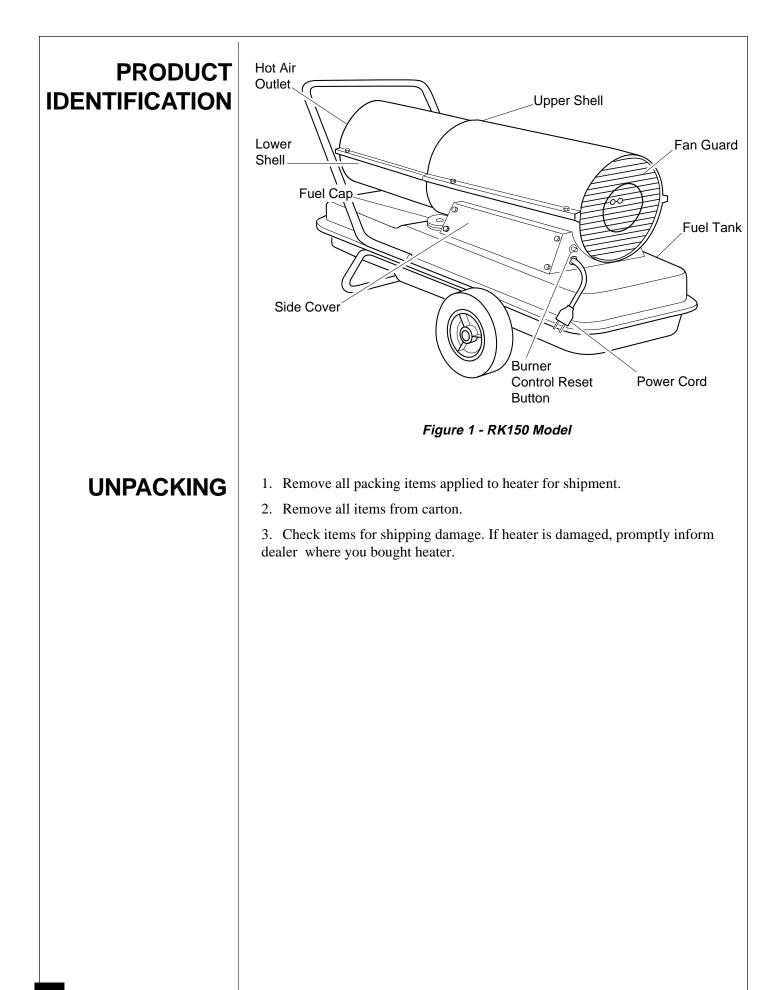
# **Reddy Heater**<sup>®</sup> PORTABLE FORCED **AIR HEATER OWNER'S MANUAL** Model RK150 Heater Size 150,000 Btu/Hr IMPORTANT Read and understand this manual before assembling, starting, or servicing heater. Improper use of heater can cause serious injury. Keep this manual for future reference.

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SAFETY INFORMATION	MARNINGS IMPORTANT: Read this owner's manual carefu before trying to assemble, operate, or service to use of this heater can cause serious injury or o explosion, electrical shock, and carbon monox	this heater. Imprope leath from burns, fir ide poisoning.

**Carbon Monoxide Poisoning:** Early signs of carbon monoxide poisoning resemble the flu, with headaches, dizziness, or nausea. If you have these signs, the heater may not be working properly. **Get fresh air at once!** Have heater serviced. Some people are more affected by carbon monoxide than others. These include pregnant women, persons with heart or lung disease or anemia, those under the influence of alcohol, and those at high altitudes.

Make certain you read and understand all warnings. Keep this manual for reference. It is your guide to safe and proper operation of this heater.

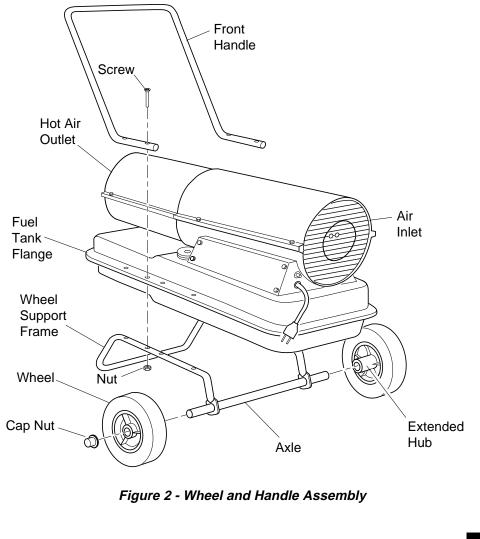


## ASSEMBLY

This model is furnished with wheels and a front handle. Wheels, handle, and the mounting hardware are found in the shipping carton.

