

AC-70, AC-115 AND AC-165 SPACE HEATERS



JOHN DEERE

**OPERATOR'S
MANUAL**



Introduction

THANK YOU for purchasing a John Deere product.

READ THIS MANUAL carefully to learn how to operate and service your machine correctly. Failure to do so could result in personal injury or equipment damage. This manual and safety signs on your machine may also be available in other languages. (See your John Deere dealer to order.)

THIS MANUAL SHOULD BE CONSIDERED a permanent part of your machine and should remain with the machine when you sell it.

MEASUREMENTS in this manual are given in both metric and customary U.S. unit equivalents. Use only correct replacement parts and fasteners. Metric and inch fasteners may require a specific metric or inch wrench.

RIGHT HAND AND LEFT HAND sides are determined by facing the motor end of the machine.

The SERIAL NUMBER is located in the Specification or Identification Numbers section. Accurately record all the numbers to help in tracing the machine should it be stolen. Your dealer also needs these numbers when you order parts. File the identification numbers in a secure place off the machine.

WARRANTY is provided from your John Deere dealer for customers who operate and maintain their equipment as described in this manual. The warranty is explained on the warranty certificate shown in this manual.

This warranty provides you the assurance that your dealer will back products where defects appear within the warranty period. Should the equipment be abused, or modified to change its performance beyond the original factory specifications, the warranty will become void.

WARNING

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

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All information, illustrations and specifications in this manual are based on the latest information available at the time of publication. The right is reserved to make changes at any time without notice.

Safety

RECOGNIZE SAFETY INFORMATION

This is the safety alert symbol. When you see this symbol on your machine or in this manual, be alert to the potential for personal injury.

Follow recommended precautions and safe operating practices.



UNDERSTAND SIGNAL WORDS

A signal word--DANGER, WARNING or CAUTION--is used with the safety-alert symbol. DANGER identifies the most serious hazards.

DANGER or WARNING safety signs are located near specific hazards. General precautions are listed on CAUTION safety signs. CAUTION also calls attention to safety messages in this manual.



FOLLOW SAFETY INSTRUCTIONS

Carefully read all safety messages in this manual and on your machine safety signs. Keep safety signs in good condition. Replace missing or damaged safety signs. Be sure new equipment components and repair parts include the current safety signs. Replacement safety signs are available from your John Deere dealer.

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

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

If you do not understand any part of this manual and need assistance, contact your John Deere dealer.





CARBON MONOXIDE - POISONOUS GAS



DANGER: CARBON MONOXIDE POISONING MAY LEAD TO DEATH!

Space heaters exhaust contains carbon monoxide - a poisonous gas that can kill you. You CAN NOT smell or see this gas.

Carbon Monoxide Poisoning: Early signs of carbon monoxide poisoning resemble the flu, with headaches, dizziness, and/or nausea. If you have these signs, the space heater may not be working properly. Get fresh air at once! Have space 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.

Never use a space heater in enclosed or partially-enclosed spaces without proper ventilation. Use only in well-vented areas. Before using space heater, provide at least a three-square-foot (2800 square cm) opening of fresh, outside air for each 100,000 Btu / Hr (30 kw) of rating. Space heaters can produce high levels of carbon monoxide very quickly. When you use a space heater, remember that you cannot smell or see carbon monoxide. Even if you can't smell exhaust fumes, you may still be exposed to carbon monoxide.

If you start to feel sick, dizzy, or weak while using a space heater, get to fresh air **RIGHT AWAY**. **DO NOT DELAY**. The carbon monoxide from space heaters can rapidly lead to full incapacitation and death.

If you experience serious symptoms, get medical attention immediately. Inform medical staff that carbon monoxide poisoning is suspected. If you experienced symptoms while indoors, have someone call the fire department to determine when it is safe to re-enter the building.

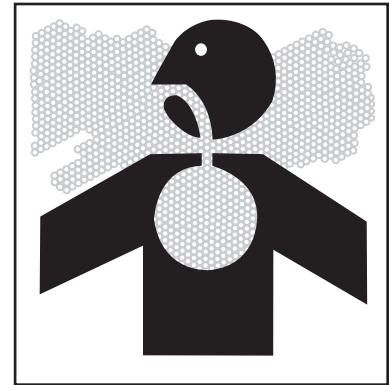
NEVER operate the space heater in an explosive atmosphere, near combustible materials or where ventilation is not sufficient to carry away exhaust fumes. **Exhaust fumes can cause serious injury or death.**

NEVER run space heaters inside homes, garages, sheds, or other semi-enclosed spaces without proper ventilation. These spaces can trap poisonous gases **EVEN IF** you run a fan or open doors and windows. Use only in well-vented areas. Before using space heater, provide at least a three-square-foot (2800 square cm) opening of fresh, outside air for each 100,000 Btu / Hr (30 kw) of rating.

If you start to feel sick, dizzy, or weak while using the space heater, shut it off and get fresh air **RIGHT AWAY**. See a doctor. You may have carbon monoxide poisoning.

Install battery-operated carbon monoxide alarms or plug-in carbon monoxide alarms with battery back-up in your home, according to the manufacturer's installation instructions. The carbon monoxide alarms should be certified to the requirements of the latest safety standards for carbon monoxide alarms. (UL 2034, IAS 6-96, or CSA 6.19.01).

Test your carbon monoxide alarm frequently and replace dead batteries.





SAFETY WARNING WHEN REFUELING

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

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.

Only the type of fuel specified on the space heater's data plate shall be used.

All flame, including the pilot light, if any, shall be extinguished and the space heater allowed to cool, prior to fueling.

During fueling, all fuel lines and fuel-line connections shall be inspected for leaks. Any leaks shall be repaired prior to returning the space heater to service.

At no time shall more than one day's supply of space heater fuel be stored inside a building in the vicinity of the space heater. Bulk fuel storage shall be outside the structure.

All fuel storage shall be located a minimum of 25 feet (762cm) from space heaters, torches, welding equipment, and similar sources of ignition (exception: the fuel reservoir integral with the space heater unit).

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.

Fuel storage shall be in accordance with the authority having jurisdiction.

Observe all safety regulations for the safe handling of fuel. Handle fuel in safety containers. If the container does not have a spout, use a funnel.

Do not overfill the fuel tank, leave room for the fuel to expand.

Do not refill fuel tank while the unit is running. Before refueling the space heater, turn it off and let it cool down.

Fill the tank only on an area of bare ground. While fueling the tank, keep heat, sparks and open flame away. Carefully clean up any spilled fuel before starting the unit.

Always fill fuel tank in an area with plenty of ventilation to avoid inhaling dangerous fumes.

