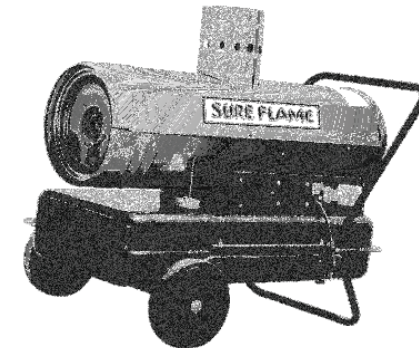




**SURE FLAME®**

**ID90**

**Indirect-Fired Diesel/Oil  
Construction Heater**



July 12, 2006

Service and Maintenance Manual  
Please Retain for Future Reference

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**SURE FLAME®** Products

A Division of Haul-All Equipment Ltd.  
Lethbridge, Alberta, Canada  
[www.sureflame.ca](http://www.sureflame.ca)

## 1. GENERAL SAFETY RULES

- READ INSTRUCTIONS CAREFULLY. READ AND FOLLOW ALL INSTRUCTIONS. PLACE INSTRUCTIONS IN A SAFE PLACE FOR FUTURE REFERENCE. DO NOT ALLOW ANYONE WHO HAS NOT READ THESE INSTRUCTIONS TO ASSEMBLE, LIGHT, ADJUST OR OPERATE THE HEATER.
- IF THE INFORMATION IN THIS MANUAL IS NOT FOLLOWED EXACTLY, A FIRE OR EXPLOSION MAY RESULT CAUSING PROPERTY DAMAGE, PERSONAL INJURY OR LOSS OF LIFE.
- SERVICE MUST BE PERFORMED BY A QUALIFIED SERVICE AGENCY.
- UNVENTED PORTABLE HEATERS USE AIR (OXYGEN) FROM THE AREA IN WHICH IT IS USED. ADEQUATE COMBUSTION AND VENTILATION AIR MUST BE PROVIDED. REFER TO INSTRUCTIONS.

### WARNING

DO NOT STORE OR USE GASOLINE OR OTHER FLAMMABLE VAPORS AND LIQUIDS IN THE VICINITY OF THIS OR ANY OTHER APPLIANCE.

### WARNING

FIRE, BURN, INHALATION, AND EXPLOSION HAZARD. KEEP SOLID COMBUSTIBLES, SUCH AS BUILDING MATERIALS, PAPER OR CARDBOARD, A SAFE DISTANCE AWAY FROM THE HEATER AS RECOMMENDED BY THE INSTRUCTIONS. NEVER USE THE HEATER IN SPACES WHICH DO OR MAY CONTAIN VOLATILE OR AIRBORNE COMBUSTIBLES, OR PRODUCTS SUCH AS GASOLINE, SOLVENTS, PAINT THINNER, DUST PARTICLES OR UNKNOWN CHEMICALS.

### WARNING

COMBUSTION BY-PRODUCTS PRODUCED WHEN USING THIS PRODUCT CONTAIN CARBON MONOXIDE, A CHEMICAL KNOWN TO THE STATE OF CALIFORNIA TO CAUSE CANCER AND BIRTH DEFECTS (OR OTHER REPRODUCTIVE HARM).

### GENERAL HAZARD WARNING

FAILURE TO COMPLY WITH THE PRECAUTIONS AND INSTRUCTIONS PROVIDED WITH THIS HEATER, CAN RESULT IN DEATH, SERIOUS BODILY INJURY AND PROPERTY LOSS OR DAMAGE FROM HAZARDS OF FIRE, EXPLOSION, BURN, ASPHYXIATION, CARBON MONOXIDE POISONING, AND/OR ELECTRICAL SHOCK. ONLY PERSONS WHO CAN UNDERSTAND AND FOLLOW THE INSTRUCTIONS SHOULD USE OR SERVICE THIS HEATER. IF YOU NEED ASSISTANCE OR HEATER INFORMATION SUCH AS AN INSTRUCTIONS MANUAL, LABELS, ETC. CONTACT THE MANUFACTURER.

