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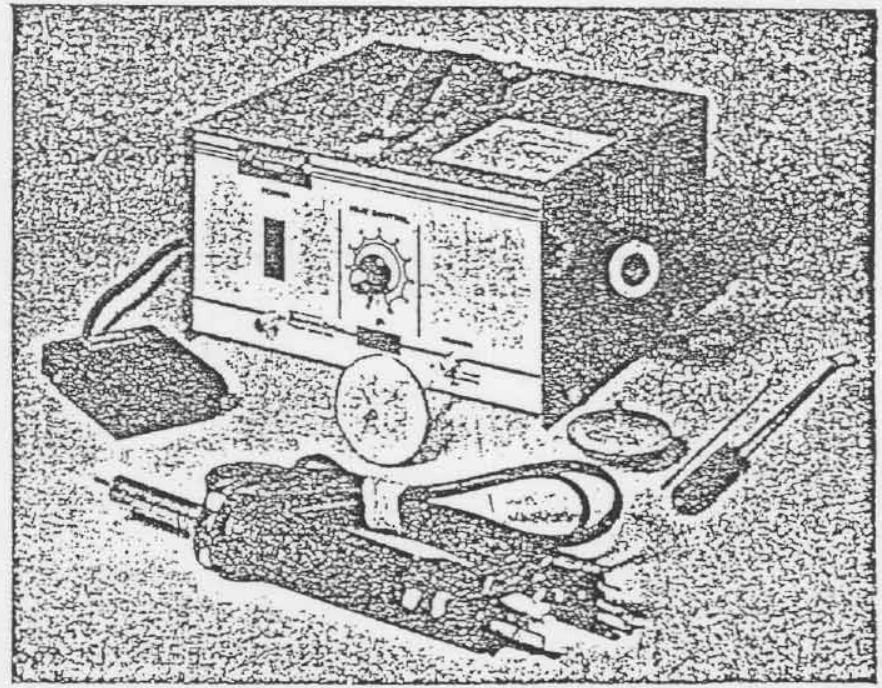
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**PAGE**™

**D-SODR**™ *systems*

**MODEL PC-20**

GENERAL OPERATING  
AND MAINTENANCE INSTRUCTIONS



**PAGE**®  
**INCORPORATED**  
Systems for PCB Repair Anywhere™

D-SODR™ SYSTEMS - MODEL PC-20 SERIES

The Model PC-20 D-Sodr™ System consists of three basic components:

POWER SOURCE

Including vacuum pump, electrical connection and front panel control, and receptacles for power and vacuum. Actuation of the pump is via an ON-OFF switch within the connected integral Foot Pedal Assembly. An Auxiliary Ground is provided to permit grounding of the workpiece so that no voltage difference can be generated between it and the handpiece to avoid damage to sensitive circuit board components.

SODR-X-TRACTOR ASSEMBLY WITH THERMO-DRIVE™ HEAT CONTROL

AND VISIFILTER™

The Sodr-X-Tractor handpiece permits the easy and efficient removal of solder from virtually any type solder joint, using controlled temperature, pressure, vacuum and air flow. It is a lightweight (under 10 oz.) assembly, consisting of a replaceable tip, heat generator, molten solder transfer tube, molten solder receiving chamber and a handle. It is designed with an in-line air/vacuum path to assure high velocity airflow and minimal blockages, and to assure simplified cleaning with a straight, non-flexible rod. The insulated solder chamber is in the handle, and is easily removed for cleaning. The handpiece provides a quick connect type positive locking seal system of the chamber to assure high vacuum loading.

It is capable of accommodating straight leads and wire wrap pins up to .062" square and 3-1/2" in length. The chamber is readily replaceable, and can filter ingested, volatilized flux and coatings. It is also hand removable via a quick-twist connection without danger to the user of touching the heated chamber, and without disturbing or disconnecting any heated elements or electrical connections. A primary filter is provided within the glass chamber and is readily visible thru the opening at the rear of the handpiece.

Handpiece incorporates the PACE Thermo-Drive (high heat recovery) system that maintains the proper temperature level at the tip during the full desoldering cycle. As the solder is removed by high velocity vacuum, Thermo-Drive allows for rapid tip and joint cooldown which prevents resweat and further heating of the work area. After solder removal, Thermo-Drive instantly pumps heat back into the tip in preparation of the next cycle.

Models PC-20A, PC-20E and PC-20AEJ are provided with 110 VAC 60 watt heaters. A 40 watt 24 VAC heater is provided with the Model PC-20BE system. A standard 3-wire grounded tip system is used on all models, and heavy duty, double clad Super Tips are provided to assure extended operational life, greater heat conductivity, high strength and good work visibility.

## VisiFilter™

An external, dual microfiltration, low airflow impedance filter is provided to trap volatiles which normally cannot be handled by micro-particle filters. It features a wide dispersion area within the filter to equally distribute flux, residue, etc., across the entire filter surface to prevent localized residue build up and to assure longer operational life. A transparent outer shell permits immediate and direct indication of when the filter must be changed, and a spare VisiFilter is provided with the system.

### HOT CUBBY STAND ASSEMBLY

Provides an efficient and convenient means to hold the Sodr-X-Tractor handpiece.

### SET UP

The Power Source should be placed where adequate space and lighting will provide suitable working conditions. (See Illustration for Nomenclature).

