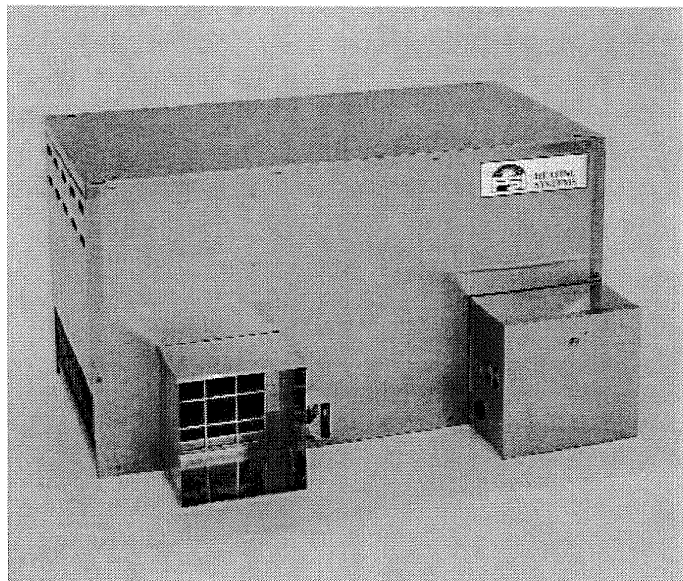




# Owner's Manual and Instructions

## Agricultural Animal Confinement Building Heaters



SERIES	IGNITION TYPE	OUTPUT (BTUH)
1450	Hot	40,000
	Surface	60,000
	Ignition	150,000
		225,000

Available in  
either L.P. Vapor  
Withdrawal or  
Natural Gas  
Configurations.



Warnock Hersey



## Congratulations!

**You have purchased the finest agricultural building heater available.**

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

We, at PSI, **thank you** for your confidence in our products and welcome any suggestions or comments you may have.....call us, at 800-562-2966.



## **ATTENTION ALL USERS**

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### **Agricultural Confinement Building Heaters**

Agricultural confinement building heaters are intended only for installation in farm buildings used for the confinement of poultry and livestock and which are not used as human workplaces for periods in excess of 4 hours per day. This type of heater is not intended for use in other types of buildings including those used for human dwelling, grain storage or grain handling or where gasoline or other liquids having flammable vapors are stored or used.

This heater has been tested and evaluated by ITS/Warnock Hersey in accordance with:

- A.G.A. Requirement 5-88 and is listed and approved for U.S. installations as a direct-fired circulating heater for agricultural confinement buildings.
- WP-GPN-003 and is listed and approved for Canadian installations as an agricultural confinement building heater.
- CAN 1-2.20 and is listed and approved for Canadian installations as a gas-fired brooder.

Refer to the ventilation requirements for agricultural confinement buildings in this manual.

### **Agricultural Building Heaters**

Agricultural building heaters are intended only for installation in farm buildings excluding those used for human dwelling, grain storage or grain handling, or where gasoline or other liquids having flammable vapors are stored or used.

This heater has been tested and evaluated by ITS/Warnock Hersey in accordance with GPN-003 and is listed and approved for Canadian installations as an agricultural building heater.

Refer to the ventilation requirements for agricultural building heaters in this manual

If you are considering using this product for any application other than its intended use, then please contact your fuel gas supplier or PSI at 800-562-2966.



## 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 heater.
- 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 PSI at 800-562-2966.



## WARNING

- Proper gas supply pressure must be provided to the inlet of the heater.
- Refer to the heater's 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, building damage or loss of livestock.
- Gas pressure below the minimum inlet pressure specified at the heater inlet may cause improper combustion.
- Improper combustion can lead to asphyxiation or carbon monoxide poisoning and therefore serious injury or death to humans and livestock.



## 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.



## WARNING

### Fire and Explosion Hazard

- Keep solid combustibles a safe distance away from the heater.
- Solid combustibles include wood or paper products, feathers, straw, 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.

## CONSIGNES DE SECURITE

Il est interdit d'utiliser des liquides inflammables ou degageant des vapeurs inflammables, a proximite de tout appareil fonctionnant au gaz.

## CONSIGNES DE SECURITE

Si vous sentez une odeur de gaz:

- Ouvrez les fenetres.
- Ne touchez pas aux interrupteurs electriques.
- Eteignez toute flamme nue.
- Contactez immediatement votre compagnie de gaz.

## FOR YOUR SAFETY

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

## FOR YOUR SAFETY

If you smell gas:

- Open windows.
- Don't touch electrical switches.
- Extinguish any open flame.
- Immediately call your gas supplier.

<b>SECTION</b>	<b>PAGE</b>
General Information .....	3
Heater Specifications .....	4
Safety Precautions .....	5
Installation Instructions	
General .....	7
Ventilation .....	8
Air Diverter Installation Instructions .....	8
Hanging Instructions .....	9
Sediment Trap Assembly .....	10
Thermostat Installation .....	10
Manual Shut-Off Valve, Hose and Regulator Assembly .....	10
Start-Up Instructions .....	11
Shut-Down Instructions .....	11
Variable Heat Output .....	12
Cleaning Instructions .....	13
Maintenance Instructions .....	13
Service Instructions	
Motor and Fan Wheel Assembly .....	14
Air Proving Switch with Paddle .....	14
Igniter .....	15
Flame Sensor .....	15
Gas Pressure Checks .....	16
Testing the Manual Reset High Limit Switch .....	17
Troubleshooting Guide .....	18
Electrical Connection and Ladder Diagram .....	25
Mechanical Ventilation Interlock Wiring .....	25
Heater Component Function .....	26
Parts Identification	
Parts Schematic .....	27
Parts List .....	28
Wire Selection Table .....	29
Fastener Selection Table .....	29
Warranty Policy .....	30
Replacement Parts and Service .....	30

## General Information

This Owner's Manual includes all options and accessories commonly used on this heater. However, depending on the configuration purchased, some options and accessories may not be included.

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

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

The gas supply line installation, installation of the heater, and 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 PSI distributor or PSI for assistance, or if you have any questions about the use of the equipment or its application.

PSI has a policy of continuous product improvement. It reserves the right to change specifications and design without notice.

# Heater Specifications

		Model							
SPECIFICATIONS		40		60		150		225	
Fuel Type		L.P. Gas	Natural Gas	L.P. Gas	Natural Gas	L.P. Gas	Natural Gas	L.P. Gas	Natural Gas
Maximum Input per Hour		40,000		60,000		150,000		225,000	
Minimum Input per Hour		22,000		32,000	30,000	90,000	96,000	150,000	
Ventilation Air Required to Support Combustion		200 CFM		250 CFM		625 CFM		900 CFM	
Inlet Gas Supply Pressure Acceptable at the Inlet of the Heater for Purpose of Input Adjustment	MAX.	13.5 in. W.C.							
	MIN.	L.P. 11.0 in. W. C. N.G. 7.0 in. W.C.							
Burner Manifold Pressure		L.P. 10.0 in. W. C. N.G. 4.0 in. W.C.							
Fuel Consumption Per Hour	MAX.	1.85 lbs.	40 cu. ft.	2.77 lbs.	60 cu. ft.	6.94 lbs.	150 cu. ft.	10.42 lbs.	225 cu. ft.
	MIN.	.92 lbs.	20 cu. ft.	1.48 lbs.	32 cu. ft.	4.16 lbs.	90 cu. ft.	6.94 lbs.	150 cu. ft.
Ball Bearing									
Motor Characteristics		1/10 H.P. 1550 RPM				1/4 H.P. 1100 RPM		1/3 H.P. 1100 RPM	
Electrical Supply (Volts/Hz/Phase)		115/60/1							
Amp Draw (Starting Amps Includes Igniter)	STARTING	6.0				10.0		14.0	
	CONTINUOUS OPERATION	1.0				2.2		4.0	
Dimensions L x W x H (in inches)		29 x 12 1/2 x 11 1/4				38 1/2 x 18 1/2 x 16 1/2		36 1/2 x 20 x 18 1/4	
Minimum Safe Distances From Nearest Combustible Materials	TOP	1 ft. (.3 m)							
	SIDES	1 ft. (.3 m)							
	BACK	1 ft. (.3 m)							
	BLOWER OUTLET	10 ft. (3 m)							
	GAS SUPPLY	L.P. Gas Supply — 6 ft. (1.83 m) Natural Gas Supply — N/A							
Net Weight (lbs.)		48				95		105	
Shipping Weight (lbs.)		56				105		120	

## 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 PSI 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 in humans leading to serious injury or death. Symptoms of carbon monoxide poisoning can include headaches, dizziness and difficulty in breathing.
- Symptoms of improper combustion affecting livestock can be disease, lower feed conversion, or death.

## FUEL GAS ODOR

LP 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 (LP) gas tank or cylinder fuel supply valves, or the main fuel supply valve located at the meter if you use natural gas.
- Propane (LP) 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.
- Natural gas is lighter than air and can collect around rafters or ceilings.
- 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 (LP) or natural gas. You must determine if you can smell the odorant in these fuel gases.
- Learn to recognize the odor of propane (LP) gas and natural gas. Local propane (LP) gas dealers and your local natural gas supplier (utility) 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. Odors present in animal confinement buildings can mask fuel gas odor.
- The odorant in propane (LP) gas and natural 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 (LP) gas odor may differ in intensity at different levels. Since propane (LP) 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 (LP) gas and natural gas have a distinctive odor. Learn to recognize these odors. (Reference Fuel Gas Odor and Odor Fading sections above.)
- Even if you are not properly trained in the service and repair of the heater, ALWAYS be consciously aware of the odors of propane (LP) gas and natural gas.
- If you have not been properly trained in repair and service of propane (LP) gas and natural gas fueled heaters, then do not attempt to light heater, perform service or repairs, or make any adjustments to the heater on propane (LP) gas or natural gas fuel system.
- 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!

## Safety Precautions

1. Do not attempt to install, repair, or service this heater or the gas supply line 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.
2. All installations and applications of PSI heaters must meet all relevant local, state and national codes. Included are L.P. 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.
    - a. For U.S.A. installations and applications:
      - 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.
    - b. For Canadian Installations and Applications:
      - CAN1-B149.1 or CAN1-B149.2 Installation Codes
      - CSA C22.1 Part 1 Standard Canadian Electrical Code. CSA C22.2 No. 3, Electrical Features of Fuel-Burning Equipment.
  3. Do not move, handle, or service heater while in operation or connected to a power or fuel supply.
  4. This heater may be installed in areas subject to washdown. This heater may only be washed on the external case assembly—see Cleaning Instructions. Do not wash the interior of the heater. Use only compressed air, soft brush or dry cloth to clean the interior of the heater and it's components. After external washdown, do not operate the heater until it is completely dry. In any event, do not operate this heater for at least one hour after external washdown.
  5. For safety, this heater is equipped with manual reset high-limit switches and an air flow 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.

