



DO NOT REMOVE

OPERATION AND MAINTENANCE
INSTRUCTIONS FOR THE

PRC-151 SERIES

Bench Top Repair Systems

MODELS

PRC-151 PRC-151BE

MANUAL NO. 5050-0210

Featuring

Thermo-Drive™

HEAT CONTROL

— 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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INTRODUCTION:

The PACE PRC-151 models are programmable repair systems with Zero Power Switching (ZPS) for desoldering static/voltage sensitive mos-type devices. They have a unique expansion capability that can be varied to meet the changing conditions in todays modern electronics.

There are three (3) versions of the PACE Repair Systems;

- PACE Model PRC-151 (domestic) with PPS-101 Power Source (refer to Figure 1),
- PACE Model PRC-151BE (export) with PPS-101BE (220VAC) Power Source (refer to Figure 1)

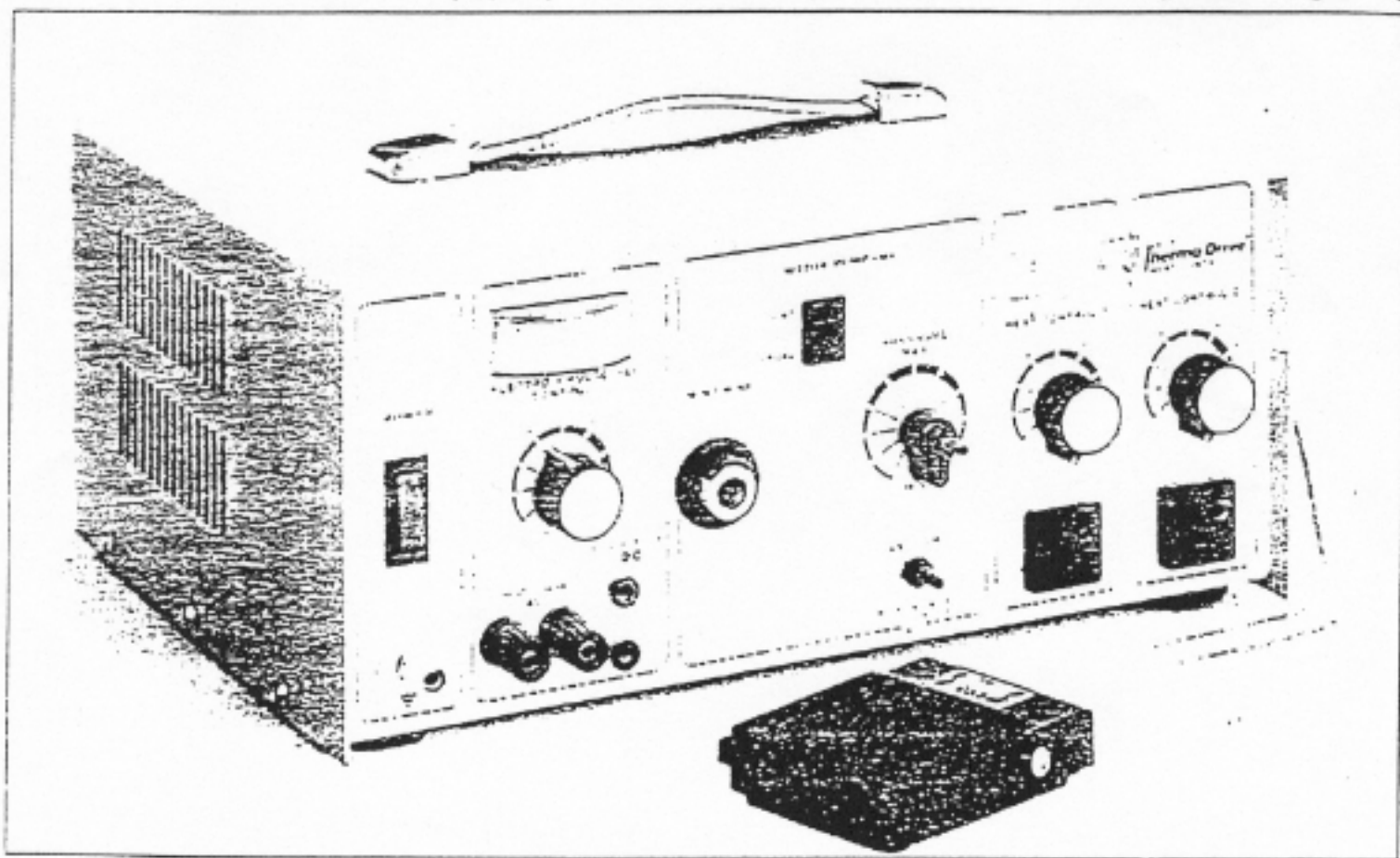


FIGURE 1. PACE REPAIR SYSTEM PRC-151 (PACE POWER SOURCE PPS-101)

GENERAL INFORMATION

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-151—120VAC, 50-60Hz, 5 amp
PRC-151BE (PPS-101BE)—220VAC, 50-60Hz, 2 amp
- **Physical Parameters:**
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)

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.

PRODUCT APPLICATION:

The following sections of this manual will familiarize you with the parts and operation of the unit. This product is very versatile however, and may be used to satisfy a variety of application requirements. If you require assistance in the use of this product in your particular application, contact your local authorized PACE dealer or call PACE Applications Engineering at (301) 490-9860.

