

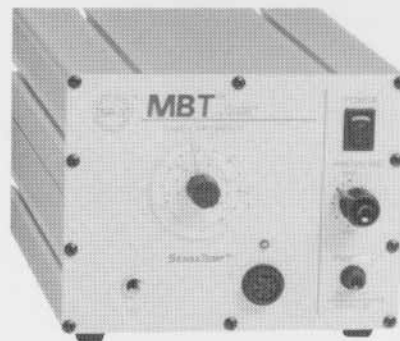
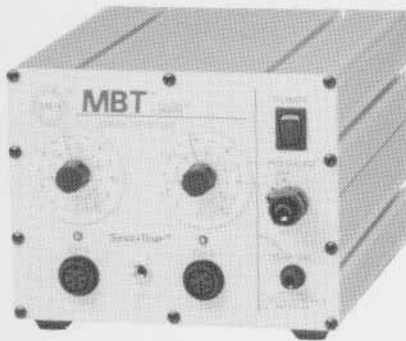
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INCORPORATED



MBT 201, MBT 101 SYSTEMS



SERVICE MANUAL



MANUAL NO. 5050-0340

REV. B



*Systems for Development, Production
and Repair of Electronic Assemblies*

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PACE Incorporated has provided training on all of its products since 1958 as well as advanced technology training in all aspects of hand soldering, rework and repair.

Additional copies of this manual or other PACE literature may be obtained from:

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GENERAL INFORMATION

INTRODUCTION

This manual will assist the technician in performing preventive maintenance and corrective maintenance on the MBT 201 & MBT 101 systems. If you should encounter any difficulty correcting a system malfunction, contact the PACE Service Department at TEL: (888) 535-7223 (toll-free), FAX (301) 483-7030.

The MBT 101 & MBT 201 Universal Soldering/Desoldering Systems provide the user with the power and versatility to remove and install SMD and Thru-Hole devices. The power source incorporates a highly responsive SensaTemp (closed-loop) temperature control system which provides up to 120 watts of total power to the two output channels on the MBT 201 systems and 60 watts of total power to a single output channel on the MBT 101 systems. The MBT 201 and MBT 101 systems contain an internal motor pump to supply vacuum and air pressure to accessory handpieces. Accessory handpieces (standard & optional) and special use tips allow the user to remove and replace a wide variety of component configurations.

The MBT 201 & MBT 101 systems are available in either the 115 VAC (Domestic) version, 100 VAC (Japan) version or 230 VAC (Export) version. Systems with an "A" designation after the system number (e.g., MBT 201A) incorporate an Auto Snap-Vac system that features a minimum run time of 1.2 seconds when the motor pump is activated. The systems package the power source with a selection of accessories and functional aids. These systems are as follows.

- MBT 201 SYSTEM -** Consists of PPS 80 (115 VAC, 60 Hz Version) power source plus a selection of handpieces and accessories.
- MBT 201J SYSTEM -** Consists of PPS 80J (100 VAC, 50/60 Hz Version) power source plus a selection of handpieces and accessories.
- MBT 201E SYSTEM -** Consists of PPS 80E (230 VAC, 50 Hz Version) power source, plus a selection of handpieces and accessories.
- MBT 101 SYSTEM -** Consists of PPS 75 (115 VAC, 60 Hz Version) power source, plus a selection of handpieces and accessories.
- MBT 101J SYSTEM -** Consists of PPS 75J (100 VAC, 50/60 Hz Version) power source, plus a selection of handpieces and accessories.
- MBT 101E SYSTEM -** Consists of PPS 75E (230 VAC, 50 Hz Version) power source plus a selection of handpieces and accessories.

GENERAL INFORMATION

SPECIFICATIONS

POWER REQUIREMENTS

- PPS 75 (MBT 101 System) - Version operates on 97-127 VAC, 50/60 Hz.
86 Watts, 0.75 Amp typical; 120 Watts, 1.0 Amp maximum
- PPS 75J (MBT 101J System) - Version operates on 90-115 VAC, 50/60 Hz.
86 Watts, 0.86 Amp typical; 120 Watts, 1.2 Amp maximum
- PPS 75E (MBT 101E System) - Version operates on 196-264 VAC, 50 Hz.
86 Watts, 0.44 Amp typical; 100 Watts, 0.55 Amp maximum
- PPS 80 (MBT 201 System) - Version operates on 97-127 VAC, 50/60 Hz.
138 Watts, 1.2 Amp typical; 184 Watts, 1.6 Amp maximum
- PPS 80J (MBT 201J System) - Version operates on 90-115 VAC, 50/60 Hz.
138 Watts, 1.4 Amp typical; 184 Watts, 1.8 Amp maximum
- PPS 80E (MBT 201E System) - Version operates on 196-264 VAC, 50 Hz.
138 Watts, 0.6 Amp typical; 199 Watts, 0.9 Amp maximum

VACUUM AND AIR

- Vacuum Rise Time: 200 ms average as measured by PACE
PPM 100 Process Monitor.
- Vacuum: 51 cm Hg. (20 in. Hg.) (nominal)
- Pressure: .48 Bar (7 P.S.I.) (nominal **MAX** setting)
- Air Flow: 9 SLPM (0.32 SCFM) maximum

EOS/ESD

- Tip-To-Ground Resistance: Less than 2 ohms.
- AC Leakage: Less than 2 millivolts RMS from 50Hz to 500Hz.

ENVIRONMENTAL REQUIREMENTS

- Operating Temperature: 0°C to 50°C (32°F to 120°F)
- Storage Temperature: -40°C to 100°C (-40°F to 212°F)

TEMPERATURE OF SENSATEMP HANDPIECES

- Minimum Setting: 232°C (450°F), nominal.
- Maximum Setting: 482°C (900°F), nominal.
- Accuracy: 5% of control setting.
- Idle Tip Temperature Stability: $\pm 1.1^{\circ}\text{C}$ (2°F), nominal.

NOTE

Actual minimum and maximum Operating Tip Temperatures may vary depending on handpiece & tip selection.

GENERAL INFORMATION

CAPABILITIES

All capabilities are dependent upon the use of the appropriate Functional Accessories or Work Aids (refer to Basic Operation section). Available SensaTemp handpieces and their associated assembly and repair functions are listed below. An Operations and Maintenance Manual is provided separately with each handpiece which describes the applications and recommended procedures for that particular tool.

SP-2A Sodr-Pen Soldering Iron - Provides a wide range of SMD and thru-hole installation and removal capability as well as unsurpassed thermal performance on heavy, multilayer thru-hole assemblies at safe, lower working temperatures. A wide variety of 3/16" shank, quick change thru-hole and SMD tips (for chip components, SOTs, SOICs and other components) are available.

SP-1A Sodr-Pen Soldering Iron - Uses 1/8" shank tips and features a slimmer, more compact heater than the SP-2A Sodr-Pen for easier access on densely populated assemblies.

SX-70 Sodr-X-Tractor handpiece - Air handpiece ideal for thru-hole desoldering on extra high mass multilayer boards. Also ideal for removal of TSOP & TQFP surface mount components and for "Flo" desoldering during surface mount land preparation.

TT-65 ThermoTweez handpiece - Performs removal of PLCC (J Leaded), LCCC (leadless) and other surface mount devices.

TP-65 ThermoPik handpiece - Air handpiece performs removal of Flat Pack, QFP & PQFP surface mount devices.

DTP-80 Dual ThermoPik handpiece - Air handpiece performs removal of large Flat Pack, QFP, PQFP & BGA surface mount devices.

TJ-70 Mini ThermoJet handpiece - Air handpiece. Focused hot air reflow handpiece used for installation of all types of surface mount devices.

NOTE

The MBT 201 and MBT 101 products feature PACE's unique SensaTemp closed loop temperature management system which will function only with the SensaTemp handpieces listed above. Do not attempt to use any other handpiece. Likewise, use SensaTemp handpieces on only those systems with a SR-3 or SR-4 rating (marked on Front Panel of Power Source). These include other MBT systems (MBT 101, MBT 201 and higher) and all ST series systems.

GENERAL INFORMATION

PARTS IDENTIFICATION

1. **POWER SWITCH** - Turns system ON ("1") and OFF ("0"); controls input power to system.
2. **CH 1 VARIABLE TEMPERATURE CONTROL** - Allows the operator to adjust the tip temperature for handpiece/tip combination connected to channel 1.
3. **CH 2 VARIABLE TEMPERATURE CONTROL (MBT 201 Systems Only)** - Allows the operator to adjust the tip temperature for handpiece/tip combination connected to channel 2.
4. **CH 1 POWER RECEPTACLE** - Provides power, tip ground, sensing circuitry and finger switch connection from MBT system to the handpiece connected to channel 1.
5. **CH 2 POWER RECEPTACLE (MBT 201 Systems Only)** - Provides power, tip ground, sensing circuitry and finger switch connection from MBT system to the handpiece connected to channel 2.
6. **CH 1 LED** - Green LED provides visual indication of duty cycle control of channel 1. Indicator lights as power is applied to the connected handpiece.
7. **CH 2 LED (MBT 201 Systems Only)** - Green LED provides visual indication of duty cycle control of channel 2. Indicator lights as power is applied to the connected handpiece.
8. **AUTO SNAP-VAC PORT (SNAP-VAC Port on non "A" systems)** - Quick connect fitting which provides quick-rise vacuum for Sodr-X-Tractor or ThermoPik handpieces.
9. **CONTROLLABLE PRESSURE PORT** - Quick connect fitting with adjustable valve which provides variable air flow for Sodr-X-Tractor handpiece (in Hot Jet Mode) and Mini ThermoJet handpiece.
10. **EARTH GROUND RECEPTACLE** - Provides positive earth ground to which a ground cable can be connected from the workpiece or work surface as part of a static control program.
11. **TIP & TOOL STAND (not shown)** - Holder and cleaning station for handpiece(s). Configuration of stand is applicable to the handpieces(s) purchased.
12. **TIP & TEMPERATURE CHART HOLDER** - Holds PACE'S Tip & Temperature Selection System Charts (standard accessory on MBT 201 systems) which enable the operator to accurately set true, correct operating tip temperature for any handpiece/tip configuration.
13. **POWER CORD** - Provides main power to system from AC outlet to AC Power Receptacle.
14. **AC POWER RECEPTACLE/FUSE HOLDER** - Receptacle for providing power to the system from AC outlet through power cord, and location of fuse which protects system from overcurrent conditions.
15. **FUSE** - Provides overload protection for MBT system.

GENERAL INFORMATION

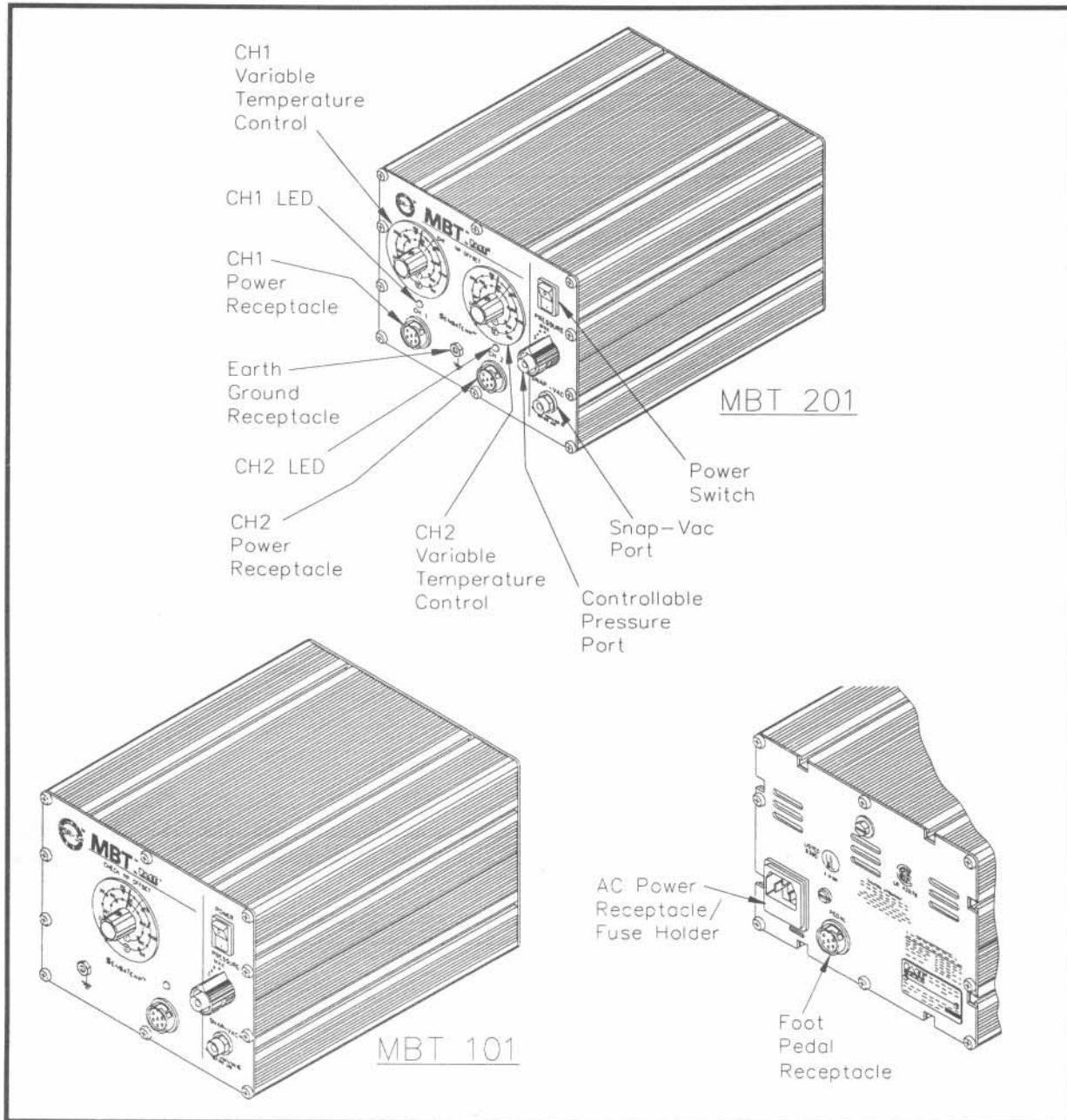


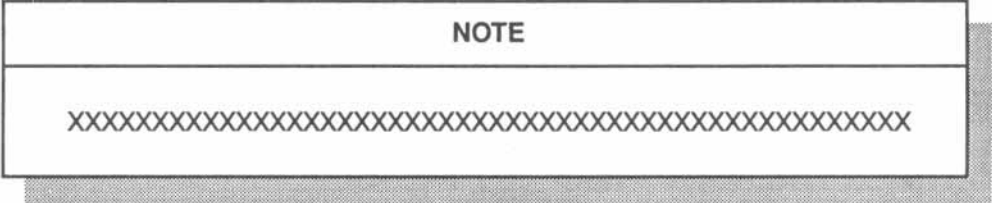
Figure 1. Parts Identification

SAFETY

The purpose of this "SAFETY" section is to inform users of the heading guidelines used in this manual to indicate special Notes, Cautions, Warnings or Dangers. Also included are recommended precautions which must be observed when operating or servicing this product.

