

TRIAD

WEDGE WELDING SYSTEM

OPERATING INSTRUCTIONS



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INTRODUCTION

The **Triad Wedge Welding System** is designed for in house fabrication of a wide range of flexible membranes. This includes, but is not limited to, PVC, PP, PE, LDPE, Urethane, etc.

Thickness of material that can be welded will vary also with product. Normal range is 5-100 mil thickness and can be supported or non-supported material.

The **Triad** comes complete with three different guides. This will allow you to perform the overlap weld, hem weld, prayer weld and many more welding options.

The **Triad** uses a hot wedge as its heat source. This method will give you smokeless and quiet operation. The wedge also allows for welding thinner products without distortion.

The **Triad** can be used as a stationary welder or in an automatic mode. When using the Triad in an automatic mode, a track system is suggested. Please refer to Track System Specifications.

We suggest that you make samples welds of your product to achieve the correct settings for heat, speed and wedge alignment before you start welding

WEDGE ADJUSTMENT AND IDENTIFICATION

Proper wedge alignment is essential to achieve a proper weld. Units are preset at the factory. Sample welds should be made prior to actual use of the machine.

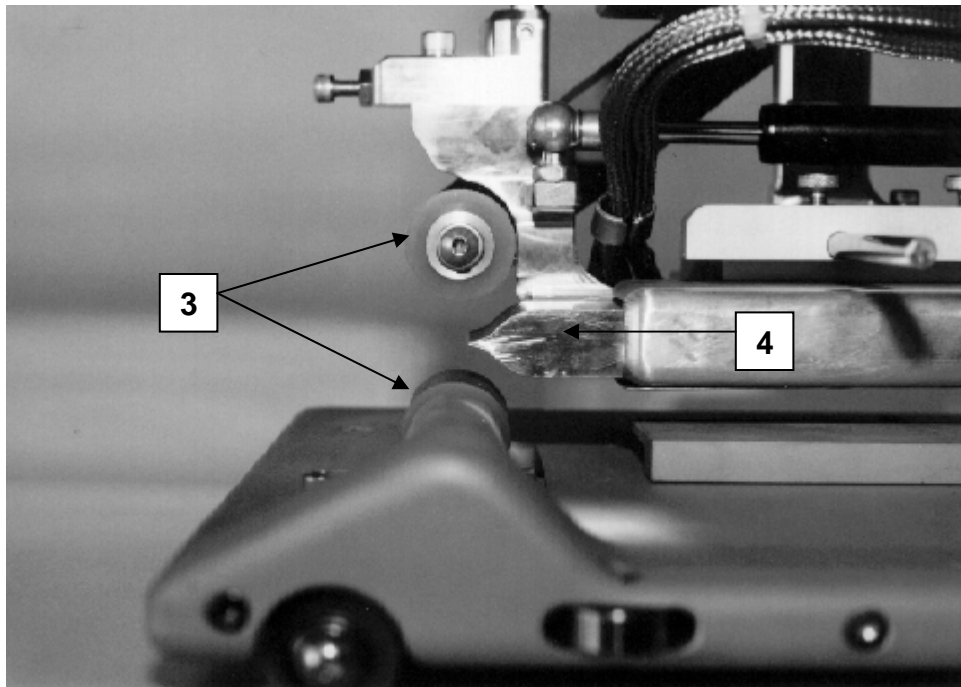
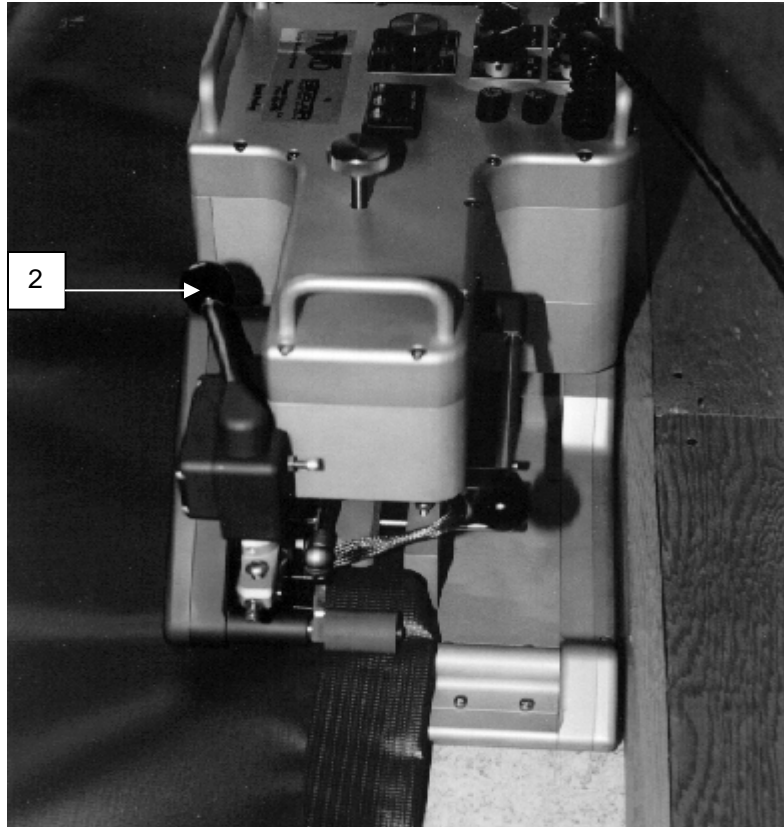
If sample welds are good only on one side or the other, or only partially welded, this means the wedge is not aligned or square to the rollers, and alignment adjustment is needed.

Unplug unit from power source and make sure the wedge is cool before you work on the machine.

