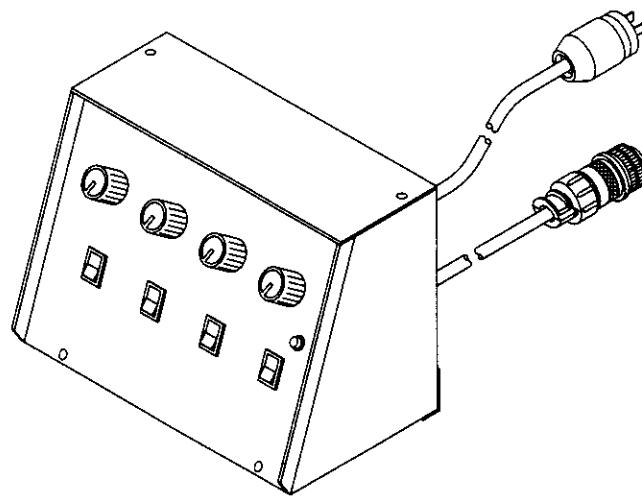




**Miller**<sup>®</sup>

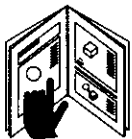
January 1994 Form: OM-898C  
Effective With Serial No. KD540406

# OWNER'S MANUAL



## PC-300

- Pulsar Control
- For GTAW-P Welding
- Requires Suitable Welding Power Source Using A Positive Reference Command Signal Not To Exceed +10 Volts DC And A 14-Pin Receptacle
- Allows Operator Control Of Pulse Waveform With Various Gases, Metals, And Joints
- Provides Control Of Output (Contactor), Pulses Per Second (Frequency), Peak Amperage, % Of On Time (Pulse Width), And Background Amperage
- The Unit Also Provides Remote Peak Amperage, Remote Background Amperage, And Remote Output (Contactor) Control



- Read and follow these instructions and all safety blocks carefully.
- Have only trained and qualified persons install, operate, or service this unit.
- Call your distributor if you do not understand the directions.



- Give this manual to the operator.



- For help, call your distributor
- or: MILLER Electric Mfg. Co., P.O. Box 1079, Appleton, WI 54912 414-734-9821

# MILLER'S TRUE BLUE™ LIMITED WARRANTY

Effective January 1, 1992  
(Equipment with a serial number preface of "KC" or newer)

This limited warranty supersedes all previous MILLER warranties and is exclusive with no other guarantees or warranties expressed or implied.

LIMITED WARRANTY - Subject to the terms and conditions below, MILLER Electric Mfg. Co., Appleton, Wisconsin, warrants to its original retail purchaser that new MILLER equipment sold after the effective date of this limited warranty is free of defects in material and workmanship at the time it is shipped by MILLER. THIS WARRANTY IS EXPRESSLY IN LIEU OF ALL OTHER WARRANTIES, EXPRESS OR IMPLIED, INCLUDING THE WARRANTIES OF MERCHANTABILITY AND FITNESS.

Within the warranty periods listed below, MILLER will repair or replace any warranted parts or components that fail due to such defects in material or workmanship. MILLER must be notified in writing within thirty (30) days of such defect or failure, at which time MILLER will provide instructions on the warranty claim procedures to be followed.

MILLER shall honor warranty claims on warranted equipment listed below in the event of such a failure within the warranty time periods. All warranty time periods start on the date that the equipment was delivered to the original retail purchaser, or one year after the equipment is sent to the distributor.

1. 5 Years Parts -- 3 Years Labor
  - \* Original main power rectifiers
2. 3 Years -- Parts and Labor
  - \* Transformer/Rectifier Power Sources
  - \* Plasma Arc Cutting Power Sources
  - \* Semi-Automatic and Automatic Wire Feeders
  - \* Robots
3. 2 Years -- Parts and Labor
  - \* Engine Driven Welding Generators  
(NOTE: Engines are warranted separately by the engine manufacturer for a period of two years.)
  - \* Air Compressors
4. 1 Year -- Parts and Labor
  - \* Motor Driven Guns
  - \* Process Controllers
  - \* Water Coolant Systems
  - \* HF Units
  - \* Grids
  - \* Spot Welders
  - \* Load Banks
  - \* SDX Transformers
  - \* Running Gear/Trailers
  - \* Field Options

(NOTE: Field options are covered under True Blue™ for the remaining warranty period of the product they are installed in, or for a minimum of one year -- whichever is greater.)
5. 6 Months -- Batteries
6. 90 Days -- Parts and Labor
  - \* MIG Guns/TIG Torches
  - \* Plasma Cutting Torches

- \* Remote Controls
- \* Accessory Kits
- \* Replacement Parts

MILLER'S True Blue™ Limited Warranty shall not apply to:

1. Items furnished by MILLER, but manufactured by others, such as engines or trade accessories. These items are covered by the manufacturer's warranty, if any.
2. Consumable components, such as contact tips, cutting nozzles, contactors and relays or parts that fail due to normal wear.
3. Equipment that has been modified by any party other than MILLER, or equipment that has been improperly installed, improperly operated or misused based upon industry standards, or equipment which has not had reasonable and necessary maintenance, or equipment which has been used for operation outside of the specifications for the equipment.

MILLER PRODUCTS ARE INTENDED FOR PURCHASE AND USE BY COMMERCIAL, INDUSTRIAL USERS AND PERSONS TRAINED AND EXPERIENCED IN THE USE AND MAINTENANCE OF WELDING EQUIPMENT.

In the event of a warranty claim covered by this warranty, the exclusive remedies shall be: at MILLER'S option: (1) repair; or (2) replacement; or, where authorized in writing by MILLER in appropriate cases, (3) the reasonable cost of repair or replacement at an authorized MILLER service station; or (4) payment of or credit for the purchase price (less reasonable depreciation based upon actual use) upon return of the goods at customer's risk and expense. MILLER'S option of repair or replacement will be F.O.B. Factory at Appleton, Wisconsin, or F.O.B. at a MILLER authorized service facility as determined by MILLER. Therefore no compensation or reimbursement for transportation costs of any kind will be allowed.

TO THE EXTENT PERMITTED BY LAW, THE REMEDIES PROVIDED HEREIN ARE THE SOLE AND EXCLUSIVE REMEDIES. IN NO EVENT SHALL MILLER BE LIABLE FOR DIRECT, INDIRECT, SPECIAL, INCIDENTAL OR CONSEQUENTIAL DAMAGES (INCLUDING LOSS OF PROFIT), WHETHER BASED ON CONTRACT, TORT OR ANY OTHER LEGAL THEORY.

ANY EXPRESS WARRANTY NOT PROVIDED HEREIN AND ANY IMPLIED WARRANTY, GUARANTY OR REPRESENTATION AS TO PERFORMANCE, AND ANY REMEDY FOR BREACH OF CONTRACT, TORT OR ANY OTHER LEGAL THEORY WHICH, BUT FOR THIS PROVISION, MIGHT ARISE BY IMPLICATION, OPERATION OF LAW, CUSTOM OF TRADE OR COURSE OF DEALING, INCLUDING ANY IMPLIED WARRANTY OF MERCHANTABILITY OR FITNESS FOR PARTICULAR PURPOSE, WITH RESPECT TO ANY AND ALL EQUIPMENT FURNISHED BY MILLER IS EXCLUDED AND DISCLAIMED BY MILLER.

Some states in the U.S.A. do not allow limitations of how long an implied warranty lasts, or the exclusion of incidental, indirect, special or consequential damages, so the above limitation or exclusion may not apply to you. This warranty provides specific legal rights, and other rights may be available, but may vary from state to state.

In Canada, legislation in some provinces provides for certain additional warranties or remedies other than as stated herein, and to the extent that they may not be waived, the limitations and exclusions set out above may not apply. This Limited Warranty provides specific legal rights, and other rights may be available, but may vary from province to province.

## RECEIVING-HANDLING

Before unpacking equipment, check carton for any damage that may have occurred during shipment. File any claims for loss or damage **with the delivering carrier**. Assistance for filing or settling claims may be obtained from distributor and/or equipment manufacturer's Transportation Department.

When requesting information about this equipment, always provide Model Designation and Serial or Style Number.

Use the following spaces to record Model Designation and Serial or Style Number of your unit. The information is located on the rating label or nameplate.

Model \_\_\_\_\_

Serial or Style No. \_\_\_\_\_

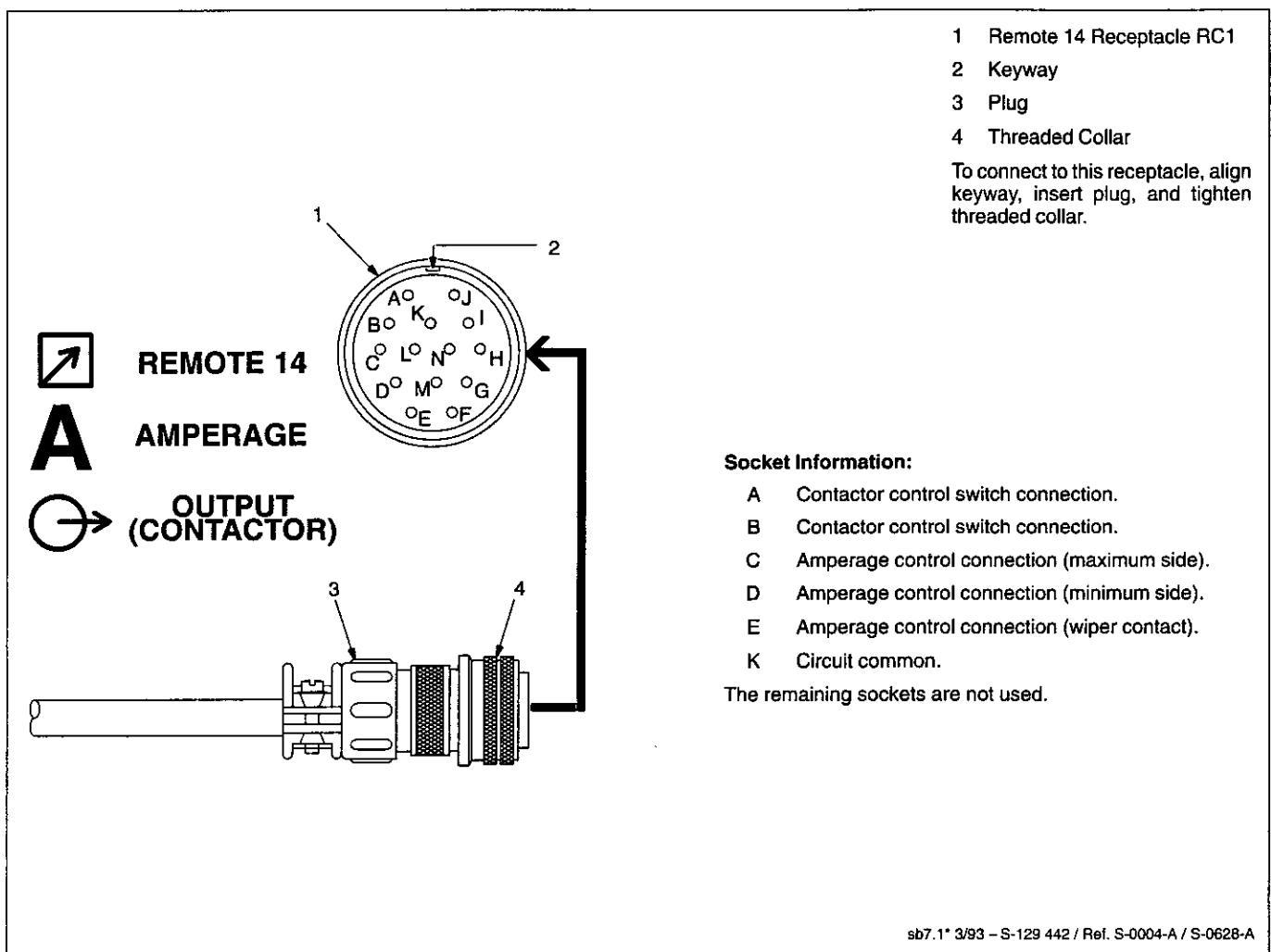
Date of Purchase \_\_\_\_\_

*After this manual was printed, refinements in equipment design occurred. This sheet lists exceptions to data appearing later in this manual.*

