the appropriate electrical leads for the component being replaced.
4. The auto reset backflash can be tested by by-passing it out of the electrical circuit:
 - Reconnect the electrical supply and open fuel supply valves.
 - If the heater lights, the switch is defective and must be replaced.
 - Do not leave the jumper on or operate the heater if the part is defective. Replace the part immediately.
 - An alternate method for checking the component is to perform a continuity check.
5. For reassembly, reverse the respective service procedure. Ensure gas connections are tightened securely.
6. After servicing, start the heater to ensure proper operation and check for gas leaks.
7. Clean the heater's burner orifice with compressed air or a soft, dry rag. Do not use files, drills, broaches, etc. to clean the orifice. Doing so may enlarge the holes, causing combustion or ignition problems. Replace the orifice if it cannot be cleaned properly.

Service Instructions

MOTOR AND FAN ASSEMBLY

1. Loosen the set screw on the fan hub and slide the fan off of the fan shaft.
2. Remove the nut and bolt that secure the motor within the motor mount.
3. When installing motor and fan:
 - Ensure motor is centered within the motor mount.
 - Set screw of fan must be located over flat of motor shaft before tightening
 - Position fan so side opposite of fan hub is flush with end of shaft
 - Spin the fan to make sure it does not hit heater components.

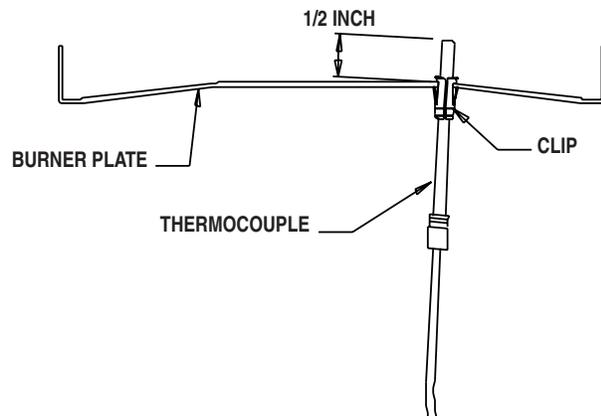
FIG. 6



THERMOCOUPLE

1. Disconnect the thermocouple contact nut from the pilot safety control valve.
2. Disconnect the two electrical leads from the energy cut off block on the thermocouple.
3. Pull the thermocouple from its retaining clip.

FIG. 7



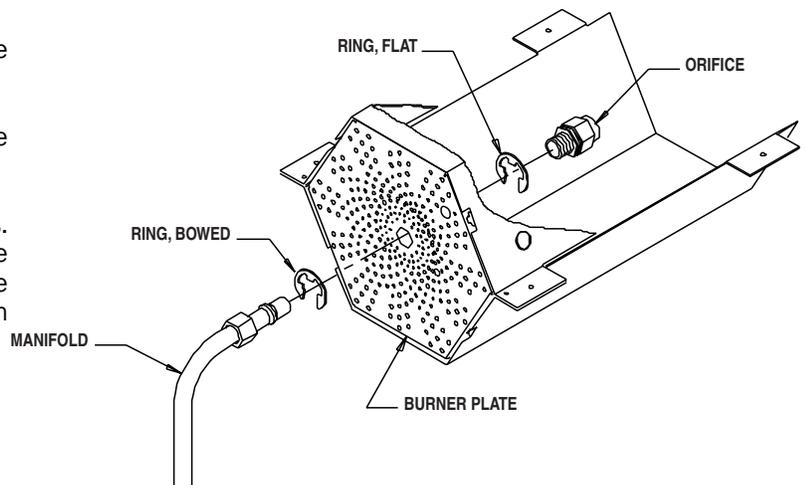
ATTENTION

- When properly installed, the tip of the thermocouple will extend 1/2 in. from the retaining clip on the combustion side of the burner plate.
- When tightening the contact nut of the thermocouple, thread the nut in fingertight and snug it in place a wrench.

BURNER ORIFICE

1. Loosen the compression nut at the orifice inlet.
2. Remove the bowed retaining ring nearest the compression nut.
3. Reach down the heater barrel, and pull the orifice from the burner plate.
4. The replacement orifice ships with two retaining rings. Push the flat ring into the slot nearest the orifice holes. Reaching down the barrel, position the orifice into the burner plate. Secure the orifice into position using the bowed retaining clip.

