



MONITOR™

M441 Heating System Owner's Guide

IMPORTANT : READ THIS OWNER'S GUIDE CAREFULLY AND THOROUGHLY BEFORE INSTALLING OR USING YOUR HEATER.


RETAIN THIS OWNER'S GUIDE FOR FUTURE REFERENCE.



SAFETY ALERT SYMBOL

These symbols appear as important safety precautions and should be understood and followed by the owner to assure safe operation of the heater.

For Quick Reference

	Page
SECTION A:  Important Caution	1
SECTION B: Specifications	5
Special Features	5
Safety Features	5
SECTION C: Tools Needed for Heater Installation	6
Accessories You May Need	7
Window Installation	7
Flue Pipe Extensions	8
SECTION D: Heater Installation	9
Flue Pipe Clearances	10
SECTION E: Fueling	15
Fueling Options Available	15
External Tank Installation	15
Empty Fuel Tank	16
SECTION F: Starting Instructions	17
SECTION G: Adjusting Room Temperature	18
SECTION H: Turning Off the Heater	18
SECTION I: Relighting the Heater	18
SECTION J: Programming the Heater	19
Setting the Clock	19
Programming for Automatic Heater Operation	20
Manual Operation	20
SECTION K: Protective Features	21
Loss of Power-Automatic Reset	21
Electrical Fuse	21
Overheat Prevention	21
SECTION L: Care of the Heater	22
SECTION M: Troubleshooting Guide	24

SECTION A

IMPORTANT CAUTION

WARNING

USE ONLY CRYSTAL CLEAR KEROSENE. NEVER USE GASOLINE, WHITE GAS, CAMP FUEL OR OTHER FLAMMABLE LIQUIDS. USE OF SUCH FUELS CAN RESULT IN AN EXPLOSIVE FIRE AND CAUSE SEVERE INJURY.



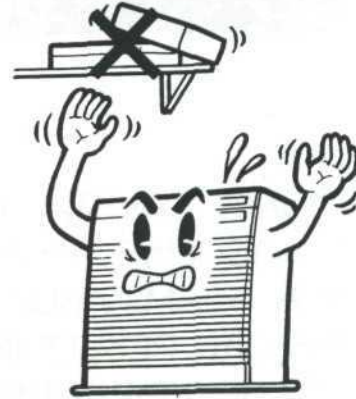
CAUTION

1. Make sure that there is no fuel leakage from fuel tank and fuel pipe joint.

2. Make sure that flue pipe (exhaust pipe, air supply hose) is connected properly.



3. Keep heater clean and do not store any flammable items on or near the heater.



4. Don't use the heater for drying clothes.



5. Should anything abnormal occur in the heater, remain calm, turn it off (do not unplug) and contact your Monitor dealer.

6. Risk of burns.
Flue pipe and louver may have high surface temperature.



7. Do not place yourself or others too close to the heater.

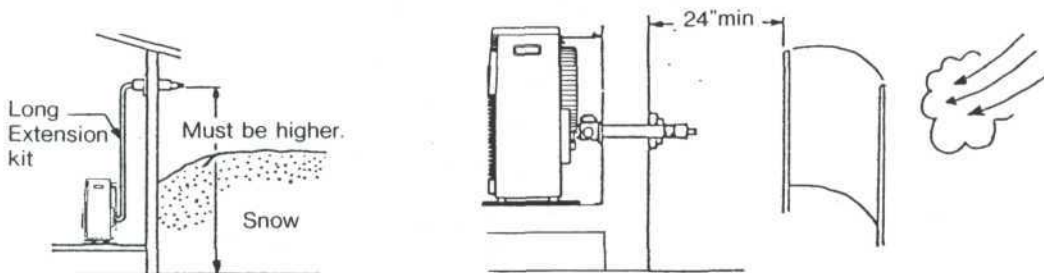
8. Installation of heater in extreme humidity or dust areas is not recommended.
Any removal of unit parts or remodeling is strictly forbidden.



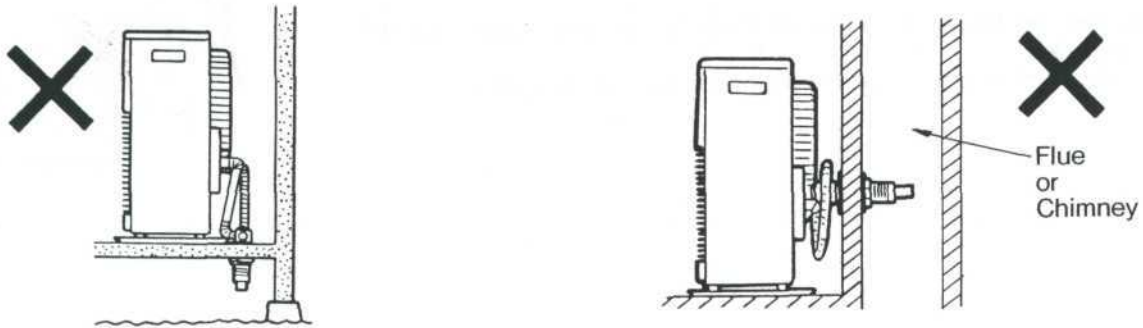
9. Do not sit on the heater.
Placing ornaments or plants on the heater is not recommended.
Excess heat may cause damage to ornament or plant and overwatering or spilling of water may cause shock to you or damage to the heater.



10. In areas of heavy snow accumulation, flue pipe may need to be installed higher to avoid being buried.
In open areas with strong wind, a wind break may be necessary to avoid exhaust gases being blown back into the intake and causing poor combustion.



11. Do not install nor exhaust the flue pipe into a crawl space or underneath floor nor into a flue or chimney.

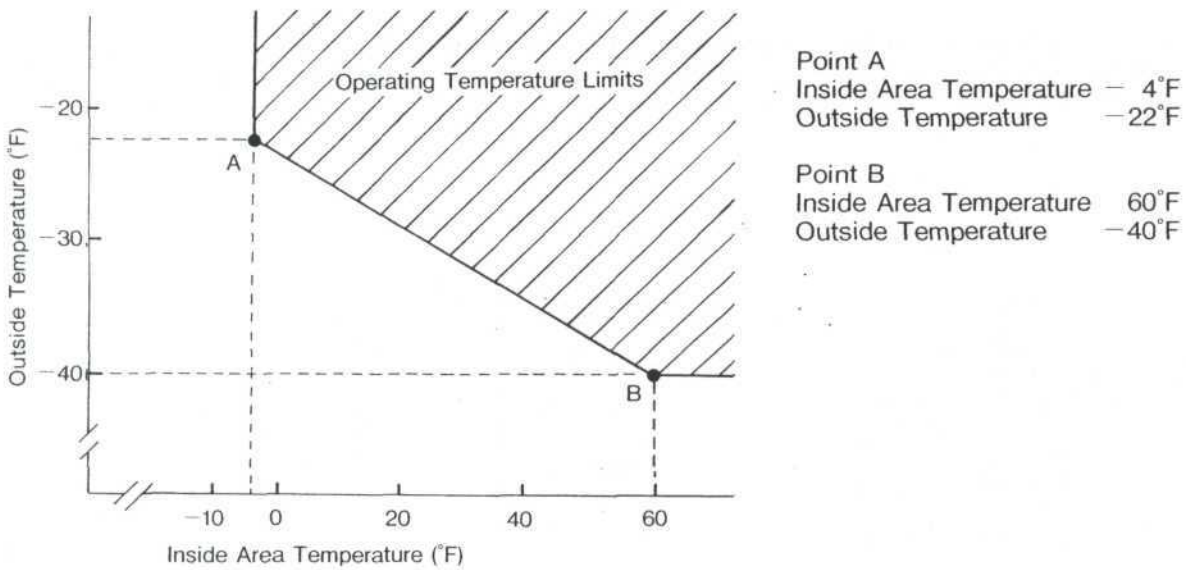


12. OPERATING ALTITUDES HIGHER LIMITS

This heater is designed to be used no higher than 3000FT. above sea level. Do not operate at altitudes higher than 3000FT. above sea level.

13. OPERATING TEMPERATURE LIMITS

Please use the Monitor within the range of temperatures indicated by the shaded area shown on the graph below.



SECTION B

SPECIFICATIONS

Model	Monitor 441
Fuel Type	Crystal Clear Kerosene
Heater Efficiency	93%*
Heat Rating	High: 43,000 BTU/hour H.Medium: 33,900 BTU/hour L.Medium: 21,000 BTU/hour Low: 16,200 BTU/hour
Heater Output	High: 40,000 BTU/hour H.Medium: 31,500 BTU/hour L.Medium: 19,500 BTU/hour Low: 15,000 BTU/hour
Fuel Tank	Separate (Not supplied with heater)
Fuel Consumption	High: 0.319 Gallon/hour H.Medium: 0.25 Gallon/hour L.Medium: 0.16 Gallon/hour Low: 0.12 Gallon/hour
Power Source	120 Volts AC; 60 Hz.
Power Consumption	Ignition: 340 Watts Operation: 80 Watts (Average)
Heated Air Delivery	High: 388 Cubic feet/minute H.Medium: 388 Cubic feet/minute L.Medium: 300 Cubic feet/minute Low: 300 Cubic feet/minute
Vent Pipe Hole	2½-inches Diameter
Dimensions	Height: 26.6 inches Width: 28.7 inches Depth: 13.8 inches
Weight	82 Pounds, empty

* When considering heat of condensation is lost, then net efficiency is 87%.

SPECIAL FEATURES

AUTOMATIC IGNITION

MEMORY BACK UP: Set memory can be kept in case of power failure for up to 5 minutes.

DUAL BLOWERS: Separate fans for combustion and room air circulation.

THERMOSTATICALLY CONTROLLED: Adjusts to the desired room temperature.

BUILT-IN TIMER: Heater will automatically operate as programmed by the user.

AUTOMATIC RESET AFTER POWER FAILURE: Heater will automatically resume operation after power is restored.

INDICATOR LIGHTS: Easy-to-see signals show when heater is in operation, when timer is activated, and when the burner is operating in low, medium or high modes.

CHOICE OF FUEL SUPPLY: Connect to separate tank.

MULTIPLE HEAT EXCHANGER: Extracts 87% of heat from burner.

CLEAN OPERATION: Products of combustion are vented outside.

CONSUMES NO ROOM AIR: Air for combustion is drawn from outside.

EASY INSTALLATION: Includes all parts required for standard installation.

SAFETY FEATURES

SAFE RE-LIGHTING: Heater will not restart until its combustion chamber has cooled.

ELECTRICAL PROTECTION: Heater automatically shuts off in the unlikely event of a malfunction in the electrical circuitry or disruption of the power supply.

NO EXHAUST IN ROOM: Products of combustion are discharged outdoors.

FLUE PIPE: Outside air is drawn through a pipe-within-a-pipe venting system. This process preheats combustion air and regains heat from exhaust gases.

⚠ CAUTION: ALTERNATE POWER SOURCES

The Monitor 441 may not operate when powered by sources such as an auxiliary generator, UPS (Uninterrupted Power Source), inverters, etc. Check with your dealer for guidance on specific applications.

