

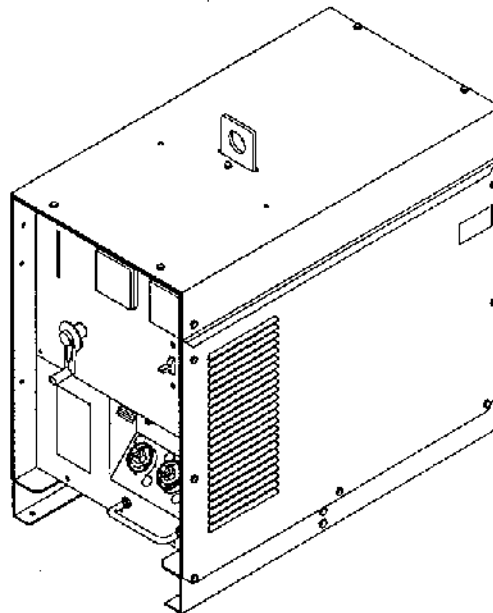


**Miller**®

February 1993 Form: OM-235P

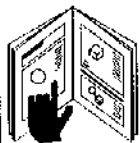
Effective With Serial No. KD342492

# OWNER'S MANUAL



## CP-200 And CP-300

- Constant Voltage DC Welding Power Source
- For GMAW Welding
- 200 And 300 Amperes At 100% Duty Cycle
- Uses Three-Phase Input Power (See Rating Label)
- 115 And 24 VAC Overload Protection
- High/Low Stabilizer
- 14-Pin Remote Control Receptacle



- 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, and are as follows:

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.)
4. 1 Year — Parts and Labor
  - \* Motor Driven Guns
  - \* Process Controllers
  - \* Water Coolant Systems
  - \* IIF 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.
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 \_\_\_\_\_

# ERRATA SHEET

May 11, 1993

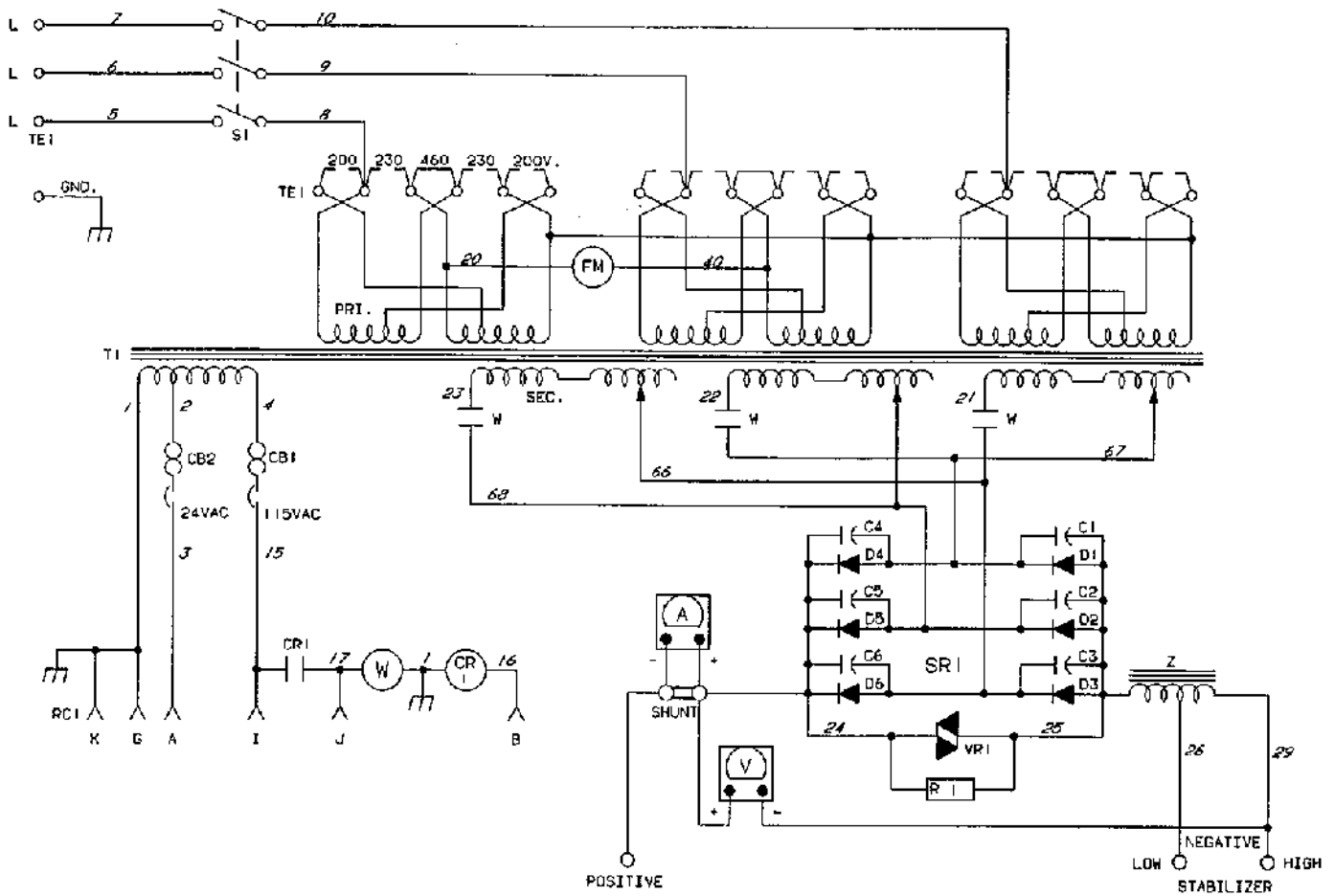
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Use above FORM number when ordering extra manuals.

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

## CHANGES TO SECTION 6 – ELECTRICAL DIAGRAMS

Replace Figure 6-1. Circuit Diagram For Welding Power Source



SB-116 409-D

Figure 6-1. Circuit Diagram For Welding Power Source

## CHANGES TO SECTION 7 – PARTS LIST

Change Parts List as follows:

**	Dia. Mkgs.	Part No.	Replaced With	Description	Quantity
21-7	T1	Added	162 379	TRANSFORMER, pwr main (230/460/575) (consisting of)	1
21-8			162 359	COIL, pri/sec top	1
21-9			162 360	COIL, pri/sec center	1
21-10			162 361	COIL, pri/sec bottom	1

\*\*First digit represents page no – digits following dash represent item no.

BE SURE TO PROVIDE MODEL AND SERIAL NUMBER WHEN ORDERING REPLACEMENT PARTS.



# ARC WELDING SAFETY PRECAUTIONS

## WARNING

ARC WELDING can be hazardous.

**PROTECT YOURSELF AND OTHERS FROM POSSIBLE SERIOUS INJURY OR DEATH. KEEP CHILDREN AWAY. PACEMAKER WEARERS KEEP AWAY UNTIL CONSULTING YOUR DOCTOR.**

In welding, as in most jobs, exposure to certain hazards occurs. Welding is safe when precautions are taken. The safety information given below is only a summary of the more complete safety information that will be found in the Safety Standards listed on the next page. Read and follow all Safety Standards.

**HAVE ALL INSTALLATION, OPERATION, MAINTENANCE, AND REPAIR WORK PERFORMED ONLY BY QUALIFIED PEOPLE.**

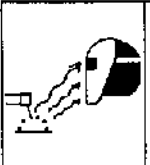


### **ELECTRIC SHOCK can kill.**

Touching live electrical parts can cause fatal shocks or severe burns. The electrode and work circuit is electrically live whenever the output is on. The input power circuit and machine internal circuits are also live when power is on. In semi-automatic or automatic wire welding, the wire, wire reel, drive roll housing, and all metal parts touching the welding wire are electrically live. Incorrectly installed or improperly grounded equipment is a hazard.

1. Do not touch live electrical parts.
2. Wear dry, hole-free insulating gloves and body protection.
3. Insulate yourself from work and ground using dry insulating mats or covers.
4. Disconnect input power or stop engine before installing or servicing this equipment.

5. Properly install and ground this equipment according to its Owner's Manual and national, state, and local codes.
6. When making input connections, attach proper grounding conductor first.
7. Turn off all equipment when not in use.
8. Do not use worn, damaged, undersized, or poorly spliced cables.
9. Do not wrap cables around your body.
10. Ground the workpiece to a good electrical (earth) ground.
11. Do not touch electrode if in contact with the work or ground.
12. Use only well-maintained equipment. Repair or replace damaged parts at once.
13. Wear a safety harness if working above floor level.
14. Keep all panels and covers securely in place.



### **ARC RAYS can burn eyes and skin; NOISE can damage hearing.**

Arc rays from the welding process produce intense heat and strong ultraviolet rays that can burn eyes and skin. Noise from some processes can damage hearing.

#### **NOISE**

1. Use approved ear plugs or ear muffs if noise level is high.

#### **ARC RAYS**

2. Wear a welding helmet fitted with a proper shade of filter (see ANSI Z49.1 listed in Safety Standards) to protect your face and eyes when welding or watching.
3. Wear approved safety glasses. Side shields recommended.
4. Use protective screens or barriers to protect others from flash and glare; warn others not to watch the arc.
5. Wear protective clothing made from durable, flame-resistant material (wool and leather) and foot protection.



### **FUMES AND GASES can be hazardous to your health.**

Welding produces fumes and gases. Breathing these fumes and gases can be hazardous to your health.

1. Keep your head out of the fumes. Do not breathe the fumes.
2. If inside, ventilate the area and/or use exhaust at the arc to remove welding fumes and gases.
3. If ventilation is poor, use an approved air-supplied respirator.
4. Read the Material Safety Data Sheets (MSDSs) and the manufacturer's instruction for metals, consumables, coatings, and cleaners.

5. Work in a confined space only if it is well ventilated, or while wearing an air-supplied respirator. Shielding gases used for welding can displace air causing injury or death. Be sure the breathing air is safe.
6. Do not weld in locations near degreasing, cleaning, or spraying operations. The heat and rays of the arc can react with vapors to form highly toxic and irritating gases.
7. Do not weld on coated metals, such as galvanized, lead, or cadmium plated steel, unless the coating is removed from the weld area, the area is well ventilated, and if necessary, while wearing an air-supplied respirator. The coatings and any metals containing these elements can give off toxic fumes if welded.

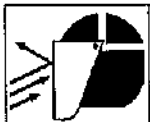


### **WELDING can cause fire or explosion.**

Sparks and spatter fly off from the welding arc. The flying sparks and hot metal, weld spatter, hot workpiece, and hot equipment can cause fires and burns. Accidental contact of electrode or welding wire to metal objects can cause sparks, overheating, or fire.

1. Protect yourself and others from flying sparks and hot metal.
2. Do not weld where flying sparks can strike flammable material.
3. Remove all flammables within 35 ft (10.7 m) of the welding arc. If this is not possible, tightly cover them with approved covers.
4. Be alert that welding sparks and hot materials from welding can easily go through small cracks and openings to adjacent areas.

5. Watch for fire, and keep a fire extinguisher nearby.
6. Be aware that welding on a ceiling, floor, bulkhead, or partition can cause fire on the hidden side.
7. Do not weld on closed containers such as tanks or drums.
8. Connect work cable to the work as close to the welding area as practical to prevent welding current from traveling long, possibly unknown paths and causing electric shock and fire hazards.
9. Do not use welder to thaw frozen pipes.
10. Remove stick electrode from holder or cut off welding wire at contact tip when not in use.
11. Wear oil-free protective garments such as leather gloves, heavy shirt, cuffless trousers, high shoes, and a cap.



### **FLYING SPARKS AND HOT METAL can cause injury.**

Chipping and grinding cause flying metal. As welds cool, they can throw off slag.

1. Wear approved face shield or safety goggles. Side shields recommended.
2. Wear proper body protection to protect skin.



### CYLINDERS can explode if damaged.

Shielding gas cylinders contain gas under high pressure. If damaged, a cylinder can explode. Since gas cylinders are normally part of the welding process, be sure to treat them carefully.

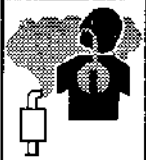
1. Protect compressed gas cylinders from excessive heat, mechanical shocks, and arcs.
2. Install and secure cylinders in an upright position by chaining them to a stationary support or equipment cylinder rack to prevent falling or tipping.

3. Keep cylinders away from any welding or other electrical circuits.
4. Never allow a welding electrode to touch any cylinder.
5. Use only correct shielding gas cylinders, regulators, hoses, and fittings designed for the specific application; maintain them and associated parts in good condition.
6. Turn face away from valve outlet when opening cylinder valve.
7. Keep protective cap in place over valve except when cylinder is in use or connected for use.
8. Read and follow instructions on compressed gas cylinders, associated equipment, and CGA publication P-1 listed in Safety Standards.



## WARNING

### ENGINES can be hazardous.



### ENGINE EXHAUST GASES can kill.

Engines produce harmful exhaust gases.

1. Use equipment outside in open, well-ventilated areas.
2. If used in a closed area, vent engine exhaust outside and away from any building air intakes.



### ENGINE FUEL can cause fire or explosion.

Engine fuel is highly flammable.

1. Stop engine before checking or adding fuel.
2. Do not add fuel while smoking or if unit is near any sparks or open flames.
3. Allow engine to cool before fueling. If possible, check and add fuel to cold engine before beginning job.
4. Do not overfill tank – allow room for fuel to expand.
5. Do not spill fuel. If fuel is spilled, clean up before starting engine.



### MOVING PARTS can cause injury.

Moving parts, such as fans, rotors, and belts can cut fingers and hands and catch loose clothing.

1. Keep all doors, panels, covers, and guards closed and securely in place.
2. Stop engine before installing or connecting unit.

3. Have only qualified people remove guards or covers for maintenance and troubleshooting as necessary.
4. To prevent accidental starting during servicing, disconnect negative (-) battery cable from battery.
5. Keep hands, hair, loose clothing, and tools away from moving parts.
6. Reinstall panels or guards and close doors when servicing is finished and before starting engine.



### SPARKS can cause BATTERY GASES TO EXPLODE; BATTERY ACID can burn eyes and skin.

Batteries contain acid and generate explosive gases.

1. Always wear a face shield when working on a battery.
2. Stop engine before disconnecting or connecting battery cables.
3. Do not allow tools to cause sparks when working on a battery.
4. Do not use welder to charge batteries or jump start vehicles.
5. Observe correct polarity (+ and -) on batteries.



### STEAM AND PRESSURIZED HOT COOLANT can burn face, eyes, and skin.

The coolant in the radiator can be very hot and under pressure.

1. Do not remove radiator cap when engine is hot. Allow engine to cool.
2. Wear gloves and put a rag over cap area when removing cap.
3. Allow pressure to escape before completely removing cap.

## PRINCIPAL SAFETY STANDARDS

*Safety in Welding and Cutting*, ANSI Standard Z49.1, from American Welding Society, 550 N.W. LeJeune Rd, Miami FL 33126

*Safety and Health Standards*, OSHA 29 CFR 1910, from Superintendent of Documents, U.S. Government Printing Office, Washington, D.C. 20402.

