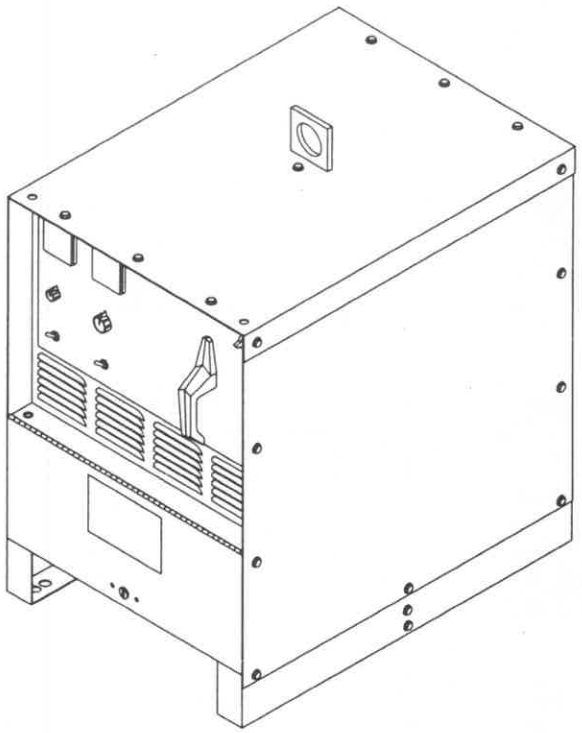
Miller®

February 1992 FORM: OM-318C

Effective With Serial No. KC175614

MODEL: Shopmaster™ 300 AC/DC



OWNER'S MANUAL

▶ **IMPORTANT:** *Read and understand the entire contents of this manual, with special emphasis on the safety material throughout the manual, before installing, operating, or maintaining this equipment. This unit and these instructions are for use only by persons trained and experienced in the safe operation of welding equipment. Do not allow untrained persons to install, operate, or maintain this unit. Contact your distributor if you do not fully understand these instructions.*

MILLER ELECTRIC Mfg. Co.
A Miller Group Ltd., Company

P.O. Box 1079
Appleton, WI 54912 USA
Tel. 414-734-9821

PRINTED IN USA

LIMITED WARRANTY

EFFECTIVE: AUGUST 6, 1990

This 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 hereof, MILLER Electric Mfg. Co., Appleton, Wisconsin warrants to its Distributor/Dealer that all new and unused Equipment furnished by MILLER is free from defect in workmanship and material as of the time and place of delivery by MILLER. No warranty is made by MILLER with respect to engines, trade accessories or other items manufactured by others. Such engines, trade accessories and other items are sold subject to the warranties of their respective manufacturers, if any. All engines are warrantied by their manufacturer for two years from date of original purchase, except Deutz engines which have a one year, 2000 hour warranty.

Except as specified below, MILLER's warranty does not apply to components having normal useful life of less than one (1) year, such as spot welder tips, relay and contactor points, MILLERMATIC parts that come in contact with the welding wire including nozzles and nozzle insulators where failure does not result from defect in workmanship or material.

MILLER shall be required to honor warranty claims on warranted Equipment in the event of failure resulting from a defect within the following periods from the date of delivery of Equipment to the original user:

1. Arc welders, power sources, robots, and components ..... 1 year
2. Load banks ..... 1 year
3. Original main power rectifiers ..... 3 years (labor – 1 year only)
4. All welding guns, feeder/guns and torches .... 90 days
5. All other MILLERMATIC Feeders ..... 1 year
6. Replacement or repair parts, exclusive of labor . 60 days
7. Batteries ..... 6 months

provided that MILLER is notified in writing within thirty (30) days of the date of such failure.

As a matter of general policy only, MILLER may honor claims submitted by the original user within the foregoing periods.

In the case of MILLER's breach of warranty or any other duty with respect to the quality of any goods, the exclusive remedies therefore 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, therefore, no compensation for transportation costs of any kind will be allowed. Upon receipt of notice of apparent defect or failure, MILLER shall instruct the claimant on the warranty claim procedures to be followed.

ANY EXPRESS WARRANTY NOT PROVIDED HEREIN AND ANY IMPLIED WARRANTY, GUARANTY OR REPRESENTATION AS TO PERFORMANCE, AND ANY REMEDY FOR BREACH OF CONTRACT 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 OF FITNESS FOR PARTICULAR PURPOSE, WITH RESPECT TO ANY AND ALL EQUIPMENT FURNISHED BY MILLER IS EXCLUDED AND DISCLAIMED BY MILLER.

EXCEPT AS EXPRESSLY PROVIDED BY MILLER IN WRITING, MILLER PRODUCTS ARE INTENDED FOR ULTIMATE PURCHASE BY COMMERCIAL/INDUSTRIAL USERS AND FOR OPERATION BY PERSONS TRAINED AND EXPERIENCED IN THE USE AND MAINTENANCE OF WELDING EQUIPMENT AND *NOT* FOR CONSUMERS OR CONSUMER USE. MILLER'S WARRANTIES DO NOT EXTEND TO, AND NO RESELLER IS AUTHORIZED TO EXTEND MILLER'S WARRANTIES TO, ANY CONSUMER.

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 7, 1992 FORM: OM-318C

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

▶**IMPORTANT:** *Use Serial Number of unit to select appropriate Diagrams 6-1 and 6-2.*

Replace Diagram 6-1. Circuit Diagram For Welding Power Source (see Pages 2 and 3 on this Errata Sheet)

Replace Figure 6-2. Wiring Diagram For Welding Power Source (see Pages 4 thru 7 on this Errata Sheet)

CHANGES TO SECTION 8 – PARTS LIST

Change Parts List as follows:

**	Dia. Mkgs.	Part No.	Replaced With	Description	Quantity
22-		Added	012 653	FUSE, mintr gl .5A	2
22-	F1	Added	098 376	HOLDER, fuse mintr	1
23-28	RFC1	131 527	152 293	CHOKE	1
23-		Added	153 369	KIT, label	1
25-21	RC1	151 143	151 998	RECEPTACLE, (consisting of)	1
	C17		152 002	LEAD ASSY, elect	1
	C18		152 004	LEAD ASSY, elect	1
	C19		152 000	LEAD ASSY, elect	1