SECTION C

Before installing your heater, be sure to check and comply with local and state building and electrical codes that may apply to vented heaters in your area. Permanent wiring must be installed by a licensed electrician.

TOOLS NEEDED FOR HEATER INSTALLATION

Check the following charts to be sure you have all the tools required to install your Monitor 441 Heating System.

STANDARD TOOLS	APPLICATION
Phillips Head Screwdriver	Installation of Heater Parts
Steel Tape Measure	Taking Measurements
Pen or Pencil	Marking Drilling Location
Exterior Caulk	Caulking Between Packing and Wall
Yardstick or Long Straight Edge	Checking Angle of Hole for Flue Pipe
Soapy Water	Lubricating Sleeve Hardware

SPECIAL TOOLS	APPLICATION
Electric Drill	Accommodating Hole Saw and Drill Bit
2½ inch Hole Saw Attachment	Cutting Hole for Flue Pipe
Long ¼ inch Drill Bit	Drilling Pilot Hole Through Wall
Level	Checking Angle of Hole for Flue Pipe and for checking heater level.

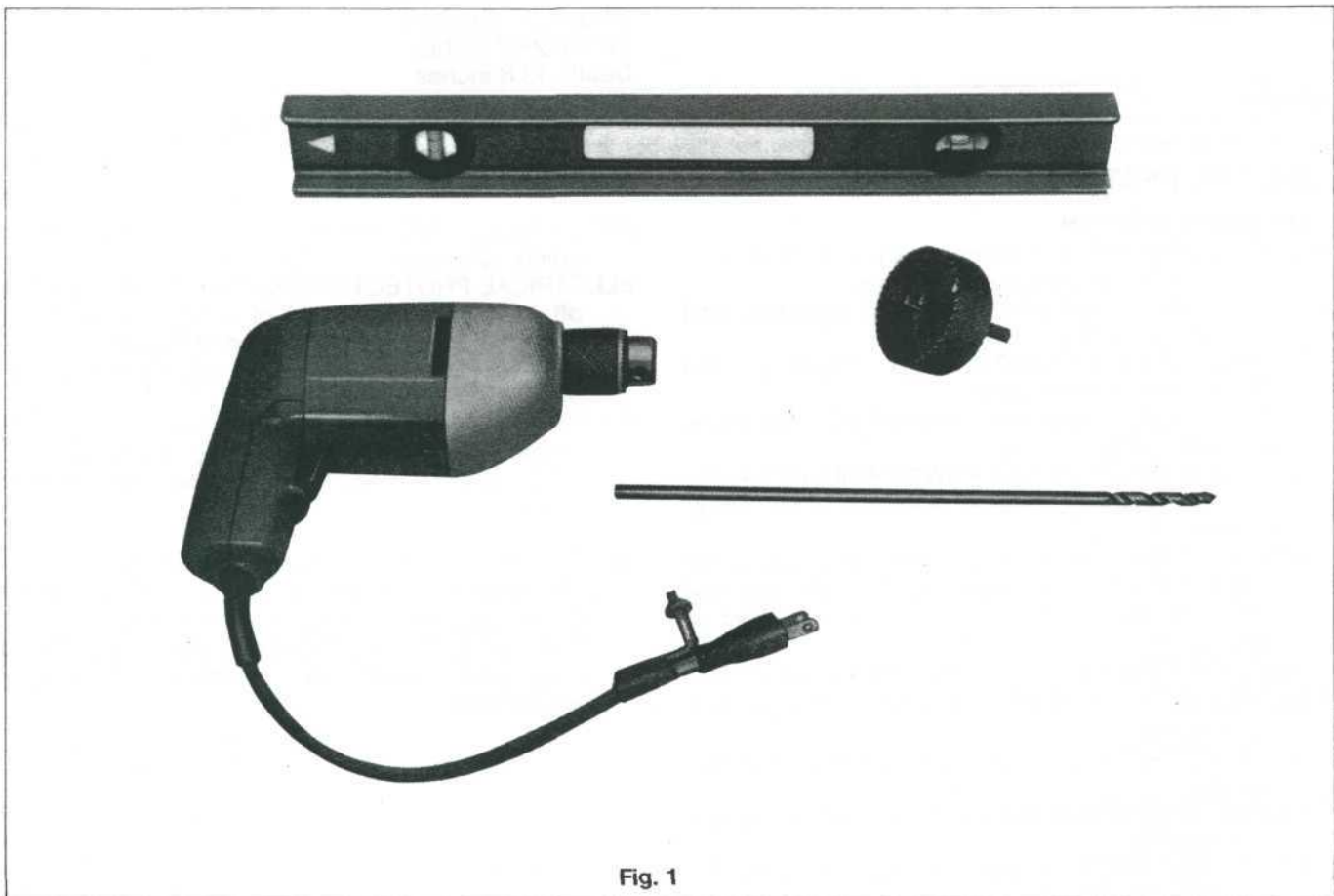


Fig. 1

ACCESSORIES YOU MAY NEED

Check the list below and see your MPI dealer for accessories you may need or want for installation of your heating system.

ACCESSORY		APPLICATION
Medium Flue Pipe	P/N 8206	For use where wall thickness is up to 14½ inches
Long Flue Pipe	P/N 8005	For use where wall thickness is up to 20 inches
Electric Lifter Pump	P/N 1101	For use with large capacity tank where gravity feed is not practical
Window Installation Kit (See Window Installation below)	P/N 8208, 8209, 8001	For use where "through-the window" flue pipe installation is desired
Extra Short, Short, Medium or Long Extension Kit or Elbow Adapter Kit (See Flue Pipe Extensions, page 8)		For use where "standard" installation is not practical
Fitting and Tank		For large capacity fueling: To be dealer installed

WINDOW INSTALLATION

The use of "through-the-window" installation for your flue pipe will require a window installation kit and one of the 4 (extra short, short, medium or long) extension kits.

In order to determine which extension kit is required, measure the distance from the floor to the TOP of your window sill (see Figure 2) and refer to the chart below.

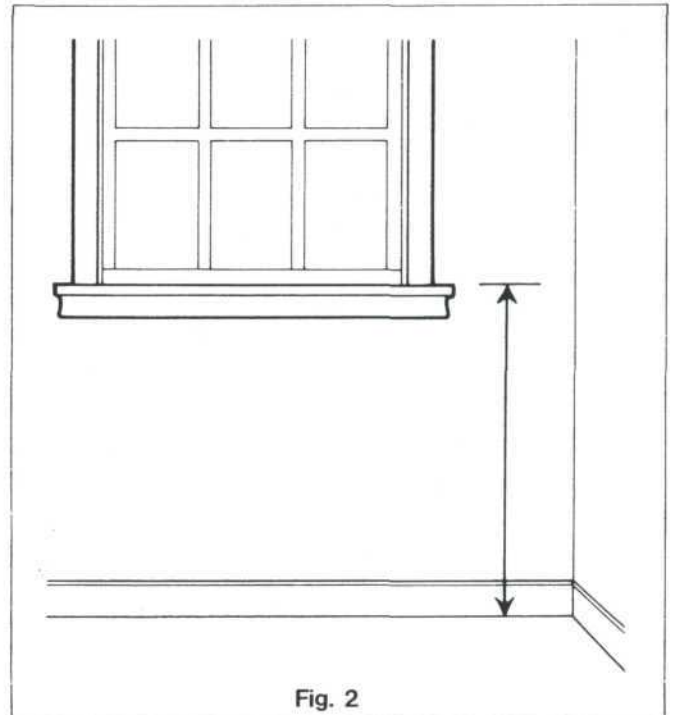


Fig. 2

IF THE MEASUREMENT IS:	YOU NEED
20⅔ to 25 inches	Extra Short Extension Kit P/N 8212
25 to 33⅙ inches	Short Extension Kit P/N 8204
33⅙ to 51⅓ inches	Medium Extension Kit P/N 8203
51⅓ to 86⅓ inches	Long Extension Kit P/N 8202
	Elbow Adapter Kit P/N 8213

NOTE: Window kit installation is prohibited when the window is required to meet the local building code requirements for ventilation, emergency escape, or rescue.

One or more Elbow Adapter Kit may be needed if heater is installed on inside wall.

FLUE PIPE EXTENSIONS

Four standard extension kits are available from your Monitor dealer. Most installations can be made with one of these kits. In special cases, custom installations may be required. These may be made with components purchased from your dealer.

In any installation the following limitations **MUST NOT BE EXCEEDED**:

1. The total length of either the intake or exhaust pipe should not exceed 10 feet with 3 elbows, 13 feet with 2 elbows, or 16 1/2 feet with 1 elbow.

2. These elbows should include the one used at the heater but not the one on the air supply hose nor the integral bends in the flue pipe. (See Figure 3)
3. The correct damper as shown on Page 13 must be used.

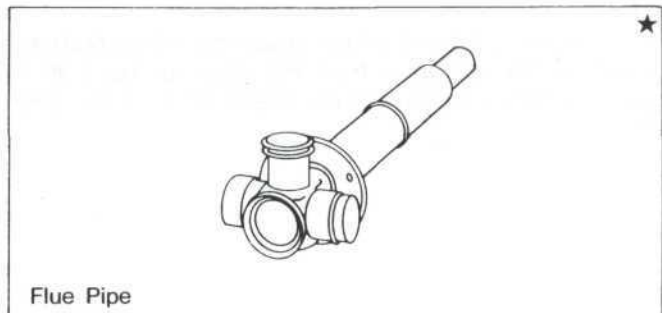
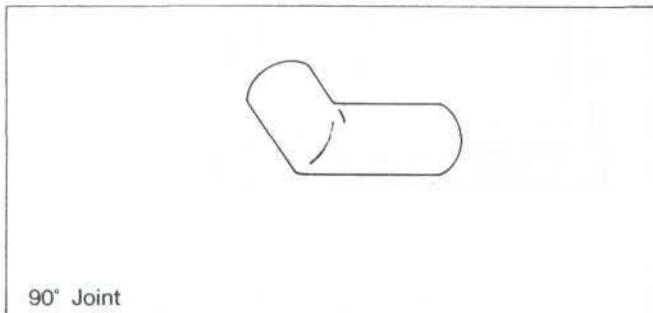
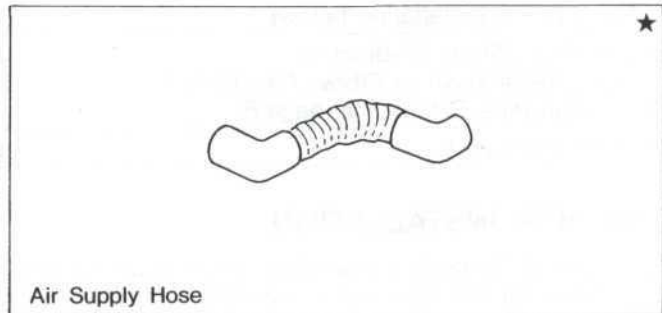
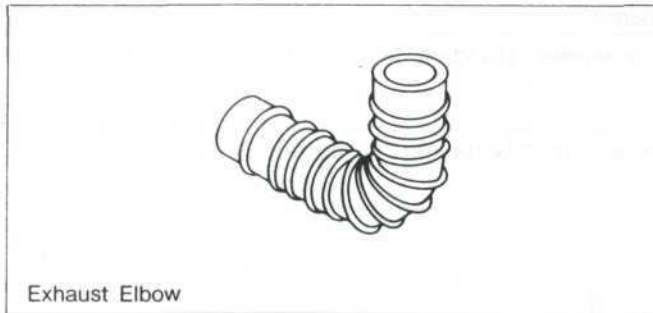


Fig. 3

★ Do not count

SECTION D

HEATER INSTALLATION

Step 1: Fill Out Owner Registration Card

Remove your owner registration card from the plastic envelope containing the owner's guide. It should be filled out and mailed as soon as possible.