GENERAL INFORMATION

TABLE 1. PPS-101/101BE 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.
- CIRCUIT BREAKER (PPS-101BE ONLY)—provides overload protection for low voltage DC Outputs.
- 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) (PPS-101BE ONLY)—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-101/101BE Power Source. Refer to Table 1 for identification of each part.

GENERAL INFORMATION

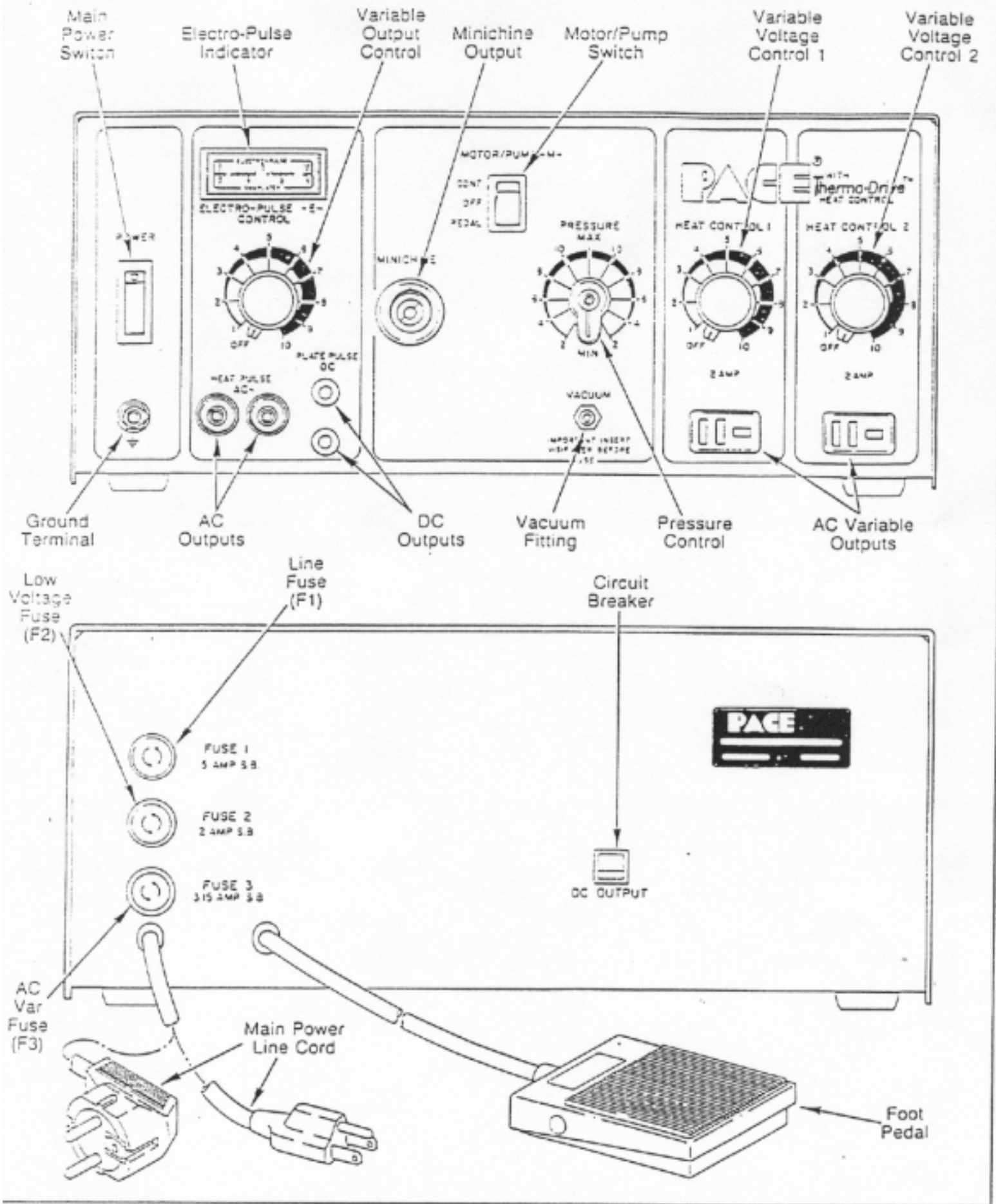
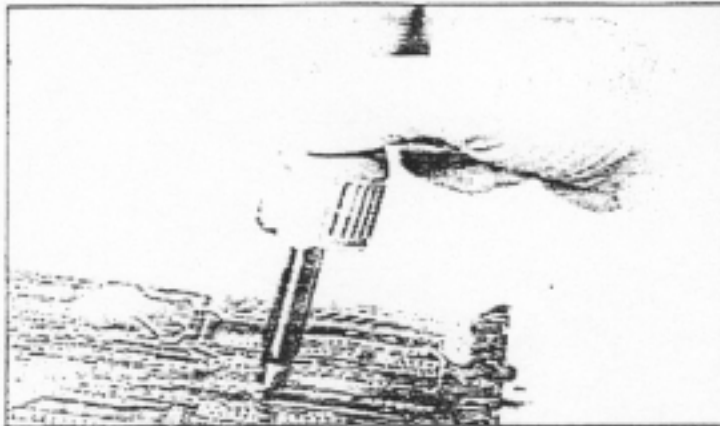