NEVER store fuel for your space heater in the home. Gasoline, propane, kerosene, and other flammable liquids should be stored outside of living areas in properly-labeled, non-glass safety containers. Do not store them near a fuel-burning appliance, such as a natural gas water heater in a garage. If the fuel is spilled or the container is not sealed properly, invisible vapors from the fuel can travel along the ground and can be ignited by the appliance's pilot light or by arcs from electric switches in the appliance.





ELECTRICAL HAZARDS



DANGER- IMPROPER CONNECTION OF THE EQUIPMENT-GROUNDING CONDUCTOR CAN RESULT IN A RISK OF ELECTROCUTION. CHECK WITH A QUALIFIED ELECTRICIAN OR SERVICE PERSON IF YOU ARE IN DOUBT AS TO WHETHER THE UNIT IS PROPERLY GROUNDED.

Use only the electrical voltage and frequency specified on model plate.

Space heater must be grounded. Use only a properly grounded three-wire extension cord. Plug into grounded outlet only. If it should malfunction or breakdown, grounding provides a path of least resistance for electric current to reduce the risk of electric shock.

The space heater is a potential source of electrical shock if not kept dry. Keep the space heater dry and do not use in rain or wet conditions. To protect from moisture, operate it on a dry surface under an open, canopy-like structure. Dry your hands if wet before touching the space heater.

Check that the entire cord is free of cuts or tears and that the plug has all three prongs, especially a grounding pin.

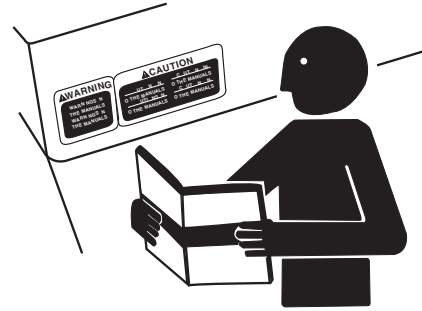




IMPORTANT SAFETY INSTRUCTIONS

1. Use only in areas free of flammable vapors or high dust content.
2. Minimum clearance from any combustibile materials: 8 feet (244 cm) from hot air outlet; 4 feet (122 cm) from top; and 4 feet (122 cm) from sides and inlet.
3. Locate space heater on a stable and level surface while hot or operating or a fire may occur.
4. Use only in well-vented areas. Before using space heater, provide at least a three-square-foot (2800 square cm) opening of fresh, outside air for each 100,000 Btu / Hr (30 kw) of rating.
5. Keep children and animals away from space heater at all times.
6. Never start space heater when combustion chamber is hot or if fuel has accumulated in combustion chamber.
7. When used with thermostat, space heater may start at anytime.
8. When space heater is moved or stored, it must be in a level position or fuel spillage may occur.
9. Use space heater only in accordance with local ordinances and codes.
10. Never use gasoline, crankcase drainings, naphtha, paint thinners, alcohol, or other highly flammable fuels.
11. Never use space heater where gasoline, paint thinner, or other highly flammable vapors are present.
12. Never use space heater in living or sleeping areas.
13. Never leave a space heater plugged in without adult supervision if children or animals are likely to be present.
14. Never move, handle, refuel, or service a hot, operating, or plugged-in space heater.
15. Never attach duct work to front or rear of space heater.
16. Never attach space heater to external fuel tank.
17. Space 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 10 feet (304.8cm). 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 space heater due to wind action.
18. Unplug space heater when not in use.
19. Never block air inlet (rear) or air outlet (front) of space heater.

SAVE THESE INSTRUCTIONS



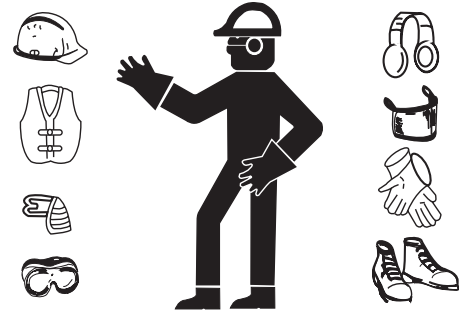


WEAR PROTECTIVE CLOTHING

Wear close fitting clothing and safety equipment appropriate to the job.

Wear a suitable hearing protective device such as earmuffs or earplugs to protect against objectionable or uncomfortable loud noises.

Operating equipment safely requires the full attention of the operator. Do not wear radio or music headphones while operating machine.

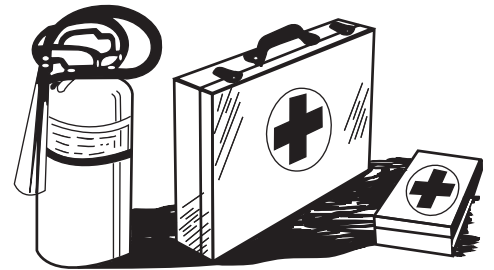


PREPARE FOR EMERGENCIES

Keep a first aid kit and fire extinguisher handy.

Keep emergency numbers for doctors, ambulance service, hospital and fire department near your telephone.

Be prepared if a fire starts.



INSPECT SPACE HEATER

Be sure all covers, guards and shields are tight and in place.

Locate all operating controls and safety labels. Inspect power cord for damage before using. There is a hazard of electrical shock from crushing, cutting or heat damage.

Remove all packing items applied to space heater for shipment. Remove all items from carton. Check items for any shipping damage. If space heater is damaged, promptly inform dealer where you bought space heater.

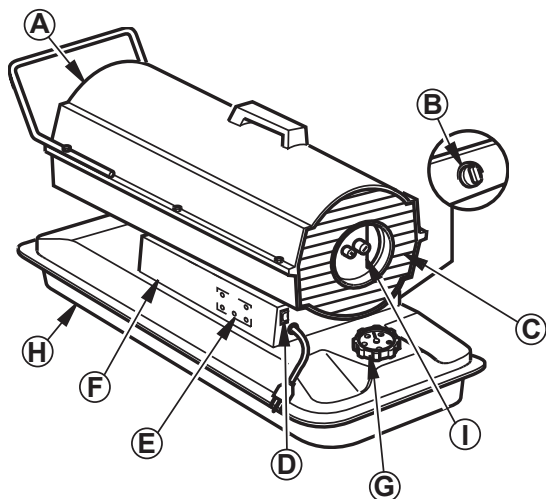
SERVICE SPACE HEATER SAFELY

Before servicing the space heater, shut off unit and allow unit to cool down.