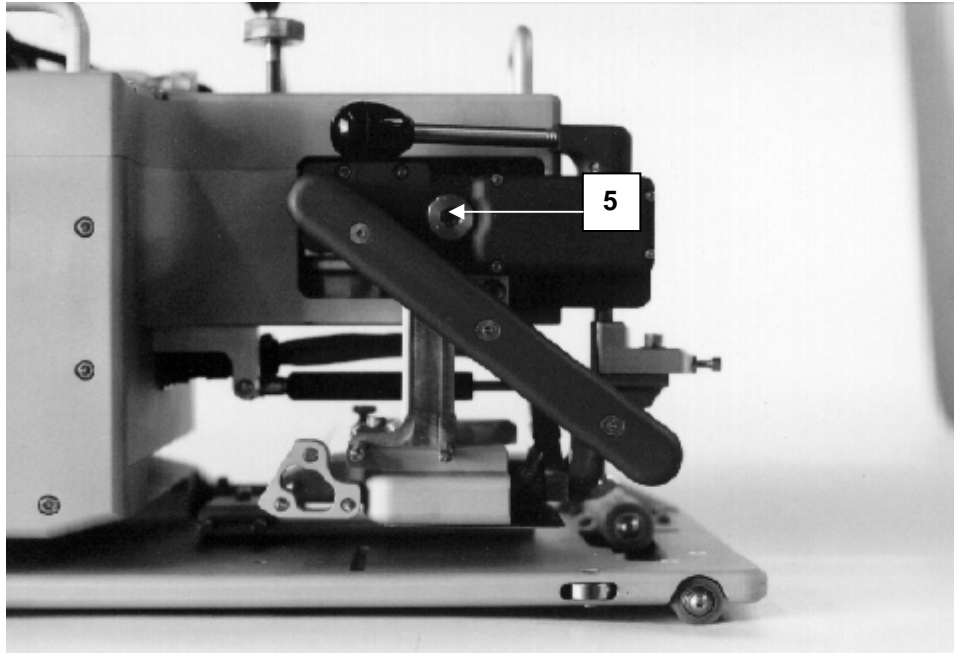
1. Pull Pressure Roller Handle #1 down. This will close Pressure Rollers.



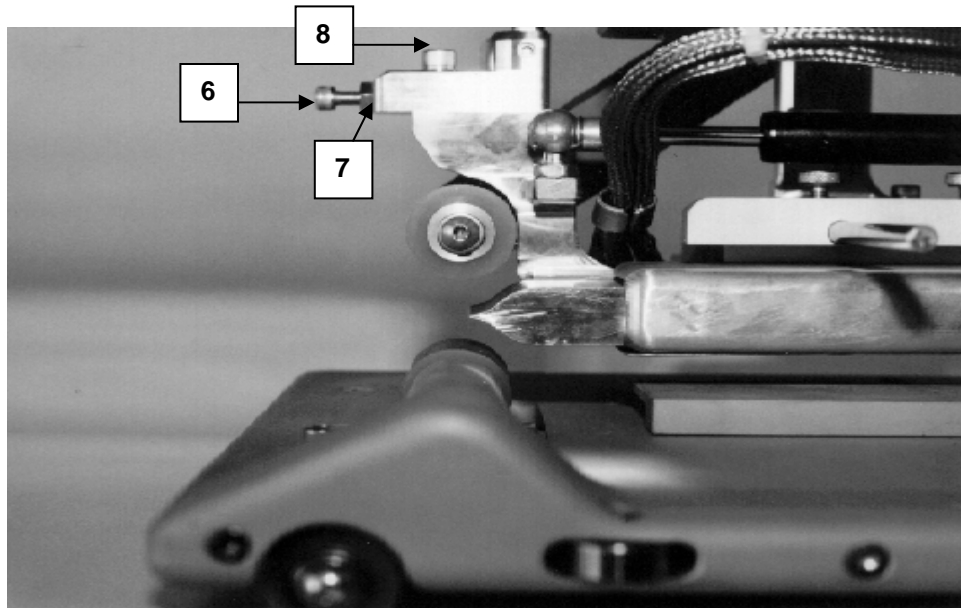
2. Swing Wedge Handle #2 in. This will engage wedge with rollers. The wedge #4 should rest or fit snug into the rollers #3 on both sides and should be centered.



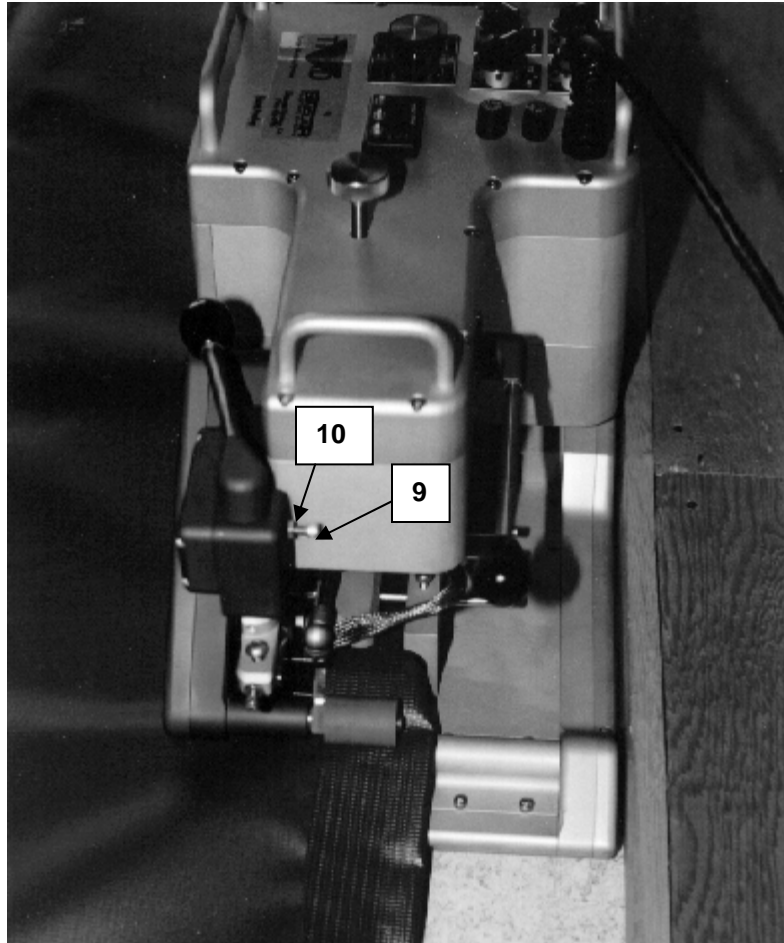
3. To center wedge between rollers, turn screw #5, this will fine tune wedge up and down. Only a 1/8 or 1/4 turn is necessary. Do not overturn. Move Pressure Roller Handle up and down slowly to check centering adjustment. Swing wedge handle in and out to ensure proper positioning.