Step 2: Check for Parts

Before discarding packing materials, be sure you have located the following:

- Flue Pipe
- Sleeve Nut
- Spill Tray
- Room Temp. Sensor (attached to the rear of the heater)
- Cardboard Template
- "STANDARD" Damper
- "EXTENSION" Damper
- Wall Clamps (2)
- Rubber Packing
- Joint Pipe
- Cloth Insulation Cover
- Outer Flange
- Pipe Holder
- Small Bag of Screws
 - Tapping, Type A - #8x $\frac{3}{4}$
 - Tapping, Type A - #8x $\frac{5}{16}$

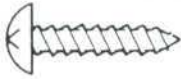
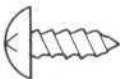
 <p>For securing sleeve and wall clamps</p>	 <p>For securing wall clamps</p>
SIZE	
#8x $\frac{3}{4}$ Tapping	#8x $\frac{5}{16}$ Tapping

Fig. 4

Step 3: Choose a Location for Your Heater

In choosing a location for your heater, the following guidelines must be considered:

- The heater MAY be installed on combustible floors.
- The area around the heater should be free of obstacles that might interfere with the free flow of air. Allow the clearances shown in Figure 5.

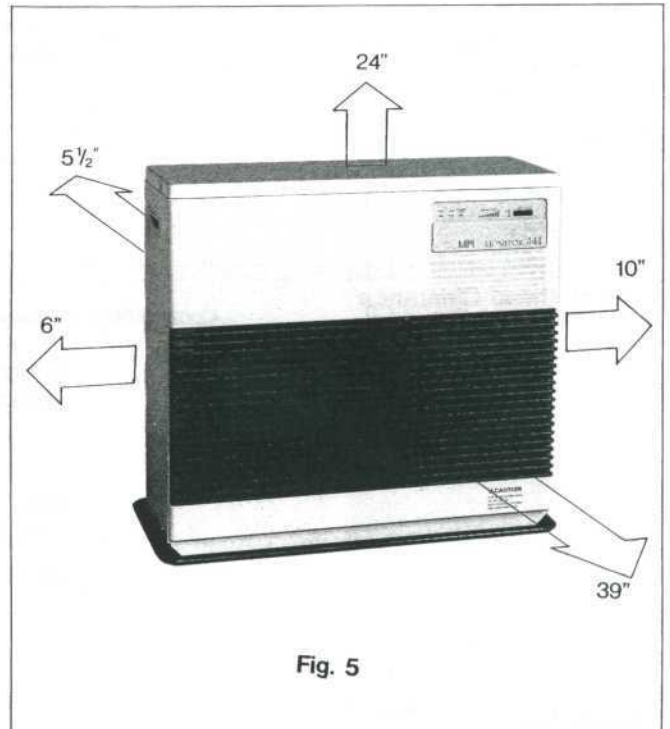


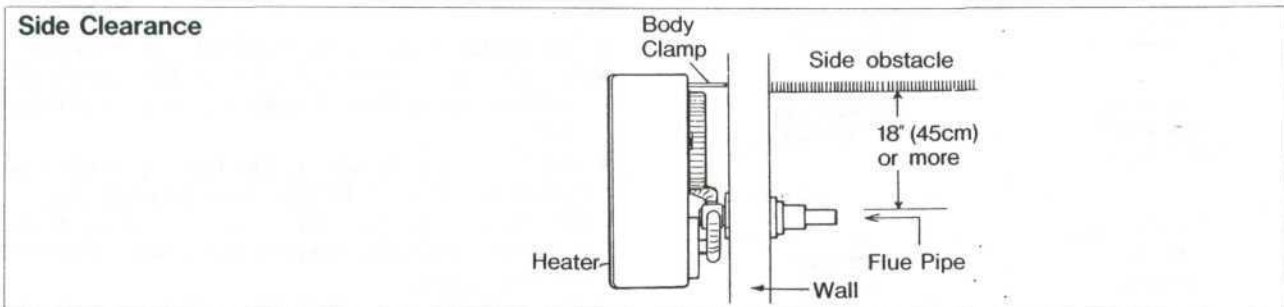
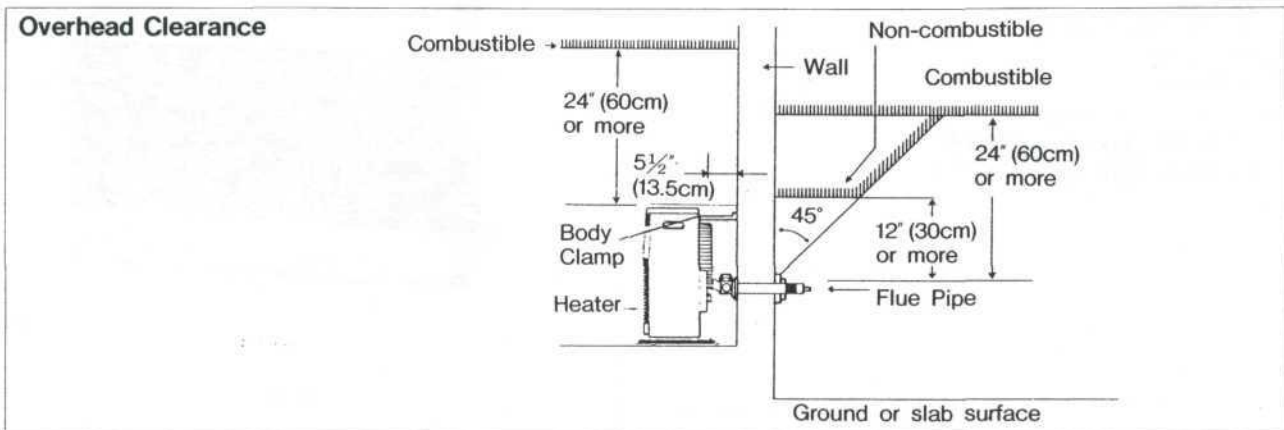
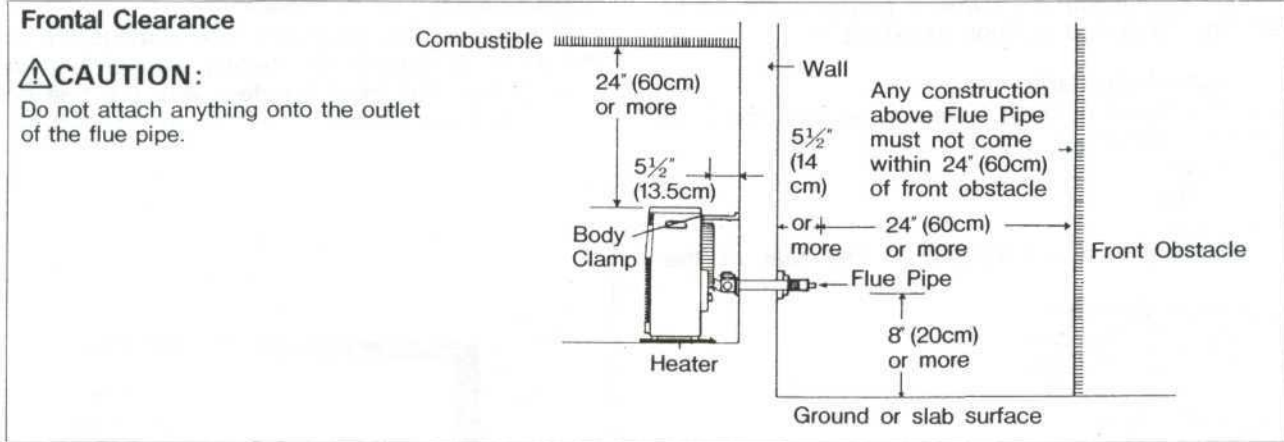
Fig. 5

- The heater must not be installed in a fireplace.
- An AC wall outlet must be within reach of the heater's power cord. Extension cords must not be used.
- The area outside where the flue pipe will emerge should be free of foliage, fuel storage tanks and flammable objects. Air should circulate freely in the area. Allow the clearances shown in Figure 6 on the next page.
- The wall where flue pipe hole will be cut should be free of plumbing pipes, electrical wires, studs, air ducts and other obstacles.

NOTE: Use the cardboard template provided with your heater for flue pipe location.

FLUE PIPE CLEARANCES

Flue pipe installations should provide for venting to an unconfined space through which there is a free flow of outdoor air. Clearances to adjacent walls or obstacles must comply with the requirements shown below.



IMPORTANT:

(1) In areas of heavy snow falls, ground surface clearance must be increased according to average snow falls, to prevent flue pipe from being buried.



(2) In open area with strong wind, a wind break may be necessary.

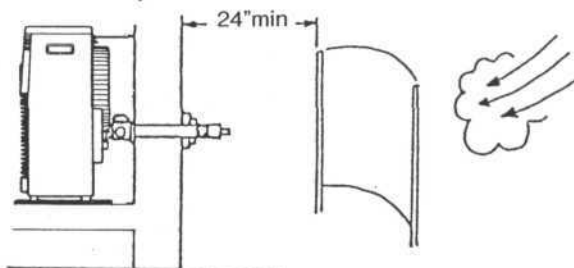


Fig. 6

Step 4: Drill a Pilot Hole

NOTE: The following directions apply to "standard" installation. For other methods, follow instructions included with accessory kits.

For walls up to 8½ inches thick, use a short flue pipe; for walls up to 14½ inches thick, use a medium flue pipe; and for walls up to 20 inches thick, use a long flue pipe.

Use the template to position the hole to be drilled. The "red dot" indicates the exact center of the hole. Using an electric drill and a long drill bit, make a pilot hole through the wall (Figure 7). Be sure the hole extends through the outside wall.