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

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

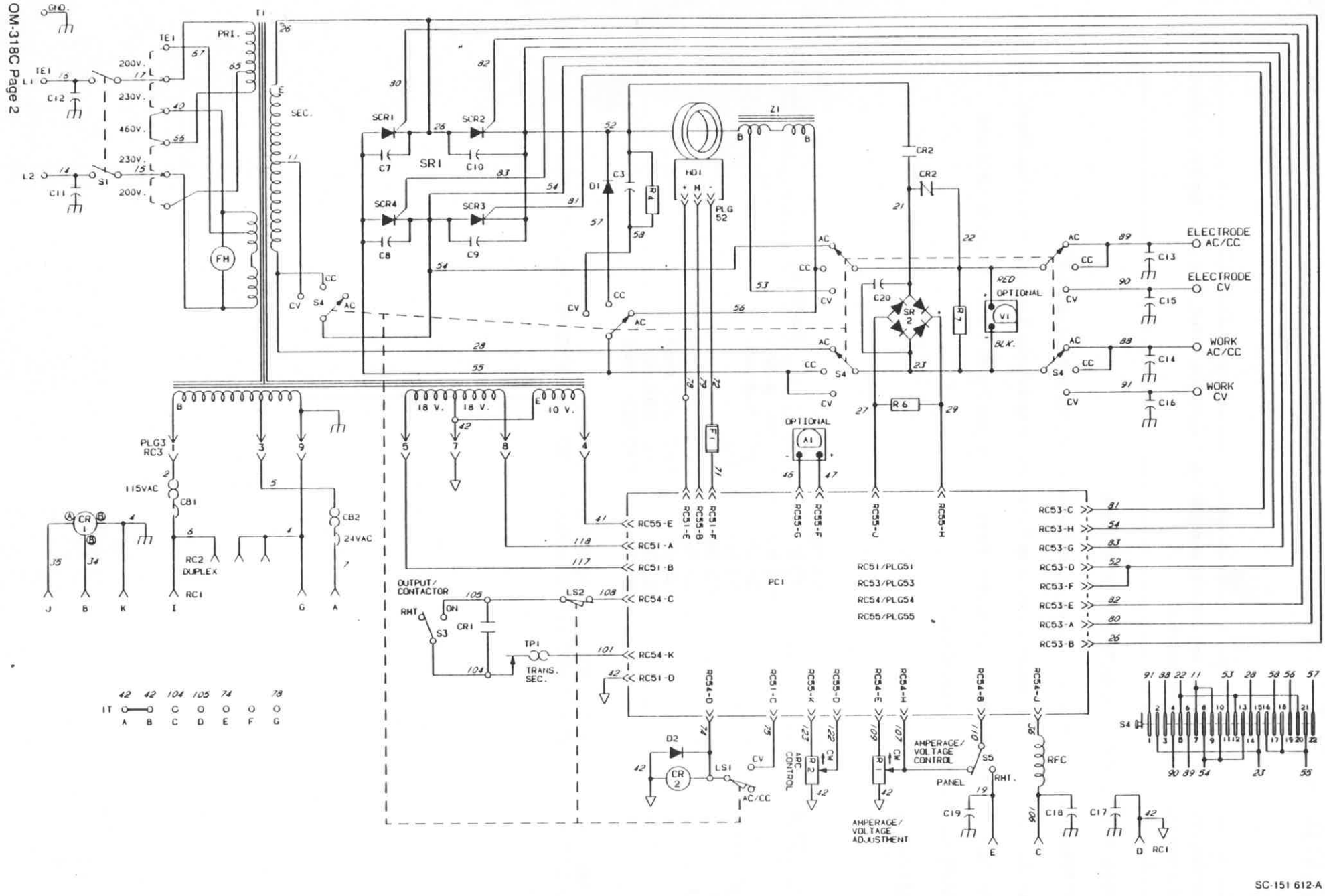


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Diagram 6-1. Circuit Diagram For Welding Power Source Effective With Serial No. KC218706 Thru KC237899

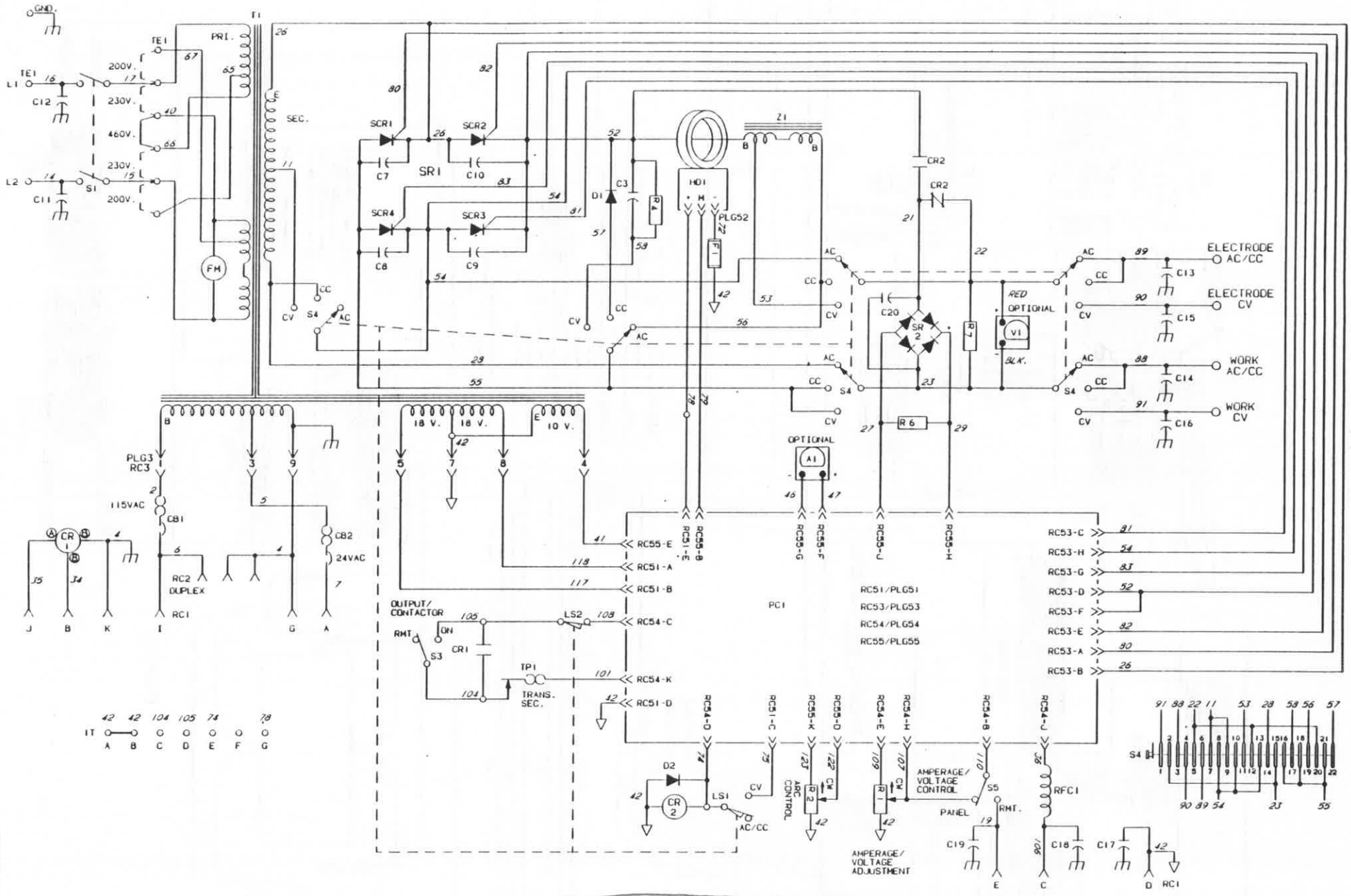

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Diagram 6-1. Circuit Diagram For Welding Power Source Effective With Serial No. KC237900

