



Pro-Wedge



XL Operator's Manual

Model Number: 500-0100/XL/A

Revision: D

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Scope of Manual:

This manual contains procedures for safety, general unpacking, set-up, and operation of your DEMTECH Services, Inc. Pro-Wedge.

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Manual Number: **500-OPERATOR'S MANUAL/3XL, Revision: D**

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1 Safety Precautions

Safety precautions for operating personnel and equipment:

WARNING 1: Operating personnel should perform only the procedures described and recommended in this manual. Only qualified service personnel familiar with electrical shock hazards and mechanical entanglement hazards present inside the equipment should perform disassembly or corrective maintenance of the equipment.

WARNING 2: To avoid shock hazards, the equipment must be grounded with an adequate earth ground in accordance with local and national electrical codes.

WARNING 3: The locations of potentially dangerous voltages and other hazards are identified and labeled on the equipment. Be careful to observe these warnings when installing, operating, maintaining or servicing the equipment. Observe all warnings in this manual.

WARNING 4: Make sure to turn off the equipment power and remove the ~ (AC) line cord from the power outlet before attempting to service the equipment. Do not perform service unless you are qualified and trained to do so.

WARNING 5: This product is intended for operator attended operation only. This product should never be left unattended at any time while it is plugged in and the power is turned on.

WARNING 6: This product is intended for operation in dry environments only. Higher humidity environments should be kept non-condensing by avoiding large temperature swings.

CAUTION 1: Observe the precautions given on the equipment and within this manual to prevent damage to the equipment.

CAUTION 2: Before connecting the equipment to its electrical power source, check that the ~ (AC) voltage, frequency and current to be supplied to the equipment are correct and match the serial plate affixed to the system.

CAUTION 3: Use proper handling and packaging procedures for Electro-Static Discharge (ESD) sensitive circuit boards. Assume that all circuit boards are sensitive to potential damage from ESD.

CAUTION 4: Unauthorized personnel should not remove from the equipment those panels or covers that are provided for protection and/or require a tool to remove.

2 General Safety & Maintenance Information

The Pro-Wedge is a high voltage piece of equipment. Always disconnect the power source before performing service and maintenance to the unit. Never pull or carry welder by the power cord or electrical connection. Always keep slack in extension cord while in operation to avoid damage to the power connection. Keep hands and other body parts clear of heating wedge and elements when hot. Always use Pro-Wedge in a well-ventilated area when welding materials such as PVC that produce toxic fumes. Do not inhale toxic fumes when present. Do not operate near flammable materials. Do not apply flammable liquids to seam area. Allow unit to cool down for at least 5 minutes before putting back into shipping/storage case. Protect unit from exposure to direct rainfall or standing water. Never attempt to weld in standing water.

2.1 *Intended Use*

For additional product information please refer to the product data sheet.

The Pro-Wedge XL is intended as professional use equipment and not intended for sale to the general public. The total input power of the Pro-Wedge is specified as greater than 1 kW although in lightly loaded conditions the actual power may be less than 1 kW.

The Pro-Wedge has been manufactured according to the latest technology and current safety regulations. However, improper use or abuse may lead to hazardous conditions for the user or third party or damage to the unit.

Always have this manual handy at the location where the Pro-Wedge is being used so that it can be referred to quickly and easily.

The technician assigned to operate this welder must have read through and become familiar with this manual before starting work, particularly the section on safety.

Do not make changes or modifications to the Pro-Wedge relative to safety without contacting the manufacturer for advice.

2.2 *Maintenance*

Maintenance, inspection and adjustment of the Pro-Wedge may only be carried out by qualified personnel. Before removing or installing spare parts or performing other repair operations to the Pro-Wedge, consult the manufacturer for advice on proper procedures. This will help insure a safe and successful outcome. Always make sure all screw connections are tight before attempting to operate the unit after maintenance or repair. Also make sure all covers, guards, and other safety devices have been reinstalled before use.

3 General Product Data

The DEMTECH Services, Inc. Pro-Wedge XL Geo-Membrane Wedge Welder, hereinafter referred to as the Pro-Wedge or welder, dramatically speeds the welding of plastic sheet materials through the use of its wedge heating elements and multiple pressure roller design. These features combined with state-of-the-art electrical and electronics controls and an easy to use User Interface (UI) makes performing welding tasks very efficient. The semi-automated operation of the welder eliminates cumbersome setup and speeds up processing time while providing a very rugged and reliable welder. The enclosed controller sub-system is easy to maintain. You can be assured the Pro-Wedge has been built using the highest quality materials available which include Billet Aluminum and ground and hardened steel. DEMTECH Services, Inc. strives to make our welders easy to use and built to last. Just like all other DEMTECH Services, Inc. products, even a first time user will be productive in minutes.

4 Operating Environment

The Pro-Wedge is intended to be operated within the following environmental conditions. Operating the welder in environments which are less than or greater than nominal can adversely affect performance.

Temperature+65 to +90°F; 74°F Nominal (+18 to +32°C; 23°C Nominal)

Humidity (non-condensing)0 to 90%; 45% Nominal

Elevation0 to 7,000 Ft; 2,000 Ft Nom (0 to 2,134 meters; 610 meters Nom)

5 Site Preparation

Before proceeding with the unpacking and installation instructions in the following section(s) make sure the work site is prepared and ready to install the Pro-Wedge. You should have an adequate power source capable of provided clean Alternating Current (AC) power at 120-240 Volts at the rated current. Refer to the welder serial plate affixed to the inside side of the Side Frame near the Upper Nip Arm for the voltage and current requirements of your welder. The install area should be clean, dry and free of debris and provide adequate working area to allow efficient and effective use of the welder.

Follow the detailed unpacking and installation instructions carefully.

6 Unpacking, Power Connection, and Accessories

6.1 Unpacking

Before opening the shipping/storage case for the first time and unpacking the welder, inspect the outside of the case thoroughly for any signs of mishandling or damage during shipping. Report any damage to the shipping carrier immediately and **do not proceed with unpacking**. You should consult your administration concerning claims for shipping damage. Please notify DEMTECH Services, Inc. or your authorized DEMTECH distributor where the product was purchased in the event of any shipping damage.

Unlatch and open the shipping/storage case lid and inspect inside the case and equipment thoroughly for any signs of mishandling or damage during shipping. Report any damage to the shipping carrier immediately and **do not proceed with unpacking**. You should consult your administration concerning claims for shipping damage. Please notify DEMTECH Services, Inc. or your authorized DEMTECH distributor where the product was purchased in the event of any shipping damage.

The Pro-Wedge hot wedge welder is delivered to you in a sturdy, reusable shipping/storage case. The custom foam insert protects the unit from damage during shipping and should be stored in the case at all times when not in use. When the unit is out of the case, make sure the lid is closed to avoid dirt, dust and rain from getting inside. Once the Pro-Wedge has been removed from the case, it is ready for use except for any necessary set-up adjustments. For set-up procedure, refer to the set-up adjustment section in this manual.

Make note of the orientation of the equipment and packing foam inserts inside the shipping case to facilitate any repackaging requirements in the future. To avoid injury and/or damage to the welder, be sure to use adequate care when lifting, removing or replacing the welder into the shipping/storage case. The welder must be removed from the shipping/storage case and placed in an appropriate location suitable for the welding you intend to perform.