HEADING GUIDELINES

PACE adheres to the following Heading Guidelines (based on OSHA guidelines) when listing special information or precautions to be taken. Especially important are all procedures and practices which, if not strictly observed, could result in injury or loss of life. These "NOTES", "CAUTIONS", "WARNINGS" and "DANGERS" are inserted in this manual whenever deemed necessary. They appear in a blocked off form with double outline and a shaded background to highlight the information as shown below.



NOTE

Used to indicate a statement of company recommendation or policy. The message may relate directly or indirectly to the safety of personnel or protection of property. NOTE is not associated directly with a hazard or hazardous situation and is not used in place of "CAUTION", "WARNING" or "DANGER".

CAUTION

Used to indicate a hazardous situation which may result in minor or moderate injury. May also be used to alert personnel to conditions, procedures and practices which, if not observed, could result in damage to or destruction of the product or other equipment.

WARNING

Used to define additional information that if not closely followed might result in serious damage to equipment and represent a potential for serious personnel injury.

DANGER

Defines additional information that if not closely followed might result in severe personnel injury or death. Danger is not used for property damage unless personal injury risk is present.

PRECAUTIONS

The following are general safety precautions which personnel must understand and follow when using or servicing this product. These precautions may or may not be included elsewhere in this manual.

USEAGE PRECAUTIONS

CAUTIONS

1. SensaTemp handpiece heaters and installed tips are hot when handpiece is powered on. **DO NOT** touch either the heater or tip. Severe burns may result! Always store handpiece in the appropriate Tip & Tool Stand when not in use.
2. Always use this system in a well ventilated area. A fume extraction system such as those marketed by PACE are highly recommended to protect personnel from solder flux fumes.
3. Exercise proper precautions when using chemicals (e.g., solder paste). Refer to the Material Safety Data Sheet (MSDS) supplied with each chemical and adhere to all safety precautions recommended by the manufacturer.

NOTES

1. The solder collection chamber in the PACE Sodr-X-Tractor is made of glass. Never remove this chamber using pliers. Breakage of the chamber may result. Always remove using the procedures recommended by PACE in the associated handpiece manual.
2. The glass solder collection chamber in the PACE Sodr-X-Tractor is hot when the handpiece is in use. When removing the chamber for cleaning, never touch the glass with bare hands. Allow the chamber to cool before cleaning.
3. Always store any connected handpiece in the appropriate Tip & Tool Stand.

SERVICING PRECAUTIONS

DANGERS

POTENTIAL SHOCK HAZARD - Repair procedures performed on these products should be performed by qualified service personnel only. Line voltage parts will be exposed when equipment is disassembled. Service personnel must avoid contact with these parts when troubleshooting the power source.

NOTES

Refer to the MBT 201A, MBT 101A Operation & Maintenance Manual (P/N 5050-0381) for complete information on system operation.

To insure continued peak performance. Use genuine PACE replacement parts.

REPAIR

REPAIR PROCEDURE

The "REPAIR" section of this manual provides the technician with the information necessary to determine the source and take the necessary steps to correct the malfunction of a unit. In order to perform the most expedient repair, the technician must follow the process listed below step by step, in order. Failure to do so will make the repair much more difficult.

1. PERIODIC MAINTENANCE - No periodic or special maintenance is required on these systems.
2. SERVICE HINTS - Read these helpful hints which give information on operation and troubleshooting.
3. CORRECTIVE MAINTENANCE - A guide for resolving malfunctions caused by improper maintenance or handpiece failure. Locate the "Symptom" in the "Corrective Maintenance" section which best describes the malfunction of the failed unit. Check each point described under "Solution" in order of listing.
4. CALIBRATION - Lists procedures for performing tip temperature tests to check handpieces and calibration of units. Perform these procedures if operating tip temperatures appear to be incorrect or periodically to ensure calibration maintenance.
5. DISASSEMBLY/ASSEMBLY - Contains Disassembly/Assembly instructions which enables the technician to disassemble and assemble the unit properly.
6. FLOW CHARTS & WIRING DIAGRAMS - Easy to follow Flow Charts and Wiring Diagrams which enable the technician to determine the source of a malfunction down to an assembly (e.g., Main PCB Assembly) level. Locate the Flow Chart which best describes the malfunction of the failed unit. Follow the instructions on the Flow Chart and perform the checks indicated to determine the source of the malfunction.
7. PACE SERVICE DEPARTMENT - If the cause for the malfunction has not been determined at this point, call the PACE Service Department at TEL:(888) 535-7223 (toll-free), FAX (301) 483-7030.

DANGER

POTENTIAL SHOCK HAZARD - Repair Procedures are to be performed by qualified service personnel only. Removal of the power source panels exposes line voltage parts. Service personnel must insure that the AC Power Cord is disconnected prior to disassembly.

REPAIR

SERVICE HINTS

1. **FUSE FAILURES:** Failures are usually caused by shorts in the handpiece. Always check each connected handpiece using the "Heater Assembly Checkout Procedures" table before replacing the fuse.

NOTE
Insure that the replacement fuse is the proper value for the power source. Refer to the "Power Source Replacement Parts" table.

2. **VACUUM FAILURES:** Failures of this nature can be caused by either the unit or the handpiece. Remove the air hose (and attached VisiFilter) from the **AUTO SNAP-VAC** (or **SNAP-VAC**) Port and check for vacuum at the port. If sufficient vacuum is present, the malfunction exists in the handpiece. Further, if vacuum is sufficient at the port, check the vacuum level at the end of the glass solder collection chamber (Sodr-X-Tractor handpieces only, chamber must be checked cold). Take the applicable steps shown following.
 - a) **Handpiece Failures:** Replace VisiFilter if necessary; clean heater bore and replace tip, check air hose for holes and ensure that glass solder collection chamber (Sodr-X-Tractor handpieces only) is properly seated against heater seal.
 - b) **Unit Failures:** Remove the unit front panel (see "Disassembly/Reassembly"). Check internal hosing for kinks and replace internal VisiFilter (attached to pressure port on motor pump assembly).
3. **HEATING CONTROL CIRCUITS:** Must be checked under load (with handpiece/s plugged in). The output(s) are obtained by switching triacs on and off. The voltage level to the handpiece(s) does not change when adjusting the Variable Temperature Control knob(s). Temperature level is achieved by varying the number of "on" cycles that the voltage is applied as opposed to the number of cycles "off". The control circuit of the unit varies the duty cycle of voltage application as required to achieve and maintain the set temperature of the handpiece.
4. **HEATING FAILURES:** Usually caused by defective handpiece heaters. In normal operation, the channel LED will turn hard on until the preset temperature is reached, will blink when at temperature and will be off when temperature is higher than the set temperature (when reducing set temperature). If the channel LED is always hard on or never lights, the handpiece heater assembly is probably defective. Refer to the "Heater Assembly Checkout Procedures" table.

CORRECTIVE MAINTENANCE**VISIFILTER ELEMENT REPLACEMENT**

Follow the procedure listed below to replace the VisiFilter element when it becomes clogged or discolored.

1. Disconnect the handpiece air hose by gently turning and pulling the coupled Fittings.
2. Disconnect the Visifilter and hose assembly from the Power Source by gently turning and pulling the male Fitting inserted into the **AUTO SNAP-VAC** Port.
3. Disconnect VisiFilter from both attached 1 inch air hoses by gently turning and pulling the VisiFilter while holding each of the hoses.
4. Separate the 2 plastic housing halves of the VisiFilter in the following manner.
 - a) Grasp the VisiFilter in the palm of the hand with the Male Nib (air hose connection) marked "FLOW IN" facing you.
 - b) Pull against one of the Wing Tabs while pulling on the Male Nib with the free hand to open the interconnection of the plastic housings at that Wing Tab.
 - c) Pull against the second Wing Tab while pulling on the Male Nib to open the remaining interconnection and separate the plastic housings.
5. Remove the old or discolored Element and discard.
6. Insert the replacement VisiFilter Element into the housing marked "FLOW IN". Center the Element in the housing well.
7. Squeeze the 2 plastic housing halves together using 4 plastic Bumps on the housing marked "FLOW OUT" as pressure points. The 2 plastic housings will snap together and lock the VisiFilter Element in position.
8. Reconnect the 1 inch air hoses (removed in step 3) to the VisiFilter.

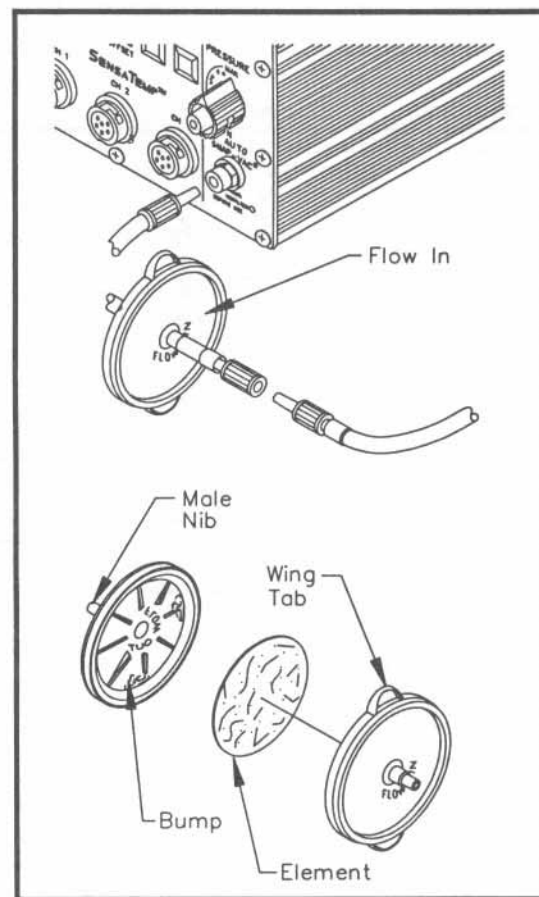


Figure 2. VisiFilter Element Replacement

REPAIR

HANDPIECES

The following "Heater Assembly Checkout Procedures" are applicable to all PACE SensaTemp handpieces except for the TT-65 ThermoTweez & DTP-80 handpieces. Refer to applicable Operation & Maintenance Manual for troubleshooting procedures pertinent to that handpiece.

Perform the "Heater Assembly Checkout Procedures" with the handpiece (and heater) at room temperature. If the handpiece is warm, resistance readings will be different from those shown.

Symptom	Checkout Procedure	Cause	Solution	Heater Specifications
No heat	Check resistance - Pin 2 to Pin 5. Refer to "Heater Specifications" . If resistance is high -	Open Heater	Replace heater assembly.	SX-70 = 8 - 10 ohms
	Check resistance - Pin 3 to Pin 6. If circuit reads open -	Open Sensor	Replace Heater Assembly.	SP-1A = 10 - 12 ohms SP-2A = 8 - 10 ohms
Handpiece overheating	Check resistance - Pin 3 to Pin 6. If less than 105 ohms - -	Shorted Sensor	Replace Heater Assembly.	TP-65 = 9 - 11 ohms
Fuse blows when unit is turned on.	Check fuse for proper value and type (Time Delay or Fast Blo)	Incorrect fuse installed.	Replace fuse with proper value and type.	TJ-70 = 6 ohms
	Check resistance - Pin 2 to Pin 5. Refer to "Heater Specifications" column. If resistance is low - -	Solder short in Handpiece. Shorted Heater	Remove Short. Replace Heater Assembly & Fuse F1. Replace Heater Assembly & Fuse F1.	
No Ground on Tip.	Check resistance - Pin 4 to a NEW Tip. Resistance should be less than 2 ohms. If not - -	Oxidation buildup in Heater Bore.	Clean heater bore with proper wire brush.	
		Defective Heater	Replace Heater Assembly.	