6. Do not operate the heater with its door open or panel removed.
7. Do not locate fuel gas containers or fuel supply hoses anywhere near the blower outlet of the heater.
8. Do not block air intakes or discharge outlets of the appliance. Doing so may cause improper combustion or damage to heater components leading to property damage or animal loss.
9. The hose assembly (if provided) 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.
10. Check for gas leaks and proper function upon heater installation, before building repopulation or when relocating.
11. This heater should be inspected for proper operation by a qualified service person before building repopulation and at least annually.
12. Always turn off the gas supply to the heater if the heater is not going to be used in the heating of livestock.
13. This appliance 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.
14. Hot surface ignition heaters will make up to three trials for ignition. If ignition is not achieved after the third trial, the control system will "lock out" the gas control valve. If gas is smelled after system lock out has occurred, immediately close all fuel supply valves. Do not relight until you are sure that all as that may have accumulated has cleared away. In any event, do not relight the heater for at least 5 minutes.
15. In a hanging type installation, rigid pipe or copper tubing coupled directly to the heater may cause gas leaks during movement, and therefore must not be used. Use only gas hose assemblies that are rated and approved for LP-gas and natural gas in a hanging type installation.
16. Installations not using the gas hose supplied with this appliance must connect dimensionally using American National Standard Wrought Steel and Wrought Iron Pipe B36/10-1970. (Aluminum piping or tubing shall not be used.) Copper tubing when used for conveying natural gas, shall be internally tinned or equivalently treated to resist sulphur.

# Installation Instructions

## GENERAL



### WARNING

#### Fire or Explosion Hazard.

Can cause property damage, severe injury or death.

- Disconnect power supply before wiring to prevent electrical shock or equipment damage.
- To avoid dangerous accumulation of fuel gas, turn off gas supply at the appliance service valve before starting installation, and perform gas leak test after completion of installation.
- Do not force the gas control knob. Use only your hand to turn the gas control knob. Never use any tools. If the knob 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 PSI recommendations when installing this heater. If during the installation 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 and is hung level. 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 must have the proper gas regulator installed for the application. A regulator must be connected to the gas supply so that gas pressure at the inlet to the gas valve is regulated within the range specified on the dataplate at all times. Contact your gas supplier, or PSI if you have any questions.
5. The heater's gas regulator (with pressure relief valve) should be installed outside of building. Any regulators inside the buildings must be properly vented to the outside. Local, state and national codes always apply to regulator installation. Natural gas regulators with vent limiting device may be mounted indoors without venting to outdoors.
6. All gas pressure regulators must be installed in strict accordance with the manufacturer's safety instructions. These instructions accompany each regulator.
7. Insure that all accessories that ship within the heater have been removed from inside of heater and installed. This pertains to air diverters, hose, regulator, etc.
8. Make certain that a sediment trap is installed at the gas valve inlet to prevent foreign materials (pipe compound, pipe chips and scale) from entering the gas valve. Debris blown into the gas valve may cause

that valve to malfunction resulting in a serious gas leak that could result in a possible fire or explosion causing loss of products, building or even life. A properly installed sediment trap will keep foreign materials from entering the gas valve and protect the safe functioning of that important safety component.

9. Any heater connected to a piping system must have an accessible, approved manual shut off valve installed within 6 ft. of the heater it serves.
10. Check all connections for gas leaks using approved gas leak detectors. Gas leak testing is performed as follows: 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. Further 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. Further 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.



### 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.

11. A qualified service agency must check for proper operating gas pressure upon installation of the heater.
12. Light according to instructions on the heater or within owner's manual.
13. It is extremely important to use the proper size and type of gas supply line to assure proper functioning of the heater. Contact your fuel gas supplier for proper line sizing and installation.
14. This heater can be configured for use with either L.P. vapor withdrawal or natural gas. Consult the dataplate, located on the blower outlet side of the



case assembly, for the gas configuration of the specific heater. Do not use the heater in an L.P. gas liquid withdrawal system or application. If you are in doubt, contact PSI.

15. Eventually, like all electrical/mechanical devices, the thermostat can fail. Thermostat failure may result in either an underheating or overheating condition which may damage critical products and/or cause animal injury or death. Critical products and/or animals should be protected by a separate back-up control system that limits high and low temperatures and also activates appropriate alarms.
16. 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 building and also to the individual heater. Contact your fuel gas supplier if you have any questions.

17. 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.
18. Do not exceed input rating stamped on the dataplate of the heater. Do not exceed the burner manifold pressure stated on the dataplate. Do not use an orifice size different than specified for the specific input rating of this heater, fuel type configuration and altitude.

---

## VENTILATION

1. Ventilation must be provided as indicated in the Heater Specification table of this manual or on the data plate of the heater.
2. Ventilation Requirements:
  - a. Canadian Installations, Agricultural Confinement Building Heater, Gas-Fired Brooder.
    - A ventilation system shall be provided in accordance with national, provincial, local codes of CAN/CGA-B149 if local code requirements do not exist.
    - CAN/CGA-B149 requires the building have ventilation of not less than 3 cfm per 1,000 BTUH input of the heater. Ventilation must be provided as indicated in the Heater Specification table of this manual or on the data plate of the heater.
  - b. Canadian Installations, Agricultural Building Heater.
    - A ventilation system shall be provided in accordance with national, provincial, local codes or CAN/CGA-B149 if local code requirements do not exist.

- Installation requires the building have ventilation of not less than 3 cfm per 1,000 BTUH input of the heater. Ventilation must be provided as indicated in the Heater Specification table of this manual or on the data plate of the heater.
- Mechanical ventilation shall be interlocked with the heater to prevent heater operation unless the ventilation air flow is proven by an air flow proving device.
- Air for combustion shall be supplied from outdoors. The size of the opening shall be in accordance with Table 5.2.2A of CAN/CGA-B149.
- The opening (or duct termination if ducted) shall be within 1 foot (300 mm) above, and within 2 feet (600 mm) horizontally from the burner level of the heater.
- An opening to the outdoors shall be located in accordance with local code requirements, or CAN/CGA-B149 if local code requirements do not exist.

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## AIR DIVERTER INSTALLATION INSTRUCTIONS

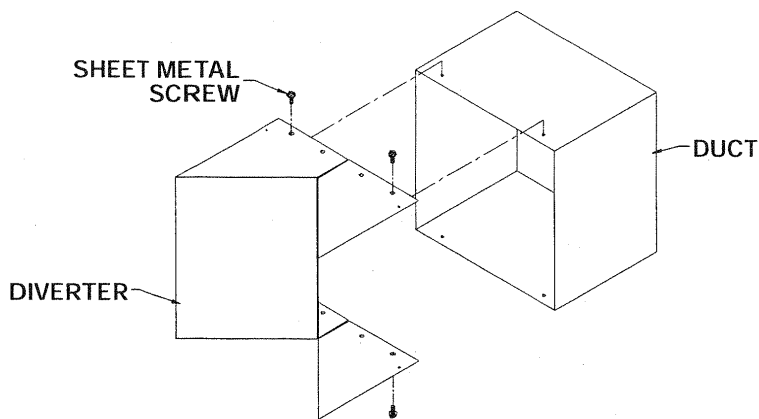
(Optional accessory.)  
(Appearance of the outlet on heater may vary from model to model.)  
(Continued on Page 9)

1. Optional air diverters can be installed in the heater outlet to provide two 45 degree paths to the heated air as it exits the heater. Installation options include installing the diverters in such a way as to broadly distribute the air in two 45 degree paths or to focus the air flow in one 45 degree direction.

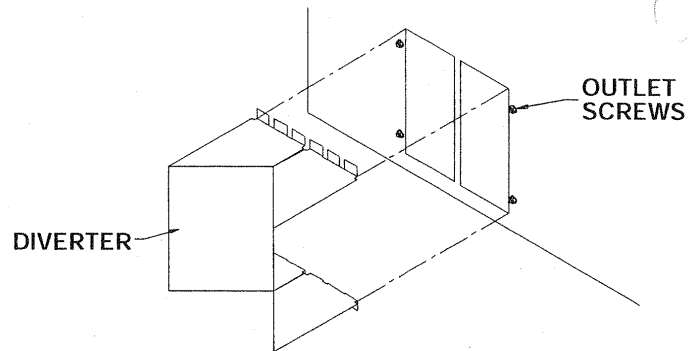
- a. **40,000, 60,000, and 225,000 BTUH Heaters**  
Mount the air diverter to the outlet duct of the heater by lining up the screw holes in the diverter with the holes in the duct. Secure in place with the screws included with the air diverter.
- b. **150,000 BTUH Heaters**  
Insert the tabs of air diverters between sheet metal case front and blower outlet. Loosen the blower outlet screws if necessary.

**FIG. 1**

a. 40,000, 60,000, and 225,000 BTUH Heaters



b. 150,000 BTUH Heaters



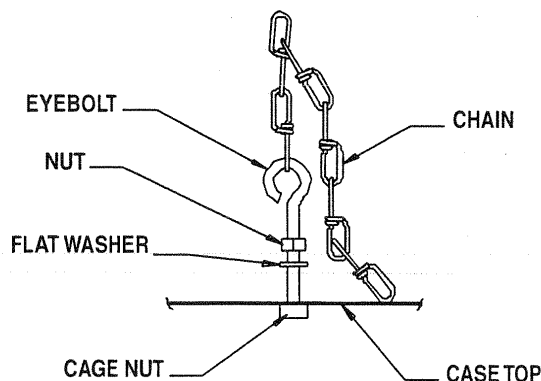
**Alternate Air Diverter Installations**



## HANGING INSTRUCTIONS

1. Assemble according to the illustration below and tighten all eyebolts securely.

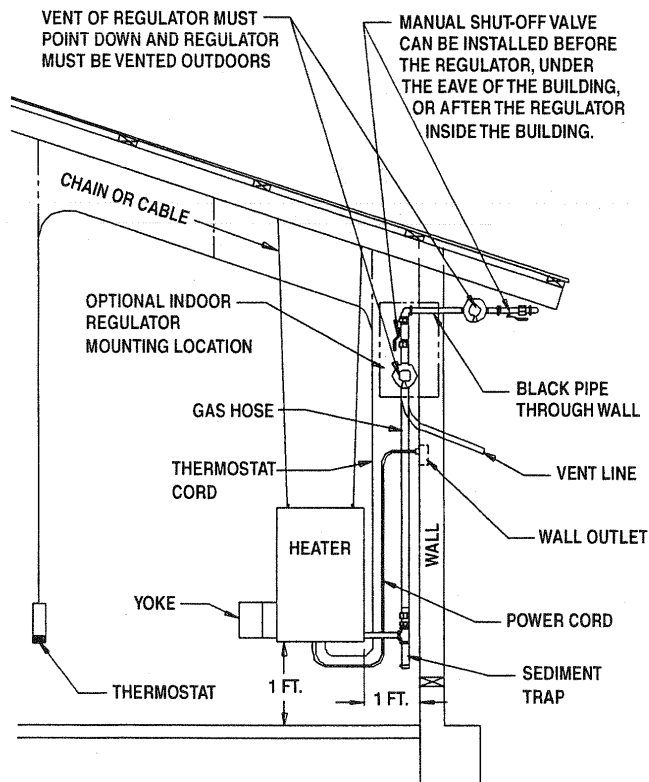
**FIG. 2**



2. Be sure heater is securely fastened and is hanging level. (Check crosswise and lengthwise.)
4. See Fig. 3 for **typical** indoor installation. In any animal confinement building, consideration must be given to making sure the heater is located away from the livestock so that livestock cannot knock the heater, tear it loose from its mounting, or damage the heater or its gas supply line in any way. Make sure you observe and obey minimum clearance distances to combustible materials as stated in the specification section of this owner's manual and on the heater dataplate.