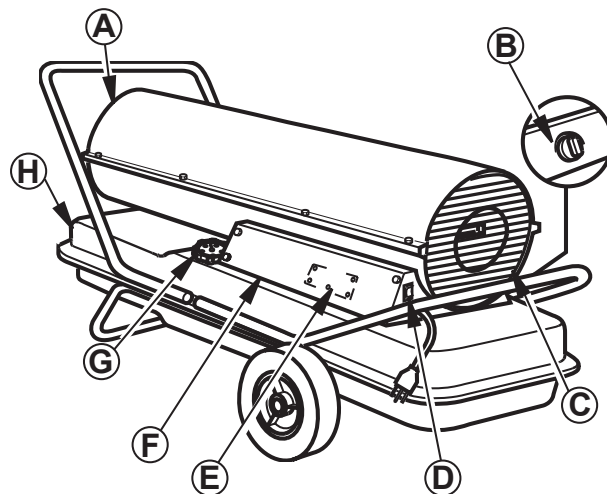
Service space heater in a clean dry flat area.

Controls

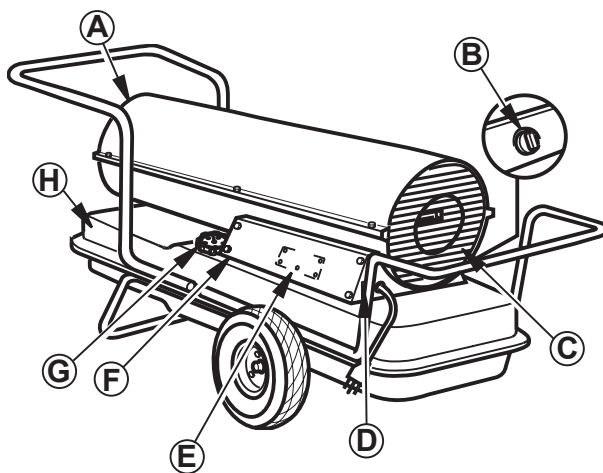
CONTROLS



AC-70



AC-115



AC-165

A -- Hot Air Outlet
B -- Thermostat Knob
C -- Fan Guard

D -- ON / OFF Switch
w/ Light
E -- Ignition Control Assembly
(On Inside of Side Cover)
F -- Side Cover

G -- Fuel Cap / Gauge
H -- Fuel Tank
I -- Air Filter End Cover

Assembly

ASSEMBLY

NOTE: For 115 and 165 Models Only

These models are furnished with wheels and a handle. Some models are furnished with a second handle also. Wheels, handle(s), and the mounting hardware are found in the shipping carton.

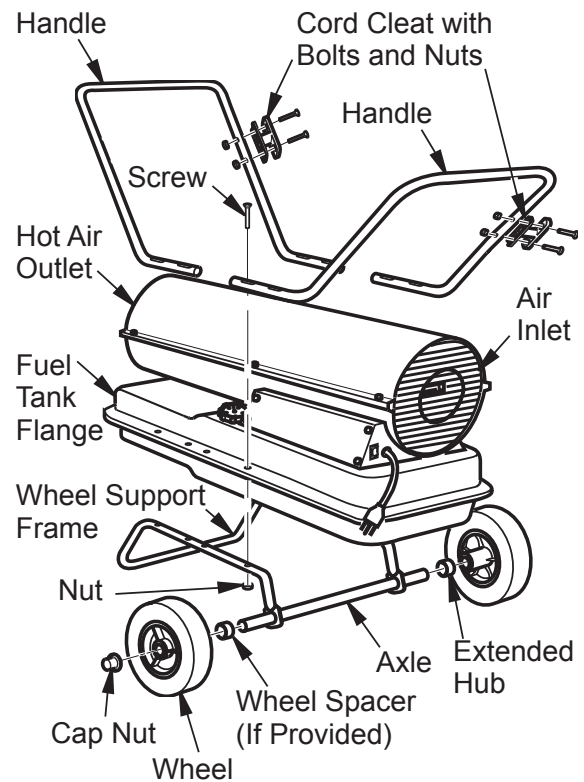
Tools Needed

- Medium Phillips Screwdriver
- 3/8" Open or Adjustable Wrench
- Hammer

1. Slide axle through wheel support frame. Install wheel spacers if provided. Install wheels on axle.

IMPORTANT: When installing wheels, point extended hub of wheels toward wheel support frame (Fig. 1).

2. Place cap nuts on axle ends. Gently tap with hammer to secure.
3. Place space heater on wheel support frame. Line up holes on fuel tank flange with holes on wheel support frame.
4. Place handle(s) on top of fuel tank flange. Insert screws through handle(s), fuel tank flange, and wheel support frame. Attach nut, hand tight after each screw is inserted.
5. After all screws are inserted, tighten nuts firmly.



(Fig. 1)

Preparation

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 SPACE 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 SPACE HEATER.

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

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

FUELS

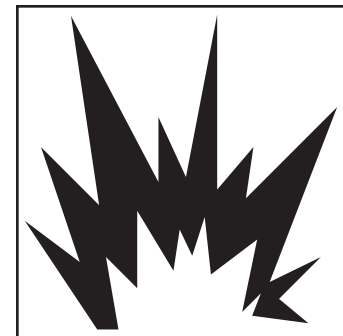
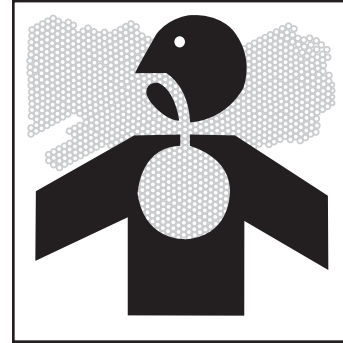
! WARNING: USE ONLY KEROSENE, #1/#2 DIESEL/ FUEL OIL, JET A OR JP8 FUELS TO AVOID RISK OF FIRE OR EXPLOSION. NEVER USE GASOLINE, OIL DRAINED FROM CRANKCASES, NAPHTHA, PAINT THINNERS, ALCOHOL OR OTHER HIGHLY FLAMMABLE FUELS.

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

- noticeable odor
- additional fuel filter maintenance
- the need for nontoxic, anti-icer additives in very cold weather

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 space 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 space heater. Foreign matter may also require space heater's fuel system to be frequently cleaned.