## CHANGES TO SECTION 3 – INSTALLATION

Replace Section 3-4. Remote 14 Receptacle Information And Connections

### 3-4. Remote 14 Receptacle Information And Connections



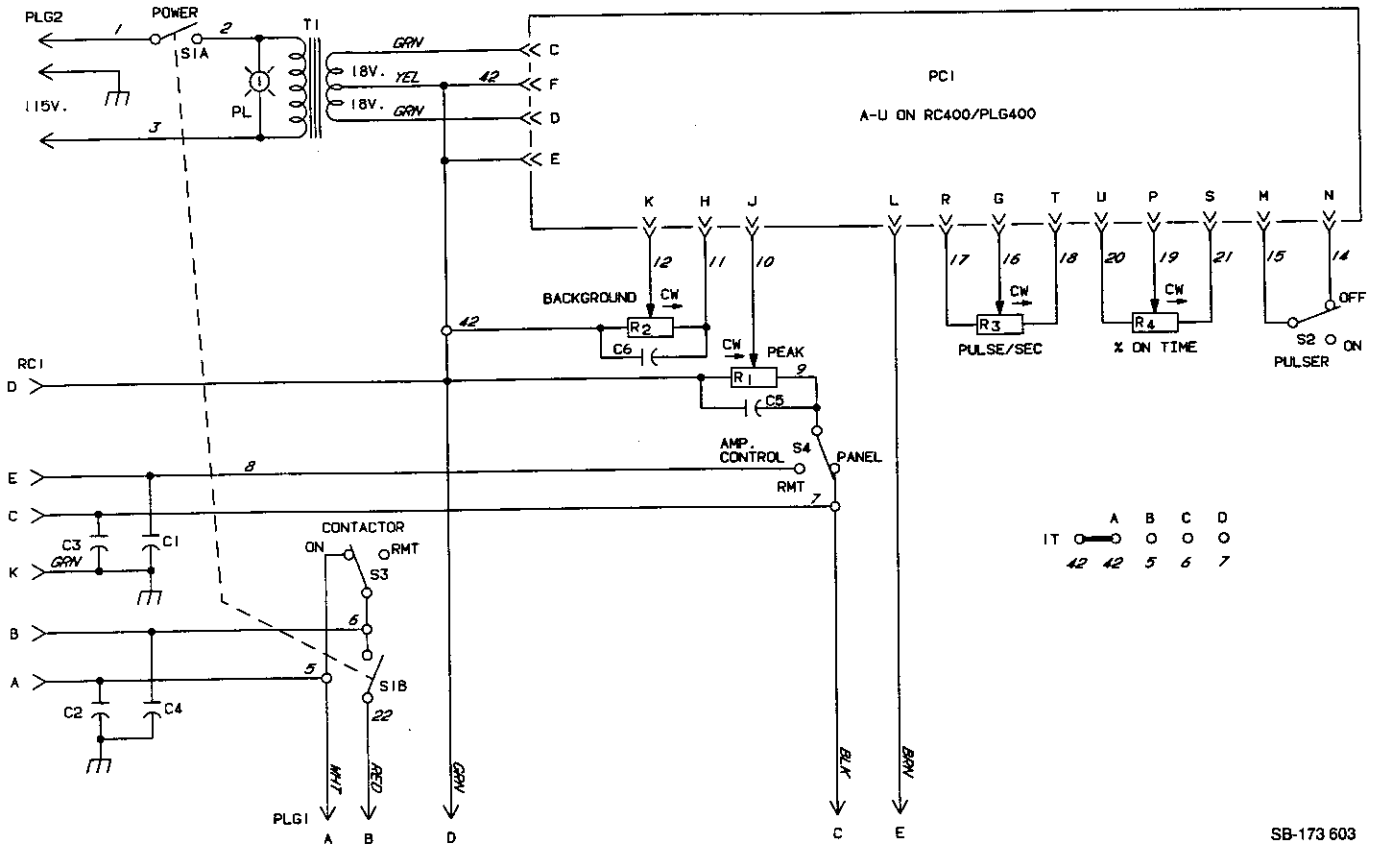
sb7.1\* 3/93 – S-129 442 / Ref. S-0004-A / S-0628-A

**Figure 3-4. Remote 14 Connections**

## CHANGES TO SECTION 6 – ELECTRICAL DIAGRAMS

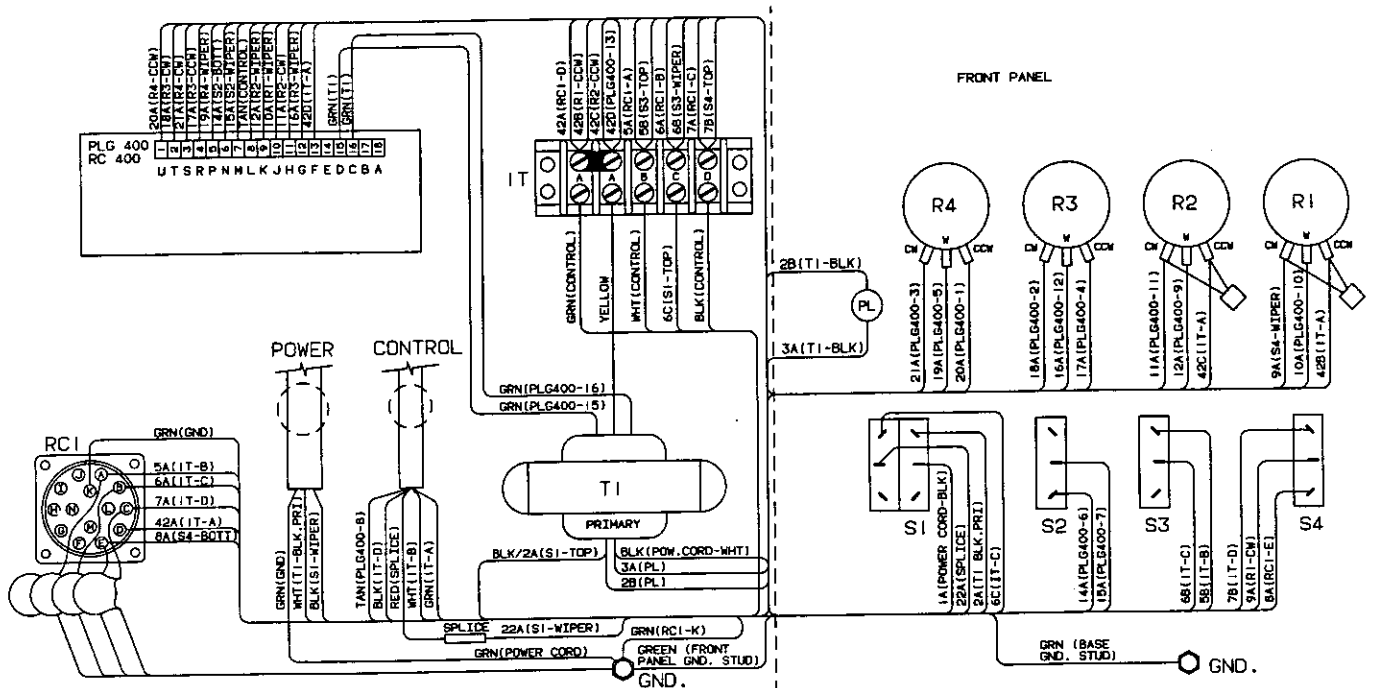
Replace Figure 6-1. Circuit Diagram For Pulser Control (see Page 2 of this Errata Sheet)

Replace Figure 6-2. Wiring Diagram For Pulser Control (see Page 2 of this Errata Sheet)



SB-173 603

Figure 6-1. Circuit Diagram For Pulser Control Effective With Serial No. KF840452



SB-173 604

Figure 6-2. Wiring Diagram For Pulser Control Effective With Serial No. KF840452

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# SECTION 1 – SAFETY INFORMATION

mod1.1 2/93

- Read all safety messages throughout this manual.
- Obey all safety messages to avoid injury.
- Learn the meaning of WARNING and CAUTION.

- 1 Safety Alert Symbol
- 2 Signal Word  
WARNING means possible death or serious injury can happen.  
CAUTION means possible minor injury or equipment damage can happen.
- 3 Statement Of Hazard And Result
- 4 Safety Instructions To Avoid Hazard
- 5 Hazard Symbol (If Available)
- 6 Safety Banner  
Read safety blocks for each symbol shown.
- 7 NOTE  
Special instructions for best operation – not related to safety.

Figure 1-1. Safety Information

# SECTION 2 – SPECIFICATIONS

Table 2-1. Pulse Control

Specification	Description
Overall Dimensions	Height: 7-1/8 in (181 mm); Width: 9-1/4 in (235 mm); Length: 5-1/2 in (140 mm)
Weight	Net: 7.2 lb (3.3 kg); Ship: 8.8 lb (4 kg)
Input Power Cord With Plug	8 ft (2.4 m)
Additional Required Equipment	Welding Power Source And High-Frequency Unit
Welding Power Source Type Needed	Constant Current (CC) DC, With Suitable Remote 14 Receptacle And A Positive Reference Command Signal Not To Exceed +10 Volts DC
Welding Processes	Gas Tungsten Arc-Pulse Welding (GTAW-P)

