PACE®
INCORPORATED
Systems for PCB Repair Anywhere™

OPERATION AND MAINTENANCE INSTRUCTIONS FOR THE

PRC-150 SERIES
Bench Top Repair Systems

MODELS

PRC-150-C **PRC-151G**
PRC-151 **PRC-151BE**

MANUAL NO. 5050-0112

Featuring
Thermo-Drive™
HEAT CONTROL

REV. B

GENERAL INFORMATION

Before using your PACE Bench Top Repair System(s), read the following instructions and procedures in this manual to become familiar with its proper operation and maintenance. Used and maintained properly, it will perform reliably for many years.

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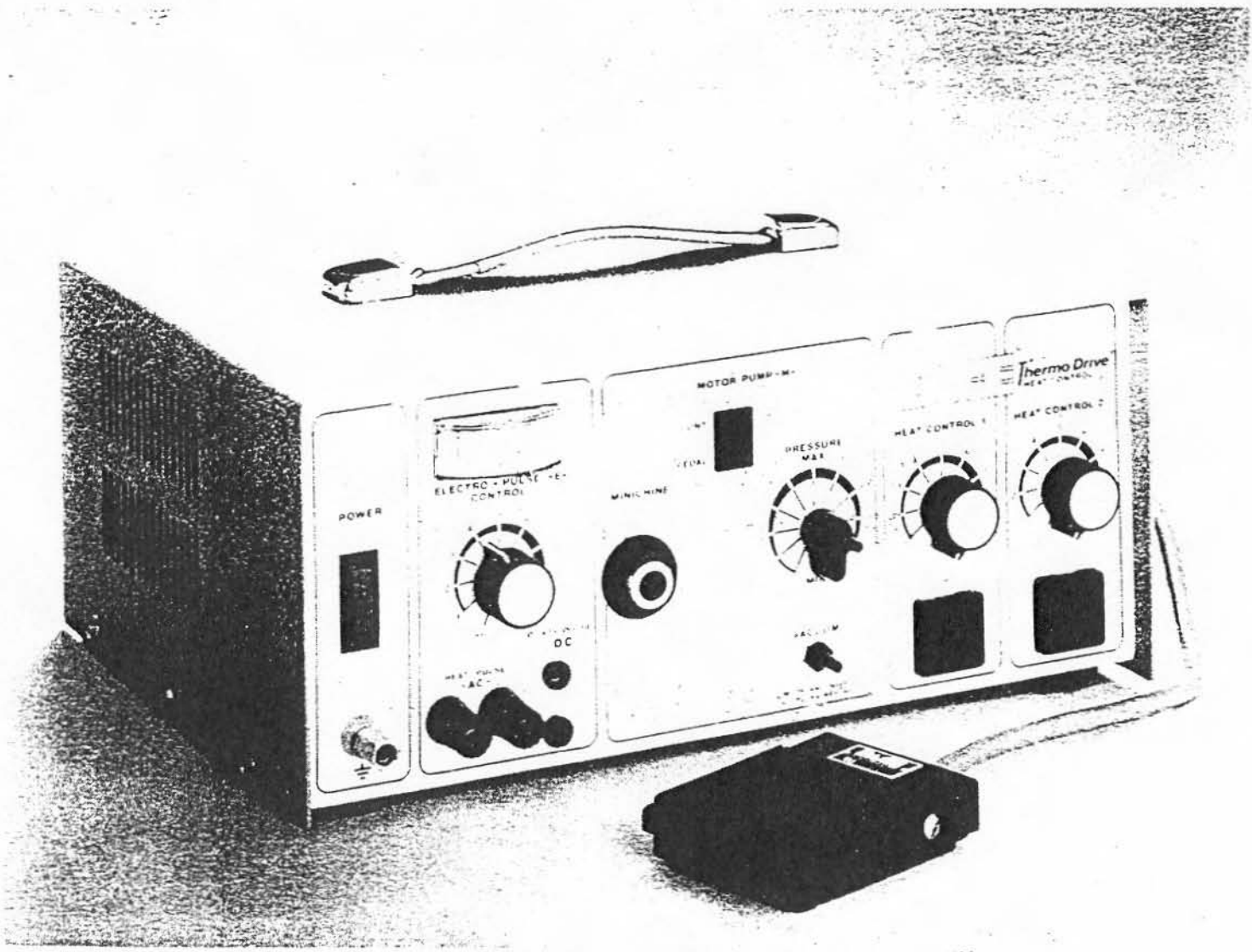


FIGURE 1. PACE REPAIR SYSTEM PRC-150C/151
(PACE POWER SOURCE PPS-100C/101)

GENERAL INFORMATION

INTRODUCTION:

The PACE PRC-150 and 151 Models are programmable repair systems with a unique expansion capability that can be varied to meet the changing conditions in todays modern electronics.

There are six (6) versions of the PACE Repair Systems;

- PACE Model PRC-150C (domestic) which consists of PACE Power Source PPS-100C (see Figure 1),
- PACE Model PRC-151*/PRC-151G* (domestic) which consists of PACE Power Source PPS-101 (see Figure 1), and
- PACE Model PRC-151BE* (export) which consists of PACE Power Source PPS-101BE (220VAC) or PPS-101BUK (240VAC) (see Figure 1)

*Zero Power Switching (ZPS) for desoldering static/voltage sensitive mos-type devices.

SPECIFICATIONS:

- **General Characteristics:**
  a. variable air pressure and flow control.
  b. dual switch control foot pedal.
  c. foot pedal control (three position).
  d. heavy-duty electrical output power control.
- **Variable Air Pressure:**
  0.05 psi to 12.0 psi
- **Power Requirements:**
  PRC-150—120VAC, 50-60Hz, 5 amp
  PRC-151—120VAC, 50-60Hz, 5 amp
  PRC-151G—120VAC, 50-60Hz, 5 amp
  PRC-151BE (PPS-101BE)—220VAC, 50-60Hz, 2 amp or
  (PPS-101BUK)—240VAC, 50-60Hz, 2 amp
- **Physical Parameters:**

Model PPS-100C
13"W x 5½"H x 10"L (51 cm W x 21 cm H x 39 cm L)

Model PPS-101
13"W x 5½"H x 10"L (51 cm W x 21 cm H x 39 cm L)

Model PPS-101BE
13"W x 5½"H x 10"L (51 cm W x 21 cm H x 39 cm L)

Model PPS-101 BUK
13"W x 5½"H x 10" L (51 cm W x 21 cm H x 39 cm L)

GENERAL INFORMATION

CAPABILITIES:

All capabilities are dependent upon the use of the proper Functional Accessories or Work Aids. (see Functional Accessories and Work Aids section).

- Capabilities:
  a. controlled desoldering for removal of solder joint configuration
  b. abrading
  c. milling
  d. drilling
  e. grinding and cutting for circuit board repair
  f. removal of conformal coatings
  g. high strength reflow soldering
  h. accurate component forming
  i. conductive and resistive heating for safe removal of components
  j. repair of damaged plated-thru holes and terminals
  k. replating of damaged or worn connectors/contacts
- The two position Foot Pedal allows total foot control of power to Functional Accessories for required heat time cycle, vacuum/pressure dwell time, and fine control of rotary power.

PARTS IDENTIFICATION

TABLE 1. PPS-101 POWER SOURCE PANEL IDENTIFICATION

- MAIN POWER SWITCH—controls input power.
- ELECTRO-PULSE INDICATOR—readout of power to VAC Heating Outputs and DC Swaplating Outputs when Foot Pedal is depressed. (Used as reference setting only).
- MOTOR PUMP SWITCH—provides three (3) operational sequences in conjunction with two position Foot Pedal.
- PRESSURE CONTROL—"quick-connect" variable pressure flow control.
- VARIABLE VOLTAGE CONTROL 1—supplies variable voltage to AC VAR Output 1.
- VARIABLE VOLTAGE CONTROL 2—supplies variable voltage to AC VAR Output 2.
- AC VARIABLE OUTPUTS—2 amp AC outlets used for Functional Accessories.
- VACUUM FITTING—"quick-connect" vacuum flow for solder removal.
- MINICHINE™ OUTPUT—high torque, low RPM output, "quick-connect" while in idle or running mode.
- DC OUTPUTS—electrical output controlled by Variable Output Control.
- AC OUTPUTS—electrical output for Functional Tool Cord, controlled by Variable Output Control.
- GROUND TERMINAL—provides positive ground connection when required.
- VARIABLE OUTPUT CONTROL—adjusts output power level to AC/DC Outputs.
- LINE FUSE (F1)—provides overload protection for main unit.
- AC VAR FUSE (F2)—provides overload protection for AC VAR Outputs 1 and 2.
- FOOT PEDAL—controls mechanical, pneumatic or primary electrical functions.
- MAIN POWER LINE CORD—provides main power input for Power Source.

Figure 2 identifies the front and rear panel controls and indicators mounted on the PPS-100/101 Power Source. Refer to Table 1 for identification of each part.