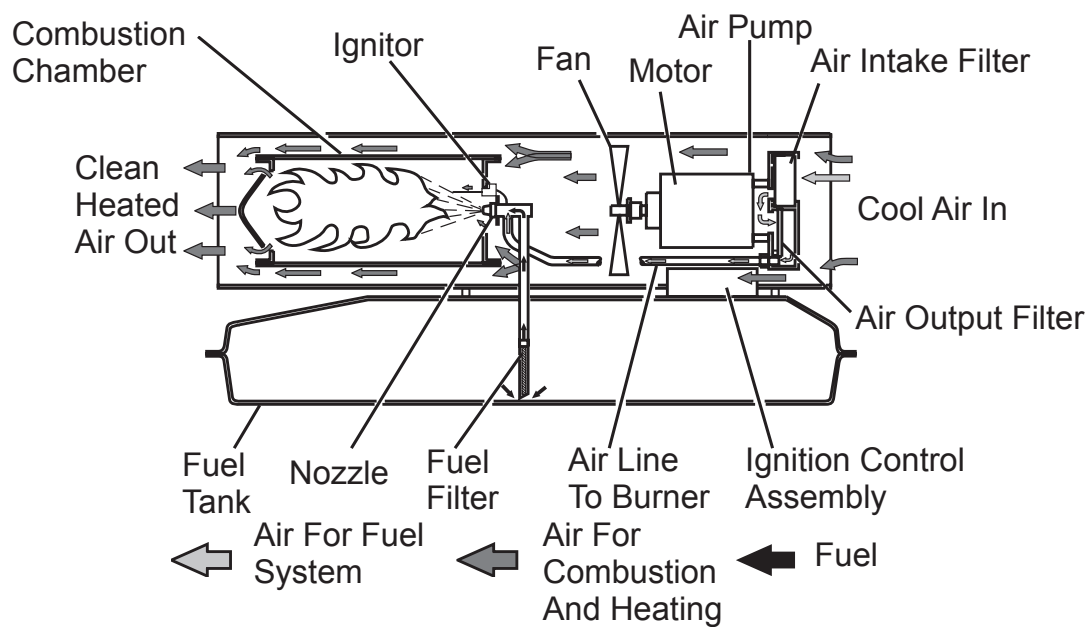
THEORY OF OPERATION

The Fuel System: The air pump forces air through the air line. The 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 ignition control assembly provides power to the ignitor. This ignites the fuel / air mixture in the combustion chamber.

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



Operation

OPERATION

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

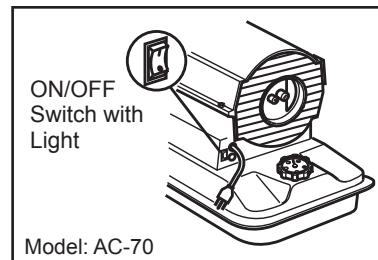
START SPACE HEATER:

1. Follow all ventilation and safety information.
2. Place the space heater in an area that provides maximum circulation of the heated air. Follow all location requirements noted in the Safety Information.
3. Fill fuel tank with kerosene, #1#2 diesel / fuel oil, JET A or JP-8 fuel.
4. Attach fuel cap.
5. For thermostat models, turn thermostat knob clockwise to the high position.
6. Plug space heater's power cord into approved, grounded, three-wire extension cord. Extension cord must be at least six feet (1.8 meters) long.

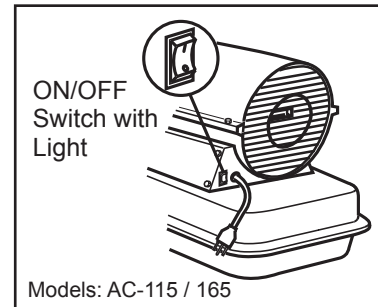
Extension Cord Size Requirement:

- 6 to 10 feet (1.8 to 3 meters) long, use 18AWG (0.75 mm²) rated cord
 - 11 to 100 feet (3.3 to 30.5 meters) long, use 16 AWG (1.0 mm²) rated cord
 - 101 to 200 feet (30.8 to 61 meters) long, use 14 AWG (1.5 mm²) rated cord
7. Plug extension cord into standard 120 volt / 60 hertz, 3-prong grounded outlet. Push ON / OFF switch to ON(I) position and space heater should start in 5 seconds. (Fig. 2 & 3) If space heater does not start, see Troubleshooting.
 8. Adjust thermostat knob to the desired setting.

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



(Fig. 2)



(Fig. 3)

OPERATION

STOP SPACE HEATER:

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

Troubleshooting



WARNING: HIGH VOLTAGE. NEVER SERVICE SPACE HEATER WHILE IT IS PLUGGED IN, OPERATING, OR HOT. SEVERE BURNS AND ELECTRICAL SHOCK CAN OCCUR.

Symptom	Problem	Solution
Motor does not start five seconds after space heater is plugged in.	No power to space heater.	Check circuit breaker in electrical panel.
	ON / OFF switch not in the ON (I) position.	Verify the ON / OFF switch is in ON (I) position and light is on.
	Thermostat setting is too low.	Turn thermostat knob to a higher setting.
	Bad electrical connection between motor and ignition control assembly or ignition control assembly and power cord.	Check all electrical connections.
	Binding pump rotor.	If fan does not turn freely, see "Maintenance: Pump Rotor".
	Defective ignition control assembly.	Replace ignition control assembly.
	Defective motor.	Replace motor.
	Blown fuse or ignitor control assembly.	See "Maintenance: Ignition Control Assembly".



WARNING: HIGH VOLTAGE. NEVER SERVICE SPACE HEATER WHILE IT IS PLUGGED IN, OPERATING, OR HOT. SEVERE BURNS AND ELECTRICAL SHOCK CAN OCCUR.

Symptom	Problem	Solution
Motor starts and runs but space heater does not ignite	No fuel in tank.	Fill tank with kerosene.
	Pump pressure incorrect.	See "Maintenance: Pump Pressure Adjustment".
	Dirty fuel filter.	See "Maintenance: Fuel Filter".
	Obstruction in nozzle.	See "Maintenance: Nozzle Assembly".
	Water in fuel tank.	Drain and flush fuel tank with clean kerosene.
	Bad electrical connection between ignitor and ignition control assembly.	Check electrical connections.
	Defective ignitor.	Replace ignitor, see "Maintenance: Ignitor".
Space heater ignites but ignition control assembly shuts space heater off after a short period of time.	Defective ignition control assembly.	Replace ignition control assembly.
	Pump pressure incorrect.	See "Maintenance: Pump Pressure Adjustment".
	Dirty air intake, air output, and/or lint filter.	See "Maintenance: Air Output, Air Intake, and Lint Filters".
	Dirty fuel filter.	See "Maintenance: Fuel Filter".
	Obstruction in nozzle.	See "Maintenance: Nozzle Assembly".
	Photocell assembly not properly installed (not seeing the flame).	Make sure photocell boot is properly seated in bracket.
	Dirty photocell lens.	Clean photocell lens.
	Bad electrical connection between photocell and ignition control assembly.	Check electrical connections.
	Defective photocell.	Replace photocell.
	Defective ignition control assembly.	Replace ignition control assembly.

Service

MAINTENANCE

PREVENTATIVE MAINTENANCE SCHEDULE:



WARNING: HIGH VOLTAGE. NEVER SERVICE SPACE HEATER WHILE IT IS PLUGGED IN, OPERATING, OR HOT. SEVERE BURNS AND ELECTRICAL SHOCK CAN OCCUR.

