PROPERTY OF ENGINEERING SERVICES

DO NOT REMOVE



OPERATION AND MAINTENANCE INSTRUCTIONS FOR THE

PRC-350C SERIES Bench Top Repair Systems

MODELS

PRC-350C PRC-350C/ZPS PRC-350CE/ZPS

MANUAL NO. 5050-0066

Featuring

Thermo-DriveTM

REV. B

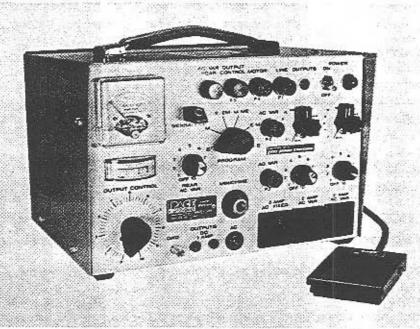


FIGURE 1A. PACE REPAIR SYSTEM PRC-350C (PACE POWER SOURCE PPS-200C)

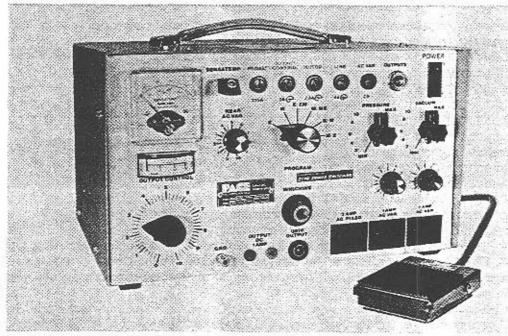


FIGURE 1B. PACE REPAIR SYSTEM PRC-350CE (PACE POWER SOURCE PPS-200CE)

Before using your PRC-350C Repair System, 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.

Table of Contents

	Page
Introduction	2
Specifications	2
Capabilities	
Parts Identification	
Optional Functional Accessories and Work Aids	9
Set-up	
Operation	
Maintenance	15
Replacement Parts	20

INTRODUCTION:

The PACE Model PRC-350C is a programmable repair system with a unique expansion capability that can be varied to meet the changing conditions in todays modern electronics.

There are two versions of the PACE Repair Systems;

- PACE Model PRC-350C which consists of PACE Power Source PPS-200C* (see Figure 1A), and
- PACE Model PRC-350CE which consists of PACE Power Source PPS-200CE, Export Unit (see Figure 1B)
 - *PPS-200C is available with the optional Zero Power Switching (ZPS)

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.

The Functional Accessories utilize the controlled power from the Power Source and apply it to the work piece, thus creating a process. The Functional Accessories may be used independently or in combination to provide the flexibility and capability to meet all your working needs. As you become skilled in using this Repair System, you will find that many difficult tasks become routine simple operations. You will probably need additional accessories to solve other repair problems and to permit repair operations to high quality standards.

Optional Zero Power Switching (ZPS) is available for desoldering static/voltage sensitive mostype devices. (Zero Power Switching is standard on the 220/240VAC export model).

SPECIFICATIONS:

- General Characteristics:
 - a. corrosion-proof, sliding rotor, dry vane, brushless motor pump featuring integral high torque. low RPM mechanical output.
 - b. variable air pressure and flow control.
 - c. variable vacuum and flow control.
 - d. quick connect vacuum/air pressure fittings.

- e. master programmer for extended mode sequencing, auxiliary power adaption.
- f. auxiliary programming.
- g. temperature sensing device and indicator.
- h. dual switch control foot pedal.
- i. quarter-turn fasteners for retention of hinged rear inspection cover.
- j. foot pedal control.
- k. heavy-duty electrical output power control.
- Variable Air Pressure:

0.05 psi to 20.0 psi (0.03 atm to 1.36 atm)

· Variable Vacuum Pressure:

0.05 in. Hg to 20.0 in. Hg (0.0017 atm to 0.668 atm)

Power Requirements:

PRC-350C - 120VAC, 50-60Hz, 5 amp PRC-350CE - 220/240VAC, 50-60Hz, 2 amp

Physical Parameters:

Model PPS-200C-

1134"W x 81/2"H x 10"L (30 cm W x 22 cm H x 25 cm L)

21 lbs. (9.5 kg)

Model PPS-200CE -

 $12\%\text{W} \times 8\%\text{"H} \times 11\%\text{"L}$ (35 cm W x 22 cm H x 29 cm L)

33 lbs. (15 kg)

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
- Auxiliary Power and Programming Adaption is available when used with the Patch Cord and PPS-20A (PPS-20AE) Power Source. The three wire grounded Power Cord meets safety requirements. Zero Power Switching (ZPS) is available for use with electro statically sensitive components.
- 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.
- Universal Power Cord provides a single, convenient means to adapt each of the available pulsed-heat low voltage Functional Accessories.