#### **Tools Needed**

- Medium Phillips Screwdriver
- 3/8" Open or Adjustable Wrench
- Hammer
- 1. Slide axle through wheel support frame. Install wheels on axle. *IMPORTANT:* When installing wheels, point extended hub of wheels toward wheel support frame (see Figure 2).
- 2. Place cap nuts on axle ends. Gently tap with hammer to secure.
- 3. Place heater on wheel support frame. Make sure air inlet end (rear) of heater is over wheels. Line up holes on fuel tank flange with holes on wheel support frame.
- 4. Place front handle on top of fuel tank flange. Insert screws through handle, fuel tank flange, and wheel support frame. Attach nut finger tight after each screw is inserted.
- 5. After all screws are inserted, tighten nuts firmly.



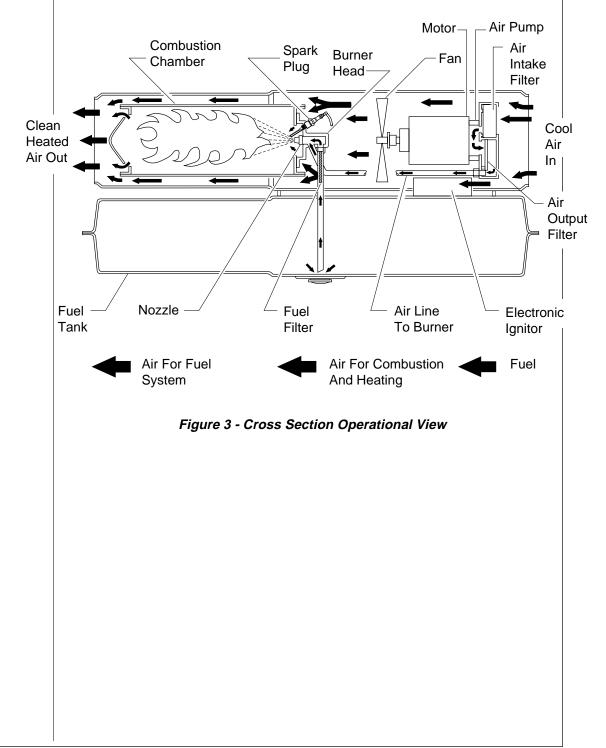
## THEORY OF OPERATION

**The Fuel System:** The air pump forces air through the air line. The air is then pushed through the burner head nozzle. This air causes fuel to lift from the tank. A fine mist of fuel is sprayed into the combustion chamber.

**The Air System:** The motor turns the fan. The fan pushes air into and around the combustion chamber. This air is heated and provides a stream of clean, hot air.

**The Ignition System:** The electronic ignitor sends voltage to the spark plug. The spark plug ignites the fuel and air mixture.

**The Burner Control System:** This system causes the heater to shut down if the flame goes out.



## **FUELS**

## 

Use only kerosene or No. 1 fuel oil to avoid risk of fire or explosion. Never use gasoline, naphtha, paint thinners, alcohol, or other highly flammable fuels.

Do not use heavy fuels such as No. 2 fuel oil or No. 2 Diesel. Using heavy fuels will result in:

- clogged fuel filter and nozzle
- carbon build up on spark plug
- the need of nontoxic anti-icer in fuel during very cold weather

*IMPORTANT:* Use a KEROSENE ONLY storage container. Be sure storage container is clean. Foreign matter such as rust, dirt, or water will cause the burner control to shut down heater. Foreign matter may also require you to clean fuel system often.

## VENTILATION



Follow the minimum fresh, outside air ventilation requirements. If proper fresh, outside air ventilation is not provided, carbon monoxide poisoning can occur. Provide proper fresh, outside air ventilation before running heater.

Provide a fresh air opening of at least 4 1/2 square feet (4,180 square cm). Provide extra fresh air if more heaters are being used.

Example: A 150,000 Btu/Hr heater requires one of the following:

- a two-car garage door [16 feet (5 meter) wide opening] raised 3.5 inches (8.9 cm)
- a single-car garage door [9 feet (2.75 meter) wide opening] raised 6 inches (15.25 cm)
- two, thirty-inch (76.2 cm) wide opening windows raised 11 inches (28 cm)

### **OPERATION**

## 

Review and understand the warnings in the Safety Information Section. They are needed to safely operate this heater. Follow all local codes when using this heater.