Item	How Often	How to
Fuel tank	Flush every 150-200 hours of operation or as needed.	See "Storage: Storing, Transporting, or Shipping".
Air output and lint filters	Replace every 500 hours of operation or once a year.	See "Maintenance: Air Output, Air Intake, and Lint Filters".
Air intake filter	Wash and dry with soap and water every 500 hours of operation or as needed.	See "Maintenance: Air Output, Air Intake, and Lint Filters".
Fuel filter	Clean twice a heating season or as needed.	See "Maintenance: Fuel Filter".
Ignitor	No maintenance required.	
Fan blades	Clean every season or as needed.	See "Maintenance: Fan".
Motor	Not required / permanently lubricated.	

MAINTENANCE (CONTINUED):

⚠ WARNING: TO AVOID RISK OF BURN AND ELECTRICAL SHOCK, NEVER ATTEMPT TO SERVICE SPACE HEATER WHILE IT IS PLUGGED IN, OPERATING, OR HOT.

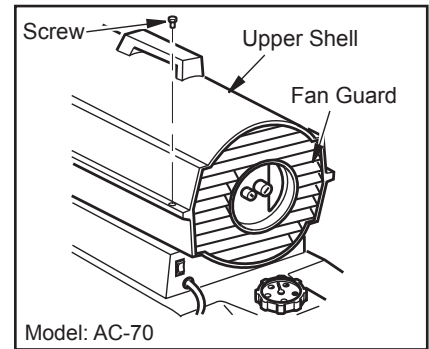
UPPER SHELL REMOVAL:

1. Remove screws along each side of space heater using 5/16" nut-driver. These screws attach upper and lower shells together. (Fig. 4 or 5)
2. Lift upper shell off.
3. Remove fan guard.

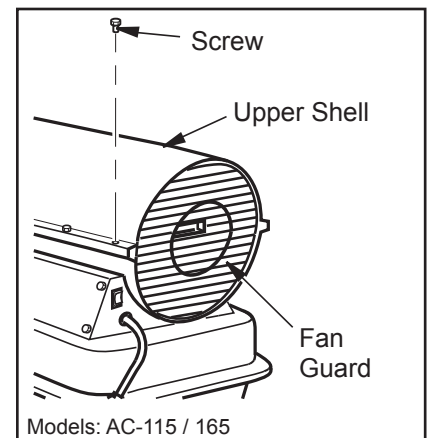
FAN:

IMPORTANT: Remove fan from motor shaft before removing motor from space heater. The weight of the motor resting on the fan could damage the fan pitch. (Fig. 6)

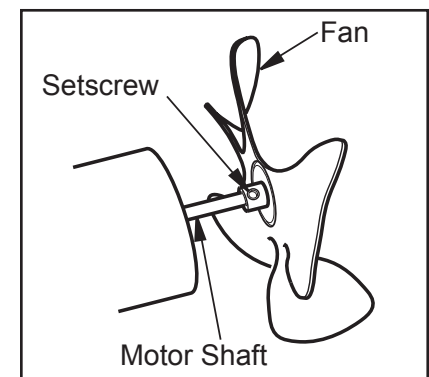
1. Remove upper shell. (Fig. 4 or 5)
2. Use 1/8" allen wrench to loosen setscrew which holds fan to motor shaft.
3. Slip fan off motor shaft.
4. Clean fan using a soft cloth moistened with kerosene or solvent.
5. Dry fan thoroughly.
6. Replace fan on motor shaft. Place fan hub flush with end of motor shaft. (Fig. 7)
7. 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.



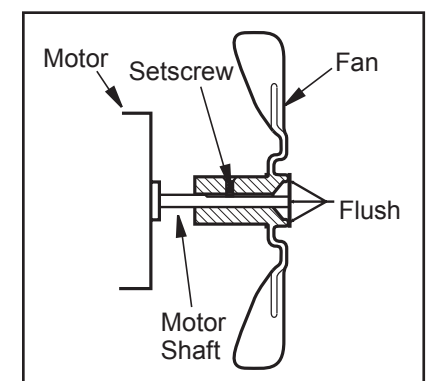
(Fig. 4)



(Fig. 5)



(Fig. 6)



(Fig. 7)

MAINTENANCE (CONTINUED):

AIR OUTPUT, AIR INTAKE AND LINT FILTERS:

1. Remove upper shell. (Fig. 4 or 5)
2. Remove filter end cover screws using 5/16" nut-driver. (Fig. 8 or 9)
3. Remove filter end cover.
4. Replace air output and lint filters.
5. Wash or replace air intake filter (see "Preventative Maintenance Schedule").
6. Replace filter end cover.
7. Replace fan guard and upper shell.

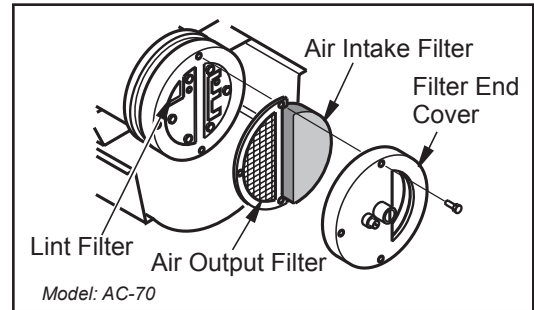
IMPORTANT: Do not oil filters.

PUMP PRESSURE ADJUSTMENT:

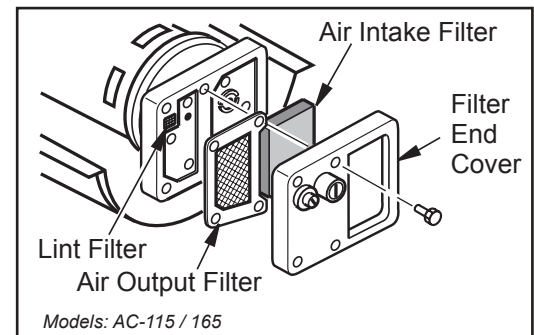
1. Remove pressure gauge plug from filter end cover (Fig. 10).
2. Install a pressure gauge.
3. Start space heater (See "Operation"). Allow motor to reach full speed.
4. Adjust pressure. Turn relief valve to right to increase pressure. Turn relief valve to left to decrease pressure (Fig. 11). See specifications below for correct pressure for each model.

Model:	Pump Pressure:
70	4.7 PSI
115	5.1 PSI
165	5.6 PSI

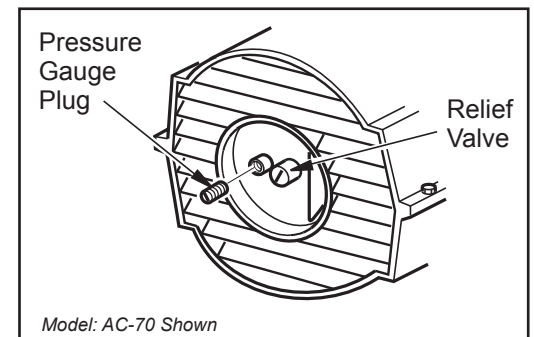
5. Remove pressure gauge. Replace pressure gauge plug in filter end cover.