FIGURE 2. PPS-101/101BE POWER SOURCE PANEL IDENTIFICATION

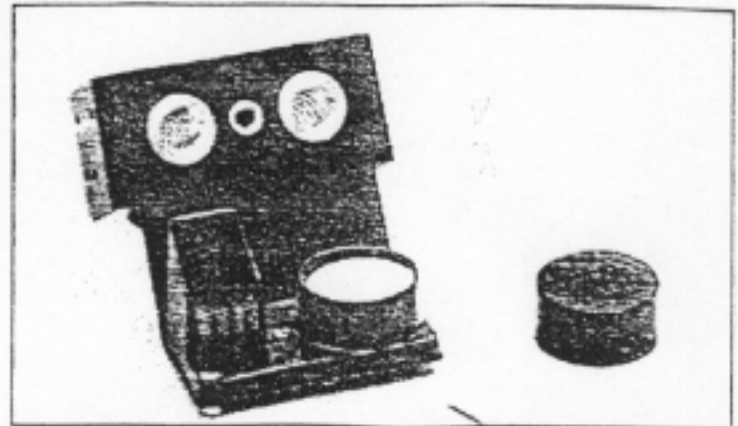
GENERAL INFORMATION

FUNCTIONAL ACCESSORIES and WORK AIDS

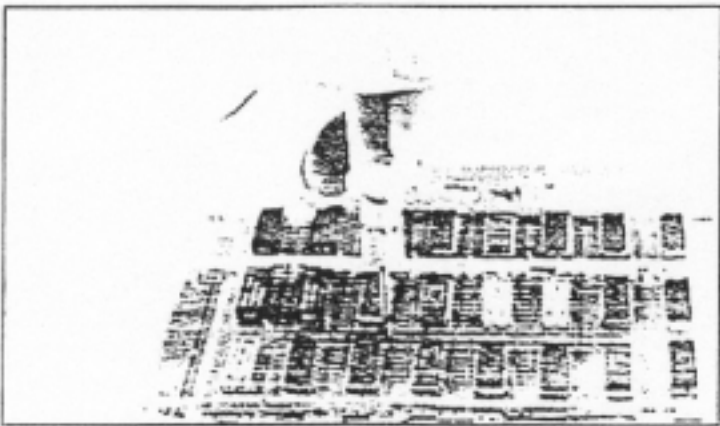
The following Functional Accessories and Work Aids are optional items. Those necessary to perform your rework, repair or modification tasks are normally selected for delivery with the Power Source. The accessories are shown in order of importance to their usage for typical repair work.



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



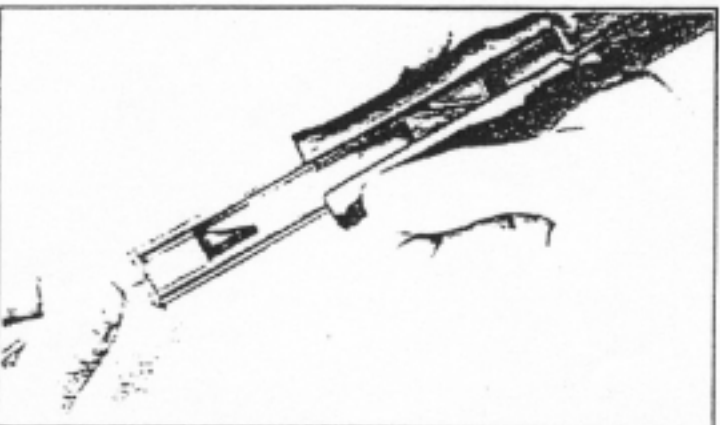
2. SPECIAL AIDS — Hot Cubby/Cleaning System for storing and cleaning SODR-X-TRACTOR and Soldering Iron; and the Conform I for forming axial lead components, straightening and cutting transistor leads to length.



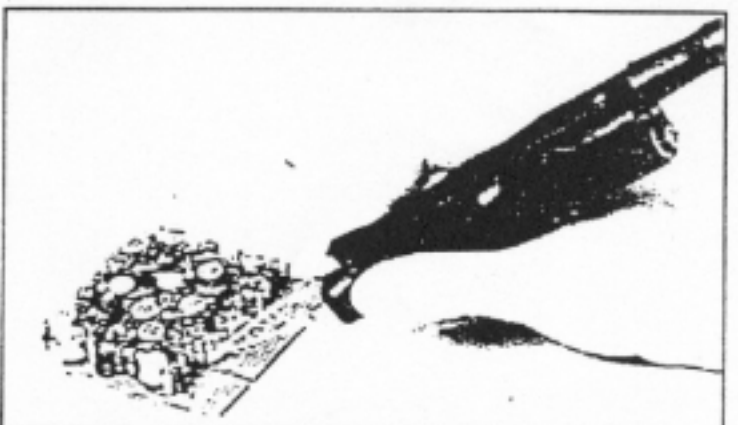
3. MINICHINE™ MINIATURE MACHINING SYSTEM — Provides the capability to drill, mill, abrasive clean, grind and polish various metallic and non-metallic materials.



