TOYOSTOVE®

TOYOTOMI

LASER CLEAN HEATING SYSTEM/VENTED HEATER
INSTALLATION AND OPERATION INSTRUCTIONS

LASER CLEAN VENTED

MODEL **Laser 73**

IMPORTANT

READ AND UNDERSTAND INSTRUCTIONS BEFORE INSTALLING OR USING HEATER.
RETAIN INSTRUCTIONS FOR FUTURE REFERENCE. CHECK AND LOCAL CODES FOR PERMITTED USE.

CONTENTS

SECTION A: SPECIFICATIONS

Model:	Laser 73
Heater Efficiency:	92% (1)
Heat Rating:	High — 40,000 BTU/h Med. — 27,000 BTU/h Low — 15,000 BTU/h
Fuel Consumption:	High — 0.301 gal/h Med. — 0.203 gal/h Low — 0.113 gal/h
Fuel System:	External tank (2)
Fuel Type:	Water Clear No. 1-K Kerosene Only
Dimensions (W x H x D): (Includes drip tray)	30" x 27-½" x 16-¾"
Weight:	88 lbs. Empty
Vent Pipe Hole:	3-1/8" — 3-1/2" diameter
Maximum Length of Vent Pipe System:	10 ft., 3 bends or less
Electrical Rating:	120 Volts AC, 60Hz Preheat — 280W Burning — 66W
Typical Room Size (3):	1670 square feet (0°F) 2000 square feet (20°F)

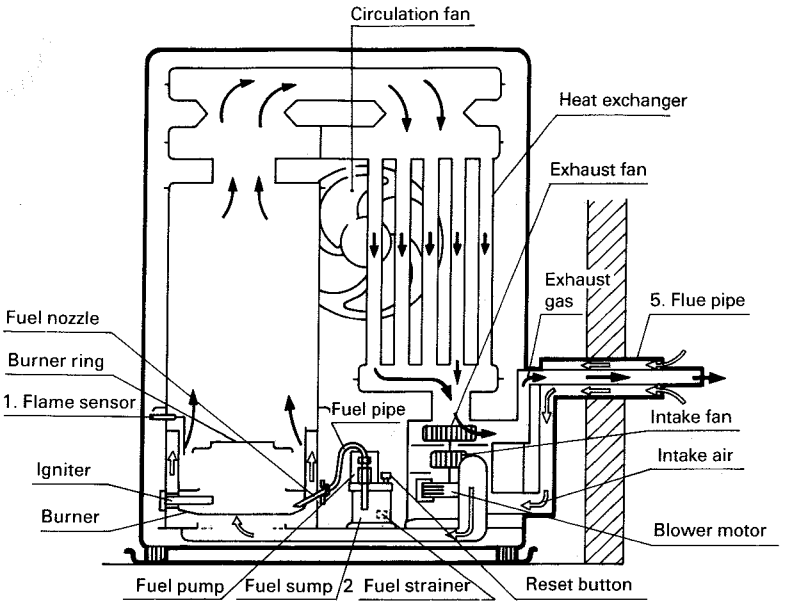
(1) Heat and vaporized water are produced by the combustion process of this kerosene heater. This rating does not take into account heat loss due to condensation of water vapor.

(2) External tank to be purchased from local suppliers.

(3) 0°F Heat Load = 24 BTU/ft²/hr
20°F Heat Load = 20 BTU/ft²/hr
Room size for which this heater is suitable will vary depending on outside temperature, house insulation, window size, and other factors.

SAFETY FEATURES

Your Laser 73 is equipped with the following safety features. Please familiarize yourself with these features. When your heater is extinguished due to a safety mechanism, be sure to identify and correct the problem.



1. **Flame Sensor**
   Heater will automatically stop all operations if ignition fails or if flame fails during combustion, in order to prevent fuel overflow. Error code will be displayed on the digital indicator.

2. **Fuel Strainer**
   Special strainer catches any dirt or impurities present in the fuel before it is sent to the burner.

3. **Overheat Protector**
   Automatically stops all operations if heater cabinet reaches abnormally high temperatures due to motor malfunction or abnormal combustion, in order to prevent fire.

4. **Power Failure Recovery System**
   If power fails during heater operation, heater will turn off. When power resumes, heater will automatically reignite to maintain the selected room temperature.

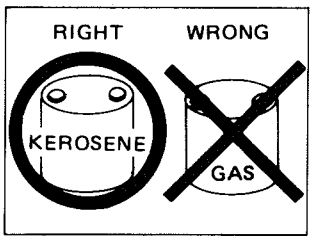
5. **Fully Vented System**
   Flue pipe system provides outside air for combustion and vents all combustion products to the outdoors.

6. **Fusible Link Valve**
   If a household fire should occur, bringing the fuel line or heater to extremely high temperatures, the fusible link valve will stop the fuel supply to the burner. This will prevent the fuel supply from the external tank continuing to flow into the house.

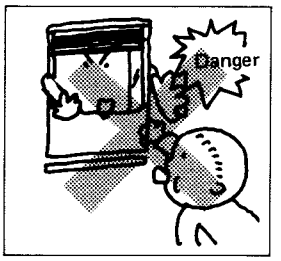
SECTION B:
SAFETY TIPS FOR OPERATION

CAUTION: Heater and vent pipe system must be properly installed before operation. Please follow instructions under "Installation", Section I.

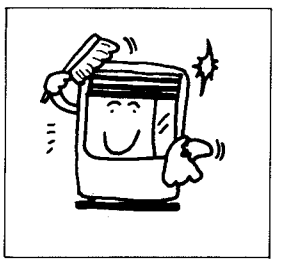
1. Never use any fuel other than water-clear kerosene (ASTM No.1-K Kerosene). NEVER USE GASOLINE. Use of gasoline can lead to uncontrollable flames, resulting in destructive fire.



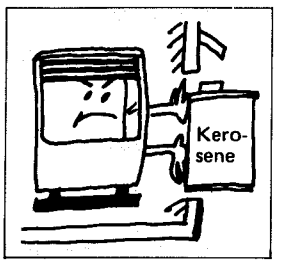
2. Due to high surface temperatures, keep heater away from children, furniture and clothing while in operation (See Page 23).



3. To prevent abnormal operation and prolong heater life, be sure to perform routine maintenance (See Pages 12—13).



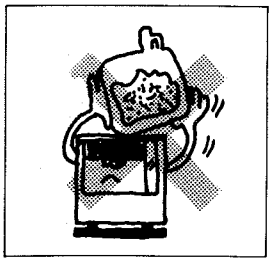
4. Never store or transport kerosene in other than a metal or plastic container that is (1) acceptable for kerosene, (2) non-red in color, and (3) clearly marked, "KEROSENE". Never store kerosene in the living space.



SECTION C:
FUEL GUIDE

The Toyostove Laser 73 is designed for use with water clear No. 1-K kerosene only. Use of low-quality kerosene will cause burner performance to drop, leading to abnormal combustion and reduced heater life.

Purchase only 1-K kerosene in non-red cans reserved exclusively for kerosene and marked accordingly with the word "KEROSENE". Always store your kerosene in a separate area from where you store gasoline for your power equipment to avoid accidental use of gasoline in your heater.



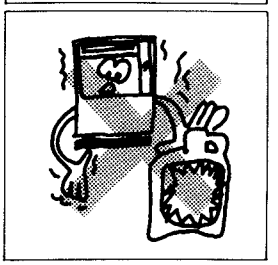
What to Buy . . .

ALWAYS : Crystal clear, colorless, high-quality KEROSENE, ASTM No. 1-K.

ALWAYS : Kerosene free of contaminants, water or cloudiness.

NEVER : Gasoline, alcohol, white gas, camp stove fuel or additives.

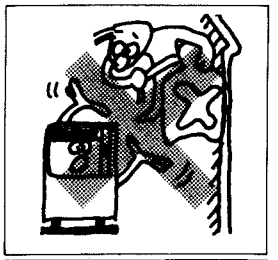
NEVER : Yellow or sour-smelling fuel.



How to Store It . . .

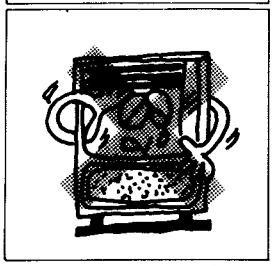
ALWAYS : Store in a clean container, non-red in color, clearly marked KEROSENE.

ALWAYS : Store away from direct sunlight, heat sources or extreme temperature changes.



NEVER : In a glass container, or one that has been used for other fuels.

NEVER : For longer than six months. Begin each heating season with fresh kerosene; discard at the end of season.

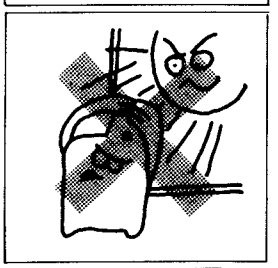


NEVER : In the living space.

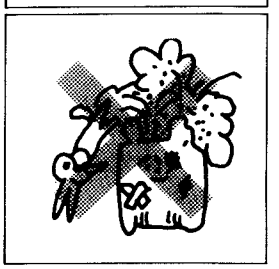
Why It is Important . . .

Pure, clean kerosene is essential for safe and efficient heater operation. Poor quality or contaminated kerosene can cause:

- Excess tar deposits on burner and flue pipe
- Incomplete combustion
- Reduced heater life

