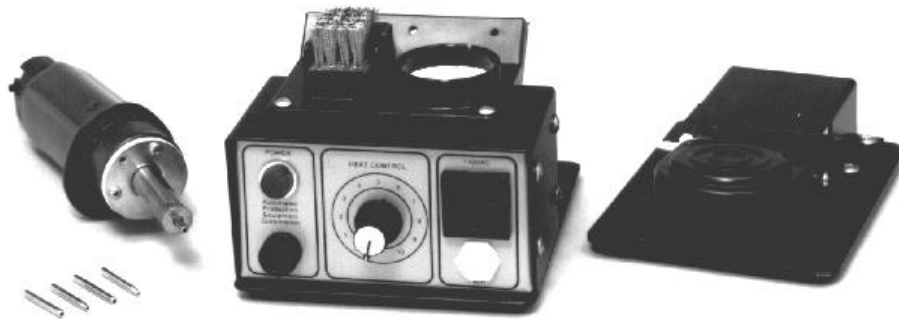


A. P. E. CORP.



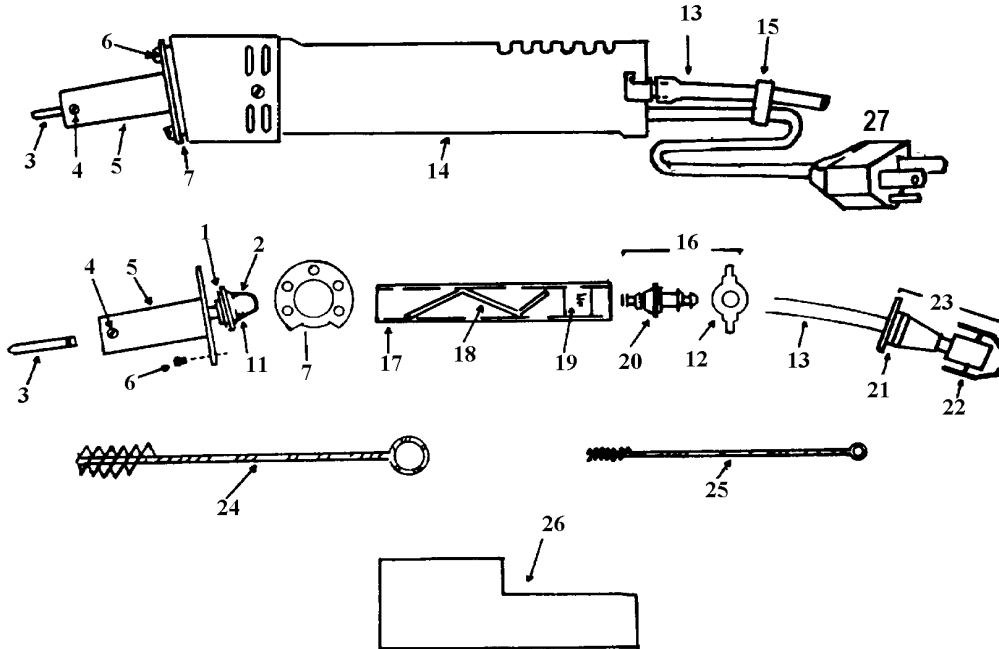
EX-675
PNEUMATIC DESOLDER STATION

INSTRUCTIONS FOR OPERATING THE EX-675

1. CONNECT THE PLASTIC CLEAR AIR TUBE OF THE HAND TOOL TO THE WHITE AIR FITTING ON THE FRONT OF THE EX-675 MACHINE, WHERE IT INDICATES "AIR".
2. PLUG THE HAND TOOL ELECTRIC PLUG INTO THE EX-675 "110 VAC" RECEPTACLE ON THE FRONT OF THE MACHINE.
3. CONNECT THE CLEAR PLASTIC TUBE THAT COMES FROM THE REAR OF THE EX-675 MACHINE INTO THE WHITE AIR FITTING THAT PROTRUDES FROM THE SIDE OF THE "PNEU-VAC" ® FOOT SWITCH TRANSDUCER.
4. CONNECT THE SHOP'S AIR SUPPLY TO THE WHITE AIR FITTING IN THE FOOT SWITCH UNDER THE SHIELD.
5. CONNECT THE POWER CORD TO THE REAR RECEPTACLE OF THE EX-675 AND TO THE SHOP'S 110 VOLT RECEPTACLE.
6. APPLY THE SHOP'S AIR PRESSURE TO THE PNEU-VAC ® FOOT SWITCH.
7. TURN THE HEAT CONTROL KNOB CLOCKWISE TO APPLY ELECTRIC POWER. THE RED INDICATOR LIGHT WILL ILLUMINATE. TURN TO POSITION 10 TO OBTAIN QUICK HEAT ON THE DESOLDER TIP. AFTER A FEW MINUTES, TURN THE KNOB BACK TO POSITION 7 FOR NORMAL OPERATION.
8. STEP ON THE PNEU-VAC® FOOT SWITCH TO CREATE VACUUM IN THE DESOLDER HAND TOOL.