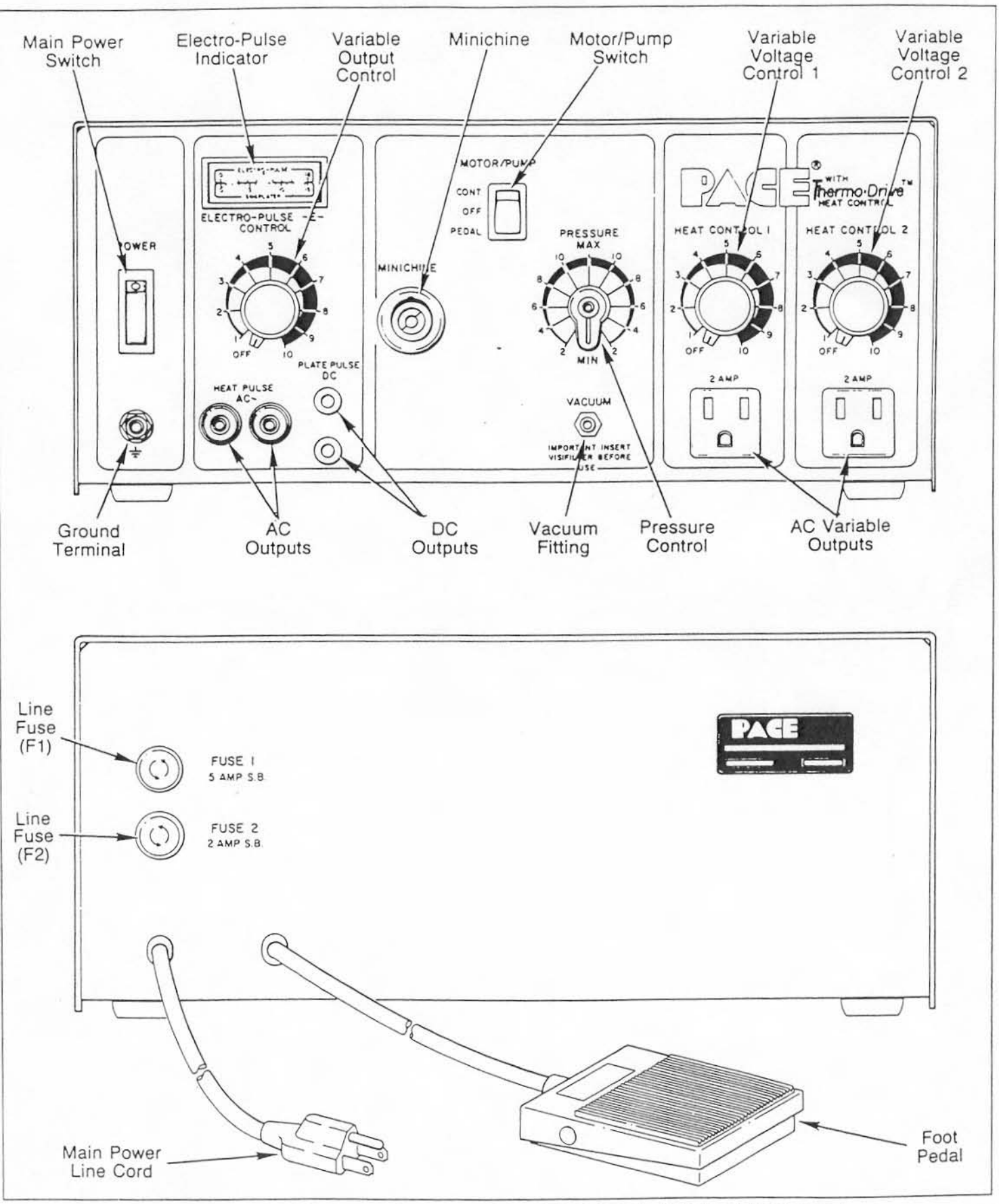


FIGURE 2. PPS-101 POWER SOURCE PANEL IDENTIFICATION

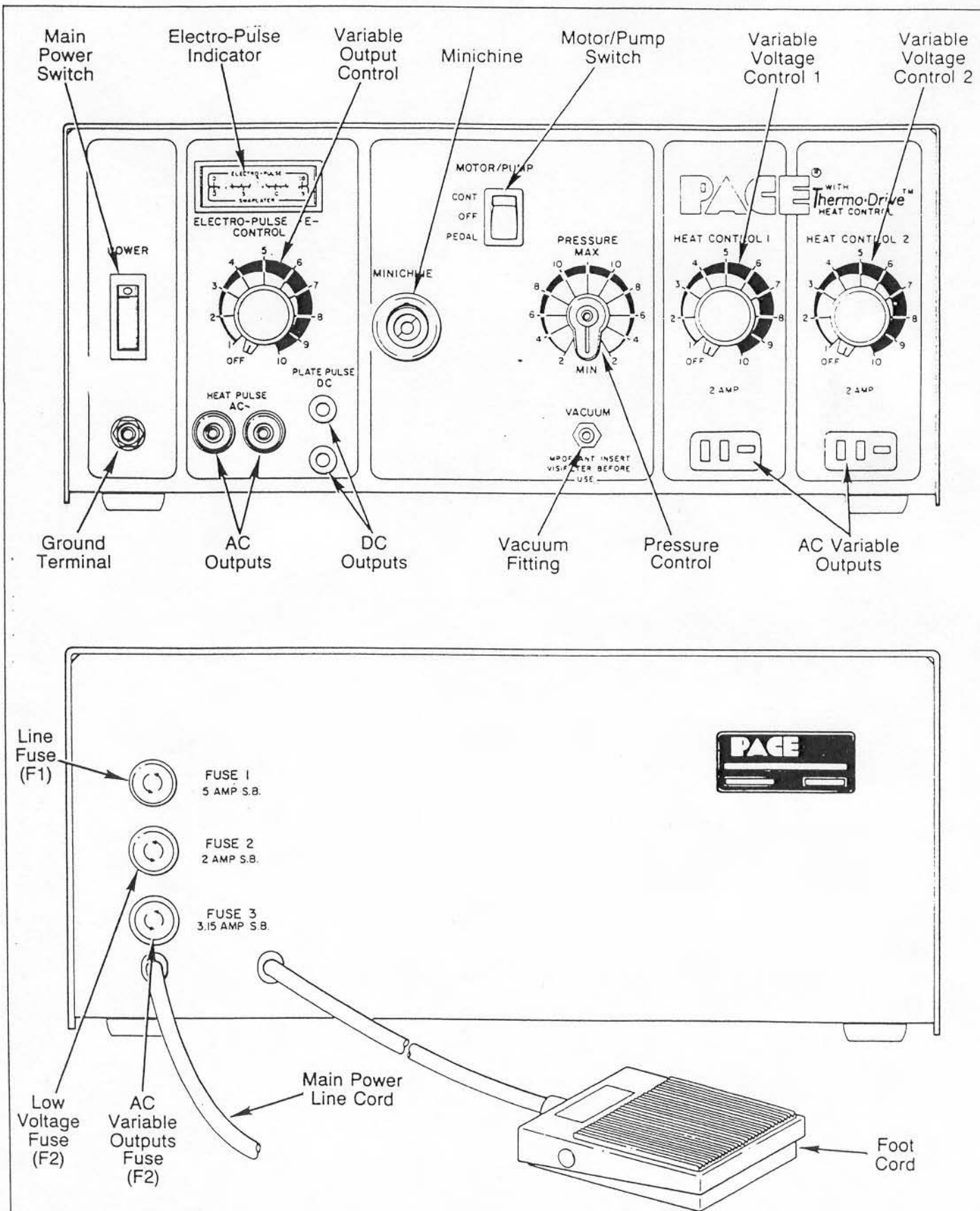


FIGURE 3. PPS-101BE (PPS-101BUK) POWER SOURCE PANEL IDENTIFICATION

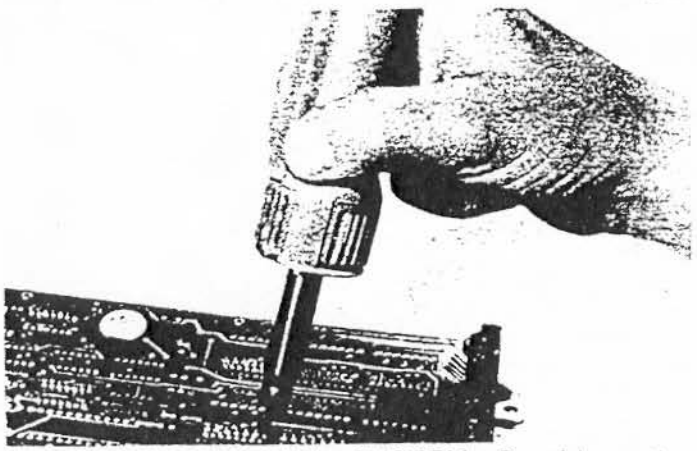
TABLE 2. PPS-101BE POWER SOURCE PANEL IDENTIFICATION

- MAIN POWER SWITCH—controls input power.
- ELECTRO-PULSE INDICATOR—readout of power to VAC Heating Outputs and DC Swaplating Outputs when Foot Pedal is depressed. (Used as reference setting only).
- MOTOR PUMP SWITCH—provides three (3) operational sequences in conjunction with two position Foot Pedal.
- PRESSURE CONTROL—"quick-connect" variable pressure flow control.
- VARIABLE VOLTAGE CONTROL 1—supplies variable voltage to AC VAR Output 1.
- VARIABLE VOLTAGE CONTROL 2—supplies variable voltage to AC VAR Output 2.
- AC VARIABLE OUTPUTS—2 amp AC outlets used for Functional Accessories.
- VACUUM FITTING—"quick-connect" vacuum flow for solder removal.
- MINICHINE™ OUTPUT—high torque, low RPM output, "quick-connect" while in idle or running mode.
- DC OUTPUTS—electrical output controlled by Variable Output Control.
- AC OUTPUTS—electrical output for Functional Tool Cord, controlled by Variable Output Control.
- GROUND TERMINAL—provides a positive ground reference connection when required.
- VARIABLE OUTPUT CONTROL—adjusts output power level to AC/DC Outputs.
- LINE FUSE (F1)—provides overload protection for main unit.
- LOW VOLTAGE FUSE (F2)—provides overload protection for low voltage AC and DC Outputs.
- AC VAR FUSE (F3)—provides overload protection for AC VAR Outputs 1 and 2.
- FOOT PEDAL—controls mechanical, pneumatic or primary electrical functions.
- MAIN POWER LINE CORD—provides main power input for Power Source.

