

# OPERATING AND MAINTENANCE INSTRUCTIONS

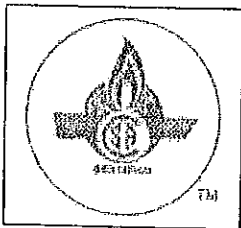
P/N 120944-001

## MODEL 1690D IN-LINE HEATER (FOR USE WITH 1325D VENTILATOR)

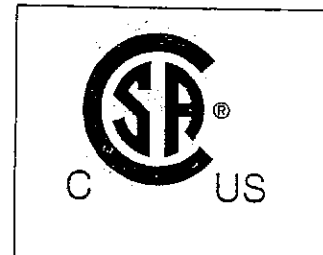
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EXPLODED VIEW DRAWING (P/N 118655)  
WIRING DIAGRAM (P/N 118617)  
ACCESSORIES/OPTIONS



**T. A. PELSUE COMPANY**  
2500 S. Tejon St., Englewood, CO 80110  
Phone: (303) 936-7432 or (800) 525-8460  
Fax: (303) 934-5581



**PELSUE 1690D PROPANE-FUELED HEATER/BLOWER**



**1.0 GENERAL**

**1.01** This manual covers the description, operation and maintenance of the Pelsue Model 1690D propane-fueled portable in-line heater.

**PLEASE TAKE THE TIME TO READ THIS PAMPHLET BEFORE OPERATING HEATER/BLOWER.**

**1.02** The heater, when used with our 1325D series axial blower, is specifically designed to provide a completely portable source of heated fresh air. The heater is powered by an external AC electrical source and L.P. fuel, source regulated down to 15-50 PSI, 1.03 + 3.5 BAR.

**2.0 SAFETY PRECAUTIONS**

**! GENERAL HAZARD WARNING**

FAILURE TO COMPLY WITH THE PRE-CAUTIONS 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 CUSTOMER SERVICE:  
1-800-525-8460.

**! 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**

NOT FOR HOME OR RECREATIONAL VEHICLE USE.

We cannot anticipate every use which may be made of our heaters. CHECK WITH YOUR LOCAL FIRE SAFETY AUTHORITY IF YOU HAVE QUESTIONS ABOUT APPLICATIONS.

Other standards govern the use of fuel gases and heat producing products in specific applications. Your local authority can advise you about these.

**2.01** The heater is primarily intended for the temporary heating of manholes, vaults, and buildings under construction,

alteration or repair. Do not use the heater for other than its intended use.

**2.02** The heater can be connected to any liquid propane (vapor) cylinder meeting ANSI/NFPA 58-1986 and CAN/CGA-B149.2 current edition, 20 lb. to 100 lb. cylinders being the most widely used.

**2.03** The heater and fuel supply installation must conform with the local codes or, in the absence of local codes, with the standard for the storage and handling of liquefied petroleum gases, ANSI/NFPA 58-1986. In Canada follow CAN/CGA B149.2 Installation Code and other applicable code requirements specified by the authority having jurisdiction.

**2.04** Always keep the propane cylinder in an upright position. The heater is designed to work only with liquid propane vapor.

**2.05** All propane cylinders that supply fuel to the heater shall incorporate an in-line filter, regulator and excess flow valve per UL 125-1980. Regulator assemblies are available through the Pelsue Company, but are not supplied with this appliance.

**2.06** Prior to connecting the propane supply to the heater, verify that the supply pressure is regulated down to the input requirements of the heater (15-50 PSI, 1.03 - 3.5 BAR). A regulator assembly external of this appliance must be used for this purpose, see above paragraph 2.05.

**2.07** Always check for leaks after connecting or disconnecting the propane supply. The distinctive odor of propane gas should alert you that a

connection is leaking. Check for leaks by applying a solution of soapy water at each connection. Never check for leaks with an open flame. An undetected leak can cause extreme danger as a potential explosion hazard. Shut off the supply of propane at the cylinder prior to tightening any connection, then open the supply and re-check for leaks by applying more soapy water.

**2.08** Avoid subjecting propane cylinders to excessive heat. Never direct the outlet of the heater toward any propane cylinder within 20 feet. Locate the heater at least six feet from any propane cylinder. Exercise care in handling the cylinder to avoid dropping or other abusive treatment.