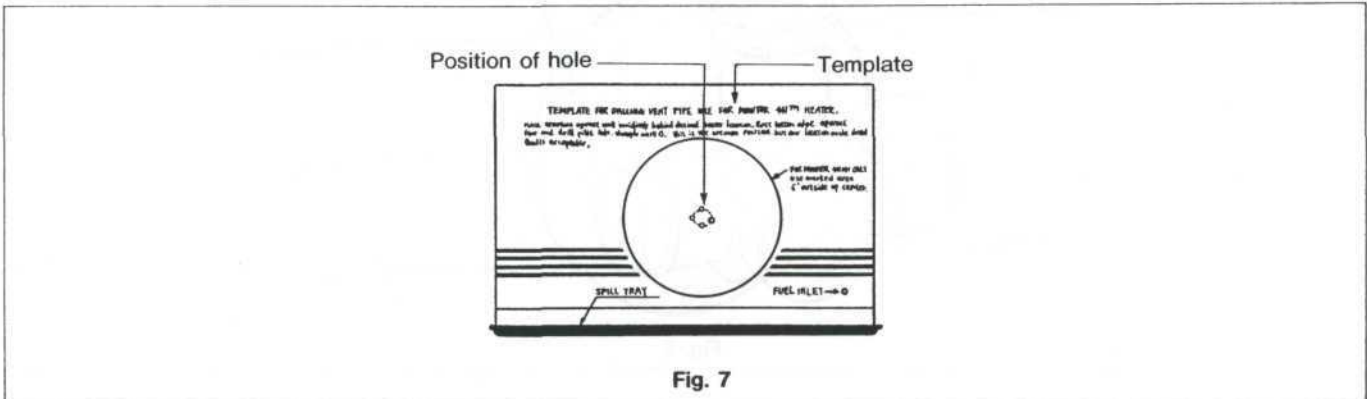


Fig. 7

CAUTION: The opening on the inside wall should be approximately ¼ inch higher than on the outside wall so the flue pipe will slope downward when installed. This will allow condensation to drain outdoors.

Step 5: Cut the Hole for the Flue pipe

Using a hole saw attachment and an electric drill, cut a 2½ inch diameter hole through the inner and outer walls (Figure 8).

After the hole is cut, use a straight edge and a level to be sure the inside opening is approximately ¼ inch higher than the outside opening.

NOTE: After cutting the inside wall, remove the insulation. Make sure there are no obstructions inside the wall, such as electrical wiring, water pipes, hot air ducts, etc.

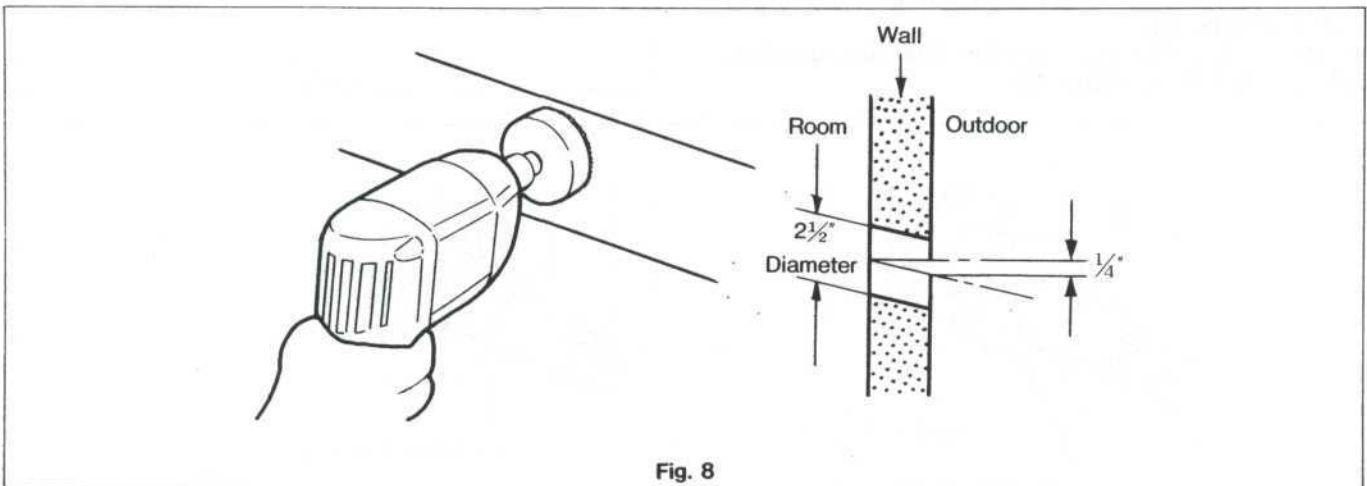


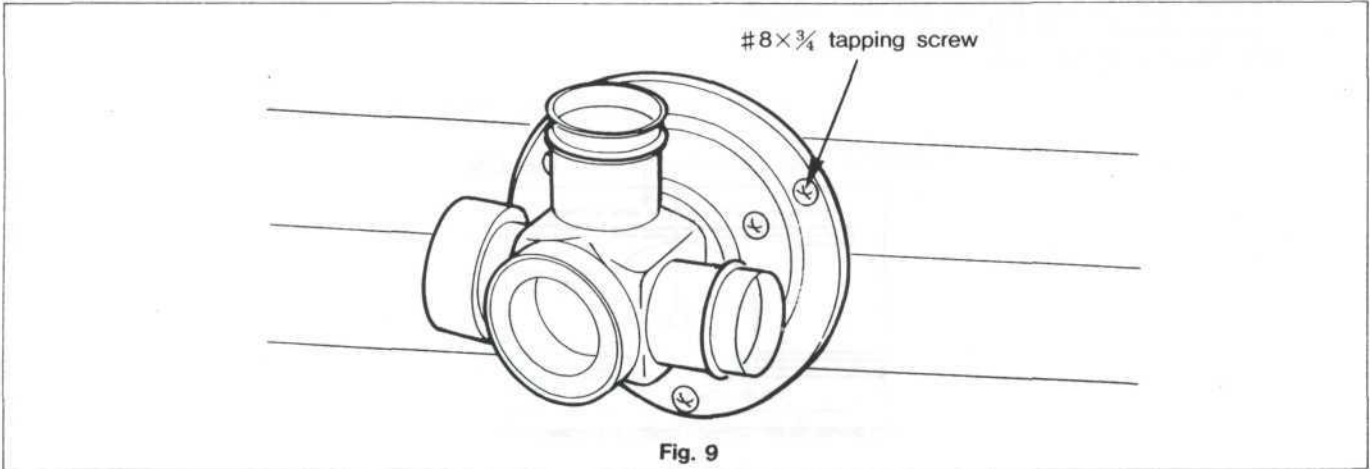
Fig. 8

Step 6: Install the Flue Pipe

From **INSIDE** the building, insert the flue pipe (with arrow pointing "up") into the hole. Fasten the flue pipe

with the 3 #8x $\frac{3}{4}$ tapping screws (Figure 9). (See Figure 4 for screw size and application.)

NOTE: Top center port is an extra exhaust port.

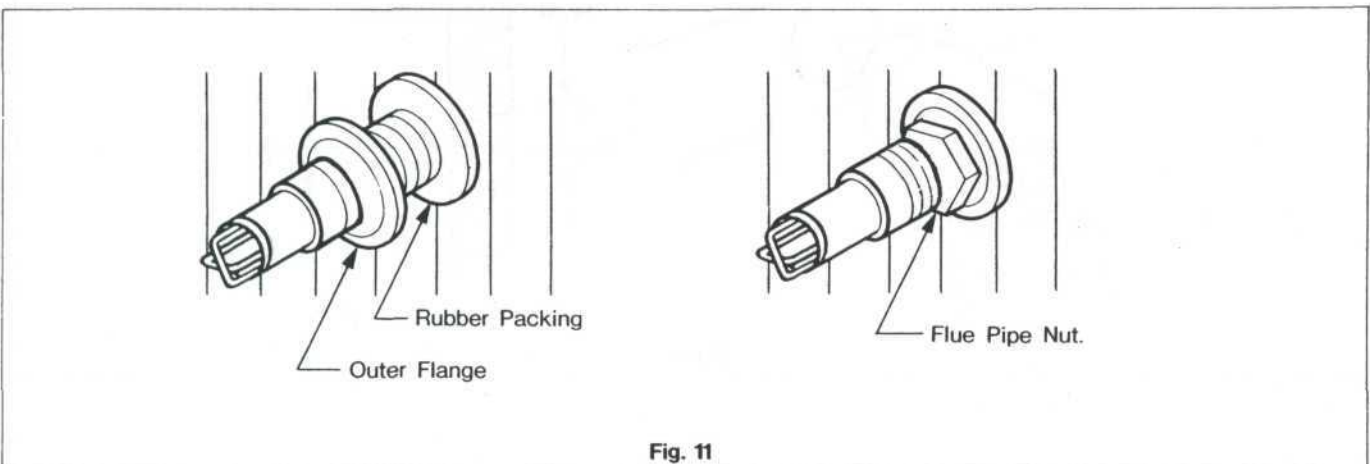
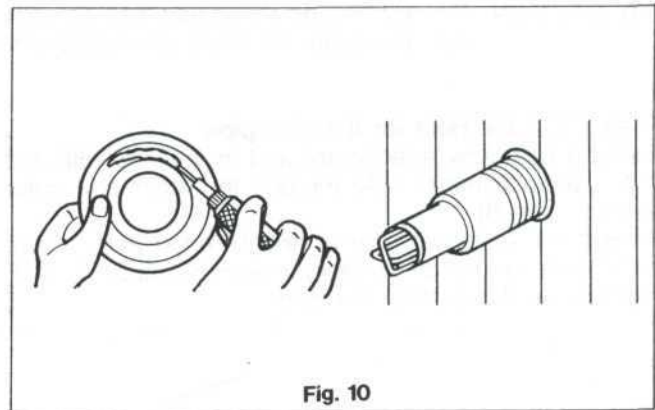


Step 7: Install the Outer Flange

Apply caulking material to the inside ridge of the rubber packing (Figure 10). Holding the "Up" mark to the top, slide the rubber packing onto the sleeve (caulk side to the wall).

NOTE: If it is difficult to slide the packing onto the sleeve, apply soapy water to the inside of the packing.

Once the rubber packing is in place, slide the outer flange onto the sleeve with the conical side pointing outward (Figure 11). Screw the flue pipe nut onto the flue pipe grooves, and tighten it firmly (Figure 11).



Step 8: Install the Spill Tray

Place the spill tray on the floor where you plan to locate your heater.

Remove the 2 sets of screws from the cabinet (Figure 12).

Position the heater on the spill tray so the legs of the cabinet fit into the circular indentations in the spill tray (Figure 12).

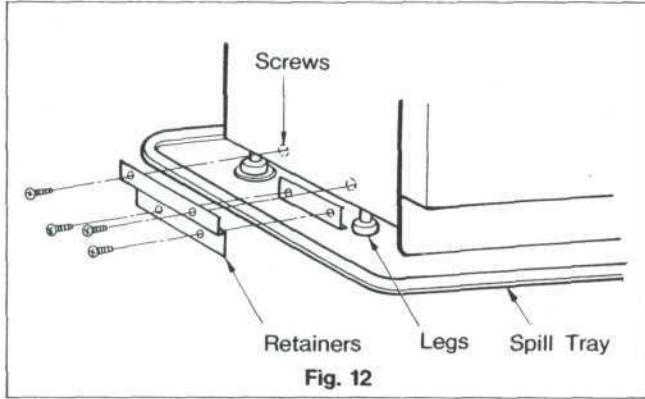


Fig. 12

Step 9: Level the cabinet

In order for heater to operate properly, it must be positioned on a level surface. Ensure proper leveling by adjusting each leg and by using a carpenter's level to check both side to side, and front to back level condition.

Attach and tighten both sets of retainers and screws.

Step 10: Install the Joint Pipe

At the rear of the heater, slide the large end opening of the joint pipe into the exhaust port outlet of the heater. Be sure the joint pipe is fully seated. Slide the fabric cover over the joint pipe (Figure 13).