**FIG. 3**

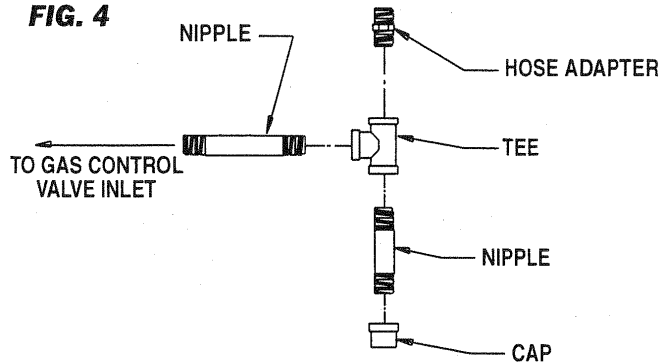
NOTE: REGULATORS SHOULD ALWAYS BE MOUNTED OUTDOORS. IF CIRCUMSTANCES FORCE INSTALLING THE REGULATOR INDOORS, THE REGULATOR'S VENT MUST BE VENTED OUTDOORS USING VENT LINE NO SMALLER THAN VENT OPENING.



## SEDIMENT TRAP ASSEMBLY

Assemble the tee, nipples and cap together and tighten securely. The sediment trap assembly must always be mounted in a vertical position. Make sure pipe thread compound that is resistant to both L.P. and natural gas is used in making all connections. **Check all connections for gas leaks using approved gas leak detectors.**

**FIG. 4**



## THERMOSTAT INSTALLATION

**⚠ WARNING**  
**Electrical Shock Hazard**

- Disconnect the electrical supply before connecting the thermostat to the heater.
- Failure to follow this warning can result in electrical shock, leading to personal injury or death.

### 1. To Connect the Series Tap Plug Thermostat Kit:

- a. Connect the power cord of the heater to the female side of the plug on the end of the thermostat cord.

- b. Plug the male side of the series tap plug on the thermostat cord into a three-wire (grounded) electrical outlet within the building.

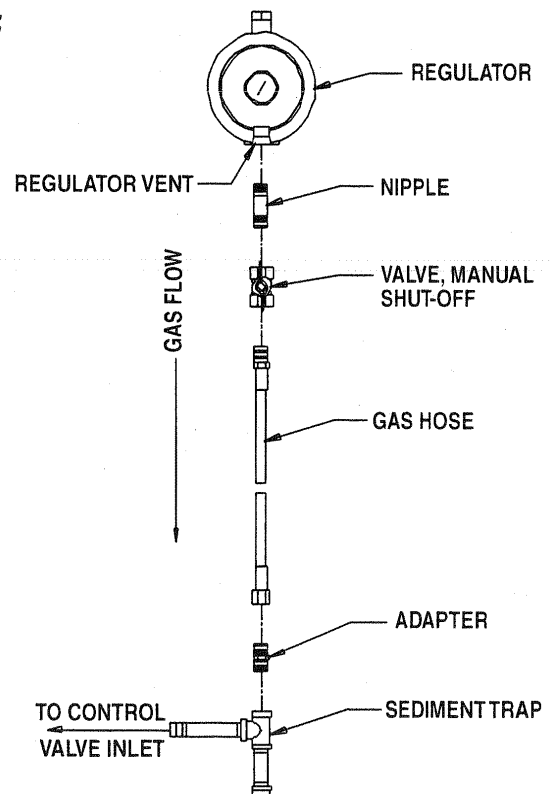
### 2. To Connect the Direct Wired Thermostat Kit to the Control Box on the Heater:

- a. The installation and wiring of a thermostat must be done by an electrician or someone properly qualified.
- b. The thermostat may use 18 gauge, 3 wire (with ground) cord to handle the voltage being supplied to the thermostat.
- c. The heater must be tested for proper operation after the thermostat has been connected.

## MANUAL SHUT-OFF VALVE, HOSE AND REGULATOR ASSEMBLY

1. Always use approved pipe thread compound suitable for use with L.P. or natural gas on the threaded connections.
2. Assemble the components together according to the figure. This view is to show general assembly of the components only.
3. Tighten all connections securely.
4. **Check all connections for gas leaks using approved gas leak detectors.**

**FIG. 5**

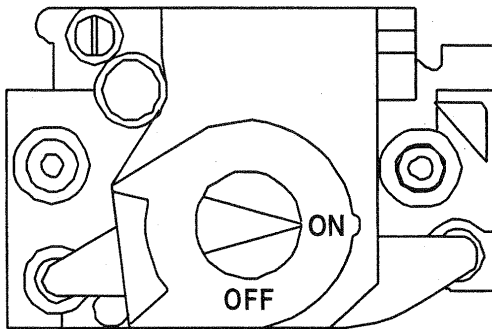


## Start-Up Instructions

Follow steps 1 - 6 on initial start-up after heater installation by a qualified gas heater service person. For normal start-up, simply set the thermostat above room temperature. The heater will start.

1. Open all manual fuel supply valves and check for gas leaks using approved leak detectors. The gas control valve on the heater has a manual shut-off feature incorporated into the valve assembly and will be located within the gas control and electrical enclosure. Open the enclosure and make sure the indicator on the valve is turned to the "on" position. Close and latch the enclosure. See Fig. 6.

**FIG. 6**



2. Connect the electrical cord to an approved electrical outlet.
3. Set the thermostat (if supplied) to desired room temperature.
4. This heater includes a hot surface ignition (HSI) control module for purposes of controlling the timing of the ignition process of the heater as well as monitoring of the safety functions. The HSI module is contained within the gas control and electrical

enclosure. On the HSI module is a red light emitting diode (LED). This LED indicates the status of the heater. The LED is visible external of the control enclosure through the plastic eye. A constant light from the LED is an indicator that the heater is functioning correctly. Any flash pattern by the LED is indicative that there is a problem in the operation of the heater. Refer to the troubleshooting decal on the access panel at the fan motor end of the heater for assistance in troubleshooting. Only qualified and properly trained personnel shall service or repair the heater.

5. On a call for heat, the motor will start up and run for five (5) seconds and then stop. This "pre-purge" is a safety feature and a normal operational characteristic prior to ignition taking place. After the motor has stopped, the igniter will heat up (approximately 17 seconds). After igniter warm up time has been achieved, the motor will start again and shortly thereafter ignition will occur.

**NOTE:** It is normal for air to be trapped in the gas hose on new installations. The heater may attempt more than one trial for ignition before the air is finally purged from the line and ignition takes place.

6. The HSI control will make up to three trials for ignition. Each trial for ignition will take approximately 20 seconds. The first two trials for ignition will occur within 40 seconds if ignition is not achieved. A 15 minute "wait period" will then begin after the second trial for ignition has taken place. After the 15 minute time span has elapsed, the third and final trial for ignition will take place. If ignition is not achieved at this final trial, the system will "lock out", and a "three flash" pattern will be indicated by the LED.

## Shut-Down Instructions

If the heater is to be shut down for cleaning, maintenance or repair, follow steps 1 - 5. Otherwise, simply turn thermostat to off or no heat for standard shut down.

1. Close all manual fuel supply valves.
2. With the heater lit, allow heater to burn off excess fuel in gas supply hose.

3. Turn the indicator on the gas control to off.
4. Turn thermostat to off or no heat position.
5. Disconnect the heater from the electrical supply.

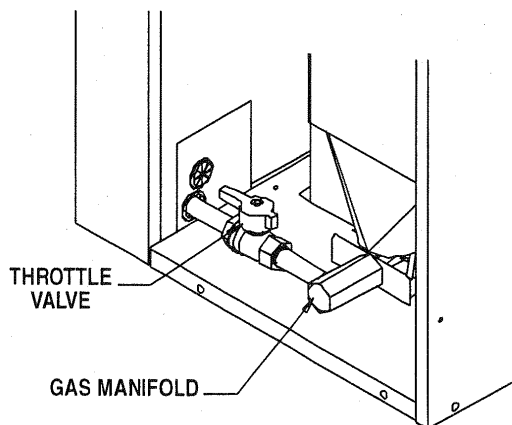
## Variable Heat Output

1. All models of propane (LP) gas or natural gas heaters have a throttle valve for varying heat output located between the gas control valve and gas manifold assemblies. THIS IS NOT A MANUAL GAS SHUT OFF VALVE.
2. The throttle valve can be adjusted to deliver either minimum heat or maximum heat. When the throttle

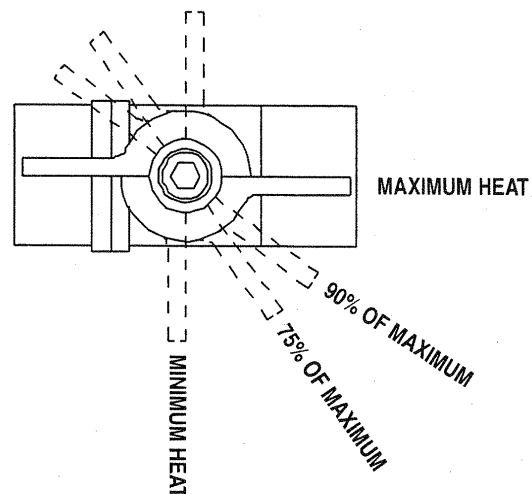
valve handle is parallel to the gas flow, the valve is completely open to deliver maximum heat output. (Refer to Fig. 7.)

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. (Refer to Fig. 8.)

**FIG. 7**



**FIG. 8**



## 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, aging, or the corrosive atmosphere of an animal confinement building.
- 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 the electrical supply.
2. The heater should have dirt or dust removed periodically:
  - a. After each flock or between building re-population, give the heater a general cleaning using compressed air or a soft brush on its interior and exterior. At this time, dust off the motor case to prevent the motor from over-heating and shutting the heater down.
  - b. At least once a year, give the heater a thorough cleaning. At this time, remove the fan and motor assembly and brush or blow off the fan wheel, giving attention to the individual fan blades. Make sure the burner air inlet venturi ports and the "throat" of the casting are free of dust accumulation and the area between the heat chamber top and inside case is also free of dust. Additionally, the flame sensor should be removed and cleaned according to the service instructions within this Owner's Manual.
  - c. When washing with water, observe and obey the Warning within these Cleaning Instructions. This same Warning is also supplied on the heater.