Table 1. Heater Assembly Checkout Procedures

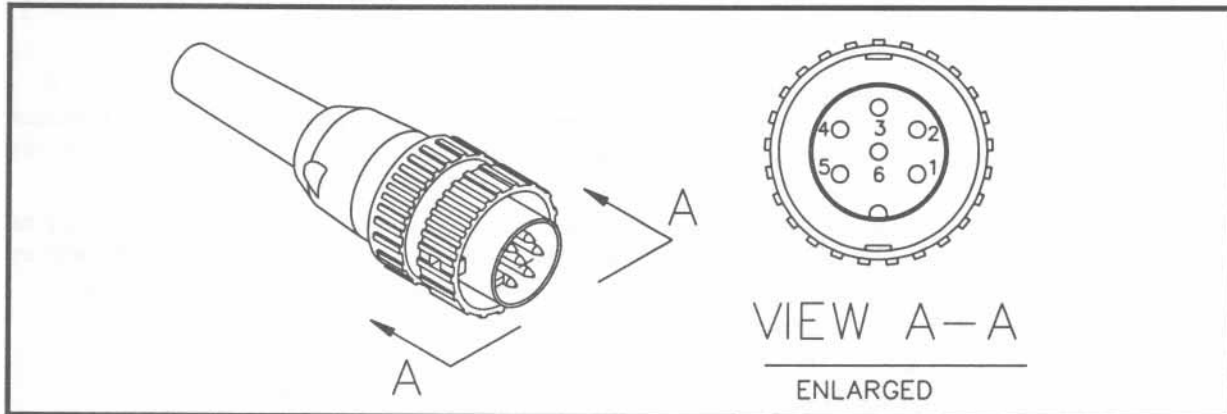


Figure 3. Connector Plug Wiring

POWER SOURCE

Most malfunctions are simple and easy to correct. Refer to the table shown below to clear these malfunctions.

SYMPTOM	PROBABLE CAUSE	SOLUTION
No power to system.	Blown Fuse (F1)	Disconnect all handpieces. Replace fuse F1 located on rear of Power Source in the AC Receptacle/Fuse Holder with proper value and type. Refer to table 3, page 36.
	Blown Fuse(F1) caused by defective handpiece.	If fuse blows when handpiece is plugged in, see Table 1 or refer to the applicable handpiece manual. Replace the fuse.
No heat on handpiece. Other handpieces work on Power Source channel.	Defective Heater	See Table 1 or refer to applicable handpiece manual.
No heat on handpiece. Other handpieces do not work on Power Source channel.	Defective control circuit.	Refer to "Troubleshooting" section Heat Output flow chart or Contact the PACE Service Department.

Table 2. Power Source Corrective Maintenance

REPAIR

CALIBRATION

All PACE SensaTemp controllers can be checked for calibration without the need to adjust any internal controls. If there is a requirement to check the actual tip temperature of a SensaTemp handpiece, perform the following procedure for attaching a thermocouple wire to the handpiece tip. A Process Monitor is available from PACE which will provide a temperature readout and can perform a variety of additional tests such as Tip to Ground resistance.

The only adjustment which can be made by a technician is the temperature control knob(s). The knob(s) may be adjusted by setting the actual tip temperature (as measured in the procedure below) to the level normally used by the operator. Loosen the knob set screw and adjust the knob pointer to match the readout on the dial setting with that of the temperature measuring instrument; then tighten the set screw to secure.

A thermocouple may be attached to a tip by spot welding a thermocouple wire onto the end of the tip or by embedding the wire into a drilled hole at the tip end. Either method will produce accurate results.

MATERIALS REQUIRED

1. **PACE Process Monitor or Temperature Meter**
2. **Soldering Iron Tip.** Listed below are the available tips PACE uses (with and without embedded thermocouples).
 - a) Use PACE part number 7021-0004-P1 tip with embedded thermocouple or tip only part number 1121-0337 on handpieces with 4.76 mm (3/16 inch) heater bore.
 - b) Use PACE part number 7021-0003-P1 tip with embedded thermocouple or tip only part number 1121-0130 on handpieces with 3.18 mm (1/8 inch) heater bore.

NOTE

When using tips with embedded K type thermocouples supplied by PACE with a K type temperature meter, a PACE part number 1332-0164-P1 RCA to Omega style, K type, thermocouple adapter must be used.

The following items are needed if you are NOT using the PACE part number 7021-0003-P1 or 7021-0004-P1 embedded tips.

3. **Thermocouple**, 30 AWG ("K" type when using Process Monitor or type compatible with Temperature Meter)
4. **Copper Wedge** (used when embedding thermocouple) or 16 AWG Bare Copper Wire (1.22 mm (.048 inch) O.D.)
5. **Drill Bit** (used when embedding thermocouple), 1.5 mm (.059 inch) diameter

SPOT WELDING PROCEDURE

1. Place the thermocouple end onto the tip just past the tinned end (approximately 6.35 mm (.25 inch)).
2. Spot weld the thermocouple to the tip. Check to insure that the thermocouple is properly attached to the tip.

EMBEDDING PROCEDURE

1. Drill a 1.5 mm (.059 inch) hole just past the tinned end of the Solder Tip (approximately 6.35 mm (.25 inch) when using one of the recommended PACE tips). Drill to a depth of 2.54 mm (.100 inch).
2. Place the end of the Thermocouple wire into the hole. Ensure that the end of the wire bottoms out in the hole.
3. Wedge the Thermocouple into place using the copper wedge or bare copper wire. The Thermocouple should be wedged as air tight as possible.

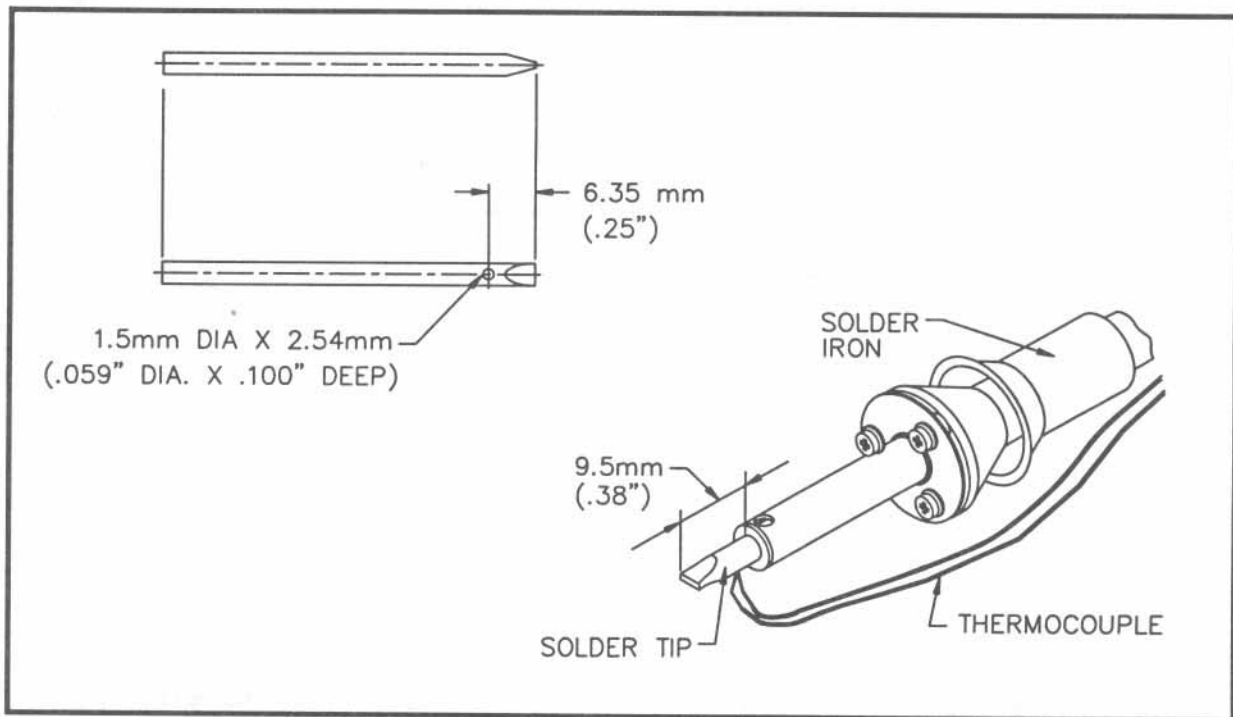


Figure 4. Thermocouple Attachment

TIP TEMPERATURE TEST

1. Install the tip into the handpiece to be tested with the end of the tip properly seated. The recommended PACE tips are shown extending out of the heater 9.5mm (.375 inch).
2. Connect the free end of the thermocouple wire to the PACE Process Monitor (or temperature meter).
3. Apply power to the handpiece and allow temperature to stabilize.

REPAIR

DISASSEMBLY/ASSEMBLY

DISASSEMBLY

To disassemble the unit for servicing, perform the following procedure step by step, in sequence using the illustrations as a guide. The procedure directs the technician to remove the unit from the chassis. The unit pictured is a PPS 80. PPS 75 and "A" version units are assembled in the same manner. Position of the motor pump and air hose routing may not be indicative of your system.

DANGER

POTENTIAL SHOCK HAZARD - The following procedures are to be performed by qualified service personnel only. Removal of the power source exposes line voltage parts. Service personnel must insure that the AC Power Cord is disconnected prior to disassembly.

1. Place the unit on a suitable work surface. Insure that the power cord has been disconnected from the back of the power source.