The o-rings that seal the joint pipe may be dry and tight. A little soapy water will ease installation.

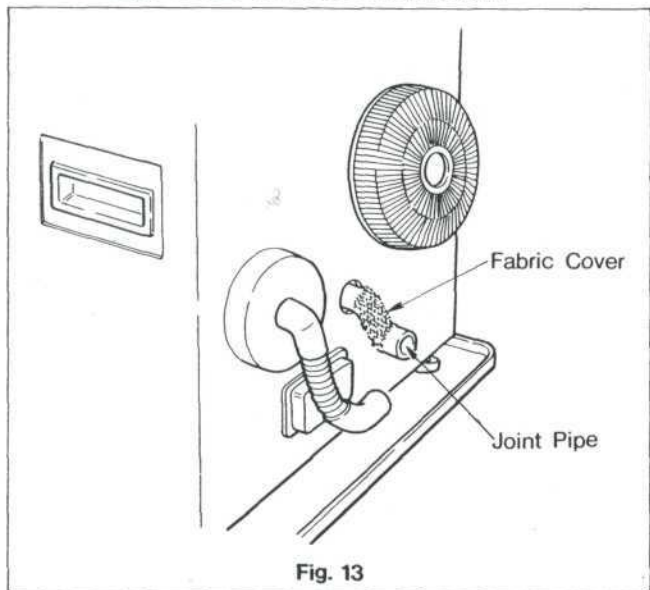


Fig. 13

Step 11: Connect the Heater to the Flue Pipe

Move the heater toward the wall, guiding the joint pipe into the center port of the flue pipe (Figure 14).

Be sure the joint pipe is completely inserted into the flue pipe.

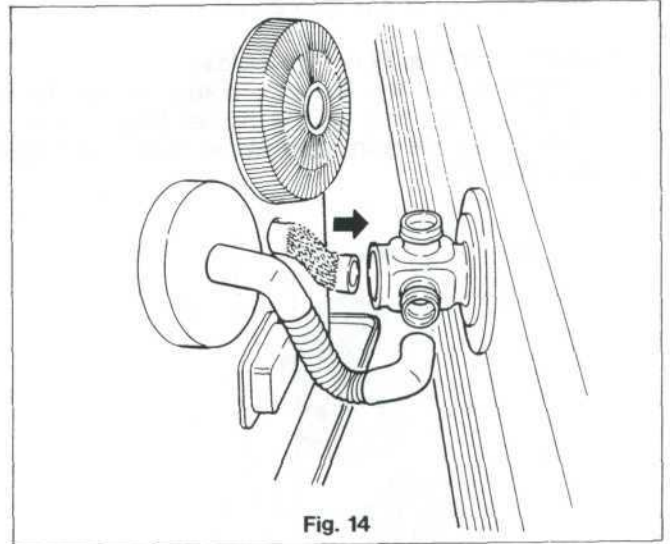


Fig. 14

Step 12: Install the Air Damper

If installation is standard (that is no extension kits are required), place the air damper marked with a "STANDARD" over the air intake flange on the flue pipe (Figure 15).

Place the hose band around the end of the air supply hose. Push the air supply hose onto the air intake flange and secure the hose with the hose band.

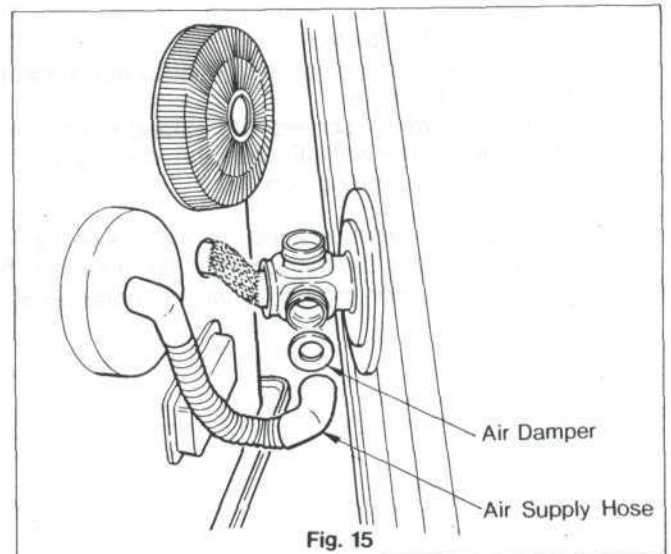


Fig. 15

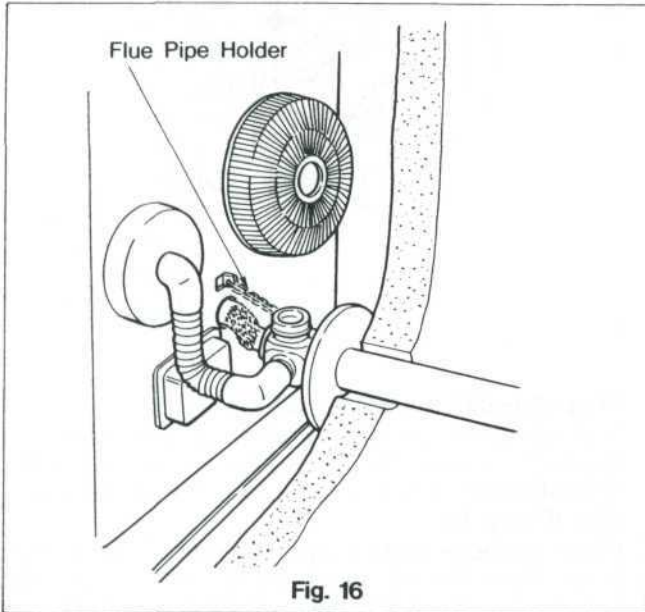
NOTE: Do not place intake hose onto metal capped exhaust port.

NOTE:

The "STANDARD" damper is to be used with extension kits up to a total overall length of 20 inches and a maximum of 3 bends (90° elbow).
The "EXTENSION" damper must be used when extension kit or kits exceed 20 inches.

Step 13: Install the Flue Pipe Holder

Place the ring of the flue pipe holder around the flue pipe. The other side of the holder hooks in a slot directly above the joint pipe at the rear of the heater (See Figure 16).



Step 14: Secure the Heater

Insert the narrow ends of the 2 wall clamps into sockets on the rear of the heater.
Loosen the adjustment screws and extend the clamps until they touch the wall. Fasten the clamps to the wall with 2 #8x³/₄ tapping screws.

NOTE: If use of wall clamps is not feasible or practical, the heater should be secured by screws to floor through punched holes in spill tray.

Step 15: Recheck the Heater

Before proceeding, check again to be sure there are no flammable materials close to the heater. Check to be sure the heater is level.
Examine the flue pipe to be sure connections are tight.

SECTION E

FUELING

⚠ WARNING: Use only crystal clear kerosene. Never use gasoline, white gas, camp fuel or other flammable liquids. Use of such Fuels can result in an explosive fire and cause severe injury.

FUELING OPTIONS AVAILABLE

Fueling of your Monitor 441 Heating System can be accomplished in one of 2 ways:

1. Gravity Fed Large Capacity External Tank:

Practical for large heating needs where bulk delivery of kerosene is available. This system should be installed by a qualified plumber or fuel supply technician.

2. Large Capacity External Tank with Pump:

For large heating needs where a gravity fed system is not practical. An electric lifter pump, especially designed for use with your Monitor 441 heating system, is available from your dealer.

When using a gravity fed tank or pumping system to supply fuel, the inlet pressure to the heater must not exceed 2.5 psi.

EXTERNAL TANK INSTALLATION- Gravity Fed

NOTE: External tank installations must comply with the National Fire Protection Association code NFPA 31 or locally applicable codes, such as the 1979 Uniform Mechanical Code No. 5-1, that are consistent with NFPA 31. Check with your local building official.

To install a large capacity, gravity fed external tank, follow the instructions below, and refer to Figure 17 for one possible installation. Use of a qualified installer is recommended.

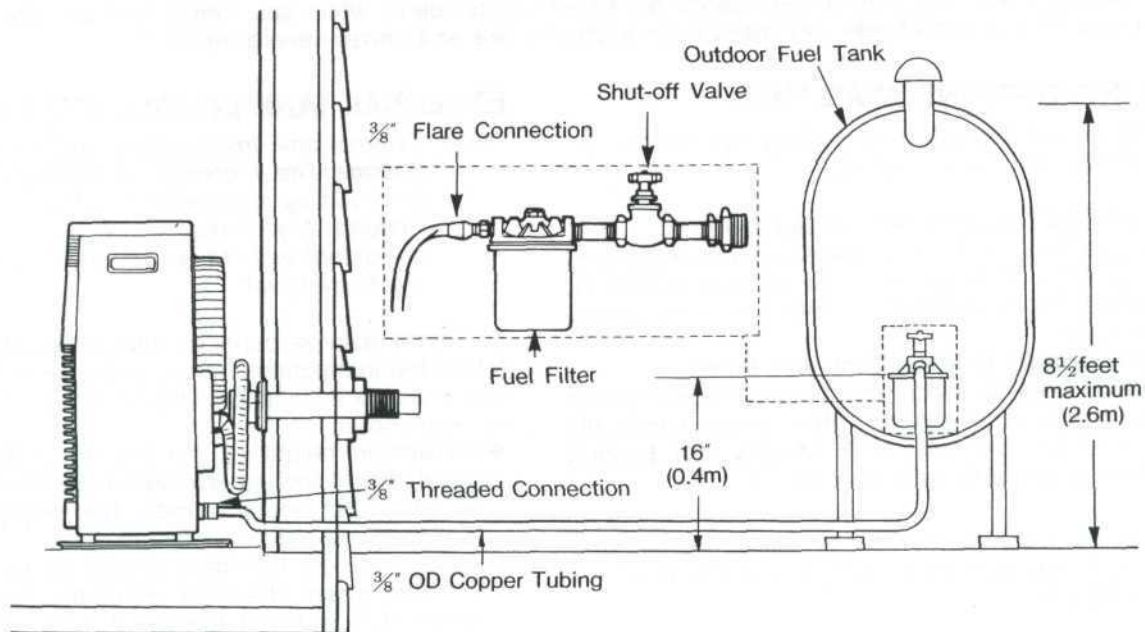
- Installation height of the bottom of the fuel tank should be 16 inches or more above the floor surface on which the heater stands. This ensures that inlet fuel pressure will be sufficient.
- The top of the fuel tank should be no higher than 8½ feet above the floor under the heater. Heights above 8½ feet will exceed the 2.5 psi inlet limit, and a pressure reducer will need to be installed at or near the unit.
- The horizontal length of piping should not exceed 100 feet and should be free of sharp bends or obstructions.
- Piping should include no inverse U-type bends (to avoid air locks, which could block the fuel supply).
- Only ¾ inch OD copper tubing should be used. The tubing should be bent carefully to avoid crimping.
- A fuel filter is recommended for use on the fuel line near the tank, and a shut-off valve should be installed at the tank.
- A flare adaptor can be used to make a flared tubing connection between the unit and the filter at the tank.
- The fuel tank should be located no closer than 3 feet to a source of heat.
- The fuel tank should have an opening for filling on the top and vent with a weather-proof cap on the side. On some tanks the vent and fill spout use the same opening.