### **WARNING**

This heater may be washed only on the external case assembly provided:

- A. The heater is disconnected from the electrical supply.
- B. All access panels are securely closed.
- C. Water spray nozzle shall not discharge within 6 ft. of the heater.
- D. The water pressure does not exceed 45 PSIG for 10 seconds on each side of heater.
- E. The heater is not reconnected to electrical supply for a minimum of 1 hour or until the heater is thoroughly dry.

Improper cleaning of the 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.

Clean internal components of the heater with a soft, dry brush or cloth, or compressed air.

## Maintenance Instructions

1. Have your gas supplier check all gas piping annually for leaks or restrictions in gas lines. Also, at this time have your gas supplier clean out the sediment trap of any debris that may have accumulated.
2. **The appliance area shall be kept clear and free from combustible materials, gasoline, and other flammable vapors and liquids.**
3. Regulators can wear out and function improperly. Have your gas supplier check the date codes on all

regulators installed and check delivery pressures to the appliance to make sure that the regulator is reliable.

4. Regulators must be periodically inspected to make sure the regulator vents are not blocked. Debris, insects, insect nests, snow, or ice on a regulator can block vents and cause excess pressure at the appliance.

# Service Instructions

## MOTOR AND FAN WHEEL ASSEMBLY

1. Shut off the gas supply to the heater.
2. Disconnect the heater from its electrical supply.
3. Open the case fan access panel on the motor end of the heater.
4. Disconnect the motor leads.
5. Remove the screws securing the motor mounting plate to the fan housing.
6. Pull the fan and motor assembly from the housing.
7. Loosen the square head set screw(s) on the fan wheel with a wrench.
8. Pull the fan wheel from the motor shaft. Use a wheel puller if necessary.
9. Remove the four (4) nuts securing the motor to the mounting plate.
10. To replace the motor and fan, reverse the above procedures.

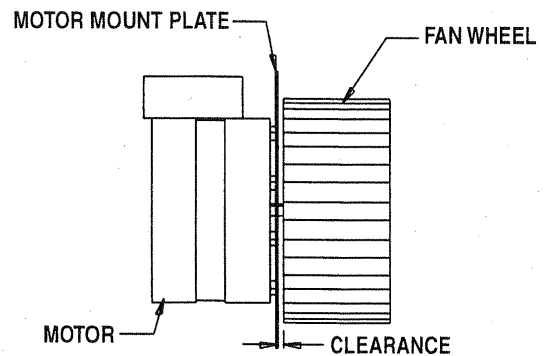
NOTES: a. Fan wheel to motor mount plate spacing must be adjusted to proper clearance before tightening the fan wheel to the motor shaft.

b. Make sure that set screw(s) of the fan are on the "flats" of motor shaft when tightening.

**Heat Output (BTUH)**  
40,000/60,000/150,000  
225,000

**Clearance**  
3/8 in.  
1/8 in.

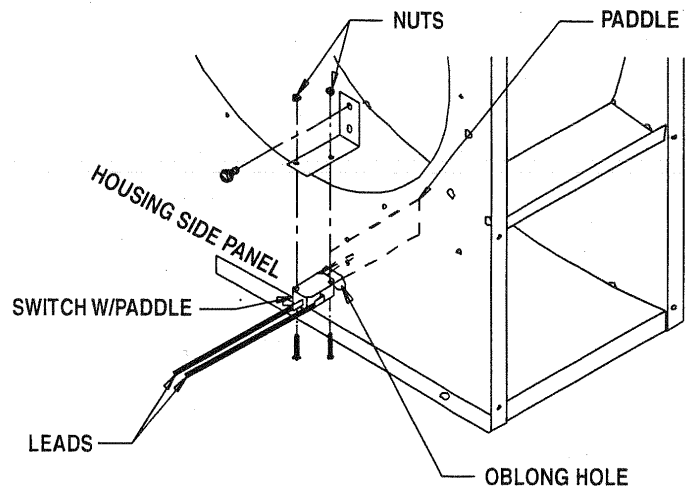
**FIG. 9**



## AIR PROVING SWITCH WITH PADDLE

**FIG. 10**

1. Shut off the gas supply to the heater.
2. Disconnect the heater from its electrical supply.
3. Open the case access panel on the control box end of the heater.
4. Remove the two (2) sheet metal screws holding the switch with bracket to blower housing. Remove the assembly by turning the switch assembly 90° so the paddle on the switch arm can be pulled through the oblong hole on side of fan housing.
5. Disconnect the leads from the air proving switch.
6. To replace the switch, reverse the above procedure. The replacement switch will be pre-assembled to its mounting bracket.



### IMPORTANT

Make sure you don't bend the switch arm when installing the replacement switch. Bending the switch arm may create ignition problems later.

## IGNITER

See Fig. 11

1. Shut off the gas supply to the heater.
2. Disconnect the heater from its electrical supply.
3. Open the burner end access panel.
4. Disconnect the igniter.
5. Loosen the screw that secures the igniter shield and igniter to the mounting bracket.
6. Position the replacement igniter to the igniter bracket so the lip on back side of the igniter is resting on the edge of the mounting bracket and so the mounting hole in the igniter straddles the mounting screw.
7. Replace the igniter shield.
8. Tighten the mounting screw snugly. **DO NOT OVERTIGHTEN.** Overtightening can cause cracks in base of igniter, possibly leading to future igniter failure.

9. Connect the igniter to the igniter power supply leads.
10. Close and secure the burner access panel.

### IMPORTANT

- Do not handle the igniter by the igniter element. Doing so may cause premature igniter failure. Handle the igniter by its ceramic base, or by its leads.
- Center the igniter shield over the igniter element, making sure the shield does not touch the igniter element, otherwise igniter damage will occur when the igniter is energized..
- Do not overtighten the igniter mounting screw. Overtightening will crack the base of the igniter, leading to premature failure.

## FLAME SENSOR

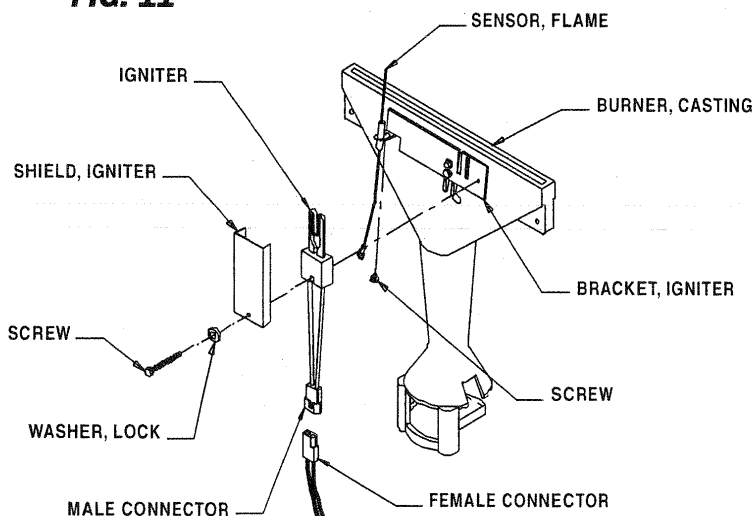
Complete this procedure at least once during the heating season.

1. To help maintain proper flame sense, the sensor should be removed from its mounting bracket and its metal rod cleaned using steel wool or emery cloth. Rub briskly to remove build up of dust, dirt and aluminum oxide. Be careful not to fracture the ceramic base of the sensor.
2. Check the flame sensor's ceramic base for any cracks. If cracks are found, replace the sensor.

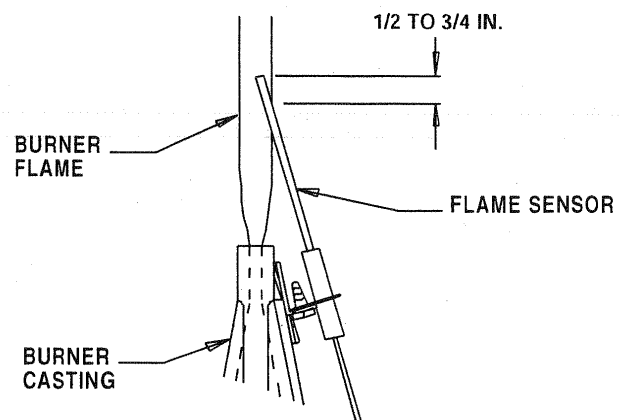
### IMPORTANT

- For proper flame sense operation, the flame sensor tip must be properly positioned within the burner flame. Normally 1/2 in. to 3/4 in. is sufficient.

**FIG. 11**



**FIG. 12**







## **WARNING** Fire and Explosion Hazard

- Do not disassemble the gas control valve.
- Do not attempt to replace any components on the gas control valve.
- The gas control valve must be replaced if any physical damage occurs to the control valve assembly.
- Failure to follow this warning will result in fire or explosions, leading to injury or death to humans and livestock, and building damage.

### ATTENTION

- The following explains a typical procedure to be followed in checking gas pressures.
- The gas pressures will vary depending upon model number and fuel type.
- Consult the dataplate on the heater or page 4 in this manual for specific pressures to be used in conjunction with this procedure.
- Gas pressure measured at the inlet to the gas valve is Inlet Pressure and gas pressure measured at the outlet of the gas valve is burner Manifold Pressure.

### A. Preparation

1. Obtain two pressure gauges capable of reading up to 35 in. W.C.
2. Disconnect the heater from the electrical supply and close the fuel supply valve to the heater inlet.
3. Open the control box.
4. Brush or blow off any dust and dirt on or in the vicinity of the gas control valve.

### B. Gauge Installation

1. Remove the inlet and outlet pressure tap plugs. See Fig. 13.
2. Securely connect a pressure gauge to each pressure tap port.
3. Open the fuel supply valves to the heater and reconnect the heater electrical supply.
4. Start the heater.

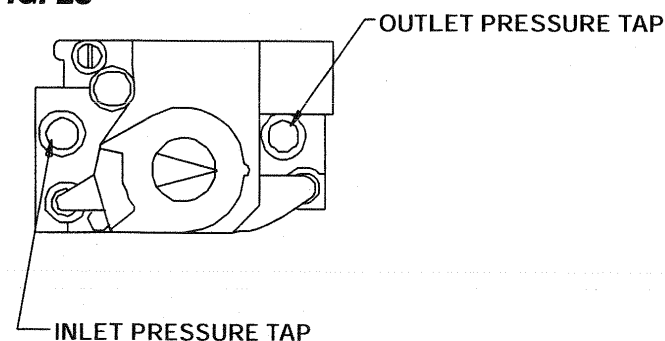
### C. Reading Pressures

1. With the heater operating, the pressure gauges should read the pressures specified on the dataplate.
2. Do the readings at the inlet and outlet pressure gauges agree with that specified on the dataplate? If so, then no further checking or adjustment is required. Proceed to Section D.
3. If the inlet pressures do not agree with that specified on the dataplate, then the building system regulator controlling gas pressure to the heaters requires adjustment.
4. If the inlet pressures are correct and the burner manifold pressure does not agree with that specified on the dataplate, then the gas control valve's internal pressure regulator requires adjustment. See Fig. 14 for regulator location.