2. Remove the 10 Front Panel mounting screws.

3. Pull the Front Panel forward 3 inches.

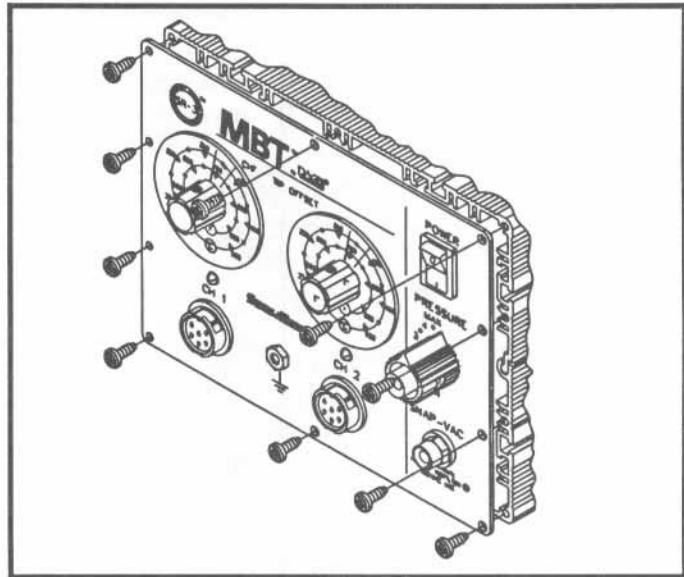


Figure 5. Removing Front Panel

4. Reposition the unit with the rear of the unit facing forward.

5. Remove the single hex head screw and the 8 Rear Panel mounting screws.

6. Pull the Rear Panel forward 2 inches and lay face down on the work surface.

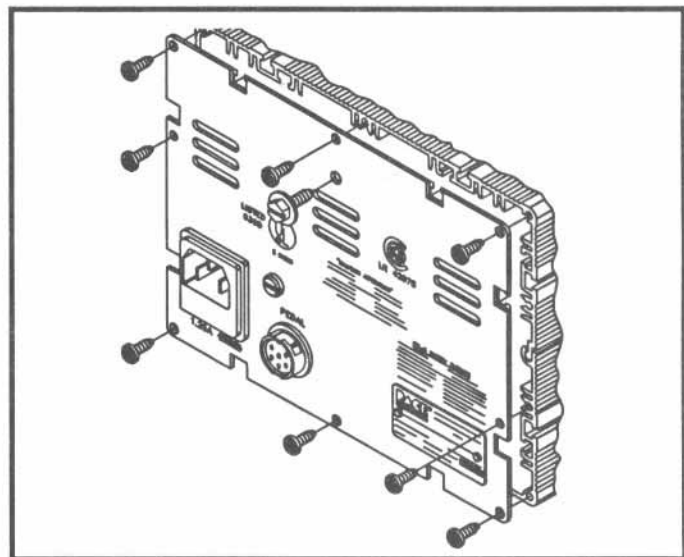


Figure 6. Removing Rear Panel

REPAIR

7. Take note of all cabling attached to the PC Board and unplug each connection.

8. Remove any hosing connections on the Front Panel assembly.

9. Remove the PC Board by carefully sliding it out through the rear of the unit.

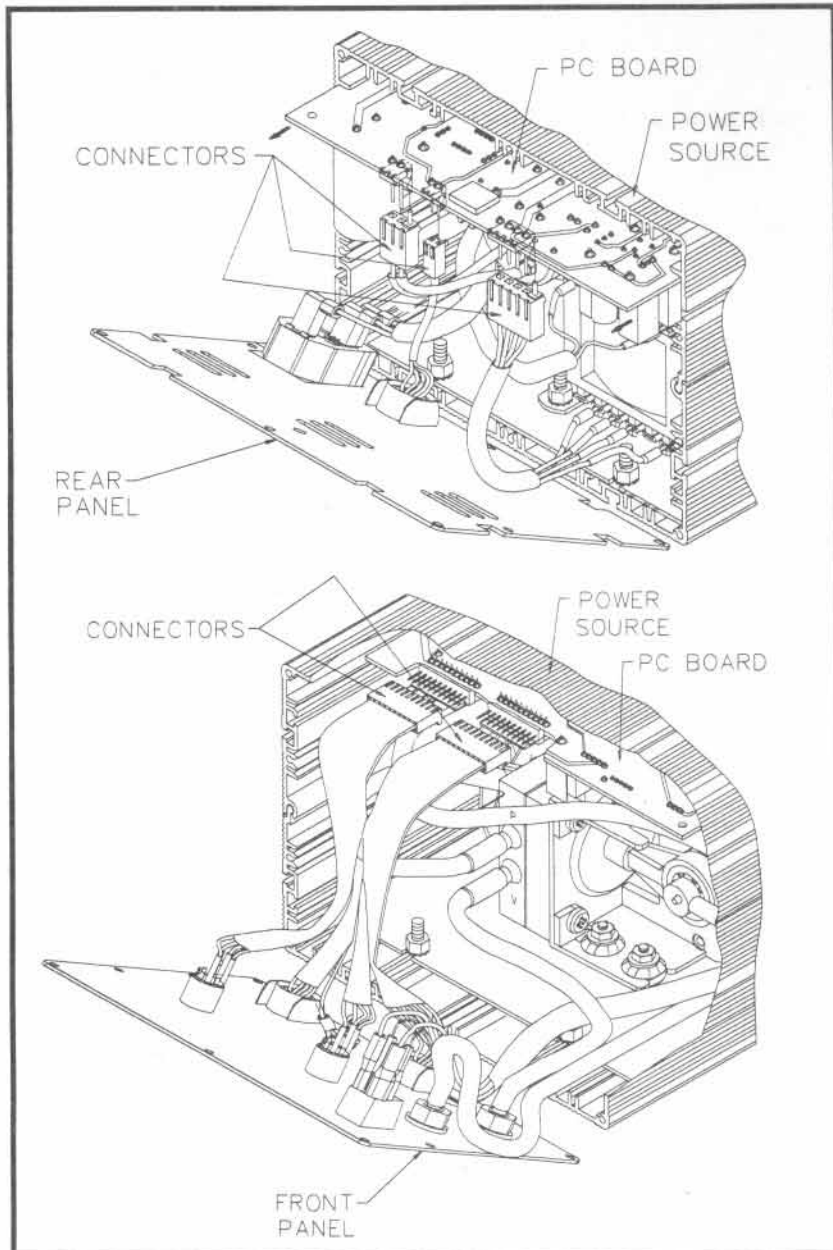


Figure 7. Removing PC Board

10. Set the PC Board aside.

11. There are 4 mounting screws with locking nuts which secure the Transformer Assembly to the chassis. Two are located on the front base of the unit and 2 are located on the rear base. One rear mounting screw secures Green grounding wires. Loosen each of the 4 locking nuts. Remove the Green wires and slide the nuts and screws out of the unit.

12. Slide the transformer assembly out of the front of the power source chassis.

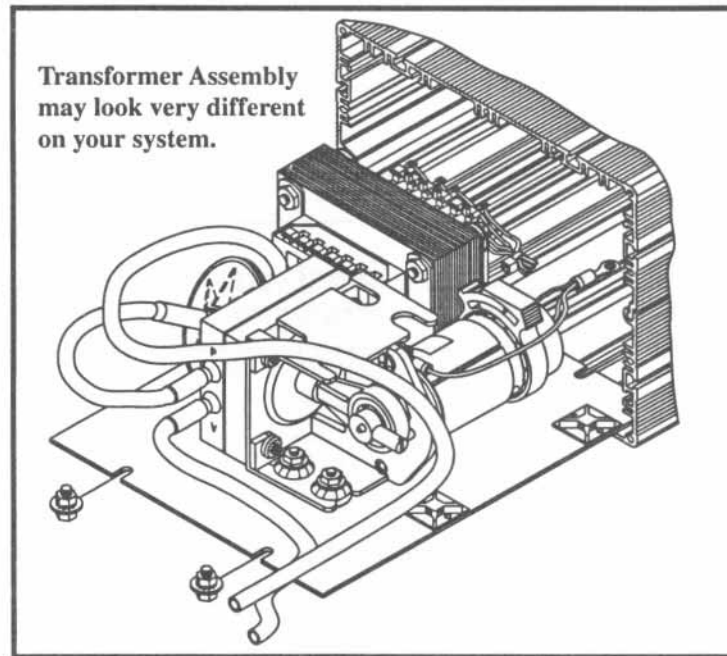


Figure 8. Removing Transformer Assembly

13. Carefully place the PC Board on top of the transformer assembly and reconnect panel cabling and hoses removed in steps 7 and 8 (see Figure 8). Note that if the system has 2 hoses, the lower hose connects to the **AUTO SNAP-VAC Port** (or **SNAP-VAC Port**). Check to insure that the PC Board is not shorting to the transformer or motor pump assembly.

14. The unit can now be connected to the house AC supply to troubleshoot system.

REPAIR

ASSEMBLY

1. Disconnect the AC power cord.

DANGER

POTENTIAL SHOCK HAZARD - Insure that the AC power is disconnected before proceeding to step 2.

2. Disconnect the PC Board, hosing and panel connections. Slide the transformer assembly and PC Board back into the chassis and reconnect in reverse order of the Disassembly procedure. Insure that the following precautions are taken in the process.
 - a) Insure that the PC Board is installed in the top slot in the chassis. Refer to Figure 7, page 18.
 - b) Insure that the rear edge of the transformer assembly plate is flush with the rear of the chassis.
 - c) When reconnecting cabling, insure that all wiring connections are correct.
 - d) When reinstalling the Front Panel assembly, insure that the hose(s) are attached and do not kink when the panel is screwed to the chassis.
3. Check unit for proper operation.

FLOW CHARTS

The following flow charts should be used to determine the source of a malfunction down to an assembly level. Locate the flow chart which best describes the malfunction.