- A. Plug the Power Source into an appropriate main power receptacle. To protect operating personnel the instrument panel and cabinet are grounded. This instrument is equipped with a three conductor power cable. The third conductor is the ground conductor and when the cable is plugged into an appropriate receptacle the instrument is grounded.
- B. Place the foot pedal (6) where it may be comfortably reached and depressed. You may find it more desirable to pass the cord around the rear of the bench to avoid more cords than necessary in front of the operator.
- C. NOTE: The ON-OFF Power Switch (4) controls all power coming into the system. The Variable AC outlet (1) is independently controlled by the associated knob (2) from OFF-ON to Max.
- D. Place the ON-OFF Power Switch (4) in the ON position. The red indicator light (5) will come on.
- E. Depress the foot pedal, causing pump to operate as indicated by sound.

- F. Plug the polarized Sodr-X-Tractor cord into the AC VAR receptacle (1).
- G. Connect one end of the air line to the metal fitting on the rear of the Sodr-X-Tractor.
- H. Connect the VisiFilter to the other end of the air line, with the raised lettering toward the handpiece.
- I. Connect the black "Quick Connect" fitting to the end of the clear air line (at the rear of the VisiFilter), and then connect the fitting to the front panel vacuum outlet (8), using a 90° twist-lock motion.

#### OPERATION -

##### A. TIP SELECTION

One of the most important aspects for successful Solder Joint Removal is the selection of the proper size Tip. There are several points to keep in mind.

1. The Inside Diameter (ID) of the Tip must be large enough to fit over the lead while providing sufficient room so that air and solder can be drawn through the Tip.
2. The Outside Diameter (OD) of the Tip must be smaller than the diameter of the pad to permit direct tip contact with copper surface while preventing direct Tip contact to baseboard. This will eliminate possibilities of scorching and will prevent high vacuum pick-off forces.
3. The Sodr-X-Tractor Tip should be treated as you would your soldering iron tip. After each Solder Joint Removal operation, excess solder should be lightly wiped off.
4. Normal Tip extension is 1/2" to 5/8" from tip end to heater end.
5. The Set Screw is treated with a special, high temperature, permanent lubricant and does not require further lubrication. However, the screw should be loosened in its thread seat at least once every 8 operating hours.

##### WARNING:

When tightening a new Tip into place, the Set Screw is tightened 1/4 turn beyond the point of contact with the Tip. Turning the screw farther will crush the tip out of round and cause it to jam in the heater assembly. After removal of a tip, the in-line heater assembly should be cleaned with the small wire brush to remove the built-up oxides which reduce heat transfer efficiencies.

6. Sodr-X-Tractor Tips, like soldering iron tips, wear out. The operator is cautioned to watch the tip for wear so that the tip can be removed before complete "Wash Out":

Rate of X-TRACTOR Tip "Wash Out" is directly related to:

- a. Relative velocity of the molten solder.
- b. Temperature of the Tip and solder.
- c. Total area of contact of molten solder to interior side walls of Tip.
- d. Total volume of solder removed.
- e. Percentage of idling time at high temperatures.

Therefore, ascertaining the wear life of a specific type and size for a given application is best determined during active operations.

#### CONSIDERATIONS FOR TIP SELECTION.

Three Tip Types are available for the PACE Sodr-X-Traction System:

SUPER TIP -- Heavy Walled, Chamfered, Dual Clad Copper.  
ALLOY TIP -- Special Alloy, Dual Clad, Chamfered.  
DOUBLE WALL TIP -- Copper & Steel, Dual Clad.

#### TIP CHARACTERISTICS.

All Tips are consumable items. The principle of the Sodr-X-Traction Technique requires molten solder to be rapidly drawn through the Tip. As a result of this action, Tips are consumed by solder "Wash Out."

SUPER TIP - This tip provides the best ductility characteristics over the Alloy and Double Wall Tips and incorporates the following advantages:

1. Maximum heating capability.
2. Minimum potential for damaging pad areas and associated circuitry due to the matching of Tip and Circuit ductility at temperature.
3. Easily modified to suit specific work requirements.  
(Note: - Removal of Tip cladding will reduce life factors.)

Recommendation: SUPER TIPS are recommended for use on expensive boards. It should be remembered that the principle of Sodr-X-Traction is to recover, without damage, assemblies which are inoperable. The cost of the assembly must be the major consideration; not the price of the Tip.

ALLOY TIP - This Tip has a greater life expectancy than the Super Tip. Factors to consider here are as follows:

1. Heating capability and potential for modification are similar to SUPER Tip.  
(Note: - Removal of Tip cladding will reduce life factors.)
2. The relatively harder nature of the alloy, of the ALLOY Tip, at temperature permits its use in unclenching leads without bending, increases its life factor, but also increases its mar factor.

Recommendation: It is suggested that this Tip be used for continuous operation where medium price assemblies are being reworked and repaired. This Tip will prove most economical for the medium range of work where extended Tip life is considered to be an important factor and potential for marring work surfaces is limited.

DOUBLE WALL TIPS - This Tip has a life expectancy greater than the SUPER Tip. Selection of this Tip type should be based on the following characteristics:

1. Heat transfer characteristics of the Double Wall Tip are slightly less than for Super Tips, but do provide longer operational life.
2. Tip has greatest strength with double wall design and can be used for unclenching of heavy leads.

Recommendation: This Tip should be used where best life and strength are desired, and for tasks such as wave soldering touch-up, component salvage and other work where contact with pads or circuitry is minimal.

CUSTOM TIPS: PACE will provide Custom Tips for specific applications upon the request of the customer.