6.2 Electrical Plug Connection

The Pro-Wedge is supplied with an appropriate U.S. plug-end according to the specified operating voltage of the welder. The supplied plug-end can be replaced by the customer as long as the new one is rated at a minimum of 20 amps.

6.3 *Power Requirements*

The voltage requirement of your Pro-Wedge is 120-240 Volts AC only.

Note: The above operating voltage range refers to actual voltage at point of welder plug-in. In other words, the voltage under load at the welder end of the extension cord. To measure voltage under load, connect the welder to the extension cord and generator that will be used. Start the generator and turn both welder power switches to the on position. While the number 1 indicator light on the temperature controller is illuminated and the wedge is heating, separate the plug at the end of the welders power cord just enough to expose the prongs. Using a digital voltmeter, measure the voltage under load between the hot and neutral prongs.

This procedure should only be performed by a qualified electrician.

6.4 Generator Recommendation

If using house power from a building circuit, please contact the manufacturer for advice on plug and cord configuration. In-field generators should be rated for at least 3500 watts; however, a rating of 5000 watts or more is recommended in order to obtain the best welder performance and temperature control. As a rule, the higher the wattage of the generator, the better the performance of the welder. Keep in mind that the length and wire gauge of the extension cord being used, combined with the capacity of the generator, will ultimately determine the operating voltage reaching the welder.

6.5 Extension Cords

Extension cords should be at least 12 gauge and regardless of overall length should have a minimum of 3 plug-end connections.

Maximum recommended extension cord length:

10 gauge, 3 wire	12 gauge, 3 wire	14 gauge, 3 wire
500 Feet	250 Feet	100 Feet

6.6 Accessories

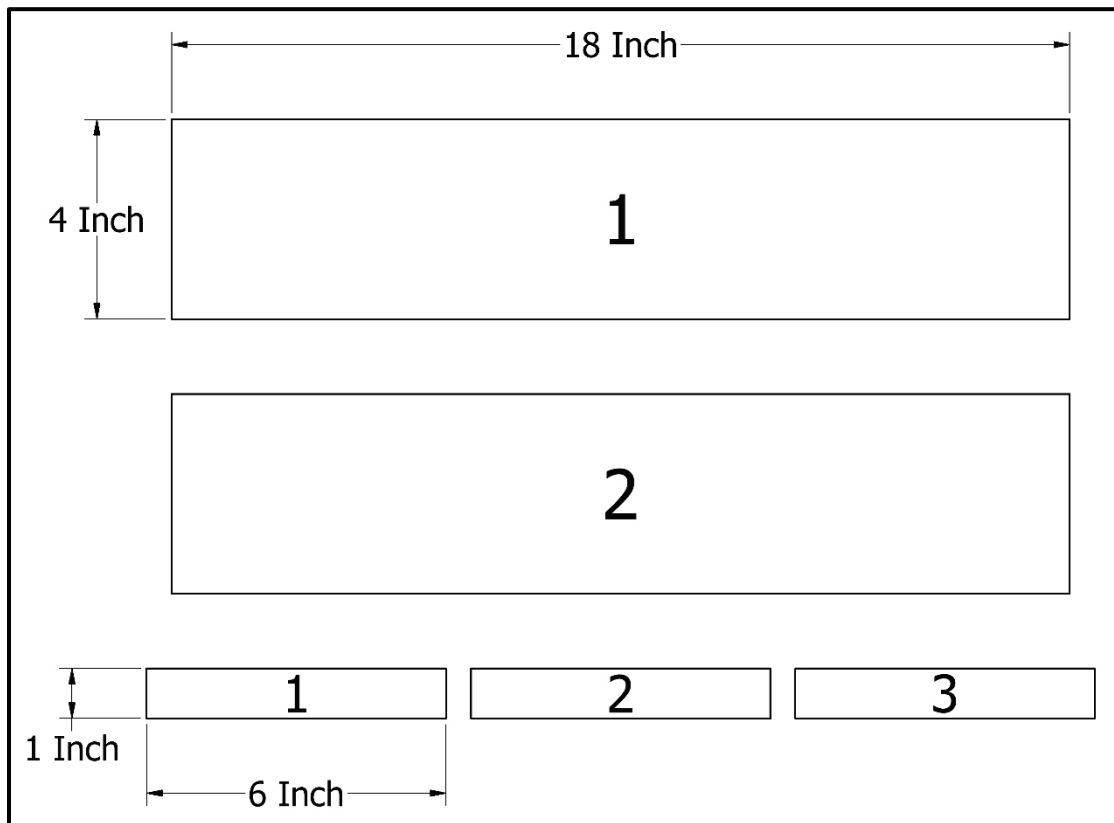
The Pro-Wedge has been designed to weld a wide range of materials on most sub grade types. However, for the best results on each job site, there are many different accessories available to help make the welding process easier. For example, the independent front travel rollers can be replaced with a wide tubular roller to help prevent sand and loose dirt from pushing up onto the bottom sheet of material. For extreme cases of sandy sub grades, an outrigger system and raised rear travel roller are available. Please contact supplier for more information and pricing.

7 Welder Set-up

The initial set-up of the Pro-Wedge is by far the most critical aspect for proper operation of the welder. Proper set-up not only leads to quality welding results but also minimizes wear and tear on the welder itself. Adjusting the welder too tight can result in excessive wear on drive-train parts such as gears, chains, sprockets, etc.

7.1 Set-Up Preparation

The procedures described in the following sections cover the initial set-up required for various mil thickness materials and tolerances. These adjustments must be made while the wedge heater is at room temperature. Refer to Figures 1 through 7 on the following pages while performing these procedures. Referring to Diagram 1, use the actual material you intend to weld, or if this is not possible use material that is the same mil thickness, cut two pieces approximately 4 inches wide by 18 inches long and three smaller pieces approximately 1/2 inch wide by 6 inches long. These five pieces of material will be used as "gauges" for setting three adjustments on the Pro-Wedge.

**Diagram 1**

7.2 Adjustment #1: Wedge Centering

- a. Adjust the upper and lower contour rollers away from the wedge so they will not interfere with the wedge centering adjustment. Using a 4mm hex wrench remove the Lower Contour Roller Adjustment Cover (1) (see Figure 1) to expose the Adjustment Screw. Using a 10mm box end wrench loosen the Locknut (2) (see Figure 1). Using a 3mm hex wrench turn the Adjustment Screw (3) (see Figure 1) counter-clockwise, lowering the Lower Contour Roller Assembly (4) (see Figure 1) away from the Wedge.

