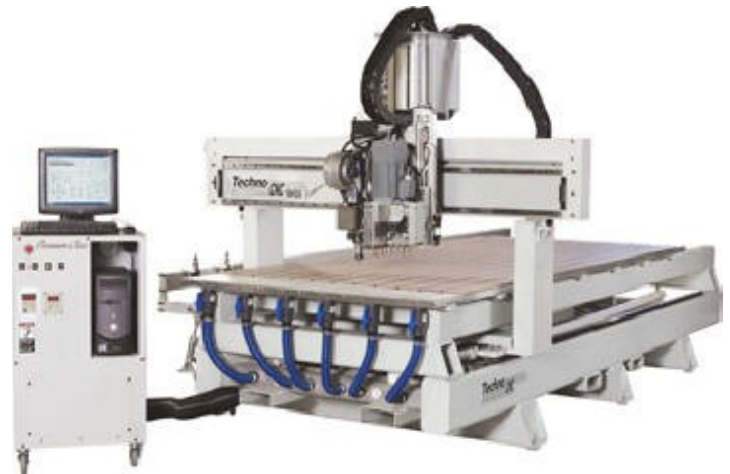


This guide is designed to help you install a Vacuum Table accurately and thoroughly. Follow the instructions step by step to properly install your Vacuum Table. If at any time you have a question, please call Techno at (631) 648-7481.

The following is a breakdown of the installation process:

- 1) Preparing the Surface
- 2) Creating the Guides
- 3) Applying the Tape
- 4) Laying Down the Phenolic
- 5) Cutting the Table
- 6) Attaching the Valves and Manifold
- 7) Wiring the Vacuum Blower



PREPARING THE SURFACE

- 1) Free the TABLE of any debris. This includes a previous table top, tape, and any other debris.(See Fig1)
 - 2) Sand the table top with fine aluminum sandpaper, or if it is possible, sand the table top with an orbital sander.(Fig 2)
- *Fig 3 shows the difference between a sanded and unsanded area of the table.
- 3) Sweep out any debris that might be stuck within the T-slots.
 - 4) Thoroughly clean the surface of the table with Acetone. Remove ALL traces of aluminum powder.

WARNING! Do not proceed without thoroughly cleaning the Table surface, this is extremely important!

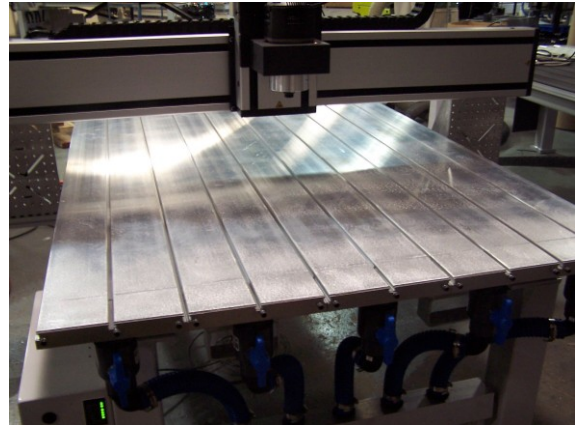


Fig 1

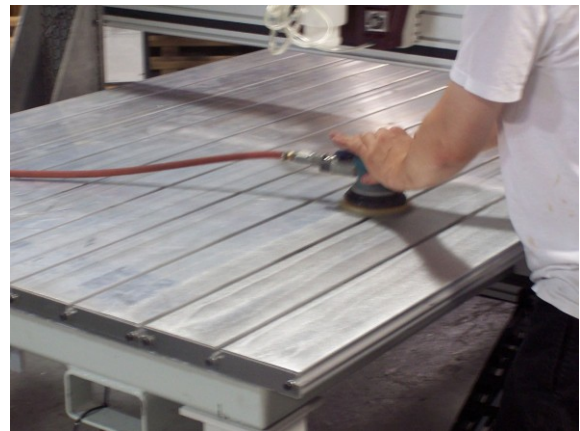
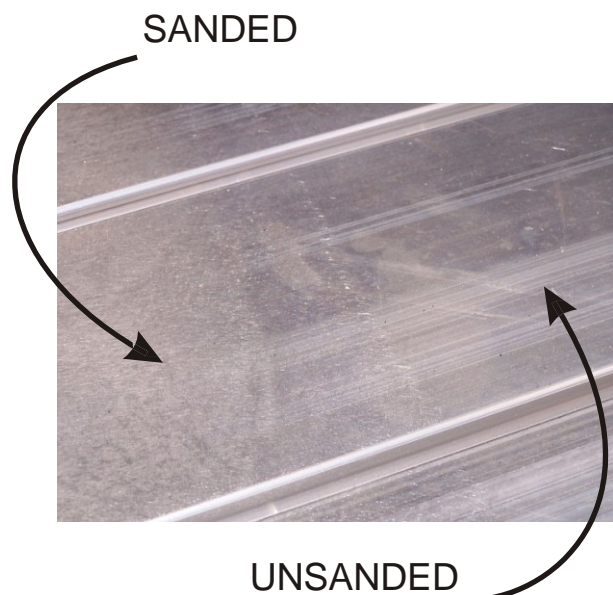