*Recommended Safe Practices for the Preparation for Welding and Cutting of Containers That Have Held Hazardous Substances*, American Welding Society Standard AWS F4.1, from American Welding Society, 550 N.W. LeJeune Rd, Miami, FL 33126

*National Electrical Code*, NFPA Standard 70, from National Fire Protection Association, Batterymarch Park, Quincy, MA 02269.

*Safe Handling of Compressed Gases in Cylinders*, CGA Pamphlet P-1, from Compressed Gas Association, 1235 Jefferson Davis Highway, Suite 501, Arlington, VA 22202.

*Code for Safety in Welding and Cutting*, CSA Standard W117.2, from Canadian Standards Association, Standards Sales, 178 Rexdale Boulevard, Rexdale, Ontario, Canada M9W 1R3.

*Safe Practices For Occupation And Educational Eye And Face Protection*, ANSI Standard Z87.1, from American National Standards Institute, 1430 Broadway, New York, NY 10018.

*Cutting And Welding Processes*, NFPA Standard 51B, from National Fire Protection Association, Batterymarch Park, Quincy, MA 02269.

# TABLE OF CONTENTS

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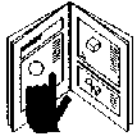
<b>SECTION 1 – SAFETY INFORMATION</b> .....	1
<b>SECTION 2 – SPECIFICATIONS</b>	
2-1. Volt-Ampere Curves .....	2
2-2. Duty Cycle .....	2
<b>SECTION 3 – INSTALLATION</b>	
3-1. Selecting A Location And Moving Welding Power Source .....	3
3-2. Installing Gas Supply .....	4
3-3. Selecting And Preparing Weld Output Cables .....	5
3-4. Connecting To Weld Output Terminals .....	6
3-5. Remote 14 Receptacle Information, Connections, And Overload Protection .....	7
3-6. Connecting Input Power .....	8
3-7. Wire Feeder Position On Welding Power Source .....	10
<b>SECTION 4 – OPERATION</b> .....	11
<b>SECTION 5 – MAINTENANCE &amp; TROUBLESHOOTING</b>	
5-1. Routine Maintenance .....	14
5-2. Troubleshooting .....	14
<b>SECTION 6 – ELECTRICAL DIAGRAMS</b> .....	17
<b>SECTION 7 – PARTS LIST</b>	
Figure 7-1. Main Assembly .....	20
Figure 7-2. Panel, Rear w/Components .....	22
Figure 7-3. Panel, Front w/Components .....	23
Figure 7-4. Rigging Assembly, Brush .....	24
Figure 7-5. Terminal Assembly, Primary .....	26



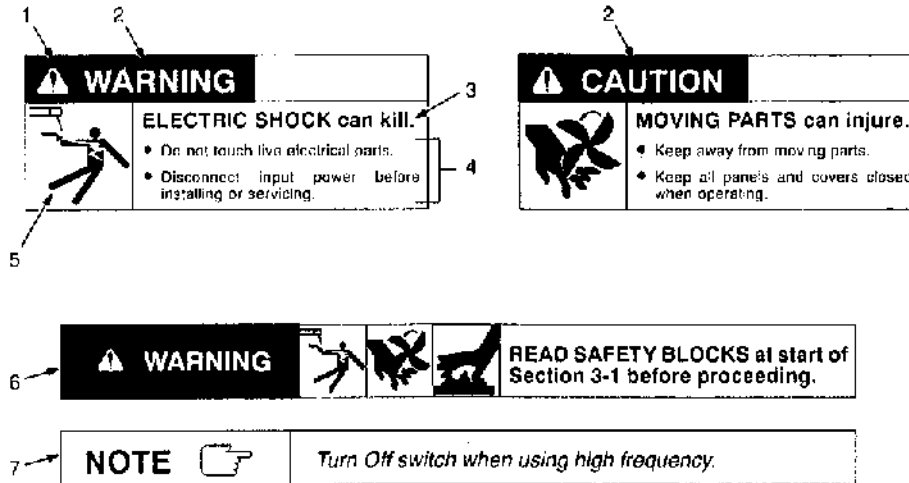


# SECTION 1 – SAFETY INFORMATION

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- 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. Welding Power Source

Specification	Description	
Type Of Output	Constant Voltage/Direct Current (CV/DC)	
Welding Processes	Gas Metal Arc Welding (GMAW)	
Overall Dimensions	See Figure 3-2	
Options	See Rear Cover	
	200 Ampere Model	300 Ampere Model
Type Of Input Power	Three-Phase; 200, 220, 230, 380, 460, 520, Or 575 Volts AC; 50/60 Hz	Three-Phase; 200, 220, 230, 380, 415, 460, 520, Or 575 Volts AC; 50/60 Hz
Input Amperes At Rated Output	21.4 A At 200 V, 19.4 A At 220 V, 18.6 A At 230 V, 11.3 A At 380 V, 9.3 A At 460 V, 8.3 A At 520 V, 7.4 A At 575 V	38 A At 200 V, 34.5 A At 220 V, 33 A At 230 V, 20 A At 380 V, 18.3 A At 415 V, 16.5 A At 460 V, 14.6 A At 520 V, 13.2 A At 575 V
Rated Weld Output	200 Amperes, 28 Volts DC At 100% Duty Cycle; 260 Amperes, 28 Volts DC At 60% Duty Cycle (See Section 2-2)	300 Amperes, 32 Volts DC At 100% Duty Cycle; 390 Amperes, 32 Volts DC At 60% Duty Cycle (See Section 2-2)
Max. Open-Circuit Voltage	13-39 Volts DC	14-44 Volts DC
KW Used At Rated Output	7 kW	12.3 kW
Weight	Net: 251 lb (114 kg); Ship: 261 lb (118 kg)	Net: 287 lb (130 kg); Ship: 297 lb (135 kg)

## 2-1. Volt-Ampere Curves

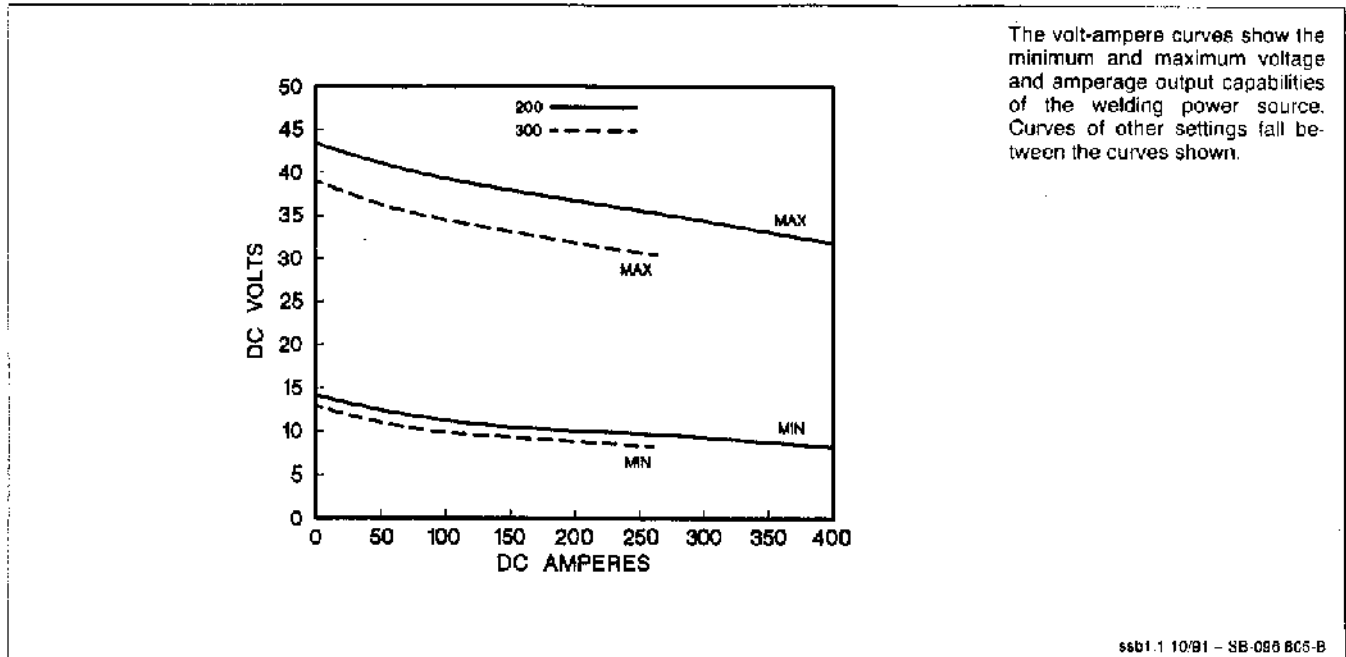


Figure 2-1. Volt-Ampere Curves

## 2-2. Duty Cycle

### ⚠ CAUTION

EXCEEDING DUTY CYCLE RATINGS will damage unit.

- Do not exceed indicated duty cycles.

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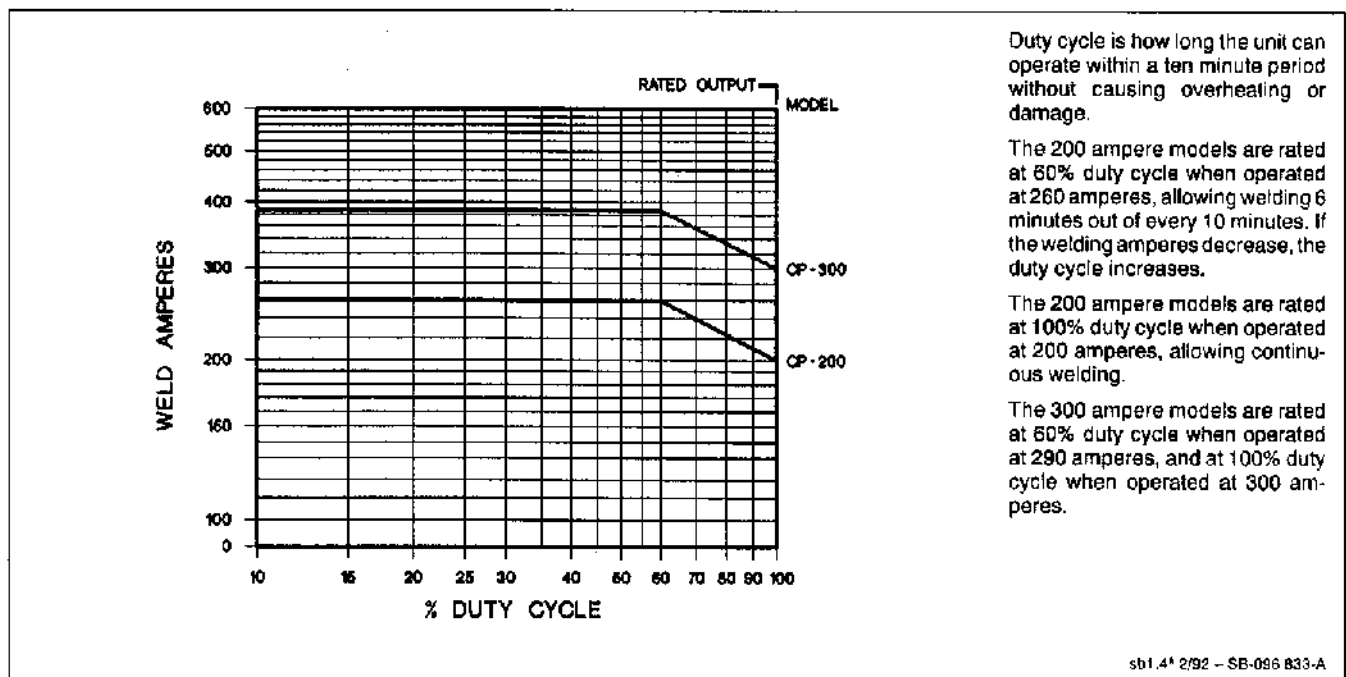







Figure 2-2. Duty Cycle Chart

# SECTION 3 – INSTALLATION

## 3-1. Selecting A Location And Moving Welding Power Source

 <b>WARNING</b>			
	<b>ELECTRIC SHOCK can kill.</b> <ul style="list-style-type: none"> <li>Do not touch live electrical parts.</li> <li>Disconnect input power conductors from deenergized supply line BEFORE moving welding power source.</li> </ul>		<b>FUMES can be hazardous; LACK OF FRESH AIR AND PROPER VENTILATION can be harmful.</b> <ul style="list-style-type: none"> <li>Do not breathe welding fumes.</li> <li>Place unit only where there is a good fresh air supply and proper ventilation.</li> </ul>
	<b>FIRE OR EXPLOSION can result from placing unit on, over, or near combustible surfaces.</b> <ul style="list-style-type: none"> <li>Do not locate unit on, over, or near combustible surfaces.</li> <li>Do not install unit near flammables.</li> </ul>		<b>FALLING EQUIPMENT can cause serious personal injury and equipment damage.</b> <ul style="list-style-type: none"> <li>Use lifting eye to lift unit only, NOT running gear, gas cylinders, or any other accessories.</li> <li>Use equipment of adequate capacity to lift the unit.</li> </ul>
	<b>BLOCKED AIRFLOW causes overheating and possible damage to unit.</b> <ul style="list-style-type: none"> <li>Do not block or filter airflow.</li> </ul> Warranty is void if any type of filter is used.		9warm1.1 2/92

