

MASTER®

GB - PORTABLE FORCED AIR HEATERS

FR - APPAREILS DE CHAUFFAGE INDIVIDUELS À AIR FORCÉ

DE - TRAGBARE HOCHDRUCK EISLUFTTURBINEN

NL - VERPLAATSBARE HETELUCHTKANONNEN

IT - GENERATORE D'ARIA CALDA A RISCALDAMENTO DIRETTO

ES - CALENTADORES PORTATILES DE AIRE FORZADO

SV - PORTABEL VÄRMEFLÄKT MED FORCERAT LUFTFLÖDE

FI - KANNETTAVA KUUMAILMAPUHALLIN

DK - VARMEKANONER

NO - TRANSPORTABLE VARMEAPPARATER MED VIFTE

PL - PRZENOŚNE OLEJOWE NAGRZEWNICE POWIETRZA

**RU - ПЕРЕДВИЖНЫЕ ВОЗДУХОНАГРЕВАТЕЛИ
С СИСТЕМОЙ НАДДУВА**

HU - HORDOZHATÓ, GÉPI LÉGFŰTŐ BERENDEZÉS

CZ - PŘENOSNÉ OHŘÍVAČE S NUCENÝM OBĚHEM VZDUCHU

**LT - KILNOJAMOJO ORO ŠILDYTUVO SU TIESIOGINIU KURO
PADAVIMU**

EE - TEISALDATAV OTSEKÜTTEGA ÕHUSOOJENDI

LV - GAISA SILDĪTĀJA AR ŠĶIDRĀ KURINĀMĀ DEGLI

**OWNER'S MANUAL - MANUEL D'UTILISATION - BEDIENUNGSANLEITUNG -
GEBRUIKERSHANDLEIDING - MANUALE D'ISTRUZIONE - MANUALE DEL PROPIETARIO -
ANVÄNDARMANUAL - KÄYTTÖOPAS - BRUGSANVISNING - BRUKERHÅNDBOK - INSTRUKCJA
OBSŁUGI - РУКОВОДСТВО ДЛЯ ПОЛЬЗОВАТЕЛЯ - FELHASZNÁLÓI KÉZIKÖNYV - PŘÍRUČKA
PRO UŽIVATELE - EKSPLOATAVIMO INSTRUKCIJOS - KASUTUSJUHEND - LIETOŠANAS
INSTRUKCIJA**

**Heater sizes - Production de la chaleur - Heizgerät-Größen - Vermogen - Potenza termica
- Tamaños - Effekt storlekar - Lämmittimen lämpötehot - Størrelse - Størrelser - Nagrzewnice
o wydajności - Мощность нагревателей - Fűtőberendezések teljesítménye - Vákon ohřívačů**

- Modeliai - Våljundvöimsus - Izejas jauda:

10, 20, 29 y 44 kW

(35.000, 70.000, 100.000 and 150.000 Btu/Hr)

**Models - Modèles - Modelle - Modellen - Modelli - Modelos - Modeller - Mallit - Model -
Modeller - Modele - Модели - Modellek - Modely - Modeliai - Mudelid - Modelji:**

B35CED, B70CED, B100CED, B150CED

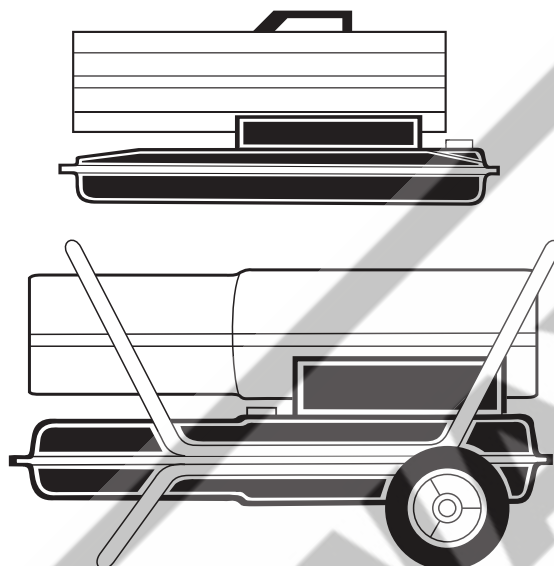


SPECIFICATIONS - SPÉCIFICATIONS - TECHNISCHE DATEN - TECHNISCHE GEGEVENS - DATI TECNICI - ASPECIFICACIONES - SPECIFIKATIONER - TEKNISET TIEDOT - SPECIFIKATIONER - SPESIFIKASJONER - SPECYFIKACJE - ТЕХНИЧЕСКИЕ ХАРАКТЕРИСТИКИ - MŰSZAKI ADATOK - TECHNICKÉ ÚDAJE - SPECIFIKACIJOS - TEHNILISED ANDMED - TEHNISKIE DATI