Fig 2



*Fig 3

PENCILING THE GUIDELINE

- 1) Insert a small PENCIL into a 1/4 inch collet. You may have to sand the PENCIL down so that it fits snugly in the collet. (Fig 4)
Place the collet into the Spindle of the machine.

NOTE: You will only have one of the types of collets pictured in Fig 4

- 2) Jog the Y-Axis all the way to the front of the machine, then zero the axis at this position.
- 3) Next jog the Y-Axis so that $Y = 0.25$, and jog the X-Axis all the way to the left of the machine.
- 4) Lower the Z-Axis until the pencil tip is barely touching the table surface. Jog the machine along the X-Axis, towards the right side of the machine, making a line across the table. (Fig 5)

NOTE: Stop and lower the Z-Axis slightly if the pencil no longer makes a mark on the table. Use Jog Step at 0.005" to lower the pencil a small amount.

It is also important to make sure that the line is the darkest on each end so when following the next steps, your table will be aligned as straight as possible. (See Fig 6)



Fig 4

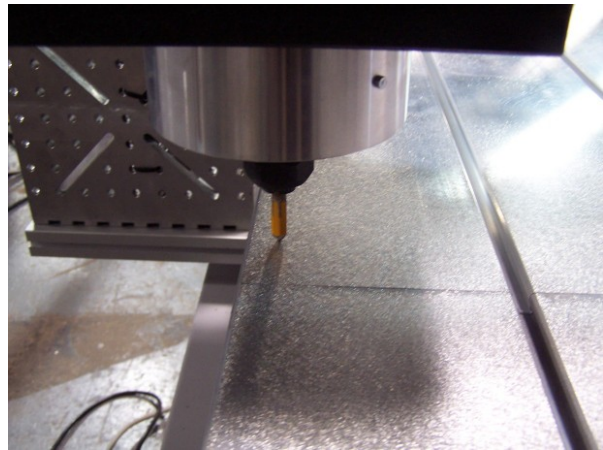


Fig 5

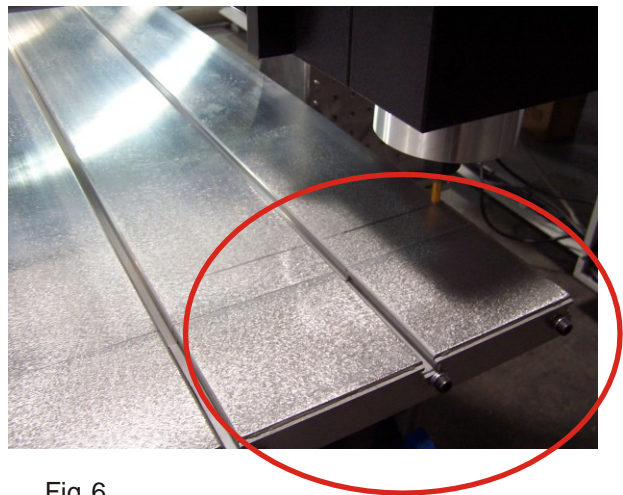


Fig 6

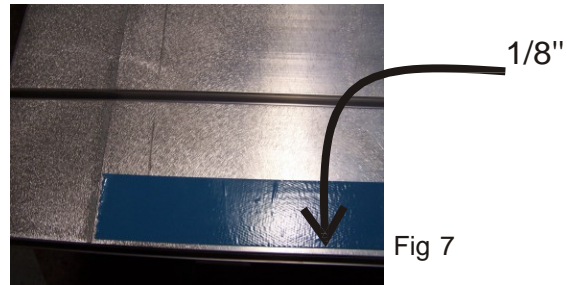
APPLYING THE TAPE

- 1) Remove the collet from the spindle, and jog the machine to where the Y-Axis is at the back of the machine.
- 2) Using a roll of tape, place strips on the table with 2" of excess going past the pencil marks. Keep the tape as straight as possible, approximately 1/8" away from the edges of the aluminum extrusion. See Fig 7.