PARTS IDENTIFICATION:

Figure 2 identifies the front and rear panel controls and indicators mounted on the PPS-200C Power Source. Refer to Table 1 for identification of each part.

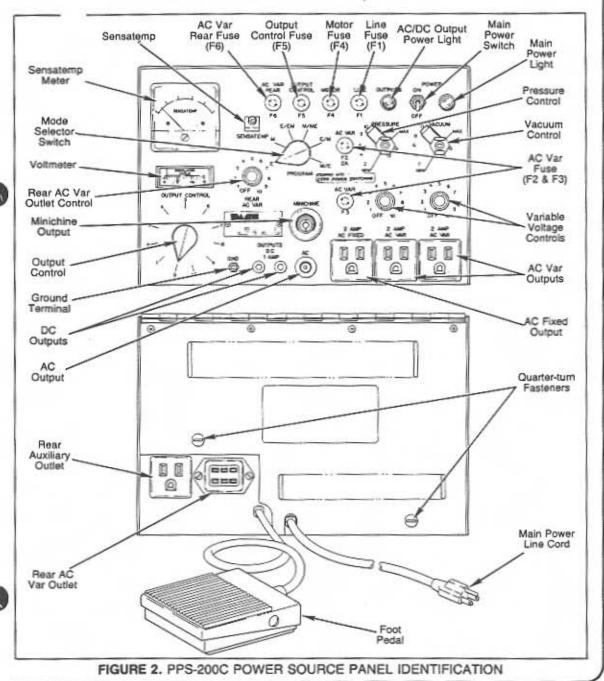


TABLE 1, PPS-200C POWER SOURCE PANEL IDENTIFICATION

- SENSATEMP™ METER—temperature readout from Sensatemp™.
- SENSATEMP™—temperature receiving/sending thermocouple.
- AC VAR REAR FUSE (F6) provides overload protection for AC VAR Outlet on back panel.
- OUTPUT CONTROL FUSE (F5) provides overload protection for AC/DC Outputs.
- MOTOR FUSE (F4) provides overload protection for Motor.
- LINE FUSE (F1)—provides overload protection for main unit.
- AC/DC OUTPUT POWER LIGHT—amber light indicates AC/DC Outputs activated.
- MAIN POWER SWITCH—controls input power.
- MAIN POWER PILOT LIGHT—red light indicates Main Power Switch is "ON".
- PRESSURE CONTROL—"quick-connect" variable pressure flow control.
- VACUUM CONTROL—"quick-connect" variable vacuum flow control.
- AC VAR FUSE (F2 and F3) provides overload protection for AC VAR Outputs.
- AC VAR OUTPUTS-2 amp AC outlets used for Functional Accessories.
- VARIABLE VOLTAGE CONTROLS—controls line voltages to AC VAR Outputs from "OFF" to "MAX".
- AC FIXED OUTPUT—provides line voltage.
- MINICHINE™—high torque, low RPM output, "quick-connect" while in idle or running mode.
- AC OUTPUT—electrical output for Universal Cord, controlled by Output Control Knob.
- . DC OUTPUTS-electrical output controlled by Output Control Knob.
- . GROUND TERMINAL provides positive ground connection when required.
- OUTPUT CONTROL—adjusts output power level at AC/DC Outputs.
- MODE SELECTOR SWITCH—provides various operational sequences in conjunction with two position Foot Pedal.
- REAR AC VAR OUTLET CONTROL—variable voltage control for rear AC VAR Outlet.
- VOLTMETER—readout for DC Outputs.
- MAIN POWER LINE CORD—provides main power input for Power Source.
- FOOT PEDAL—controls mechanical, pneumatic or primary electrical functions.
- REAR AC VAR OUTLET—grounded AC electrical output controlled by AC VAR Outlet Control.
- REAR AUXILIARY OUTLET—outlet for auxiliary power units.
- QUARTER-TURN FASTENERS retains hinged rear panel to permit easy access for inspection and servicing of Filters.

CAUTION

Disconnect line cord from power before opening cabinet,

Figure 3 identifies the front and rear panel controls and indicators mounted on the PPS-200CE Power Source, Refer to Table 2 for identification of that part.