## B. CONTROL SETTINGS

### 1. Variable Heating Control

Tip temperature of the SODR-X-TRACTOR is controlled by adjusting the AC VAR knob. For average work, the SODR-X-TRACTOR should be operated at a setting between 6.5 and 8 for 40 watt heaters and 4 to 5 for 60 watt heaters. However, if the Solder Joint does not completely melt in approximately one second, the temperature setting may be raised in small increments to achieve rapid solder melt and ideal setting.

Settings are repeatable and should be recorded for specific job requirements. When working with large Solder Joints and multi-layer boards, higher temperature will be required for successful Solder Joint Removal. (See Aux. Heating Procedure). When not in continuous use the Sodr-X-Tractor should be allowed to idle at a temperature setting of 4 for 40 watt heaters and 1½ - 2 for 60 watt units.

NOTE: To reduce tip temperature rapidly, first lower AC VAR setting and then use vacuum power to pull cool air thru the tip and heater for twenty seconds. Allow fifteen seconds for temperature stabilization. Increase or decrease of effective heating of the tip will also depend on how far the tip extends out of the Sodr-X-Tractor heater assembly.

2. Vacuum Operation for Solder Joint Removal

The Vacuum Operation is suited for the removal of Surface and Reinforced Hole Solder Joints (i.e., those found on Single-Sided Boards, Double-Sided Boards, Plated-thru-Holes, Eyelet and Funnelet Reinforced Holes, and Standoff Terminals).

VACUUM CONTINUUM

The PC-20 is designed to make specific use of the principle of VACUUM CONTINUUM. After the initial surge of vacuum removes the free solder, the vacuum should be continued for approximately two seconds while oscillating the lead with the X-Tractor Tip to cause a cool down of the lead, hole and pads, thus preventing them from resweating to each other. Failure to make use of VACUUM CONTINUUM in conjunction with a stirring or oscillating motion of the lead with the tip of the SODR-X-TRACTOR will allow sweat joints to form with consequent hole or pad tear out when pulling leads. An additional side effect of not maintaining vacuum for at least two seconds is possible blockage of the X-TRACTOR heater tube since sufficient time is not provided for molten solder to travel the length of the tube and enter the chamber. If blockage should occur, as a result of insufficient Vacuum Continuum, see Section on "Corrective Maintenance."

- a. Surface Solder Joint Removal includes Single-sided boards, Double-sided boards and Standoff Terminations. To remove these Solder Joints, the properly selected Tip is placed on the Solder Joint. When Solder melt is observed, depress the foot pedal to achieve the Vacuum. As solder is removed and the air is flowing through joint, draw the tip away from the pad area and allow the Vacuum Continuum to draw cool air through the Solder Joint area as you oscillate the lead in the hole to prevent sweating of the lead to the pad. If lead is clipped and termination is straight-thru, the lead and solder will be removed simultaneously.

1. Clinched Leads:

Where leads are clinched, the heated Tip of the SODR-X-TRACTOR should be placed at the lead bend. The solder is then melted and X-Tracted, removing as much as possible. Then the Tip is used as a lever to straighten the clinched lead, avoiding touching pad or board surface. (NOTE: - Super Tips will bend when used on large diameter leads. Therefore, use Alloy Tips or the soldering iron for straightening.) Allow time for cool down. Heat and Vacuum are applied for a second time to remove residual solders. The slight oscillating motion which is produced by rotating the Tip is performed to prevent leads from re-sweating while Vacuum Continuum cools the lead and pad areas.



A second method for removing clinched leads is accomplished by notching the tip to allow it to fit over the bent over lead. When solder is X-Tracted, a slight oscillating motion at the tip, in conjunction with Vacuum Continuum is employed as before, thus preventing resweat of the lead to the pad.

After the Solder Joint is removed, the lead may be mechanically straightened with pliers. However, if a slight sweat joint remains, mechanical shearing action can be employed without touching the pad area. Preclipping clinched lead will allow solder and lead to be removed simultaneously.

2. Double-sided Boards with no hole support have two separate Solder Joint which must be removed independently of each other. Whenever possible, leads should be clipped on the component side, leaving a straight stub so that removal of the second solder joint will also remove the lead. Where leads cannot be clipped, or where components must be saved, a heat sinking device should be used between the component body and the Solder Joint. The Solder Joint on the component side of the board is removed first (a notched tip may be desirable). The Solder Joint at the lead termination is then removed.
3. In situations where a pad has no circuitry associated with it, it is recommended that the tip be maintained slightly angled to the pad during initial vacuum application. Maintain a slight downward pressure to provide a reduction of vacuum force while using Vacuum Continuum for surface cooling. Do NOT stir lead.
- b. Reinforced Holes include Boards with Plated-Thru-Holes and Eyeletted or Funneletted Holes. The principle of Solder Joint Removal for Reinforced Holes is distinctive and quite different from the problems associated with Surface Solder Joint Removal. This is due to the problem of leads resweating to side walls. The use of Vacuum Continuum and additional dwell time is mandatory for the removal of Thru-Hole or Reinforced Hole Solder Joints.
  1. Place the heated tip on the Solder Joint using the lead and solder as the primary vehicle to transmit heat into the Joint. NOTE: The principle heat transfer vehicle is the solder and lead. Pads and reinforced holes should not be used as the primary vehicle for transfer of heat.
  2. Watch for the solder melt on the opposite side of the board as an indication of the through melt. When this is observed, activate Vacuum. After the initial surge of Vacuum clears the hole, raise the tip slightly so that it is not in contact with the pad. Allow Continuing Vacuum to cool down the joint area while stirring the lead to prevent it from sweating to the reinforced hole wall. Stirring is not necessary where lead is clipped and is X-Tracted with the initial vacuum surge.