NOTE: You will need to apply two pieces of tape per strip of the aluminum extrusion. The tape should be no less than 100" long. The tape will end slightly past the spindle when it is at the back of the table. See Fig 7a.

Also note that if the tape runs out in the middle of a strip, cut the tape, and start with a new piece of tape, **KEEPING** the gap in between the two pieces as small as possible.

- 3) After the whole table has the tape applied, (Fig 8), pat down the tape by hand to make sure it is sticking to the table.
- 4) Peel back the first 5" of blue tape backing. You may need to use a razorblade to help remove the blue backing from the tape.(Fig 9)
- 5) Place a long straight-edge (a bar approximately 50" by 2" by .25" is perfect) against the pencil mark on both edges - the bar should be closer to the front of the machine than the pencil mark.(Fig 10)



TWO PIECES
SIDE BY SIDE

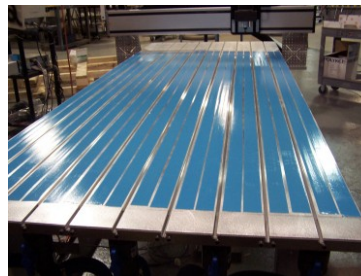
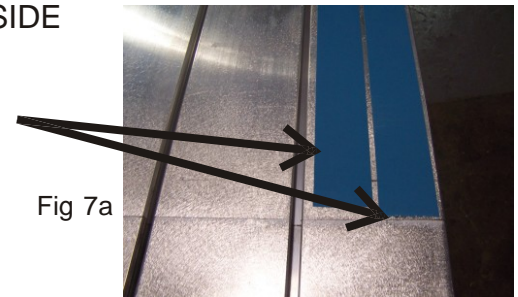


Fig 8



Fig 9

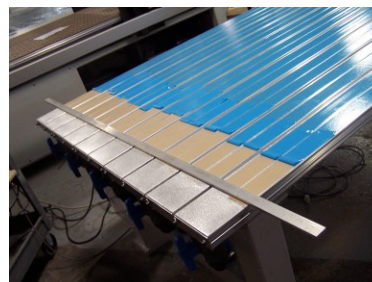


Fig 10

ADHERING THE PHENOLIC

- 1) Peel off the first two pieces of blue backing entirely.
- 2) Clean one side of all the phenolic with acetone thoroughly. Keep track of which side is clean, and **DO NOT** stack the clean pieces in any way that would compromise their cleanliness.

NOTE: The first phenolic is the most difficult to apply, it is suggested that two people are used to apply the first phenolic. Have one person hold the far end above the Table while the other person aligns the phenolic.

- 3) With two people present, carry the clean phenolic over to the table, position the phenolic above the tape so that it is of equal distance on either side of the metal extrusion. Carefully place the phenolic down on the table and check the equal distance for the length of the phenolic. See Fig. 11 and 11a.
- 4) For the subsequent strips of phenolic use a piece of wood to keep it elevated off the tape (Fig 12, 12a).
- 5) Gently lower the phenolic on to the tape. Remove the wood piece as you lower the phenolic onto the tape. (Fig 13-13a) Repeat for the rest of the table (Fig 13b).

NOTE: It is important that the phenolic is centered in the extrusion. It is also important that the front of the phenolic is squarely against the straightedge. If the piece does not go on well, quickly and gently remove it and place it down again. If you have to remove it more than once, the tape may need to be replaced.