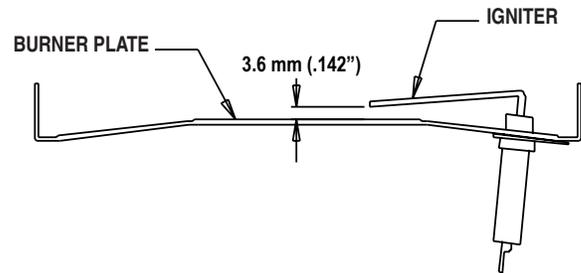
FIG. 8



Test the ignitor periodically. With the gas supply shut off, turn the heater on. If there is not a spark, or a weak spark is evident, either check the gap of the igniter electrode or clean the electrode.

- Ensure the tip of igniter tip is 3.6 mm. from the burner plate. See Fig.9.
- To promote a strong spark and good flame sense, periodically clean the igniter of dirt buildup using a small wire brush or emery cloth.

FIG. 9



BACKFLASH SWITCH

1. Remove the mounting screw from the switch's support bracket.
2. The replacement switch ships attached to its mounting bracket. Ensure gap of switch to burner plate is 1/4 inch.

Testing the Backflash Switch

The switch is an auto reset temperature switch. It should be tested at least once a year, normally when the heater is given a thorough cleaning.

- a. Remove the switch with bracket from the heater.
- b. Holding the switch by its mounting bracket, apply a soft flame only to the sensing portion on the backside of the switch. Be careful not to melt the switch housing when testing.
- c. Within a short time you should here a pop coming from the switch, indicating that the electrical contacts have opened. Check the switch contacts for continuity to verify the circuit has opened.
- d. Allow the switch to cool down. The switch will reset itself shortly. Check for continuity across the terminal to verify contact closure.

FIG. 10

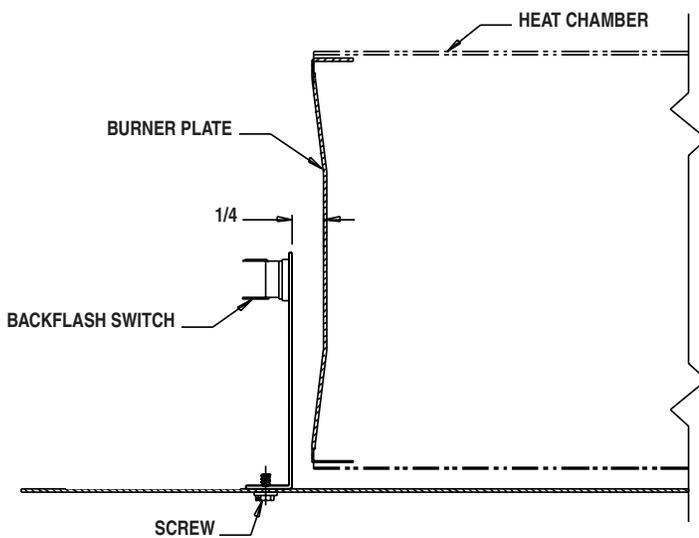
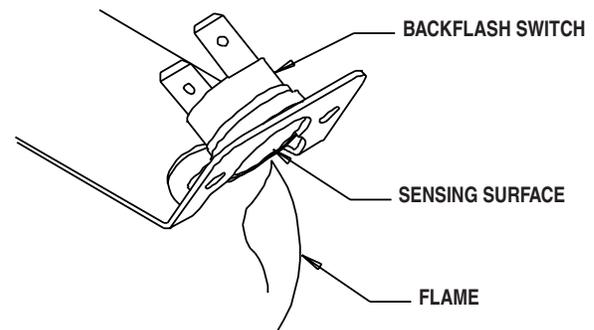