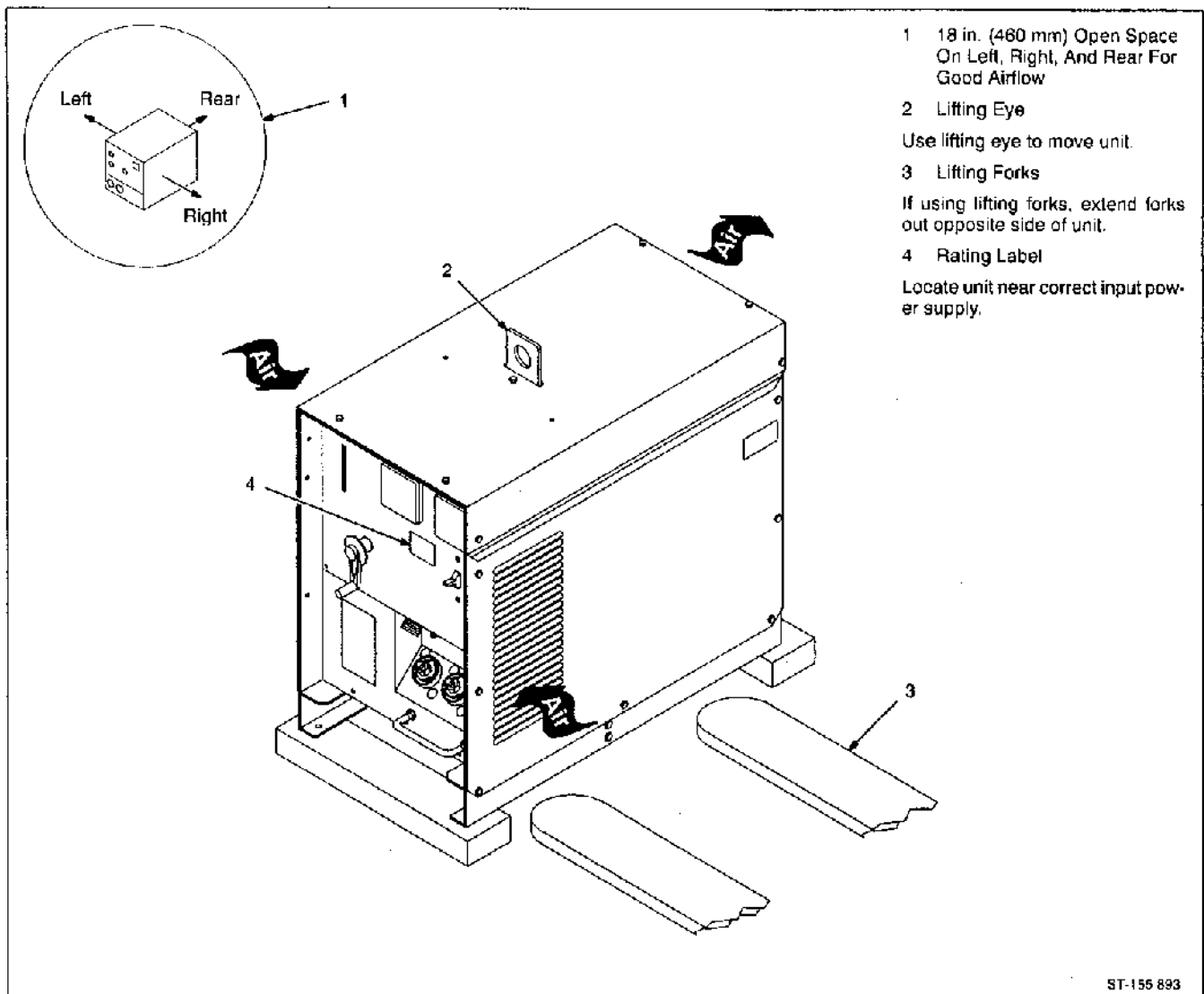
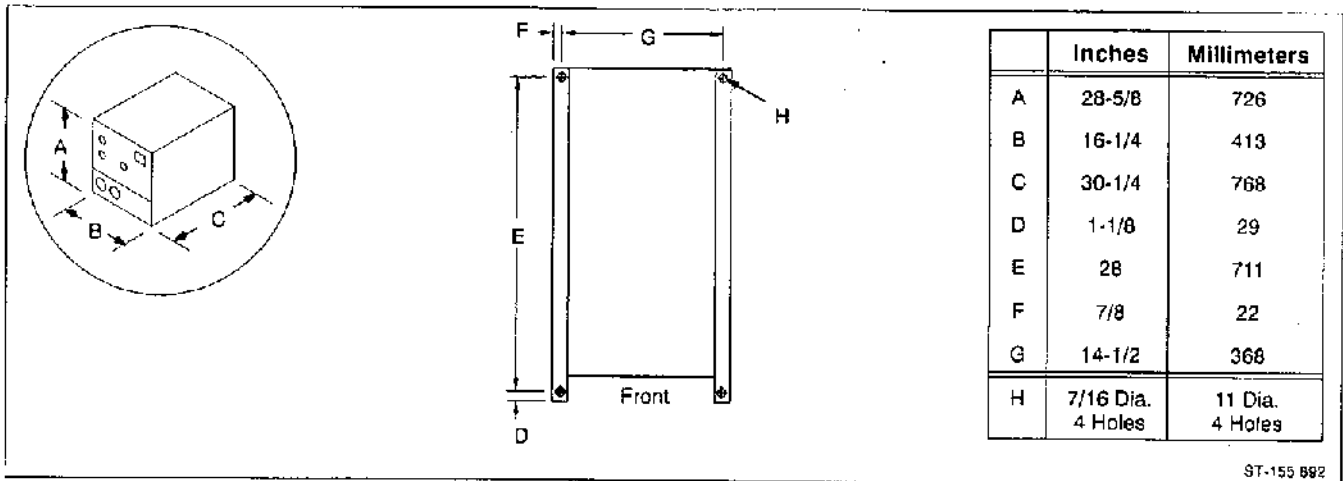




Figure 3-1. Location and Movement Of Welding Power Source



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Figure 3-2. Overall Dimensions And Base Mounting Hole Layout

### 3-2. Installing Gas Supply

<b>⚠ WARNING</b>	
 <p><b>CYLINDERS can explode if damaged.</b></p> <ul style="list-style-type: none"> <li>• Keep cylinders away from welding and other electrical circuits.</li> <li>• Never touch cylinder with welding electrode.</li> <li>• Always secure cylinder to running gear, wall, or other stationary support.</li> </ul>	 <p><b>BUILDUP OF SHIELDING GAS can harm health or kill.</b></p> <ul style="list-style-type: none"> <li>• Shut off shielding gas supply when not in use.</li> </ul>

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Obtain gas cylinder and chain to running gear, wall, or other stationary support so cylinder cannot fall and break off valve.

- 1 Cap
- 2 Cylinder Valve

Remove cap, stand to side of valve, and open valve slightly. Gas flow blows dust and dirt from valve. Close valve.

- 3 Cylinder
- 4 Regulator/Flowmeter

Install so face is vertical.

- 5 Gas Hose Connection

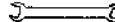
Fitting has 5/8-18 right-hand threads. Obtain and install gas hose.

- 6 Flow Adjust

Typical flow rate is 20 cfh (cubic feet per hour). Check wire manufacturer's recommended flow rate.

- 7 CO<sub>2</sub> Adapter
- 8 O-Ring

Install adapter with O-ring between regulator/flowmeter and CO<sub>2</sub> cylinder.

**Tools Needed:**  
 1-1/8, 5/8 in

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Figure 3-3. Typical Regulator/Flowmeter Installation

### 3-3. Selecting And Preparing Weld Output Cables

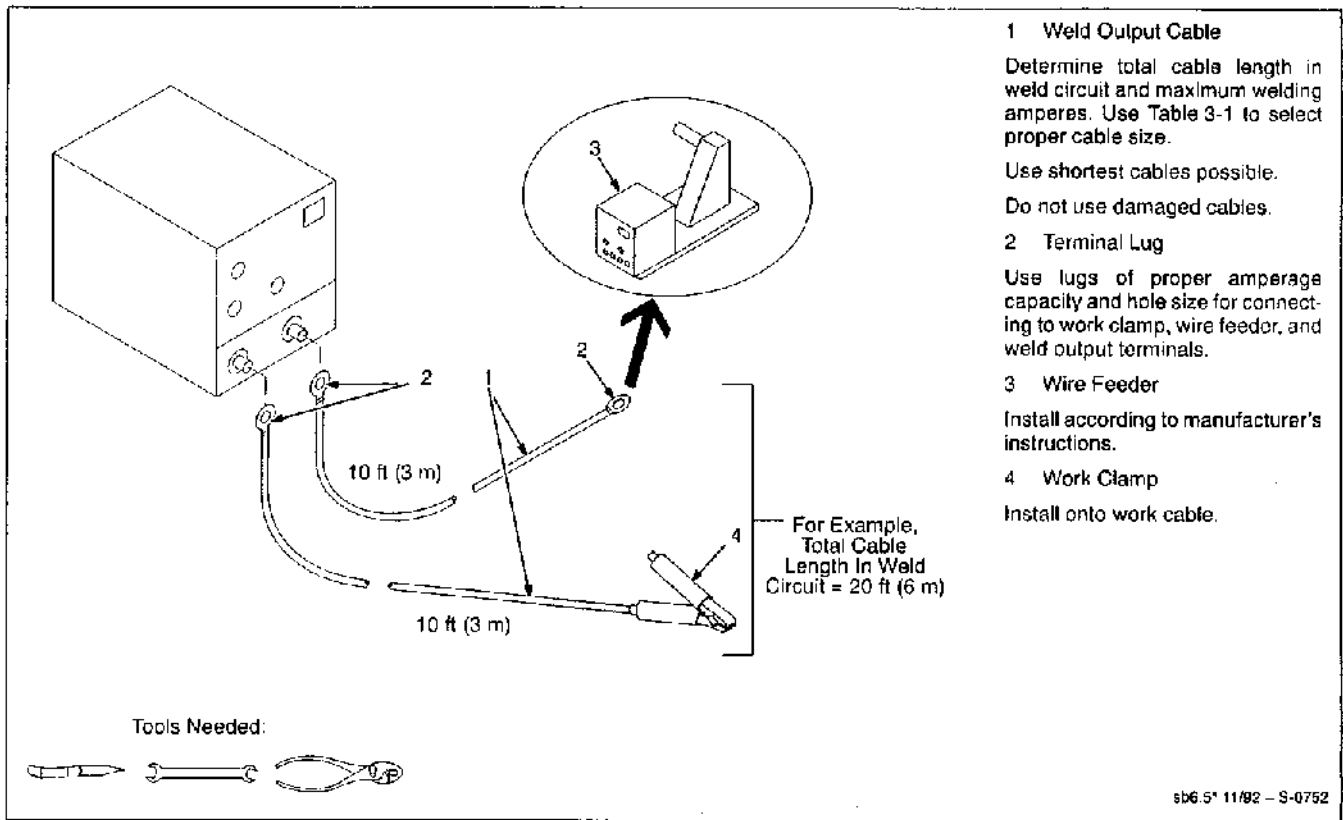


Figure 3-4. Selecting And Preparing Weld Output Cables

Table 3-1. Weld Cable Size\*

Welding Amperes	Total Cable (Copper) Length In Weld Circuit Not Exceeding							
	100 ft (30 m) Or Less		150 ft (45 m)	200 ft (60 m)	250 ft (70 m)	300 ft (90 m)	350 ft (105 m)	400 ft (120 m)
	10 To 60% Duty Cycle	60 Thru 100% Duty Cycle	10 Thru 100% Duty Cycle					
100	4	4	4	3	2	1	1/0	1/0
150	3	3	2	1	1/0	2/0	3/0	3/0
200	3	2	1	1/0	2/0	3/0	4/0	4/0
250	2	1	1/0	2/0	3/0	4/0	2-2/0	2-2/0
300	1	1/0	2/0	3/0	4/0	2-2/0	2-3/0	2-3/0
350	1/0	2/0	3/0	4/0	2-2/0	2-3/0	2-3/0	2-4/0
400	1/0	2/0	3/0	4/0	2-2/0	2-3/0	2-4/0	2-4/0
500	2/0	3/0	4/0	2-2/0	2-3/0	2-4/0	3-3/0	3-3/0

\*Weld cable size (AWG) is based on either a 4 volts or less drop or a current density of not more than 300 circular mils per ampere. S-0007-C

### 3-4. Connecting To Weld Output Terminals

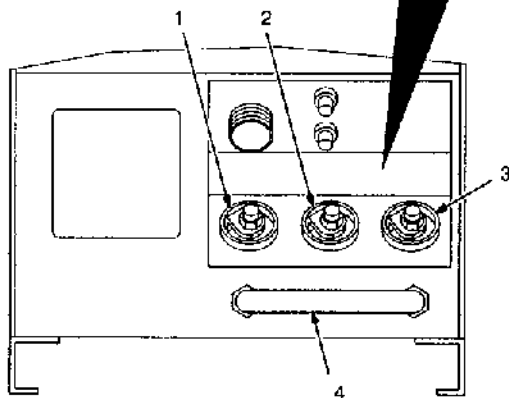
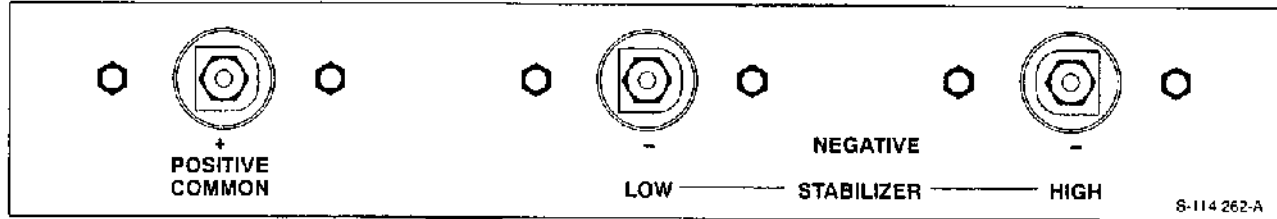
## ⚠ WARNING



**ELECTRIC SHOCK can kill.**

- Do not touch live electrical parts.
- Turn Off welding power source, and disconnect input power before making any weld output connections.

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- 1 Positive (+) Common Weld Output Terminal
- 2 Low Stabilizer Negative (-) Weld Output Terminal
- 3 High Stabilizer Negative (-) Weld Output Terminal
- 4 Weld Cable Strain Relief Bracket

Route cables under bracket.

For Electrode Positive (DCEP), connect work cable to Low Stabilizer Negative (-) terminal, or High Stabilizer Negative (-) terminal, and wire feeder cable to Positive (+) Common terminal.

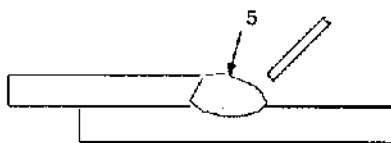
For Electrode Negative (DCEN), reverse cable connections.

- 5 Typical Weld Bead Using Low Stabilizer Negative (-) Weld Output Terminal

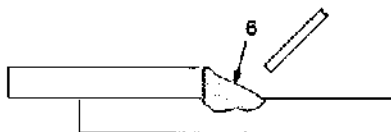
Use Low Stabilizer Negative (-) terminal to obtain arc type and weld bead suitable for some mild steel applications.

- 6 Typical Weld Bead Using High Stabilizer Negative (-) Weld Output Terminal

Use High Stabilizer Negative (-) terminal to reduce weld bead crowning, and spread the weld puddle.

