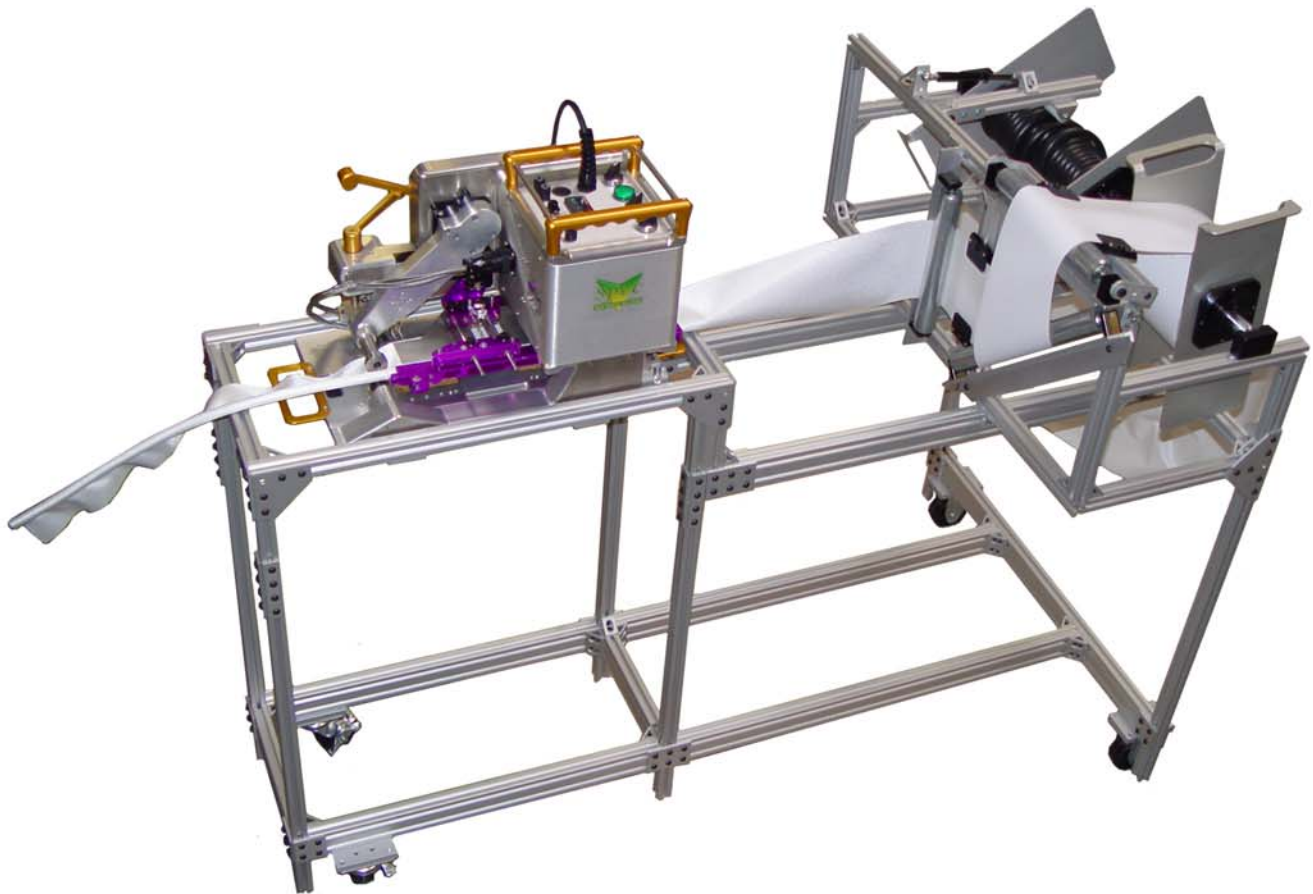


Sinclair Keder Machine



OPERATING INSTRUCTIONS



U.S. PATENT NO 5,865,942



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INTRODUCTION

The **Spec Hot Wedge Welders** are designed for the in house fabrication of a wide range of flexible thermoplastics. This includes, but is not limited to, PVC, PP, PE, LDPE, urethane, geomembrane material, etc. Acrylic coated fabrics can also be welded with the addition of our Thermal Bonding Tape.

The different **Spec** models provide a specific type weld: Overlap, Hem (hem cord/ flat hem /pockets), Thick Material.

The **Spec** uses a hot wedge as its heat source. The bonding of thermoplastics is achieved by a combination of heat (temperature), speed (exposure time) and pressure (bonding force). This method will give you smokeless and quiet operation. The wedge also allows for welding thinner products without distortion.

The **Spec** can be used as a stationary welder or in a self propelled mode. When using the Spec in a self propelled mode, a track system is suggested. It is important in most applications to provide support and/or tension to materials while welding. Please refer to Track System Specifications.

We suggest that you make sample welds of your materials to achieve the correct settings for heat, speed and pressure before you start welding your finished product. In addition, wedge alignment is critical to a quality weld. Be sure to review the wedge alignment section of this manual.

Wedge Alignment & Adjustment

Proper alignment of the wedge is essential to achieving a quality weld of the thermoplastic material. A variety of issues relating to the bonding of the material, flow of material through the machine, and the aesthetic finish of the weld can be attributed to the proper positioning of the wedge. It is therefore crucial to understand and practice the various adjustments for wedge alignment.

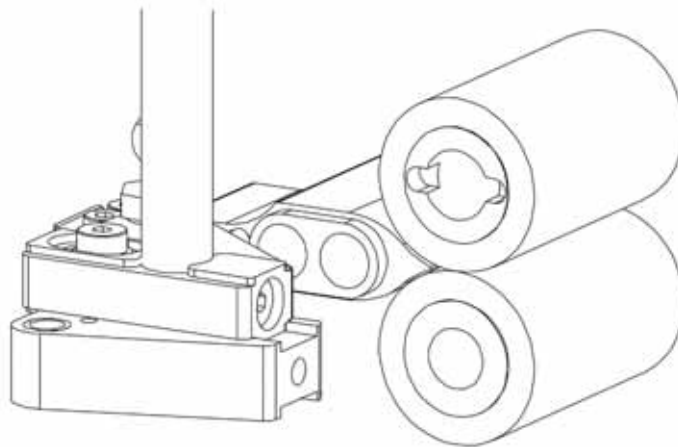
It is recommended to review the alignment of the wedge:

- On a weekly basis;
- When beginning new welding projects;
- Changing wedge style and sizes;
- Large variance of material weight or density;
- Noticeable wedge wear;
- Transportation of the machine;
- Change in operator of machine.

There are three alignments for the Spec Wedge: Vertical, Angle, and Horizontal. The vertical alignment refers to the up and down position of the wedge in relation to the pressure rollers. The angle alignment refers to the wedge tip position with respect to being parallel with the pressure rollers. And the horizontal alignment refers to the forward or aft position between the wedge tip and the pressure rollers.

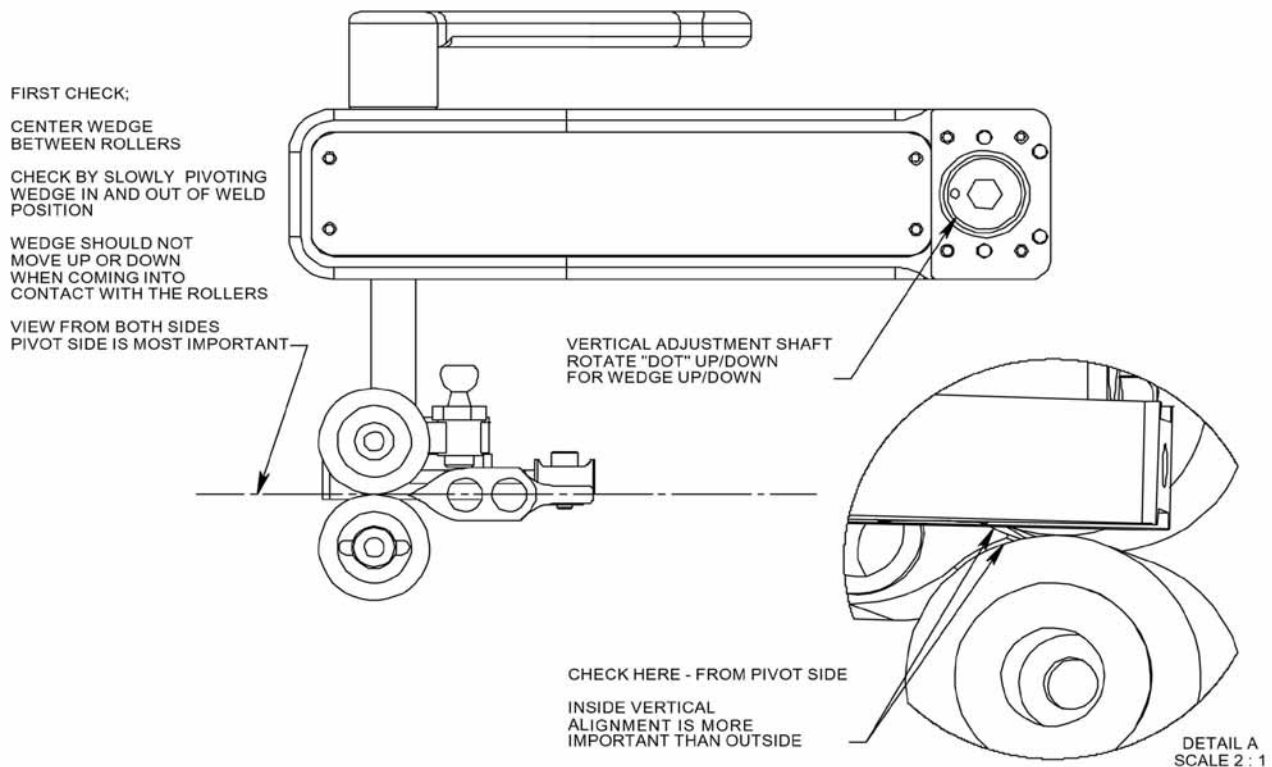
Initially the Spec Wedge Welder is aligned and tested at the factory. A visual review of the alignment should be made upon receiving the machine. In addition, sample welds should be made first to test the alignment as well as the material to be sealed before starting on an actual project.