FIG. 12



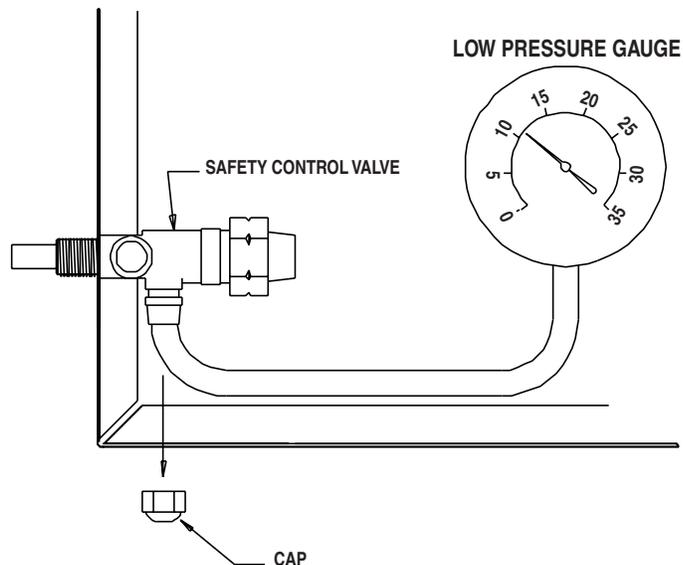
GAS CONTROL VALVE

WARNING
Fire and Explosion Hazard

- Do not disassemble the safety control valve.
- Do not attempt to replace any component of the safety control valve.
- The safety control valve must be replaced if any damage occurs to the valve.
- Failure to follow this warning will result in fire or explosion, leading to severe injury, death, or property damage.

1. Remove the cap on the underside of the control valve. See Fig.11.
2. Connect a pressure gauge at this point, capable of reading up to 35 in. W.C. (L.B. White gauge part number 00764.)
3. Reconnect the heater to its electrical supply and open the fuel supply valves to the heater.
4. When the burner lights, the flowing gas pressure must be 11 in. W.C. If not, either of the following conditions exist:
 - a. Gas control inlet screen is plugged with debris. Disassemble as needed. Remove the inlet screen and clean with compressed air, or replace.
 - b. Single stage regulator is out of adjustment. Replace the regulator.
5. After checking, remove gas gauge. Reinstall cap (tighten securely).

FIG. 11



READ THIS ENTIRE SECTION BEFORE BEGINNING TO TROUBLESHOOT PROBLEMS.

The following troubleshooting guide provides systematic procedures for isolating equipment problems. This guide is intended for use by a QUALIFIED GAS HEATER SERVICE PERSON. **DO NOT ATTEMPT TO SERVICE THESE HEATERS UNLESS YOU HAVE BEEN PROPERLY TRAINED.**

TEST EQUIPMENT REQUIRED

The following pieces of test equipment will be required to troubleshoot this system with minimal time and effort.

- **Digital Multimeter** - for measuring AC and DC voltage and resistance.
- **Low Pressure Gauge** - for checking inlet and manifold pressures at the gas control valve against dataplate rating.

 **WARNING**
Electrical Shock and Burn Hazard

- Troubleshooting this system may require operating the unit with line voltage present and gas on. Use extreme caution when working on the heater.
- Failure to follow this warning may result in property damage, personal injury or death.

- Visually inspect equipment for apparent damage.
- Check all wiring for loose connections and worn insulation.

Use the flow charts on the following pages to troubleshoot problems. To use the charts effectively, you must first identify the problem. The problems are numbered along with a brief explanation of each problem. Start at the diamond closest to the identified problem and proceed with each step, performing the suggested tests. After each step or test, the guide will direct the service person to the next logical step based on the outcome of the previous check.

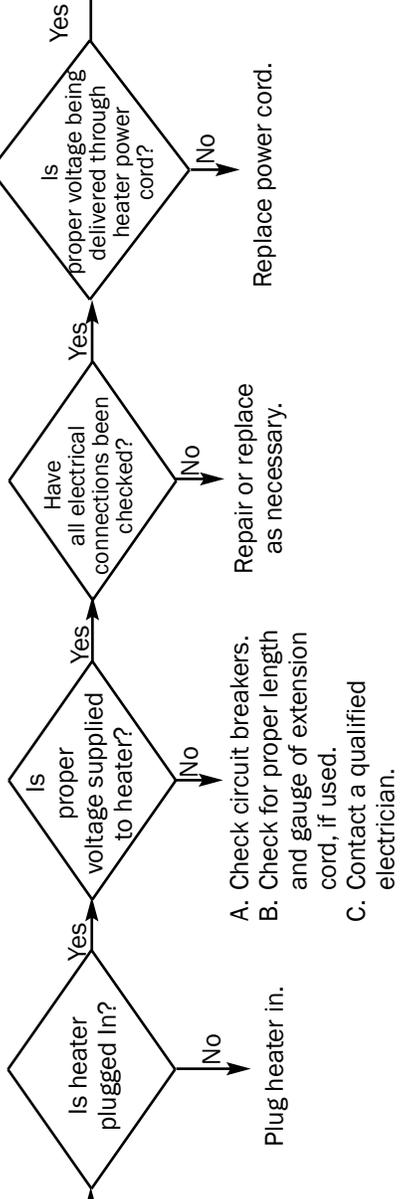
Components should be replaced only after each step has been completed and replacement is suggested in the flow chart.