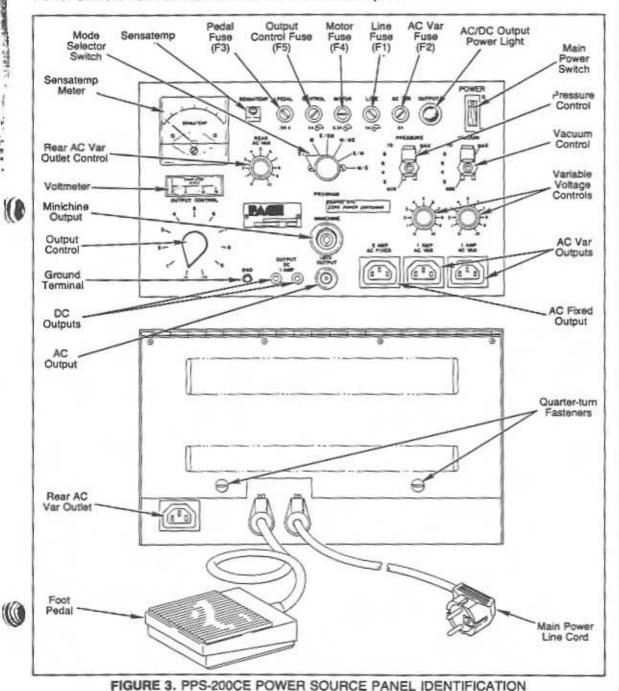


TABLE 2. PPS-200CE POWER SOURCE PANEL IDENTIFICATION

- SENSATEMP™ METER—temperature readout from Sensatemp™.
- SENSATEMP™—temperature receiving/sending thermocouple.
- PEDAL FUSE (F3) provides overload protection for Foot Pedal control.
- . OUTPUT CONTROL FUSE (F5) provides overload protection for AC/DC Outputs.
- MOTOR FUSE (F4) provides overload protection for Motor.
- . LINE FUSE (F1) provides overload protection for main unit.
- AC/DC OUTPUT POWER LIGHT—amber light indicates AC/DC Outputs activated.
- MAIN POWER SWITCH—controls input power, red neon light in switch indicates Main Power is "ON".

STATES STATES STATES

- PRESSURE CONTROL "quick-connect" variable pressure flow control.
- VACUUM CONTROL—"quick-connect" variable vacuum flow control.
- AC VAR FUSE (F2) provides overload protection for AC VAR Outputs.
- AC VAR OUTPUTS 2 amp AC outlets used for Functional Accessories.
- VARIABLE VOLTAGE CONTROLS—controls line voltages to AC VAR Outputs from "OFF" to "MAX".
- AC FIXED OUTPUT—provides line voltage.
- . MINICHINE™-high torque, low RPM output, "quick-connect" while in idle or running mode.
- · AC OUTPUT-electrical output for Universal Cord, controlled by Output Control Knob.
- DC OUTPUTS electrical output controlled by Output Control Knob.
- . GROUND TERMINAL provides positive ground connection when required.
- OUTPUT CONTROL—adjusts output power level at AC/DC Outputs.
- MODE SELECTOR SWITCH—provides various operational sequences in conjunction with two position Foot Pedal.
- REAR AC VAR OUTLET CONTROL-variable voltage control for rear AC VAR Outlet.
- VOLTMETER—readout for DC Outputs.
- . MAIN POWER LINE CORD-provides main power input for Power Source.
- FOOT PEDAL—controls mechanical, pneumatic or primary electrical functions.
- REAR AC VAR OUTLET—grounded AC electrical output controlled by AC VAR Outlet Control.
- QUARTER-TURN FASTENERS—retains hinged rear panel to permit easy access for inspection and servicing of Filters.

CAUTION

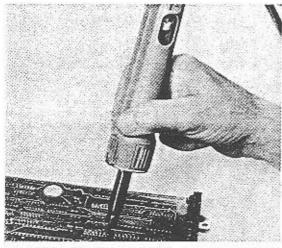
Disconnect line cord from power before opening cabinet.

en de la composition de la com

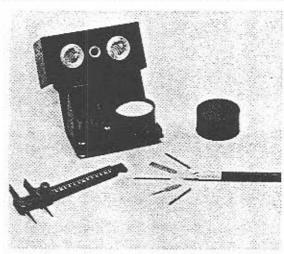
Page Historia

FUNCTIONAL ACCESSORIES and WORK AIDS

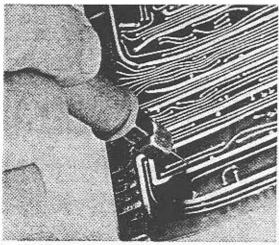
The following information is provided to help you identify the Functional Accessories and Work Aids available and their capabilities. All items shown are optional. Those necessary to perform your rework, repair or modification tasks are normally selected for delivery with the Power Source. The accessories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



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

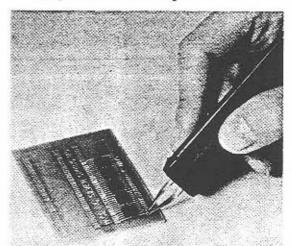


 SPECIAL AIDS—includes the Hot Cubby and Cleaning System for storing and cleaning both the SODR-X-TRACTOR and soldering iron; and the Conform I for forming axial lead components and straightening and cutting transistor leads to length.