CAUTION: If the Solder Joint is not completely removed on the first attempt, DO NOT TRY TO REHEAT and X-Tract. Allow the Joint to cool down. Resolder the Joint with the Soldering Iron and again allow time for the joint to cool. Now, repeat the Sodr-X-Traction procedure allowing more time for the Joint to melt completely before applying the Vacuum.



### AUXILIARY HEATING

Situations may arise where the Sodr-X-Tractor cannot provide sufficient heat to successfully melt and remove certain Solder Joint Configurations, particularly those which are found in multi-layer boards with internal ground planes and heat sinks. Recommended procedures for these situations is as follows:

1. Set Sodr-X-Tractor temperature control to 6.5.
2. Place the circuit board in a vertical position in a work holding fixture.
3. Apply heat with a Soldering Iron along the component lead from the component side of the board while simultaneously applying heat with the Sodr-X-Tractor from the termination side.
4. When a melt is achieved, apply vacuum and remove molten solders.  
Be sure to oscillate lead with the X-Tractor while applying Vacuum Continuum.

### CONFORMAL COATINGS

As a general rule, Conformal Coatings should be removed prior to Solder Joint Removal to minimize heat dissipation and to prevent volatiles and residues from fouling Power Source and Sodr-X-Tractor mechanisms. Use approved methods for coating removal or contact PACE for removal methods for all types of Conformal Coatings.

Where coatings are thin, 5 to 10 mils, solder joints and coatings can be removed simultaneously by Vacuum X-Traction with molten solders acting as the vehicle to wash highly localized surfaces free of coating residues.

### MULTI-PIN PARTS

The same principle that is used to X-Tract one lead is used to X-Tract components with multiple leads. Each lead and associated joint is treated as an entity to provide minimum heating effects to total workpiece while assuring effective removal of each Solder Joint.

AUTION: Double check that each lead is free in the hole before attempting to remove Dual-In-Line Packs, TO Cans or multi-pin devices. A few extra seconds to accomplish this will be worth the time and effort.

### SYSTEM MAINTENANCE

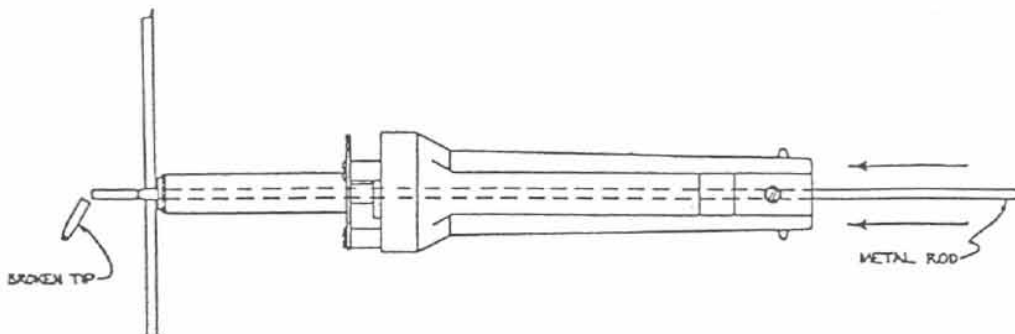
#### A. Tip Care:

NOTE: Sodr-X-Tractor Tips should be cared for in the same manner as Soldering Iron Tips. Tips should be kept clean.

1. After each Sodr-X-Traction or soldering operation, the Tip should be wiped lightly. This will remove excess solder and flux.
2. Care must be taken to watch for Sodr-X-Tractor Tip washout. The Tip must be removed before it becomes so thin that it breaks off in the heater assembly.

### 3. Removal of Broken Tip

If the Tip does break off in the Heater assembly, a steel rod, slightly less than 1/8" in diameter, should be used to ram the broken Tip out of the Heater tube while the Sodr-X-Tractor is idling hot. With set screw removed, insert ram rod from handle end, support front face of heater and drive it out. ( See Sketch).



### B. Tip Replacement:

When changing tips in the Sodr-X-Tractor, the following steps are recommended:

1. While the unit is idling hot, back out the permanently lubricated set screw to free the tip in Heater assembly but do not remove screw completely.
2. Remove the Tip from the Heater.
3. Clean Heater with small wire brush to remove oxide buildup.
4. Place new Tip in Heater.
5. Tighten set screw 1/4 turn past the point of contact to secure Tip in place.

NOTE: Although set screws are permanently lubricated, it is essential that they be loosened at least once every eight operating hours.

### POWER SOURCE FAULT CHECK LIST

<u>Fault</u>		<u>Correction</u>
Motor won't run	1. No Power	Plug in line cord
	2. Fuse blown	Replace Fuse

CARE AND MAINTENANCE OF THE  
PACE SODR-X-TRACTOR™ HANDPIECE

GENERAL:

Like all precision tools, the PACE SODR-X-TRACTOR™ requires proper care and maintenance if it is expected to perform with a minimum of down time. The basic preventive maintenance measures will insure maximum usage for a minimum effort.

INTRODUCTION:

The Sodr-X-Tractor handpiece permits the easy and efficient removal of solder from virtually any type solder joint, using controlled temperature, pressure, vacuum and air flow. It is a lightweight (under 10 oz.) assembly, consisting of a replaceable tip, heat generator, molten solder transfer tube, molten solder receiving chamber and a handle. It is designed with an in-line air/vacuum path to assure high velocity airflow and minimal blockages, and to assure simplified cleaning with a straight, non-flexible rod. The insulated solder chamber is in the handle, and is easily removed for cleaning. The handpiece provides a quick connect type positive locking seal system of the chamber to assure high vacuum loading.

