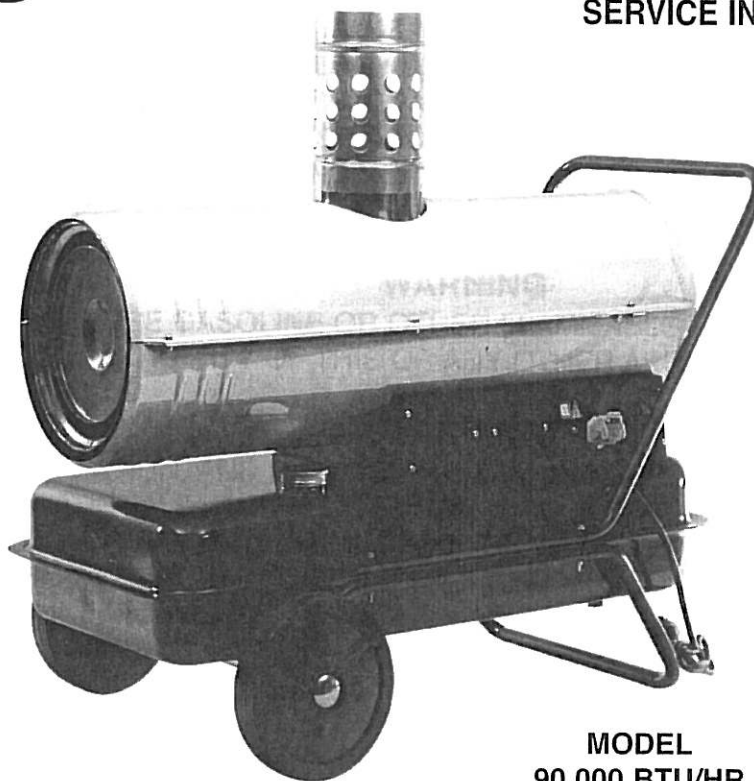




HEAT WAGON, INC
INDIRECT FORCED AIR DIESEL
CONSTRUCTION HEATERS
OPERATING, INSTALLATION, PART LISTS AND
SERVICE INSTRUCTIONS



MODEL
90,000 BTU/HR
LVF90



WARNING

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



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 MONOXI-
DE
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.**

RETAIN THESE INSTRUCTIONS FOR FUTURE REFERENCE

HEAT WAGON, INC
VALPARAISO, IN 46383
TELEPHONE: 219 - 464 - 8818
www.heatwagon.com



Notes

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).

WARNING

NOT FOR HOME OR RECREATIONAL VEHICLE USE

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 #	LVF 90
Thermal Power (BTU/hr)	91,745
Air Flow Rating (ft ³ /min)CFM	530
Fuel Type	Diesel Kerosene
	#1-2 Fuel Oil
Fuel Consumption (gal/hr)	0.68
Fuel Nozzle	0.75 gph
Efficiency (%)	80.0
Noise Level at 2m (dB(A))	75
Voltage (V)	115V 60Hz 1ph
Electrical Power (W)	390
Current Rating (A)	4.0
Weight (lb)	95
Length (in)	37
Width (in)	22
Height (in)	25
Tank Capacity (gal)	12
Air Pressure Setting (psi)	4.8

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 square foot per US gallon capacity at the unit level (for model LVF 90, the capacity is 0.68 gal/hr and the area must be $0.68 \times 1 = 0.68$ square feet)

When an indirect-fired heater not connected to a flue pipe is used in a closed room, provide a minimum opening area of 3 square feet per US gallon capacity (for model LVF90 the area must be $0.68 \times 3 = 2.04$ square feet) 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 (610 mm)
Air inlet side:	2 ft (610 mm)
Top:	5 ft (1525 mm)
Hot air outlet side:	10 ft (3050 mm)
Floor:	0 ft (0 mm)
Flue pipe:	3 ft (915 mm)

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 permanently installed HVAC ducting.

4.2 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 be checked for any evident non-compliance with rules of use, safety and protection.