# SECTION 3 – INSTALLATION

## 3-1. Typical Connections

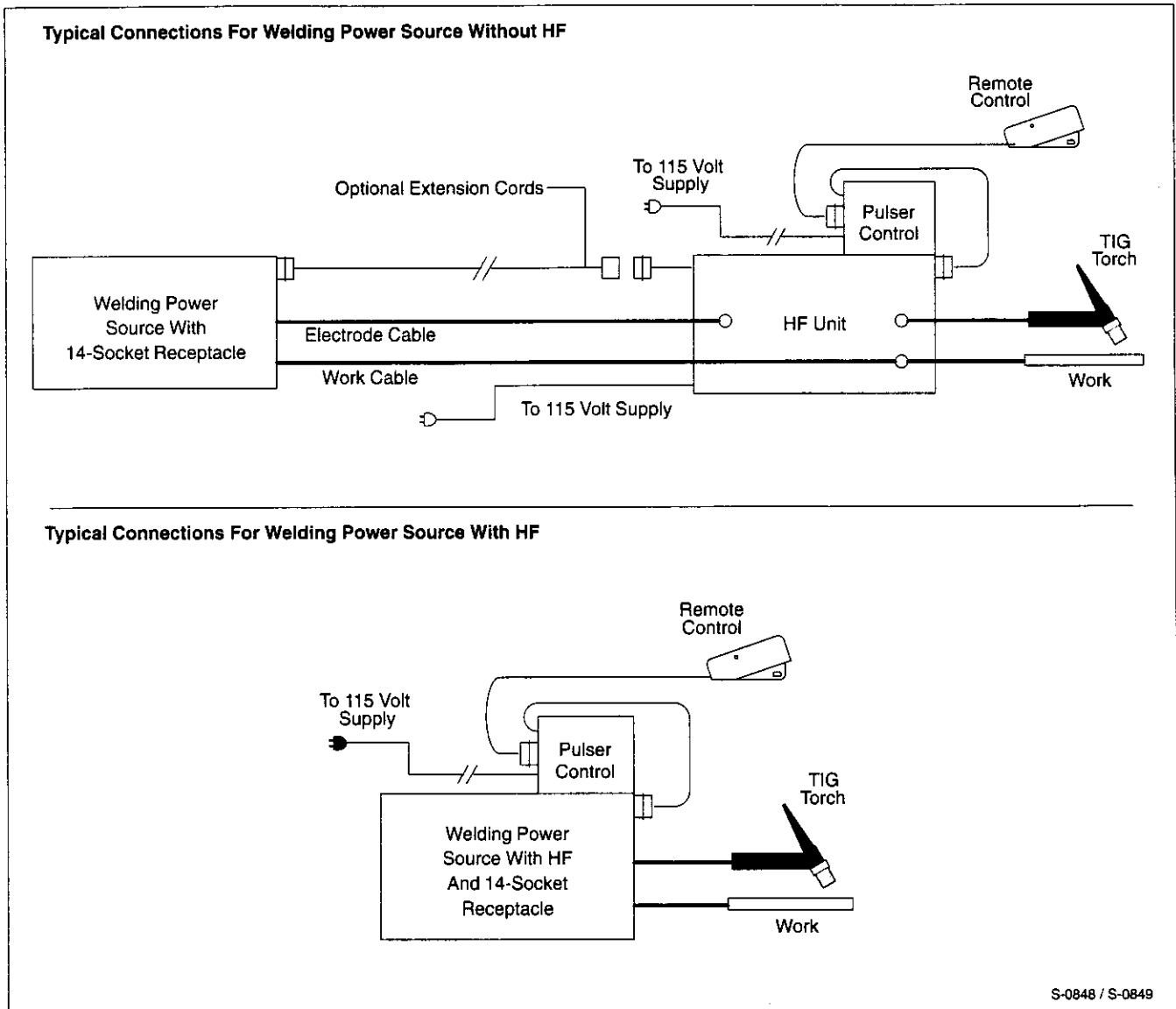


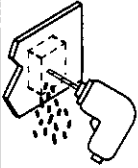



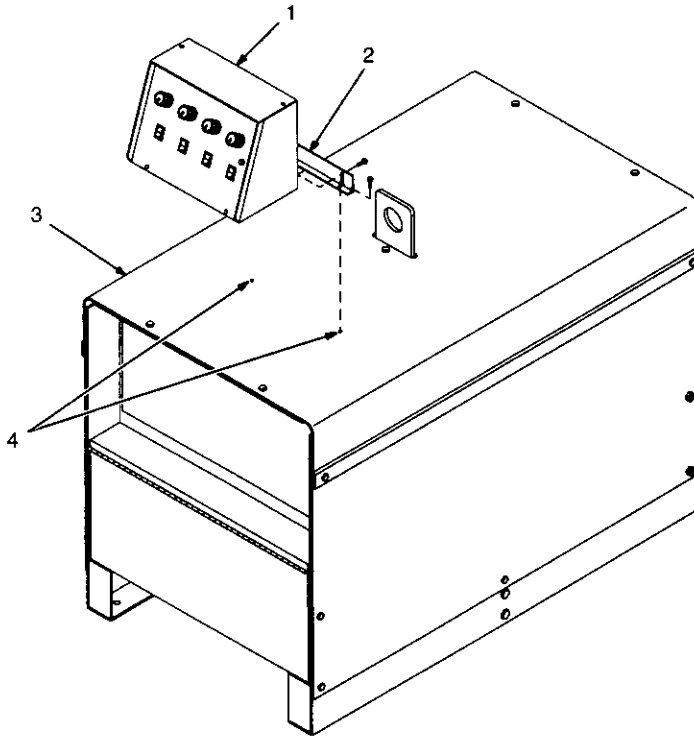
Figure 3-1. Typical Connections



### 3-2. Mounting Bracket Installation

 <b>WARNING</b>		
	<p><b>ELECTRIC SHOCK can kill.</b></p> <ul style="list-style-type: none"> <li>• Do not touch live electrical parts.</li> <li>• Turn Off welding power source, and disconnect input power before beginning this installation.</li> <li>• Turn Off pulser control, and remove input power plug from receptacle before beginning this installation.</li> <li>• Turn Off high-frequency unit, if applicable.</li> </ul>	 <p><b>FILINGS AND TOOLS HITTING INSIDE PARTS can damage unit.</b></p> <ul style="list-style-type: none"> <li>• Cover parts.</li> <li>• Clean unit and remove covers before operating.</li> </ul>
	<p>Have only qualified persons familiar with and following standard safety practices install this bracket.</p> <p style="text-align: right; font-size: small;">fwarn1.1" 2/93 / fwarn4.1 9/91</p>	

 If welding power source has an external high-frequency unit, it may be desirable to install pulser control on the high-frequency unit.



- 1 Pulser Control
  - 2 Mounting Bracket
- Bracket may be installed as shown or it may be turned outward.
- 3 Welding Power Source Cover
  - 4 Mounting Holes

Remove cover from welding power source.

Mark location of mounting holes on welding power source cover using the bracket as a template. Be sure area is free of electrical wiring and components.

If there is sheet metal under the cover, drill two 3/16 in (4.7 mm) at marked location. Place cover on welding power source, and use as a template to mark holes in unit sheet metal. Remove cover and drill two 5/32 in (4 mm) holes in sheet metal.

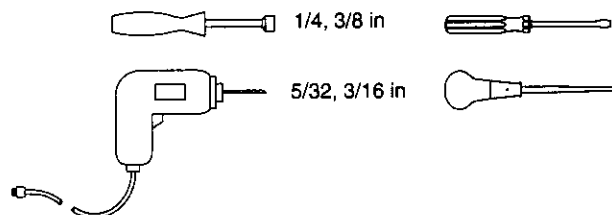
If there is no sheet metal under the cover, drill two 5/32 in (4 mm) holes in cover.

Reinstall cover.

Use two No. 8 sheet metal screws (not supplied) to secure bracket to welding power source.

Use two No. 8 sheet metal screws (not supplied) to secure pulser control to bracket.



Tools Needed:




ST-800 532

**Figure 3-2. Mounting Bracket Installation**


### 3-3. Setting Pulses Per Second DIP Switch

<b>⚠ WARNING</b>	
 <p><b>ELECTRIC SHOCK can kill.</b></p> <ul style="list-style-type: none"> <li>Do not touch live electrical parts.</li> <li>Turn Off welding power source, and disconnect input power before inspecting or installing.</li> <li>Turn Off pulser control, and remove input power plug from receptacle before inspecting or installing.</li> <li>Turn Off high-frequency unit, if applicable.</li> </ul>	 <p><b>STATIC ELECTRICITY can damage parts on circuit boards.</b></p> <ul style="list-style-type: none"> <li>Put on grounded wrist strap BEFORE handling boards or parts.</li> </ul> <p style="text-align: right; font-size: small;">swam1.1* 2/93 / twarn5.1* 9/91</p>

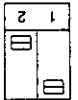
 Be sure the selected range matches the pulsing capability of the welding power source being used.

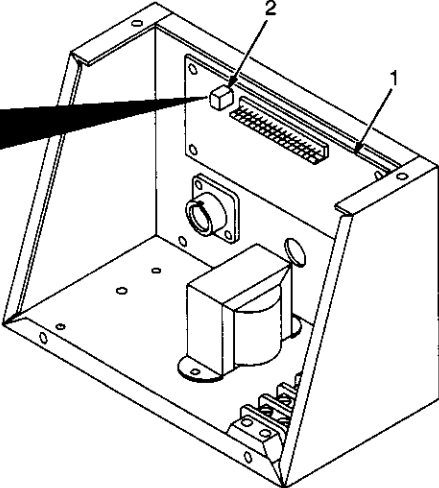
Set Switches

0.5 To 20  
Pulses Per  
Second



10 To 300  
Pulses Per  
Second





1 Pulser Circuit Board PC1

2 Pulses Per Second DIP Switch S1

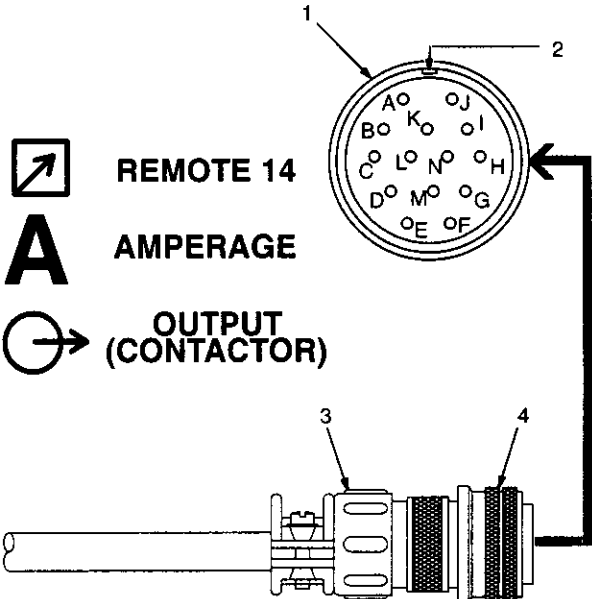
Two ranges of pulses per second control (pulse frequency) are available. Unit is shipped with switches set for 0.5 to 20 pulses per second. If 10 to 300 pulses per second is desired, set switches as shown.

Reinstall wrapper.

ST-800 533

Figure 3-3. Setting Pulses Per Second DIP Switch

### 3-4. Remote 14 Receptacle Information And Connections



**REMOTE 14**

**A** **AMPERAGE**

**OUTPUT (CONTACTOR)**

1 Remote 14 Receptacle RC1

2 Keyway

3 Plug

4 Threaded Collar

To connect to this receptacle, align keyway, insert plug, and tighten threaded collar.

**Socket Information:**

- A Contactor control switch connection.
- B Contactor control switch connection.
- C Amperage control connection (maximum side).
- D Amperage control connection (minimum side).
- E Amperage control connection (wiper contact).

The remaining sockets are not used.