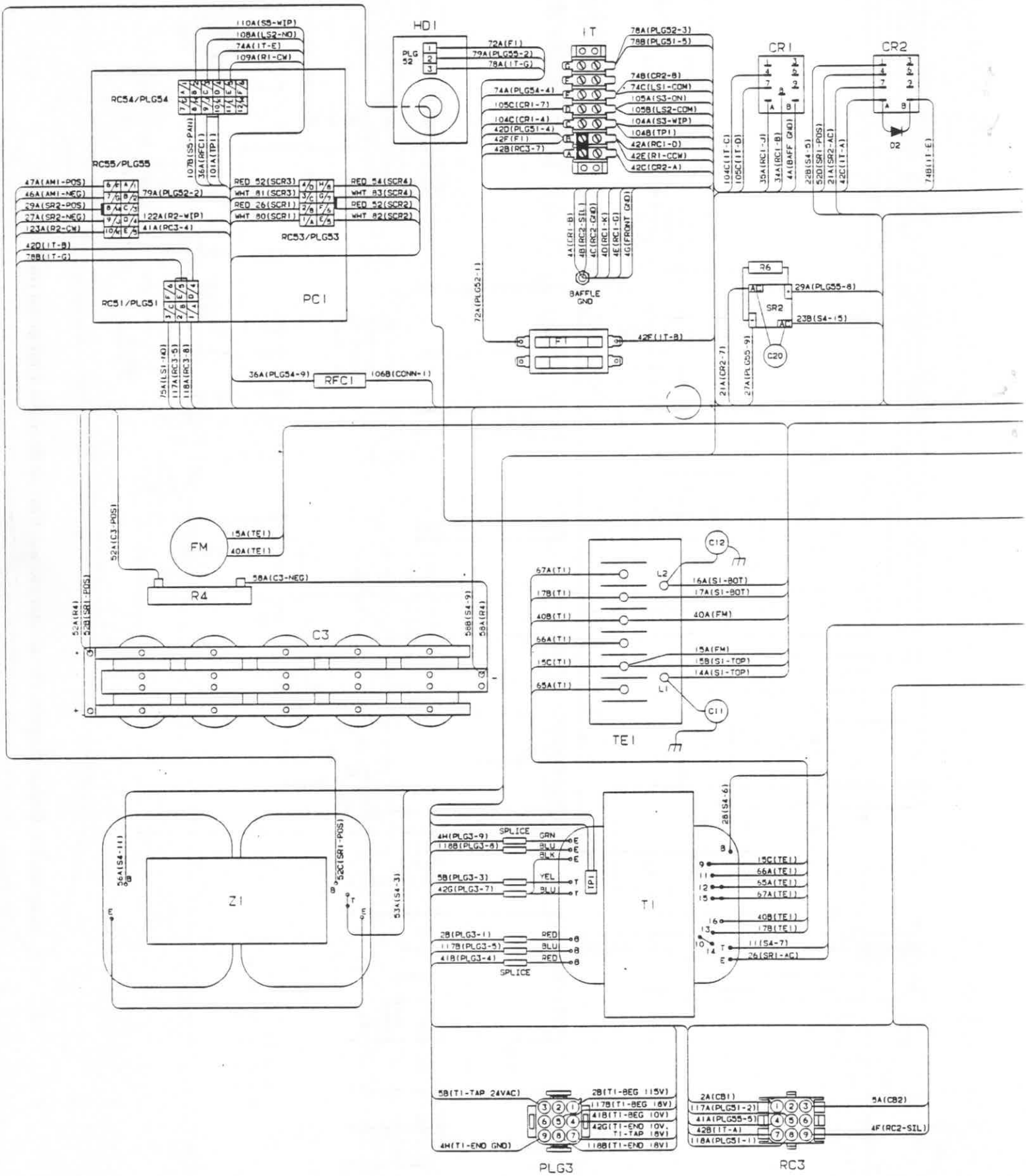
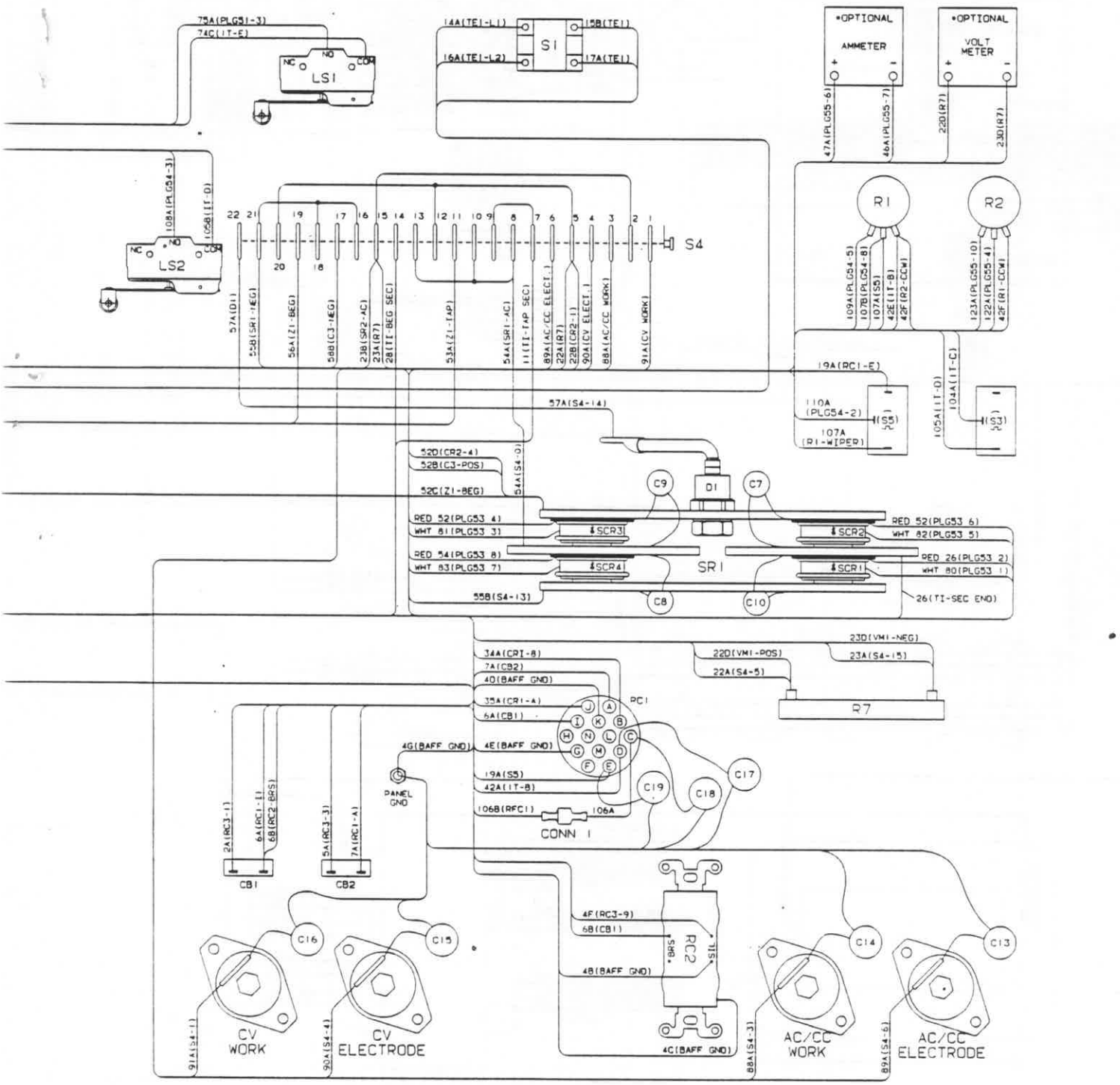


Figure 6-2. Wiring Diagram For Welding Power Source Effective With Serial No. KC237900


*OPTIONAL
AMMETER
*OPTIONAL
VOLT METER
S1
LS1
LS2
S4
R1
R2
R7
SR1
SCR1
SCR2
SCR3
SCR4
D1
PC1
CONN 1
CB1
CB2
RC2
CV WORK
CV ELECTRODE
AC/CC WORK
AC/CC ELECTRODE
PANEL GND
75A(PLG51-3)
74C(IT-E)
14A(TE1-L1)
16A(TE1-L2)
15B(TE1)
17A(TE1)
47A(PLG55-6)
46A(PLG55-7)
220(R7)
230(R7)
108A(PLG54-3)
106B(IT-D)
57A(D1)
52B(SR1-NEG)
56A(Z1-BEG)
58B(C3-NEG)
23B(SR2-AC)
23A(R7)
28(IT-BEG SEC)
53A(Z1-TAP)
54A(SR1-AC)
111(IT-TAP SEC)
89A(AC/CC ELECT.)
22A(R7)
22B(CR2-1)
90A(CV ELECT.)
88A(AC/CC WORK)
91A(CV WORK)
109A(PLG54-5)
107B(PLG54-8)
107A(S5)
42E(IT-B)
42F(R2-CCW)
123A(PLG55-10)
122A(PLG55-4)
42F(R1-CCW)
19A(RC1-E)
110A (PLG54-2)
107A (R1-WIPER)
105A(IT-D)
104A(IT-C)
57A(S4-14)
52D(CR2-4)
52B(C3-POS)
52C(Z1-BEG)
54A(S4-9)
RED 52(PLG53 4)
WHT 81(PLG53 3)
RED 54(PLG53 8)
WHT 83(PLG53 7)
558(S4-13)
RED 52(PLG53 6)
WHT 82(PLG53 5)
RED 26(PLG53 2)
WHT 80(PLG53 1)
26(TI-SEC END)
34A(CR1-B)
7A(CB2)
40(BAFF GND)
35A(CR1-A)
6A(CB1)
4G(BAFF GND)
4E(BAFF GND)
19A(S5)
42A(IT-B)
106B(RFC1)
106A
23D(VM1-NEG)
23A(S4-15)
22D(VM1-POS)
22A(S4-5)
2A(RC3-1)
6A(RC1-1)
6B(RC2-6A5)
5A(RC3-3)
7A(RC1-4)
4F(RC3-9)
6B(CB1)
4B(BAFF GND)
4C(BAFF GND)
91A(S4-1)
90A(S4-4)
88A(S4-3)
89A(S4-6)
C1
C2
C3
C4
C5
C6
C7
C8
C9
C10
C11
C12
C13
C14
C15
C16
C17
C18
C19