**2.09** Maintain 24" clearance along sides and at inlet of heater, and maintain 18" clearance above heater from combustible and fuel containers. When used with a hose, maintain 24" clearance from end of hose. When used without hose, maintain 60" clearance from end (outlet) of heater.

**2.10** Make sure the heater is level and stable prior to operation. Locate the heater so that its electric cords are not laying in water or other liquids.

**2.11** The heater should be inspected before each use and at least annually by a qualified service person. Contact the Pelsue service department for the factory authorized service center nearest you.

**2.12** The hose assembly shall be visually inspected prior to each use of the heater. If it is evident that there is excessive abrasion or wear, or the hose is cut, it must be replaced prior to the heater being put into operation. See the enclosed parts list for the replacement hose part number.

**2.13** Always maintain adequate ventilation when operating this heater.

**2.14** The appliance should be installed and grounded in accordance with CSA C22.1 Canadian Electrical Code Part 1 or local authority having jurisdiction. Always use a three-prong ground fault interrupter receptacle to power the heater. Test the receptacle for ground fault prior to plugging in heater.

**2.15** Do not wear loose clothing that can become tangled in the operating heater or blower.

**2.16** Never handle energized power cords with wet hands. Do not place fingers or any other objects in the inlet or outlet openings.

**2.17** Always face blower inlet into the wind to keep exhaust gases away from air intake.

**2.18** Always keep the inlet, outlet and exhaust clear of obstructions.

**2.19** Before shutting off heater, first turn off fuel at the cylinder and allow the fuel in the hoses and piping to evacuate and burn. Then switch off the heater.

**2.20** Never transport or store the heater while it is connected to its fuel supply. Make sure the valve on the cylinder is tightly closed. Always disconnect propane from heater prior to transporting. Always store the propane cylinders in accordance with Chapter 5 of the standard for the storage and handling of liquefied petroleum gases, ANSI/NFPA 58-1986 and CAN/CGA-B149.2 current edition.

### **3.0 MAINTENANCE AND REPAIR**

**3.01** Be sure all equipment is unplugged from the electric power, the appropriate circuits are disconnected and the propane supply is shut off before doing any maintenance or repair work on the heater.

**3.02** Be sure burner, orifices, igniter and sensor are cleaned at least once a year to prevent poor combustion.

**3.03** Check all power cords for cuts, frayed ends, or brittle insulation. See the enclosed parts list for the replacement cord part number.

**3.04** See page - 7 for the trouble shooting chart.

**3.05** For additional service information, contact:

T.A. Pelsue Service Department  
2500 South Tejon Street  
Englewood, Colorado 80110  
Phone 303-936-7432 or  
1-800-525-8460  
Fax (303) 934-5581

### **4.0 PRODUCT DESCRIPTION:** The Pelsue 1690D In-Line Heater

**A.** An aluminum heater housing containing the heat exchanger with five burner jets, spark igniter, flame sensor.

**B.** A control box on the side of heater contains a transformer, electronic circuit board, regulator, solenoid valve, pilot light, ON-OFF switch, air pressure differential switch, hi-limit switch, circuit breaker and power cord.

**4.01 DIMENSIONS & WEIGHTS**

Width: 13.5" (34.9 cm)  
Length: 18.50" (46.9 cm)  
Height: 15.25" (38.74 cm)  
Weight: 30 lbs.

**4.02 MODEL SPECIFICATIONS & PERFORMANCE:**

Model 1690D - 120V AC, 50/60 HZ, 1 amp. (When connected to a 1325D Blower, combination unit requires 4 amps).

BTU: 70,000 Heat Rise: 100° F at outlet of heater

**5.0 MAJOR COMPONENT DETAILS:**

**5.01 Burner Jets:** The burner jets (five each) emit propane gas which, when mixed with the proper air volume, provide high temperature flames.

*NOTE: Burner jets cannot be ignited unless the blower is in operation, the pressure switch is activated, and the heater housing has not become overheated, which causes the hi-limit switch to open. The hi-limit switch will automatically reset once the unit has cooled to a safe temperature.*

**5.02 Transformer:** The transformer provides a means of converting incoming 120V AC to 12V AC. The transformer is activated by the control switch.

**5.03 Rectifier:** The rectifier provides the means of converting from 12V AC to 12V DC. This voltage powers the circuit board and solenoid valve that controls the L.P. gas to the burners. The transformer is activated by the control switch.