The problems are listed below along with the page number on which you may find the flow chart for the specific problem.

Problem	Description	Page
1.	Fan Motor Does Not Run	17
2.	Fan Motor Runs, Heater Does Not Light	17
3.	Burner Flame Drops Out After 10-15 Minutes Of Operation	17
4.	Heater Lights But Does Not Stay Lit	18
5.	Backflash Switch is Open	18

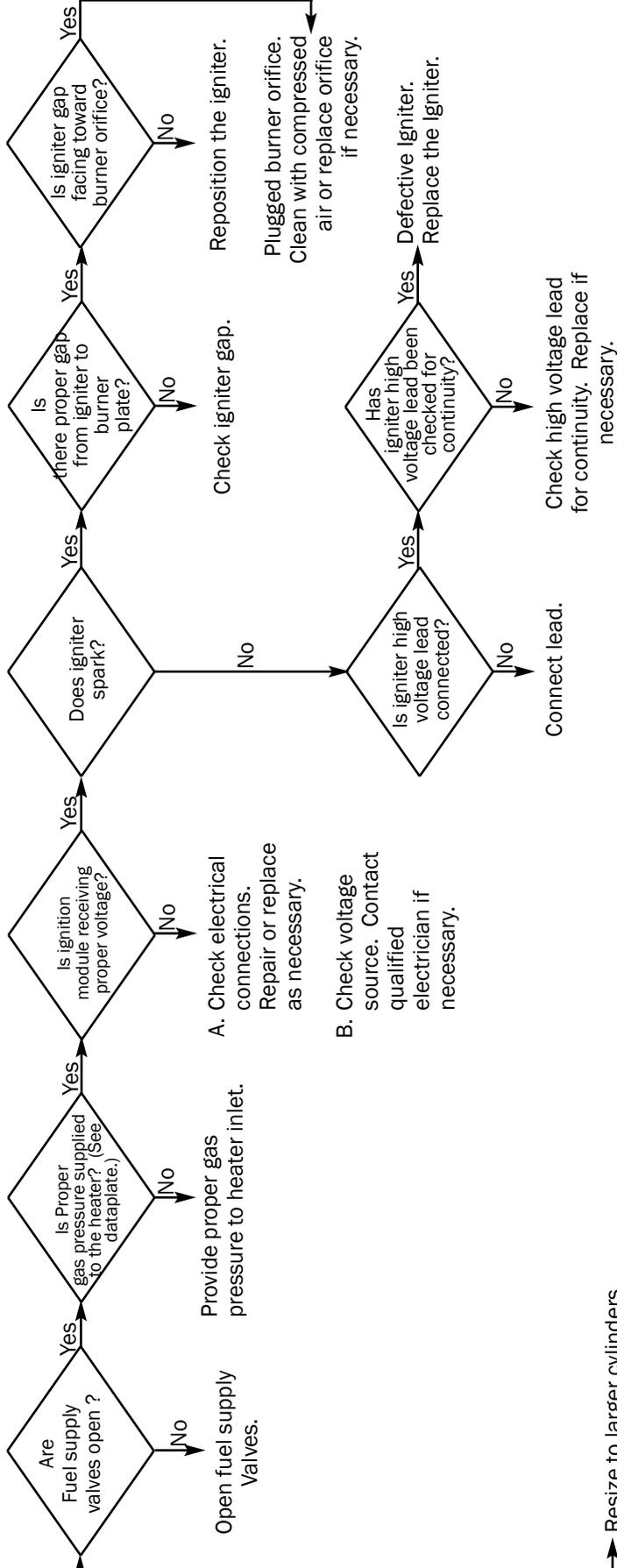
Problem 1

Fan Motor Does Not Run.



Problem 2

Fan Motor Runs, Heater Does Not Light.