4. Adjustment Screw #6 will move wedge on a center axis left and right. Loosen Locking Screw #8 to make adjustment. Loosen Lock Nut #7, turn Adjustment Screw clockwise to bring right side of wedge in and counterclockwise to bring left side in. When adjusted properly, tighten Locking Screw and Lock Nut.



5. Wedge Stop Screw #9 will stop travel of wedge when positioning wedge in weld position. Loosen Locknut #10 , turn Adjustment Screw in or out to proper position. The edge of the wedge should fit snug and square into the rollers on each end.



Make a test weld before proceeding with job. Fine tuning your adjustments can be made while wedge is hot. Do not run Hot Wedge into Silicon Rollers without material in machine for extended periods, as it will distort the silicon.

Note: For thicker products (30mil and up) backing the wedge out may be necessary to allow room for material.

WEDGE CLEANING AND HONING

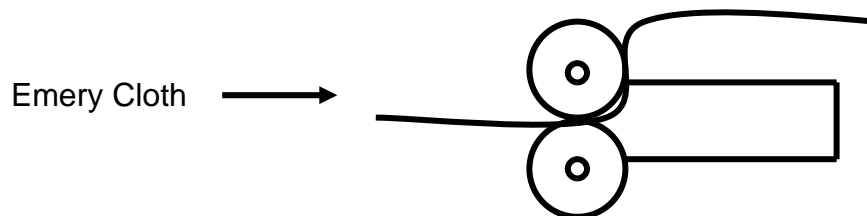
For accurate welds and longer wedge life, the wedge should be cleaned and honed on a regular basis.

CLEANING: Wedge cleaning should be done daily. There are two ways to clean the wedge.

1. With the Pressure Rollers in the up position and the wedge in the weld position, use the Brass Brush provided and clean wedge top and bottom. This can be done after every weld or as needed.
2. The second method of cleaning the wedge is to increase the temperature to 510 degrees C for 5-10 minutes. This will burn the residue on the wedge and it will flake off. Use the Brass Brush to remove.

HONING: Wedge Honing should be done if there are signs of wear on the wedge. This is evident with uneven welds, rounding edges or corners on the wedge.

1. Install both smooth steel rollers on machine, (do not hone the wedge with the Silicon rollers on machine).
2. Turn the forward/reverse switch to reverse position.
3. Swing wedge into weld position and close rollers.
4. Take the fine Emery Cloth provided, and run it back through the rollers on top of the wedge. Repeat this step on the bottom of the wedge.
5. Repeat step 4 top and bottom until there is even wear the full length of wedge.
6. If Honing does not true up the wedge, refer to Wedge Adjustment section. A combination of honing and adjustment may be necessary.

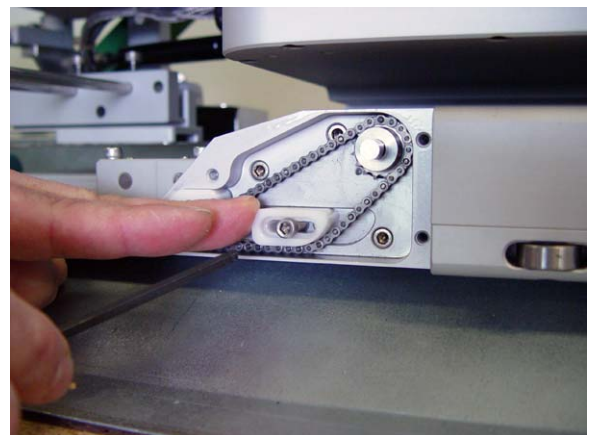
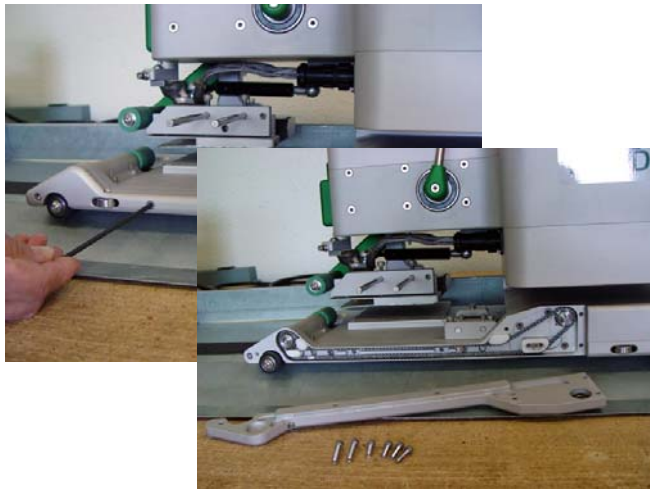


Drive System Maintenance

The drive system of the Triad is made from a series of chains running within the machine. Maintenance to the drive system can be a result of various factors including slack in the chain tension, wear to the plastic chain rubs, and a disconnection of the chain.

Lower Final Drive Chain:

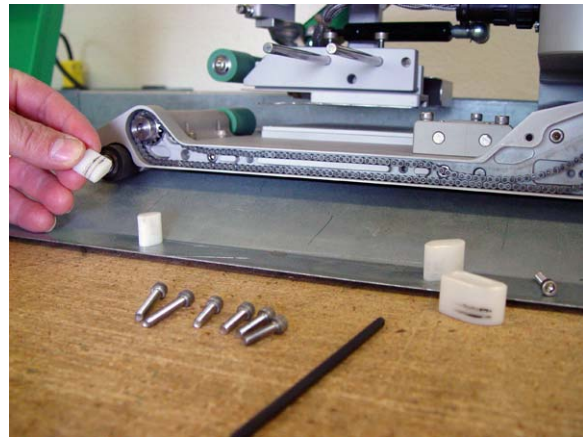
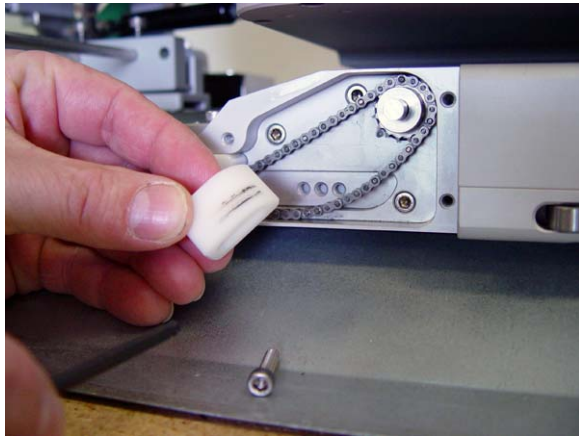
1. Use a $9/64$ " hex wrench to remove the screws on the bottom side panel of the Triad. Removing this panel will expose the chain, master link, tension plastic rub, three additional plastic rubs, sprockets, and bearings.
2. Rotate the lower pressure roller back and forth to observe the slack in the chain.
3. Loosen the screw for the tension plastic rub and push forward to remove slack from the chain. Tighten the screw and recheck. The screw for the plastic tension rub can be placed in successive threaded holes to make several tension adjustments.
4. **Note:** Do not apply any tension on the chain as this will cause stress and possible failure to various parts in this area. Adjust only enough to remove slack in the chain.