sb7.1\* 3/93 - S-129 442 / Ref. S-0004-A / S-0628-A

Figure 3-4. Remote 14 Connections

### 3-5. Interconnecting Cord And Electrical Input Connections

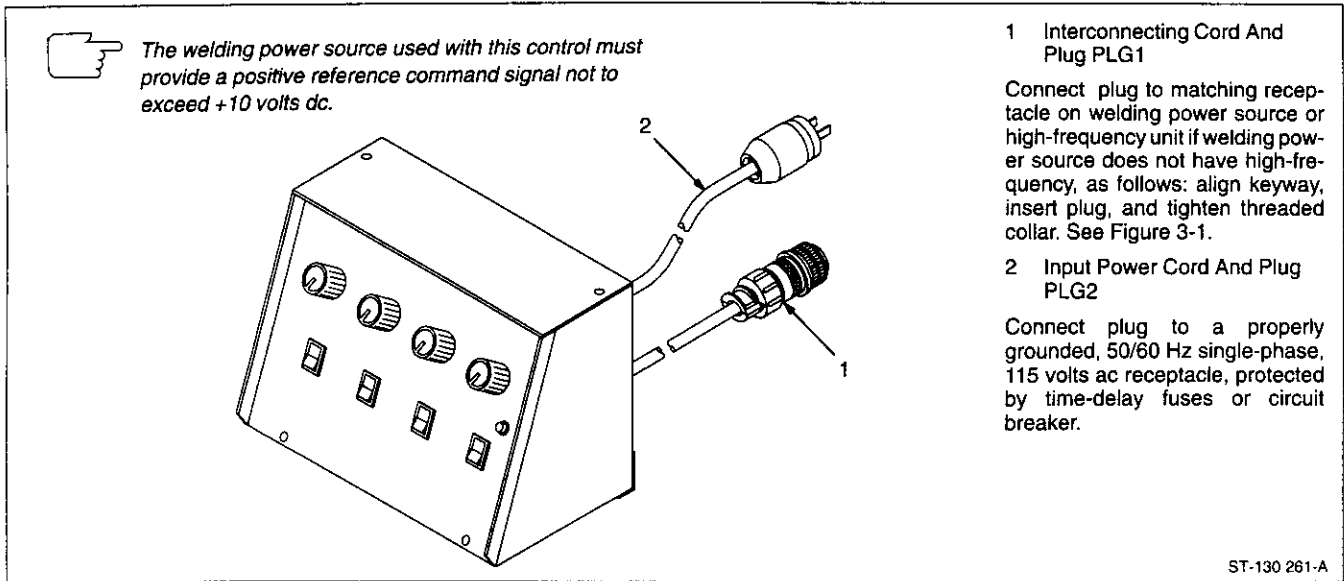


Figure 3-5. Interconnecting Cord And Electrical Input Connections

## SECTION 4 – OPERATION

<b>WARNING</b>			
	<b>ELECTRIC SHOCK can kill.</b> <ul style="list-style-type: none"> <li>Always wear dry insulating gloves.</li> <li>Insulate yourself from work and ground.</li> <li>Do not touch live electrical parts.</li> <li>Keep all panels and covers securely in place.</li> </ul>		<b>ARC RAYS can burn eyes and skin; NOISE can damage hearing.</b> <ul style="list-style-type: none"> <li>Wear welding helmet with correct shade of filter.</li> <li>Wear correct eye, ear, and body protection.</li> </ul>
	<b>FUMES AND GASES can be hazardous to your health.</b> <ul style="list-style-type: none"> <li>Keep your head out of the fumes.</li> <li>Ventilate area, or use breathing device.</li> <li>Read Material Safety Data Sheets (MSDSs) and manufacturer's instructions for material used.</li> </ul>		<b>MAGNETIC FIELDS FROM HIGH CURRENTS can affect pacemaker operation.</b> <ul style="list-style-type: none"> <li>Pacemaker wearers keep away.</li> <li>Wearers should consult their doctor before going near arc welding, gouging, or spot welding operations.</li> </ul>
	<b>WELDING can cause fire or explosion.</b> <ul style="list-style-type: none"> <li>Do not weld near flammable material.</li> <li>Watch for fire; keep extinguisher nearby.</li> <li>Do not locate unit over combustible surfaces.</li> <li>Do not weld on closed containers.</li> <li>Allow work and equipment to cool before handling.</li> </ul>	See Safety Precautions at beginning of manual for basic welding safety information.	

swam6.1\* 10/91

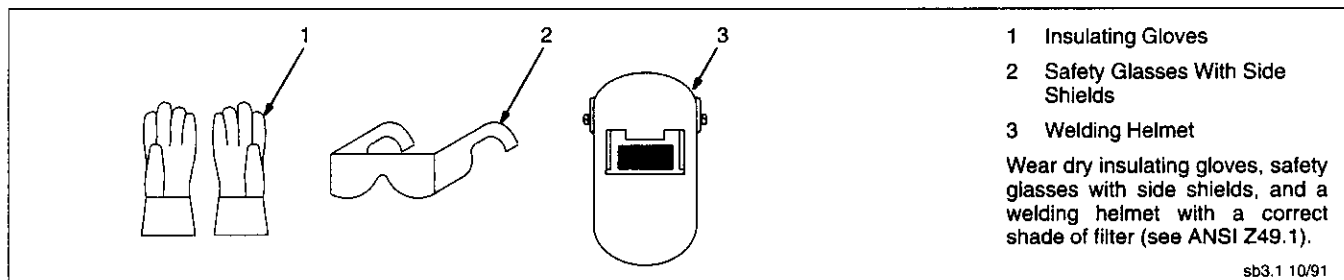
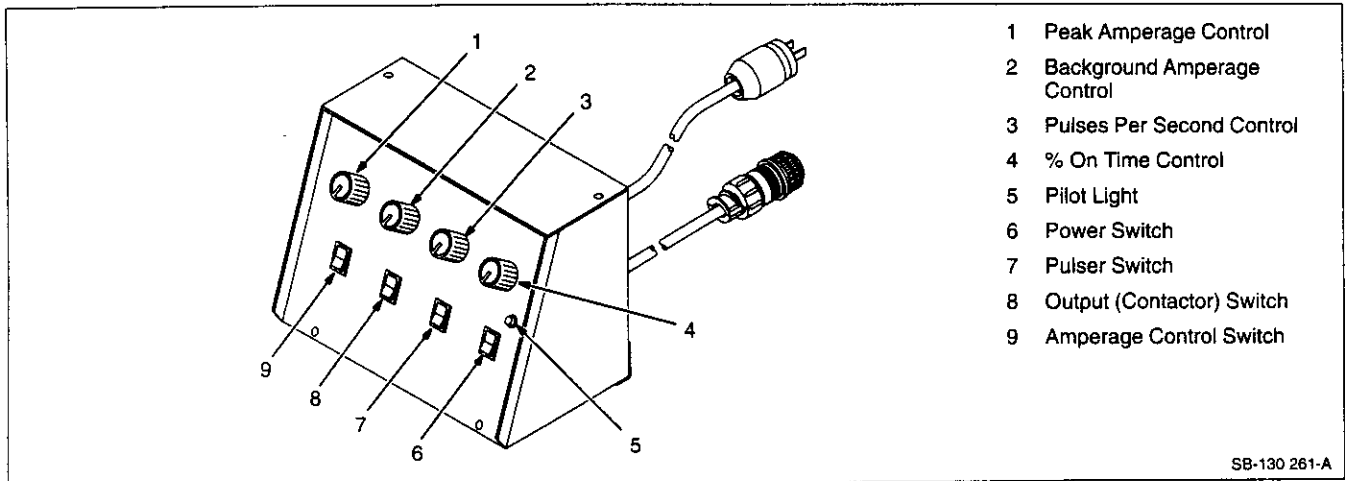


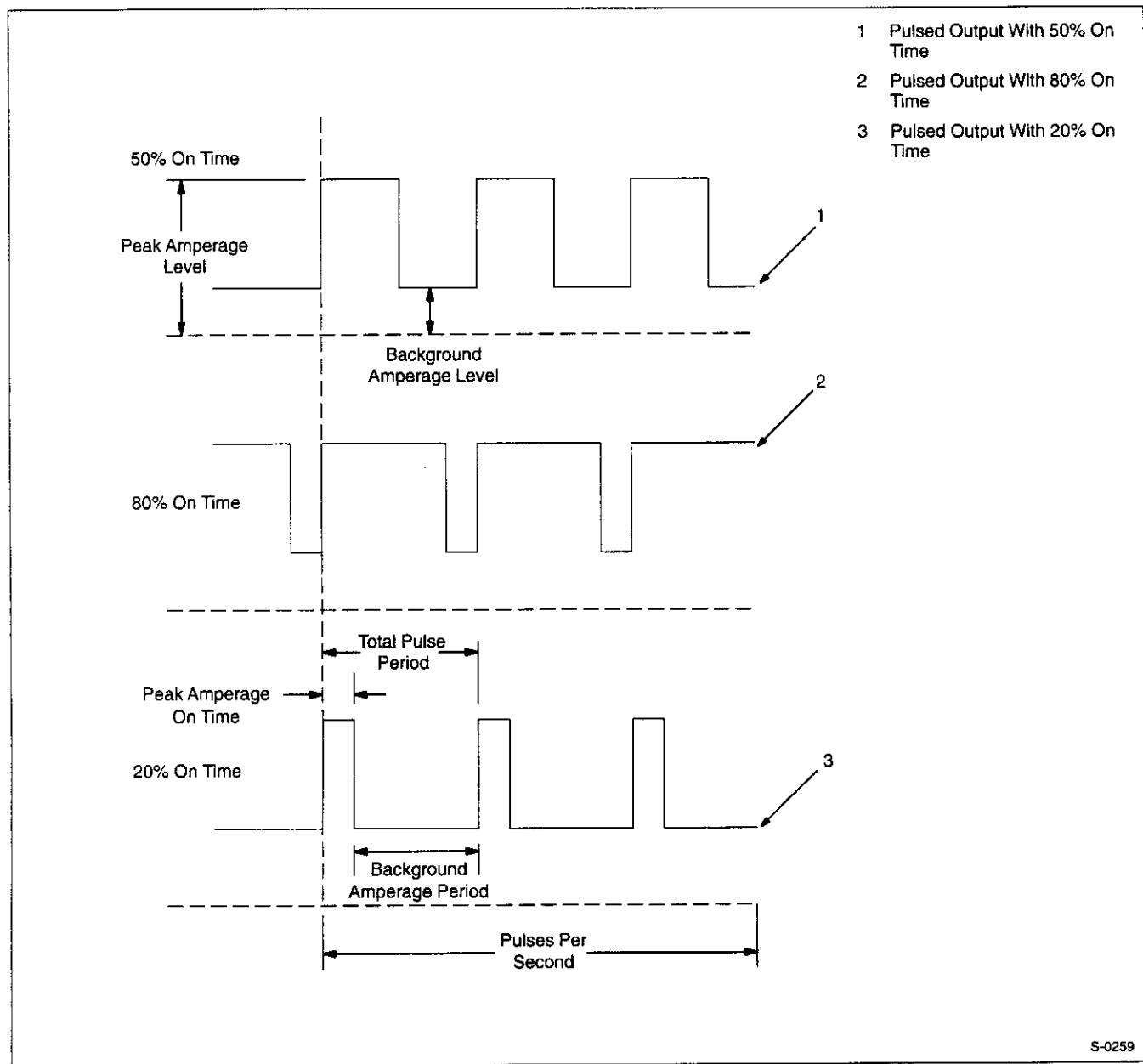
Figure 4-1. Safety Equipment



- 1 Peak Amperage Control
- 2 Background Amperage Control
- 3 Pulses Per Second Control
- 4 % On Time Control
- 5 Pilot Light
- 6 Power Switch
- 7 Pulsar Switch
- 8 Output (Contactor) Switch
- 9 Amperage Control Switch