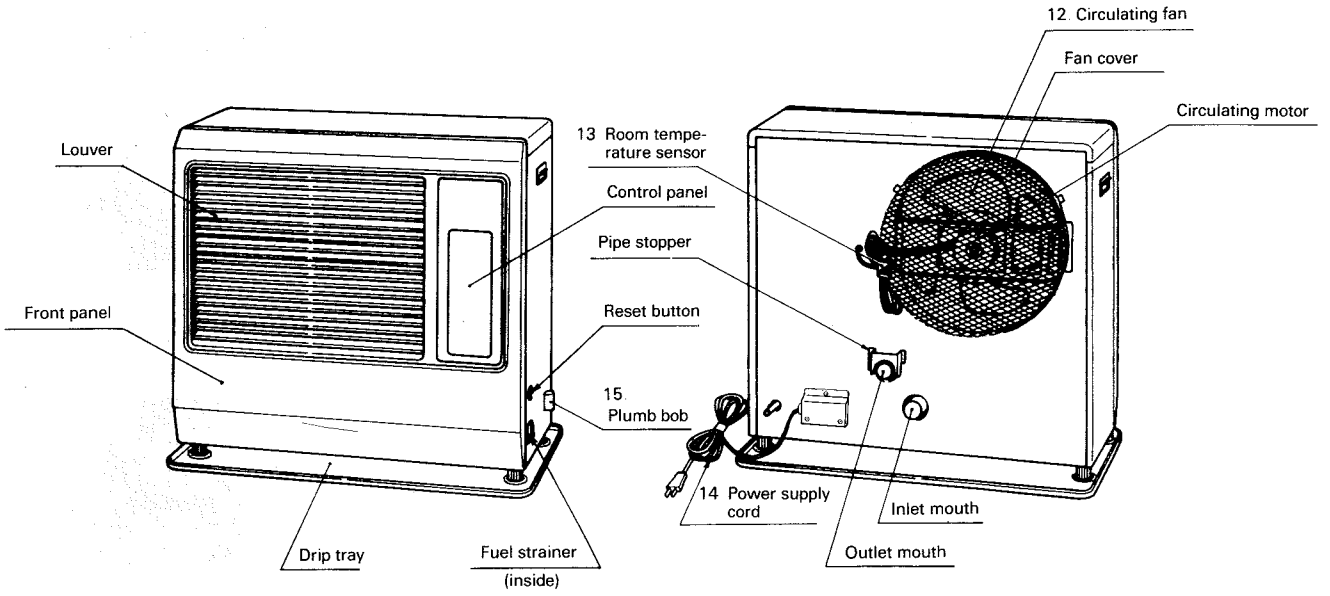


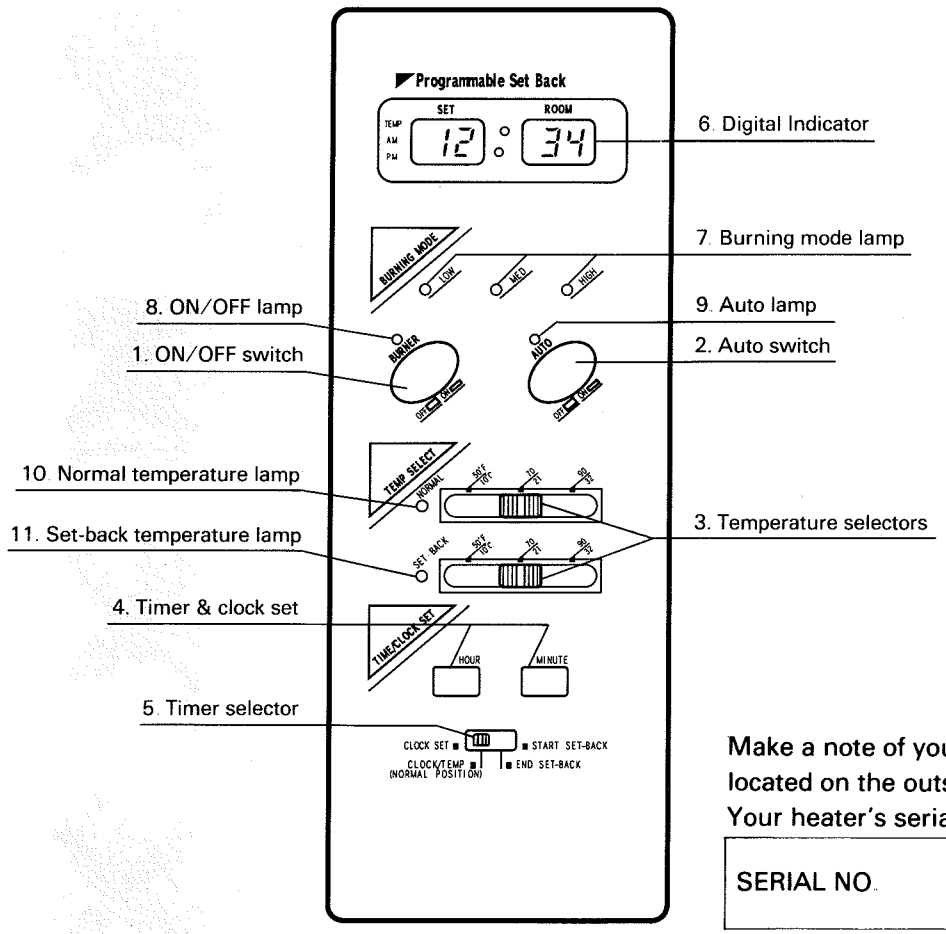
Use of a highly volatile flammable fuel such as gasoline can produce uncontrollable flames, creating a severe fire hazard.



SECTION D:
OPERATING CONTROLS AND PART NAMES

Before using heater, familiarize yourself with the following operating controls and names.





Make a note of your heater's serial number, located on the outside cabinet surface.
Your heater's serial number:

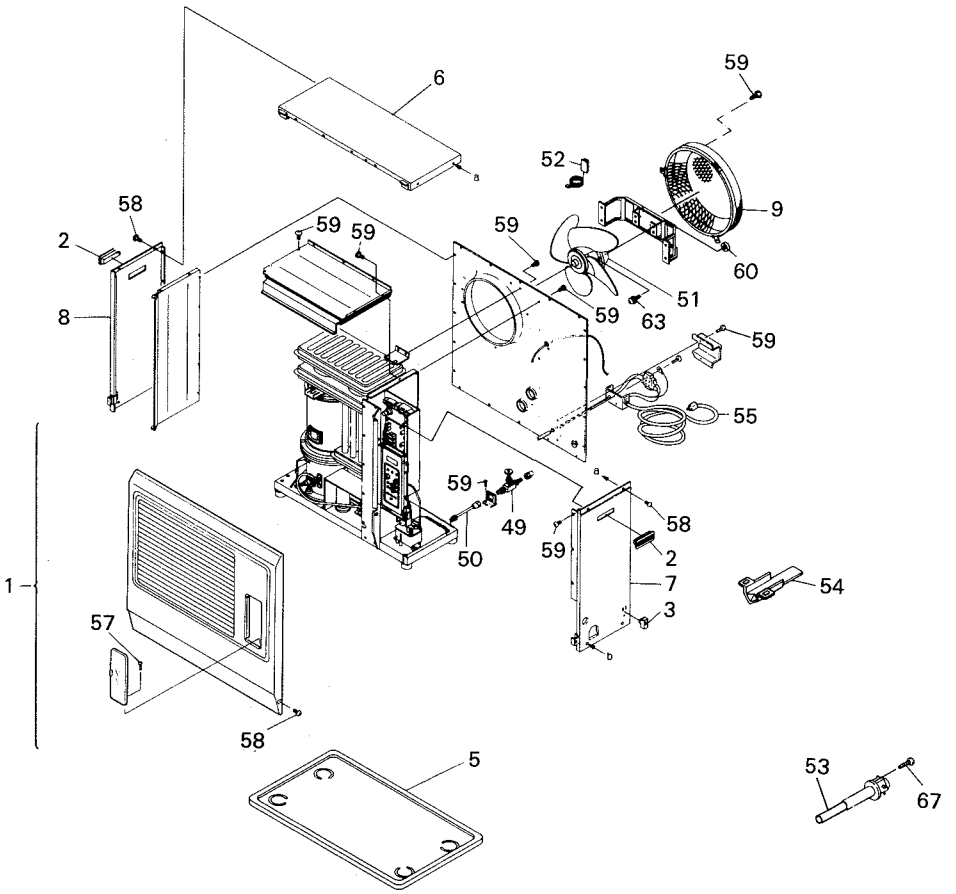
SERIAL NO.

1. ON/OFF switch:	Main switch which turns heater on and off. When switched on, heater begins operation and combustion starts after preheat period.
2. Auto switch:	The switch turns automatic operation modes on and off which have been programmed into timer.
3. Temperature selectors:	"NORMAL" and "SET-BACK" temperature selectors allow user to select desired temperature during manual or automatic operation.
4. Timer & clock set:	Timer and clock set modes can be set by pressing hour or minute buttons.
5. Timer selector:	Clock, clock set, "SET-BACK" mode, start time set and end time set can be selected by this switch.
6. Digital indicator:	Displays clock, set temperature, room temperature and error code.
7. Burning mode lamp:	Indicates whether heater is operating at high, medium or low combustion.
8. ON/OFF lamp:	Lights when heater is in operation and flashes when heater is in prepurge or postpurge.
9. Auto lamp:	Lights when automatic operation is in use.
10. Normal temperature lamp:	Lights when heater runs with manual or "NORMAL" mode of automatic operation.
11. Set-back temperature lamp:	Lights when heater runs with "SET-BACK" mode of automatic operation.
12. Circulating fan:	Three-speed motor supplies high-capacity warm air flow during high combustion for heating room up quickly, and low or medium-capacity warm air flow during low or medium combustion for maintaining comfortable room temperature.
13. Room temperature sensor:	Constantly senses room temperature and supplies information to heater so that desired room temperature can be maintained.
14. Power supply cord:	For use in 120V, AC electrical outlets only.
15. Plumb bob:	Allows user to check if heater is positioned evenly.

INDICATOR LAMPS

ON/OFF lamp	Flashing	- Pre-heating, pre-purging and post-purging mode
	Lit	- Heater in operation
AUTO lamp	Flashing	- Power loss of more than 10 seconds
	Lit	- Heater in operation at auto mode
LOW lamp	Lit	- Heater in operation at low combustion
MED lamp	Flashing	- Pre-purging mode (without flame)
	Lit	- Heater in operation at medium combustion
HIGH lamp	Lit	- Heater in operation at high combustion
NORMAL lamp	Lit	- Heater in operation at normal mode
SET-BACK lamp	Lit	- Heater in operation at set-back mode

RE. #	PARTS #	DESCRIPTION
1	20478446	Front panel assembly
2	20475804	Carrying handle
3	20450007	Plumb bob
4	20474970	Adjustable leg
5	20478129	Drip tray
6	20478160	Top plate
7	20478163	Right side panel
8	20478164	Left side panel
9	20475172	Fan cover
10	20475844	Heat exchanger
11	20475808	Heat chamber assembly
12	20478442	Burner assembly
13	20478443	Burner ring
14	20478026	Fuel nozzle
15	20478383	Fuel nozzle gasket
16	20475518	Igniter
17	20474080	Igniter gasket
18	20474921	Igniter guide gasket
19	20474920	Igniter cover
20	20478411	Primary flame rod
21	20475194	Burner gasket
22	20475850	Lower burner gasket
23	20475831	Mica window
24	20475881	Peep window gasket
25	20474992	Joint packing
26	20475893	Heat chamber gasket
27	20478437	Blower motor assembly
28	20478447	Blower motor assembly with case
29	20475871	Blower motor exhaust fan
30	20475883	Blower motor intake fan
31	20475875	Blower motor case gasket
32	20475878	Rubber mat
33	20475877	O-ring (ϕ75)
34	20475534	Fuel sump
35	20478419	Fuel pump
36	20478441	Fuel pipe assembly
37	20475550	Inlet strainer
38	20475551	Drain screw with O-ring
39	20475552	Strainer gasket
40	20478312	Main circuit board
41	20478378	Fuse A
42	20478379	Fuse B
43	20478306	High limit switch
44	20478376	Indicator lamp circuit
45	20478301	Knob for temp selector
46	20478317	Transformer
47	20477414	PCB support
48	20478314	PCB support (S)
49	10005597	Fusible link valve
50	20475852	Leveler fuel pipe
51	20479469	Circulation fan motor
52	20478373	Thermistor
53	20479801	Standard flue pipe
54	20474925	Oil catch
55	20475535	Power supply cord
56	20474014	Spacer A
57	20474059	Holder A
58	20478156	Screw 1S
59	20474050	Screw C
60	20474039	Insulator A
61	20474057	Flange nut
62	20475553	Screw 1P
63	20474055	Screw O

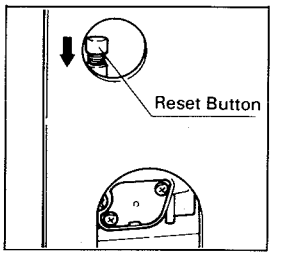


RE. #	PARTS #	DESCRIPTION
64	20450120	Screw for igniter unit
65	20478090	Screw 1T
66	20475874	Washer for blower motor
67	20474272	Screw M
68	20478495	Instruction manual
69	20478499	Carton

SECTION E:
OPERATION

BEFORE IGNITION

1. Open the valve(s) of the external fuel tank.



2. If using heater for the first time, or after heater has been out of fuel, press the red reset button once for a period of one second in order to send fuel to the fuel regulator.

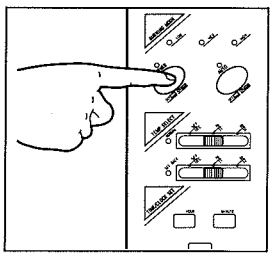
   Note: Make sure there is no fuel leakage from the fuel line or joints.

IGNITION

1. Plug heater into a 120V, AC electric outlet.

2. Push in ON/OFF switch to "ON" position. On digital indicator, the room temperature and the set temperature will be shown. ON/OFF lamp will start to flash and then blower motor and ignition will start.

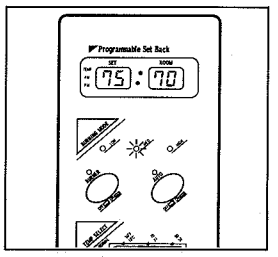
   Note: Heater will not start when room temperature exceeds the selected setting.



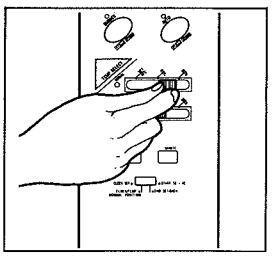
3. Burning model lamp "MED" will start to flash after approx. 3 - 9 minutes. (*) After ignition, burning mode lamp "MED" will change from flashing to continuous. Then, after 10 seconds, burning mode lamp will turn to "LOW" and burning mode lamp "LOW" will come on. Circulation fan will turn on after approx. 3 minutes.

   Note: (*) Pre-heat time depends on the room temperature.

Room temperature:		
	below 34°F	- 9 minutes
	34°F - 61°F	- 6 minutes
	over 61°F	- 3 minutes



4. Heater will operate at "LOW" or "MED" burning mode for approx. 6 minutes after ignition, regardless of temperature control setting. Burner mode lamp will continue to light on "LOW" or "MED" while the prepurging is in effect. After this period, output may be adjusted as desired using the "NORMAL" temperature selector as directed in the following instructions.

