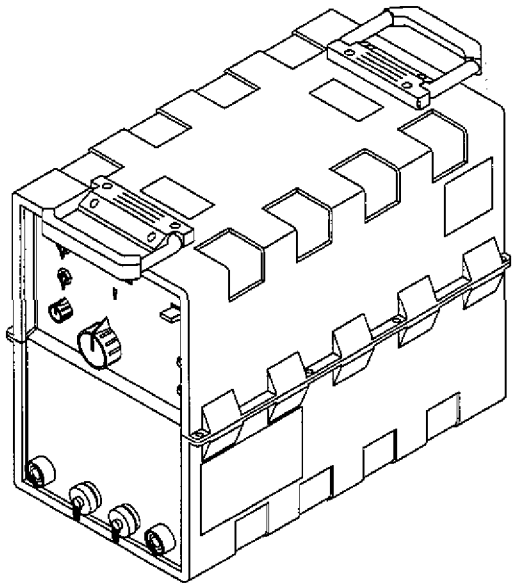
Miller®

November 1995 Form: OM-2205L

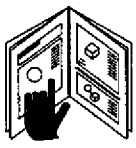
Effective With Serial No. KG017632

OWNER'S MANUAL

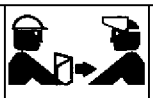


XMT® 300 CC/CV

- CC/CV DC Welding Power Source
- For GMAW, GMAW-P, FCAW, GTAW, GTAW-P, And SMAW Welding
- 300 Amperes, 32 Volts DC At 60% Duty Cycle
- Uses Single-Phase Or Three-Phase Input Power
- Protection For Control Circuit, 24 VAC, 115 VAC, And Overheating
- AUTO-LINK™ Circuitry
- 14 And 17-Pin Remote Control Receptacles
- For Options And Accessories, See Rear Cover



- 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, 1995
(Equipment with a serial number preface of "KD" 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 a North American distributor or eighteen months after the equipment is sent to an International distributor.

1. 5 Years Parts – 3 Years Labor
   * Original main power rectifiers
   * Inverters (input and output rectifiers only)
2. 3 Years — Parts and Labor
   * Transformer/Rectifier Power Sources
   * Plasma Arc Cutting Power Sources
   * Semi-Automatic and Automatic Wire Feeders
   * Inverter Power Supplies
   * Intellitigs
   * Robots
3. 2 Years — Parts and Labor
   * Engine Driven Welding Generators
     (NOTE: Engines are warranted separately by the engine manufacturer.)
   * Air Compressors
4. 1 Year — Parts and Labor
   * Motor Driven Guns
   * Process Controllers
   * IHPS Power Sources
   * Water Coolant Systems
   * HF Units
   * Grids
   * Spot Welders
   * Load Banks
   * SDX Transformers
   * Running Gear/Trailers
   * Plasma Cutting Torches (except APT, ZIPCUT & PLAZCUT Models)
   * Tecumseh Engines
   * Deutz Engines (outside North America)
   * 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
   * APT, ZIPCUT & PLAZCUT Model 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 _____

ARC WELDING SAFETY PRECAUTIONS

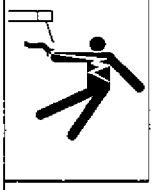
⚠ WARNING

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.

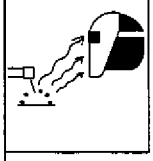
HAVE ALL INSTALLATION, OPERATION, MAINTENANCE, AND REPAIR WORK PERFORMED ONLY BY QUALIFIED PEOPLE.



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 semiautomatic 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 big enough to prevent any physical contact with the work or ground.
4. Disconnect input power or stop engine before installing or servicing this equipment. Lockout/tagout input power according to OSHA 29 CFR 1910.147 (see Safety Standards).
5. Properly install and ground this equipment according to its Owner's Manual and national, state, and local codes.
6. Always verify the supply ground – check and be sure that input power cord ground wire is properly connected to ground terminal in disconnect box or that cord plug is connected to a properly grounded receptacle outlet.
7. When making input connections, attach proper grounding conductor first – double-check connections.
8. Frequently inspect input power cord for damage or bare wiring – replace cord immediately if damaged – bare wiring can kill.
9. Turn off all equipment when not in use.
10. Do not use worn, damaged, undersized, or poorly spliced cables.
11. Do not drape cables over your body.
12. If earth grounding of the workpiece is required, ground it directly with a separate cable – do not use work clamp or work cable.
13. Do not touch electrode if you are in contact with the work, ground, or another electrode from a different machine.
14. Use only well-maintained equipment. Repair or replace damaged parts at once. Maintain unit according to manual.
15. Wear a safety harness if working above floor level.
16. Keep all panels and covers securely in place.
17. Clamp work cable with good metal-to-metal contact to workpiece or worktable as near the weld as practical.



ARC RAYS can burn eyes and skin; NOISE can damage hearing; FLYING SLAG OR SPARKS can injure eyes.

Arc rays from the welding process produce intense visible and invisible (ultraviolet and infrared) rays that can burn eyes and skin. Noise from some processes can damage hearing. Chipping, grinding, and welds cooling throw off pieces of metal or slag.

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 to protect your face and eyes when welding or watching (see ANSI Z49.1 and Z87.1 listed in Safety Standards).
3. Wear approved safety glasses with side shields.
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, cleaners, and degreasers.
5. Work in a confined space only if it is well ventilated, or while wearing an air-supplied respirator. Always have a trained watchperson nearby. Welding fumes and gases can displace air and lower the oxygen level 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.

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, slag, open flames, sparks, and arcs.
2. Install cylinders in an upright position by securing to a stationary support or cylinder rack to prevent falling or tipping.
3. Keep cylinders away from any welding or other electrical circuits.
4. Never drape a welding torch over a gas cylinder.
5. Never allow a welding electrode to touch any cylinder.
6. Never weld on a pressurized cylinder – explosion will result.
7. Use only correct shielding gas cylinders, regulators, hoses, and fittings designed for the specific application; maintain them and associated parts in good condition.
8. Turn face away from valve outlet when opening cylinder valve.
9. Keep protective cap in place over valve except when cylinder is in use or connected for use.
10. Read and follow instructions on compressed gas cylinders, associated equipment, and CGA publication P-1 listed in Safety Standards.

WELDING can cause fire or explosion.

Welding on closed containers, such as tanks, drums, or pipes, can cause them to blow up. Sparks can fly off from the welding arc. The flying sparks, hot workpiece, and hot equipment can cause fires and burns. Accidental contact of electrode to metal objects can cause sparks, explosion, overheating, or fire. Check and be sure the area is safe before doing any welding.

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, drums, or pipes, unless they are properly prepared according to AWS F4.1 (see Safety Standards).
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.
12. Remove any combustibles, such as a butane lighter or matches, from your person before doing any welding.

⚠ 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.

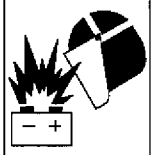
Engine fuel is highly flammable.

1. Stop engine and let it cool off before checking or adding fuel.
2. Do not add fuel while smoking or if unit is near any sparks or open flames.
3. Do not overfill tank – allow room for fuel to expand.
4. 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.

It is best to check coolant level when engine is cold to avoid scalding.

1. If the engine is warm and checking is needed, follow steps 2 and 3.
2. Wear safety glasses and gloves and put a rag over cap.
3. Turn cap slightly and let pressure escape slowly 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.

EMF INFORMATION

NOTE ☞ *Considerations About Welding And The Effects Of Low Frequency Electric And Magnetic Fields*

The following is a quotation from the General Conclusions Section of the U.S. Congress, Office of Technology Assessment, *Biological Effects of Power Frequency Electric & Magnetic Fields – Background Paper*, OTA-BP-E-53 (Washington, DC: U.S. Government Printing Office, May 1989): ". . . there is now a very large volume of scientific findings based on experiments at the cellular level and from studies with animals and people which clearly establish that low frequency magnetic fields can interact with, and produce changes in, biological systems. While most of this work is of very high quality, the results are complex. Current scientific understanding does not yet allow us to interpret the evidence in a single coherent framework. Even more frustrating, it does not yet allow us to draw definite conclusions about questions of possible risk or to offer clear science-based advice on strategies to minimize or avoid potential risks."

To reduce magnetic fields in the workplace, use the following procedures:

1. Keep cables close together by twisting or taping them.
2. Arrange cables to one side and away from the operator.
3. Do not coil or drape cables around the body.
4. Keep welding power source and cables as far away as practical.
5. Connect work clamp to workpiece as close to the weld as possible.

About Pacemakers:

The above procedures are among those also normally recommended for pacemaker wearers. Consult your doctor for complete information.

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SECTION 1 – SAFETY INFORMATION

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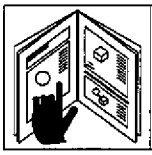
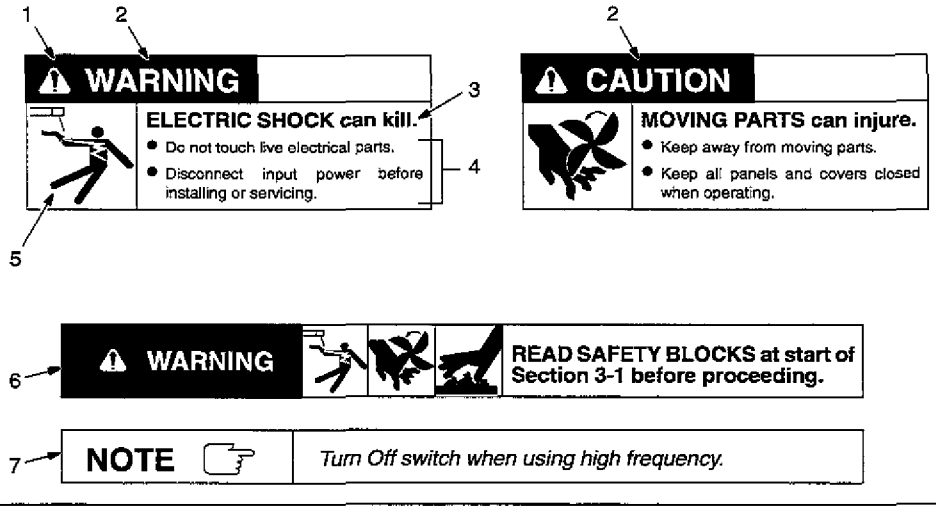


- Read all safety messages throughout this manual.
- Obey all safety messages to avoid injury.
- Learn the meaning of WARNING and CAUTION.



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 Current/Constant Voltage (CC/CV), Direct Current (DC)	
Welding Processes	Gas Metal Arc (GMAW), Gas Metal Arc - Pulsed (GMAW-P), Flux Cored Arc (FCAW), Gas Tungsten Arc (GTAW), Gas Tungsten Arc - Pulsed (GTAW-P), Shielded Metal Arc (SMAW) Welding	
Input Power Cord	12 ft (3.7 m)	
Overall Dimensions	Length: 21-3/4 in (522 mm); Width: 12 in (305 mm); Height: 17-3/8 in (441 mm)	
Weight	Net: 77 lb (35 kg); Ship: 82 lb (37 kg)	
	With Three-Phase Input	**With Single-Phase Input**
Rated Weld Output	300 Amperes, 32 Volts DC At 60% Duty Cycle (See Section 2-2)	225 Amperes, 29 Volts DC At 60% Duty Cycle (See Section 2-2)
Type Of Input	230, 460, Or 575 Volts AC; 50/60 Hz	230, 460, Or 575 Volts AC; 50/60 Hz
Input Amperes At Rated Output	42 A At 230 V, 21 A At 460 V, 16.4 A At 575 V	50.8 A At 230 V, 29 A At 460 V, 23.6 A At 575 V
Input Amperes While Idling (Fan Not Running)	1.2 A At 230 V, 0.6 A At 460 V, 0.6 A At 575 V	1.1 A At 230 V, 0.6 A At 460 V, 0.6 A At 575 V
KVA/KW Used At Rated Output	16.1 kVA/11.3 kW	12.8 kVA/7.8 kW
Voltage Range In CV Mode	10-36 Volts DC	10-36 Volts DC
Amperage Range In CC Mode	5-375 A	5-225 A
Max. Open-Circuit Voltage	80 Volts DC	80 Volts DC

2-1. Volt-Ampere Curves

The volt-ampere curves show the minimum and maximum voltage and amperage output capabilities of the welding power source. Curves of other settings fall between the curves shown.

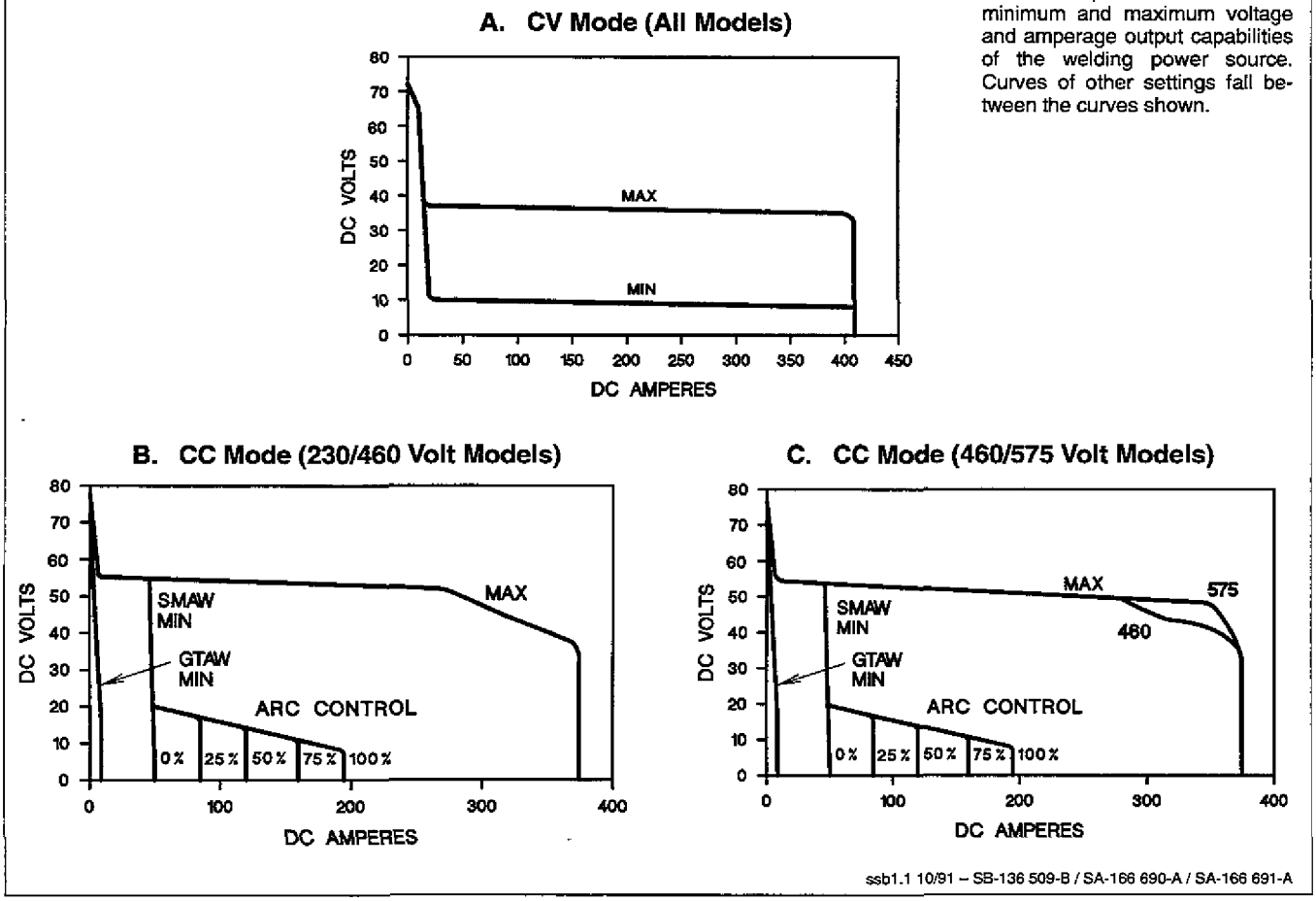


Figure 2-1. Volt-Ampere Curves

2-2. Duty Cycle

⚠ CAUTION

WELDING LONGER THAN RATED DUTY CYCLE can damage unit and void warranty.

- Do not weld at rated load longer than shown below.

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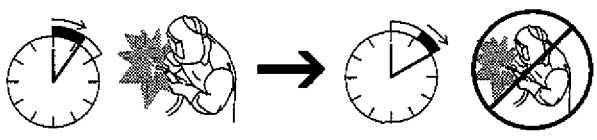
Definition

Duty Cycle is percentage of 10 minutes that unit can weld at rated load without overheating.