#### **To Start Heater**

- 1. Follow all ventilation and safety information.
- 2. Fill fuel tank with kerosene or No. 1 fuel oil.
- 3. Attach fuel cap.
- 4. Plug power cord of heater into 220 volt/60 hertz grounded outlet. Use an extension cord if needed. Use only a three-prong, grounded (earthed) extension cord.

#### **Extension Cord Wire Size Requirements**

Up to 100 feet (30.5 meters) long, use 16 AWG (1.0 mm<sup>2</sup>) rated cord 101 to 200 feet (30.8 to 61 meters) long, use 14 AWG (1.5 mm<sup>2</sup>) rated cord

Heater will start when power cord is plugged into outlet. If not, push in burner control reset button (see Figure 4).

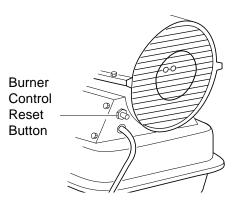


Figure 4 - Burner Control Reset Button

#### **To Stop Heater**

1. Unplug power cord from outlet.

#### **To Restart Heater**

- 1. Wait 2 minutes after stopping heater.
- 2. Repeat steps under To Start Heater, above.

## STORING, TRANSPORTING, OR SHIPPING

*Note:* If shipping, transport companies require fuel tanks to be empty.

1. Drain fuel tank. *Note:* Some mode

*Note:* Some models have drain plug on underside of fuel tank. If so, remove drain plug to drain all fuel. If heater does not have drain plug, drain fuel through fuel cap opening. Be sure all fuel is removed.

- 2. Replace drain plug if provided.
- 3. If any debris is noted in old fuel, add 1 or 2 quarts (1 or 2 liters) of clean kerosene to tank, stir, and drain again. This will prevent excess debris from clogging filters during future use.
- 4. Replace fuel cap or drain plug. Properly dispose of old and dirty fuel. Check with local automotive service stations that recycle oil.
- 5. If storing, store heater in dry place. Make sure storage place is free of dust and corrosive fumes.

*IMPORTANT:* Do not store kerosene over summer months for use during next heating season. Using old fuel could damage heater.

## PREVENTATIVE MAINTENANCE SCHEDULE

## 

Never service heater while it is plugged in, operating, or hot. Severe burns and electrical shock can occur.

<u>ltem</u> Fuel tank	How Often Flush every 150-200 hours of operation or as needed.	How To See Storing, Transporting, or Shipping, above.
Air output and lint filters	Replace every 500 hours of operation or once a year.	See Air Output, Air Intake, and Lint Filters, page 11.
Air intake filter	Wash and dry with soap and water every 500 hours of op- eration or replace as needed.	See Air Output, Air Intake, and Lint Filters, page 11.
Fuel filter	Clean twice a heating season or replace as needed.	See Fuel Filter, page 12.
Spark plug	Clean and regap every 600 hours operation or replace as needed.	See Spark Plug, pages 12.
Fan blades	Clean each season or as needed.	See Fan, page 11.
Motor	Not required/permanently lubrica	ited.

## TROUBLE-SHOOTING

## 

Never service heater while it is plugged in, operating, or hot. Severe burns and electrical shock can occur.

<u>OBSERVED FAULT</u>	POSSIBLE CAUSE	<u>REMEDY</u>			
Heater ignites, but burner control shuts	Wrong pump pressure	See Pump Pressure Adjustment, page 12.			
off heater after a short period of time.	Dirty air output, air intake and lint filters	See Air Output, Air Intake and Lint Filters, page 11. See Fuel Filter, page 12.			
	Dirty fuel filter				
	Dirt in nozzle	See Nozzle, page 13.			
	Dirty photocell lens	Clean photocell lens.			
	Bad burner control	Replace burner control.			
Heater will not ignite, but motor runs	Wrong pump pressure	See Pump Pressure Adjustment, page 12.			
for a short period of time.	Carbon deposits on spark plug and/or improper gap	See Spark Plug, pages 12.			
	Dirty fuel filter	See Fuel Filter, page 12.			
	Dirt in nozzle	See Nozzle, page 13.			
	Water in fuel tank	Drain and flush fuel tank with clean kerosene. See <i>Storing, Transporting</i> <i>or Shipping,</i> page 9.			
	WARNING: High voltage!				
		Make sure electronic ig- nitor mounting is tight.			
	Electronic ignitor not grounded				
	÷	nitor mounting is tight.			
Motor does not start when heater is plugged	grounded				

## SERVICE PROCEDURES

#### **Upper Shell Removal**

- Remove screws along each side of heater using 5/16" nutdriver. These screws attach upper and lower shells together.
- 2. Lift upper shell off.
- 3. Remove fan guard.