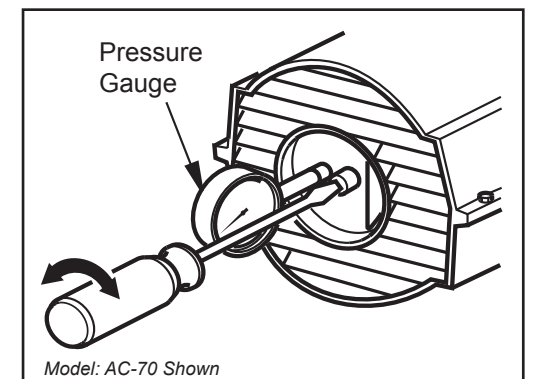
(Fig. 8)



(Fig. 9)



(Fig. 10)

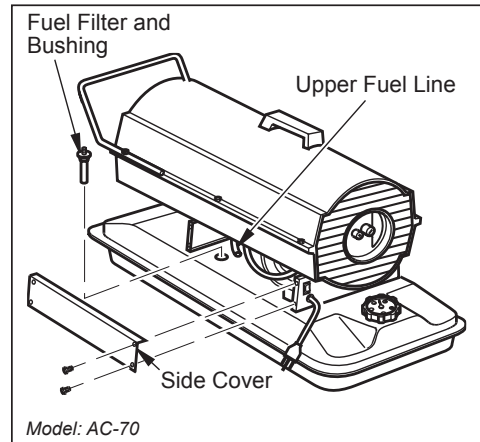


(Fig. 11)

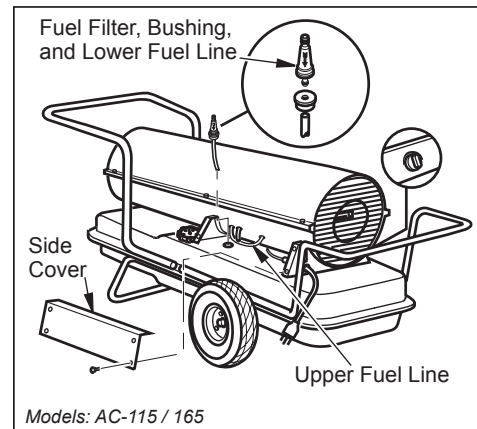
MAINTENANCE (CONTINUED):

FUEL FILTER:

1. Remove side cover screws using 5/16" nut-driver.
2. Remove side cover.
3. Pull upper fuel line off fuel filter neck (Fig. 12 or 13).
4. Carefully pry bushing, fuel filter, and lower fuel line (AC-115/165 models only) out of fuel tank (Fig. 13).
5. Wash fuel filter with clean fuel and replace in tank.
6. Attach upper fuel line to fuel filter neck.
7. Replace side cover.



(Fig. 12)



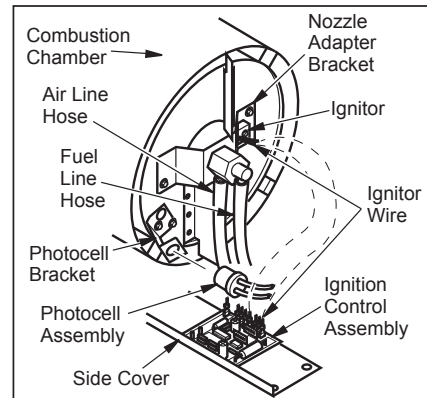
(Fig. 13)

MAINTENANCE (CONTINUED):**IGNITOR:**

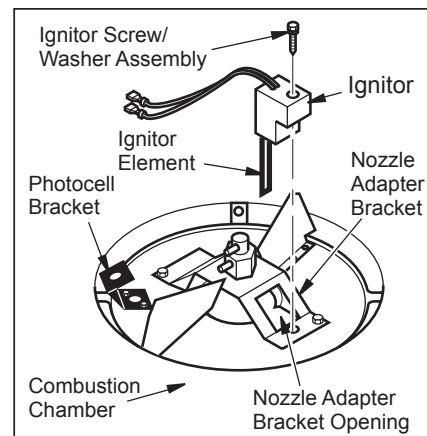
1. Remove upper shell and fan guard (See "Maintenance: Upper Shell Removal").
2. Remove fan.
3. Remove 4 side cover screws with a 5/16" nut driver. Remove side cover (Fig. 12 or 13).
4. Disconnect ignitor wires from ignition control assembly (Fig. 14). Pull the ignitor wires up through the hole in the lower shell.
5. Disconnect fuel line hose and air line hose. Remove photocell from photocell bracket (Fig. 14).
6. Remove combustion chamber. Stand combustion chamber on end with nozzle adapter bracket on top (Fig. 15).
7. Remove ignitor screw with a 1/4" nut driver. Carefully remove ignitor from nozzle adapter bracket.

⚠ CAUTION: DO NOT BEND OR STRIKE IGNITOR ELEMENT. HANDLE WITH CARE.

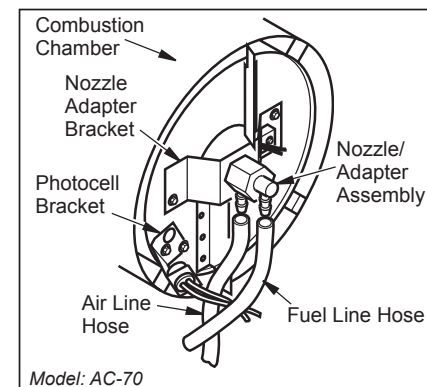
8. Carefully remove replacement ignitor from packing.
9. Carefully guide ignitor into opening in nozzle adapter bracket. Do not strike ignitor element. Attach ignitor to nozzle adapter bracket with screw using a 1/4" nut driver (Fig. 16). Torque .90 to 1.69 N-m (8 to 15 in-lbs) Do not over torque.
10. Replace combustion chamber.
11. Route the ignitor wires back down through the hole in the lower shell. Connect wires to the ignition control assembly (Fig. 15).
12. Replace side cover (Fig. 13 or 14).
13. Connect and route fuel line hose and air line hose to nozzle adapter assembly. See "Maintenance: Fuel and Air Line Replacement and Proper Routing".
14. Replace photocell in photocell bracket. Route wires as shown in either Fig. 16 or Fig. 17.
15. Replace fan.
16. Replace fan guard and upper shell.