### WARNING

NOT FOR HOME OR RECREATIONAL VEHICLE USE

### WARNING

YOUR SAFETY IS IMPORTANT TO YOU AND TO OTHERS, SO PLEASE READ THESE INSTRUCTIONS BEFORE YOU OPERATE THIS HEATER

- THE ELECTRICAL SYSTEM TO WHICH THE APPLIANCE IS CONNECTED MUST COMPLY WITH CURRENT LEGISLATION. INSTALLATION REQUIRES A SUITABLE CIRCUIT BREAKER IN THE MAIN DISTRIBUTION BOARD.
- UNPLUG THE APPLIANCE BEFORE PERFORMING ANY MAINTENANCE OPERATIONS.
- ALWAYS CHECK THE POWER CABLE BEFORE USING THE APPLIANCE. IT MUST NOT BE BENT, TAUT, STREACHED, CRUSHED OR ANY WAY DAMAGED.
- THE POWER CABLE CONNECTION MUST BE MADE BY QUALIFIED PERSONNEL ONLY. USE AN ORIGINAL POWER CABLE ONLY WITH A 3-PIN APPROVED PLUG.
- DANGER (BURNS)! DO NOT TOUCH THE EXHAUST GAS OUTLET.

## 2. APPLIANCE DESCRIPTION

- Mobile space heater with closed combustion chamber and gas exhaust duct (indirect-fired heater)

## 3. TECHNICAL SPECIFICATIONS

Model #	ID90
Capacity	91,750 BTU/hr (26.8 kW)
Air Flow Rating	557 ft <sup>3</sup> /min (265 l/s)
Fuel Type	Diesel Kerosene #1-2 Fuel Oil
Fuel Consumption	0.66 gal/hr (2.47 l/hr)
Fuel Nozzle	0.75 gph
Efficiency	80.0%
Noise Level at 2m	75 dB(A)
Voltage	115V 60Hz 1ph
Electrical Power	280 W
Current Rating	4.0 A
Weight	95 lb (43 kg)
Length	37" (94 cm)
Width	22" (56 cm)
Height	25" (64 cm)
Tank Capacity	12 gal (45 l)
Air Pressure Setting	4.6 psi

## 4. INSTALLATION INSTRUCTIONS

### 4.1. General instructions

- THE INSTALLATION OF THE EQUIPMENT SHALL BE IN ACCORDANCE WITH THE REGULATION OF AUTHORITIES HAVING JURISDICTION AND CSA B139.
- The heater must be operated only by properly trained personnel. The manufacturer's instructions must be followed.

- The heater must be installed and operated so that people are not exposed to dangers deriving from exhaust gases, from the hot air flow and in such a way that no fire risks exist.
  - It is forbidden to install the heater in the surroundings of flammable materials, combustible products, or in places where explosion risk exist.
  - When an **indirect-fired** heater connected to a flue pipe is used in a closed room, provide a minimum opening area of 1 ft<sup>3</sup> per US gallon capacity at the unit level.
  - When an **indirect-fired** heater **not** connected to a flue pipe - is used in a closed room, provide a minimum opening area of 3 ft<sup>3</sup> per US gallon capacity at the unit level and a continuous, natural air circulation through windows and doors.
- For the use of the heater the general and special fire safety regulations in force in all fields of applications must be followed. In any case the following minimum safety clearances from materials or objects in the surroundings of the heater must be assured:

Side:	2 ft	(61 cm)
Air inlet side:	2 ft	(61 cm)
Top:	5 ft	(153 cm)
Hot air outlet side:	10 ft	(305 cm)
Floor:	0 ft	(0 cm)
Flue pipe:	3 ft	(92 cm)

- Floors and ceilings must be made of fireproof materials in the place where the heater is operated.
- The air inlet and outlet must never be blocked for any reason.
- Install the heater on a flat, level floor in a steady position.
- It is forbidden to connect direct-fired heaters to air ducts.

#### Maintenance and checks

- Depending on the operational conditions, usually every year, the heater should be checked by qualified personnel.
- Prior to start-up, the user must check for any evident non-compliance with rules of use, safety and protection.

#### 4.2 Assembly instructions

The appliance is equipped with wheels and handle. Wheels, handle and the mounting accessories are found in the shipping carton.

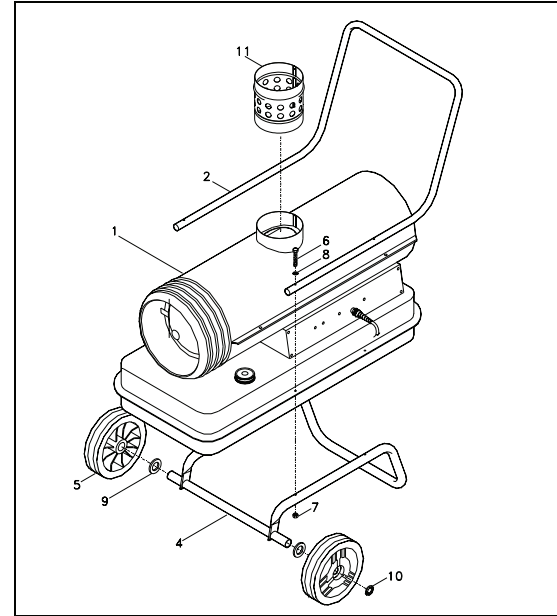
- 1) 1 body of the heater
- 2) 1 handle
- 3) 1 wheel support frame
- 4) 1 axle
- 5) 2 wheels
- 6) 4 screws
- 7) 4 nuts
- 8) 4 washers
- 9) 2 spacer rings
- 10) 2 cap nuts
- 11) flue adaptor