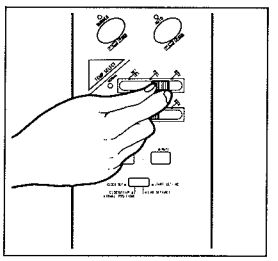


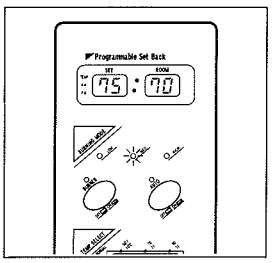
ADJUSTING ROOM TEMPERATURE

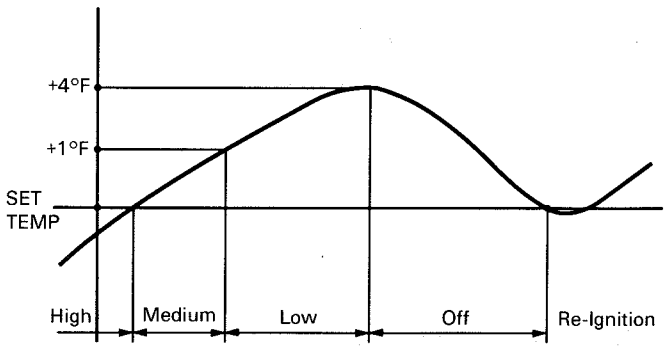
1. The temperature control should be set at the position you find most comfortable. Heat output will be regulated automatically in accordance with the room temperature registered by the room temperature sensor.

2. Heater will burn at high combustion until room temperature reaches the selected temperature level. When room temperature reaches the selected setting, heater will automatically shift to medium or low combustion to maintain the desired temperature. When the room temperature exceeds the selected setting, heater will automatically shut off. As room temperature drops, heater will automatically re-start to maintain desired settings.

   Note: Burning mode lamps indicate at which output level the heater is operating at any given time. The heater shifts automatically between low, medium and high output levels to maintain the desired temperature.







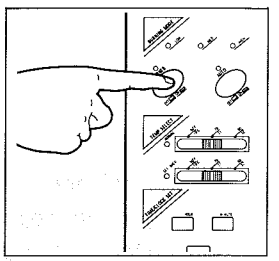
TURNING HEATER OFF

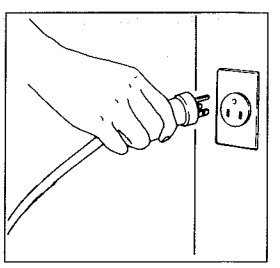
Press ON/OFF switch to "OFF" position. (Auto lamp and temperature lamp will go out. Burning mode lamp will flash until flame disappears.) Circulation fan and combustion fan motors continue to operate for approximately three (3) minutes to cool heater down. Make sure ON/OFF lamp goes out when fans stop.

Note: If ON/OFF switch is pressed to "ON" position during the cool down period, heater will automatically re-start at the end of cool down period.

Note: Disconnect heater plug from electrical outlet after power lamp has turned off if heater will be out of use for any period.

Note: Plug should also be disconnected during electrical storms or damage may occur.



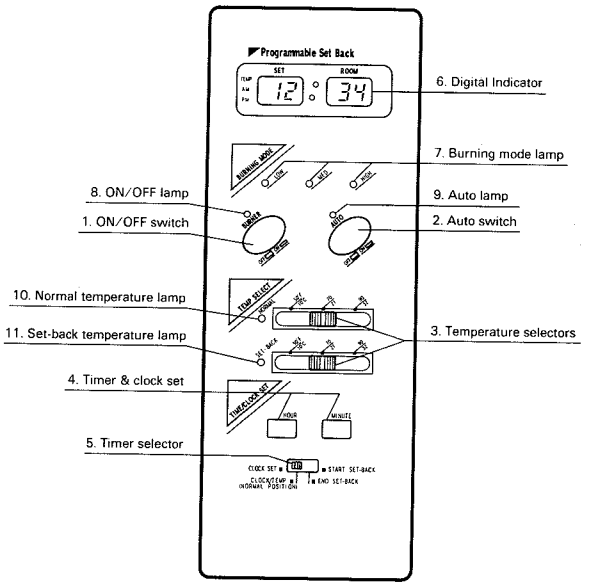


PROGRAMING FOR AUTOMATIC OPERATION

1. SET CLOCK — Position Timer Selector to "CLOCK SET". Press "HOUR" and "MINUTE" button of TIMER/CLOCK SET to correct time. Position Timer Selector to "CLOCK/TEMP" (NORMAL POSITION) after clock setting is completed. Current time will be shown on Digital Indicator.

   Note: "HOUR" or "MINUTE" button will change the time every one (1) unit. Holding the button cotinuously will cause the time to change rapidly.

   Note: In the event of power failure for over 10 seconds, all clock and timer settings are cancelled. If Digital Indicator is flashing "PM 12:00" or AUTO lamp is flashing, this indicates a power loss of more than 10 seconds. At this point, you need to reset all time and set-back functions.



   Note: Your desired temperature setting will be displayed on Digital Indicator when you set the room temperature. The temperature scale on temperature selector is just for your reference. The figures on Digital Indicator and on Scale may not match; This is normal.

2. TO START TIME OF "SET-BACK" MODE — Position Timer Selector to "START SET-BACK". Press "HOUR" and "MINUTE" button of TIMER/CLOCK SET to set desired start time. Start time of "SET-BACK" mode will be shown on Digital Indicator. (Ex. PM 10:00)

   Note: When set the time of "SET-BACK", the "MINUTE" button will advance time by ten (10) units. (Ex. 10:00, 10:10, 10:20 etc.)

3. TO END TIME OF "SET-BACK" — Position Timer Selector to "END SET-BACK". Press "HOUR" and "MINUTE" button of TIME/CLOCK SET to set desired end time. End time of "SET-BACK" mode will be shown on Digital Indicator. (Ex. AM 6:00)

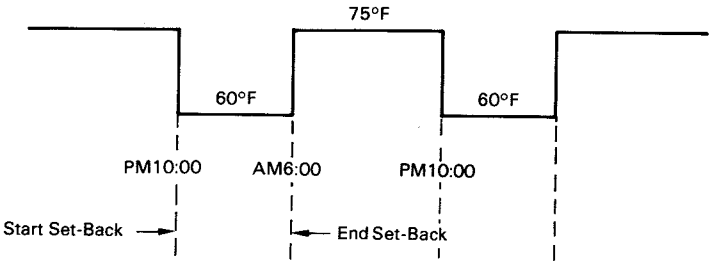
   Note: Always return Timer Selector position to "CLOCK/TEMP" (NORMAL POSITION) at the end of "SET-BACK" mode settings. Digital Indicator will display the current time.

4. TURN POWER ON — Press both ON/OFF switch and AUTO switch to the "ON" position. The room temperature and the set temperature will be displayed on Digital Indicator.

5. SET ROOM TEMPERATURE — Slide Temperature Selector knob on "NORMAL" mode operation and "SET-BACK" to set desired temperatures. (Ex. "NORMAL" — 75°F, "SET-BACK" — 60°F)

   Note: "SET-BACK" mode operation is designed for energy savings. "SET-BACK" mode operation can be programmed in 24 hours periods.

   Ex.



MANUAL COMBUSTION (This feature is for testing purposes only.)

This heater also can be kept burning at desired combustion mode (High, Medium or Low) manually, regardless of room temperature.

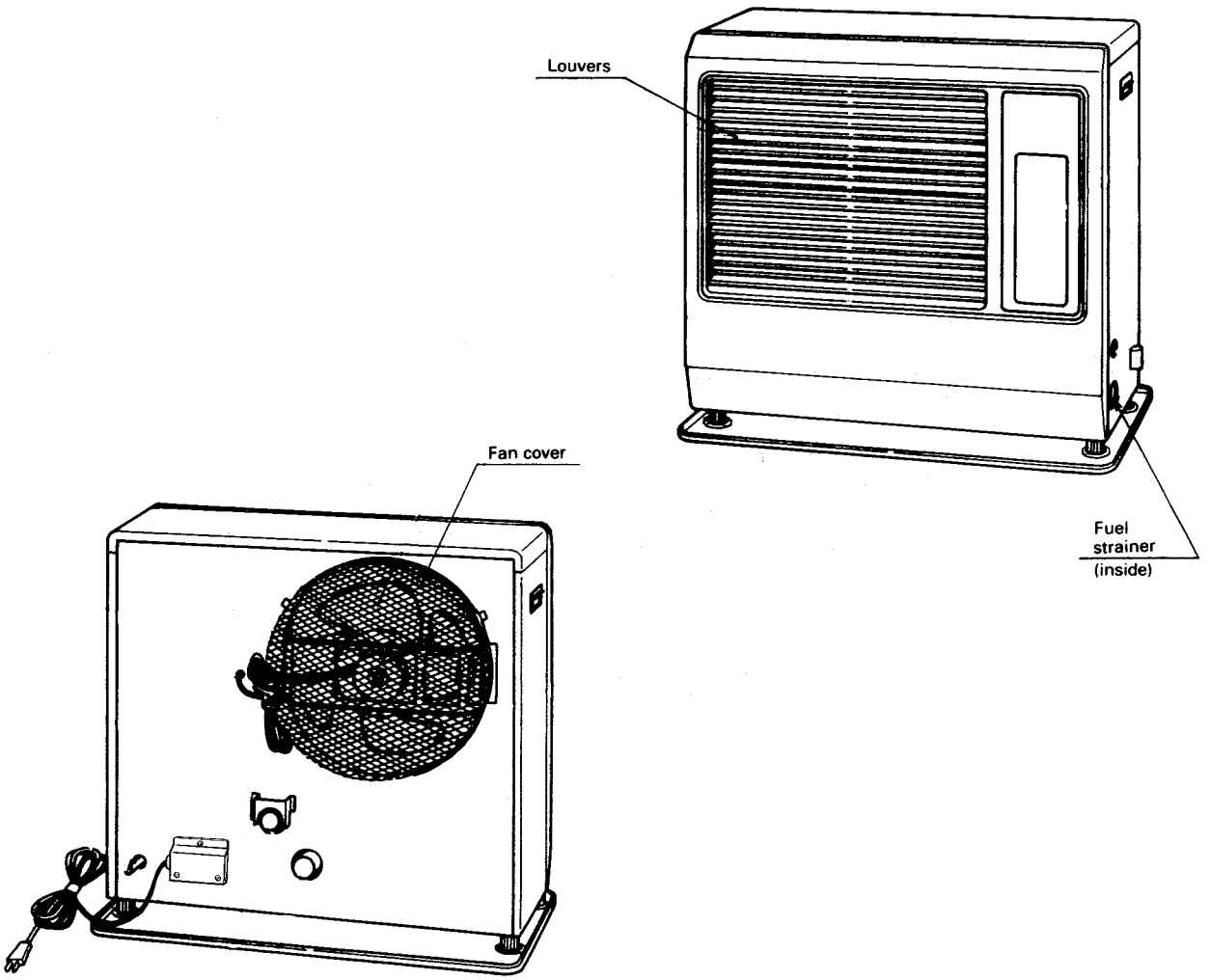
1. Press the "HOUR" button and "MINUTE" button at the same time for more than three (3) seconds when ON/OFF switch is "ON".
2. P1, P2 or P3 will be displayed on the Digital Indicator;
   P1 = Low mode
   P2 = Medium mode
   P3 = High mode
   Then select desired combustion mode by pressing either "MINUTE" or "HOUR" button. "MINUTE" button changes combustion mode to higher; "HOUR" button changes combustion mode to lower.
3. To clear, press the "HOUR" button and "MINUTE" button at the same time for more than three (3) seconds until normal temperature display returns.

SECTION F: ROUTINE MAINTENANCE

CAUTION: Be sure to unplug heater before performing any checks or cleaning.

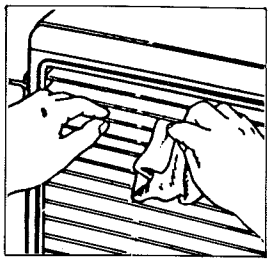
CAUTION: Allow heater to cool completely before cleaning or maintenance.

FOR OPTIMUM HEATER PERFORMANCE, THE PARTS SHOWN BELOW SHOULD BE CLEANED REGULARLY:



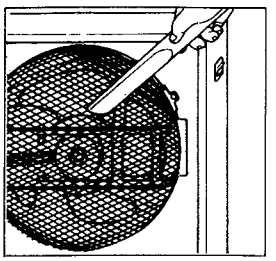
1. Clean Louvers (ONCE A WEEK)

Dust and stains should be wiped off louvers with a damp cloth.



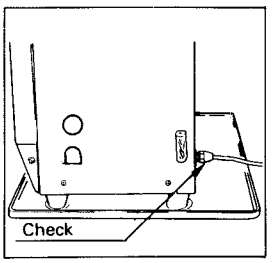
2. Clean Circulation Fan Cover (ONCE A WEEK)

Remove any dust or pet hair from the fan cover on the back of the heater.



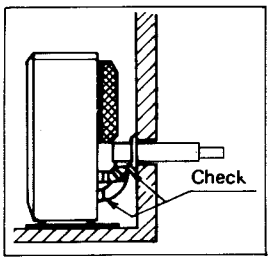
3. Check for Kerosene Leaks (REGULARLY)

Make it a habit to check for any sign of kerosene leakage along the fuel line and at all joints. Kerosene leaks may lead to risk of fire.