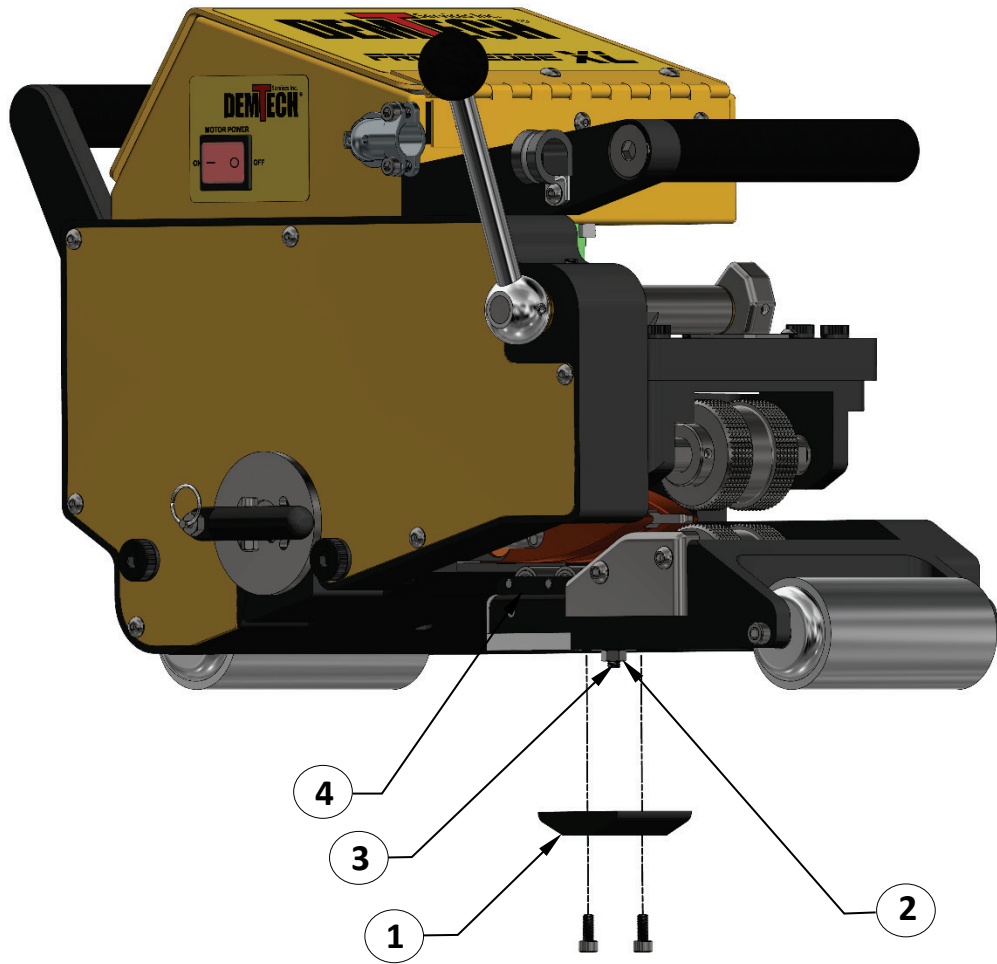


Figure 1

- b. Using a 10mm box end wrench loosen the Locknut (1) (see Figure 2) on the Upper Contour Roller Adjustment Knob. Turn the Adjustment Knob (2) (see Figure 2) counter-clockwise, raising the Upper Contour Roller Assembly (3) (see Figure 2) away from the Wedge.

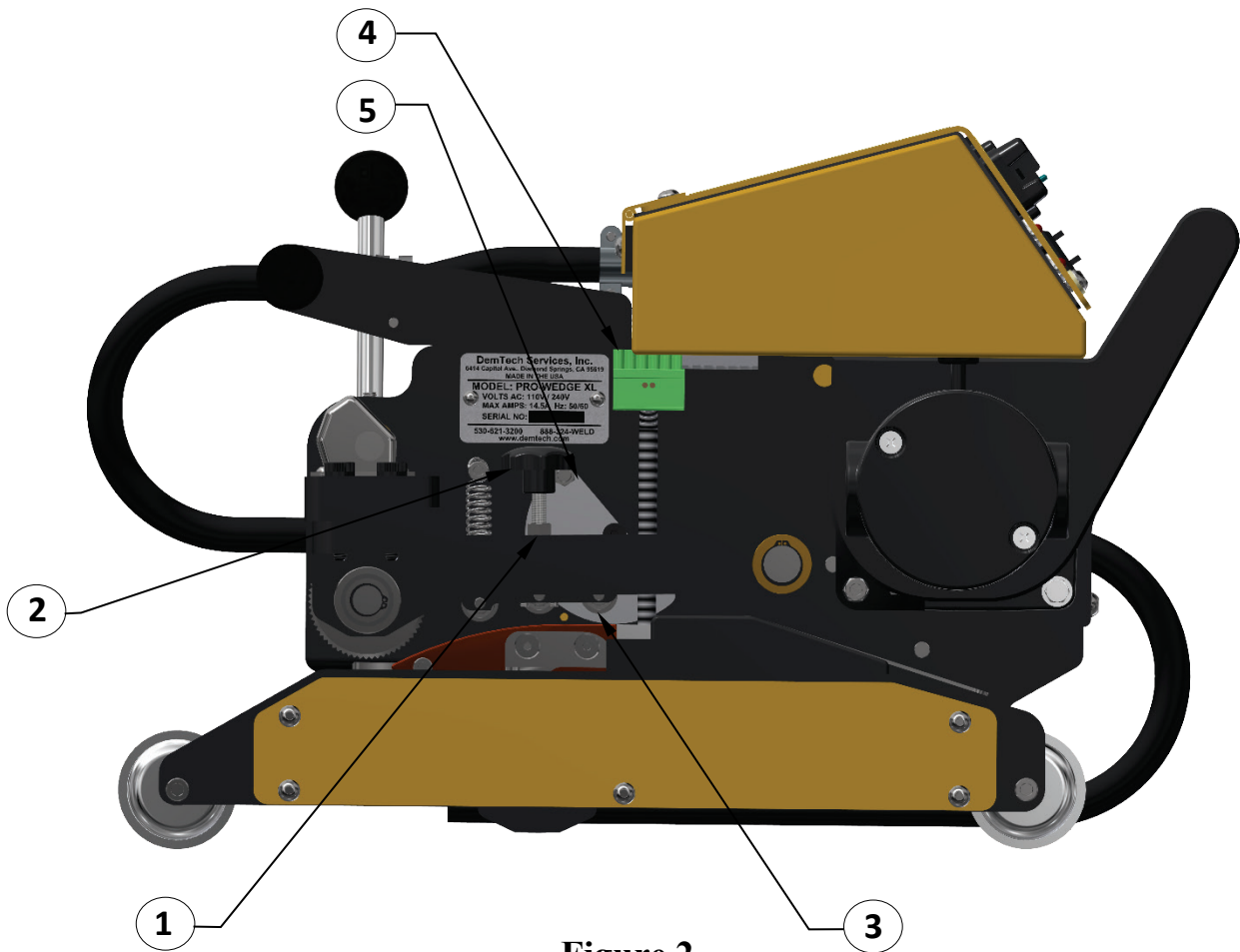


Figure 2

- c. Place two of the 1/2" X 6" material pieces, each folded in half, between the Nip Rollers (1) (see Figure 3). This procedure simulates two layers of material between the Rollers. Be sure these pieces do not extend past the Nip Rollers into the welder. Rotate the Nip Pressure Cam (2) (see Figure 3) to the corresponding mil thickness position indicated on the side of the Pressure Cam by rotating the Nip Pressure Cam Lever (3) (see Figure 3) clockwise.

