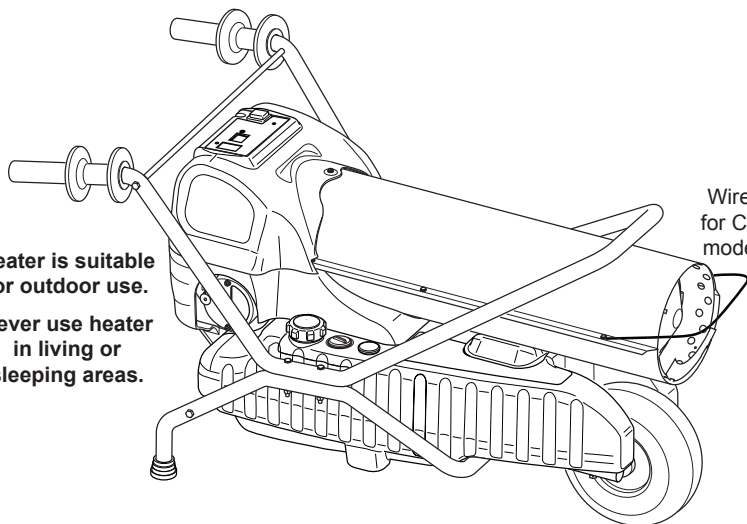


DESA™

HEATING PRODUCTS

PORTABLE FORCED AIR HEATERS OWNER'S MANUAL



Heater is suitable for outdoor use.

Never use heater in living or sleeping areas.

Wire Guard for Canadian models only.

HEATER SIZES:
100,000, 150,000 AND 200,000 BTU/HR
KEROSENE/DIESEL HEATER WITH BUILT-IN THERMOSTAT

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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Save this manual for future reference.
For more information, visit www.desatech.com

SAFETY

⚠ WARNING: This product contains and/or generates chemicals known to the State of California to cause cancer or birth defects or other reproductive harm.

IMPORTANT: Read this owner's manual carefully and completely before trying to assemble, operate or service this heater. Improper use of this heater can cause serious injury or death from burns, fire, explosion, electrical shock and carbon monoxide poisoning.

⚠ DANGER: Carbon monoxide poisoning may lead to death!

Carbon Monoxide Poisoning: Early signs of carbon monoxide poisoning resemble the flu, with headaches, dizziness and/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.

1. Use only kerosene, #1/#2 diesel/fuel oil, JET A or JP-8 fuels to avoid risk of fire or explosion. Never use gasoline, oil from crank cases, naphtha, paint thinners, alcohol or other highly flammable fuels.
2. Fueling
 - a) Personnel involved with fueling shall be qualified and thoroughly familiar with the manufacturer's instructions and applicable regulations regarding the safe fueling of heating units.
 - b) Only the type of fuel specified on the heater's data plate shall be used.
 - c) All flame shall be extinguished and the heater allowed to cool, prior to fueling.
- d) During fueling, all fuel lines and fuel-line connections shall be inspected for leaks. Any leaks shall be repaired prior to returning the heater to service.
- e) At no time shall more than one day's supply of heater fuel be stored inside a building in the vicinity of the heater. Bulk fuel storage shall be outside the structure.
- f) All fuel storage shall be located a minimum of 762 cm (25 feet) from heaters, torches, welding equipment and similar sources of ignition (exception: fuel reservoir integral with heater unit or any authorized auxiliary tank connected to heater unit).
- g) Whenever possible, fuel storage shall be confined to areas where floor penetrations do not permit fuel to drip onto or be ignited by a fire at lower elevation.
- h) Fuel storage shall be in accordance with the authority having jurisdiction.
3. Use only the electrical voltage and frequency specified on model plate.
4. Heater is suitable for outdoor use.
5. Heater must be grounded. Use only a properly grounded three-wire extension cord. Plug into grounded outlet only.
6. Use only in areas free of flammable vapors or high dust content.
7. Minimum clearance from any combustible materials: 8 feet (244 cm) from hot air outlet, 6 feet (183 cm) from top, and 4 feet (120 cm) from sides and inlet.
8. Locate heater on a stable and level surface while hot or operating or a fire may occur.
9. Heater is acceptable for use on flooring such as wood (a combustible material).
10. Use only in well vented areas. Before using heater, provide at least a 2800 square cm (three-square-foot) opening of fresh, outside air for each 30 kw (100,000 Btu/Hr) of rating.
11. Keep children and animals away from heater at all times.
12. Never start heater when combustion chamber is hot or if fuel has accumulated in combustion chamber.
13. This heater is equipped with a thermostat. Heater may start at anytime.

SAFETY

Continued

14. Never leave a heater plugged in without adult supervision if children or animals are likely to be present.
15. Use caution when moving or storing heater when fuel tank contains fuel. Fuel spillage can occur.
16. Use heater only in accordance with local ordinances and codes. Canadian residents should refer to *CSA standard B139, Installation Code for Oil Burning Equipment* for recommended installation practice.
17. Never use gasoline, crankcase drainings, naphtha, paint thinners, alcohol or other highly flammable fuels.
18. Never use heater where gasoline, paint thinner or other highly flammable vapors are present.
19. Never use heater in living or sleeping areas.
20. Never move, handle, refuel or service a hot, operating or plugged-in heater.
21. Never attach duct work to front or rear of heater.
22. Heaters used in the vicinity of tarpaulins, canvas or similar enclosure materials shall be located a safe distance from such materials. The recommended minimum safe distance is 304.8 cm (10 feet). It is further recommended that these enclosure materials be of a fire retardant nature. These enclosure materials shall be securely fastened to prevent them from igniting or from upsetting the heater due to wind action.
23. Unplug heater when not in use.
24. Never block air inlet (rear) or air outlet (front) of heater.
25. **Warning to New York City Residents**
For Use Only At Construction Sites in accordance with applicable NYC codes under NYCFD certificate of approval #4803, #4899 and #4909.
26. Never use external fuel sources or tanks that are not specifically designed for use with this heater.

UNPACKING

1. Remove all packing items applied to heater for shipment.
2. Remove all items from carton.
3. Check items for any shipping damage. If heater is damaged call DESA Heating, LLC at 1-866-672-6040 for replacement parts before returning to dealer.

PRODUCT IDENTIFICATION

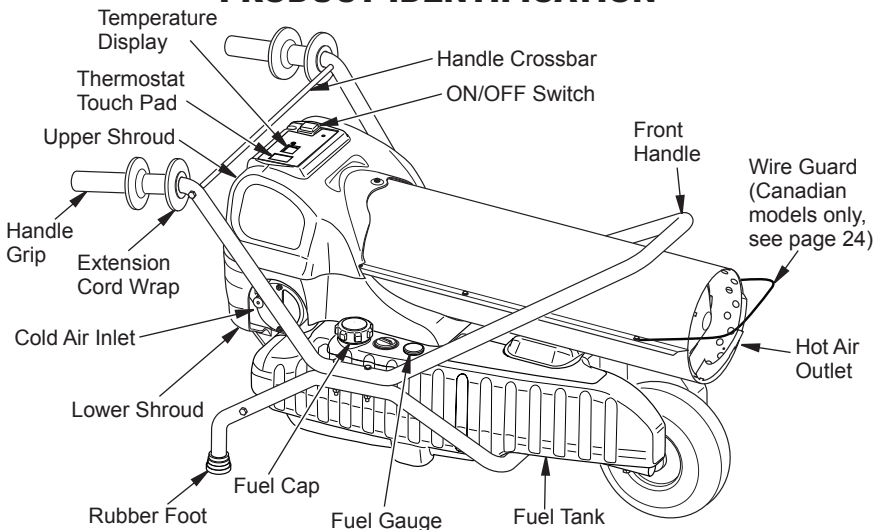


Figure 1 - 100, 150 and 200 Models

SPECIFICATIONS

100 Models

- Output Rating: 100,000 Btu/Hr
- Fuel: Use only kerosene, #1/#2 diesel*/fuel oil, JET A or JP-8 fuels
- Fuel Tank Capacity: 13.5 gal (51.1 liters)
- Fuel Consumption per Hr: 0.75 gal (2.84 liters)
- Pump Pressure (psi): 5.9
- Electric Requirements: 120 V/60 HZ
- Amperage (Normal Run): 4.2
- Typical Motor Speed (RPM): 3315
- Motor Horsepower: 1/5
- Shipping Weight (Approx.): 71 lb (32.2 kg)
- Heater Weight without Fuel (Approx.): 60 lb (27.2 kg)

150 Models

- Output Rating: 150,000 Btu/Hr
- Fuel: Use only kerosene, #1/#2 diesel*/fuel oil, JET A or JP-8 fuels
- Fuel Tank Capacity: 13.5 gal (51.1 liters)
- Fuel Consumption per Hr: 1.13 gal (4.28 liters)
- Pump Pressure (psi): 6.4
- Electric Requirements: 120 V/60 HZ
- Amperage (Normal Run): 4.2
- Typical Motor Speed (RPM): 3300
- Motor Horsepower: 1/4
- Shipping Weight (Approx.): 71 lb (32.2 kg)
- Heater Weight without Fuel (Approx.): 60.5 lb (27.4 kg)

200 Models

- Output Rating: 200,000 Btu/Hr
- Fuel: Use only kerosene, #1/#2 diesel*/fuel oil, JET A or JP-8 fuels
- Fuel Tank Capacity: 13.5 gal (51.1 liters)
- Fuel Consumption per Hr: 1.45 gal (5.49 liters)
- Pump Pressure (psi): 7.1
- Electric Requirements: 120 V/60 HZ
- Amperage (Normal Run): 4.2
- Typical Motor Speed (RPM): 3300
- Motor Horsepower: 1/4
- Shipping Weight (Approx.): 73 lb (33.1 kg)
- Heater Weight without Fuel (Approx.): 62.5 lb (28.3 kg)

* Use of #2 diesel/fuel oil will result in noticeable odor and could require additional fuel filter maintenance. Use in extreme cold temperatures may require nontoxic anti-icer additives.