When using a gravity fed tank to supply fuel, the inlet pressure to the heater must not exceed 2.5 psi.

The Monitor 441 comes equipped with a ⅜" pipe thread connection. A straight, or 90 degree pipe-to-flare fitting or a firomatic valve can be used for the fuel line connection. If a firomatic valve is being used:

Valve Position-Open/Close

Turn counterclockwise to open, clockwise to close. If threaded valve stem is sticking up about ¼", valve is open. If handle screws off stem, valve is closed.



NOTE: Fuel tank must be a minimum 3 feet away from flue pipe.

Fig. 17

EMPTY FUEL TANK

If at any time during the operation of your heater you find.

- Burner Status indicators are blinking.
- No heat.
- No flame.

You can assume you are out of fuel. Should this situation occur, take the following steps.

Step 1: Turn the Heater Off

Press the Operation Button to put it in the "Off" position.

Step 2: Refuel

Refill your fuel tank with kerosene.

Step 3: Turn the Heater On

Press the Operation Button to put it in the "On" position.

SECTION F

STARTING INSTRUCTIONS

Step 1: Plug in the Heater

Plug in the AC cord, and route it away from the area of the flue pipe. It is recommended that no other appliance share the same outlet.

Step 2: Prime the Heater

If using the heater for the first time, or if the heater has not been in operation for sometime, press the fuel set lever at the lower right hand side of the cabinet and release it slowly 2 or 3 times (Figure 18).

CAUTION: Do not continue pressing lever repeatedly as this may cause overfilling of constant level valve inside.

NOTE: After a power outage, there is a three-minute waiting period before the unit restarts, provided the ON/OFF switch is in the "ON" position.

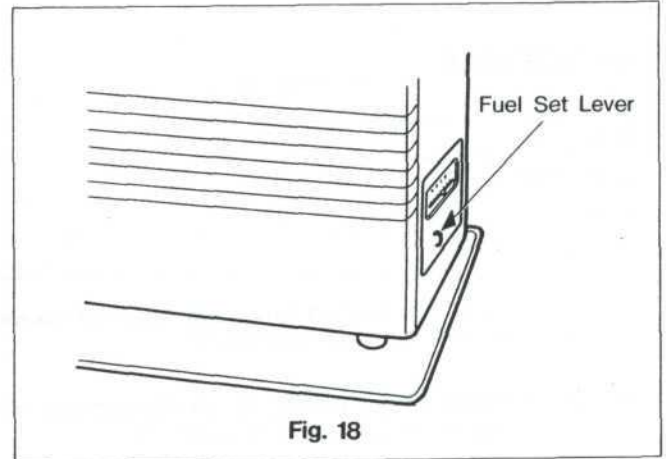


Fig. 18

Step 3: Set "ON" Button

Depress the operation button to put it in the "ON" position. The "Operation Lamp" lights indicating "Set Room Temperature" and "present room temperature". Burner status lamps will light and ignition will start after approximately three minutes. In 5 to 10 minutes the circulation fan will start to operate, and warm air will be felt coming through the cabinet grill.

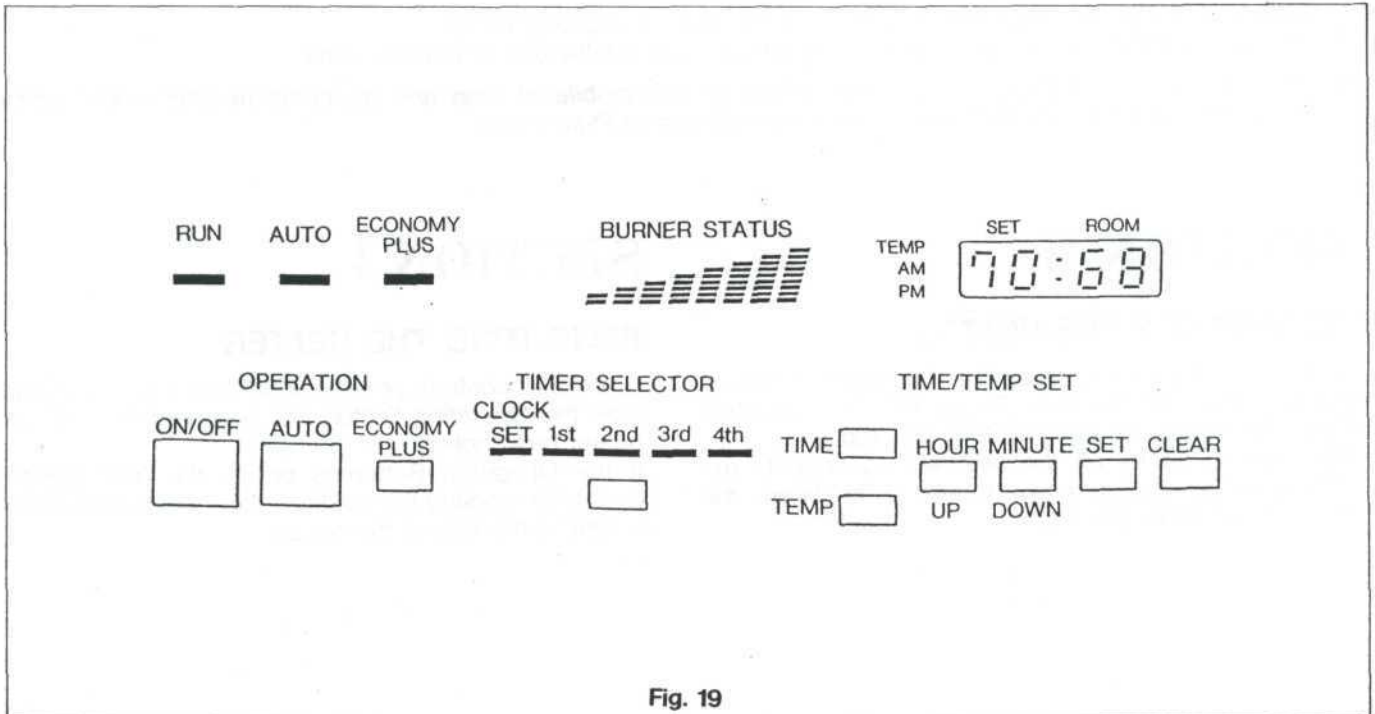


Fig. 19

SECTION G

ADJUSTING ROOM TEMPERATURE

Pressing either the "Up" or "Down" button will increase or decrease the set temperature by 2 degree increments. Once desired temperature is displayed, press set button to lock into memory.

The lights on the control panel will indicate the level of heater operation – low, medium or high. The heater

will automatically change its heat output until the desired room temperature is reached. While it cycles, you may hear the circulation fan change speed.

Depending on the output required to maintain the desired room temperature, the indicator lights will illuminate in the following pattern:

BURNER MODE	LIGHT PATTERN
High	8 indicators – On
H.Medium	6 indicators – On
L.Medium	4 indicators – On
Low	2 indicators – On
Off	*No lights on

* The heater will shut itself off temporarily when the desired room temperature has been reached and restart automatically when necessary to maintain room temperature.

NOTE: The heater may display room temperature 4 degrees above set temperature, depending on heater load conditions, before shutting itself off.

INSTRUCTIONS FOR ECONOMY PLUS MODE

To engage the economy plus mode, simply press down the button labeled "Economy Plus", to disengage press again.

NOTE: Operation switch must be "ON" and in manual mode.

This feature minimizes the "ON" and "OFF" cycling of the unit by allowing it to overshoot the set temperature by 12 degrees instead of the normal 4 degrees.

The advantages of this feature are to increase the overall efficiency of the unit by:

1. Decreasing electrical consumption by decreasing the frequency of ignition cycles.
2. Reducing heat loss during the prepurge and postpurge cycles.
3. Reducing inefficient combustion associated with start up and shut down.
4. Prolonging component life by decreasing expansion and contraction of internal parts.

NOTE: This feature could be compared to driving an automobile in stop and go traffic (regular mode) versus highway driving with cruise control engaged (Economy Plus mode).

SECTION H

TURNING OFF THE HEATER

To turn off the heater, press the Operation Button to put it in the "Off" position (Figure 19). The operation light will go out, and the fuel flow will stop.

After turning heater off the fans will continue to run until unit has cooled down to the point where the fans will automatically stop.

SECTION I

RELIGHTING THE HEATER

Automatic controls prevent your heater from relighting after the Operation Button has been set to "Off" until heater has cooled.

If the Operation Button is put in the "On" position during the cooling period, the heater will automatically relight at the end of the period.

SECTION J

PROGRAMMING THE HEATER

SETTING THE CLOCK

Step 1: Set the Timer Selector

Press the "Timer Selector" button, at which time the "Clock Set" Light will illuminate. The LED indicator in the Display Window will show 88:88 at this point.

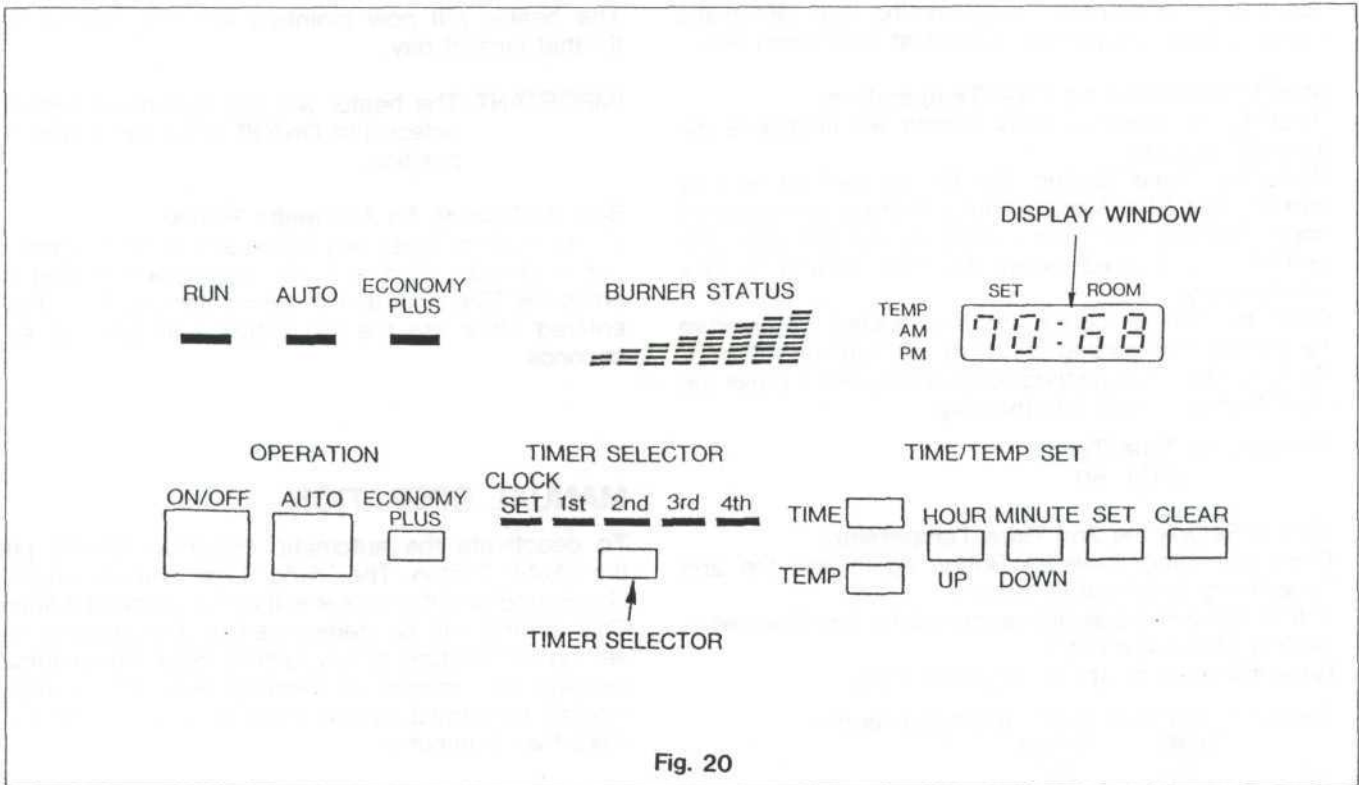


Fig. 20

Step 2: Set the Hour

Press the "Hour" Button until the correct hour (either A.M. or P.M.) appears in the window.