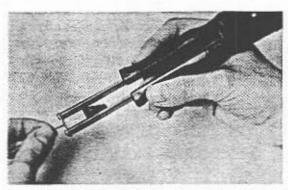


MINICHINE™ MINIATURE MACHINING SYSTEM— Provides the capability to drill, mill, abrasive clean, grind and polish various metallic and non-metallic materials.

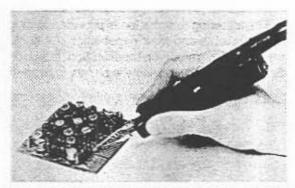
10



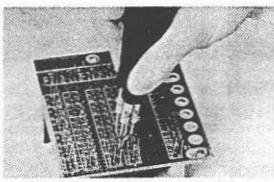
THERMOPARTING and LAPFLO SOLDERING SYSTEMS—Thermoparting provides a primary and safe means for removing thick conformal coatings from circuit board assemblies without damage. Lapflo pencil-like unit provides a dependable and safe means of producing reflow soldered joints for flat packs on circuit boards.



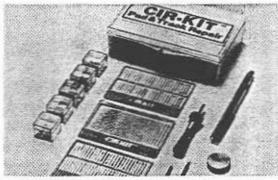
 THERMAL STRIP SYSTEM—Provides capability for stripping wire insulations from 12AWG to 30 AWG, solid or stranded wires, without damaging the wire conductor.



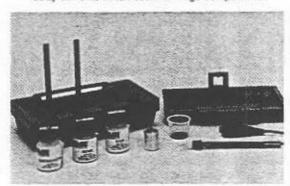
 RESISTWEEZ RESISTANCE TWEEZERS – Provides capability to solder very closely spaced pins, terminals and lugs, as found in connectors and small parts.



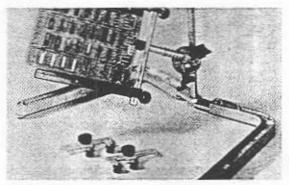
 CONDUCTWEEZ HEATING TWEEZERS – Pulsetype tweezer heating system is used for soldering and desoldering closely spaced, limited access areas where pulsed conductive heating is desired to prevent stray currents which could damage components.



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

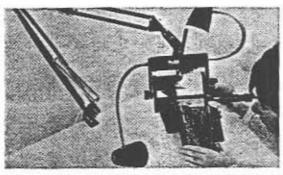


 SWAPLATING SYSTEM—Self-contained, easy to use electro-plating system for rapid, controlled replating of connectors, contacts, wave guides, etc. Solutions available for electro cleaning plus tin, lead, copper, nickle and gold plating.

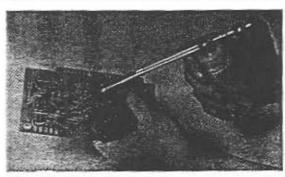


 WORK HANDLING AND POSITIONING SYSTEM— Provides the holding and positioning of modules, chassis, connectors and delicate work.

THE RESERVE OF THE PROPERTY OF



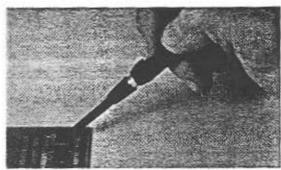
 OPTICAL LIGHTING SYSTEM—A large lens with full binocular capability up to 14 inches. Manipulative qualities and balanced lighting arrangement provides infinite adjusting capability. Models available for mounting to upright column of work handling system.



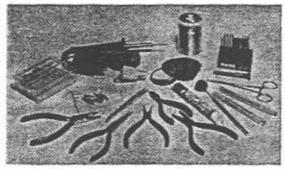
 SPRAY SYSTEM—Provides ability to spray small areas with fine coatings of solvents, paints, cleaners, etc.



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



 VACUUM CLEANING AND HANDLING SYSTEM— Permits the air pressure removal of particles from limited access areas. Handling of delicate parts can be accomplished.



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

Additional Items available are:

- 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.

OPERATION

SET-UP:

Using Figures 2 and 3 in the "Parts Identification" section, place the Switches and Control Knobs in the following position:

- . all Switches and Control Knobs should be placed in the "OFF" or "O" position,
- main power supply receptable should be polarized, properly grounded and checked before equipment initial operation,
- mechanical and low voltage AC/DC power are programmed with the "PROGRAM" Mode Selector Switch. Duty cycle for low voltage AC/DC Outputs are 50%.