SB-130 261-A

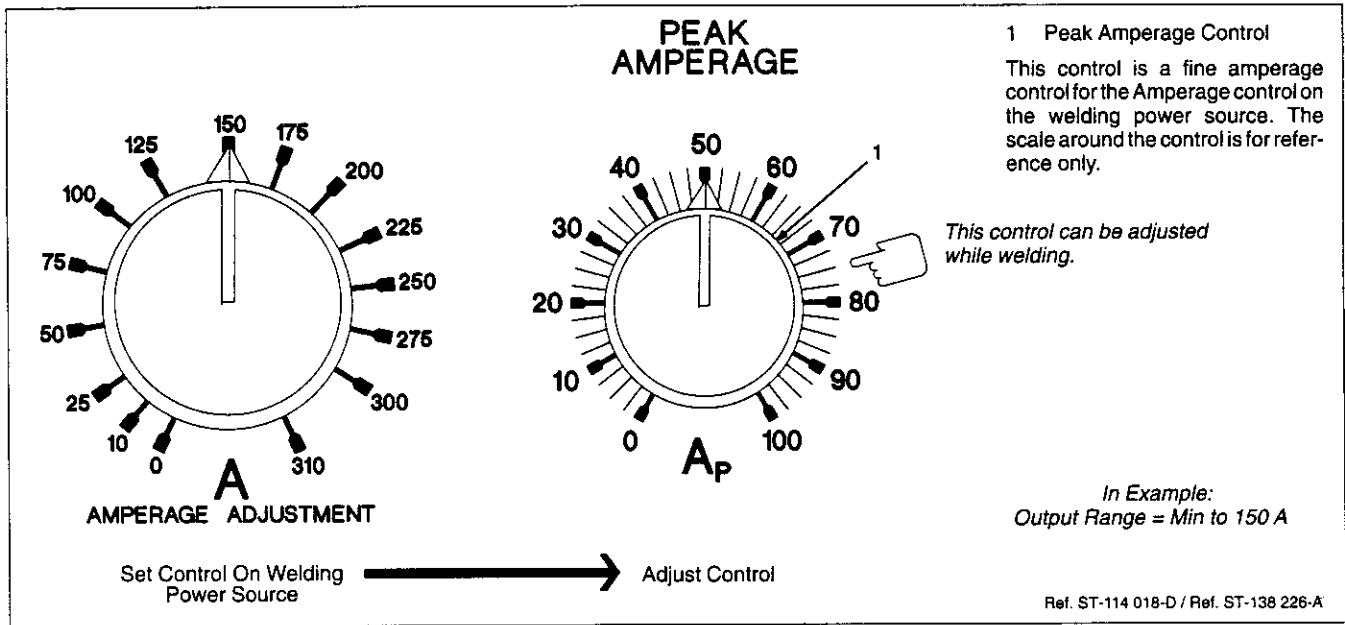
Figure 4-2. Controls



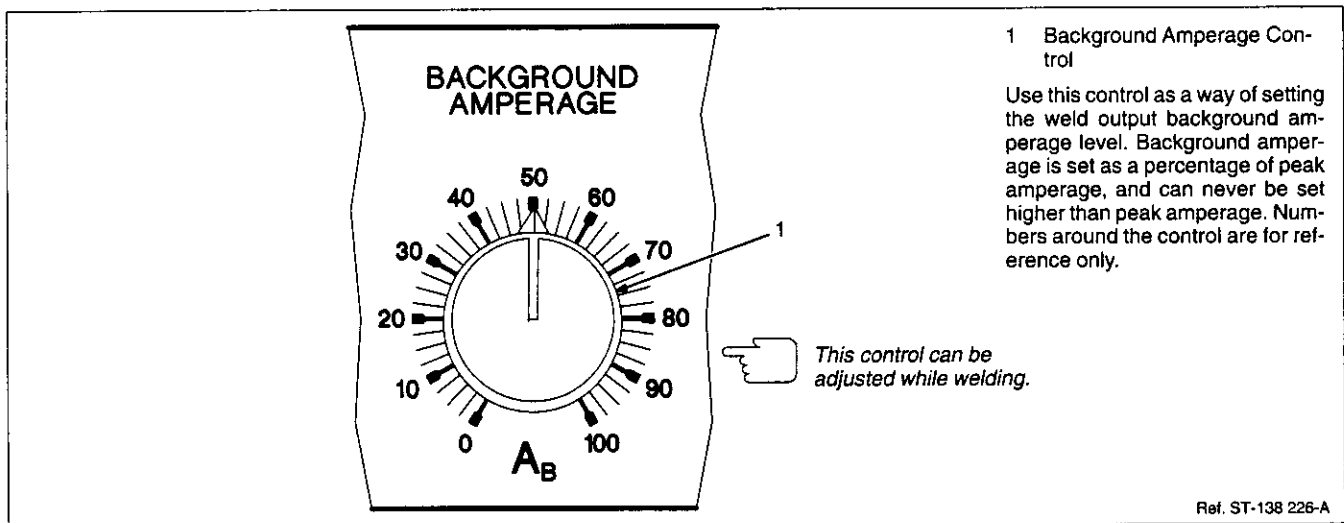
- 1 Pulsed Output With 50% On Time
- 2 Pulsed Output With 80% On Time
- 3 Pulsed Output With 20% On Time

S-0259

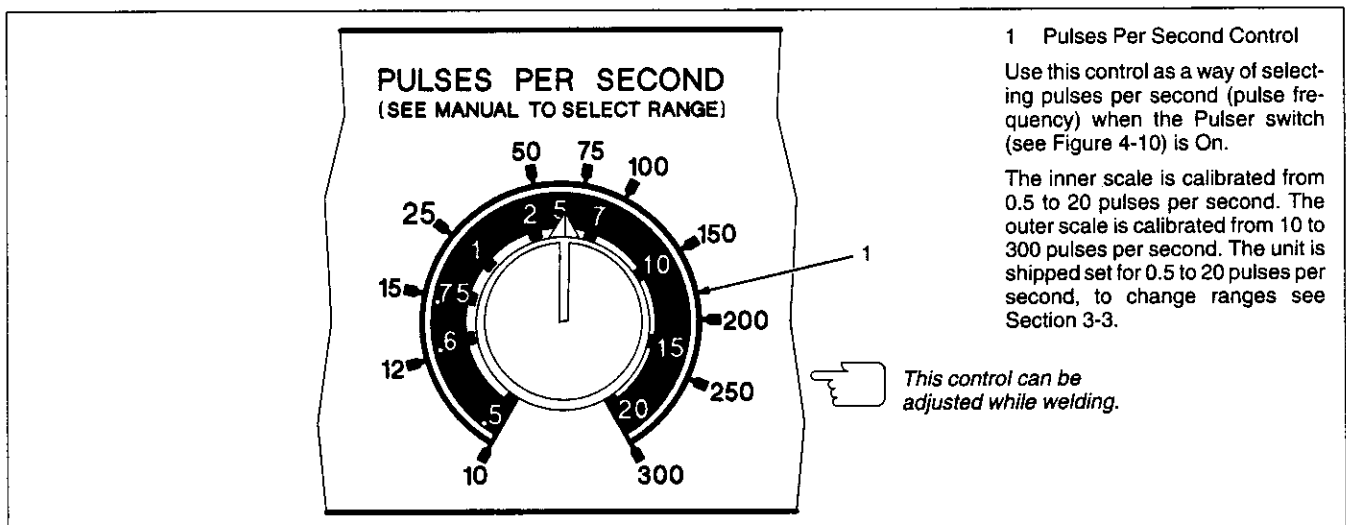
Figure 4-3. Examples Of Pulsed Output Waveforms



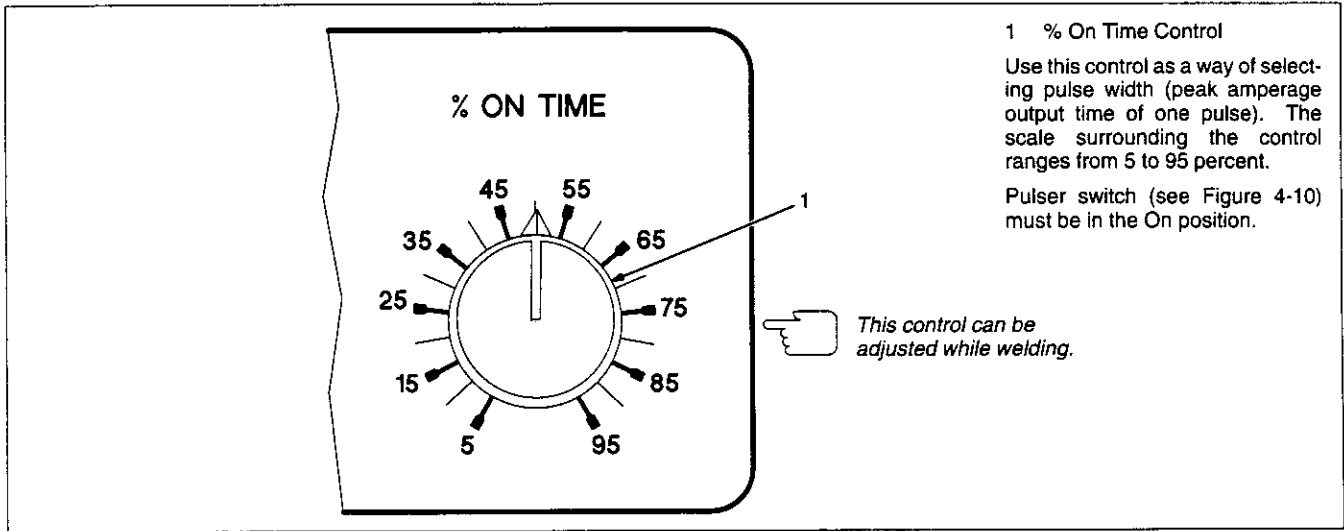
**Figure 4-4. Peak Amperage Control**



**Figure 4-5. Background Amperage Control**

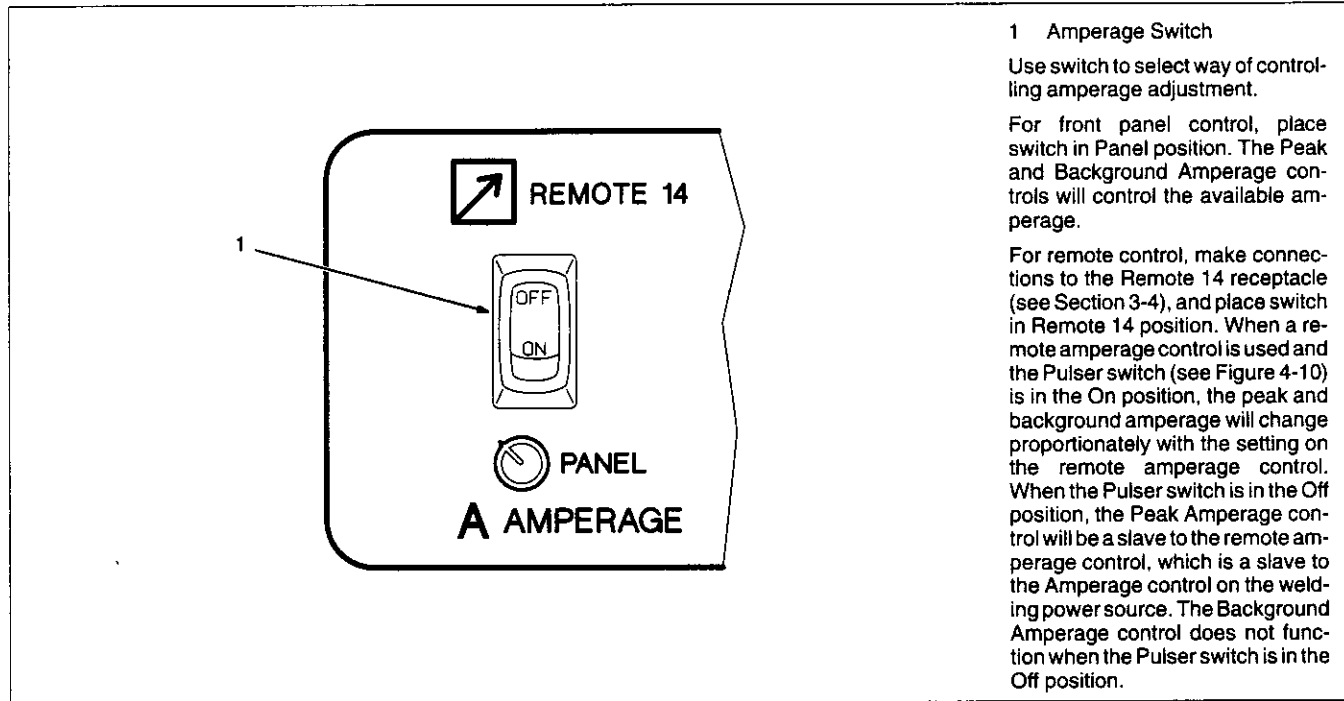


**Figure 4-6. Pulses Per Second Control**



**1 % On Time Control**  
 Use this control as a way of selecting pulse width (peak amperage output time of one pulse). The scale surrounding the control ranges from 5 to 95 percent.  
 Pulsar switch (see Figure 4-10) must be in the On position.

**Figure 4-7. % On Time Control**



**1 Amperage Switch**  
 Use switch to select way of controlling amperage adjustment.  
 For front panel control, place switch in Panel position. The Peak and Background Amperage controls will control the available amperage.  
 For remote control, make connections to the Remote 14 receptacle (see Section 3-4), and place switch in Remote 14 position. When a remote amperage control is used and the Pulsar switch (see Figure 4-10) is in the On position, the peak and background amperage will change proportionately with the setting on the remote amperage control. When the Pulsar switch is in the Off position, the Peak Amperage control will be a slave to the remote amperage control, which is a slave to the Amperage control on the welding power source. The Background Amperage control does not function when the Pulsar switch is in the Off position.