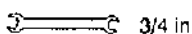


Low Stabilizer  
17 Volts, 100 Amps



High Stabilizer  
17 Volts, 100 Amps

Tools Needed:



3/4 in

Ref. ST-119 476 / S-0082

Figure 3-5. Weld Output Connections

### 3-5. Remote 14 Receptacle Information, Connections, And Overload Protection

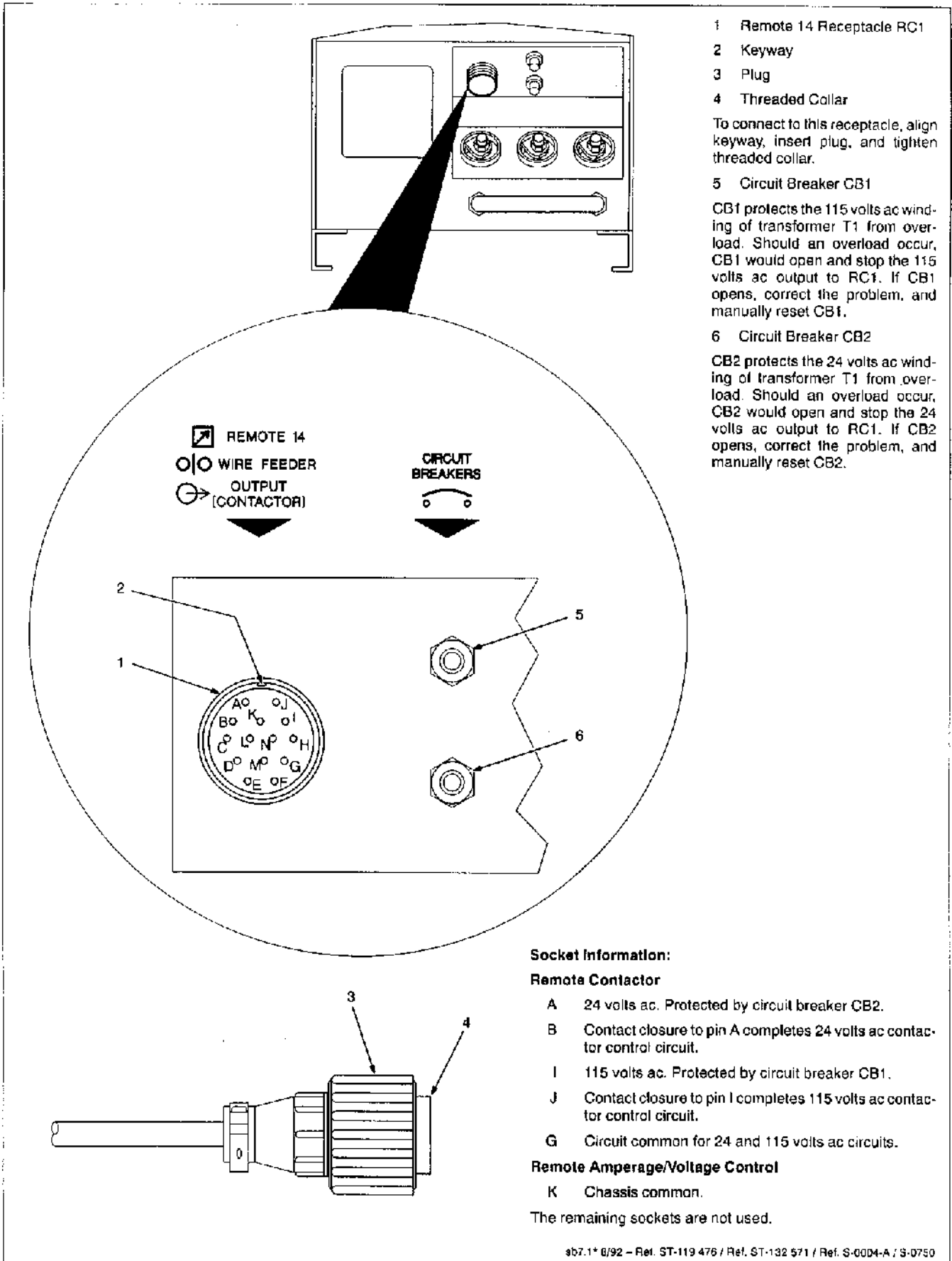


Figure 3-6. Remote 14 Connections And Circuit Breakers CB1 And CB2

### 3-6. Connecting Input Power

## ⚠ WARNING

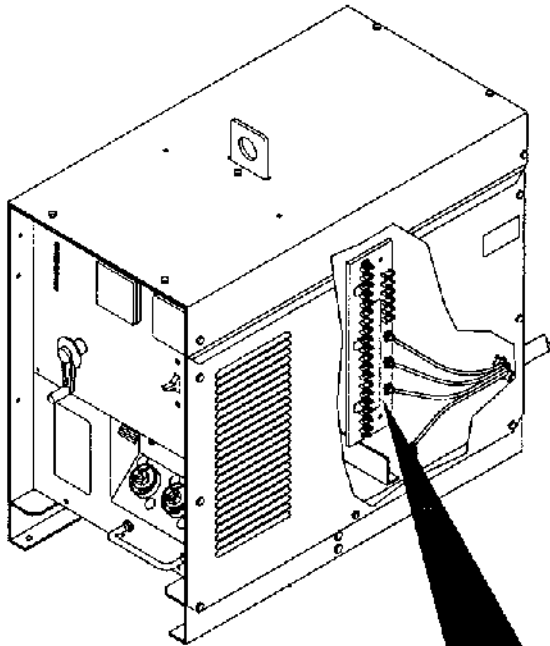


### ELECTRIC SHOCK can kill.

- Do not touch live electrical parts.
- Turn Off welding power source, and disconnect input power before inspecting or installing.
- Have only qualified persons install unit.
- Installation must meet National Electrical Code and all other codes.

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#### A. Positioning Jumper Links



Jumper links allow operation on different input voltages and are factory set for the highest input voltage.

Check input voltage available at site.

Remove top cover and right side panel to check jumper links.

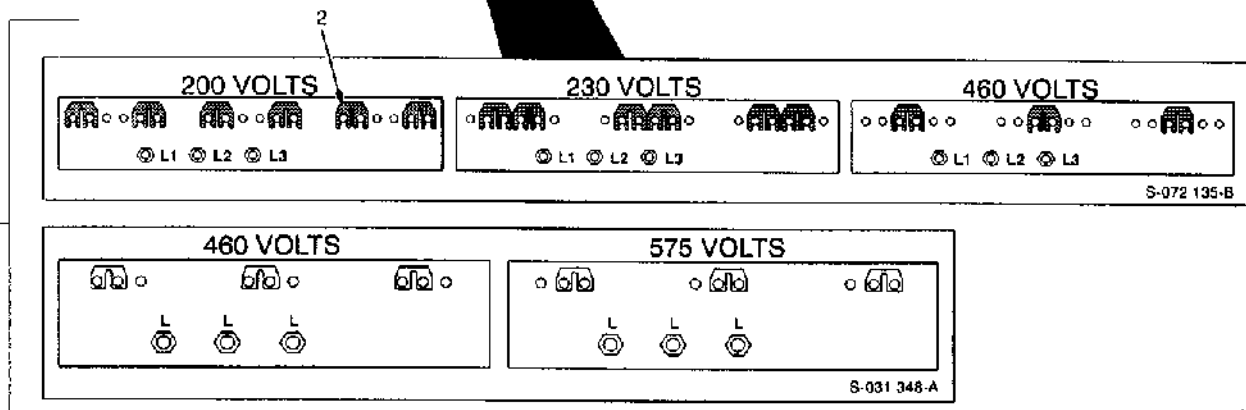
- 1 Input Voltage Label – Only One Is On Unit

Look at jumper links and compare link position with unit label.

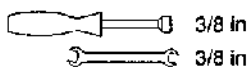
- 2 Input Voltage Jumper Links

Move links to match input voltage. For example, use 230 volts position when 230 volts input power is available.

Reinstall top cover and right side panel or go on to Figure 3-8.



#### Tools Needed:

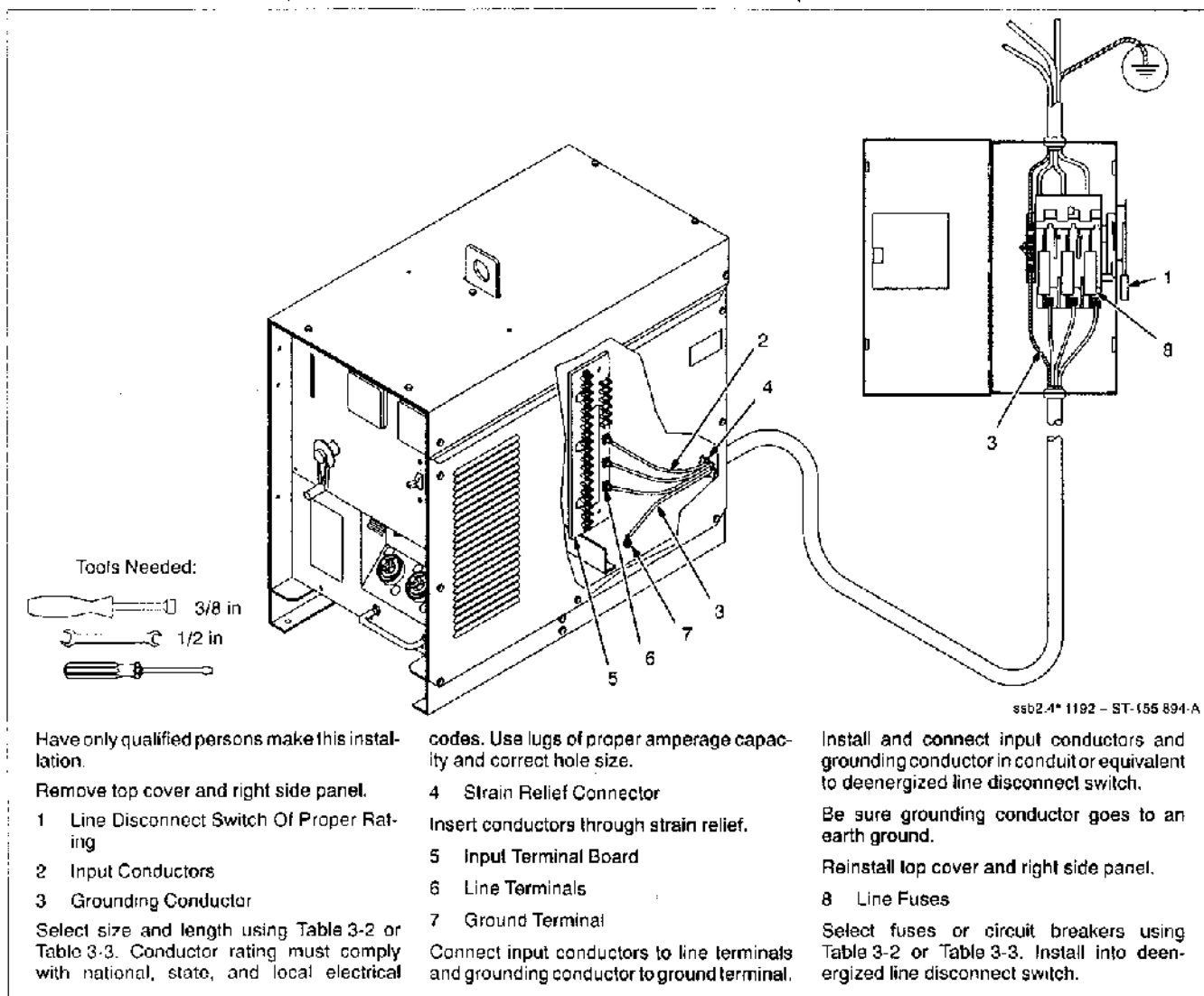


swb5.1\* 2/92 – Ref. ST-155 494

Figure 3-7. Input Voltage Jumper Links Location



## B. Connecting Input Power



**Figure 3-8. Input Power Connections**

**Table 3-2. Electrical Service Requirements For 200 Ampere Models\***

Input Voltage	200	220	230	380	460	520	575
Input Amperes At Rated Output	21	19	19	11	9	8	7
Circuit Breaker Size Range In Amperes <sup>1</sup>	32 thru 43	29 thru 39	28 thru 37	17 thru 22	14 thru 19	12 thru 16	11 thru 15
Fuse Size In Amperes <sup>2</sup>	30	30	30	15	15	10	10
Input Conductor Size in AWG/Kcmil <sup>3</sup>	10	12	12	14	14	14	14
Maximum Input Conductor Length In Feet (Meters) <sup>4</sup>	122 (37)	89 (27)	97 (30)	172 (52)	251 (77)	321 (98)	393 (120)
Grounding Conductor Size In AWG/Kcmil <sup>5</sup>	10	12	12	14	14	14	14

\* These values are calculated from the 1990 edition of the National Electrical Code (NEC).

<sup>1</sup> Circuit breaker range is 150% to not more than 200% of rated input amperage of the welding power source (Article 630-12(a) of NEC).

<sup>2</sup> Standard fuse size is that closest to 150% of rated input amperage of the welding power source (Article 630-12(a) of NEC).

<sup>3</sup> Input conductor size is for insulated copper wire with 75°C rating with not more than three single current-carrying conductors in a cable or raceway (Table 310-16 of NEC).

<sup>4</sup> Maximum length is to prevent more than a 3% voltage drop between service entrance and input terminals of the welding power source (Articles 210-19(a) and 215-2(b) of NEC).

<sup>5</sup> The grounding conductor shall be colored or identified as specified in the NEC. Grounding conductor size for copper wire is not required to be larger than input conductor (Article 250-95 of NEC).

Table 3-3. Electrical Service Requirements For 300 Ampere Models\*

Input Voltage	200	220	230	380	415	460	520	575
Input Amperes At Rated Output	38	35	33	20	18	17	15	13
Circuit Breaker Size Range In Amperes <sup>1</sup>	57 thru 76	52 thru 69	50 thru 66	30 thru 40	28 thru 37	25 thru 33	22 thru 29	20 thru 27
Fuse Size In Amperes <sup>2</sup>	60	50	50	30	30	25	20	20
Input Conductor Size In AWG/Kcmil <sup>3</sup>	8	8	8	12	12	12	14	14
Maximum Input Conductor Length In Feet (Meters) <sup>4</sup>	105 (32)	127 (39)	139 (42)	151 (46)	160 (55)	221 (67)	183 (56)	223 (68)
Grounding Conductor Size In AWG/Kcmil <sup>5</sup>	10	10	10	12	12	12	14	14

\* These values are calculated from the 1990 edition of the National Electrical Code (NEC).

<sup>1</sup> Circuit breaker range is 150% to not more than 200% of rated input amperage of the welding power source (Article 630-12(a) of NEC).

<sup>2</sup> Standard fuse size is that closest to 150% of rated input amperage of the welding power source (Article 630-12(a) of NEC).

<sup>3</sup> Input conductor size is for insulated copper wire with 75°C rating with not more than three single current-carrying conductors in a cable or raceway (Table 310-16 of NEC).

<sup>4</sup> Maximum length is to prevent more than a 3% voltage drop between service entrance and input terminals of the welding power source (Articles 210-19(a) and 215-2(b) of NEC).

<sup>5</sup> The grounding conductor shall be colored or identified as specified in the NEC. Grounding conductor size for copper wire is not required to be larger than input conductor (Article 250-95 of NEC).

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### 3-7. Wire Feeder Position On Welding Power Source

⚠

## WARNING

**FALLING WIRE FEEDER can cause serious personal injury and equipment damage.**

- Do not put wire feeder where it will tip or fall.
- Put all four rubber feet solidly on a flat surface.