"PROGRAM" Mode Selector Switch provides combinations of Motor (M) and Electrical (E) functions as follows:

"PROGRAM" MODE SELECTOR SWITCH POSITION	INDICATION	
E	Foot Pedal activation provides "AC" and "DC" Outputs on these terminals. AC/DC Output Power Light (amber) illuminates.	
М	Provides *MINICHINE™ mechanical/power, Pressure and Vacuum Controls when the Foot Pedal is activated.	
E/ME	The first position of the Foot Pedal provides power to primary electrical "AC" and "DC" Or puts, while the second Foot Pedal position provides primary electricals in combination withe Motor.	
M/ME	In this Mode, the Motor is activated by the first position of the Foot Pedal. When the Pedal is fully depressed, the Motor and primary electricals are activated in combination.	
E/M	The first position of the Foot Pedal activates primary electricals. The second position of the Foot Pedal operates only the Motor.	
M/E	The Motor is activated in the first position of the Foot Pedal. Full depression of the Foot Pedal activates only the primary electrical outputs.	

The numbered settings on the "Output Control" provides accurate repeatability for desireable power levels to the Functional Accessories.

Using Figures 2 and 3 for reference, set-up the Power Source as outlined in the following steps:

- position the Power Source on a convenient bench and plug in the "Main Power Line Cord" into a three wire grounded outlet,
- attach the Hot Cubby to the bracket located on the right side of 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" receptable and the Soldering Iron to the other "AC VAR Output" receptable of the Power Source,
- attach the Extractor "quick connect" fitting to either the "Vacuum Control" for solder removal
 or "Pressure Control" for pressure or hot air jet modes,
- adjust the "Vacuum Control" on the Power Source to "MAX" for solder removal.
- adjust the "Pressure Control" on the Power Source to "MAX" position for air pressure, and to "MIN" for hot air jet.
- adjust the "AC Variable Outlet Controls" to a setting of "10" so that the Soldering Iron and Extractor will be ready for use.

OPERATION

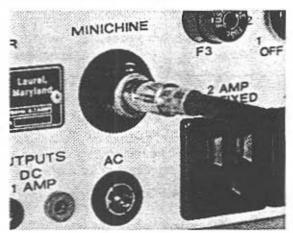
OPERATION:

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,
- adjust the right "Variable Voltage Control" on the Power Source to a setting of "8". Allow approximately 10-15 minutes of warm up time for the Extractor,
- after the Extractor has heated up for 10-15 minutes, adjust the "Variable Voltage Control" for an operating temperature of between 5-8 setting,

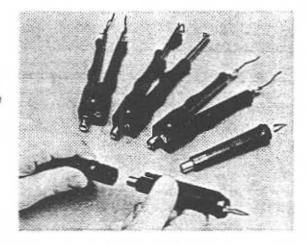
To use the "Minichine", set the PROGRAM "Mode Selector Switch" to "M",

 insert the Flex Shaft into "Minichine" drive output. Tap Foot Pedal to rotate drive for easy engagement. Double detent of Foot Pedal provides "ready" and "run" position,



To use Functional Accessories,

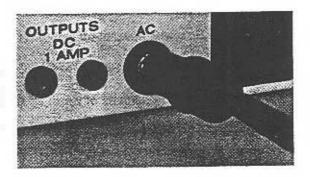
 attach a Functional Accessories tool to the Universal Cord.



- . place PROGRAM "Mode Selector Switch" to the "E" position for low voltage AC/DC output,
- adjust the "Output Control" for desired power to Functional Accessories tool. Start with lower setting, increase control setting to desired heat.

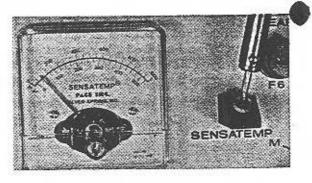
OPERATION

 insert Universal Cord into the "AC Output" receptacle. Depress Foot Pedal to activate power. The "AC/DC Output Power Light" (amber) will illuminate when current flows,

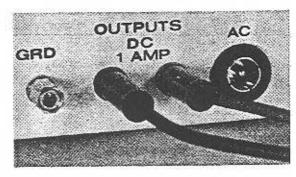


 for auxiliary heating or fast cool down operations, set PROGRAM "Mode Selector Switch" to E/M position. Use Foot Pedal to activiate power,

 the "Sensatemp" sensing device is used to find the operating temperature of a heated Function Accessories tool tip.



 attach the Plating Cables to the black and red "DC Outputs". (The Cables can be reversed for reverse polarity).