60% Duty Cycle:
At 300 Amperes With Three-Phase Input Power,
At 225 Amperes With Single-Phase Input Power



Chart

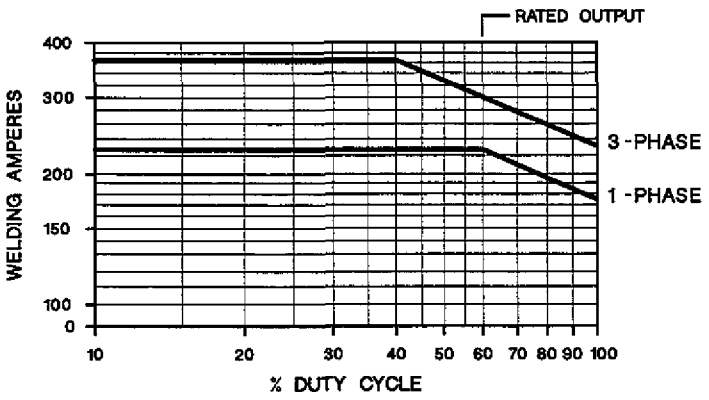


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Figure 2-2. Duty Cycle Chart

SECTION 3 – INSTALLATION

3-1. Typical Process Connections

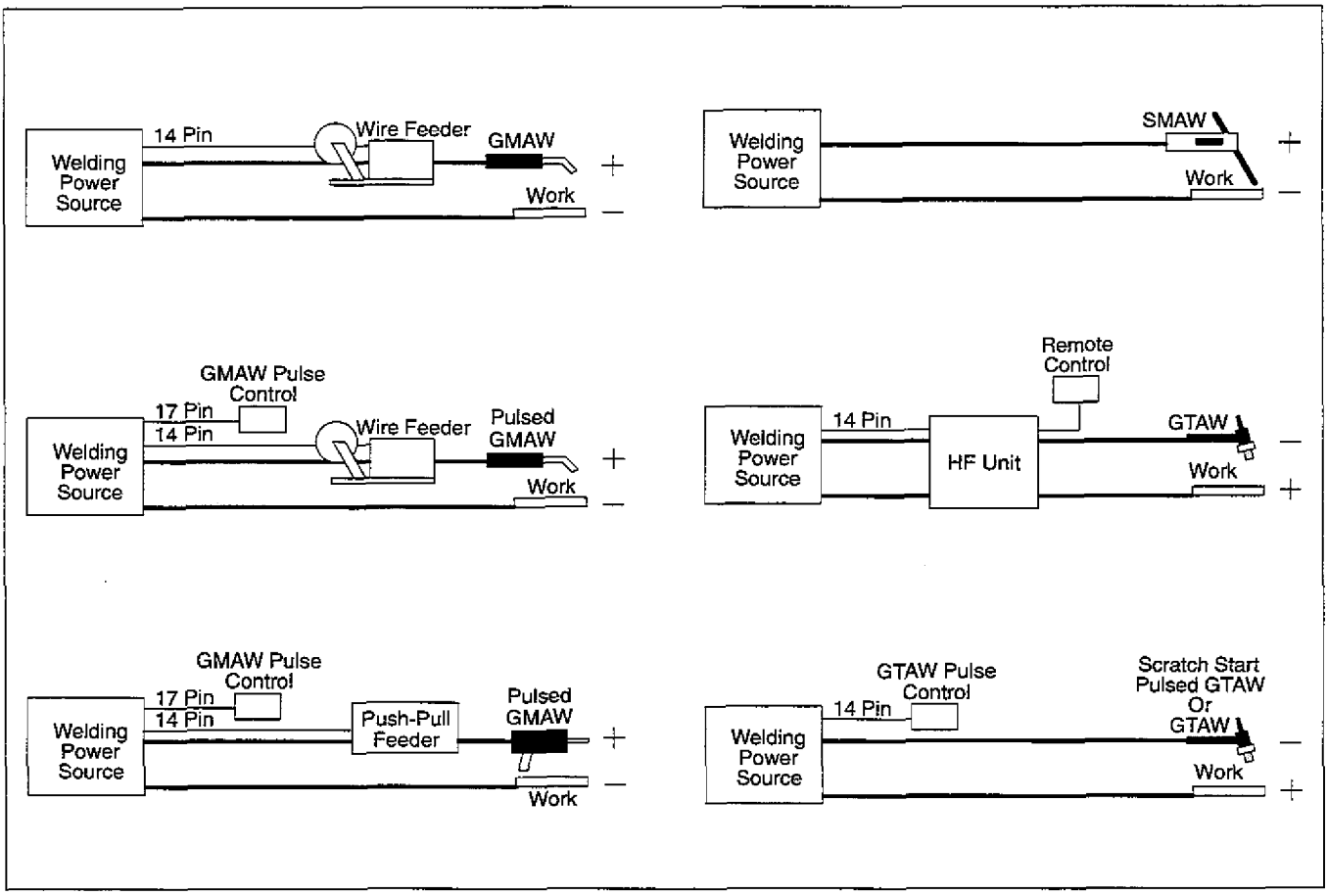


Figure 3-1. Typical Process Connections

3-2. Selecting A Location And Moving Welding Power Source

⚠ WARNING

ELECTRIC SHOCK can kill.

- Do not touch live electrical parts.
- Disconnect input power conductors from de-energized supply line BEFORE moving welding power source.

FIRE OR EXPLOSION can result from placing unit on, over, or near combustible surfaces.

- Do not locate unit on, over, or near combustible surfaces.
- Do not install unit near flammables.

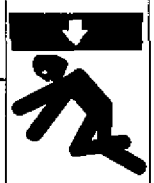
BLOCKED AIRFLOW causes overheating and possible damage to unit.

- Do not block airflow.
- Use only factory-approved filter.

Warranty is void if any unapproved filter is used.

FUMES can be hazardous; LACK OF FRESH AIR AND PROPER VENTILATION can be harmful.

- Do not breathe welding fumes.
- Place unit only where there is a good fresh air supply and proper ventilation.



FALLING EQUIPMENT can cause serious personal injury and equipment damage.

- Lift unit at handles.
- Have two persons of adequate physical strength lift unit.
- Move unit with hand cart or similar device of adequate capacity.
- If using a fork lift vehicle, secure unit on a proper skid before transporting.

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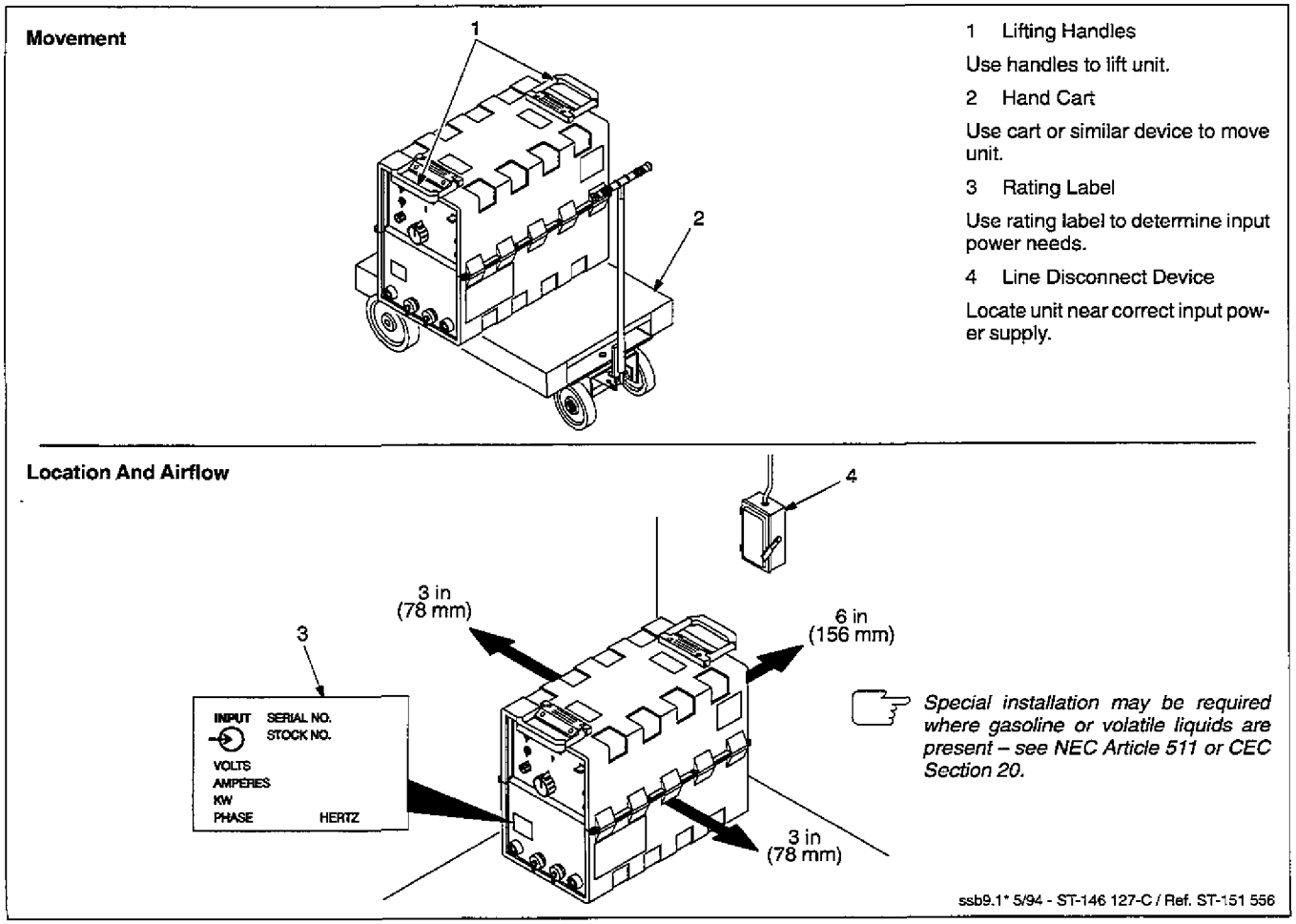

Figure 3-2. Location and Movement Of Welding Power Source

3-3. Selecting And Preparing Weld Output Cables

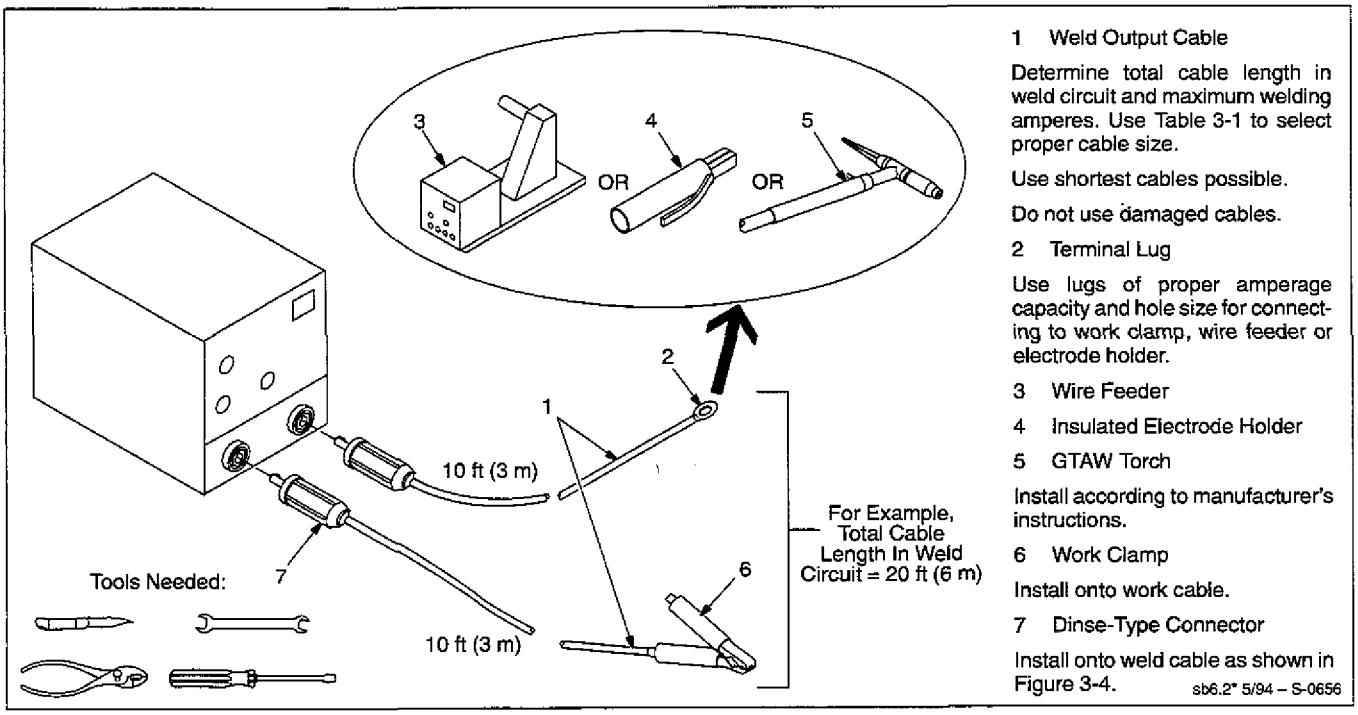

Figure 3-3. Selecting And Preparing Weld Output Cables

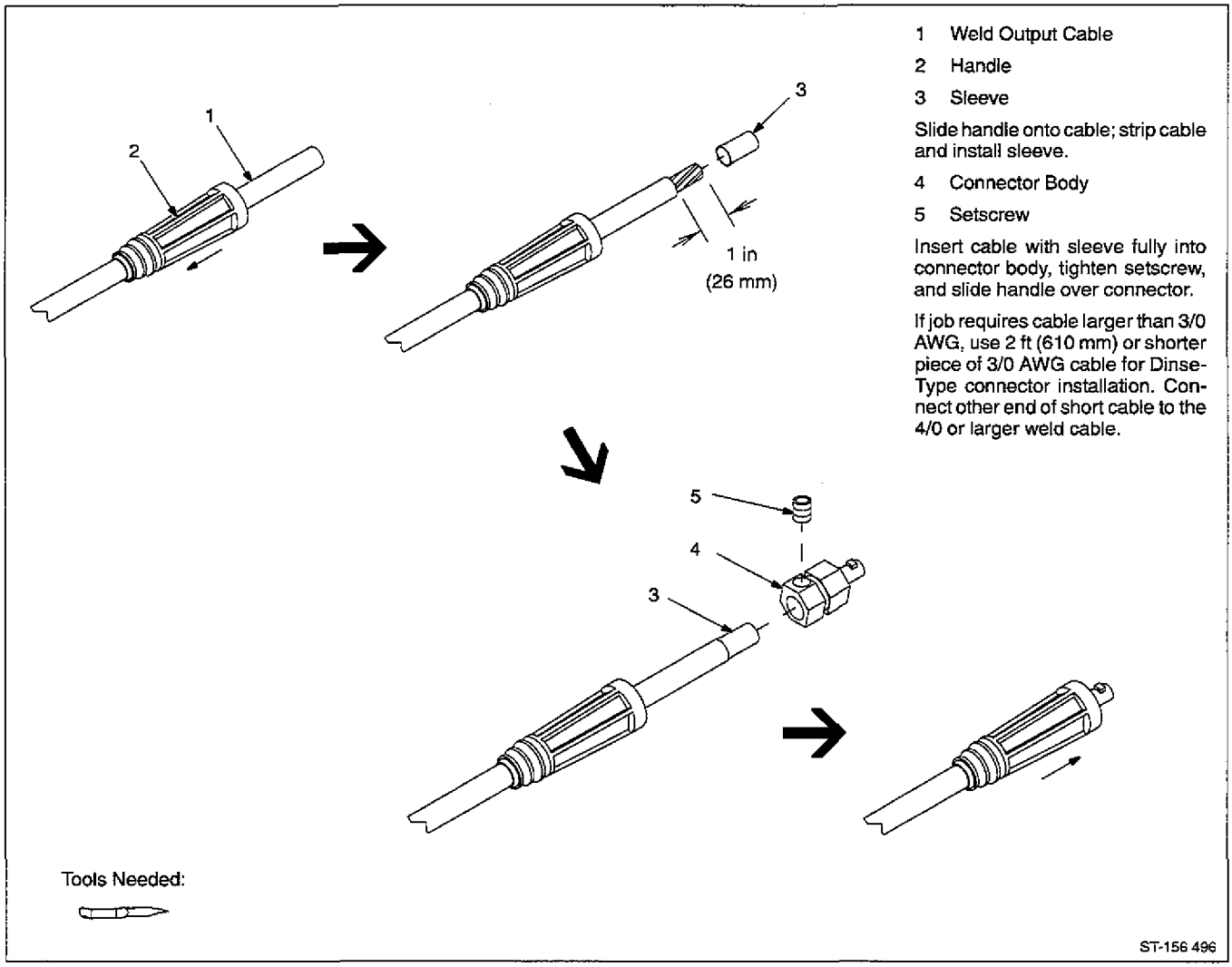

Figure 3-4. Dinse-Type Connector Assembly

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 at least 300 circular mils per ampere. S-0007-D

3-4. Connecting To Weld Output Receptacles

⚠ WARNING

ELECTRIC SHOCK can kill; ARCING can burn skin or damage electrical equipment.

- Do not touch live electrical parts.
- Turn Off welding power source before making any weld output connections.
- Do not change position of welding cable connectors while welding.
- Be sure connectors are secure in receptacles before welding.

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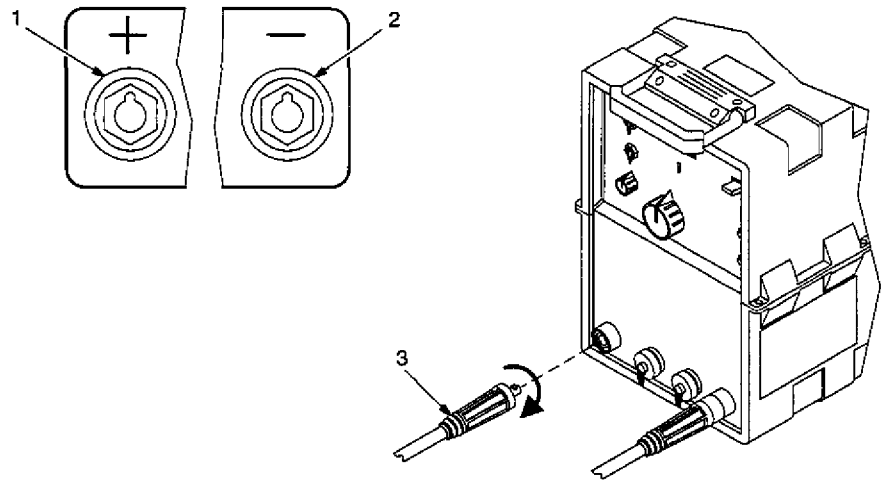


1 Positive (+) Weld Output Receptacle

2 Negative (–) Weld Output Receptacle

3 Connector

For DC Electrode Positive (DCEP), connect work cable connector to negative (–) receptacle and electrode holder cable connector to positive (+) receptacle.

For DC Electrode Negative (DCEN), reverse cable connections.