PREVENTIVE MAINTENANCE

Note

Numbers in parenthesis refer to the Exploded View, Figure 1, Page 15.

Heater Tube Assembly (Item 13)

The Heater Tube Assembly must be cleaned with the wire brush whenever tips are changed. During continuous solder removal operations, the Heater Tube Assembly should be cleaned approximately every four hours.

Glass Chamber (Item 6)

Flux and solder build-up within the chamber will depend on the amount of solder extracted from each joint and the amount of joints extracted in any given period of time. The Glass Chamber and the associated "S" Baffle (Item 20) should, therefore, be cleaned as often as necessary with the large bristle brush. To prevent solder from clinging to the Baffle and the Tube, the chamber and baffles should be very lightly coated with mineral oil. Do not use silicone oil or grease as it may deposit in the vacuum source.

### Primary Visible Filter (Item 22)

The white, primary Visible Filter located within the rear of the Glass Chamber should be changed whenever heavy deposits of contaminants are noticeable. (Refer to Paragraph 3, under Corrective Maintenance.) It is very important that this filter be kept clean. This assures optimum air flow, minimum flow restriction, and keeps contaminants from reaching the vacuum sources.

### CORRECTIVE MAINTENANCE

#### Insufficient Vacuum

Reduction of vacuum will reduce the capability of the Sodr-X-Tractor. It can also become potentially dangerous to the workpiece through heat damage. If the operator notices that solder joints are not being completely removed (on a consistent basis), and that the problem is not caused by the tip, the following potential causes should be checked:

1. Blockage of the Heater Transfer Tube - Loss or reduction of vacuum could be caused by the partial or complete blockage of the tube at its point of entrance into the Glass Chamber. A common cause of this is failure to maintain a continuum of vacuum for at least two (2) seconds after solder is removed from the joint. In this event, solder, which is not completely evacuated into the Glass Chamber, may adhere to the inside of the Heater Transfer Tube where it could solidify and cause the blockage.

Removal of the blockage is as follows:

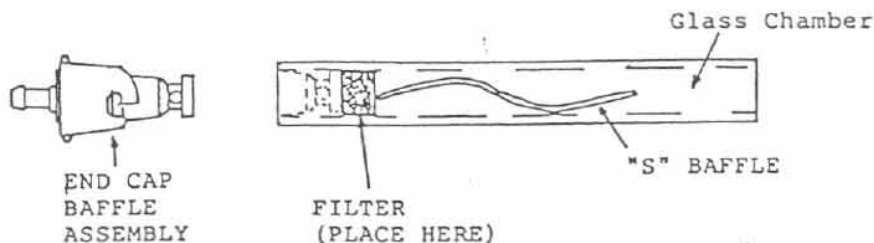
- a. Using pliers, remove the tip from the Heater. Then, holding the Sodr-X-Tractor in a vertical position with the Heater up, melt 1 to 1-1/2 feet of 1/16" diameter solder into the Heater Transfer Tube.
- b. Using a piece of 3/32" round solid copper or brass rod, approximately 5-6 inches in length, run the rod into the heater as far as possible, while holding the rod with the pliers.
- c. Turn heat control to maximum. Allow time for rod to heat, which melts the solder blocking the air passage.

#### CAUTION

Do not remove the Glass Chamber before clearing.

Do not point towards you or others, as flux may cause solder to bubble out of the heater tube.

- d. The solder and the rod combine to form a heat path to melt the blockage. As this occurs, slowly push the rod through to remove the blockage.
  - e. Clean the Heater Transfer Tube with the small wire brush supplied with the unit.
2. Shifting of "S" Baffle - If the "S" Baffle has shifted within the Glass Tube to a position where it blocks the Transfer Tube, the vacuum could be reduced. It is important that the "S" Baffle have enough tension so that it maintains a constant position in the chamber. This may be adjusted by bending the "S" Baffle between your fingers. DO NOT ATTEMPT TO BEND THE "S" BAFFLE WHILE IT IS IN THE GLASS CHAMBER. The baffle should be seated just in front of the End Cap Baffle Assembly, leaving sufficient room for the Filter (Refer to Figure 2). The front end position of the "S" Baffle should not directly interfere with solder flow out of the Transfer Tube for at least 1" of travel.
  3. Clogged Primary Filter - Loss of vacuum could be caused by a clogged, or partially-clogged, Primary White Filter within the Glass Tube. This would be visible through the aperture in the rear of the Sodr-X-Tractor Handpiece. It would appear as a yellowish contaminant on, and in, the white filter material (such as caused by flux); or, by a grayish-black contaminant if solder has caused the clogging. This problem is readily cleared by changing the filter.
  4. Dirty Final (VisiFilter)  
If the Final (VisiFilter) requires replacement, disconnect it from both plastic hoses, and simply reconnect the new filter. Caution, the front (descriptive) side of the Filter must connect to the end of the hose from the Sodr-X-Tractor.
  5. Damaged Air Line - A damaged or holed air line could cause partial or full loss of vacuum. Examine the air line and replace if necessary.
  6. Loose End Cap Baffle Assembly - If not firmly pushed in and seated within the Glass Tube, a loose End Cap Baffle Assembly will cause partial or full loss of vacuum. Also, be certain that this assembly is spring-loaded into place at the rear of the handle.