Begin all alignment adjustment with a cool, clean wedge.



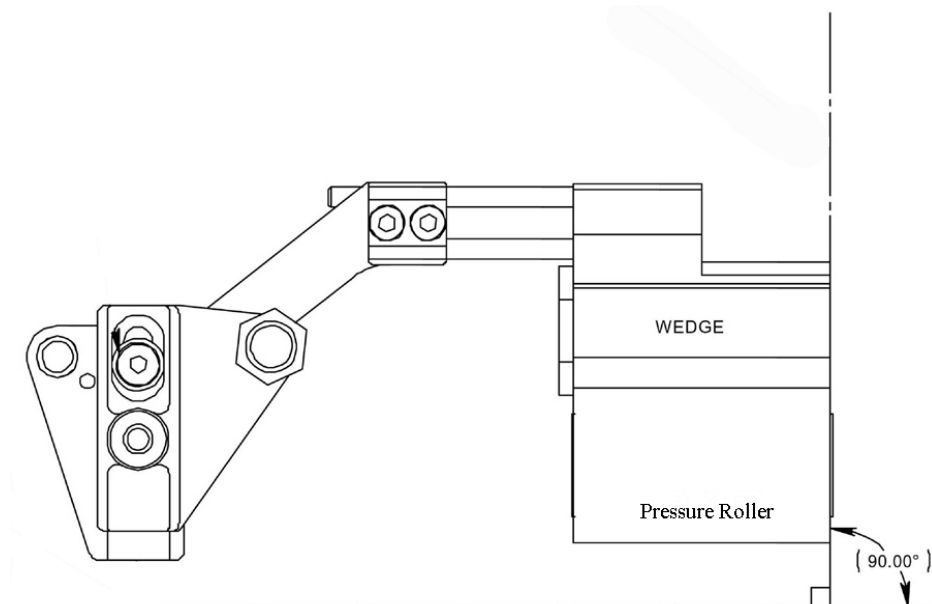
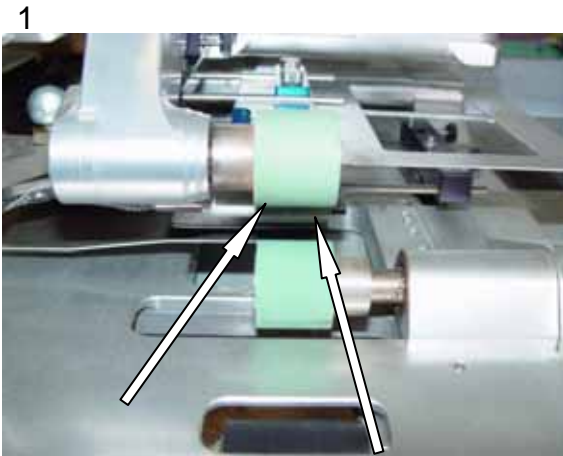
For the vertical alignment, the proper position should be the wedge tip centered between the pressure rollers.

1. Take a small piece of the material to be welded, fold in half, and place between the pressure rollers. Close the rollers together with the fold of material just inside the center of the roller.
2. Engage the wedge lever in to the welding position. Begin by viewing the wedge tip position from the inner, pivot side. Slowly move the wedge in and out of the welding position; the wedge tip should just contact the fold of material.
3. If adjustment up or down is needed, use the 8mm hex wrench in the vertical adjustment. Turn the wrench clockwise or counterclockwise for either the up or down movement viewing from the pivot side. When adjustment is correct, view from the outer side of the wedge.



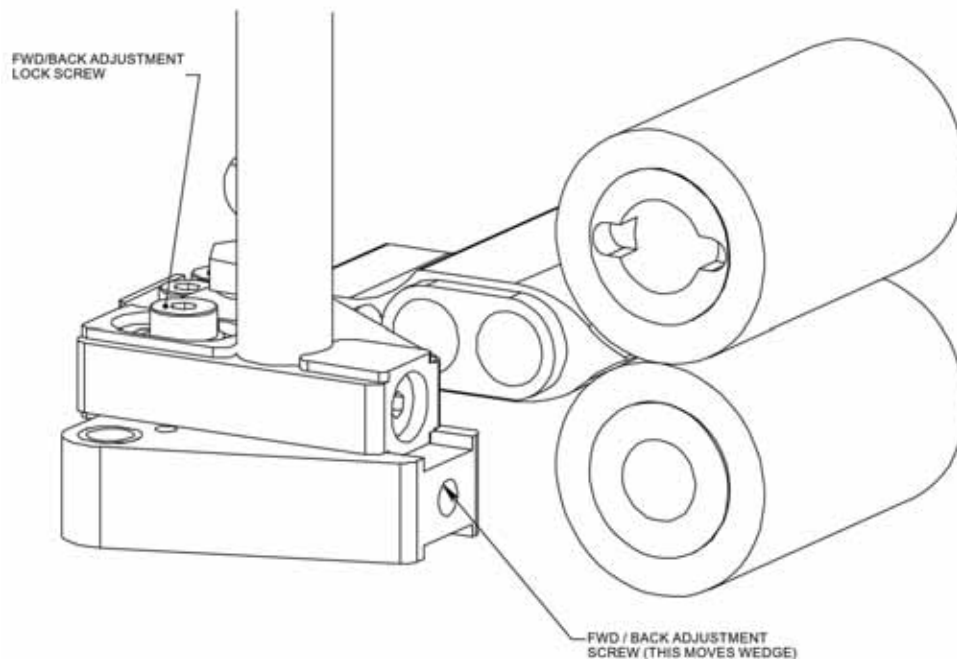
For the angle alignment, the proper position for most applications should be the tip of the wedge parallel to the pressure rollers.

1. Open the pressure rollers. Turn the wedge in to the welding position. Make a comparison of the wedge tip to the bottom of the upper pressure roller. To view this, adjust your field of vision at the rear of the Spec and above the welding area so that the tip of the wedge is seen just below the bottom edge of the upper pressure roller.
2. Adjust the angle of the wedge using a 4mm hex wrench in the angle adjustment screw located next to the wedge service pin in the wedge pivot housing. Viewing the position of the wedge tip, adjust if necessary. Turning the adjustment screw clockwise moves the outer edge of the wedge away from the pressure rollers. Turning the adjustment screw counterclockwise moves the outer edge of the wedge towards the pressure rollers.

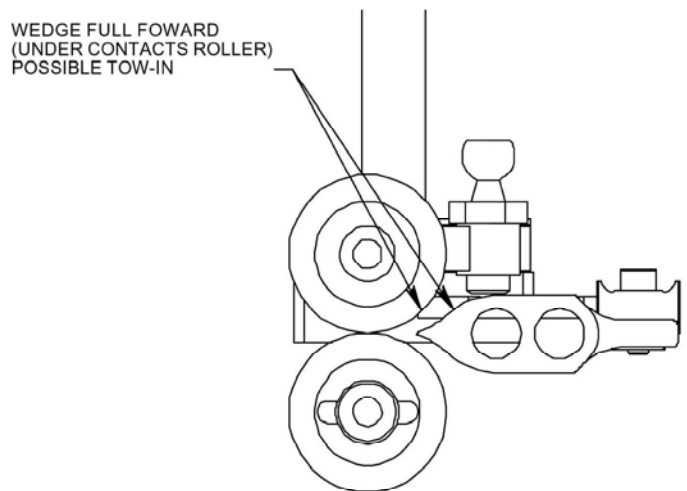
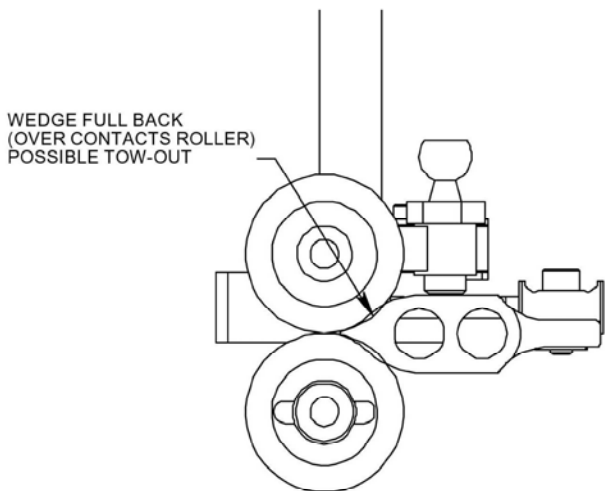
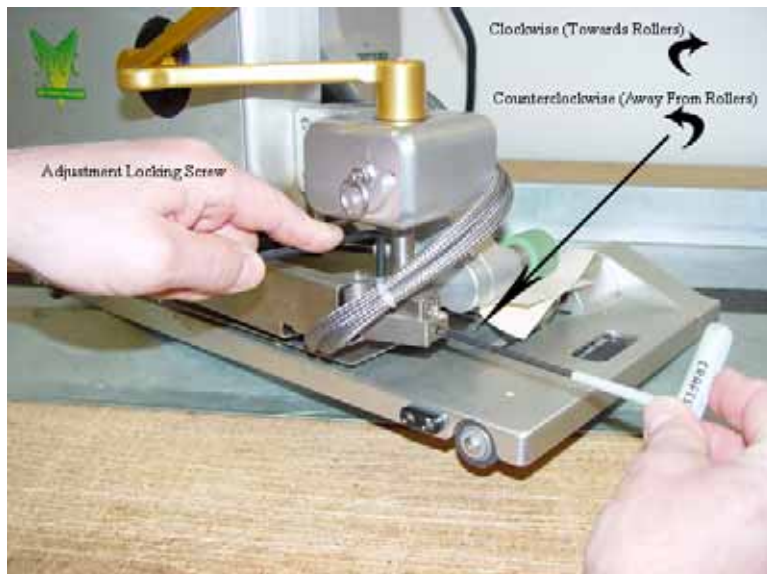