#### Fan

*IMPORTANT:* Remove fan from motor shaft before removing motor from heater. The weight of the motor resting on the fan could damage the fan pitch.

- 1. Remove upper shell (see above).
- 2. Use 1/8" Allen wrench to loosen setscrew which holds fan to motor shaft.
- 3. Slip fan off motor shaft.
- 4. Clean fan using soft cloth moistened with kerosene or solvent.
- 5. Dry fan thoroughly.
- Replace fan on motor shaft. Place fan hub flush with end of motor shaft (see Figure 6).
- Place setscrew on flat of shaft. Tighten setscrew firmly (40-50 inch-pounds/4.5-5.6 n-m).
- 8. Replace fan guard and upper shell.

## Air Output, Air Intake, and Lint Filters

- 1. Remove upper shell (see above).
- 2. Remove filter end cover screws using 5/16" nut-driver.
- 3. Remove filter end cover.
- 4. Replace air output and lint filters.
- 5. Wash or replace air intake filter (see *Preventative Maintenance Schedule*, page 9).
- 6. Replace filter end cover.
- 7. Replace fan guard and upper shell.

IMPORTANT: Do not oil filters.

## 

#### Never service heater while it is plugged in, operating, or hot. Severe burns and electrical shock can occur.

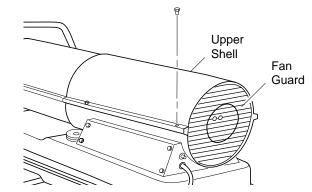


Figure 5 - Upper Shell Removal

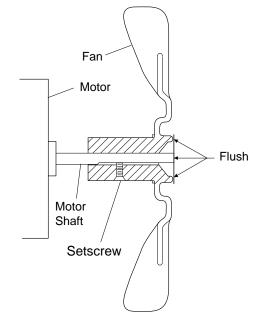


Figure 6 - Fan Cross Section

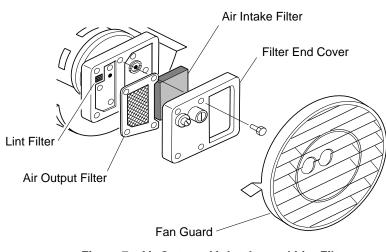


Figure 7 - Air Output, Air Intake, and Lint Filters

#### Pump Pressure Adjustment

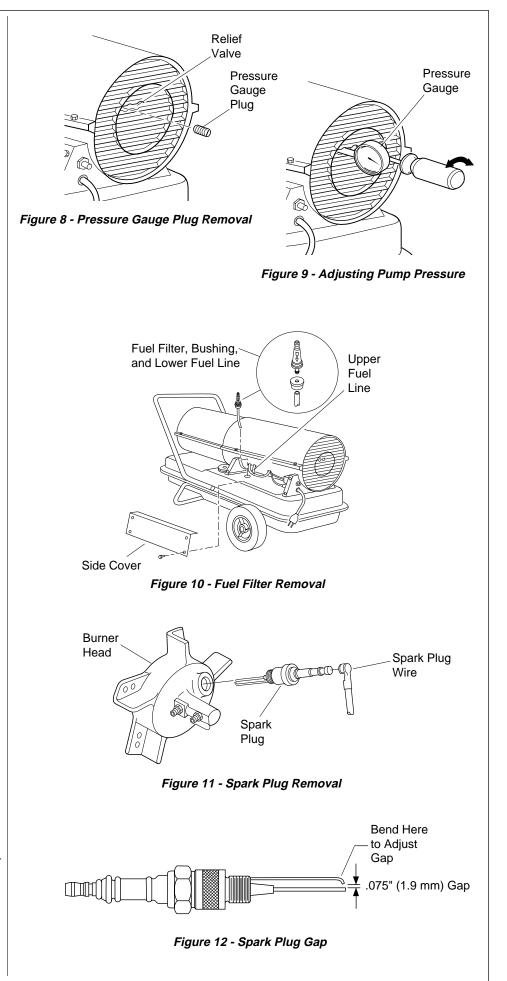
- 1. Remove pressure gauge plug from filter end cover.
- 2. Install accessory pressure gauge (part number HA1180).
- 3. Start heater (see *Operation*, page 8). Allow motor to reach full speed.
- Adjust pressure. Turn relief valve to right to increase pressure. Turn relief valve to left to decrease pressure. Adjust pump pressure to 4.9 psi.
- 5. Remove pressure gauge. Replace pressure gauge plug in filter end cover.