**Figure 4-8. Amperage Switch**

**Table 4-1. Availability Of Open-Circuit Voltage When Welding Power Source is Energized**

Power Switch	Remote Control Switch Position	Pulsar Control Output (Contactor) Switch Position	Welding Power Source Output (Contactor) Switch Position	Open-Circuit Voltage
ON	ON or OFF	ON	ON	Available
ON	ON or OFF	ON	REMOTE	Available
ON	ON or OFF	REMOTE 14	ON	Available
ON	OFF	REMOTE 14	REMOTE	Not Available
ON	ON	REMOTE 14	REMOTE	Available
OFF	ON or OFF	ON or REMOTE 14	REMOTE	Not Available
OFF	ON or OFF	ON or REMOTE 14	ON	Available

# ⚠ WARNING

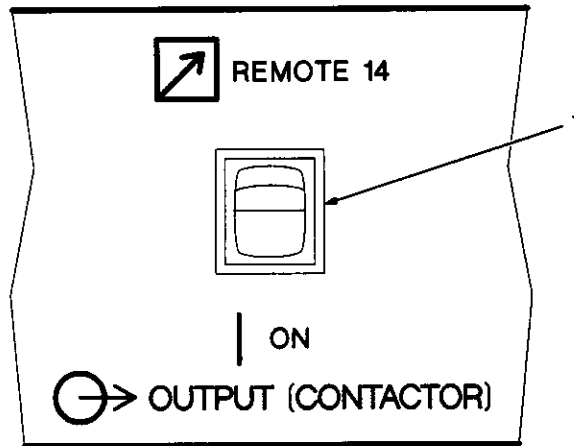


## ELECTRIC SHOCK CAN KILL.

- Do not touch live electrical parts.
- Do not touch the weld output terminals on the welding power source when the contactor is energized.
- Do not touch torch or electrode and work clamp at the same time.

## UNEXPECTED WELD OUTPUT can cause serious personal injury or damage to workpiece or equipment.

- Use Power switch on welding power source to shut down weld output.
- The Power switch on this unit disconnects the 115 volts ac but does not turn off the output (contactor) circuitry. As a result, the Output (Contactor) switch on the Pulser Control is functional even when the Power switch on this unit is Off. If the contactor is energized, the welding power source will provide open-circuit voltage at minimum output level without control.



### 1 Output (Contactor) Switch

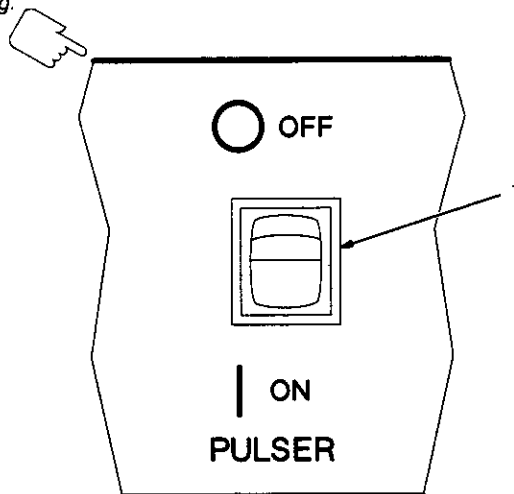
Use switch to select way of controlling unit output. Availability of open-circuit voltage depends on the position of the Pulser Control Output (Contactor) switch and the position of the welding power source Output (Contactor) switch (see Table 4-1).

For front panel control, place switch in On position.

For remote control, place switch in Remote 14 position (see Section 3-4)

Figure 4-9. Output (Contactor) Switch

*This switch may be turned On and Off while welding.*



### 1 Pulser Switch

When this switch is in the On position, the welding power source output will pulse between the background and peak amperage settings of this pulser control (see Figure 4-5 and Figure 4-4).

When this switch is in the Off position, the welding power source output remains at peak amperage level.

This switch may be placed in either the On or Off position before or during welding. If placed in the On position before welding, the output amperage may begin pulsing at either the peak or background level. If placed in the On position while welding, pulsing begins at the peak amperage level and pulses to the background level.

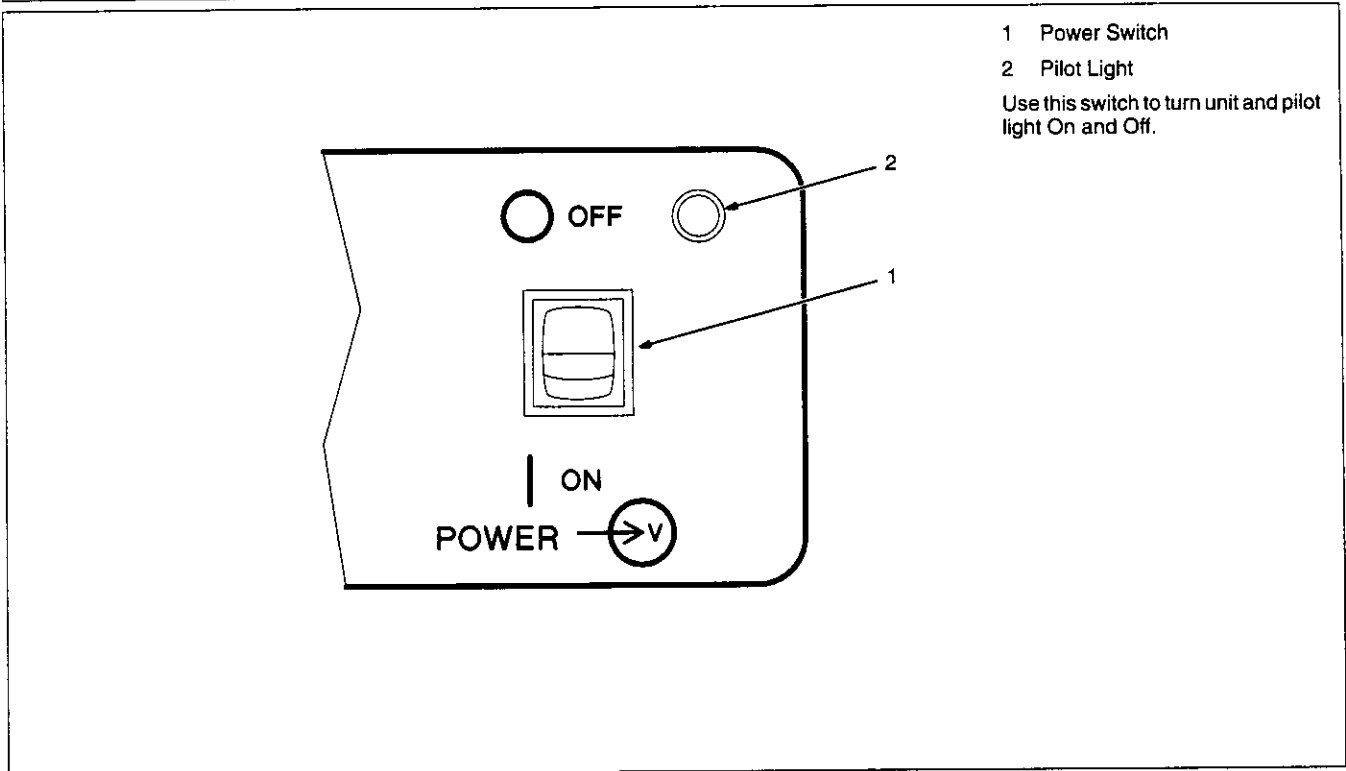
Figure 4-10. Pulser Switch

# ⚠ WARNING

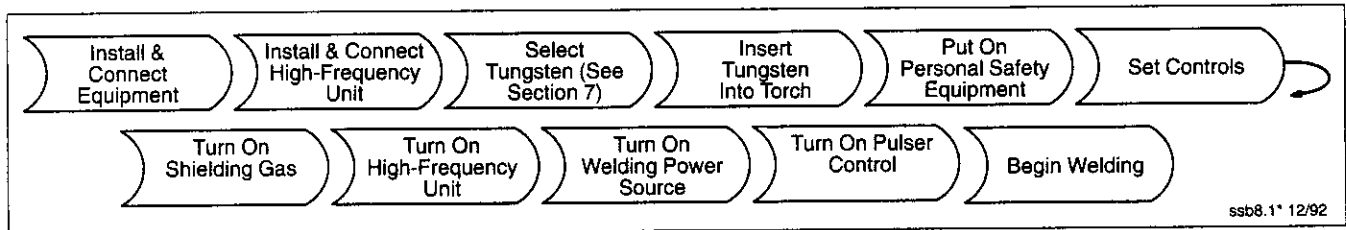
**UNEXPECTED WELD OUTPUT can cause serious personal injury or damage to workpiece or equipment.**

- Use Power switch on welding power source to shut down weld output.

The Power switch on this unit disconnects the 115 volts ac but does not turn off the output (contactor) circuitry. As a result, the Output (Contactor) switch on the Pulsar Control is functional even when the Power switch on this unit is Off. If the contactor is energized, the welding power source will provide open-circuit voltage at minimum output level without control.




**Figure 4-11. Power Switch And Pilot Light**



**Figure 4-12. Sequence Of Gas Tungsten Arc– Pulse Welding (GTAW–P)**



# SECTION 5 – MAINTENANCE & TROUBLESHOOTING

<b>⚠ WARNING</b>	
	<p><b>ELECTRIC SHOCK can kill.</b></p> <ul style="list-style-type: none"> <li>• Do not touch live electrical parts.</li> <li>• Turn Off welding power source, and disconnect input power before inspecting, maintaining, or servicing.</li> <li>• Turn Off pulser control, and remove input power plug from receptacle before inspecting, maintaining, or servicing.</li> <li>• Turn Off high-frequency unit, if applicable.</li> </ul>
Maintenance to be performed only by qualified persons.	

## 5-1. Routine Maintenance





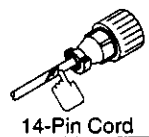



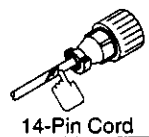
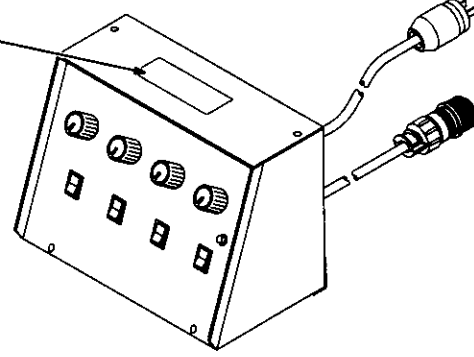



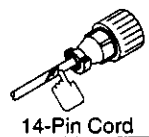
 <b>3 Months</b>	<b>⚠ Turn Off all power before maintaining.</b>				
<table border="1"> <tr> <td style="text-align: center;"> See Section 8</td> <td style="text-align: center;"> Replace Unreadable Labels</td> </tr> <tr> <td style="text-align: center;"> Replace Cracked Parts</td> <td style="text-align: center;"> 14-Pin Cord</td> </tr> </table>	 See Section 8	 Replace Unreadable Labels	 Replace Cracked Parts	 14-Pin Cord	
 See Section 8	 Replace Unreadable Labels				
 Replace Cracked Parts	 14-Pin Cord				
ST-130 261-A					

Figure 5-1. Maintenance Schedule

## 5-2. Troubleshooting


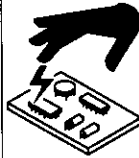
<b>⚠ WARNING</b>	
	<p><b>ELECTRIC SHOCK can kill.</b></p> <ul style="list-style-type: none"> <li>• Do not touch live electrical parts.</li> <li>• Turn Off welding power source, and disconnect input power before inspecting, maintaining, or servicing.</li> <li>• Turn Off pulser control, and remove input power plug from receptacle before inspecting, maintaining, or servicing.</li> <li>• Turn Off high-frequency unit, if applicable.</li> </ul>
	<p><b>STATIC ELECTRICITY can damage parts on circuit boards.</b></p> <ul style="list-style-type: none"> <li>• Put on grounded wrist strap BEFORE handling boards or parts.</li> </ul>
Troubleshooting to be performed only by qualified persons.	
swam1.1* 2/93 / twam5.1* 9/91	