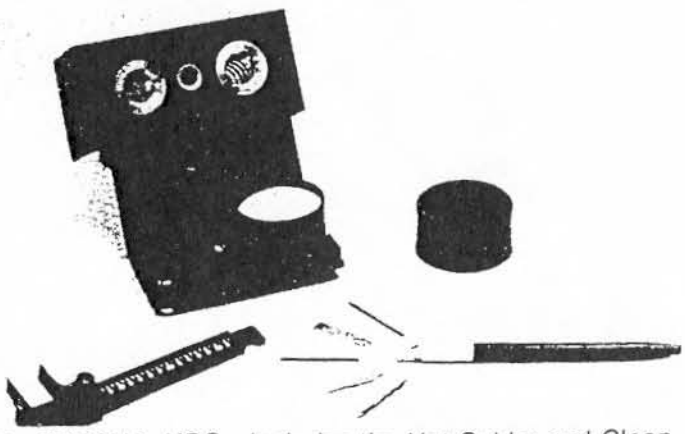
Figure 3 identifies the front and rear panel controls and indicators mounted on the PPS-101BE (PPS-101BUK) Power Source. Refer to Table 2 for identification of each part.

FUNCTIONAL ACCESSORIES and WORK AIDS

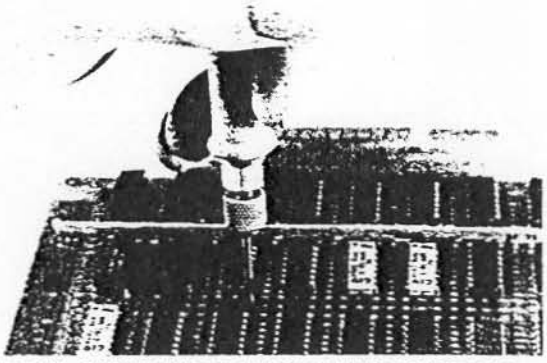
The following information is provided to help you identify the Functional Accessories and Work Aids available and their capabilities. All items shown are optional. Those necessary to perform your rework, repair or modification tasks are normally selected for delivery with the Power Source. The accessories are shown in order of importance to their usage for typical repair work.



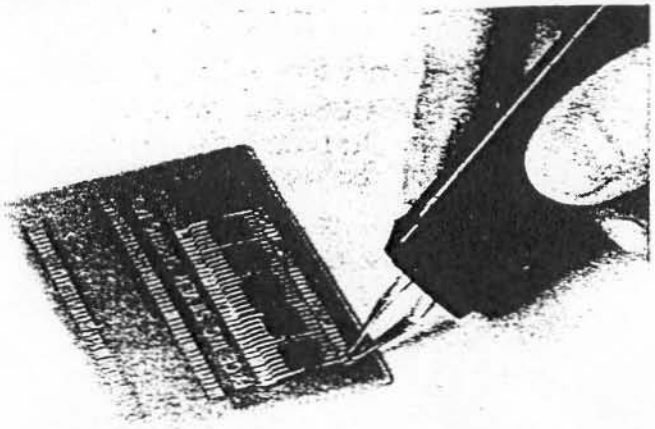
1. SODR-X-TRACTION SYSTEM—Provides the capabilities to melt solder joints and remove via vacuum of pressure.



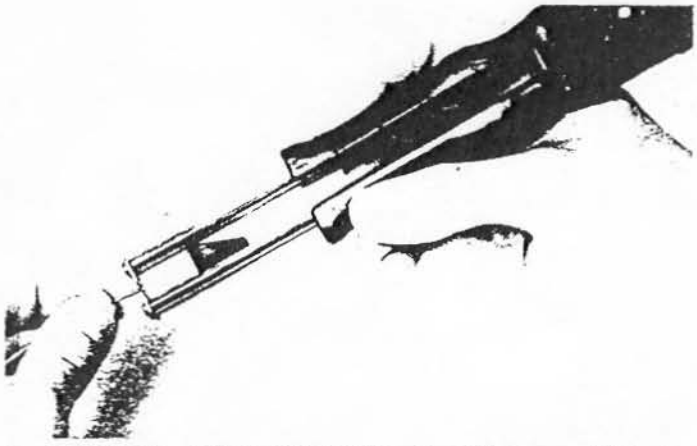
2. SPECIAL AIDS—Includes the Hot Cubby and Cleaning System for storing and cleaning both the SODR-X-TRACTOR and soldering iron; and the Conform I for forming axial lead components and straightening and cutting transistor leads to length.



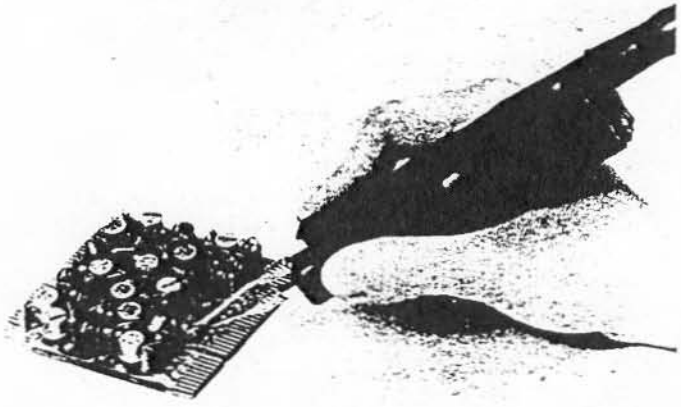
3. MINICHINE™ MINIATURE MACHINING SYSTEM—Provides the capability to drill, mill, abrasive clean, grind and polish various metallic and non-metallic materials.



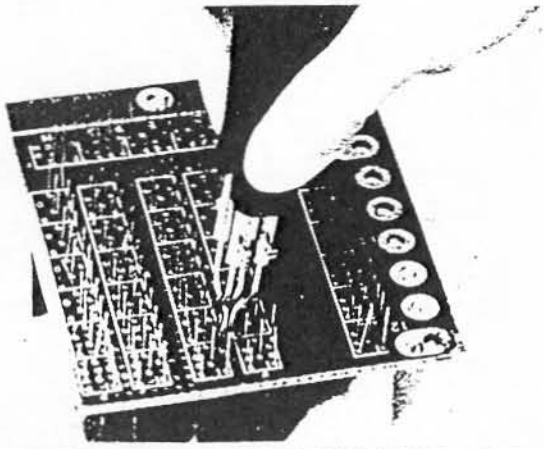
4. THERMOPARTING and LAPFLO SOLDERING SYSTEMS—Thermoparting provides a primary and safe means for removing thick conformal coatings from circuit board assemblies without damage. Lapflo pencil-like unit provides a dependable and safe means of producing reflow soldered joints for leaded chip carriers (flat packs) on circuit boards.



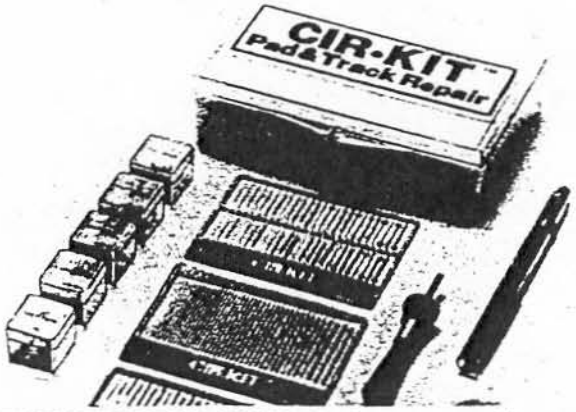
5. THERMAL STRIP SYSTEM—Provides capability for stripping wire insulations from 12 AWG to 30 AWG, solid or stranded wires, without damaging the wire conductor.



6. RESISTWEEZ RESISTANCE TWEEZERS—Provides capability to solder very closely spaced pins, terminals and lugs, as found in connectors and small parts.

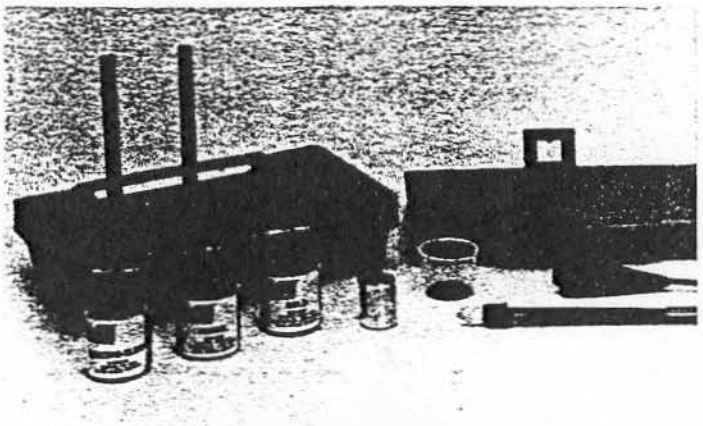


7. CONDUCTWEEZ HEATING TWEEZERS—Pulse-type tweezer heating system is used for soldering and desoldering closely spaced, limited access areas where pulsed conductive heating is desired to minimize the possibilities of stray currents which could damage components.