4. Check Flue Pipe Area (ONCE A WEEK)

Check the flue pipe joint to make sure connection is firm. Use a vacuum cleaner to remove any dust or pet hair.



5. Clean Fuel Strainer (ONCE A MONTH)

The strainer of the fuel sump should be cleaned once a month and before storing heater at the end of each season.

(a) Close the valve(s) of the separate fuel tank.

(b) To catch the fuel which will drain out, set the oil catch below the strainer cover, with a small container under it.

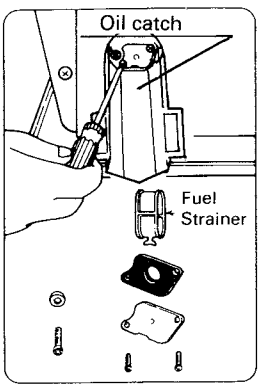
(c) Loosen the two screws from the strainer cover and remove.

(d) Remove the strainer and wash with kerosene.

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

(f) Wipe away any spilled kerosene.

(g) Open the valve (s) of separate fuel tank. Check for kerosene leakage.



Note: Be sure to unscrew the drain screw to remove all remaining kerosene from the fuel sump at the end of each season.

SECTION G:
TROUBLESHOOTING

NOTE BEFORE REQUESTING FOR REPAIR AND SERVICES

The following symptoms are normal during operation of the heater.

	CONDITION	REASON
When heater is started or extinguished.	White smoke or smell at initial use after purchase.	Machine oil or dust burns of the surfaces of the burner or heat exchanger.
	Flames flashing for a few minutes after ignition.	The burner is cold and igniter is kept running for a while after ignition.
	Occasionally makes "cracking" noise when heater is ignited or extinguished.	Expansion and shrinkage of metal parts when they are heated or cooled.
	Warm air will not blow as soon as ignited.	To prevent uncomfortable cool air from coming out at the beginning, circulation fan start up is delayed.
	Audible chugging sound from fuel pump when started first time or after running out of fuel.	Air is in the pump. However, noise should stop within 1 minute.*
When heater is in operation.	"Ticking" noise.	Noise of fuel pump in operation. Normal.
	Part of the heat chamber or the heat exchanger is heated to a cherry red color.	Normal.
	Occasional yellow flickering in blue flame.	Normal.

*If sound from fuel pump does not decrease and heater shuts off, check:

1. Push red reset button on constant level valve. DO NOT hold down.
2. Insure that all valves are open and filter is clear.
3. Insure external fuel tank has fuel and filters are clean.

Should problems arise during operation or ignition, use this chart to determine the cause and the proper steps to take. Be sure to unplug heater and allow to cool completely before taking corrective measures.
In the event that heater should extinguish itself, without any action or your part, you should look to the digital indicator for any of the following error codes.

ERROR CODE	PROBLEM	CAUSE	SOLUTION
	POWER LAMP FAILS TO TURN ON	Disconnected power plug Circuit board malfunction	Plug into 120V AC outlet. Consult your dealer.
EE2	NO IGNITION	Out of fuel	Check fuel gauge on fuel tank; refuel.
EE2		Fuel tank valve closed	Open valve by turning counterclockwise.
EE2		Air pocket in fuel line	Push reset button on the fuel sump, located right inside, once.
EE2		Clogged flue pipe	Clean flue pipe.
EE2		Clogged fuel strainer	Clean fuel strainer (See page 13).
EE2		Igniter, circuit board or fuel pump malfunction	Consult your dealer.
EE8		Blower motor malfunction	Consult your dealer.
EE6	EXTINGUISHED AFTER IGNITION	Air pocket in fuel line	Push reset button on the fuel sump, located right inside, once.
EE6		Out of fuel	Check fuel gauge on fuel tank; refuel.
EE6		High limit switch activated	Clean circulation fan cover, remove any obstructions.
EE6		Flame sensor malfunction	Consult your dealer.
EE8		Blower motor malfunction	Consult your dealer.
	POOR COMBUSTION/ NOISY COMBUSTION	Soot buildup in flue pipe	Clean out any soot.
		Burner ring not properly seated	Consult your dealer.
		Altitude too high (See page 23.)	Consult your dealer.
EE10	DOES NOT EXTINGUISH	Fuel drain in burner	Consult your dealer.
	ODOR	Leaking flue pipe	Tighten all flue pipe connections.
		Kerosene leakage	Tighten all fuel line joints. Wipe away any kerosene drippage.
		Faulty packing or gasket in combustion area	Consult your dealer.

If the corrective measures outlined above do not solve the problem, please consult your TOYOSTOVE dealer.

AUTOMATIC CLEANING SYSTEM

Heater will automatically clean igniter for ten (10) minutes every day at 2:00 a.m. and display "CL:10" on Digital Indicator if heater is running at that time.

MANUAL CLEANING SYSTEM

Heater will clean igniter for ten (10) minutes manually.

1. Press the "HOUR" button and "MINUTE" button at the same time for more than three (3) seconds when ON/OFF switch is "OFF".
2. Display will appear "CL:10" on Digital Indicator. Cleaning will begin and end without any additional input.

Note: Cleaning igniter is important to prolong igniter life. It is recommended that the igniter be cleaned once a week.

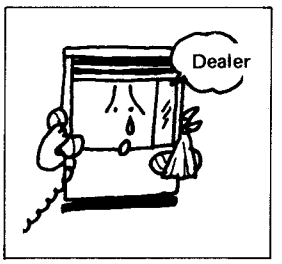
SECTION H:
LONG TERM STORAGE

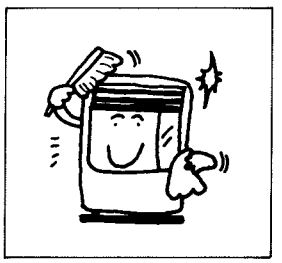
At the close of each heating season, or when you do not plan to use your heater for an extended period, the following procedures are recommended.

1. As the end of the season approaches, calculate your kerosene purchases so that you can use up all the kerosene you have on hand. When kerosene is stored for over six months, its quality may deteriorate. The use of such kerosene will have an unfavorable effect on heater operation.

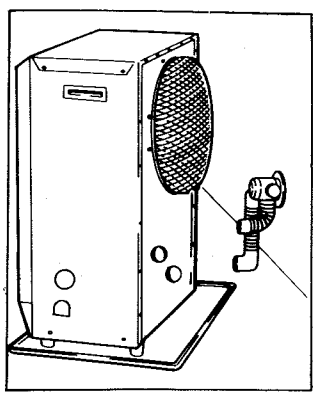
2. If your heater needs any service or repair, now is the time to call your dealer and get it done before storage. That way your heater will be ready for immediate use when the next heating season begins.

3. If you plan to store your heater in place,
   (a) Unplug heater.
   (b) Close the main tank valve.
   (c) Remove all kerosene from the fuel sump and clean the fuel strainer (see page 13).
   (d) Wipe off any stains or dust on heater with a damp cloth, then wipe once again using a dry cloth.
   (e) Cover heater completely with a large plastic bag to protect from dust.





4. To store heater in another location,
   (a) Unplug heater.
   (b) Close the main tank valve.
   (c) Remove all kerosene from the fuel sump and clean the fuel strainer (see page 13).
   (d) Disconnect fuel line and flue pipe from the heater.
   Note: Kerosene remaining in the fuel line may flow out when fuel line is disconnected. Have a container ready to catch drainage.
   (e) Remove any soot accumulated in the flue pipe using a brush and/or vacuum cleaner.
   (f) Wipe off any stains or dust on heater with a damp cloth, then wipe once again using a dry cloth.
   (g) Put the heater and flue pipe in the original shipping box, and store in a dry place. If original shipping box is not available, cover the heater completely with a large plastic bag to protect from dust during storage.
   (h) Plug inner and outer sleeve openings using the two rubber caps provided for this purpose.



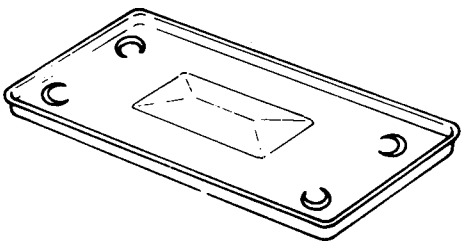
SECTION I: INSTALLATION

TOOLS NEEDED FOR INSTALLATION

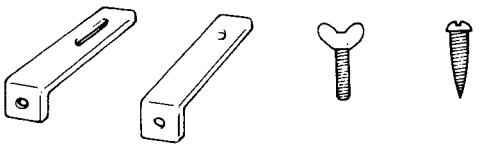
Tool	Use
Phillips Head Screwdriver	Installation of flue pipe, etc.
Electric Drill	Drilling hole in wall for flue pipe
Hole Saw, 3½" diameter	Making hole in wall for flue pipe
Hacksaw (with a 32 teeth/inch blade)	Cutting wall sleeve

STANDARD INSTALLATION PARTS

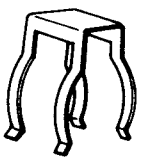
The following standard installation parts are enclosed with heater. For alternate installation methods, you may need to purchase additional accessories which are available from your TOYOSTOVE dealer. See "Accessory Parts", page 19.



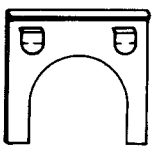
Drip tray (1) (PART #20478129)



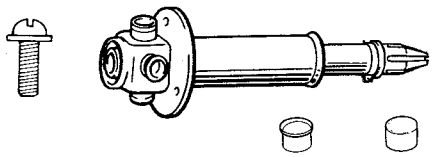
Wall Brackets (2 sets) (PART #20474962)



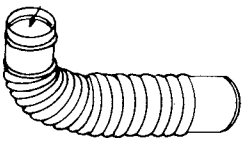
Pipe holder (1) (PART #20474963)



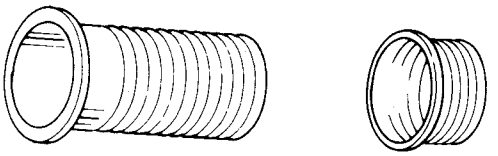
Pipe stopper (1) (PART #20474964)



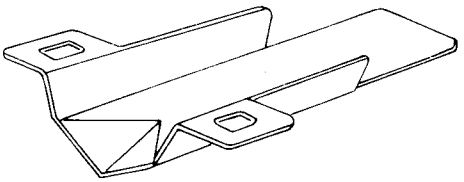
Standard Flue Pipe (1) (PART #20479801)
Exhaust Air Cap (PART #20474945)
Intake Air Cap (PART #20474949)



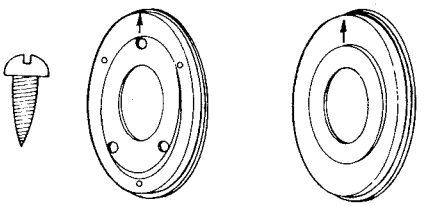
Bent Joint (1) (PART #20474984)



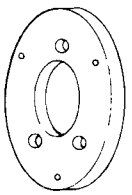
Wall Sleeve and Sleeve Nut (1 ea.)
(PART #20479867)



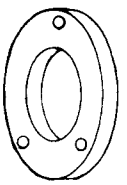
Oil Catch (1) (PART #20474925)



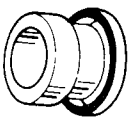
(PART #20474968) (PART #20474969)
Inner and Outer Sleeve Flange (1 ea.) w/screws



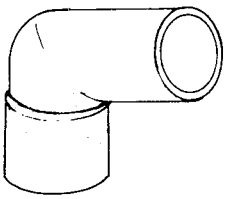
Flange Gasket (2) (PART #20474971)



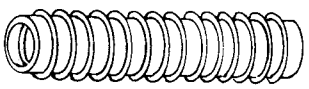
Flue Pipe Gasket (1) (PART #20474974)



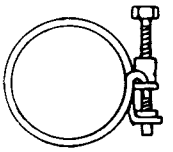
Sleeve Cap (2) (PART #20474978)



L-Shaped Hose (2) (PART #20474975)



Inlet Hose (1) (PART #20474951)