#### **Fuel Filter**

- Remove side cover screws using 5/16" nut-driver.
- Remove side cover.
- 3. Pull upper fuel line off fuel filter neck.
- 4. Carefully pry bushing, fuel filter, and lower fuel line out of fuel tank.
- 5. Wash fuel filter with clean fuel and replace in tank.
- 6. Attach upper fuel line to fuel filter neck.
- 7. Replace side cover.

#### Spark Plug

- 1. Remove upper shell (see page 11).
- 2. Remove fan (see page 11).
- 3. Remove spark plug wire from spark plug.
- 4. Remove spark plug from burner head using 13/16" open-end wrench.
- 5. Clean and regap spark plug electrodes to .075" (1.9 mm) gap.
- 6. Install spark plug in burner head.
- 7. Attach spark plug wire to spark plug.
- 8. Replace fan (see page 11).
- 9. Replace fan guard and upper shell.



#### Nozzle

- 1. Remove upper shell (see page 11).
- 2. Remove fan (see page 11).
- 3. Remove fuel and air line hoses from burner head.
- 4. Remove spark plug wire from spark plug.
- 5. Remove spark plug from burner head using 13/16" open-end wrench.
- Remove three screws using 5/ 16" nut-driver and remove burner head from combustion chamber.
- 7. Place burner head into vise and lightly tighten.
- 8. Carefully remove nozzle from burner head using 5/8" socket wrench (see Figure 14).
- 9. Blow compressed air through face of nozzle. This will free any dirt in nozzle area.
- 10. Inspect nozzle seal for damage.
- 11. Replace nozzle into burner head and tighten firmly (80-110 inchpounds / 9.1-12.4 n-m).
- 12. Attach burner head to combustion chamber.
- 13. Install spark plug in burner head.
- 14. Attach spark plug wire to spark plug.
- 15. Attach fuel and airline hoses to burner head.
- 16. Replace fan (see page 11).
- 17. Replace fan guard and upper shell.

#### Pump Rotor

#### (Procedure if rotor is binding)

- 1. Remove upper shell (see page 11).
- 2. Remove filter end cover screws using 5/16" nut-driver.
- 3. Remove filter end cover and air filters.
- Remove pump plate screws using 5/16" nut-driver.
- 5. Remove pump plate.
- 6. Remove rotor, insert, and blades.

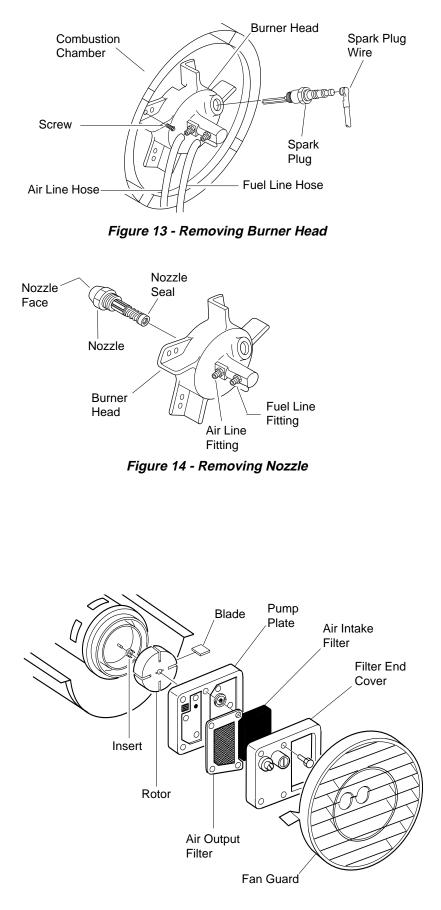


Figure 15 - Rotor Location

Continued

- 7. Check for debris in pump. If debris is found, blow out with compressed air.
- 8. Install insert and rotor.
- 9. Check gap on rotor. Adjust to .003"/.004" (.076-.101 mm) if needed (see Figure 16).

*Note:* Rotate rotor one full turn to insure the gap is .003"/.004" (.076-.101 mm) at tightest position. Adjust if needed.