ASSEMBLY

Estimated assembly time: 20 minutes

Tools Needed

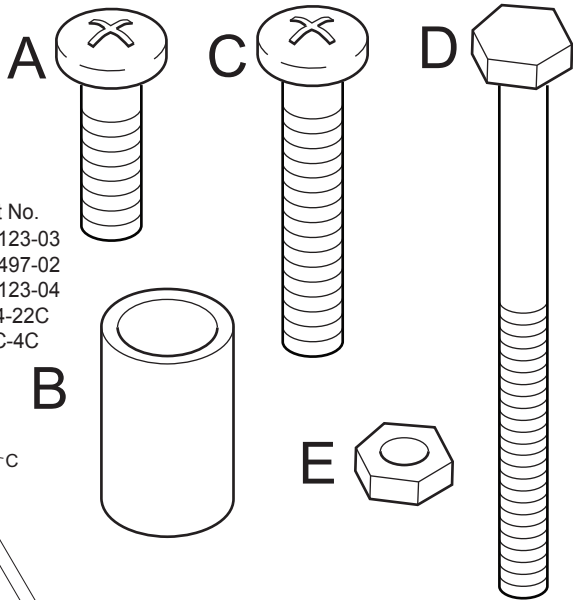
- 5/16" nut driver or wrench
- 7/16" socket/ratchet or wrenches
- #4 Phillips screw driver

All models are furnished with a wheel, mounting hardware and handles. Parts will be found in shipping carton.

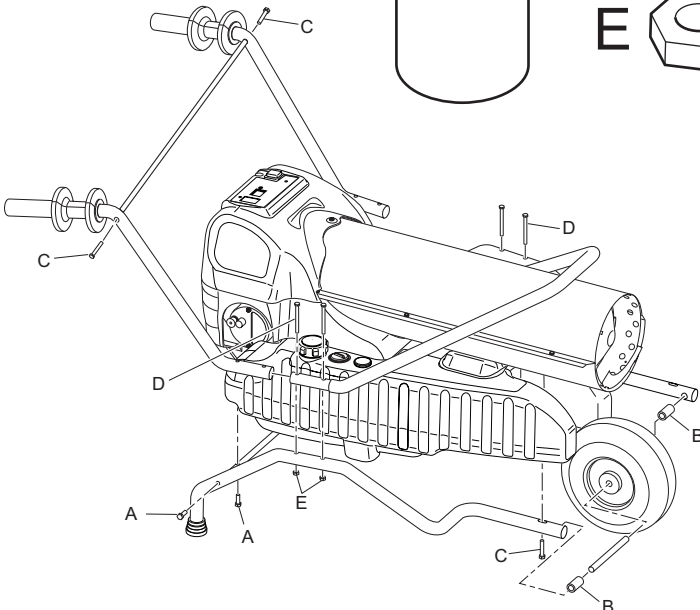
You should have the following assembly parts:

Wheel (1), Axle (1), Handle Crossbar (1), Rear Cross Support (1), Legs (2), Rubber Feet (2), Rear Handles (2), Front Handle (1), Handle Grips (2), Extension Cord Wraps (2) (see page 26).

Parts are referenced by designated letter throughout assembly instructions. Hardware packet provided with heater may contain more parts than needed for heater assembly. Hardware packet, part number 122094-01, contains the following (quantity used in parenthesis):



Description	Part No.
A 5/16" - 18 x 7/8 PPH (4)	121123-03
B Spacer (2)	113497-02
C 5/16" - 18 x 1 1/2 PPH (4)	121123-04
D 1/4" - 20 x 2 3/4 Bolt (4)	HC4-22C
E 1/4 - 20 Nut (4)	NTC-4C



ASSEMBLY

Continued

Wire Guard (Canadian Models)

1. Remove two screws securing front of upper shell to lower shell (see Figure 2).
2. Place wire guard on top of upper shell flange.
3. Insert screws through wire guard and upper shell flange. Tighten screws firmly.

Wire Guard Screws
(Canadian models only)

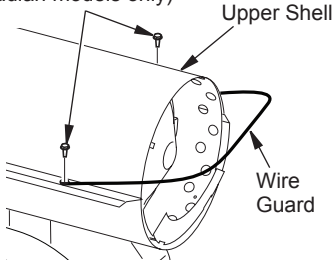


Figure 2 - Attaching Wire Guard

Wheel and Handles

IMPORTANT: Install hardware finger tight only at this time. After assembly is complete, use tools to tighten entire assembly

1. Place heater with bottom of tank flat on floor.
2. Attach rear cross support with two bolts (A), see Figure 3.
3. Push rubber feet onto each leg (left and right), see Figure 4.

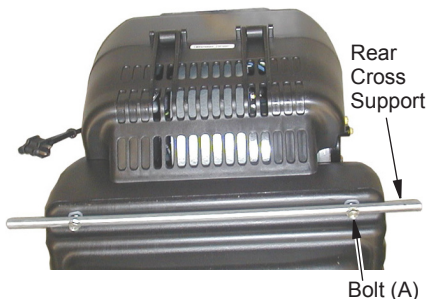


Figure 3 - Attaching Rear Cross Support

4. Assemble each leg (left and right) onto each side of rear cross support. Loosely secure each side with bolts (A) (see Figure 5).
5. Lift front of heater so it is resting on back of shroud and back of legs (see Figure 8).
6. Insert axle through wheel. Slide one spacer (B) onto each end of wheel axle. See Figure 6.



Figure 4 - Rubber Feet and Legs

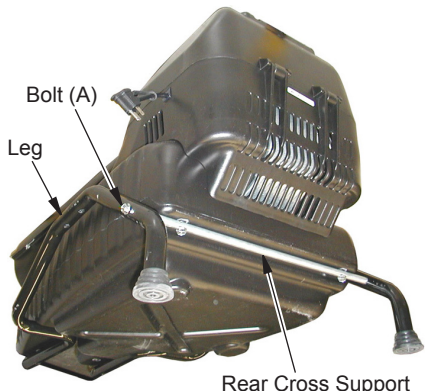


Figure 5 - Legs Attached to Rear Cross Support

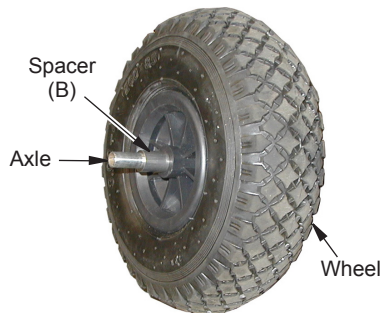


Figure 6 - Wheel and Axle

ASSEMBLY

Continued

7. Assemble wheel axle into front holes of legs (see Figure 7).
8. Secure front legs to tank with two bolts (C) (see Figure 8).
9. Tighten bolts from step 4 securing legs to rear cross support.
10. Set heater down to floor on wheel and rear legs.
11. Slide rear handle onto each end of front handle. Insert bolts (D) into holes (2 per side) (see Figure 9).
12. Lift handle assembly over heater. Align and guide bolts into holes in leg.
13. Secure assembly with nuts (E) (see Figure 10).
14. Tighten entire assembly with tools.

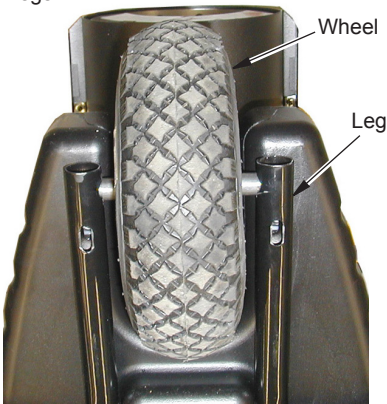


Figure 7 - Installing Wheel and Axle

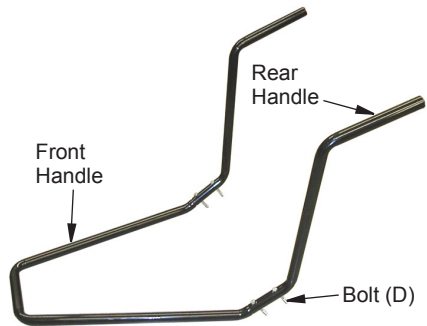


Figure 9 - Front and Rear Handle Assembly



Figure 8 - Attaching Legs to Tank

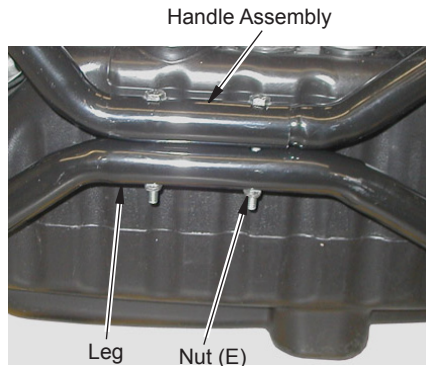


Figure 10 - Handle and Leg Assembly

ASSEMBLY

Continued

15. Assemble extension cord wrap to each rear handle (see Figure 11).
16. Push handle grips onto handles (see Figure 11).
17. Attach handle crossbar with 2 bolts (C)

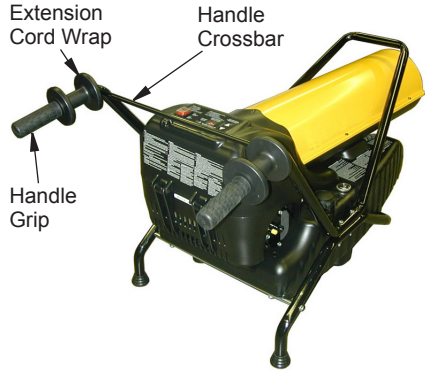


Figure 11 - Handle Grip and Cord Cleat Assembly

FUELS

⚠ WARNING: Use only kerosene, #1/#2 diesel/fuel oil, JET A or JP-8 fuels to avoid risk of fire or explosion. Never use gasoline, oil drained from crankcases, naphtha, paint thinners, alcohol or other highly flammable fuels.