It is recommended to check wear to all the plastic rubs when the chain is adjusted. When a 1/16" to 1/8" (1.5 to 3 mm) depth is cut into the plastic, these parts will need to be replaced.

To evaluate and replace the plastic rubs:

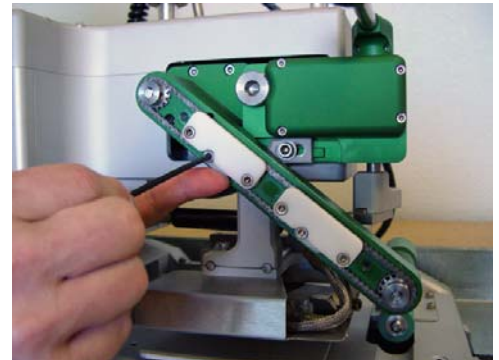
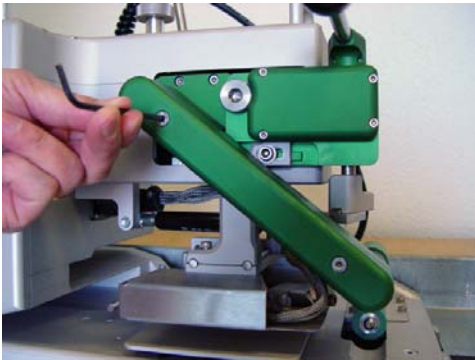
1. Remove the tension in the chain by loosening and sliding back the tension plastic rub.
2. Remove the screw and tension rub screw to examine the wear to the tension plastic rub. Remove the remaining three plastic rubs to examine. Follow the guidelines mentioned above.
3. Replace the rubs within the same position by using the indentation cut in the Triad body. Then replace the tension plastic rub and screw. Adjust the chain as described previously.



Check the chain connecting link to make sure the safety clip is intact. If the chain has come apart during operation, the chain and/or master link will possibly need replacement. When reassembling a master link, make sure the safety clip is installed with the proper direction of travel (as shown).

Upper Final Drive Chain:

1. Use a 1/8" hex wrench to remove the screws on the green side cover of the upper pressure roller arm. When removing the cover, the chain, master link, plastic rubs, plastic tension levers, and sprockets will be visible.
2. If a droop or sag in the upper portion of the chain is seen, adjustment is necessary.
3. Locate the two screws which hold the plastic tension levers in position. Use the 9/64" hex wrench to loosen one of these levers.
4. Push the lever up into the larger plastic rub section to remove the slack in the chain and retighten the screw. Again, do not over tighten.



Periodically examine the wear in the plastic rubs for this chain drive. They will not wear as quickly as the other chain yet will need replacement when worn. Follow the same wear factor as the other chain. Also check the connecting link for the chain. When reassembling a master link, make sure the safety clip is installed with the proper direction of travel (as shown).



For further information regarding the various chains and other drive assemblies, refer to the support section of our website at www.sinclairequipment.com

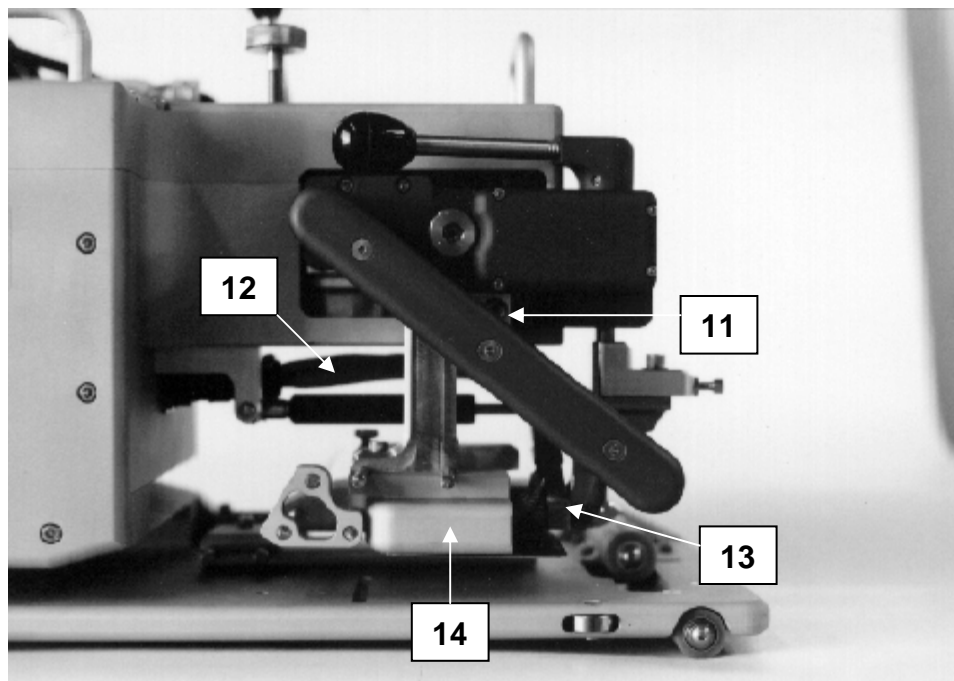
WEDGE REPLACEMENT

IMPORTANT NOTE: New wedge must be installed with lead bracket.