Problem 3

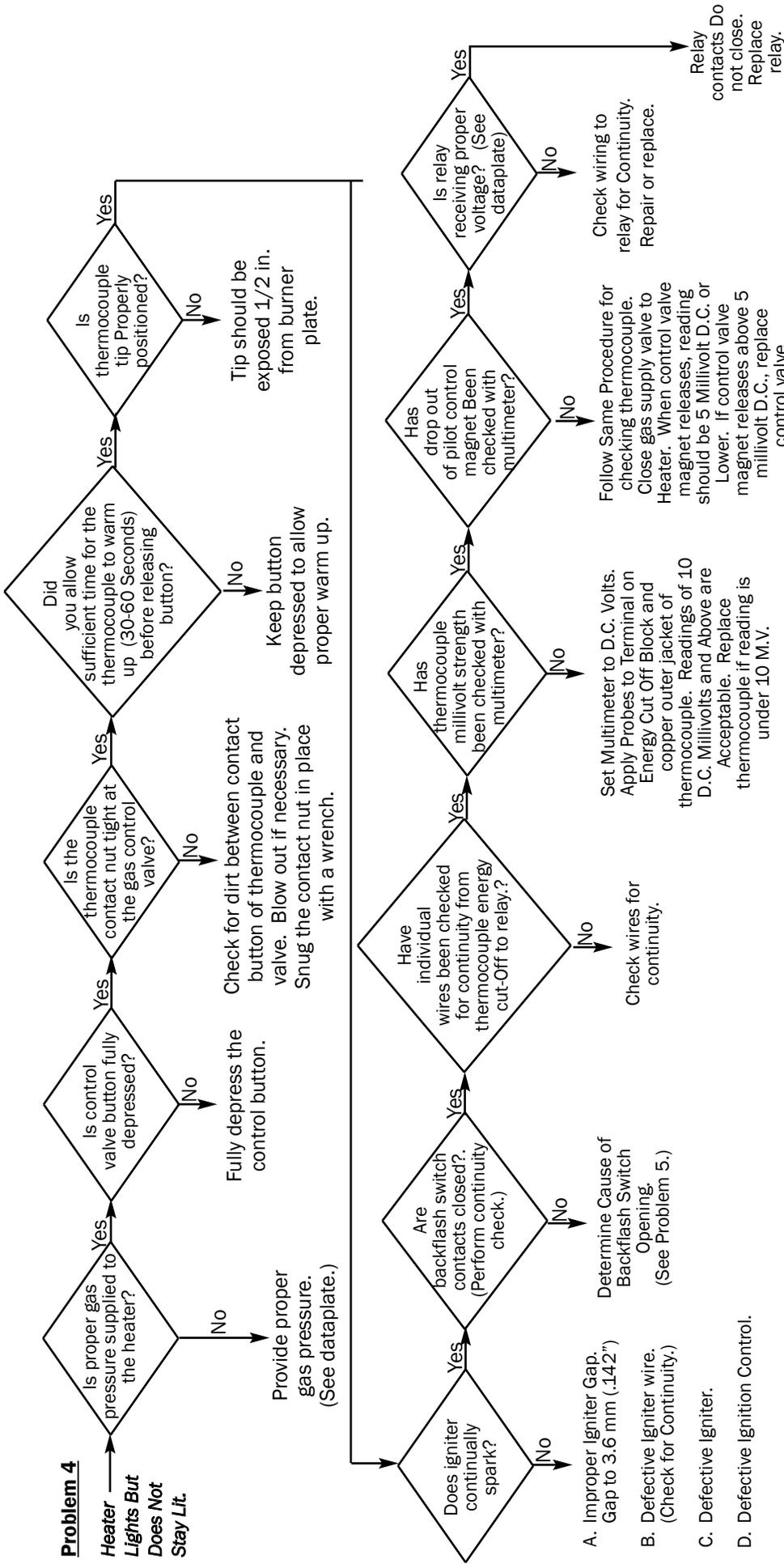
Burner Flame Drops Out After 10-15 Minutes of Operation.



Resize to larger cylinders.