Use only kerosene, #1/#2 diesel*/fuel oil, JET A, JP-8 fuels. Heavier fuels such as No. 2 fuel oil, No. 2 diesel fuel may also be used but will result in:

- noticeable odor
- additional fuel filter maintenance

* Use of #2 diesel/fuel oil in extreme cold temperatures may require nontoxic anti-icer additives.

Do not use fuels heavier than No. 2 grade or heavy oils such as oil drained from crankcases. These heavy oils will not ignite properly and will contaminate the heater.

IMPORTANT: Use a KEROSENE ONLY (blue) or DIESEL ONLY (yellow) storage container. Be sure storage container is clean. Foreign matter such as rust, dirt or water will cause the ignition control assembly to shut down heater. Foreign matter may also require heater's fuel system to be frequently cleaned.

VENTILATION

⚠ WARNING: Provide a fresh air opening of at least three square feet (2,800 square cm) for each 100,000 BTU/HR rating. Provide extra fresh air if more heaters are being used. The minimum ventilation requirements must be followed to avoid risks associated with carbon monoxide poisoning. Make certain these requirements are met prior to operating heater.

Example: A 200,000 Btu/Hr (58.6 kw) heater requires one of the following:

- a two-car garage door [16 feet (4.88 meter) opening] raised 5" (12.7 cm)
- a single-car garage door [9 feet (2.74 meter) opening] raised 8" (20.3 cm)
- two, 30" (76.2 cm) windows raised 15" (38.1 cm)

THEORY OF OPERATION

The Fuel System: The air pump forces air through the air line. Air is then pushed through the nozzle. This air causes fuel to be lifted 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 high voltage ignitor provides power to the spark ignitor. This ignites the fuel/air mixture in the combustion chamber.

The Flame-Out Control System: This system causes the heater to shut down if the flame goes out.

OPERATION

IMPORTANT: Review and understand the warnings in the Safety section, page 2. They are needed to safely operate this heater. Follow all local ordinances and codes when using this heater.

TO START HEATER

1. Follow all ventilation and safety information.
2. Locate heater to provide maximum circulation of the heated air. Follow all location requirements noted in Safety, page 2.
3. Fill fuel tank with fuel. Use only kerosene, #1/#2 diesel/fuel oil, JET A or JP-8 fuels to avoid risk of fire or explosion. Never use gasoline, oil drained from crank cases, naphtha, paint thinners, alcohol or other flammable fuels.
4. Attach fuel cap.
5. Plug heater's power cord into approved, grounded, three-wire extension cord. Extension cord must be at least six feet (1.8 m) long.

Extension Cord Size Requirement

6 to 10 feet (1.8 to 3 m) long, use 18 AWG (0.75 mm²) rated cord

11 to 100 feet (3.3 to 30.5 m) long, use 16 AWG (1.0 mm²) rated cord

101 to 200 feet (30.8 to 61 m) long, use 14 AWG (1.5 mm²) rated cord

6. Plug extension cord into standard 120 volt/60 hertz, 3-prong grounded outlet.
7. Push ON/OFF switch to the ON (I) position.
8. Wait 10 seconds for LED to display. Adjust thermostat by pressing ▲ to change set point higher. Press ▼ to change set temperature lower. If heater set temperature is higher than the surrounding air temperature, heater should ignite immediately. If heater thermostat set temperature is lower than surrounding air temperature, heater will not ignite.

A cold heater may affect the thermostat setting. This thermostat is a general-heating control. It is not intended for precise temperature control. Adjust thermostat until heater cycles at the desired setting.

⚠ WARNING: This heater is equipped with a thermostat. Heater may start at any time.

TO STOP HEATER

1. Push ON/OFF switch to the OFF (O) position.
2. Unplug heater when not in use.

TO RESET HEATER

1. Push ON/OFF switch to the OFF (O) position and wait 10 seconds. (Wait two minutes if heater has been running.)
2. Repeat steps under To Start Heater.

Temperature Display

This heater is equipped with a digital temperature display. The temperature being shown represents the air nearest to control cover. The temperature of air in surrounding areas may be much different from temperature being displayed. Display may show [] when thermostat control or temperature sensor are disconnected from control or if they are damaged. If this occurs, control will continue to operate as before, however, unit will not cycle off during operation. See Figure 13.

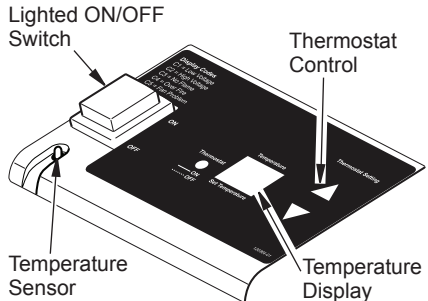


Figure 13 - Control Cover with Temperature Display

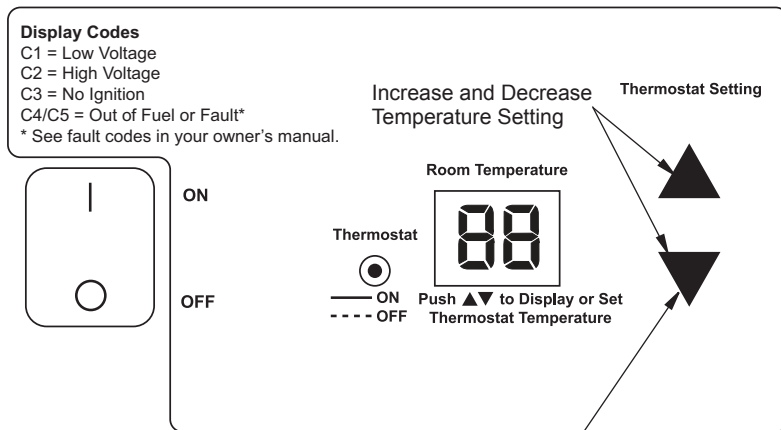
OPERATION

Continued

Error Codes

This heater will display error codes whenever there is an abnormal shutdown or problems with supply voltage. Make sure you have read all instructions and see [Troubleshooting](#), page 13, before attempting to rectify any problems with your heater.

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



LED display will show surrounding temperature unless up and down arrow keys are pressed. After pressing these keys, display shows set point temperature for a second and then will change back to display surrounding temperature.

This thermostat will store the last set point even if power is removed. Unit will maintain this set point until a new set point is entered.

Figure 14 - Controls Display

OPERATION WITH PORTABLE GENERATOR

⚠ WARNING: Before operating heater or any appliance from a portable generator, verify that generator has been properly connected to earth ground. Improper grounding or failure to ground generator can result in electrocution if a ground fault occurs. Refer to owner's manual supplied by generator manufacturer for proper grounding procedures.

Operating voltage range of heater is 108 to 132 Volts (120 Volts +/- 10%). Prior to plugging heater into generator output voltage should be verified (if generator is equipped with automatic idle feature, output voltage should be measured with generator running

at full speed). If voltage does not measure in this range heater should not be plugged into generator.

Refer to [Operation](#), page 10, for starting, stopping and resetting heater procedures.

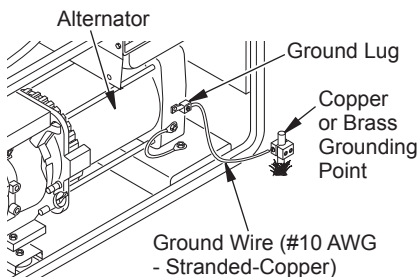


Figure 15 - Typical Generator Grounding Method (Generator construction may vary from that shown)

STORING, TRANSPORTING OR SHIPPING

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

1. Remove excess fuel from tank using a siphon pump. Drain remaining fuel through filler neck by tipping heater on its side.
2. If any debris is noted in old fuel, add 1 or 2 quarts of clean kerosene to tank, stir and drain again. This will prevent excess debris from clogging filters during future use.