EX-675 Desolder Irons

MODEL EX - 1000 & EX - 1500



ITEM DESCRIPTION	PART NO.	ITEM DESCRIPTION	PART NO.
1 Seal Support	6700-0028	22 Quick Disconnect	6700-8799
2 Forward Seal Assy.	6700-3700	23 Stop Clog Filter Assy.	6700-5000
3 Desolder Tips	See Tip Page	24 Bristle Brush, Glass Tube	6700-0010
4 Set Screws	6700-7700-P10	25 Wire Brush, Heater Assy.	6700-0112
5 Heater & Seal Assy (110v)	6700-0045	26 Handpiece Insulator	6700-0286
6 Heater Retaining Screws (3 pk)	6700-7017-P3	27 Line Cord Assy.(110v Nema Plug)	6700-4000
7 Heater Insulator (2 pk)	6700-3813-P2	EX- 1000 DESOLDER HANDPIECE	
11 Seal	6700-7201	Handpiece Complete (110v)	1000-6700●
12 End Cap Retaining Clip	6700-7302	Handpiece Alone (110v)	1000-6701
13 Tube Assy. (6 Feet)	7000-8790	EX - 1500 ANTI-STATIC DESOLDER HANDPIECE	
Tube Assy. (12 Feet)	7000-8701	Handpiece Complete (110v)	1500-6700▲
14 Handpiece Replacement Assy	6700-0287	Handpiece Alone (110v)	1500-6701
15 Hose Clamp	6700-2002-P5	Handpiece Consist of :	
16 End Cap Assembly	6700-7300	Desolder Tool w/Heater	
17 Glass Tube (1 pk)	6700-3200-P1	Stop-Clog Filter Assy.	6700-5000
17 Glass Tube (6 pk)	6700-3200-P6	Tube Assy.	7000-8790
18 "S" Baffle	6700-4100	Desolder Tip Kit (1 ea. Standard sizes)	6700-4223
19 Glass Tube Filters (25 Pk)	6700-0100-P25	Bristle Brush, Glass Tube (1 ea.)	6700-0010
Glass Tube Filters (50 Pk)	6700-0100-P50	Wire Brush, Heater Assy. (1 ea.)	6700-0112
20 Rear Seal	6700-7200	Quick Disconnect (1 ea)	6700-8799
21 Stop-Clog Filter Fixed	3000-5002	Hose Clamps	6700-2002-P5
Stop-Clog Filter Replaceable	3000-5003	CONTENTS HANDPIECE ALONE	
Replaceable Element (10 pk)	3000-5001-P10	Desolder Tool w/Heater	
Replaceable Element (25 pk)	3000-5001-P25	Stop-Clog Filter Assy	6700-5000
Replaceable Element (50 pk)	3000-5001-P50	Tube Assy.	7000-8790
●-STANDARD WITH EX-675			
▲-OPTIONAL WITH EX-675			

SET UP

The EX-675 requires the use of factory air pressure to perform the desoldering task. A minimum of sixty pounds per square inch (60 PSI) of factory air pressure is required with a maximum of 110 pounds per square inch (110 PSI).

All air pressure lines should include a three (3) micron filter to protect the footpedal assembly and transducer from oil, heat, dust, and water that can enter the system and effect performance. Contaminates lodged in the transducer will reduce vacuum power and result in clogging of the desoldering handpiece.

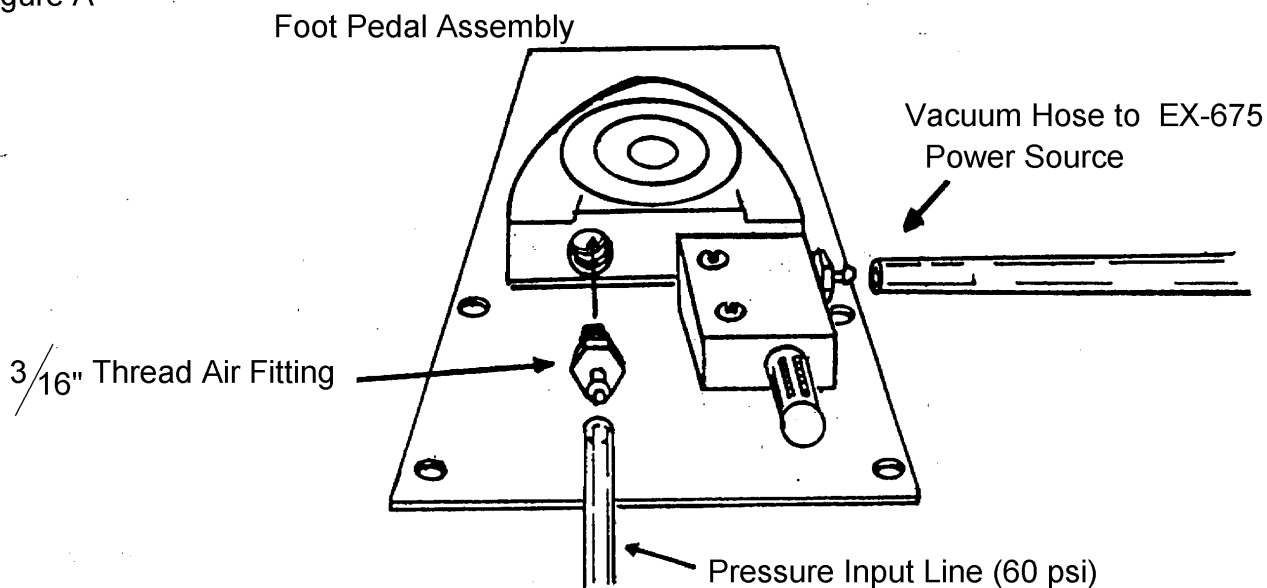
The following chart will provide a reference for the desired vacuum when using factory air pressure in the EX-675.

Factory Air Pressure in PSI	Vacuum Strength in Inches of Hg
60 (min)	18" to 20"
80 (min)	20" to 22"
110 (max)	24" to 26"

To attach the factory air pressure line to the footpedal assembly, first remove the transducer cover held in place with four screws secured to the base plate.