The wedge should be replaced when honing and adjustment is no longer effective. If heater failure occurs after a period of time, the heaters may not be easily removed. The wedge and heater will most likely have to be replaced together.

1. Unplug machine and make sure wedge is cool.
2. Remove Horn Bracket Screw #11 and remove Wedge Horn Assembly #14.
3. Unscrew and detach Heater Connector #12.
4. Remove both Wedge Screws #13, and remove wedge.
7. Install new wedge with Wedge Screws. Attach Heater Connector and re-attach Wedge Horn.
6. Center Horn Bracket slot with Screw #11 and tighten.
7. Wedge alignment may be necessary, please refer to Wedge Adjustment Section.

Note: Wedge Horn assembly will move back and forth in slot for #11 screw. Moving the horn will increase or decrease exposure of material to wedge for different preheat time or exposure. Thinner products need little preheat, thicker material need more.

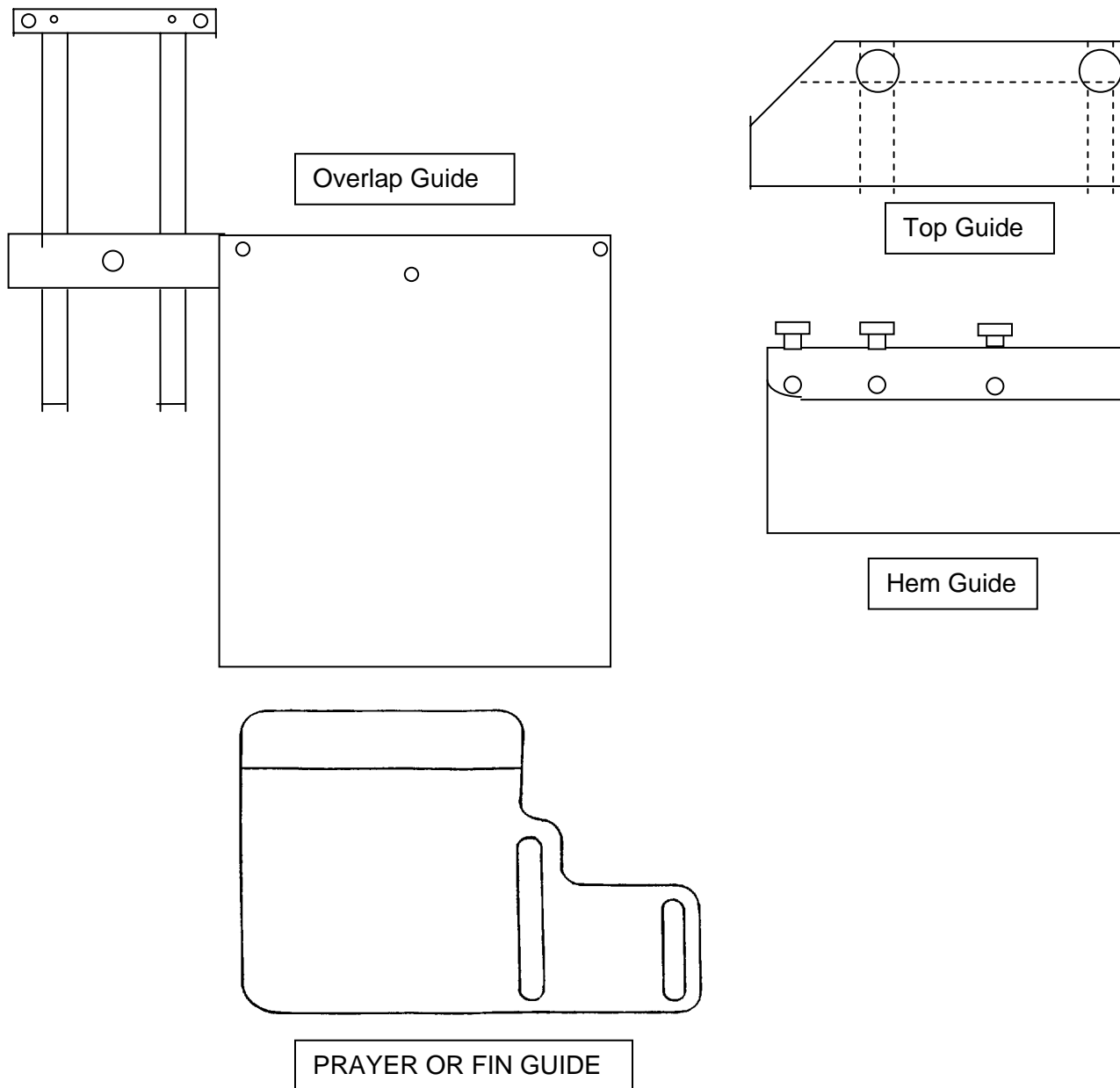


GUIDES

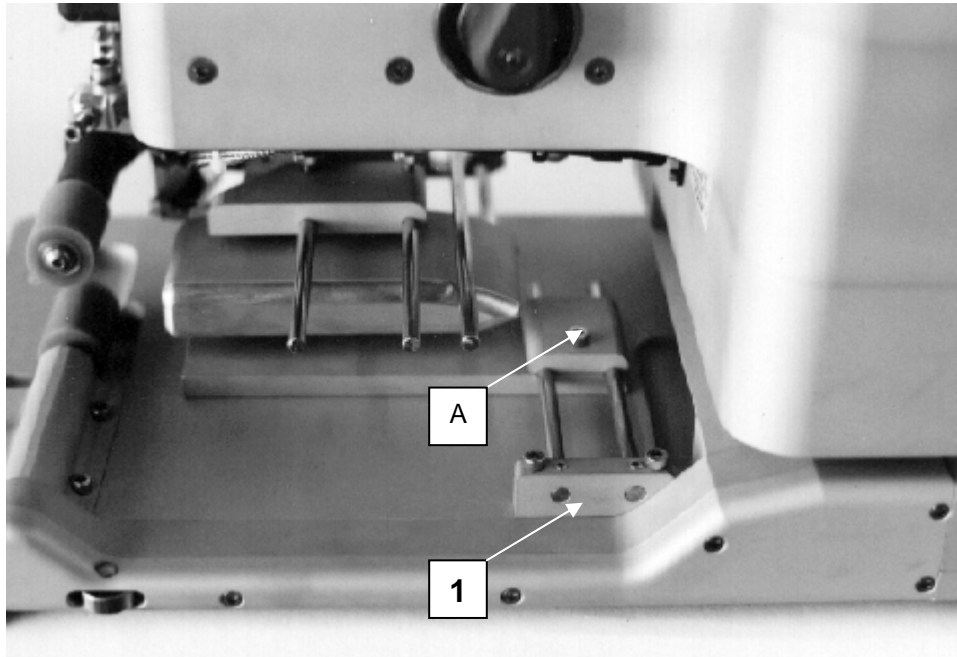
All Guides shown below are included with the purchase of the standard machine. Each guide will give you a specific type of weld and more. You can only use one guide system at a time.