Table 5-1. Welding Trouble

Trouble	Remedy	Section
No pulsing	Secure cord connections.	3-5
	Be sure Power switch is On.	Figure 4-11
	Be sure Pulser switch is On.	Figure 4-10
	If remote control is not used, place Amperage switch in Panel position. If remote control is used, place switch in Remote 14 position, and be sure remote control is connected to Remote 14 receptacle.	Figure 4-8, 3-4
	If remote control is not used, place Output (Contactor) switch in On position. If remote control is used, place switch in Remote 14 position, and be sure remote control is connected to Remote 14 receptacle.	Figure 4-9, 3-4

Trouble	Remedy	Section
No amperage control.	If remote control is not used, place Amperage switch in Panel position. If remote control is used, place switch in Remote 14 position, and be sure remote control is connected to Remote 14 receptacle.	Figure 4-8, 3-4
Minimum weld output with no control from welding power source.	Be sure Power switch is On.	Figure 4-11
	If remote control is not used, place Amperage switch in Panel position. If remote control is used, place switch in Remote 14 position, and be sure remote control is connected to Remote 14 receptacle.	Figure 4-8, 3-4
	Be sure Peak Amperage control is set above the minimum (0).	Figure 4-4
Pulsing too fast or too slow.	Be sure positions on internal DIP switch are set for proper range to match Pulses Per Second control.	Figure 3-3, Figure 4-6

# SECTION 6 – ELECTRICAL DIAGRAMS

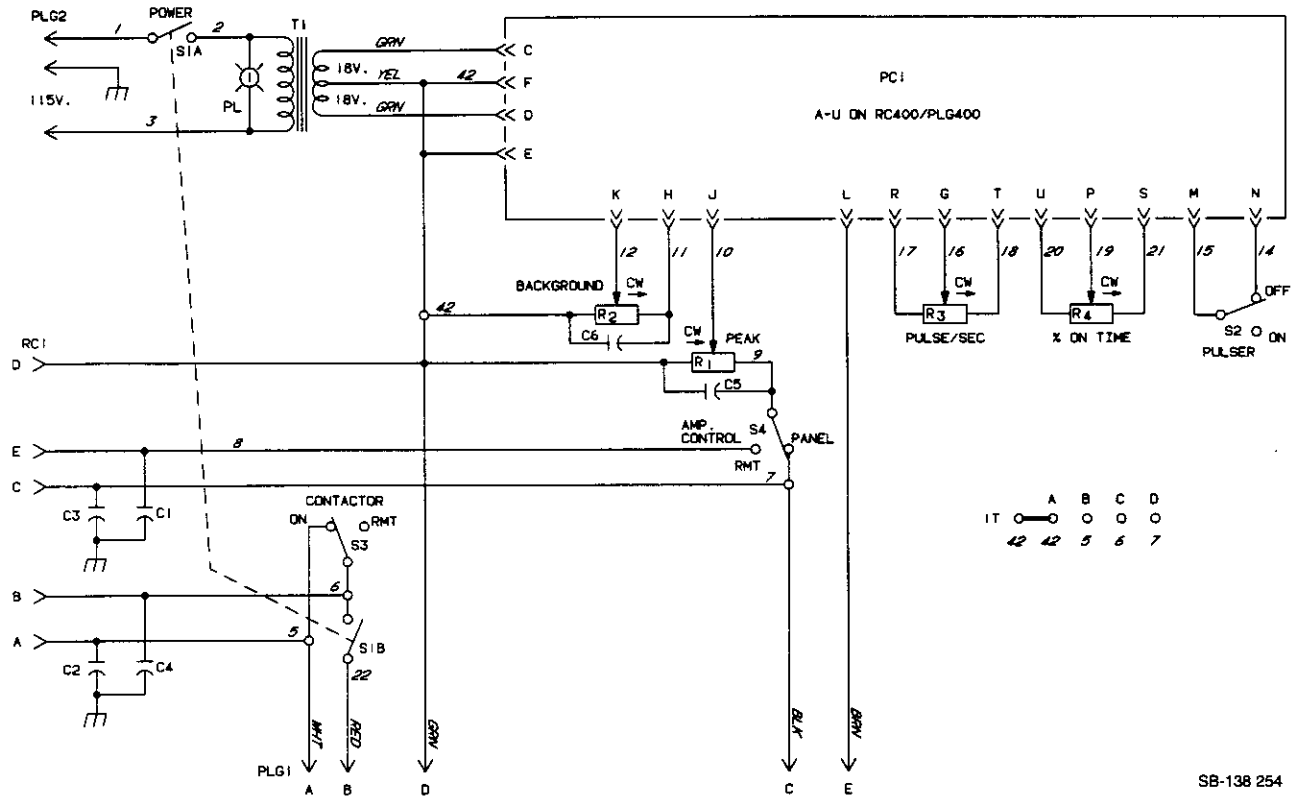


Figure 6-1. Circuit Diagram For Pulser Control

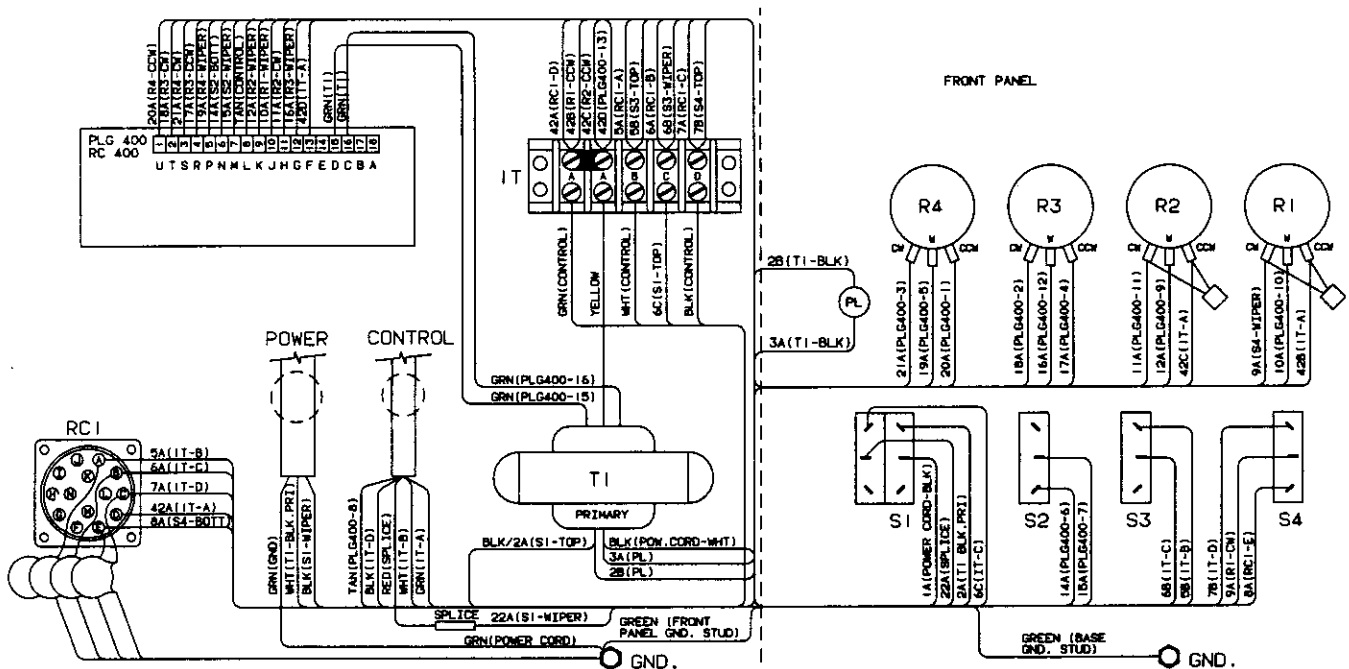


Figure 6-2. Wiring Diagram For Pulser Control

# SECTION 7 – TUNGSTEN ELECTRODE

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## NOTE

For additional information, see your distributor for a handbook on the Gas Tungsten Arc Welding (GTAW) process.

Wear clean gloves to prevent contamination of tungsten electrode.

## 7-1. Selecting Tungsten Electrode

Table 7-1. Tungsten Size

Electrode Diameter	Amperage Range - Gas Type♦ - Polarity			
	DC – Argon – Electrode Negative/Straight Polarity	DC – Argon – Electrode Positive/Reverse Polarity	AC – Argon – Using High Frequency	AC – Argon – Balanced Wave Using High Freq.
<b>Pure Tungsten (Green Band)</b>				
.010"	Up to 15	*	Up to 15	Up to 10
.020"	5-20	*	5-20	10-20
.040"	15-80	*	10-60	20-30
1/16"	70-150	10-20	50-100	30-80
3/32"	125-225	15-30	100-160	60-130
1/8"	225-360	25-40	150-210	100-180
5/32"	360-450	40-55	200-275	160-240
3/16"	450-720	55-80	250-350	190-300
1/4"	720-950	80-125	325-450	250-400
<b>2% Thorium Alloyed Tungsten (Red Band)</b>				
.010"	Up to 25	*	Up to 20	Up to 15
.020"	15-40	*	15-35	5-20
.040"	25-85	*	20-80	20-60
1/16"	50-160	10-20	50-150	60-120
3/32"	135-235	15-30	130-250	100-180
1/8"	250-400	25-40	225-360	160-250
5/32"	400-500	40-55	300-450	200-320
3/16"	500-750	55-80	400-500	290-390
1/4"	750-1000	80-125	600-800	340-525
<b>Zirconium Alloyed Tungsten (Brown Band)</b>				
.010"	*	*	Up to 20	Up to 15
.020"	*	*	15-35	5-20
.040"	*	*	20-80	20-60
1/16"	*	*	50-150	60-120
3/32"	*	*	130-250	100-180
1/8"	*	*	225-360	160-250
5/32"	*	*	300-450	200-320
3/16"	*	*	400-550	290-390
1/4"	*	*	600-800	340-525

♦ Typical argon shielding gas flow rates are 15 to 35 cfh (cubic feet per hour).

\*Not Recommended.

The figures listed are intended as a guide and are a composite of recommendations from American Welding Society (AWS) and electrode manufacturers.

S-0009

## 7-2. Preparing Tungsten

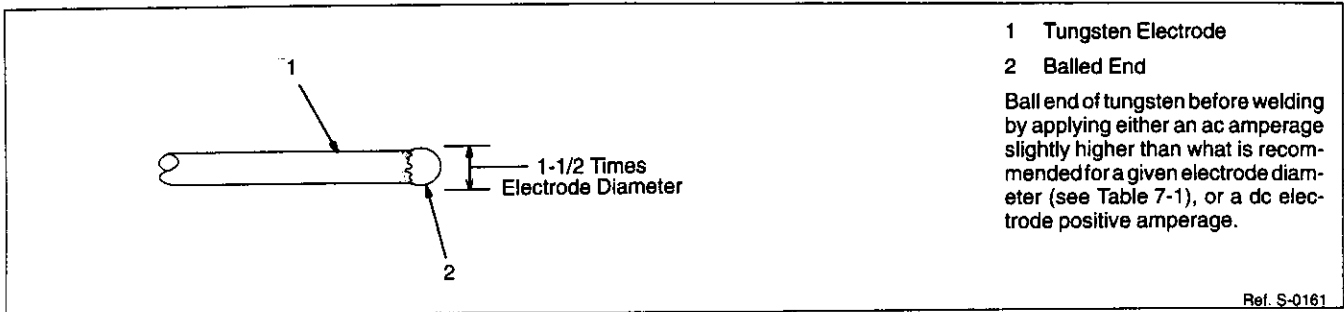


Figure 7-1. Preparing Tungsten For AC Or DC Electrode Positive (DCEP) Welding

**CAUTION**

**FLYING SPARKS AND HOT METAL can cause injury and start fires.**

- Shape tungsten electrode only on grinder with proper guards in a safe location wearing proper face, hand, and body protection.
- Keep flammables away.