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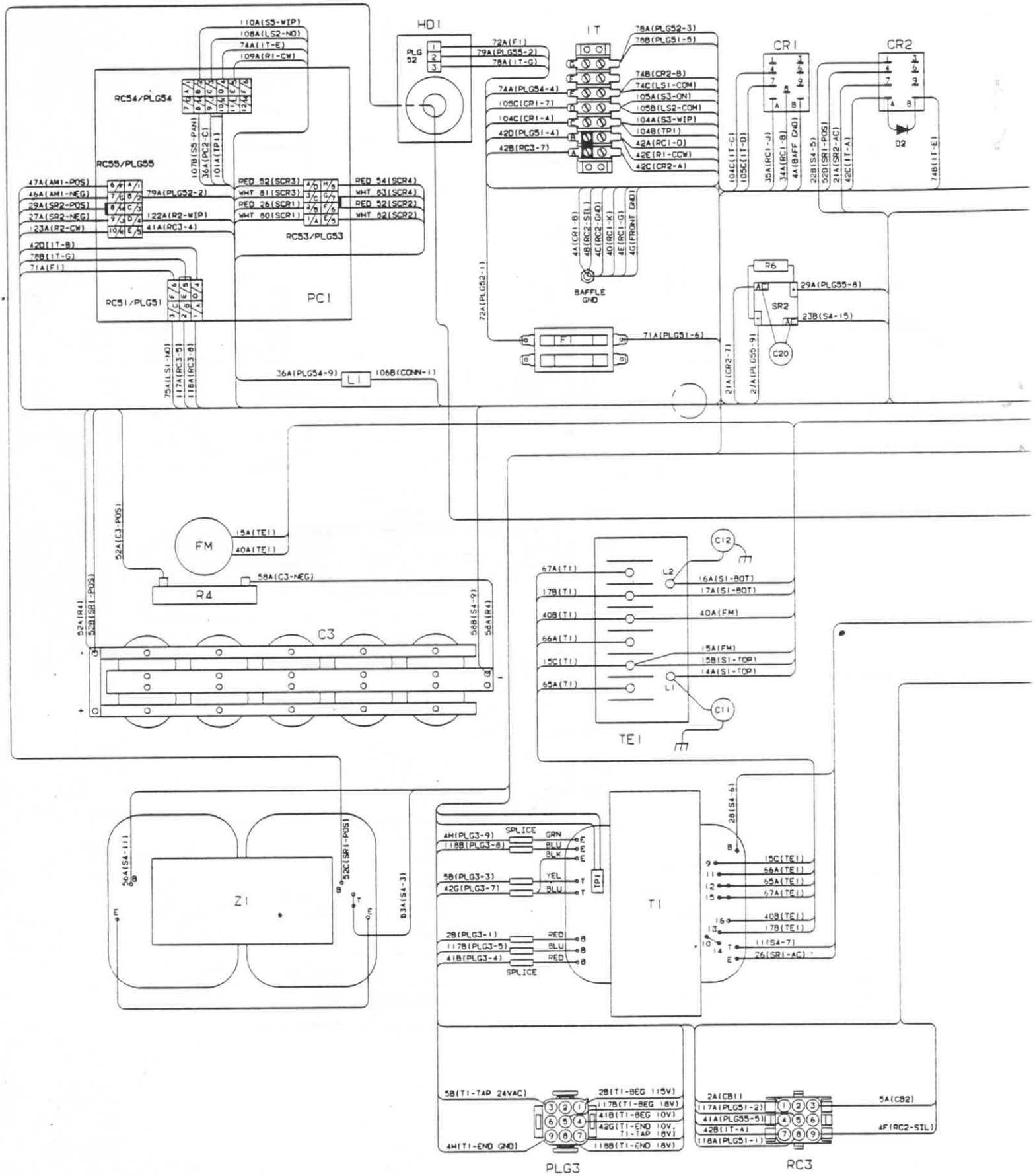
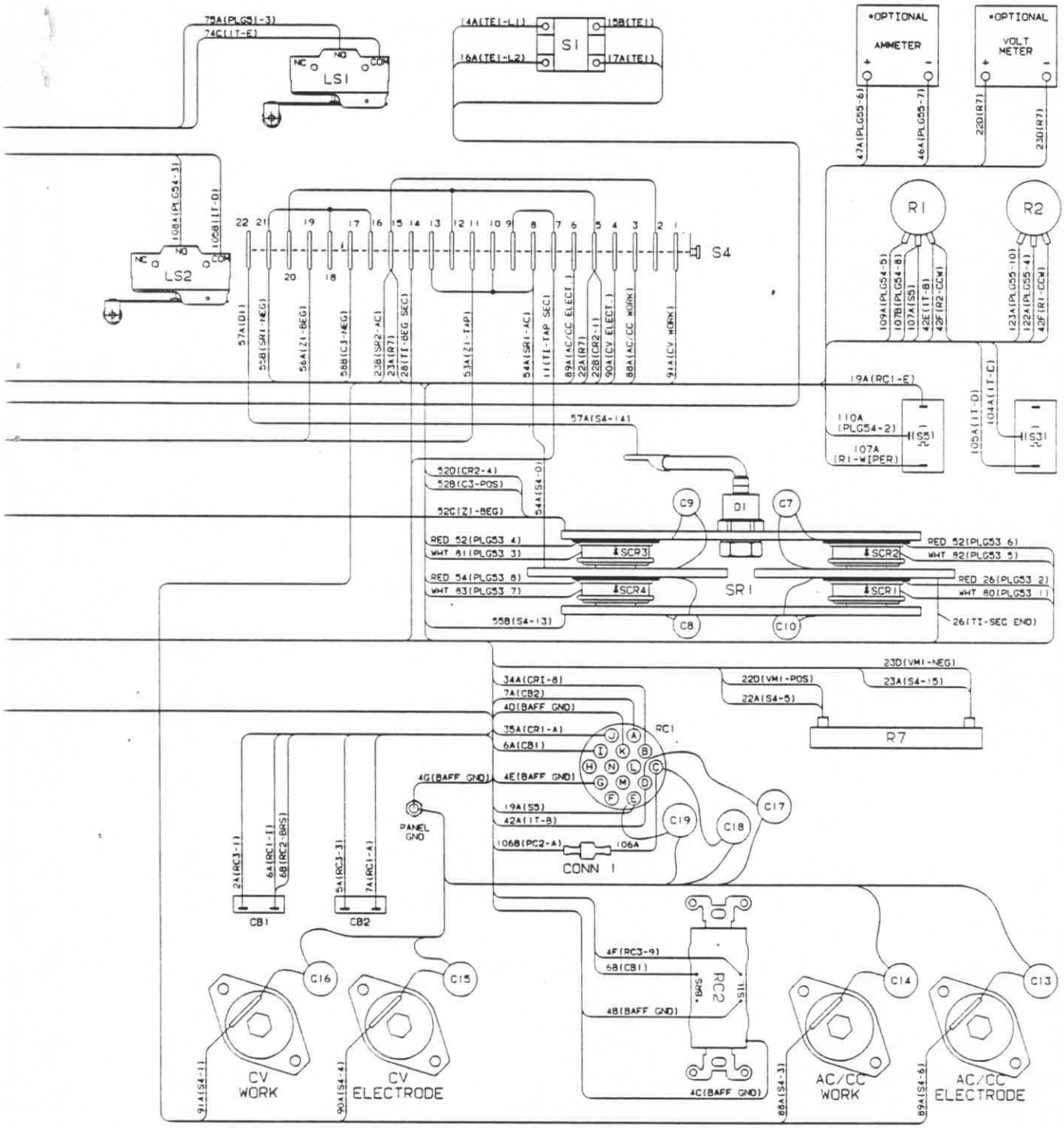


Figure 6-2. Wiring Diagram For Welding Power Source Effective With Serial No. KC218706 Thru KC237899


*OPTIONAL AMMETER
*OPTIONAL VOLT METER
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LS2
S1
S4
R1
R2
R7
SR1
SCR1
SCR2
SCR3
SCR4
D1
RC1
RC2
C7
C8
C9
C10
C13
C14
C15
C16
C17
C18
C19
CB1
CB2
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105B(IT-D)
57A(D1)
55B(SR1-NEG)
56A(Z1-BEG)
58B(C3-NEG)
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23A(R7)
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90A(CV ELECT.)
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91A(CV WORK)
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107B(PLG54-8)
107A(S5)
42E(IT-B)
42F(R2-CCW)
123A(PLG55-10)
122A(PLG55-4)
42F(R1-CCW)
19A(RC1-E)
110A (PLG54-2)
107A (R1-WIPER)
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35A(CR1-A)
6A(CB1)
4G(BAFF GND)
4E(BAFF GND)
19A(S5)
42A(IT-B)
1068(PC2-A)
106A
2A(RC3-1)
6A(RC1-1)
68(RC2-BRS)
5A(RC3-3)
7A(RC1-4)
4F(RC3-9)
68(CB1)
48(BAFF GND)
4C(BAFF GND)
91A(S4-1)
90A(S4-4)
88A(S4-3)
89A(S4-6)

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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.
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. Turn off all equipment when not in use.
7. Do not use worn, damaged, undersized, or poorly spliced cables.
8. Do not wrap cables around your body.
9. Ground the workpiece to a good electrical (earth) ground.
10. Do not touch electrode while in contact with the work (ground) circuit.
11. Use only well-maintained equipment. Repair or replace damaged parts at once.
12. Wear a safety harness to prevent falling if working above floor level.
13. 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.

1. 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.
2. Wear approved safety glasses. Side shields recommended.
3. Use protective screens or barriers to protect others from flash and glare; warn others not to watch the arc.
4. Wear protective clothing made from durable, flame-resistant material (wool and leather) and foot protection.
5. Use approved ear plugs or ear muffs if noise level is high.

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 breath 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 Institue, 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

SECTION 1 – SAFETY SIGNAL WORDS

mod1.1 9/91

The following safety alert symbol and signal words are used throughout this manual to call attention to and identify different levels of hazard and special instructions.

⚠ WARNING

WARNING statements identify procedures or practices which must be followed to avoid serious personal injury or loss of life.