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

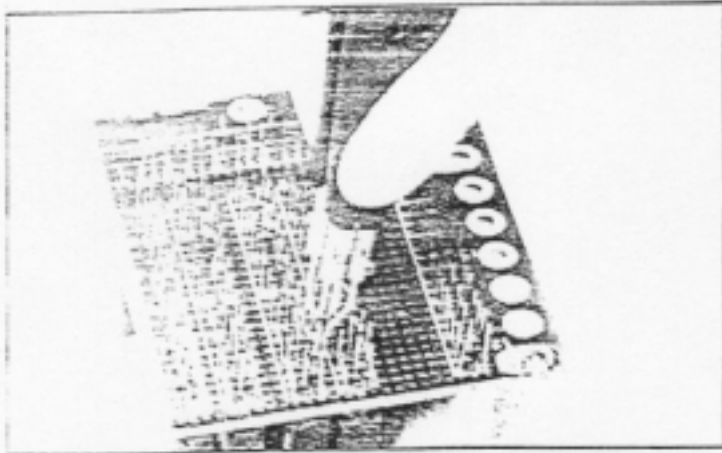


5. THERMAL STRIP SYSTEM — Provides capability for stripping wire insulations from 12 AWG to 30 AWG, solid or stranded wires, without damaging the wire conductor.

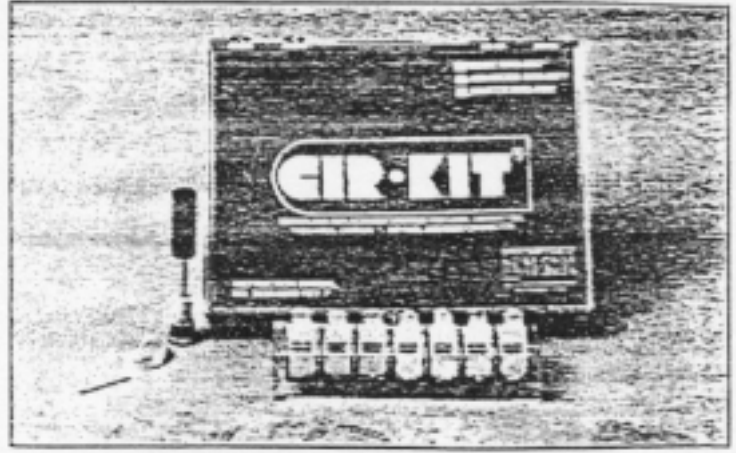


6. RESISTWEEZ RESISTANCE TWEEZERS — Provides capability to solder very closely spaced pins, terminals and lugs, as found in connectors and small parts.

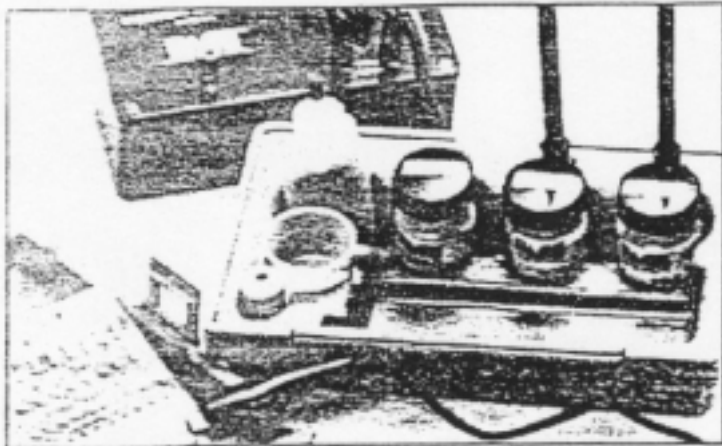
GENERAL INFORMATION -



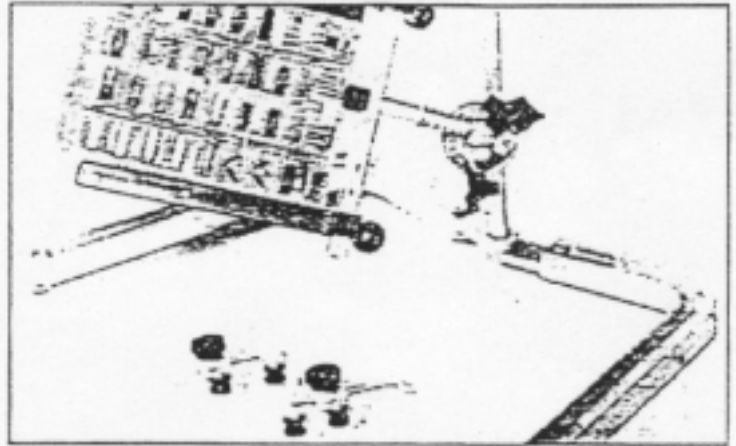
7. CONDUCTTWEEZ HEATING TWEEZERS—Pulse-type tweezer heating system is used for soldering and desoldering closely spaced, limited access areas where pulsed conductive heating is desired to minimize the possibilities of stray currents which could damage components.