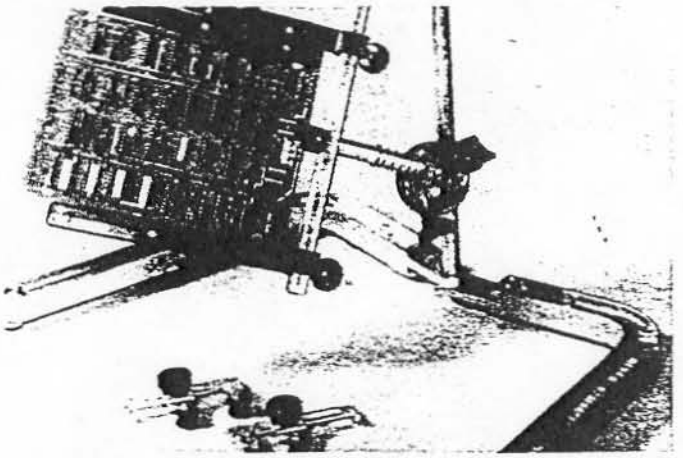


8. CIRKIT SELECTOR PACK—Includes everything needed to repair and/or replace lifted, damaged or missing pads or conductors on printed circuit boards.

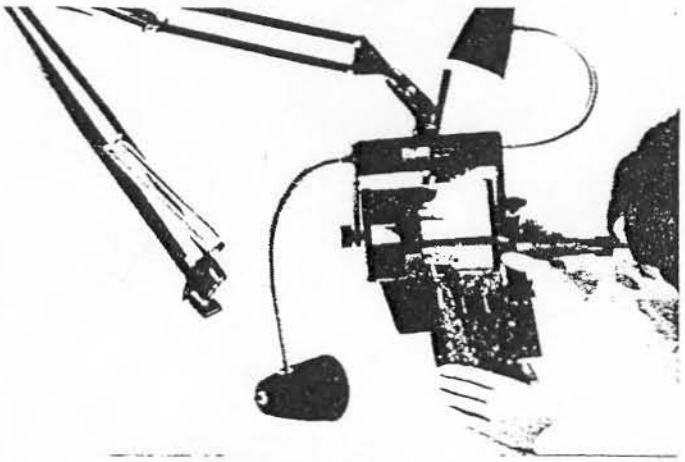
GENERAL INFORMATION



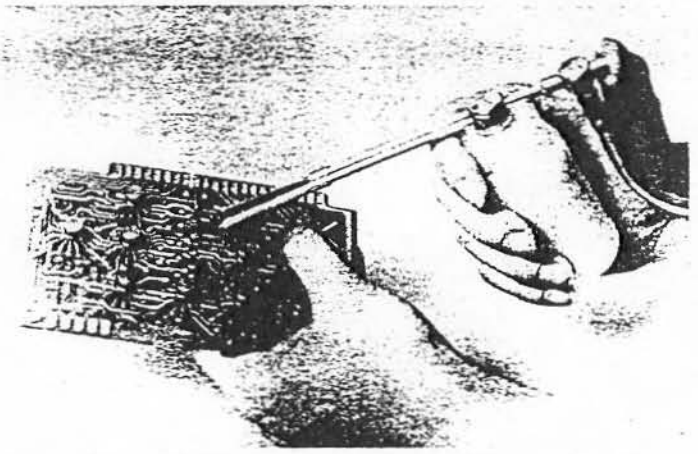
9. SWAPLATING SYSTEM—Self-contained, easy to use electro-plating system for rapid, controlled replating of connectors, contacts, wave guides, etc. Solutions available for electro cleaning plus tin, lead, copper, nickle and gold plating.



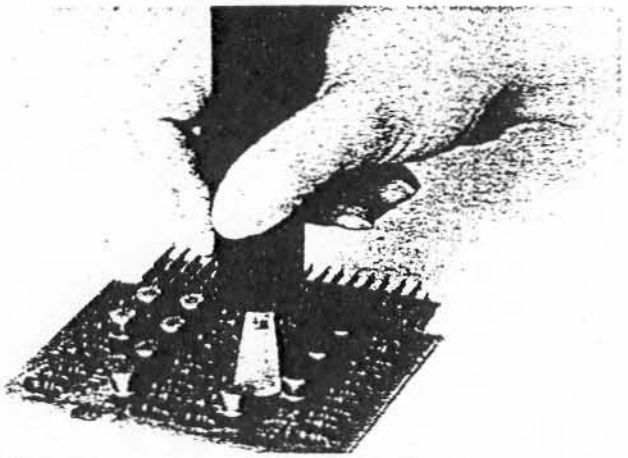
10. WORK HANDLING AND POSITIONING SYSTEM—Provides the holding and positioning of modules, chassis, connectors and delicate work.



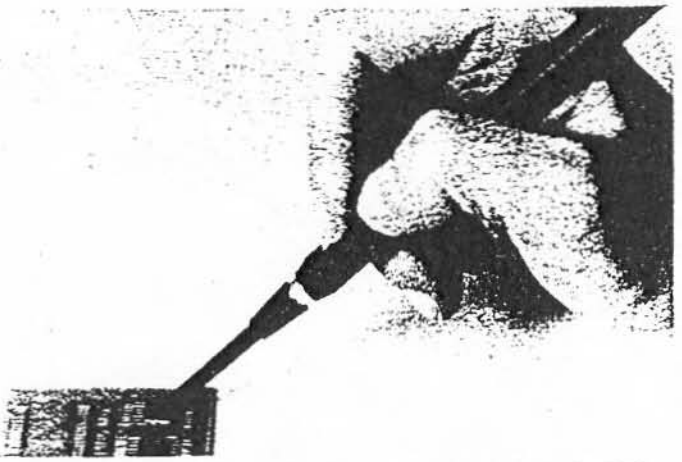
11. OPTICAL LIGHTING SYSTEM—A large lens with full binocular capability up to 14 inches. Manipulative qualities and balanced lighting arrangement provides infinite adjusting capability. Models available for mounting to upright column of work handling system.



12. SPRAY SYSTEM—Provides ability to spray small areas with fine coatings, solvents, paints, cleaners, etc.

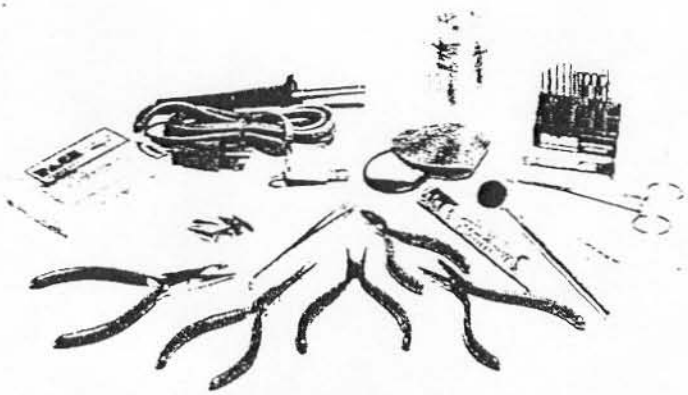


13. ENVIRONMENTAL PROBE SYSTEM—Provides a flow of heated air at 140°F for safely isolating component thermal intermittents and spot drying capability.



14. VACUUM CLEANING AND HANDLING SYSTEM—Permits the air pressue removal of particles from limited access areas. Vacuum handling of delicate parts can be accomplished.

GENERAL INFORMATION



15. HAND TOOLS—A selected variety of hand tools to melt a broad variety of electronic repair problems.

Additional items available are:

16. MATERIALS KIT—Includes solvent, coating material, epoxy and flux in safe individual containers. Provided with devices to meter, mix and apply them.
17. ACCESSORY CASE—A convenient case for storage and transportation of Functional Accessories.

SET-UP:

Using Figure 2 and 3 in the "Parts Identification" section, set-up the Power Source as outlined in the following steps:

- position the Power Source on a convenient bench and plug the "Main Power Line Cord" into a three wire grounded outlet,
- attach the Hot Cubby to the bracket located on the right side of the Power Source,
- place the PACE Extractor and Soldering Iron into the Hot Cubby. Assemble clips to attach vacuum hose to AC Power Cord,
- connect the Extractor AC Power Cord plug into the right "AC VAR Output" receptacle and the Soldering Iron to the other "AC VAR Output" receptacle of the Power Source, cut clear plastic vacuum hose 1" to 3" from end and attach one end to VisiFilter™ and the other end to the "Vacuum Fitting" on Power Source,
- attach Extractor vacuum hose to lettering side of VisiFilter for solder removal,
- attach the Extractors vacuum hose to the "Pressure Control" for pressure or hot air jet modes,
- adjust the "Pressure Control" on the Power Source to "MAX" position for air pressure, and the "MIN" for hot air jet,
- adjust the "AC Variable Voltage Controls" to a setting of "10" so that the Extractor and Soldering Iron will be ready for use,
- position the "Foot Pedal" for operators convenience.