⚠ CAUTION

CAUTION statements identify procedures or practices which must be followed to avoid minor personal injury or damage to this equipment.

▶**IMPORTANT:** *statements identify special instructions necessary for the most efficient operation of this equipment.*

SECTION 2 – SPECIFICATIONS

Table 2-1. Welding Power Source

Specifications	Description					
Type Of Output	DC/CV, DC/CC, Or AC/CC (Direct Current/Constant Voltage, Direct Current/Constant Current, Or Alternating Current/Constant Current)					
Welding Processes	Shielded Metal Arc Welding (SMAW), Gas Metal Arc Welding (GMAW), Gas Tungsten Arc Welding (GTAW), Flux Cored Arc Welding (FCAW)					
Overall Dimensions	See Figure 3-3					
Weight	Net: 370 lbs. (168 kg); Ship: 380 lbs. (172 kg)					
Options	See Rear Cover					
Rated Weld Output	NEMA Class II (40) – 200 Amperes, 28 Volts AC At 40% Duty Cycle (see Section 2-1) NEMA Class II (50) – 300 Amperes, 32 Volts DC At 50% Duty Cycle (see Section 2-1)					
	60 Hz			50 Hz		
	AC Mode	CC Mode	CV Mode	AC Mode	CC Mode	CV Mode
Type Of Input Power	200, 230, 460, Or 575 Volts AC			220, 380, Or 415 Volts AC		
Input Amperes At Rated Output	85A At 200V, 74A At 230V, 37A At 460V, 29A At 575V	105A At 200V, 91A At 230V, 46A At 460V, 36A At 575V	103A At 200V, 90A At 230V, 45A At 460V, 36A At 575V	69A At 220V, 40A At 380V, 36A At 415V	88A At 220V, 51A At 380V, 47A At 415V	72A At 220V, 42A At 380V, 38A At 415V
KVA Used At Rated Output	16.8 kVA	20.9 kVA	20.7 kVA	15.1 kVA	19.3 kVA	15.8 kVA
KW Used At Rated Output	8.2 kW	13.7 kW	13.6 kW	7.8 kW	13.1 kW	12.7 kW
Max. Open-Circuit Voltage	80 Volts AC	68 Volts DC	40 Volts DC	80 Volts AC	57 Volts DC	40 Volts DC

2-1. Volt-Ampere Curves And Duty Cycle

⚠ CAUTION

EXCEEDING DUTY CYCLE RATINGS will damage unit.

- Do not exceed indicated duty cycles.

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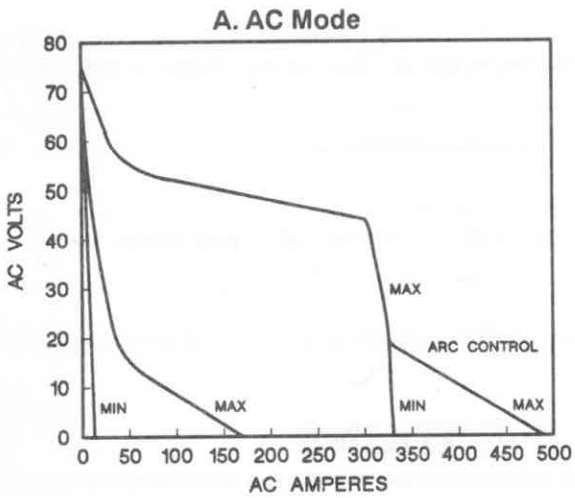
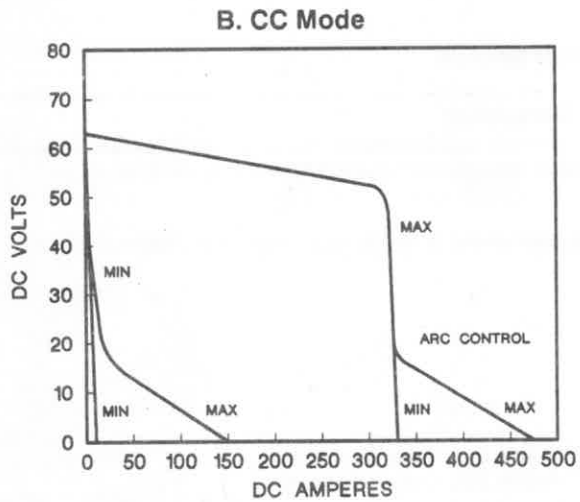


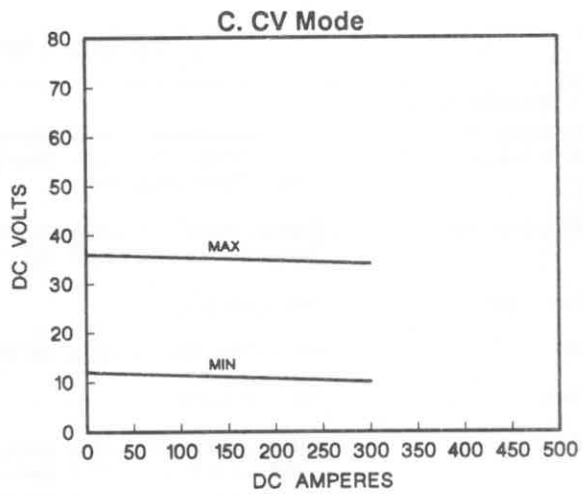
The volt-ampere curves show the minimum and maximum voltage and amperage output capabilities of the welding power source. Curves of other settings fall between the curves shown.

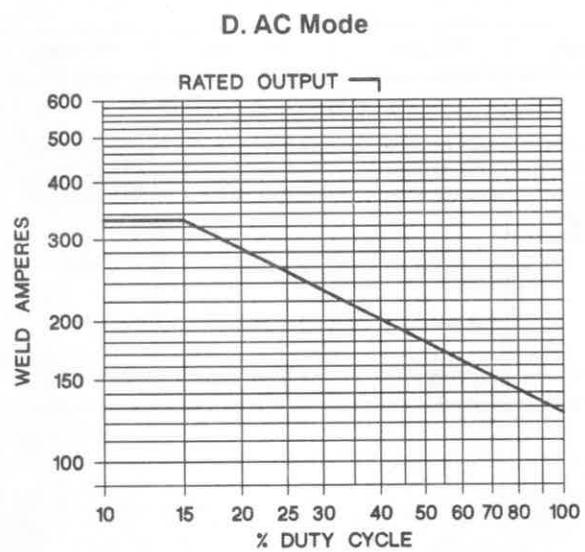
Duty cycle is how long the unit can operate within a ten minute period without causing overheating or damage.

This unit is rated at 40% duty cycle when operated in the 200 amperes AC output range, allowing welding 4 minutes out of every 10 minutes. If the welding amperes decrease, the duty cycle increases.

This unit is rated at 50% duty cycle when operated in the 300 amperes DC output range, allowing welding 5 minutes out of every 10 minutes.







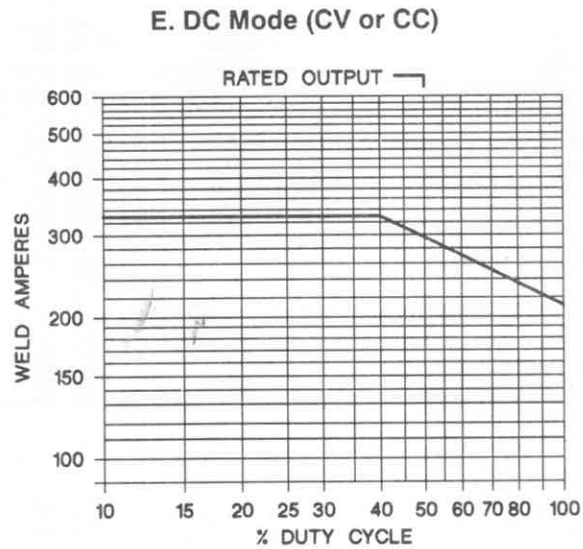


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Figure 2-1. Volt-Ampere Curves And Duty Cycle