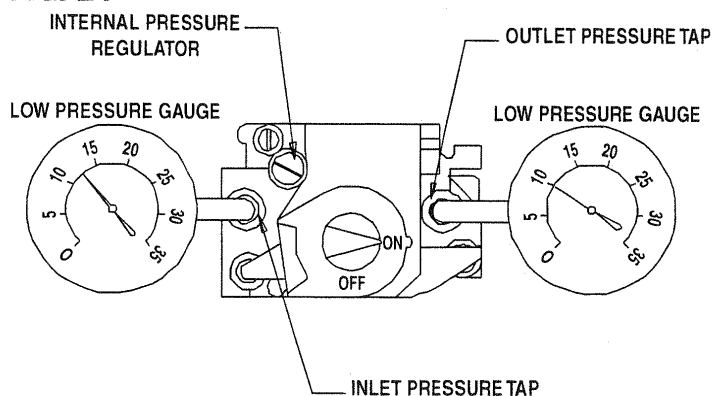
### D. Completion

1. Once inlet and burner manifold pressures have been confirmed and/or properly set, close the fuel supply valve to the heater and allow the heater to burn off any gas remaining in the gas supply line.
2. Disconnect the heater from its electrical supply.
3. Remove the gauges.
4. Reinstall the pressure tap plugs and tighten securely.

**FIG. 13**



**FIG. 14**



## TESTING THE MANUAL RESET HIGH LIMIT SWITCH



### **WARNING**

#### **Fire Hazard**

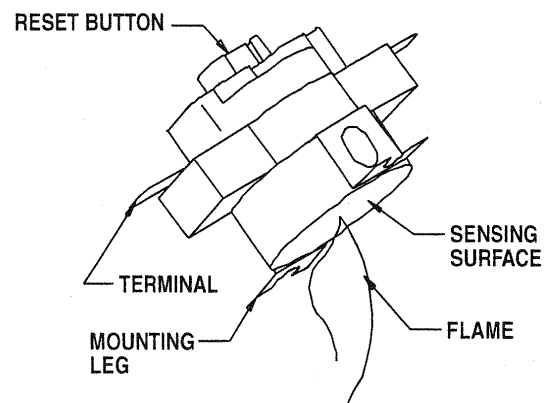
- Do not operate the appliance with the high limit switch bypassed.
- Operating the heater bypassed high limit switch may lead to overheating, possibly resulting in a fire, with subsequent damage to the heater, building damage, or loss of livestock.

This heater has two high limit switches. One is located near the heat chamber face, while the other is located on the fan housing at the opposite end of the heater. The high limit switches should be tested a minimum of once per year when the heater is given a thorough cleaning.

1. Disconnect the heater from its electrical supply.
2. The high limit switches have different temperature ratings. To eliminate confusion, remove and test only one high limit switch at a time.
3. Holding the switch by one of its mounting legs or electrical terminals, apply a small flame only to the sensing portion on the back of the switch. **Be careful not to melt the plastic housing of the switch when conducting this test.**

4. Within a minute, you should hear a "pop" coming from the switch, which indicates the contacts of the switch have opened. Check for lack of electrical continuity across the switch terminals to verify contacts have opened.
5. Allow the switch cool down for about a minute before firmly pressing the red reset button on the switch.
6. Check for electrical continuity across the switch terminals to make sure the contacts have closed.
7. Reinstall the switch back into the heater. Reconnect the heater to its electrical supply. Start the heater and check for proper operation.

**FIG. 15**



# Troubleshooting Guide

## READ THIS ENTIRE SECTION BEFORE BEGINNING TO TROUBLESHOOT PROBLEMS.



### 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.

The troubleshooting flow charts on the following pages provide systematic procedures for isolating equipment problems. The charts are intended for use by a QUALIFIED GAS HEATER SERVICE PERSON. **DO NOT 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.
- **Microamp Diagnostic Kit** - (PSI Part No. 120-08507)  
When used with a standard digital multimeter, this kit allows testing of the flame sensor on direct ignition systems.
- **Low Pressure Gauge** - (PSI Part No. 550-00764) for checking inlet and outlet pressures of the gas control valve against dataplate rating.

### INITIAL PREPARATION

- Visually inspect equipment for apparent damage.
- Check all hoses for abrasion and wear. Replace any that are suspect.
- Make sure heater is properly installed and meets minimum clearances to nearest combustible materials. (Refer to dataplate on heater.)
- Check all wiring for loose connections and worn insulation.

Refer to the system operation sequence in this section to gain an understanding as to how the equipment operates during a call for heat. Understanding the operation sequence of the ignition module and related components is essential as it will relate directly to problem solving provided by the flow charts.

The ignition control module is self-diagnostic. The red light on the module will flash a specific pattern depending upon the problem which is diagnosed. To effectively use the flow charts, you must first identify what the problem is by the flashing pattern of the L.E.D. (light emitting diode) diagnostic light. If the light is flashing, the flash pattern will be followed by a pause and then a repeat of the flash pattern until the problem is corrected. Refer to the tables below to identify what page to refer to when troubleshooting any problems.

The L.E.D. will only be on when the selector switch is positioned to "Heat" and the thermostat is set above room temperature. The L.E.D. will not be on when the selector switch is positioned to "Vent".

### Heating Mode Problems

#### Page

L.E.D. Diagnostic light not on during a call for heat ...20

L.E.D. diagnostic light flashing:

A. Rapid Flash	...21
B. Long Flash (2 seconds on - 2 seconds off)	...21
C. One Time	...21
D. Two Times	...22
E. Three Times	...23
F. Four Times	...24
G. Five Times	...24
H. Six Times	...24

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

**DIRECT IGNITION OPERATION SEQUENCE:****(Heating Mode)**

- Line Voltage is Sent to Transformer
- 24 V.A.C. is sent from Transformer to the Thermostat
- A call for Heat Occurs
- 24 V.A.C. is sent from Thermostat to Ignition Control Module
- Red Light on Ignition Module Begins to Glow
- Ignition Control Module Performs an Internal Safe Start Check
  - Internal Components are Tested
  - Voltage is sent to Flame Sensor from Control Module to Start Flame Proving Process
  - Air Flow Circuit is Checked
- Ignition Control Module Begins Safety Lockout Timing
- Ignition Control Module Starts Fan Motor for Prepurge
  - Air Flow Switch is Checked for Proper Operation
  - Module Stops the Fan Motor
- Ignition Control Module Powers the Igniter
- Ignition Control Module Restarts the Fan Motor (after igniter warm-up)
  - Air Flow Switch Closes
  - Gas Control Valve Opens
- Ignition Occurs
  - Igniter stays "Powered-up" for 6 seconds after Ignition
  - Flame Proving occurs (in 6 seconds)
  - Igniter Shuts Off
  - Gas Valve Stays Open
- Room Warms to Desired Temperature
  - Thermostat is Satisfied
  - Heater Shuts Down
- Process Starts Again on Call for Heat

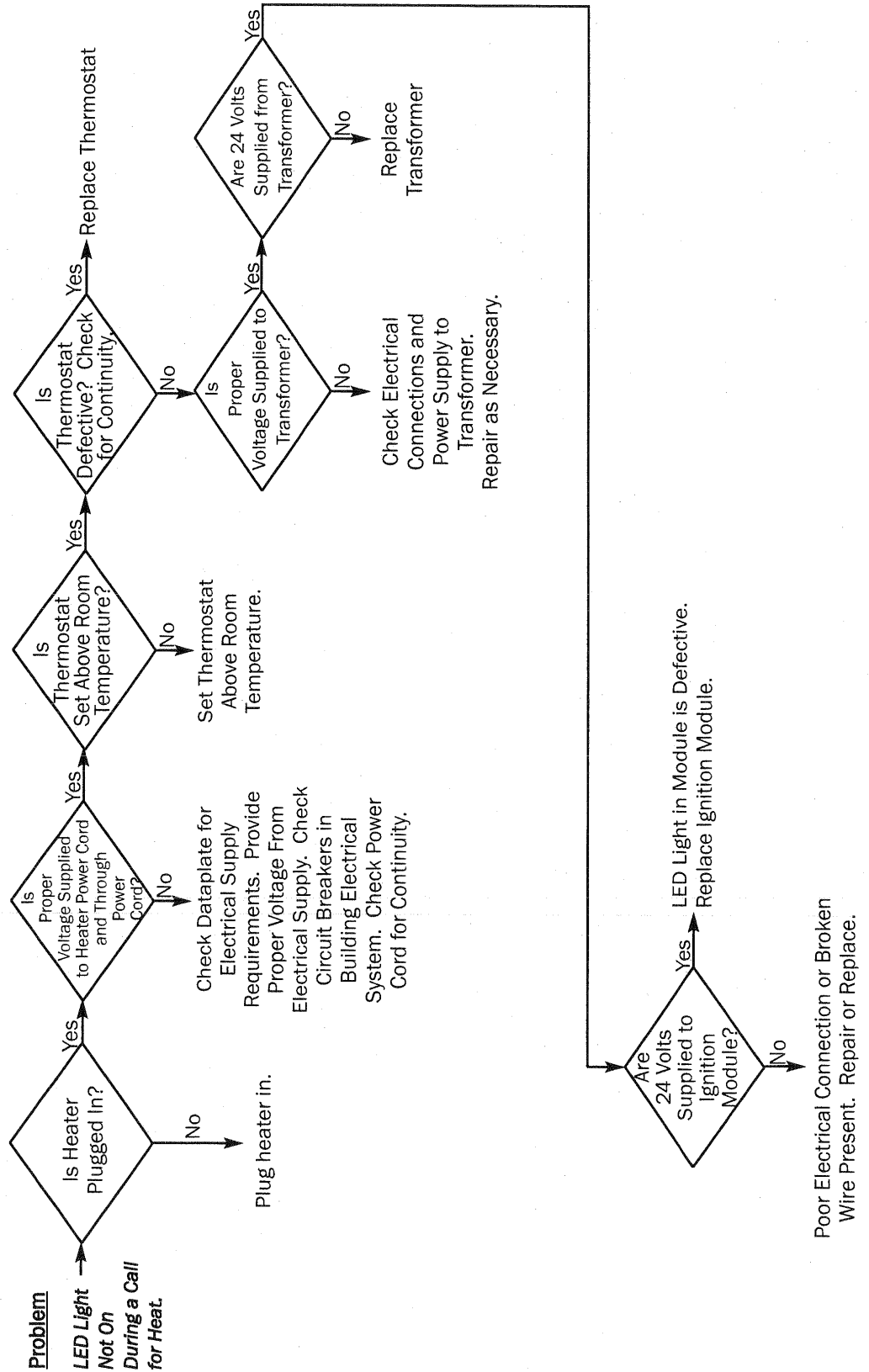
**MULTIPLE IGNITION TRIAL SEQUENCE:**

- First Trial for Ignition Takes Approximately 30 Seconds
- Two More Trials for Ignition will Occur
  - Second Trial Follows Immediately if First Trial Fails
  - Module Starts a 15 Minute "Wait" Period to Allow Ignition Interruption to Pass
  - Third and Final Trial Occurs After 15 Minute Wait Period
- If Ignition Control Module Does Not Prove Flame After Third Trial, the Module Goes into Safety Lockout (3 Flash Pattern)
  - Igniter Shuts Down
  - Fan Motor Stops
  - Gas Valve Closes
- To Manually Reset the Ignition System
  - Unplug the Heater and Plug it back in