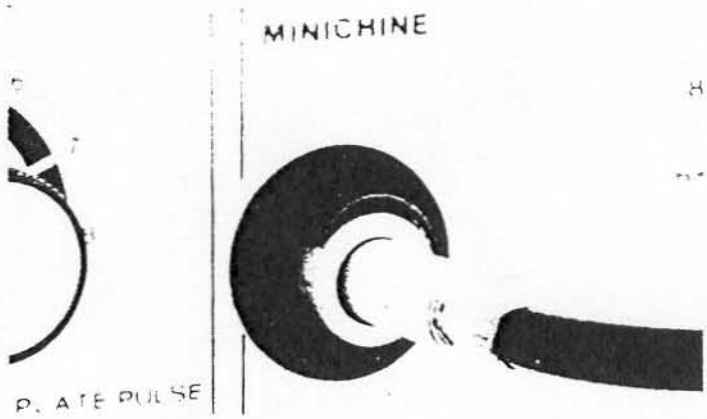
OPERATION:

The Power Source is now set-up and ready to place into operation. Perform the following steps to become operable, again using Figures 2 and 3 for reference:

- place the "Main Power Switch" to the "ON" position,
- place the "Motor Pump-Switch" to the "PEDAL" position,
- adjust the right "Variable Voltage Control" on the Power Source to a setting of "8". Allow approximately 10 minutes,
- after the Extractor has heated up for 10 minutes, adjust the "Variable Voltage Control" for an operating temperature of between 6.5-8.0.

To use the "Minichine":

- set the "Motor Pump-Switch" to PEDAL",
- insert the Flex Shaft into "Minichine" drive output. Tap Foot Pedal to rotate drive for easy engagement. Double detent of Minichine cable provides "ready" and "run" position. (NOTE: Rotational power for the Minichine is activated with the Foot Pedal or the "Motor Pump-Switch" in the "CONT" position).

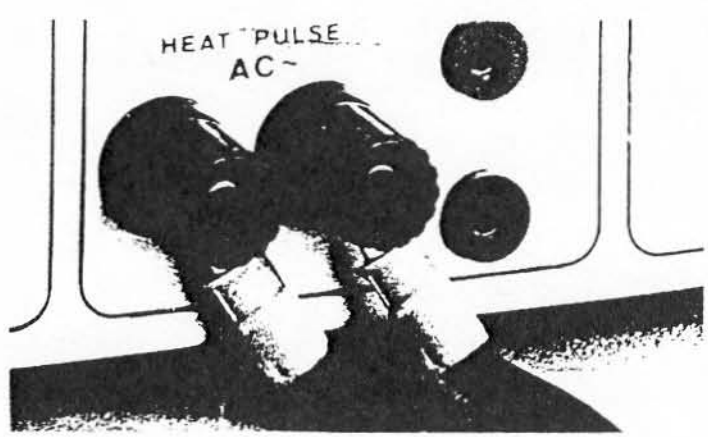


To use the Functional Accessories:

Low Voltage AC

- place "Motor Pump-Switch" to the "OFF" position for "AC/DC Low Voltage Outputs", when vacuum and/or air pressure not required,
- attach the quick connect Universal Power Cord to a Functional Accessories Tool. The Power Cord permits rapid interchange of various Functional Tools and eliminates the need for a separate integral Power Cord.

- attach the Universal Power Cord (Pace Part No. 7000-0023) to the "AC Output" terminals.



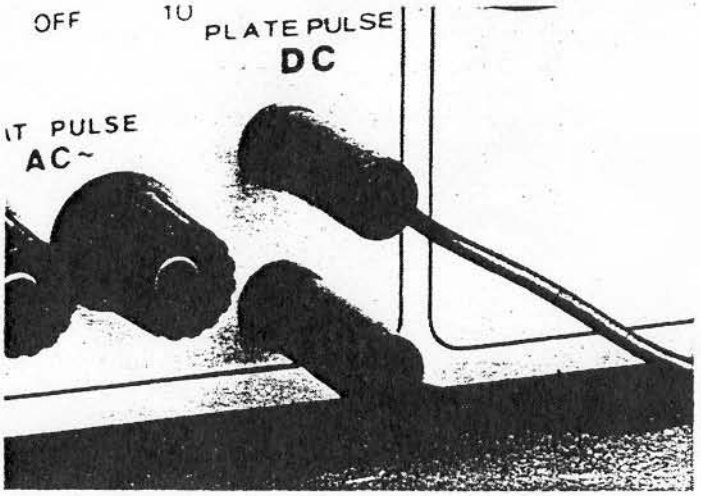
NOTE:

For auxiliary heating operations, set "Motor Pump-Switch" to "PEDAL" position. Depress Foot Pedal to first position which activates low voltage power.

OPERATION

Low Voltage DC

- for plating operation, set "Motor Pump-Switch" to "PEDAL" position. Depress the Foot Pedal and adjust the "Variable Output Control" to the desired DC voltage on the "Electro-Pulse Indicator",



- attach the Plating Cables to the black and red "DC Outputs". For reversed polarity, insert "red" into "black" and "black" into "red",

NOTE:
Protect your tools and tips from heat damage. Turn "Variable Output Control" to "Off" position after task is completed.

Recommend low voltage settings for Functional Accessories are shown in Table 3. Heat Application Chart. These settings are approximate and in actual use may be varied for variations and power. It is always best to start with the lower setting and increase the heat in small increments to prevent overheating and damage to the work piece.

TABLE 3. HEAT APPLICATION CHART

Functional Accessories Tool	Control Setting	Operation
Resistweez	10	Soldering Cup Terminal
		Feedthru capacitor removal.
Striptweez	5.5	Wire stripping, vinyl insulation
	8.5	Wire stripping, Teflon insulation
Conductweez	8	Soldering light work
Thermo Part	5	Foam, poly U removal
	6	Epoxy removal
	7.25	Lifting clinched leads
Lapflo	5.3	Flat pack soldering, standard tip

NOTE: Refer to Swaplating Manual for Control Setting of various plating materials.

MAINTENANCE

Maintenance of the PACE Power Source is minor and relatively easy to perform. Following is a maintenance table and should be performed as outlined.

TABLE 4. CORRECTIVE ACTION FOR MOST COMMON MALFUNCTIONS
(Refer to FIGURE 4 for reference)

Symptom	Condition	Solution
General loss of vacuum	Normal usage	1. Check VisiFilter weekly or daily if used constantly. 2. Replace VisiFilter as needed when discoloration occurs.
Improper Minichine Drive	Build up of flux or coating of residue within the Pump. (NOTE: This normally happens if the unit is run without the Visi-Filter).	1. Disconnect Main Power Plug. 2. Locate Motor/Pump in the center of the chassis. 3. Remove the three (3) screws from bottom of chassis and nut from back of Minichine. (NOTE: Do Not, at any time, loosen the four (4) #6-32 nuts that holds the Pump housing of the Motor. 4. Remove the Fan from the Motor shaft by loosening the set screw on the Fan shaft. 5. Remove the nuts from the standoff studs located on bottom of the Motor/Pump bracket. Remove the Pump from bracket and place on a bench with open side of Pump housing down. 6. Remove the four (4) #10-32 x 1⅛" screws which hold the Pump housing and remove the Pump plates and valve sheet from the housing. 7. Separate the Pump plates (with valve sheet between them) and remove the valve sheet. Clean the valve sheet by wiping it on a lint free cloth dampened with PACE Solvent (P/N 6997-0001) or equivalent, such as Trichlorethane 1.1.1. Clean both sides and allow to dry. 8. Clean Pump plates, using a cotton swab and solvent, allow to dry before reassembling. 9. Clean the Pump diaphram using the PACE Solvent on a proper towel. Clean both sides and allow to dry immediately. 10. Clean recessed area of the Pump housing using PACE Solvent on a cotton swab. 11. Reassemble the Pump. When reassembling, it is imperative that the rubber diaphram be centered around the raise circular center of the plastic support washer. The notches in the Pump plates must line up, and the valves in the valve sheet must line up with the valves in the Pump plates. 12. Replace the four (4) #10-32 x 1⅛" screws. Tighten the screws approximately ¼ turn after contact with Pump plate and in a diagonal method. 13. Replace the Fan insuring that a 1/16" gap exists between the Fan and Motor.

ELECTRICAL PROTECTION

All electrical circuits of the Power Sources are fully protected and replacement of electrical components should not be necessary. Refer to Figure 5 (PPS-100C), Figure 6 (PPS-101), Figure 7 (PPS-101BE) and Figure 8 (PPS-101BUK) for schematic diagrams of each Power Source available.