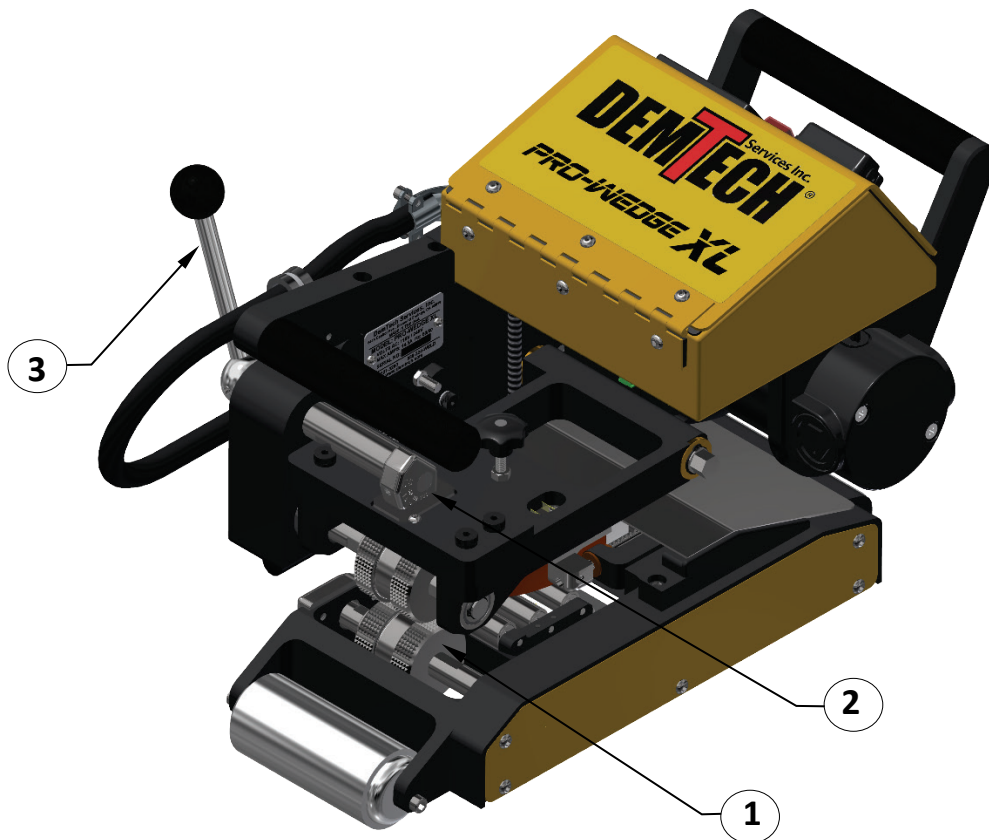


Figure 3

- d. Move the Wedge to the Engaged/Welding position by rotating the Wedge Engagement Handle (1) (see Figure 4) counter-clockwise. Using a 5mm hex wrench adjust the Wedge with the Wedge Height Adjustment Screw (2) (see Figure 4) as needed, up or down, to center the Wedge between the Nip Rollers. Turning the Adjustment Screw clockwise raises the Wedge, counter-clockwise lowers it.



Figure 4

7.3 *Adjustment #2: Wedge Engagement Position*

Before beginning Adjustment #2 make sure the Wedge Engagement Handle has no free play. If it does tighten the Pinion Gear Set Screw (1) (see Figure 5). This adjustment controls how close the Wedge is to the Nip Rollers when it is in the Engaged/Welding position.

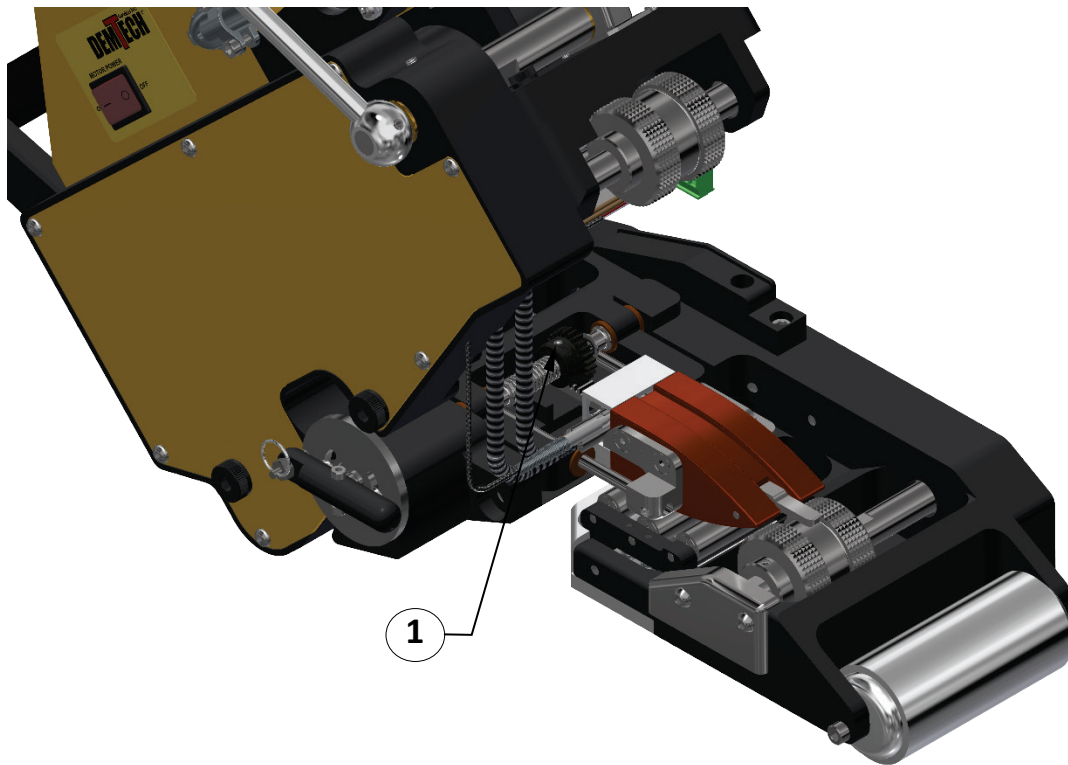


Figure 5

- a. While adjusting the Wedge engagement position refer to Diagram 2 and Figure 6. Pull out the Wedge Engagement Handle Lock-In Plunger (1) (see Figure 6) and rotate the Handle to a central position between the two Hold-Down Screws (2) (see Figure 6). Loosen the Hold-Down Screws and rotate the Wedge Engagement Handle counter-clockwise until the Lock-In Plunger drops into the Lock-In Hole (3) (see Figure 6). The Lock-In Disc (4) (see Figure 6) should now rotate with the Engagement Handle.
- b. Slowly turn the Engagement Handle to position the Wedge so the distance between the upper tip surface of the Wedge and the Upper Nip Roller is the same distance as between the two Nip Rollers. This distance will be equal to twice the thickness of the material to be welded. This same clearance should be maintained between the lower tip surface of the Wedge and the Lower Nip Roller.