Max power - Puissance thermique max. - Max Wärmeleistung - Max Vermogen - Potenza termica max - Potencia térmica max - Värmestyrka max - Enimmäislämpöteho - Maks. Termisk Effekt - Maksimal varmeeffekt - Wydajność - Номинальная выходная мощность - Teljesítmény - Jmenovitá výkon - Nominalioji galia - Väljundvõimsus - Izejas jauda	10 kW 35.000 Btu/h	20 kW 70.000 Btu/h	29 kW 100.000 Btu/h	44 kW 150.000 Btu/h
Fuel - Combustible - Kraftstoff - Brandstof - Combustibile - Combustible - Bränsle - Polttoaine - Brændstof - Brennstoff - Paliwo - Топливо - Fűtőolaj - Palivo - Kuras - Kütus - Kurināmais	diesel	diesel	diesel	diesel
Fuel Tank Capacity - Capacité Du Reservoir Fuel - Kraftstofftank / Fassungsvermögen - Tankinhoud - Capacità serbatoio - Capacidad del tanque de combustible - Tankstorlek - Polttoainesäiliön tilavuus - Tankkapacitet i liter - Størrelse på brennstofftanken - Pojemność zbiornika paliwa - Емкость топливного бака - Fűtőolajtartály térfogata - Kapacita palivové nádrže - Kuro talpyklos talpa - Kütusepaagi maht - Kurināmā tvertnes	15 Lt	19 Lt	44 Lt	44 Lt
Fuel Consumption - Consommation Fuel - Kraftstoffverbrauch - Brandstofverbruik - Consumo di combustibile - Consumo de combustibile - Bränsleförbrukning - Polttoaineenkulutus - Petroleumsforbrug - Brennstofforbruk - Zuzycie paliwa - Расход топлива - Fűtőolaj fogyasztás - Spotreba paliva - Kuro išeikvojimas - Kütusekulu - Kurināmā patēriņš	1,1 Lt/h	1,85 Lt/h	2,7 Lt/h	4,1 Lt/h
Electric Requirements - Tension-V - Elektrischer Anschluß - Netvoeding - Alimentazione elettrica - Requisitos eléctricos - Elektrisk strøm - Sähkövirta - El-type - Elektriske krav - Wymagania odnosnie zasilania - Электропитание - Villamos csatlakozás - Potrebné elektrické napetí - Elektros sistemas priežiūros reikalavimai - Nõuded elektrisüsteemile - Prasības elektriskajai sistēmai	230 V / 50 Hz	230 V / 50 Hz	230 V / 50 Hz	230 V / 50 Hz
Amperage - Ampérage - Stromstärke - Stroomsterkte - Amperaggio - Amperaje - Strömstyrka, ampere - Ampeerikulutus - Strømstyrke - Strømstyrke - Pobór prądu - Ток - Áramfelvétel - Potrebná elektrická proud - Srovės stiprumas amperais - Voolutugevus - Barošanas spriegums	0,8 A	1 A	1,2 A	1,2 A
Hot Air Output - Débit D'air - Heißluftausstoß - Blaasvermogen hete lucht - Portata d'aria - Salida de aire caliente - Hetluftsutsläpp - Kuumailmateho - Varmiluftmængde i m3 i minuttet - Varmluftskapasitet - Wydajność ciepłego powietrza - Выход горячего воздуха - Meleg levegő kibocsátás - Vāstup horkého vzduchu - Karšto oro našumas - Kuuma õhu tootlikkus - Karstā gaisa jauda	4 m³/h	6,4 m³/h	12 m³/h	14,2 m³/h
RPM - Régime Moteur - U/min - Toerental - Giri al minuto - Velocidad - RPM - Kierrosluku - Omdrejningstal i minuttet, el-motor - Obroty na minute - Скорость вращения электродвигателя - Fordulatszám - Otáčky za minutu - Apsisukimai per minutę - pööret minutis - apgriezieni minūtē	1425	2850	2850	2850

PORTABLE FORCED AIR HEATER

OWNER'S MANUAL



Heater Sizes: 10, 20, 29, 44 kW
Models: 35.000, 70.000, 100.000, 150.000 Btu/Hr
CED

IMPORTANT: Read and understand this manual before assembling, starting or servicing heater. Improper use of heater can cause serious injury. Keep this manual for future reference.

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SAFETY INFORMATION

 WARNINGS

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.

- Use only No. 1 fuel oil to avoid risk of fire or explosion. Never use gasoline, naphtha, paint thinners, alcohol, or other highly flammable fuels.
- 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, including the pilot light, if any, 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 762cm (25 feet) from heaters, torches, welding equipment, and similar sources of ignition (exception: the fuel reservoir integral with the 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.
- Never use heater where gasoline, paint thinner, or other highly flammable vapors are present.
- Follow all local ordinances and codes when using heater.
- 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 304.8cm (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.
- 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.
- Use only in places free of flammable vapors or high dust content.
- Use only the electrical voltage and frequency specified on model plate.
- Use only a three-prong, grounded extension cord.
- Minimum heater clearances from combustibles: Outlet: 250 cm (8 Ft.) Sides, Top, and Rear: 125 cm (4 Ft.)
- Locate heater on a stable and level surface if heater is hot or running or a fire may occur.
- When moving or storing heater, keep heater in a level position or fuel spillage may occur.
- Keep children and animals away from heater.
- Unplug heater when not in use.
- When used with thermostat, heater may start anytime.
- Never use heater in living or sleeping areas.
- Never block air inlet (rear) or air outlet (front) of heater.
- Never move, handle, refuel, or service a hot, operating, or plugged-in heater.
- Never attach duct work to front or rear of heater.