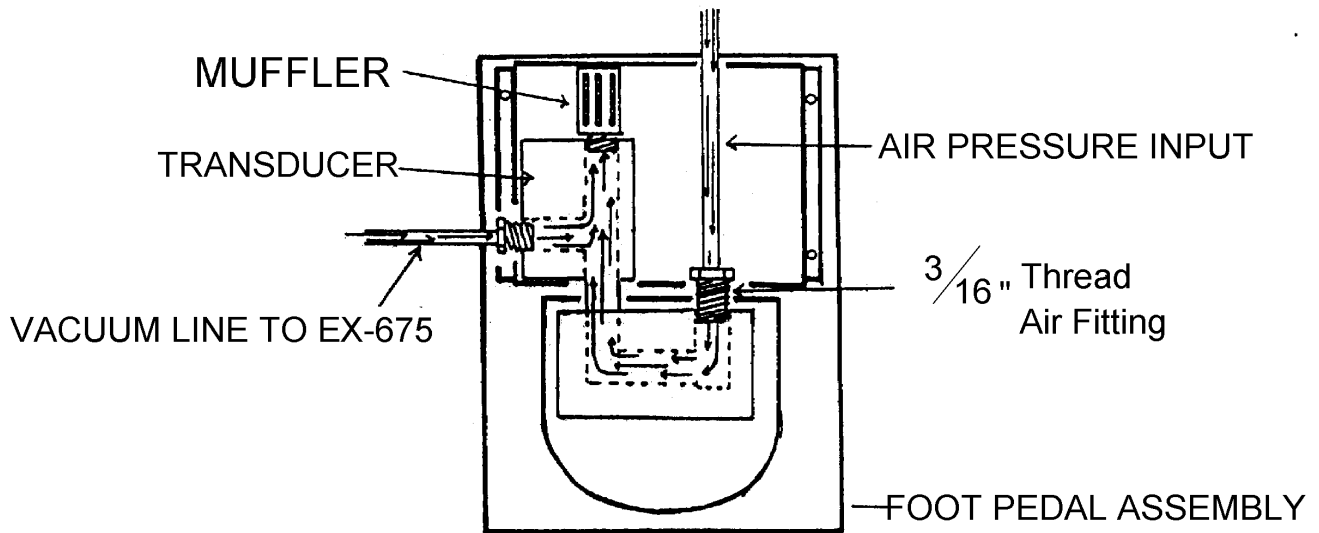
After the cover is removed, the air pressure input receptacle is exposed. A fitting with 3/16 inch thread must be used to attach the factory air line to the footpedal assembly (see figure A)

Figure A



Once the air line has been attached, the transducer cover can be replaced and the vacuum hose of the desoldering handpiece can be fitted to the transducer assembly.

When the footpedal is depressed, the air pressure will pass through the footpedal and transducer, creating a vacuum from the venturi principal. The vacuum is the result of the large volume of air passing the vacuum hose opening at high speed (see figure B).



TEMPERATURE CONTROL

Variable AC Temperature Control

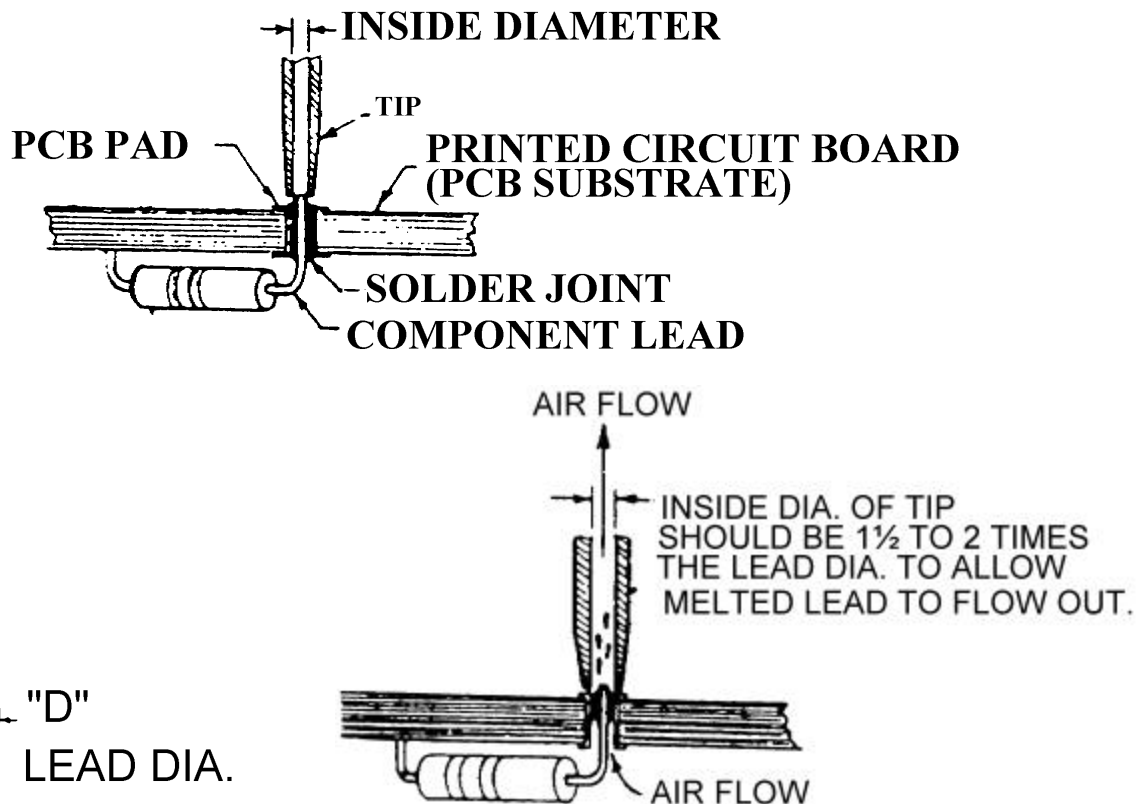
The model EX-675 offers the A.P.E. voltage regulator to vary heater and tip temperature. By plugging the desoldering handpiece into the EX-675, voltage is regulated from 30 volts (min) to 110 volts (max). This voltage regulation offers a temperature range of approximately 350 degrees fahrenheit to 950 degrees fahrenheit.

Normal range for most work is in the 6 to 8 range. A rough approximation of tip temperature is almost 100 degrees F. per number. For example: a setting of 8 will be in the temperature range of 700 to 800 degrees F. For best results, the solder joint should melt in under two seconds. The control should be set close to the highest setting possible to achieve the quickest solder melt. This way, the heat does not have time to dissipate to the surrounding areas. Higher settings are required for large solder joints and multilayer boards. When not in constant use, reduce setting and allow the EX-675 to idle at 4 or 5 to conserve energy and increase tip life.