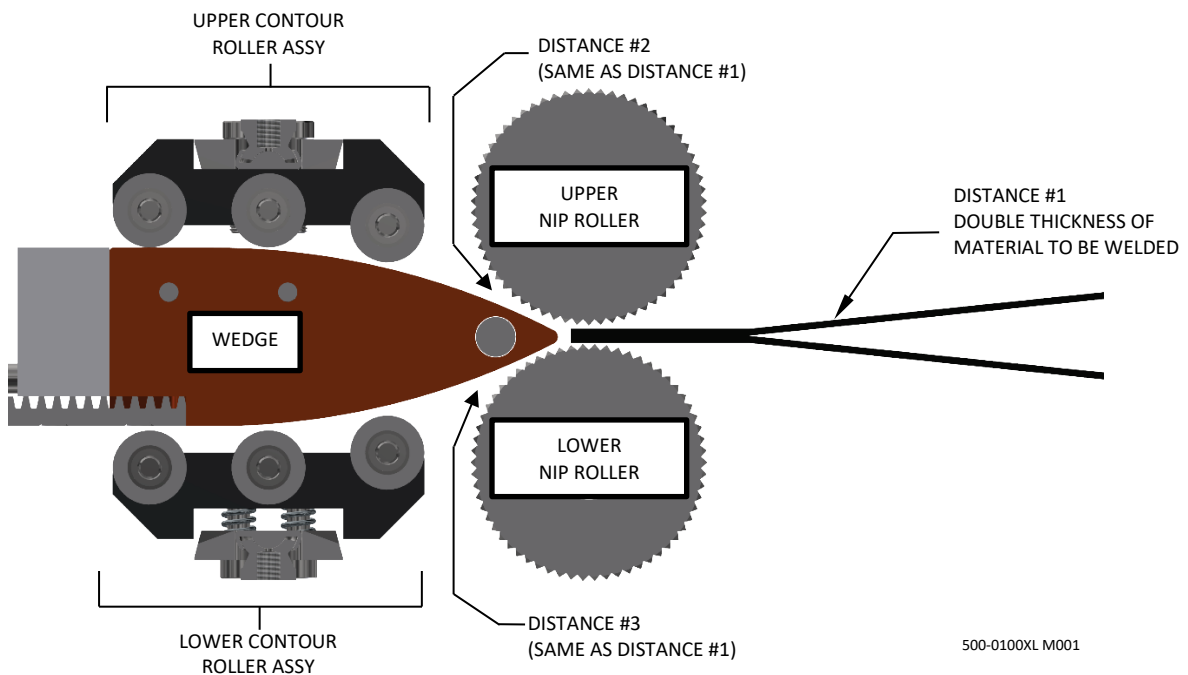
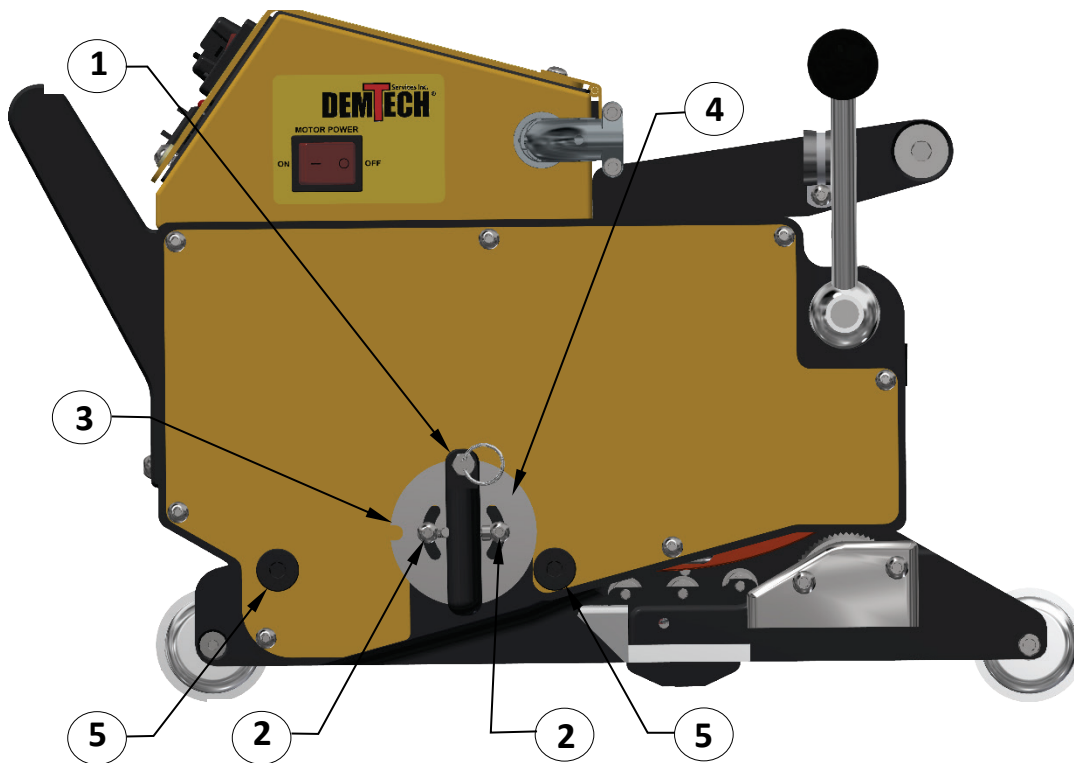


Diagram 2

**Figure 6**

- c. Once adjusted the Lock-In Disc must be tightened in place. Firmly hold down the Lock-In Disc, pull out the Wedge Engagement Handle Lock-In Plunger and rotate the Handle to a central position between the two Hold-Down Screws. Do not allow the Lock-In Disc to move during this procedure. Firmly tighten both Hold-Down Screws then rotate the Wedge Engagement Handle counter-clockwise until the Lock-In Plunger drops into the Lock-In Hole. Verify that the Wedge engaged position did not change during this procedure.

7.4 Adjustment #3: Upper and Lower Contour Rollers

Before beginning Adjustment #3 make sure the Wedge is locked into the Engaged/Welding position and the two folded 1/2" X 6" material pieces are still locked between the Nip Rollers. **This Adjustment may seem time consuming at first but with practice and experience the entire set-up process takes only a few minutes.**

- a. Insert one of the 4" X 18" material pieces between the Lower Contour Roller Assembly and the Wedge (see Diagram 3). This piece should extend out of the front of the welder (opposite end from the Nip Rollers). Adjust the Lower Contour Roller Assembly upwards by turning the Adjustment Screw (3) (see Figure 1) clockwise until the Wedge begins to move up slightly.
- b. Insert the remaining 4" X 18" material piece between the Upper Contour Roller Assembly and the Wedge (see Diagram 4). This piece should extend out of the front of the welder (opposite end from the Nip Rollers). Adjust the Upper Contour Roller Assembly downwards by turning the Upper Contour Roller Adjustment Knob (2) (see Figure 2) clockwise until the desired tension is achieved.
- c. Check for proper adjustment by grabbing hold of the upper material piece protruding from the front of the welder and move it forward and backward. The fit should be snug causing a drag on the material. Check the lower material piece in the same way. Further adjust the Upper and/or Lower Contour Roller Assemblies as necessary to achieve the desired snug fit. When finished the drag (friction) on the upper and lower material pieces should feel the same. During all adjustments make sure the Wedge remains centered between the Nip Rollers.
- d. Once the desired tension is achieved tighten both Upper and Lower Contour Roller Assembly Locknuts being careful not to over-tighten, replace the Lower Contour Roller Adjustment Cover remove all material pieces from welder.

