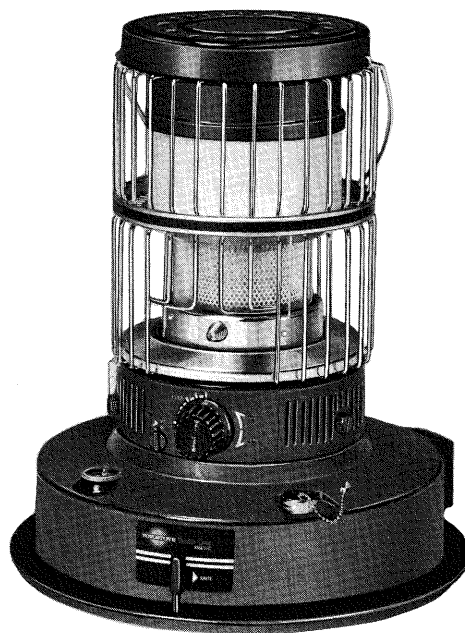




# PORTABLE KEROSENE HEATER

## OPERATION AND MAINTENANCE INSTRUCTION

MODEL **KRA-105**



FOR SAFE AND EFFICIENT OPERATION OF YOUR TOYOSTOVE™ PORTABLE HEATER,  
PLEASE READ THE FOLLOWING INSTRUCTIONS CAREFULLY.

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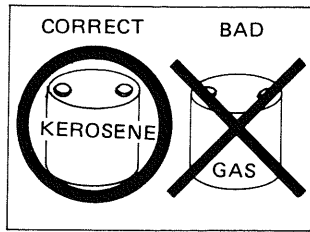
# SAFETY TIPS

BEFORE OPERATING YOUR HEATER, PLEASE REVIEW THESE THESE SAFETY TIPS:

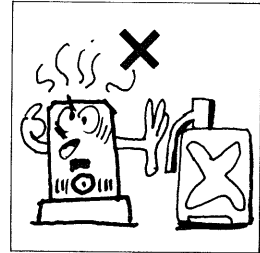
## — WARNING —

### RISK OF EXPLOSION

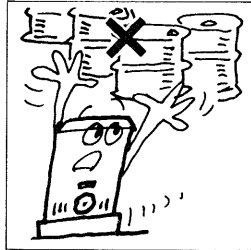
- Never use any fuel other than pure kerosene (ASTM 1K or equivalent).  
Never use gasoline.



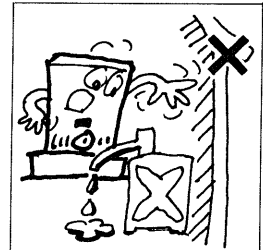
- Never refill heater fuel tank when heater is operating or still hot.



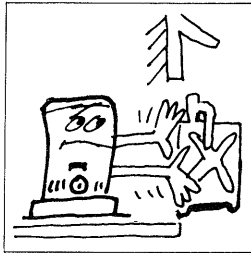
- Never use heater in areas where flammable vapors or gases may be present.



- Never fill heater fuel tank in living space. Fill heater tank outdoors. Never overfill your heater. Always replace heater tank cap securely after refueling.

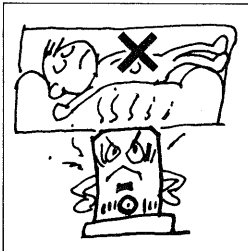


- Never store kerosene in any container other than an approved safety can or store kerosene in living space.

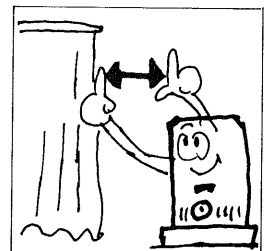


### RISK OF BURNS, OR FIRE

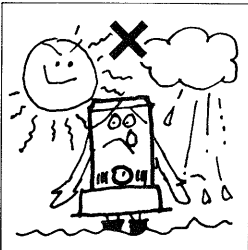
- Due to high surface temperatures, keep children, clothing and furniture away.



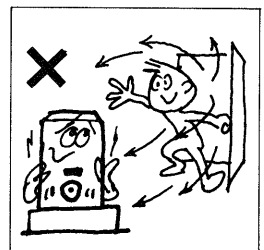
- Do not operate heater less than three (3) feet from walls, draperies, clothing, or furniture.



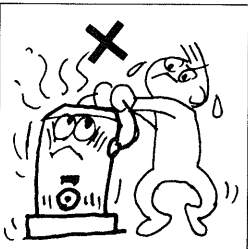
- Do not operate your heater in areas exposed to strong drafts.



- Do not operate your heater in high traffic areas such as doorways or hallways where it may be touched, jarred, or tipped accidentally.



- Do not move, fuel, or attempt to service your heater while it is burning, or still hot.



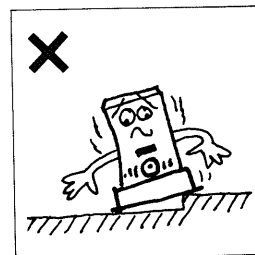
# RISK OF ASPHYXIATION

- Use heater only in well ventilated areas.

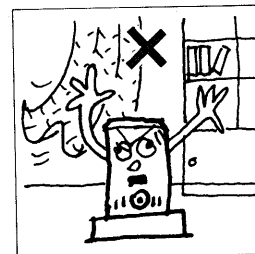
*"In a house of typical construction, that is, one that is not of unusually tight construction due to heavy insulation and tight seals against air infiltration, as adequate supply of air infiltration, an adequate supply of air for combustion and ventilation is provided through infiltration. However, if the heater is used in a small room where less than 200 cubic feet (5.7 m<sup>3</sup>) of air space is provided for each 1000 Btu per hour of heater rating (considering the maximum burner adjustment), the door(s) to adjacent room(s) should be kept open or the window to the outside should be opened at least 1 inch (25.4 mm) to guard against potential buildup of carbon monoxide. Do not use the heater in a bathroom or any other small room with the door closed."*

## SAFE LOCATION AND USE

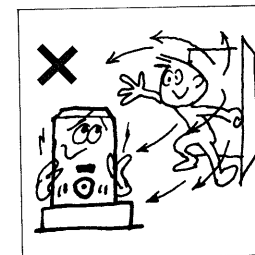
1. Always keep heater level. To help you do so, a "plumb bob" is attached to the side of the heater. Always observe it when you place the heater in a new location. (See item 2, page 6)



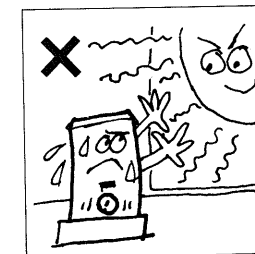
2. Keep heater at least three feet away from all combustible materials such as clothing, curtains, furniture, etc.