### Insufficient Heat

The standard PACE Sodr-X-Tractor Handpiece is provided with a 40-watt heater element. After extensive use over long periods of time, the heater might have to be replaced. If the unit is used with a standard PACE Sodr-X-Traction Power Source, heater life can be extended by following the temperature setting instructions provided in the instruction manual. Using the recommended setting of 6.5 to 8 for most work, and an idling temperature setting of 4, will significantly improve heater life expectancy for the standard 40-watt heater.

### Heater Removal and Replacement

- a. Disconnect power cord. To remove the heater assembly, allow the heater to cool. Unscrew the three screws in the heater flange which hold the heater assembly to the handle. Loosen nylon stress relief. Screw at rear of handpiece.
- b. Slowly remove the heater from the handle by pushing the 3 wire cord through the handle from the baffle assembly end. Do not pull the heater assembly itself.
- c. If a replacement heater is being installed, use pliers to grasp the connector pins attached to the wire of the heater assembly. Ease each pin from its connector since the pins are tightly fitted.
- d. Replace heater assembly by inserting pins into line cord connectors. Pull slack through handle and remount heater assembly to handle. Be sure to use the metal spacer between the flange and ground cord connection.

### NOTE

The exact positioning of the wires is important, since the center wire can deflect the chamber off center if not properly located.



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SODR-X-TRACTOR<sup>R</sup>

REPLACEMENT PARTS AND TIPS

UX-20V

1.	SODR-X-TRACTOR Model SX-199 24 VAC	1	6010-0017
	SODR-X-TRACTOR Model SX-201 115 VAC	1	6010-0025
2.	Handle Assy.	1	6010-0024
3.	Assy. w/Male Fitting and VisiFilter <sup>TM</sup>	1	1325-0017
5.	Baffle and End Cap Assembly	1	4010-0031
6.	Chamber, Glass	1	1265-0003
7-10.	Spacer Kit (includes 3 ea nylon spacers, 3 ea screws w/lock washers) Hardware for mounting ground Terminal.	1	6993-0014
11.	Seal Front	1	1213-0008
12.	Seal Support	1	4010-0028
13.	Heater & Seal Assy. 24 VAC 40 watt	1	6010-0016
	Heater & Seal Assy. 115 VAC 60 watt	1	6010-0015
14.	Set Screw	1	1348-0285
15.	Tip (See Tip Listing, Page 19)		
16.	Brush, Bristle	1	1127-0002
17.	Brush, Wire	1	1127-0006
18.	Power Cord Assembly 24 VAC	1	1332-0032
	Power Cord Assembly 115 VAC	1	1332-0009
19.	Clamps (not shown)	6	1211-0002
20.	"S" Baffle	1	4010-0033
21.	Seal, Rear	1	1213-0001
22.	Filter, Sodr-X-Tractor	1	1309-0018
23.	VisiFilter <sup>TM</sup>	1	1309-0020

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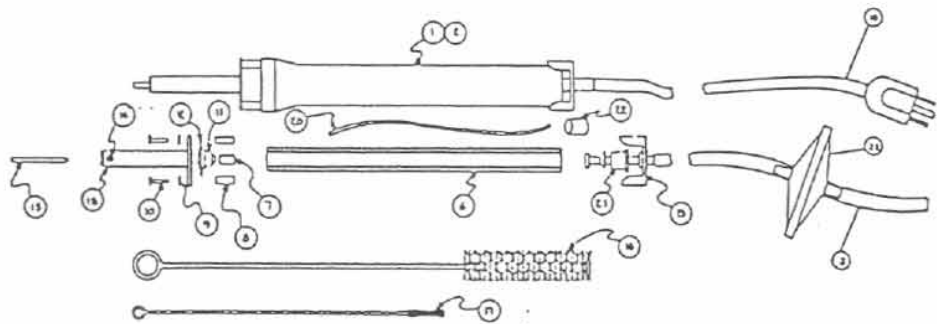


FIGURE 1

MAINTENANCE OF THE  
PACE DIAPHRAGM PUMP

Normally, the Diaphragm Pump will require no maintenance. However, it is important that the external, final (VisiFilter™) filter be occasionally checked to assure that it is not contaminated. If it is, the filter should be replaced.