For the horizontal alignment, the wedge tip and surface should just make contact with the pressure rollers.

1. Lower the pressure rollers together and engage the wedge in to the welding position. View this alignment from the inside or pivot side of the wedge.
2. To adjust, open the pressure rollers and place a 3mm hex wrench in the fwd/back adjustment screw located on the adjustment hub.
3. With a 4mm hex wrench, just loosen the adjustment locking screw.



4. Rotating the fwd/back adjustment screw clockwise will move the wedge tip away from the pressure rollers. Rotating counterclockwise will move the wedge tip towards the pressure rollers. When changing directions on this screw, there will be a couple of rotations on the screw that produce no movement to the wedge.
5. View movement of the wedge from above. Rotate the fwd/back adjustment screw in $\frac{1}{4}$ to $\frac{1}{2}$ turns at a time, checking the new wedge position each time. When completed, retighten the adjustment locking screw. Remove the two hex wrenches.
6. Swing the wedge out of the welding position, close the pressure rollers, and engage the wedge in again to the welding position. Check the alignment as in step 1. If further adjustment is necessary, repeat all steps.



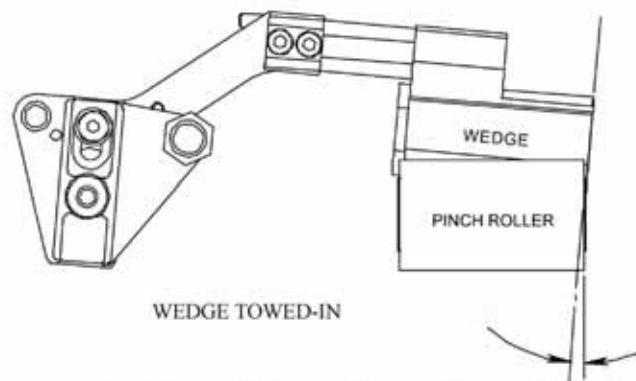
A special adjustment to the angle alignment should be considered for larger wedge sizes (30mm +), thicker materials, or to help control the material during the welding process. This application involves making a slight “toe-in” angle to the outer edge of the wedge.

1. Open the pressure rollers and remove the upper material guide tray.
2. Place a straight edge against the outside edge of the wedge. Observe the angle between the straight edge and the pressure rollers. This angle should initially be 90 degrees.
3. Place a 4mm hex wrench in the angle adjustment screw located next to the wedge service pin on the wedge pivot housing.
4. Turn the wrench counterclockwise so that the outside tip of the wedge makes an inward movement towards the pressure rollers. Use the straight edge against the edge of the wedge to again determine this “towed-in” angle. The exact angle needed is at your discretion; initial make a 5 degree change and then make test welds to determine the results.
5. Review this “toe-in” adjustment by closing the pressure rollers and turning the wedge into the welding position. When the rollers are slowly opened, or separated, a slight movement inward of the outer edge of the wedge tip should be seen. And when closed again, the wedge will be pushed back.

2



3 & 4



Wedge Cleaning

The welding of various thermoplastics will result in burned coating residue which will accumulate on the surface of the hot wedge. Cleaning of the wedge is required daily if not several times depending on the accumulation and resulting quality of the weld. The wedge should be cleaned after heavy use, changing thermoplastic materials, or if not in use for long periods of time.

The best way to clean the surface of the wedge involves burning the residue to the point it is released from the metal surface and is easy to blow or brush off.

1. With the wedge in the stowed position, turn the wedge engagement lever in slightly and gently pull on the wedge service pin. The lever will now rotate out farther than the stowed position to the service position.
2. Increase the temperature of the wedge to 510 degrees. Allow sufficient time for the residue to be baked off the wedge, typically 5 to 10 minutes.
3. Once the residue is loose from the metal, blow or *gently* brush to eliminate. Do not scrub the metal surface as it will be scratched and worn.
4. If residue is still present, allow more time to continue this process.
5. When cleaned, lower temperature and rotate the wedge back in to the stowed position.

1



2



3



Wedge Removal & Replacement

When changing to different size seam widths, the hot wedge will need to be removed and replaced with a different wedge. In addition, if the wedge no longer heats, wedge alignment is no longer effective, or the wedge surface is worn or destroyed, the wedge must be replaced. Always work with a cool wedge with the power switched off and electrically disconnected from the power source.

1. With a cold wedge, rotate the wedge out to the service position as described in wedge cleaning.
2. Remove the two clamps holding the electrical wires secure to the machine using a Phillips head screwdriver. Tilt the Spec Welder on its side. One clamp is located under the arm of the wedge mount arm. The other is on the inside corner of the wedge pivot housing.
3. Electrically disconnect the wedge wires from the Spec control box by unscrewing the locking ring and gently pulling the connector from the socket.
4. Loosen the two locking screws for the clamping system of the wedge retaining rods to the wedge mount arm. Pull the wedge from the clamp and remove.

2



2



3



4



To install a new wedge:

1. Position and insert the two retaining rods from the wedge into the clamping system on the wedge mount arm. Slightly tighten the two set screws to hold the wedge to the arm.
2. Rotate the wedge engagement lever so the wedge is in the welding position.
3. Adjust the position of the wedge side to side relative to the lower pressure roller. Most often the wedge tip will match the size of the roller. In other case the wedge tip may be smaller and should be centered in the lower pressure roller.
4. Carefully rotate the wedge back out to the service position and secure the two cap screws for the clamp. Re-check the position of the wedge to the roller.
5. Electrically connect the wedge wires to the Spec control box by twisting the braids near the connector so that it lines up with the socket, insert and rotate the locking ring clockwise to secure.
6. Replace the two electrical wire clamps to their respective position as in #2 of the removal process.
7. With the installation of a new wedge it is recommended to perform a wedge alignment, especially if the wedge removed was well worn.

1



3



5



Spec Keder Guide System

Top & Bottom Edge Guides:

When the Spec Keder Machine is assembled at the factory, the top and bottom edge guides have been position correctly for the width of material and PVC cord that is being ordered with the machine. If changing to different width material, PVC cord, and/or different style keder (single or double fold), the top and bottom edge guides will need to be adjusted. To adjust:

1. Begin by removing the entire keder guide system from the Spec machine. With the wedge in the service position, remove the two Phillips head screws from the guide mount and side of the machine. Carefully pull out and remove the entire guide system and set aside to work with.
2. Loosen the two black thumb screws on the top of the outer cord channel guide and slide the two guide sections completely apart.