PRODUCT IDENTIFICATION

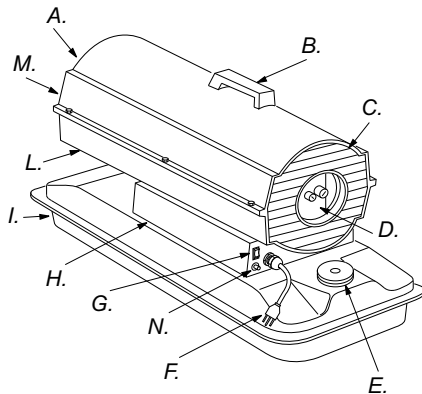


Figure 1 – Model 35.000 e 70.000 Btu/Hr

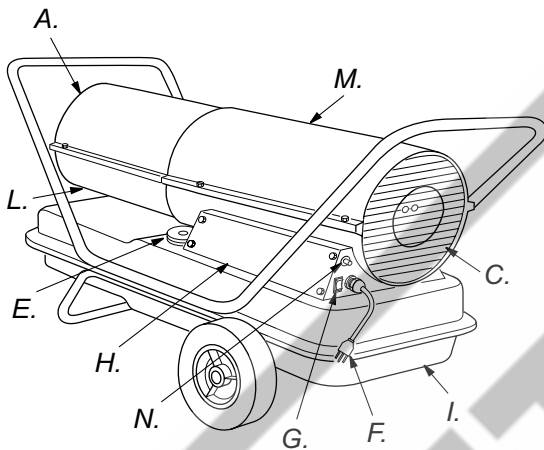


Figure 2 – Model 100.000 e 150.000 Btu/Hr

(see figure 1, e 2)

A. Hot Air Outlet, **B.** Handle, **C.** Fan Guard, **D.** Air Filter End Cover, **E.** Fuel Cap, **F.** Power Cord, **G.** ON/OFF Switch with Light, **H.** Side Cover, **I.** Fuel Tank, **L.** Lower Shell, **M.** Upper Shell, **N.** Flame-out control reset button.

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, promptly inform dealer where you bought heater.

FUELS

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

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

- clogged fuel filter and nozzle
- use of non-toxic anti-icer in fuel during very cold weather

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

ASSEMBLY

(for 100.000 and 150.000 Btu/Hr models only)

These models are furnished with wheels and handles. Wheels, handles, and the mounting hardware are found in the shipping carton.

Tools Needed

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

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

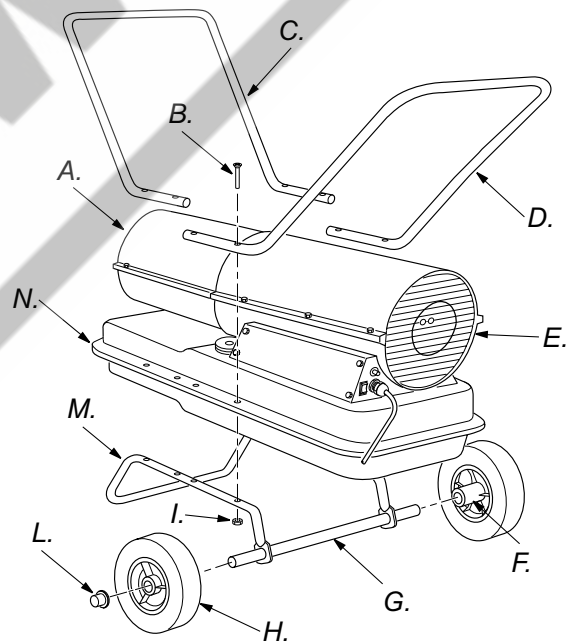


Figure 3 – Wheel and Handle Assembly.

A. Hot Air Outlet, **B.** Screw, **C.** Front Handle, **D.** Rear Handle, **E.** Air Inlet, **F.** Extended Hub, **G.** Axle, **H.** Wheel, **I.** Nut, **L.** Cap Nut, **M.** Wheel Support Frame, **N.** Fuel Tank Flange.

VENTILATION

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

Provide a fresh air opening of at least 2800 square cm (three square feet) for each 30kw (100,000 Btu/Hr) rating. Provide extra fresh air if more heaters are being used..

Example: A 43kw (150,000 Btu/Hr) heater requires one of the following:

- a two-car garage door [4.9 meter (16 feet) opening] raised 9 cm (3.5 inches).
- a single-car garage door [2.75 meter (9 feet) opening] raised 15.25 cm (6 inches).
- two, 76 cm (30 inch) windows raised 28 cm (11 inches).

THEORY OF OPERATION

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

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

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

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

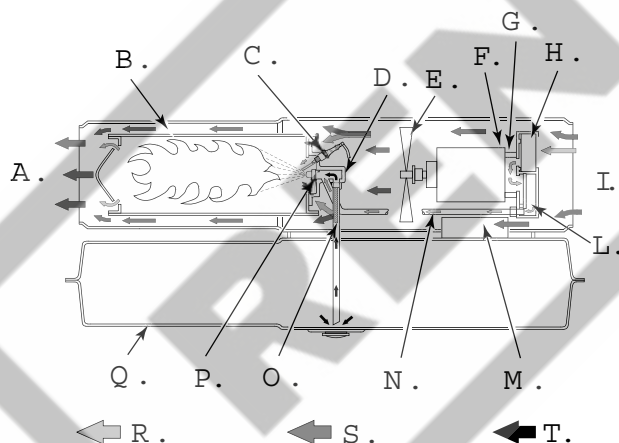


Figure 4 – Cross Section operational view.

(see figure 4)

A. Clean Heated Air Out, B. Combustion Chamber, C. Spark plug, D. Burner Head, E. Fan, F. Motor, G. Air Pump, H. Air Intake Filter, I. Cool Air In, L. Air Output Filter, M. Ignition Control Assembly, N. Air Line To Burner, O. Fuel Filter, P. Nozzle, Q. Fuel Tank, R. Air For Fuel System, S. Air For Combustion And Heating, T. Fuel.