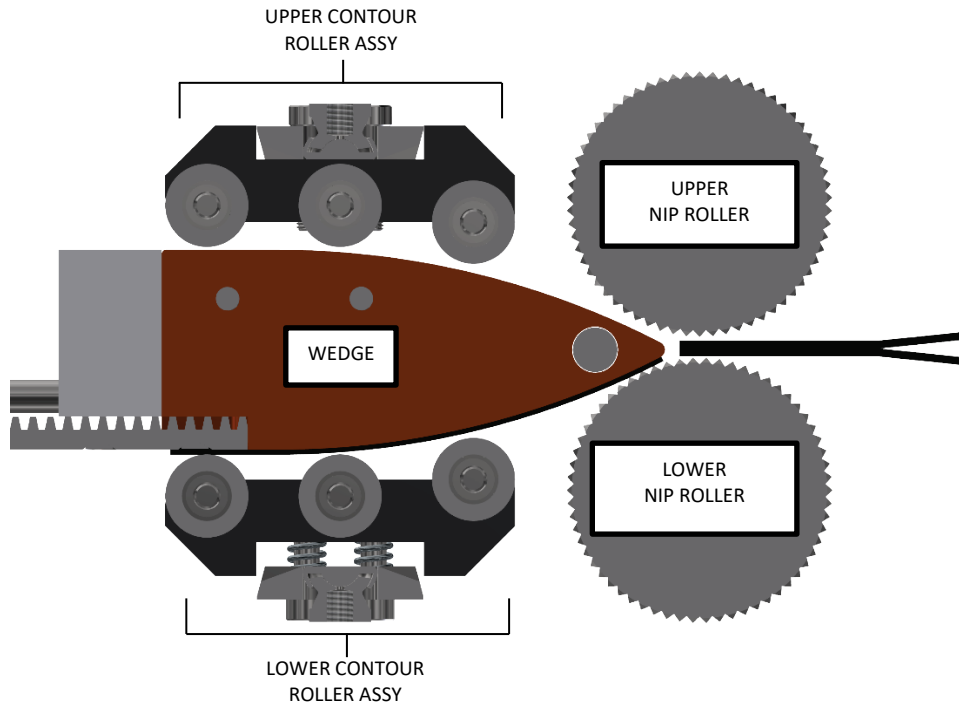


Diagram 3

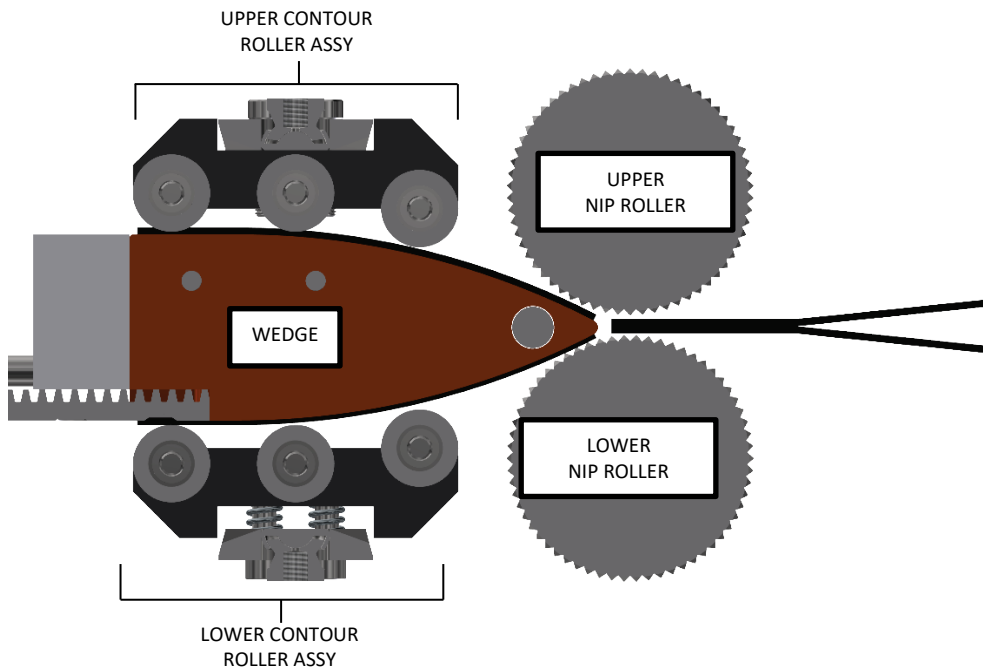


Diagram 4

7.5 Wedge Timing Definition

Wedge timing is the position of the Wedge in its Engaged/Welding position in relation to the Engagement Handle Lock-In Plunger to Lock-In Hole position. If the Wedge timing is off the ability to adjust the welder through its full range of adjustment is compromised. Full range travel is between the two positions of the Wedge in the Engaged/Welding position and the Wedge in the Retracted/Loading position.

7.6 Wedge Re-Timing

Loosen the two Lock-In Disc Hold-Down Screws (2) (see Figure 6). Position the Lock-In Disc so the two Hold-Down Screws are centered in the arced grooves of the Disc (see Figure 6). Tighten the Hold-Down Screws. Pull out the Engagement Handle as far as possible, approximately 5/8" (see Figure 7) which disengages the Pinion Gear from the Wedge Rack and rotate the Engagement Handle approximately 15 degrees clockwise. Release the Handle back in and rotate handle counter-clockwise moving the wedge towards the Nip Rollers. This resets the engagement of the Pinion Gear to the Wedge Rack by approximately one gear tooth. Repeat this process as many times as necessary until the Lock-In Plunger drops into the Lock-In Hole on the Lock-In Disc and the tip of the Wedge has approximately 1/8" clearance between it and the lower nip roller. The Wedge has now been re-timed.