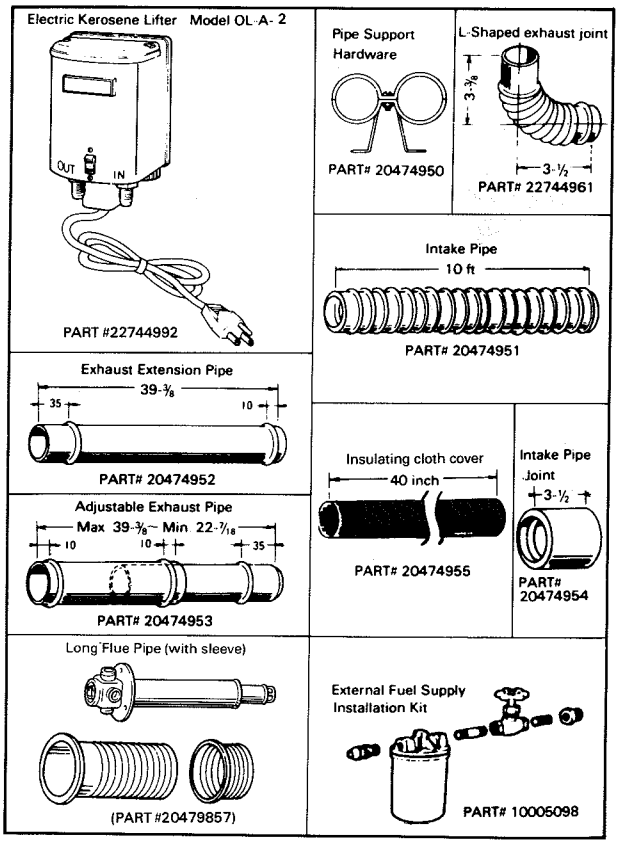
Hose Band (2) (PART #20474977)

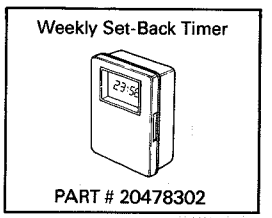
ACCESSORY PARTS

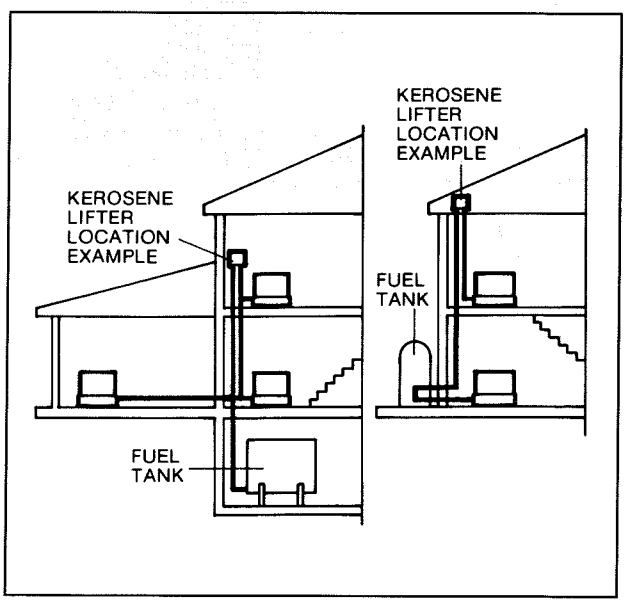
The following accessory parts are available for use in non-standard installation of the Laser 73. After giving careful consideration to your desired heater and flue pipe locations and flueling system, consult your TOYOSTOVE dealer to purchase the necessary accessory parts.

Accessory	Part No.	Application
Extension pipes (L)*	22744998	Extends pipe system by 61-3/4 to 78-3/4"
Extention pipes (M)*	22744997	Extends pipe system by 22-1/2 to 39-3/8"
Extension pipes (S)*	22744996	Extends pipe system by 12-5/8 to 19-5/8"
L-Shaped exhaust joint*	22744961	For 90 degree bend in exhaust pipe
Electric Kerosene Lifter Model OL-A-2	22744992	Used to lift fuel to heater when fuel tank is located underground or outdoors in a position lower than the heater. With automatic recovery.
Window Kit (L)	20475589	for installation fo flue pipe in windows from 31 to 50 inches wide.
Window Kit (S)	20475588	For installation of flue pipe in windows from 20 to 32 inches wide.
Long flue pipe	20479857	For installation in wall thicknesses 18 inches.
External Fuel Supply Installation Kit	10005098	For installation of external tank system
Weekly set-back timer	20478302	Weekly programmable timer to control ON/OFF of SET-BACK mode

* Total length of extension pipe between heater and flue pipe must be no greater than 10 ft. No more than three bends may be used in extension pipe.

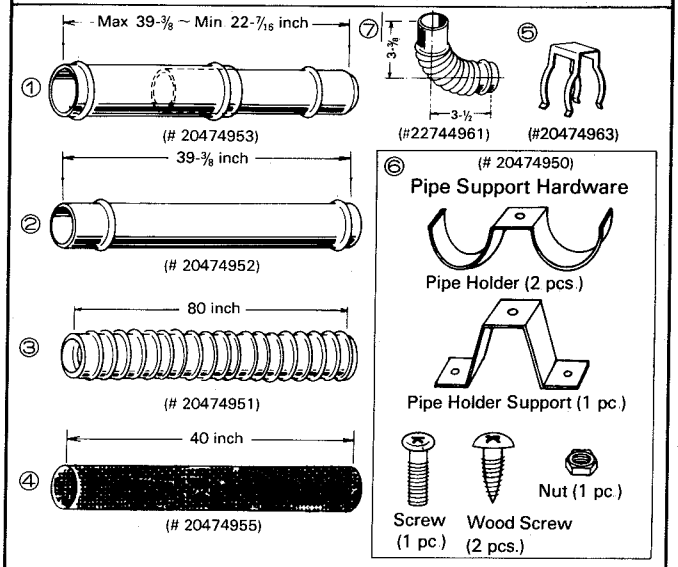






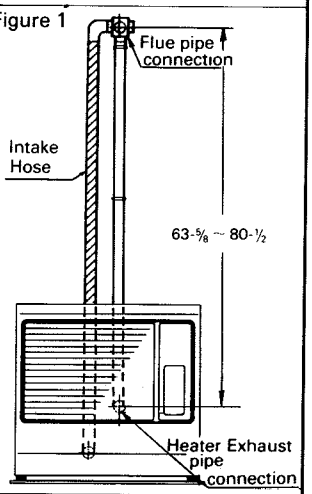
EXTENSION KIT

Extension Pipes (L) PART #22744998



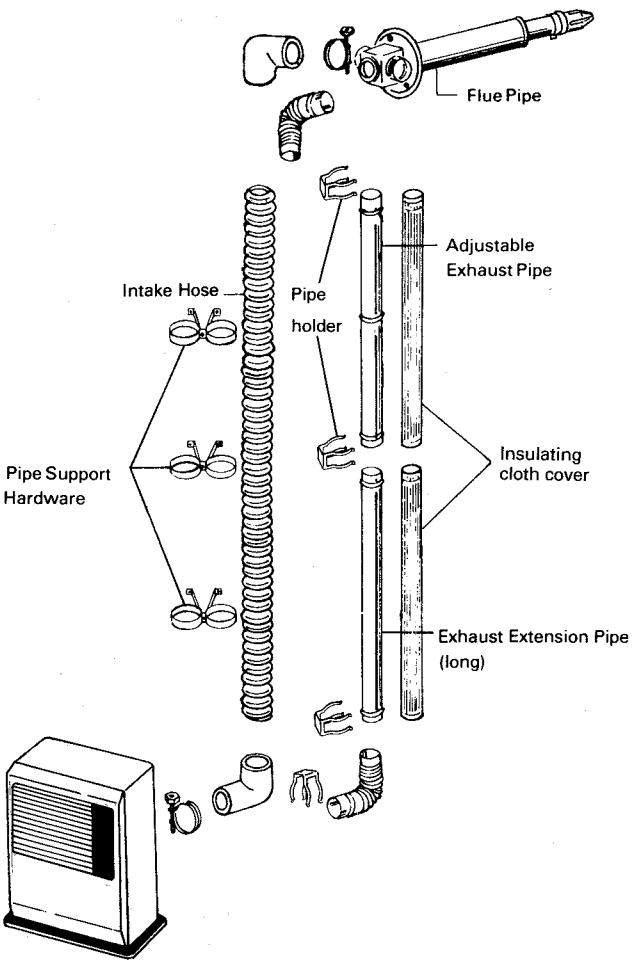
No.	Name of Part	Qty.
①	Adjustable Exhaust Pipe Max. 39-3/8 ~ 22-7/16	1
②	Exhaust Extension Pipe (long, 39-3/8 inch)	1
③	Intake Pipe 80 inch	1
④	Insulating cloth cover (40 inch)	2
⑤	Pipe Holder	2
⑥	Pipe Support Hardware	3 sets
⑦	L-Shaped Exhaust Joint	1

Figure 1



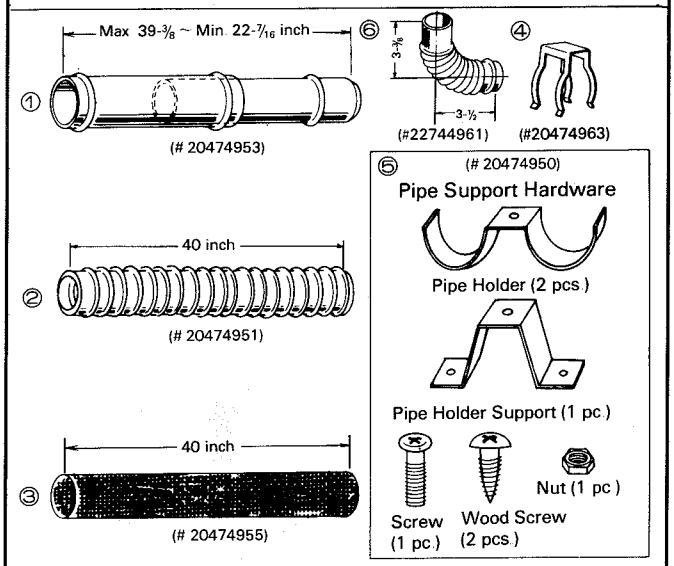
When using the "Extension pipes (L)" extension kit, the distance between the heater exhaust pipe connection and the flue pipe connection must be at least 63-5/8 inch but no more than 80-1/2 inch. (see Figure 1 for reference)

INSTALLATION WITH EXTENSION PIPES (L)



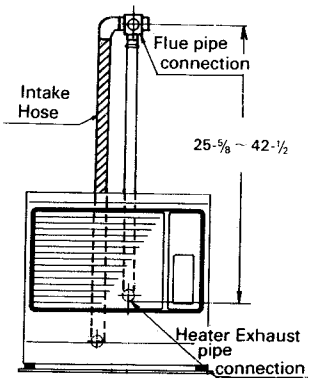
NOTE: Use "L"-shaped Exhaust Joint if necessary.

Extension Pipes (M) PART #22744997



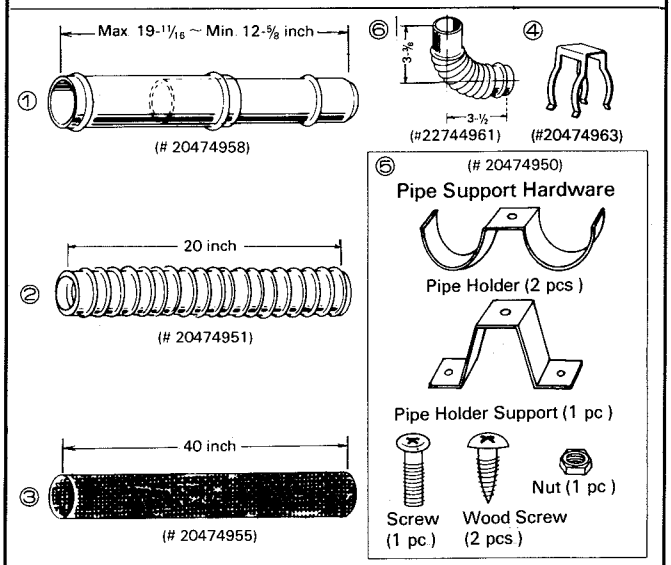
No.	Name of Part	Qty.
①	Adjustable Exhaust Pipe Max. 39-3/8 ~ 22-7/16	1
②	Intake Pipe 40 inch	1
③	Insulating cloth cover 40 inch	1
④	Pipe Holder	2
⑤	Pipe Support Hardware	2 sets
⑥	L-Shaped Exhaust Joint	1

Figure 1



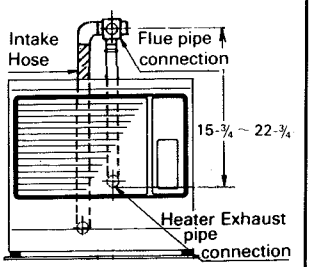
When using the "Extension pipes (M)" extension kit, the distance between the heater exhaust pipe connection and the flue pipe connection must be at least 25-5/8 inch but no more than 42-1/2 inch. (see Figure 1 for reference)

Extension Pipes (S) PART #22744996



No.	Name of Part	Qty.
①	Adjustable Exhaust Pipe Max. 19-11/16 ~ 12-5/8	1
②	Intake Pipe 20 inch	1
③	Insulating cloth cover 40 inch	1
④	Pipe Holder	2
⑤	Pipe Support Hardware	1 set
⑥	L-Shaped Exhaust Joint	1