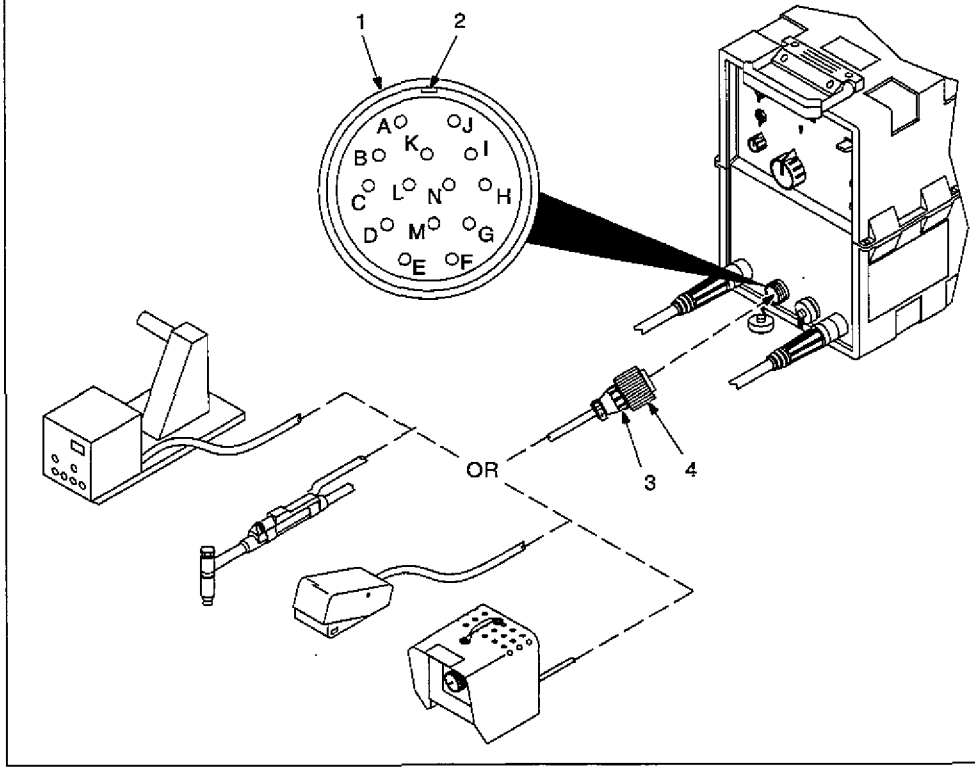
See Figure 3-1 for typical polarity choices.

To connect to receptacle, align keyway, insert connector, and turn clockwise until tight.

Ref. SD-150 135-B / ST-152 027-B

Figure 3-5. Connecting To Weld Output Receptacles

3-5. Remote 14 Receptacle RC2 Information And Connections



1 Remote 14 Receptacle RC2 (See Table 3-2)

2 Keyway

3 Plug

4 Threaded Collar

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

sb7.1 5/94 – ST-800 663 / Ref. S-0004-A / S-0750

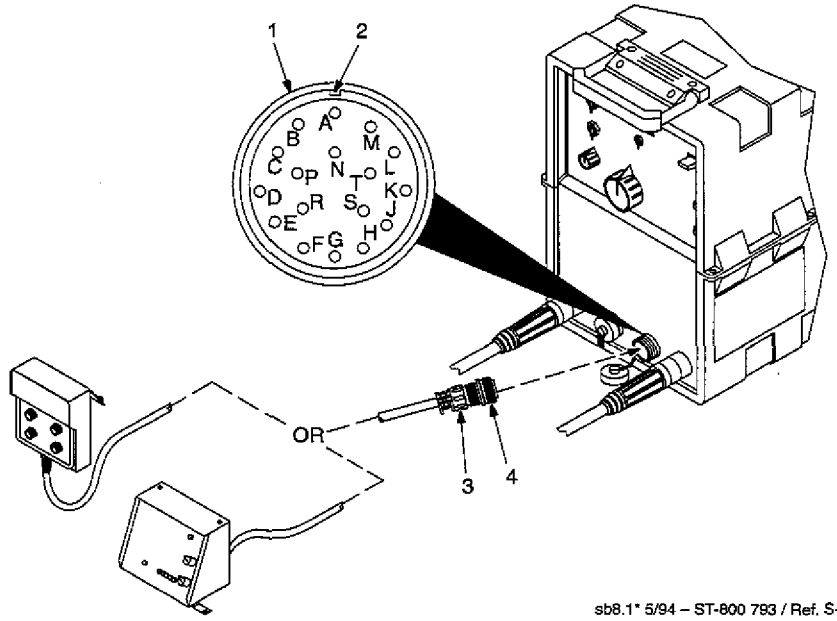
Figure 3-6. Remote 14 Connections

Table 3-2. Remote 14 Socket Information

REMOTE 14	Socket*	Socket Information
OUTPUT (CONTACTOR)	A	24 volts ac. Protected by circuit breaker CB2.
	B	Contact closure to A completes 24 volts ac contactor control circuit.
	I	115 volts ac. Protected by circuit breaker CB1.
FEEDER	J	Contact closure to I completes 115 volts ac contactor control circuit.
	G	Circuit common for 24 and 115 volts ac circuits.
	C	+10 volts dc output to remote control.
	D	Remote control circuit common.
A/V AMPERAGE VOLTAGE	E	0 to +10 volts dc input command signal from remote control.
	K	Chassis common.

*The remaining sockets are not used.

3-6. Remote 17 Receptacle RC1 Information And Connections



1 Remote 17 Receptacle RC1 (See Table 3-3)

2 Keyway

3 Plug

4 Threaded Collar

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

sb8.1* 5/94 – ST-800 793 / Ref. S-0003-A / S-0628-A / Ref. ST-151 254 / Ref. ST-120 318

Figure 3-7. Remote 17 Connections

Table 3-3. Remote 17 Socket Information

REMOTE 17	Socket*	Socket Information
OUTPUT (CONTACTOR)	D	Contactor on/off signal; +13 to +24 volts dc contactor on, 0 volts dc contactor off.
	A	+10 volts dc output to remote control; allows full control of A/V output from remote control.
	B	0 to +10 volts dc input command signal from remote control.
	H	+24 volts dc; fused at 1/2 ampere.
A/V AMPERAGE/ VOLTAGE	K	0 to +10 volts dc output to remote control set by panel A/V control; allows percent of panel A/V control from remote control.
	L	–24 volts dc; fused at 1/2 ampere.
CV/CC	C	CV/CC select; +13 to +24 volts dc selects CV, 0 volts dc selects CC.
METER	E	Current feedback; 0 to +10 volts dc, 1 volt per 100 amperes.
	M	Voltage feedback; 0 to +10 volts dc, 1 volt per 10 arc volts.
	F	Circuit common for sockets A, B, D, E, K, and M.
Circuit Common	P	Circuit common for sockets H and L.
	S	Chassis common.

*The remaining sockets are not used.

3-7. 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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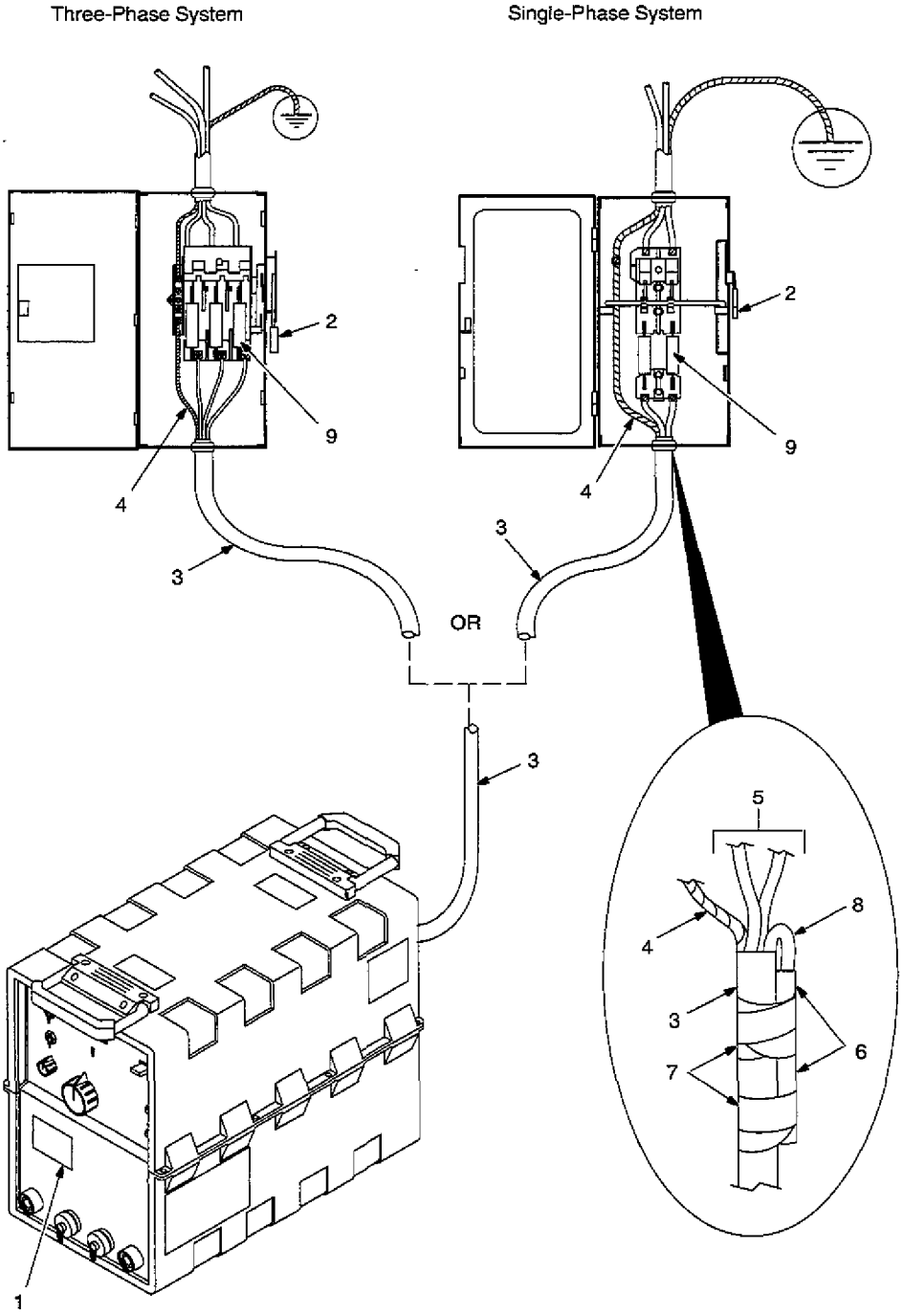


Have only qualified persons make this installation.

1 Rating Label

Use single or three-phase, 50/60 Hz, ac input power which matches one of the voltages shown. The AUTO-LINK circuitry senses the input voltage and automatically links the unit for operation.

2 Line Disconnect Device Of Proper Rating

3 Input Power Cord

4 Grounding Conductor - Green Or Green With Yellow Stripe(s)

Install grounding conductor and input conductors from unit to deenergized line disconnect device.

Connect grounding conductor first, then line input conductors.

Be sure grounding conductor goes to an earth ground.

5 Black And White Input Conductor

6 Insulation Sleeving

7 Electrical Tape

8 Red Input Conductor

Red conductor not used in single-phase system. Insulate and isolate conductor by sliding insulation sleeving over end of lead, bending lead back, and taping to power cord.

9 Overcurrent Protection

Select type and size using Table 3-4. Install into deenergized line disconnect device (fused disconnect switch shown).

ssb 2.3* 11/93 Ref. SC-144 221 / Ref. SC-070 399-C / Ref. ST-146 127-C

Figure 3-8. Input Power Connections

Table 3-4. Electrical Service Guide

	Three-Phase			Single-Phase		
Input Voltage	230	460	575	230	460	575
Input Amperes At Rated Output	42	21	16.4	50.8	29	23.6
Max Recommended Standard Fuse Or Circuit Breaker Rating In Amperes	60	30	25	80	40	35
Reference: 1993 National Electrical Code (NEC).						S-0092J

SECTION 4 – OPERATION

⚠ WARNING

ELECTRIC SHOCK can kill.
- Always wear dry insulating gloves.
- Insulate yourself from work and ground.
- Do not touch live electrical parts.
- Keep all panels and covers securely in place.

FUMES AND GASES can be hazardous to your health.
- Keep your head out of the fumes.
- Ventilate area, or use breathing device.
- Read Material Safety Data Sheets (MSDSs) and manufacturer's instructions for material used.

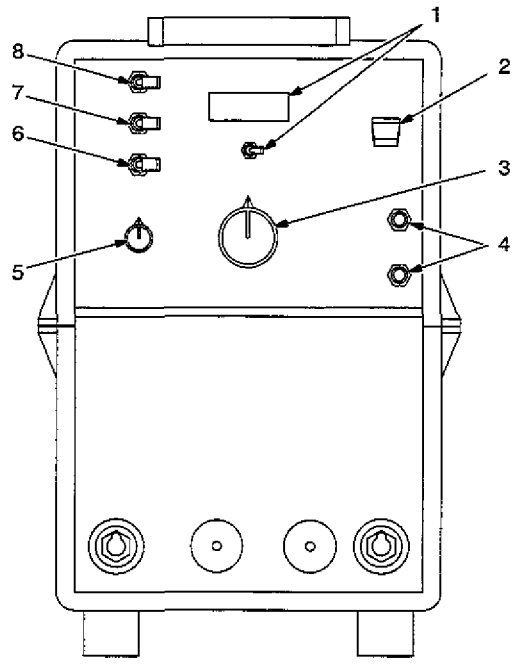
WELDING can cause fire or explosion.
- Do not weld near flammable material.
- Watch for fire; keep extinguisher nearby.
- Do not locate unit over combustible surfaces.
- Do not weld on closed containers.
- Allow work and equipment to cool before handling.

ARC RAYS can burn eyes and skin; NOISE can damage hearing.
- Wear welding helmet with correct shade of filter.
- Wear correct eye, ear, and body protection.

MOVING PARTS can cause injury.
- Keep away from moving parts.
- Keep all doors, panels, covers, and guards closed and securely in place.

MAGNETIC FIELDS FROM HIGH CURRENTS can affect pacemaker operation.
- Pacemaker wearers keep away.
- Wearers should consult their doctor before going near arc welding, gouging, or spot welding operations.

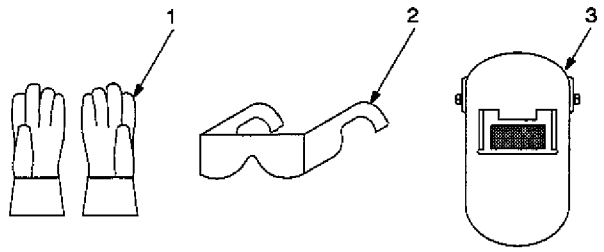
See Safety Precautions at beginning of manual for basic welding safety information. swarn6.1 10/91



1 Amperage/Voltage Meter And Switch
2 Power Switch
3 Amperage/Voltage Control
4 Circuit Breakers CB1 And CB2 (See Section 5-3)
5 Arc Force (Dig)/Inductance Control
6 Output (Contactor) Switch
7 Amperage/Voltage Control Switch
8 CC/CV Switch

ST-146 128-C

Figure 4-1. Controls



Wear the following while welding:

1 Dry, Insulating Gloves

2 Safety Glasses With Side Shields

3 Welding Helmet With Correct Shade Of Filter (See ANSI Z49.1)

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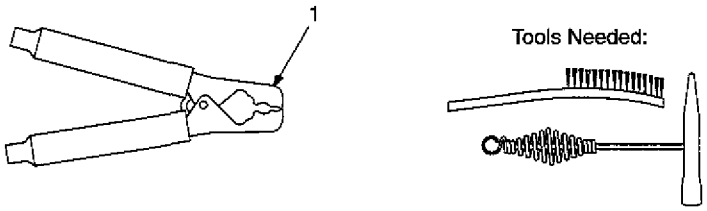
Figure 4-2. Safety Equipment



1 Work Clamp

Connect work clamp to a clean, paint-free location on workpiece, as close to weld area as possible.

Use wire brush or sandpaper to clean metal at weld joint area. Use chipping hammer to remove slag after welding.

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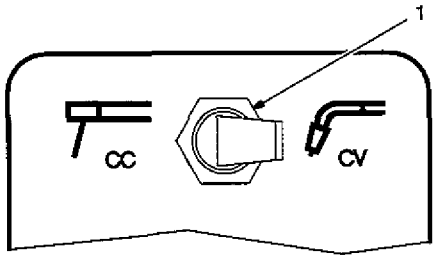
Figure 4-3. Work Clamp



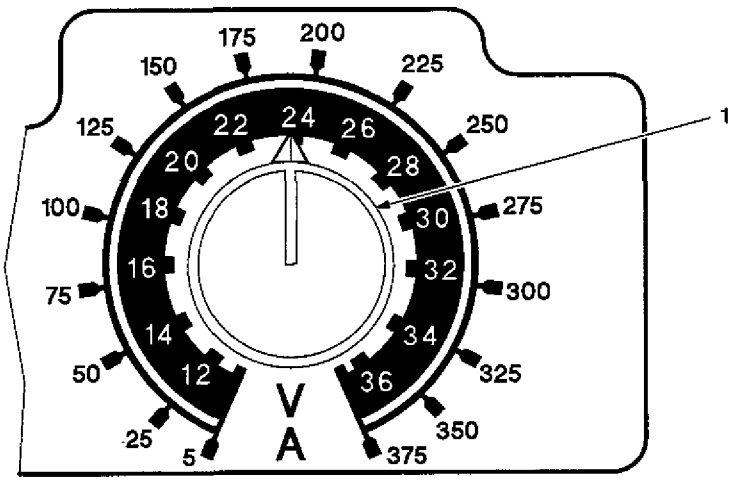
1 CC/CV Switch

Use switch to select type of weld output. Use constant current (CC) position for SMAW, GMAW-Pulsed, GTAW, and GTAW-Pulsed. Use constant voltage (CV) position for GMAW and FCAW.

Switch position determines the operation of the Amperage/Voltage control (see Figure 4-5) and the CC - Arc Force (Dig)/CV - Inductance control (see Figure 4-6).

Ref. ST-163 420-A

Figure 4-4. CC/CV Switch

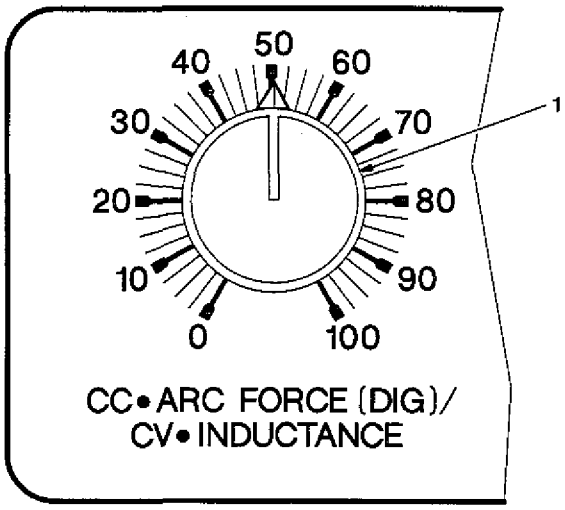


1 Amperage/Voltage Adjustment Control

Use CC/CV Switch (see Figure 4-4) to select weld amperage (CC) or voltage (CV). In CC, adjust control according to amperage (A) scale. In CV, adjust control according to voltage (V) scale.