— OR —

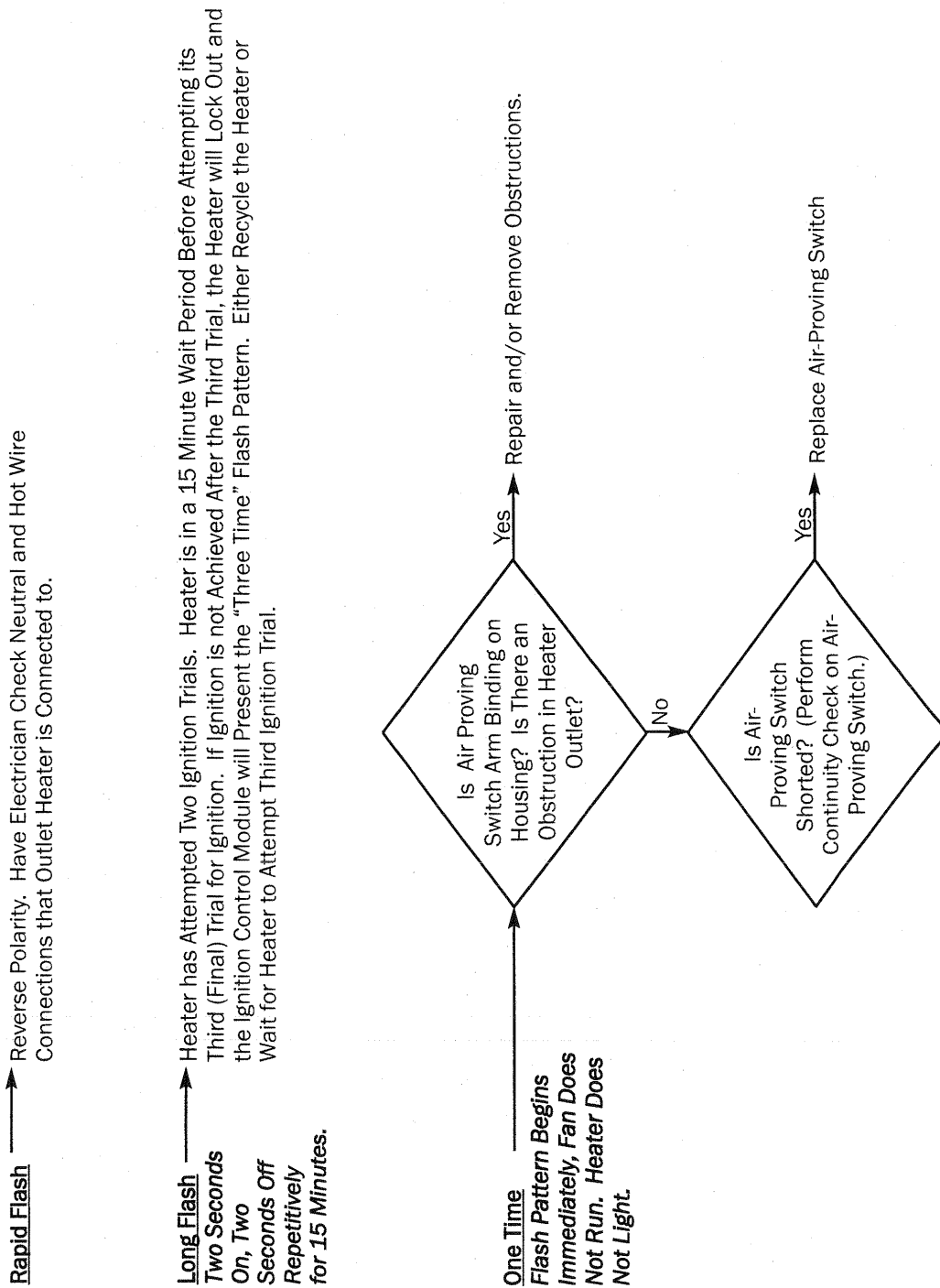
Turn Thermostat to "Off" or "No Heat" and Then Back to Above Room Temperature

