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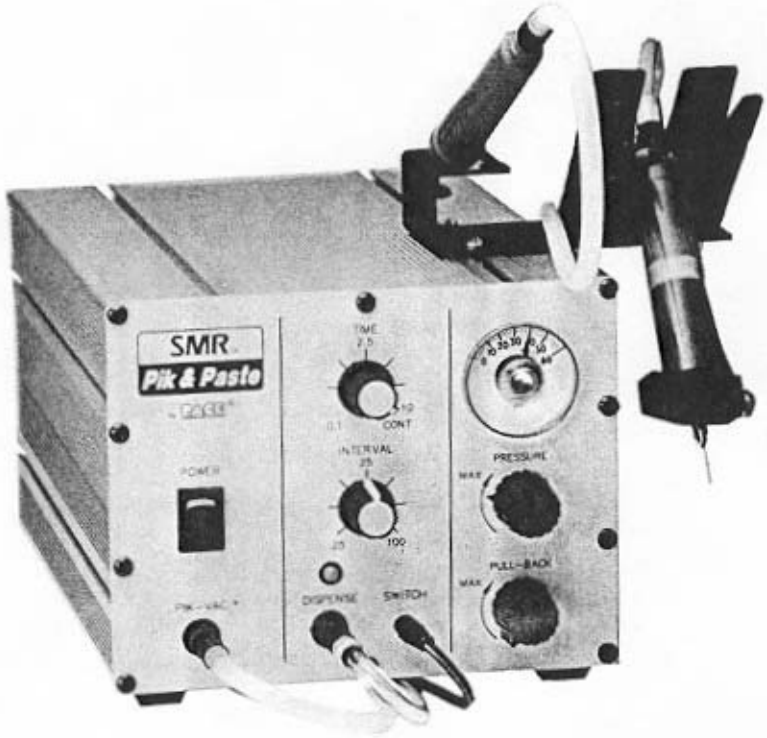
PACE®
INCORPORATED

PIK & PASTE 100 SYSTEMS



SYSTEM OPERATION & MAINTENANCE MANUAL

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USE OF THIS MANUAL

The information contained in this manual will provide the user with the basic knowledge necessary to properly operate and maintain the PACE Pik & Paste 100 system. PACE STRONGLY RECOMMENDS THAT THE USER READ AND FULLY UNDERSTAND THE "OPERATION" PORTION OF THIS MANUAL PRIOR TO USE OF SYSTEM. If you encounter any difficulty operating your system, call your local authorized PACE dealer or contact PACE Applications Engineering directly at Tel. (301) 490-9860 or FAX (301) 604-9215.

INTRODUCTION

The Pik & Paste 100 is a microprocessor controlled, self-contained, automatic liquid dispensing and component handling system.

The automatic liquid dispensing feature has a self-contained, high pressure pump and reservoir. Pressure is adjustable for each individual application. A Vacuum **PULL-BACK** Control allows accurate dispensing of even low viscosity liquids.

The Pik-Vac feature provides a quiet and gentle vacuum source to the Pik-Vac wand for use in the handling and placement of surface mount components and other small parts.

GENERAL INFORMATION

SPECIFICATIONS

Models: Pik & Paste 100 - Version operates on 103-127 VAC, 60 Hz. 60 Watts.

Pik & Paste 100E - Version operates on 195-264 VAC, 50/60 Hz. 60 Watts.

Size:	13.3 cm H x 16.5 cm W x 25.4 cm D (5.25 in H x 6.5 in W x 10.0 in D)
System Weight:	3.6 Kg (8 Lbs)
Dispenser Output Pressure Range:	0-2.76 Bar (0-40 PSI)
Shot Time Control Time Range:	0.1-10 seconds
Interval Time Control Repeat Range:	0.5-100 seconds
Timing Repeatability:	± 1%
Typical Viscosity Range: (varies with different needle configurations)	100 - 550,000 centipoise (1 centipoise = .01 gram/cm sec.)
Vacuum Pull-Back Range:	0 cm Hg. - 3.8 cm Hg. (0" Hg. - 1.5" Hg.)

PARTS IDENTIFICATION

FRONT PANEL

1. **POWER SWITCH** - Turns system ON ("1") and OFF ("0"); controls input power to the system. Also provides power to the Pik-Vac vacuum pump.
2. **PIK-VAC PORT** - Quick connect fitting which provides vacuum for Pik-Vac handpiece.
3. **SHOT TIME CONTROL** - Determines variable time controlled shot (0.1 - 10 seconds) of air pressure at **DISPENSE** Port upon finger switch (or optional foot pedal) actuation. In **CONT** position, continuous air pressure is delivered from the **DISPENSE** Port upon finger switch (or optional foot pedal) actuation. Delivery of air pressure stops immediately if the finger switch (or optional foot pedal) is released.
4. **INTERVAL TIME CONTROL** - Provides an adjustable delay (.5 - 100 seconds) between Shot **TIME** Control dispense shots.
5. **DISPENSE LED** - Illuminates Green when air pressure is delivered from the **DISPENSE** Port. Illuminates Yellow when the dispense pump reservoir is charging (no air pressure delivery from **DISPENSE** Port). Illuminates Red for system fault.
6. **DISPENSE PORT** - Quick connect fitting which provides air pressure (timed or continuous) to dispensing barrel.
7. **FINGER SWITCH RECEPTACLE** - Provides finger switch connection for start of timed or continuous dispensing operation.
8. **VACUUM PULL-BACK CONTROL** -Provides adjustable vacuum (PULL-BACK) control to prevent drip or oozing of low viscosity fluids between dispensing cycles.
9. **PRESSURE CONTROL** - Adjustable output air pressure regulator provides precision control of fluid flow.
10. **PRESSURE GAUGE** - Provides analog display of air pressure output to **DISPENSE** Port.

REAR PANEL

11. **AC POWER RECEPTACLE/FUSE HOLDER** - Receptacle for providing power to the Pik & Paste 100 system from AC outlet through power cord. Also location of fuse (F1) which protects the system from overcurrent conditions.
12. **FUSE F1** - Provides overload protection for Pik & Paste 100 system.
13. **FOOT PEDAL RECEPTACLE** - Input for optional foot pedal to actuate dispense cycles of the system.

14. **LOW PRESSURE PORT** - Low pressure output with quick connect fitting. Controlled by the **POWER** Switch (on front panel).

15. **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.

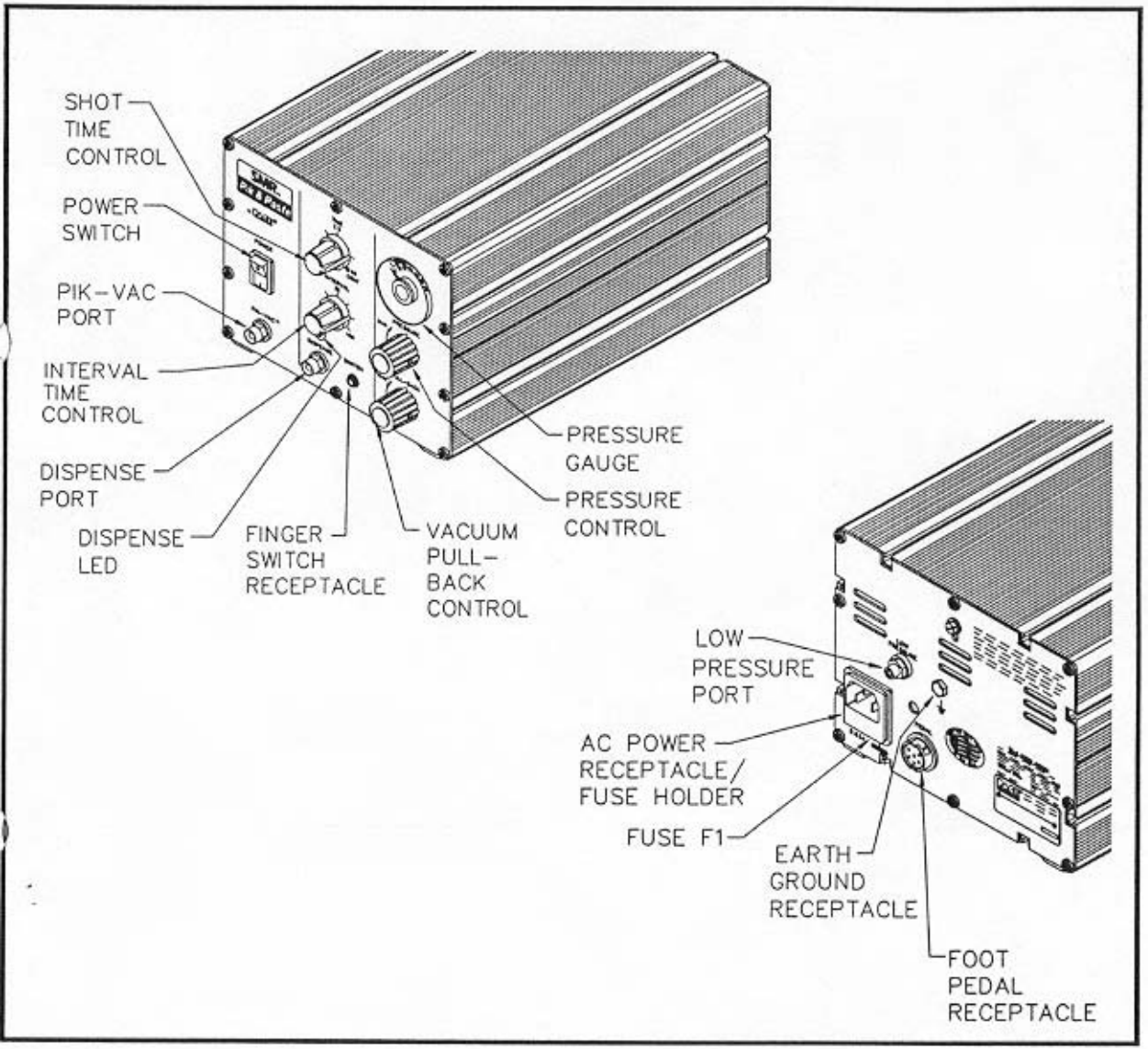


FIGURE 1. PARTS IDENTIFICATION

CAPABILITIES

DISPENSING

This component of the system can dispense a variety of solder creams, fluxes, potting compounds, adhesives and low viscosity liquids. The Dispense air hose comes equipped to accept standard 10cc material barrels. The self-contained pump supplies nominal 2.76 Bar (40psi) of air pressure to the barrel. Above the **DISPENSE** Port, you will find the Shot Time Control labeled **TIME**. With this control in the continuous (**CONT**) position the dispenser pump will supply continuous air pressure to the barrel while the finger switch (or optional foot pedal) remains depressed. In the **0.1** to **10** position, each actuation of the finger switch (or foot pedal) will activate the pump for the indicated time period. If the finger switch (or optional foot pedal) is released during the cycle time period, delivery of air pressure stops immediately. The LED will light Green when air pressure is being applied to the barrel.

NOTE

The dispense pump will periodically run for short periods (runs every 15 minutes for 15 seconds) to maintain internal pressure. The pump will continue to run (LED lit Yellow) while the system recharges. The Pik-Vac pump runs continuously.

NOTE

As with any dispensing system, when thick viscous material or solder paste is to be dispensed, ensure that the material is fresh, has been stored properly and is at room temperature as per supplier's recommendations.

COMPONENT HANDLING

A PACE PV-65 PIK-VAC Vacuum Wand lets you easily pick up and accurately place components. Turning on the system **POWER** Switch will cause a continuous vacuum at the **PIK-VAC** Port. A variety of tips and vacuum cups are supplied to handle most surface mount components and other small parts.

LOW PRESSURE

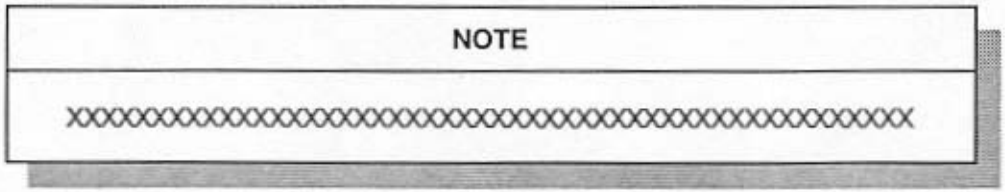
An auxiliary **LOW PRESSURE** Port located on the rear panel can be used to operate low pressure accessories such as a sprayer.

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 personnel 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.

USAGE PRECAUTIONS

CAUTIONS

1. **HYGIENIC PRACTICES** - Personnel who handle dispensing materials should wash their hands and face thoroughly before eating, smoking or using rest room facilities.

2. **TRAINING** - Proper training should be given to personnel handling these materials.

3. Exercise proper precautions when using chemicals (e.g., adhesives). Refer to the Material Safety Data Sheet (MSDS) supplied with each chemical and adhere to all safety precautions recommended by the manufacturer.

4. The use of Safety Glasses is recommended when loading barrels.

NOTES

Turn **POWER** Switch OFF ("0") when equipment is not in use for extended periods of time.

SERVICING PRECAUTIONS

DANGERS

POTENTIAL SHOCK HAZARD - Repair procedures performed on this product 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

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

5. Assemble and install the PACE part number 6019-0041 Pik & Paste Cubby (with drip trays) to the power source. Assembly instructions are enclosed with the cubby.

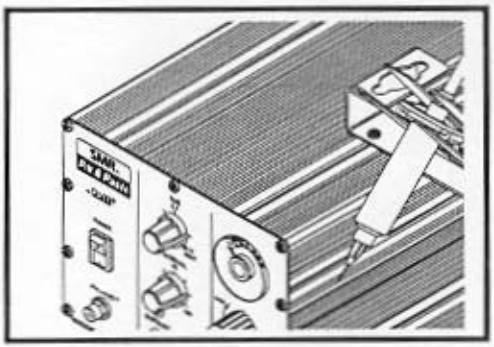


FIGURE 3. POWER SOURCE WITH CUBBY

NOTE

The Pik & Paste Cubby is designed to accommodate 5, 10 & 30cc barrels only.