Control setting may affect remote amperage/voltage control (see Figure 4-8).

Figure 4-5. Amperage/Voltage Adjustment Control



1 CC • Arc Force (Dig)/ CV • Inductance

Use CC/CV Switch (see Figure 4-4) to select weld amperage (CC) or voltage (CV). If CC position is selected, adjust Arc Force (Dig). If CV, adjust Inductance.

Numbers around control are for reference only.

CC • Arc Force (Dig)

For SMAW (Stick Electrode) welding, use control to help start an arc or make vertical or overhead welds (control increases amperage at low arc voltage, as shown in Figure 2-1).

When set at 0, short-circuit amperage at low arc voltage is the same as normal welding amperage.

When set at 100, short-circuit amperage at low arc voltage increases to help arc starting.

Select setting best suited for application.

Set control at 0 for GTAW and GMAW-P welding.

CV • Inductance

Use this control to change weld output inductance for GMAW and FCAW. Inductance determines the "wetness" of the weld puddle. When setting increases, wetness increases.

Figure 4-6. Arc Force (Dig)/Inductance Control

⚠ WARNING

ELECTRIC SHOCK can kill.

- Do not touch live electrical parts.
- Do not touch weld output terminals when contactor is energized.
- Do not touch electrode and work clamp at the same time.

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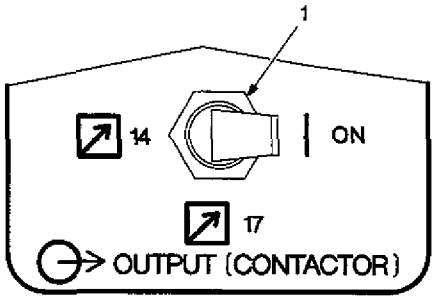


⚠ **Weld output terminals are energized when switch is On and Power is On.**

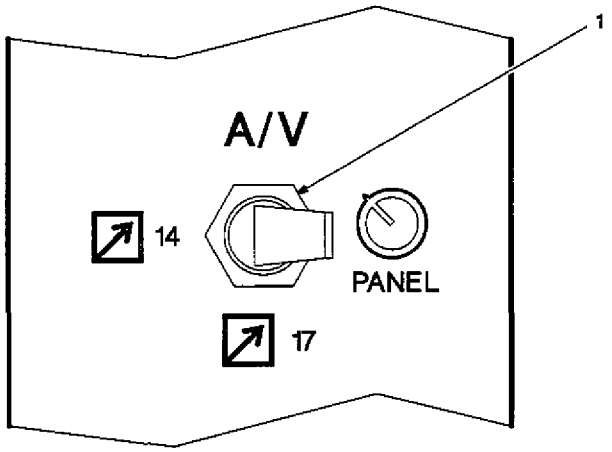
1 Output (Contactor) Switch

Use switch to select way of controlling unit output.

For weld output, place switch in On position.

For remote output control, place switch in Remote 14 or Remote 17 position (see Section 3-5 or 3-6).

Figure 4-7. Output (Contactor) Switch



1 Amperage/Voltage Control Switch

Use switch to select way of controlling amperage and voltage adjustment.

For front panel control, place switch in the Panel position.

For remote control, place switch in Remote 14 or Remote 17 position (see Sections 3-5 and 3-6).

Remote control at Remote 17 receptacle RC1 adjusts percent of front panel setting if socket K is used. If socket A is used, remote control adjusts the full range of the welding power source output, regardless of front panel control setting.

Remote control at Remote 14 is percent of front panel control.

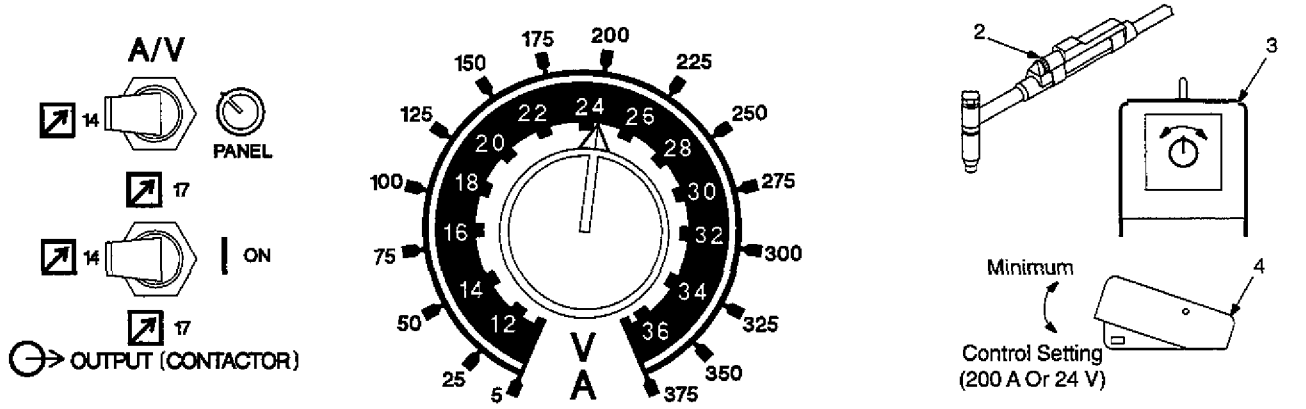
2 Fingertip Control

3 Remote Hand Control

4 Remote Foot Control

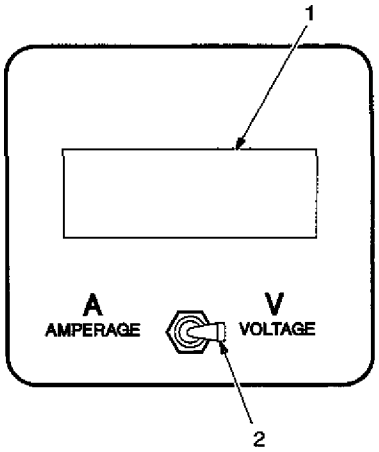
See example below.

Example: Combination Remote Amperage/Voltage Control



ST-159 059 / S-0769 / S-0774

Figure 4-8. Amperage/Voltage Control Switch



Switch Positions		Meter Display	
A/V	CC/CV	When Not Welding	When Welding
A	CC	Preset Amps	Actual Amps
A	CV	Preset Volts	Actual Amps
V	CC	Preset Amps	Actual Volts
V	CV	Preset Volts	Actual Volts

1 Amperage/Voltage Meter

Use meter to read amperage and voltage output. The preset value is displayed when not welding.

When welding, the meter displays weld amperage output of the unit if amperage is selected. If voltage is selected when welding, the meter displays voltage at the weld output terminals, but not necessarily the welding arc due to cable resistance, poor connections, etc.

The value displayed is held for 15 seconds after welding stops if the hold function is On (see Section 5-4).

See table for the values displayed for A/V and CC/CV switch settings.

2 Meter Switch

Use switch to select amperage or voltage display.

Figure 4-9. Amperage/Voltage Meter And Switch

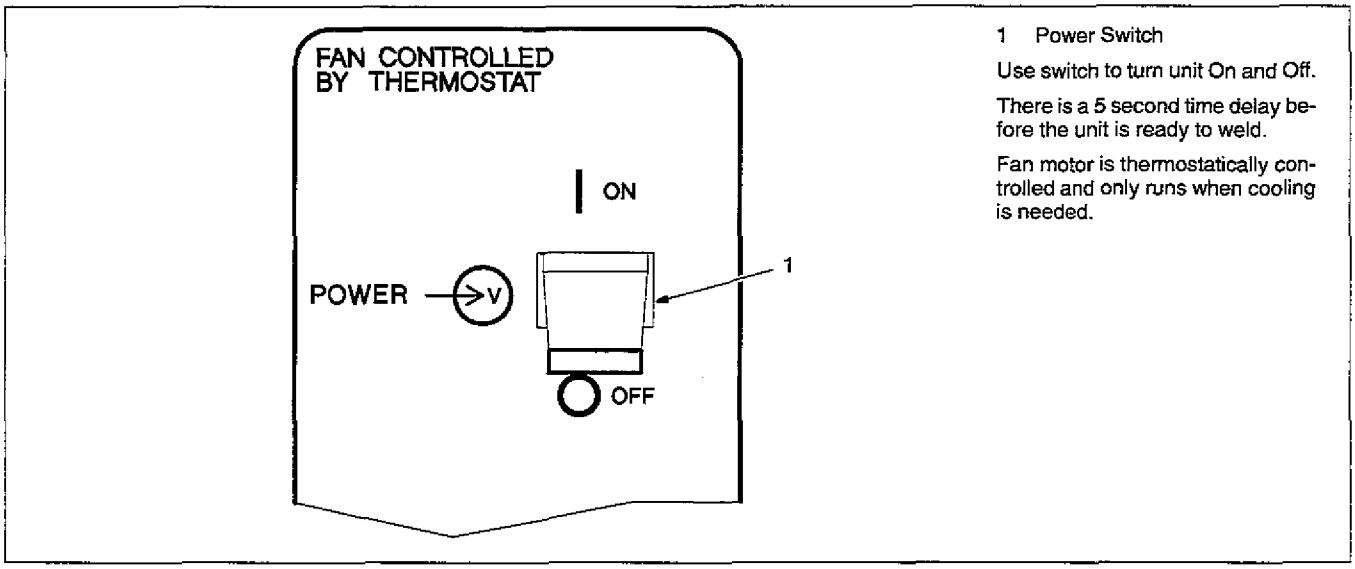


Figure 4-10. Power Switch

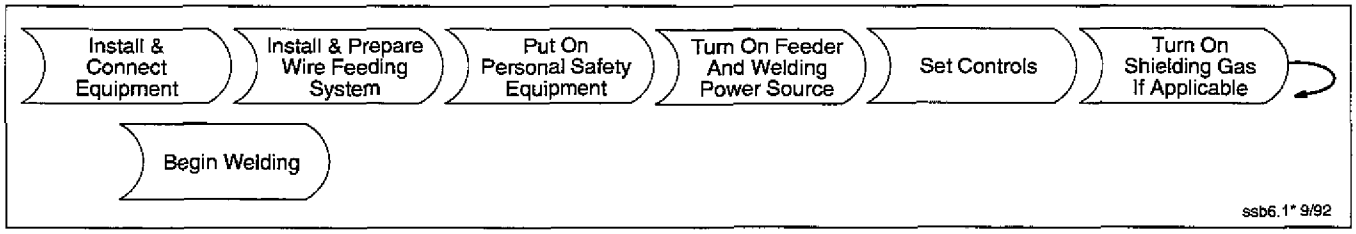


Figure 4-11. Sequence Of Gas Metal Arc Welding (GMAW) And Flux Cored Arc Welding (FCAW)

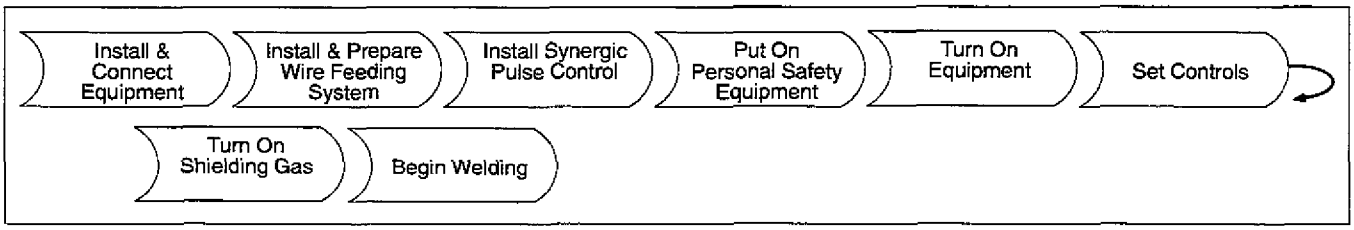


Figure 4-12. Sequence Of Gas Metal Arc Welding - Pulsed (GMAW-P)

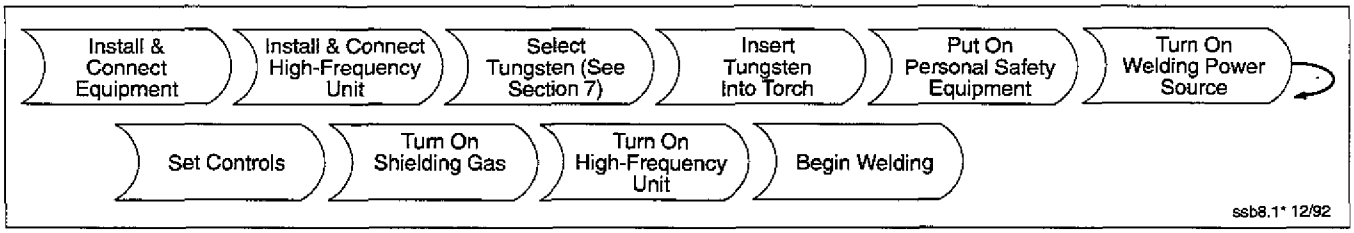


Figure 4-13. Sequence Of Gas Tungsten Arc Welding (GTAW)

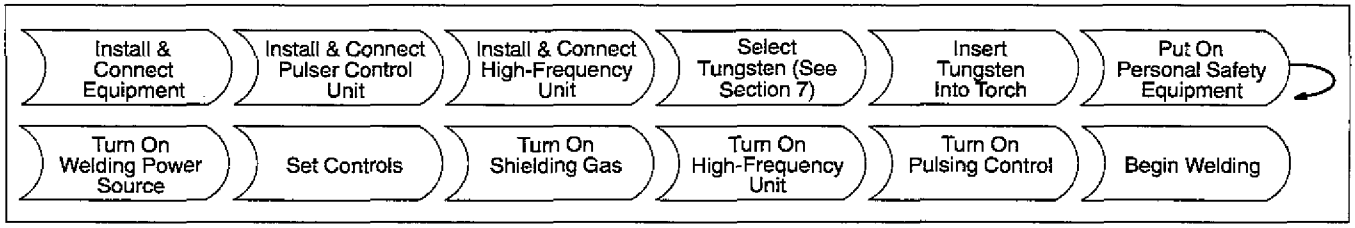


Figure 4-14. Sequence Of Gas Tungsten Arc Welding - Pulsed (GTAW-P)

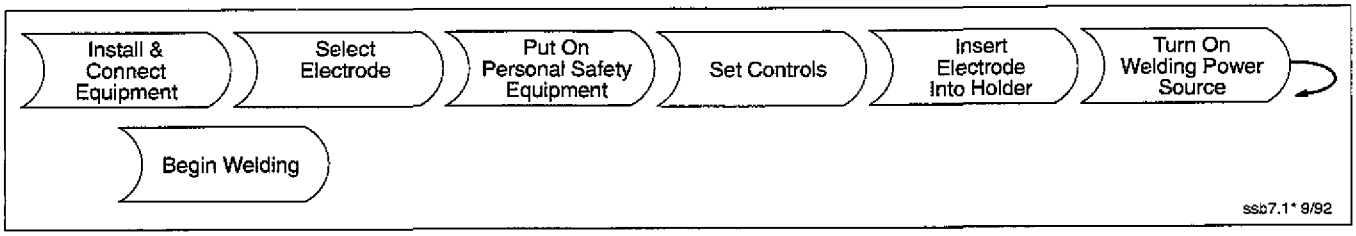


Figure 4-15. Sequence Of Shielded Metal Arc Welding (SMAW)

SECTION 5 – MAINTENANCE & TROUBLESHOOTING

⚠ WARNING

ELECTRIC SHOCK can kill; SIGNIFICANT DC VOLTAGE exists after removal of input power.

- Do not touch live electrical parts.
- Turn Off welding power source, disconnect input power, wait 60 seconds, measure voltage on input capacitors according to Section 5-2, and be sure voltage is near zero before touching any parts.

HOT PARTS can cause severe burns.

- Allow cooling period before maintaining or servicing.

MOVING PARTS can cause injury.

- Keep away from moving parts.

STATIC ELECTRICITY can damage parts on circuit boards.

- Put on grounded wrist strap BEFORE handling boards or parts.
- Use proper static-proof bags and boxes.

Maintenance to be performed only by qualified persons.