OPERATION

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

TO START HEATER

1. Follow all ventilation and safety information.
2. Fill fuel tank with No. 1 fuel oil.
3. Attach fuel cap.
4. Plug power cord of heater into standard 230 volt/50 hertz, grounded (earthed) outlet. Use an extension cord if needed. Use only a three-prong, grounded (earthed) extension cord.

Extension cord wire size requirements:

Up to 30 meters (100 feet) long, use 1.0 mm² (16 AWG) conductor.
30 to 61 meters (101 to 200 feet) long, use 1.5 mm² (14 AWG) conductor.

Push ON/OFF switch to ON (I) position and heater should start in 5 seconds. If heater does not start, see *Troubleshooting* (page 7).

TO STOP HEATER

Push ON/OFF switch to OFF (O) position.

TO RESET HEATER

1. Wait 2 minutes after stopping heater.
2. Repeat steps under *To Start Heater*.

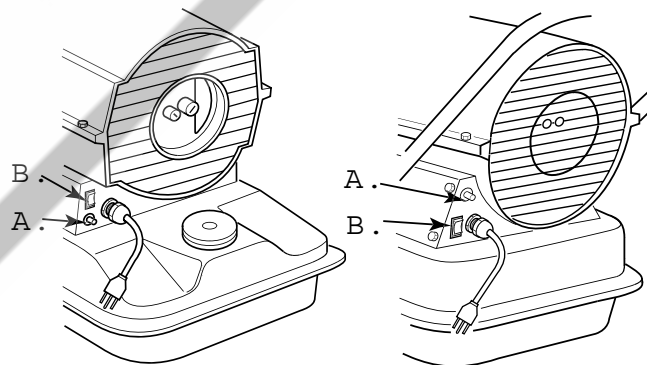


Figure 5-6 – ON/OFF Switch, Models 10KW, 20 KW, 30 KW and 43 KW.

(see figure 5 e 6)

A. Flame-out control reset button, B. ON/OFF Switch with Light,

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 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 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	Flush every 150-200 hours of operation or as needed	See <i>Storing, Transporting, or Shipping</i> .
Air output and lint filters	Replace every 500 hours of operation or once a year	See <i>Air Output, Air Intake, and Lint Filters</i> , page 7
Air intake filter	Wash and dry with soap and water every 500 hours of operation or as needed	See <i>Air Output, Air Intake, and Lint Filters</i> , page 7
Fuel filter	Clean twice a heating season or as needed	See <i>Fuel Filter</i> , page 6
Spark plug	Clean and regap every 600 hours operation or replace as needed	See <i>Spark plug</i> , page 6
Fan blades	Clean every season or as needed	See <i>Fan</i> , page 9
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.

OBSERVED FAULT	POSSIBLE CAUSE	REMEDY
Heater ignites, but flame-out control shut off heater after a short period of time	1. Wrong pump pressure 2. Dirty air output, air intake, and lint filters 3. Dirty fuel filter 4. Dirt in nozzle 5. Dirty photocell lens 6. Bad flame-out control	1. See <i>Pump Pressure Adjustment</i>, page 10. 2. See <i>Air Output, Air Intake and Lint Filters</i>, page 10 3. See <i>Fuel Filter</i>, page 8 4. See <i>Nozzle</i>, page 11 5. Clean photocell lens 6. Replace flame-out control
Heater will not ignite, but motor runs for a short period of time	1. Wrong pump pressure 2. Carbon deposits on spark plug and/or improper gap 3. Dirty fuel filter 4. Dirt in nozzle 5. Water in fuel tank	1. See <i>Pump Pressure Adjustment</i>, page 7 2. See <i>Spark Plug</i>, page 6 3. See <i>Fuel Filter</i>, page 6 4. See <i>Nozzle</i>, page 8 5. Drain and flush fuel tank with clean kerosene. See <i>Storing, Transporting, or Shipping</i>.
WARNING: High voltage!		
	6. Electronic ignitor not grounded (earthed) 7. Bad electronic ignitor	6. Make sure electronic ignitor mounting is tight 7. Replace electronic ignitor
Motor does not start when heater is plugged in, fan rotates slowly or does not turn	1. Flame-out control not reset 2. Binding pump rotor	1. Reset flame-out control button, see Figures 5 and 6, page 4 2. If fan is hard to turn, see <i>Pump Rotor</i>, page 9