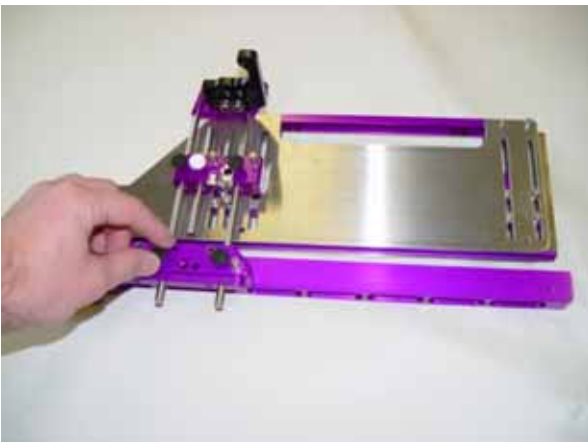
1a



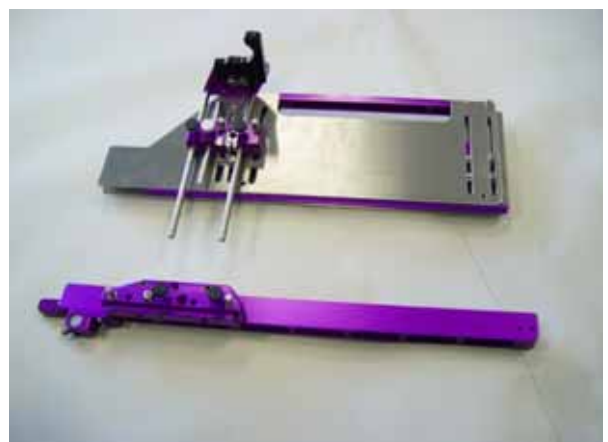
1b



2a

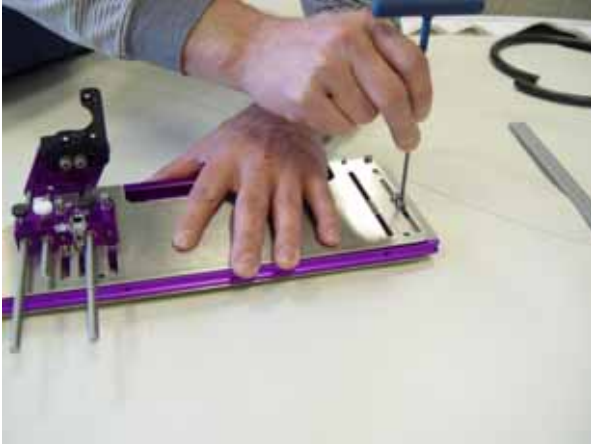


2b

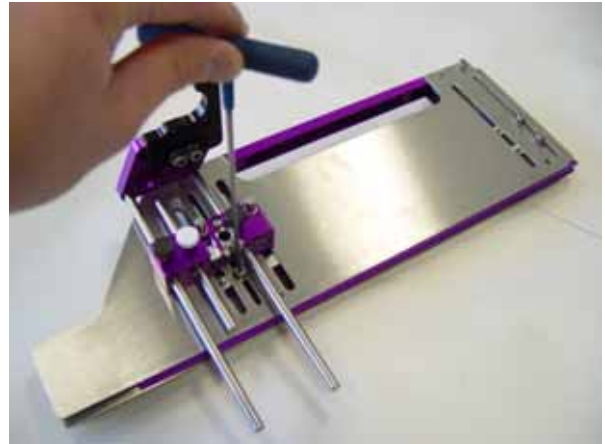


3. Working on the inner Keder guide section, loosen the two clamping cap screws for the top edge guide using a 3mm hex wrench. One of these screws is near the front of the guide; the other is just in front of the adjustment block.

3a



3b



4. Follow the same procedure as step 3 to loosen the two clamping cap screws directly behind the ones completed in step 3. This will loosen the bottom edge guide. One of these screws is recessed in the adjustment block between the black and white thumb screws.

4a

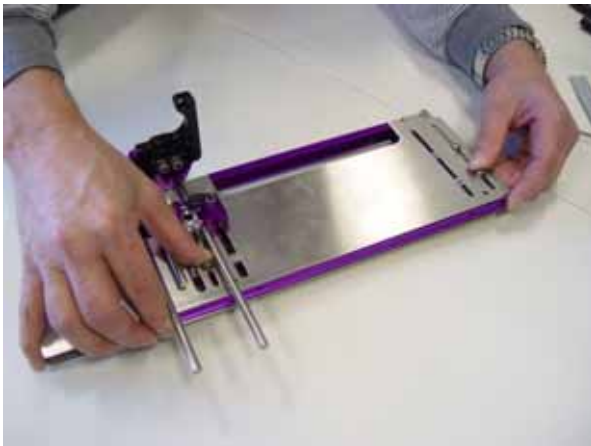


4b

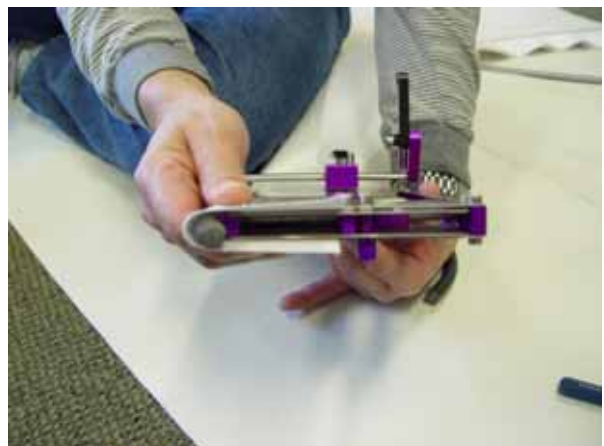


5. The inner top guide edge is a narrow metal strip sandwiched between the top two plates of the inner keder guide assembly. It will slide towards or away from the edge of the inner keder guide by applying force on the front clamping cap screws and pushing or pulling in either direction against either edge of the inner keder guide.
6. For a double flap keder, insert a sample of the proper width of material as well as the proper diameter PVC cord to be completed. Adjust the inner top guide edge to touch the top edge of material. Slide the bottom edge guide up against the top edge guide and check for the lower edge of material touching the bottom guide edge.
7. When completed, hold both the material and cord in position while tightening the two sets of clamping cap screws.

5



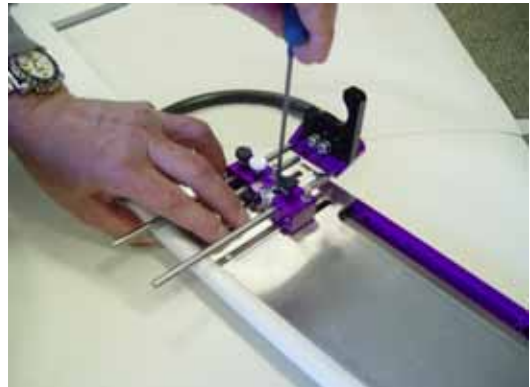
6



7a



7b

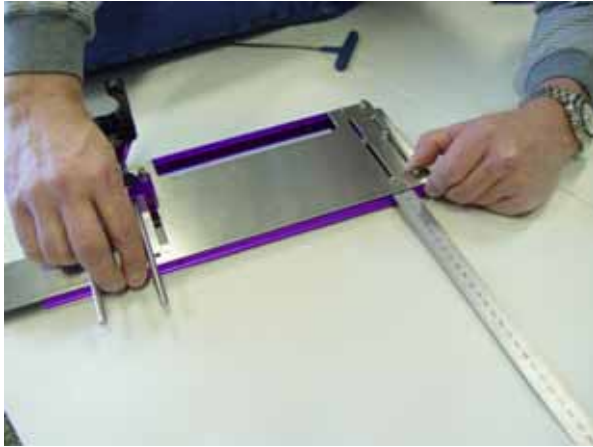


7c

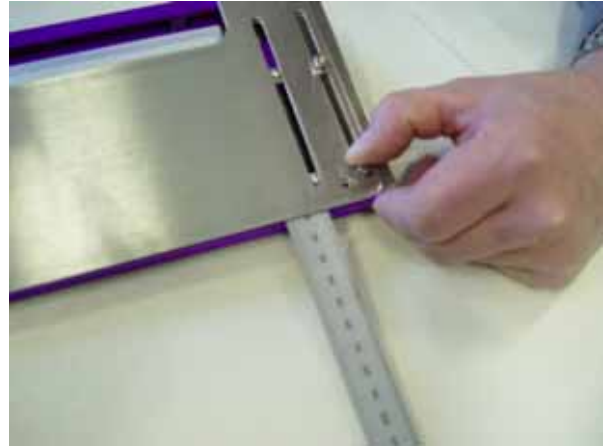


8. For a single flap keder, slide the top material guide edge fully forward. If needed, use a ruler to measure the distance between the top material guide edge and the edge of the inner keder guide section. This should be near 10mm in distance. When completed, tighten the two clamping cap screws.