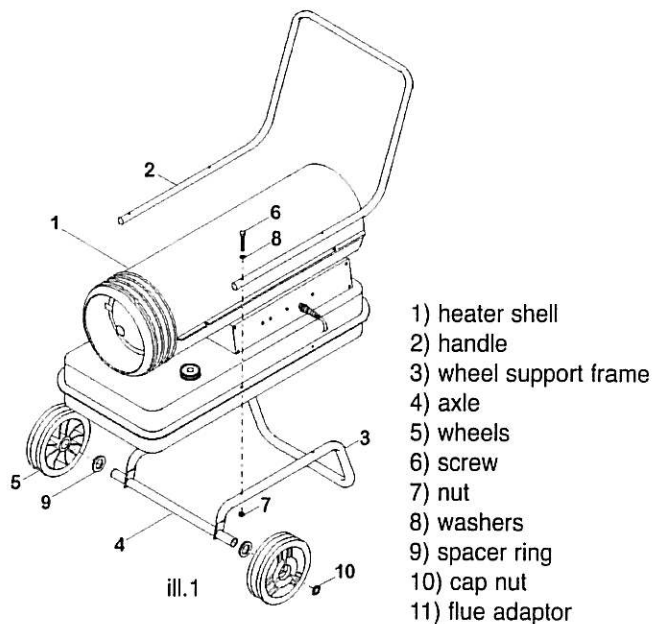
4.3 Assembly instructions

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 finger nut 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 a exhaust duct. (see ill. 2) To get a proper draft (at least 0,04 water inches) 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 9 feet. 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 it to maximum temperature.

Turn switch to position "ON"

Set the desired temperature on room thermostat.

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

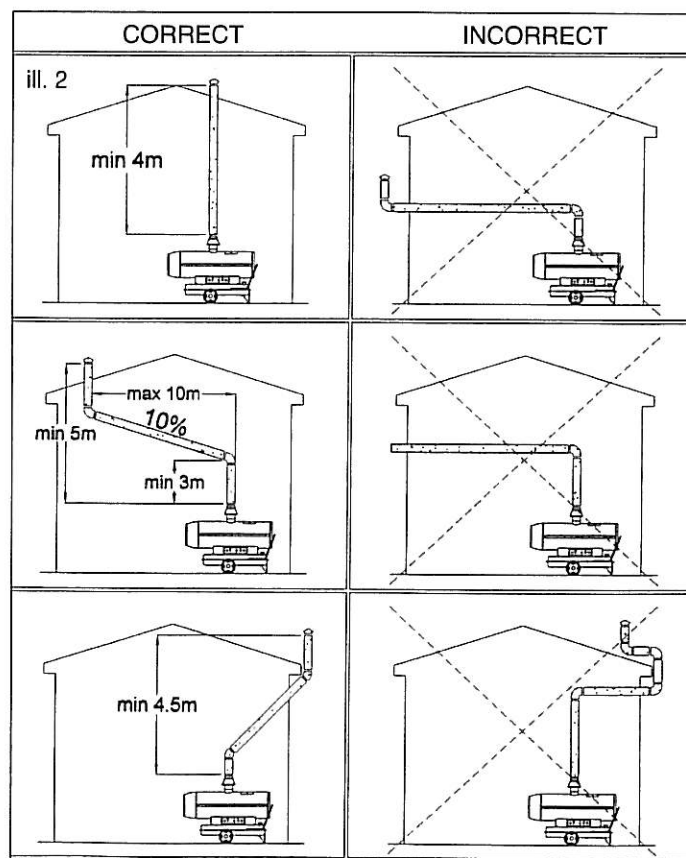
When the appliance locks out, move the ON/OFF switch to position OFF and then to position ON again to restart the appliance (see also "Troubleshooting")

5.3. Air pressure switch

The heater is equipped with an air pressure switch that controls the airflow pressure. In the event of an overheating the pressure switch shuts cuts power to the solenoid valve and the heater shuts 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).

5.4. Shut-down

Move the switch to the "OFF" position. The fan continues to rotate for approx. 1 min 45 sec in order to cool the combustion chamber. Then the appliance automatically shuts down.



5.5 Outdoor use

If the heater is used outdoors, follow the general installation instructions detailed above (see point 4). Moreover, the heater should not be directly exposed to the weather. Provide proper protection from rain, snow, wind, humidity etc. the use of a vent cap is also required.

Never disconnect the supply plug to stop the heater while in operation

The heat accumulation could damage the components: allow the cooling sequence by turning off heater via the remote thermostat (if equipped) or by using the ON/OFF toggle switch

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).

Keep the heater clean to ensure good combustion and long life.