NOTE: The "Hour" and "Minute" Buttons can be pressed and held or pressed momentarily to change the time.

Step 3: Set the Minute

Press the "Minute" Button until the correct time appears in the window. Immediately press the "Set" Button.

NOTE: If the "Set" Button is not pressed within 1 minute after the time is set, the programming will be cancelled.

PROGRAMMING FOR AUTOMATIC HEATER OPERATION

The Monitor 441 Heating System is capable of providing up to 4 different temperature settings for 4 different times of the day. Not all 4 settings have to be used; 2, 3 or 4 settings can be used. A clear understanding of programming temperatures and time from the previous pages is needed before programming the automatic settings. Also, the present time must have been set.

Step 1: Setting the 1st Time/Temperature

Pressing the Timer Selector Button will illuminate the Time/Temp Light.

Press the "Time" Button. Set the 1st desired time by pressing the "Hour" and "Minute" Buttons as described under, "Setting the Clock". Once the desired time "AM or PM" is displayed, press the "Set" Button to lock into memory.

Press the "Temp" button. Set the desired temperature for the 1st time setting by using the "Up" and "Down" Buttons. Once the desired temp is displayed, press the "Set" Button to lock into memory.

Example: 1st Time/Temp
8AM 60°

Step 2: Setting the 2nd Time/Temperature

Press the Timer Selector Button again and the 2nd Time/Temp Light will illuminate.

Follow same steps as above, except for 2nd time/temp. (ie; 2nd 5PM 74Degrees)

Repeat if a 3rd or 4th setting is desired.

Typical Example of a 4-time/temp selection:

	TIME	TEMP
1st	8AM	60°
2nd	5PM	74°
3rd	11PM	70°
4th	5:30AM	76°

Step 3: Activate Automatic Operation

For the heater to operate on automatic once the settings are in memory, simply press the "Auto" Button on the control panel. The "Auto" Light will illuminate to confirm the heater is in the automatic operation mode. The heater will now maintain the programmed temp for that time of day.

IMPORTANT: The heater will not operate in automatic unless the On/Off switch is in the "On" position.

Step 4: Clearing An Automatic Setting

If you wish to clear any automatic setting, press the Timer Selector Button to the appropriate setting and press the "Clear" button. A new setting will need to be entered otherwise the old setting will return after 30 seconds.

MANUAL OPERATION

To deactivate the automatic operation, simply press the "Auto" Button. The "Auto" Light will no longer be illuminated and the heater will run on a manual setting. This setting will be determined by the previous auto setting for that time of day, unless reset. The automatic settings will remain in memory even if the unit is running in manual, unless there is a power outage for more than 5 minutes.

SECTION K

PROTECTIVE FEATURES

LOSS OF POWER-AUTOMATIC RESET:

NOTE: If power to the heater is interrupted, a thud-like noise may be heard in the combustion chamber. This is normal, and should not cause alarm. For power interruptions of up to 5 minutes, the set memory is kept and will resume operation automatically with the set memory. For power interruptions beyond 5 minutes, your heater will resume operation (after a 3 minutes cool down period) in the MANUAL mode and maintain room temperature according to the setting temperature you've selected by using the slide selector for the reset temperature at the lower right hand side of the cabinet (Figure 21). When the TIME Button is pressed or the TIMER SELECTOR Button is pressed to illuminate the CLOCK SET Light, The Display Window will show 88:88 indicating the need to reset the clock and re-program the heater for automatic operation.

REMARK: In order to display reset temperature, it should be set before the heater is plugged in and energized. New reset temperature selected after plugged in will take effect only after a power loss, greater than five minutes.

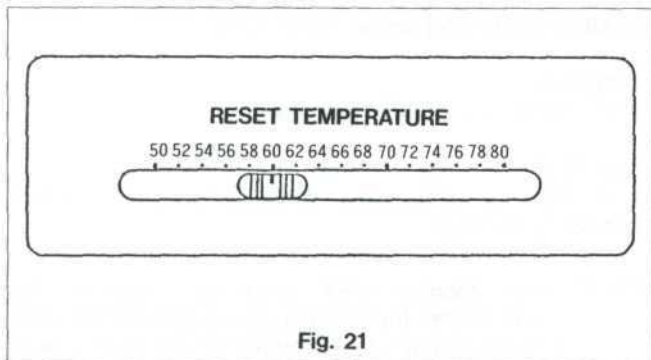


Fig. 21

ELECTRICAL FUSE

In the unlikely event of a failure in the heater's electrical system, a fuse will "blow" and interrupt the power. Do not attempt to change the fuse.

Contact your MPI dealer for the name of a trained and certified service representative in your area.

NOTE: Using a surge protector can minimize the chances of a blown fuse caused by power surges.

OVERHEAT PREVENTION

If your heater overheats, a thermostatic switch will automatically stop the flow of kerosene and extinguish the flame. The Burner status indicators are blinking.

Restore heater operation by following the steps below.

NOTE: Other symptoms listed in the trouble shooting chart may cause burner status indicators to blink, besides an overheat situation.

Step 1: Turn the Heater Off

Press the Operation Button to put it in the "Off" position.

Step 2: Allow the Heater to Cool

Wait approximately 30 to 45 minutes for the heater to cool completely.

Step 3: Unplug the Heater from the Wall Outlet.

Step 4: Remove Obstructions

The overheated condition may be caused by obstructions blocking the air flow to the heater. Check:

- The front of the heater
- The circulation fan (on the back of the heater).
- The flue pipe (outside)

Step 5: Remove the Louver

Remove the screws at the louver, and carefully remove the louver (Figure 22).

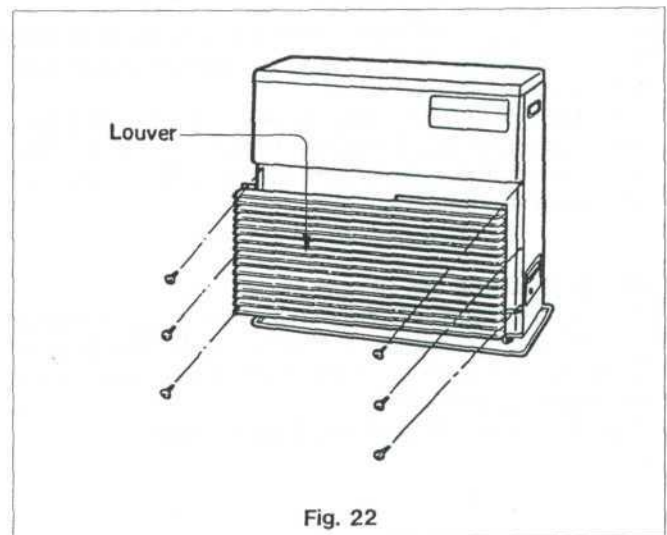


Fig. 22

Remove any accumulation of dust or other matter that may be covering the burn chamber and the heat exchangers inside the heater.

Step 6: Replace the Louver

Step 7: Plug in the Heater

Step 8: Re-program the Heater

Step 9: Turn Heater On

⚠ CAUTION: If the unit overheats a second time, turn it off and contact your MPI dealer for service.

SECTION L

CARE OF THE HEATER

Push operation switch to "OFF" remove the AC Plug from the wall outlet and wait approximately 30 minutes for the heater to cool before performing any of the following steps.

Step 1: Retrieving Objects from Inside the Heater

Should an object fall inside the heater, through the grill openings, it must be removed to avoid affecting the operation of the heater.

After allowing the heater to cool, remove the front cover panel. (See Step 5 of the previous section.) After the object has been removed, replace the front cover before attempting to re-start the heater.

Step 2: Cleaning the Cabinet

When the cabinet is soiled, wipe it with a damp cloth. Restore the shine with a dry cloth. The use of abrasive household cleaners may dull the finish.

Step 3: Checking the Flue Pipe

At the beginning of each heating season, check the inside of the flue pipe. Foreign matter, spider webs, etc. must be removed. Be sure all fittings and joints are tight.

Step 4: Cleaning the Interior

Remove the Front Cover Panel (as described in Step 5 of the previous section), and vacuum and wipe away dust or other accumulation. Look for signs of fuel leakage around the joint pipe and the bottom of the cabinet. If fuel is detected, wipe it away and if necessary, contact your MPI dealer for any necessary repairs.

Step 5: Cleaning the Blower Guard

Heating efficiency will be reduced if the blower guard at rear of the cabinet is blocked with dirt or dust. Blockage also produces a rise in heat that could cause the heater to shut off. Wipe the guard clean at least once a week.

Step 6: Cleaning the Fuel Strainer

The strainer of the fuel constant level valve should be cleaned once a year and before storing heater at the end of each season.

Step 6-A:

Turn knob of the shut-off valve installed at the external tank to close the fuel line. (See Figure 17).

Step 6-B:

To catch the fuel which will drain out, set the drain guide made by cardboard below the strainer cover, with a small container under it. (See Figure 23)

Step 6-C:

Loosen the two screws from the strainer cover and remove.

Step 6-D:

Remove the strainer and wash with pure kerosene. If strainer is damaged, replace it.

Step 6-E:

Return the strainer to its original position. Replace strainer cover and screw to secure.

Step 6-F:

Wipe away any spilled kerosene.

Step 6-G:

Turn the knob of the shut-off valve to open. Check for kerosene leakage.

NOTE: Your Monitor may sometimes require more service than that shown above. Should this occur please contact your Monitor Products, Inc., dealer for service. A preseason maintenance check up could be performed by your dealer to ensure trouble free operation during the season. Ask him for details of his routine maintenance program.