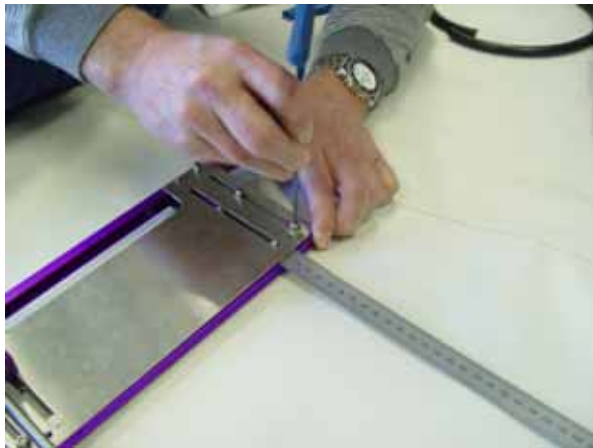
8a



8b



8c

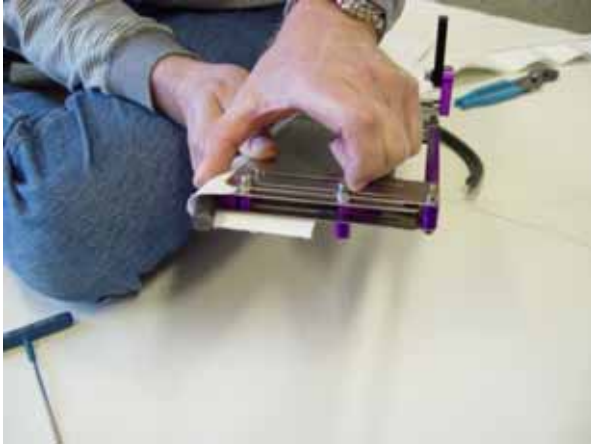


8d

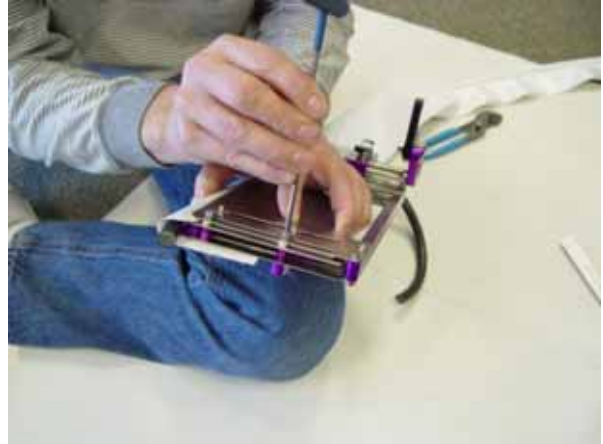


9. As with the double flap described in step 6, insert a sample of the proper width of material as well as the proper diameter PVC cord to be completed. Place the top edge of material against the top material guide edge just completed in step 8. Slide the bottom edge guide up against the lower edge of material. When completed, tighten the lower material guide edge clamping cap screws.

9a



9b



9c



10. Re-assemble the inner and outer sections of the keder guide system tightening the black thumb screws to secure.

10a Double Flap Keder



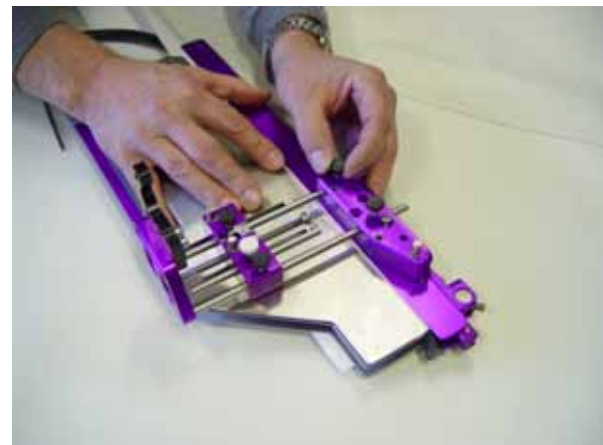
10b



10c Single Flap Keder



10d



11. Carefully re-insert the hem guide into the Spec machine, properly line up the dowel pins, and re-insert & tighten the Phillips head screws through the guide mount to secure the keder guide system to the Spec machine.

11a



11b



12. Turn the wedge in to the welding position. Loosen the two black thumbscrews on the top of the adjustment block. Place a straight edge against the side of the wedge and slide the inner keder guide section out to match the straight edge. When positioned, retighten the black thumbscrews.

12a

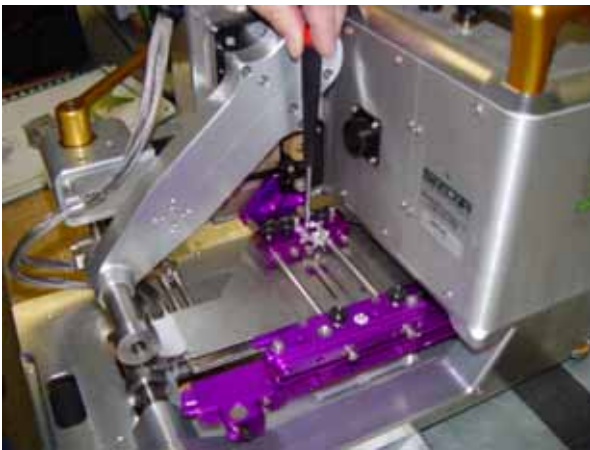


12b



13. Check to make sure the wedge moves cleanly from the welding position to the stow position and back. If it scraps within the inner keder guide section, loosen the two set screws on the side of the adjustment block and use a Phillips head screwdriver on the screw within the adjustment block to raise or lower the guide section.
14. Check the alignment of the outer keder guide section. If it needs centering to the inner section, loosen the two set screws on the side of the guide mounting block and use a Phillips head screwdriver on the screw within the mounting block to raise or lower the outer guide.

13



14



Keder Framework & Delivery System Set Up

A special framework has been designed to hold the Spec Keder Machine and deliver the PVC material and cord. This framework comes partially disassembled and will need to be completed. Depending on the shipping configuration, the framework may be pictured in one of the various breakdowns below. Locate the appropriate breakdown of your shipment below and complete the necessary assembly.

1. Removing the framework from the packing box(es), layout the various sections on the floor to separate. It is possible to have 2, 3, or 4 different sections. Note the picture below to follow.

1



2. The first assembly may be the lower base support pieces to the front leg and roller support. Place the support pieces into the angle connection and tighten the screws. Completed should look like the picture below.

2a



2b



2c



2d



3. Lay the completed front leg support section on its side and position the material delivery section of the framework in a similar manner. The legs should fit up and into the brackets attached to the material delivery section. Tighten screws on both legs.

3a



3b



3c



3d



4. Place the completed front section of the framework upright with the roller wheels on the ground. Upright the machine support section of the framework on its roller wheels. The two sections can now be joined. Tighten all screws associated with these two sections.

4a



4b



4c



5. As a completed assembly, the Keder Delivery System framework should look like the picture below.



Material & Cord Set -up

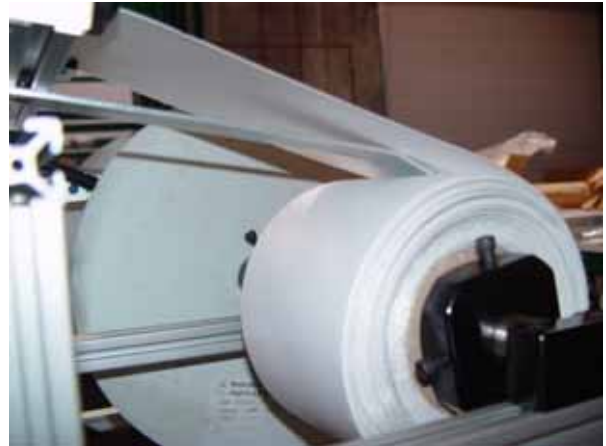
The Spec Keder Machine is designed to accept a variety of different width PVC coated material as well as various diameter PVC cord for the production of finished keder. Please refer to the appendix with our chart of both double and single flap style keder to determine the necessary material and cord to purchase. With these products, the following is a description of the preparation needed to set-up the Spec Keder Machine for production.

1. Slide the spool of PVC cord through the longer of the two roller shafts located at the end of the framework for the delivery system. Position the spool correctly on the shaft and use the end clamps to secure. The cord should now be thread through the hole and extended out towards the Spec Keder machine. Follow the same procedure for installing the roll of material.