The **Top Guide** will be used with all three different welding functions, overlap, hem and prayer welds. All Guides are adjustable.

To achieve a precise weld with no loose flap on top or bottom of sheet, guides should be adjusted so that they are even with the width of wedge, or welding area.



1. **Overlap Weld.** Attach Overlap Guide #1 to base plate with the two screws provided. Loosen screw (A) to adjust bottom side of overlap for proper alignment and re-screw.



2. **Hem Weld.** Slide Hem Guide #2 onto the three stainless rods up to the outer Horn Guide #3 (**Diagram #1**), leaving enough area between the two so material will slide easily. Tighten thumbscrew (B) (**Diagram #1**), this will allow the outer Horn guide and Hem guide to move as one. This dictates the size of the hem to be welded. Push on Hem Slide #4 (**Diagram #2**) to achieve desired hem width or size. When this is done, tighten thumbscrews (C) (**Diagram #1**) to lock in place.

Diagram #1

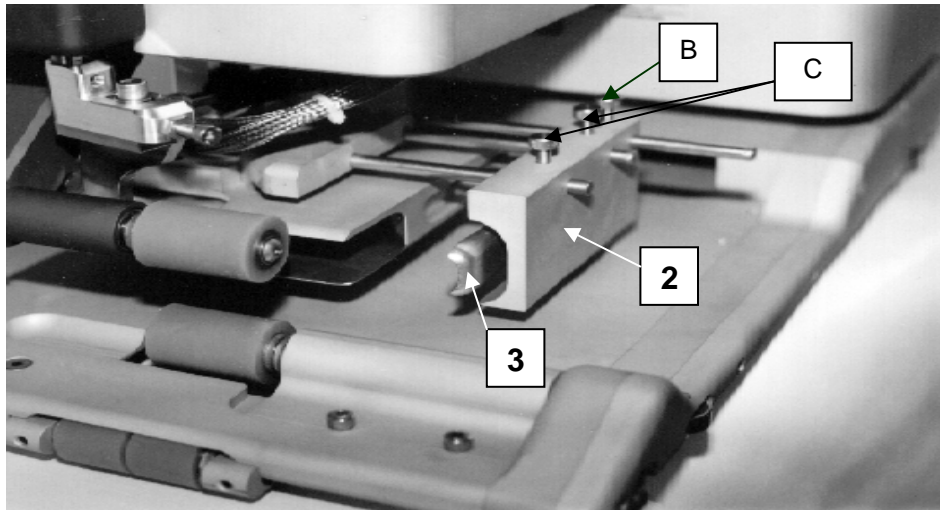
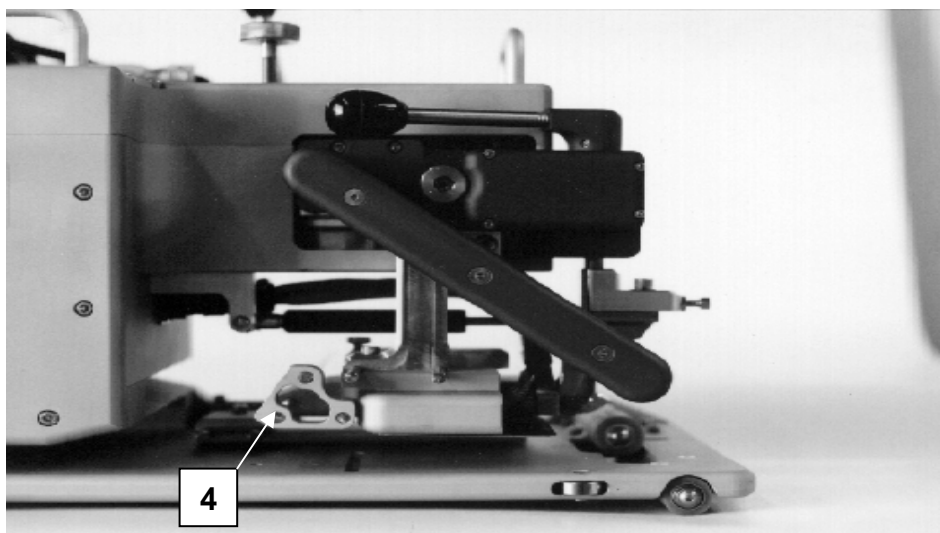
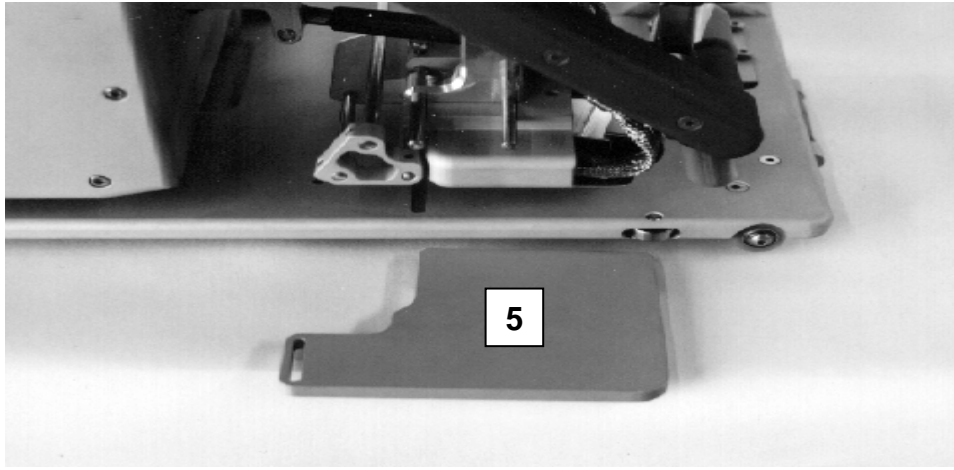