NO POWER

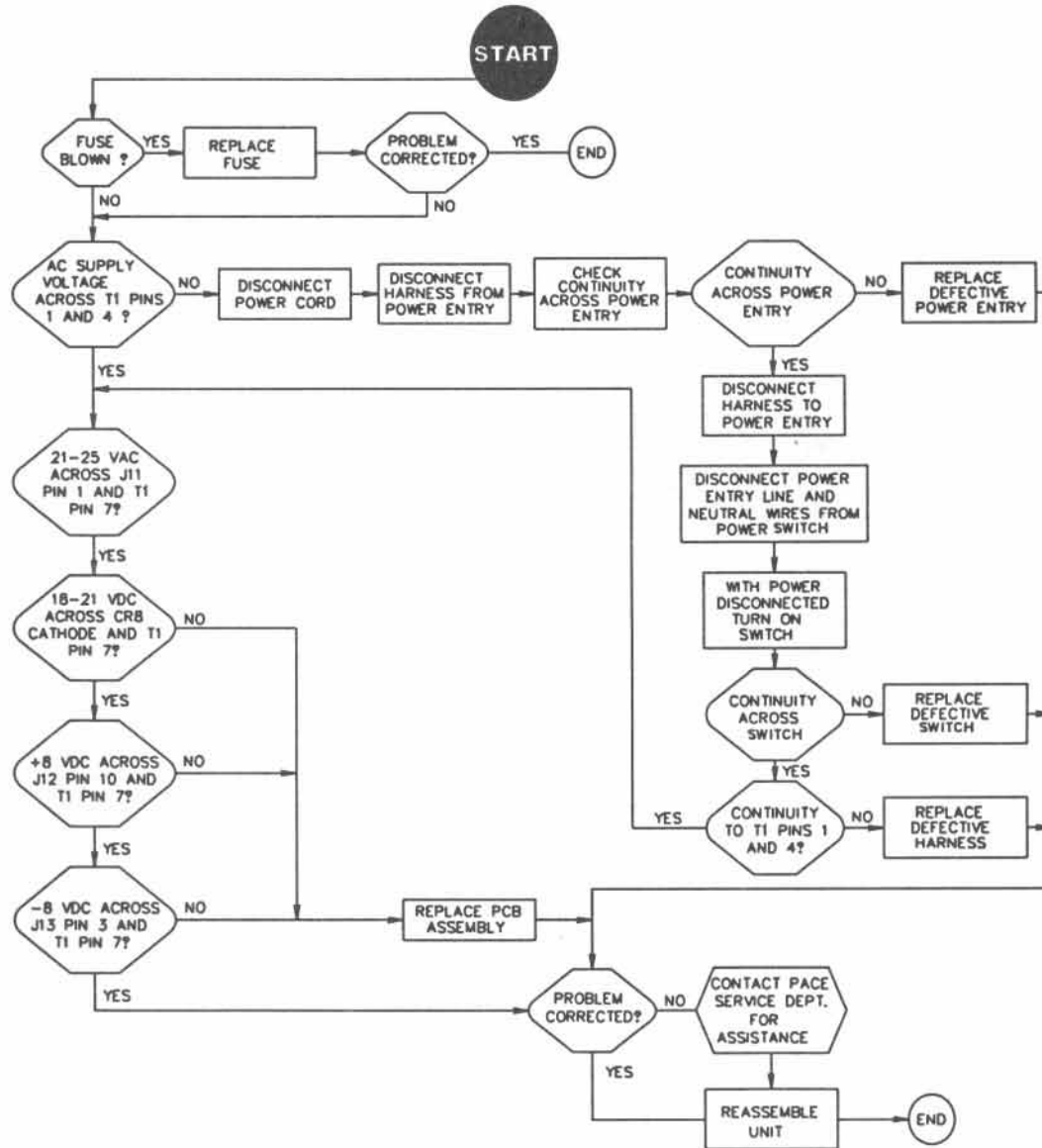


Figure 9. No Power Flow Chart

REPAIR

HEAT OUTPUT

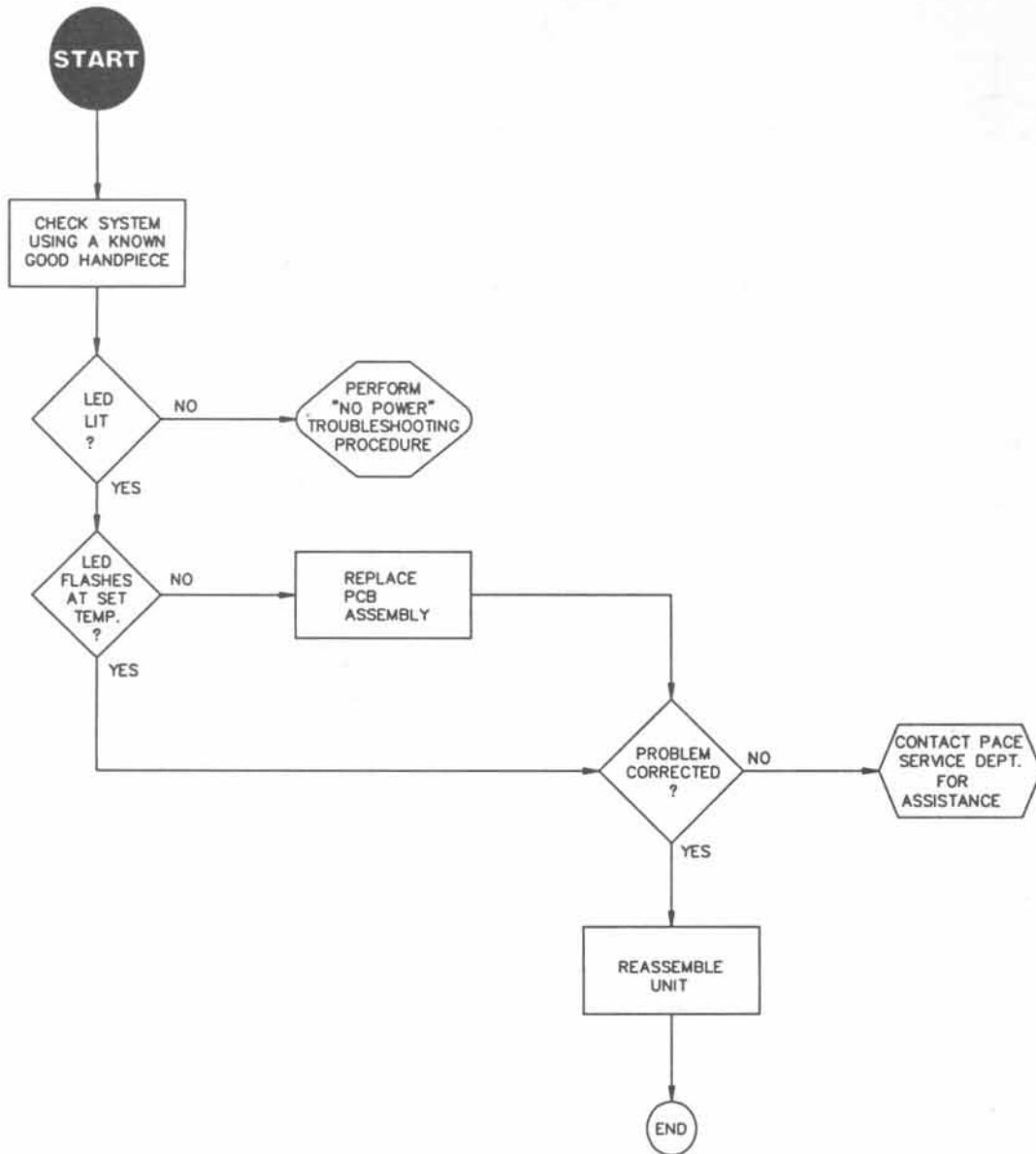


Figure 10. Heat Output Flow Chart

MOTOR MALFUNCTION

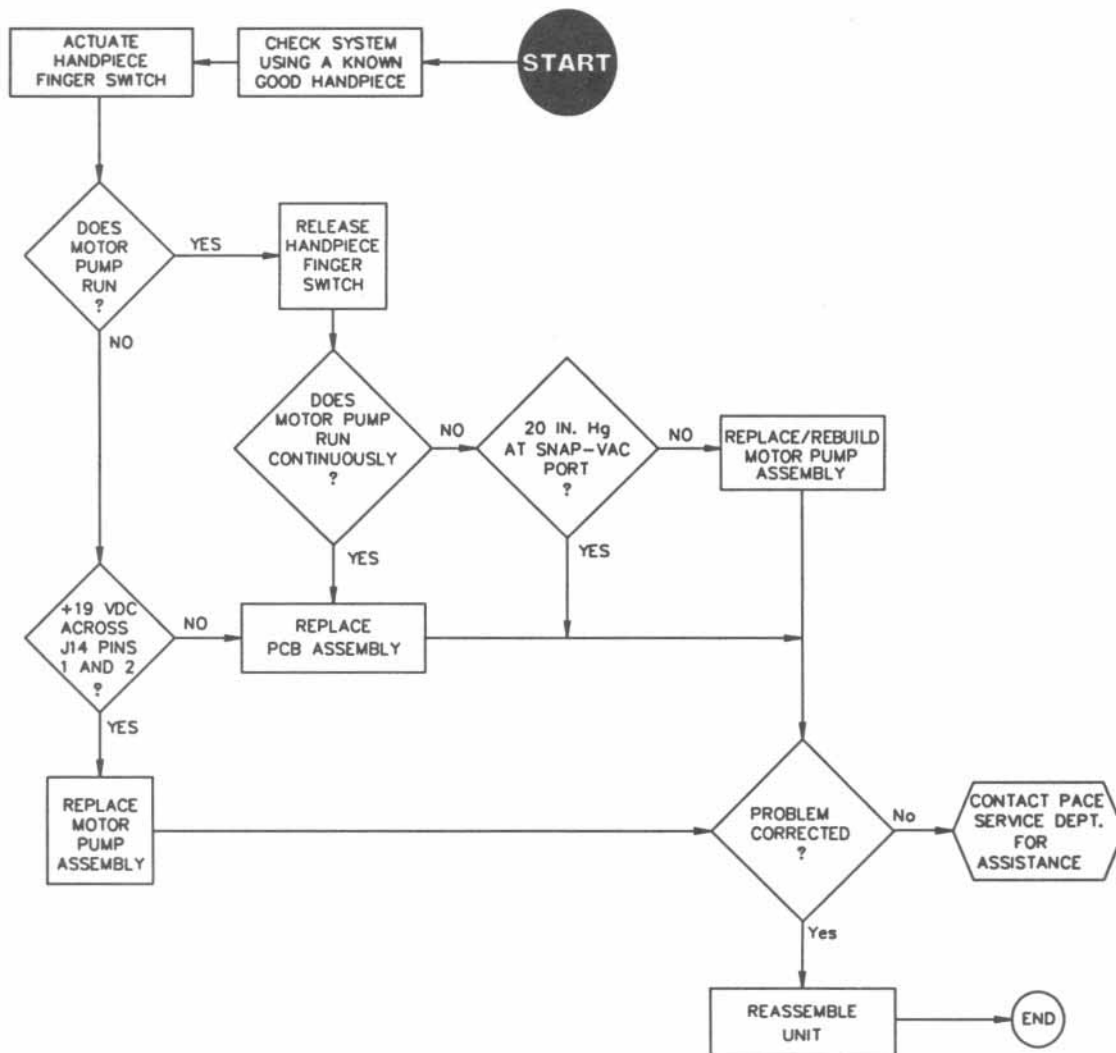


Figure 11. Motor Malfunction Flow Chart

REPAIR

WIRING DIAGRAMS

PPS 80 POWER SOURCES

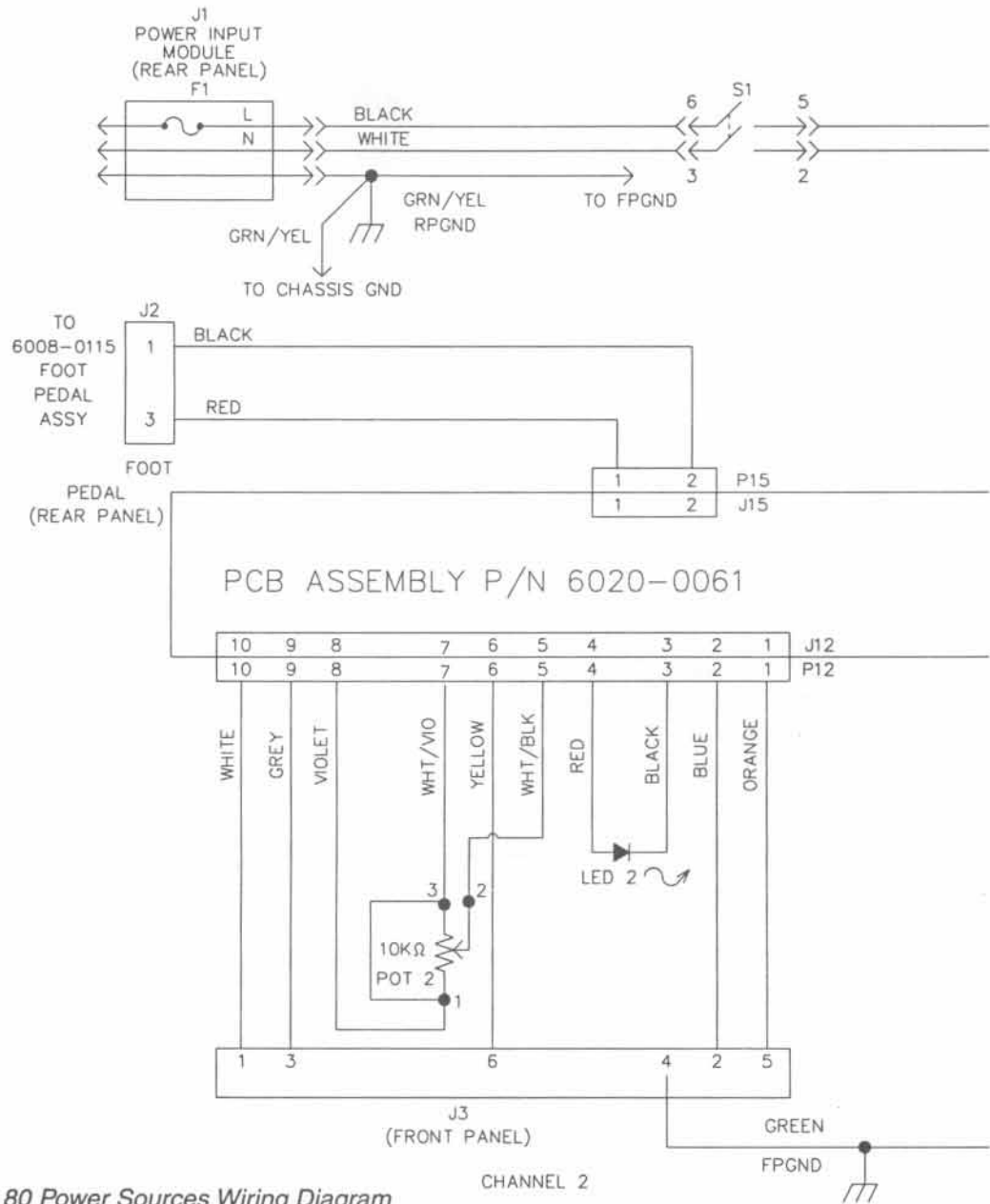
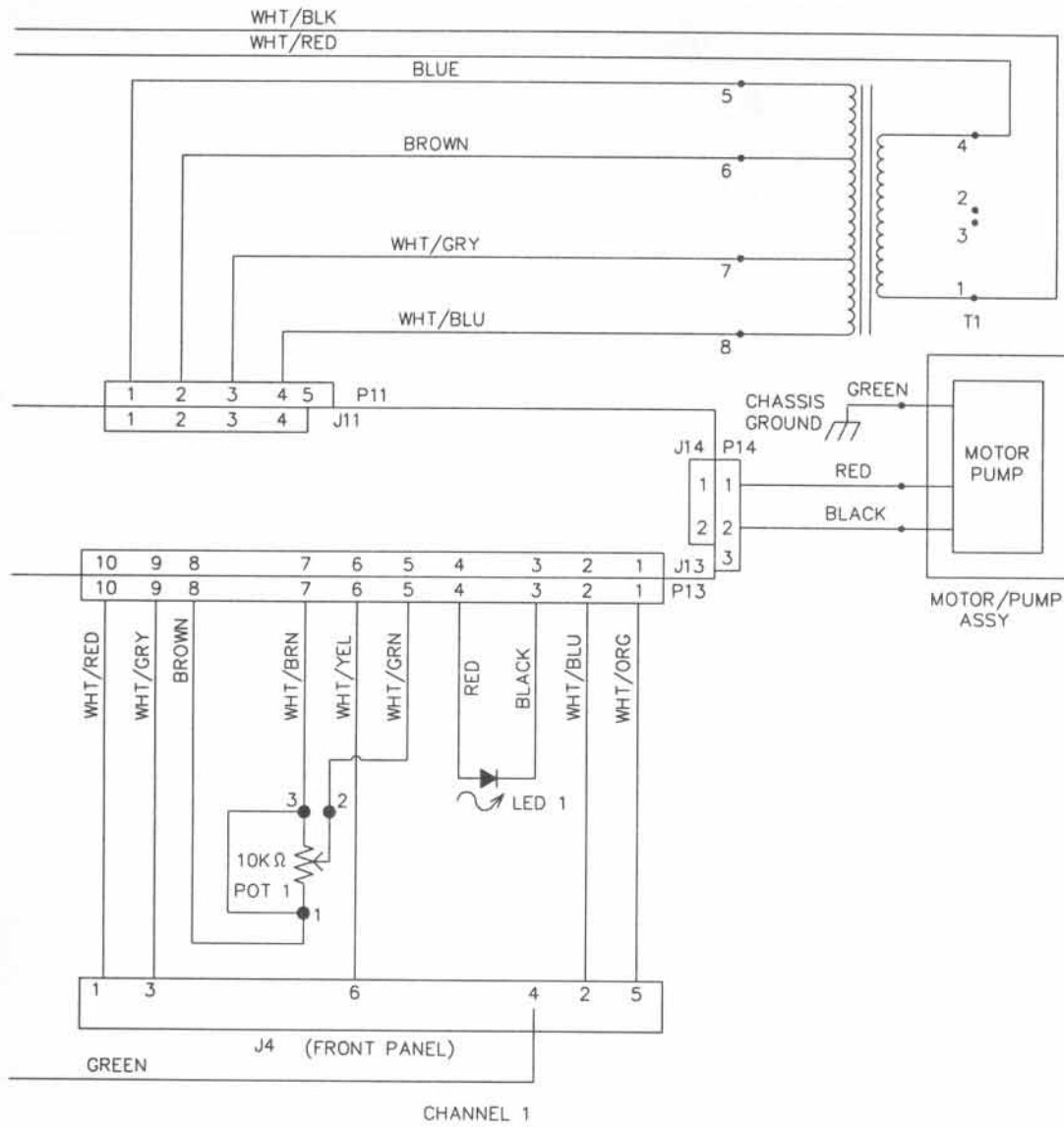


Figure 12. PPS 80 Power Sources Wiring Diagram

REPAIR

If you have any questions or notice any discrepancies between this wiring diagram and the wiring in your PACE power source, contact the PACE Service Department for assistance.