NOTE

The dispenser and the Pik-Vac are each supplied with an Air Hose. The Pik-Vac is supplied with a translucent, milky colored, silicone Air Hose. The Air Hose supplied with the dispenser is a clear plastic. **DO NOT** use the translucent Air Hose on the dispenser.

DISPENSER INSTALLATION

6. Locate the Paste Dispenser Kit (PACE P/N 6993-0152) provided with the system.

7. Attach the ridged end of the male quick connect Hose Mount Fitting to one end of the clear plastic Air Hose.

8. Insert the male quick connect Hose Mount Fitting (attached to Air Hose) into the female DISPENSE Port.

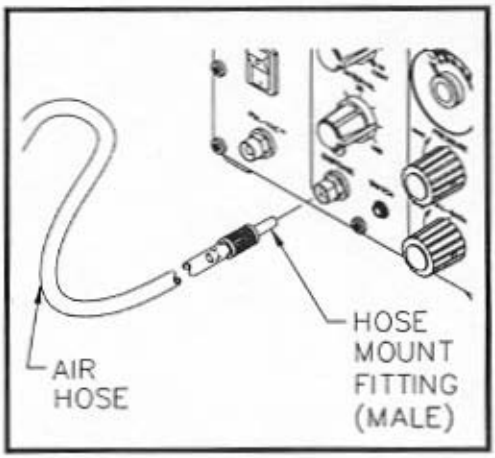


FIGURE 4. DISPENSE PORT CONNECTION

DISPENSER INSTALLATION CONT'D

9. Slide the Hose Clamp over the free end of the Air Hose. Push the Hose Clamp back 1 inch from the end of the Air Hose.

> **NOTE**
>
> PACE supplies a Barrel Adapter for only the 10 cc size Barrel. PACE does not supply Barrels. Barrels and Barrel Adapters may be purchased from a variety of vendors.

10. Attach the free end of the Air Hose to the nipple on the Barrel Adapter (10 cc adapter is supplied).

11. Secure the Air Hose to the Barrel Adapter by sliding the Hose Clamp down over the Air Hose/Barrel Adapter connection. Screw the clamp over the Air Hose to fitting connection to secure in position.

12. Attach the Barrel Adapter to a Barrel prefilled with material (not supplied). Place the Barrel in the Pik & Paste Cubby.

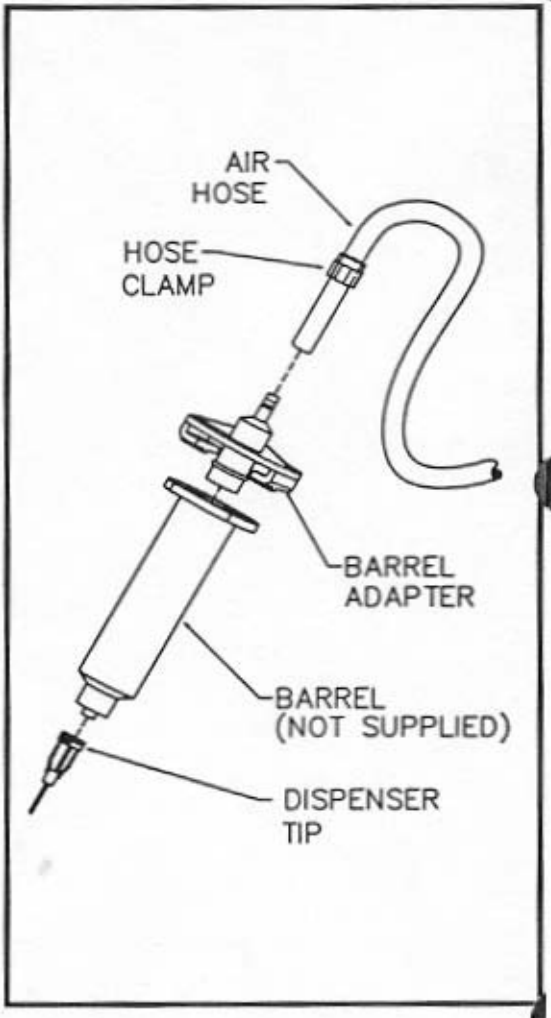


FIGURE 5. BARREL CONNECTION

FINGER SWITCH INSTALLATION

13. Place the Finger Switch over the end of the attached Barrel as shown in the illustration. Tighten Screw to secure in position.

14. Attach the supplied Cable Clips over the Air Hose and Finger Switch wiring as shown. Install the first clip 1 inch behind the Barrel Adaptor to Air Hose connection. Install the remaining clips evenly along the length of the Air Hose.

15. Insert the Finger Switch Cable Jack into the Finger **SWITCH** Receptacle on front panel of the power source to enable dispense operation.

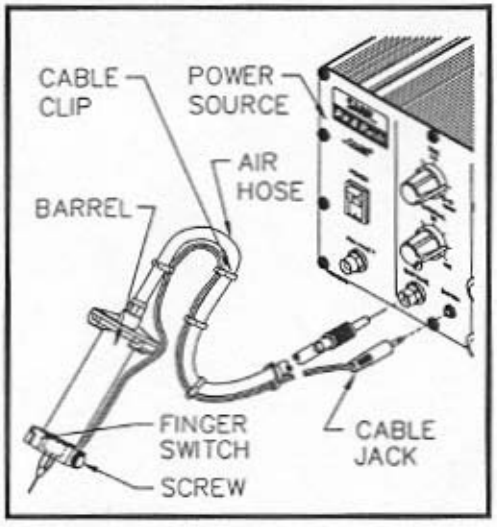


FIGURE 6. FINGER SWITCH

FOOT PEDAL CONNECTION

16. If the optional foot pedal has been purchased, insert the foot pedal connector plug into the **PEDAL** Receptacle on the rear panel of the power source using the following procedure.

    a) Turn Locking Ring fully counterclockwise.

    b) Orient Connector Key with the Receptacle Keyway.

    c) Insert connector plug into **PEDAL** Receptacle.

    d) Turn Locking Ring fully clockwise to lock in place.

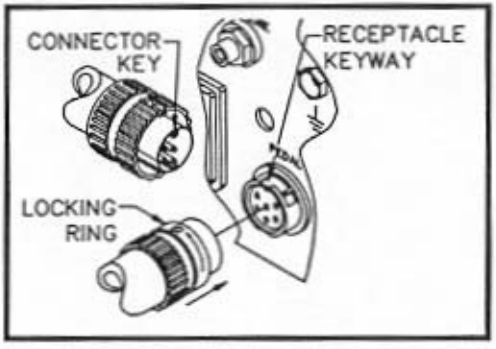


FIGURE 7. FOOT PEDAL

PIK-VAC INSTALLATION

17. Locate the Pik-Vac (P/N 7027-0001-P1) and the Vacuum Cup Kit (P/N 6993-0154) supplied with the system.
18. Attach the ridged end of a male quick connect Hose Mount Fitting to each end of the translucent, milky colored, silicone Air Hose.
19. Attach one male quick connect Hose Mount Fitting (with attached Air Hose) to the rear of the Pik-Vac handpiece.
20. Insert the other male quick connect Hose Mount Fitting (with attached Air Hose) into the **PIK-VAC** Port.
21. Attach the metal Vacuum Tip to the end of the Pik-Vac handpiece.

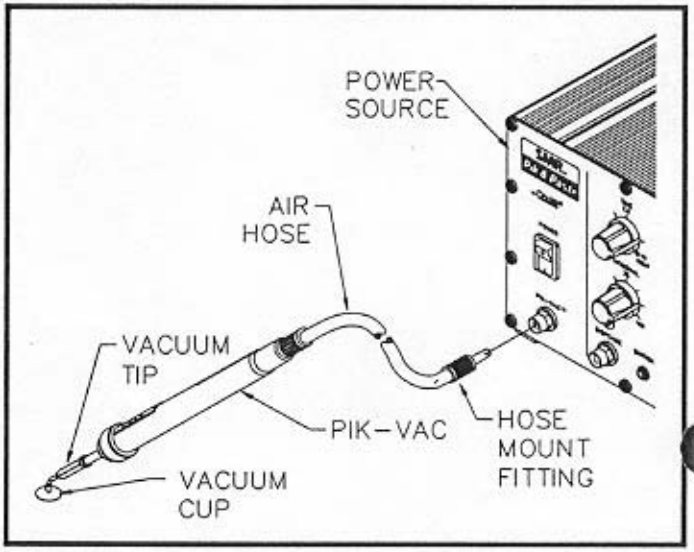


FIGURE 8. PIK-VAC

CAUTION

When removing any Air Hose, turn and pull. DO NOT attempt to pull Air Hose directly off. Damage to or breakage of Hose Mount Fitting may occur.

POWER CONNECTION

22. Plug the prong end of the power cord into a convenient three wire grounded AC power outlet. The system is now ready for operation.
23. Read the "OPERATION" section of this manual thoroughly before operating the system.

INTRODUCTION

The Pik & Paste systems are easy to operate and allow the operator the flexibility of using the features as desired.

NOTE

PLEASE READ THE FOLLOWING "OPERATION" SECTION THOROUGHLY BEFORE ATTEMPTING TO USE THE SYSTEM.

POWER UP

1. Insure that the system is properly prepared for operation. Refer to the "Set-Up" portion of this manual. The prefilled barrels of dispensing material (and vacuum cup when placing components) selected for your application should be connected to the unit.

2. Turn the **POWER** Switch to the ON ("1") position.

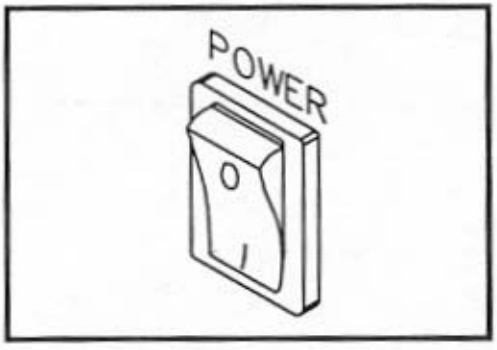


FIGURE 9. POWER ON

OPERATION

DISPENSING

PACE recommends that the operator become familiar with the operation of the dispenser by first applying the material to a piece of scrap paper or scrap PC board. Use this method to obtain the desired results for each dispensing material and application.

MATERIALS USED FOR DISPENSING

CAUTION

Always refer to the Material Safety Data Sheet supplied with the material as a guide for proper handling and safety precautions. Any material being dispensed must be compatible with the barrels (e.g., polypropylene) being used.

Listed following are some of the materials which may be dispensed.

PREFILLED BARRELS

Barrels prefilled with solder creams and brazing pastes of 100 to 550,000 centipoise viscosity may be dispensed using the needle size selections provided with your system.

All types of adhesives (anaerobics, cyanoacrylates and epoxies) dispense well. Eliminate any "stringing" of the material by using a small tip. If stringing does occur, dilute the adhesive with a solvent recommended by the material manufacturer.

ANAEROBICS

Application of the minimum amount of material dispensed in dot form using the "Timed" method is recommended.

CYANOACRYLATES

Application similar to anaerobics. Recommendations are identical to anaerobics.

CAUTION

Careful handling of these materials is essential to avoid skin contact. Do not use cyanoacrylates in any application which may see high temperatures (e.g., solder connections). Release of small amounts of cyanide gases may occur under such conditions.

EPOXIES

One part epoxies may be dispensed in a normal manner in either the Timed or CONT (continuous) mode. Viscosity of two part epoxies will change as the material cures. Use only the amount necessary in the dispensing barrel. If changes in viscosity occur, an increase in application time or change in tip size may be required for proper results.

LUBRICANTS

All types dispense well and may be dispensed in a normal manner in either the timed or CONT (continuous) mode.

SILICONES/RTV

Usually single component, solvent based potting compounds or adhesives which cure due to the evaporation of solvents contained in the material. Once exposed to the atmosphere, Silicones/RTV have a short shelf life. Always use fresh material.

SOLDER AND BRAZING PASTES

Use of prefilled barrels supplied by the manufacturer is recommended. If filling of barrels is required, use caution to avoid entrapment of air in the paste. Pastes have a short shelf life; always use fresh paste.

OTHER LIQUIDS

Virtually any viscous liquid can be dispensed to insure proper deposition quantity and location including fluxes and solder mask/solder resist. Always refer to the material manufacturer's recommendations and precautions. For any questions regarding application, contact the material manufacturer or contact PACE directly at tel. (301) 490-9860, Fax. (301) 604-9215.

MATERIAL LOADING

PACE recommends the use of preloaded barrels whenever practical to minimize any handling or safety precaution requirements. When loading is required, adhere to all precautions recommended by the manufacturer. Refer to the Material Safety Data Sheet supplied with each material for information on important safety procedures and a listing of any toxic chemical elements.

Loading of low viscosity materials are easily accomplished by placing an empty Barrel (with barrel tip cap installed) into the Pik & Paste Cubby. Pour the material slowly into the barrel using a Squeeze Bottle or small funnel.

Barrels prefilled with solder creams and brazing pastes of 100 to 550,000 centipoise viscosity may be dispensed using the needle size selections provided with your system.

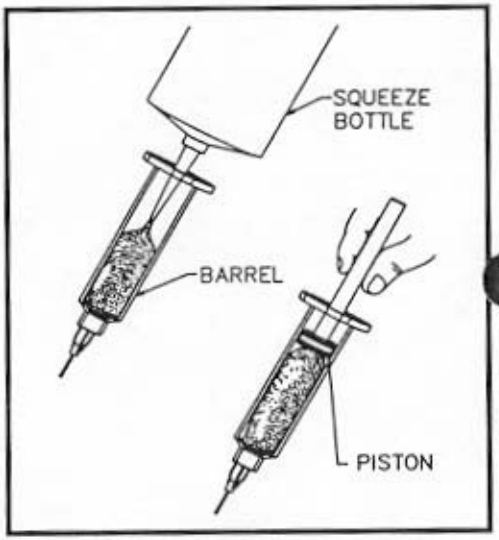


FIGURE 10. MATERIAL LOADING

CAUTION

Fill the Barrel to a level of no more than 2/3 of the Barrel capacity. Dispensed amount variations will be avoided and the material will be prevented from getting on the Barrel adapter. Do not allow the Barrel to tip upside down or lay flat. If fluid leaks back into the system through the air hose, damage to the pump may occur.