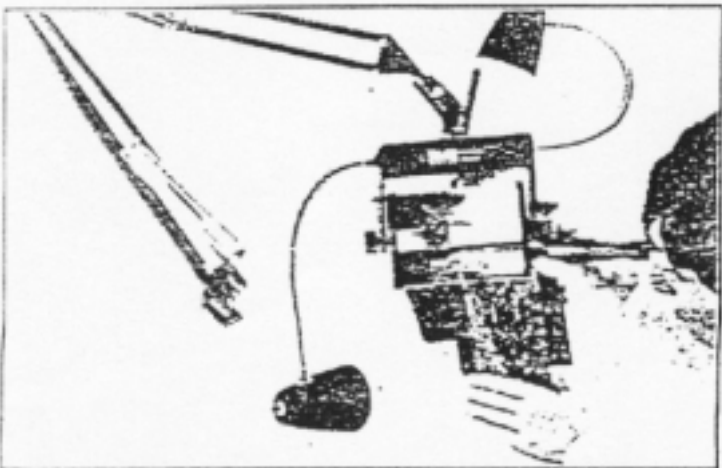
8. CIRCUIT SELECTOR PACK—Everything needed to repair and/or replace lifted, damaged or missing pads or conductors on printed circuit boards.



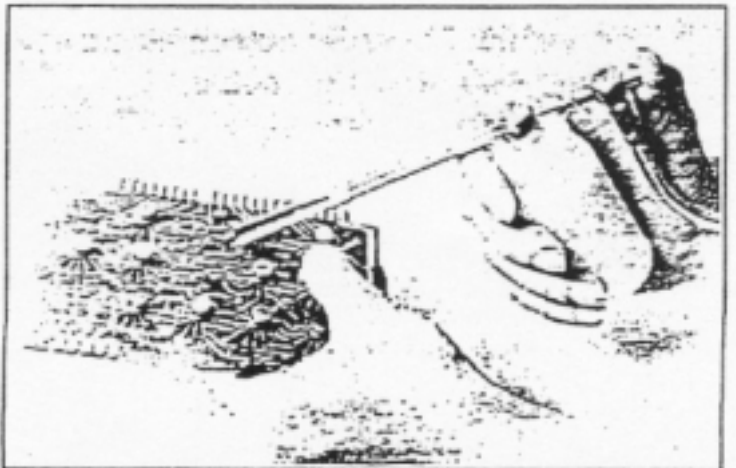
9. SWAPLATING SYSTEM—Self-contained, easy to use electro-plating system for rapid, controlled replating of connectors, contacts, wave guides, etc. Solutions available for electro cleaning plus tin, lead, copper, nickel and gold plating.



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

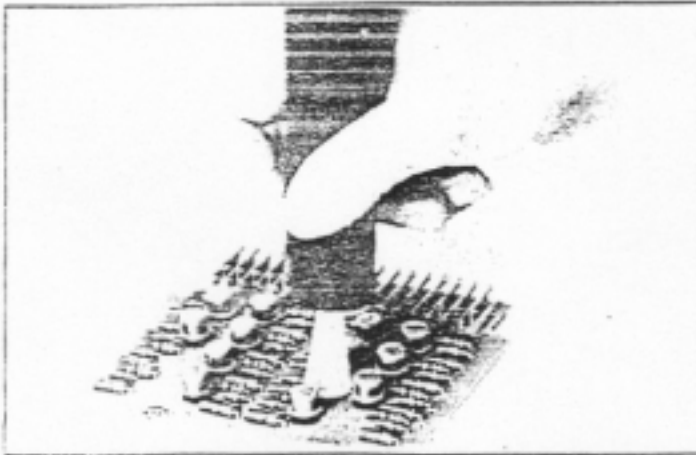


11. OPTICAL LIGHTING SYSTEM—A large lens with full binocular capability up to 14 inches. Manipulative qualities and balanced lighting arrangement provides infinite adjusting capability. Models available for mounting to upright column of work handling system.

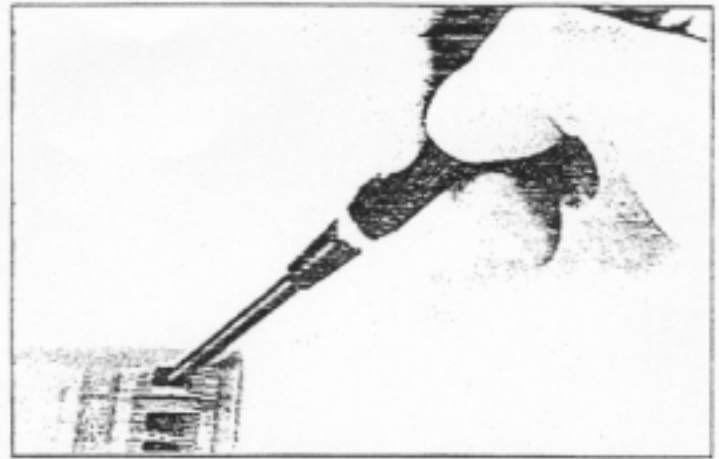


12. SPRAY SYSTEM—Provides ability to spray small areas with fine coatings, solvents, paints, cleaners, etc.

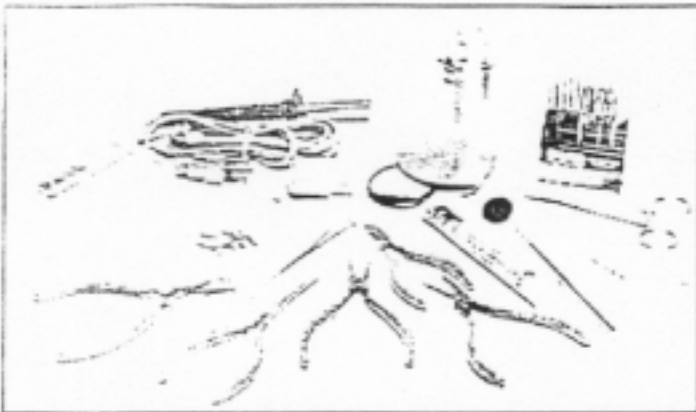
GENERAL INFORMATION



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 pressure removal of particles from limited access areas. Vacuum handling of delicate parts can be accomplished.