REPAIR

PPS 80A POWER SOURCES

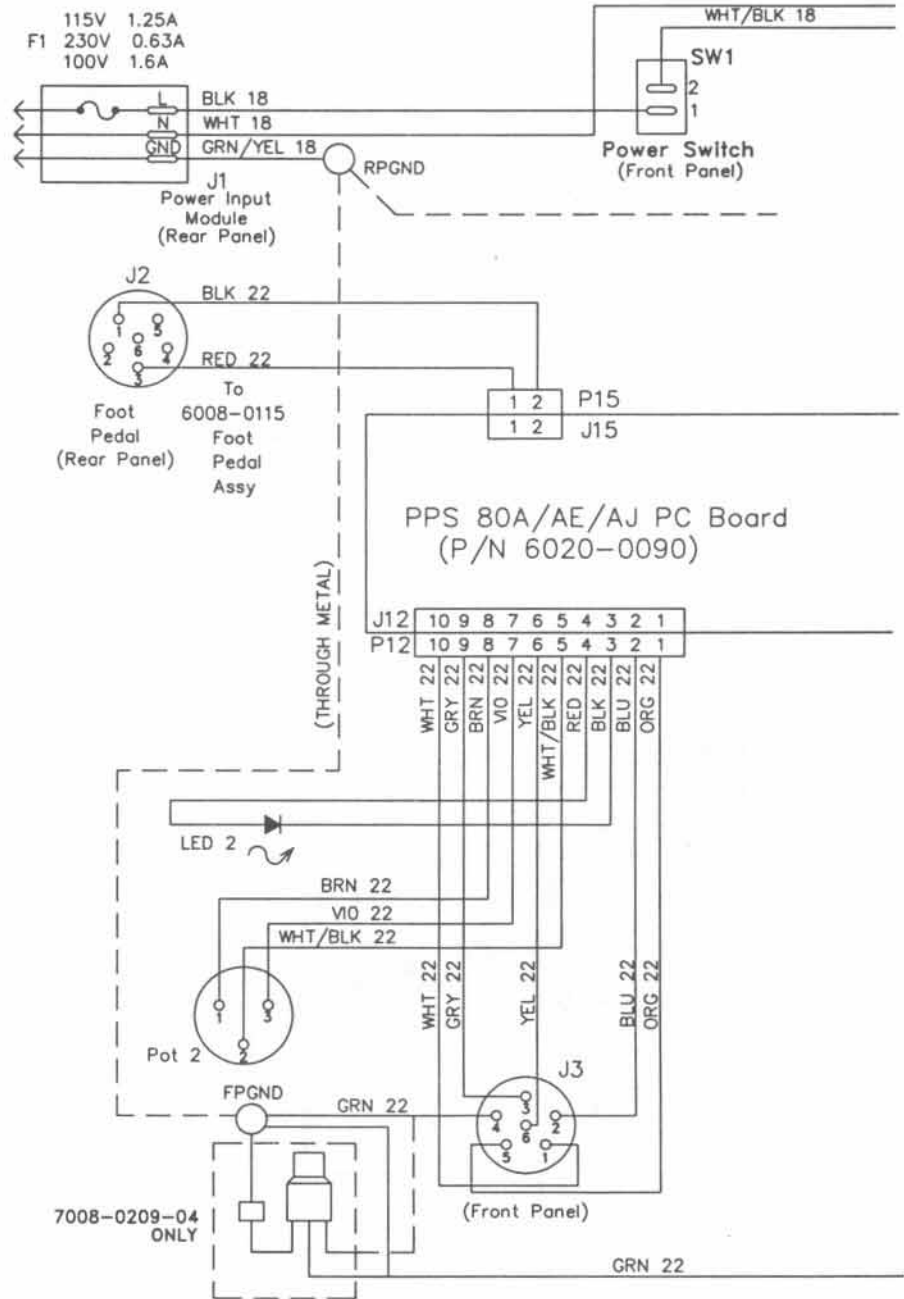


Figure 13. PPS 80A Power Sources Wiring Diagram

REPAIR

PPS 75 POWER SOURCES

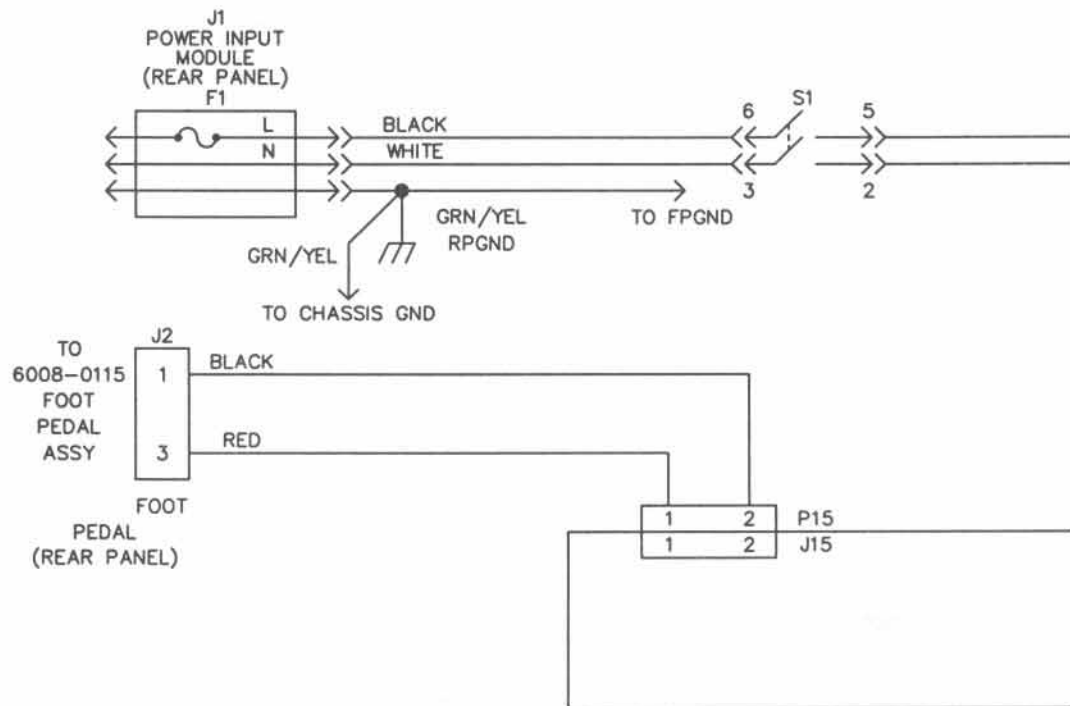
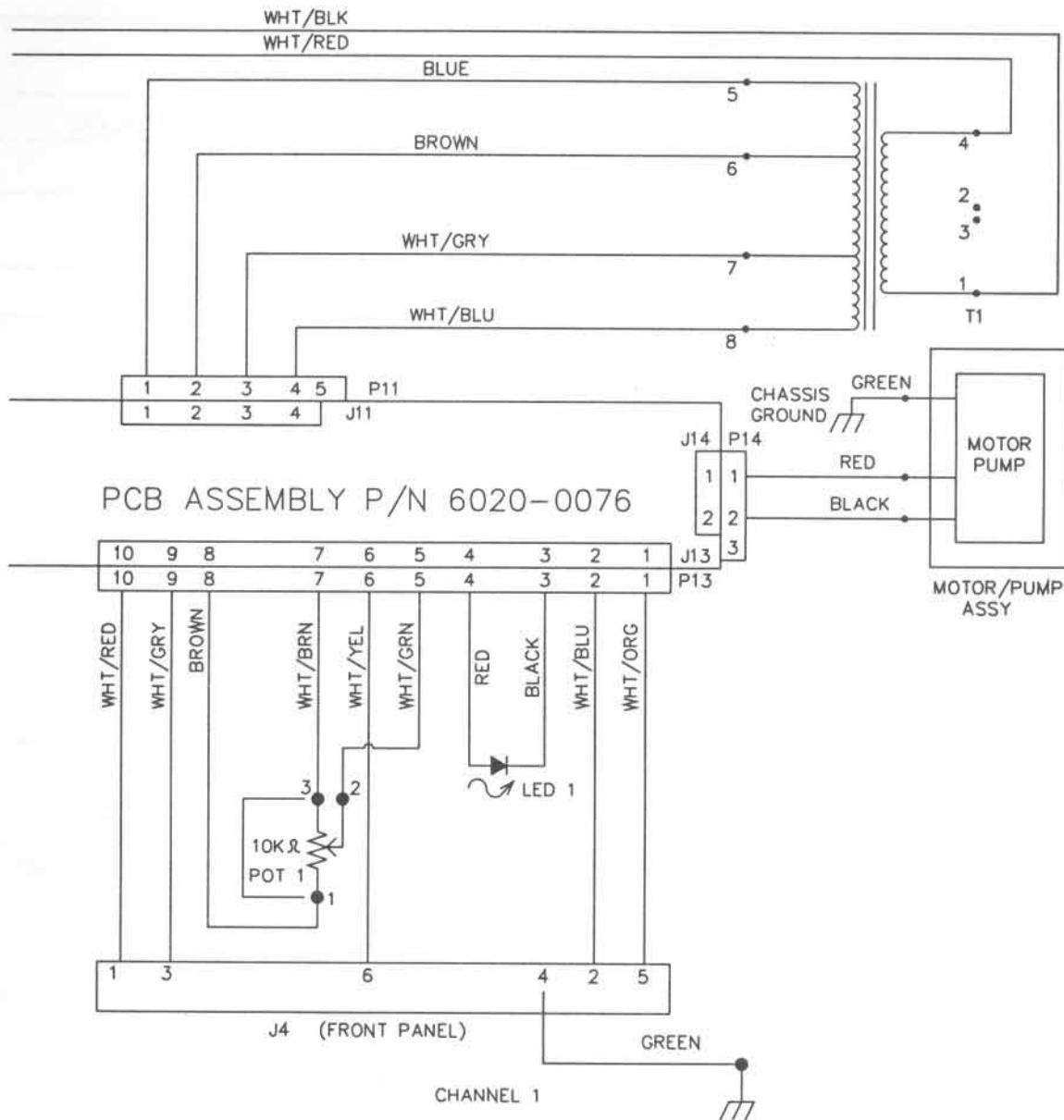


Figure 14. PPS 75 Power Sources Wiring Diagram

If you have any questions or notice any discrepancies between this wiring diagram and the wiring in your PACE power source, contact the PACE Service Department for assistance.



REPAIR

PPS 75A POWER SOURCES

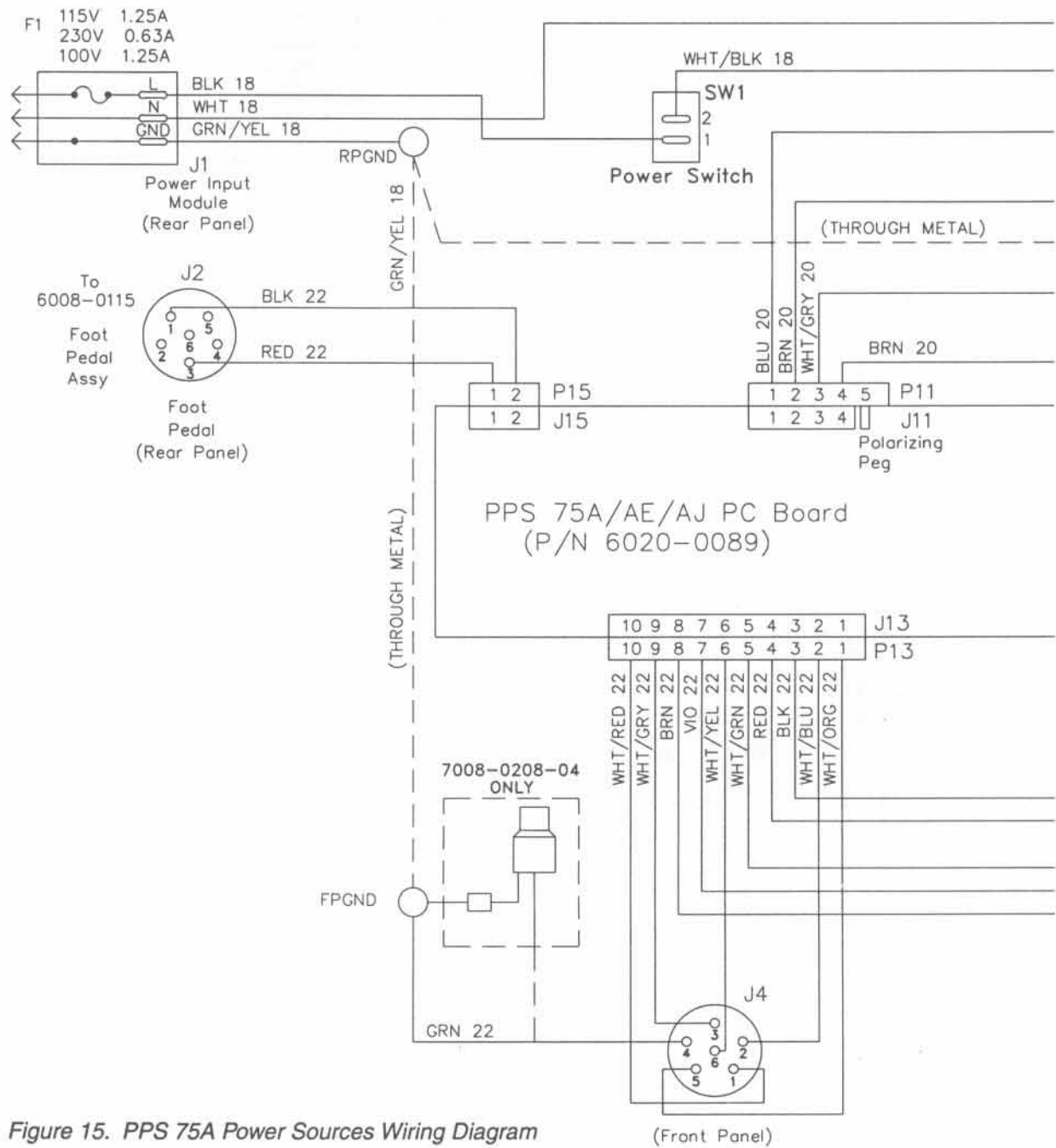
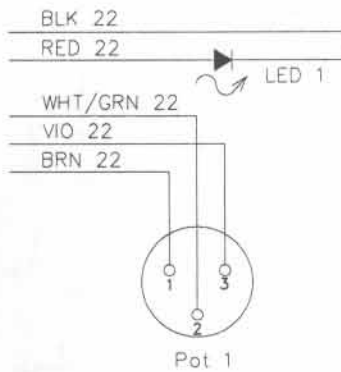
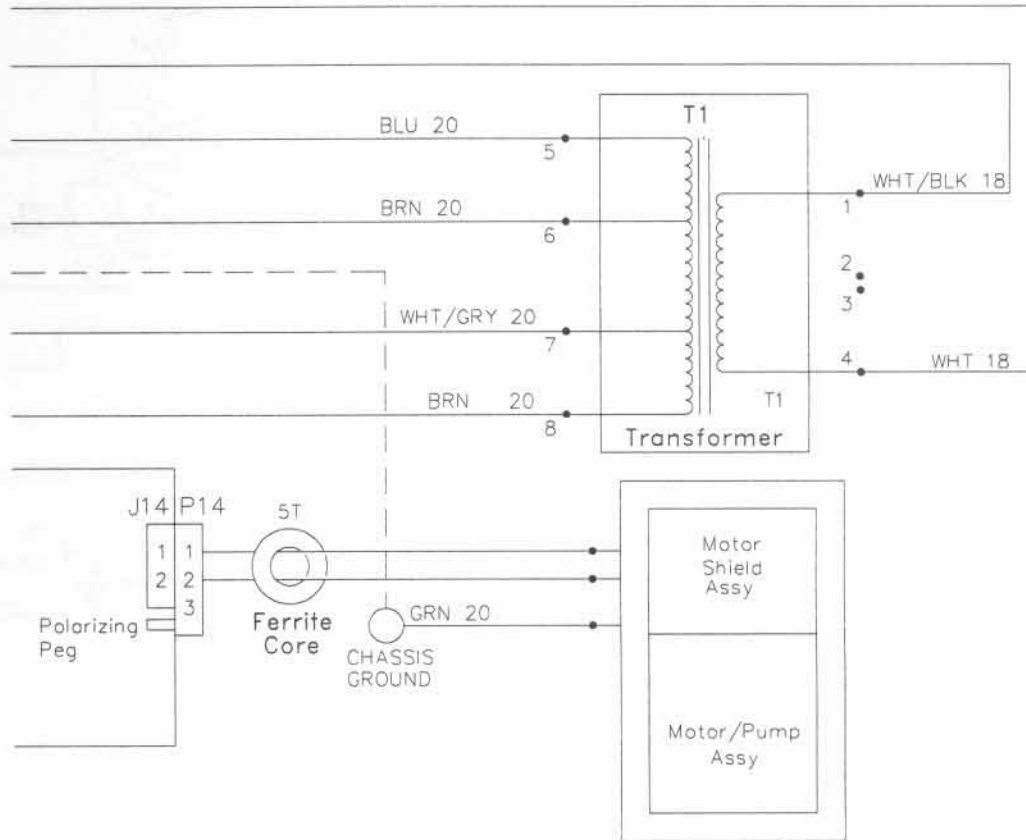