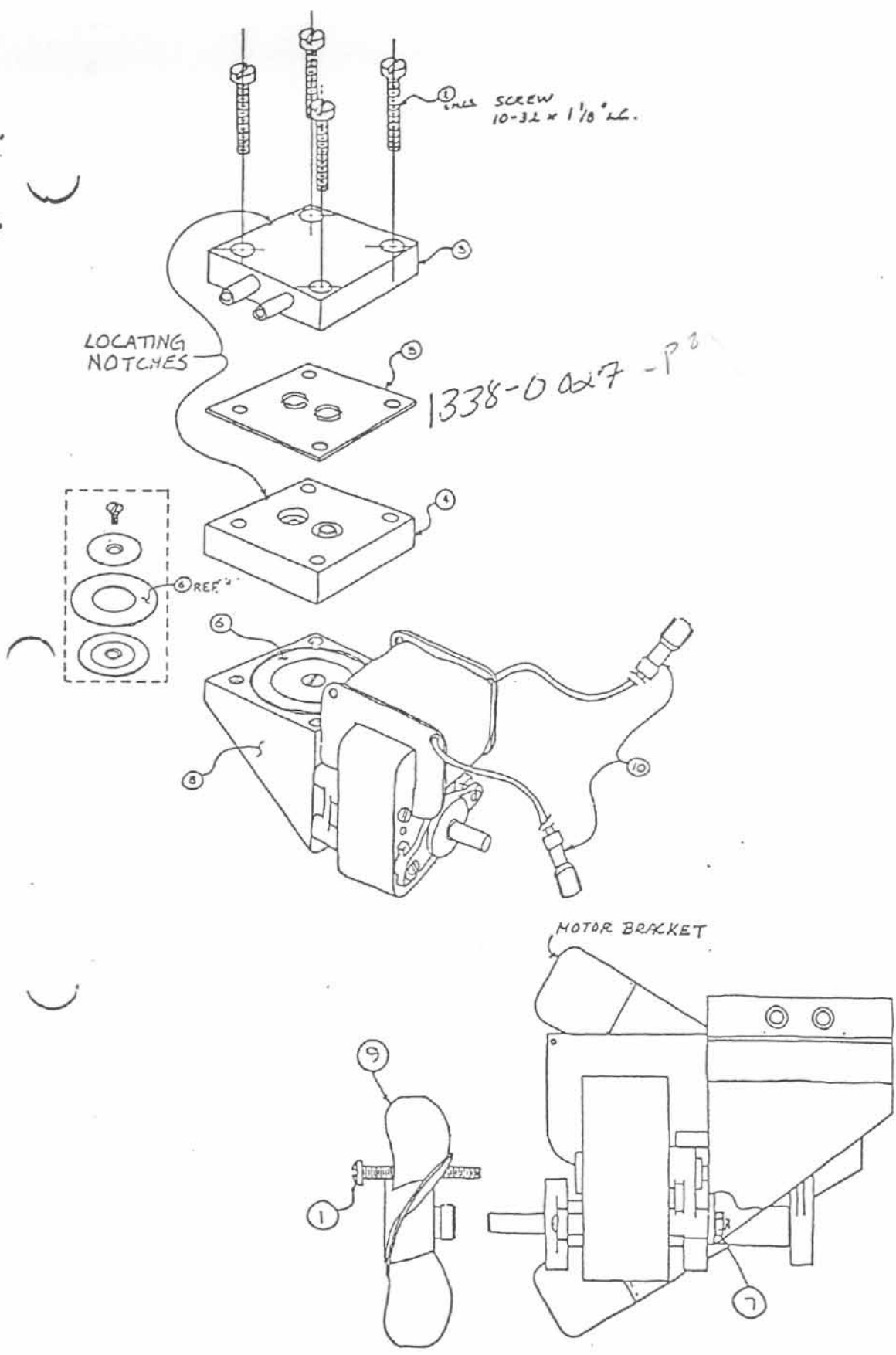
In the rare instance that flux or volatiles have contaminated the pump (normally, only if pump is run without the filter), the pump can be disassembled and cleaned (or components replaced) per the following instructions.

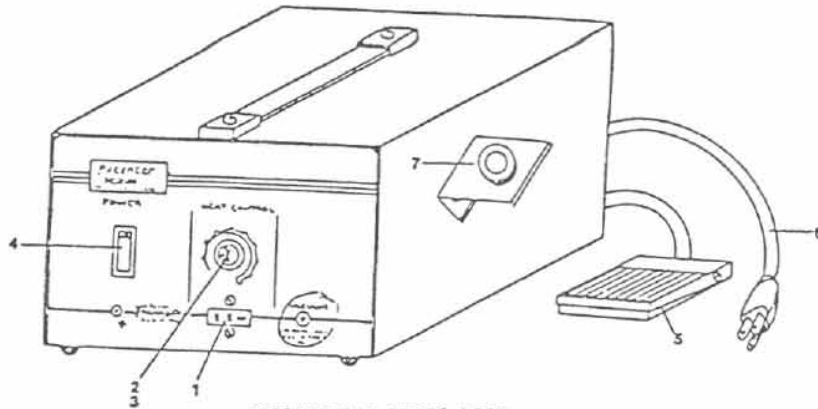
Servicing Instructions

1. Disconnect quick connect lugs (Item 10). Remove the fan (Item 9, 1338-0033) from the motor shaft. Remove the 6-32 x 1-5/8" screw (Item 1, 1405-0392) which holds the motor pump on the bracket. Remove pump from bracket and place on bench with open side of the pump housing (Item 10, 1140-0007) down.
2. Remove the four 10-32 x 1-1/8" screws (Item 2, 1405-0086) which hold the pump plates (Items 3, 4) to the pump housing and remove the pump plates and valve sheet from the pump housing. Separate the pump plates (with valve sheet between them) and remove the valve sheet (Item 5, 1338-0027). Clean valve sheet by wiping it on a lint-free cloth soaked with PACE solvent (P/N 6997-0001) or equivalent such as Trichloroethylene. Clean both sides and allow to dry immediately. Clean pump plates, using a cotton swab and solvent. Clean thoroughly and allow to dry before reassembling.
3. Clean diaphragm (Item 6, 1338-0025) using solvent on a paper towel. Clean both sides and allow to dry immediately. Also clean recessed area of pump housing (Item 8, 1140-0007) using solvent on a cotton swab.
4. Reassemble the pump. When reassembling, it is imperative that the rubber diaphragm be centered around the raised circular center of the plastic support washer. The notches in the pump plates must line up, and the valves in the valve sheet must line up with the valves in the pump plates. The four 10-32 x 1-1/8" screws are to be tightened approximately 1/4 turn past contact with pump plate and in a diagonal method.

When replacing the fan, a 1/16" gap must be left between the fan and the motor.