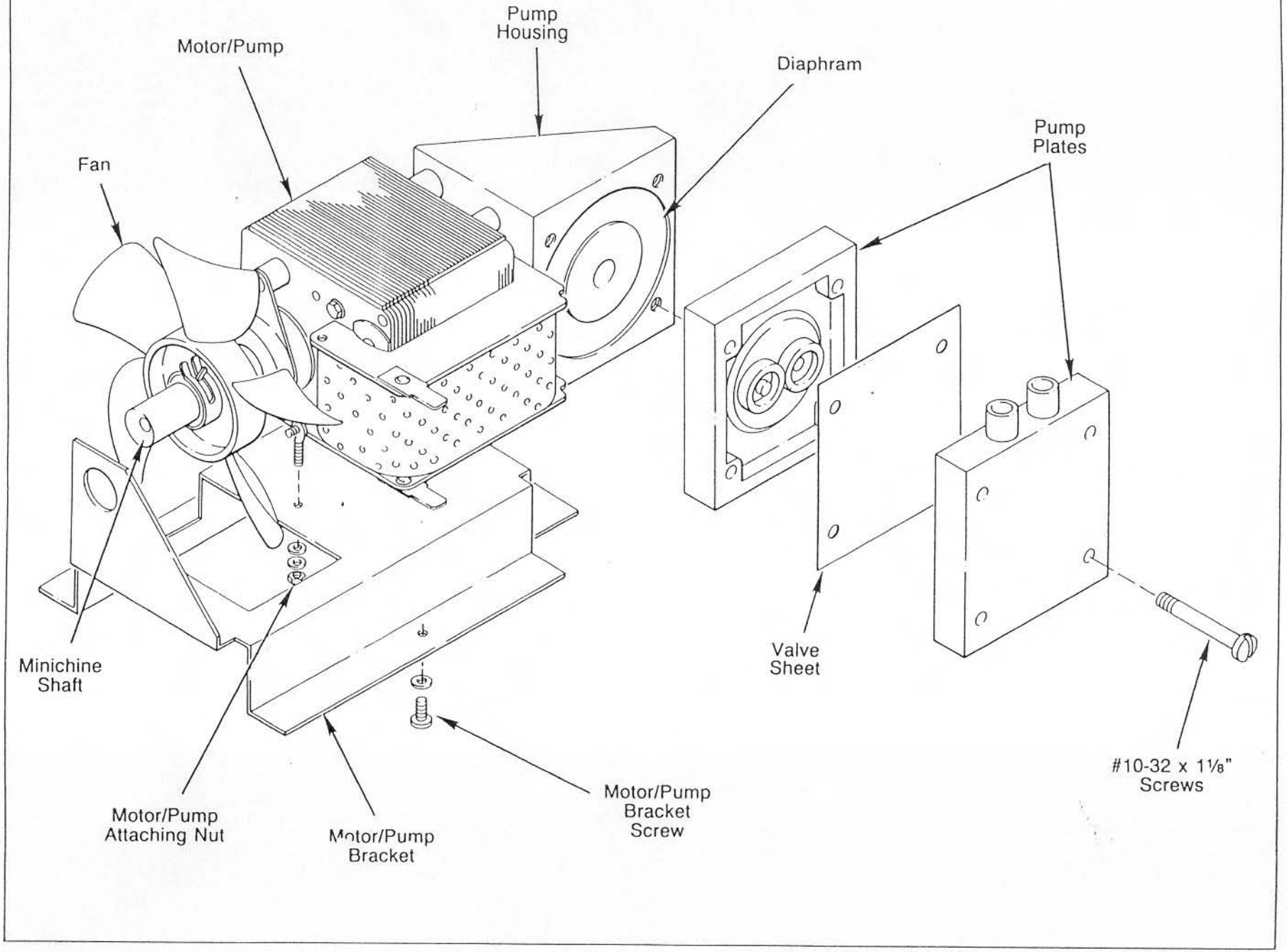


FIGURE 4. MOTOR/PUMP ASSEMBLY

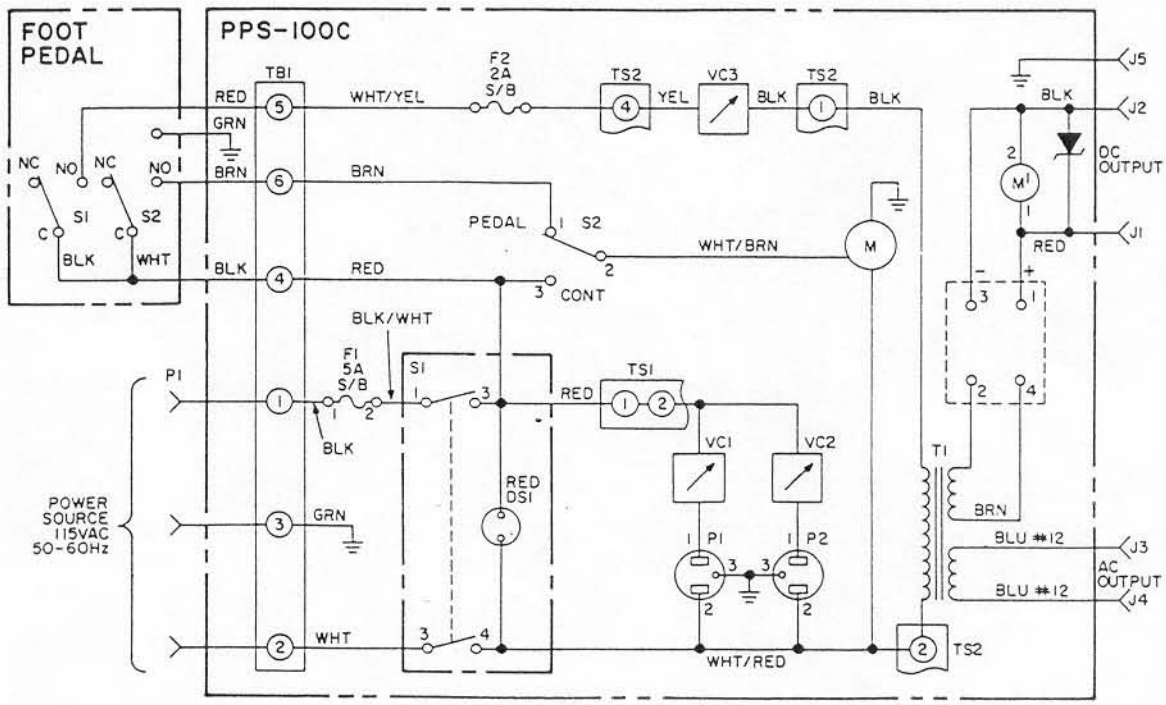


FIGURE 5. SCHEMATIC OF PACE POWER SOURCE PPS-100C

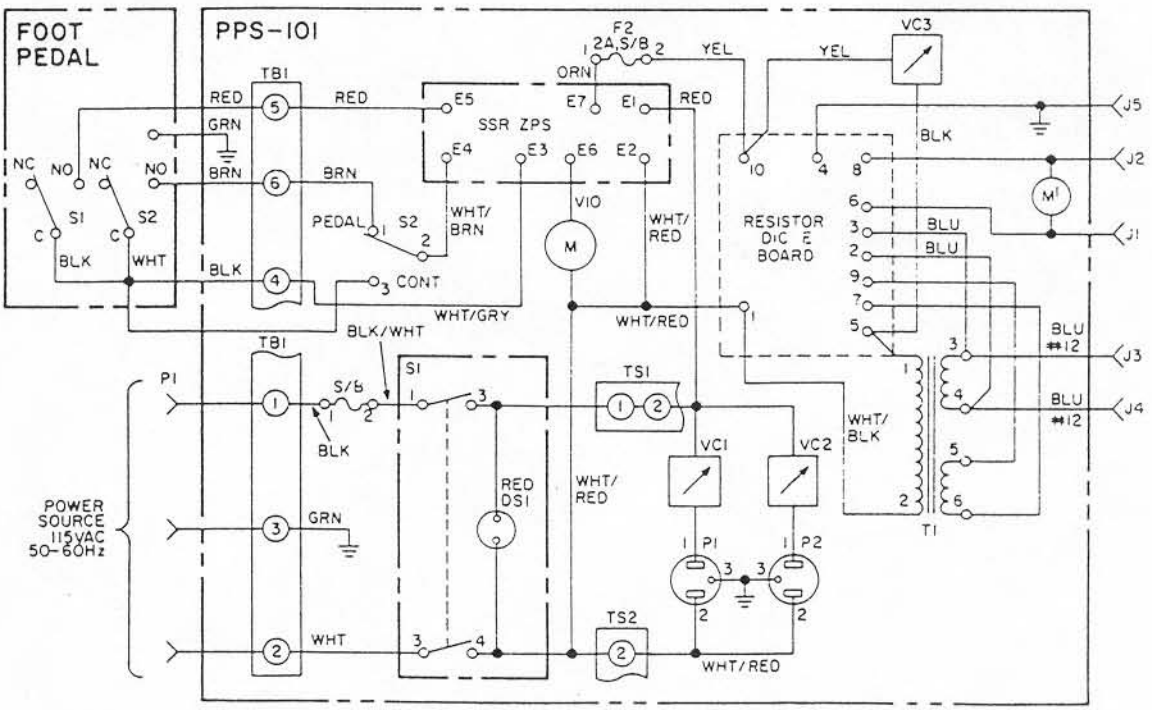


FIGURE 6. SCHEMATIC OF PACE POWER SOURCE PPS-101

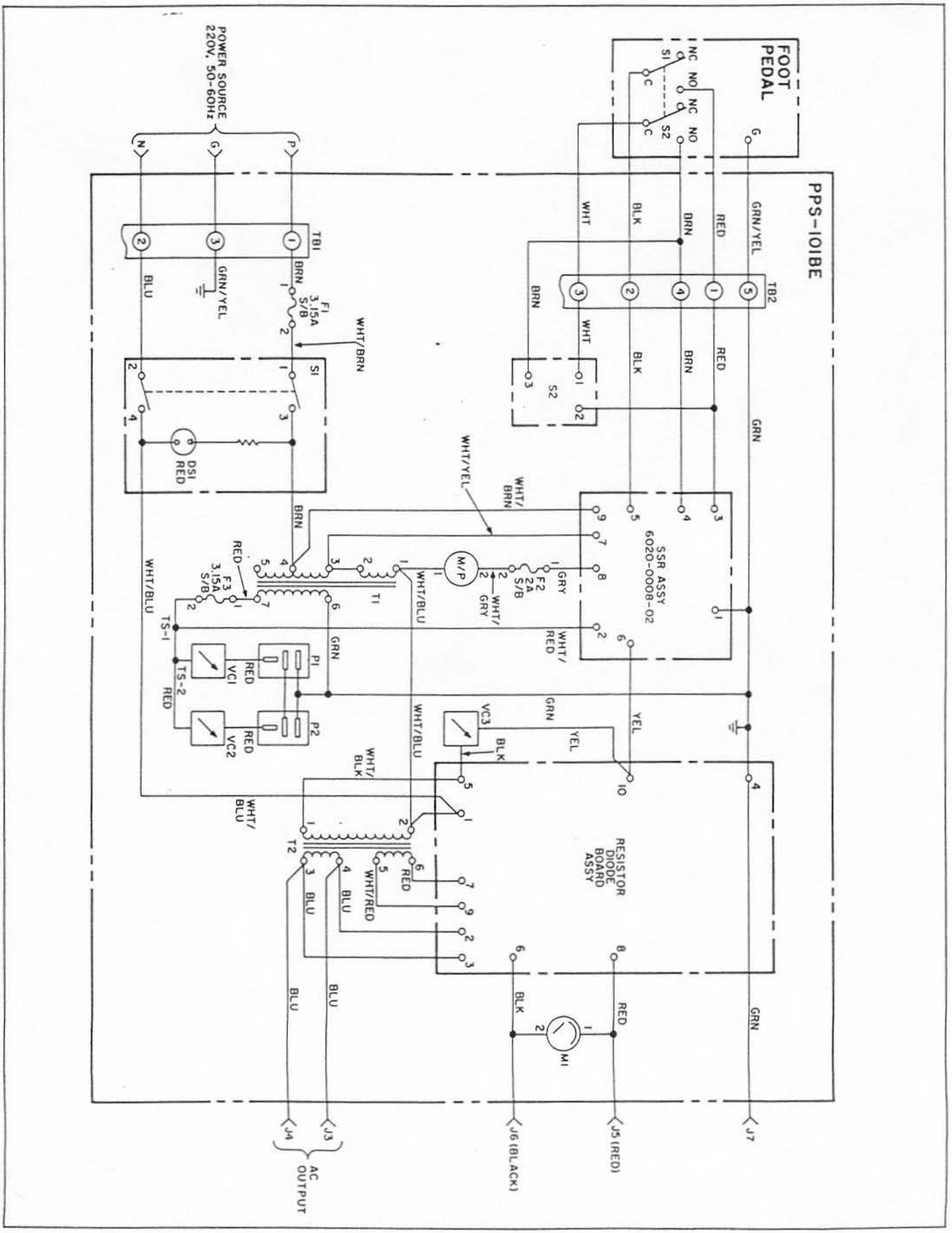


FIGURE 7. SCHEMATIC OF PACE POWER SOURCE PPS-101BE

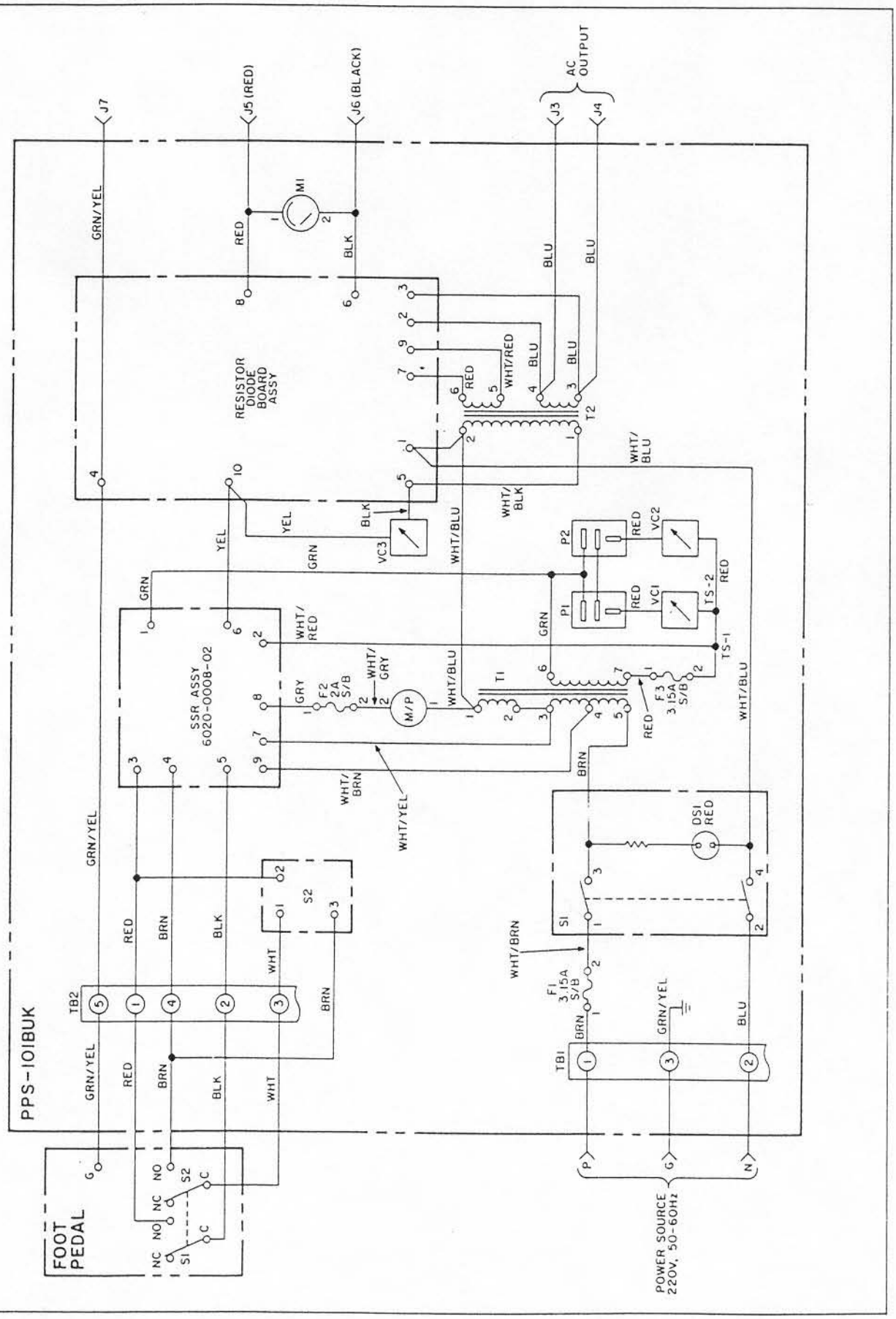


FIGURE 8. SCHEMATIC OF PACE POWER SOURCE PPS-101BUK

REPLACEMENT PARTS:

Table 5 shows the available Systems, their associated Power Sources and part numbers.

TABLE 5. REPAIR SYSTEMS

Repair System	Power Source	Part Number (Power Source)
PRC-150C	PPS-100C	7008-0126
PRC-151*	PPS-101/ZPS	7008-0127-02
PRC-151G*	PPS-101/ZPS	7008-0127-02
PRC-151BE*	PPS-101BE/ZPS	7008-0128-03
	PPS-101BUK	7008-0128-02

*The PACE Repair System is designed to be custom outfitted by the user. All Functional Accessories and Work Aids are optional and should be selected based on your requirements.

When ordering replacement parts for your PACE Repair System(s), use Figure 9 and Table 6 or Figure 10 and Table 7 for locating the desired part. Use the item number in the illustration, then refer to the Table for that item number and part description/part number.

The parts breakdown shown in Figure 9 and Table 6 are used for the PRC-150C System. Figure 10 and Table 7 are used for the PRC-151, 151G and 151BE Systems.