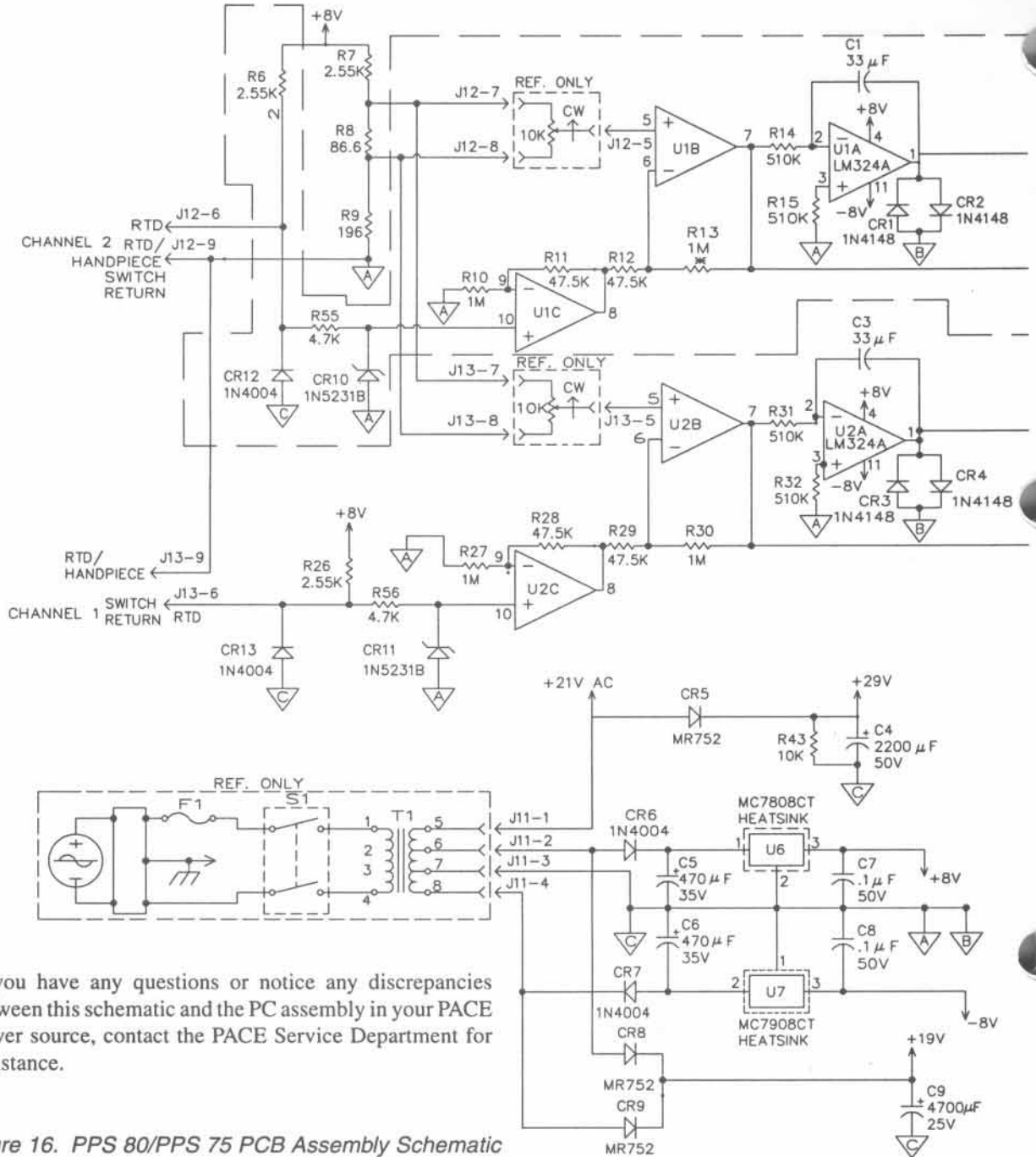
Figure 15. PPS 75A Power Sources Wiring Diagram



If you have any questions or notice any discrepancies between this wiring diagram and the wiring in your PACE power source, contact the PACE Service Department for assistance.

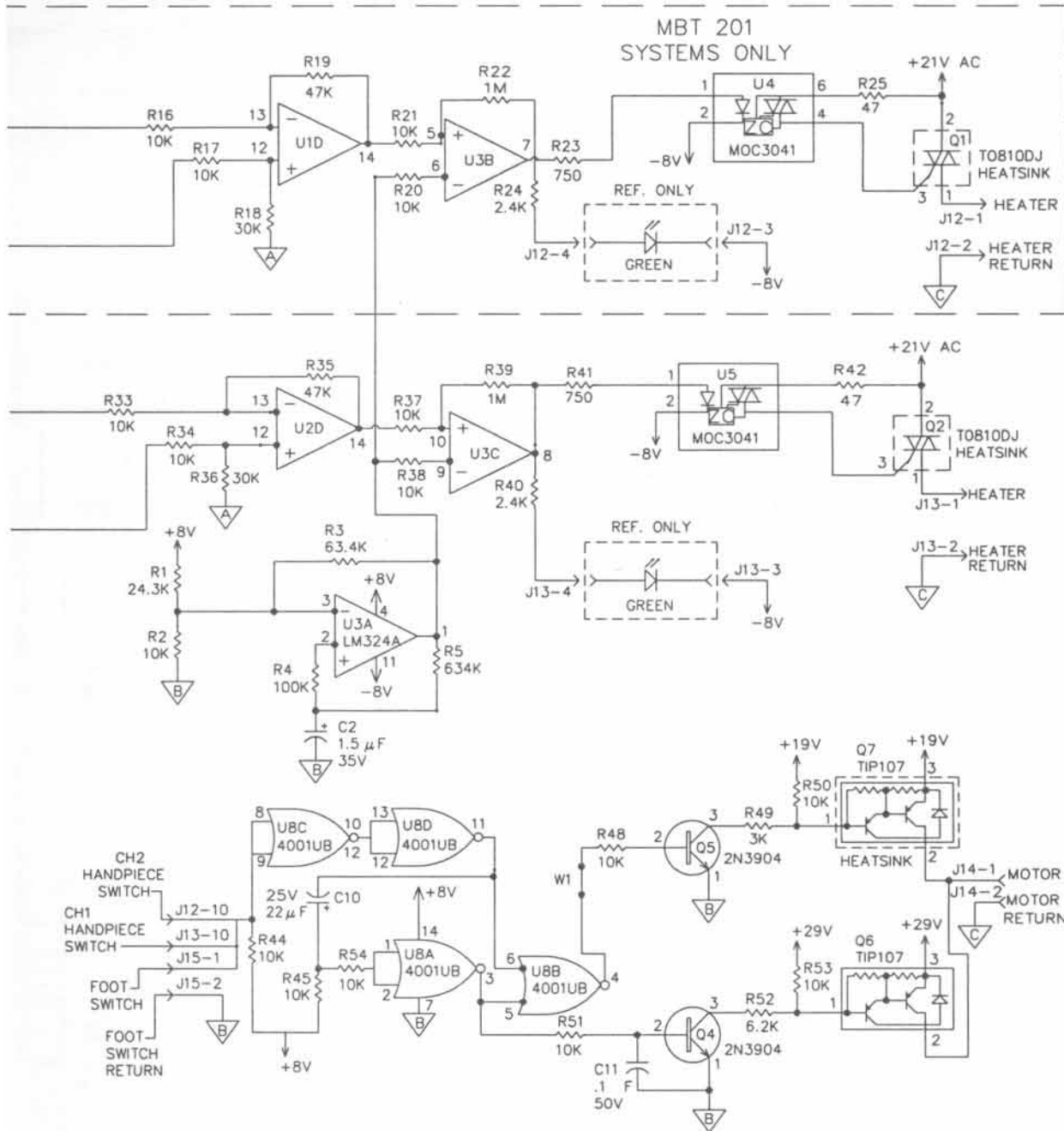
REPAIR

PPS 80/PPS 75 PCB ASSEMBLY SCHEMATIC



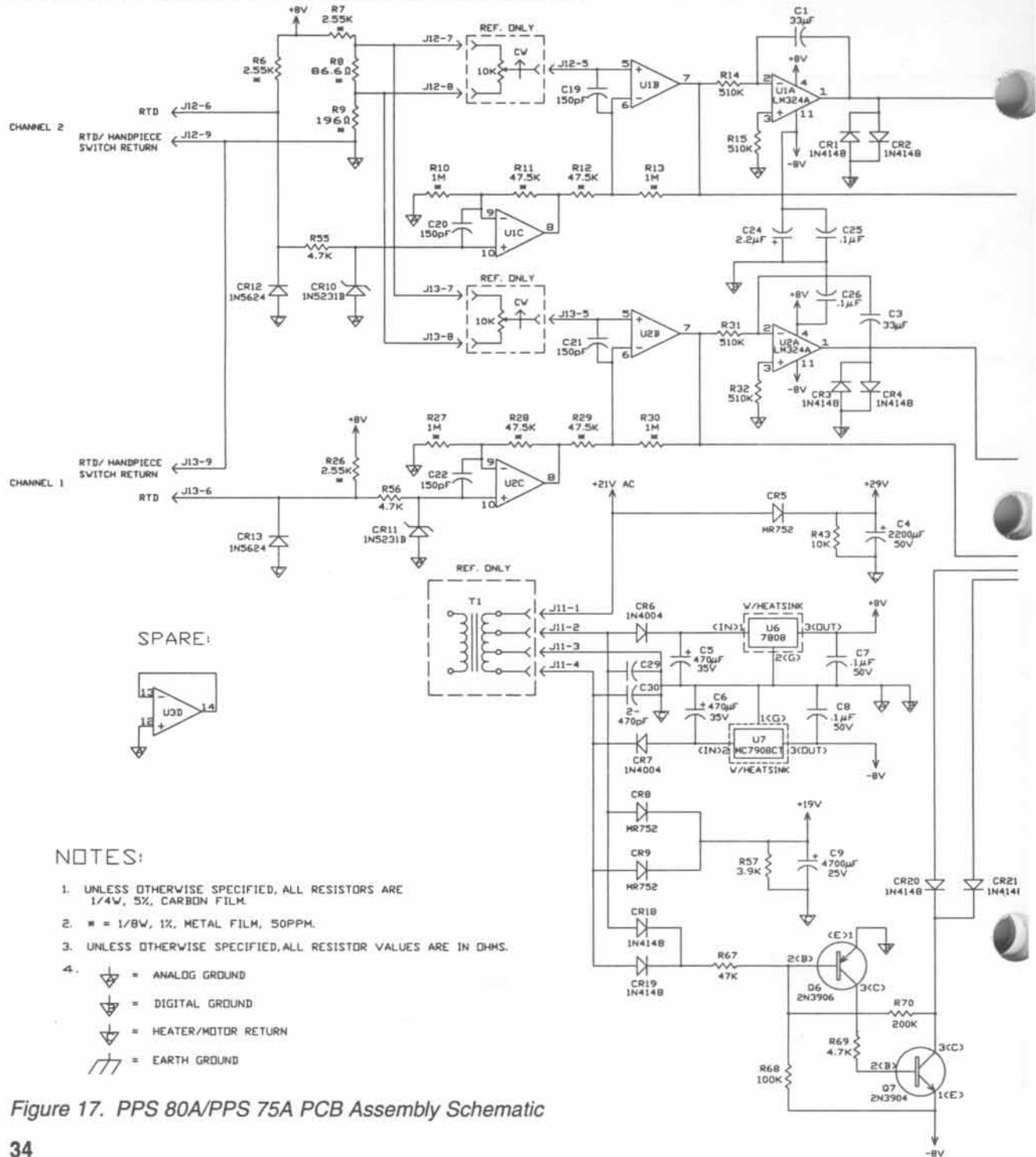
If you have any questions or notice any discrepancies between this schematic and the PC assembly in your PACE power source, contact the PACE Service Department for assistance.