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5-1. Routine Maintenance

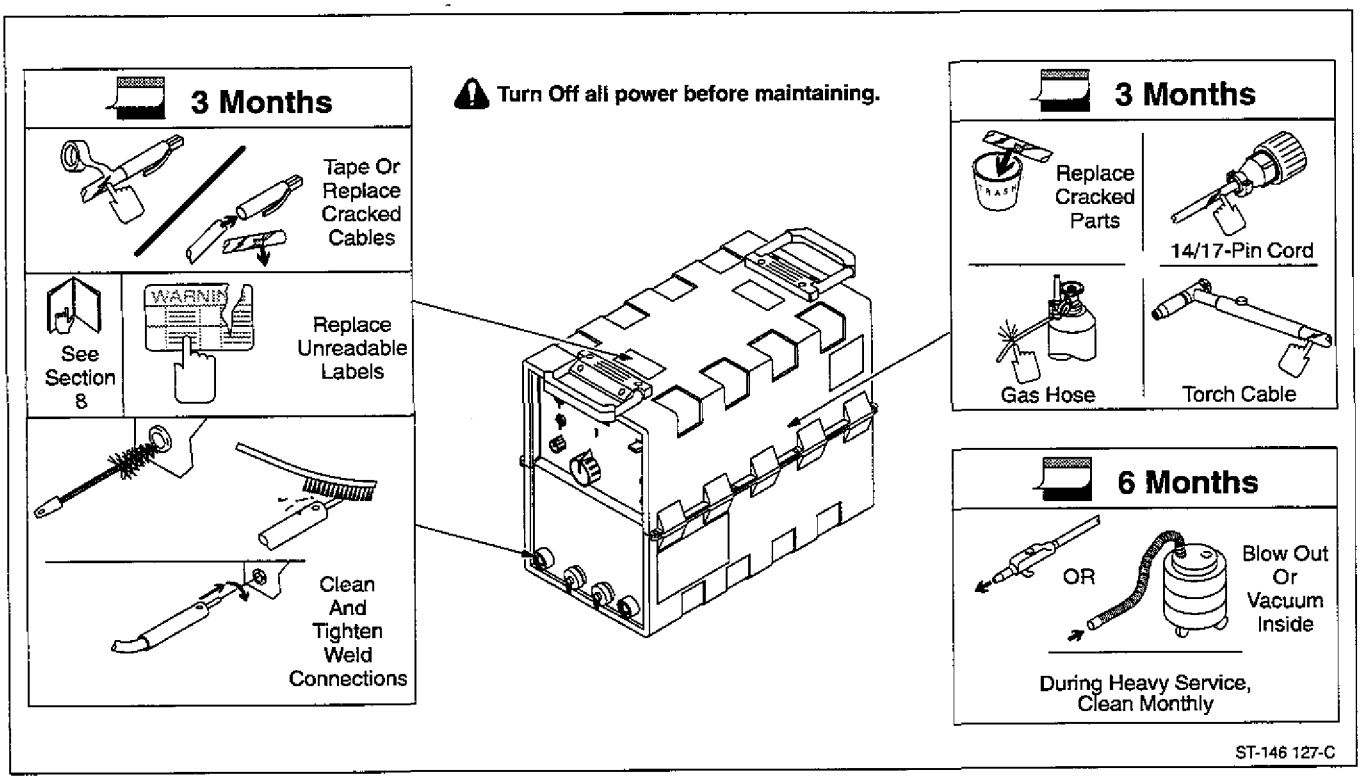


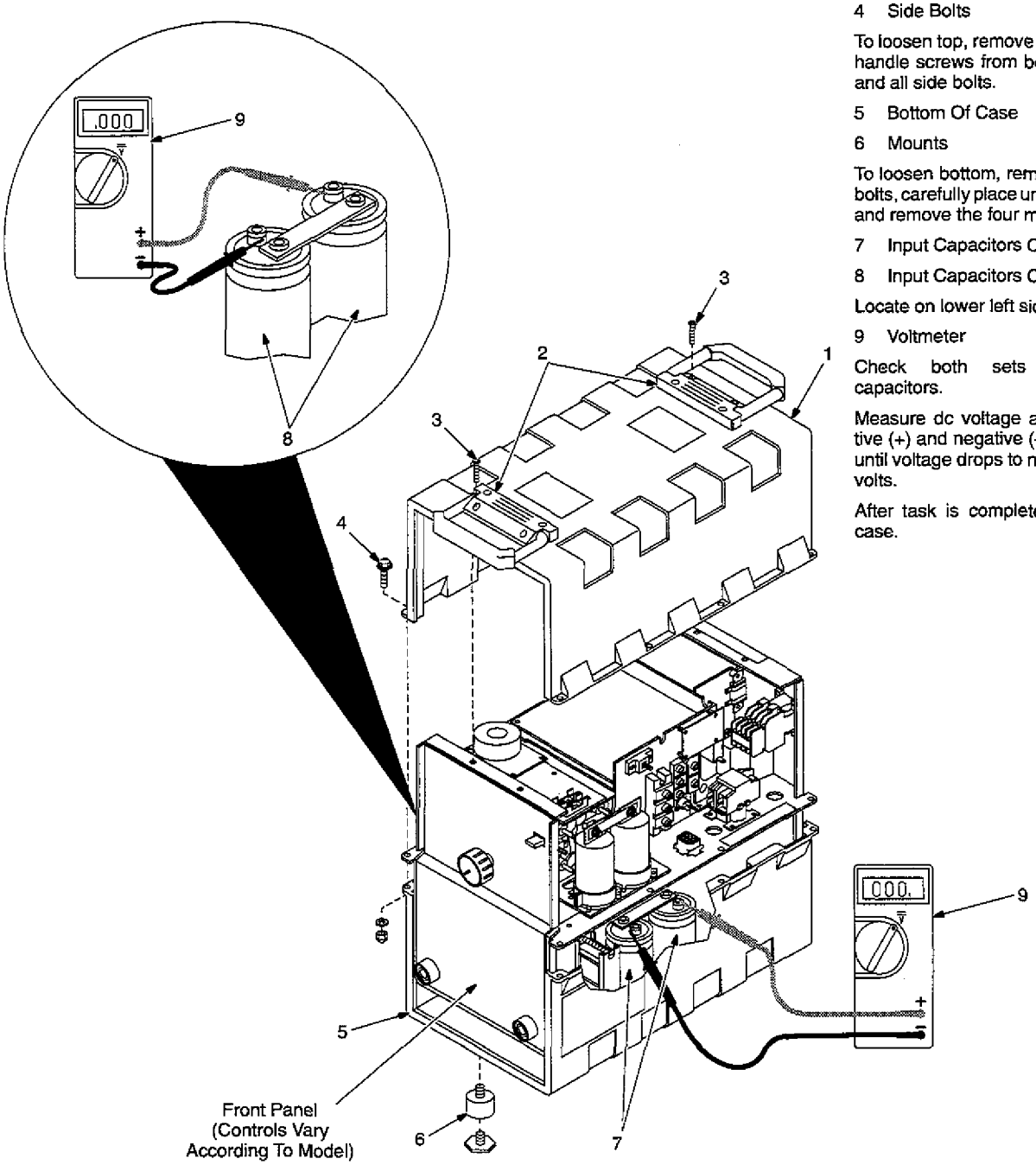
Figure 5-1. Maintenance Schedule

5-2. Removing Case And Measuring Input Capacitor Voltage

⚠ WARNING 

READ SAFETY BLOCKS at start of Section 5 before proceeding.

⚠ Significant DC voltage can remain on capacitors after unit is Off. Always check capacitors as shown to be sure they have discharged before working on unit.



Turn Off welding power source and disconnect input power.

1 Top Of Case

2 Handles

3 Outside Handle Screws

4 Side Bolts

To loosen top, remove two outside handle screws from both handles and all side bolts.

5 Bottom Of Case

6 Mounts

To loosen bottom, remove all side bolts, carefully place unit on its side and remove the four mounts.

7 Input Capacitors C12, C13

8 Input Capacitors C8, C9

Locate on lower left side.

9 Voltmeter

Check both sets of input capacitors.

Measure dc voltage across positive (+) and negative (–) terminals until voltage drops to near 0 (zero) volts.

After task is completed, reinstall case.

Tools Needed:

5/32 in

3/8, 7/16 in

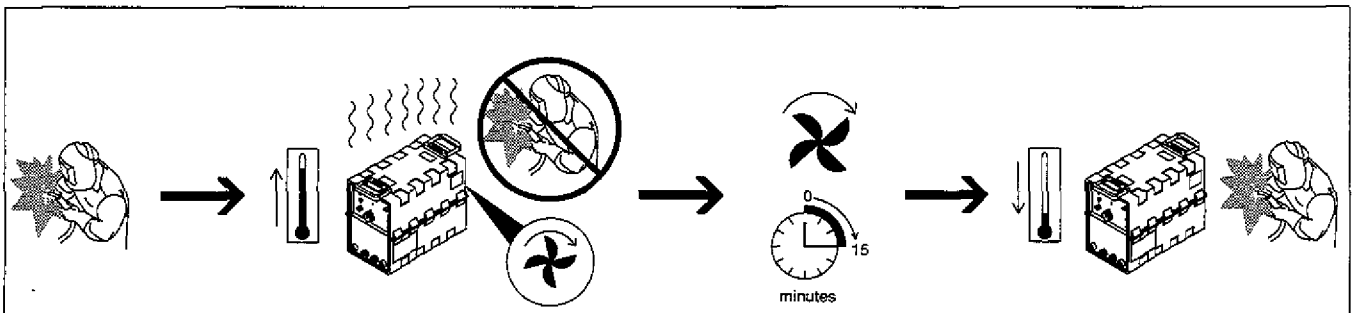
Ref. ST-152 114-E

Figure 5-2. Removing Case And Measuring Input Capacitor Voltage

5-3. Overload Protection

⚠ WARNING  **READ SAFETY BLOCKS at start of Section 5 before proceeding.**

A. Overheating



When overheated, thermostat opens, output stops, and cooling fan keeps running.

Let fan run for 15 minutes.

Start welding.

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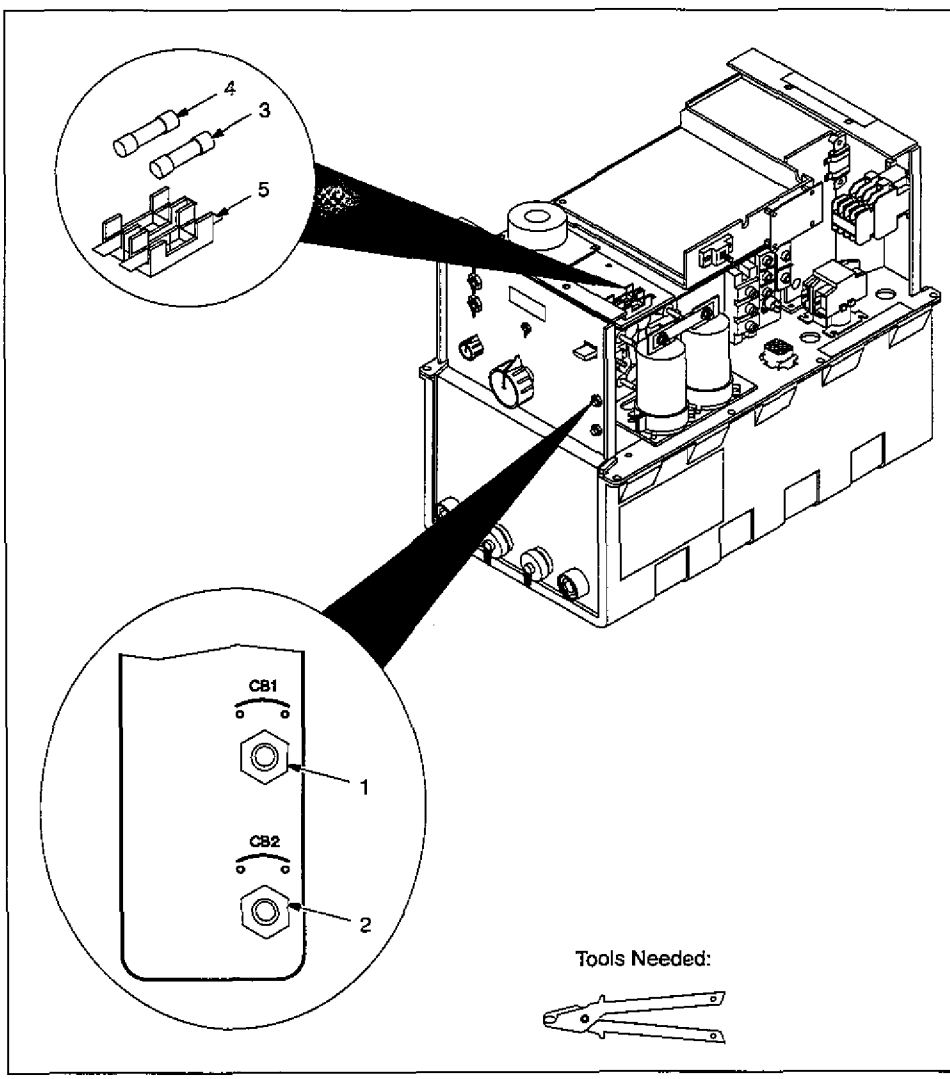
Figure 5-3. Overheating

B. Fuses And Circuit Breakers



Turn Off welding power source, disconnect input power, and check voltage on input capacitors according to Section 5-2 before proceeding.

1 Circuit Breaker CB1

If CB1 opens, remote devices requiring 115 volts shut down. Manually reset CB1.

2 Circuit Breaker CB2

If CB2 opens, remote devices requiring 24 volts shut down. Manually reset CB2.

3 Fuse F3

4 Fuse F4

F3 and F4 protect Control Board PC1. If F3 opens, remote control devices that require +24 volts dc from Remote 17 receptacle RC1 to operate shut down. If F4 opens, remote control devices that require –24 volts dc from RC1 to operate shut down.

Remove top cover (see Section 5-2) to check and replace fuses.

See Parts List for fuse sizes. Use proper tool when removing fuses.

5 Fuse Holder

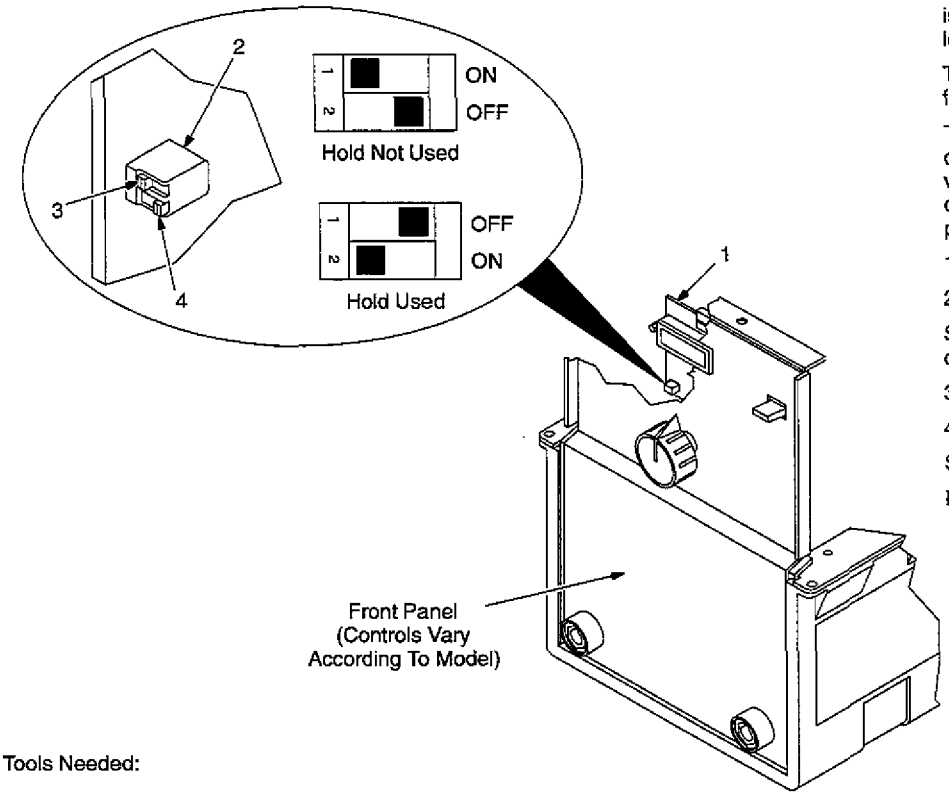
Tools Needed:

ST-152 115-G / Ref. ST-144 223-E / Ref. ST-140 517

Figure 5-4. Overload Protection

5-4. Changing Amperage/Voltage Meter Hold Function

⚠ WARNING **READ SAFETY BLOCKS at start of Section 5 before proceeding.**



The Amperage/Voltage meter is able to hold the displayed weld output value for 15 seconds after welding stops. If the hold function is not used, the displayed value leaves when welding stops.

This procedure allows the hold function to be turned On or Off.

Turn Off welding power source, disconnect input power, and check voltage on input capacitors according to Section 5-2 before proceeding.

1 Digital Meter Board PC5

2 DIP Switch S2

S2 is accessible from the left side of the unit.

3 Toggle 1

4 Toggle 2

Set toggles in desired position.

Reinstall top of case.

Tools Needed:

Non-Conductive

ST-159 050-B

Figure 5-5. Changing Amperage/Voltage Meter Hold Function

5-5. Troubleshooting

⚠ WARNING

ELECTRIC SHOCK can kill. SIGNIFICANT DC VOLTAGE exists after removal of input power.

- Do not touch live electrical parts.
- Turn Off welding power source, disconnect input power, wait 60 seconds, measure voltage on input capacitors according to Section 5-2, and be sure voltage is near zero before touching any parts.

HOT PARTS can cause severe burns.

- Allow cooling period before servicing.

MOVING PARTS can cause injury.

- Keep away from moving parts.

STATIC ELECTRICITY can damage parts on circuit boards.

- Put on grounded wrist strap BEFORE handling boards or parts.
- Use proper static-proof bags and boxes.

Troubleshooting to be performed only by qualified persons.