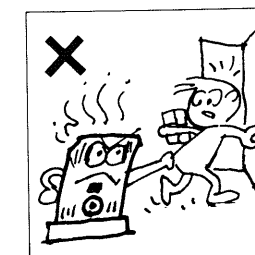
3. Do not operate your heater in areas where it will be exposed to strong drafts. Strong drafts can cause the flame to be unstable and the heater to be less efficient.



4. Do not operate heater in direct sunlight to avoid overheating, causing abnormal flame behavior. When room temperature goes above a level comfortable to you, open the door to the rest of the house, or turn heater down. Do not allow room temperature in the room to go above 80° - 85°F.



5. Before going out or at bedtime, turn the heater off, make sure the wick is in its lowest position (see Extinguishing the Flame on page 9 ), and flame is completely extinguished.



# SPECIFICATIONS

MODEL	KRA-105
HEAT RATING*	17,500 BTU/hr.
FUEL TANK CAPACITY	1.95 Gallons
BURNING TIME/TANK	15 hours at 17,500 BTU/hr.
SIZE (WxHxD)	18-5/8"x21-5/8"x18-5/8"
WEIGHT	25.4 lbs., empty
WICK ADJUSTER	3-step
EXTINGUISHER	Automatic, Manual
IGNITER	Automatic, powered by two (2) "D" size batteries

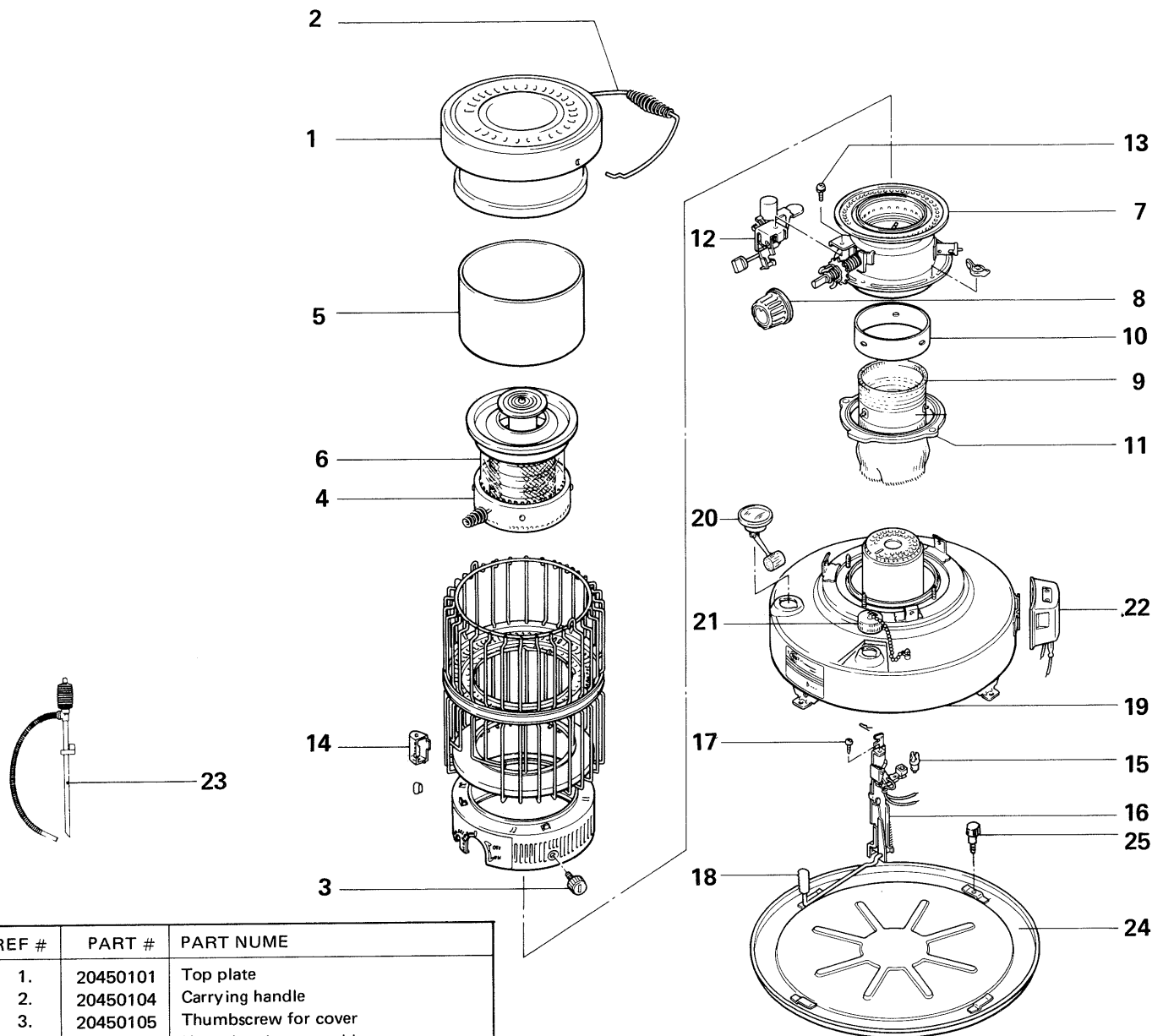
## \*Matching Room Size to HEAT RATING

- Because the "Heat Load" of an area to be heated is influenced by so many factors, it is impossible to specify a heater output to an exact room size.
- If you use a heater too large for the area to be heated, the temperature you desire will be reached quickly. In such cases, to avoid overheating the area, the heater must be turned off frequently, or doors opened to other areas of the house, or windows to the outside opened to cool the area.
- If you use a heater too small for the area to be heated, it will take much longer to reach the desired temperature, in fact it may not be reached at all depending on the outside weather conditions.
- As a "rule of thumb", the following can be given as a guide:  
If you live in an area of the country exposed to severe winter temperatures, multiply the primary area (in square feet) to be heated by 24 BTU/ft<sup>2</sup>/hr, if you live in a moderate climatic area, multiply the primary area (in square feet) by 12 BTU/ft<sup>2</sup>/hr.