Figure 16. PPS 80/PPS 75 PCB Assembly Schematic



REPAIR

PPS 80A/PPS 75A PCB ASSEMBLY SCHEMATIC

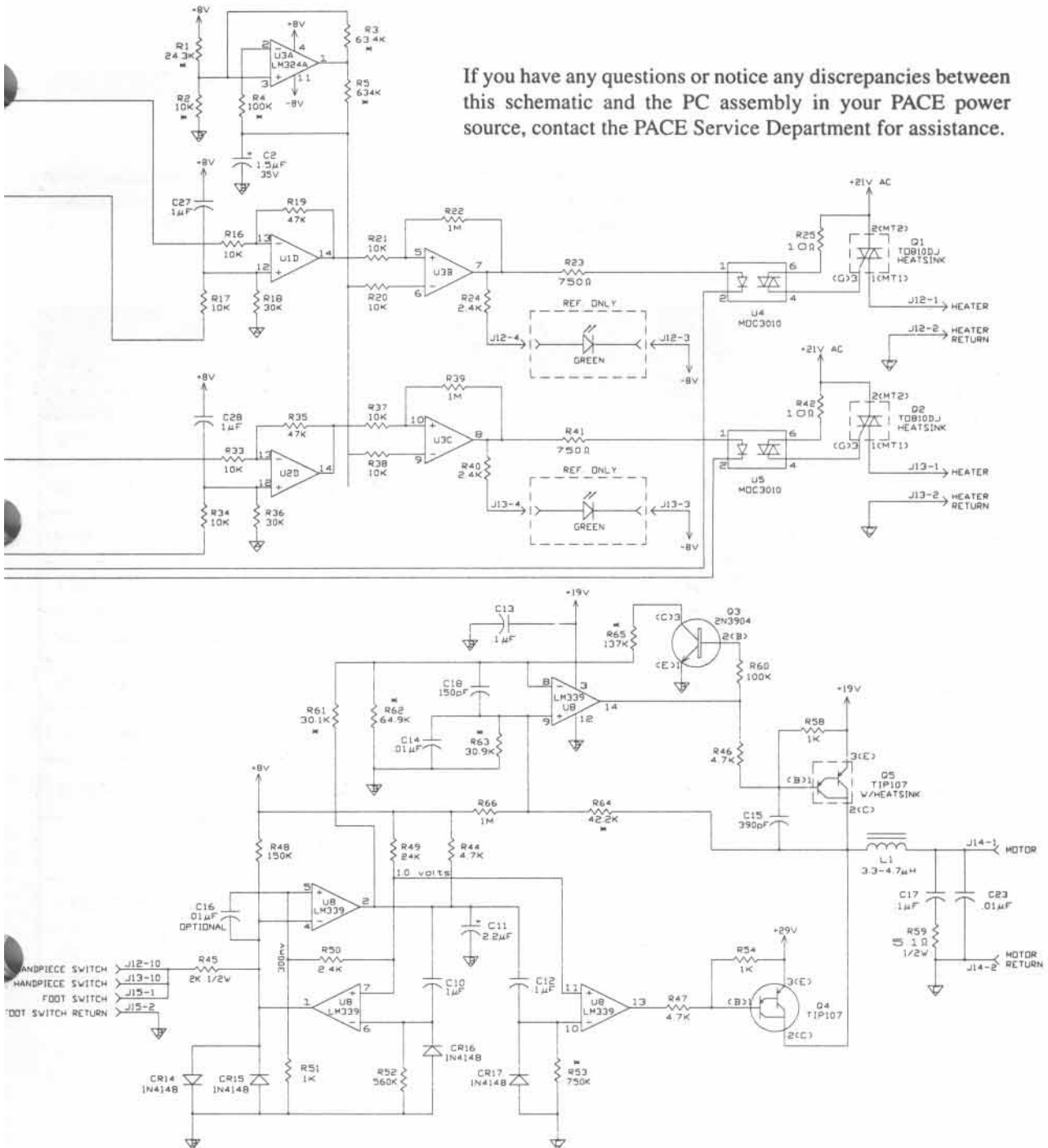


NOTES:

1. UNLESS OTHERWISE SPECIFIED, ALL RESISTORS ARE 1/4W, 5%, CARBON FILM.
2. ■ = 1/8W, 1%, METAL FILM, 50PPM.
3. UNLESS OTHERWISE SPECIFIED, ALL RESISTOR VALUES ARE IN OHMS.
4.
 - ▽ = ANALOG GROUND
 - ▽ = DIGITAL GROUND
 - ▽ = HEATER/MOTOR RETURN
 - ⏏ = EARTH GROUND

Figure 17. PPS 80A/PPS 75A PCB Assembly Schematic

If you have any questions or notice any discrepancies between this schematic and the PC assembly in your PACE power source, contact the PACE Service Department for assistance.



REPLACEMENT PARTS

POWER SOURCE

Listed below are the power source replacement parts which may be ordered directly from PACE sales or through your local authorized PACE distributor. Refer to Figure 1. To obtain any power source parts other than those listed below, contact the PACE Service Department directly at Tel. # (888) 535-7223 (toll-free) or Fax # (301) 483-7030.

Item Number	Description	Part Number		
		MBT 201 MBT 101	MBT 201J MBT 101J	MBT 201E MBT 101E
1	Power Switch	1157-0052	1157-0052	1157-0052
2	AC Power Receptacle/Fuse Holder	1207-0151	1207-0151	1207-0151
3	PCB Assembly (MBT 201A/J/E systems)	6020-0090	6020-0090	6020-0090
	(MBT 201/J/E non "A" systems)	6020-0061	6020-0061	6020-0061
	(MBT 101A/J/E systems)	6020-0089	6020-0089	6020-0089
	(MBT 101/J/E non "A" systems)	6020-0076	6020-0076	6020-0076
4	Motor Pump Assembly	6993-0188	6993-0188	6993-0188
5	Motor Pump Assembly Rebuild Kit	6993-0190	6993-0190	6993-0190
6	Fuse (F1), 1.25A Time Lag (MBT 201(A), MBT 101(A)/J)	1159-0217	1159-0251	----
	0.63A Time Lag (MBT 201(A)E, MBT 101(A)E)	----	----	1159-0214
	1.60A Time Lag (MBT 201(A)J)	----	----	1159-0256

Table 3. MBT 201/101 Power Source Replacement Parts

REPLACEMENT PARTS

ACCESSORIES

Listed below is a partial listing of accessory replacement parts. For a complete, current listing of available parts, contact PACE sales or your local authorized PACE distributor.

Item Number	Description	Part Number
1	Tip Maintenance Station	6993-0138
2	Replacement Sponge for Tray (7 pieces)	4021-0007-P7
3	Fiber Cleaning Tool (for Surface Mount tips)	1100-0232
4	Replacement Fiber Filler (pkg. of 2)	1127-0013-P2
5	Sponge Cleaning Tool (for Surface Mount tips)	1100-0233
6	Replacement Sponge Filler (pkg. of 5)	4021-0006-P5
7	Cleaning Sponge, Tip & Tool Stands	4021-0008-P3
8	Tip Redi-Rak	6021-0007
9	Tip & Tool Stand Redi-Rak	6021-0008
10	Foot Pedal	6008-0115
11	Tip & Temperature Selection System Charts Booklet	5050-0251
12	Tip & Temperature Selection System Chart Holder	1257-0186-P1
13	Power Source Interlock Kit	6993-0141
14	PACE Screwdriver	1100-0230
15	Service Manual	5050-0340

Table 4. Accessory Replacement Parts

REPLACEMENT PARTS

HANDPIECES

Listed below is a listing of available handpieces, Tip & Tool Stands & replacement heaters. For a complete, current listing of available parts & accessories, contact PACE sales or your local authorized PACE distributor.

Item Number	Description	Part Number
SensaTemp Handpieces		
1	SP-2A Sodr-Pen	6025-0014-P1
2	SP-1A Sodr-Pen	6025-0013-P1
3	SX-70 Sodr-X-Tractor	6010-0077-P1
4	TJ-70 Mini ThermoJet	7023-0002-P1
5	TP-65 ThermoPik	7024-0001-P1
6	DTP-80 Dual ThermoPik	7029-0001-P1
7	TT-65 ThermoTweez	7025-0001-P1
Tip & Tool Stands for SensaTemp Handpieces		
8	SP Tip & Tool Stand (used with items #1 & 2 above)	6019-0043
9	SX Tip & Tool Stand (used with items #3, 4 & 5 above)	6019-0044
10	TT Tip & Tool Stand (used with item #7 above)	6019-0046
11	DTP Tip & Tool Stand (used with item #6 above)	6019-0047
12	Tip & Tool Stand Redi-Rak	6021-0008

Table 5. Available Handpieces

Item Number	Description	Part Number
Sodr-X-Tractors		
1	SX-70 Heater & Seal Assembly	6010-0077-P1
2	SX-65A Heater & Seal Assembly	6010-0073-P1
Soldering Irons		
3	SP-2A Sodr-Pen Heater Assembly	6010-0086-P1
4	SP-1A Sodr-Pen Heater Assembly	6010-0085-P1
5	IR-70 Heater Assembly	6010-0078-P1
SMT Handpieces		
6	TJ-70 Heater Assembly	6010-0084-P1
7	TP-65 Heater Assembly	6010-0081-P1
TT-65 & DTP-80 Heater Assemblies		
8	Heater Assembly With Sensor	6010-0082-P1
9	Heater Assembly Without Sensor	6010-0083-P1

Table 6. Replacement Heaters

REPLACEMENT PARTS

HANDPIECE PARTS

Listed below are the handpiece replacement parts which may be ordered directly from PACE sales or through your local authorized PACE distributor. To obtain any handpiece parts other than those listed below, contact the PACE Service Department directly at Tel. # (888) 535-7223 (toll-free) or Fax # (301) 483-7030.

Item Number	Description	Part Number
1	Glass Chamber, SX-70 Sodr-X-Tractor	1265-0009-P1
2	Silicone Rubber Chamber, SX-70 Sodr-X-Tractor	1265-0010-P1
3	VisiFilter, Fixed	1309-0020
4	VisiFilter, Replaceable	1309-0028
5	Replaceable VisiFilter Elements (available in quantities of 10, 25, 50)	1309-0027
6	Sodr-X-Tractor Filter (available in quantities of 10, 50)	1309-0018
7	Heater Set Screws	1348-0547-P1
8	Vacuum Tubing, Translucent Silicone (66" length)	1342-0001-14
9	Vacuum Tubing, Translucent Silicone (54" length)	1342-0001-13
10	Vacuum Tubing (DTP-80 only)	1342-0027
11	Hose Clamps (all except DTP-80 handpiece)	1321-0085-P6
12	Hose Clamps, DTP-80	1321-0274-P6
13	Quick-Disconnect Fitting (Male)	1259-0087
14	Quick-Disconnect Fitting (Female)	1259-0086
15	Quick-Disconnect Fitting, Male, w/vacuum release (DTP-80 only)	1259-0102
16	Cable Marker Kit (Colored Tabs for hose/cord identification)	6993-0136
17	Tip Tool	1100-0206
18	Tip & Vacuum Cup Tool (DTP-80 & TP-65)	1100-0239
19	Tip Alignment Tool, ThermoTweez	1100-0234
20	Bristle Brush	1127-0002
21	Wire Brush, 3/16" Diameter	1127-0014
22	Wire Brush, 1/8" Diameter	1127-0006
23	Tip Cleaner Kit	6993-0151
24	AdapTip	1360-0083-P1
25	Vacuum Cup Kit, (DTP-80 & TP-65)	6993-0153
26	Thermal Insulative Handpiece Sleeve (all SensaTemp Air Handpieces)	1346-0065
27	Cushion Grip Kit (TT-65 & DTP-80)	6993-0184
28	Replacement Pads for Cushion Grips (TT-65 & DTP-80)	1317-0029-P2

Table 7. Handpiece Replacement Parts