Loading of high viscosity fluids may be accomplished using any of a number of loading systems available in the market place.

TIP SELECTION

Selection of the proper tip for the application is essential to obtain the optimum deposition rate and amount. Check the specifications of the material manufacturer for recommended tip sizing. Listed below are the four tip sizes available from PACE. Tips with other sizes and design configurations are available from a wide variety of vendors. For solder paste deposition, PACE recommends use of this chart as a general guideline for tip selection.

The tip size and duration of the dispense cycle determine material deposition (dot or stripe size). Dispense several dots (or stripes) onto a piece of scrap paper or board to check for desired results.

NOTE

Never install a used tip. The tip may be clogged with material used in a previous application. Install a new tip and discard after the required dispensing operation is completed.

Item No.	Description	Tip Color	Recommended Application For Solder Paste Dispensing	Part Number
1	Dispenser Tip, .023" I.D., (pkg. of 5)	Pink	.050" (1.3mm) Component Lead Pitch	1121-0409-P5
2	Dispenser Tip, .020" I.D., (pkg. of 5)	Purple	.031" (.8mm) Component Lead Pitch	1121-0410-P5
3	Dispenser Tip, .016" I.D., (pkg. of 5)	Blue	.025" (.6mm) Component Lead Pitch	1121-0411-P5
4	Dispenser Tip, .013" I.D., (pkg. of 5)	Orange	.020" (.5mm) Component Lead Pitch	1121-0412-P5

TABLE I. TIP SELECTION

DISPENSING OF MATERIAL

The operator may select the **CONT** (continuous) or timed mode of operation.

The **CONT** mode allows the operator to dispense the material for as long as the finger switch (or optional foot pedal) remains actuated. The **CONT** mode is recommended for use when dispensing a continuous stripe of material.

The timed mode allows the operator to select a dispense time of 0.1 to 10 seconds as determined by the Shot **TIME** Control for as long as the finger switch (or optional foot pedal) remains actuated. Use of this mode is recommended for all repetitive dispensing applications (e.g., dot dispensing).

Follow the procedure below to obtain proper results.

1. Insure that the proper material (in barrel) and tip have been installed.

2. Set the Shot **TIME** Control for the length of shot time desired or set the switch to **CONT** for continuous operation.

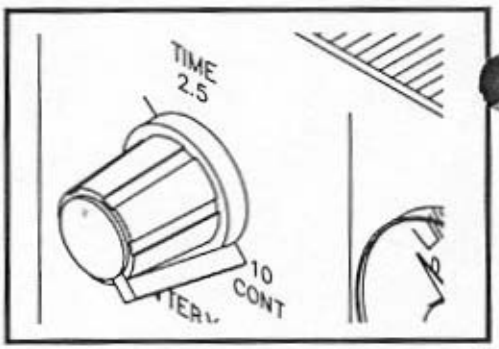


FIGURE 11. SHOT TIME CONTROL

3. Set the **INTERVAL** Time Control for the length of shot interval desired.

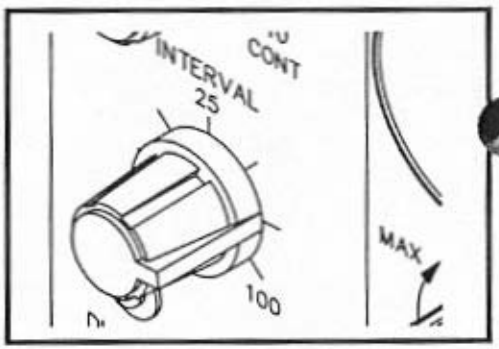


FIGURE 12. INTERVAL TIME CONTROL

4. Adjust the **PRESSURE** Control to the desired pressure. Refer to the material suppliers recommendations when available. If no supplier recommendation is available, the operator must adjust for optimum results.

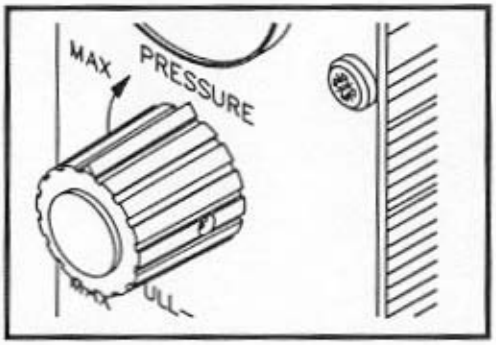


FIGURE 13. PRESSURE CONTROL

5. Adjust the Vacuum **PULL-BACK** Control in the following manner to prevent dripping or oozing of the dispense material.

   a) Turn Vacuum **PULL-BACK** Control knob fully counterclockwise. The barrel material will begin to ooze or drip if it has a low viscosity level.

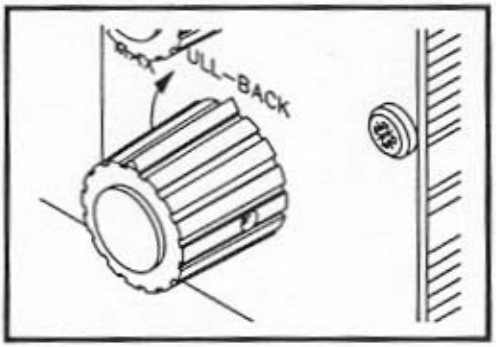


FIGURE 14. VACUUM PULL-BACK CONTROL

NOTE

The barrel material will not drip or ooze unless it is has a low viscosity level. If dripping or oozing does not occur, leave the Vacuum **PULL-BACK** Control knob set in the fully counterclockwise position.

   b) Turn the Vacuum **PULL-BACK** Control knob clockwise as necessary until the barrel material stops dripping or oozing.

   c) Check periodically during dispensing operation and adjust as necessary.

DISPENSING OF MATERIAL CONT'D

6. Holding the barrel as shown (at a 45° angle) to the work), rest the tip on a scrap piece of paper and dispense a small amount of material. This initial dispensing will fill the tip with material.

7. Wipe any material residue from end of tip.

8. Hold the barrel as shown over the work area.

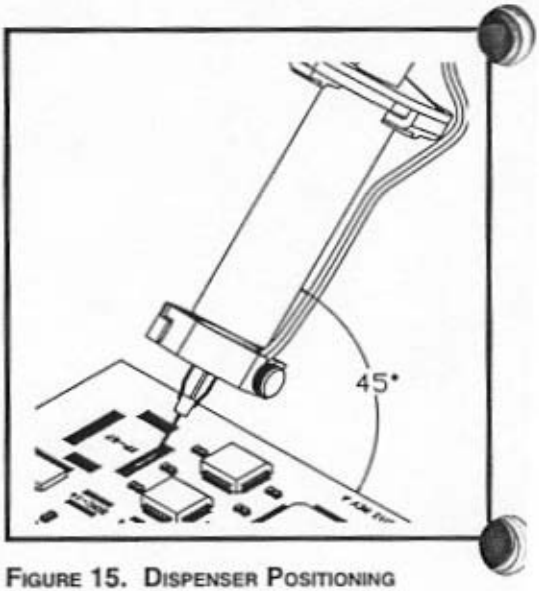


FIGURE 15. DISPENSER POSITIONING

9. Activate the finger switch (or optional foot pedal) to dispense material. Upon activation, the dispense cycle....

   In the **CONT** mode will remain on until the finger switch (or optional foot pedal) is released.

   In the timed mode the cycle will continue only for the period of time selected on the Shot **TIME** Control (unless the finger switch or optional foot pedal is released). The cycle will repeat following the delay time set on the Time INTERVAL Control if the finger switch (or optional foot pedal) remains actuated.

   The dispense pump will activate periodically (and any time material is being dispensed) to maintain required air pressure. The Dispense LED will illuminate throughout the dispense cycle and while the dispense pump is activated.

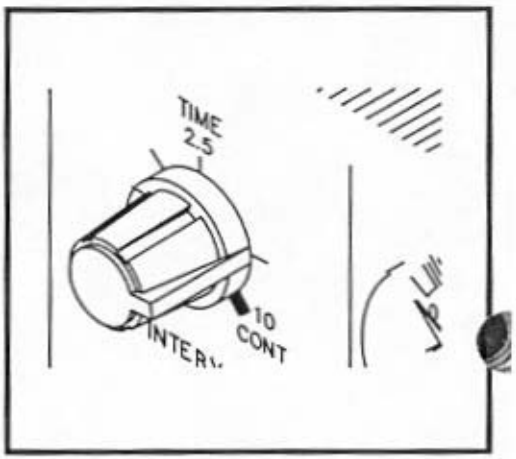


FIGURE 16. SHOT TIME CONTROL

10. Place the barrel in the Pik & Paste Cubby when dispense operation is complete.

CAUTION

Do not allow the barrel to tip upside down or lay flat. If fluid leaks back into the system through the air hose, damage to the pump may occur.

NOTE

Condensation may occur in the air hose after extended use. This is a normal occurrence. To remove the condensation, disconnect the air hose from the barrel adapter and actuate the dispense pump. The air pressure will blow the condensation from the air hose.

DISPENSING SUGGESTIONS

1. Dispose of all tips and barrels after use. Always use new tips and barrels to prevent contamination, insure cleanliness and provide consistent, repeatable material deposition.

2. When dispensing different dot sizes, select a tip/time combination which dispenses small dots. These small dots may be dispensed in multiples to provide the deposition amount required. Use of the feature in this manner can eliminate frequent tip changes and dispense cycle time adjustments.

3. In situations where the metal tip may scratch or damage the work, install a short section of heat shrinkable tubing or sleeving. The tubing (or sleeving) should extend 1.5 mm (1/16") past the tip end.

4. Keep all dispenser components clean to prevent clogging and/or irregular deposition.

PIK -VAC OPERATION

1. Insure that the system is properly prepared for operation. Refer to the "Set-Up" portion of this manual.

2. The vacuum cup selected for your application should be connected to the unit Pik-Vac wand. Use of the metal vacuum tip for removal/replacement of very small component works well; but, for larger components, install one of the supplied Vacuum Cups onto the tip. For best results, use a size slightly smaller than the body of the component to be removed or placed. For very large components, use the largest Vacuum Cup.

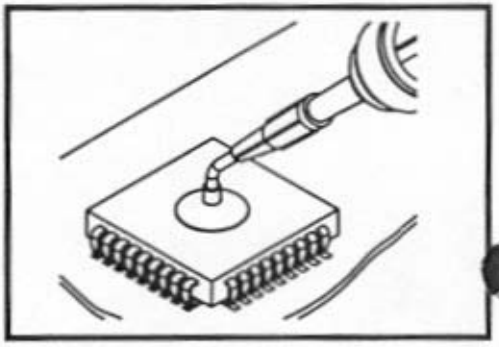


FIGURE 17. VACUUM CUP

3. Turn the **POWER** Switch ON ("1"). Vacuum is applied to the **PIK-VAC** Port whenever the switch is "ON".

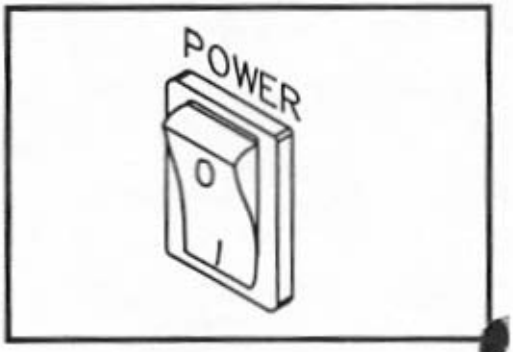


FIGURE 18. POWER ON

4. Grasp the handpiece as you would a pen or pencil with the Vacuum Cup (or metal tip) pointing down and the Vacuum Control Port pointing up.

5. Place the Vacuum Cup and/or the Vacuum Cup (or metal tip) gently onto the top surface of the Component body. Extra caution must be taken to avoid bending of leads on fine pitch devices.

6. Place one finger over the Vacuum Control Port. Vacuum is now being applied to the Component body.

7. Gently lift the Component off the PC assembly (removal operation) or out of the component holder (placement operation).

8. Lower the Component gently into position on the PC assembly (placement operation) or component holder (removal operation).