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Table 5-1. Welding Trouble

Trouble	Remedy	Section
No weld output; unit completely inoperative.	Be sure Power switch is On.	Figure 4-10
	Be sure line disconnect switch is On.	3-7
	Check line fuse(s) and replace if needed. Reset circuit breakers.	3-7
	Check for proper input connections.	3-7
No weld output; fan motor FM running.	Check position of Output (Contactor) switch.	Figure 4-7
	Thermostat TP1 open (overheating). Allow fan to run; thermostat closes when unit has cooled.	5-3
Low weld output with no control.	Check position of Amperage/Voltage Control switch.	Figure 4-8
	Have Factory Authorized Service Station/Service Distributor check control board PC1.	--
Limited output and low open-circuit voltage.	Check incoming power for correct voltage. Replace line fuse if open or reset circuit breaker.	3-7
	Check for proper input and output connections.	3-3, 3-4, 3-7
Erratic or improper weld output.	Tighten all welding cable connections.	3-3, 3-4
	Check for proper size and type of cable.	3-3
	Check for proper input and output connections.	3-3, 3-4, 3-7
	Replace electrode.	7-1, 7-2
Remote device completely inoperative.	Connect remote control to correct Remote receptacle.	3-5, 3-6
	If remote device connected to Remote 14 receptacle RC2, reset circuit breaker CB1 and/or CB2.	5-3
	If remote device connected to Remote 17 receptacle RC1, check fuses F3 and/or F4 and replace if needed.	5-3
Fan motor does not run.	Have Factory Authorized Service Station/Service Distributor check thermostats TP2 and/or TP3 and fan motor.	--
Wandering arc; poor control of arc direction.	Reduce gas flow rate.	--
	Select proper size tungsten.	7-1
	Properly prepare tungsten.	7-2
Tungsten electrode oxidizing and not remaining bright after conclusion of weld.	Shield weld zone from drafts.	--
	Increase postflow time.	--
	Check and tighten all gas fittings.	--
	Water in torch. Refer to torch Owner's Manual for part(s) requiring replacement, and repair torch as necessary.	--

NOTES

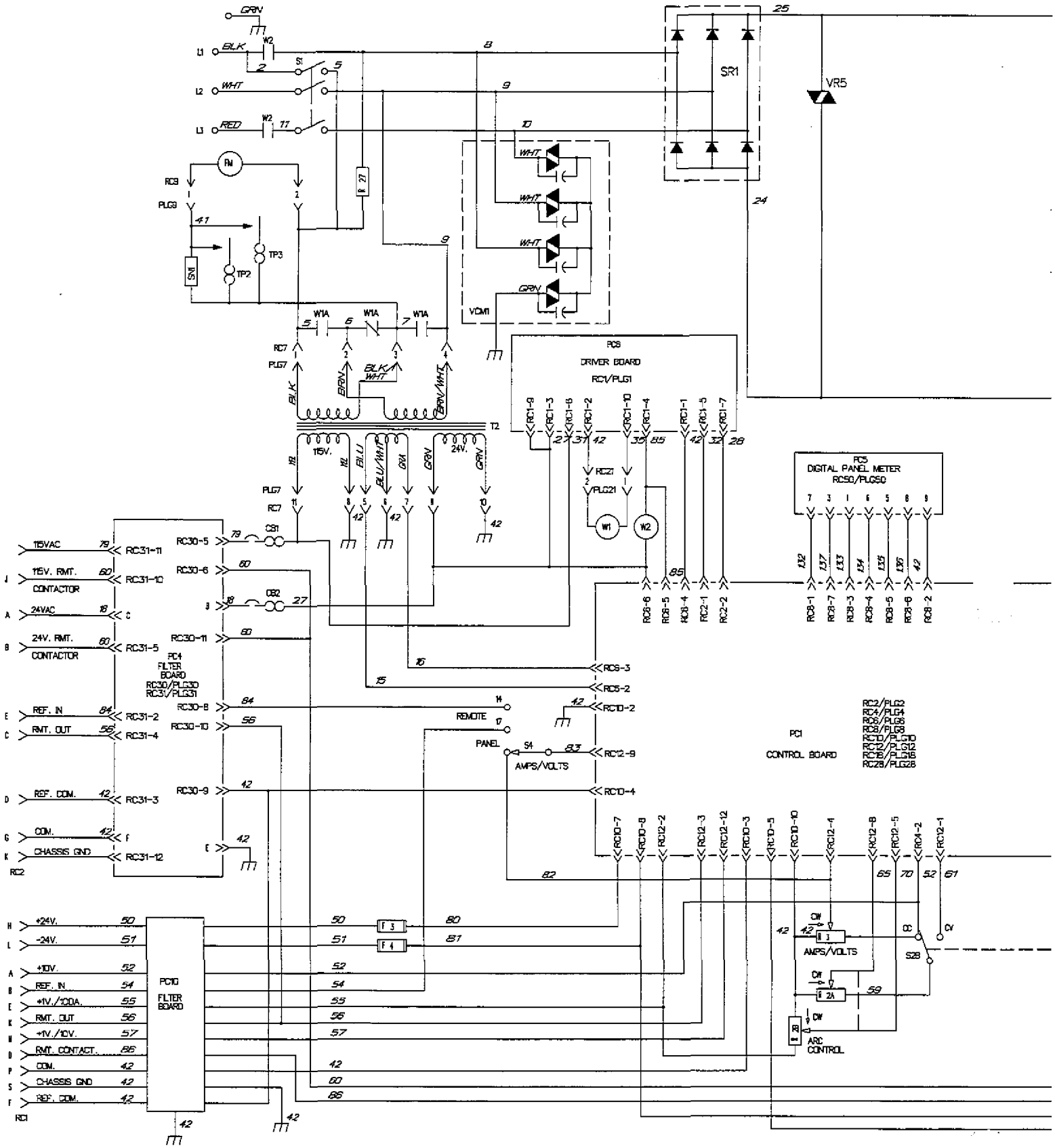
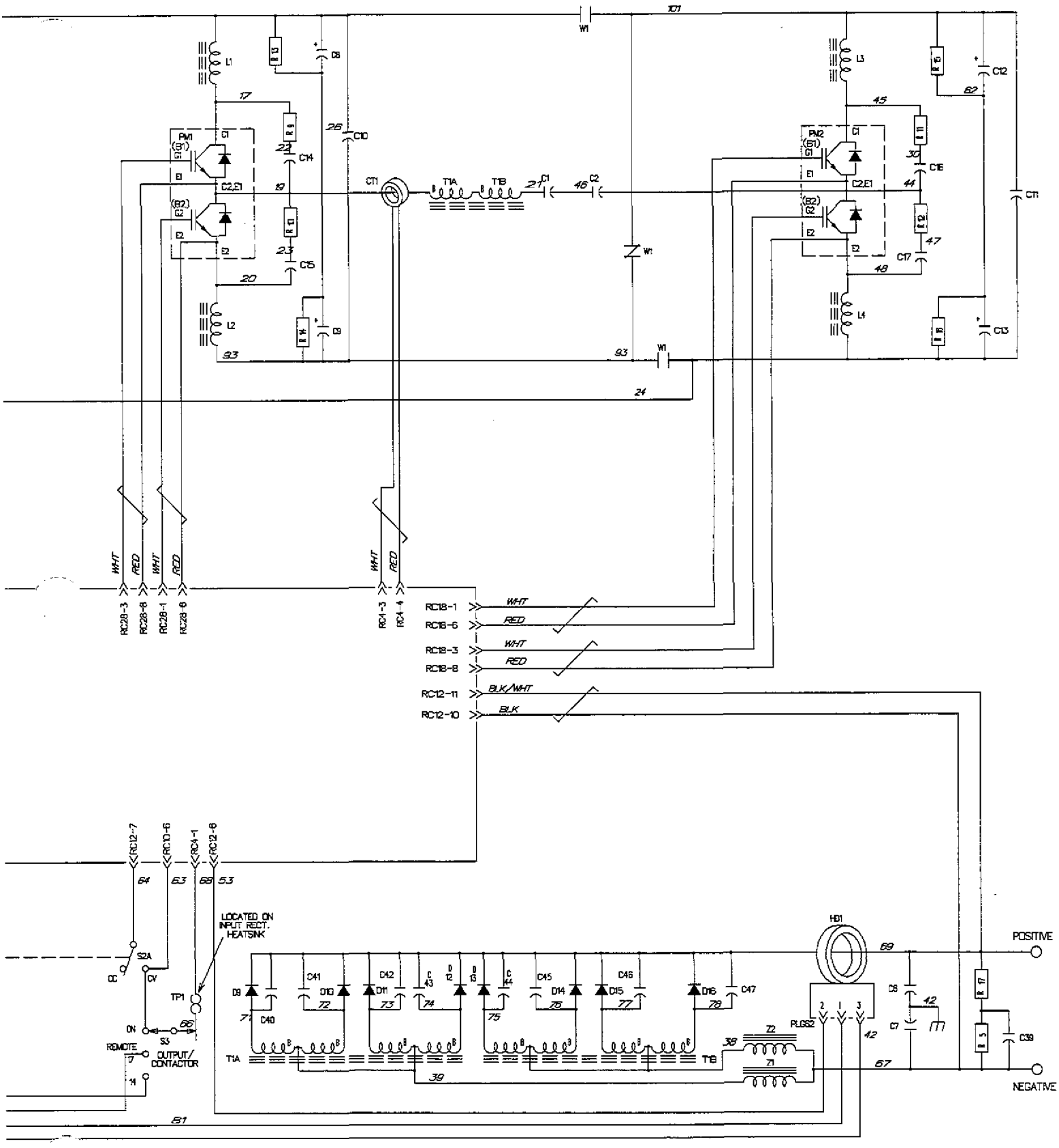


Figure 6-1. Circuit Diagram For 230/460 Volt Models


W1
101
L1
L2
L3
L4
PM1
PM2
CT1
T1A
T1B
C1
C2
C10
C11
C12
C13
C14
C15
C16
C17
D8
D9
R9
R10
R11
R12
R13
R14
R15
R16
17
19
20
21
23
24
26
30
44
45
46
47
48
62
93
WHT
RED
RC28-3
RC28-8
RC28-1
RC28-6
RC4-3
RC4-4
RC18-1
RC18-6
RC18-3
RC18-8
RC12-11
RC12-10
BLK/WHT
BLK
RC12-7
RC10-6
RC4-1
RC12-6
64
63
68
53
LOCATED ON INPUT RECT. HEATSINK
S2A
CC
CV
TP1
ON
S3
REMOTE
OUTPUT/ CONTACTOR
66
14
81
D9
D10
D11
D12
D13
D14
D15
D16
C40
C41
C42
C43
C44
C45
C46
C47
71
72
73
74
75
76
77
78
39
HD1
69
POSITIVE
NEGATIVE
Z2
PLUG2
C8
C7
R17
R5
C39
42
67
38

SD-178 771

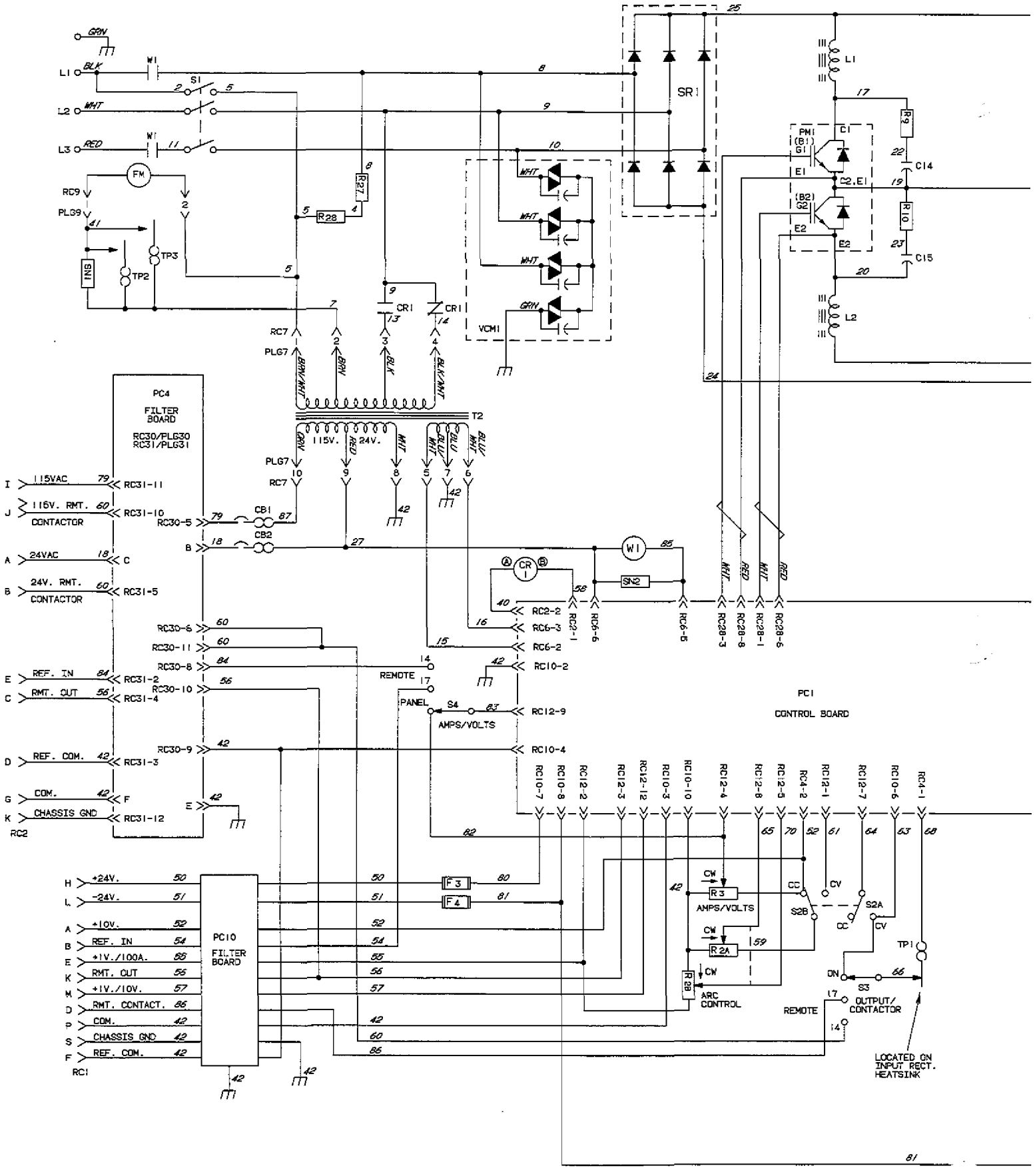
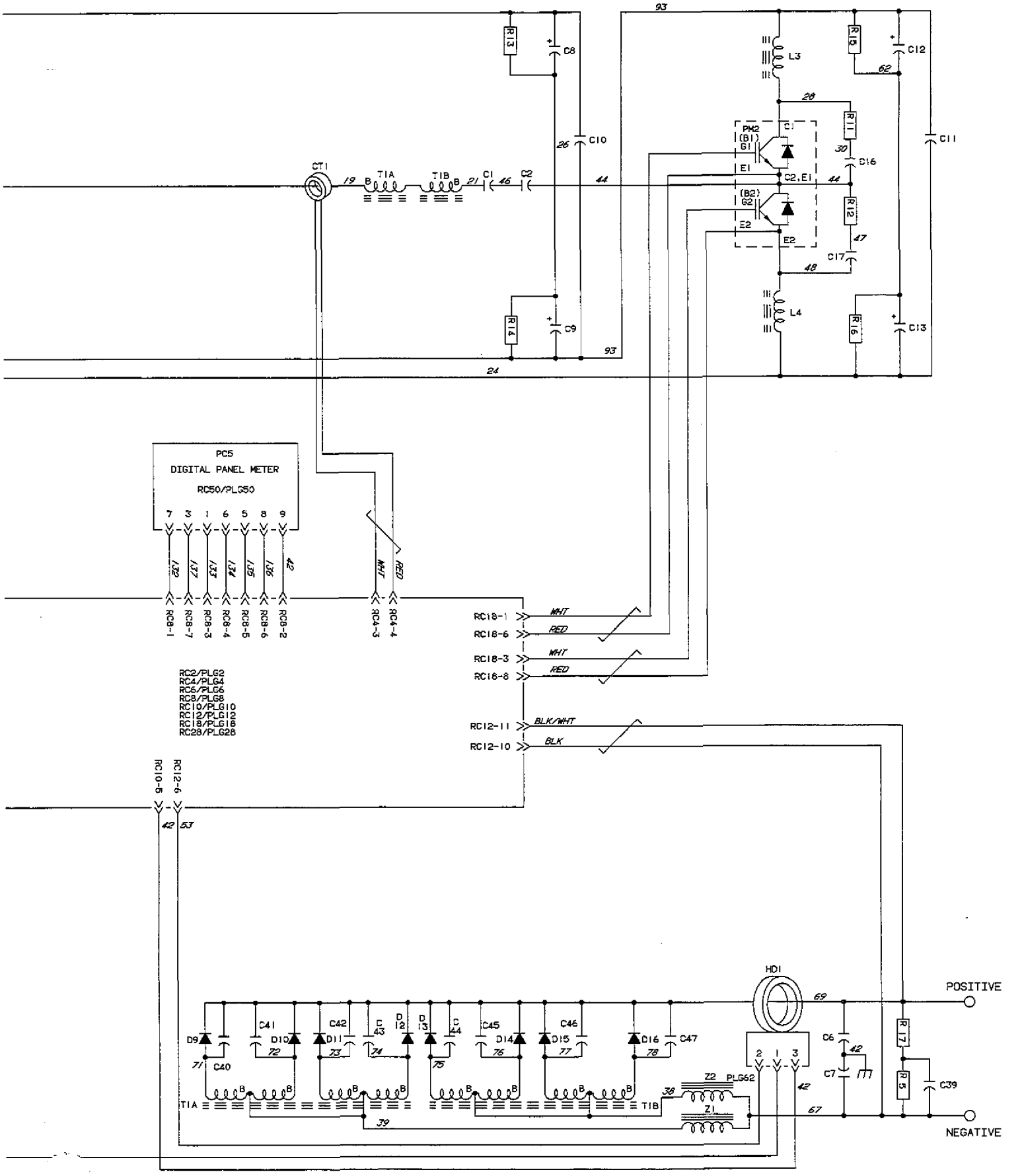


Figure 6-2. Circuit Diagram For 460/575 Volt Models


PC5
DIGITAL PANEL METER
RC50/PLG50
RC2/PLG2
RC4/PLG4
RC6/PLG6
RC8/PLG8
RC10/PLG10
RC12/PLG12
RC18/PLG18
RC28/PLG28
CT1
TIA
TIB
C1
C2
C8
C9
C10
C11
C12
C13
C16
C17
C39
C40
C41
C42
C43
C44
C45
C46
C47
C6
C7
R11
R12
R13
R14
R15
R16
R17
R5
L3
L4
PM2
(B1)
G1
E1
C1
C2,E1
(B2)
G2
E2
HDI
Z1
Z2
PLG62
D9
D10
D11
D12
D13
D14
D15
D16
RC18-1
RC18-6
RC18-3
RC18-8
RC12-11
RC12-10
RC10-5
RC12-6
WHT
RED
BLK/WHT
BLK
POSITIVE
NEGATIVE

SD-170 439

SECTION 7 – TUNGSTEN ELECTRODE

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.
Pure Tungsten (Green Band)				
.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
2% Thorium Alloyed Tungsten (Red Band)				
.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
Zirconium Alloyed Tungsten (Brown Band)				
.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

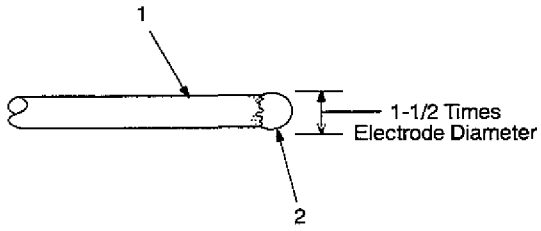
♦Typical argon shielding gas flow rates are 15 to 35 cfh (cubic feet per hour).

*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



1 Tungsten Electrode

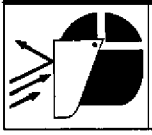
2 Balled End

Ball end of tungsten before welding by applying either an ac amperage slightly higher than what is recommended for a given electrode diameter (see Table 7-1), or a dc electrode positive amperage.