SERVICE PROCEDURES

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

UPPER SHELL REMOVAL

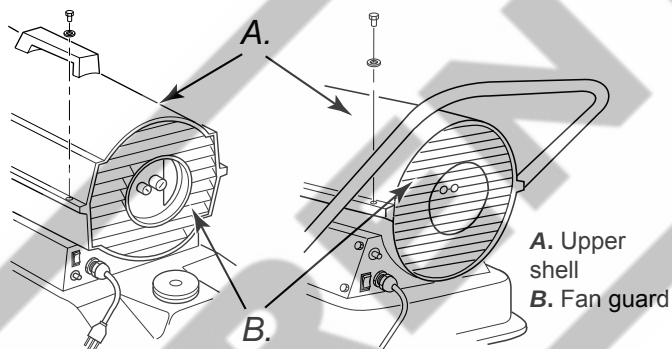
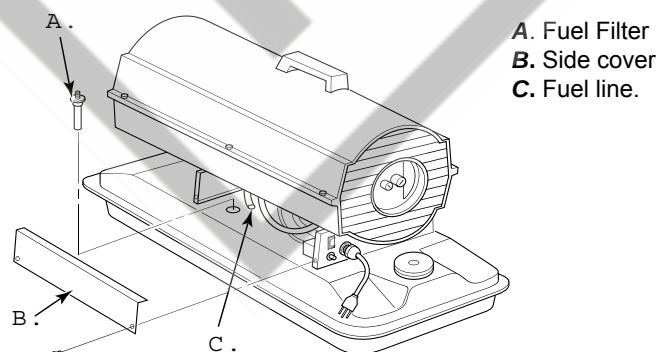
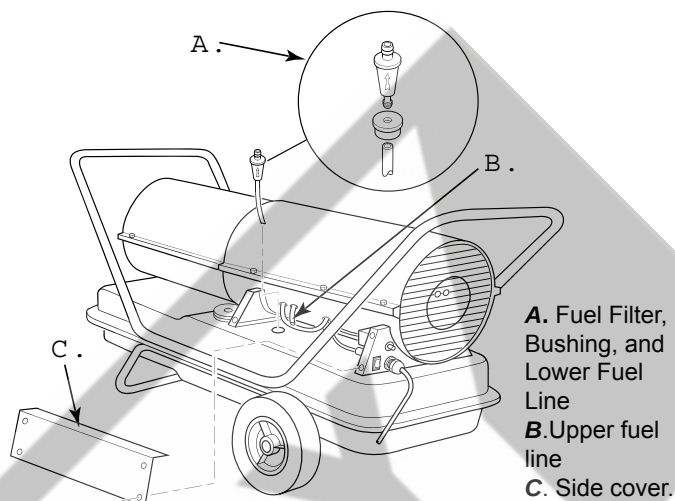
1. Remove screws and lock washers along each side of heater using 5/16" nutdriver. These screws attach upper and lower shells together.
2. Lift upper shell off.
3. Remove fan guard.

FUEL FILTER**(35.000 and 70.000 Btu/Hr Models)**

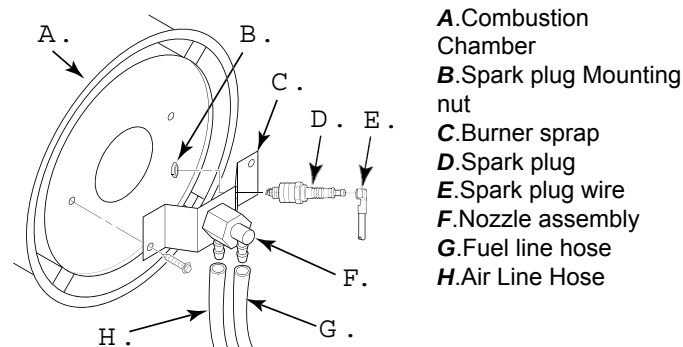
1. Remove side cover screws using 5/16" nut-driver.
2. Remove side cover.
3. Pull rubber fuel line off fuel filter neck.
4. Carefully pry bushing and fuel filter out of fuel tank.
5. Wash fuel filter with clean fuel and replace in tank.
6. Attach rubber fuel line to fuel filter neck
7. Replace side cover.

FUEL FILTER**(100.000 and 150.000 Btu/Hr Models)**

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

**Figure 7-8 – Upper Shell Removal.****Figure 9 – Fuel Filter Removal, 35.000 and 70.000 Btu/Hr.****Figure 10 – Fuel Filter Removal, 100.000 and 150.000 Btu/Hr.****SPARK PLUG****(35,000 Btu/Hr Model)**

1. Remove upper shell.
2. Remove fan (see page 9).
3. Remove fuel and air line hoses from nozzle assembly.
4. Remove spark plug wire from spark plug.
5. Remove two screws using 5/16" nut-driver and remove burner strap.
6. Place hex-body of spark plug into vise and tighten.
7. Remove spark plug mounting nut using 11/16" open-end wrench.
8. Remove burner strap from spark plug.
9. Clean and regap spark plug electrodes to 1.4 mm (.055") gap.
10. Replace burner strap onto spark plug. Rotate burner strap to position spark plug electrodes (see Figure 13).
11. Tighten spark plug with spark plug mounting nut.
12. Release hex-body of spark plug from vise.
13. Replace burner strap onto combustion chamber.
14. Attach spark plug wire to spark plug.
15. Attach fuel and air line hoses to nozzle assembly.
16. Replace fan (see page 9).
17. Replace fan guard and upper shell.

**Figure 11 – Spark plug removal, 35.000 Btu/Hr model.**

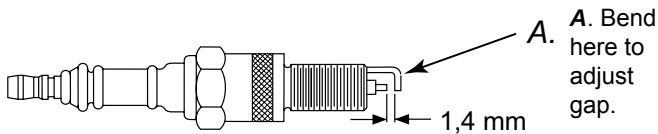


Figure 12 – Spark plug gap, 35.000 Btu/Hr model.

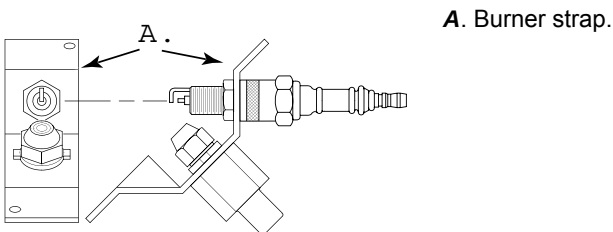


Figure 13 – Spark plug rotation, 35.000 Btu/Hr model.