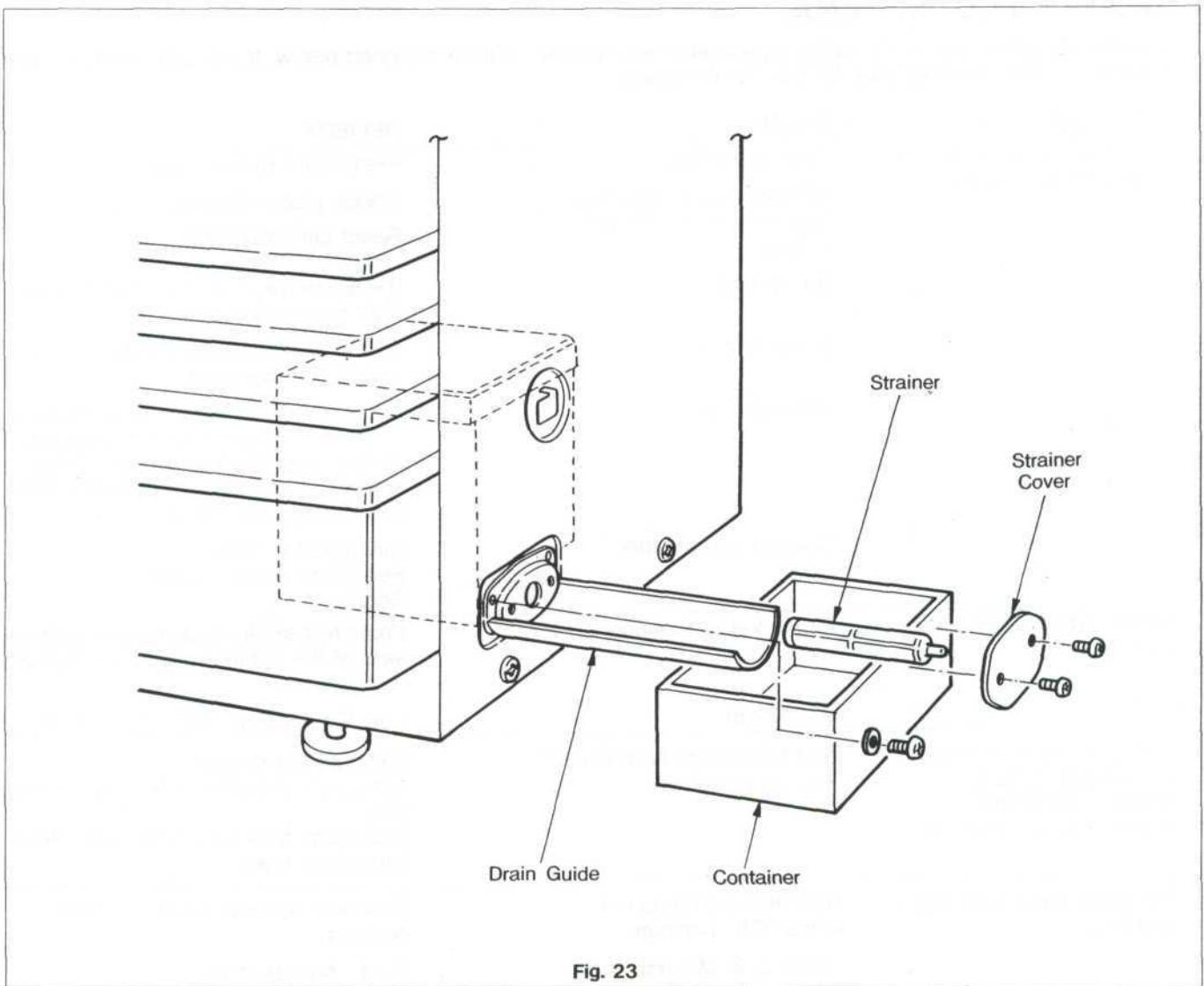


Fig. 23

Step 7: Storing the Heater

During summer months or long periods when your heater will not be in operation, take the following steps:

- Clean off the exterior cabinet with a damp cloth, and brush or vacuum dust from the grills.
- Cover the heater to protect it from dust.
- DO NOT DISASSEMBLE the heater or extension kits. Replacement of lost parts is an unnecessary expense.
- Shut off fuel supply to unit.
- Disconnect or shut off power supply to unit to prevent possible damage from lighting or power surges.

SECTION M

TROUBLESHOOTING GUIDE

Should symptoms appear during the operation of your heater, refer to the chart below, If you are unable to restore normal operation, contact your MPI dealer for service.

SYMPTOM	CAUSE	REMEDY
Heater does not go on with operation switch.	Timer is in Auto.	Press Auto Button again.
	AC cord is disconnected from wall outlet. Power failure.	Check plug and power source. Reset circuit breaker.
	Out of fuel.	Press the fuel set lever at the lower right hand side of the cabinet.
	Igniter Failure.	Call your MPI Dealer for Inspection and/or Replacement.
	Water in fuel.	Refill with fresh kerosene. Section L. <i>Note: If strainer is severely clogged, contact your Monitor dealer to check and clean the inside of constant level valve and pump screen.</i>
Heater extinguishes after lighting.	Clogged fuel strainer.	Clean fuel strainer. See "Care of the heater" Section L.
	Air pocket in fuel line.	Press fuel set lever on lower right hand side of the cabinet and release slowly 2 or 3 times.
Erratic changes in room temperature. (Slight differences in room temperature are normal.)	Out of fuel.	See "Empty Fuel Tank" Section E.
	Poor location of heat sensor. Poor air movement.	Relocate the sensor. Make sure clearances are kept around unit. Add room fans to better circulate air throughout area.
Automatic timer does not start heater.	Operation switch is not in the "ON" position.	Depress operation button to "ON" position.
	Timer is in Manual.	Press Auto Button.
	Timer improperly programmed.	See "Programming for Automatic Operation" Section J.
	Power interruption.	See "Loss of Power", Section K.
Flame does not reach normal size.	Heater is not level.	Check level.
Poor flame, sounds of combustion, soot at the rear of the heater.	Loose flue pipe.	Allow heater to cool completely; tighten all connections.
Soot on inside of burner window or exhaust ports of flue pipe.	Obstruction of combustion air intake system or combustion fan failure.	Inspect air intake system and air supply elbow for blockage. Clean with a brush, if necessary, and carefully reconnect.
Heater switches from automatic to manual operation: display window shows 88 : 88.	Power interruption; automatic reset.	See "Loss of Power", Section K.

NOTE: Several of the symptoms mentioned above may also be signs that your unit is due for routine maintenance, especially if it is several years old. Contact your Monitor dealer for an appointment.

Monitor 441™ Vented Heating Systems Limited Warranty

MONITOR PRODUCTS, INC., warrants each MONITOR 441 vented heating system sold by it to be free from defects in material and workmanship, under normal use and service, for one year after the date of original retail purchase, subject to the term and conditions stated below. An extended parts only warranty period of 36 months is provided for combustion chamber and heat exchanger. The remainder of the unit is subject to the 12 months warranty as provided herein.

1. **WARRANTOR:** This warranty is granted by MONITOR PRODUCTS, INC., P.O. Box 3408, Princeton, New Jersey 08543.
2. **PARTIES TO WHOM WARRANTY IS EXTENDED:** This warranty shall be extended only to the original retail purchaser.
3. **PARTS COVERED:** All products and parts manufactured by or for MONITOR PRODUCTS, INC., except as provided for herein. Replacement parts are warranted only for the balance of the original warranty period.
4. **PARTS NOT COVERED:** The following parts are not covered by this warranty: fuel filters, venting kits, extension kits, fuses, and all parts damaged by lightning.
5. **REMEDY:** If, within the applicable warranty period, any product or part included in this warranty proves to be defective in material and/or workmanship, then MONITOR PRODUCTS, INC., shall repair or replace, at its option, the defective product or part. Service at the point of installation (not including dealer travel time) will be provided at no charge to the customer, but must be performed by a MONITOR PRODUCTS, INC., dealer authorized to sell and service the MONITOR 441 vented heating system.
6. **PROCEDURE FOR OBTAINING PERFORMANCE UNDER THIS WARRANTY:** In order to obtain performance of the obligations under this warranty, the original purchaser must promptly (in no event later than thirty (30) days after discovery of the defect) notify the local MONITOR PRODUCTS, INC., dealer authorized to sell and service the MONITOR 441 vented heating system. Service will be provided during normal business hours within a reasonable time after the dealer has been notified of the need for service. If you are unable to locate a local MONITOR PRODUCTS, INC., dealer authorized to sell and service the MONITOR 441 vented heating system, call or write to: SERVICE DEPARTMENT, MONITOR PRODUCTS, INC., 7A Marlen Drive, Robbinsville, NJ 08691, (609) 584-0505

Any claim made under this warranty must be accompanied by proof of original purchase date sales invoice or cancelled check showing serial number is satisfactory evidence.

7. **SOLE REMEDY:** The remedy and liability for any breach of warranty, express or implied, set forth above is the sole and exclusive remedy and the limit of liability for any such breach.
8. **EXCLUSIONS AND IMPLIED WARRANTIES:** THIS WARRANTY DOES NOT EXTEND TO ANY DEFECT DUE TO THE NEGLIGENCE OF OTHERS, FAILURE TO INSTALL, OPERATE OR MAINTAIN THE HEATER IN ACCORDANCE WITH THE INSTALLATION, OPERATION AND MAINTENANCE INSTRUCTIONS FURNISHED WITH EACH NEW HEATER, UNREASONABLE USE, ACCIDENTS, ACTS OF GOD, FIRE, SNOW, FLOODS, LIGHTNING, ALTERATIONS, ORDINARY WEAR AND TEAR, THE USE OF UNAUTHORIZED OR NON-STANDARDIZED PARTS OR ACCESSORIES OR THE USE OF ANY FUEL OTHER THAN GOOD QUALITY KEROSENE SUCH AS 1K GRADE. ALL IMPLIED WARRANTIES, IF ANY, ARISING UNDER STATE LAW IN CONNECTION WITH THE SALES BY MONITOR PRODUCTS, INC., OF ANY NEW HEATER ARE LIMITED IN DURATION TO THE DURATION OF THIS WRITTEN WARRANTY. THERE ARE NO WARRANTIES, EXPRESS OR IMPLIED, OF MERCHANTABILITY, FITNESS FOR A PARTICULAR PURPOSE OR OTHERWISE WHICH EXTEND BEYOND THIS WARRANTY. MONITOR PRODUCTS, INC., SHALL NOT BE RESPONSIBLE FOR ANY INCIDENTAL OR CONSEQUENTIAL DAMAGES. WHETHER AS A RESULT OF BREACH OF WARRANTY, NEGLIGENCE, STRICT LIABILITY IN TORT OR OTHERWISE.

NOTE: SOME STATES DO NOT ALLOW: (A) LIMITATIONS ON HOW LONG AN IMPLIED WARRANTY LASTS; OR (B) THE EXCLUSION OR LIMITATION OF INCIDENTAL OR CONSEQUENTIAL DAMAGES, SO THE ABOVE LIMITATIONS OR EXCLUSIONS MAY NOT APPLY TO YOU.

9. **NO VARIATION OF TERMS:** THE PARTIES INTEND THAT THIS WARRANTY BE THE EXCLUSIVE AND FINAL EXPRESSION OF AGREEMENT. No person has the authority to orally, in writing or in any other way vary the terms, conditions or exclusions, of this warranty or to make any express warranties other than those contained herein.
10. **LEGAL RIGHTS:** This warranty gives you specific legal rights and you may also have other rights which vary from state to state.

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