**5.04 Fuse holder:** The in-line fuse, 1-amp, protects the transformer and circuit board from excessive currents. This fuse is not protecting the 120V ac outlet.

**5.05 Spark Igniter:** The spark igniter furnishes a high voltage spark to provide initial combustion of the propane gas present at the burner jets. If the flame is extinguished during the duty cycle, the igniter will provide one immediate retry for ignition before going into lockout. To reactivate or retry for ignition, simply turn the control switch off for 30 seconds.

*Note: Electrodes are designed for a gap sparking of 0.125" ± 0.032" (3.2mm ± 0.8mm). If this spacing is not as specified, the electrodes should be replaced. Electrode assemblies should not be adjusted or disassembled.*

**5.06 Flame Sensor:** This component monitors the burner to insure that a flame exists. Should a flame-out occur, the sensor signals the circuit board to interrupt power to the solenoid and shut off fuel to the burner.

**5.07 Heat Exchanger:** The heat exchanger is constructed of stainless steel to provide high efficiency, high heat tolerance and minimum corrosion.

**5.08 Internal Regulator:** The regulator provides a factory preset pressure of 10.5" w.c. to the burners. This unit is factory pre-set and sealed and should not be adjusted.

**5.09 Propane Solenoid Valve:** The solenoid valve turns on or off the flow of propane to the heater burners. The solenoid valve is controlled by the electronic circuit board. The solenoid valve will close due to a flame-out, an over-temperature condition in the heater.

housing, shut-down of the blower or from turning the control switch to "OFF".

**5.10 Air Pressure Differential Switch:**

This switch is activated by the air stream when-ever the blower is turned on. This switch controls the input power to the electronic circuit board. DO NOT obstruct the inlet tube. DO NOT tamper in any way with the switch.

**5.11 Solid State Circuit Board:**

The circuit board provides constant monitoring of combustion chamber flame so to shut off system if the flame is extinguished. In the event of flame-out, if a flame is not established during the required period (approximately 6.8 seconds) the electronic circuit will close the solenoid valve and lock out. Circuit must then be reset as described in 5.05. NOTE: There is a 4 second delay after switch is turned on and prior to ignition for a safety purge.

**5.12 Hi-Limit Switch:**

The hi-limit switch controls the input power to the electronic circuit board and opens when an excessive temperature rise inside the heater housing occurs. It automatically resets after a few minutes of cool down. High temperature is set to turn off at 250-deg's and on at 210-deg's.

**6.0 START UP & OPERATING PROCEDURES**

**READ ENTIRE START UP & OPERATING PROCEDURE BEFORE OPERATING HEATER**

**6.01 PRE-START PROCEDURE**

**CAUTION:** Read, 2.0 SAFETY PRECAUTIONS.

A. Make sure the heater switch is "OFF".

B. Check chimney screen and heater intake for obstructions.

C. Place the 1325D Blower outlet into the 1690D Heater inlet.

D. Install an 8" dia. x 15' long duct hose onto the outlet of heater.

E. Position the heater/blower assembly upwind of the manhole with the inlet facing the wind.

F. Check blower inlet and outlet guard screens for obstructions. Check immediate area around blower for objects that could be sucked into the inlet and remove from area.

G. Plug in power cord on heater to receptacle.

H. Connect and fully open propane bottle. Use a propane gas bottle with regulator and set pressure between 15 - 50 PSI (1.03 - 3.5 BAR). See paragraphs 2.05 and 2.06.

**6.02 START PROCEDURE**

**CAUTION:** BEFORE STARTING, MAKE CERTAIN THAT NO OBJECTS ARE PLACED ON TOP OF THE HEATER CHIMNEY. DO NOT TOUCH, LOOK INTO OR LEAN OVER CHIMNEY WHILE HEATER IS STARTING OR OPERATING!

A. Plug blower cord into heater receptacle

B. Turn heater control switch on. There will be a 4 second delay prior to ignition once switch is turned on to facilitate a safety purge of the combustion chamber. After this delay, the igniter

should be sparking and the heater should fire.

**C.** Allow ventilator to purge duct for approximately 1 minute before installing end of hose into any confined space. **BE SURE NO TOXIC FUMES CAN BE BLOWN INTO AN UNVENTILATED AREA.**

**D.** If using a windbag at the end of the blower hose, insure that the windbag ports are not blocked or restricting free air flow.