SPARK PLUG

(70/100/150,000 Btu/Hr Models)

1. Remove upper shell (see page 6).
2. Remove fan (see page 9).
3. Remove spark plug wire from spark plug.
4. Remove spark plug from burner head using 13/16" open-end wrench.
5. Clean and regap spark plug electrodes as follows:
70/100,000 Btu/Hr Models: 1.9 mm
150,000 Btu/Hr Model: 2.8 mm
6. Install spark plug in burner head.
7. Attach spark plug wire to spark plug.
8. Replace fan (see page 9).
9. Replace fan guard and upper shell.

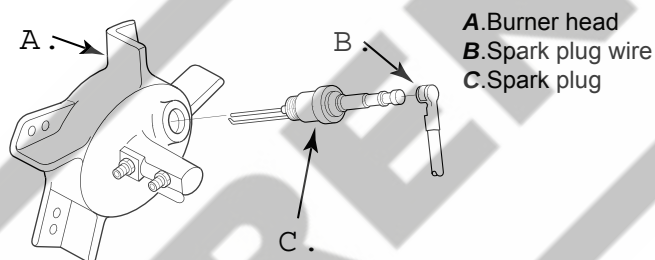


Figure 14 – Spark plug removal, 70.000, 100.000, 150.000 Btu/Hr models.

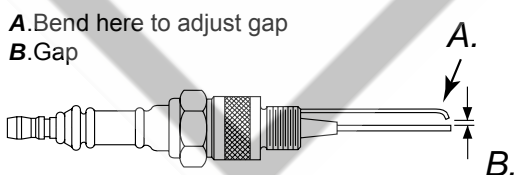


Figure 15 – Spark plug gap, 70.000, 100.000, 150.000 Btu/Hr models.

AIR OUTPUT, AIR INTAKE, AND LINT FILTERS

1. Remove upper shell (see page 6).
 2. Remove filter end cover screws using 5/16" nut-driver.
 3. Remove filter end cover.
 4. Replace air output and lint filters.
 5. Wash or replace air intake filter (see *Preventative Maintenance Schedule*, page 5).
 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.
2. Install accessory pressure gauge (part number 4109.427).
3. Start heater (see *Operation*, page 4). 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 below for correct pressure for each model.
5. Remove pressure gauge. Replace pressure gauge plug in filter end cover.

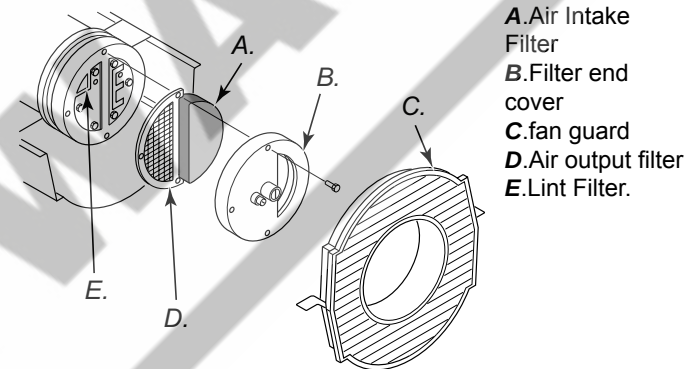


Figure 16 – Air output, air intake and lint filters, 35.000 and 70.000 Btu/Hr models.

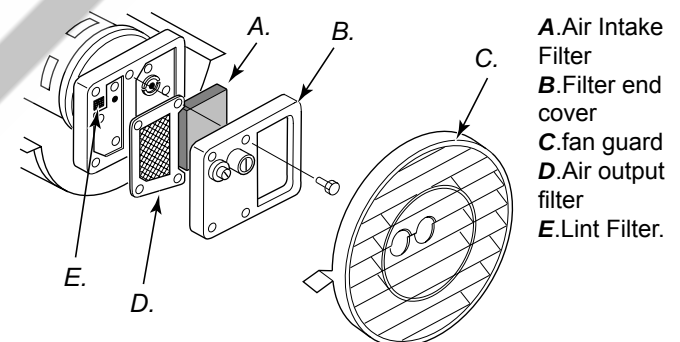


Figure 17 – Air output, air intake and lint filters, 100.000 and 150.000 Btu/Hr models.

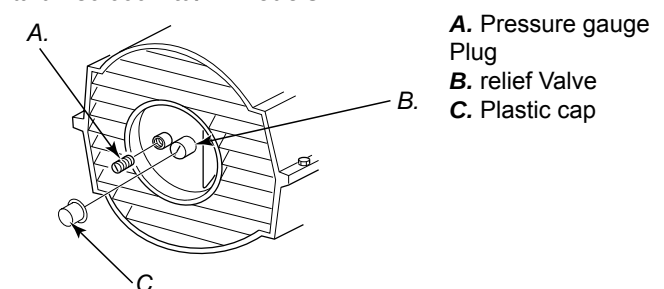


Figure 18 – Pressure Gauge Plug removal.