Ref. S-0161

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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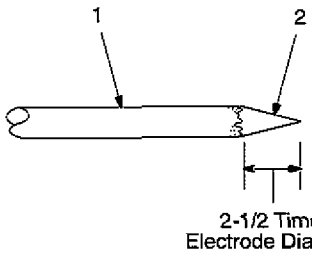
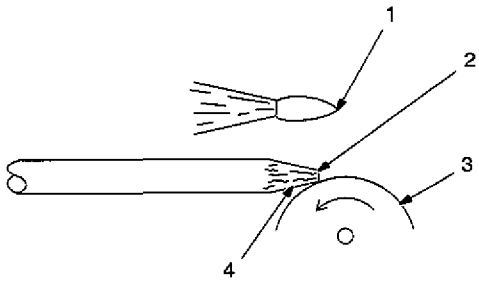


1 Tungsten Electrode

2 Tapered End

Grind end of tungsten on fine grit, hard abrasive wheel before welding. Do not use wheel for other jobs or tungsten can become contaminated causing lower weld quality.

Ref. S-0161



Ideal Tungsten Preparation – Stable Arc

1 Stable Arc

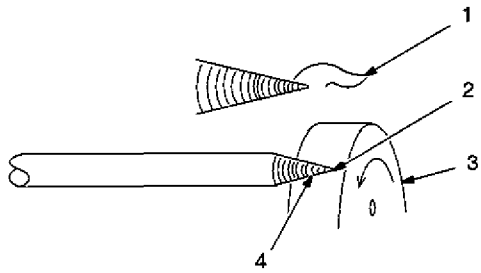
2 Flat

Diameter of this flat determines amperage capacity.

3 Grinding Wheel

4 Straight Ground

Ref. S-0162



Wrong Tungsten Preparation – Wandering Arc

1 Arc Wander

2 Point

3 Grinding Wheel

4 Radial Ground

Ref. S-0162

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

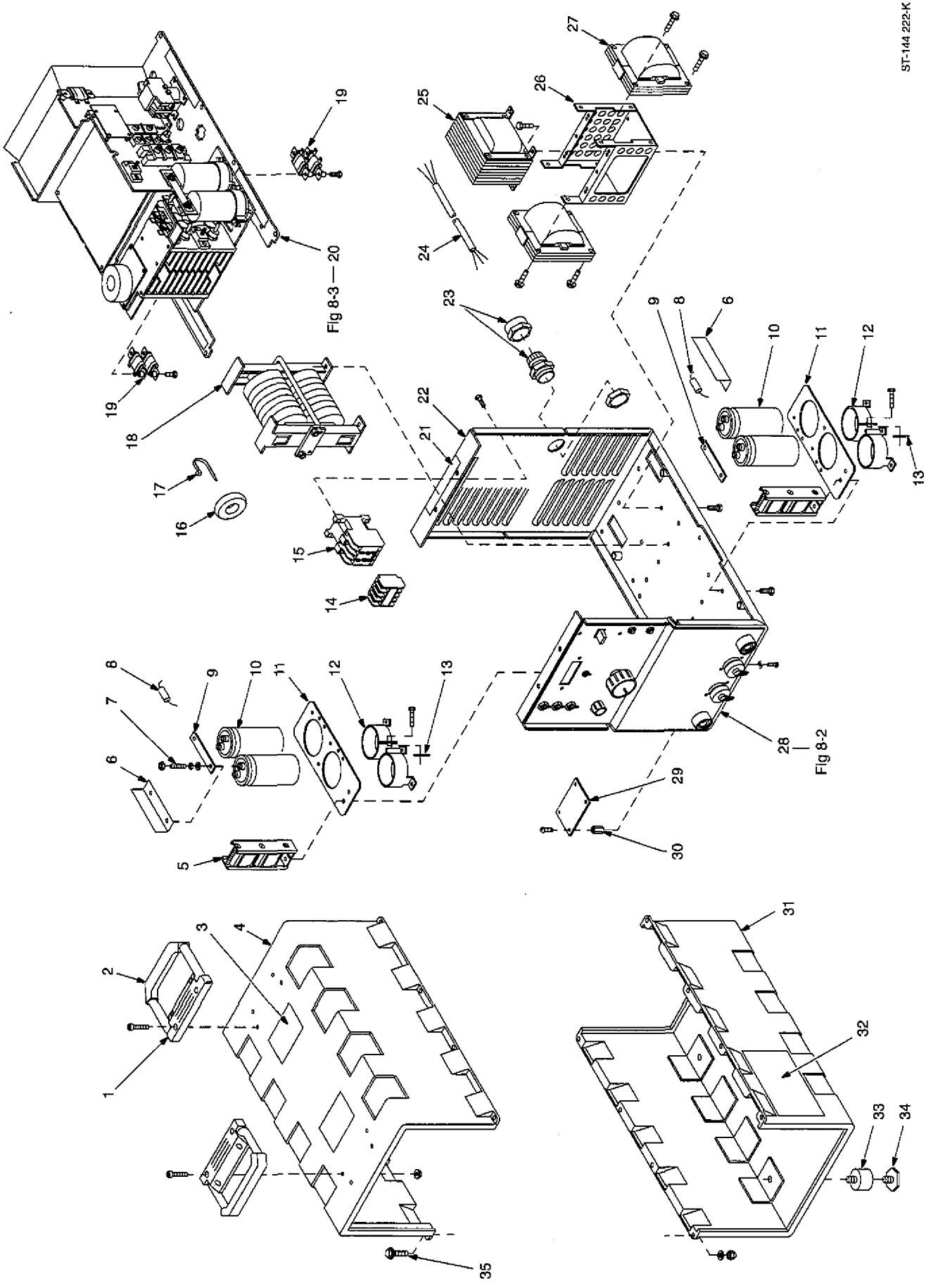


Figure 8-1. Main Assembly (208-230/460V Model Illustrated)

Item No.	Dia. Mkgs.	Part No.	Description	Quantity Model 208-230/460V	Quantity Model 460/575V
Figure 8-1. Main Assembly					
1		126 415	CLAMP, saddle	2	2
2		126 416	HANDLE, molded plastic	2	2
3		138 442	LABEL, caution falling equipment can cause injury	2	2
4		+141 350	CASE	1	1
5	L1-4	133 639	CHOKE, DVDT	2	2
6		145 245	INSULATOR, elctlt	2	2
7		155 642	SCREW, set .250-28 x 1.000 cup pt sch stl	8	8
8	C10,11	164 812	CAPACITOR	2	2
9		143 748	BUS BAR	2	2
10	C8,9,12,13	135 786	CAPACITOR, elctlt 4000uf 250VDC	4	
10	C8,9,12,13	140 891	CAPACITOR, elctlt 2800uf 300VDC		4
11		136 227	STRIP, mtg capacitor bracket	2	2
12		108 105	CLAMP, capacitor 2.500dia	4	4
13		133 405	NUT, speed 10-24 flat type rectangular	4	4
14	W1A	157 661	INTERLOCK, cntor IEC 2NO-2NC 10A 4P	1	
		158 567	LINK, jumper	3	
15	W1	157 660	CONTACTOR, IEC 25A 4P 2NO-2NC contacts	1	
		158 567	LINK, jumper	2	
		158 568	LINK, jumper large	1	
	PLG21	131 054	CONNECTOR & SOCKETS, (consisting of)	1	
		113 746	CONNECTOR, rect skt 24-18ga Molex 39-00-0038	2	
	RC21	135 635	CONNECTOR & PINS, (consisting of)	1	
		114 656	CONNECTOR, rect pin 24-18ga Molex 39-00-0040	2	
		146 112	BLANK, snap-in nyl .218mtg hole		2
16	CT1	158 555	TRANSFORMER, current	1	1
17		020 265	CABLE TIE, 0-1.750 bundle	1	1
18	T1	172 012	TRANSFORMER, HF	1	1
19	R13-16	139 812	RESISTOR, WW fxd 30W 5K ohm	4	4
20		Fig 8-3	CHASSIS, mid	1	1
21		126 026	LABEL, warning electric shock	1	1
22		+159 620	CASE SECTION, front/bottom/back (consisting of)	1	1
		161 136	NUT, .312-18 stl insert	4	4
		161 135	NUT, 10-24 stl insert	4	4
		148 329	LABEL, caution incorrect voltage will damage unit	1	
		148 330	LABEL, caution incorrect voltage will damage unit		1
23		134 229	BUSHING, strain relief .640/.770 ID x 1.470mtg hole	1	1
24		158 559	CABLE, pwr 12ft	1	
24		152 710	CABLE, port No. 10 4/c (order by ft)		12ft
25	T2	165 659	TRANSFORMER, control	1	
25	T2	161 224	TRANSFORMER, control		1
	PLG7	166 680	CONNECTOR & PINS, (part of T2) (consisting of)	1	1
		113 633	CONNECTOR, rect pin 20-14ga Amp 350218-1	12	12
	RC7	166 679	CONNECTOR & SOCKETS, (consisting of)	1	1
		114 066	CONNECTOR, rect skt 20-14ga Amp 350536-1	12	12
26		140 894	BRACKET, mtg stab	1	1
27	Z1,2	141 437	STABILIZER	2	2
28		Fig 8-2	PANEL, front w/components	1	1
29	PC4	166 064	CIRCUIT CARD, receptacle bypass	1	1
	PLG30,31	130 203	CONNECTOR & SOCKETS, (consisting of)	2	2
		113 746	CONNECTOR, rect skt 24-18ga Molex 39-00-0038	12	12
30		115 440	STAND-OFF, 6-32 x .687 lg	4	4
31		+141 574	CASE, bottom	1	1
32		134 327	LABEL, warning general precautionary	2	2
33		143 915	MOUNT, sgl stud 1.5dia x 1.375 lg .312-18 stud	4	4
34		133 948	FOOT, mounting	4	4
35		169 771	SCREW, shld stl hexhd 10-32 x .875	8	8

+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.

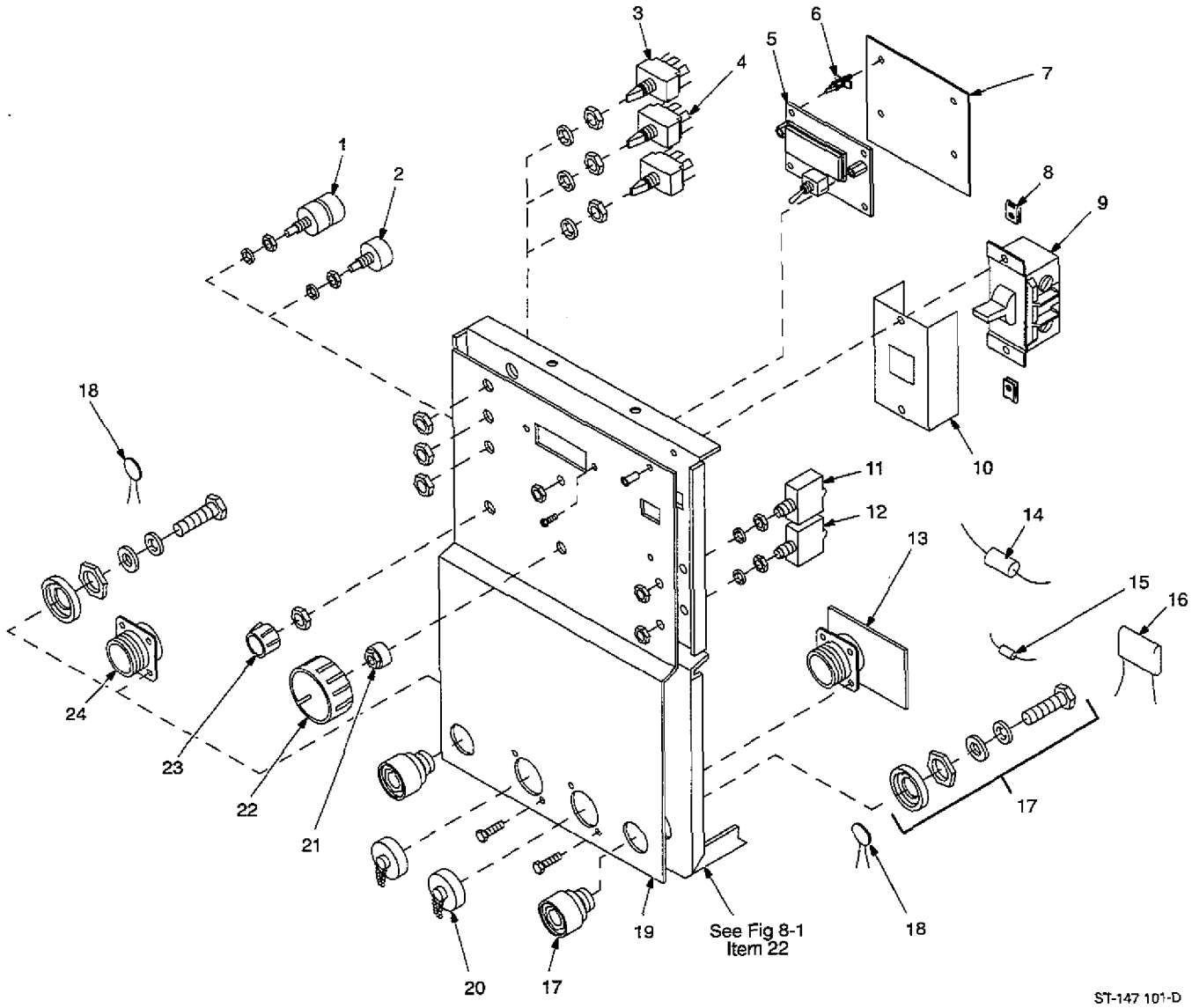


Figure 8-2. Panel, Front w/Components

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

Figure 8-2. Panel, Front w/Components (Fig 8-1 Item 28)

1	R2	039 462	POTENTIOMETER	1
2	R3	035 897	POTENTIOMETER, C sltd sft 1/T 2W 1000 ohm	1
3	S2	134 848	SWITCH, tgl DPDT 15A 125VAC	1
4	S3,4	134 840	SWITCH, tgl SPTT 15A 125VAC	2
5	PC5	157 011	CIRCUIT CARD, meter	1
	PLG50	089 222	CONNECTOR, rect 11skt plug Amp 1-640440-1	1
6		134 058	STAND-OFF SUPPORT, PC card .156dia	4
7		158 563	STRIP, protector PC card	1
8		148 297	NUT, speed U-type 10-32	2
9	S1	128 756	SWITCH, tgl 3PST 40A 600VAC	1
10		146 684	INSULATOR, switch pwr	1
11	CB1	089 807	CIRCUIT BREAKER, man reset 1P 2.5A 250V	1
12	CB2	083 432	CIRCUIT BREAKER, man reset 1P 10A 250V	1
13	RC1, PC10	137 542	CIRCUIT CARD, connector 17 pin	1
		097 866	CONNECTOR, circ 17 pin plug Amphenol MS-3106A-20-29P	
		073 296	CONNECTOR, circ clamp str rlf sz 20-22 Amphenol 97-3057-12-6	
14	R17	604 178	RESISTOR, C 2W 100 ohm	1
15	R5	030 044	RESISTOR, MF .5W 100K ohm	1
16	C39	035 561	CAPACITOR, polye met film 4uf 200V	1
17	Pos,Neg	129 525	RECEPTACLE, twlk insul fem (Dinse type) 50/70 series	2
		042 418	CONNECTOR KIT, Dinse male 50 series (consisting of)	2
		134 746	WRENCH, hex 5mm short	1
18	C6,7	138 115	CAPACITOR	2
19			NAMEPLATE, (order by model and serial number)	1
20		039 885	CONNECTOR, circ protective cap Amphenol 9760-20	2
21		135 299	LOCK, shaft pot .375-32 x .250dia shaft	1
22		097 924	KNOB, pointer	1
23		097 922	KNOB, pointer	1
24	RC2	143 976	CONNECTOR w/SOCKETS, (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 sz 17-20 Amp 206322-2 (or)	
		143 922	CONNECTOR, circ clamp str rlf sz 17-20 Amp 206070-3	

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

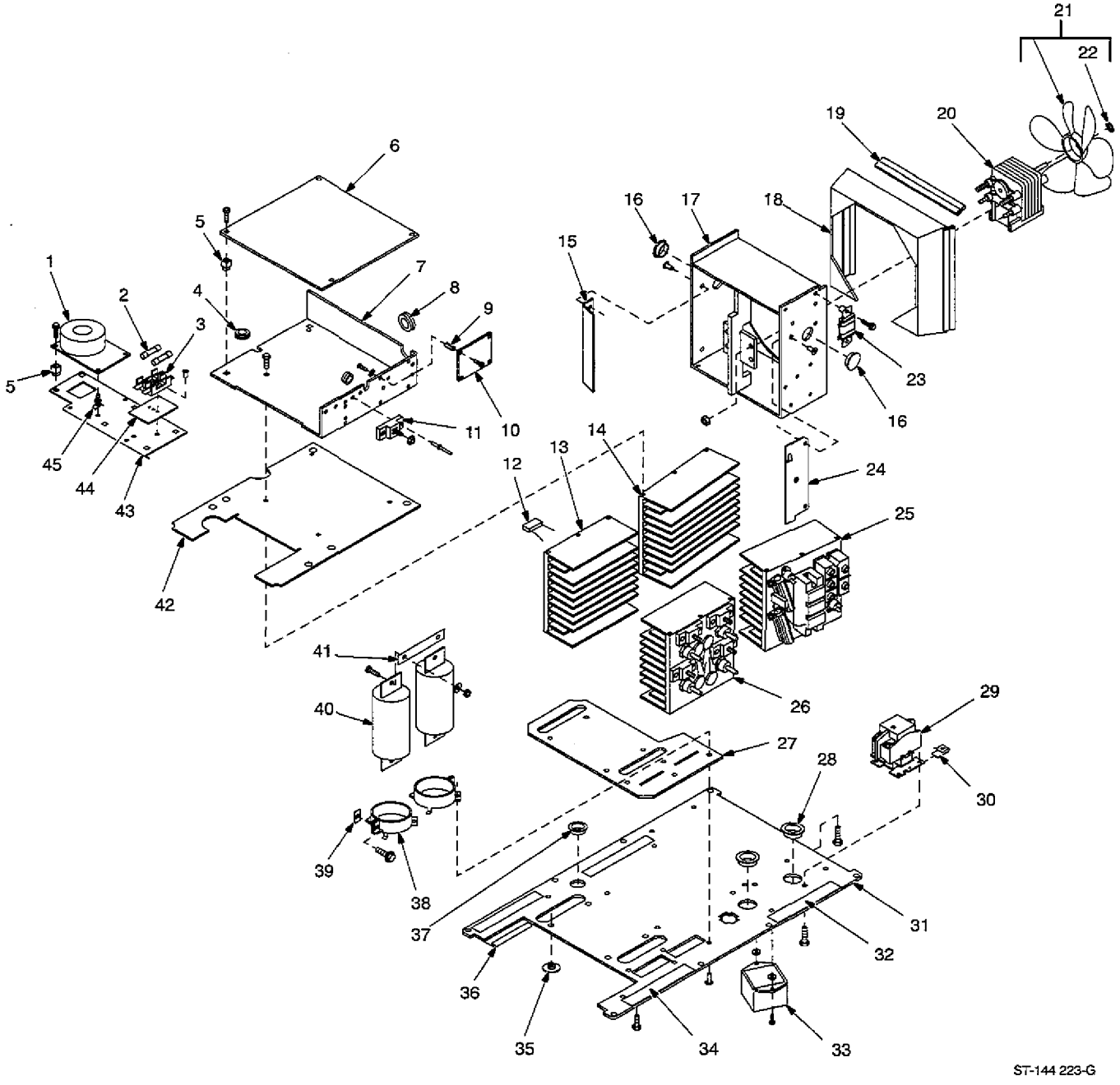


Figure 8-3. Chassis, Mid (208-230/460V Model Illustrated)