To assemble the heater, proceed as follows (see ill.1):

Slide axle (4) through wheel support frame (3). Install in the following order: spacer rings (9), wheels (5), and cap nuts (10) on axle ends, by tapping lightly. Connect the flue adaptor (11) to the exhaust collar and then to a flue pipe (indirect-fired heaters only).

Place heater on wheel support frame and line up holes on the fuel tank flange with holes on wheel support frame.

Insert screws and washers through handles, fuel tank flange and wheel support frame. Attach nut finger tight after each screw is inserted, then tighten all nuts firmly.



#### 5. INSTRUCTIONS FOR USE

##### 5.1. Start-up

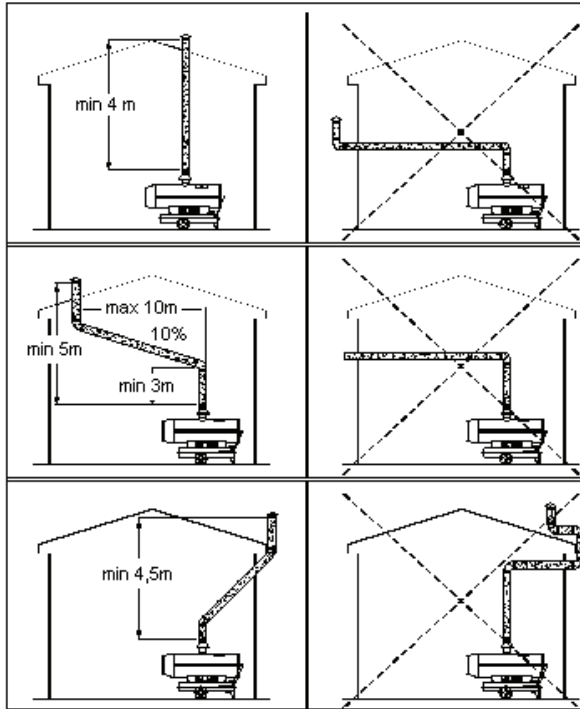
Fill the tank with clean fuel.

Connect the power plug to a 115V ~ 60 Hz single-phase, grounded power outlet. Electrical grounding is mandatory.

Move the ON/OFF switch to the "ON" position.

- Connect the heater to a chimney or to an exhaust duct. To get a proper draught (at least 0.04 in w.c.) in the chimney the exhaust gas path must rise. Avoid any elbows and bends in the first part of the exhaust ducts for at least 3 m. For operation of heater in closed rooms without flue refer to the instructions for installation (par. 4)

- If a room (remote) thermostat is used, set maximum temperature on it.
- Turn switch to position "ON"
- Set the desired temperature on room thermostat.



#### 5.2. Manual reset/restart (ON/OFF switch)

Should the appliance lock out, move the ON/OFF switch to position OFF and then to position ON again to restart the appliance (see also "Troubleshooting")

#### 5.3. Air pressure switch - Temperature Limit Control

The heater is equipped with an air pressure switch that controls the airflow pressure. In the event of an overheating the pressure switch shuts the heater down. If this occurs, detect and eliminate the cause of overheating before using the heater again. Have the heater inspected by a qualified technician if required. To reset, let the unit cool unit down and then restart it as described above (see par. 5.2).

The heater is also equipped with a temperature control fixed to the combustion chamber, that can be reached through the inspection cover. In the event of overheating the limit control causes the heater to lock out. If this occurs:

- unplug the unit
- let the heater cool
- check and remove possible causes of overheating
- turn ON/OFF switch to OFF and then to ON again.
- check correct operation

#### 5.4. Shut-down

Move ON/OFF switch to OFF position. The fan continues to rotate for approx. 1 minute and 45 seconds in order to cool the combustion chamber. Then the appliance automatically shuts down.

**Never disconnect the supply plug to stop the heater while in operation**  
The large amount of heat produced could damage components

### 6. MAINTENANCE

**BEFORE PERFORMING ANY MAINTENANCE OPERATIONS, ALWAYS DISCONNECT THE HEATER FROM THE ELECTRICAL SUPPLY.**

Maintenance must be carried out by qualified personnel (see also section 7). The appliance must be thoroughly cleaned once a year to assure correct combustion and long life.