Model	Pump pressure (Bar/PSI)
35.000 Btu/Hr	0,207 / 3
70.000 Btu/Hr	0,365 / 5,3
100.000 Btu/Hr	0,275 / 4
150.000 Btu/Hr	0,337 / 4,9

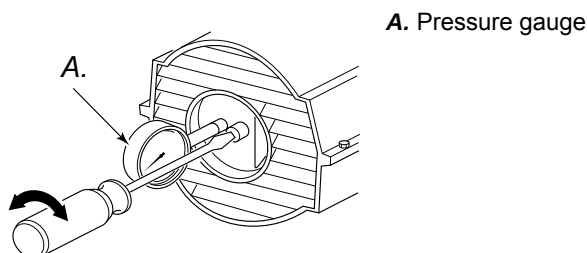


Figure 19 – Adjusting pump pressure.

NOZZLE

(35,000 Btu/Hr Model)

1. Remove upper shell (see page 6).
2. Remove fan (see page 9).
3. Remove fuel and air line hoses from nozzle assembly.
4. Turn nozzle assembly 1/4 turn to left and pull toward motor to remove.
5. Place plastic hex-body into vise and lightly tighten.
6. Carefully remove nozzle from the nozzle adapter using 5/8" socket wrench.
7. Blow compressed air through face of nozzle. This will free any dirt in nozzle area.
8. Inspect nozzle seal 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).
10. Attach nozzle assembly to burner strap.
11. Attach fuel and airline hoses to nozzle assembly. See *Fuel and Airline Replacement and Proper Routing* see page 9.
12. Replace fan (see page 9).
13. Replace fan guard and upper shell.

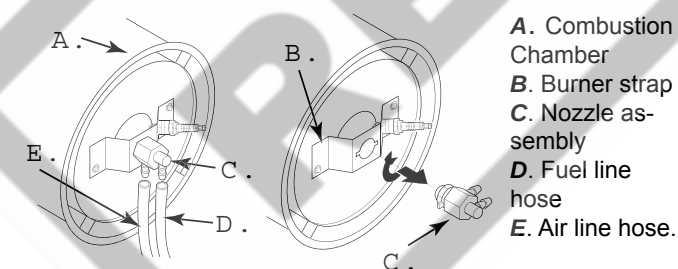


Figure 20 – Removing air and fuel line hoses, 35.000 Btu/Hr Model.

Figure 21 – Removing nozzle assembly, 35.000 Btu/Hr Model.

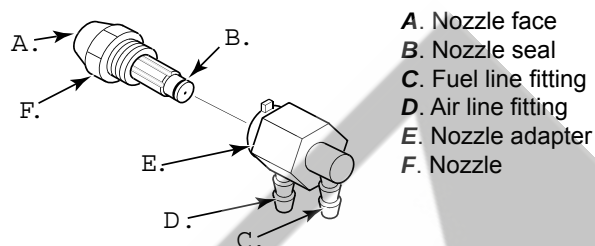


Figure 22 – Nozzle and nozzle adapter, 35.000 Btu/Hr.

NOZZLE

(70/100/150,000 Btu/Hr Models)

1. Remove upper shell (see page 6).
2. Remove fan (see page 9).
3. Remove fuel and air line hoses from burner head.
4. Remove spark plug wire from spark plug.
5. Remove spark plug from burner head using 13/16" open-end wrench.
6. Remove three screws using 5/16" nut-driver and remove burner head from combustion chamber.
7. Place burner head into vise and lightly tighten.
8. Carefully remove nozzle from burner head using 5/8" socket wrench (see Figure 24).
9. Blow compressed air thru face of nozzle. This will free any dirt in nozzle area.
10. Inspect nozzle seal for damage.
11. Replace nozzle into burner head and tighten firmly (9.1-12.4 n-m/80-110 inch-pounds).
12. Attach burner head to combustion chamber.
13. Install spark plug in burner head.
14. Attach spark plug wire to spark plug.
15. Attach fuel and airline hoses to burner head.
16. Replace fan (see page 9).
17. Replace fan guard and upper shell.

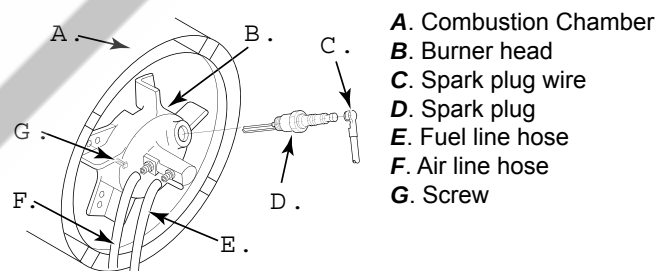


Figure 23 – Removing burner head, 70.000, 100.000, 150.000 Btu/Hr models.

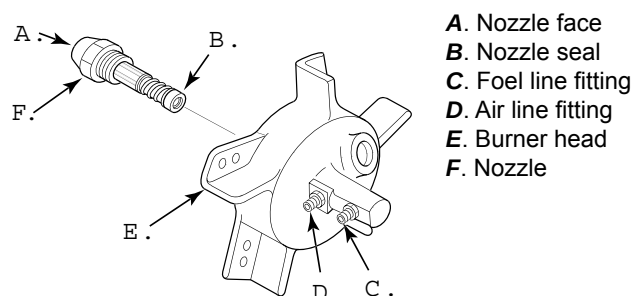


Figure 24 – Removing nozzle, 70.000, 100.000, 150.000 Btu/Hr models.

Continued

PUMP ROTOR**(Procedure if Rotor is Binding)**

1. Remove upper shell (see page 6).
2. Remove filter end cover screws using 5/16" nut-driver.
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.
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 (see Figure 25).