- for plating operations, set PROGRAM "Mode Selector Switch" to the "E" position. Depress
 the Foot Pedal and adjust the "Output Control" to the desired DC voltage on the "Voltmeter",
- auxiliary Power Source Patch Cord for "Rear AC VAR Outlet" on back of unit controlled by "Rear AC VAR Outlet Control".

Recommended 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 in 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 workpiece.

TABLE 3. HEAT APPLICATION CHART

Functional Accessories Tool	Meter Indicator	Control Setting	Operation
Resistweez	7V	5.5	Soldering cup terminals.
Resistweez	10V	7.0	Feed thru capacitor removal.
Thermo Part	2 to 2.5V	2.0 to 2.2	Foam, poly V and epoxy removal
Thermo Part	5.5V	5.0	Lifting clinched lead.
Lapflo	2 to 2.5V	2.0 to 2.2	Flat pack soldering, standard tip
Striptweez	5V	5	Wire stripping, vinyl insulation
Striptweez	7V (slow strip) 9V (fast strip)	5.2 6.5	Wire stripping Teflon insulation
Conductweez	10V (small parts) max (large parts)	8 10	Light work Heavy work
Electroplating	8V 6V 4V	6.2 5.0 3.5	Electo clean Nickel plating Gold plating



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

Symptom	Condition	Solution
Dirty Filter(s) or Motor/Pump Normal useage		1. Check Filters weekly and replace monthly. a. Disconnect Main Power Line Cord from power source before opening cover. b. Loosen ¼ turn fasteners on rear of Power Source and lift cover. c. Locate Motor/Pump in the center of the chassis. d. Remove black Cap(s) from the Muffler on the Motor/Pump Assembly see Figure 4. Clean and/or replace if necessary.
General loss of vacuum Buildup of flux or coating of residue within the Pump		1. Disconnect Main Power Line Cord from power source before opening cover. 2. Loosen ¼ turn fasteners on rear of Power Source and lift cover. 3. Locate Motor/Pump in the center of the chassis. 4. Loosen the three (3) Retaining Screws on Pump Housing, remove Screws, Cover plate and Carbon Wear Plate assembly, see Figure 5. 5. Remove Varies from Rotor, flush Pump Housing and Rotor with flux solvent. 6. Clean Vanes with solvent. 7. Reassemble Vanes in Rotor. 8. Replace Cover Plate, Carbon Wear Plate and Screws as an assembly 9. Refer to Replacement Parts List for Motor/Pump Overhaul Kit.



ELECTRICAL PROTECTION

All electrical circuits of the Powers Sources are fully protected and replacement of electrical components should not be necessary. Refer to Figure 6 (PPS-200C), Figure 7 (PPS-200C/ZPS) and Figure 8 (PPS-200CE) for schematic diagrams of each Power Source available.