SECTION 3 – INSTALLATION

3-1. Typical Process Connections

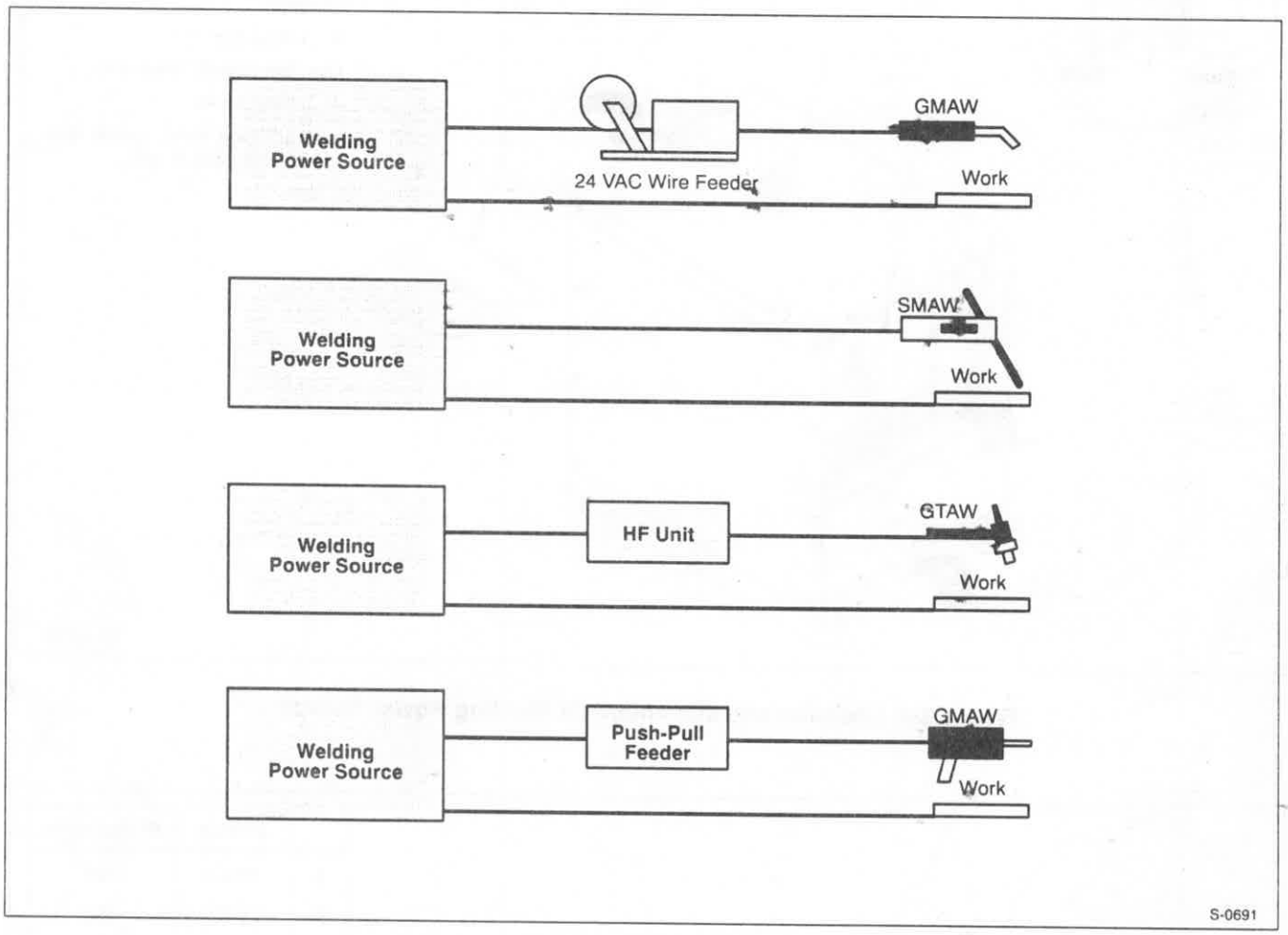

Figure 3-1. Typical Process Connections

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 deenergized 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 or filter airflow.

Warranty is void if any type of 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.

- Use lifting eye to lift unit only, NOT running gear, gas cylinders, or any other accessories.
- Use equipment of adequate capacity to lift the unit.

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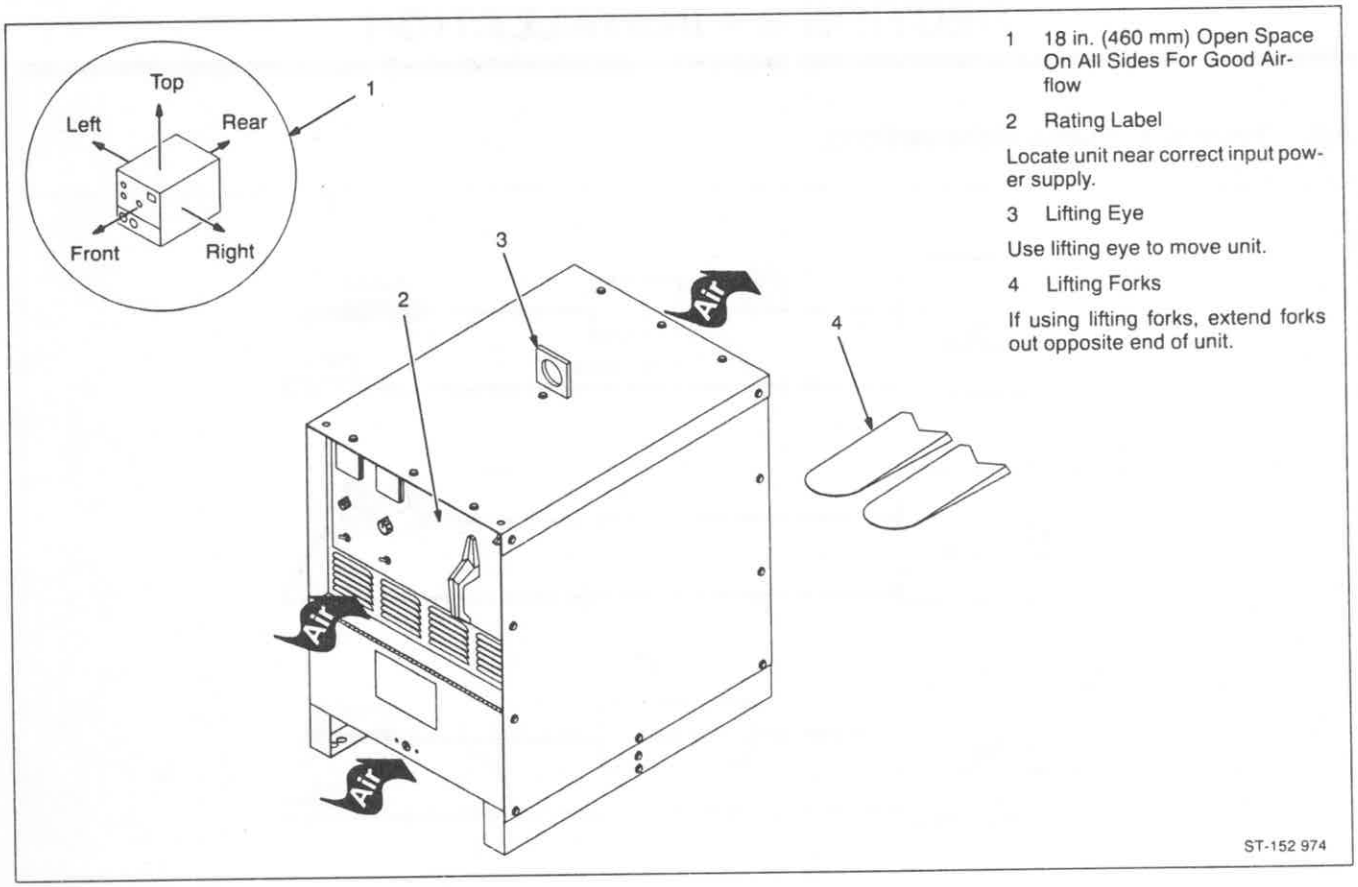
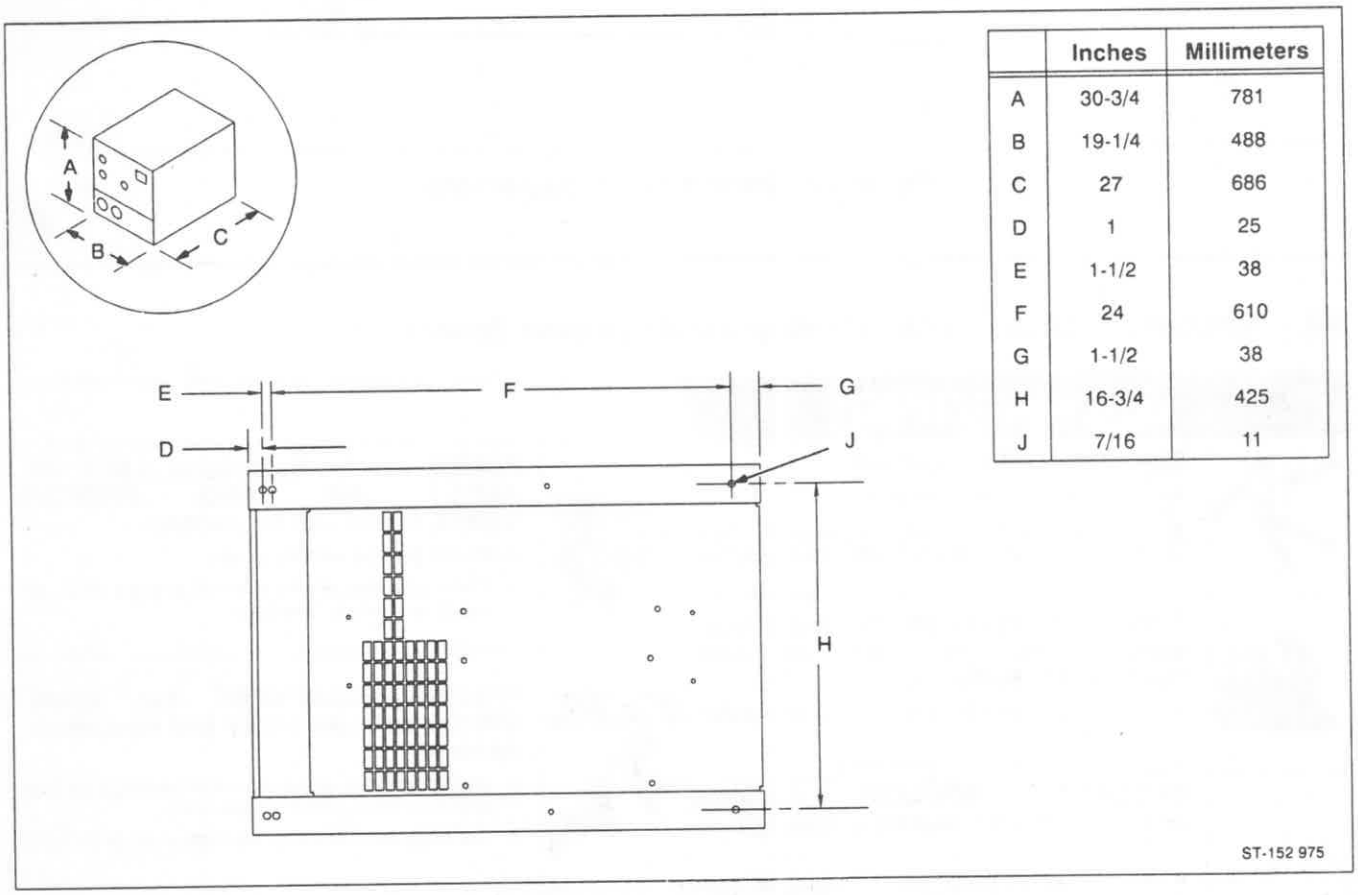