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

SET-UP:

Using Figure 2 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 Extractor and Soldering Iron into the Hot Cubby. Assemble clips to attach vacuum hose to AC Power Cord,
- connect the Extractor to the right "AC VAR Output" receptacle and the Soldering Iron to the left "AC VAR Output" receptacles. Cut clear plastic vacuum hose 1" to 3" from end, 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 "Pressure Control" to the "MAX" position for air pressure, and the "MIN" for hot air jet,
- adjust "AC Variable Voltage Controls" to setting "10". Extractor and Soldering Iron is ready for use,
- position the "Foot Pedal" for operators convenience.

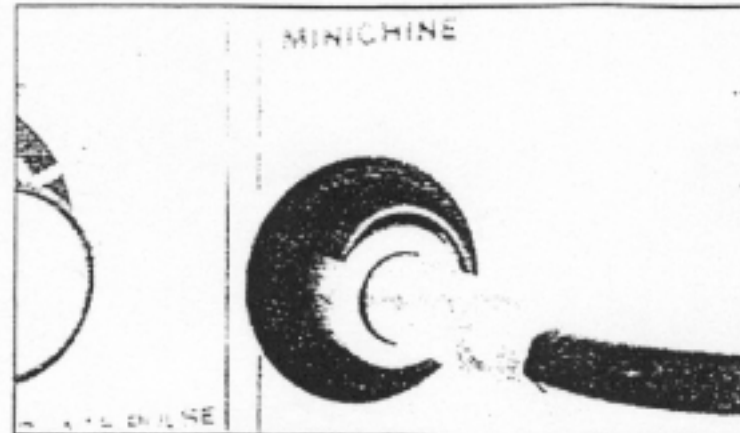
OPERATION:

The Power Source is now set-up and ready to place into operation. Perform the following steps to become operable, again using Figure 2 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" to setting "8". Allow approximately 10 minutes,
- let Extractor heat up for approximately 10 minutes, adjust the "Variable Voltage Control" for operating temperature of between 6.5-8.0.

HOW TO USE MINICHINE:

- set the "Motor Pump-Switch" to PEDAL,
- insert the Flex Shaft into "Minichine" output. Tap Foot Pedal to rotate drive for easy engagement. Double detent of Minichine cable provides "ready" and "run" position.



NOTE

Rotational power is activated with Foot Pedal or "Motor Pump-Switch" in the "CONT" position.

HOW TO USE FUNCTIONAL ACCESSORIES:

Low Voltage AC

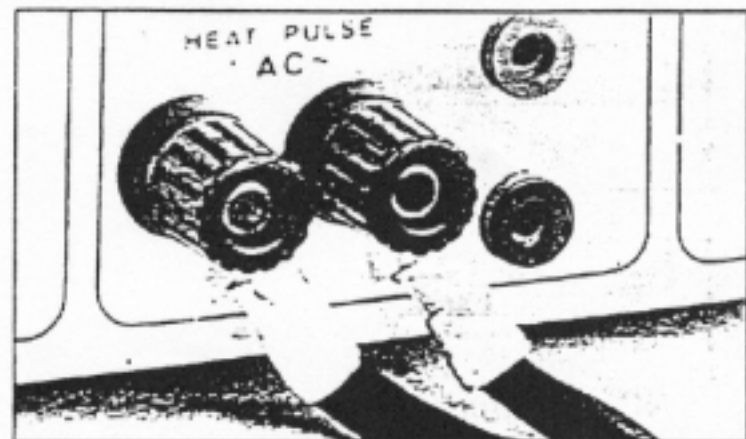
- place "Motor Pump-Switch" in "OFF" position for "AC/DC Low Voltage Outputs", when the vacuum and/or air pressure is not required,



IMPORTANT

The Low Voltage AC Output is designed to operate at a maximum duty cycle of one (1) minute ON—one (1) minute OFF.

- attach "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 Universal Power Cord to "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.

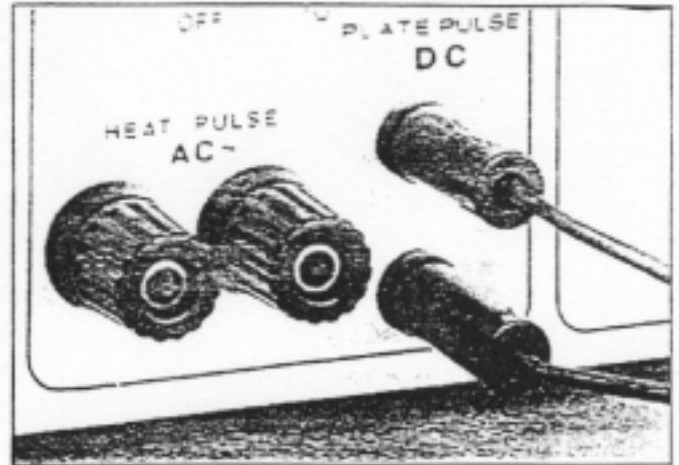
OPERATION

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.