The following must be cleaned at least once a year or even more often depending on fuel used and operating environment/conditions:

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. 3)

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.

Ignition Electrodes (ill. 4)

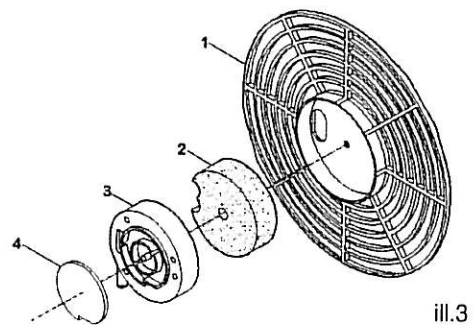
Clean, adjust and if necessary replace ignition electrodes every 300 hours of functioning. For electrode gap see illustration.

Pump Pressure Adjustment

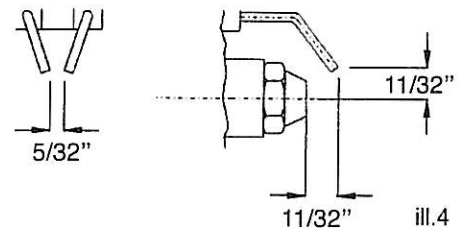
Remove pressure gauge plug from filter end cover. Install a pressure gauge with a precision of at least 0.2 psi. Start heater and read air pressure value. Turn the screw clockwise to increase the pressure, counterclockwise to decrease it. The pressure factory setting is as follows:

Model	Air Pump Pressure (psi)
LVF 90	4.8
Electrical	

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



ill.3



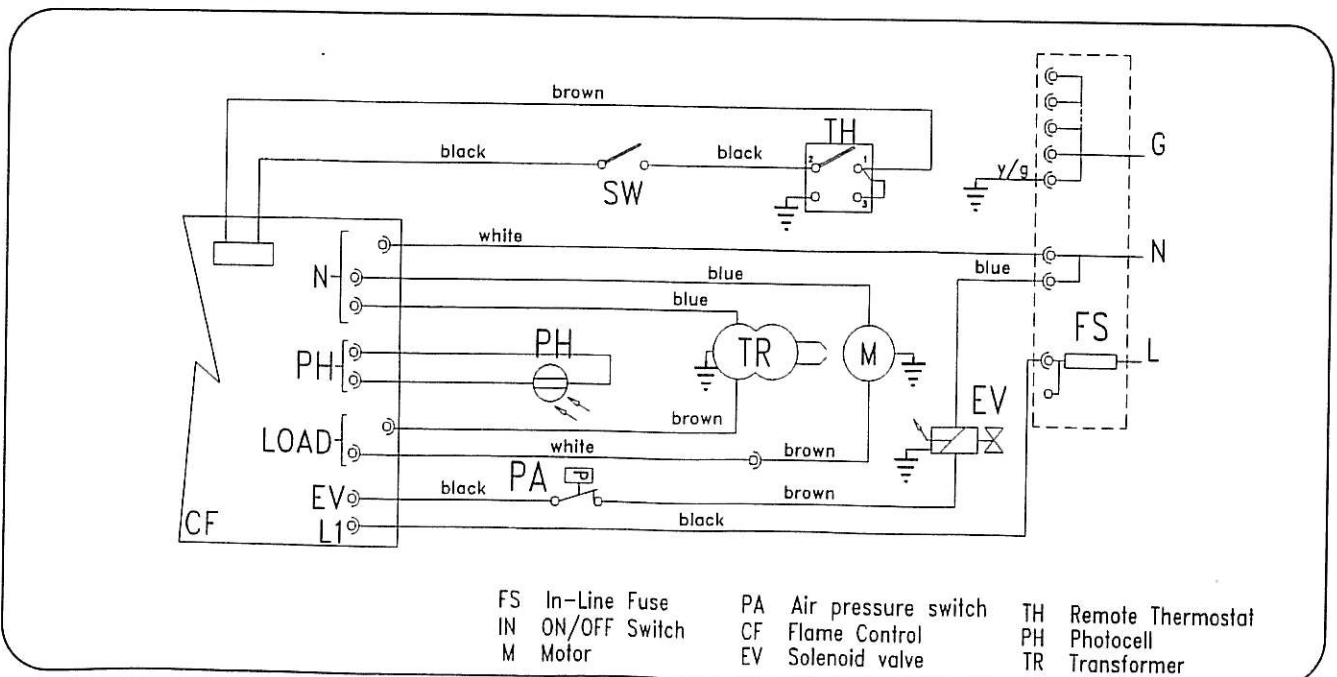
ill.4

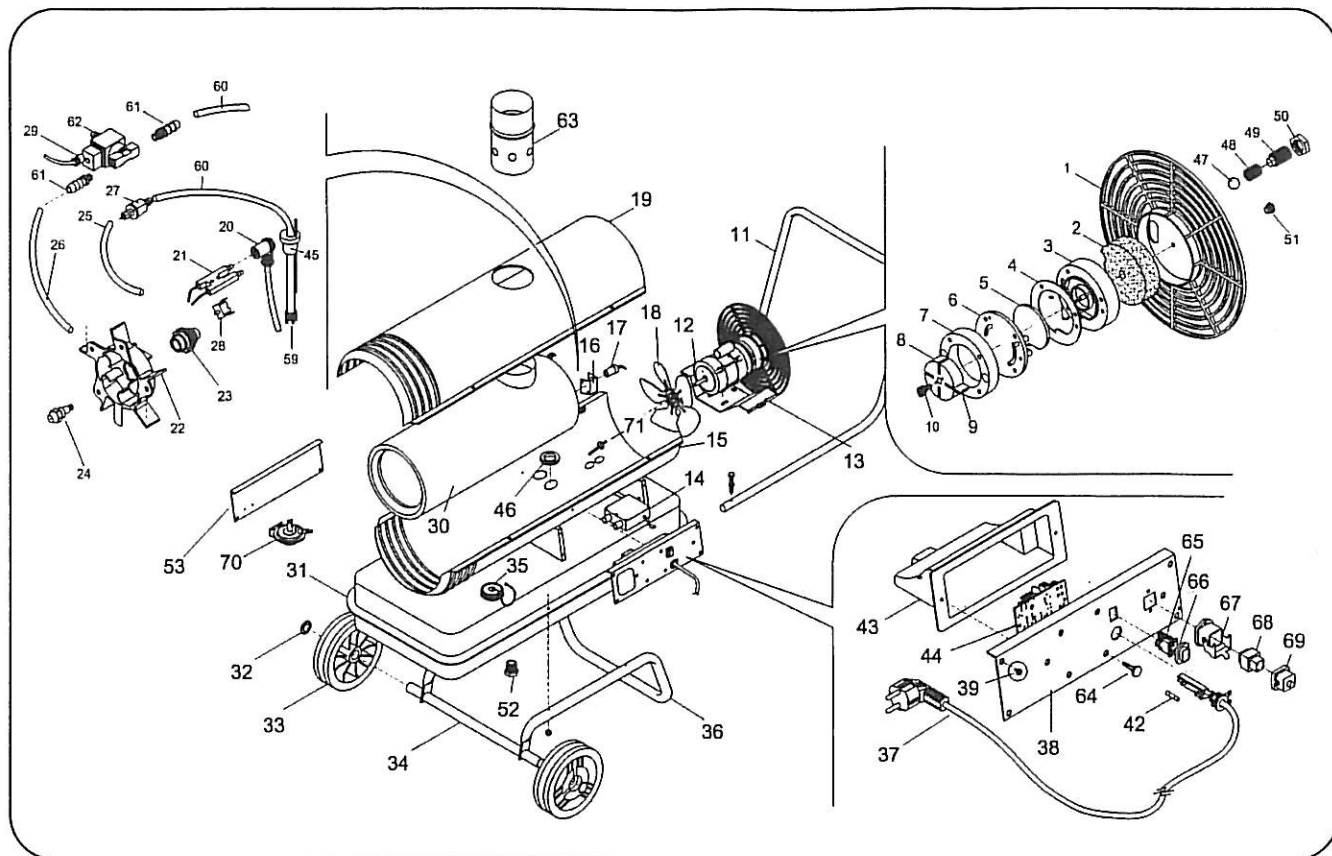
7. TROUBLESHOOTING

The maintenance operations written in boldface must be carried out only by an authorized Technical Service.