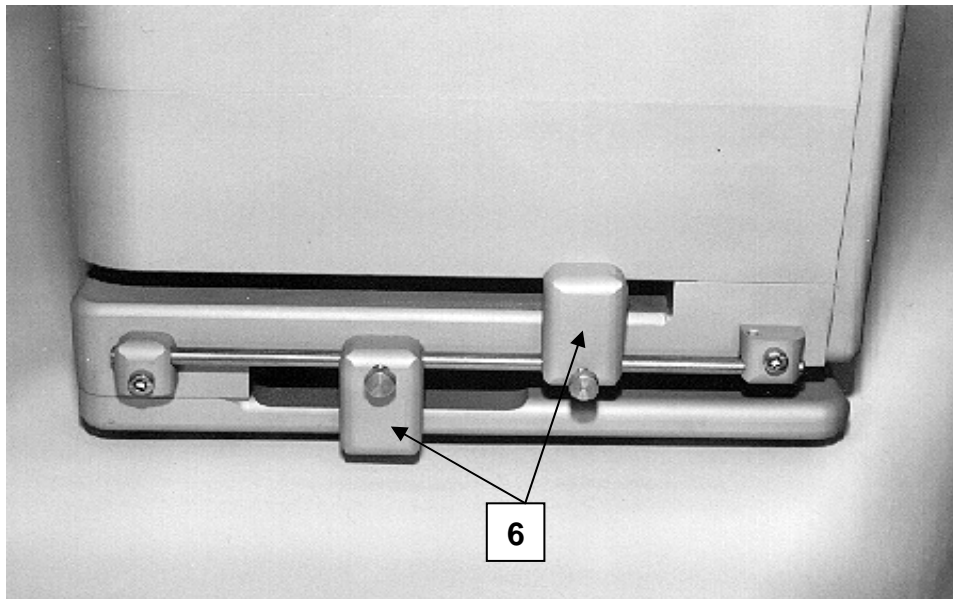
Diagram #2



3. **Prayer or Fin Weld.** Position the Prayer Guide #5 under the Welding Horn, placing the key way into the slot. Fasten with screw provided once proper alignment is completed.



4. Front Guides #6 are adjustable to pre-align material before you reach the welding process. This will help the operator in feeding material into machine properly.

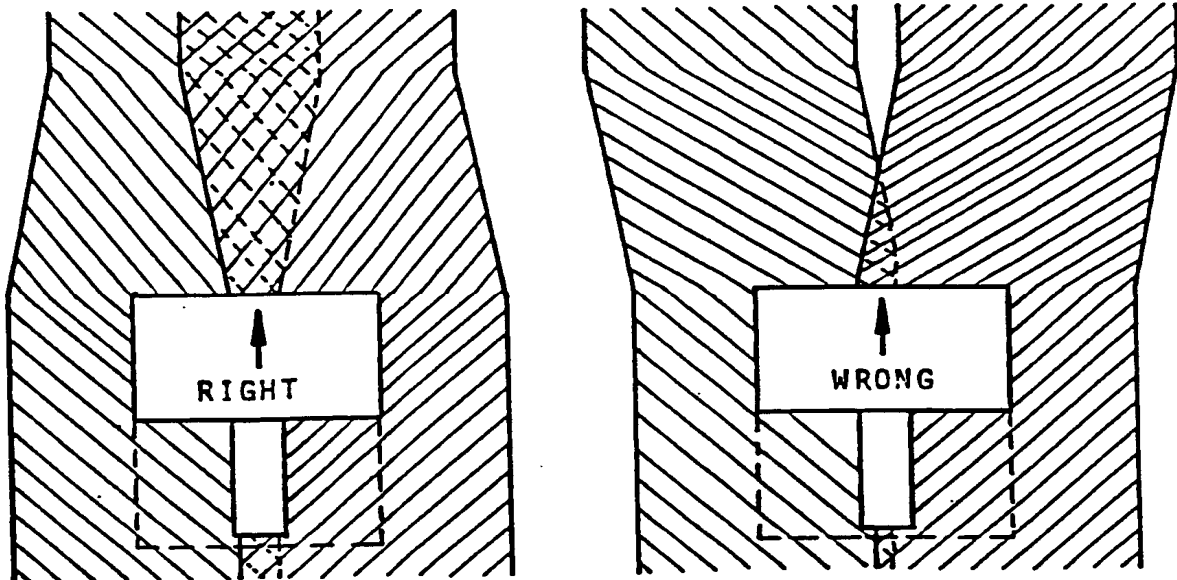


MATERIAL SETUP

Material should be laid out as flat as possible, either on the floor or table depending on how you set up your fabrication area. With most material and especially thinner goods, it is preferred to pull out the wrinkles or pull taunt. The use of sheet metal in or next to the machine on the table, allows for the use of magnets to position and hold the material. Taping material taunt is a good practice.

To perform overlap welds, always overlap material more than the final weld width.

Example: With a 1 1/2" weld width, overlap the end of material or run 2 to 2 1/2". The machine and front guides will push the material to the desired overlap. If the material is not overlapped or positioned properly, the machine will not make the desired overlap weld. See sample below.



TRACK WELDING SPECIFICATIONS

Listed below in Figure 1 are the dimensions for building your Track System. Always check the **Triad** in the track to make sure it does not bind up or that the track is too big so the **Triad** will not be crisscrossing the track.