Desoldering Tip Selection

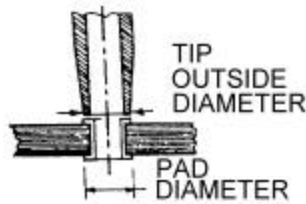
Proper selection of the tip is the key to successful desoldering.

1. **Inside Diameter** – The tip should be large enough to fit over the lead to be desoldered. A slight clearance is necessary to allow the solder to flow through the tip. Although several tip diameters will work, ideally a tip inside diameter of $1\frac{1}{2}$ to 2 times the lead diameter is best.



2. **Outside Diameter** – The O.D. of the tip should be less than the diameter of the circuit board pad. This is to avoid burning or marking the board material. The tip wall thickness provides the path of heat into the solder joint. Thicker walls are preferable for large solder joints and bigger heat sinks to conduct the heat to the solder joint as quickly as possible.

HEAT TO THE SOLDER JOINT AS QUICKLY AS POSSIBLE.



3. **Tip Care** – After each period of use, the tip should be cleaned off with the stand brush and inspected for signs of wear. The tip end may get frayed or spread out causing rough edges that can scratch a board.

Tips should be removed from heater several times a day to clean heater and to remove oxidation from outside of the tip.

Note : Failure to remove tip for long period of time may result in tip seizing in heater due to expansion from oxidation.



4. **Tip Wear** – Desoldering tips tend to wear out faster than soldering iron tips for many reasons such as:
- Increased surface area exposed to oxidation.
 - Cycling of temperature from hot to cold.
 - Wearing out of inner surface from molten solder and flux passing through.
 - Mechanical wear from bending leads and stirring action.
 - High temperature causes oxidation.
5. **Set Screw** – An anti-seizing lubricating compound is impregnated into the set screw to prolong useful life. The set screw should be loosened every few hours to extend life. When holding tip in place, the set screw should be tightened to just make contact with tip and then turned only $\frac{1}{4}$ turn additional to avoid crushing tip wall and making tip removal difficult
6. **Tip Tips** – Tips should be positioned so they protrude about $\frac{1}{2}$ " from heater. Personal preference for variations will affect the temperature and thermal recovery time of the tip. The adjustment of the temperature control in conjunction with position of tip as well as type of tip used can give infinite variations.
7. **Special Tips** – Special tips are available from the distributors or factory. Tips can be bent, beveled, slotted and flattened to meet special requirements. Consult with distributor for specific problems.



SOLDER JOINT REMOVAL

The desoldering handpiece is a simple but critical tool. Understanding its functions will make its use and maintenance easier.

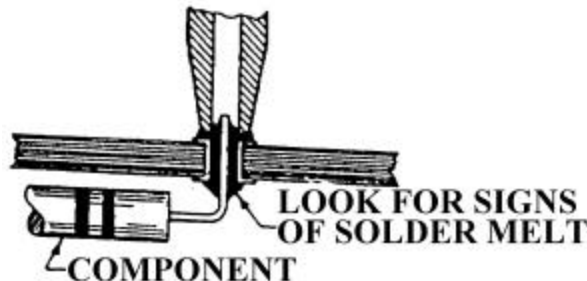
1. Through the tip, the solder joint is heated to make the solder molten. The vacuum is energized to extract the molten solder up through the tip and heater and into the glass collection tube. A metal baffle is positioned in the glass tube to provide a surface for the molten solder to adhere to. The felt filter at the rear end of the glass tube will trap fine particles and vapors that are drawn in preventing these particles from reaching the vacuum pump.
2. A seal on both ends of the glass tube serves to provide the vacuum from the power supply through the hose to the heater and tip. The seals permit quick disconnection of the glass collection tube for removal of the solder and changing of the filter.
3. The tip is heated by the heater which also carries the vacuum. A tight seal at the tip is essential to both transfer the heat and the vacuum to the solder joint. The tip must not be blocked or have "blow holes" in its sides.

Plated Through And Reinforced Hole Joint Removal

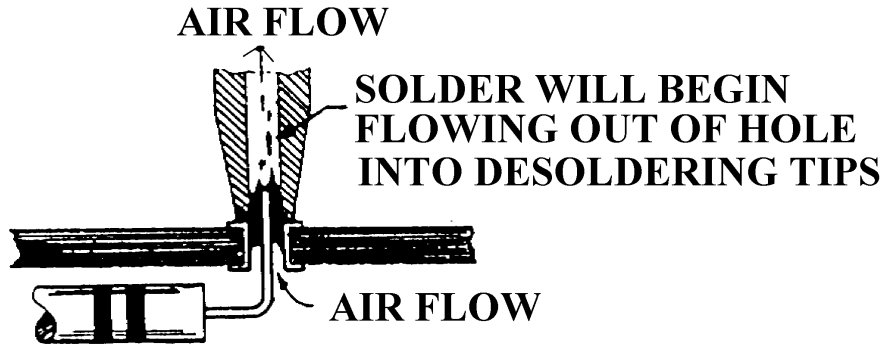
These joints have solder in holes that are plated through. Complete evacuation of solder must be achieved before the component can be removed. Using four basic steps, the joint can be removed. The first step is to make the solder molten. This can be verified by glancing at the component side of the joint and watching for the first sign of bubbling or movement of the solder at the joint. Continuation of the basic steps will assure good joint removal. These steps are as follows:

A. Heating the Solder Joint

Lay the tip over the lead against the pad-lead junction. This will ensure there is adequate melting of the solder. The time needed should be only a few seconds. It is helpful to watch the component side of the PCB for full melt of solder.