Fig 11

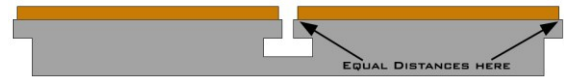
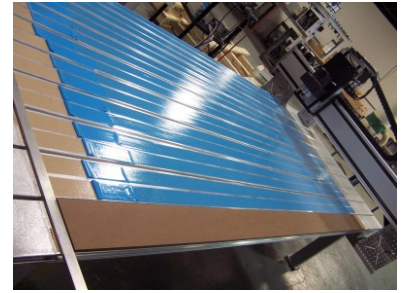


Fig 11a

Fig 12

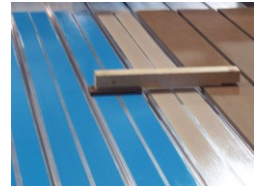


Fig 12a



Fig 13



Fig 13a

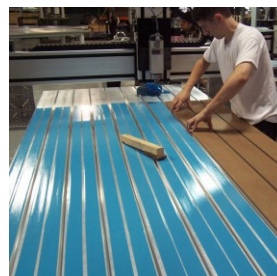
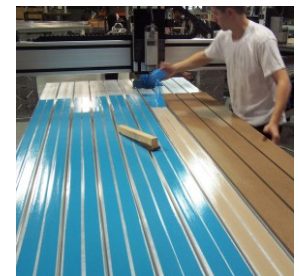


Fig 13b



- 6) After you place all subsequent pieces down from one side to the other remove the straight edge and use a razorblade to trim the excess tape from both ends.(Fig 14)
- 7) Get on top of, and walk all over, the table surface. Pay special attention (stomp on) to the edges and corners of the phenolic. After you have walked on the table enough, walk on it some more. Your table should now look like Fig 15 .

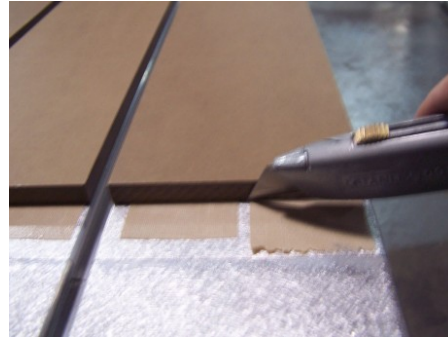


Fig 14



Fig 15

ZEROING THE CUTTER

- 1) Place the 1/4" cutter in a collet and in the spindle. Home all Axes. ("Home", then "All" buttons) and lower the cutter into the middle T-slot of the middle extrusion of the table.
- 2) Using Jog Step of .005", bump the cutter up against one side of the T-slot (Figure 16, 16a). Zero the X axis at the edge of the T-slot. Using jog-step of .005", jog the cutter to the other side of the T-slot (Figure 16b).

NOTE: It is important to have the cutter up against the edge of the T-slot on the right, just as it was against the T-slot on the left. The X-Axis distance indicator should read approximately .0800". It could be anywhere from .06 to .1, but if it is far from these values, repeat steps 1 and 2.

- 3) Divide that value in half, (for instance, .0824 becomes .0412) and use the Goto button to Goto $X=1/2$ that value.
- 4) Once at that spot, it should look like the cutter is in the middle of the T-slot. Zero the X-Axis here.
- 5) Switch back to jog continuous and jog the cutter upwards out of the T-slot. Jog the cutter an inch to the right so it is over a piece of phenolic, and jog the Z axis down so it is within .1 of the top of the table surface.
- 6) Jog the cutter so the cutter is half on and half off the phenolic in the Y axis.



Fig 16

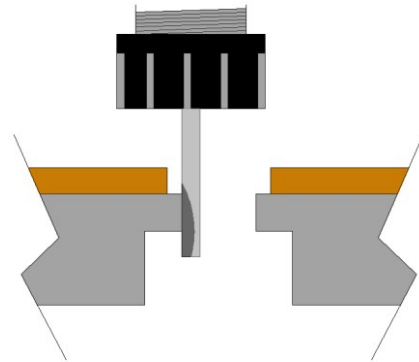


Fig 16a

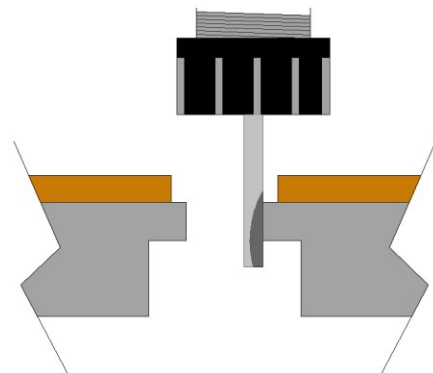


Fig 16b

- 7) Zero the Y axis here. Now Goto Y=.5",
Zero Y there.
- 8) Move the Z axis to approximately 2" above
the phenolic. Zero the Z axis.
- 9) Click Goto, Click and hold the origin button
(or press the letter 'o' on the keyboard)
- 10) Your cutter should now be at the center of
the X axis, .5" in from the edge of the Y-Axis,
and 2" above the table.