# OUTSTANDING FEATURES AND BENEFITS

- **AUTOMATIC EXTINGUISHER:** Automatically extinguishes the flame if heater is jarred or tipped. Extinguisher can also be activated manually in emergency situation.
- **FUEL FEED:** Fuel is fed to the flame through the wick. The fuel is not under pressure therefore, if the flame goes out, the fuel flow stops.
- **LOW CENTER OF GRAVITY:** The heater is designed such, that the weight is concentrated in the base making accidental tipover difficult, if not impossible.
- **DOUBLE TANK CONSTRUCTION AND SPECIAL OIL RESISTANT SEALS:** Minimize leakage of fuel in case of accidental tipover.
- **HEAVY ZINC COATING OF FUEL TANK:** Prevents corrosion when water is present in the fuel.
- **HIGH EFFICIENCY:** The unique "Double Clean<sup>TM</sup>" combustion system increases combustion efficiency, thereby greatly reducing unwanted combustion products.
- **EASY MAINTENANCE:** No tools are required to change the wick, or perform other maintenance operations.
- **DUAL BURN CHAMBER:** Provides more efficient combustion and wide adjustment range of heat output.
- **THREE STEP WICK ADJUSTER:** Helps maintain good wick performance and extends useful wick life.

# COMPONENT PARTS



REF #	PART #	PART NAME
1.	20450101	Top plate
2.	20450104	Carrying handle
3.	20450105	Thumbscrew for cover
4.	20450108	Heat chamber assembly
5.	20450109	Upper glass cylinder
6.	20450110	Lower glass cylinder
7.	20450111	Wick adjuster with pendulum assembly
8.	20450112	Wick adjuster knob
9.	20450113	Glass fiber wick
10.	20450114	Wick sleeve
11.	20450115	Rubber packing
12.	20450116	Pendulum assembly
13.	20450017	Screw for pendulum assembly
14.	20450007	Plumb bob
15.	20450018	Igniter coil
16.	20450119	Igniter unit
17.	20450120	Screw for igniter unit
18.	20450121	Igniter lever
19.	20450122	Fuel tank assembly
20.	20450123	Fuel gauge
21.	20450124	Fuel tank cap
22.	20450127	Battery holder
23.	20450028	Manual fuel siphon
24.	20450129	Drip tray
25.	20450130	Thumbscrew for drip tray

You should register heater's serial number.  
The serial number is located on the outside surface of fuel tank or cabinet.  
You need replacement parts or service in the future, reference to this number will assure you of obtaining the proper parts quickly.

Your heater's serial number

SERIAL NO.

# ASSEMBLY AND OPERATION

## INSPECTION AND ASSEMBLY

**NOTE:** Please save the shipping carton and packing materials for future storage of your heater.

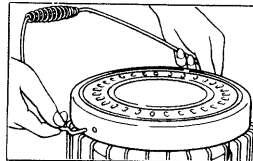
### 1. REGISTRATION CARD

Take out the registration card from the shipping carton and fill it out and mail it as soon as possible.

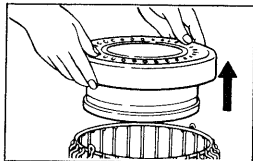
### 2. REMOVE PACKING MATERIALS

Remove all packing materials from your heater.

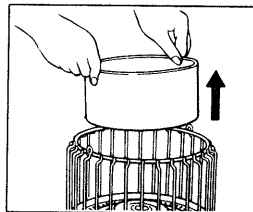
- a. Spread the sides of the heater's carrying handle, and lift it away.



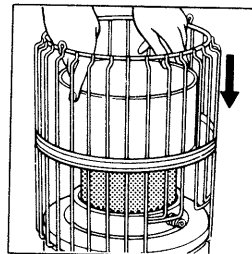
- b. Lift off the top plate.



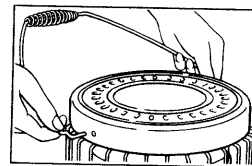
- c. Remove the upper glass cylinder and packing material.



- d. Replace the upper glass cylinder.



- e. Replace the top plate and carrying handle.

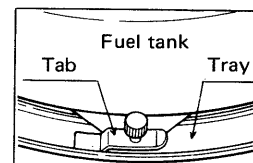


### 3. INSTALL THE DRIP TRAY

**NOTE:** DO NOT operate your heater without the drip tray.

Place the drip tray on the floor. Remove the thumbscrew:

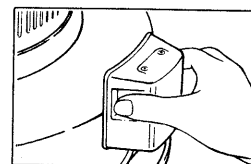
- Place the heater onto the drip tray so the four (4) feet of the heater are next to the four (4) tabs on the tray.
- Turn the heater clockwise until the feet slide into their tabs.
- Replace the thumbscrew to secure the tray.



### 4. INSTALL THE BATTERIES

Locate the battery holder on the back of your heater. Slide it up, slowly—to avoid damaging the wires.

- Insert the two "D" size batteries according to the plus (+) and minus (—) markings inside the holder.
- Slide the battery holder back in place.



### 5. TIGHTEN COVER THUMBSCREWS

Tighten the three (3) LARGE thumbscrews around the heater cover above the fuel tank.

# FUELING

## WARNING: RISK OF EXPLOSION

*Never use any fuel other than pure kerosene (ASTM 1K or equivalent). Never use gasoline. Never refill heater fuel tank when heater is operating or while still hot. Never use heater in areas where flammable vapors, or gases may be present. Never fill heater tank in living space. Fill heater tank outdoors. Never store kerosene in any container other than an approved safety can or store kerosene in the living space. Never store kerosene in same area where gasoline is stored.*

### 1. INSERT THE SIPHON

Insert the straight tube of the siphon into the kerosene container. Remove the fuel tank cap on the heater, and insert the siphon's flexible hose into the fuel tank opening. To hold the hose in place, and reduce the possibility of a spill, push it over the wire guide inside the tank.