### **6.03 SHUT-OFF PROCEDURE**

**A.** Turn propane off at the bottle(s) and allow heater to burn off residual fuel.

**B.** Turn control switch to "OFF".

**C.** Disconnect propane bottle from heater. Be sure no connections are leaking.

**D.** Leave blower on for five (5) minutes to cool the heat exchanger.

**E.** Remove the blower and blower hose.

**TROUBLE SHOOTING CHART**

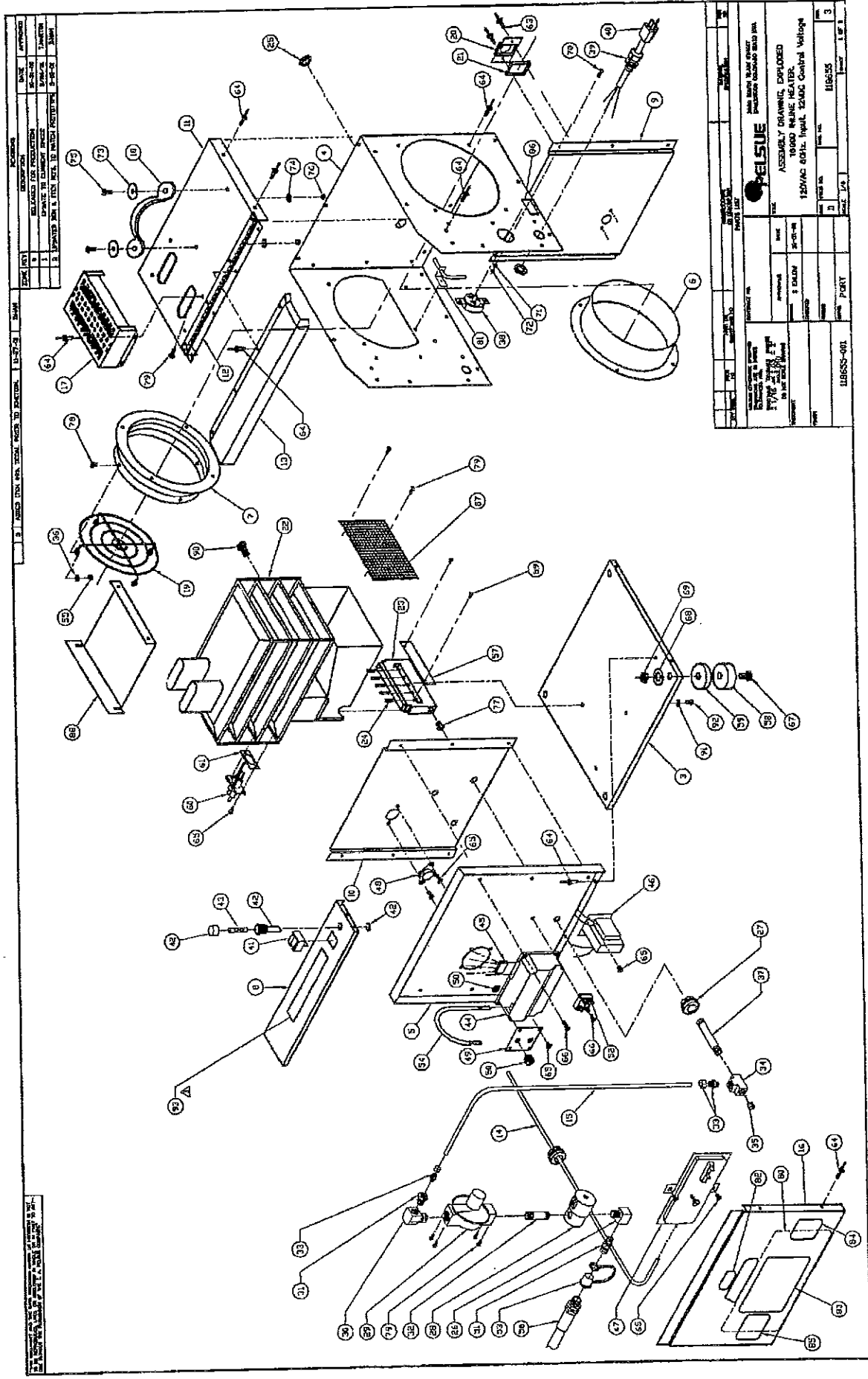
**CAUTION; If a generator is being used for the power supply, voltage must be checked periodically. Low voltage will affect the blower CFM and the circuit board.**