NOTE: If this is not the case, repeat the
appropriate steps.

- 11) Click Setup, then in the upper left, click
Offsets. Choose an empty memory slot for
this location, Put a name in the text box
(perhaps "vacuum", and store the current
location in whatever number you have
chosen.) Click OK.

CUTTING THE TABLE

- 1) Put the 1.5" flycutter in a .5" collet and in the spindle. Be sure that it is very tight.
- 2) Jog the cutter over a piece of phenolic and jog the Z axis down until the cutter is barely over the material. Zero the Z axis here. Fig 17
- 3) Goto the origin. The cutter should be located just above the material, 1/2" in from the front.
- 4) Verify that the spindle will run at 18,000 RPM (On most inverters the display should read 300.0)
- 5) Start the file 0FLYCUT1500.NC with the programmed speeds. When this file is done, inspect the table. If there are spots on the table that have not been cut, jog the Z axis down by -.015", re-zero the Z axis, and repeat the cut.
- 6) Continue to lower and cut until the entire table has been cut. Fig 17a.
- 7) Next Place the 1/4" cutter in the spindle and Zero the Z axis to the top of the material. Run file 1FLATCUT250.NC.
- 8) Place the 1/2" ball endmill in the spindle and Zero the Z axis to the top of the material (not to the bottom of the previous cut!)Run file 2BALLCUT500.nc
- 9) Place the .297" drill bit in a 5/16 collet in the spindle and lower the RPM of the spindle to 12,000. (200.00 on most invertors.)
- 10) Zero the bit to the top of the flycut surface, not the top of the ballcut surface. Run file 3VENTHOLES297.NC.
- 11) Place the countersink bit in the spindle and turn the spindle back up to 18,000 RPM. Zero the bit to the top of the flycut material. Run file 4COUNTERSINK500.nc.

- 12) Place the small drill bit in the spindle in a 1/8" collet and in the spindle. Zero the Z-Axis to the top of the material as before. Run the file 5SCREWHOLES159.NC



Fig 17



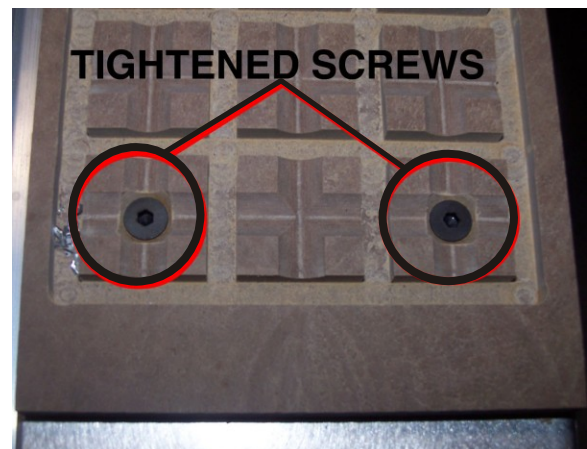
Fig 17a

FINISHING THE TABLE

- 1) Using a 10-32 tap, tap the 40 holes at the edges of the phenolic.
- 2) Use the supplied screws with a 1/8" allen key to screw down the table. Do not use an impact wrench to tighten the screws. Do not tighten the screws excessively.

BELOW ARE PICTURES OF WHAT YOUR FINISHED VACUUM TABLE WILL LOOK LIKE!

SIDE VIEW



ATTACHING THE VALVES AND MANIFOLD

- 1) Using an M6 Tap, tap the three holes per extrusion (Total of 15 holes in the front, and 15 holes in the back) about $\frac{1}{2}$ " deep. See Fig 18.
- 2) In the back, attach the cover plates with the small M6 screws followed by lock washers, followed by regular washers. Use plenty of silicone to seal the surfaces together. (Fig 18a)
- 3) Using silicone between the two, place the remaining plates on the valve extensions so that the three holes in the plates line up with the holes in the valve extensions. The plates should go on the same side as the blue handles. Figures 19, 19a.
- 4) Put a lock washer around one of the long M6 screws, and then a washer. Put one of these through all 15 holes in the plate-manifold combination.
- 5) Using silicone on the valve extrusion, attach the valve assemblies to the table. Tighten the M6 screws until the gap disappears between the table and the valve. Figures 20, 20a.
- 6) Wipe off all excess silicone after it dries.