### 2. CLOSE THE AIR VENT

Turn the air vent knob on the top of the siphon clockwise to close the air vent.

### 3. SIPHON THE FUEL

To start the flow of kerosene, squeeze the bulb of the siphon vigorously 6 or 7 times. Once the flow begins, it is no longer necessary to squeeze the bulb.

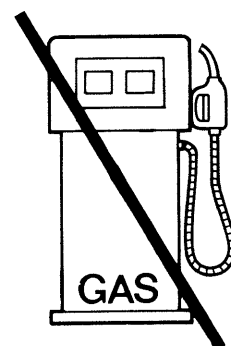
**NOTE:** To avoid overfilling the tank, watch the fuel gauge. As the indicator enters the red zone, stop the flow by turning the air vent knob counterclockwise. (Be especially careful to avoid overfilling the tank with very cold kerosene otherwise overflow of the fuel tank might occur when the fuel warms up.)

### 4. REPLACE THE FUEL TANK CAP

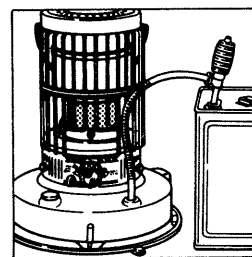
### 5. SATURATE NEW OR DRY WICK

If your wick is new, or if the heater has been empty for some time, the wick should be turned to its lowest position and allowed to saturate with kerosene.

To lower the wick, turn the wick adjuster knob counterclockwise until it stops. Wait approximately 30 minutes before lighting the heater.



USE KEROSENE ONLY



# CHECK BEFORE LIGHTING

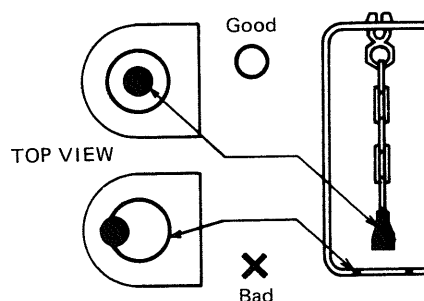
### 1. LOCATE YOUR HEATER AWAY FROM WALLS

Allow at least 3 feet or clearance between the heater and walls, curtains, shelving or other combustible materials.

### 2. LEVEL THE HEATER

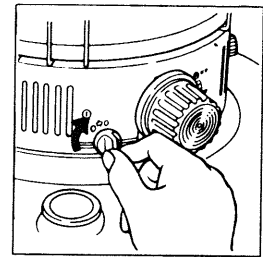
The heater should be operated on a firm, level floor. A built-in level indicator is located on the left side of the heater. When the heater is level, the end of the chain will lie approximately in the center of the red circle.

**NOTE:** If your heater is not level, change locations. Do not prop it with books or other objects.



### 3. ENGAGE THE AUTOMATIC EXTINGUISHER

Engage the automatic extinguisher by turning the set knob clockwise into vertical position.



## VENTILATION

### WARNING – RISK OF ASPHYXIATION

*"In a house of typical construction, that is, one that is not of unusually tight construction due to heavy insulation and tight seals against air infiltration, an adequate supply of air for combustion and ventilation is provided through infiltration. However, if the heater is used in a small room where less than 200 cubic feet (5.7 m<sup>3</sup>) of air space is provided for each 1000 Btu per hour of heater rating (considering the maximum burner adjustment), the door(s) to adjacent room(s) should be kept open or the window to the outside should be opened at least 1 inch (25.4 mm) to guard against potential buildup of carbon monoxide. Do not use the heater in a bathroom or any other small room with the door closed."*

The heat output of the KRA-105 is too high for small rooms such as bathrooms. Its use in such small areas is not recommended. Should it be necessary for it to be used in such as area temporarily, be sure a door to an adjoining room, or hallway is open.

### AVOID DRAFTS

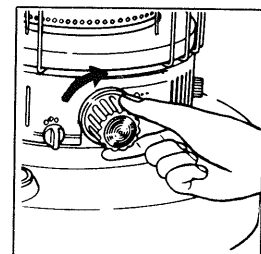
Do not operate your heater in drafty areas or locations where opening doors may create gusts of air. Drafts or strong air current may make flame unstable and affect heater performance.

## LIGHTING

**NOTE:** When you first use your new heater, ignite it out of the living area of your house, either in a garage or an area outside protected from strong drafts. Burn it for about 15 minutes to remove all of the protective oil present on the burner parts. If this 15 minutes "burn-in" is done inside, some objectionable odor will be observed. This procedure is necessary **ONLY THE FIRST TIME** you ignite your heater.

#### 1. RAISE THE WICK

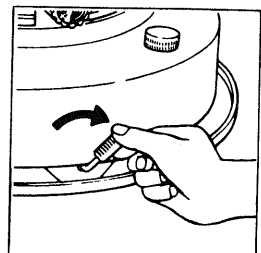
Turn the wick adjuster knob clockwise until it stops. As the wick rises within the heater, the wick adjuster knob turns with some resistance and makes a sound like the winding of a clock. Once the wick has reached its proper height, the automatic extinguisher is fully engaged. The wick adjuster knob can now move freely left or right to adjust the flame.



#### 2. AUTOMATIC LIGHTING

Push the igniter lever gently to the right and down, the igniter coil should glow and touch the wick.

When flame appears, release the igniter lever.



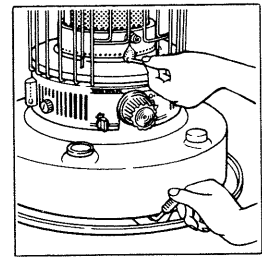
**NOTE:** If you have difficulty igniting wick, let up on the igniter lever very slightly to remove the igniter coil from direct contact with the wick.



### 3. LIGHTING WITH A MATCH

You should not have to light the heater with a match, but should it become necessary, push the igniter lever and touch the match to the top of the wick. Do not allow burned parts of the match to fall or remain on the wick.