3. Properly dispose of old and dirty fuel. Check with local automotive service stations that recycle oil.

4. 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



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

Item	How Often	How To
Fuel tank	Clean every season or as needed	See <u>Storing, Transporting, or Shipping</u>
Air output and lint filters	Replace every 500 hours of operation or once a year	See <u>Air Output, Air Intake and Lint Filters</u> , page 16
Air intake filter	Wash and dry with soap and water every 500 hours of operation or as needed	See <u>Air Output, Air Intake and Lint Filters</u> , page 16
Fuel filter	Clean twice a heating season or as needed	See <u>Fuel Filter</u> , page 17
Spark Ignitor	Clean and regap every 500 hours of operation or replace as needed	See <u>Spark Ignitor</u> , page 17
Fan blades	Clean every season or as needed	See <u>Fan</u> , page 15
Motor	Not required/permanently lubricated	

TROUBLESHOOTING

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


FAULT CONDITION	POSSIBLE CAUSE	REMEDY
Motor does not start after heater is plugged in and ON/OFF switch is on (I)	<ol style="list-style-type: none"> 1. No power to heater 2. Thermostat setting is too low 	<ol style="list-style-type: none"> 1. Check circuit breaker in electrical panel 2. Adjust thermostat to a higher setting by pressing ▲ or ▼ on touch pad
<div style="border: 1px solid black; padding: 5px; display: inline-block;"> ⚠ WARNING: High voltage! </div>		
Code C1 appears on control panel display C1 = Low Voltage	<ol style="list-style-type: none"> 3. Bad electrical connection between motor and control assembly, or control and ON/OFF switch, or ON/OFF switch and power cord 4. Binding pump rotor 5. Defective control assembly 6. Defective motor 7. Defective ON/OFF switch 8. Heater is being supplied with voltage below 108 volts, 60 Hz. Poor supply circuit, extension cord too long or gauge of cord is too small to support the power requirements for heater. See extension cord size requirements on page 8 	<ol style="list-style-type: none"> 3. Check all electrical connections. See <u>Wiring Diagram</u>, page 20 4. If fan does not turn freely, see <u>Pump Rotor</u>, page 19 5. Replace control assembly 6. Replace motor 7. Replace ON/OFF switch 8. Confirm supply voltage is above 108 volts
Code C2 appears on control panel display C2 = High Voltage	<ol style="list-style-type: none"> 9. Heater is being supplied with voltage above 132 volts 	<ol style="list-style-type: none"> 9. Confirm supply voltage is below 132 volts
Motor starts and runs but heater does not ignite. Code C3 appears on control panel display. C3 = No Ignition	<ol style="list-style-type: none"> 1. No fuel in tank 2. Pump pressure incorrect 3. Dirty fuel filter 4. Obstruction in nozzle 5. Water in fuel tank 	<ol style="list-style-type: none"> 1. Fill tank. See <u>Fuels</u>, page 8 2. See <u>Pump Pressure Adjustment</u>, page 16 3. See <u>Fuel Filter</u>, page 17 4. See <u>Nozzle Assembly</u>, page 17 5. Drain and flush fuel tank with clean kerosene. See <u>Storing, Transporting or Shipping</u>, page 12

⚠ WARNING: High voltage!

- | | |
|--|--|
| <ol style="list-style-type: none"> 6. Bad electrical connection between spark ignitor and control assembly 7. Defective spark ignitor 8. Defective control assembly 9. Electronic ignitor not grounded | <ol style="list-style-type: none"> 6. Check electrical connections. See <u>Wiring Diagram</u>, page 20 7. Replace spark ignitor, see page 17 8. Replace control assembly 9. Loose wire connections. Defective or loose ground wire. Check electrical connections. See <u>Wiring Diagram</u>, page 20 |
|--|--|

TROUBLESHOOTING

Continued

FAULT CONDITION	POSSIBLE CAUSE	REMEDY
Heater ignites but control assembly shuts heater off after a short period of time	1. Pump pressure incorrect	1. See <u>Pump Pressure Adjustment</u> , page 16
	2. Dirty air intake, air output, and/or lint filter	2. See <u>Air Output, Air Intake, and Lint Filters</u> , page 16
	3. Dirty fuel filter	3. See <u>Fuel Filter</u> , page 17
	4. Obstruction in nozzle	4. See <u>Nozzle Assembly</u> , page 17
	5. Photocell assembly not properly installed (not seeing the flame)	5. Make sure photocell boot is properly seated in bracket
	6. Dirty photocell lens	6. Clean photocell lens
<div style="border: 1px solid black; padding: 5px; display: inline-block;">  WARNING: High voltage! </div>		
	7. Bad electrical connection between photocell and control assembly	7. Check electrical connections. See <u>Wiring Diagram</u> , page 20
	8. Defective photocell	8. Replace photocell
	9. Defective control assembly	9. Replace control assembly
Code C4 or C5 appear on control panel display C4/C5 = Out of Fuel or Fault	1. Not enough fuel in tank to maintain combustion	1. Add fuel and restart unit
	2. Heater inlet or outlet is covered and unit is not getting enough air for combustion	2. Remove obstructions or loose material from heater inlet or outlet

SERVICE PROCEDURES

⚠ WARNING: To avoid risk of burn and electrical shock, never attempt to service heater while it is plugged in, operating or hot.

SHROUD AND UPPER SHELL

1. Using a #4 Phillips screwdriver, remove 2 bolts securing handle crossbar to handles (see Figure 16).
2. Remove single screw securing upper shroud using 5/16" nut driver (see Figure 16). Open shroud carefully by pulling up on both sides.
3. Remove 6 screws along each side of heater using 5/16" nut driver. These screws attach upper and lower shells together (see Figure 16).
4. Lift upper shell off.

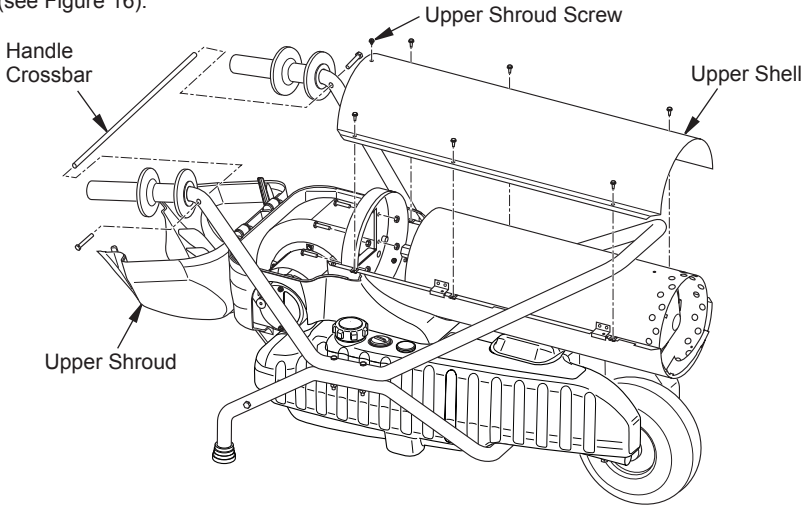


Figure 16 - Upper Shell Removal (200 Model Shown)

FAN

1. Remove upper shell (see Shroud and Upper Shell).
2. Disconnect wires from various connection points. Remove 2 screws securing blower to lower shell (see Figure 17). Carefully lift blower assembly from heater.
3. Remove 4 bolts and nuts securing blower assembly (see Figure 17).
4. Remove 3 screws securing blower sleeve to blower housing (see Figure 18). Set blower sleeve aside.

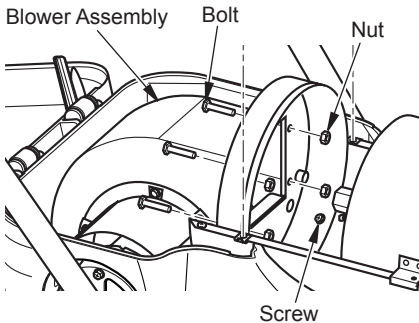


Figure 17 - Removing Blower Assembly

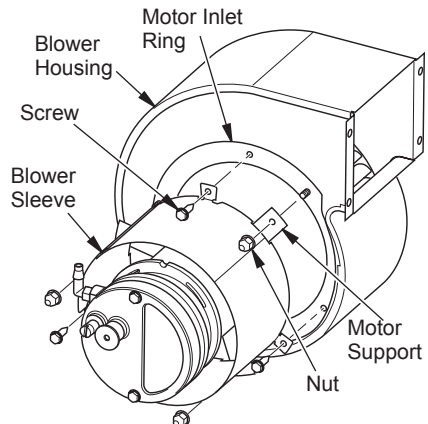


Figure 18 - Fan, Motor Shaft, and Setscrew Location

SERVICE PROCEDURES

Continued

5. Rotate fan so set screw is visible (see Figure 19). Measure gap from side of fan to side of housing. Make note of measurement.
6. Remove 3 nuts securing motor support to blower housing (see Figure 18). Carefully remove motor assembly from blower housing.
7. Use T20 torx driver to loosen setscrew which holds fan to motor shaft.
8. Slip fan off motor shaft.
9. Rinse fan under running water. Kerosene may be required if there are dirt and oil deposits on fan.
10. Dry fan thoroughly.
11. Replace fan on motor shaft.
12. Replace motor assembly and sleeve.
13. Rotate fan back to point where set screw is visible.
14. Set gap (measured in step 5) and tighten fan set screw on flat of motor shaft to 80 inch-lbs.
15. Replace blower assembly and reconnect wires.
16. Replace upper shell and upper shroud.