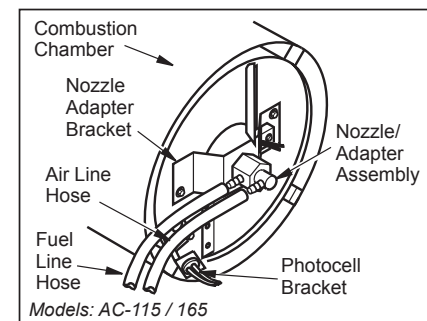
(Fig. 14)



(Fig. 15)



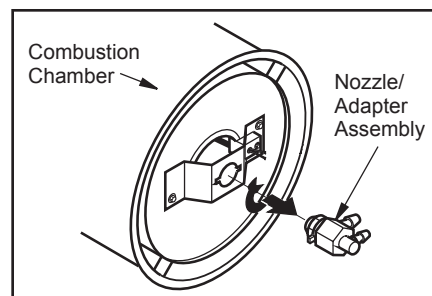
(Fig. 16)



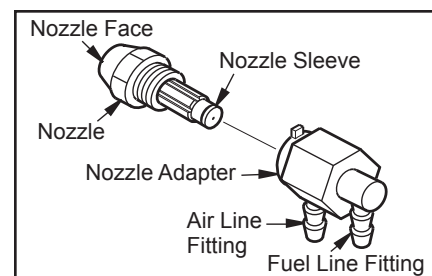
(Fig. 17)

MAINTENANCE (CONTINUED):**NOZZLE ASSEMBLY:**

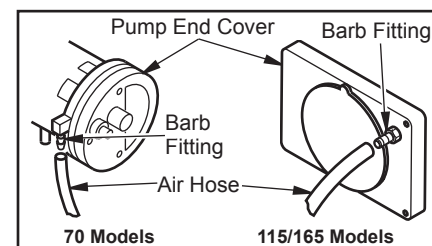
1. Remove upper shell (See "Maintenance: Upper Shell Removal")
2. Remove fan (See "Maintenance: Fan").
3. Remove fuel and air line hoses from nozzle assembly (Fig. 16 or Fig. 17).
4. Turn nozzle assembly 1/4 turn to left and pull toward motor to remove (Fig. 18).
5. Place plastic hex-body into vise and lightly tighten.
6. Carefully remove nozzle from the nozzle adapter using 5/8" socket wrench (Fig. 19).
7. Blow compressed air through face of nozzle. This will free any dirt in nozzle area.
8. Inspect nozzle sleeve for damage.
9. 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). See Fig. 19.
10. Attach nozzle assembly to burner strap (Fig. 18).
11. Attach fuel and airline hoses to nozzle assembly. See "Maintenance: Fuel and Air Line Replacement and Proper Routing".
12. Replace fan (See "Maintenance: Fan").
13. Replace fan guard and upper shell (See "Maintenance: Upper Shell Removal").



(Fig. 18)



(Fig. 19)



(Fig. 20)

FUEL AND AIR LINE REPLACEMENT AND PROPER ROUTING:

1. Remove upper shell (See "Maintenance: Upper Shell Removal").
2. Remove side cover screws using 5/16" nut driver (Fig. 12 or 13).
3. Remove side cover.
4. Inspect fuel and air line hoses for cracks and/or holes. If fuel line hose is damaged, disconnect from nozzle adapter (Fig. 16 or 17) and from fuel filter (See "Maintenance: Fuel Filter"). If air line hose is damaged, disconnect from nozzle adapter (Fig. 16 or 17) and from barb fitting on pump end cover (Fig. 20).
5. Install new air and/or fuel line. Attach one end of air line hose to barb fitting on pump end cover (Fig. 20) and the other end to nozzle adapter (Fig. 16 or 17). Attach one end of fuel line hose to fuel filter (see "Maintenance: Fuel Filter") and the other end to nozzle adapter (Fig. 16 or 17).

Note: Route hoses as shown in see Fig. 16 or 17, according to model. Hoses are not to touch photocell bracket.

6. Replace side cover.
7. Replace upper shell and fan guard (See "Maintenance: Upper Shell Removal").

MAINTENANCE (CONTINUED):**PUMP ROTOR: (Procedure if Rotor is Binding)**

1. Remove upper shell (See "Maintenance: Upper Shell Removal").
2. Remove filter end cover screws using 5/16" nut driver (Fig. 21 or 22).
3. Remove filter end cover and air filters.
4. Remove pump plate screws using 5/16" nut-driver.
5. Remove pump plate.
6. Remove rotor, insert, and blades (Fig. 21 or 22).
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 .076/.101 mm (.003"/.004") if needed (Fig. 23).

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

10. Install blades, pump plate, air filters, and filter end cover.
11. Replace fan guard and upper shell (see "Maintenance: Upper Shell Removal").
12. Adjust pump pressure (see "Maintenance: Pump Pressure Adjustment").

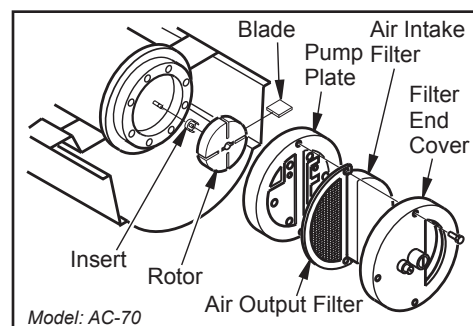
Note: If rotor is still binding, proceed as follows.

13. Perform steps 1 through 6.
14. Place fine grade sandpaper (600 grit) on flat surface. Sand rotor lightly in a "figure 8" motion four times (Fig. 24).
15. Reinstall insert and rotor.
16. Perform steps 10 through 12.

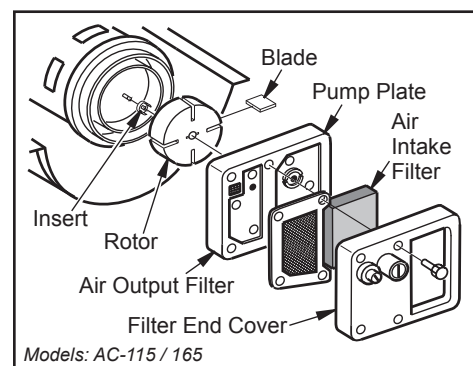
IGNITION CONTROL ASSEMBLY:

WARNING: HIGH VOLTAGE!