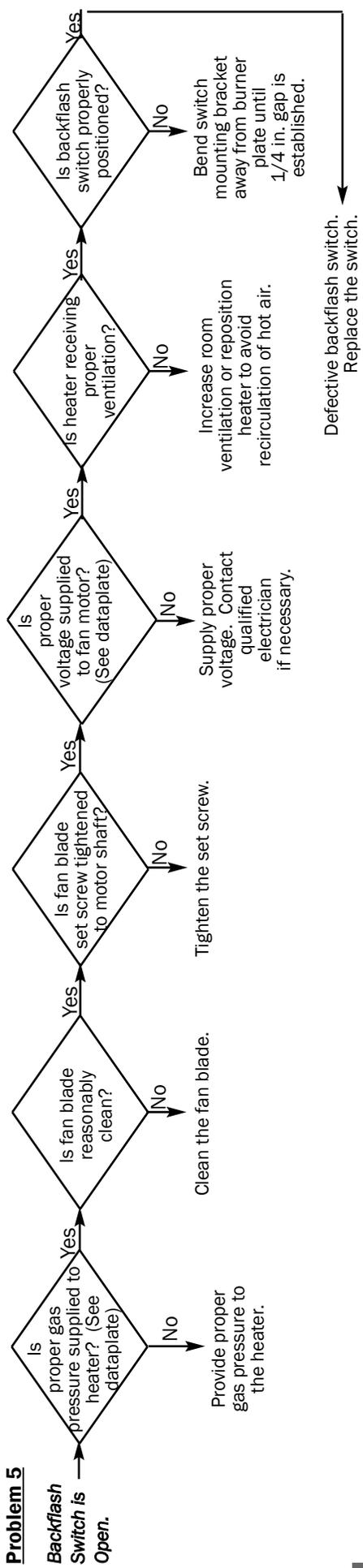
Problem 4

Heater Lights But Does Not Stay Lit.



Problem 5

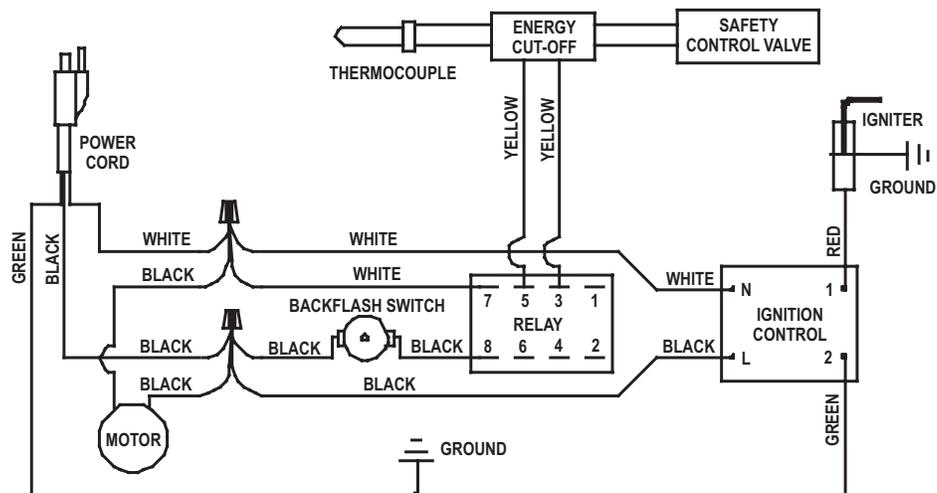
Backflash Switch is Open.



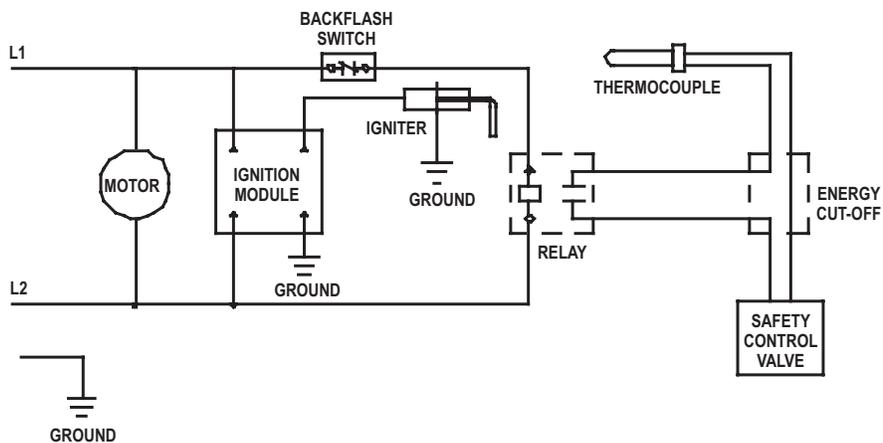
Electrical Connection and Ladder Diagram

CAUTION - REFER TO THE HEATER'S ELECTRICAL CONNECTION DIAGRAM WHEN SERVICING TO AVOID WIRING ERRORS AND HEATER MALFUNCTION. CHECK FOR PROPER OPERATION AFTER SERVICING.