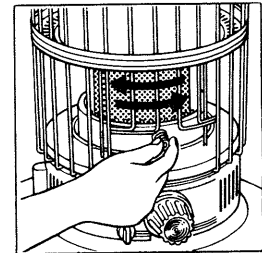
**NOTE:** To restore your heater to automatic lighting, check for weak or dead batteries or a defective igniter, as described on Page 13.



### 4. POSITION THE HEAT CHAMBER

Center the wire handle in the opening. Be sure that by moving the wire handle left and right, the heat chamber moves easily. This means that the heat chamber is properly seated.

**NOTE:** An improperly seated heat chamber will produce a high smokey flame and may cause smoke damage to your house, furnishings, and to the heater itself. Always observe the flame for 3-5 minutes after lighting to be sure it is burning properly.



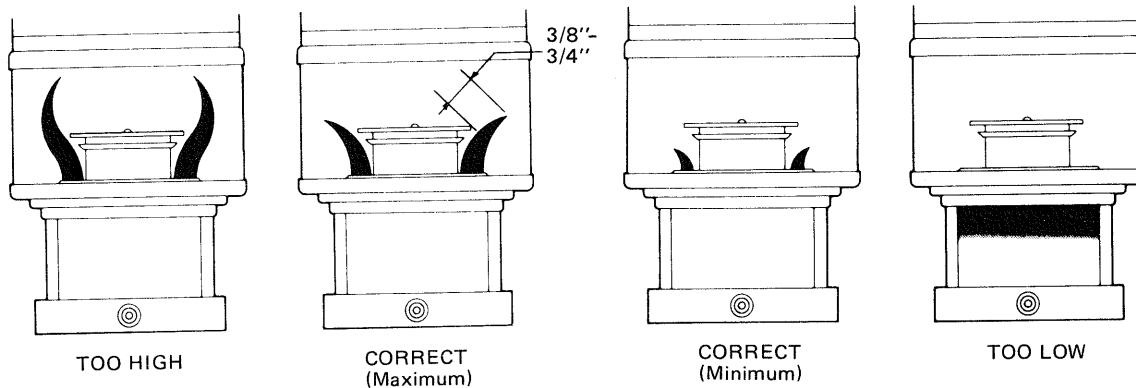
## ADJUSTING THE FLAME

### 1. WAIT FOR THE HEAT CHAMBER TO REACH OPERATING TEMPERATURE

Several minutes after lighting, flame will reach the top of the heat chamber.

### 2. CHECK THE FLAME LENGTH

Look at the flame and check its length. It should project at least 3/8-inch beyond the top disk of the heat chamber. While the flame length may vary around the circumference of the disk, the average should be between 3/8-inch to 3/4-inch.



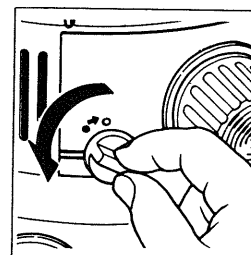
Adjust, if necessary, by turning the wick adjuster knob counterclockwise to lower wick or clockwise to raise it.

**NOTE:** Operating your heater with wick set TOO LOW will decrease efficiency. It could lead to soot build-up in heat chamber and severely deteriorate heater performance. When operating heater, be sure wick is high enough to keep the primary heat chamber heated to a uniform red glow from its top to bottom.

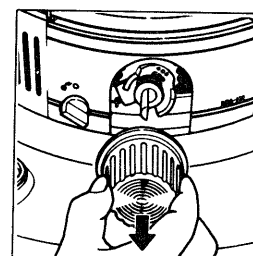
### 3. ADJUSTMENT OF MAXIMUM WICK HEIGHT

After using the heater over a long period of time, you may observe that the flame length in the heat chamber does not reach its normal level in several minutes after lighting. When this condition is observed, it means that the wick height needs adjusting using the unique 3-step adjuster.

To adjust the wick height using the 3-step mechanism, first release the automatic extinguisher by turning the set knob counterclockwise.

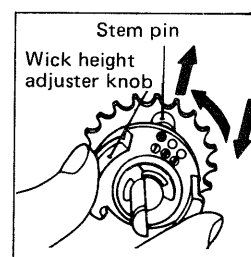


Pull the wick adjuster knob out completely (it can be removed completely from its shaft.)



The 3-step wick height adjuster, with three small holes marked ①, ②, and ③ can be seen. The stem pin is engaged in one of the holes. Pull the knob toward you and change the location of the pin from ① to ②, or from ② to ③. Each step from pin ① to ② will raise the maximum wick height by 2 mm per step. After this adjustment, replace the wick adjuster knob. Repeat Items 1-3 in the section titled "ADJUSTING THE FLAME".

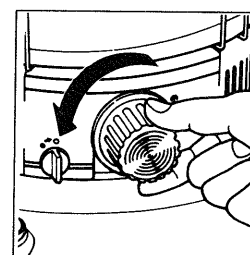
When suitable flame height can no longer be achieved even on pin position ③, it is time to clean or replace the wick. AFTER REPLACING THE WICK, CHECK THE OPERATION OF THE AUTOMATIC EXTINGUISHER BEFORE LIGHTING YOUR HEATER.



**NOTE:** Never use positions ② or ③ until position ① no longer gives adequate flame length.

## EXTINGUISHING THE FLAME

1. Turn the wick adjuster knob counterclockwise until it stops. This requires about a half turn. At this point, the flame is completely extinguished and the heater is off.



**NOTE:** DO NOT use the automatic extinguisher to routinely turn off the heater. Automatic extinguishing should occur only when the heater is jarred or tipped.

2. Look to make sure the flame is out completely.
3. Do not try to relight the heater for at least 3 minutes after extinguishing it off as this may cause smoke and odor.

# CARE AND MAINTENANCE

## CLEANING THE WICK

**NOTE:** Your heater is designed to be assembled and disassembled for maintenance without the use of tools.

### 1. WICK LIFE

With proper care, the wick in your heater should last at least one heating season. Using only fresh, clean kerosene to avoid the unnecessary accumulation of tar, and periodically allowing the wick to "burn dry" as described below, will prolong its life.