**⚠ Do not put feeder where welding wire hits cylinder.**

- 1 Wire Feeder
- 2 Lifting Eye
- 3 Rubber Feet
- 4 Installation Slots

When installing wire feeder over a lifting eye on a welding power source, select the slot that will allow all four rubber feet on base of feeder to sit securely on top of welding power source.








- 5 Wire Spool/Reel
- 6 Gas Cylinder (Customer Supplied)
- 7 Welding Power Source

Position wire feeder on welding power source so that welding wire, or wire spool/reel, does not touch gas cylinder.

ST-152 468 / ST-152 467-A

Figure 3-9. Wire Feeder Position On Welding Power Source

# 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>MOVING PARTS can cause injury.</b> <ul style="list-style-type: none"> <li>• Keep away from moving parts.</li> <li>• Keep all doors, panels, covers, and guards closed and securely in place.</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>		<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>
		See Safety Precautions at beginning of manual for basic welding safety information. <span style="float: right; font-size: small;">swam6.1 10/91</span>	

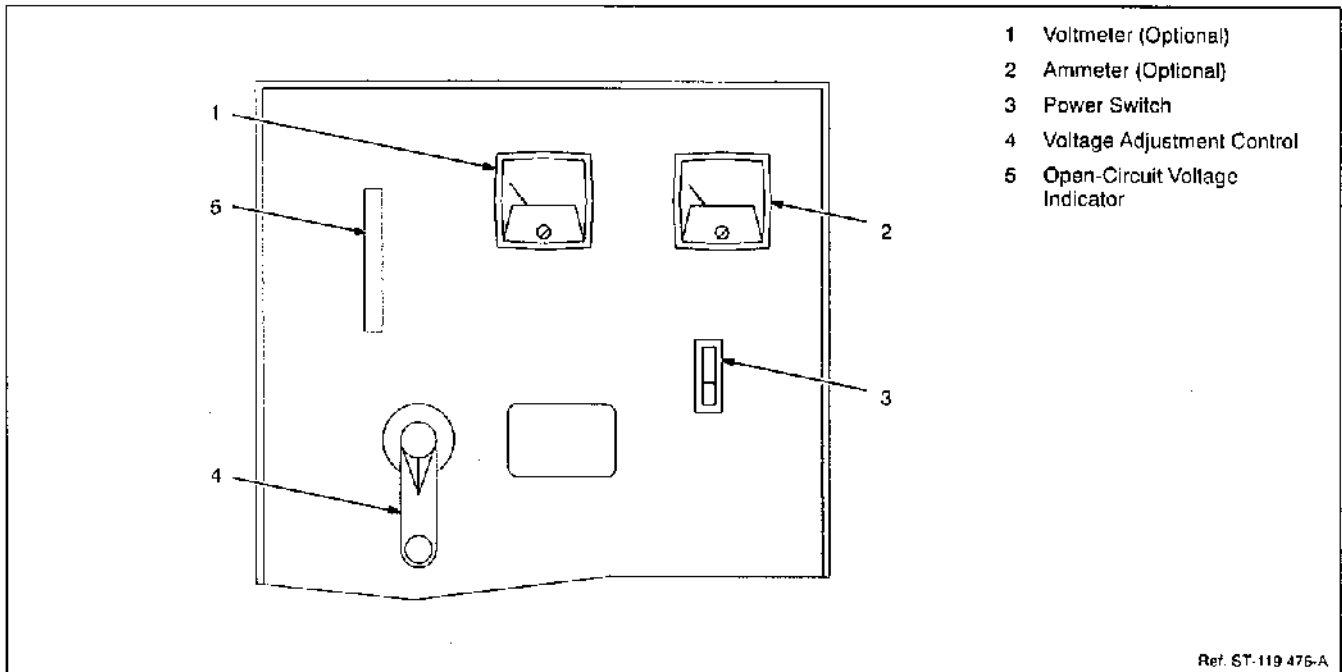


Figure 4-1. Controls

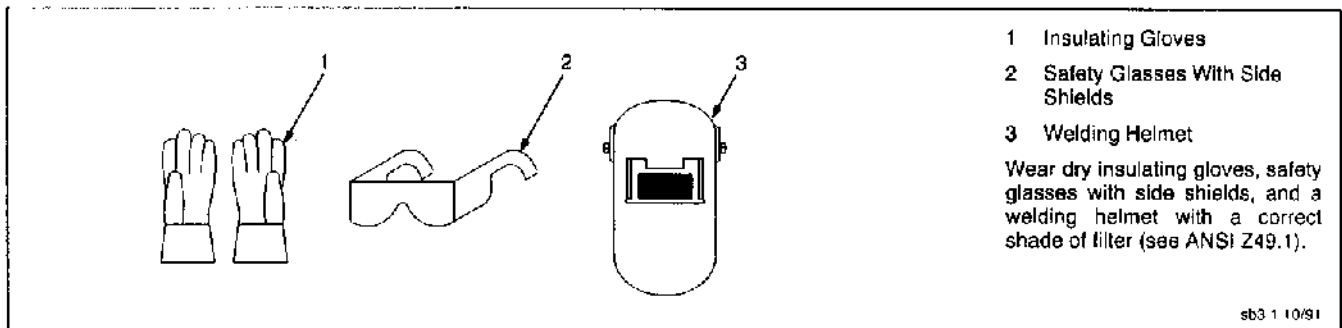


Figure 4-2. Safety Equipment

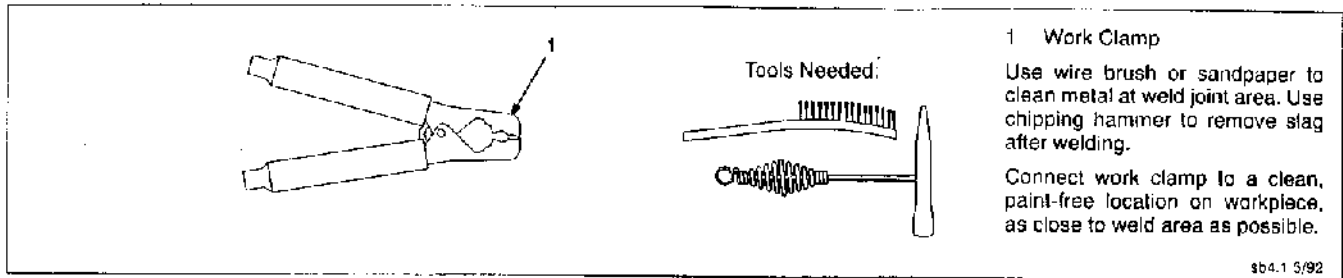


Figure 4-3. Work Clamp

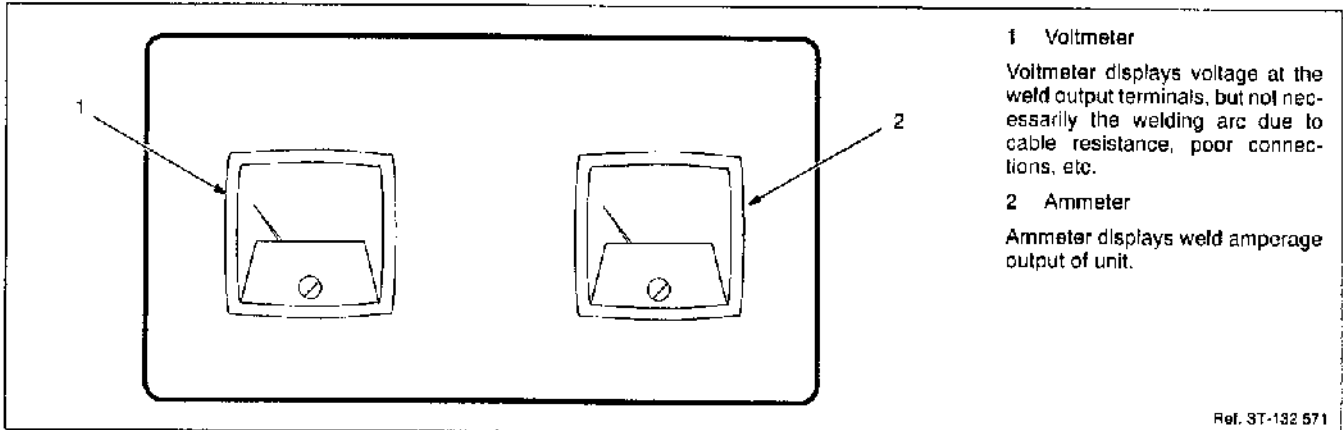


Figure 4-4. Ammeter And Voltmeter

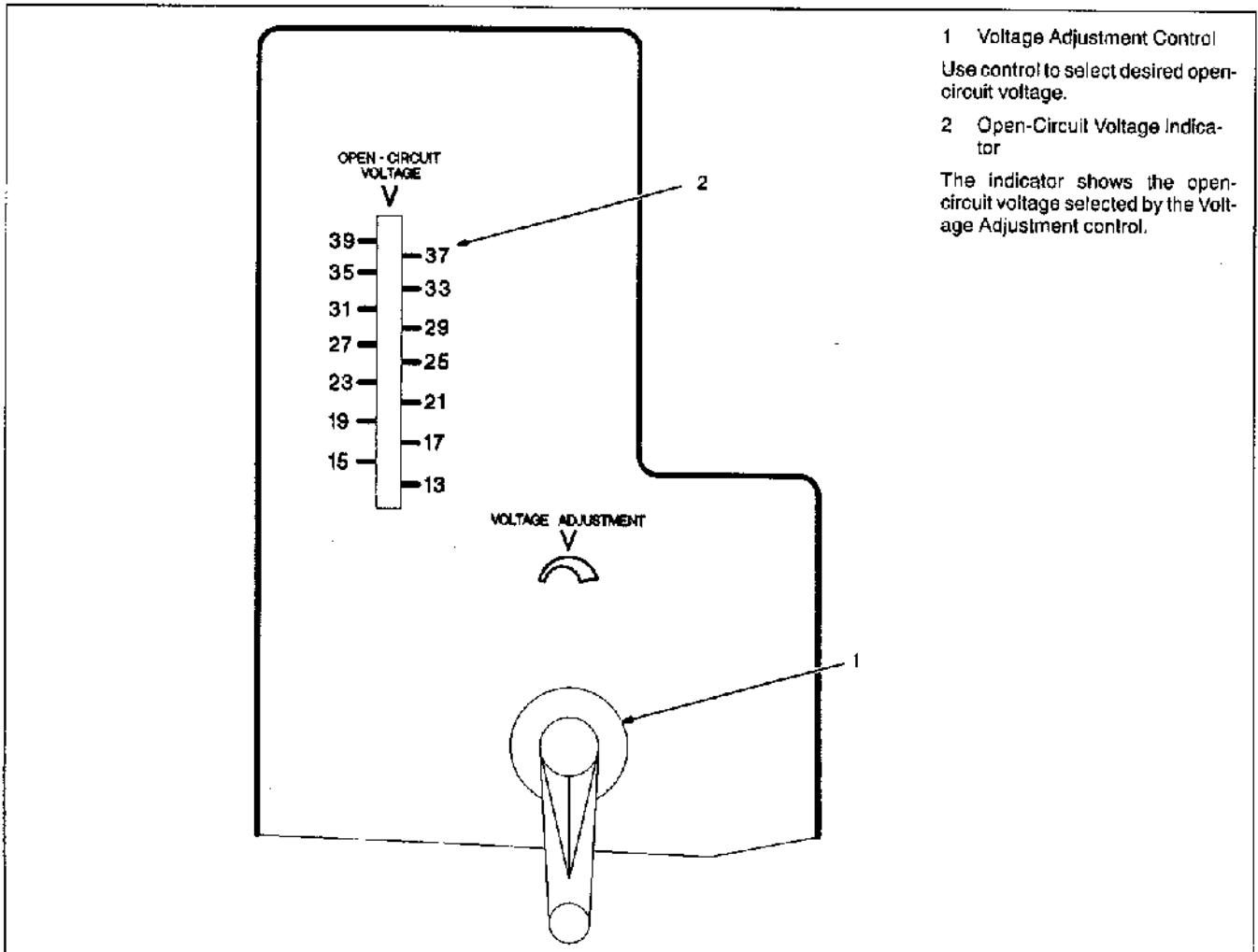


Figure 4-5. Voltage Adjustment Control And Open-Circuit Voltage Indicator

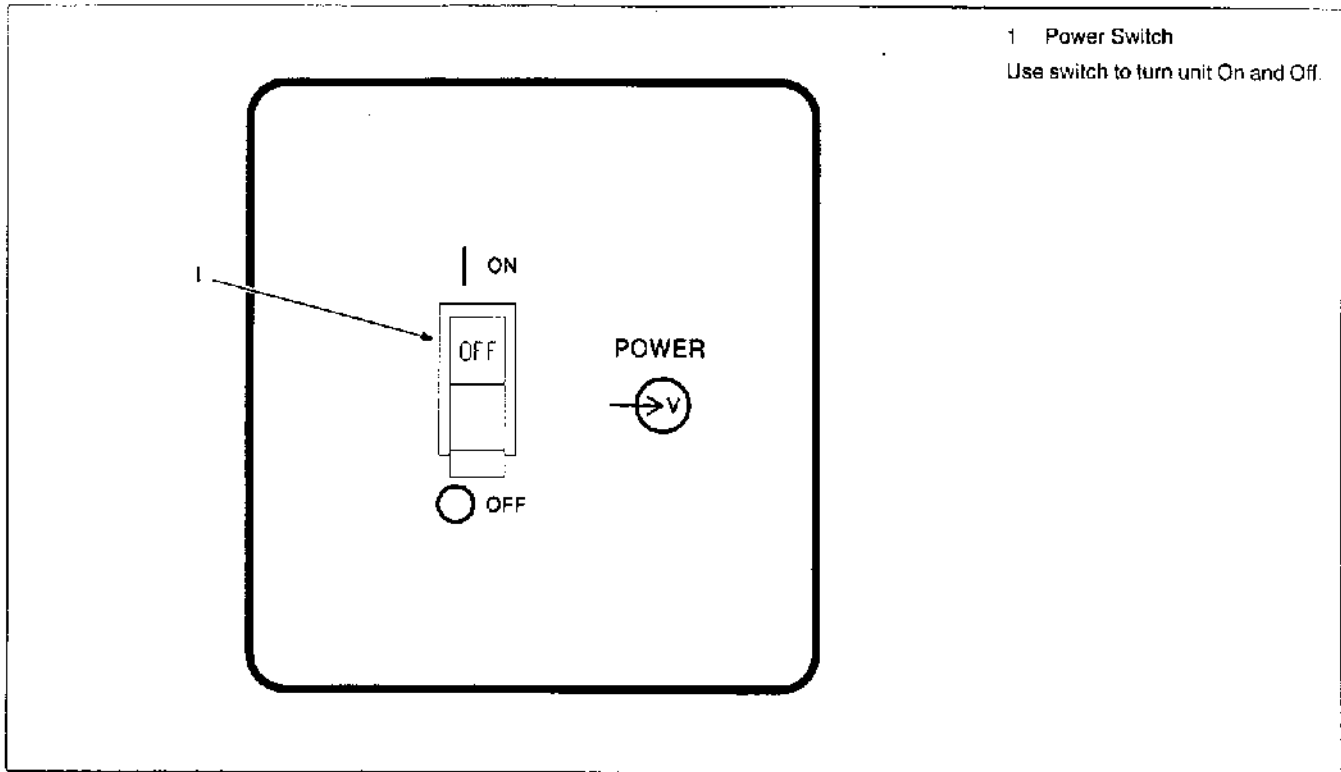


Figure 4-6. Power Switch

**WARNING**

**BUILDUP OF SHIELDING GAS** can harm health or kill.

- Shut off shielding gas supply when not in use.