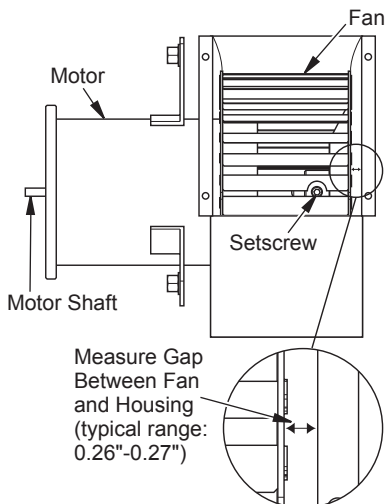


Figure 19 - Fan Side View

AIR OUTPUT, AIR INTAKE AND LINT FILTERS

1. Remove filter end cover screws using 5/16" nut-driver (see Figure 20).
 2. Remove filter end cover.
 3. Replace air output and lint filters.
 4. Wash or replace air intake filter (see *Preventative Maintenance Schedule*, page 12).
 5. Replace filter end cover.
- IMPORTANT:** Do not oil filters.
6. Proceed to *Pump Pressure Adjustment*.

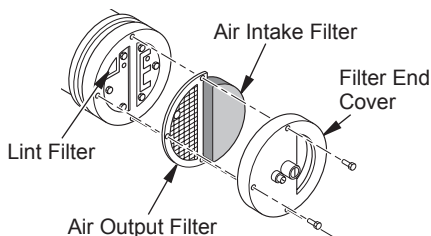


Figure 20 - Air Output, Air Intake, and Lint Filters

PUMP PRESSURE ADJUSTMENT

1. Remove pressure gauge plug from filter end cover (see Figure 21).
2. Install accessory pressure gauge (part number HA1180, see page 19).
3. Start heater (see *Operation*, page 10). Allow motor to reach full speed.
4. Adjust pressure. Turn relief valve to right to increase pressure. Turn relief valve to left to decrease pressure. See specifications correct pressure for each model (see Figure 22, page 17).
5. Remove pressure gauge. Replace pressure gauge plug in filter end cover.

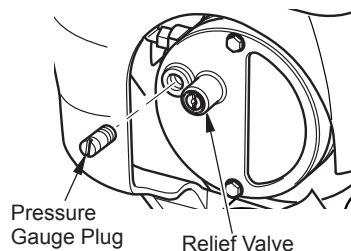


Figure 21 - Pressure Gauge Plug Removal

SERVICE PROCEDURES

Continued

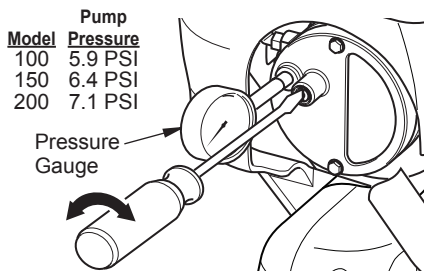


Figure 22 - Adjusting Pump Pressure

FUEL FILTER

1. Open upper shroud (see *Shroud and Upper Shell*, page 15).
2. Pull upper fuel line off fuel filter neck (see Figure 23).
3. Carefully pry bushing, fuel filter, and lower fuel line out of fuel tank (see Figure 23).
4. Wash fuel filter with clean fuel and replace in tank.
5. Attach upper fuel line to fuel filter neck.
6. Replace upper shroud.

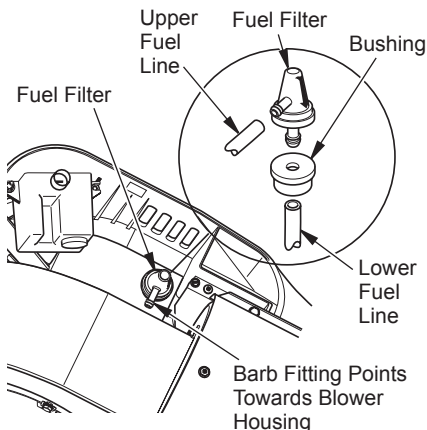


Figure 23 - Fuel Filter Removal

SPARK IGNITOR

1. Open upper shroud and remove upper shell (see *Shroud and Upper Shell*, page 15).
2. Disconnect ignitor wire from spark ignitor.
3. Remove spark ignitor screw with a 1/4" nut driver. Carefully remove spark ignitor from nozzle adapter bracket.
4. Clean and regap spark ignitor to 0.110".
5. Reassemble spark ignitor, shroud and upper shell.

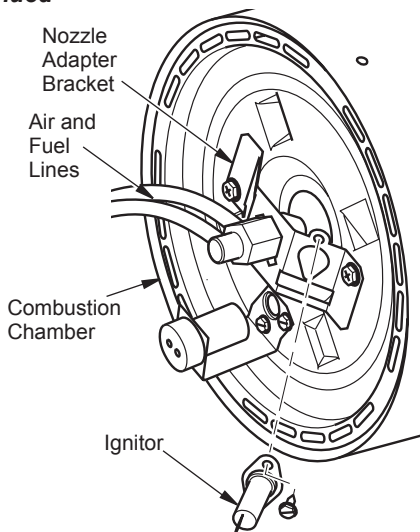


Figure 24 - Removing Spark Ignitor

NOZZLE ASSEMBLY

(For 100 and 150 Models Only)

1. Open upper shroud and remove upper shell (see *Shroud and Upper Shell*, page 15).
2. Disconnect air and fuel lines.
3. Turn nozzle assembly to notch in bracket and pull toward motor to remove (see Figure 25).
4. Place plastic hex-body into vise and lightly tighten.

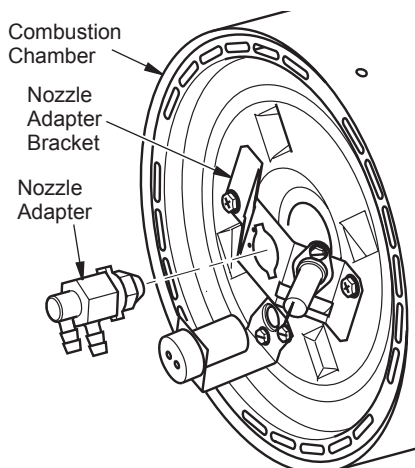


Figure 25 - Removing Nozzle/Adapter Assembly (100/150 Models)

SERVICE PROCEDURES

Continued

5. Carefully remove nozzle from the nozzle adapter using 5/8" socket wrench (see Figure 26).
6. Blow compressed air through face of nozzle. This will free any dirt in nozzle area.
7. Inspect nozzle sleeve for damage.
8. Replace nozzle into nozzle adapter until nozzle seats. Tighten 1/3 turn more using 5/8" socket wrench 4.5 to 5.1 N-m (40 to 45 in-lbs).
9. Replace nozzle adapter into bracket (see Figure 25, page 15) and rotate to position shown in Figure 24, page 15.
10. Attach fuel and airline hoses to nozzle assembly. See Fuel and Air Line Replacement and Proper Routing, page 19.
11. Replace upper shell and upper shroud.
7. Blow compressed air through face of nozzle. This will remove any debris in nozzle.
8. Inspect nozzle seal for damage.
9. Replace nozzle into nozzle adapter until nozzle seats. Tighten 80-110 in-lbs.
10. Attach nozzle adapter bracket to combustion chamber with two screws removed in step 4.
11. Reconnect spark ignitor wire, fuel line and air line.
12. Replace upper shell, upper shroud and handle crossbar.

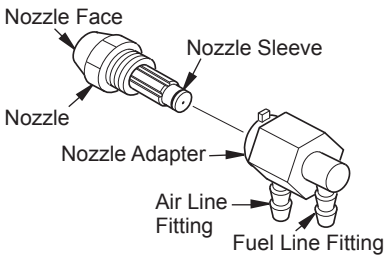


Figure 26 - Nozzle and Nozzle Adapter (100/150 Models)

(For 200 Model Only)

1. Open upper shroud and remove upper shell (see Shroud and Upper Shell, page 15).
2. Disconnect air and fuel lines.
3. Disconnect spark ignitor wire.
4. Remove two nozzle adapter bracket screws (see Figure 27).
5. Place hex-shaped aluminum nozzle adapter into vise (do not overtighten).
6. Carefully remove nozzle from nozzle adapter using 5/8" socket wrench (see Figure 28).