<u>TROUBLE</u>	<u>POSSIBLE CAUSE</u>	<u>REMEDY</u>
1. Yellow flame	A. Dirt in orifice(s)	A. Clean orifice(s).
2. Erratic flame at burner.	A. Orifice(s) loose or dirty. B. Loose connections in fuel fuel plumbing.	A Tighten or clean orifice(s). B. Check & tighten connections leading to burner.
3. Flame will not go out when burner is switched off.	A. Faulty or dirty solenoid valve. B. Circuit board failure.	A. Clean or replace solenoid valve. B. Replace circuit board.
4. Gas will not ignite when burner is turned on and spark is present.	A. L.P. Bottle is empty. A. Fill L.P. Bottle. B. Faulty solenoid valve. C. Faulty regulator. D. L.P. bottle valve is shut. E. Heater outlet is blocked. F. Fuel pressure to manifold is too low.	B. Replace solenoid valve. C. Replace regulator. D. Turn on valve. E. Remove blockage. F. Reset to 10.5" w.c.
5. No spark when control switch is turned on.	A. Circuit board has locked out system for safety reasons. B. Circuit board failure. C. Pressure switch "OFF" or faulty.	A. Recycle heater by turning off switch. B. Replace circuit board. C. Check that blower is on. Replace switch.
6. Burner lights for 3-4 seconds and then shuts off.	A. Circuit board failure. B. Flame sensor failure	A. Replace circuit board. B. Replace flame sensor/ spark igniter unit

<b>Item#</b>	<b>Part#</b>	<b>Description</b>	<b>Qty.</b>
3.	118654-001	Base - 1690D Heater	1
4.	118649-001	Housing - 1690D Heater	1
5.	120468-001	Panel - Component Wall, 1690D Heater	1
6.	106857-002	Ring - Inner Intake	1
7.	106858-002	Ring - Inner, Outlet	1
8.	118650-001	Control Panel - 1690D Heater	1
9.	118652-001	Heat Shield, View Port Side	1
10.	120469-001	Heat Shield, Component Wall Side	1
11.	118653-001	Top - 1690D Heater	1
12.	111490-001	Hinge - Control Box Cover	1
13.	118657-001	Cover- Control Panel	1
14.	112203-000	Tubing - Rubber, 7/32" Nom.	12"
15.	59Z-011000	Tubing – RD, 1/4" OD. Copper	12"
16.	111487-001	Door - Control Box Access	1
17.	118294-001	Chimney - 1690D Heater	1
18.	102090-001	Handle – Cloth Reinforced Neoprene	1
19.	111330-001	Outlet Grille	1
20.	109873-001	Sight Glass Retainer	1
21.	109872-001	Sight Glass	1
22.	118574-001	Heat Exchanger with Air Collector	1
23.	118671-001	Burner Manifold, as Machined	1
24.	120420-001	Orifice - No. 56, 1/8 NPT	5
25.	44E-017900	Plug - Snap-In-Blank, .875" DIA	1
26.	107059-001	Fitting - Street Elbow, 1/4" NPT	1
27.	62E-023500	Rubber Grommet 1/2" ID.	2
28.	26E-017100	Valve – Solenoid, 12V DC	1
29.	35G-010100	Regulator – Propane	1
30.	109545-001	Fitting – Street Elbow, 3/8"NPT	1
31.	114621-001	Fitting – Brass Bushing 3/8"MNPT x 1/8"FNPT	1
32.	108614-001	Fitting – Brass Nipple, 1/4"MNPT x 2" Lg.	1
33.	112307-001	Coupler, 1/8" NPT x 1/4" Tube Compression	2