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- Shielding Gas Cylinder
- Valve
- Gun Trigger

Open valve on cylinder just before welding.

Gun trigger turns weld output and gas flow on and off.

Close valve on cylinder when finished welding.

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Figure 4-7. Shielding Gas

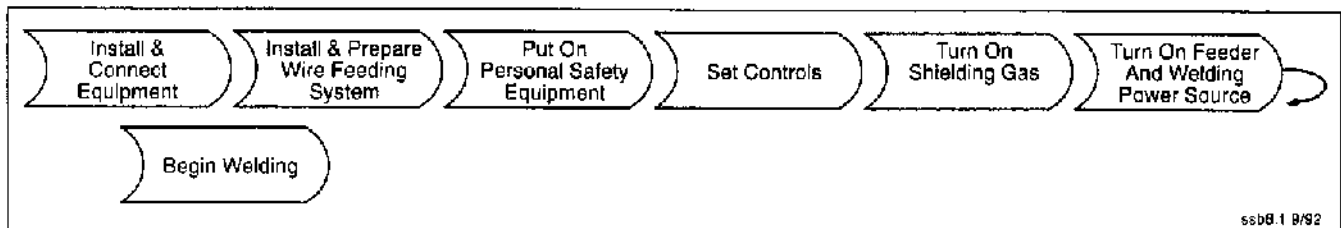






Figure 4-8. Sequence Of Gas Metal Arc Welding (GMAW)

# 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> </ul>	 <p><b>MOVING PARTS can cause injury.</b></p> <ul style="list-style-type: none"> <li>Keep away from moving parts.</li> </ul>
 <p><b>HOT PARTS can cause severe burns.</b></p> <ul style="list-style-type: none"> <li>Allow cooling period before maintaining or servicing.</li> </ul>	<p>Maintenance and troubleshooting to be performed only by qualified persons.</p> <p style="text-align: right; font-size: small;">swarn8.1* 10/91</p>

## 5-1. Routine Maintenance

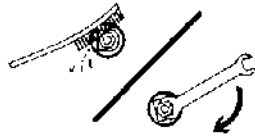
**3 Months**



Tape Or Replace Cracked Cables




Replace Unreadable Labels




Clean And Tighten Weld Terminals

**⚠ Turn Off all power before maintaining.**

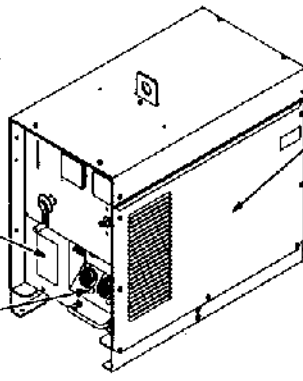
**6 Months**



OR



Blow Out Or Vacuum Inside



ST-119 477-A

Figure 5-1. Routine Maintenance

## 5-2. Troubleshooting


<b>⚠ WARNING</b>		<p><b>READ SAFETY BLOCKS</b> at start of Section 5 before proceeding.</p>
------------------	---	---

Table 5-1. Welding Trouble

Trouble	Remedy	Section
Completely inoperative; fan does not run.	Place line disconnect switch in the On position.	---
	Check and replace open line fuse(s).	---
	Check for proper jumper link positions.	3-6A
	Check for proper input connections.	3-6B
No weld output; fan motor FM running.	Reset circuit breakers CB1 and/or CB2, if necessary.	3-5
	Check and replace contactor W, if necessary.	---
	Check and replace control relay CR1, if necessary.	---

Trouble	Remedy	Section
Excessive line current; line fuse(s) and/or circuit breaker(s) open repeatedly.	Check for proper input connections.	3-6B
	Check for proper jumper link positions.	3-6A
Weld output available; fan does not run.	Check fan motor FM and replace, if necessary.	---
	Check for and remove anything blocking fan blades.	---
Fan runs slowly.	Check for proper jumper link positions.	3-6A
Limited output and low open-circuit voltage.	Check and replace open line fuse(s).	3-6B
	Check for proper input connections.	3-6B
	Check for proper jumper link positions.	3-6A
Erratic or improper weld output.	Check for proper jumper link positions.	3-6A
	Check for proper input connections.	3-8B
	Select correct size weld cables according to Table 3-1.	3-3
	Clean and tighten weld cable connections.	3-3
	Have Factory Authorized Service Station adjust brush contact on slide wire.	---
	Install wire feeder according to it's Owner's Manual.	---
No 115 volts ac output at Remote 14 receptacle RC1.	Reset circuit breaker CB1, if necessary.	3-5
No 24 volts ac output at Remote 14 receptacle RC1.	Reset circuit breaker CB2, if necessary.	3-5

# NOTES



# SECTION 6 – ELECTRICAL DIAGRAMS

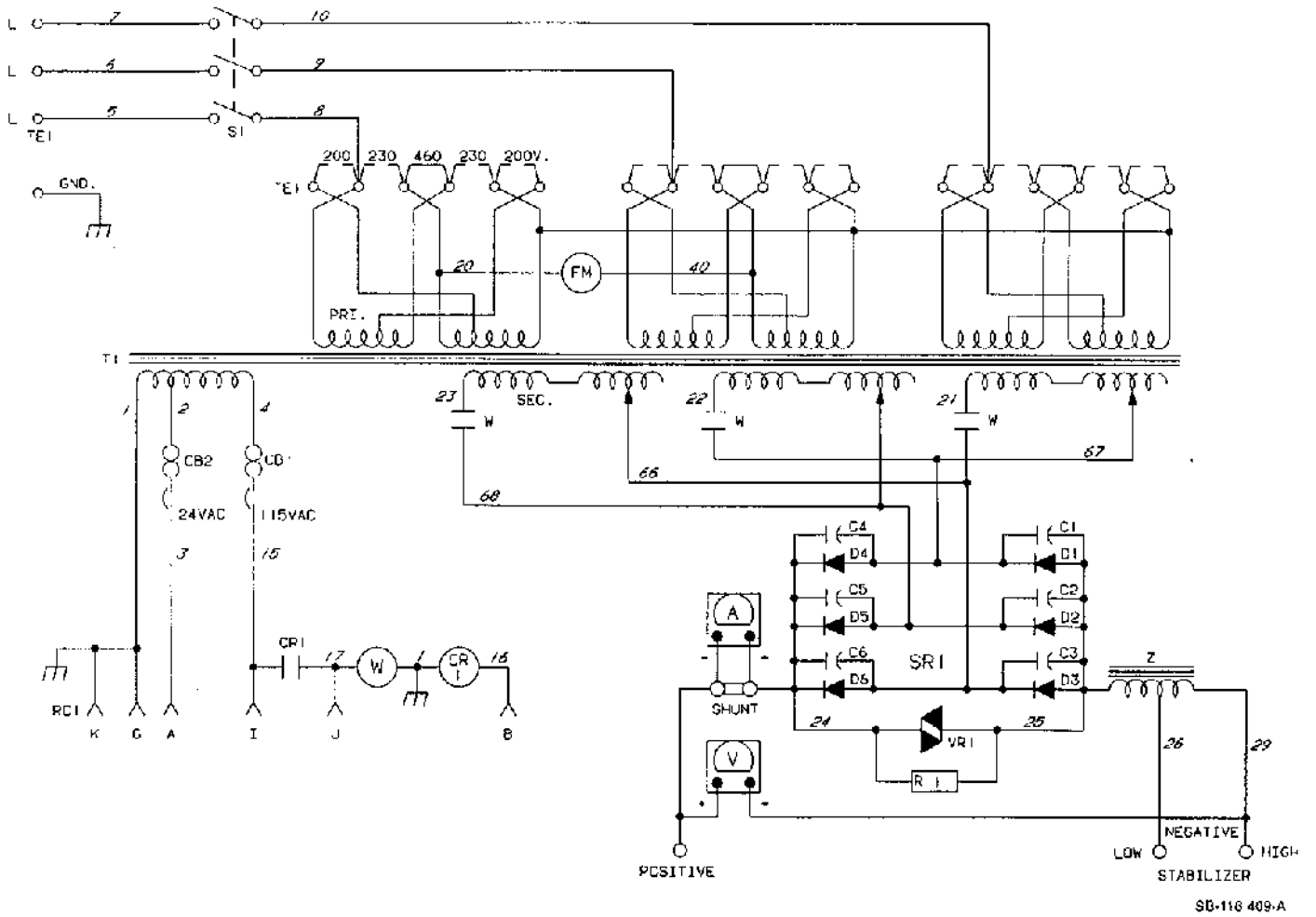


Figure 6-1. Circuit Diagram For Welding Power Source

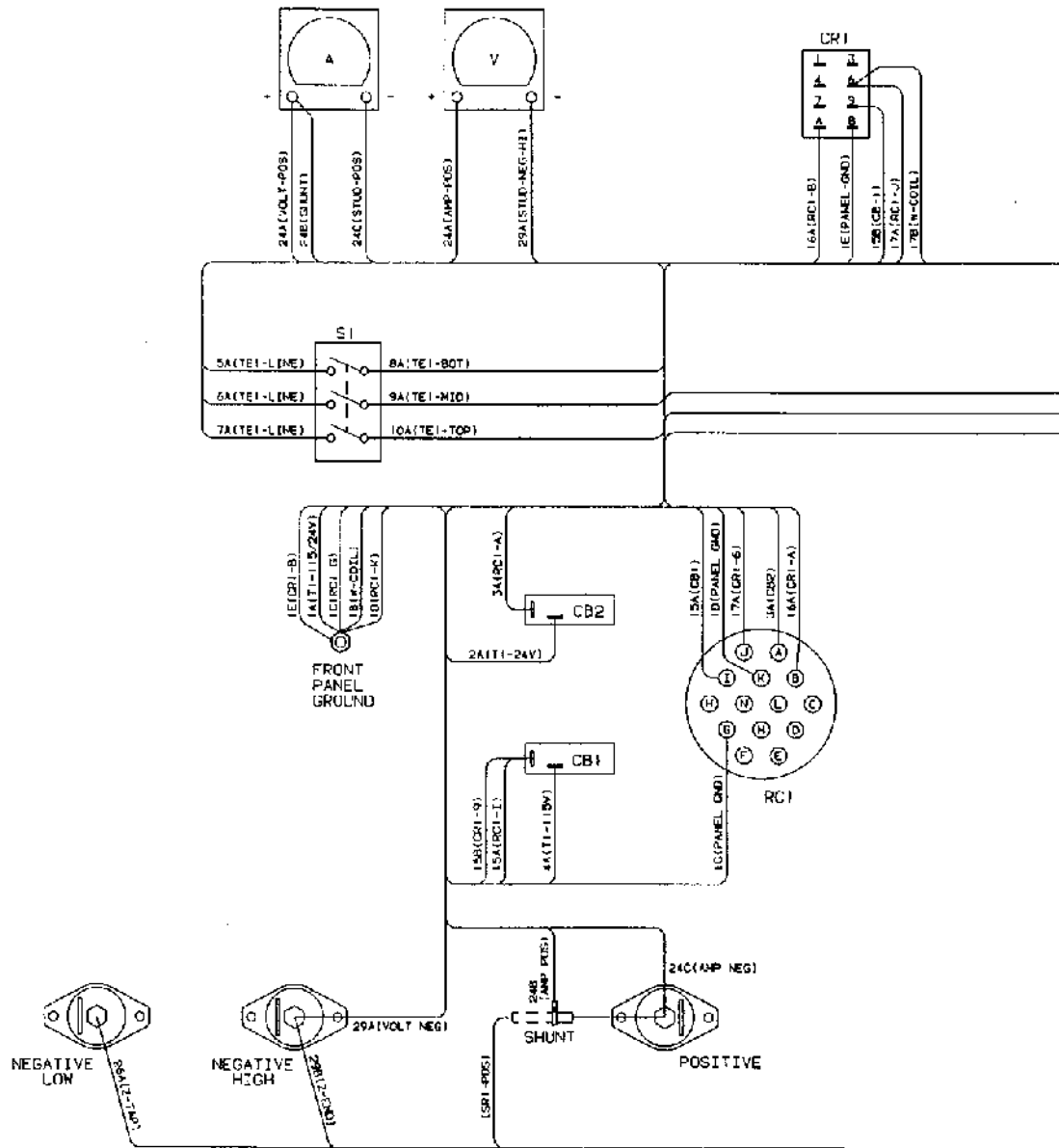
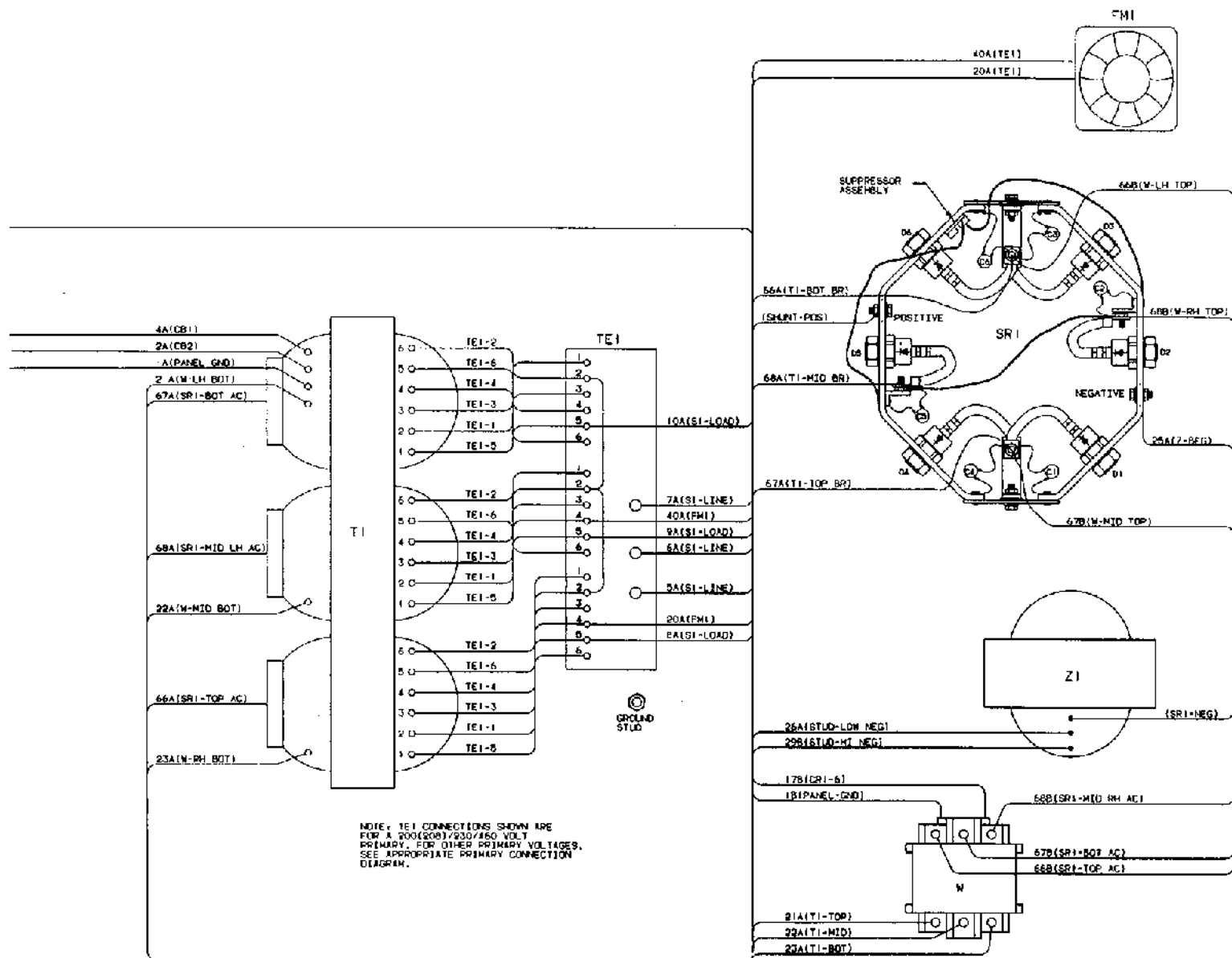