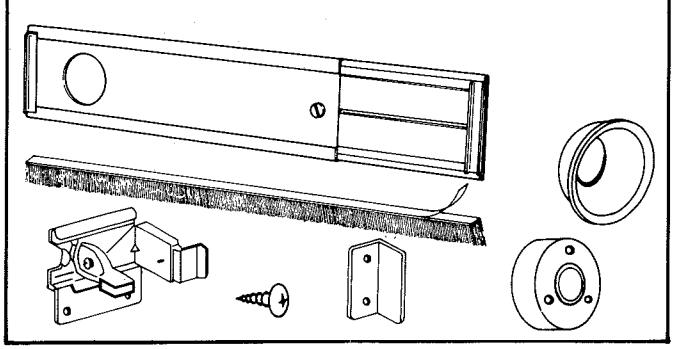
Figure 1



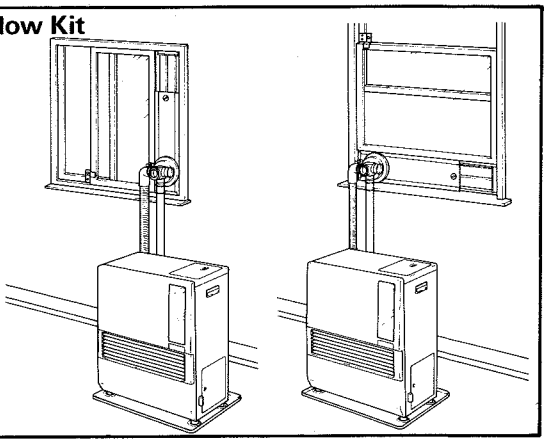
When using the "Extension pipes (S)" extension kit, the distance between the heater exhaust pipe connection and the flue pipe connection must be at least 15-3/4 nch but no more than 22-3/4 inch. (see Figure 1 for reference)

WINDOW KIT

Window Kit (L) PART #20475589 (31 - 50 inches)
Window Kit (S) PART #20475588 (20 - 32 inches)



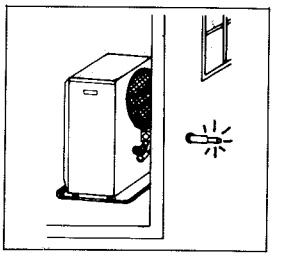
Ex. Window Kit



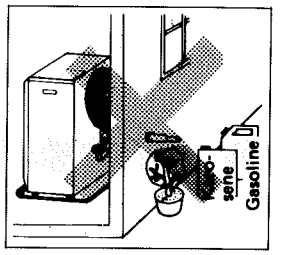
TIPS FOR SAFE INSTALLATION

Follow the safety tips below when planning the installation of your Laser 73.

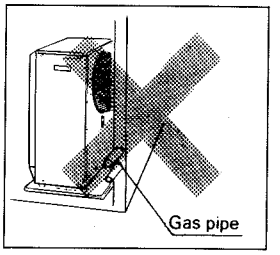
1. Intake and exhaust flue pipe openings must be fully exposed to outside air. Do not vent into garage, basement under the floor, or into any enclosed area.



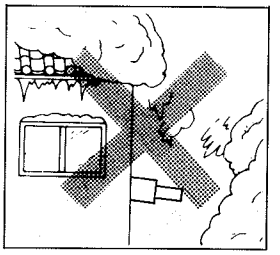
2. Do not install flue pipe in close proximity to other objects or materials (see page 23).



3. Before making a hole in your wall for the flue pipe, make sure the area is free of electrical wires, gas pipes and other obstacles.

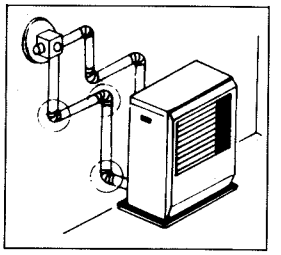


4. Do not install flue pipe where it will be exposed to heavy snow or strong drafts.



5. Total length of extension pipe between heater and flue pipe must be no greater than 10 ft. with 3 bends may be used.

   NOTE: In case of using extension pipe, always cover the exhaust pipe with insulating cloth cover.



INSTALLATION OF HEATER AND FLUE PIPE

NOTE: Check and comply with all state and local codes that may apply to vented heaters before beginning installation.

NOTE: This heater is designed to be used no more than 3000 FT. above sea level.
ASK your local dealer for using at altitudes higher than 3000 FT. above sea level.

1. Select heater location. Allow clearances as indicated below between heter and all other materials. (See Fig. 1)

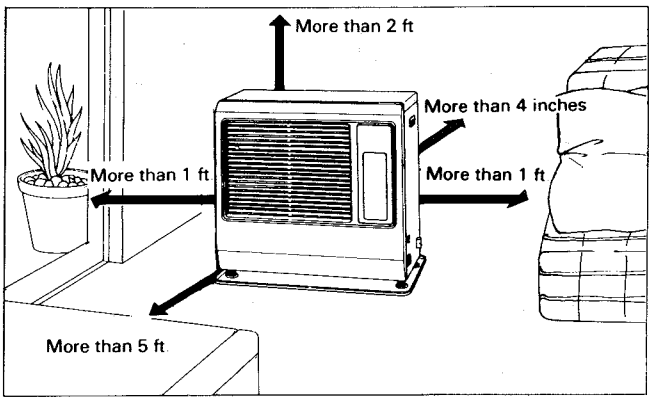


Fig. 1

2. Make sure that the outside area to where the standard flue pipe will be reach is clear of any objects. (See Fig. 2 & 3)

NOTE: Make sure wall thickness is not greater than 10 inches. If it is more than 10 inches, consult with your local dealer. A longer flue pipe will be available through your dealer or distributor.

NOTE: Flue pipe can be installed through any standard building materials. Please ask your local dealer or distributor for more details.

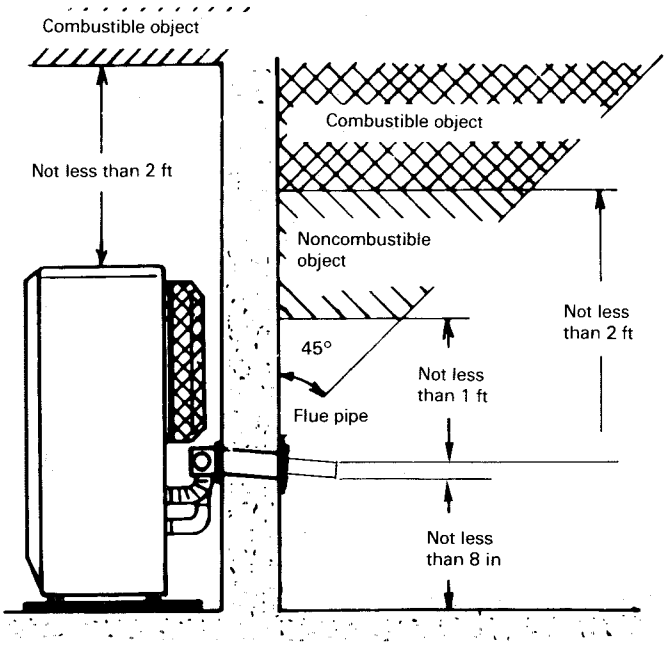


Fig. 2

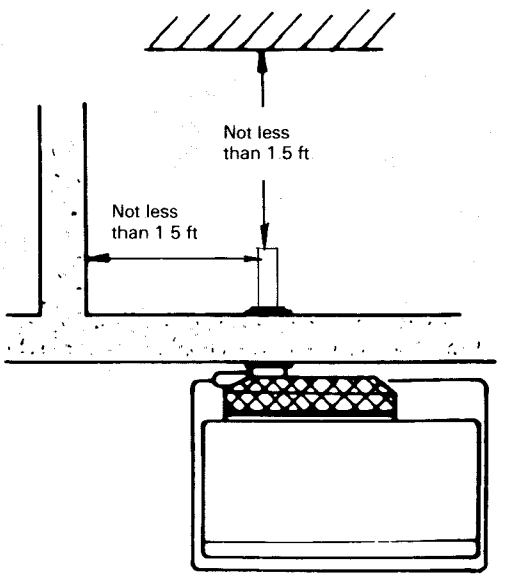


Fig. 3

3. For standard installation, use the template enclosed with the heater to position the hole for the standard flue pipe. Tack or tape template to the wall at the desired position (See Fig. 4).

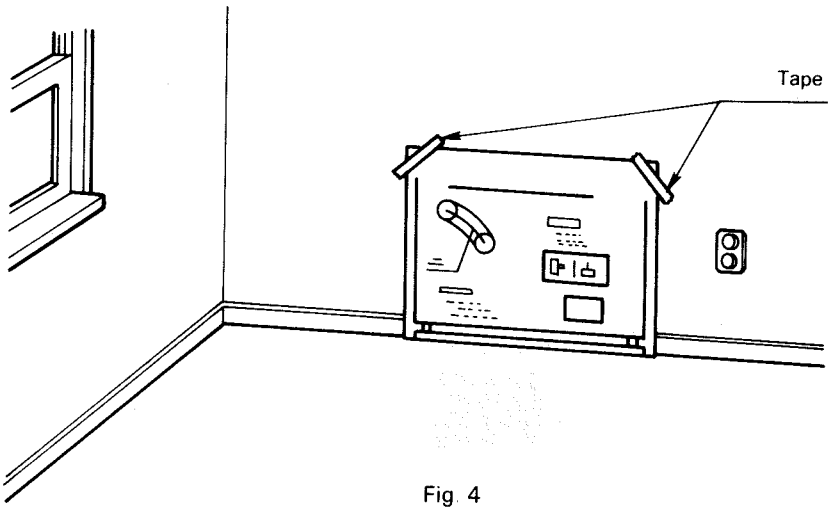


Fig. 4

NOTE: Heater should be installed on a sturdy floor. Should be level and flat.

NOTE: The template can be adjusted for use of non-standard installations such as the installation of the extension pipe kits.

4. Cut the hole for the standard flue pipe from inside the room. Use a 3-1/2" diameter hole saw attached to an electric drill (See Fig. 5). The opening on the inside wall should be slightly higher than the outside opening (approximately 1/2") so that the wall sleeve and the standard flue pipe will slope slightly downward (approximately 3 degrees) after it is installed (See Fig. 6). This will enable the draining of condensed moisture from the standard flue pipe to the outside and prevent rain or snow entering from outside after installation.

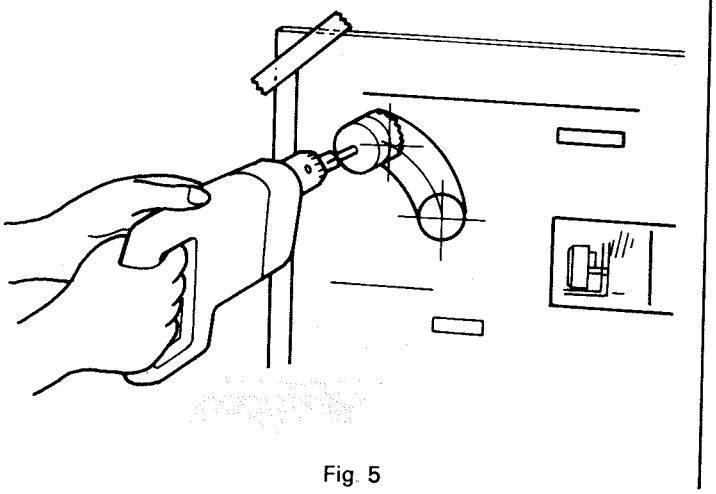


Fig. 5

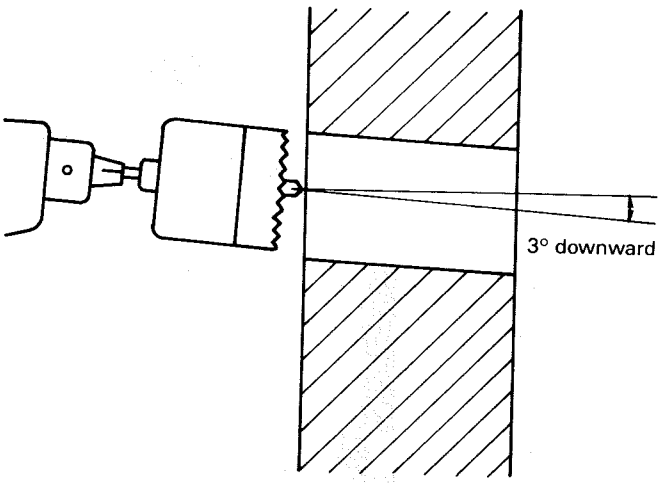


Fig. 6

NOTE: After the cutting of the hole is completed, remove the template from the wall.