### 2. WICK CONTAMINATION

Signs that a wick needs attention are:

- accumulation of tar on its top edge.
- difficulty in turning the wick adjuster knob.
- a flickering dying or small flame.

### 3. BURNING DRY

When the fuel gauge shows empty, raise the wick to its highest position and allow the heater to operate until the flame goes out completely (about ½-hour after the flame disappears). This procedure burns the tar off the wick's edge and restores it to efficient operating condition, but does not harm the wick material.

**NOTE:** To avoid odor, the heater should be allowed to burn dry outdoors in a well-ventilated place.

### 4. REMOVING ASH, CINDERS, SOOT

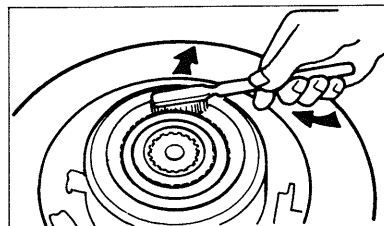
**WARNING:** Before beginning any further cleaning or maintenance, allow your heater to cool completely. Remove the batteries from the battery holder.

After the heater has cooled, remove the outer cover as described in Items 1 and 2 of the next section. Be sure the wick adjuster knob has been turned fully clockwise and the wick is in its highest position.

Remove any residue on the wick with a small nylon or plastic bristled brush. Working from bottom to top, and taking care not to fray the wick material, gently "comb" the bits of residue off the wick.

If the wick cannot be "combed" clean after burning your heater dry twice in a row, you probably need a new wick.

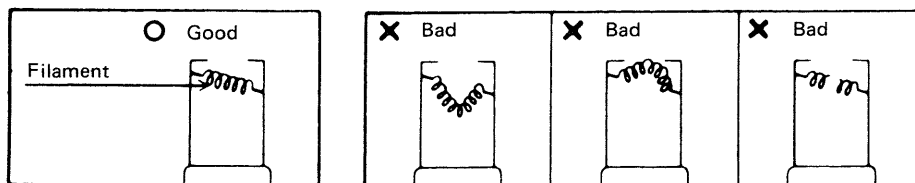
**CAUTION:** DO NOT brush back and forth across the wick. This procedure can damage the wick fibers.



Before reassembling the heater, take a few minutes to wipe the parts with a soft, cotton cloth. Loose cinders or soot may be brushed or vacuumed away. Reassemble the heater following directions in Item 7 of the next section.

# INSPECTION OF THE IGNITER COIL

If the wick does not ignite or it is hard to ignite, check if the igniter filament is broken.



If the igniter coil is found to be defective, replace it as described on page 13.

## REPLACEMENT OF PARTS

### REPLACING THE WICK

USE TOYOSTOVE™ REPLACEMENT WICK MARKED "KRA-105" TO OBTAIN PROPER PERFORMANCE.

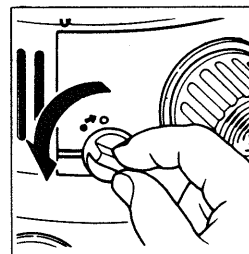
USE OF SUBSTITUTE WICKS CAN SEVERELY DAMAGE HEATER PERFORMANCE.

**NOTE:** Burning the old wick dry (see Item 3 under "Cleaning the Wick") before you remove it will eliminate most of the kerosene and make the wick easier to handle.

**WARNING:** Before disassembling your heater, allow it to cool completely. Remove the batteries from the battery holder.

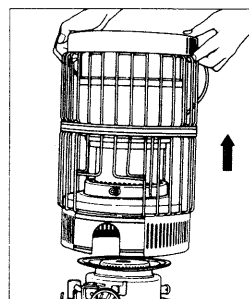
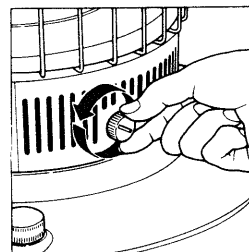
#### 1. RELEASE THE AUTOMATIC EXTINGUISHER

To release the automatic extinguisher, turn the set knob counterclockwise.



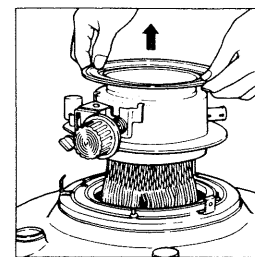
#### 2. REMOVE THE HEATER COVER

Remove the three (3) large thumbscrews holding the heater cover; lift off the carrying handle.



### 3. REMOVE THE WICK ADJUSTER ASSEMBLY

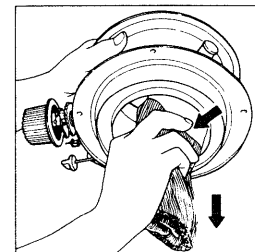
Remove the four (4) wing nuts around the wick adjuster assembly. Lift the assembly off the heater while moving it slightly back and forth.



### 4. REMOVE THE OLD WICK

Slide two fingers between the orange band on the wick and the silver wick sleeve attached to the wick adjuster. Lift the pins in the wick off the slots in the wick sleeve.

After lifting all three (3) pins off the slots, fold the wick and remove it. Leave the wick sleeve in place.

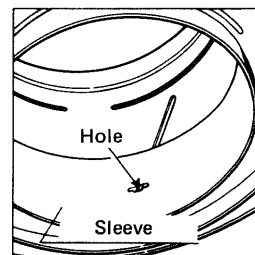


### 5. INSTALL THE NEW WICK

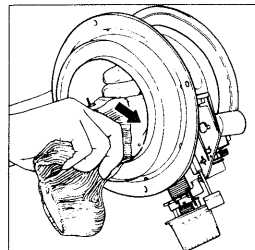
Use TOYOSTOVE™ replacement wick marked "KRA-105" to obtain proper performance. Use of substitute wicks can severely degrade heater performance.

Place the wick adjuster assembly on its side. Insure that the wick is in the wick adjuster with the three (3) holes in the section of the sleeve closer to the inside burn chamber.