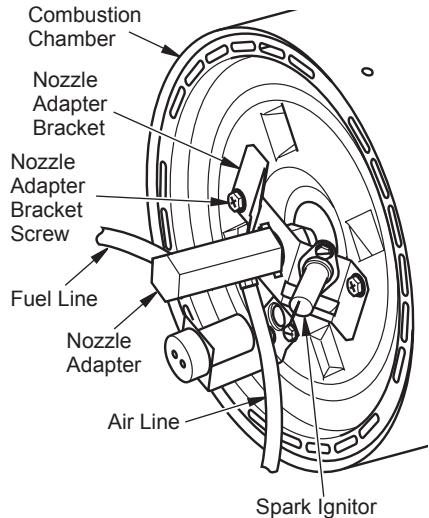


Figure 27 - Removing Nozzle/Adapter Assembly (200 Model)

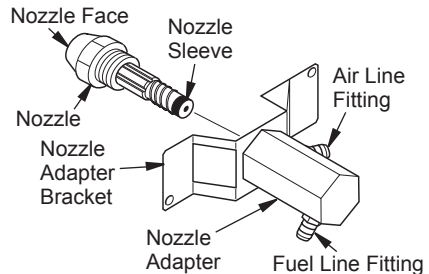


Figure 28 - Nozzle and Nozzle Adapter (200 Model)

SERVICE PROCEDURES

Continued

FUEL AND AIR LINE REPLACEMENT AND PROPER ROUTING

1. Open upper shroud (see *Shroud and Upper Shell*, page 14).
2. Inspect fuel and air line hoses for cracks and/or holes. If fuel line hose is damaged, disconnect from nozzle adapter (see Figure 24, page 17 or Figure 27) and from fuel filter (see *Fuel Filter*, page 16). If air line hose is damaged, disconnect from nozzle adapter (see Figure 24, page 17 or Figure 27, page 18) and from barb fitting on pump end cover (see Figure 29).
3. Install new air and/or fuel line. Attach one end of air line hose to barb fitting on pump end cover (see Figure 29) and the other end to nozzle adapter (see Figure 24, page 17 or Figure 27, page 18). Attach one end of fuel line hose to fuel filter (see

Fuel Filter, page 17) and the other end to nozzle adapter (see Figure 24, page 17 or Figure 27, page 18).

Note: Route hoses as shown in Figure 30. Hoses are not to touch photocell bracket.

4. Replace upper shell, upper shroud and handle crossbar..

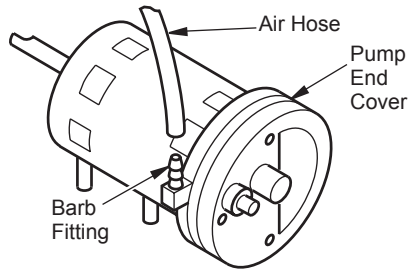


Figure 29 - Air Hose to Barb Fitting

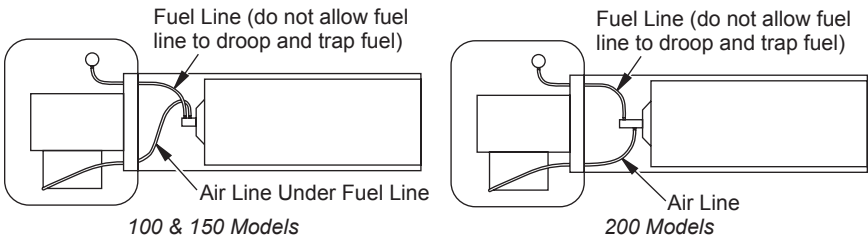


Figure 30 - Routing Air and Fuel Lines

PUMP ROTOR

(Procedure if Rotor is Binding)

1. Remove filter end cover screws using 5/16" nut driver (see Figure 31).
2. Remove filter end cover and air filters.
3. Remove pump plate screws using 5/16" nut driver.
4. Remove pump plate.
5. Remove rotor, insert, and blades (see Figure 31).
6. Check for debris in pump. If debris is found, blow out with compressed air.
7. Install insert and rotor.
8. Check gap on rotor. Adjust to 0.076/0.101 mm (0.003"/0.004") if needed (see Figure 32, page 20).

Note: Rotate rotor one full turn to ensure the gap is 0.076/0.101 mm (0.003"/0.004") at tightest position. Adjust if needed.

9. Install blades, pump plate, air filters, and filter end cover.

Note: Be sure to install parts back in original orientation.

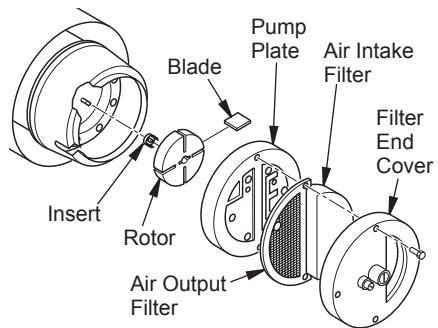


Figure 31 - Rotor Location

SERVICE PROCEDURES

Continued

10. Adjust pump pressure (see Pump Pressure Adjustment, page 16).

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

11. Perform steps 1 through 6.
12. Place fine grade sandpaper (600 grit) on flat surface. Sand rotor lightly in "figure 8" motion four times (see Figure 33).
13. Reinstall insert and rotor.
14. Perform steps 8 through 10, page 19.

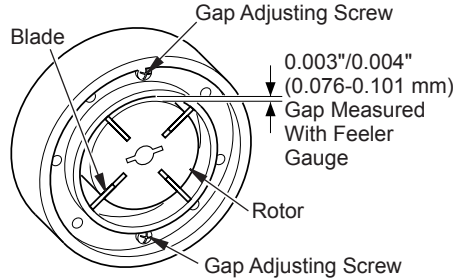


Figure 32 - Gap Adjusting Screw Locations

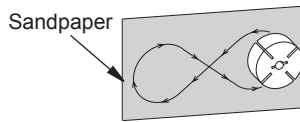
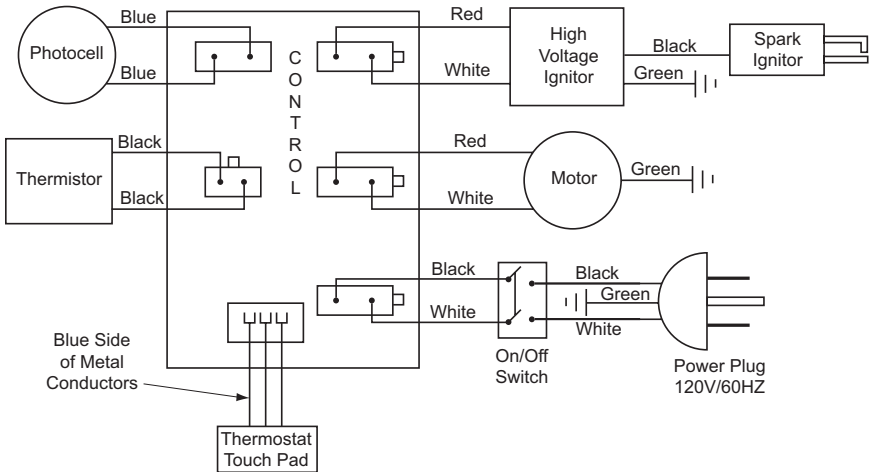


Figure 33 - Sanding Rotor

WIRING DIAGRAM



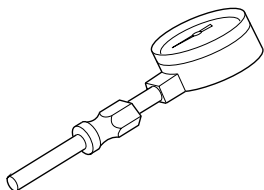
TECHNICAL SERVICE

You may have further questions about installation, operation, or troubleshooting. If so, contact DESA Heating, LLC at 1-866-672-6040. When calling please have your model and serial numbers of your heater ready.

You can also visit DESA Heating, LLC's web site at www.desatech.com.

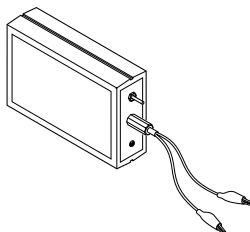
ACCESSORIES

Purchase these accessories from your local dealer. If they can not supply these accessories, either contact your nearest Parts Central or call DESA Heating, LLC at 1-866-672-6040 for information. You can also write to the address listed on the back page of this manual.



AIR GAUGE KIT - HA1180

For all models. Special tool to check pump pressure. 0-15 PSI gauge. 3/8" NPT pipe thread.