WARNING: THIS HEATER MAY START AT ANY TIME



ELECTRICAL CONNECTION DIAGRAM



ELECTRICAL LADDER DIAGRAM

IF ANY OF THE ORIGINAL WIRE AS SUPPLIED WITH THE HEATER MUST BE REPLACED, IT MUST BE REPLACED WITH WIRING MATERIAL HAVING A TEMPERATURE RATING OF AT LEAST 302°F (150°C)

Heater Component Function

Backflash Switch

Safety device which is used to break an electrical circuit in the event of an overheat condition.

Burner Orifice

Brass metering device used to feed gas at a specific rate.

Direct Spark Ignition Control Board

Electronic control board which supplies a steady voltage in turn creating a constant spark to ignite the burner gas.

Fan Blade

Component used in conjunction with fan motor to pull in air for combustion and circulate for heating.

Gas Hose

Flexible connector used to convey gas from the fuel supply to the heater.

Igniter

Electronic ignition device used on automatic spark ignition control systems. Ignites gas by spark.

Motor

Converts electrical energy into mechanical energy. It is used in conjunction with the fan blade to pull air into the burner for combustion and to circulate the air for heating purposes.

Relay

Electrical device used to prove the thermocouple circuit for flame safety.

Safety Gas Control Valve

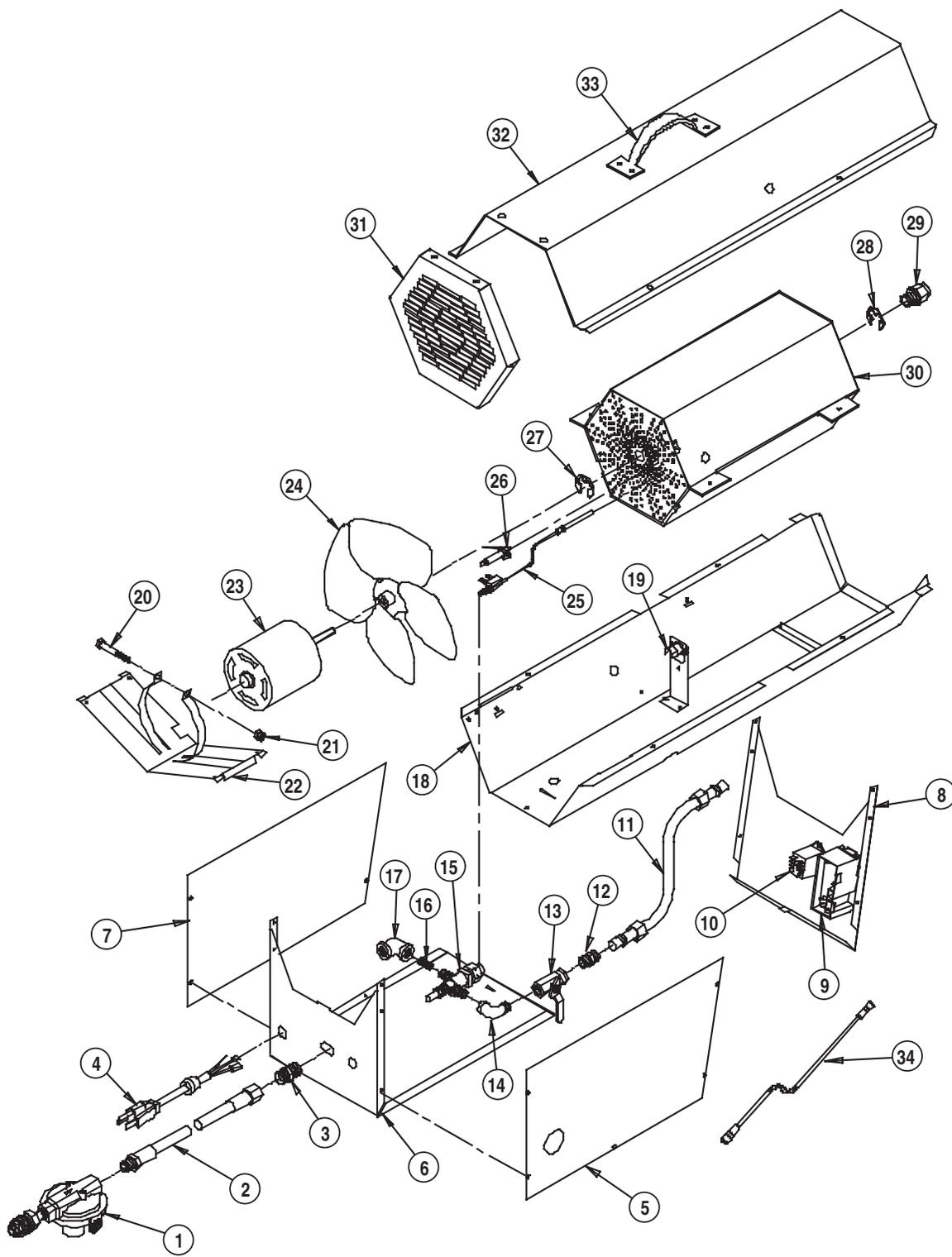
An electromagnetic gas control valve which is held open by electrical current supplied by a thermocouple and which closes automatically to shut off the gas flow if the current generated by the thermocouple becomes too weak.