Recommended low voltage settings for Functional Accessories are shown in Table 2. 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 2. 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 3. CORRECTIVE ACTION FOR MOST COMMON MALFUNCTIONS
(Refer to FIGURE 3 for reference)

SYMPTOM	CONDITION	SOLUTION
General loss of vacuum	Normal usage	<ol style="list-style-type: none"> 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 VisiFilter).	<ol style="list-style-type: none"> 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: <i>DO NOT</i>, 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 1/8" 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 diaphragm 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 diaphragm 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 1/8" screws. Tighten the screws approximately 1/4 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.

MAINTENANCE

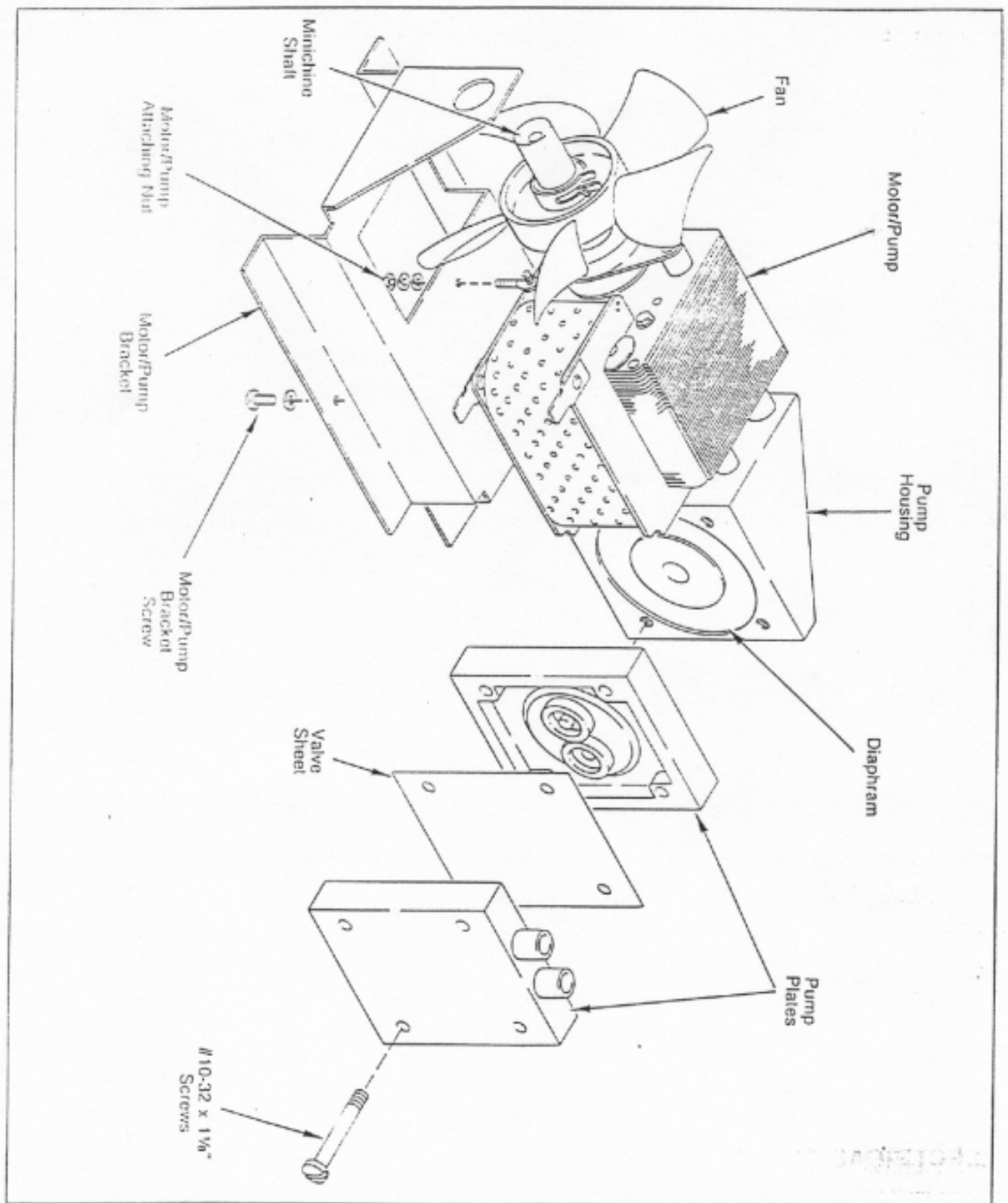


FIGURE 3. REMOVAL/REPLACEMENT AND CLEANING OF MOTOR/PUMP ASSEMBLY

REPLACEMENT PARTS

REPLACEMENT PARTS:

Table 4 shows the available Systems, their associated Power Sources and part numbers.

TABLE 4. REPAIR SYSTEMS

REPAIR SYSTEM	POWER SOURCE	PART NUMBER (POWER SOURCE)
PRC-151	PPS-101 SR-2	7008-0165
PRC-151BE	PPS-101BE	7008-0128-03

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 4 and Table 5 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.