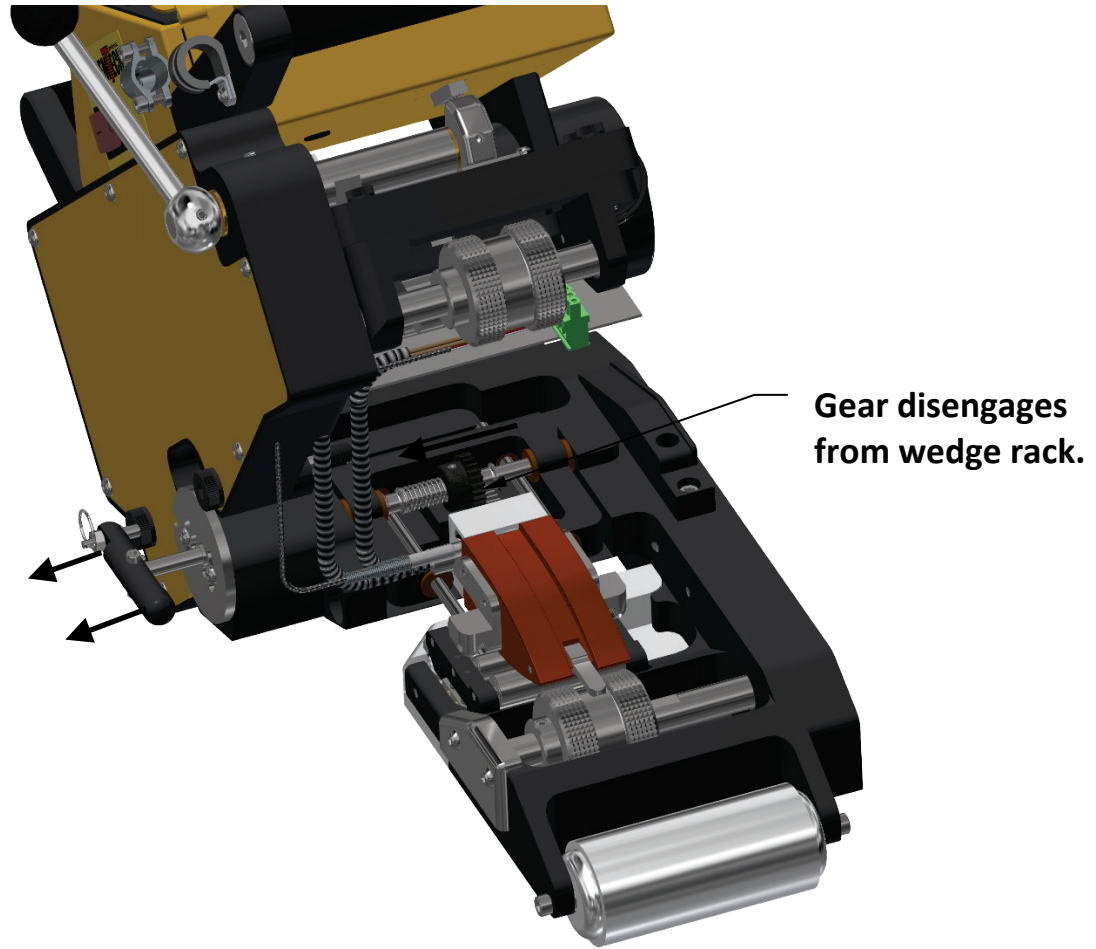


Figure 7

(Shown with side housing open for clarity.)

7.7 Wedge Removal

- a. Disconnect the Cartridge Heater / Thermocouple Plug (4) (see Figure 2) from the bottom of the controller cabinet.
- b. Using 1/4" or 6mm hex wrench remove the front and rear Frame Shoulder Bolts (5) (see Figure 6).
- c. Hinge Side Frame up and install one of the Frame Shoulder Bolts into the front bolt hole to hold the Side Frame in the open position. When the Side Frame is in the correct open position there is a threaded hole into which the Bolt can be installed (1) (see Figure 8).
- d. Rotate the Wedge Engagement Handle counter-clockwise until the Lock-In Plunger drops into the Lock-In Hole on the Lock-In Disc.
- e. Pull the Wedge Engagement Handle out far enough to insert the remaining Frame Shoulder Bolt between the Handle and the Lock-In Disc (2) (see Figure 8). This holds the Pinion Gear disengaged from the Wedge Rack so the Heater Assembly Can be removed.
- f. Release the Cartridge Heater and Thermocouple cables from behind the Heater Cable Retention Disk (5) (see Figure 2).
- g. Push down on the front of the Wedge Carriage Assembly while lifting up the tip of the Wedge and slowly pull the Wedge Assembly out of the welder.

Note: To prevent the Wedge Timing from being changed do not disturb the Wedge Engagement Handle position while the Wedge Assembly is removed from the welder.

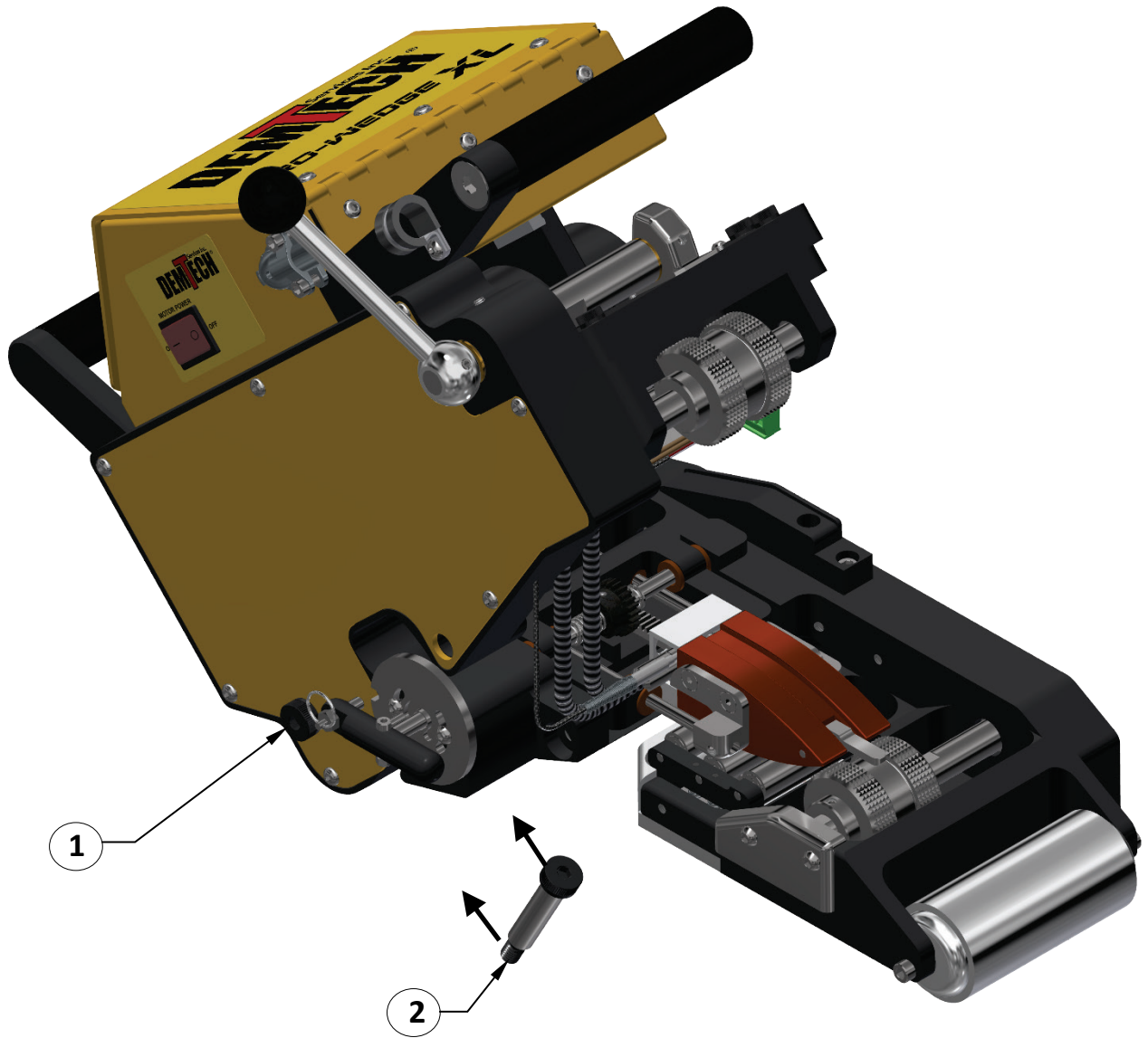


Figure 8

8 Factory Servicing

In the event your Pro-Wedge should require factory service, the entire welder needs to be returned to the factory. Refer to the following step for preparing the Pro-Wedge for return.