9. Lift the finger from the Vacuum Control Port to release the component.

10. Place the **POWER** Switch in the "OFF" (0) position when all removal/replacement operations are completed.

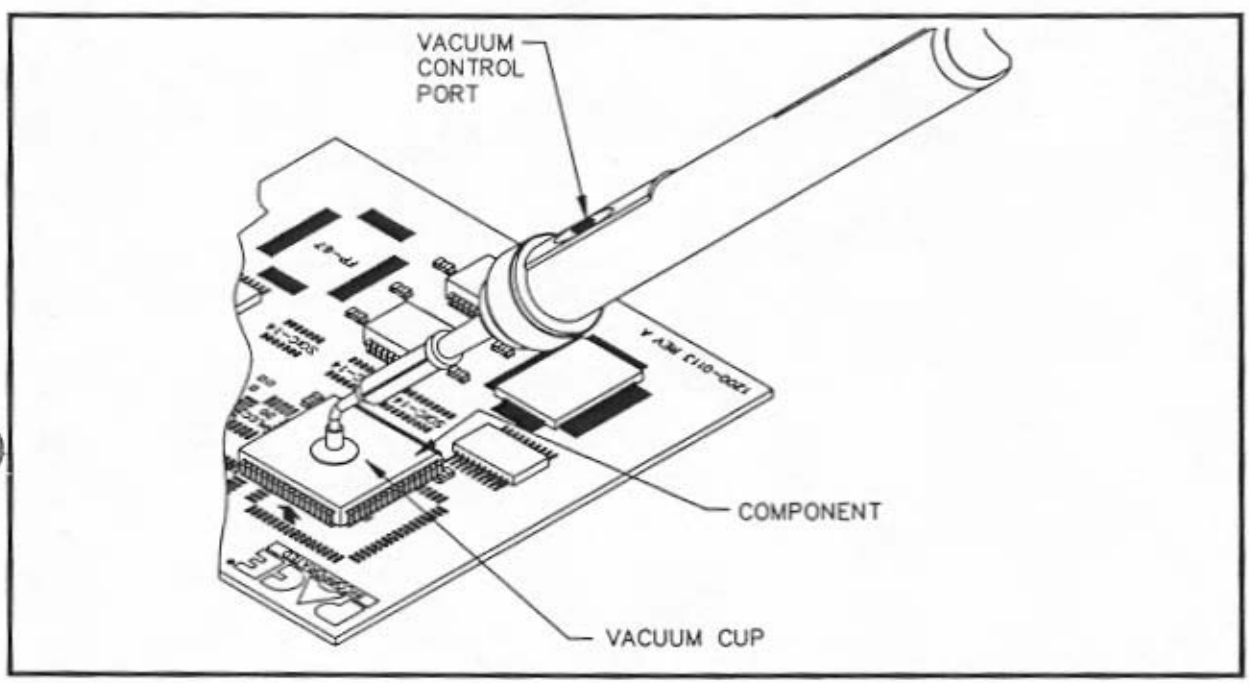


FIGURE 19. PIK-VAC OPERATION

REPAIR PROCEDURE

The "REPAIR" section of this manual provides the technician with the information necessary to determine the source of a malfunction and take the necessary steps to correct it. 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 diagnosis and repair much more difficult.

1. PERIODIC MAINTENANCE - No periodic or special maintenance is required on this system.

2. CORRECTIVE MAINTENANCE - A guide for resolving malfunctions caused by improper maintenance. 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.

3. FLOW CHARTS - Easy to follow flow charts which enable the technician to determine the source of a malfunction down to an assembly (e.g., PCB Assembly) level. Follow the instructions on the flow charts and perform the checks indicated to determine the source of the malfunction.

4. DISASSEMBLY/REASSEMBLY - Contains Disassembly/Reassembly instructions which enable the technician to disassemble and reassemble the unit properly. Disassemble the unit only when directed in the flow charts or when replacing or repairing a part.

5. WIRING DIAGRAM, ASSEMBLY DRAWING & SCHEMATIC - Used as aides in locating and/or replacing defective component or assembly.

6. PACE CUSTOMER SERVICE - If the cause for the malfunction has not been determined at this point, call PACE Customer Service at Tel. (301) 490-9860, FAX 3016049215.

DANGER

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

CORRECTIVE MAINTENANCE

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

SYMPTOM	PROBABLE CAUSE	SOLUTION
No power to unit. No functions work.	Blown fuse (F1).	Replace fuse.
	Defective power cord.	Replace power cord.
Dispenser pressure is insufficient or nonexistent.	Poor air hose connections.	Check air hose connections outside of system power source.
	Clogged dispenser tip.	Replace or clean dispenser tip.
	Defective pump, solenoid or reservoir.	Refer to "Dispensing" flow chart.
Excessive noise during paste dispense operation.	Shipping screws have not been removed.	Remove shipping screws from bottom of power source.
	Defective dispense pump.	Refer to "Dispensing" flow chart . Replace dispense pump if defective.
	Defective control pcb.	Refer to "Dispensing" flow chart . Replace control pcb if defective.
Pik-Vac has insufficient vacuum.	Poor air hose connections.	Check air hose connections outside of system power source.
	Clogged or defective metal tip or vacuum cup.	Clean/replace metal tip or vacuum cup.
	Defective Pik-Vac pump.	Refer to "Pik-Vac/Pull-Back" flow chart. Replace Pik-Vac pump if defective.

TABLE II. CORRECTIVE MAINTENANCE

DISASSEMBLY/REASSEMBLY

DISASSEMBLY

To disassemble the system power source for servicing, perform the following procedure step by step, in sequence, using the illustrations as a guide.

DANGER

POTENTIAL SHOCK HAZARD - The following procedures are to be performed by qualified service personnel only. Removal of the power source chassis 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. Position the power source with the rear panel facing forward.

3. Remove the 8 phillips head mounting screws and the 1 hex head screw.

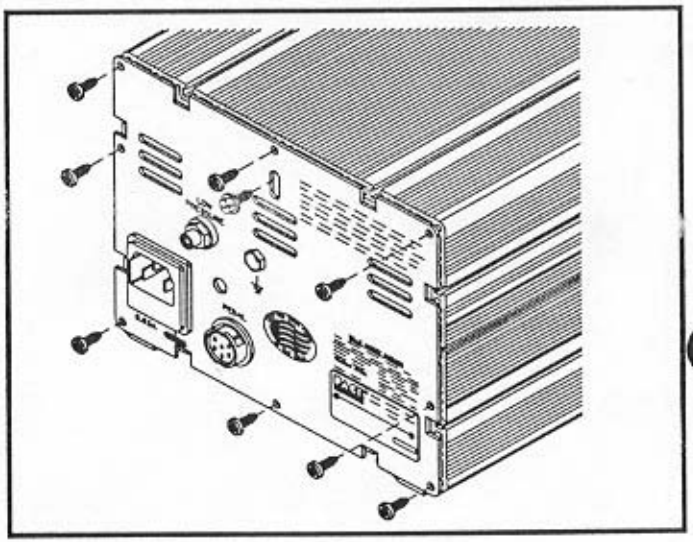


FIGURE 20. REMOVING REAR PANEL

4. Note the orientation of each of the 3 Connectors plugged into the PC Board receptacles. Disconnect the 3 Connectors from the PC Board receptacles.

5. Slide the PC Board forward and out of the power source Case. Set the PC Board aside.

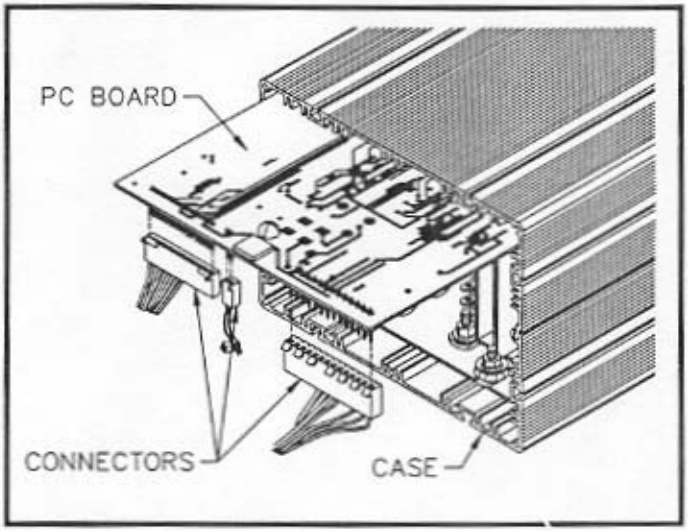


FIGURE 21. REMOVING PC ASSEMBLY

6. Reposition the power source with the front panel facing forward.

7. Remove the 10 phillips head front panel screws.

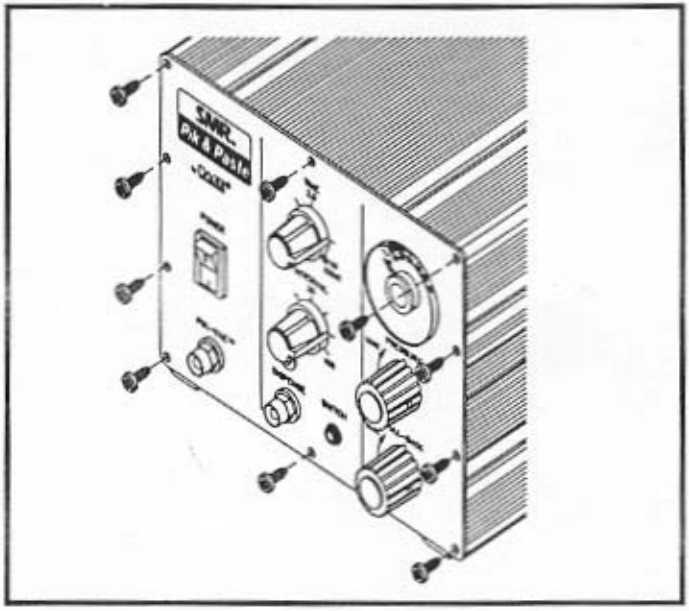


FIGURE 22. REMOVING FRONT PANEL

DISASSEMBLY CONT'D

8. Gently pull the Front Panel (with attached Chassis Assembly and Rear Panel) forward and out of the power source Case. The Rear Panel must be turned 90 degrees to allow it to slide through the power source Case. Set power source Case aside.

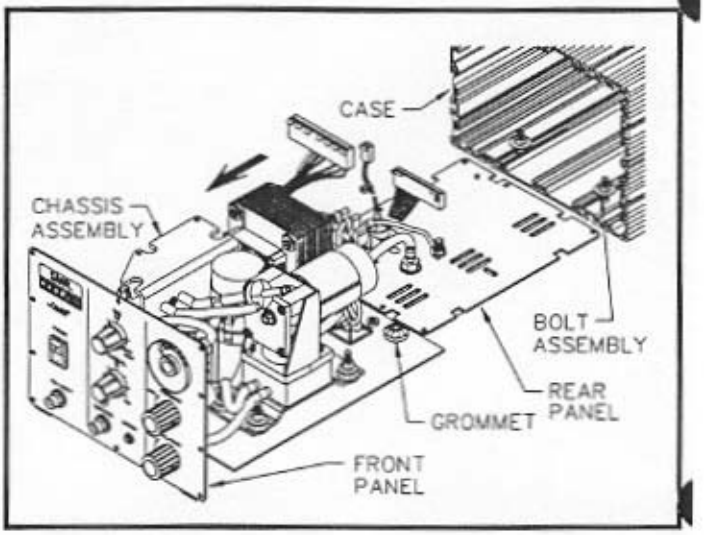


FIGURE 23. CASE REMOVAL

9. Place the PC Board (properly oriented) on top of the Chassis Assembly. Place a piece of Cardboard or other insulating material between the PC Board and Chassis Assembly.

10. Reconnect the 3 Connectors (disconnected in step 4) to the PC Board receptacles. Insure that the Connectors are properly positioned and oriented.

11. Insure that the wired connections of the AC receptacle on the Rear Panel are insulated from the Chassis Assembly.

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

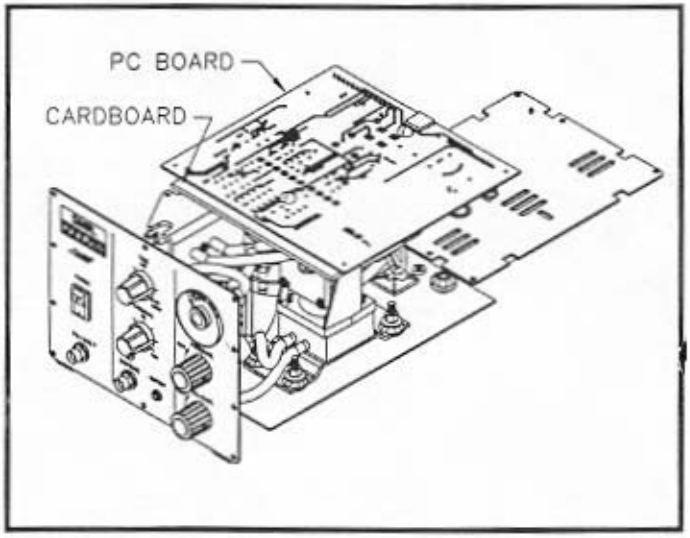


FIGURE 24. POWER SOURCE RECONNECTION

REASSEMBLY

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 3 Connectors from the PC Board receptacles. Set the PC Board aside.

3. Place the power source Case directly behind the Front Panel (with attached Chassis Assembly and Rear Panel). Insure that the Chassis Assembly is facing forward.

4. Slide the Front Panel (with attached Chassis Assembly and Rear Panel) back into the power source Case. Carefully guide the rear of the Chassis Assembly through the rubber Grommets on the Bolt Assemblies as shown.

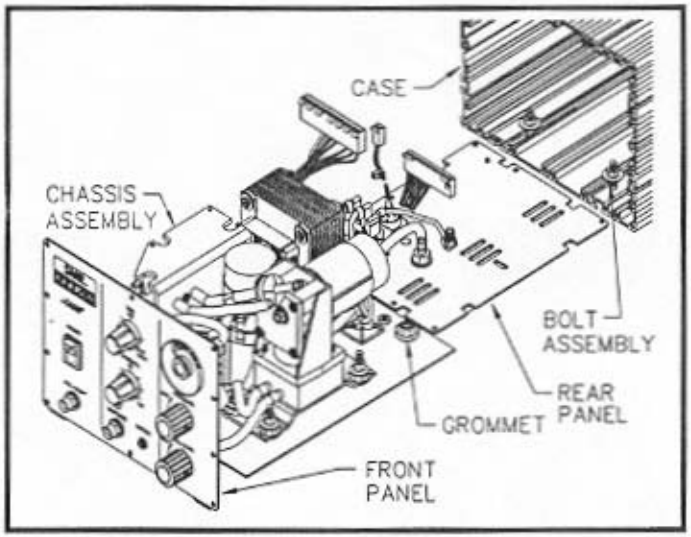


FIGURE 25. CASE INSTALLATION

REASSEMBLY CONT'D

5. Reinstall the 10 Front Panel mounting screws.

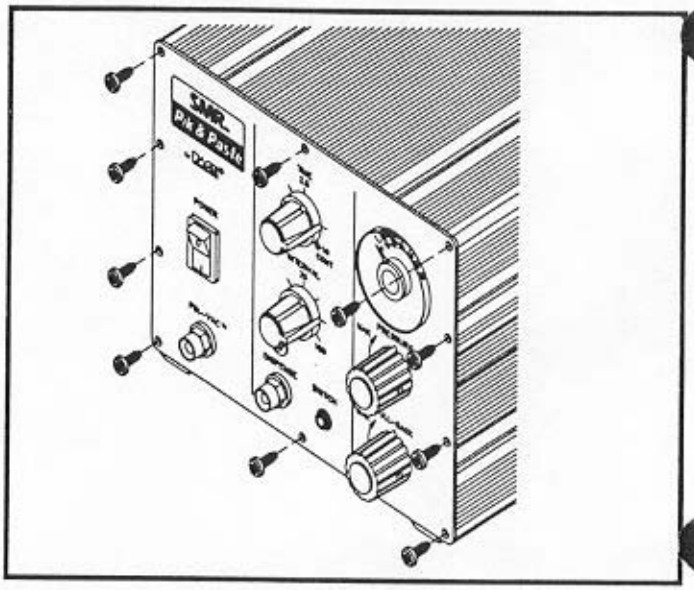


FIGURE 26. FRONT PANEL INSTALLATION

6. Reposition the power source with the Rear Panel facing forward.

7. Slide the PC Board (properly oriented) back into the power source. Insure that the PC Board is resting above the top slots in the Case.