5. a. Install the inner sleeve flange and the flange gasket to the wall sleeve and insert the wall sleeve through the wall hole from inside the room. Make sure the arrow on the inner sleeve flange is pointing up. Secure the inner sleeve flange to the wall with the three wood screws provided with the heater (See Fig. 7).

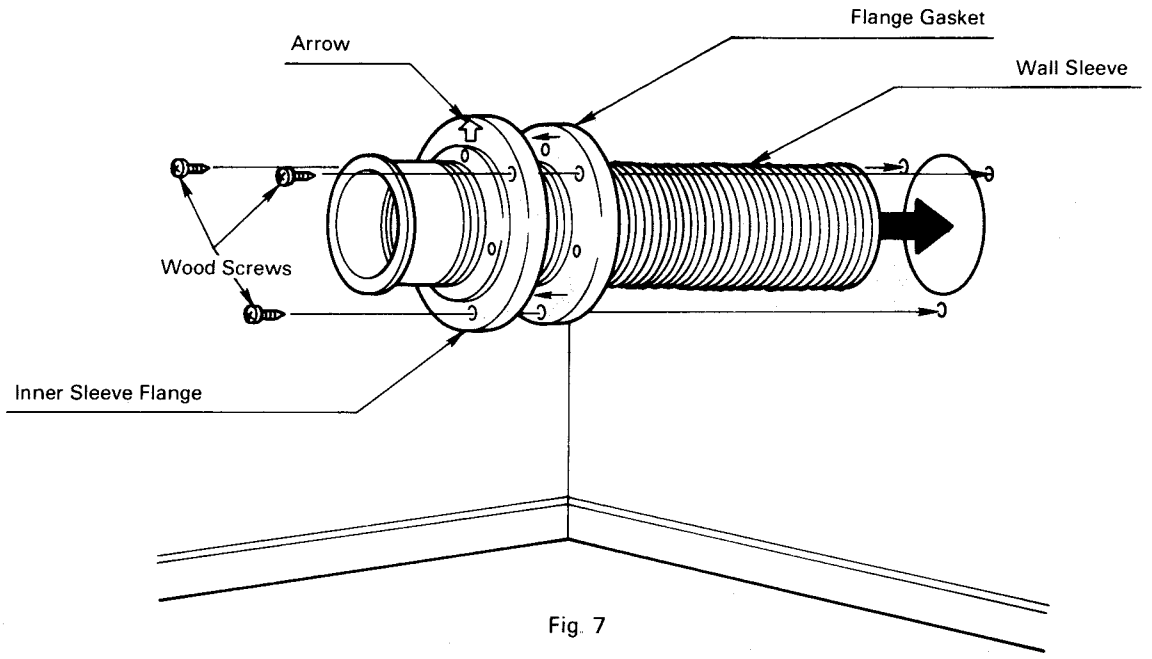


Fig. 7

b. From outside, install the outer sleeve flang and the flange gasket to the wall sleeve. Secure the wall sleeve and the outer sleeve flange tightly with the sleeve nut. Make sure arrow on the outer sleeve flange is pointing up (See Fig. 8).

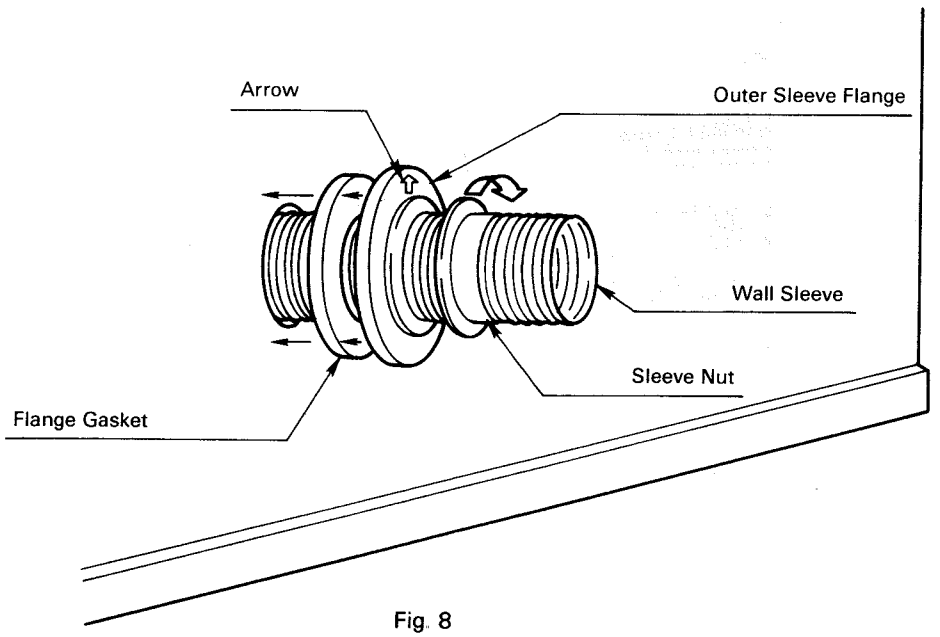


Fig. 8

6. From inside the room, insert the standard flue pipe with gasket attached through the wall sleeve. Secure the standard flue pipe to the inner sleeve flange with the three machine screws provided with the heater (See Fig. 9).

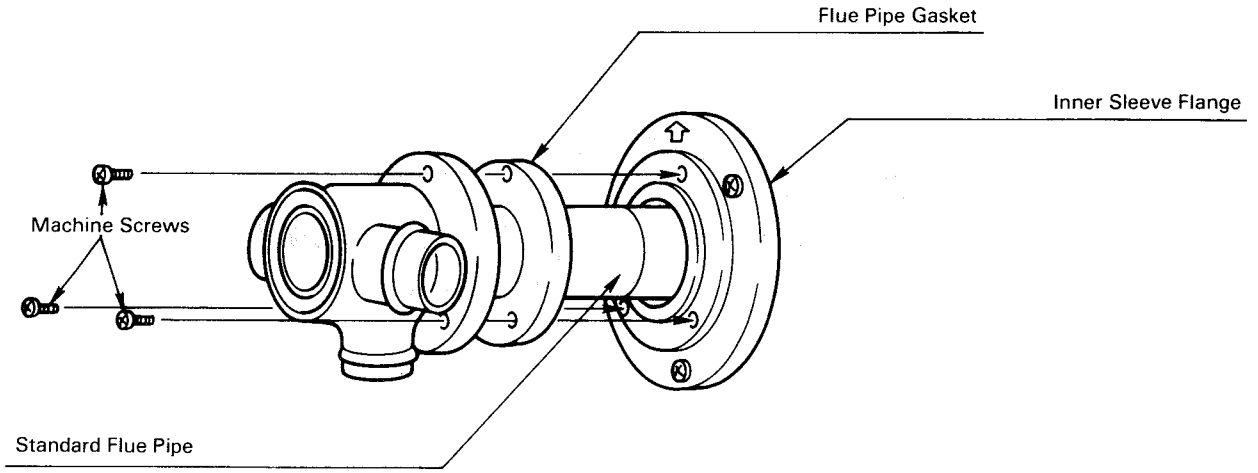


Fig. 9

NOTE: Make sure the standard flue pipe slopes slightly downward after it is installed. This will enable the draining of condensed moisture from the standard flue pipe to the outside and prevent rain or snow entering from outside after installation.

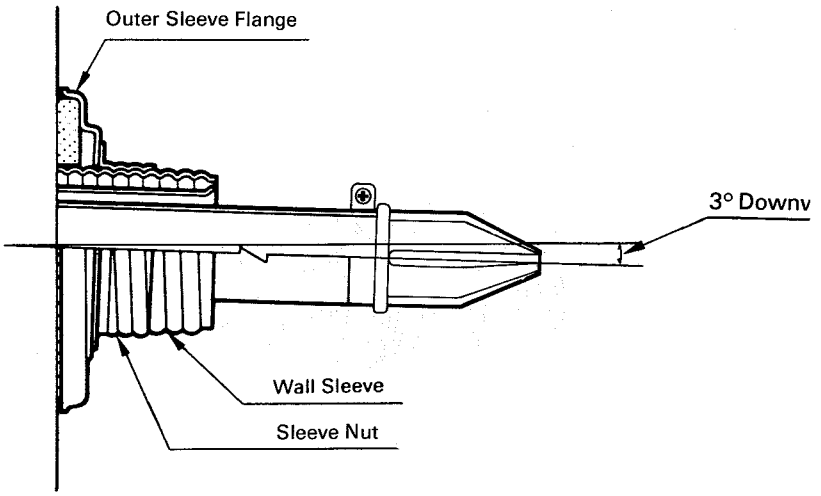


Fig. 10

7. Insert the bent joint to the exhaust mouth of the standard flue pipe. Cut the inlet hose for desired length if necessary. Attach the L-shaped hose to each end of the inlet hose and attach the L-shaped hose to the intake mouth of the standard flue pipe. Secure the L-shaped hose to the intake mouth with the hose band. Plug the unused exhaust and intake mouth with the caps provided with the heater. Make sure the caps fit tightly onto the mouth (See Fig. 11).

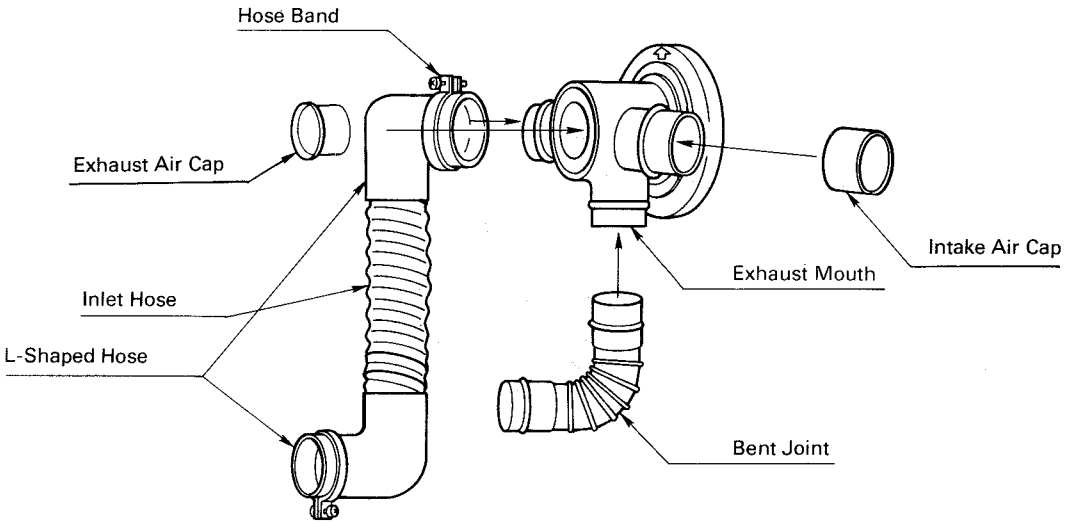


Fig. 11

NOTE: If the inlet hose is not smoothly inserted into the L-shaped hose, apply water or soap suds to the inlet hose.

8. Move the heater into position. Connect the bent joint to the exhaust outlet mouth (upper opening) and attach the L-shaped hose to the intake inlet mouth. Make sure all connections are tight (See Fig. 12).

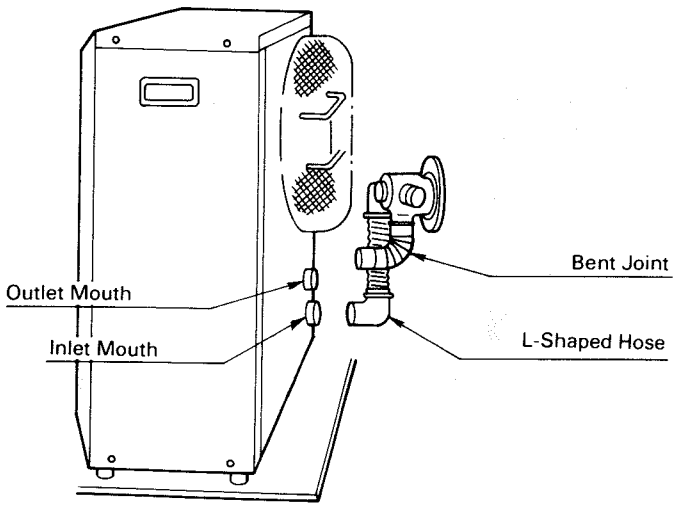


Fig. 12

19. Secure the L-shaped hose to the intake inlet mouth with the hose band. Secure the bent joint to the standard flue pipe with the pipe holder (If the extension pipe is used, also attach the pipe holder to the connection of the bent joint and the extension pipe). Secure the bent joint (or the extension pipe) to the exhaust outlet mouth by sliding the pipe stopper in the exhaust mouth bracket (See Fig. 13).