#### (Pump Rotor, continued)

- 10. Install blades, pump plate, air filters, and filter end cover.
- 11. Replace fan guard and upper shell.
- 12. Adjust pump pressure (see page 12).

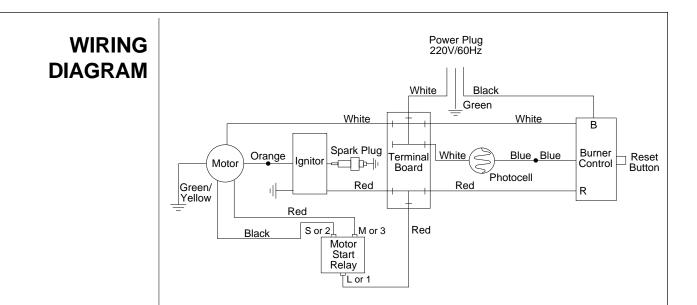
*Note:* If rotor is still binding, proceed as follows.

- 13. Perform steps 1 through 6 (see page 13).
- 14. Place fine grade sandpaper (600 grit) on flat surface. Sand rotor lightly in "figure 8" motion four times (see Figure 17).
- 15. Reinstall insert and rotor.
- 16. Perform steps 10 through 12 above.

## **SPECIFICATIONS**

Blade Gap Adju	.003"/.004" (.076101 mm) Gap Measured With Feeler Gauge Rotor	
Figure 16 - Gap Adjusting Screw Locations		
Figure 16 - Gap Adjusting Screw LocationsSandpaper<		
Output Rating (Btu/Hr.)	150,000	
Fuel	Use Only Kerosene or No. 1 Fuel Oil	
Fuel Tank Capacity (U.S. Gal./Liters)	13.5/51	
Fuel Consumption (Gal. Per Hr./Liters Per Hr.) 1.1/4.16		
Electric Requirements	220 volt/60 hertz	
Amperage (Normal Run)	2	
Amperage (Start)	9	
Hot Air Output (CFM/CMM)	500/14.2	
Motor RPM	3450	

Gap Adjusting Screw



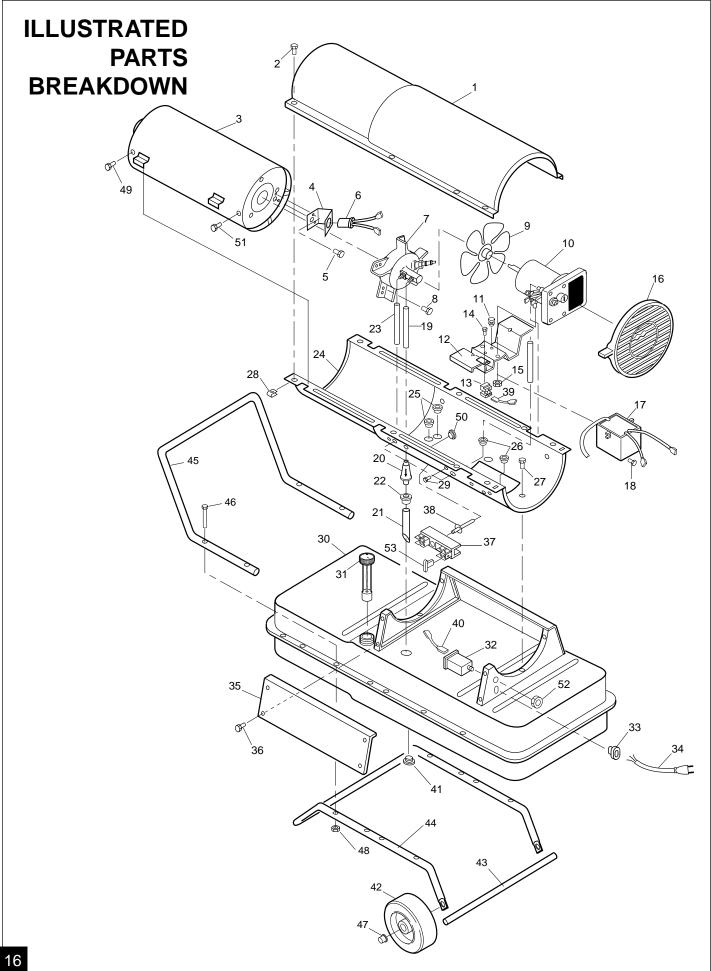
#### MAINTENANCE KITS

кіт	NUMBER
Spark Plug Kit	HA3012
Filter Kit	HA3017
Nozzle Kit	HA3010
Rotor/Air Pump Kit	HA3004
Handle Kit	HA2204
Photocell Kit	HA3019
Pump Adjustment Kit	HA3020
Fuel Tank Filter Screen Kit	HA2210