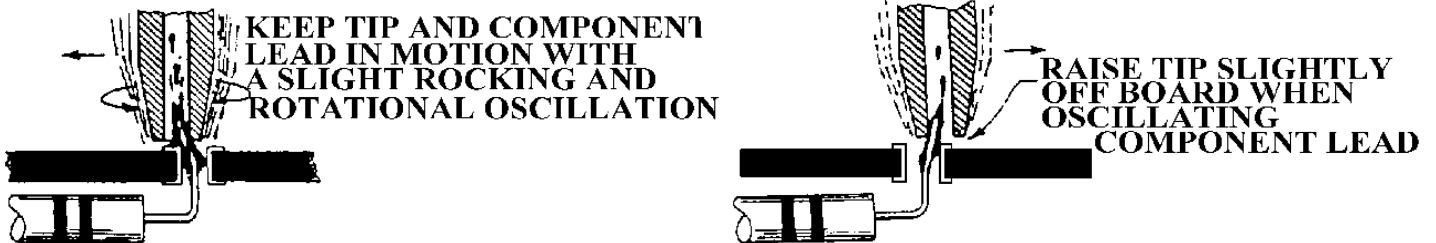


SOLDER JOINT REMOVAL (cont'd)



B. Start Vacuum

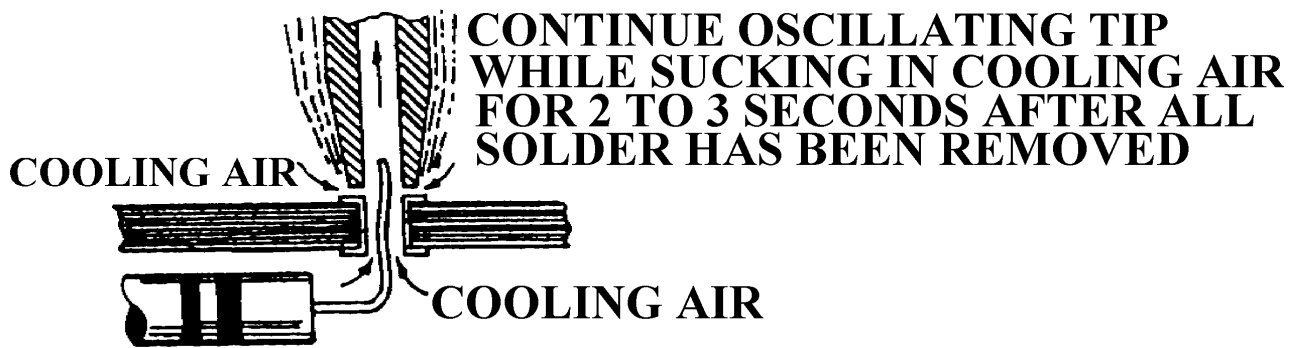
Once solder melt is observed, step on the foot pedal to suck solder from joint. Hold tip in a perpendicular position to board and let tip gently lay on pad. This will seal the pad and tip and give maximum vacuum. Do this for several seconds.



C. Oscillation

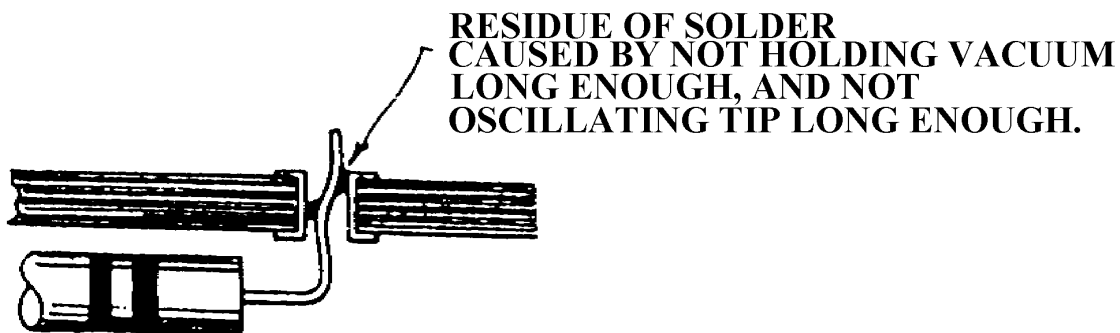
After stepping on foot pedal to begin evacuating solder, almost instantaneously begin vigorously (but gently) oscillating the component lead. Usually the lead bends more easily in one direction than the other, such as IC's. This vigorous oscillating should be done only to the lead and the weight of the tip on the board **should be removed**. Care should be taken not to scratch the pad with the tip. Keep the vacuum on at all times. The purpose of oscillating the lead is to keep the joint from re-sweating until the temperature is lowered below the melting point of the solder. The temperature is lowered by the continuous flow of cool air through the joint by the vacuum at the tip.

SOLDER JOINT REMOVAL (cont'd)



D. Remove Tip From Lead

While still holding the foot pedal and sucking air into tip, lift the tip off the component lead and away from circuit board. Maintain the vacuum for a count of three to ensure solder has had time to run into glass tube and will not stop and solidify in heater riser tube. Be sure that vacuum is continued **after** the tip is raised from component lead. When vacuum flow is stopped, heat is instantly driven into the tip and can cause a sweat joint of residue particles if not removed from joint.



Single Sided Board Joint Removal

When removing the joint, the four previous steps must be observed. These solder joints are easiest to remove but care must still be taken to prevent lifting of pads which are weakest when heat is applied. The bonding strength of the circuit pad recovers when the vacuum air cools down the joint.