PROBLEM	CAUSE	REMEDY
Motor does not start	No power or low tension	Check power line and tension Check fuse and replace if necessary
	Faulty or damaged power cord	Check power cord Replace power cord
	Faulty motor/capacitor	Check and if necessary replace
	Lock-out of appliance due to overheating	Detect the cause of overheating Shut the appliance down Check air inlet and outlet Wait some minutes and restart the appliance If required clean/replace air pressure switch
Motor runs, but the heater does not ignite and after a short time locks out	Empty fuel tank, dirty or wrong fuel	Remove wrong or dirty fuel Fill the tank with clean oil or kerosene
	Fuel filter clogged	Clean or replace fuel filter
	Air leaks in oil line	Check pipes, tighten connections, if necessary replace
	Burner nozzle clogged	Clean nozzle blowing compressed air, replace if necessary
	Oil viscosity increased due to low temperature (below 20F)	Mix oil with 10-20% kerosene
Flames come out of flue outlet	Faulty ignition transformer	Perform transformer test, call for instructions
	Inlet air to heater is obstructed	Remove air flow restriction to allow air pressure switch to close
	Air pressure switch is not closing	Check air pressure switch for continuity at normal room temperature. If there is no continuity, replace switch.
	Insufficient air flow into combustion chamber	Check fan or restrictions to air inlet
	Pump pressure too high	Check pump air pressure Set air pressure to 4.8 PSI

WIRING DIAGRAM





LVF 90 - PART LIST			
FIG.POS.	PART NR.	DESCRIPTION	
1	1	1006000311	REAR GUARD
1	2	1086001711	AIR INLET FILTER
1	3	1094007311	PLATE
1	4	1002001311	GASKET
1	5	1086000111	AIR OUTLET FILTER
1	6	1094007211	COVER
1	7	1099002911	STATOR RING
1	8	1099001811	ROTOR
1	9	1099001411	BLADE
1	10	1001008311	JOINT
1	11	MANT#GRY4020	HANDLE
1	12	1040013411	MOTOR
1	13	1094006111	MOTOR SUPPORT
1	14	1033004600	IGNITION TRANSFORMER
1	15	1094143711	LOWER CASING
1	16	1094104211	FLAME SENSOR SUPPORT
1	17	1050000911	FLAME SENSOR
1	18	1087004611	FAN
1	19	1094143811	UPPER CASING
1	20	1039043500	HT CABLE
1	21	1030001111	IGNITION ELECTRODE
1	22	1094148811	COMBUSTION HEAD
1	23	1001017011	NOZZLE HOLDER
1	24	1088014311	NOZZLE
1	25	1078000211	HOSE
1	26	1078001611	HOSE
1	27	1086001911	OIL FILTER
1	28	1036001611	SAFETY THERMOSTAT
1	29	1043002655	CABLE + CONNECTOR
1	30	CAMGEN#GRY025	COMBUSTION CHAMBER
1	31	SERBGRYP#040USA20	TANK

1	32	1022000911	WHEEL RING
1	33	1004000200	WHEEL
1	34	ASSALE#GRY4020	AXLE
1	35	1094004311	FILLING CAP
1	36	TELAOT#GRY04020	FRAME
1	37	CAVAL#USA0180USAP2	POWER CORD
1	38	CRUSCGRYP#025F20	LEFT SIDE PANEL
1	39	1016001600	SCREW
1	42	1035001900	FUSE
1	43	1001017611	COVER
1	44	1047004811	CONTROL BOARD
1	45	1002005711	GASKET
1	46	1002002100	RUBBER GASKET
1	47	1023002411	BALL
1	48	1023004511	SPRING
1	49	1023002511	SCREW
1	50	1017002111	NUT
1	51	1067006911	CAP
1	52	1067007000	DRAIN CAP
1	53	CRUSCGRYP#028C20	SIDE RIGHT PANEL
1	59	1001014711	SUCTION FITTING
1	60	1078000411	RUBBER HOSE
1	61	1067005800	HOSE HOLDER
1	62	1042003811	SOLENOID VALVE
1	63	1094138733	EXHAUST HOOD
1	64	1001015680	SPACER
1	65	1032001900	SWITCH
1	66	1002002755	SWITCH COVER
1	67	1043000600	SOCKET CASING
1	68	1043000400	SOCKET
1	69	1052001800	CAP
1	70	1046001611	AIR PRESSURE SWITCH
1	71	1046001036	HOSE FITTING