TABLE 6. LIST OF REPLACEMENT PARTS COMMON TO PACE REPAIR SYSTEMS PRC-150C
(Refer to FIGURE 9 for Item Number)

Item No.	Description	Pace Part No.
1	PPS-100C Power Source, 115V	7008-0126
2	Motor/Pump Assembly	1336-0020
3	Foot Pedal Assembly	6008-0074
4	Transformer	1192-0009
5	Rotary Switch	1285-0018
6	Rotary Switch	1285-0014
7	Knobs, Voltage Control	1222-0021
8	Switch (S2), SPDT	1157-0030
9	Switch (S1), DPST	1157-0027
10	Fuse Holder	1161-0002
11	Fuse (F1), 5A Slo-Blo	1159-0002
12	Fuse (F2), 2A Slo-Blo	1159-0005
13	Line Cord	1332-0075

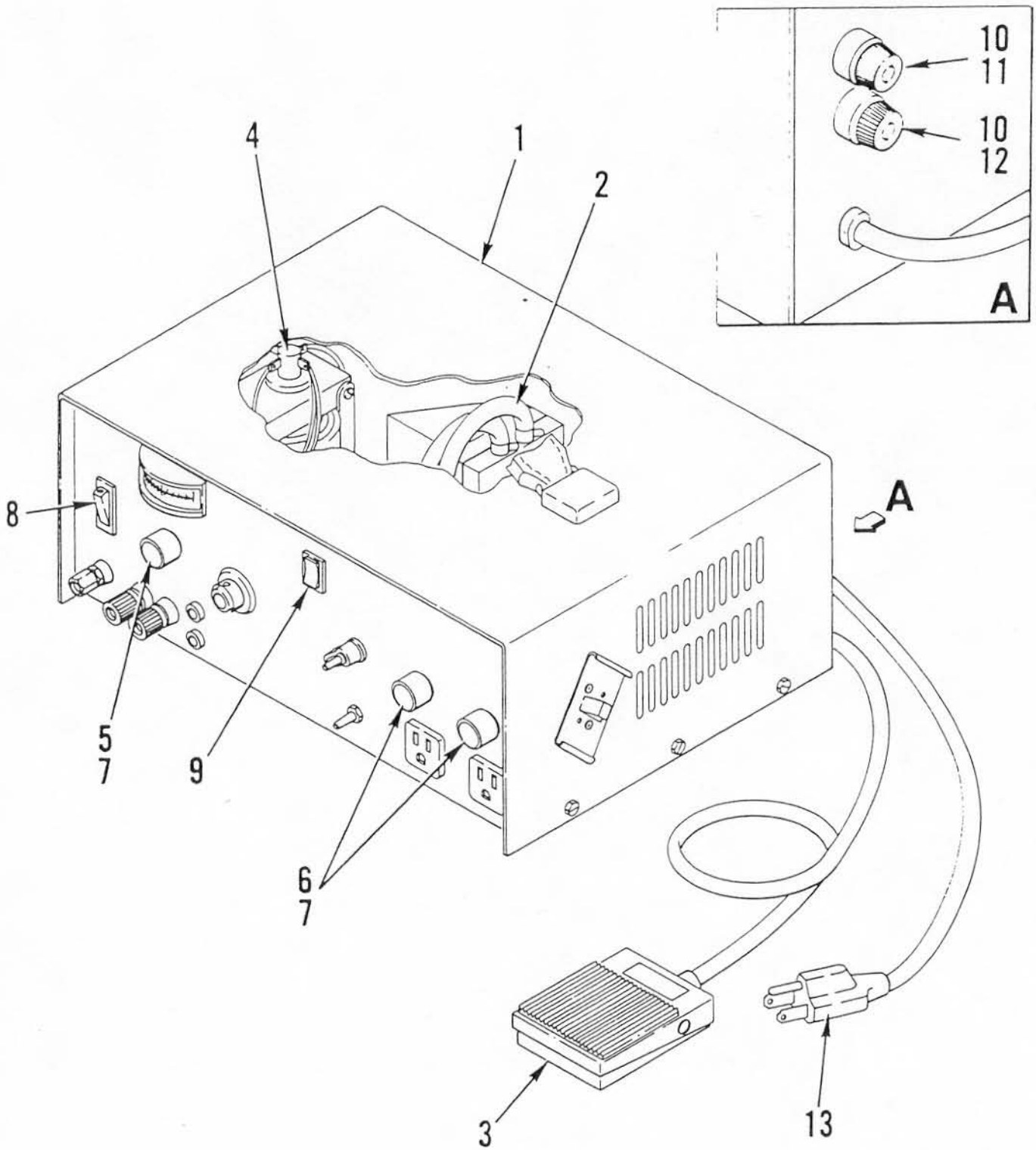


FIGURE 9. DIAGRAM OF REPLACEMENT PARTS FOR PRC-150

REPLACEMENT PARTS

TABLE 7. LIST OF REPLACEMENT PARTS COMMON TO PACE REPAIR SYSTEMS PRC-151, 151G and 151BE
(Refer to FIGURE 10 for Item Number)

Item No.	Description	Pace Part No.
1	PPS-101/ZPS Power Source	7008-0127-02
	PPS-101BE/ZPS Power Source	7008-0128-03
	PPS-101BUK Power Source	7008-0128-02
2	Motor/Pump Assembly PPS-101)	1336-0020
	Motor/Pump Assembly (PPS-101BE/101BUK)	1336-0018
3	Foot Pedal Assembly (PPS-101)	6008-0074
	Foot Pedal Assembly (PPS-101BE/101BUK)	6008-0071
4	Transformer (PPS-101)	1192-0009
	Transformer (PPS-101BE/101BUK)	1192-0039
5	Rotary Switch	1285-0018
6	Rotary Switch (PPS-101)	1285-0014
	Rotary Switch (PPS-101BE/101BUK)	1285-0030
7	Knobs, Voltage Control	1222-0021
8	Switch (S2), SPDT	1157-0030
9	Switch (S1), DPST (PPS-101)	1157-0027
	Switch (S1), DPST (PPS-101BE/101BUK)	1157-0028
10	Fuse Holder (PPS-101)	1161-0002
	Fuse Holder (PPS-101BE/101BUK)	1161-0081
11	Fuse (F1), 5A Slo-Blo (PPS-101)	1159-0002
	Fuse (F3), 3.15A Slo-Blo (PPS-101BE/101BUK)	1159-0221
12	Fuse (F2), 2A Slo-Blo (PPS-101)	1159-0005
	Fuse (F2), 2A Slo-Blo (PPS-101BE/101BUK)	1159-0219
13	Line Cord (PPS-101)	1332-0075
	Line Cord (PPS-101BE/101BUK)	1332-0071
14	ZPS Module Assembly (PPS-101)	6020-0013
15	Transformer, 24V (PPS-101BE/101BUK)	1192-0040

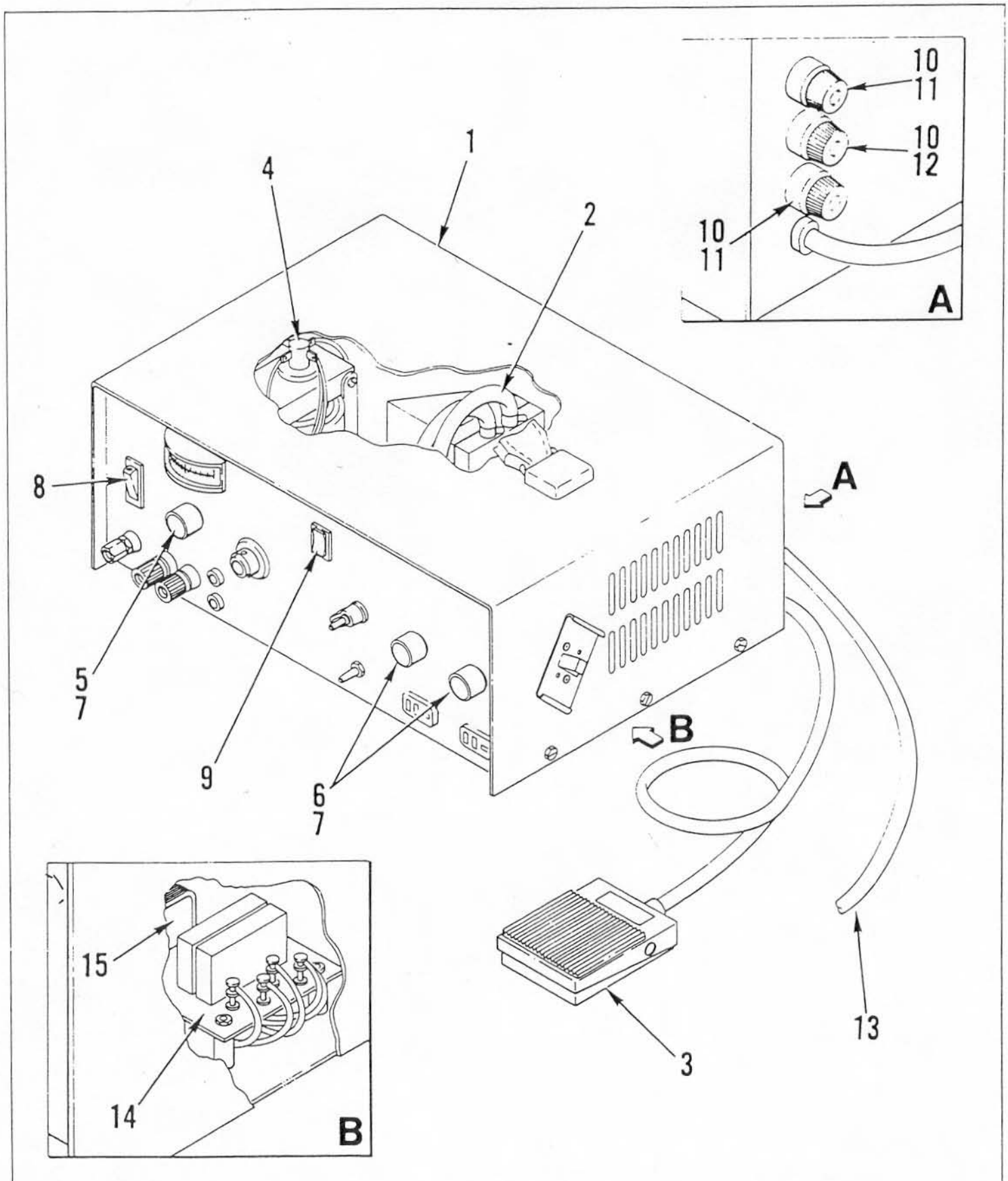


FIGURE 10. DIAGRAM OF REPLACEMENT PARTS FOR PRC-151/151G/151BE/151BUK