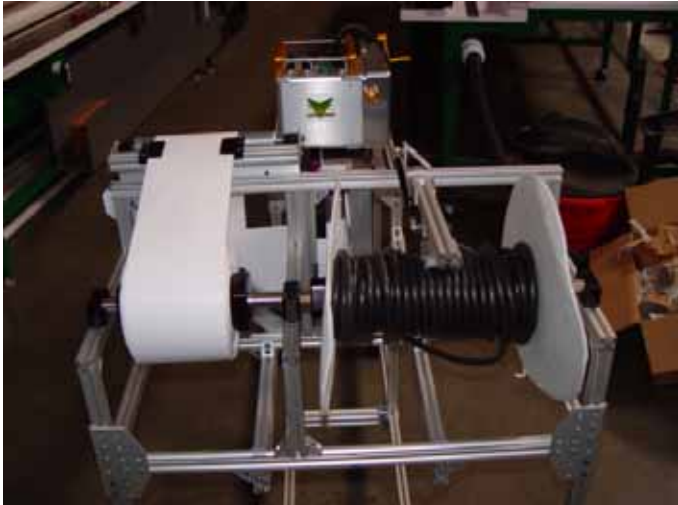
1a



1b

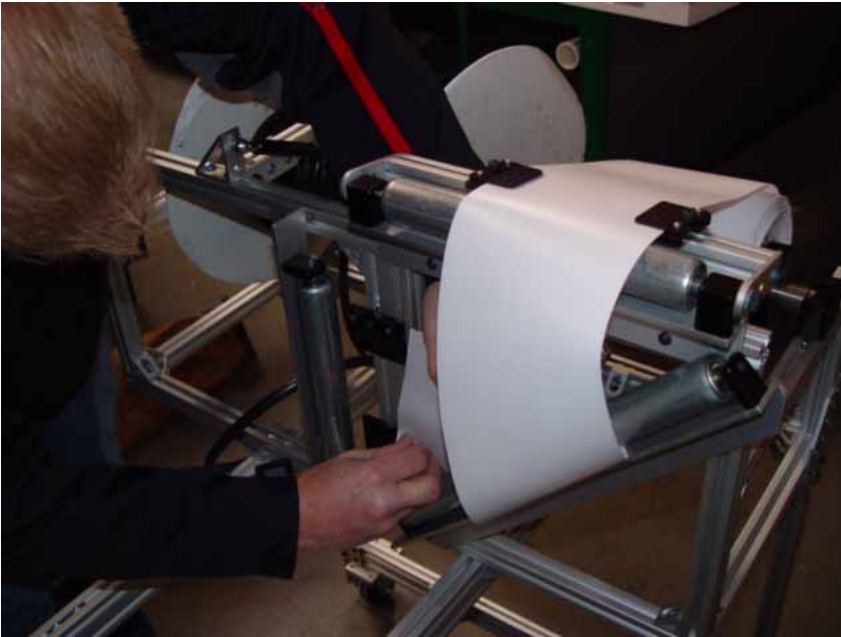


1c

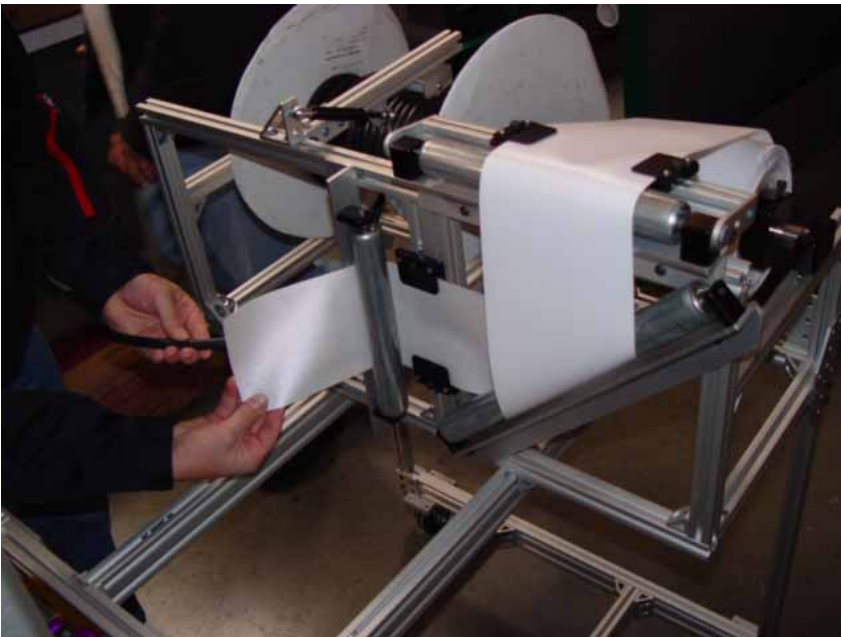


2. Feed the material through the upper retaining blocks and over the horizontal roller. Adjust the retaining blocks if necessary to secure and direct the material. Turn the material around the diagonal roller and feed through the lower retaining blocks. Again adjust the lower retaining blocks if necessary. Finally feed the material around the vertical roller and extend out towards the Spec Keder Machine.

2a



2b



3. Fold the material and begin to feed the lower fold into the lower guide opening of the keder guide system. Fold over the upper portion of the material and enter this into the upper guide opening of the keder guide system. Carefully slide the material through the guide system until it is out beyond the welding area.

3a



3b



3c

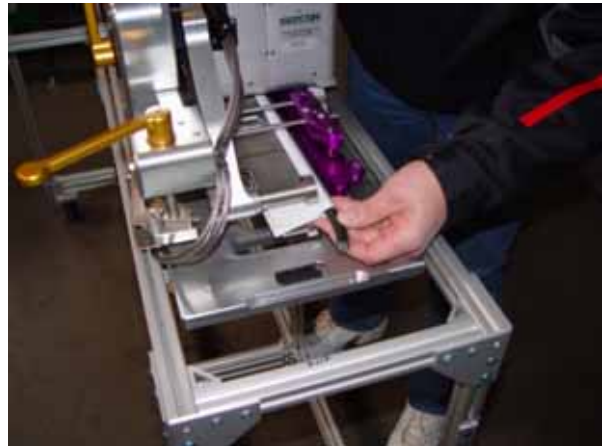


4. Feed the cord within the fold of material and slide through the keder guide system. Bring the end of the cord out from the material at the welding area.
5. Push the threaded lever on the side of the outer guide section inward to release the pressure lever arm. Carefully slide the outer guide in towards the inner guide section and position the material and cord correctly within the guide system. Tighten the two black thumbscrews on the outer guide when complete.

4a



4b



5a



5b



6. Position the material and cord again within the keder guide system and pinch the material tight around the cord. Lower the lever for the pressure rollers so that a tight fit is accomplished between the material wrapped around the cord. Pull the threaded lever counterclockwise to move the pressure lever arm out and lock it against the fold of material and cord.