Double Sided Board And Multi-Layer Board Joint Removal

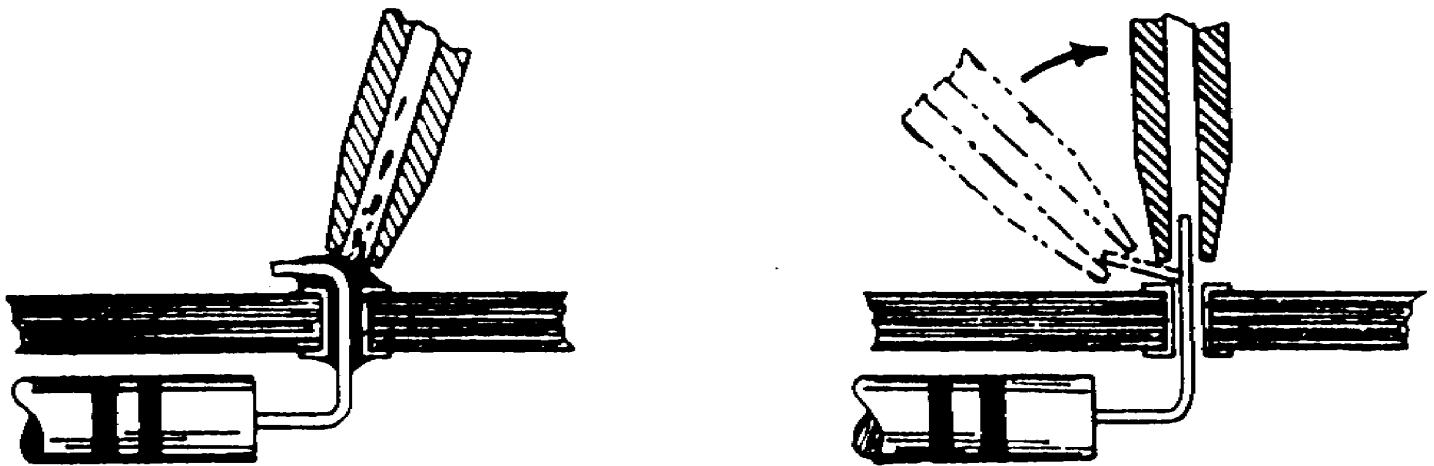
Since there is really two single sided solder joints at each location, these joints will be treated like the above joints except that additional heat and time may be required as thermal properties increase. The component side joints should be removed first. On leads that go through pads with no circuitry attached, be careful to oscillate the lead very gently to prevent the pad from being lifted.

Clinched Lead Solder Joint Removal

The first step is to straighten out the clinched lead. If the end of the lead is visible and it is laying on some circuitry, carefully slide the desoldering tip under the lead while melting the solder. After the tip is on the lead, slowly and carefully begin to straighten out the lead with the tip. When in a vertical position, proceed as in four basic steps.

When the end of the lead is not visible, it may be necessary to first lay the desoldering tip on top of the clinched lead to melt the solder. Then suck excess solder from joint thereby exposing end of component lead.

Now the lead can either be clipped off next to the hole and desoldered, or it can be straightened as shown. Resoldering and extracting of the lead yields the best results. If the lead is laying on the board without any circuitry under it, clipping the lead is safer to avoid scratching the board.



DESOLDERING HANDPIECE

TROUBLE	PROBABLE CAUSE	SOLUTION
<p>Not extracting solder but have vacuum at end of glass tube.</p>	<p>Tip clogged.</p> <p>Tip has blown hole.</p> <p>Tip is loose in heater.</p> <p>Front seal is shrunk, worn or not seated.</p>	<p>Run wire up tip.</p> <p>Replace tip.</p> <p>Replace heater.</p> <p>Examine & replace front seal with new one.</p>
<p>Not extracting solder & have <u>NO</u> vacuum at end of glass tube.</p>	<p>Hose clogged or has leak.</p> <p>Vacuum valve slide is open.</p>	<p>Examine or replace hose.</p> <p>Check valve- put in maximum vacuum.</p>
<p>Desoldering action is erratic.</p>	<p>Power cord on handpiece is making poor contact or wire is frayed inside.</p> <p>Temp. control is erratic.</p>	<p>Replace power cord.</p> <p>Try on other control and replace if control is defective.</p>

AIR-OPERATED PRODUCTION

DESOLDERING SYSTEMS

EX-675 (MEETS OR EXCEEDS EOS/ESD REQUIREMENTS MIL-STD-2000A)

Item Description	A.P.E. Part No.	Replacement Parts
------------------	-----------------	-------------------

Domestic Version Complete	0675-0000	
Export Version Complete	0675-2000	
Standard Package Consist of:		
EX-675 Power Source(110)VAC	0675-0001*	
EX-675 Power Source(220)VAC	0675-2001*	
PNEU-VAC Air Foot Pedal	9000-0053	
EX-1000 Anti-Static		
Desolder Handpiece(110 Vac)	1000-6700	
Single Holder Assembly	3550-0600	
Tip Clean Assy. MTD	6730-3803	
Operation/Maintenance Manual	0675-0675	
Starter Consumable Kit	6700-1394 ▲	
Standard Track Repair Kit	2570-0025 ▲	

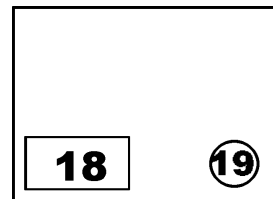
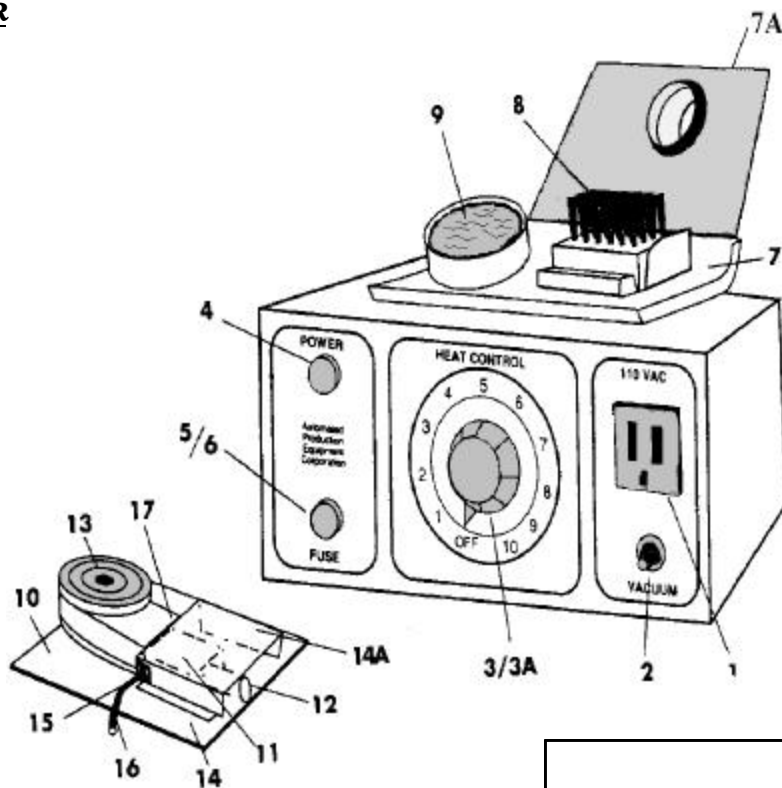