Note: Do not, at any time, loosen the four 6-32 nuts (Item 7) which hold the pump housing to the motor. This has been set at the factory and should not be changed.



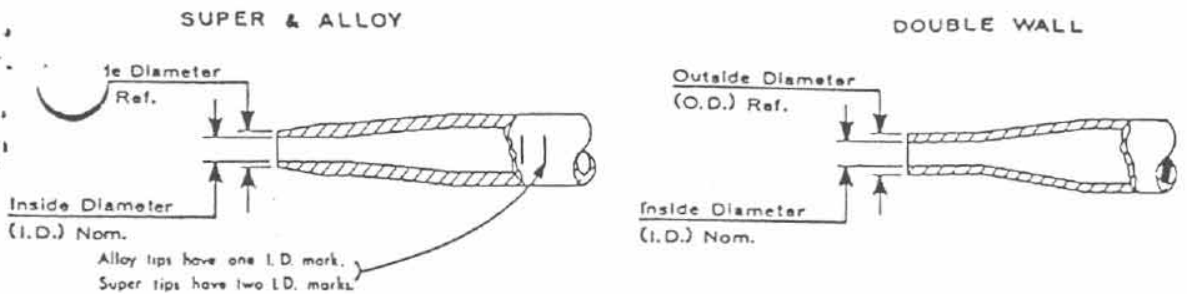


REPLACEMENT PARTS LIST

POWER SOURCES

<u>Item</u>	<u>Description</u>	<u>Qty.</u>	<u>Unit</u>	<u>Part No.</u>
	<u>POWER SOURCE-Model PC-20A</u>	115 VAC input		
		115 VAC output	1	7008-0069
1.	A.C. Receptacle	1		1207-0005
2.	A.C. Voltage Control	1		1285-0014
3.	Knob	1		1222-0006
4.	Main Switch w/Indicator Light	1		1157-0027
5.	Foot Pedal Assy.	1		6008-0058 <i>6008-0058</i>
6.	Power Cord Assy.	1		1332-0058
7.	Hot Cubby Assy.	1		6019-0017
8.	Motor Pump Assy. Complete	1		1336-0017 <i>1336-0023</i>
9.	Pump Diaphragm-Item 6, Page 16	1		1338-0025
10.	Pump Valve Sheet-Item 5, Page 16	1		1338-0027
11.	Fuse 3 Amp Slo Blo (not shown)	1		1159-0001
12.	Fuse Holder (not shown)	1		1161-0002
Model PC-20A J is the same as Model PC-20A with the following exceptions:				
	<u>POWER SOURCE Model PC-20AJ</u>	100 VAC input		
		100 VAC output	1	7008-0081
	Motor Pump Assy. 100 VAC		1	1336-0016
	<u>POWER SOURCE-Model PC-20E</u>	220 VAC input		
		115 VAC output	1	7008-0119
1.	A.C. Receptacle	1		1207-0005
2.	A.C. Voltage Control	1		1285-0014
3.	Knob	1		1222-0006
4.	Main Switch w/Indicator Light	1		1157-0028
5.	Foot Pedal Assy.	1		6008-0065
6.	Power Cord Assy.	1		1332-0064
7.	Hot Cubby Assy.	1		6019-0017
8.	Motor Pump Assy. Complete	1		1336-0017
9.	Pump Diaphragm-Item 6, Page 16	1		1338-0025
10.	Pump Valve Sheet-Item 5, Page 16	1		1338-0027
11.	Fuse 1.6 Amp Slo Blo (not shown)	1		1159-0218
12.	Fuse Holder (not shown)	1		1161-0008
13.	Transformer (not shown)	1		1192-0028
	<u>POWER SOURCE-Model PC-20BE</u>	220 VAC input		
		24 VAC output	1	7008-0116
1.	A.C. Receptacle, Polarized	1		1207-0014
2.	A.C. Voltage Control	1		1285-0030
3.	Knob	1		1222-0006
4.	Main Switch w/Indicator Light	1		1157-0028
5.	Foot Pedal Assy.	1		6008-0069
6.	Power Cord Assy.	1		1332-0064
7.	Hot Cubby Assy.	1		6019-0017
8.	Motor Pump Assy.	1		1336-0017
9.	Pump Diaphragm-Item 6, Page 16	1		1338-0025
10.	Pump Valve Sheet-Item 5, Page 16	1		1338-0027
11.	Fuse 1.6 Amp Slo Blo (not shown)	1		1159-0218
12.	Fuse Holder	1		1161-0008
13.	Transformer	1		1192-0039

# SODR-X-TRACTOR TIPS



I.D. Nom.		O.D. Ref.		SUPER TIPS (Heavy Walled Chamfered, Dual Clad, Copper) PACE Part No.
Ins.	mm	Ins.	mm	
.061	1.549	.104	2.642	1121-0217
.050	1.270	.085	2.159	1121-0216
.036	.914	.072	1.829	1121-0215
.025	.635	.060	1.524	1121-0214
.018	.457	.053	1.346	1121-0213

### ALLOY TIPS (Chamfered, Dual Clad)

.068	1.727	.125	3.175	1121-0115
.036	0.914	.072	1.829	1121-0117
.025	0.635	.060	1.524	1121-0118

### DOUBLE WALL TIPS (Dual Clad, Copper & Steel)

.036	0.914	.125	3.175	1121-0097
.025	0.635	.104	2.642	1121-0098
		.102	2.591	1121-0099

### THIN WALL TIP (Copper)

.095	2.413	.125	3.175	1121-0091*
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\*Not Chamfered



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