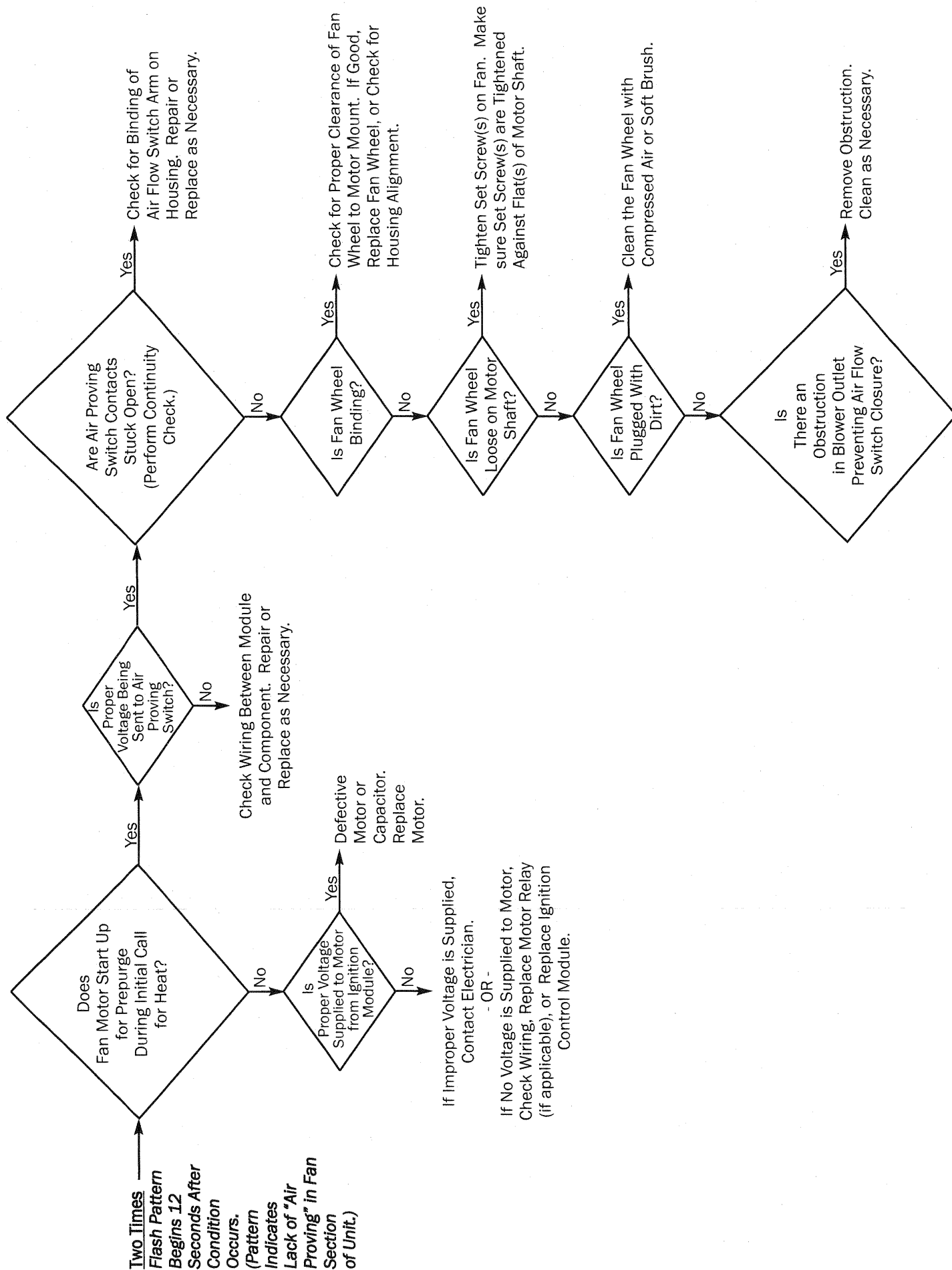
LED Constant On → Normal Operation



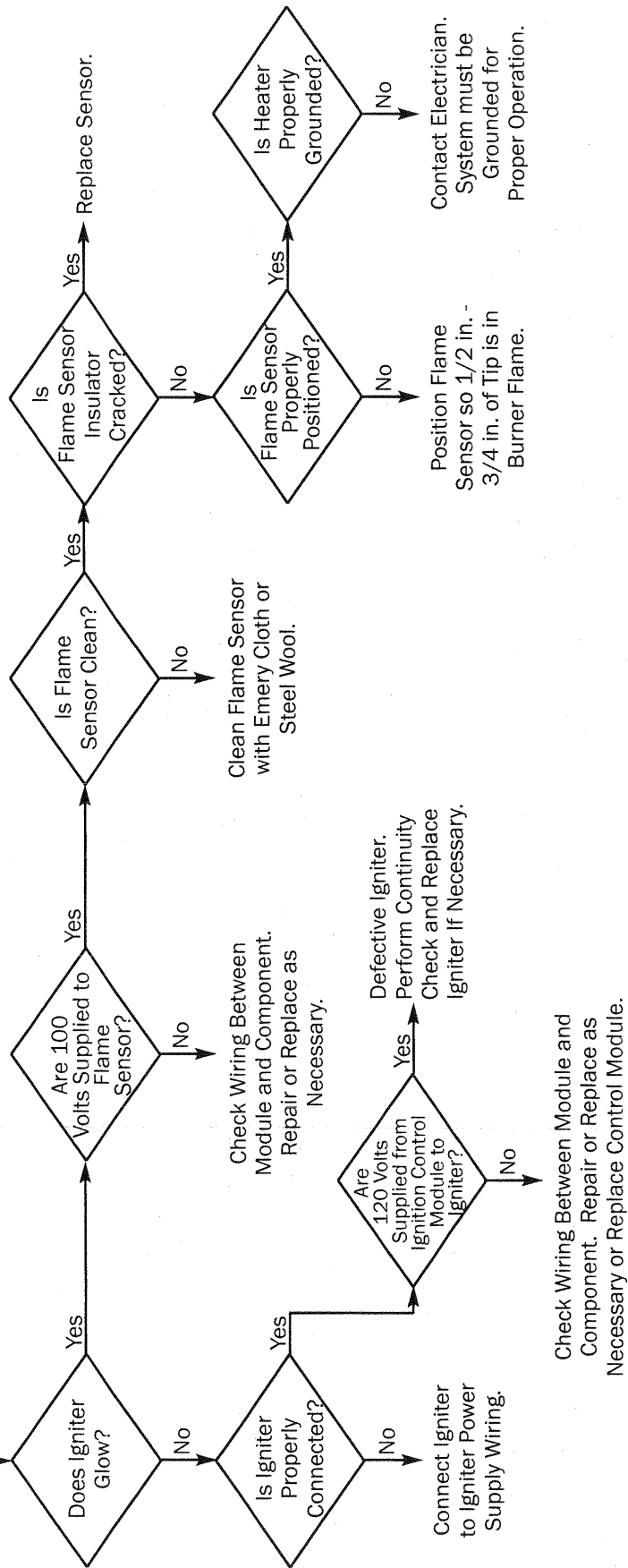
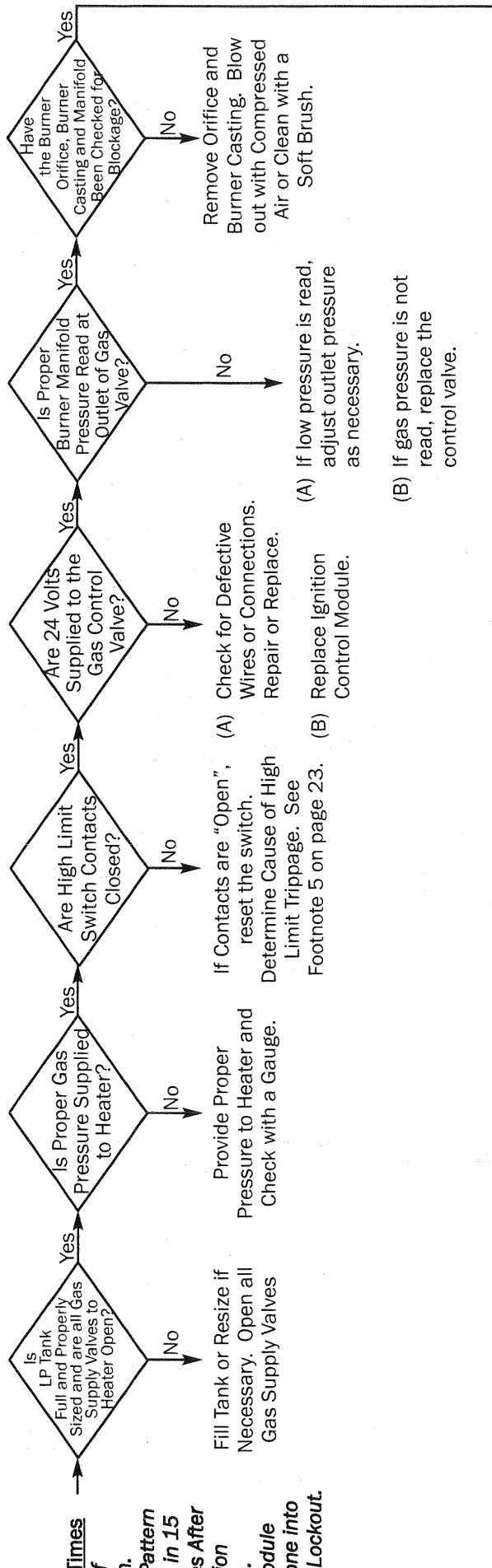
# Problem

## LED Flashing





**Three Times  
Lack of  
Ignition.  
Flash Pattern  
Begins in 15  
Minutes After  
Condition  
Occurs.  
The Module  
Has Gone into  
Safety Lockout.**





**Four Times** —————→ If HSI board does not reset, then replace the board. (Internal board fault.)  
if HSI board resets, then have qualified electrician check power source for  
power quality problems. (Frequency, line noise, line spikes, loose  
connections, too small wire gauge.)

**Five Times** —————→ See flame sensor related problems in  
*Rapid* three time flash pattern.  
*On/Off*

*Cycling of  
the Burner.*

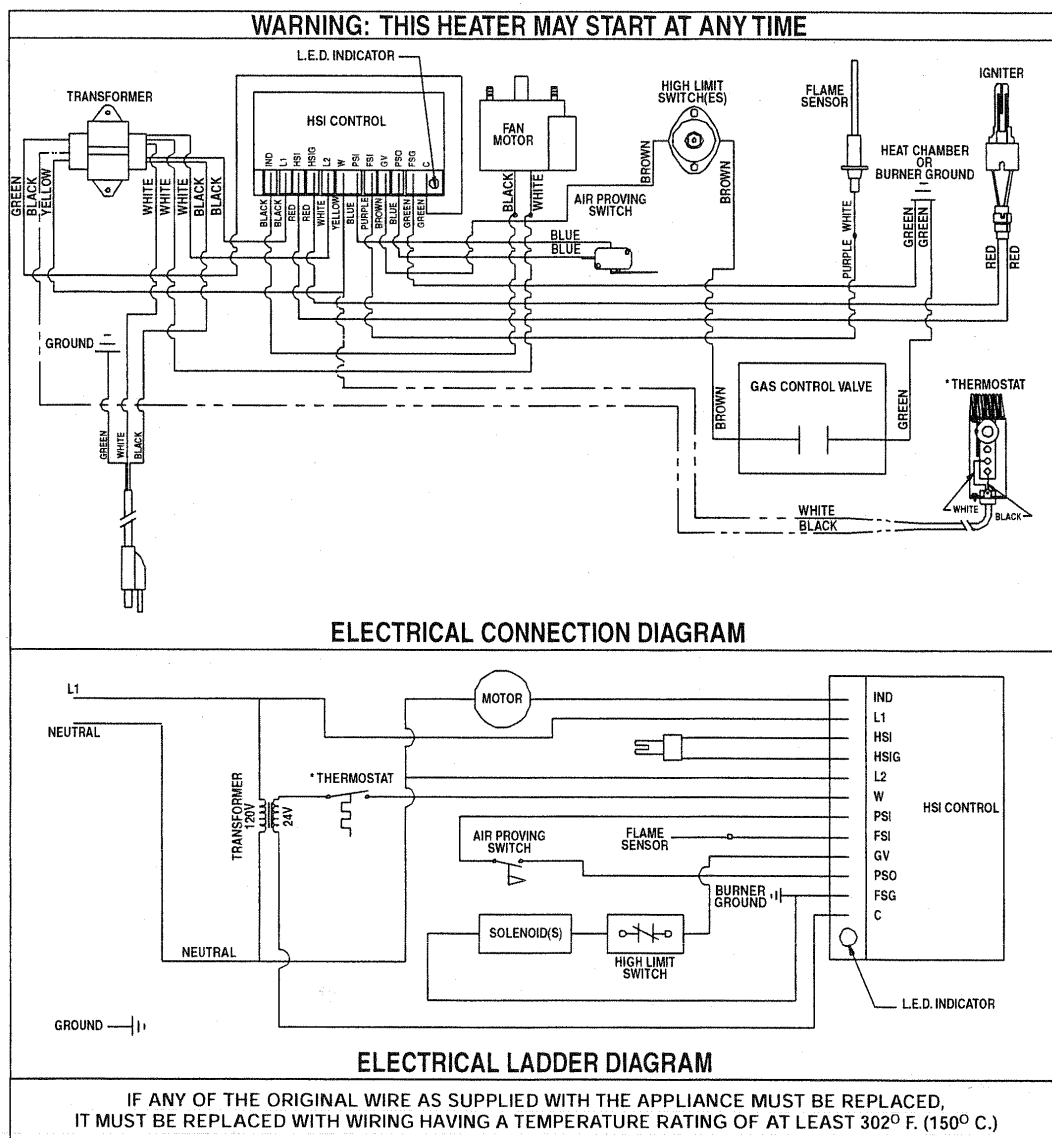
**Six Times** —————→ Low microamp output from flame sensor. With a six time flash  
pattern, the heater will continue to operate as normal. This  
flash pattern means that flame sense is low and that flame  
failure or improper operation can occur at any time. see flame  
sensor related problems in three time flash pattern.

- (1) With any electrical problem, all wiring should be checked for good connections and proper voltage and repaired if a problem is found.
- (2) **IMPORTANT:** Remember, the ignition control board sends and receives voltages throughout the entire operation sequence. The ignition control board terminals should also be checked for delivering proper voltages, in addition to the individual components as indicated by the respective flash pattern, to make sure the board itself is working properly.
- (3) In order to verify the diagnosis of the flashing LED or to reset the unit and retry ignition, disconnect the unit from power and then reconnect to power or if your heater uses a thermostat, turn down thermostat below room temperature and then turn thermostat above room temperature. When testing is completed, reset thermostat to desired temperature.
- (4) The high-limit switch will open or "trip" for a variety of reasons, such as high gas pressure, low voltage, excessive dust and dirt build-up within the heater, dirty fan assembly, fan is not tightened onto motor shaft, and obstructions in air inlets or discharge outlet of heater.

# Electrical Connection and Ladder Diagram

## CAUTION

Always refer to the heater's electrical connection diagram when servicing to avoid wiring errors and heater malfunction. Check for proper operation after servicing.



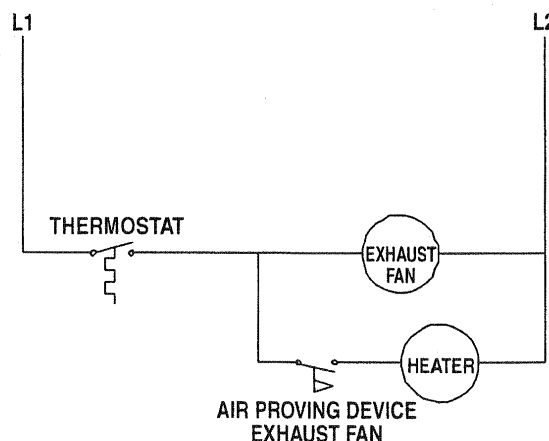
## MECHANICAL VENTILATION INTERLOCK WIRING

For Canadian Installations

### Agricultural Building Heaters:

Installation of the heater requires mechanical ventilation of not less than 3 CFM per 1,000 BTU input of the heater. The mechanical ventilation shall be interlocked with the heater to prevent operation of the heater unless the ventilation air flow is proven by an air flow proving device.

The exhaust fan CFM output must equal or exceed the ventilation air to support the combustion requirement stated in the Heater Specification table for the specific model being used.



## **Heater Component Function**

### **Air Proving Switch**

Safety device used to insure that the proper air flow is being achieved before the gas valve is opened.

### **Burner**

Cast iron component used to channel gas and provide an area at which the fuel may ignite.

### **Burner Orifice**

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

### **Fan Housing**

Chamber used for compressing air for efficient air movement.

### **Fan Wheel**

Component used in conjunction with the motor and fan housing to pull the hot air from heater and blow it into room for heating (also known as a "squirrel cage").

### **Gas Control Valve**

Houses electrical solenoids which are energized by voltage and therefore open allowing gas to pass through to burner for ignition. The gas control valve will close, shutting off the flow of fuel gas in the event burner flame goes out.

### **Gas Hose**

Flexible connector used to convey gas from supply line in building to heater.