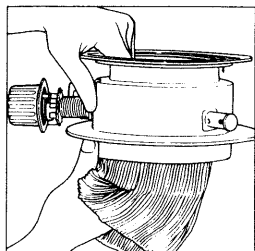
At this time, you must line up the three (3) openings in the wick adjuster: 1) the holes in the sleeve, 2) the diagonal slots in the fixed part of the wick adjuster, and 3) the slots in the moving part of the wick adjuster controlled by the wick adjuster knob.



Fold the new wick in quarters and insert it into the assembly. Place one of the pins in one of the lined-up openings. If you experience difficulty, gently turn the wick adjuster knob clockwise. Then place the two other pins, turning the wick adjuster knob if necessary. Do not bend the sleeve.



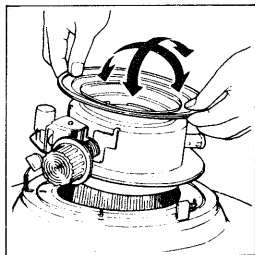
Finally, gently press the wick, all along its circumference, against the adjuster to insure that it is firmly in place.



### 6. REPLACE THE WICK ADJUSTER ASSEMBLY

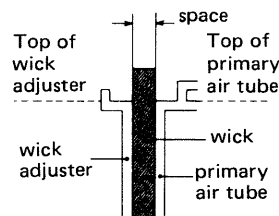
Lower the wick adjuster assembly into the fuel tank, guiding the tail of the wick so it fits over the primary air tube and evenly into place.

Point the wick adjuster shaft to the front of the heater. Insure that the wick adjuster is centered over the studs on the fuel tank.

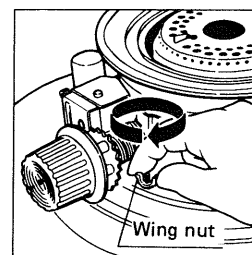


A. The space between the wick adjuster and the primary air tube should be even all around.

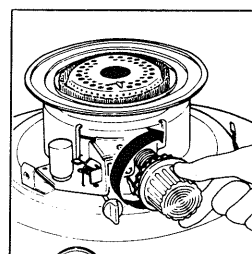
B. Make certain the top of the wick adjuster and the top of the primary air tube are the same height. If they are uneven, the flames tend to be uneven, too.



Tighten the four (4) wing nuts around the wick adjuster assembly.

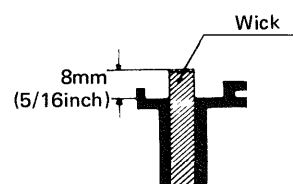


Insure that the wick moves smoothly up and down. Engage the automatic extinguisher reset knob by turning it clockwise. Turn the wick adjuster knob clockwise to raise the wick. Then turn it back and forth to observe the movement of the wick. If the wick does not move smoothly and easily, do not use heater. Disassemble and repeat Items 5 and 6. Wick height on position ① of 3-step wick adjuster should be 8 mm (5/16 in.) when wick adjuster knob fully clockwise. Please check.



**AFTER REPLACING THE WICK, CHECK THE OPERATION OF THE AUTOMATIC EXTINGUISHER.**

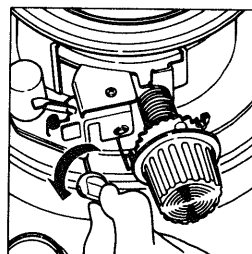
**NOTE:** Be careful to trim ONLY stray fibers. DO NOT cut the body of the wick.



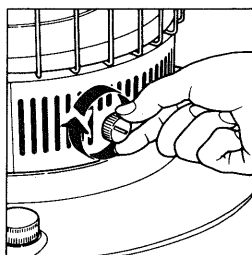
**NOTE:** Remember always start new wick on position ① of 3-step wick adjuster.

#### 7. REASSEMBLE THE HEATER

Replace the heater cover; replace and tighten the three (3) LARGE thumbscrews. Replace the batteries in the battery holder.



**NOTE:** Before lighting a new wick for the first time, turn the wick to its lowest position. Allow the wick to saturate with kerosene for 30 minutes.



## REPLACING THE IGNITER COIL

**WARNING:** Before replacing the igniter coil, allow the heater to cool completely.

#### 1. FIRST CHECK THE BATTERIES

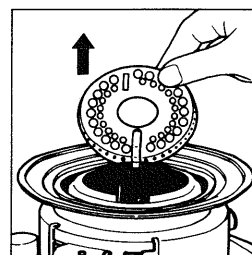
When the igniter coil no longer glows sufficiently to light the wick, replace the batteries. If proper glow is not restored, the igniter coil may be defective.

#### 2. CHANGE THE IGNITER COIL

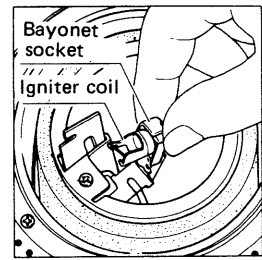
Remove the batteries from the battery holder.

Disassemble the heater as described in Items 1 and 2 of the preceding section.

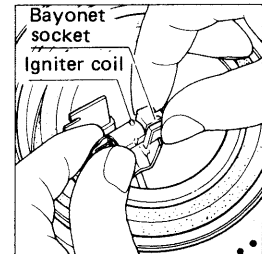
Remove the small spring clip on top of the igniter cover, lift the cover out of the way.



Push the igniter lever to raise the igniter coil into view.

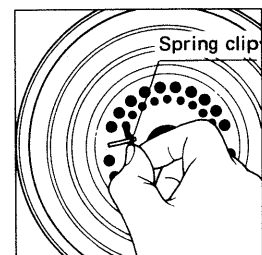


Note that the igniter coil fits into the bayonet socket the same way a flash-light bulb fits into its holder. To remove the igniter coil, push it in and twist it in either direction while holding the sides of the socket with your other hand. Install the new igniter coil by pressing it into the socket and turning.



Replace the igniter cover and small spring clip.

Reassemble the heater as described in Item 7 of the preceding section.



## STORAGE

At the end of each heating season, or when you do not plan to use your heater for an extended period of time, the following items are recommended:

### 1. CLEAN THE WICK AND HEATER

Follow directions in Items 3 and 4 under "Cleaning Wick".