8. Reconnect the 3 Connectors to the PC Board receptacles. Insure that the Connectors are properly positioned and oriented.

9. Reinstall the rear panel using the 8 phillips head mounting screws and the 1 hex head screw removed in Disassembly, step 3.

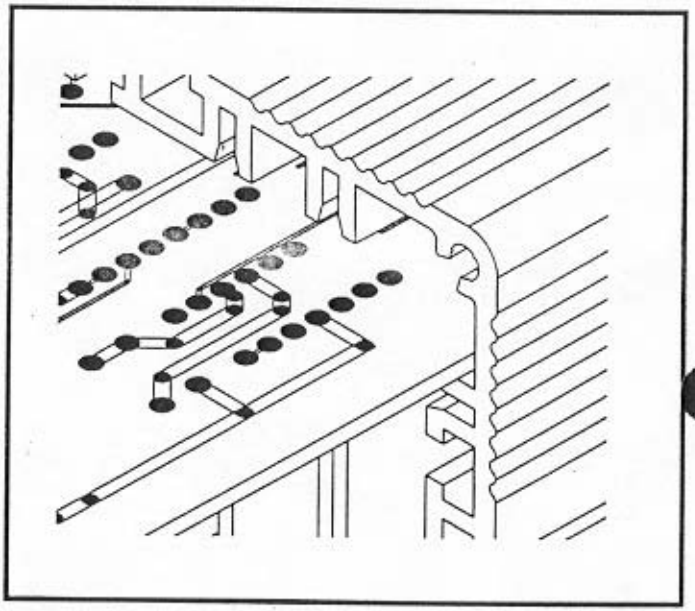


FIGURE 27. PCB INSTALLATION

10. Reconnect the AC power cord to the power source and house AC supply.

11. Check the system for proper operation.

FLOW CHARTS

The following flow charts are to be used to determine the source of a malfunction down to an assembly level. Select the flow chart most applicable to the malfunction.

DANGER

POTENTIAL SHOCK HAZARD - The following flow chart procedures are to be performed by qualified service personnel only. Removal of the power source case exposes line voltage parts. Service personnel must avoid contact with these parts when troubleshooting the system with the case removed.

POWER

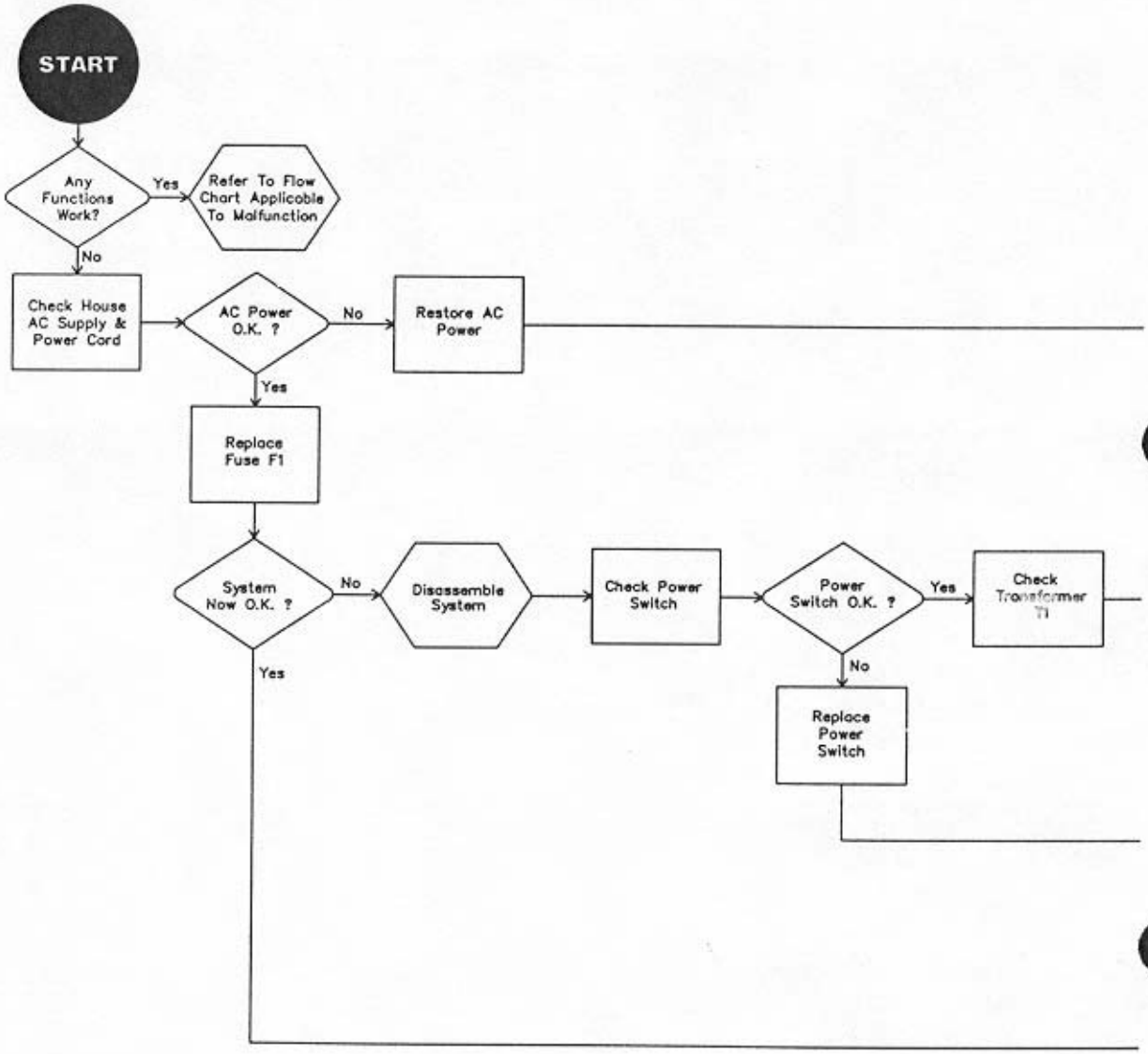
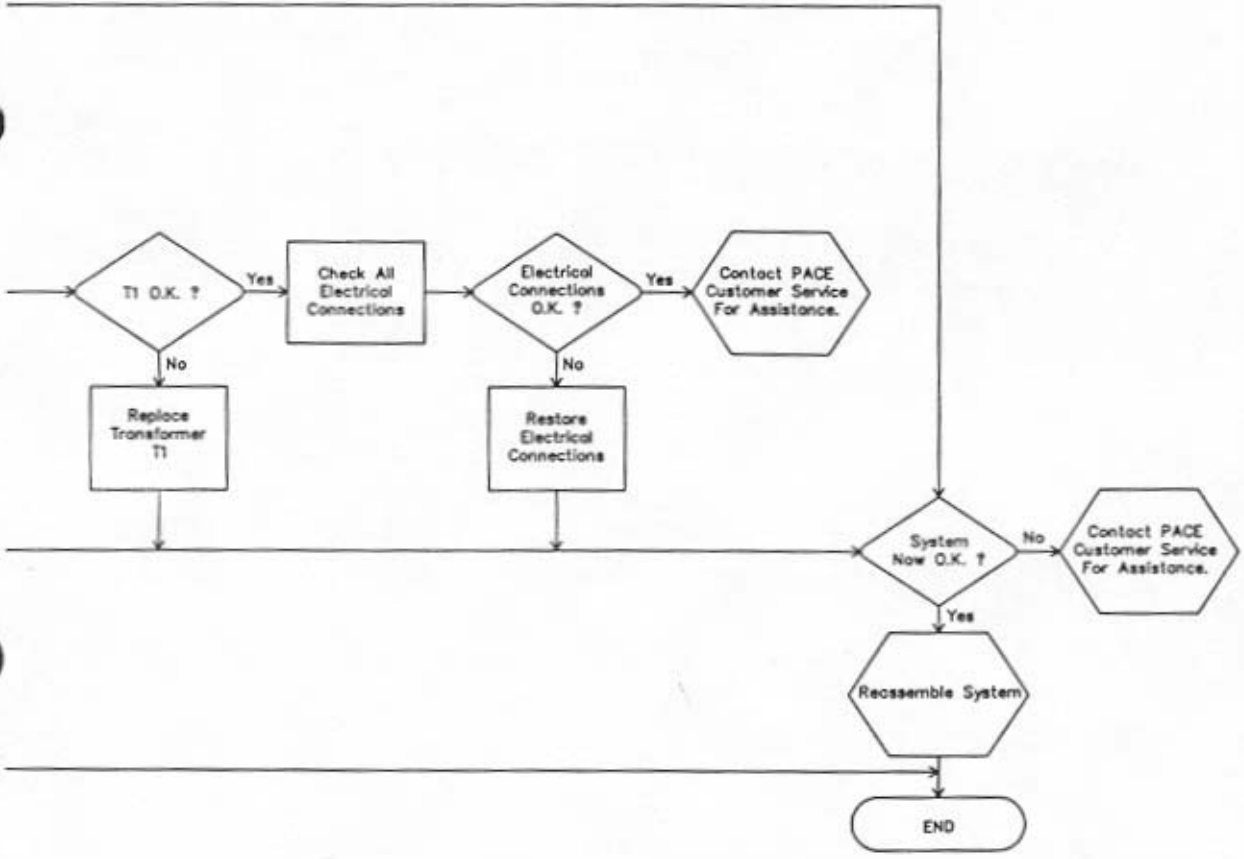


FIGURE 28. POWER FLOW CHART


T1 O.K. ?
Yes
Check All Electrical Connections
Electrical Connections O.K. ?
Yes
Contact PACE Customer Service For Assistance.
No
Replace Transformer T1
No
Restore Electrical Connections
System Now O.K. ?
No
Contact PACE Customer Service For Assistance.
Yes
Reassemble System
END