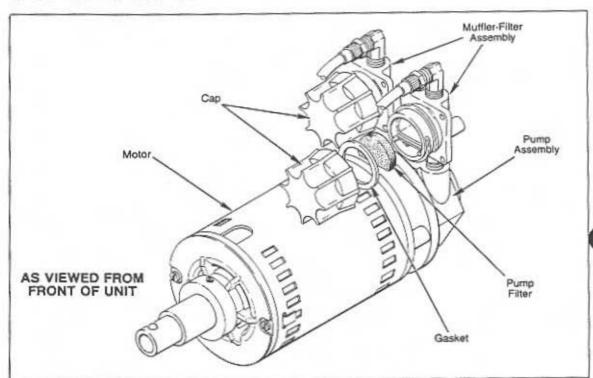


FIGURE 4. LOCATION OF FILTERS ON MOTOR/PUMP ASSEMBLY

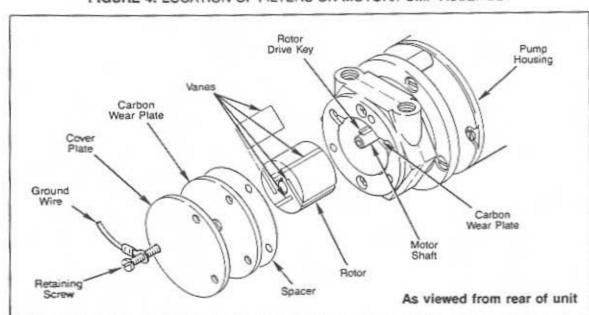
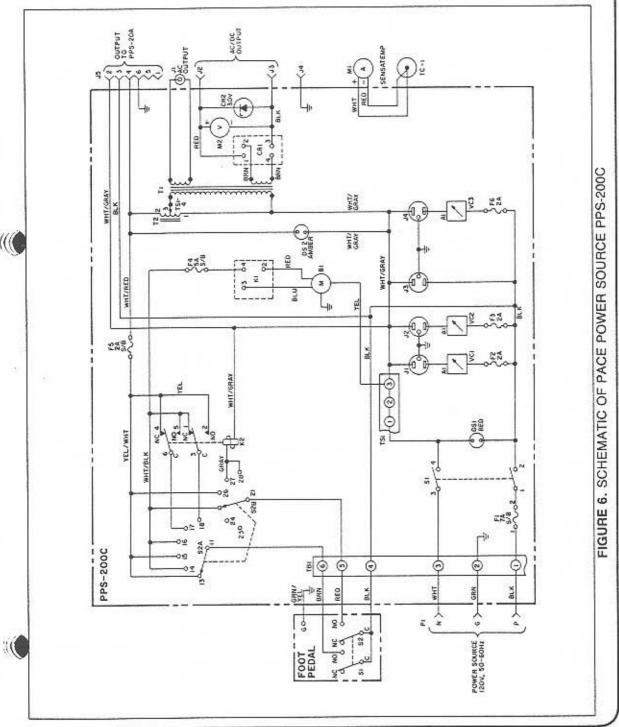
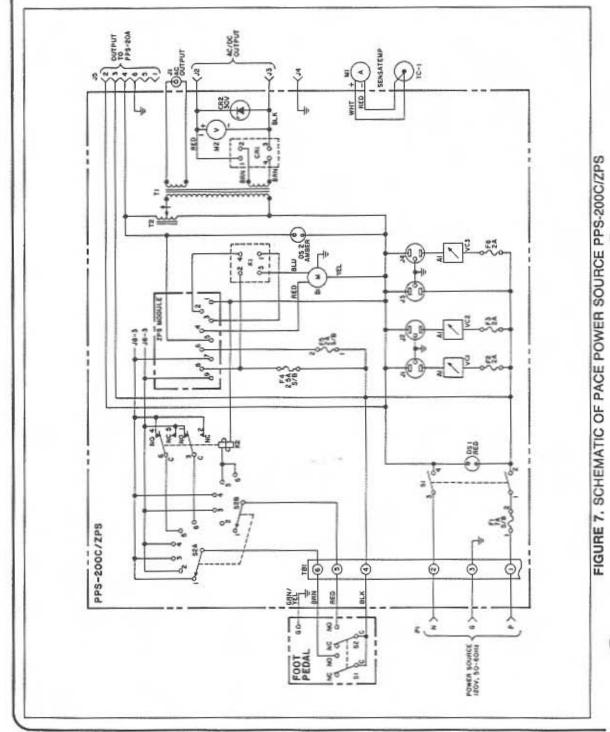
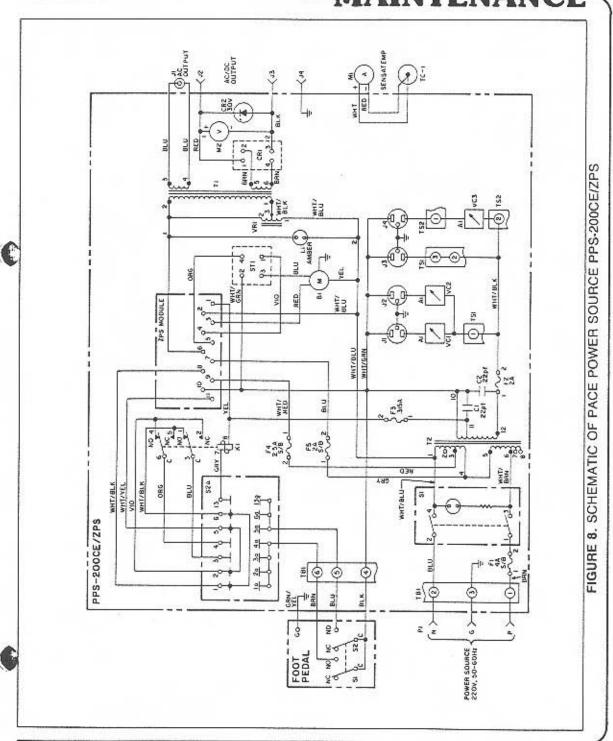


FIGURE 5. PUMP HOUSING ASSEMBLY





55



REPLACEMENT PARTS:

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

TABLE 5. REPAIR SYSTEMS

Repair System	Power Source	Part Number (Power Source)
PRC-350C*	PPS-200C	7008-0021
PRC-350C/ZPS*	PPS-200C/ZPS	7008-0079-02
PRC-350CE/ZPS*	PPS-350CE/ZPS	7008-0140-02

*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-350C and PRC-350C/ZPS Systems. Figure 10 and Table 7 are used for the PRC-350CE System.