IGNITION CONTROL ASSEMBLY/ PHOTOCELL TESTER - HA1170 PHOTOCELL TESTER ADAPTER KIT 120337-04

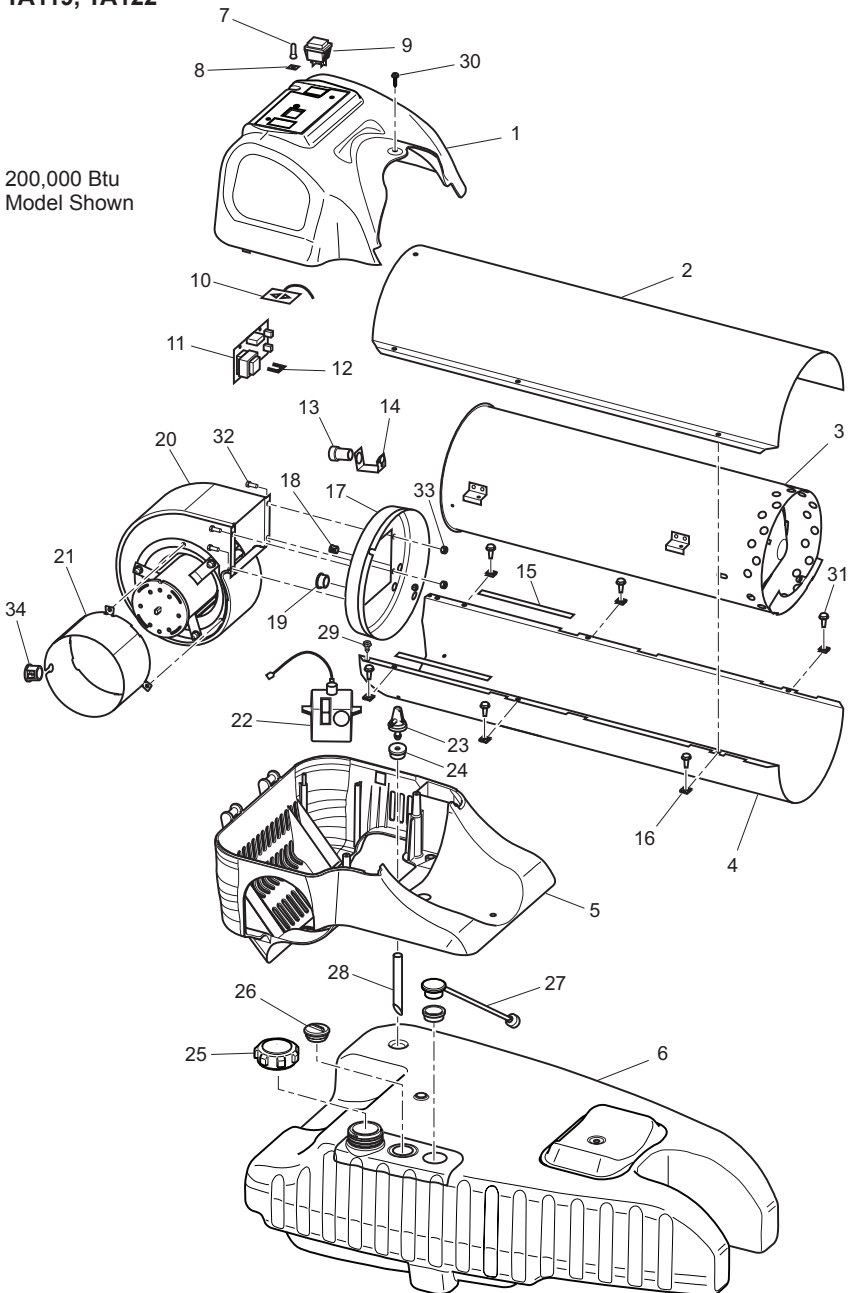
Special tool used to test the ignition control assembly and photocell.

PARTS

USA MODELS TA100, TA103, TA106, TA111, TA101, TA104, TA107, TA112,
TA102, TA105, TA108, TA113

CANADIAN MODELS TA114, TA117, TA120, TA115, TA118, TA121, TA116,
TA119, TA122

200,000 Btu
Model Shown



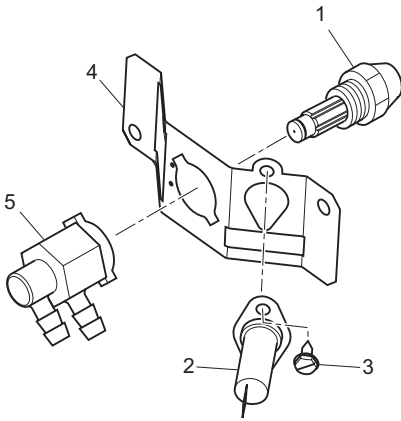
PARTS

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

KEY					
NO.	PART NO.	DESCRIPTION	100	150	200 QTY
1	122309-01	Upper Shroud	•		1
	122309-02	Upper Shroud		•	1
	122309-03	Upper Shroud			• 1
2	107353-17	Upper Shell (service part will be black)	•	•	• 1
3	098512-79	Chamber Assembly	•		1
	098512-80	Chamber Assembly		•	1
	098512-81	Chamber Assembly			• 1
4	107353-16	Lower Shell	•	•	• 1
5	122096-01	Lower Shroud Kit	•	•	• 1
6	108088-18	Fuel Tank	•	•	• 1
7	113606-02	Temperature Sensor	•	•	• 1
8	122501-01	Clip	•	•	• 1
9	120336-01	Rocker Lighted Switch	•	•	• 1
10	121593-01	Thermostat Push Pad with Decal	•	•	• 1
11	117766-01	Microprocessor Control	•	•	1
	117766-02	Microprocessor Control			• 1
12	122187-01	Control Clip	•	•	• 1
13	M16656-26	Photocell	•	•	• 1
14	103154-03	Photocell Bracket		•	• 1
	107791-01	Photocell Bracket	•		1
15	097785-13	Gasket	•	•	2
16	M11271-8	Nut Clip	•	•	• 6
17	118393-01	Blower Coupling	•	•	• 1
	097785-12	Coupling Gasket	•	•	• 1
18	M30865-02	Bushing	•	•	• 1
19	097776-01	Bushing	•	•	• 1
20	122313-01	Motor and Blower Assembly		•	• 1
	122313-02	Motor and Blower Assembly	•		1
21	122095-01	Blower Sleeve Kit	•	•	• 1
22	122097-01	Ignition Module Kit	•	•	• 1
23	118422-01	Fuel Filter	•	•	• 1
24	M10990-3	Fuel Filter Bushing	•	•	• 1
25	118428-01	Fuel Cap with Gasket	•	•	• 1
26	121600-01	Tank Remote Plug	•	•	• 1
27	121543-01	Fuel Gauge with Gasket	•	•	• 1
28	M51151-03	Lower Fuel Tube	•	•	• 1
29	100159-02	Lower Shroud Screw	•	•	• 2
30	M11084-29	Upper Shroud Screw	•	•	• 1
31	M15823-27	Shell Screw	•	•	• 6
32	M12461-62	Blower Bolts 1/4-20 x 3/8	•	•	• 4
33	103880-01	Blower Nuts 1/4 20	•	•	• 4
34	M30865-05	Bushing	•	•	• 1
PARTS AVAILABLE - NOT SHOWN					
	M51345-14	Upper Fuel Tube	•	•	1
	M51345-09	Upper Fuel Tube			• 1
	M50814-08	Air Line	•	•	1
	M50814-06	Air Line			• 1
	120337-01	Cable Assembly Switch	•	•	• 1
	M9900-197	Ignitor Ground Wire	•	•	• 1
	118418-01	Power Cord	•	•	• 1

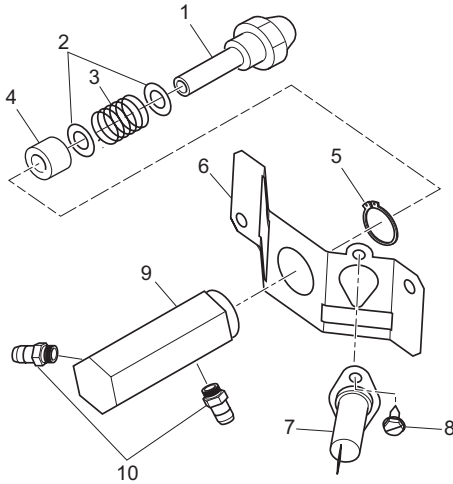
PARTS

NOZZLE ASSEMBLY 100,000 AND 150,000 BTU MODELS



KEY NO.	PART NO.	DESCRIPTION	QTY.
1	100735-35	Nozzle Assembly (100)	1
	100735-36	Nozzle Assembly (150)	1
2	117000-01	Ignitor Electrode	1
3	M10908-2	Ignitor Screw	1
4	118390-01	Nozzle Adapter Bracket	1
5	104054-01	Nozzle Adapter	1

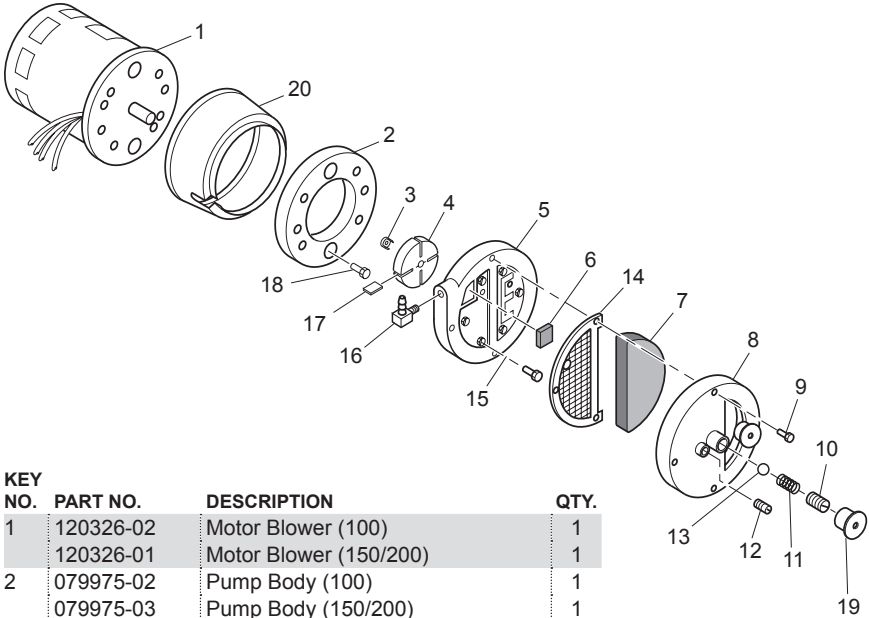
NOZZLE ASSEMBLY 200 MODELS



KEY NO.	PART NO.	DESCRIPTION	QTY.
1	100735-37	Nozzle Assembly	1
2	M10659-1	Nozzle Washer	2
3	M10809-1	Nozzle Spring	1
4	M8882	Nozzle Sleeve	1
5	107272-01	Retaining Ring	1
6	118390-02	Nozzle Adapter Bracket	1
7	117000-01	Ignitor Electrode	1
8	M10908-2	Ignitor Screw	1
9	120254-01	Nozzle Adapter	1
10	M50820-02	Barb Fitting	2