REPLACEMENT PARTS

REPLACEMENT PARTS

TABLE 5. REPLACEMENT PARTS FOR
 PRC-151/151BE SYSTEM(S)
 (Refer to Figure 4)

ITEM NO.	DESCRIPTION	PACE PART NO.	
		PPS-101	PPS-101BE
	Power Source	7008-0165	7008-0128-03
1	Motor/Pump Assembly	1336-0020	1336-0018
2	<u>Foot Pedal Assembly</u>	6008-0074	6008-0071
3	Transformer	1192-0009	1192-0039
4	Voltage Control	1285-0018	1285-0018
5	<u>Voltage Control</u>	1285-0036	1285-0030
6	Knobs, Voltage Control	1222-0021	1222-0021
7	Switch (S2), SPST	1157-0030	1157-0030
8	Switch (S1), DPST	1157-0027	1157-0028
9	Fuse Holder	1161-0002	1161-0008
10	Fuse (F1), 5A Slo-Blo	1159-0002	
	Fuse (F1 & F3), 3.15A Slo-Blo		1159-0221
11	Fuse (F2), 2A Slo-Blo	1159-0005	1159-0219
12	Circuit Breaker		1159-0240
13	Line Cord	1332-0117	1332-0071
14	ZPS Assembly (Motor)	6020-0047	
15	ZPS Assembly (Low Voltage)	6020-0048	
16	ZPS Module Assembly		6020-0008-02
17	24V Transformer		1192-0040
-	Operation/Maintenance Manual	5050-0210	5050-0210

REPLACEMENT PARTS

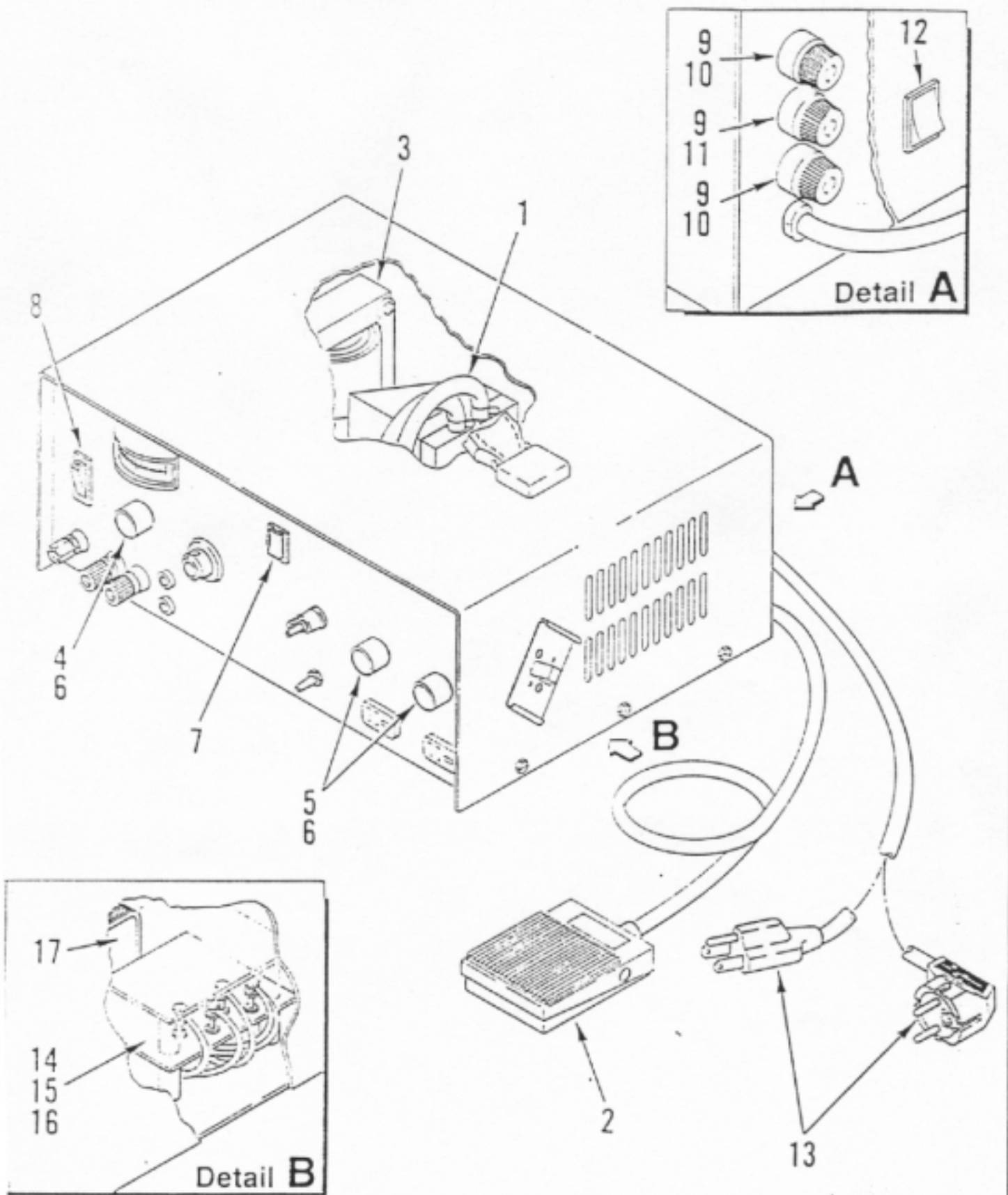


FIGURE 4. REPLACEMENT PARTS FOR PRC-151/151BE