Carefully pack the Pro-Wedge in the reusable portable shipping/storage case provided with the welder for return to DEMTECH Services, Inc.'s factory for service. Unless previous arrangements are made shipping charges and insurance are the customer's responsibility. Ship the Pro-Wedge to DEMTECH Services, Inc. at:

DemTech Services, Inc
Ship to address: 6414 Capitol Avenue
Diamond Springs, CA 95619
U.S.A.

9 Reference Documents

Appendix A, Welder Wiring Interconnect Diagram

Refer to Appendix A for the Pro-Wedge Welder Wiring Interconnect Diagram.

Appendix B, Pro-Wedge Product Warranty

Refer to Appendix B for the DEMTECH product warranty.

9.1 Appendix A

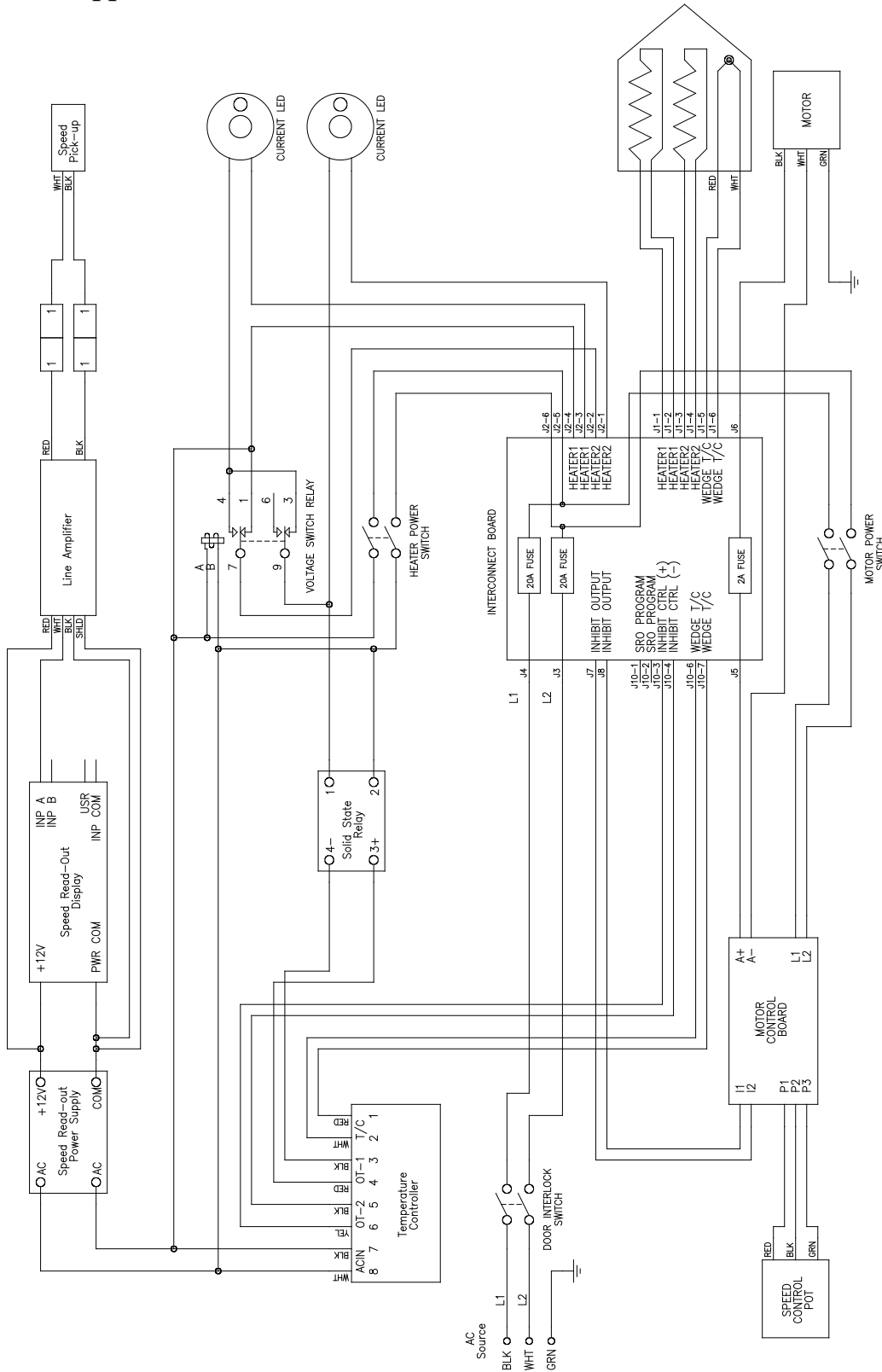


Diagram 5

Warranty

DEMTECH Services, Inc. warrants all equipment of its manufacture to be free from defects in materials, workmanship, mechanical parts, and labor for a period of one year from the date of shipment to the original buyer and ninety days for electrical. This warranty excludes normal wear items such as gears, bearings and chains. The liability under this warranty is limited to replacement parts and labor on equipment when the equipment is returned prepaid to the factory or its authorized service center with prior authorization from DEMTECH Services, Inc., and upon examination by DEMTECH Services, Inc., is determined to be defective. At DEMTECH Services, Inc.'s option, a service representative may be dispatched to the equipment location.

As an additional protection, DEMTECH Services, Inc. warrants that for a period of 90 days from the date of shipment to the original buyer, pending prior authorization from DEMTECH Services, Inc., there will be no charge for service related shipping of parts and/or equipment or for authorized travel of a service representative to the equipment location. After 90 days, all costs incurred for shipping the equipment or parts thereof or for travel are the responsibility of the buyer. Our warranty for this equipment is rendered void if the unit has been repaired, taken apart or modified, or attempted to be, unless such actions have been taken in accordance with written instructions received from DEMTECH Services, Inc. The warranty is also void if the equipment has been subjected to abuse, accident or other abnormal conditions.

IF ANY FAULT DEVELOPS,
THE FOLLOWING STEPS SHOULD BE TAKEN:

1. Notify DEMTECH Services, Inc. by calling 1-888-324-9353. Overseas customers should contact the local DEMTECH authorized service center. Please be prepared with the model number, serial number and full details of the difficulty. Upon receipt of this information, service data or shipping instructions will be provided by DEMTECH Services, Inc. Do not return the unit for repair without first contacting the factory or its representative for instructions.
2. After the initial 90 day period, on receipt of shipping instructions, forward the equipment prepaid to the factory or its authorized service center as instructed. If requested, an estimate of the charges will be made before work begins, especially with those cases where the DEMTECH Services, Inc. product is not covered by the warranty.
3. If the original carton and packing are not available, the product should be packed in a container with a strong exterior and surrounded by a protective layer of shock-absorbing material. DEMTECH Services, Inc. advises returning the equipment at full value to the carrier.

DEMTECH Services, Inc. reserves the right to make changes in design at any time without incurring any obligation to install the same changes on units previously purchased.

This warranty states the essence of the obligations or liabilities on the part of DEMTECH Services, Inc. THE FORMAL, COMPLETE AND EXCLUSIVE STATEMENT OF DEMTECH SERVICES, INC.'S WARRANTY IS CONTAINED IN ITS QUOTATIONS, ACKNOWLEDGEMENTS AND INVOICES. DEMTECH Services, Inc. neither assumes, nor authorizes any person to assume for it, any liability in connection with the sale of its equipment other than those set forth herein.