DISPENSING

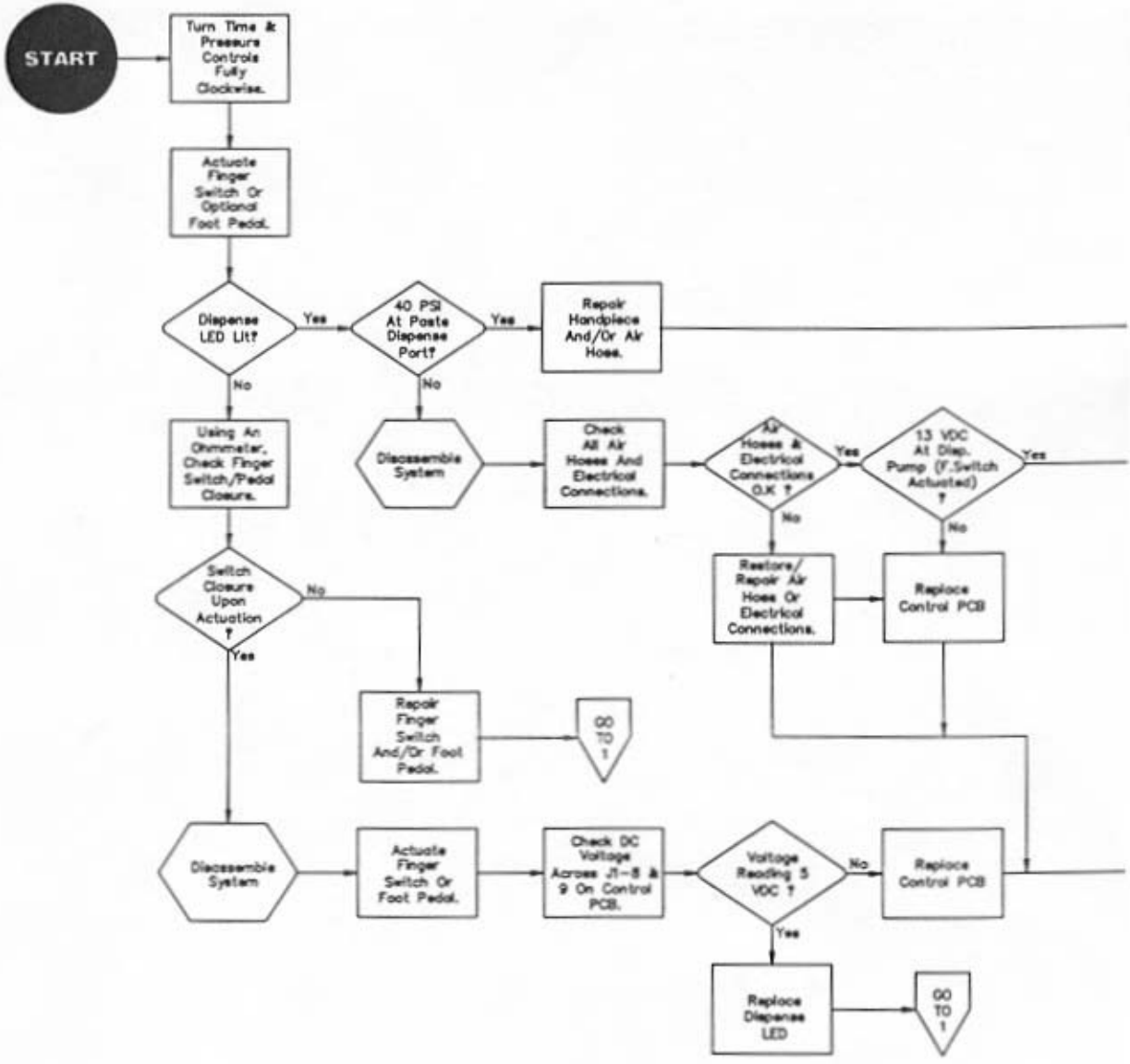
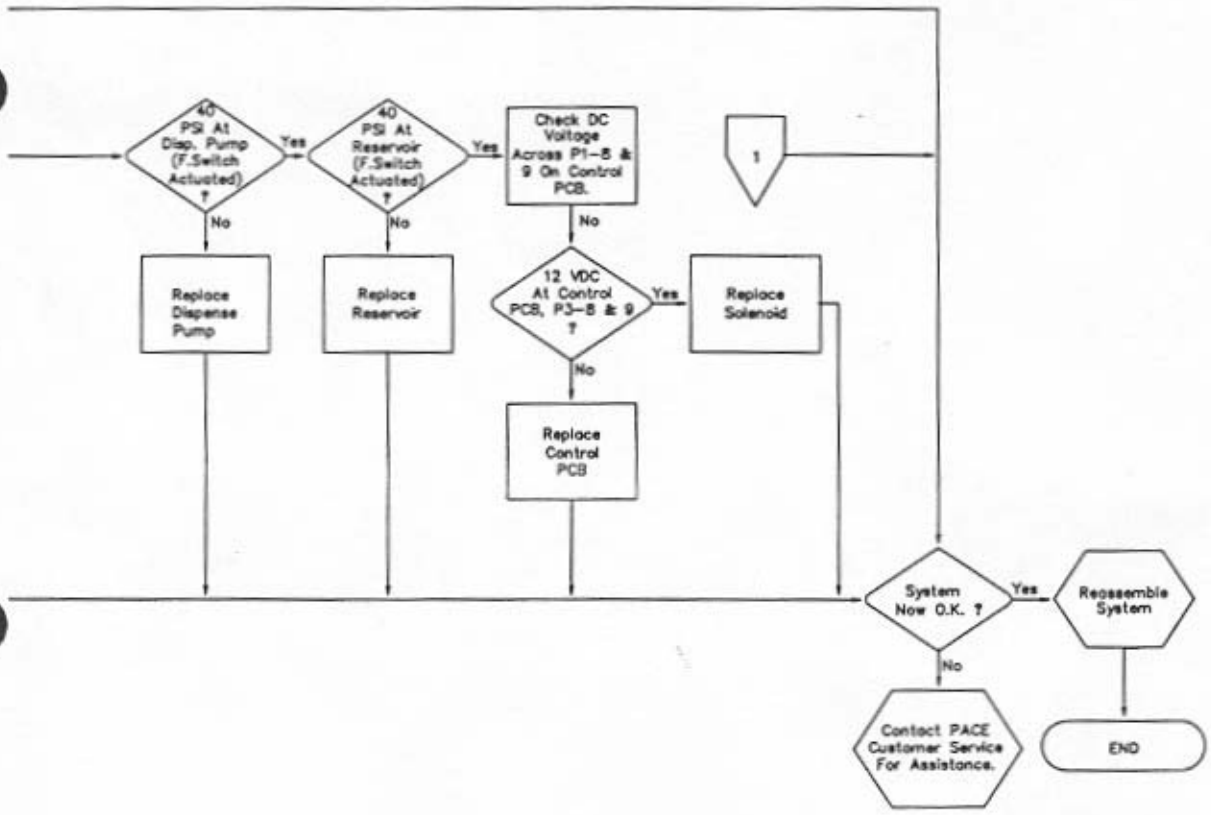


FIGURE 29. DISPENSING FLOW CHART


40 PSI At Disp. Pump (F.Switch Actuated) ?
Yes
40 PSI At Reservoir (F.Switch Actuated) ?
Yes
Check DC Voltage Across P1–8 & 9 On Control PCB.
1
No
No
No
Replace Dispense Pump
Replace Reservoir
12 VDC At Control PCB, P3–8 & 9 ?
Yes
Replace Solenoid
No
Replace Control PCB
System Now O.K. ?
Yes
Reassemble System
No
Contact PACE Customer Service For Assistance.
END

PIK-VAC/VACUUM PULL-BACK

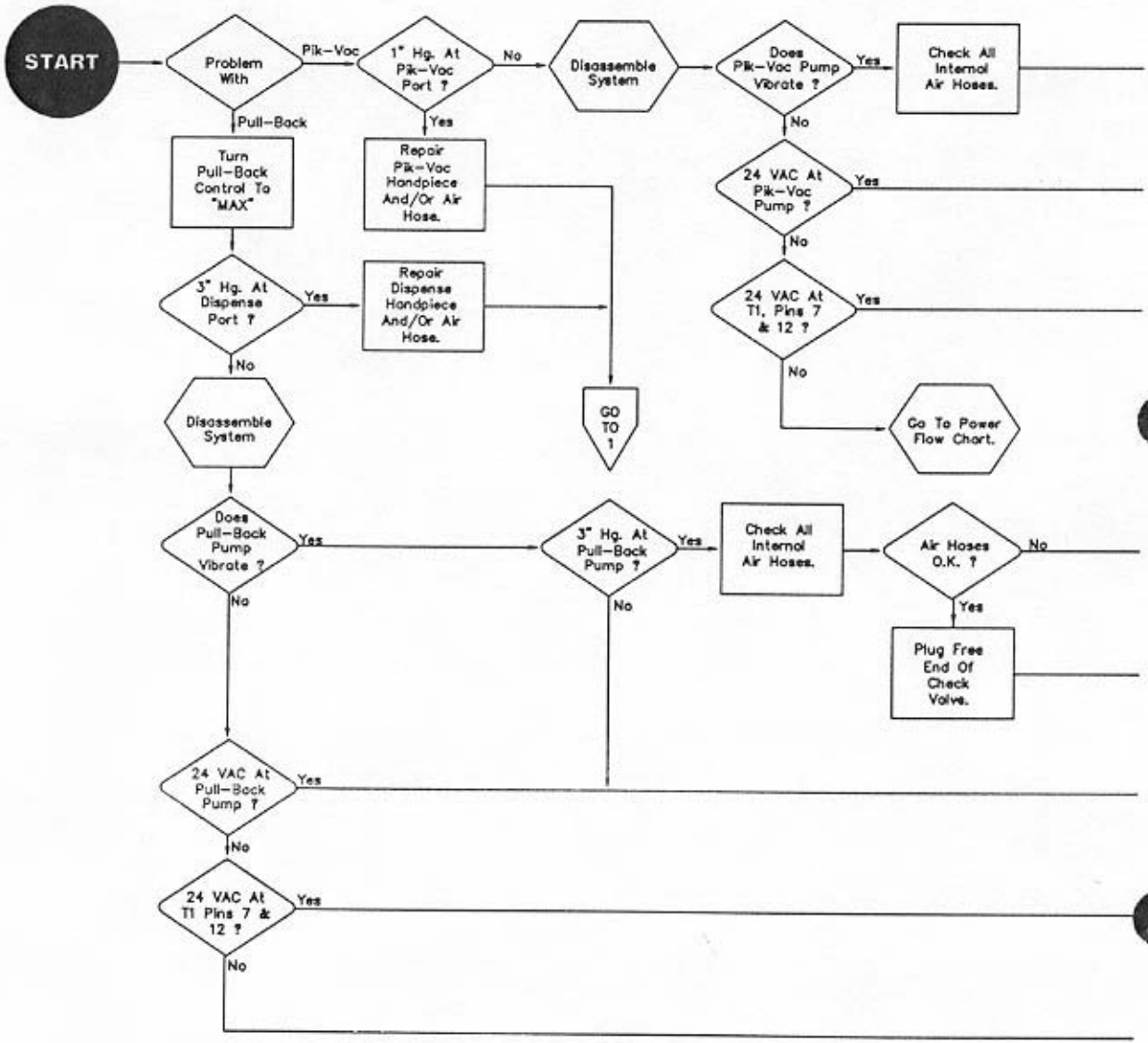
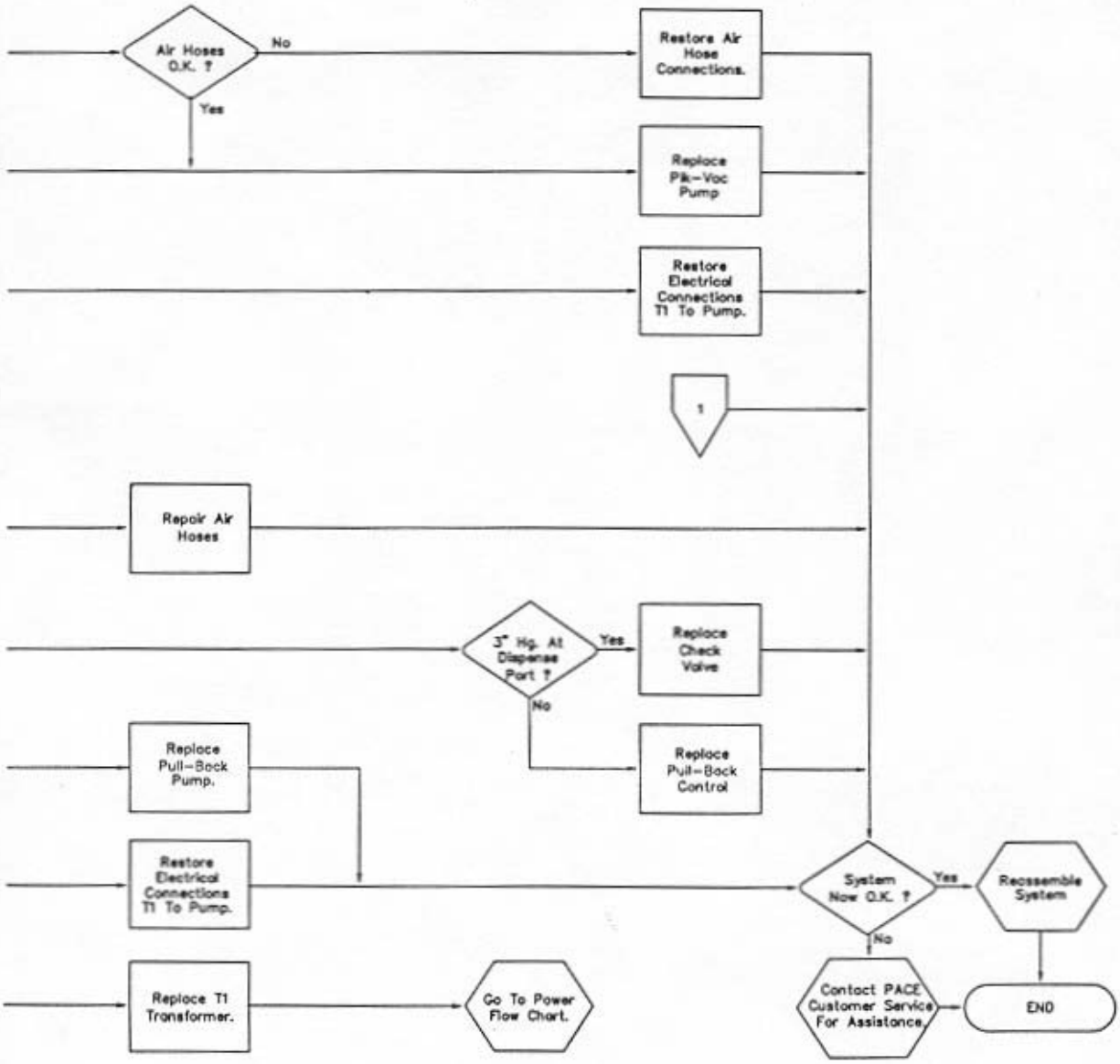


FIGURE 30. PIK-VAC/VACUUM PULL-BACK FLOW CHART


Air Hoses O.K. ?
No
Yes
Restore Air Hose Connections.
Replace Pik-Voc Pump
Restore Electrical Connections T1 To Pump.
1
Repair Air Hoses
3" Hg. At Dispense Port ?
Yes
No
Replace Check Valve
Replace Pull-Back Control
Replace Pull-Back Pump.
Restore Electrical Connections T1 To Pump.
System Now O.K. ?
Yes
No
Recassemble System
Contact PACE Customer Service For Assistance.
END
Replace T1 Transformer.
Go To Power Flow Chart.