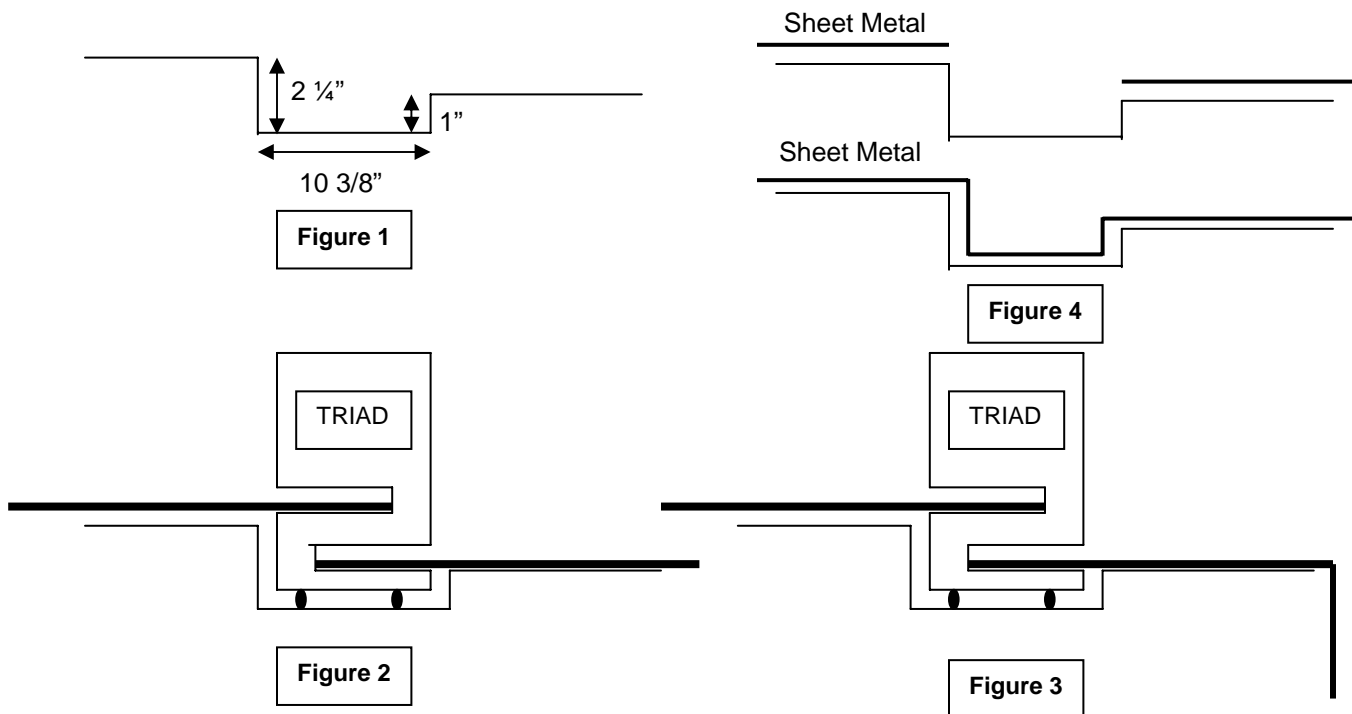
Make sure you always have a smooth, clean flat surface for the **Triad** to run on.

TABLE MOUNT TRACK: You may design your track in several ways. The best is to build the Track into the table as shown in Figure 2 below. This will allow the material to lay flat at all times, this is helpful in the welding process.

TABLE MOUNT ADD ON: You may want to add a Track on to the end of your existing table as shown in Figure 3 below. Material on the short side will then fold on the floor.

FLOOR MOUNT TRACK: By using L iron or 1" by 1" wood strips, you can mount on the floor with pins so they may be removed when not in use. This method can be used on a table for removal also.

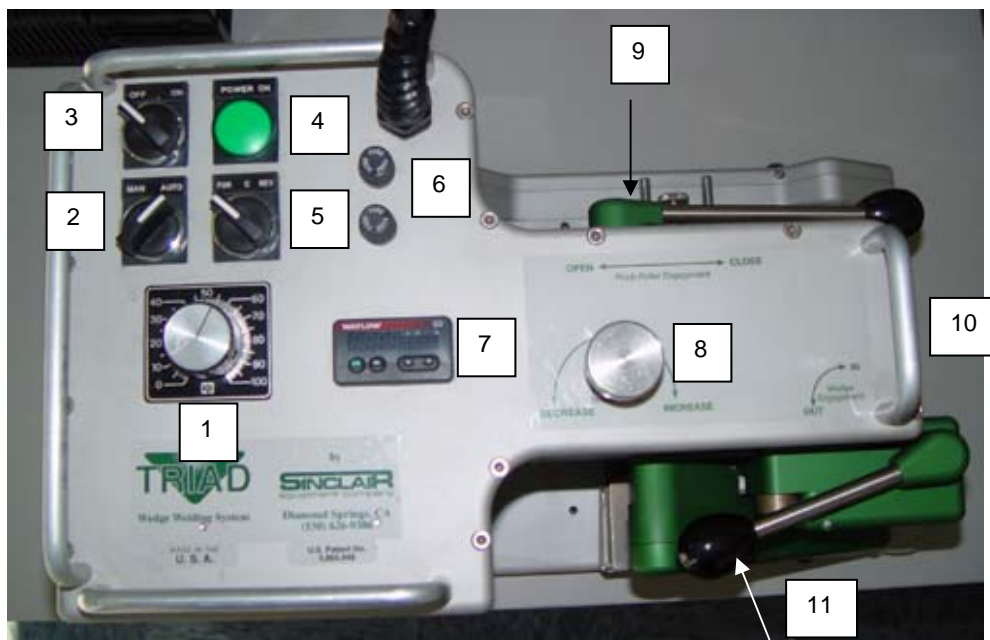
We also can suggest using sheet metal on top of the table so you may use magnets to hold and position the material. See Figure 4.



TRIAD OPERATING INSTRUCTIONS

The following procedures should be followed only after you have followed the Wedge Adjustment and Guide adjustment procedures.

1. Pull up on Red Power Switch #3 to turn machine on. The Green Power Light #4 will go on with a one second delay. The Green light will remain on as an indicator that you have power to the machine. (Push down on Red Power Switch #3 to turn machine off)
2. Temperature Controller #7 will come on as the 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. (It will take the controller 3 seconds to accept the change after setting the desired temperature)
Heat up time should be 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 #5 to Forward position. This indicates direction of machine and drive/pressure roller movement.
4. Set Man/Auto Switch #2 to Auto position. This will engage or start Drive/Pressure rollers when wedge is moved into welding position.



5. Swing Drive Wheel Assembly #10 under bottom Pressure Roller. This will make the machine move or automatic. 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. #8 is the Pressure Knob. It can be adjusted for more or less pressure, depending on the thickness of material.
8. 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 **Triad** and engage wedge with material.
10. Adjust speed control up or down until you can verify you are getting a proper weld.