EX-675 POWER SOURCE SPARE PARTS LISTING

ITEM NO.	DESCRIPTION	PART NUMBER
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MODEL EX-675		
A	Power Source Alone 110V	0675-0001
B	Power Source Alone 220V	0675-2001
1	AC Receptacle, NEMA	4000-3442
2	Vacuum Fitting	7000-8785
3	Knob	3000-8004
3A	Voltage Controller	4000-8444
4	Power Light Red, 110V	5000-8014
	Power Light Green, 220V	8000-8650
5	Fuse holder	8000-0020
6	Power Fuse, 3 Amp	8000-0041
7	Cleaning Unit Assembly	6730-3803
7A	Single Holder Attached	3550-0600
8	Brush	6730-0116
9	Sponge	6730-0118
10	Foot Pedal Base Plate	3000-8805
11	Transducer	0550-5000
12	Muffler	0550-5002
13	Pneu-Vac Foot Pedal	9000-0055
14	Pneu-Vac Foot Pedal Assembly	9000-0053
14A	Foot Pedal Shield Plate	0600-0650
15	Hose Fitting Foot Pedal	7000-8780
16	Air Hose	7000-8701
17	Air Input Fitting (60 P.S.I./Mn)	7000-8780
18	Main Power Receptacle	8000-0090
19	Hose Bushing	#####