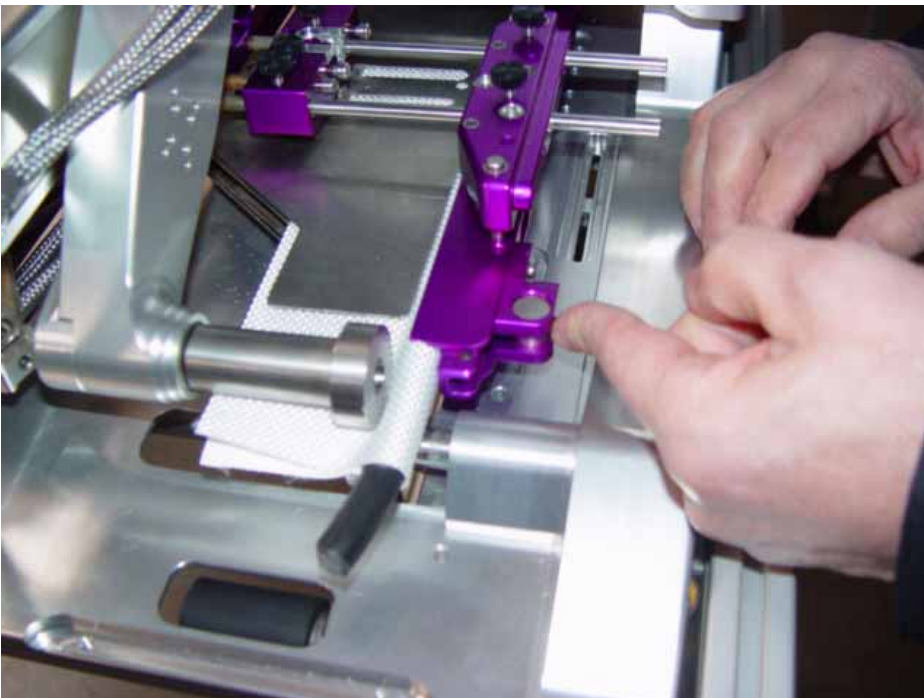
6a



6b



6c



7. The following are pictures from various angles of the material set-up.

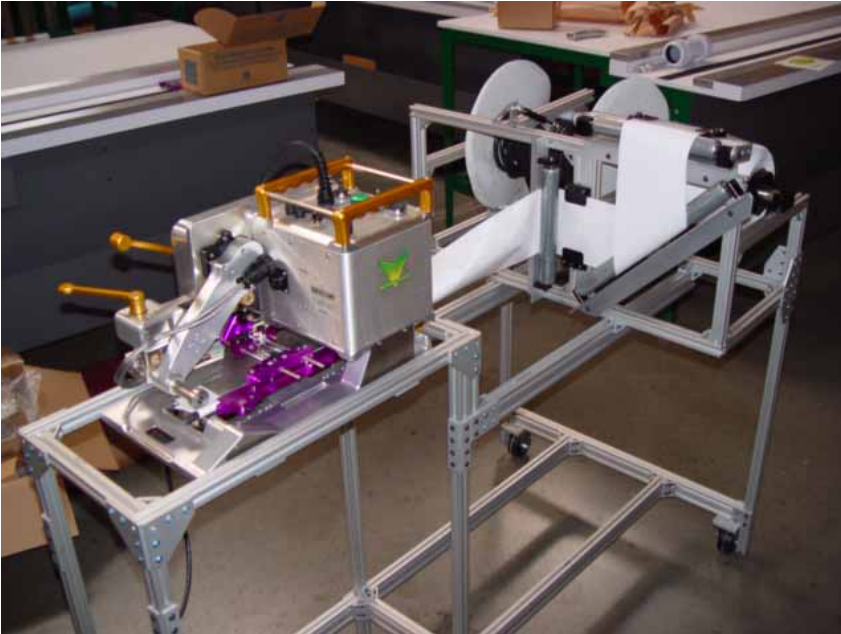
7a



7b

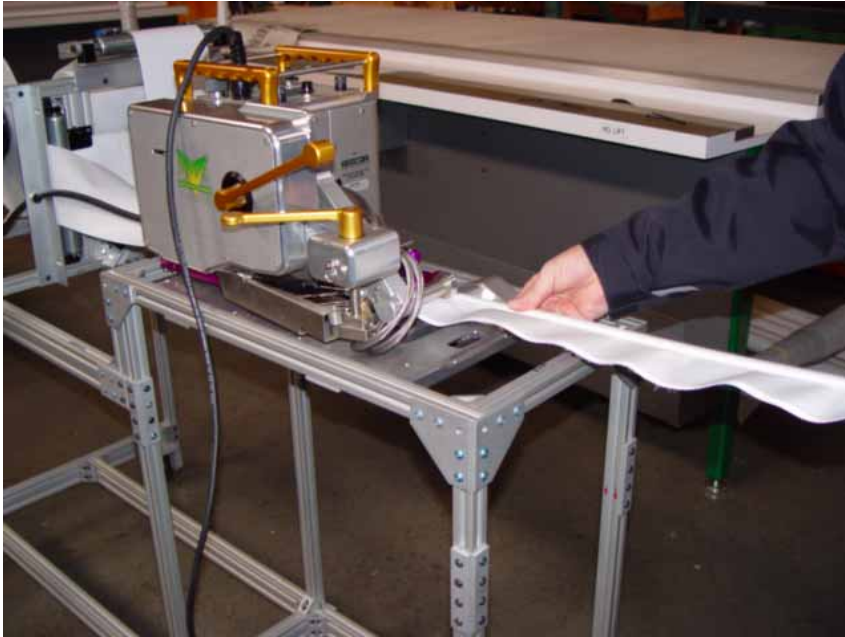


7c

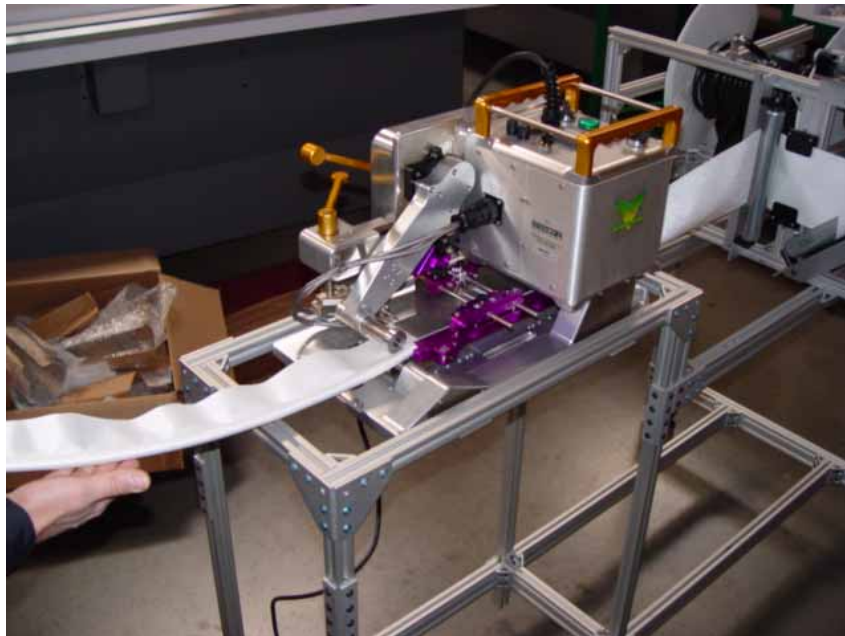


8. When the material, cord, keder guide system, and proper temperature, speed, and pressure of the Spec Welder are properly positioned, swing the wedge lever arm in to make several test strips of welded keder. Adjust any or all segments of the material set-up to make changes for a smooth running output of keder.