WIRING DIAGRAM

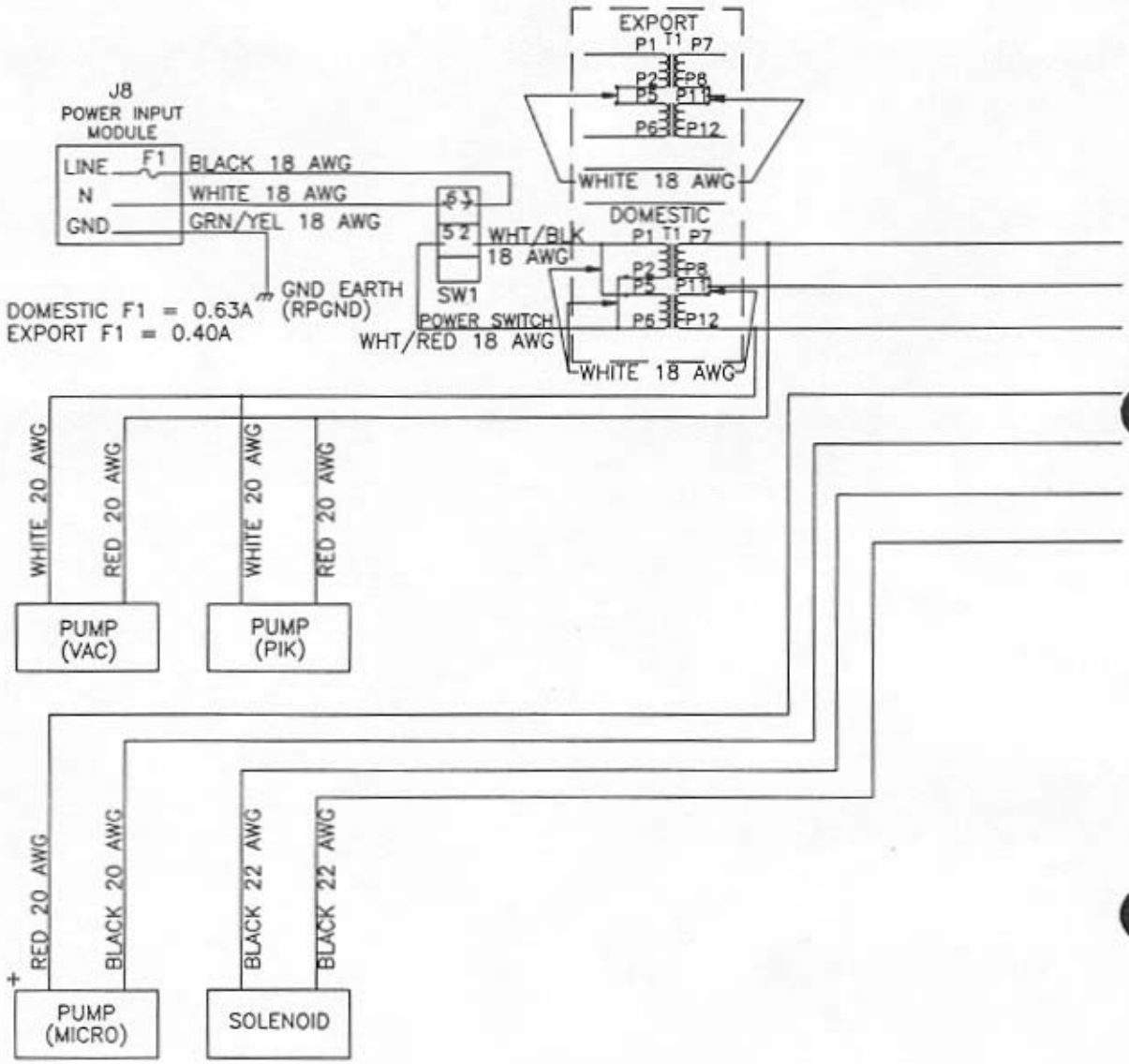
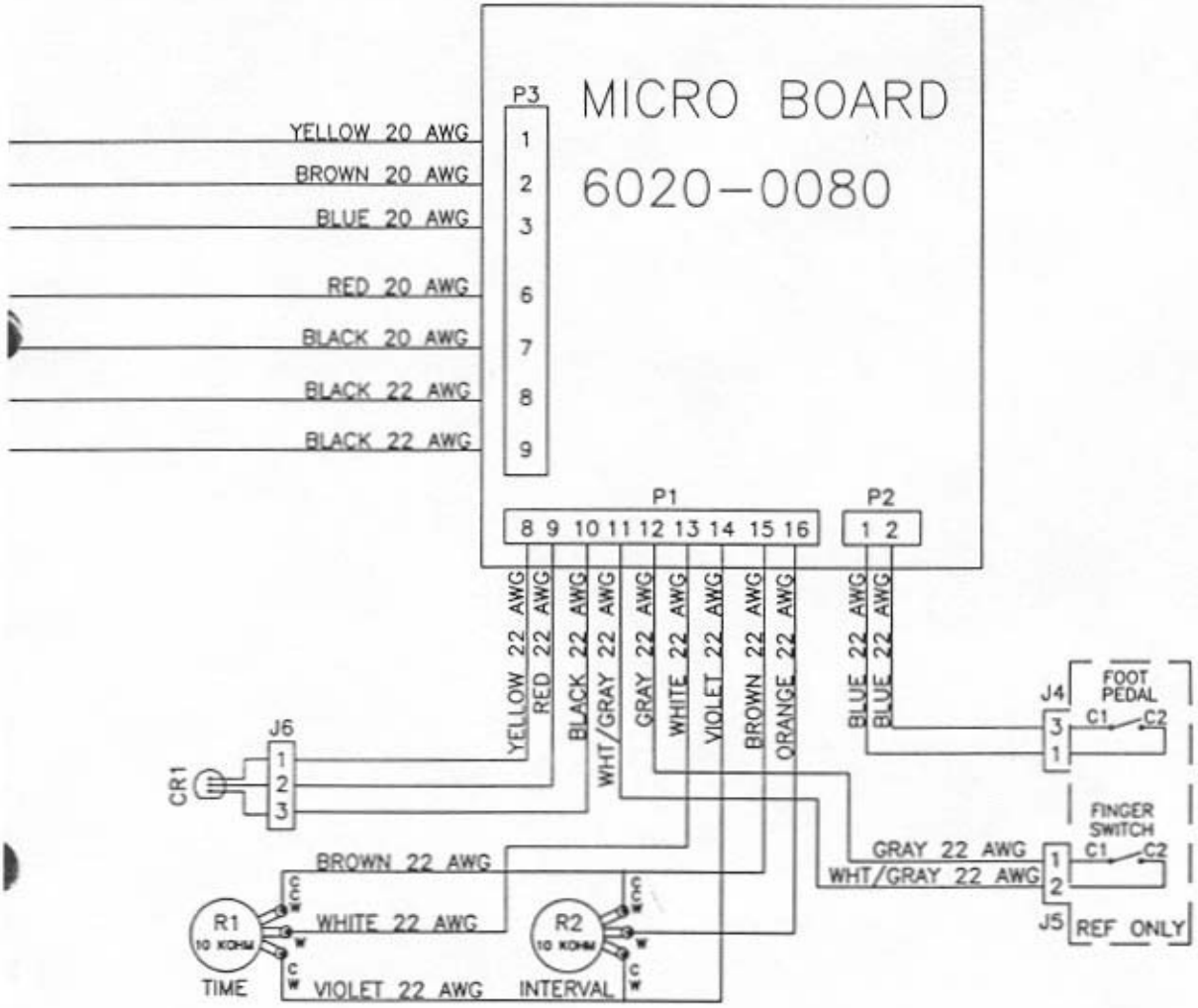


FIGURE 31. WIRING DIAGRAM


MICRO BOARD
6020-0080
P3
1
2
3
6
7
8
9
YELLOW 20 AWG
BROWN 20 AWG
BLUE 20 AWG
RED 20 AWG
BLACK 20 AWG
BLACK 22 AWG
BLACK 22 AWG
P1
8 9 10 11 12 13 14 15 16
P2
1 2
YELLOW 22 AWG
RED 22 AWG
BLACK 22 AWG
WHT/GRAY 22 AWG
GRAY 22 AWG
WHITE 22 AWG
VIOLET 22 AWG
BROWN 22 AWG
ORANGE 22 AWG
BLUE 22 AWG
BLUE 22 AWG
J6
CR1
J4
FOOT PEDAL
C1
C2
FINGER SWITCH
GRAY 22 AWG
WHT/GRAY 22 AWG
J5
REF ONLY
BROWN 22 AWG
WHITE 22 AWG
VIOLET 22 AWG
R1
10 KOHM
TIME
R2
10 KOHM
INTERVAL

SCHEMATIC

NOTES:

1. UNLESS OTHERWISE SPECIFIED, ALL RESISTOR VALUES ARE IN OHMS.
2. UNLESS OTHERWISE SPECIFIED, ALL RESISTORS ARE 1/4W 5% CARBON FILM.
3. • DENOTES 1/8W 1% METAL FILM RESISTOR.
4. UNLESS OTHERWISE SPECIFIED, ALL CAPACITOR VALUES ARE IN MICROFARADS.
5. UNLESS OTHERWISE SPECIFIED, ALL CAPACITORS ARE CERAMIC, 50V MINIMUM.
6. ⏚ = ANALOG GROUND
   ⏚ = CHASSIS GROUND

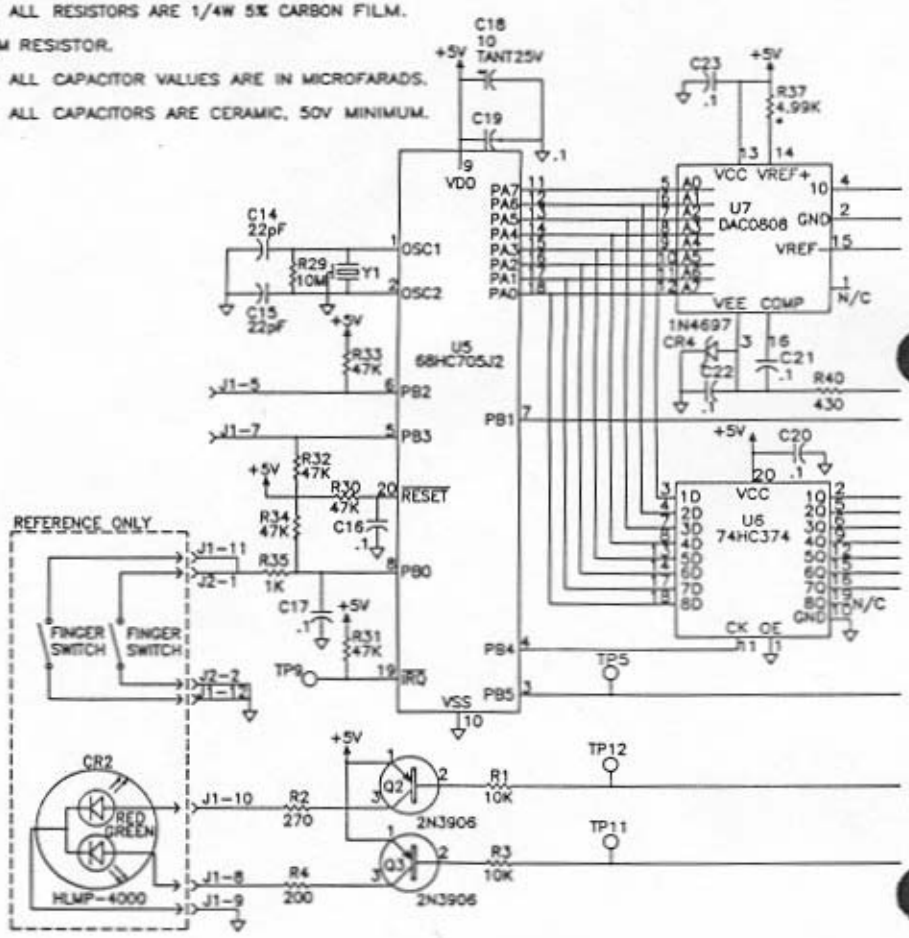
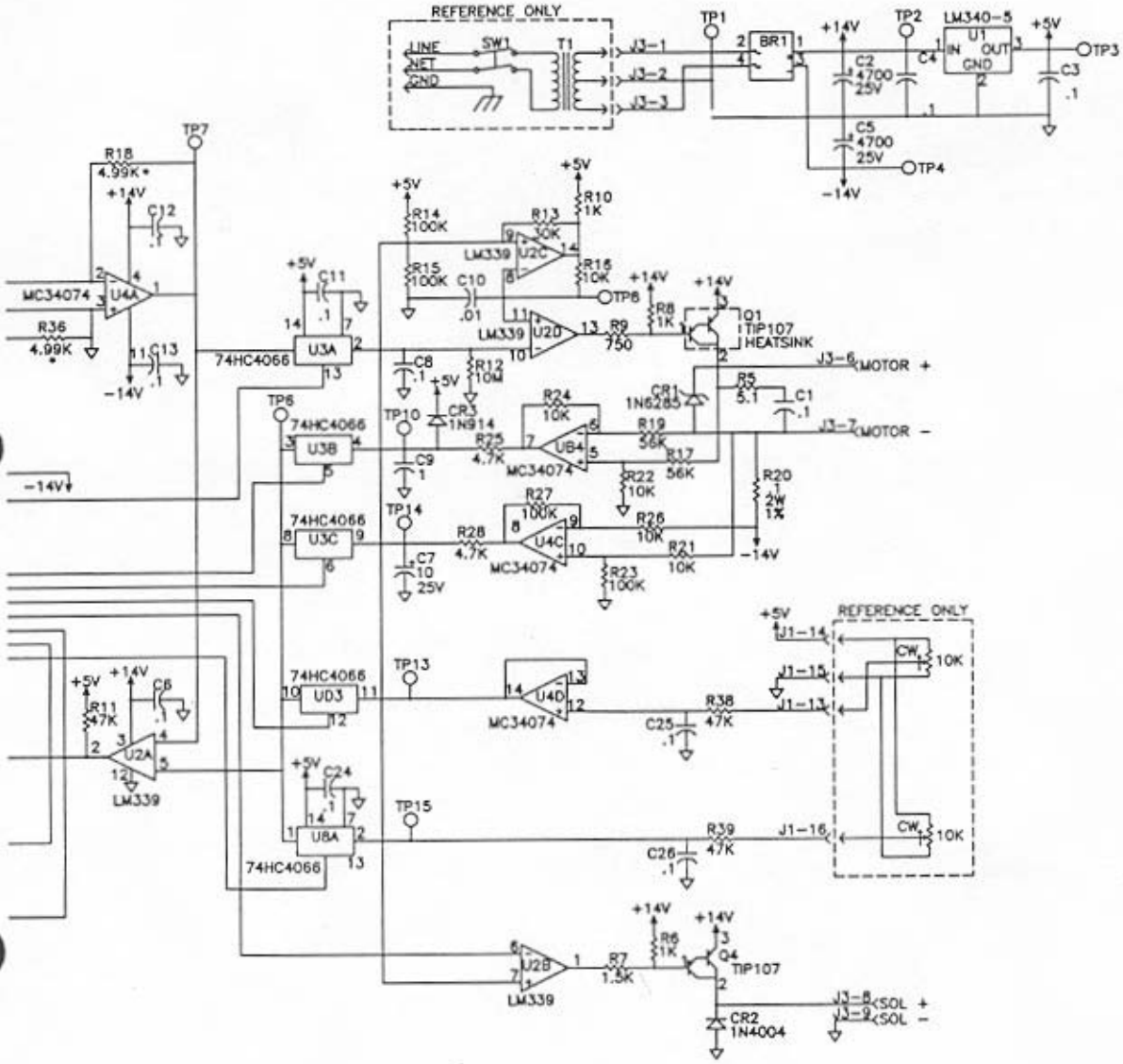