Figure 6-2. Wiring Diagram For Welding Power Source



# SECTION 7 – PARTS LIST

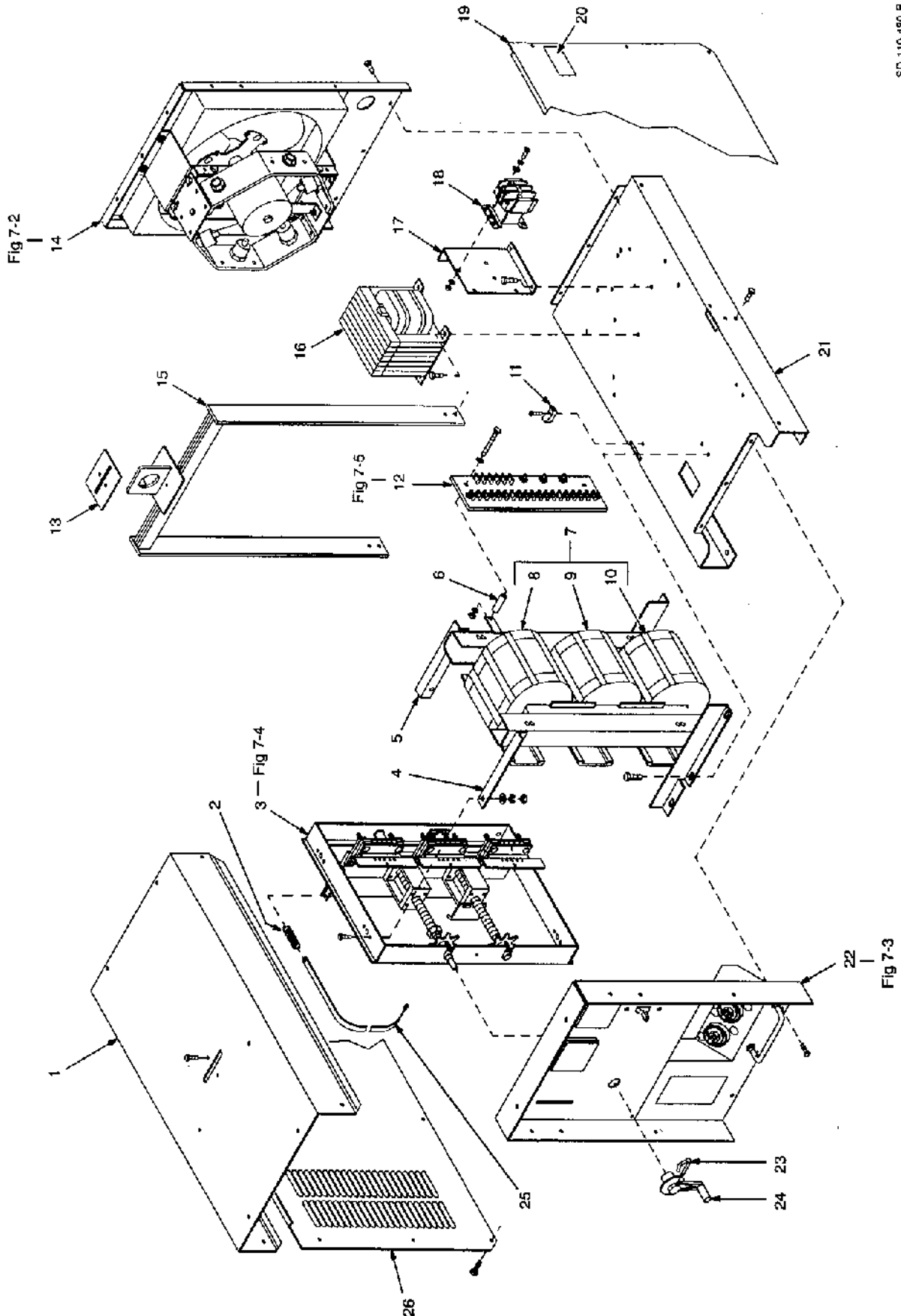
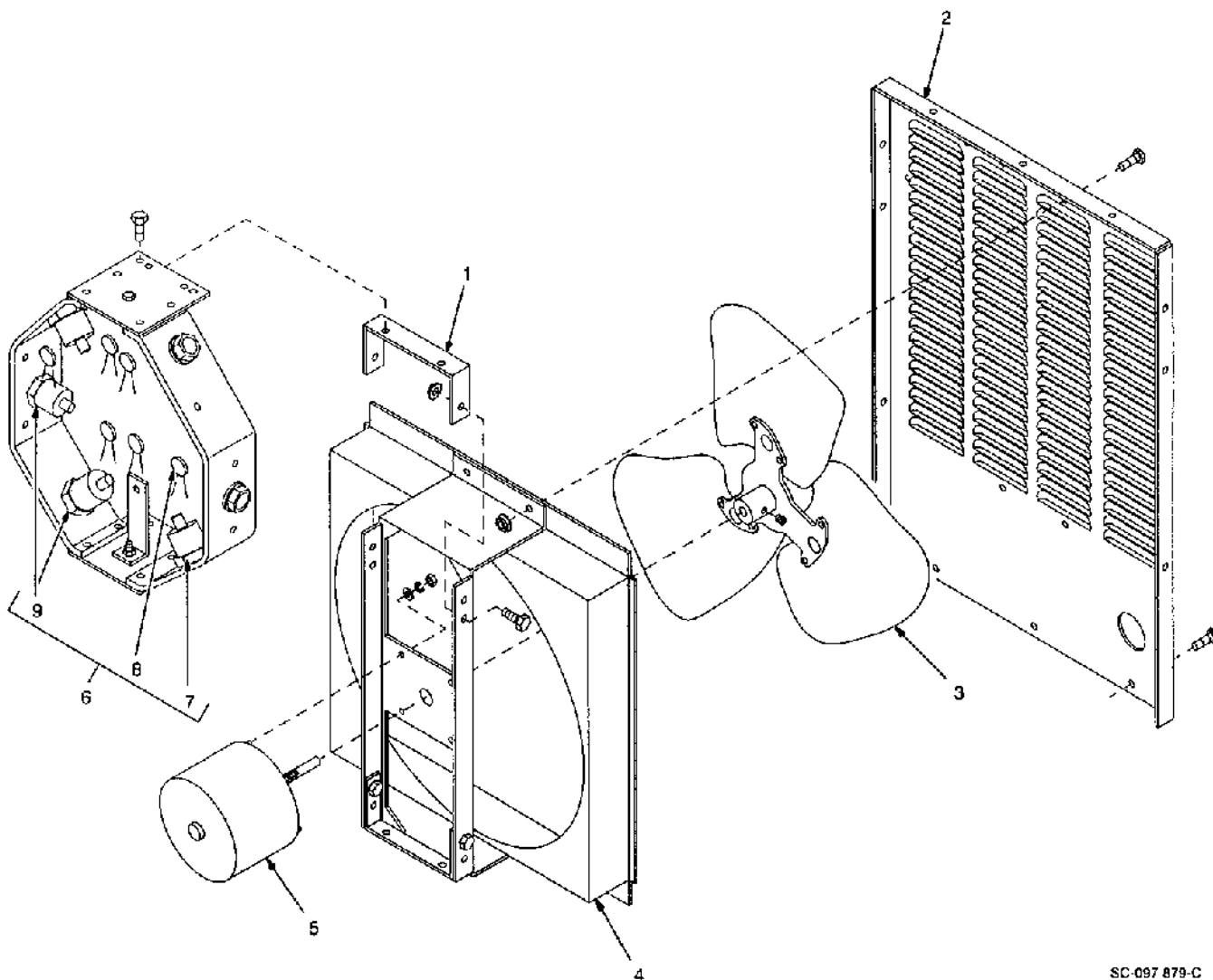


Figure 7-1. Main Assembly

Item No.	Dia. Mkgs.	Part No.	Description	Quantity	
				200 Amp	300 Amp
<b>Figure 7-1. Main Assembly</b>					
1		128 402	COVER, top	1	1
2		010 615	SPRING	1	1
3		115 133	RIGGING ASSEMBLY, brush (Fig 7-4)	1	
3		113 853	RIGGING ASSEMBLY, brush (Fig 7-4)		1
4		094 409	FRAME, front support transformer	1	1
		010 908	SCREW, cap stl hexhd .375-16 x 2.570 (mtg transformer)	4	4
		602 213	WASHER, lock stl split .375	4	4
		601 872	NUT, stl hex full fnsh .375-16	4	4
5		094 408	FRAME, rear support transformer	1	1
6		010 957	TUBING, stl .500 OD x 17ga wall x 1.750	2	2
7	T1	115 893	TRANSFORMER, pwr main (200/230/460) (consisting of)	1	
8		115 482	COIL, pri/sec top	1	
9		115 483	COIL, pri/sec center	1	
10		115 484	COIL, pri/sec bottom	1	
7	T1	117 536	TRANSFORMER, pwr main (208/230/575) (consisting of)	1	
8		116 901	COIL, pri/sec top	1	
9		116 902	COIL, pri/sec center	1	
10		116 903	COIL, pri/sec bottom	1	
7	T1	117 619	TRANSFORMER, pwr main (230/380) (consisting of)	1	
8		116 898	COIL, pri/sec top	1	
9		116 899	COIL, pri/sec center	1	
10		116 900	COIL, pri/sec bottom	1	
7	T1	117 655	TRANSFORMER, pwr main (380/520) (consisting of)	1	
8		116 895	COIL, pri/sec top	1	
9		116 896	COIL, pri/sec center	1	
10		116 897	COIL, pri/sec bottom	1	
7	T1	158 024	TRANSFORMER, pwr main (200/230/460) (consisting of)	1	
8		115 481	COIL, pri/sec top	1	
9		099 244	COIL, pri/sec center	1	
10		099 245	COIL, pri/sec bottom	1	
7	T1	158 025	TRANSFORMER, pwr main (220/380/415) (consisting of)	1	
8		131 525	COIL, pri/sec top	1	
9		131 524	COIL, pri/sec center	1	
10		131 523	COIL, pri/sec bottom	1	
7	T1	158 026	TRANSFORMER, pwr main (380/520) (consisting of)	1	
8		117 067	COIL, pri/sec top	1	
9		098 912	COIL, pri/sec center	1	
10		098 913	COIL, pri/sec bottom	1	
7	T1	158 027	TRANSFORMER, pwr main (460/575) (consisting of)	1	
8		117 068	COIL, pri/sec top	1	
9		099 247	COIL, pri/sec center	1	
10		099 248	COIL, pri/sec bottom	1	
11		117 573	CABLE TIE MOUNT, for lashing	1	1
12	TE1	008 222	TERMINAL ASSEMBLY, pri (dual voltage) (Fig 7-5)	1	1
12	TE1	038 138	TERMINAL ASSEMBLY, pri (200/230/460) (Fig 7-5)	1	1
12	TE1	085 035	TERMINAL ASSEMBLY, pri (208/230/575) (220/380/415) (Fig 7-5)	1	1
13		137 918	GASKET, lifting eye cover	1	1
14		Fig 7-2	PANEL, rear w/components	1	1
		010 323	CLAMP, hose .250-.625 clp dia	1	1
15		142 499	FRAME, lifting	1	1
16	Z	036 585	STABILIZER	1	1
17		087 796	BRACKET, mtg capacitor	1	1
18	W	605 855	CONTACTOR, def prp 40A 3P 120V (consisting of)	1	
		032 349	COIL, cntor 120VAC 40A	1	
18	W	114 780	CONTACTOR, def prp 60A 3P 115V (consisting of)		1
		114 787	COIL, cntor 115V 60A		1
19		+032 770	PANEL, RH side	1	1
20		109 035	LABEL, warning electric shock can kill	1	1
21		142 498	BASE	1	1
22		Fig 7-3	PANEL, front w/components	1	1
23		009 926	PIN, handle current control	1	1
24		009 433	HANDLE, control current	1	1
25		113 921	BAND, indicator	1	1
26		032 769	PANEL, LH side	1	1

+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.**

Item No.	Dia. Mkgs.	Part No.	Description	Quantity
<b>Figure 7-2. Panel, Rear w/Components (Fig 7-1 Item 14)</b>				
1		087 462	BRACKET, mtg rectifier	2
2		087 797	PANEL, rear	1
3		032 611	BLADE, fan 14 in 3wg 23deg	1
4		124 275	CHAMBER, plenum 14 in	1
5	FM	116 190	MOTOR, 1/12hp 230V 1550RPM	1
6	SR1	087 463	RECTIFIER, si diode (consisting of)	1
7		037 957	DIODE, rect 275A 300V RP	3
8	C1-6	031 689	CAPACITOR, rectifier	6
9		037 956	DIODE, rect 275A 300V SP	3
	R1,VR1	046 819	SUPPRESSOR	1