8a

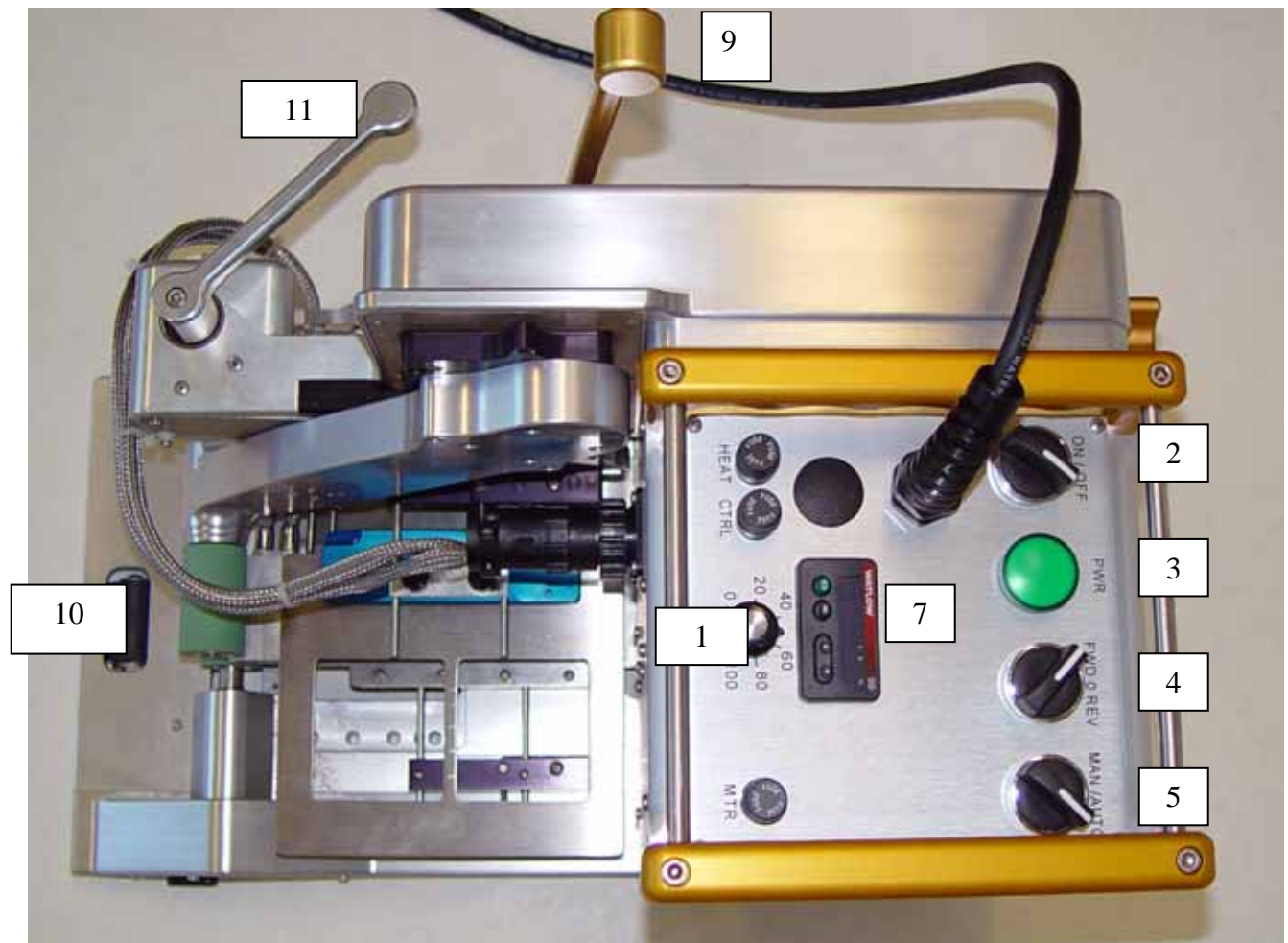


8b



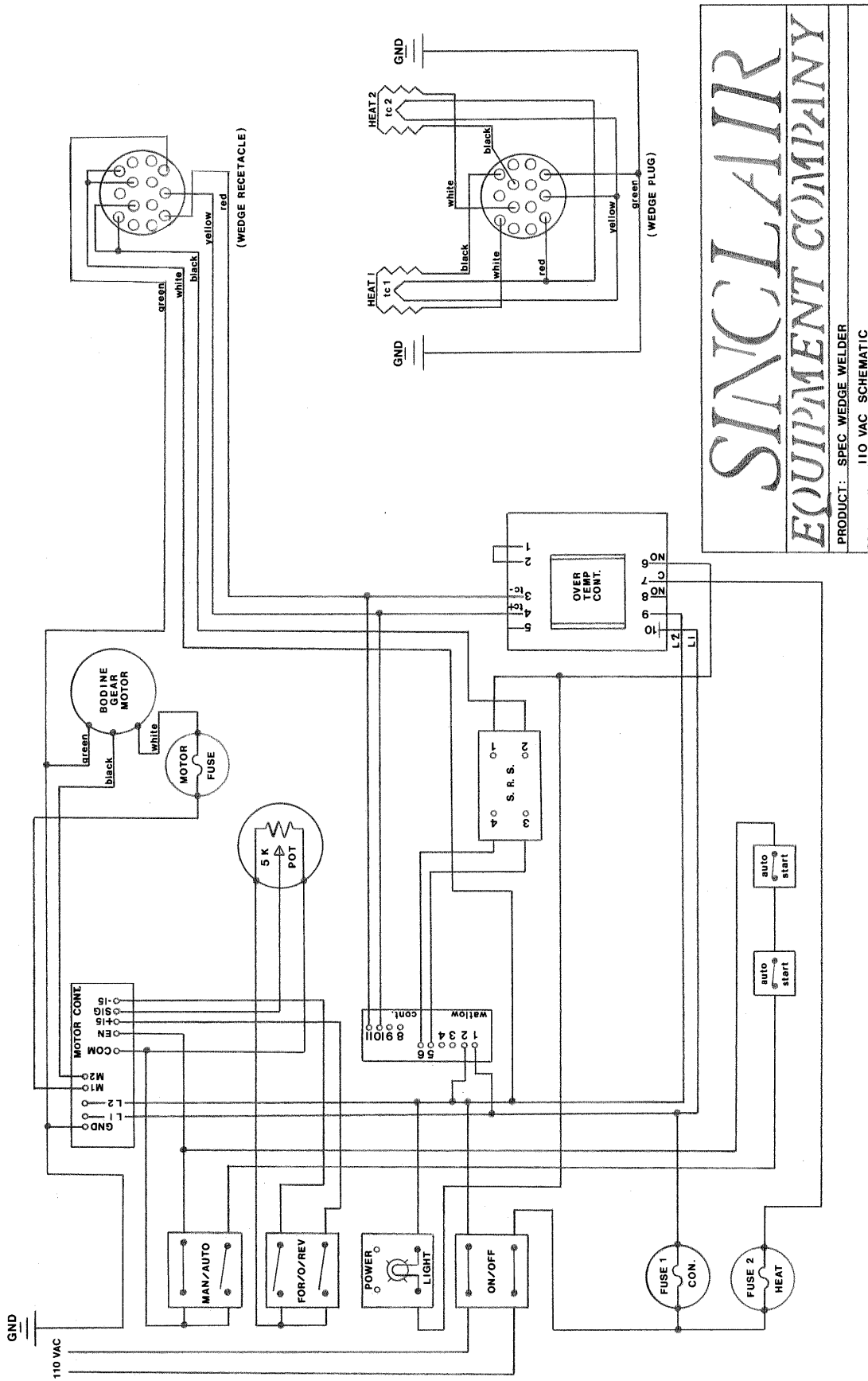
SPEC OPERATING INSTRUCTIONS

1. Turn the Power Switch #2 on. The Green Power Light #3 will go on with a one second delay. The Green light will remain on as an indicator that you have power to the heaters.
2. Temperature Controller #7 will come on with a 1-2 second delay after Green Power Light goes on. Units are set in Celsius at the factory. Press the up or down button until you reach your desired temperature. Heat up time is only one to two minutes. Do not adjust heat over 510 degrees C. For sample welds, set controller to 400 degrees C. This **may not** be your final setting.
3. Set For/Rev Switch #4 to Forward position. This indicates direction of machine and drive /pressure roller movement.
4. Set Man/Auto Switch #5 to Auto position. This will engage or start Drive/Pressure rollers when wedge is moved into welding position.

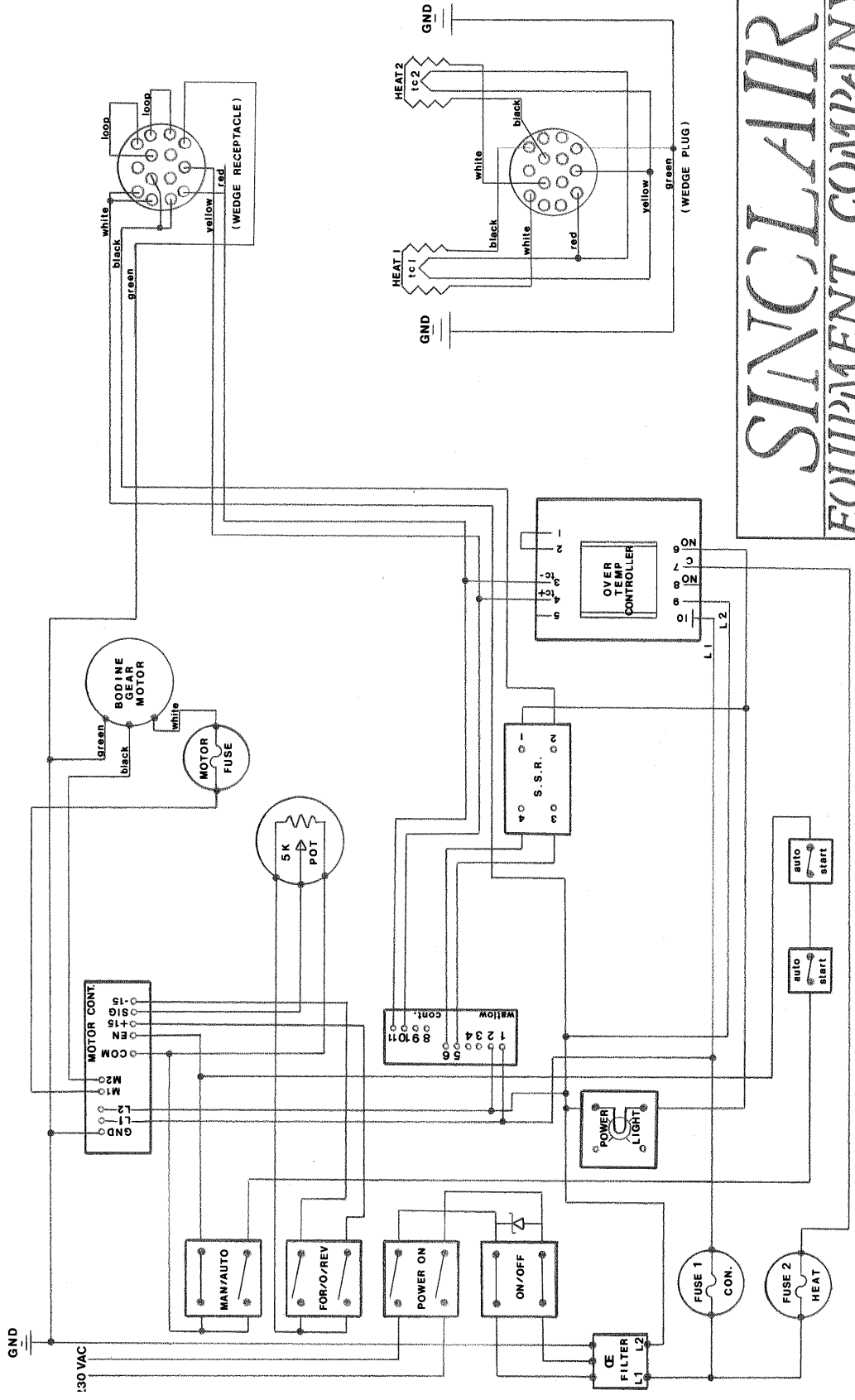


SPEC OPERATING INSTRUCTIONS, CONT.

5. Swing Drive Wheel Assembly #10 under bottom Pressure Roller. This will make the machine move automatically. With Drive Wheel Assembly out, the machine can be used in a stationary mode.
6. #1 is the Speed Control. It is adjustable from 0-30 feet per minute. Normal setting will be in the 30 to 60% range, for 12-30 mil goods.
7. Insert material into the machine with proper guides installed and close Pressure Wheel Handle #9.
9. Swing Wedge Engagement Handle #11 in toward the machine, this will automatically start forward motion of the **Spec** and engage wedge with material.
10. Adjust speed control up or down until you can verify you are getting a proper weld.



SINCLAIR
EQUIPMENT COMPANY
 PRODUCT: SPEC WEDGE WELDER
 110 VAC SCHEMATIC



SINCLAIR
EQUIPMENT COMPANY

PRODUCT: SPEC WEDGE WELDER
 230 VAC SCHEMATIC

STANDARD WARRANTY

SINCLAIR EQUIPMENT COMPANY'S tools are warranted to be free of defects in workmanship and materials for a period of one year from the date of original purchase. Should any trouble develop during this one-year period, return the complete tool, freight prepaid, to SINCLAIR'S authorized Service Center. If inspection shows the trouble is caused by defective workmanship or materials, SINCLAIR EQUIPMENT COMPANY will repair, or, at its option, replace without charge.

- This warranty does not apply to malfunctions caused by damage, unreasonable use, faulty repairs made by others, or failure to provide recommended maintenance.
- The warranty is void if the product is altered by the original consumer purchaser, or if it is used in a manner not recommended by the manufacturer.
- The warranties do not cover consequential damages or transportation charges incurred with the replacement or repair of SINCLAIR EQUIPMENT COMPANY products.
- Not responsible for lost job or down time.

In no event shall SINCLAIR be liable for any indirect, incidental, or consequential damages from the sale or use of the product. This disclaimer applies both during and after the term of this warranty.

SINCLAIR EQUIPMENT COMPANY disclaims liability for any implied warranties, including implied warranties of "merchantability" and "fitness for a specific purpose", after the one-year term of this warranty.

This warranty gives you specific legal rights, and you may have other rights, which vary from state to state. Should you have any questions, contact SINCLAIR EQUIPMENT COMPANY at (530) 626-9386.

To obtain warranty service, deliver or send the complete tool, prepaid, to SINCLAIR EQUIPMENT COMPANY. Be sure to include the following information:

- Nature of failure;
- Name and address of distributor where tool was purchased;
- Application of tool when rendered defective; and
- Proof of purchase.

To obtain individual repair parts, contact SINCLAIR EQUIPMENT COMPANY with the following information:

- Tool model number;
- Item part number; and
- Description of part.

NOTES