### **Heat Chamber**

Metal "fire box" within the appliance that provides an area where burner flame mixes with combustion air thereby providing heat.

### **High Limit Switch**

Safety device wired into the control system which is used to break an electrical circuit to the gas control valve in event of overheat situation.

### **Hot Surface Ignition Control Board**

Electronic printed circuit board which sends and receives voltages to various controls in an automatic hot surface ignition system. An important safety feature of the control board is that it will shut down the entire heater, thereby stopping the flow of fuel gas if burner flame goes out.

### **Igniter**

Ignition device used on automatic ignition control systems. Ignites gas by surface temperature rather than by spark or flame.

### **Motor**

Electric device used to force preheated air through the heater and to circulate heat within a certain area. Converts electrical energy into mechanical energy.

### **Regulator**

The heart of any gas supply installation. Used to deliver a working pressure to the appliance under varying conditions in tank pressure.

### **Sensor**

Device used in conjunction with the ignition control board to insure that the burner flame exists during a call for heat.

### **Thermostat**

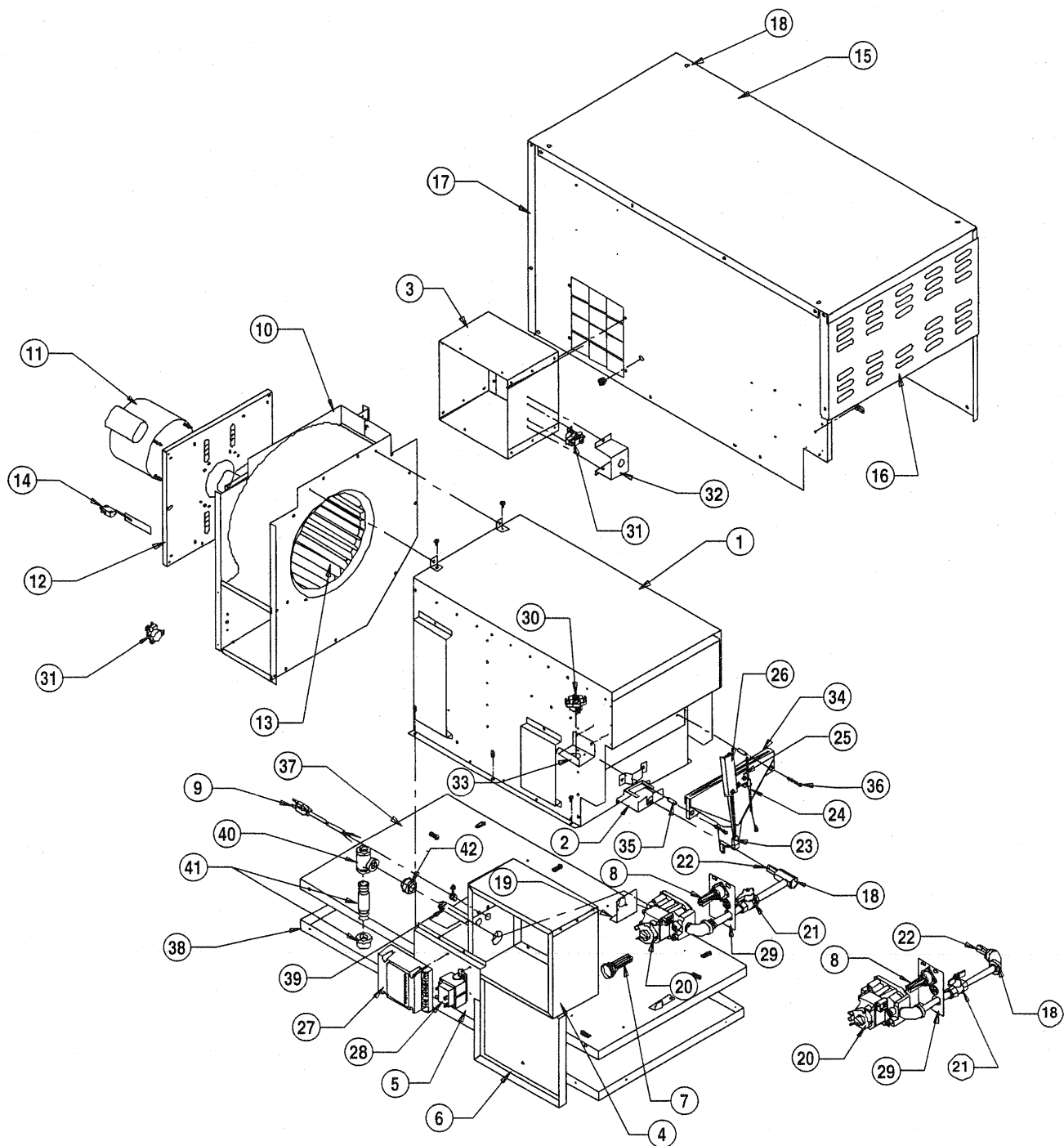
Electrical device used as an automatic "on/off" switch which will respond to changes in temperature in a certain area. Can be wired so contacts in the thermostat open or close on temperature increase or decrease.

### **Transformer**

Electrical control used to take higher incoming voltage and reduce it to lower outgoing voltage to operate certain control systems.

# Parts Identification

## PARTS SCHEMATIC



# PARTS LIST

Item	Description	Model			
		40	60	150	225
1	Heat Chamber Assembly				
	Stainless Steel	F400-80267	F400-80267	F400-80265	F400-81043
	Galvannealed Steel	F400-80268	F400-80268	F400-80266	F400-81042
2	Bracket, Burner Mount	F220-80251	F220-80251	F220-80404	F220-80404
3	Duct Assembly				
	Stainless Steel	F400-80285	F400-80285	—	F400-80322
	Galvanized Steel	F400-80286	F400-80286	—	F400-80323
4	Control Box Assembly				
	Stainless Steel		F400-81364		
	Galvanized Steel		F400-81365		
5	Bracket, Control Mounting		F240-80444		
6	Gasket		F130-80456		
7	Harness, Wiring, Female		F120-80680		
8	Harness, Wiring, Male		F120-80681		
9	Cord, Power		F120-80679		
10	Housing, Fan Assembly				
	Stainless Steel	F400-80668	F400-80666	F400-80647	F400-80531
	Galvannealed Steel	F400-80733	F400-80719	F400-80708	F400-80530
11	Motor	120-20290	120-20290	120-20554	120-20169
12	Bracket, Motor Mount	F240-80298	F240-80298	F240-80294	F240-80294
13	Blower Wheel	130-02808	130-02808	F130-83053	130-02684
14	Air Proving Switch		F400-80324		
15	Case Assembly				
	Stainless Steel	F400-81330	F400-81330	F400-81310	F400-81318
	Galvanized Steel	F400-81331	F400-81331	F400-81309	F400-81317
16	Panel, Burner End Case	F240-81323	F240-81323	F240-81307	F240-81247
17	Panel, Motor End Case	F240-81324	F240-81324	F240-81308	F240-81246
19	Bracket, Gas Valve Inlet			F240-80443	
20	Valve, Gas Control				
	Propane		F550-81243		
	Natural Gas		F550-81244		
21	Valve, Throttle				
	Propane	F410-81333	F410-81342	F410-81371	F410-81362
	Natural Gas	F410-81336	410-09722	F410-81372	F410-81363
22	Orifice, Burner				
	Propane	F310-81332	F310-81341	F310-81369	F310-81062
	Natural Gas	F310-81335	F310-81344	F310-81370	F310-81149
23	Igniter		550-09201		
24	Sensor, Flame		120-09626		
25	Bracket, Igniter	F260-80363	F260-80363	F260-80553	F260-80553
26	Shield, Igniter		240-09167		
27	Control, Ignition		120-09298		
28	Transformer		F120-81218		
29	Plate	F240-81366	F240-81366	F240-81373	F240-81155
30	Switch, High Limit (located on heat chamber)	120-05566	120-05566	F120-84144	F120-84144
31	Switch, High Limit (located near blower)		F120-84144		
32	Cover, High Limit Switch	—	—	—	F240-85957
33	Bracket, High Limit Switch		F240-86327		
34	Burner Casting	F320-80015	F320-80015	F320-80038	F320-80038
35	Spacer		130-02687		
36	Burner Mount Screw		130-02688		
37	Base Top	F240-80662	F240-80662	F240-80653	F240-80445
38	Base Bottom	F240-84677	F240-84677	F240-84684	F240-80446
39	Nipple, Gas Valve Inlet		130-05357		
40	Tee		130-02971		
41	Sediment Trap Kit		F400-80299		
42	Grommet		F130-85875		
43	Latch Kit, Control Box (not illustrated)		F500-80762		

NOTE 1: High Limit, Part No. 120-05566 is 350° F., High Limit Part Number F120-84144 is 300° F.

## WIRE SELECTION TABLE

Description	Color	Length	Model			
			40	60	150	225
Wire, Terminal "L1" on Control Module to Wire Nut and From Wire Nut to Transformer	Black	6 3/4 in.		F120-80683		
Wire, High Limit Switch to High Limit Switch	Brown	36 1/2 in.	—	—	—	F120-80682
Wire, High Limit Switch to High Limit Switch	Brown	60 in.	—	—	F120-80685	—
Wire, High Limit Switch to High Limit Switch	Brown	46 in.	F120-80686	F120-80686	—	—
Wire, Terminal "C" on Control Module to Transformer	Green	7 1/2 in.		F120-80565		
Wire, Wire Nut to Transformer and Terminal "L2" on Control Module to Wire Nut	White	6 3/4 in.		F120-80684		
Wire, Terminal "W" on Ignition Control Module to Transformer	Yellow	8 in.		F120-80564		

## FASTENER SELECTION TABLE

Description	Application	Part Number
Bolt, Eye	Hanging of Heater	130-07715
Chain	Hanging of Heater	130-07716
Nut	Sensor Mounting	F130-86169
Screw	Igniter Mounting	130-07240
Screw	Sensor Mounting	F130-86168
Screw	All Other Applications	F130-83065

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## Warranty Policy

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### HEATER

PSI Heating Systems warrants that the component parts of its heater 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 heater. If, **within 12 months from the date of purchase by the end user**, any component is found to be defective, PSI will at its option, repair or replace the defective part or heater, with a new part or heater, F.O.B., Onalaska, Wisconsin.

A warranty card on file at PSI 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 PSI.

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### PARTS

PSI Heating Systems warrants that replacement parts purchased from the company and used on the appropriate PSI heater 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 PSI, 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. PSI will not be liable for any incidental or consequential damages directly or indirectly related to the sale, handling or use of the heater, and in any event PSI's liability in connection with the heater, including for claims based on negligence or strict liability, is limited to the purchase price.

Some regions do not allow limitations on how long an implied warranty lasts, so the above limitation may not apply to you. Some regions 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.

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## Replacement Parts and Service

Contact your local PSI dealer for replacement parts and service or call PSI at 800-562-2966 for assistance. Be

sure that you have your heater model number when calling.