SC-097 879-C

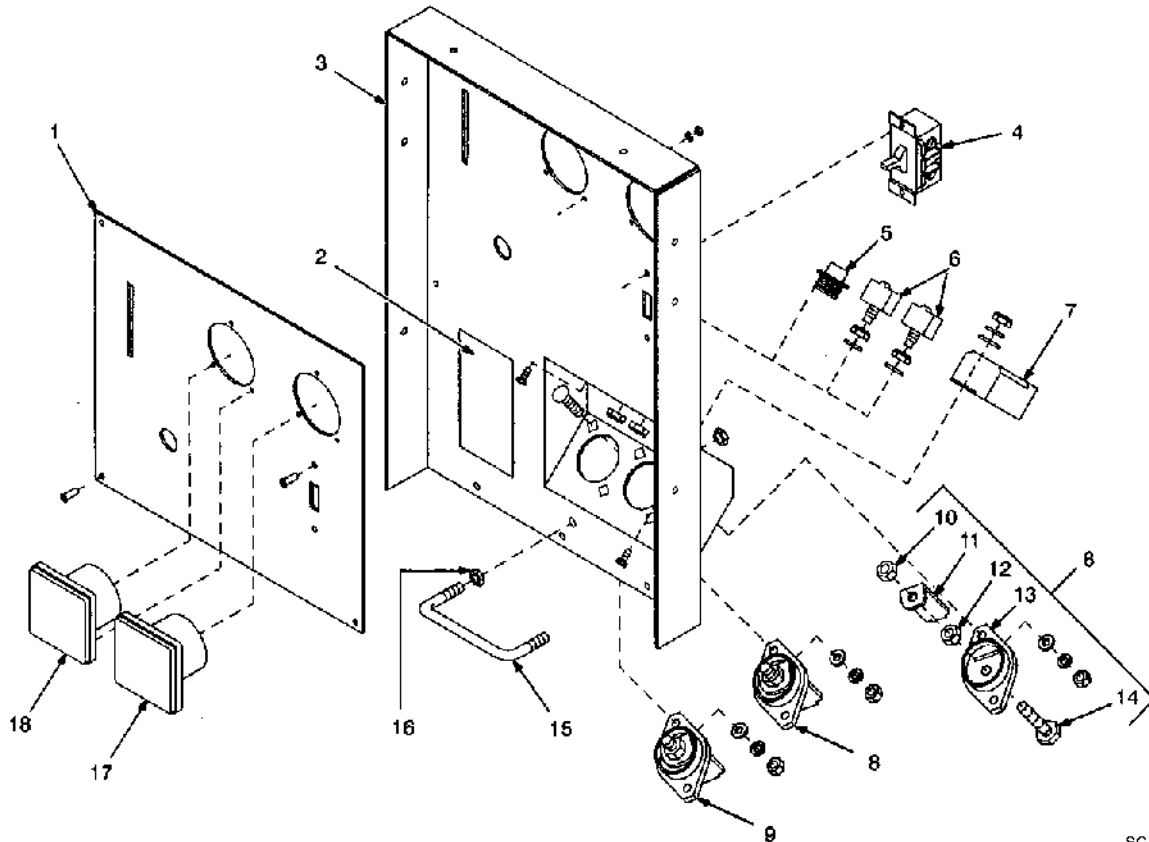
**Figure 7-2. Panel, Rear w/Components**

BE SURE TO PROVIDE MODEL AND SERIAL NUMBER WHEN ORDERING REPLACEMENT PARTS.

Item No.	Dia. Mkgs.	Part No.	Description	Quantity
----------	------------	----------	-------------	----------

Figure 7-3. Panel, Front w/Components (Fig 7-1 Item 22)

1			NAMEPLATE, (order by model and serial number)	1
2		134 464	LABEL, warning general precautionary	1
3		+112 226	PANEL, front	1
4	S1	128 756	SWITCH, tgl 3PST 40A 600VAC	1
5	RC1	143 976	CONNECTOR w/TERMINALS, (consisting of)	1
		079 534	CONNECTOR, circ skt push-in 14-18ga Amp 66358-6	14
		134 734	CONNECTOR, circ 14 pin plug Amp 213571-2	
		134 731	CONNECTOR, circ pin push-in 14-18ga Amp 213603-1	
		079 739	CONNECTOR, circ clamp str rlf Amp 206322-2	
6	CB1,2	083 432	CIRCUIT BREAKER, man reset 1P 10A 250V	2
7	CR1	006 393	RELAY, encl 24VAC DPDT	1
8		039 046	TERMINAL, pwr output black (consisting of)	2
9		039 047	TERMINAL, pwr output red (consisting of)	1
10		601 879	NUT, stl hex full fnsh .500-13	1
11		039 044	BUS BAR	1
12		601 880	NUT, stl hex jam .500-13	1
13		039 045	TERMINAL BOARD, black	1
13		039 049	TERMINAL BOARD, red	1
14		601 976	SCREW, cap stl hexhd .500-13 x 1.500	1
15		010 828	HANDLE	1
16		601 871	NUT, stl hex jam .375-16	4
		602 221	WASHER, lock stl intl tooth .375	4
17	A	121 207	METER, amp dc 50MV 0-300 scale (200A)	1
17	A	118 901	METER, amp dc 50MV 0-500 scale (300A)	1
18	V	118 902	METER, volt dc 0-50 scale	1



SC-119 478-A

Figure 7-3. Panel, Front w/Components

+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.**

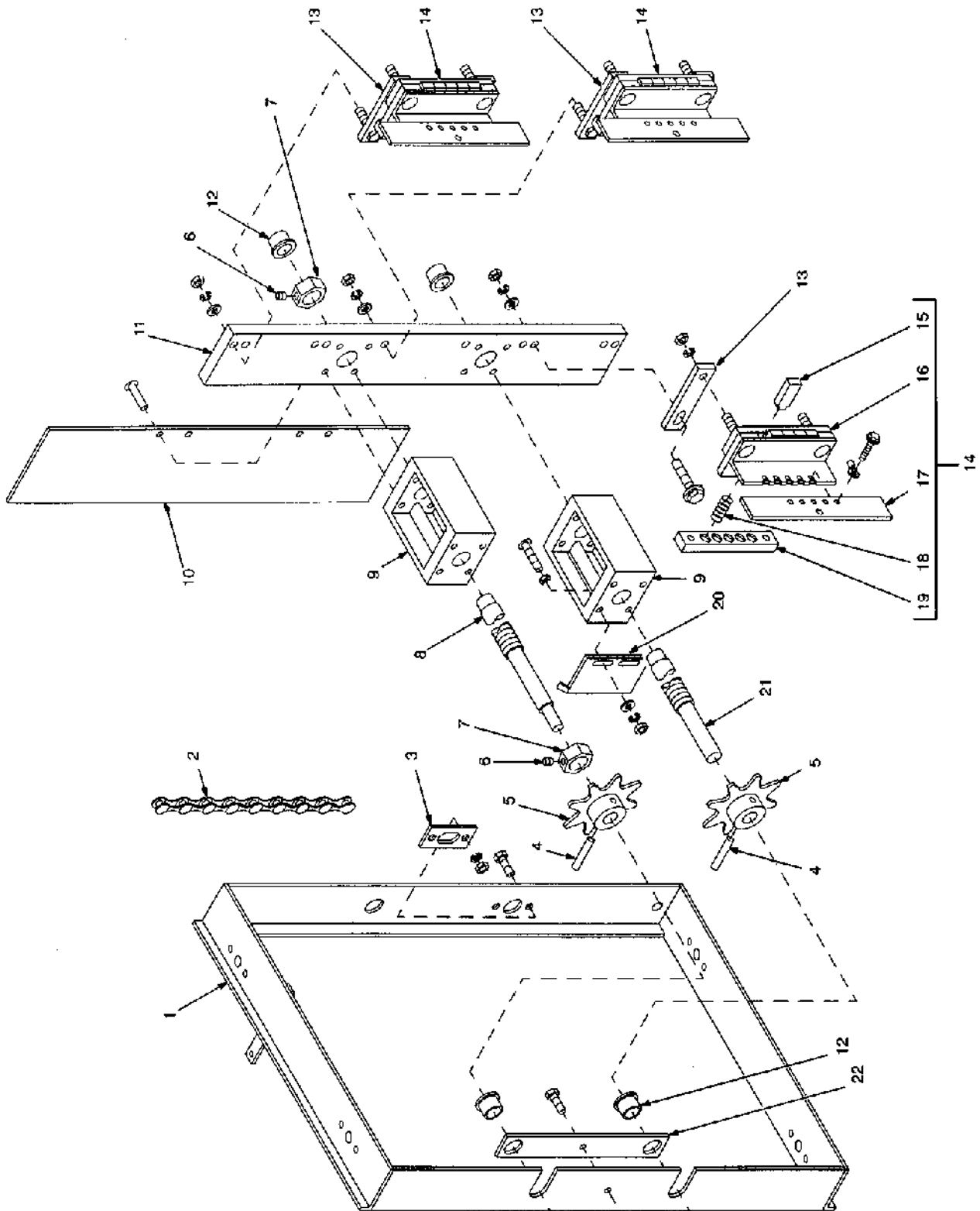


Figure 7-4. Rigging Assembly, Brush

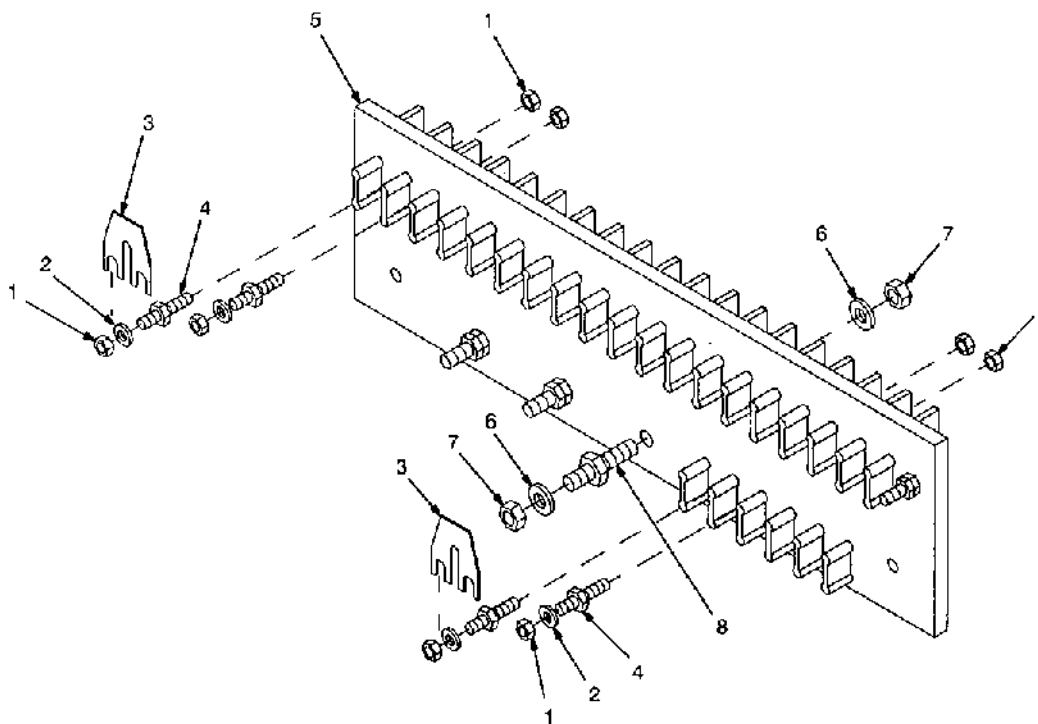


Item No.	Part No.	Description	Quantity	
			Model	
			200 Amp	300 Amp
<b>Figure 7-4. Rigging Assembly, Brush (Fig 7-1 Item 3)</b>			115 133	113 853
1	094 407	FRAME, brush rigging	1	1
2	024 843	CHAIN, roller No. 65 1/8 x 38 pitches	1	1
3	149 516	PLATE, lead screw	1	1
4	010 660	PIN, spring CS .125 x 1.125	2	2
5	024 620	SPROCKET, w/1/8 hole	2	2
6	602 177	SCREW, set stl sch .250-20 x .250	4	4
7	024 622	NUT, stop .625	2	2
8	094 454	SCREW, lead	1	1
9	010 011	COLUMN	2	2
10	087 791	BAFFLE, air	1	1
11	087 792	MOUNTING BOARD, brushholder	1	1
12	604 321	BEARING, flg oil imprg .500 ID	4	4
13	018 645	BAR, spacing brushholder	6	6
14	059 910	BRUSH SET, electrical slope (consisting of)	3	
14	072 041	BRUSH SET, electrical slope (consisting of)		3
15	*125 619	BRUSH, contact	5	
15	*044 856	BRUSH, contact		5
16	059 911	HOLDER, brush	1	1
17	018 637	BUS BAR	1	
17	044 849	BUS BAR		1
18	018 606	SPRING	5	5
19	018 638	CONTAINER, brush	1	1
20	113 922	BRACKET, indicator	1	1
21	032 780	SCREW, lead	1	1
22	094 661	RETAINER, screw lead	1	1

\*Recommended Spare Parts.

BE SURE TO PROVIDE MODEL AND SERIAL NUMBER WHEN ORDERING REPLACEMENT PARTS.

Item No.	Part No.	Description	Quantity		
<b>Figure 7-5. Terminal Assembly, Primary (Fig 7-1 Item 12)</b>			008 222	038 138	085 035
1	601 835	NUT, brs hex 10-32	18	36	30
2	010 913	WASHER, flat brs .218 ID x .460 OD x .031thk	9	18	15
3	038 618	LINK, jumper term bd pri	3	6	3
4	038 887	STUD, pri bd brs 10-32 x 1.375	9	18	15
5	038 058	TERMINAL BOARD, pri	1	1	1
6	010 915	WASHER, flat brs .250 ID x .650 OD x .031thk	6	6	6
7	601 836	NUT, brs hex .250-20 jam hvy	6	6	6
8	038 888	STUD, pri bd brs .250-20 x 1.500	3	3	3



3C-138 575

Figure 7-5. Terminal Assembly, Primary

## OPTIONS AND ACCESSORIES

### SCR CONTACTOR KIT

For 200/230/460 models.

CP-300 (#042 178)

CP-200 (#042 177)

Solid-state contactor recommended for use with high-cycle operations such as MIG spot. Replaces regular contactor, factory installed only.

### METER CALIBRATION

(#041 770 Factory)

Two analog meters.

### ADAPTER CORD

(#041 948)

1 ft. (305 m) cord with 14-pin Amphenol plug and 2-pin and 3-pin Hubbell connection. (connects power source to standard (non-digital) Miller wire feeder interconnecting cord.)

### SUGGESTED WIRE FEEDERS

S-21E and S-22A Index No. M/6.8

Spoolmatic™ 3 Gun Index No. M/1.1

XR™ -15 and XR™ -30 Index No. M/1.5

S-60 and D-60 Index No. M/2.0

For complete wire feeder information ask for the catalog sheet listed.

### NO. 23 RUNNING GEAR

(#042 413)

Includes two 8 in. (203 mm) wheels and two 4 in. (102 mm) casters and a two-compartment rack for gas cylinder(s) or Watermate™ coolant system.

### NO. 18 RUNNING GEAR

(#041 579)

Four 8 in. (203 mm) poly/rubber blend wheels with 30 in. (762 mm) towing handle.