PARTS

MOTOR AND PUMP ASSEMBLY



KEY

KEY NO.	PART NO.	DESCRIPTION	QTY.
1	120326-02	Motor Blower (100)	1
	120326-01	Motor Blower (150/200)	1
2	079975-02	Pump Body (100)	1
	079975-03	Pump Body (150/200)	1
3	M22009*, **	Insert	1
4	M22456-1*	Rotor (100)	1
	M22456-2**	Rotor (150/200)	1
5	M29608	Pump Cover (100/150)	1
	M29608-02	Pump Cover (200)	1
6	M29632***	Lint Filter	1
7	M29633***	Intake Filter	1
8	M29609	Pump End Cover	1
9	M12461-31	Screw, #10-32 x 1"	3
10	M27694 ****	Adjusting Screw	1
11	M10993-1 ****	Pressure Relief Spring	1
12	M22997 ****	Plug	1
13	M8940 ****	Steel Ball, 1/4" Diameter	1
14	M29612-01****	Output Filter	1
15	M12461-31	Screw, #10-32 x 1" (100)	6
	M12461-33	Screw, #10-32 x 1 1/8" (150/200)	6
16	103676-01	Plastic Elbow	1
17	M8643*	Blade (100)	4
	M8643-2**	Blade (150/200)	4
18	FHPF3-5C	Screw (100)	2
	FHPF3-6C	Screw (150/200)	2
19	105780-01	Plug Cap	1
20	121519-01	Rain Shield	1

* Included in Rotor Kit (Part No. HA3004) (100 Model)

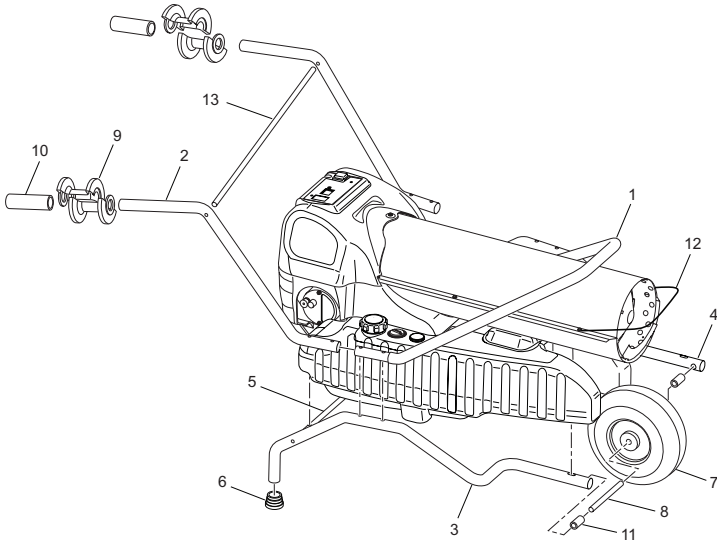
** Included in Rotor Kit (Part No. HA3005) (150 and 200 Models)

*** Included in Filter Kit (Part No. HA3014)

**** Included in Pump Adjustment Kit (Part No. HA3020)

PARTS

WHEEL AND HANDLES



KEY

NO.	PART NO.	DESCRIPTION	100	150	200	QTY
1	118404-01	Front Handle	•	•	•	1
2	118414-02	Rear Handle	•	•	•	2
3	118800-01	Left Rear Leg	•	•	•	1
4	118800-02	Right Rear Leg	•	•	•	1
5	118411-01	Cross Support	•	•	•	1
6	118433-01	Rubber Foot	•	•	•	2
7	118407-01	Wheel	•	•	•	1
8	M51015-05	Axle	•	•	•	1
9	120421-01	Extension Cord Wrap Assembly	•	•	•	2
10	118425-01	Handle Grip	•	•	•	2
11	113497-02	Spacers	•	•	•	2
12	120365-01	Wire Guard (Canadian Heaters, see page 20)	•	•	•	1
13	118411-02	Handle Crossbar	•	•	•	1
PARTS AVAILABLE - NOT SHOWN						
	122094-01	Hardware Kit	•	•	•	1

REPLACEMENT PARTS

Note: Use only original replacement parts. This will protect your warranty coverage for parts replaced under warranty.

PARTS UNDER WARRANTY

Contact authorized dealers of this product. If they can't supply original replacement part(s), call DESA Heating, LLC at 1-866-672-6040. When calling DESA Heating, LLC, have ready:

- your name
- your address
- model and serial numbers of your heater
- how heater was malfunctioning
- purchase date

Usually, we will ask you to return the part to the factory.

PARTS NOT UNDER WARRANTY

Contact authorized dealers of this product. If they can't supply original replacement part(s), either contact your nearest *Parts Central* or call DESA Heating, LLC at 1-866-672-6040 for referral information. A list of authorized dealers can be found by visiting **www.desatech.com**.

When calling DESA Heating, LLC, have ready:

- model and serial numbers of your heater
- the replacement part number

PARTS CENTRAL

These Parts Centrals are privately owned businesses. They have agreed to support our customer's needs by providing original replacement parts and accessories.

Those Heater Guys

255 E. Stowell Street
Upland, CA 91786
909-928-3011

Tool & Equipment, Co.

5 Manila Ave
Hamden, CT 06514
1-800-397-7553
203-248-7553

Portable Heater Parts

342 N. County Rd. 400 East
Valparaiso, IN 46383
All States
219-462-7441
1-888-619-7060
sales@portableheaterparts.com
techservice@portableheaterparts.com

FBD

1349 Adams Street
Bowling Green, KY 42103
270-846-1199
1-800-654-8534
Fax: 1-800-846-0090
franktalk@aol.com

Master Parts Dist.

1251 Mound Ave. NW
Grand Rapids, MI 49504
616-791-0505
1-800-446-1446
Fax: 616-791-8270
www.nbmc.com

Washer Equipment Co.

1715 Main Street
Kansas City, MO 64108
KS, MO, AR
816-842-3911
www.washerparts.com

East Coast Energy Products

10 East Route 36
W. Long Branch, NJ 07764
732-870-8809
1-800-755-8809
www.njplaza.com/ecep

21st Century

2950 Fretz Valley Road
Perkasie, PA 18944
215-795-0400
800-325-4828

Laporte's Parts & Service

2444 N. 5th Street
Hartsville, SC 29550
843-332-0191
Parts Department

Cans Unlimited, Inc.

P.O. Box 645
Taylor, SC 29687-0013
All States
803-879-3009
1-800-845-5301
cuissales@aol.com

WARRANTY

Fill In For Your Records

Model No. (Located on upper shroud) _____

Serial No. (Located on lower shroud) _____

Keep proof of purchase for your records.

LIMITED WARRANTIES FOR NEW AND FACTORY RECONDITIONED PRODUCTS

New Products: DESA Heating, LLC warrants this heater and any parts thereof, to be free of defects in materials and workmanship for one (1) year from the date of first purchase, when operated and maintained in accordance with the manufacturer's instructions. These warranties are extended only to the original retail purchaser, when proof of purchase is provided.

Factory Reconditioned Heaters: DESA Heating, LLC warrants this factory reconditioned heater and any parts thereof, to be free of defects in materials and workmanship for thirty (30) days from the date of first purchase, when operated and maintained in accordance with the manufacturer's instructions. These warranties are extended only to the original retail purchaser, when proof of purchase is provided.

This warranty covers only the cost of parts and labor required to restore the product to proper operating condition. Transportation and incidental costs associated with warranty repairs are not reimbursable under this warranty.

Warranty service is available only through authorized dealers and service centers.

This warranty does not cover defects resulting from misuse, abuse, negligence, accidents, lack of proper maintenance, normal wear, alteration, modification, tampering, contaminated fuels, repair using improper parts, or repair by anyone other than an authorized dealer or service center. Routine maintenance is the responsibility of the owner.

THIS EXPRESS WARRANTY IS GIVEN IN LIEU OF ANY OTHER WARRANTY EITHER EXPRESSED OR IMPLIED, INCLUDING WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE.

DESA Heating, LLC assumes no responsibility for indirect, incidental or consequential damages. Some states do not allow the exclusion or limitation of incidental or consequential damages or 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.

WARRANTY SERVICE

Should your heater require service, return it to your nearest authorized service center. A list of authorized service centers can be found at www.desatech.com. Proof of purchase must be presented with the heater. The heater will be inspected. A defect may be caused by faulty materials or workmanship. If so, DESA Heating, LLC will repair or replace the heater without charge.

REPAIR SERVICE

Return the heater to your nearest authorized service center. Each Service Center is independently owned and operated. Repairs not covered by the warranty will be billed at standard prices.

A service manual is available at www.desatech.com. At any time while viewing heaters, click on "tech tips".

When writing for information regarding your heater, be sure to include the model number and serial number as shown on the model plate.

For more information about this warranty, write:



DESA Heating, LLC
2701 Industrial Drive
Bowling Green, KY 42101, USA
www.desatech.com
1-866-672-6040



INDUSTRIES OF CANADA, INC.
82 Akron Road
Toronto, Ontario
M8W 1T2
www.desatech.com