In addition the following must be cleaned more often depending on fuel and operating environment:

#### Fan

Clean fan using a cloth moistened with kerosene or light solvent. Dry fan thoroughly using compressed air. Clean fan blades at least every 500 hours of functioning.

#### Nozzle

Carefully remove nozzle from the nozzle adapter. Blow compressed air through the face of nozzle to free any dirt.

#### Air Filters (ill. 2)

Clean the air filter regularly, especially if the appliance is used in dusty environments. Remove filter end cover (1), wash air intake filter (2) using a light detergent and dry it thoroughly before reinstalling. Replace air delivery filter (4) at least once a year.

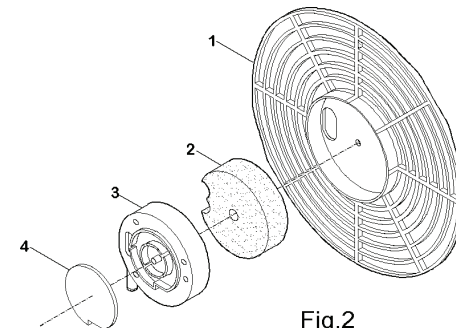


Fig.2

#### Ignition Electrodes

Clean, adjust and if necessary replace ignition electrodes every 300 hours of functioning. For electrode gap see illustration.

### Compressor Pressure Adjustment

Remove pressure gauge plug from filter end cover. Install a pressure gauge with a precision of at least 0.2 psi. Start heater and read air pressure value. If necessary adjust pressure as follows:

Model	Air Pump Pressure (psi)
ID90	4.6

### Electrical

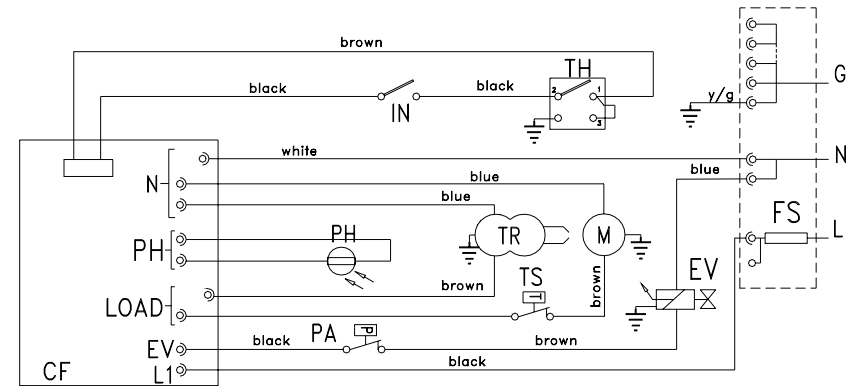
A periodic inspection of cables, electrical parts and connections by qualified personnel is recommended.

## 7. TROUBLESHOOTING

**The maintenance operations written in boldface must be carried out only by an authorized Servicing Agency.**

PROBLEM	CAUSE	REMEDY
Motor does not start	No power or low voltage	Check power line and voltage Check fuse and replace if necessary
	Faulty or damaged power cord	Check power cord <b>Replace power cord</b>
	Faulty motor/capacitor	<b>Check and if necessary replace</b>
Motor runs, but the heater does not ignite and after a short time locks out	Lock-out of appliance due to overheating	Detect the cause of overheating Shut the appliance down Check air inlet and outlet Wait several minutes and restart the appliance If required clean/replace air pressure switch
	Empty fuel tank, dirty or wrong fuel	Remove wrong or dirty fuel Fill the tank with clean oil or kerosene
	Fuel filter clogged Air leaks in oil line	<b>Clean or replace fuel filter</b> <b>Check pipes, tighten connections, if necessary replace</b>
	Burner nozzle clogged Oil viscosity increased due to low temperature	<b>Clean nozzle blowing compressed air, replace if necessary</b> Mix oil with 10-20% kerosene
Flames come out of flue outlet	Insufficient air flow into combustion chamber Pump pressure too high	<b>Check fan</b> <b>Check pump air pressure</b> <b>Set air pressure to correct rating</b>

## WIRING DIAGRAM



FS	In-Line Fuse	PA	Air pressure switch	TH	Remote Thermostat
IN	ON/OFF Switch	CF	Flame Control	PH	Photocell
M	Motor	EV	Solenoid valve	TR	Transformer
				TS	Limit Temperature Control