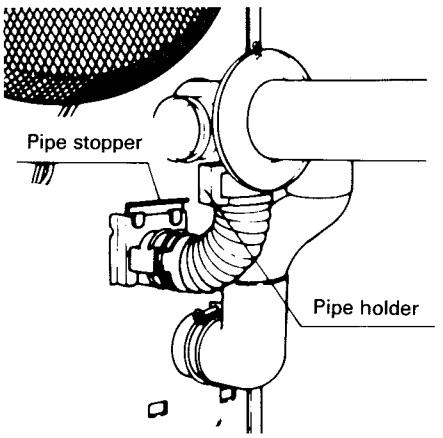
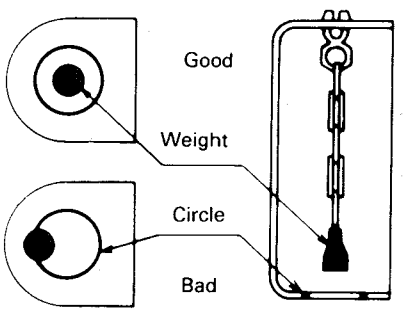


Fig. 13

10. Make sure the position of the heater is level by using the plumb bob located at the right side of the heater. The plumb bob weight should be within the circle. If the plumb bob weight is not within the circle, adjust the heater legs until the plumb bob weight is within the red circle (See Fig. 14 & 15).



Plumb bob as viewed from above

Fig. 14

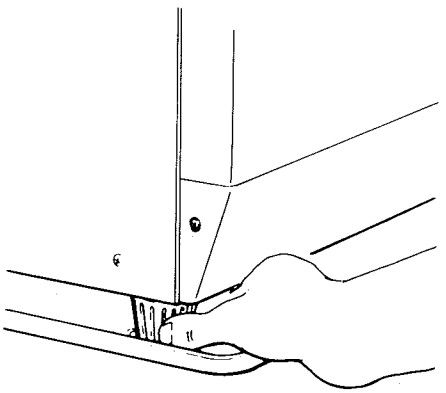
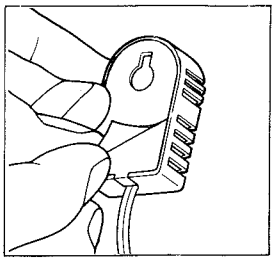


Fig. 15

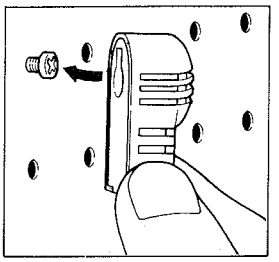
11. A room temperature sensor is provided with approximately 8 feet long extension wire. It is located on the rear of the cabinet. Make sure that the extension wire is not touching the exhaust pipe. The room temperature sensor can be installed either with the self adhesive tape on the back or with a wood screw provided with the sensor depending on the type of surface chosen for installation.

Note: Choose a location for the sensor that is not in the path of direct sunlight, drafts or the flow of warm air from the heater.

(a) Self Adhesive Tape
Peel off the protective tape on the back of the sensor and expose the adhesives. Place the sensor on the desired location on the wall and press down.



(b) Wood Screw
Screw down the wood screw provided with the heater into the desired location on the wall. Hook the back of the room temperature sensor.



12. After installation is completed, secure heater to the wall with the wall brackets provided with the heater. Make sure the heater is parallel to the wall (See Fig. 16).

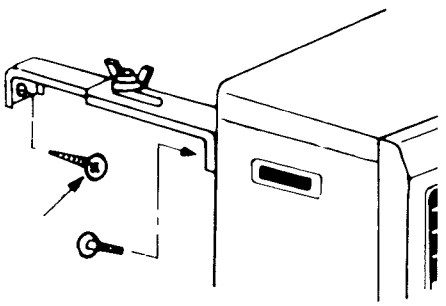


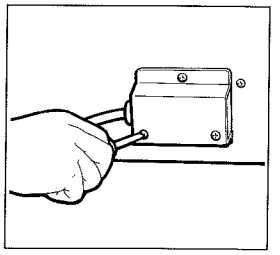
Fig. 16

13. Before ignition, recheck the following:
    a. All connections are tight and firm.
    b. The heater and the standard flue pipe areas are free of any materials.
    c. The heater is level and parallel to the wall.
    d. The exhaust and the intake holes of the standard flue pipe are fully exposed to outdoor air, but not protruded too far from the wall sleeve.

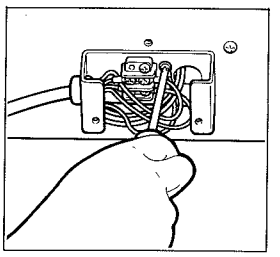
PERMANENT WIRING INSTALLATION

WARNING: MAKE SURE POWER SUPPLY CORD IS DISCONNECTED TO AVOID ANY ELECTRICK SHOCK BEFORE SERVICING. ELECTRIC SHOCK MAY CAUSE SERIOUS INJURY. INSTALLATION SHOULD BE CONDUCTED BY A LICENCED ELECTRICIAN.

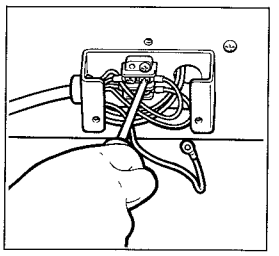
Step. 1. Disconnect power supply cord from power source. Remove three (3) screws and control box cover on the back of the heater.



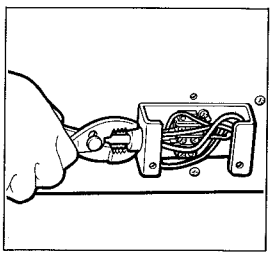
Step 2. Disconnect ground wire (green wire) from the power supply cord bracket.



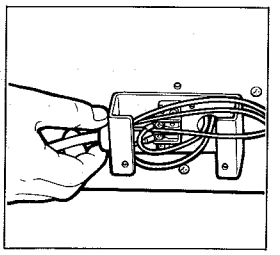
Step 3. Disconnect two power supply wires from right side of the terminal.



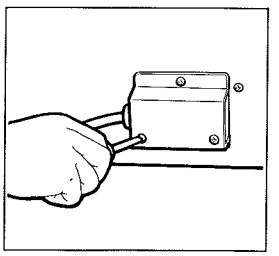
Step 4. Squeeze strain relief with the adjustable pliers to remove plastic bushing from the power supply cord bracket.
Remove the power supply cord.



Step 5. Insert the power supply cable from junction box and connect ground wire to the power supply cord bracket and power wires to the terminal.



Step 6. Affix the control box cover to the heater and insert screws.



SECTION J:
FUELING

WARNING: Use only water-clear No. 1-K kerosene. NEVER USE GASOLINE. Use of gasoline can lead to uncontrollable flames resulting in destructive fire.

Laser 73 FUEL SYSTEM OPTIONS

- **Large Capacity External Tank**

  Tank must be purchased separately and installed by a qualified fuel supply technician.

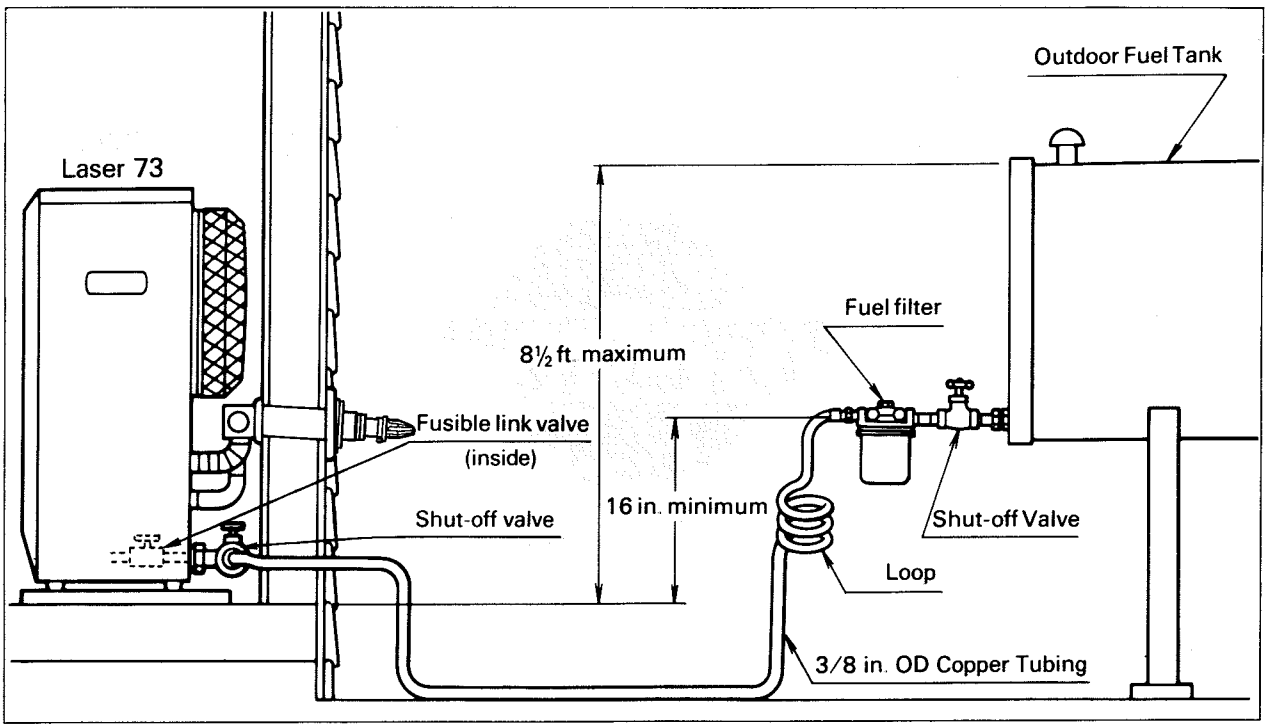
EXTERNAL TANK INSTALLATION

Note: External tank installation must comply with National Fire Protection Association Code NFPA 31 or locally applicable codes. Check with local building officials.

The following instructions should be followed for installation of a large capacity, gravity-fed external fuel tank.

- Installation height of tank's fuel outlet should be at least 16 in. above floor surface upon which heater rests.
- To avoid excess fuel pressure to heater, top of fuel tank should be no more than 8½ft. above floor surface upon which heater rests.
- Fuel tank should be located at least 6 ft. away from all heat sources.
- 3/8" OD copper tubing should be used for fuel line.
- To prevent air locks in fuel line, fuel line should be smooth with no U-shaped or sharp bends.
- Use of fuel filter in fuel line adjacent to tank is recommended, shut-off valves should also be installed on the fuel line and connected to the tank as shown below.

Note: An additional shut-off valve installed next to the exterior wall will minimize fuel to be drained should heater have to be disconnected. If the valve is on interior side, a fusible link type is recommended.



LIMITED WARRANTY

TOYOTOMI U S A., INC. ("TOYOTOMI") warrants each product and any parts thereof sold by it to be free from defects in materials or workmanship under normal use and service for TWELVE (12) MONTHS from the date of delivery to the original purchaser at retail subject to the following terms and conditions:

WHAT IS COVERED: Product or any parts thereof which are defective in materials or workmanship

WHAT IS NOT COVERED:

(1) This warranty does not extend to any defect due to the negligence of others; failure to install, operate or maintain unit in accordance with installation instructions (operating and maintenance instructions are furnished with each new unit); unreasonable use; accidents; alteration, use of unauthorized or non-standardized Toyotomi parts and accessories; electrical malfunction, i e , as resulting from power surges, short circuit, etc ; incorrect installation; use of any fuel other than that specified in owners manuals; or repair by anyone other than a service facility specified by Toyotomi

(2) Normal wear and tear of parts, including wicks, batteries, igniter coils and siphons, cutting blades, hoses, cables, burner mats and accessories

(3) This warranty does not cover shipping costs

WHO IS COVERED: The original purchaser at retail

WHAT WE WILL DO: TOYOTOMI will either repair or replace, at its option, all defective parts free of charge that are covered by this limited warranty on a carry-in basis, to your nearest authorized dealer or distributor of TOYOTOMI

WHAT YOU MUST DO FOR WARRANTY SERVICE: You must return the defective Product or part to any authorized dealer or distributor of TOYOTOMI with this LIMITED WRRANTY and a copy of your bill of sale or credit card charge receipt or other document evidencing the date of the Product's delivery. If service is not available locally, please contact our CUSTOMER RELATIONS DEPARTMENT at:

TOYOTOMI U S A., INC.
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NOTE: An extended warranty period of 36 months is offered for vented heaters only. This coverage is limited to the combustion assembly, specifically the burner pot, radiant chamber and heat exchanger. The remainder of vented heater is subject to 12 months.

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TOYOTOMI U.S.A., INC.
P.O. Box 176, Brookfield, CT 06804-0176

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