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.
12. Adjust pump pressure (see page 9).

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

13. Perform steps 1 through 6 above.
14. Place fine grade sandpaper (600 grit) on flat surface. Sand rotor lightly in "figure 8" motion four times (see Figure 26)
15. Reinstall insert and rotor.
16. Perform steps 10 through 12 above.

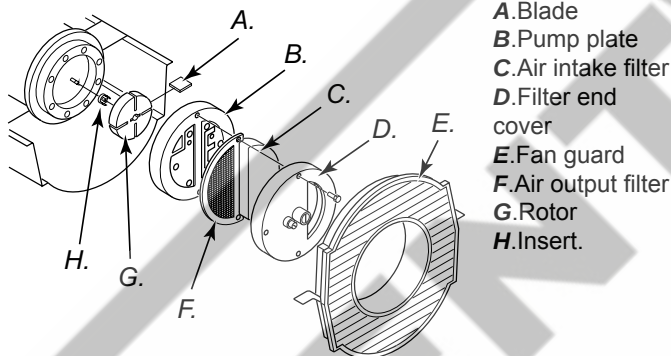


Figure 25 – Rotor location, 35.000 btu/Hr and 70.000 Btu/Hr.

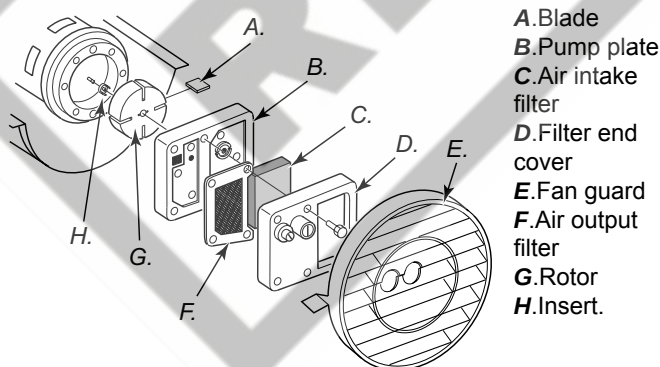
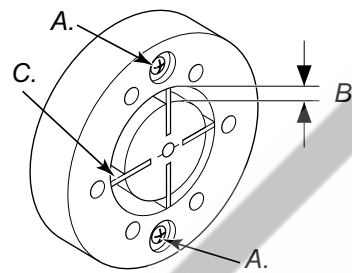


Figure 26 – Rotor location, 100.000 and 150.000 Btu/Hr.



A. gap adjusting screw
B. .076/.101 mm (.003"/.004") Gap Measured With Feeler Gauge
C. Blade

Figure 27 – Gap adjusting screw locations.

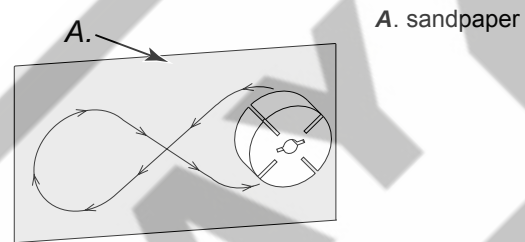


Figure 28 – Sanding rotor.

FAN

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

1. Remove upper shell (see page 6).
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 (see Figure 28).
7. Place setscrew on flat of shaft. Tighten setscrew firmly 4.5 to 5.6 N-m (40 to 50 in-lbs).
8. Replace fan guard and upper shell.

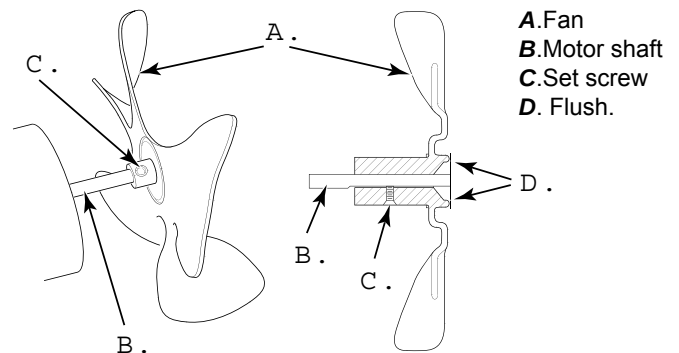


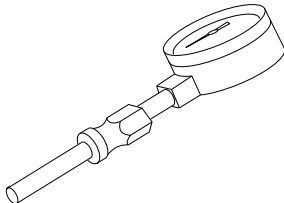
Figure 27 – Fan, motor shaft and setscrew location.

Figure 28 – Fan cross section.

Continued

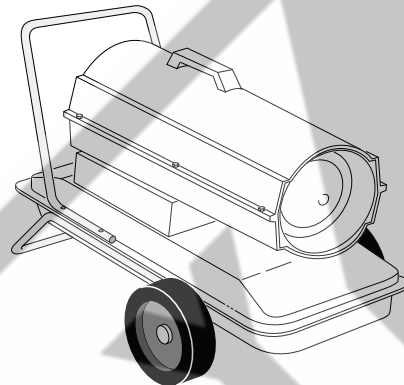
ACCESSORIES

Purchase accessories from your local dealer.



AIR GAUGE KIT - 4109.427

For all models. Special tool to check pump pressure.



HEAVY DUTY WHEELS AND HANDLE KIT - 4103.925

For heavy duty applications. Makes your heater even more portable and convenient. For 35.000 and 70.000 Btu/Hr models.

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