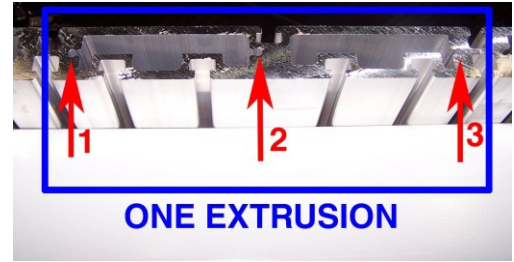


Fig 18

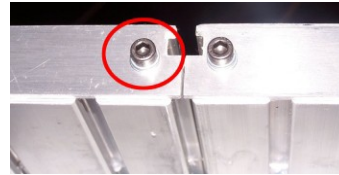


Fig 18a



Fig 19

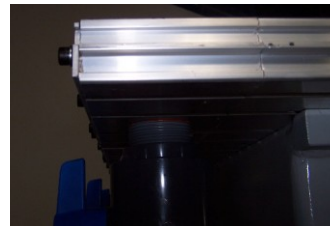
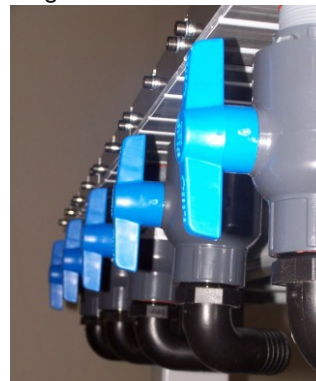


Fig 19a

Fig 20



Fig 20a



- 7) Place the square end caps in the manifold, sealing with silicone.
- 8) Place the rubber feet in the sides of the end caps, again, sealing with silicone.
- 9) Using the rubber feet to hold it in place, put the manifold between the two front legs of the table. Unscrew the rubber feet to make a tight fit. Direct the 2" fitting on the manifold towards the pump. (It can be turned forwards or backwards, depending on where your pump is) See Figures 21, 23.
- 10) Cut the 1.5" blue hose to length. Each of the lengths should reach from the valve to the manifold with a little slack. Using the supplied hose clamps, attach the hose between the valves and the manifold. Fig 22.
- 11) Using the two larger hose clamps, attach the 2" hose between the manifold and the pump. See Fig 23.

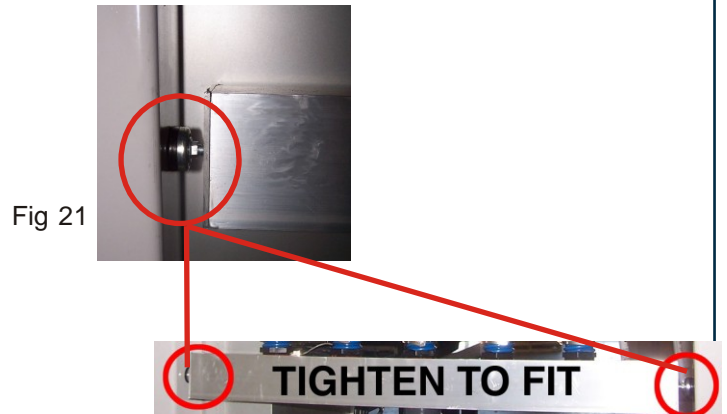


Fig 21

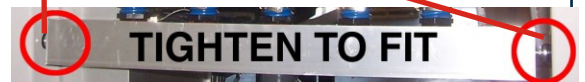
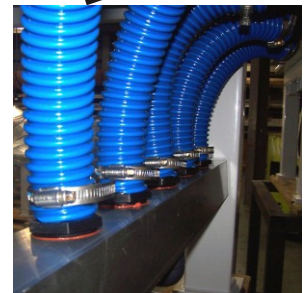