Thermocouple

A thermoelectric device that converts heat energy directly into electrical energy. It works in conjunction with the electromagnet in the gas control valve in providing gas to the main burner.

Parts Identification

PARTS SCHEMATIC



PARTS LIST

Item	Description	Part Number
1	Regulator, Single Stage	21856
2	Hose, 3/8 in. ID x 10 ft.	21841
3	Adapter, Hose	06654
4	Cord, Power	09139
5	Panel, Left with Marking	21795
6	Case, Back	21794
7	Panel, Right	21796
8	Case, Front	21798
9	Control, Ignition	21813
10	Relay with Clips and Screws	21816
11	Tube, Manifold with Nuts and Sleeves	21805
12	Union	21809
13	Valve, Heat Adjustment	21806
14	Ell, 1/4 in.	01425
15	Valve, Safety Control with Screen	21808
16	Screen	20391
17	Elbow	21807
18	Case, Barrel Bottom	21794
19	Switch, Backflash	21855
20	Bolt	03140
21	Nut	04955
22	Mount, Motor	21828
23	Motor	21830
24	Fan	21829
25	Thermocouple with Retaining Sleeve	21811
25A	Sleeve, Thermocouple Retaining (Not Illustrated)	21812
26	Igniter	21803
27	Ring, Bowed	08460
28	Ring, Flat	05847
29	Orifice with Rings	21802
30	Chamber, Heat with Igniter, Orifice and Burner Plate	21799
31	Guard, Inlet	21792
32	Case, Top	21793
33	Handle with Screws	03941
34	Ignition Lead	21826

Warranty Policy

EQUIPMENT

L.B. White Co., Inc. warrants that the component parts of its equipment are free from defects in material and workmanship, when properly installed, operated, and maintained in accordance with the Installation and Maintenance Instructions, safety guides and labels contained with each unit. If, **within 12 months from the date of purchase by the end user**, any component is found to be defective, L.B. White Co., Inc. will at its option, repair or replace the defective part or equipment, with a new part or equipment, F.O.B., Onalaska, Wisconsin.

A warranty card on file at L.B. White will automatically qualify a unit and its component parts for warranty consideration. If a warranty card is not on file, a copy of the bill of sale will be required to establish warranty qualification. If neither is available, the warranty period will be 12 months from date of shipment from L.B. White.

PARTS

L.B. White Co., Inc. warrants that replacement parts purchased from the company and used on the appropriate L. B. White equipment are free from defects both in material and workmanship for **12 months from the date of purchase by the end user**. Warranty is automatic if a component is found defective within 12 months of the date code marked on the part. If the defect occurs more than 12 months later than the date code but within 12 months from the date of purchase by the end user, a copy of a bill of sale will be required to establish warranty qualification.

The warranty set forth above is the exclusive warranty provided by L.B. White, and all other warranties, including any implied warranties or merchantability or fitness for a particular purpose, are expressly disclaimed. In the event any implied warranty is not hereby effectively disclaimed due to operation of law, such implied warranty is limited in duration to the duration of the applicable warranty stated

above. The remedies set forth above are the sole and exclusive remedies available hereunder. L.B. White will not be liable for any incidental or consequential damages directly or indirectly related to the sale, handling or use of the equipment, and in any event L.B. White's liability in connection with the equipment, including for claims based on negligence or strict liability, is limited to the purchase price.

Some states do not allow limitations on how long an implied warranty lasts, so the above limitation may not apply to you. Some states do not allow the exclusion or limitation of incidental or consequential damages, so the above limitation or exclusion may not apply to you. This warranty gives you specific legal rights, and you may also have other rights which vary from state to state.

Replacement Parts and Service

Contact your local L.B. White dealer for replacement parts and service or call the L.B. White Co., Inc. at (800) 345-7200 for assistance. Be sure that you have your heater model number and configuration number when calling.