Item No.	Dia. Mkgs.	Part No.	Description	Quantity Model 208-230/460V	Quantity Model 460/575V
Figure 8-3. Chassis, Mid (Fig 8-1 Item 20)					
1	HD1	156 313	TRANSDUCER, current 300A	1	1
	PLG62	130 204	CONNECTOR & SOCKETS, (consisting of)	1	1
		114 066	CONNECTOR, rect skt 20-14ga Amp 350536-1	3	3
2	F3,4	*012 652	FUSE, mintr gl slo-blo .5A	2	2
3		098 376	HOLDER, fuse mintr .250 x 1.250 clip 2 fuses 30A	1	1
4		010 116	GROMMET, rbr .375 ID x .500mtg hole	2	2
5		083 147	GROMMET, scr No. 8/10 panel hole .312sq .500 high	6	6
6	PC1	169 785	CIRCUIT CARD, control	1	
6	PC1	171 581	CIRCUIT CARD, control		1
	PLG2	131 054	CONNECTOR & SOCKETS (consisting of)	1	1
		113 746	CONNECTOR, rect skt 24-18ga Molex 39-00-0038	2	2
	PLG4	115 094	CONNECTOR & SOCKETS, (consisting of)	1	1
		113 746	CONNECTOR, rect skt 24-18ga Molex 39-00-0038	4	4
	PLG6	115 093	CONNECTOR & SOCKETS, (consisting of)	1	1
		113 746	CONNECTOR, rect skt 24-18ga Molex 39-00-0038	6	6
	PLG8,18,28	115 092	CONNECTOR & SOCKETS, (consisting of)	3	3
		113 746	CONNECTOR, rect skt 24-18ga Molex 39-00-0038	8	8
	PLG10	115 091	CONNECTOR & SOCKETS, (consisting of)	1	1
		113 746	CONNECTOR, rect skt 24-18ga Molex 39-00-0038	10	10
	PLG12	130 203	CONNECTOR & SOCKETS, (consisting of)	1	1
		113 746	CONNECTOR, rect skt 24-18ga Molex 39-00-0038	12	12
7		162 096	TRAY, mtg PC card	1	1
8		137 768	GROMMET, rbr .750 ID x .875mtg hole	1	1
9		141 588	STAND-OFF, 8-32 x .500 lg	4	
10	PC6	168 777	CIRCUIT CARD, driver	1	
	PLG1	115 091	CONNECTOR & SOCKETS, (consisting of)	1	
		113 746	CONNECTOR, rect skt 24-18ga Molex 39-00-0038	10	
10	R27,28	136 076	RESISTOR, WW fxd 30W 200 ohm	2	
11		072 253	STUD, connection single 10-32 x .500 x 1.250	1	1
12	SN1	152 776	SUPPRESSOR	1	1
13		158 308	RECTIFIER, si diode LH (consisting of)	1	1
	C40-43	031 689	CAPACITOR	4	4
	D9-12	149 209	KIT, diode fast recovery	4	4
	TP3	155 053	THERMOSTAT, NO	1	1
		133 290	HEAT SINK, rect	1	1
		072 253	STUD, connection single 10-32 x .500 x 1.250mtg	4	4
14		158 549	IGBT, LH (consisting of)	1	
14		161 221	IGBT, LH (consisting of)		1
	C14,15	157 451	CAPACITOR, polye met film .01uf 1600V	2	2
	PM1	150 912	KIT, transistor IGBT module	1	
	PM1	150 913	KIT, transistor IGBT module		1
	R9,10	123 231	RESISTOR, WW fxd 50W 35 ohm	2	2
		169 402	HEAT SINK, IGBT LH	1	1
15		152 780	BAFFLE, air wind tunnel LH	1	1
16		000 527	BLANK, snap-in nyl .875mtg hole	2	2
17		146 581	WIND TUNNEL, 6.500 in	1	1
18		133 295	CHAMBER, plenum 6.500 in	1	1
19		135 661	EDGE TRIM, style 3100-1/16 (order by ft)	2ft	2ft
20	FM	132 232	MOTOR, fan 220/230V 50/60Hz 3000RPM	1	1
	PLG9	131 054	CONNECTOR & SOCKETS, (consisting of)	1	1
		113 746	CONNECTOR, rect skt 24-18ga Molex 39-00-0038	2	2
	RC9	135 635	CONNECTOR & PINS, (consisting of)	1	1
		114 656	CONNECTOR, rect pin 24-18ga Molex 39-00-0040	2	2
21		155 426	KIT, fan blade (consisting of)	1	1
22		134 209	NUT, speed push-on-type .250	1	1
23	R27	136 076	RESISTOR, WW fxd 30W 200 ohm	1	
23	CR1	052 964	RELAY, encl 24VDC DPDT		1

Item No.	Dia. Mkgs.	Part No.	Description	Quantity Model 208-230/460V	Quantity Model 460/575V
			Figure 8-3. Chassis, Mid (Fig 8-1 Item 20) (Continued)		
. 24		146 689	BAFFLE, air wind tunnel RH	1	1
. 25		158 815	IGBT, RH (consisting of)	1	
. 25		161 222	IGBT, RH (consisting of)		1
	C16,17	157 451	CAPACITOR, polye met film .01uf 1600V	2	2
	PM2	150 912	KIT, transistor IGBT module	1	
	PM2	150 913	KIT, transistor IGBT module		1
	R11,12	123 231	RESISTOR, WW fxd 50W 35 ohm	2	2
	SR1	149 208	KIT, diode pwr module	1	1
	TP1	006 334	THERMOSTAT, NC	1	1
	TP2	155 053	THERMOSTAT, NO	1	1
		158 816	HEAT SINK, IGBT RH	1	
		169 403	HEAT SINK, IGBT RH		1
	VR5	091 033	VARISTOR	1	
. 26		133 968	RECTIFIER, si diode RH (consisting of)	1	1
	C44-47	031 689	CAPACITOR	4	4
	D13-16	149 209	KIT, diode fast recovery	4	4
		133 290	HEAT SINK, rect	1	1
		072 253	STUD, connection single 10-32 x .500 x 1.250mtg	4	4
. 27		139 743	INSULATOR, heat sink lower	1	1
. 28		030 170	BUSHING, snap-in nyl .750 ID x 1.000mtg hole	2	2
. 29	W2	145 407	CONTACTOR, def prp 25A 2P 24VAC	1	
. 29	W1	145 407	CONTACTOR, def prp 25A 2P 24VAC		1
	SN2	152 775	SNUBBER, poly met film 1uf 600VDC 47 ohm		1
. 30		136 190	NUT, speed U type 10-32	2	2
. 31		+158 442	PANEL, center	1	1
. 32		153 178	LABEL, warning exploding parts etc	2	2
. 33	VCM1	164 849	MODULE, varistor/capacitor 4 400 joule 1620-1980VDC	1	1
. 34		126 026	LABEL, warning electric shock	2	2
. 35		145 053	WASHER, shldr nyl .298 OD x .203 ID x 1.000 x .062shldr	4	4
. 36		099 037	EDGE TRIM, style 62-1/16 (order by ft)	1ft	1ft
. 37		010 493	BUSHING, snap-in nyl .625 ID x .875mtg hole	1	1
. 38		006 426	CLAMP, capacitor 2.000dia	2	2
. 39		133 405	NUT, speed 10-24 flat type rectangular	2	2
. 40	C1,2	132 844	CAPACITOR, polyp film 2.1uf 1000VDC	2	2
. 41		158 577	BUS BAR, interconnecting	1	1
. 42		158 443	INSULATOR, heat sink upper	1	1
. 43		158 444	STRIP, bus rectifier	1	1
. 44		154 702	INSULATOR, fuse holder	1	1
. 45		134 058	STAND-OFF SUPPORT, PC card .156dia	2	2

*Recommended Spare Parts.
+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.

OPTIONS AND ACCESSORIES

CONTROL OPTIONS

OPTIMA™ ADAPTIVE SYNERGIC GMAW (MIG) PULSE CONTROL (#042 171)

Versatile, cost effective synergic GMAW pendant designed for use with an inverter power source with any wire feeder, including automatic feeders and spool guns. Includes 25 ft. (7.6 m) cord with 17-pin plug.

- Provides precise pulsing on 10 selectable operating channels, which include programs for aluminum, stainless, mild steel, nickel, and silicon bronze.
- Provides synergic pulse spray transfer control to eliminate spatter associated with the short circuit transfer process.

Note: For best performance, do not run the XMT on 200 or 208 primary voltage when using this accessory.

INTELLITIG™ 4 PRECISION TIG CONTROLLER (#042 598)

Provides high-frequency arc starting, timed gas solenoid control and metering, pulsing, sequencing, sloping, on-screen voltage and amperage metering, and two relay contacts for fixturing. The control provides four modes of operation: Automatic, Semiautomatic, Manual GTAW and SMAW. For detailed information, refer to product Literature Index No. AY/9.0.

PC-300 PULSED GTAW (DC TIG) CONTROL (#042 297)

Can be used with power sources that have built-in high frequency, or it can be use with an external high-frequency unit. The control has two internally switchable scales: a 0.5 to 20 pulses-per-second scale for both inverter and non-inverter type power sources, and a 10 to 300 pulses-per-second scale for inverter power sources only.

Control includes 8 ft. (2.4 m) interconnecting cord and 115 VAC power cord. Front panel controls provide:

- Peak Amperage Adjustment
- Background Amperage Adjustment
- Pulses-Per-Second Adjustment (0.5 to 20 pulses-per-second scale or 10 to 300 pulses-per-second scale)
- Percent On Time Control
- Amperage Remote/Panel Control
- Output Contactor On/Off Control
- Pulser On/Off
- Power On/Off
- Remote Control Receptacle (for remote hand or foot controls)

Note: For best performance, do not run the XMT on 200 or 208 primary voltage when using this accessory.

MMP MANUAL MIG PULSER PENDANT CONTROL (#042 727)

The MMP Manual MIG Pulser Control allows manual control of the pulse wave form. This control provides independent control of the four parameters that affect the pulse process:

- Frequency: Adjust the pulse rate within a range of 20 pulses-per-second to 200 pulses-per-second.
- Pulse Width: Adjust the amount of "on" time. Maintains arc stability. Adjusts from 1 to 5 milliseconds.
- Peak Current Level: Set the "peak" amperage that the pulse wave form will allow (25% to 100% of maximum output of power source). Helps "pinch" off the electrode droplet.
- Background Current Level: Set the background current level to sustain the arc (3% to 25% of maximum output of power source).

This control allows precision pulse welding with a wide variety of wire sizes, gases, materials, and joint configurations.

Includes 25 ft. (7.6 m) connector cord and a 17-pin plug for direct connection to the front of the power source.

Note: For best performance, do not run the XMT on 200 or 208 primary voltage when using this accessory.

REMOTE CONTROLS

RFC-14 FOOT CONTROL (#129 339)

Foot current and contactor control. Includes 20 ft. (6 m) cord and 14-pin plug.

RHC-14 HAND CONTROL (#129 340)

Miniature hand control for remote current and contactor control. Dimensions: 4 in. (102 mm) x 4 in. (102 mm) x 3-1/4 in. (82 mm). Includes 20 ft. (6 m) cord and 14-pin plug.

TORCH-MOUNTED REMOTE HAND CONTROLS

RMLS-14 (#129 337)

Momentary- and maintained-contact rocker switch for contactor control. Push forward for maintained contact and back for momentary contact. Includes 20 ft. (6 m) cord and 14-pin Amphenol plug.

RCC-14 REMOTE CONTACTOR AND CURRENT CONTROL (#151 086) 14-pin plug

Rotary motion fingertip control fastens to TIG torch using two Velcro straps. Includes 28 ft. (8.5 m) control cord.

EXTENSION CORDS FOR REMOTE CONTROLS AND 24 VAC WIRE FEEDERS

14-pin Amphenol plug to a 14-pin Amphenol socket.

10 ft. (3 m)	**(#122 972)**
25 ft. (7.6 m)	**(#122 973)**
50 ft. (15.2 m)	**(#122 974)**
75 ft. (22.8 m)	**(#122 975)**

XMT ECONOMY CART (#134 505)

Small and lightweight. Slanted for convenient access to front panel controls. Storage compartment for gloves, helmet, etc.

XMT WIRE FEEDER QUICK DISCONNECT (#042 491)

Attaches S-21E or S-22A wire feeder to XMT case.

XMT CYLINDER CART (#042 537)

Has adjustable handles and is slanted for convenient access to power source front panel controls. Carries two 160 lb. (72.6 kg) gas cylinders, or one gas cylinder and one coolant system for GTAW (TIG) welding. Feeder mounted to tray above power source. Can be used with the Maxtron™, Miller Arc Pak™ or XMT inverter power supplies. Also accommodates Radiator, Watermate™, or Coolmate™ coolant systems.

OPTIONS AND ACCESSORIES

UNIVERSAL CARRYING CART AND CYLINDER RACK
(#042 934)
Accommodates any XMT power source, plug gas cylinder up to 56 in. (142.2 cm) high measuring 6 to 9 inches (15.2 to 22.8 cm) in diameter. Also provides storage for auxiliary items such as electrodes, helmets, gloves, etc. Can also be used with Econotig™, Maxstar® Series, Millermatic® 130 and Millermatic® 150 power sources.

XMT RACK
8 Pak Rack (#042 813)
For operation on 460 or 575 VAC

8 Pak Rack (#042 648)
For operation on 230 or 460 VAC

4 Pak Rack (#042 812)
For operation on 230 or 460 VAC

The rugged 8 Pak Rack houses and powers up to eight XMT 300 power sources. The rack measures 66 in. (1.68 m) wide x 41 in. (1.04 m) deep x 72 in. (1.83 m) tall, and weighs 1700 lbs. (771 kg) when loaded with eight XMTs (with no welding cables). The 4 Pak Rack measures 66 in. (1.68 m) wide x 41 in. (1.04 m) deep x 57 in. (1.45 m) tall, and weighs just 800 lbs. (363 kg) with four XMT 300 units.

The XMT Rack provides many important features:

- Two – 115 VAC, 20 Amp GFCI duplex receptacles for auxiliary tools (8 Pak Racks only)
- Provisions for paralleling power sources or common work connections
- Power sources can be locked down to prevent theft
- Captured secondary cable hangers for work leads and weld cables
- Center lifting eye
- Rugged skids for dragging or pushing

HF-251D-1 HIGH-FREQUENCY ARC STARTER/STABILIZER
(#042 388)
See Literature Index No. AY/5.1.

XMT INVERTER POWER SOURCES VIDEOTAPE
(#137 760)
An 8 minute VHS videotape describing the XMT family of inverter power sources.

MILLER EXPERT PROGRAM™
(#042 603) for XMT 300 CC/CV, 230/460 VAC
(#042 697) for XMT 300 CC/CV, 460/575 VAC

Easy-to-use computerized software program used to diagnose and service the power source. For detailed information, reference Miller Expert Program Literature Index No. AV/6.0.

Note: The serial number of the power source and diskette size (5-1/4 or 3-1/2 in.) must be specified when ordering any Miller Expert Program diskette.

INTERNATIONAL-STYLE CONNECTORS (Will accept Dinse™ or other International connectors.)

All XMT power sources are equipped with International-style connectors for secondary connections. (Power source is shipped with two – 50 mm male International-style plugs for use with #1 or #2 AWG size cable.)

INTERNATIONAL-STYLE CONNECTOR KIT
(#042 418) 50 mm
Accepts #1 or #2 AWG cable size. Required if male plugs shipped with power source must be replaced, if additional plugs are needed.

(#042 533) 70 mm
Accepts #1/0 or #2/0 AWG cable size. Required if #1/0 or #2/0 AWG size cable is to be used.

Kit includes one International-style male plug which attaches to the work and/or weld cables and plugs into the International style receptacles on the power source.

EXTENSION KIT FOR INTERNATIONAL-STYLE CABLE CONNECTORS
Used to adapt or extend weld and/or work cables.

Kit includes one male International-style plug and one in-line female International-style receptacle.
(#042 419) 50 mm
Accepts #1 or #2 AWG size cable.
(#042 534) 70 mm
Accepts #1/0 or #2/0 AWG size cable.

INTERNATIONAL/TWECO® ADAPTER
(#042 465)
A one-piece adapter which has an International-style male plug (to power source) on one end and a female Tweco receptacle (for weld cable connection) on other end.

INTERNATIONAL/CAM-LOK ADAPTER
(#042 466)
A one-piece adapter which has an International-style male plug (to power source) on one end and a Cam-Lok receptacle (for weld cable connection) on other end.

INTERNATIONAL/TIG TORCH CONNECTOR
Required for direct connection of water-cooled torches or air-cooled torches with a one-piece cable assembly.

Kit includes gas hose, gas hose fitting, and International-style TIG Block.

(#135 492)
For 80 Amp, air-cooled torch with one-piece cable assembly.

(#135 493)
For 150 Amp, air-cooled torch with one-piece cable assembly.

(#135 494)
For 200 Amp, air-cooled torch with one-piece cable assembly.

(#135 495)
For 250/300 Amp, water-cooled torch with one-piece cable assembly.