34.	32F-152200	Fitting - Female Tee - 1/8" FNPT	1
35.	109244-001	Fitting - Plug - Hex Head - 1/8" NPT	1
36.	100050-005	Flat Washer #8, Plated	4
37.	112450-001	Nipple - 1/8 x 3-1/2" Long	1
38.	26E-007000	Receptacle - 2 pole, 3 wire, 125V	1
39.	100405-004	Strain Relief	1
40.	26E-005700	Cord & Plug Set - 16/3 wire, 12' long	1
41.	120959-001	Switch - Rocker, 125/250VAC	1
42.	107336-001	Fuse Holder	1
43.	100097-006	Fuse - 1 amp	1
44.	118566-001	Circuit Board, 12V DC	1
45.	26E-041310	Cable Assembly - Circuit Board	1
46.	106447-001	Transformer, 117VAC Prime, 12VAC Sec.	1
47.	120421-001	Switch - Air Pressure	1
48.	120422-001	Switch - Thermal, Open 250, Close 210	1
49.	111492-001	Access Plate - Thermostat	1
50.	62E-011200	Rubber Grommet, 1/4" ID.	3
51.	118041-001	Fitting - Nipple, Hex, 1/4" MN	1
51b.	122429-001	Nipple - Quick Disconnect, 1/4" Body & FNPT	1
52.	106763-001	Rectifier - Bridge	1
53.	109264-001	Dust Cap - with Retainer, Yellow	1
54.	120423-001	Lead - High Tension, Spark Ignition	1
55.	100060-007	Hex Locknut, #8-32	4
56.	62I-006800	Hose Assembly, LPG 1/4 x 10'	1
57.	120425-001	Baffle - Burner Manifold	1
58.	100188-002	Rubber Foot 1-1/2" OD	4
59.	62Q-001000	Washer - Neoprene, 5/16" ID x 1-1/2" OD	4
60.	106031-001	Igniter - Spark /Flame Sensor	1
61.	106860-001	Gasket - Spark Igniter	1
62.	68n-004200	Lock Washer, Star #8	4
63.	103824-003	Rivet - Stainless Steel, 3/16"Dia x .125 Grip	2
64.	118518-001	Rivet - Stavex, Black	53

65.	68N-002800	Screw, 8-32 UNC x 3/8", Truss Head	14
66.	68N-023500	Screw, 8-32 UNC x 3/4", Truss Head	5
67.	101427-002	Screw, 1/4"-20 UNC x 3/4"	4
68.	100050-009	Flat Washer – 1/4"	4
69.	100060-010	Locknut 1/4 - 20 UNC	4
70.	101052-003	Screw - #4 - 40 UNC x 3/8"	2
71.	100907-001	Washer - Lock #4 Star	2
72.	100060-004	Hex Lock Nut - #4-40	2
73.	105558-001	Washer-Fender, #10 Plated	2
74.	100050-006	Washer - Flat #10, Type A Plated	2
75.	111841-002	Screw - #10 - 24 UNC x 1/2" - Black	2
76.	112178-001	Locknut - Nylon Insert, 10-24, Black	2
77.	108601-001	Fitting-Brass Bushing 1/4" MNPT x 1/8"FNPT	2
78.	111844-001	Screw - #8-32 x 3/8" Lg. Black	4
79.	112179-001	Screw - Sheet Metal, #8 x 3/8" Black	7
80.	120459-001	Decal - Wiring Diagram, 1690D Heater	1
81.	120461-001	Pitot Tube with Bracket	1
82.	110290-001	Decal – Warning, Unit Usage 1590/1690 Heaters	1
83.	118618-001	Decal - Serial & Rating, 1690D Heater	1
84.	110289-001	Decal - Warning Hazardous Conditions	1
85.	110292-001	Decal - Warning General Hazards	1
86.	107343-001	Decal - Electric Grounding Instructions	1
87.	120429-001	Screen - Air Collector	1
88.	120430-001	Heat Shield – Top	1
89.	107013-001	Screw, #6 x 3/8"Lg. Self Tapping, Hex Hd.	2
90.	113929-001	Sight Glass	1
91.	68N-015900	Lock Washer – 1/4" Star	1
92.	100604-005	Screw – 1/4-20 x 1/2"Lg. Hex Hd.	1
93.	121160-001	Decal – Prior to Ignition	1
94.	122429-001	Nipple – Quick Disconnect, 1/4" Body & FNPT	1