FIGURE 32. SCHEMATIC


REFERENCE ONLY
LINE
NET
GND
SW1
T1
J3-1
J3-2
J3-3
TP1
BR1
+14V
TP2
LM340-5
U1
IN
OUT
GND
+5V
TP3
C2
4700
25V
C4
C3
.1
C5
4700
25V
TP4
-14V
R18
4.99K
+14V
C12
.1
MC34074
U4A
R36
4.99K
C13
.1
-14V
TP7
74HC4066
U3A
+5V
C11
.1
R14
100K
R13
10K
LM339
U2C
R15
100K
C10
.01
R16
10K
TP6
R10
1K
R8
1K
Q1
TIP107
HEATSINK
LM339
U2D
R9
750
J3-6
MOTOR +
C8
.1
R12
10M
CR1
1N6285
R5
5.1
C1
.1
J3-7
MOTOR -
TP6
74HC4066
U3B
TP10
CR3
1N914
C9
1
R24
10K
R25
4.7K
MC34074
U4B
R19
56K
R17
56K
R22
10K
R20
2W
1%
-14V
TP14
74HC4066
U3C
R27
100K
R28
4.7K
MC34074
U4C
R26
10K
R21
10K
C7
10
25V
R23
100K
-14V
+5V
+14V
C6
.1
R11
47K
U2A
LM339
74HC4066
UD3
TP13
MC34074
U4D
R38
47K
C25
.1
+5V
C24
.1
TP15
74HC4066
U8A
R39
47K
C26
.1
REFERENCE ONLY
+5V
J1-14
J1-15
J1-13
J1-16
CW
10K
CW
10K
+14V
R6
1K
Q4
TIP107
LM339
U2B
R7
1.5K
CR2
1N4004
J3-8
SOL +
J3-9
SOL -

ASSEMBLY DRAWING

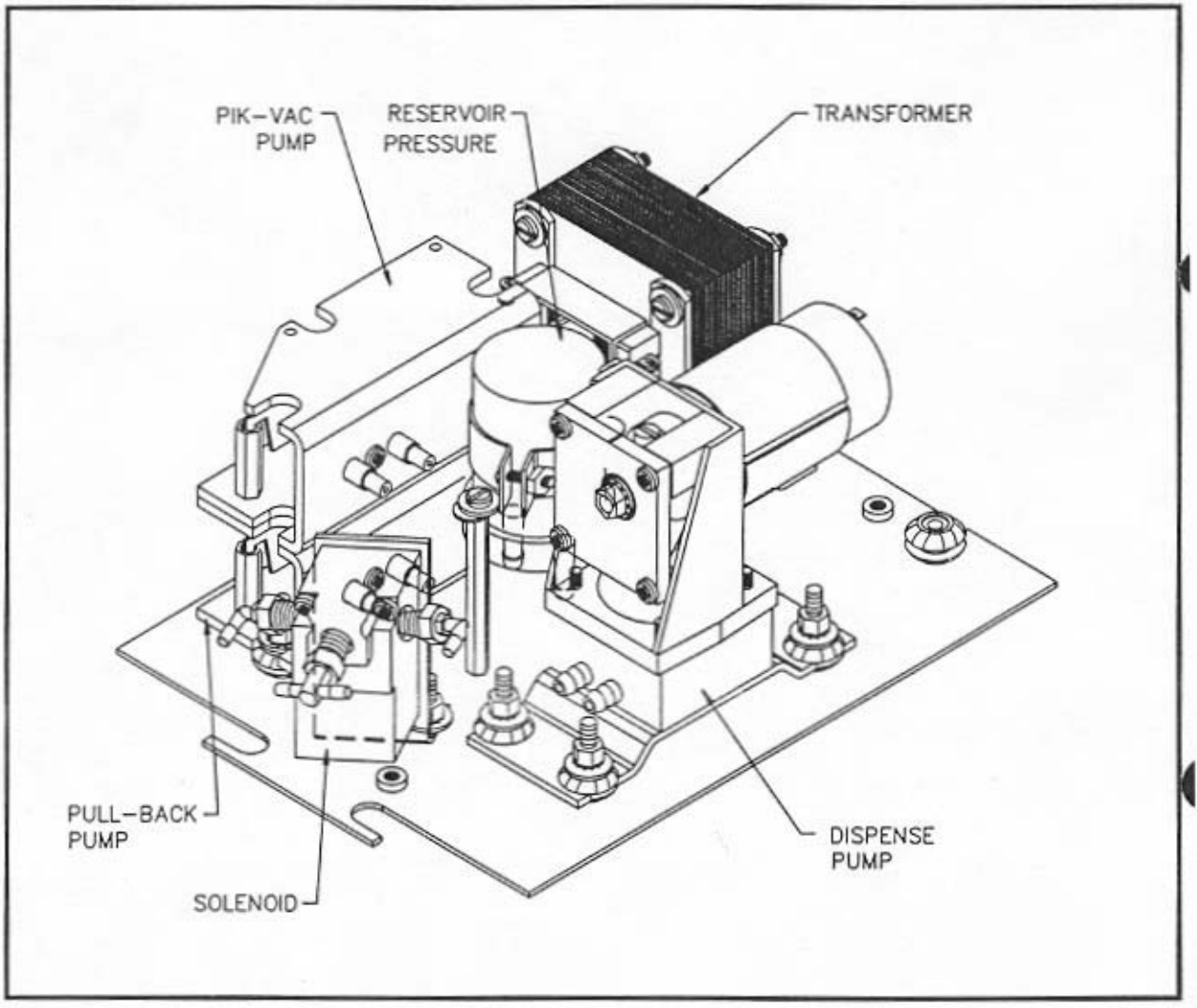
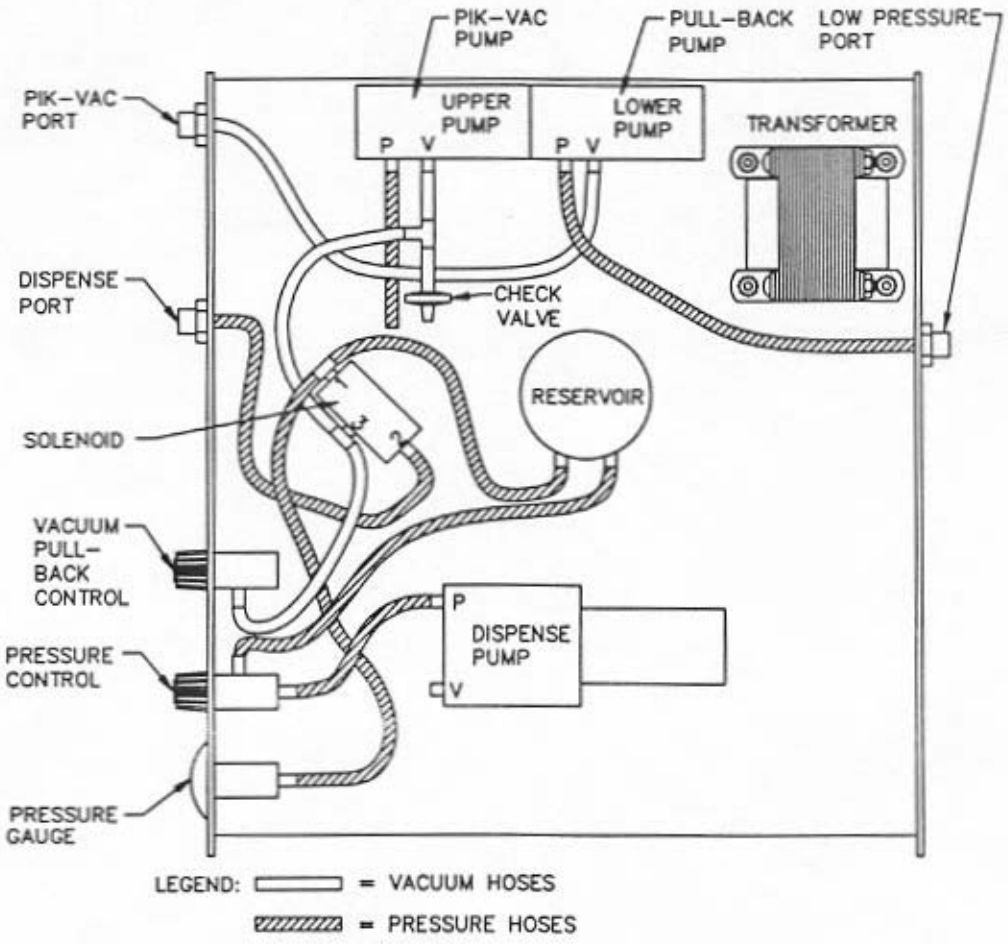


FIGURE 33. ASSEMBLY DRAWING

AIR HOSE ROUTING



THE LOCATION AND SIZE OF COMPONENTS HAVE BEEN ALTERED TO CLARIFY AIR HOSE ROUTING.
FOR SPECIFIC LOCATION OF COMPONENTS, REFER TO FIGURE 33, ASSEMBLY DRAWING.

IGURE 34. AIR HOSE ROUTING

REPLACEMENT PARTS

POWER SOURCE

Listed below are the replacement parts which may be ordered directly from PACE sales or through your local authorized PACE distributor. To obtain parts other than those shown, contact PACE Customer Service directly at Telephone (3010 490-9860, FAX (301) 604-9215.

ITEM NO.	DESCRIPTION	PACE PART NUMBER	
		P&P 100	P&P 100E
1	AC Receptacle	1207-0151	1207-0151
2	Fuse (F1) 0.63 Amp, Time Lag (pkg. of 5)	1159-0252-P5	
	0.4 Amp, Time Lag (pkg. of 5)		1159-0262-P5

TABLE III. POWER SOURCE REPLACEMENT PARTS

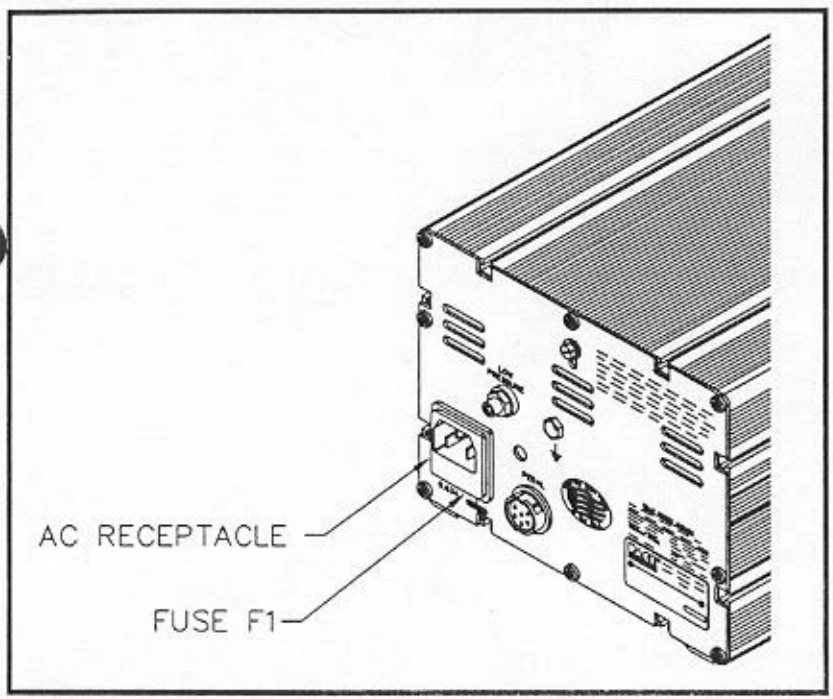


FIGURE 35. POWER SOURCE PARTS

ACCESSORIES

ITEM NO.	DESCRIPTION	PACE PART NUMBER	
		P&P 100	P&P 100E
1	Paste Dispenser Kit	6993-0152	6993-0152
2	Finger Switch Assembly	6008-0143	6008-0143
3	PV-65 Pik-Vac	7027-0001-P1	7027-0001-P1
4	Vacuum Cup Kit	6993-0154	6993-0154
5	Available Vacuum Cups & Metal Tip (pkgs. of 5)		
	Vacuum Cup, .175" I.D.	1121-0382-P5	1121-0382-P5
	Vacuum Cup, .300" I.D.	1121-0383-P5	1121-0383-P5
	Vacuum Cup, .500" I.D.	1121-0384-P5	1121-0384-P5
	Metal Tip, 45° angle	1121-0413-P5	1121-0413-P5
6	Dispenser/Pik-Vac Cubby	6019-0041	6019-0041
7	Power Cord	1332-0094	1332-0093
8	Fuse (F1) 0.63 Amp, Time Lag	1159-0252	
	0.4 Amp, Time Lag		1159-0262
9	Cable Clips, Tube To Wire, Pkg. of 5	1211-0058-P5	1211-0058-P5
10	Foot Pedal (Optional Item)	6008-0115	6008-0115

TABLE IV. ACCESSORY PARTS