Fig 22



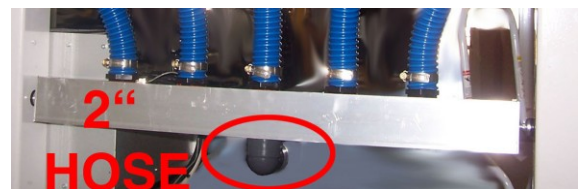
TOP VIEW



BOTTOM VIEW

****Follow the appropriate directions regarding the attachment of the wiring for the vacuum switch.****

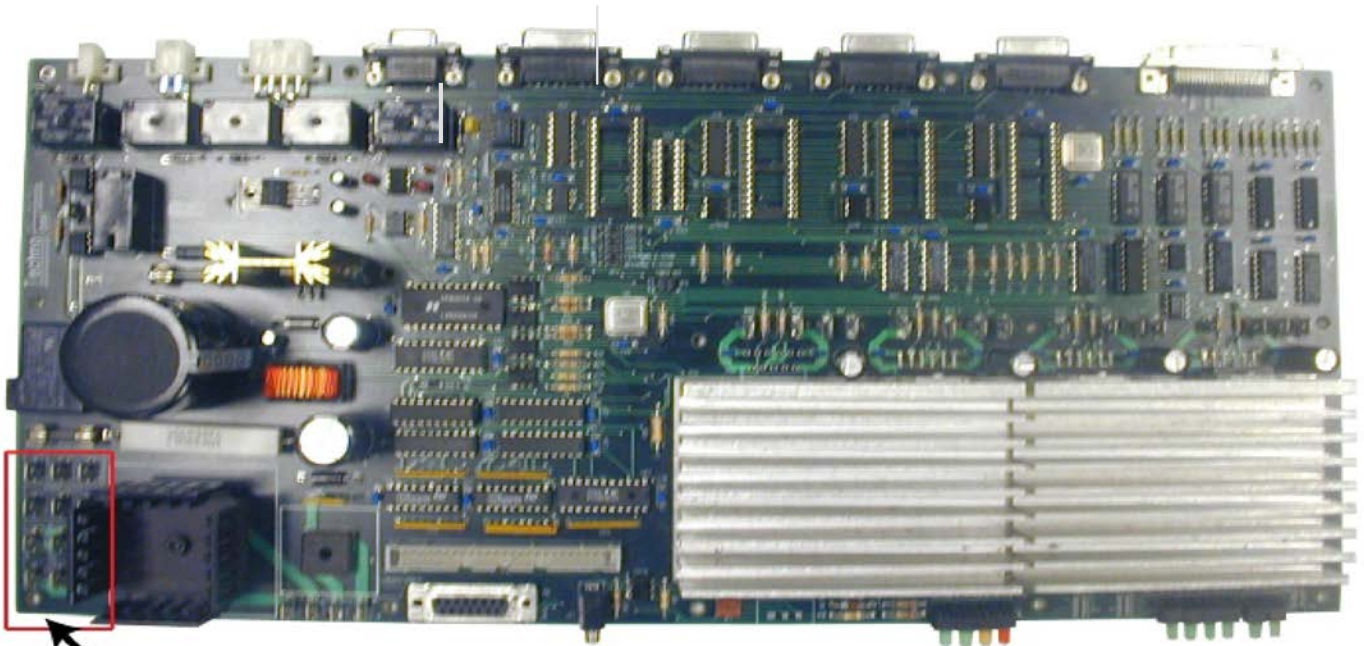
Fig 23



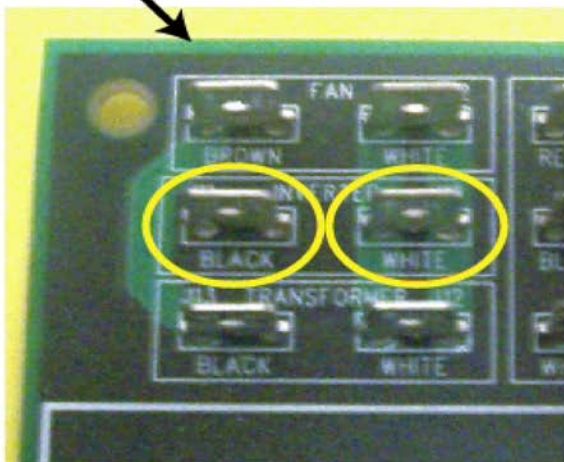
THE FINISHED VALVES/MANIFOLD

Vacuum Blower Pinouts

LP ELECTRONICS BOARD



AREA OF DETAIL (Rotated 90° CW)



Plug the black wire into the J11/ BLACK Jumper
Plug the white wire into the J 10 I WHITE Jumper
(both of which are circled in above)

The green wire goes to ground

The white connector goes to the vacuum blower
and the switch replaces the existing switch.



Make sure to have all electrical
connections performed by a
Licensed Electrician.