Figure 3-2. Location and Movement Of Welding Power Source



	Inches	Millimeters
A	30-3/4	781
B	19-1/4	488
C	27	686
D	1	25
E	1-1/2	38
F	24	610
G	1-1/2	38
H	16-3/4	425
J	7/16	11

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

3-3. Selecting And Preparing Weld Output Cables

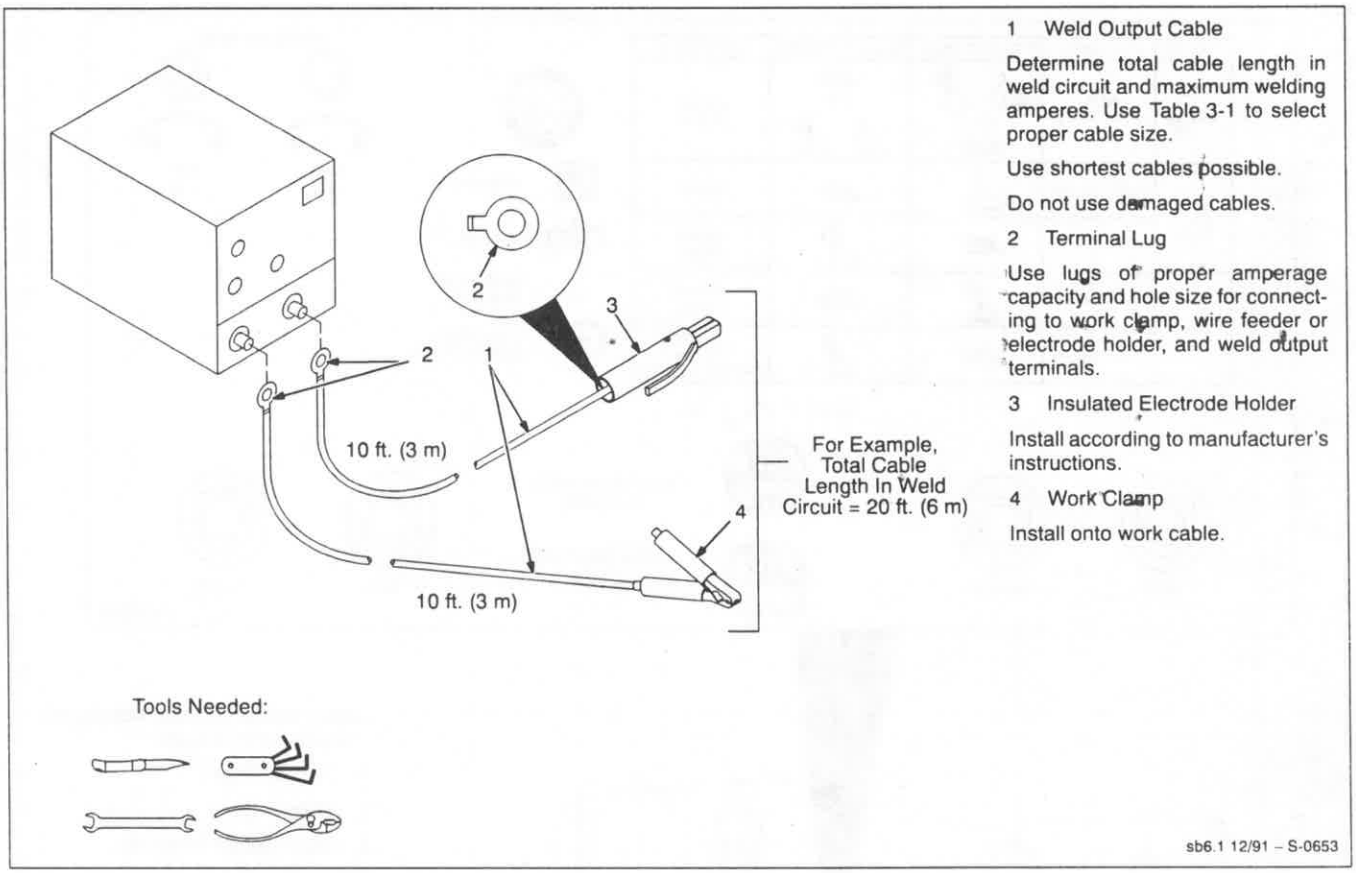


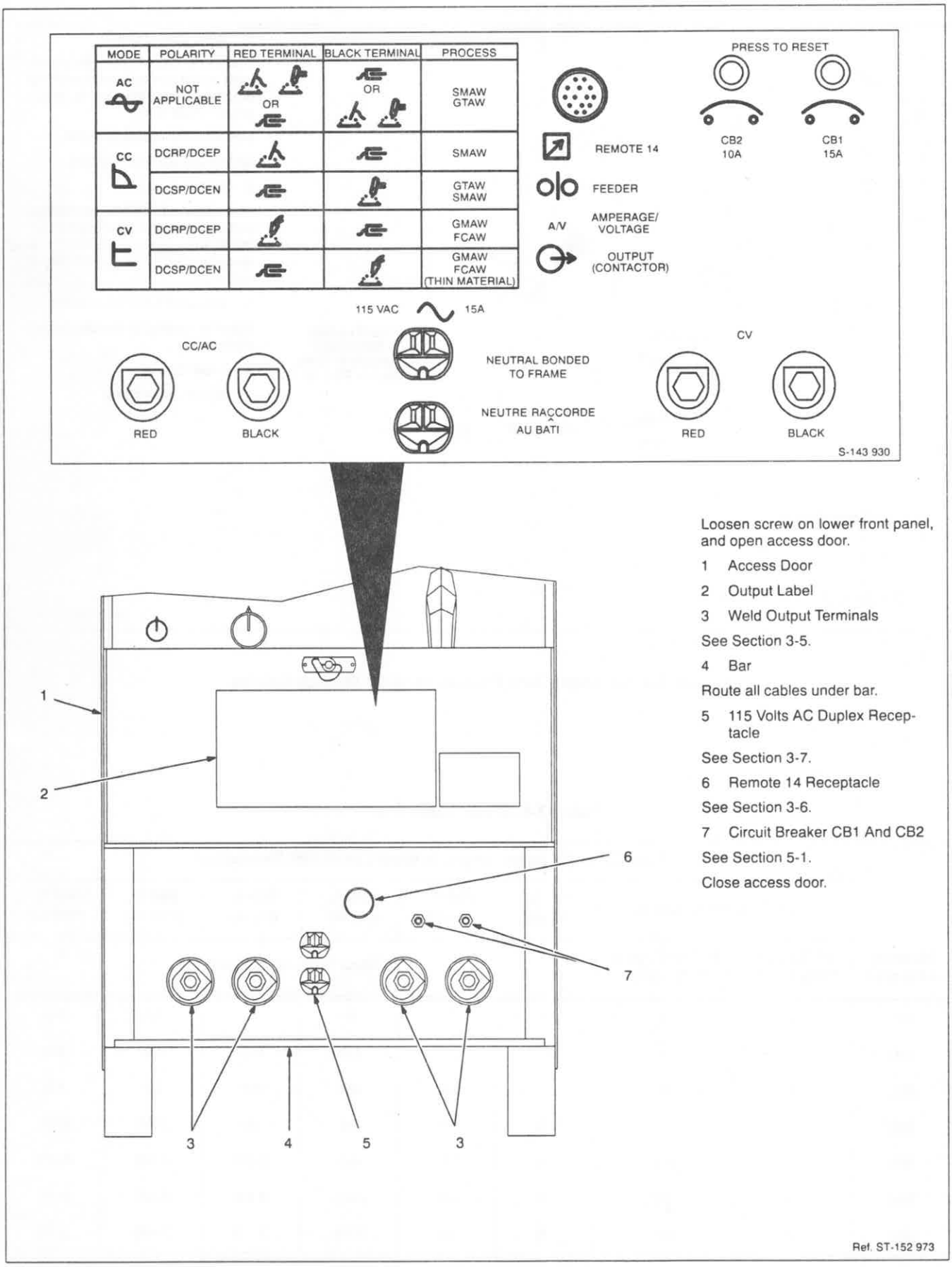
Figure 3-4. Selecting And Preparing Weld Output Cables

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

*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. Use weld cable with insulation rating equal to or greater than the open-circuit voltage of the unit.

3-4. Lower Front Panel



Loosen screw on lower front panel, and open access door.

1 Access Door

2 Output Label

3 Weld Output Terminals

See Section 3-5.

4 Bar

Route all cables under bar.

5 115 Volts AC Duplex Receptacle

See Section 3-7.

6 Remote 14 Receptacle

See Section 3-6.

7 Circuit Breaker CB1 And CB2

See Section 5-1.

Close access door.

Figure 3-5. Lower Front Panel

3-5. 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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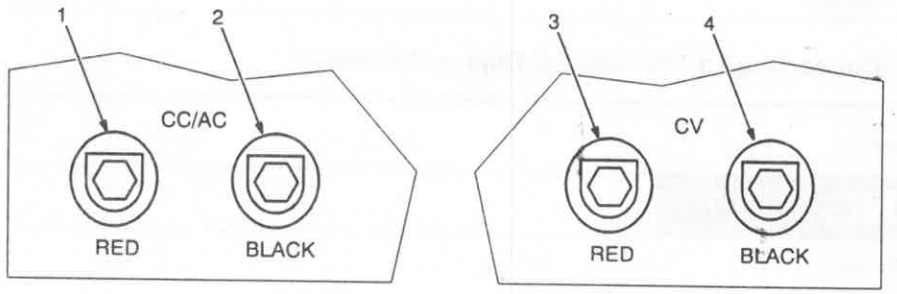


Tools Needed:

3/4 in.

1 Red CC/AC Weld Output Terminal

2 Black CC/AC Weld Output Terminal

For SMAW or GTAW welding electrode positive, connect work cable to black CC/AC terminal and electrode holder or torch cable to red CC/AC terminal.

For electrode negative, reverse cable connections.

3 Red CV Weld Output Terminal

4 Black CV Weld Output Terminal

For GMAW or FCAW welding electrode positive (DCEP), connect work cable to black CV terminal and wire feeder cable to red CV terminal.