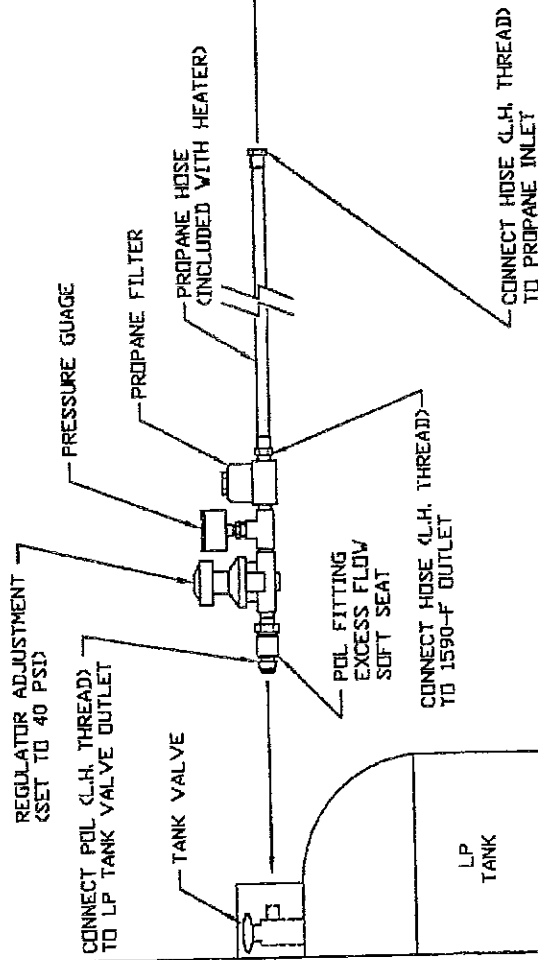
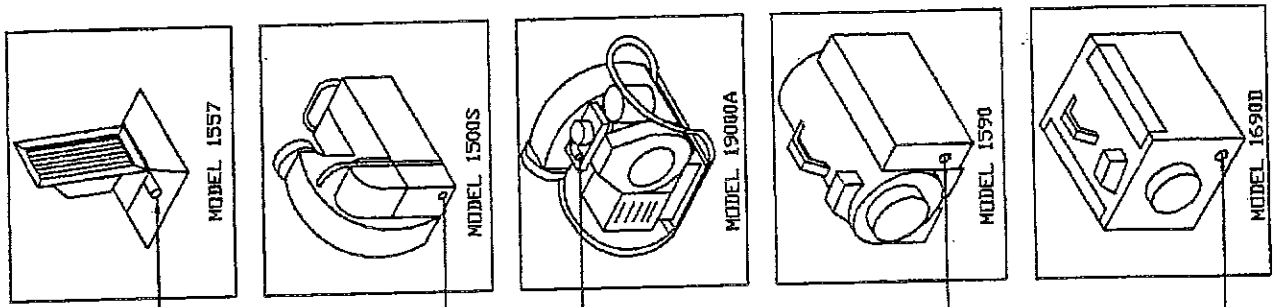


REV	DESCRIPTION	DATE	BY
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52	REVISED TO CORRECT DIMENSIONS	11-10-54	W.M.
53	REVISED TO CORRECT DIMENSIONS	11-10-54	W.M.
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64	REVISED TO CORRECT DIMENSIONS	11-10-54	W.M.
65	REVISED TO CORRECT DIMENSIONS	11-10-54	W.M.

<b>WEISSTE</b> ASSEMBLY DRAWING EXPLODED MAIN HEATER 120VAC 60Hz Input, 240VAC Control Voltage	
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OPERATING INSTRUCTIONS  
 PELSUE MODEL 1590-F REGULATOR ASSEMBLY  
 FOR USE WITH 1590, 1690 & 1500S HEATERS  
 (SOLD SEPARATELY)



BE CERTAIN ALL PROPANE CONNECTIONS ARE MADE BEFORE OPERATING. ONCE CONNECTIONS ARE MADE, OPEN LP TANK VALVE, THEN TURN THE REGULATOR ADJUSTMENT UNTIL A READING OF 40 PSI IS OBTAINED AT THE PRESSURE GAUGE. OPERATE HEATER PER INSTRUCTION MANUAL.

IF YOU NEED ASSISTANCE OR HEATER INFORMATION SUCH AS AN INSTRUCTIONS MANUAL, LABELS, ETC. CONTACT PELSUE CUSTOMER SERVICE: 1-800-525-8450

OPERATING INSTRUCTIONS  
 PELSUE MODEL 1590-F REGULATOR ASSEMBLY  
 FOR USE WITH 1500S, 1590, 1690D HEATERS (SOLD SEPARATELY)