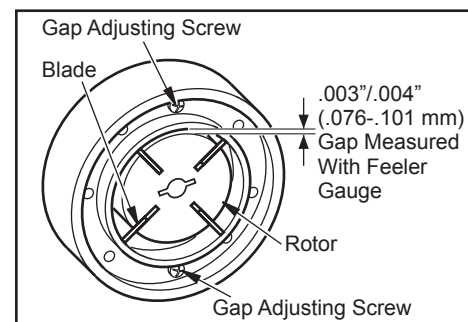
1. Unplug space heater.
2. Remove side cover screws (4) using 5/16" nut-driver to expose ignition control assembly.
3. Remove fuse cover (Fig. 25).
4. Remove fuse from fuse clips (see Fig. 25).
5. Replace fuse with fuse of the same type and rating (GMA-10). Do not substitute a fuse with a higher current rating.
6. Replace fuse cover (Fig. 25).
7. Replace side cover.



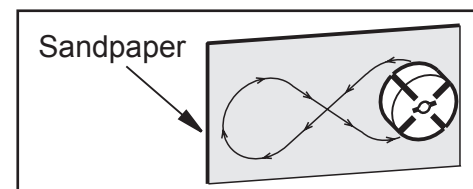
(Fig. 21)



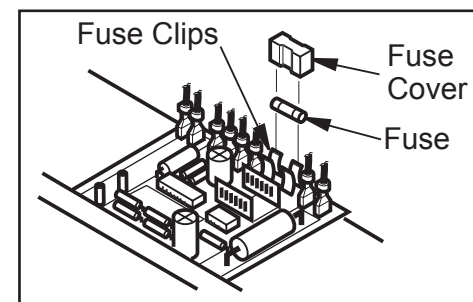
(Fig. 22)



(Fig. 23)



(Fig. 24)



(Fig. 25)

Storage

STORAGE

STORING, TRANSPORTING OR SHIPPING:

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

1. Drain fuel tank.

Note: *Some models have drain plug on underside of fuel tank. If so, remove drain plug to drain all fuel. If space 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 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 space 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 space heater.*

Specifications

ITEM	SPECIFICATION		
Model Size	70	115	165
Output Rating (BTU / Hr)	70,000	115,000	165,000
Fuel	Use only kerosene, #1/#2 diesel / fuel oil, JET A or JP-8 fuels*		
Fuel Tank Capacity (U.S. Gal. / Liters)	5 / 18.9	9 / 34	13.5 / 51
Fuel Consumption (Gal. Per Hr / Liters Per Hr)	.52 / 1.97	.85 / 3.00	1.2 / 4.54
Pump Pressure (psi)	4.7	5.1	5.6
Electric Requirements	120V / 60 HZ	120V / 60 HZ	120V / 60 HZ
Amperage (Normal Run)	2.8	3.6	3.6
Motor RPM	3440	3400	3400
Hot Air Output (CFM)	360	490	575
Motor HP	1/8	1/5	1/5
Shipping Weight (Approximate Pounds / Kilograms)	36 / 16.3	56 / 25.4	71 / 32.2
Space heater Weight without Fuel (Approximate Pounds / Kilograms)	32 / 14.5	48 / 21.8	61 / 27.7

* 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.

RECORD SERIAL NUMBER

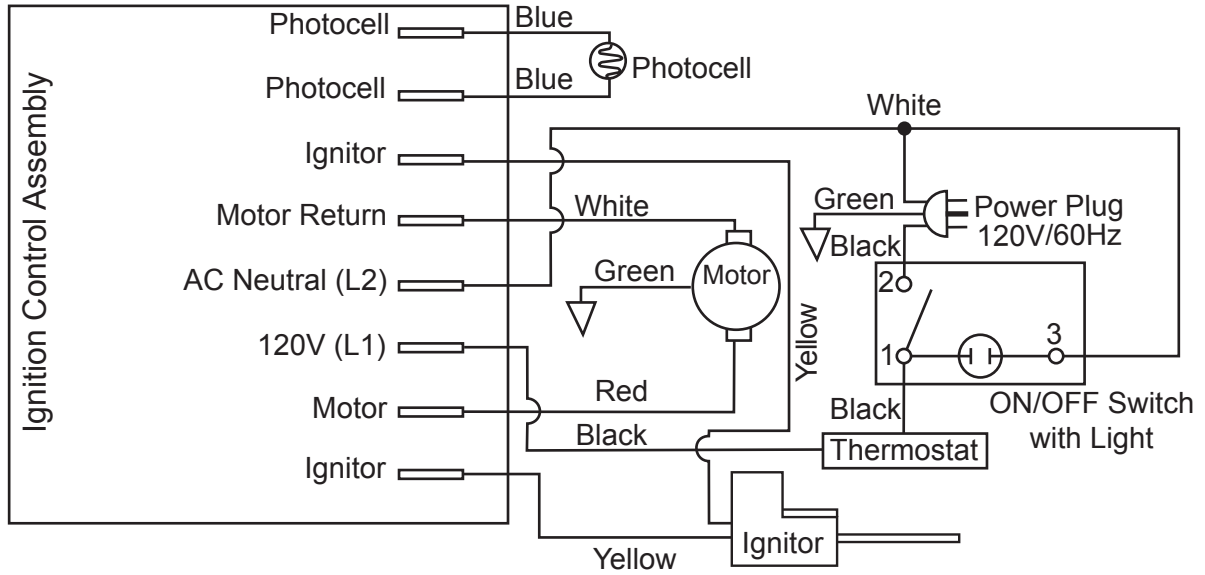
Write you model number, machine serial number and date of purchase in the spaces provided below. Your dealer needs this information when ordering parts.

Model No. _____

Machine Serial No. _____

Date of Purchase _____
(To be filled in by purchaser)

Wire Diagram



STATEMENT OF WARRANTY

John Deere warrants all parts, (except those referred to below), of your new space heater to be free from defects in materials and workmanship during the following periods:

For One (1) Year from the date of original purchase.

Defective parts not subject to normal wear and tear will be repaired or replaced at our option during the warranty period. In any event, reimbursement is limited to the purchase price paid.

EXCLUSIONS

1. This warranty does not cover parts damaged due to normal wear, misapplication, misuse, operation at other than recommended. Failure to follow recommended operating and maintenance procedures also voids warranty.
2. The use of other than genuine manufacturer repair parts will void warranty.
3. Warranty will be void if used in any application other than consumer / homeowner. Parts returned, prepaid to our factory or to an Authorized John Deere Service Center will be inspected and replaced free of charge if found to be defective and subject to warranty. There are no warranties which extend beyond the description of the face hereof. Under no circumstances shall the manufacturer bear any responsibility for loss of use of the unit, loss of time or rental, inconvenience, commercial loss or consequential damages.

For Service or Warranty Consideration, contact
Mi-T-M® Corporation, 8650 Enterprise Drive, Peosta, IA 52068
1-877-JD-KLEEN / (1-877-535-5336) Fax 563-556-1235
Monday - Friday 8:00 a.m. - 5:00 p.m. CST