TABLE 6. LIST OF REPLACEMENT PARTS COMMON TO PACE REPAIR SYSTEMS PRC-350C and PRC-350C/ZPS (Refer to FIGURE 9 for Item Number)

ITEM NO.	DESCRIPTION	PACE PART NO.
1	PPS-200C Power Source, 120V PPS-200C/ZPS Power Source, 120V	7008-0021 7008-0079-02
2	Motor/Pump Assembly	6008-0045
3	Foot Pedal Assembly	6008-0027
4	Transformer	1192-0009
5	Rotary Switch	1157-0035
6	Knob, Output Control	1222-0001
7	Knob, AC Voltage Control	1222-0006
8	Pilot Light (Amber)	1165-0005
9	Fuse Holder	1161-0002
10	Fuse (F1), 7A Slo-Blo	1159-0013
11	Fuse (F2, F3 and F6), 2A Fast Acting	1159-0004
12	Fuse (F5), 2A Slo-Blo	1159-0005
13	Fuse (F4), 5A Slo-Blo (PPS-200C)	1159-0002
1.750.00	Fuse (F4), 2.5A Slo-Blo (PPS-200C/ZPS)	1159-0022
14	Switch (S1), DPST	1157-0001
15	Line Cord	1332-0024
16	Universal Cord	7000-0005
17	ZPS Module Assembly (only on PPS-200C/ZPS, Part No. 7008-0079-02)	6020-0012
18	Pilot Light (Red)	1165-0004

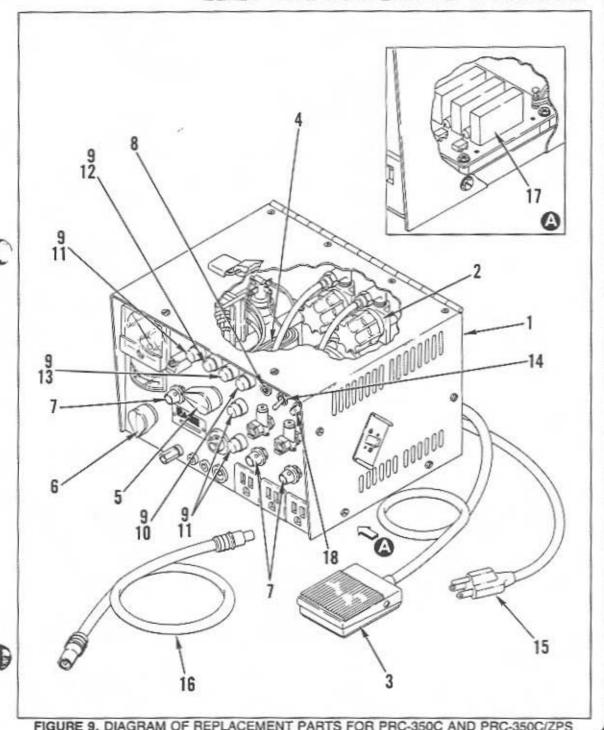


FIGURE 9. DIAGRAM OF REPLACEMENT PARTS FOR PRC-350C AND PRC-350C/ZPS

TABLE 7. LIST OF REPLACEMENT PARTS COMMON TO PACE REPAIR SYSTEM PRC-350CE/ZPS (Refer to FIGURE 10 for item Number)

ITEM NO.	DESCRIPTION	PACE PART NO.
1	PPS-200CE/ZPS Power Source, 220/240V	7008-0140-02
2	Motor/Pump Assembly	6008-0038
2	Foot Pedal Assembly	6008-0096
4	Transformer (Low Voltage)	1192-0040
5	Transformer (200W)	1192-0031
	Rotary Switch	1157-0035
7	Knob, Output Control	1222-0001
6 7 8 9	Knob, AC Voltage Control	1222-0006
9	Pilot Light Lens (Amber) Neon Lamp Lamp Holder	1171-0003 1165-0021 1167-0001
10	Fuse Holder	1161-0008
11	Fuse (F1), 4A Slo-Blo	1159-0222
12	Fuse (F2), 2A	1159-0113
13	Fuse (F5), 2A Slo-Blo	1159-0219
14	Fuse (F4), 2.5A Slo-Blo	1159-0220
15	Fuse (F3), .315A	1159-0105
16	Switch (S1), DPST	1157-0028
17	Line Cord	1332-0089
18	Universal Cord	7000-0005
19	Relay Assembly	1194-0011
20	ZPS Module Assembly	6020-0011