## ACCESSORIES

Purchase accessories and parts from your nearest dealer or service center. If they can not supply these accessories or parts, contact DESA International at:

DESA International P.O. Box 90004 Bowling Green, KY 42102-9004 U.S.A. (502) 781-9600 Parts Department AIR GAUGE KIT - HA1180

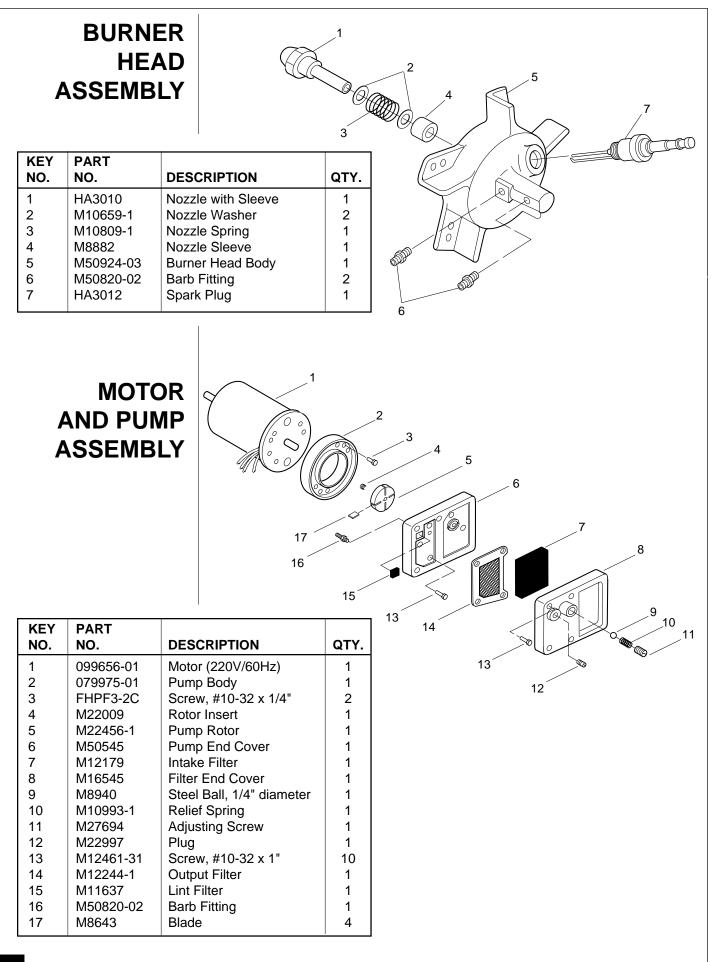


## PARTS LIST

This list contains replaceable parts used in your heater. When ordering parts, be sure to provide the correct model and serial numbers (from the model plate), then the part number and description of the desired part.