### 2. DRAIN THE FUEL TANK

After you have burned your heater dry, a small amount of kerosene will remain in the fuel tank. It should be removed in order to avoid contamination when the heater is refueled at a later date. To do this, remove the fuel cap, tip the heater toward you and insert a small syringe into the bottom-most portion of the fuel tank. Empty the tank completely before storing.

### 3. REMOVE THE BATTERIES FROM THE BATTERY HOLDER

### 4. STORE THE HEATER

The original shipping carton is the best place to store your heater. If you do not have the original packing materials, cover the heater with a large plastic bag and store in a place that is low in humidity.

# FUEL GUIDE

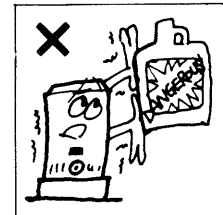
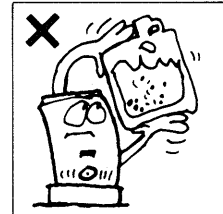
## What to Buy . . .

**ALWAYS :** Crystal clear, colorless, high quality KEROSENE, ASTM 1K or equivalent.

**ALWAYS :** Kerosene free of contaminants, water or cloudiness.

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

**NEVER :** Yellow or sour-smelling fuel.

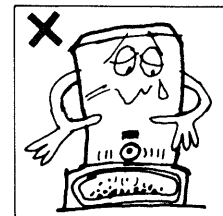
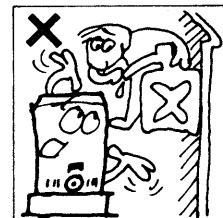


## HOW to Use It . . .

**ALWAYS :** Fill heater away from living quarters when heater is cool; use siphon.

**ALWAYS :** Check wick frequently for tar build-up. (Rapid, heavy build-up may indicate poor quality or deteriorated fuel.)

**ALWAYS :** Watch fuel gauge to avoid over-filling heater.



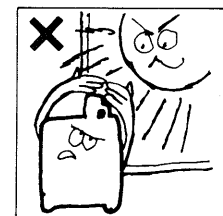
## How to Store It . . .

**ALWAYS :** In a clean container, clearly marked KEROSENE.

**ALWAYS :** AWAY FROM direct sunlight, heat sources or extreme temperature changes.

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

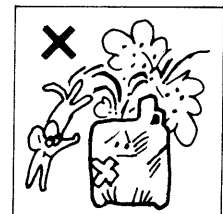
**NEVER :** For longer than 6 months. (Begin each heating season with fresh kerosene; discard at the end of the season.)



## Why is It Important . . .

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

- Excess tar deposits on the wick.
- Reduce wick life.
- Odor, smoke.
- Difficulty in igniting or extinguishing flame.
- Use of a highly volatile flammable fuel such as gasoline can produce uncontrollable flame creating a severe fire hazard.





# TROUBLESHOOTING

PROBLEM	CAUSE	SOLUTION	PAGE
Wick will not ignite.	Out of fuel.	Check fuel gauge; add fuel if necessary.	6
	Igniter coil will not glow.	Replace batteries. Replace igniter coil. If necessary.	5 13
	Water in Kerosene.	Drain tank. Remove, dry and reinstall wick. Refill with fresh, clean kerosene.	11 6
Smoke or odor.	Heat chamber tilted and not properly seated.	Move wire handle until heat chamber is properly seated and moves smoothly left and right.	8
	Flame too high.	Reduce wick height by turning wick adjuster knob counterclockwise.	8
	Dirty wick.	Clean wick as described under "Care and Maintenance."	10
	Drafts.	Relocate heater.	7
	Contaminated fuel.	Drain tank and rinse it with clean kerosene. Install new wick and refill with fresh, clean kerosene.	11 6
Flickering, dying or low flame.	Dirty wick.	Clean wick as described under "Care and Maintenance." If necessary, install new wick.	10 11
	Water in kerosene.	Drain tank. Remove, dry and reinstall wick. Refill with clean kerosene.	11 6
	Wick is too low to sustain good flame.	Raise 3-step wick adjuster to step ② or ③ . If already to step ③ , replace wick.	9 11
Wick adjuster knob is hard to turn.	Dirty wick.	Clean wick as described under "Care and Maintenance".	10
	Water in kerosene.	Drain tank. Remove, dry and reinstall wick. Refill with fresh, clean kerosene.	11 6
	Damaged mechanism.	Contact your dealer for service.	
Flame too high and cannot be adjusted using normal procedure.	Fuel contaminated with gasoline, paint thinner, denatured alcohol or other volatile substance.	IMMEDIATELY shut off heater. Drain tank and rinse it with clean kerosene. Install new wick, refill with fresh clean kerosene.	9 11 6
	Wick installed too high.	Remove wick. Reinstall wick according to directions under "Replacing the Wick".	11

# LIMITED WARRANTY

TOYOTOMI AMERICA INC. ("TOYOTOMI") warrants each heater (the "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) Product which has been subjected to abuse, accident, alteration, modification, tampering, negligence, misuse including improper or contaminated fuels, repair using improper parts, or repair by anyone other than a service facility specified by TOYOTOMI;

(2) Normal wear and tear parts, including wicks, batteries, igniter coils and siphons.

**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 WARRANTY CARD 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 or call:

TOYOTOMI AMERICA INC.  
604 Federal Road  
Brookfield, CT 06804  
(203) 775-1909

THE FOREGOING EXPRESSES ALL OF TOYOTOMI'S OBLIGATIONS AND LIABILITIES WITH RESPECT TO THE QUALITY OF PRODUCT FURNISHED BY IT. ALL OTHER WARRANTIES, EXPRESS OR IMPLIED, INCLUDING THE WARRANTIES OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE ARE DISCLAIMED. TOYOTOMI SHALL NOT BE LIABLE FOR THE LOSS OF USE OF THE PRODUCT, INCONVENIENCE, LOSS OR ANY OTHER DAMAGES, DIRECT OR CONSEQUENTIAL, ARISING OUT OF THE USE OF, OR INABILITY TO USE, THE PRODUCT OR DAMAGES RESULTING FROM OR ATTRIBUTABLE TO DEFECTS IN THE PRODUCT.

No one other than TOYOTOMI has authority to extend or modify the terms of this Limited Warranty in any manner whatsoever.

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



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