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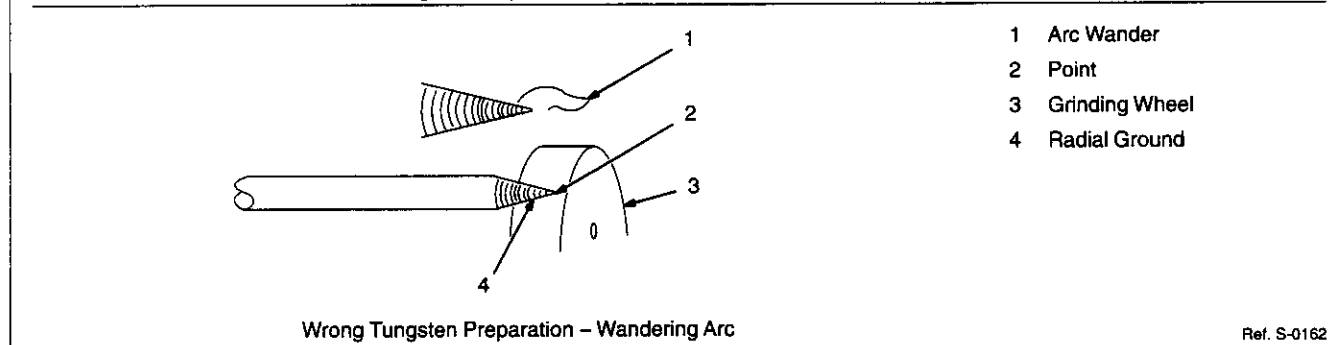
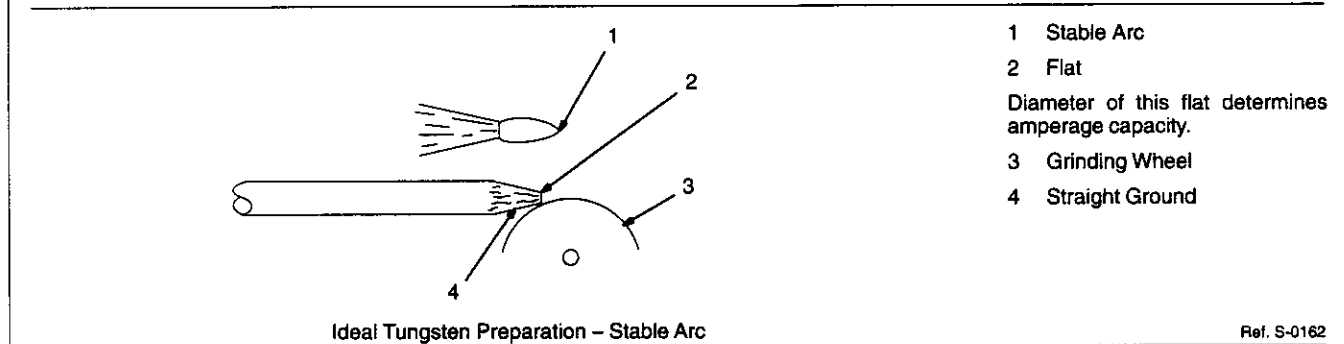
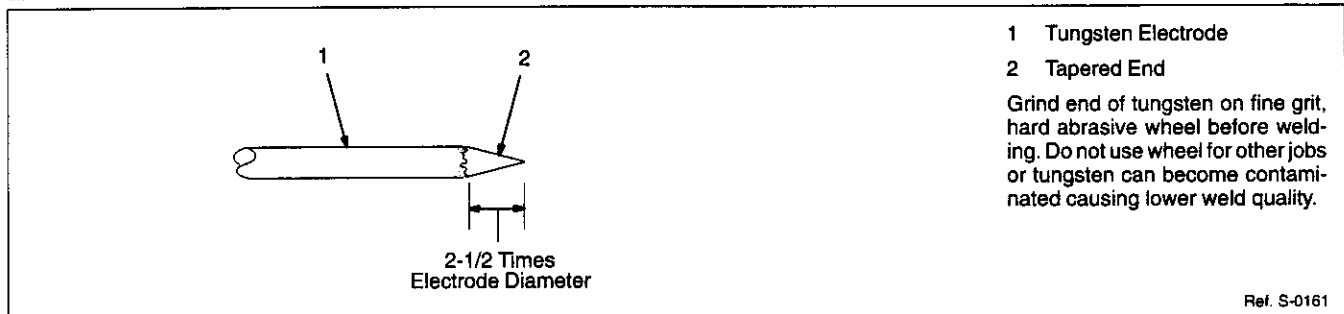
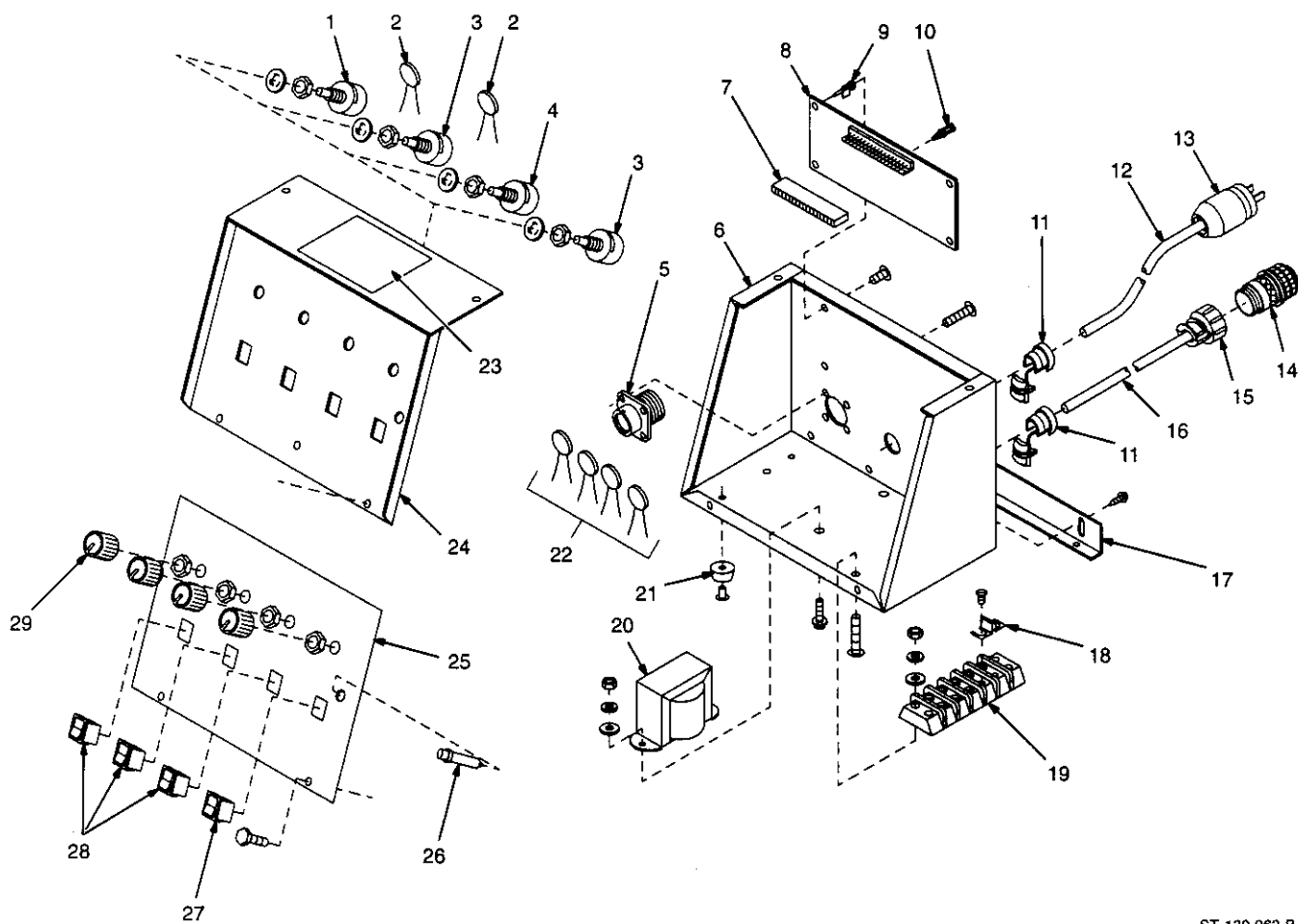


Figure 7-2. Preparing Tungsten For DC Electrode Negative (DCEN) Welding

# SECTION 8 – PARTS LIST



ST-130 263-B

Figure 8-1. Main Assembly

Item No.	Dia. Mkgs.	Part No.	Description	Quantity
<b>Figure 8-1. Main Assembly</b>				
1	R1	073 562	POTENTIOMETER, C sltd sft 1/T 2W 10K ohm	1
2	C5,6	165 747	CAPACITOR, cer mono 1uf 50VDC	2
3	R2,4	030 109	POTENTIOMETER, C sltd sft 1/T 2W 5K ohm	2
4	R3	004 186	POTENTIOMETER, C sltd sft 1/T 2W 5K ohm	1
5	RC1	143 976	CONNECTOR w/SOCKETS, (consisting of)	1
		079 534	CONNECTOR, circ skt pushin 14-18ga Amp 66358-6	14
		134 734	CONNECTOR, circ 14 pin sz 20 plug Amp 213571-2	
		134 731	CONNECTOR, circ pin pushin 14-18ga Amp 213603-1	
		079 739	CONNECTOR, circ clamp str rlf sz 17-20 Amp 206322-2	
6		127 342	CASE SECTION, sides/bottom/rear	1
7	PLG400	165 896	CONNECTOR & SOCKETS, (consisting of)	1
		079 747	CONNECTOR, rect skt 24-18ga Amp 350980-1	18
8	PC1	125 601	CIRCUIT CARD, pulser	1
9		110 375	STAND-OFF SUPPORT, PC card No. 6 screw	4
10		126 368	STAND-OFF SUPPORT, PC card No. 6 screw	1
11		070 654	BUSHING, strain relief .300 ID x .550mtg hole	2
12		007 826	CABLE, port No.18 3/c (order by ft)	8ft
13		073 690	PLUG, str grd armd 2P3W 15A 125V	1
14	PLG1	141 162	CONNECTOR & PINS, (consisting of)	1
		134 731	CONNECTOR, circ pin pushin 14-18ga Amp 213603-1	14
15		143 922	CONNECTOR, circ clamp str rlf sz 17-20 Amp 206070-3	1
16		052 246	CABLE, pwr No. 20ga 5/c (order by ft)	8ft
17		138 583	BRACKET, mtg unit (Eff w/KA861650)	1
18		601 219	LINK, jumper term blk 20A	1
19	1T	038 839	BLOCK, term 20A 5P	1
20		138 561	TRANSFORMER, control (Eff w/KA861650)	1
21		019 663	MOUNT, nprn 15/16 OD X 3/8	4
22	C1	144 478	LEAD ASSEMBLY, elect	1
22	C2	144 481	LEAD ASSEMBLY, elect	1
22	C3	144 479	LEAD ASSEMBLY, elect	1
22	C4	144 480	LEAD ASSEMBLY, elect	1
23		131 515	LABEL, warning electric shock etc	1
24		+127 343	PANEL, front	1
25			NAMEPLATE, (order by model and serial number)	1
26	PL1	027 645	LIGHT, ind red lens 125VAC	1
27	S1	131 663	SWITCH, rocker DPDT 8A 125VAC	1
28	S2-4	120 376	SWITCH, rocker SPDT 4A 230V	3
29		097 922	KNOB, pointer	4

+When ordering a component originally displaying a precautionary label, the label should also be ordered.  
**BE SURE TO PROVIDE MODEL AND SERIAL NUMBER WHEN ORDERING REPLACEMENT PARTS.**