KEY NO.	PART NUMBER	DESCRIPTION	QTY.	KEY NO.	PART NUMBER	DESCRIPTION	QTY.
1	098511-135	Upper Shell	1	32	097630-02	Burner Control	1
2	M15823-27	Screw, #10-16 x 1/2"	8	33	M11143-1	Strain Relief Bushing	1
3	098512-29	Combustion Chamber	1	34	099055-07	Power Cord	1
4	099229-01	Photocell Bracket	1	35	M51077-01AA	Side Cover	1
5	M10908-2	Screw, #6-32 x 3/8"	2	36	M11084-27	Screw, #10-16 x 1/2"	4
6	HA3019	Photocell Assembly	1	37	099125-03	Terminal Board	1
7	†	Burner Head Assembly	1	38	099157-01	Rivet	1
8	M11084-27	Screw, #10-16 x 1/2"	3	39	M16841-59	Wire Assembly	
9	097293-01	Fan	1			(Red, 13 1/2")	1
10	†	Motor and Pump Assembly	1	40	M16841-57	Wire Assembly (Red, 6")	1
11	M50631	Rubber Bumper	2	41	M27417	Drain Plug	
12	098138-02	Motor Mounting Bracket	1			(Includes "O" Ring)	1
13	M12462-15	Motor Start Relay	1	42	097896-01	Wheels	2
14	M12461-13	Screw, #8-32 x 1/4"	2	43	M16801-2	Axle	1
15	NTC-4C	Hex Lock Nut, 1/4-20	2	44	M12831-3	Wheel Support Frame	1
16	M51114-01	Fan Guard	1	45	HA2204	Front Handle	1
17	098557-07	Ignitor Kit	1	46	M12345-33	Screw, #10-24 x 1 3/4"	8
18	M11084-29	Screw, #10-16 x 3/4"	2	47	M28526	Nut cap	2
19	M51345-02	Fuel Line	1	48	NTC-3C	Hex Lock Nut, #10-24	8
20	M51150-01	Fuel Filter	1	49	099230-01	Screw, #10-16 x 3/8"	2
21	M51151-02	Fuel Line Tube	1	50	099213-01	Button Plug	1
22	M10990-3	Rubber Bushing	1	51	M11084-27	Screw, #10-16 x 1/2"	2
23	M50814-03	Air Line	1	52	099177-01	Hex Nut	1
24	098511-137	Lower Shell	1	53	078918-01	Tab Cap	1
25	M50104-03	Bushing	2				
26	M50104-01	Bushing	2	PARTS AVAILABLE - NOT SHOWN			
27	M11084-27	Screw, #10-16 x 1/2"	6				
28	M11271-8	Clip Nut	8		097204-05	Tradename Decal	
29	M15823-39	Screw, #8-18 x 1/2"	1		103253-04	General Information Decal	
30	098513-56	Fuel Tank	1		098227-84	Wiring Decal	
31	097663-03	Fuel Cap Gauge	1				

† Not available as an assembly. Order parts separately. See page 18.



NOTES	
1	

## WARRANTY AND REPAIR SERVICE

#### CERTIFICATE OF GENERAL EQUIPMENT - LIMITED 90 DAY WARRANTY

DESA International warrants new Products sold by it to be free from defects in material or workmanship for a period of ninety days after date of delivery to the first user and subject to the following conditions:

DESA International's obligation and liability under this Warranty is expressly limited to repairing or replacing at DESA International's option, any parts which appear to DESA International upon inspection to have been defective in material or workmanship when shipped from the factory. Such parts shall be provided at no cost to the user, at the business establishment of any factory authorized service center or the factory during regular working hours. The Warranty shall not apply to component parts or accessories of Products not manufactured by DESA International and which carry the warranty of the manufacturer thereof, or to normal maintenance (such as pressure adjustments) or to normal maintenance parts (such as filters and spark plugs). Replacement or repair parts installed in the Product covered by this Warranty are warranted only for the remainder of this Warranty as if such parts were original components of said Product. DESA INTERNATIONAL MAKES NO OTHER EXPRESS WARRANTY. TO THE EXTENT PERMIT-TED BY LAW DESA INTERNATIONAL MAKES NO IMPLIED WARRANTY AND MAKES NO WARRANTY OF MER-CHANTABILITY OR FITNESS FOR ANY PARTICULAR PUR-

POSE. IN ANY EVENT IMPLIED WARRANTIES INCLUDING THOSE OF MERCHANTABILITY AND FITNESS FOR A PAR-TICULAR PURPOSE ARE LIMITED TO THE DURATION OF THIS EXPRESS WARRANTY.

Any transportation charges, costs of installation, duty, taxes or any other charges whatsoever must be borne by the user. DESA International's obligation under this limited Warranty shall not include any liability for direct, indirect, incidental, or consequential damage or delay. If requested by DESA International, Products or parts for which a warranty claim is made are to be returned transportation prepaid by user to the factory. Any improper use, including operation after discovery of defective or worn parts, operation beyond capacity, substitution of parts not approved by DESA International, or any alteration or repair by others in such manner as in DESA International's judgement affects the Product materially and adversely, shall void this Warranty.

NO EMPLOYEE OR REPRESENTATIVE IS AUTHORIZED TO CHANGE THIS WARRANTY IN ANY WAY OR GRANT ANY OTHER WARRANTY UNLESS SUCH CHANGE IS MADE IN WRITING AND SIGNED BY AN OFFICER OF DESA INTERNATIONAL AT ITS HOME OFFICE.

#### WARRANTY SERVICE

Always specify model and serial numbers when communicating with the factory.

We reserve the right to amend these specifications at any time without notice. The only Warranty applicable is our standard written Warranty. We make no other Warranty, expressed or implied.

A Service Manual is available by writing to the Technical Service Department at:



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