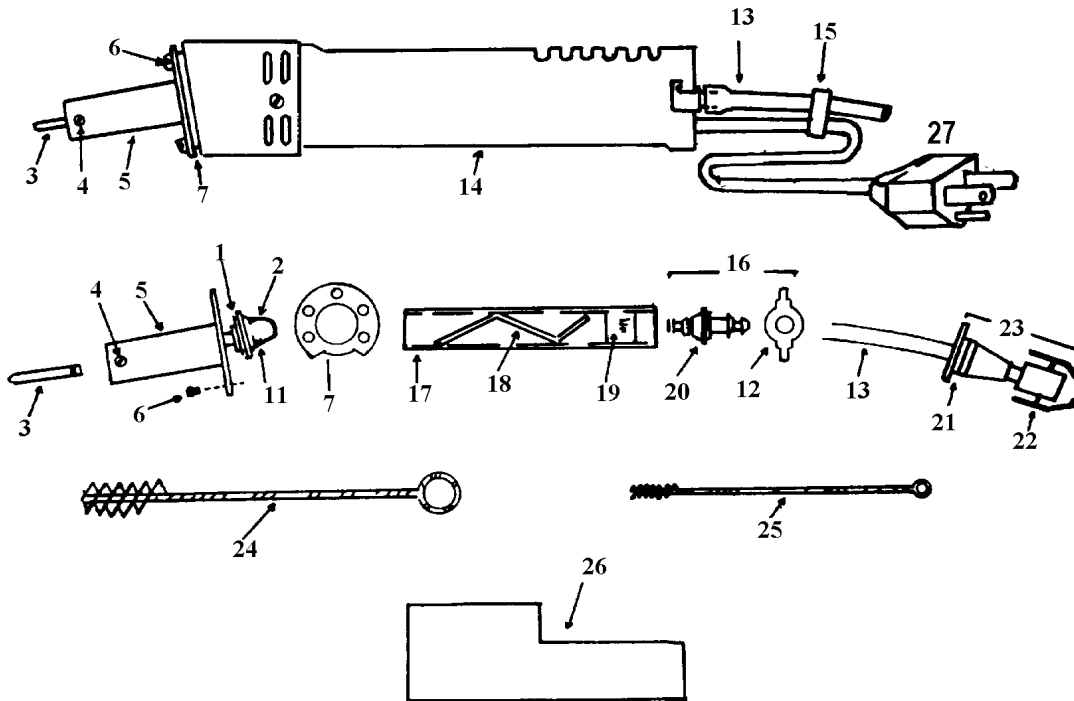
- Not Sold Separately



EX-675 Rear Panel

EX-675 Desolder Irons

MODEL EX - 1000 & EX - 1500

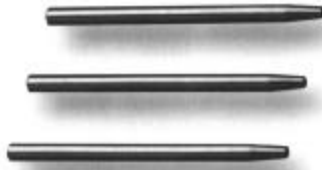


ITEM DESCRIPTION	PART NO.	ITEM DESCRIPTION	PART NO.
1 Seal Support	6700-0028	22 Quick Disconnect	6700-8799
2 Forward Seal Assy.	6700-3700	23 Stop Clog Filter Assy.	6700-5000
3 Desolder Tips	See Tip Page	24 Bristle Brush, Glass Tube	6700-0010
4 Set Screws	6700-7700-P10	25 Wire Brush, Heater Assy.	6700-0112
5 Heater & Seal Assy (110v)	6700-0045	26 Handpiece Insulator	6700-0286
6 Heater Retaining Screws (3 pk)	6700-7017-P3	27 Line Cord Assy.(110v Nema Plug)	6700-4000
7 Heater Insulator (2 pk)	6700-3813-P2	EX- 1000 DESOLDER HANDPIECE	
11 Seal	7000-7201	Handpiece Complete (110v)	1000-6700●
12 End Cap Retaining Clip	7000-7302	Handpiece Alone (110v)	1000-6701
13 Tube Assy. (6 Feet)	7000-8790	EX - 1500 ANTI-STATIC DESOLDER HANDPIECE	
Tube Assy. (12 Feet)	7000-8701	Handpiece Complete (110v)	1500-6700▲
14 Handpiece Replacement Assy	6700-0287	Handpiece Alone (110v)	1500-6701
15 Hose Clamp	6700-2002-P5	Handpiece Consist of :	
16 End Cap Assembly	6700-7300	Desolder Tool w/Heater	
17 Glass Tube (1 pk)	6700-3200-P1	Stop-Clog Filter Assy.	6700-5000
17 Glass Tube (6 pk)	6700-3200-P6	Tube Assy.	7000-8790
18 "S" Baffle	6700-4100	Desolder Tip Kit (1 ea. Standard sizes)	6700-4223
19 Glass Tube Filters (25 Pk)	6700-0100-P25	Bristle Brush, Glass Tube (1 ea.)	6700-0010
Glass Tube Filters (50 Pk)	6700-0100-P50	Wire Brush, Heater Assy. (1 ea.)	6700-0112
20 Rear Seal	6700-7200	Quick Disconnect (1 ea)	6700-8799
21 Stop-Clog Filter Fixed	3000-5002	Hose Clamps	6700-2002
Stop-Clog Filter Replaceable	3000-5003	CONTENTS HANDPIECE ALONE	
Replaceable Element (10 pk)	3000-5001-P10	Desolder Tool w/Heater	
Replaceable Element (25 pk)	3000-5001-P25	Stop-Clog Filter Assy	6700-5000
Replaceable Element (50 pk)	3000-5001-P50	Tube Assy.	7000-8790

●-STANDARD WITH EX-675 ▲-OPTIONAL WITH EX-675

DESOLDERING TIPS

Tips Desoldering



Standard Tips

Long Tips

Curved Tips

(I.D. to fit Pace & Plug Tips)

(Fits Pace MP-also for wire wrap pins)

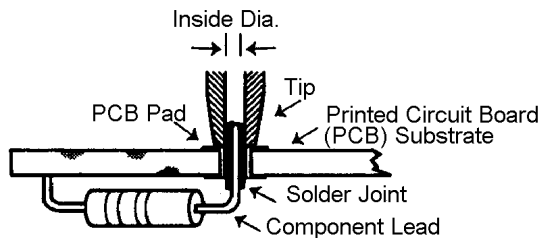
(30° bend)

I.D.	Part No.	I.D.	Part No.	I.D.	Part No.
.018	1212-0018	.060	1212-2060	.025	1212-2125
.025	1212-0225	.040	1212-2040	.040	1212-2140
.040	1212-0440	.025	1212-2025	.060	1212-2160
.050	1212-0550				
.060	1212-0660				
.080	1212-0080				
Assorted Tips	1212-1212				

DESIGNED FOR MAXIMUM HEAT CONDUCTIVITY
AND OPTIMUM OPERATING LIFE.
DESOLDER TIP SELECTION

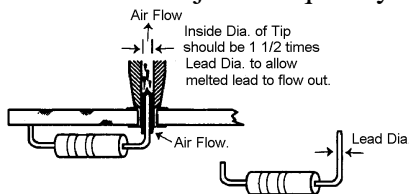
INSIDE DIAMETER

The tip should be large enough to fit over the lead to be desoldered. A slight clearance is necessary to allow the solder to flow through the tip. Although several tip diameters will work ideally a tip diameter 1 1/3 the lead diameter is best.

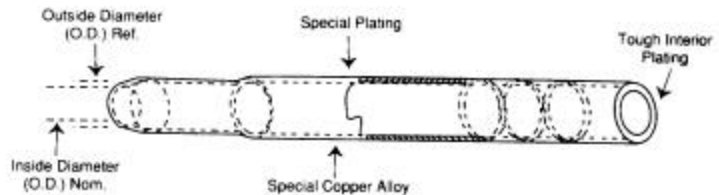


OUTSIDE DIAMETER

The O.D of the tip should be less than the diameter of the circuit board pad. This is to avoid burning or marking the board material. The tip wall thickness provides the path of heat into solder joint. Thick walls are preferable for large solder joint and bigger heat sinks to conduct the heat into the solder joint as quickly as possible.

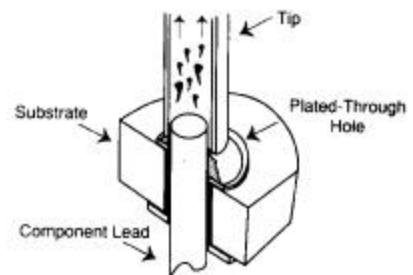
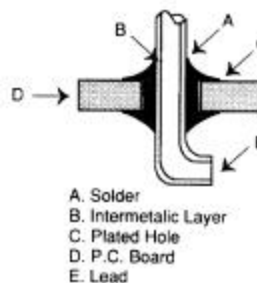


DESOLDER CROSS SECTION



MEASUREMENT OF REPLACEMENT

Typical Cross Section of Printed Circuit Board, with Plated Through Holes



A.P.E. Tips are manufactured to outlast any competitive tip on the market today Three years of research and development and specialized tooling allow us to introduce this tip with plating high conductivity copper with corrosive-resistive- inner-lining for longer life and instant heat recovery

1-888-DSOLDER TOLL FREE

NUMBER TO OBTAIN A COPY OF OUR

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AND REPAIR EQUIPMENT.

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NOTES:

A.P.E. CORP.

Automated Production Equipment Corporation

142 Peconic Avenue, Medford, NY 11763

Phone #: (631) 654-1197

Fax #: (631) 289-4735

Toll Free # 1-888-DSOLDER

Email: apecorp@aol.com