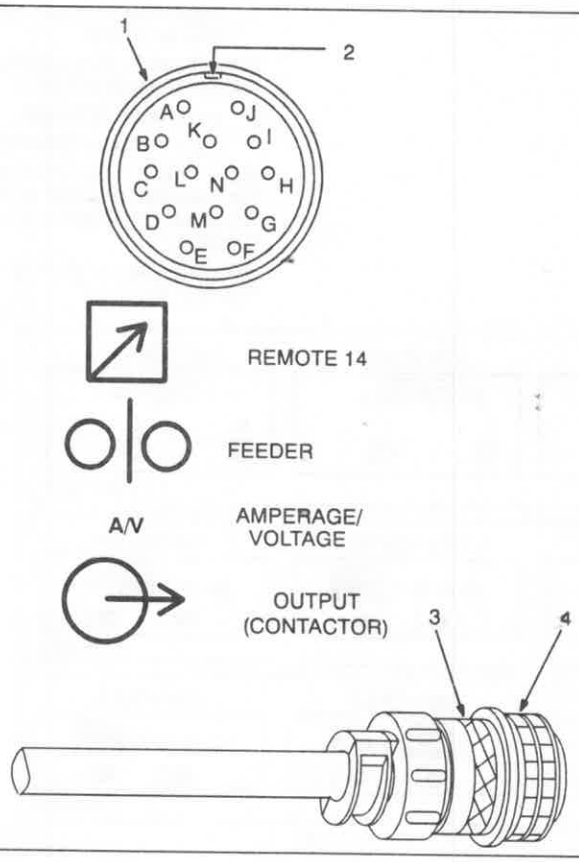
For electrode negative (DCEN), reverse cable connections.

Close access door.

Ref. S-143 930

Figure 3-6. Weld Output Connections

3-6. Remote 14 Receptacle Information And Connections



1 Remote 14 Receptacle RC1

2 Keyway

3 Plug

4 Threaded Collar

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

Close access door.

Socket Information:

Remote Contactor

A, B Contact closure completes the 24 volts ac contactor control circuit. Protected by circuit breaker CB2.

I, J Contact closure completes the 115 volts ac contactor control circuit. Protected by circuit breaker CB1.

G Circuit common for 24/115 volts ac circuit.

Remote Amperage/Voltage Control

C Command reference ;+10 volts dc.

D Control circuit common.

E Input command signal (potentiometer wiper or 0-10 volts dc source); 0 to +10 volts dc.

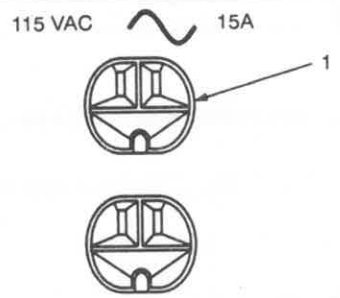
K Chassis common.

The remaining sockets are not used.

sb7.1 1/92 – Ref. S-143 930 / Ref. S-0004-A / S-0628

Figure 3-7. Remote 14 Connections

3-7. 115 Volts AC Duplex Receptacle



1 115 Volts AC Duplex Receptacle

This welding power source supplies up to 15 amperes of 115 volts ac power.

Power output is shared between this receptacle and the REMOTE 14 receptacle (see Section 3-6).

Close access door.

Ref. S-143 930

Figure 3-8. Connecting To 115 Volts AC Duplex Receptacle

3-8. 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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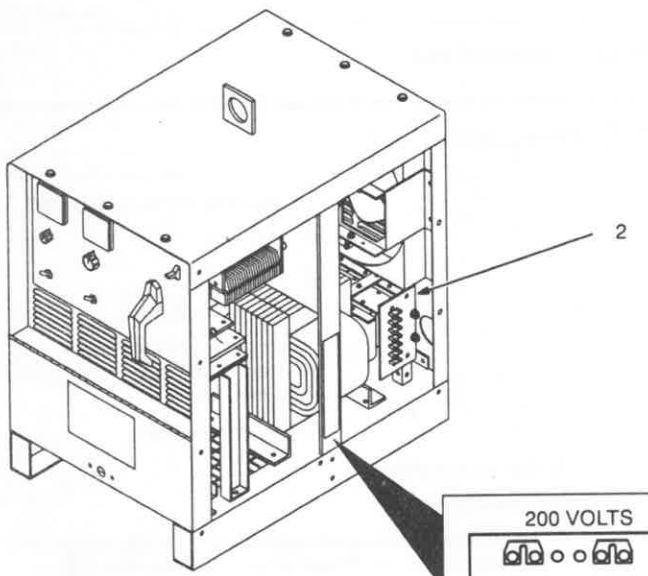
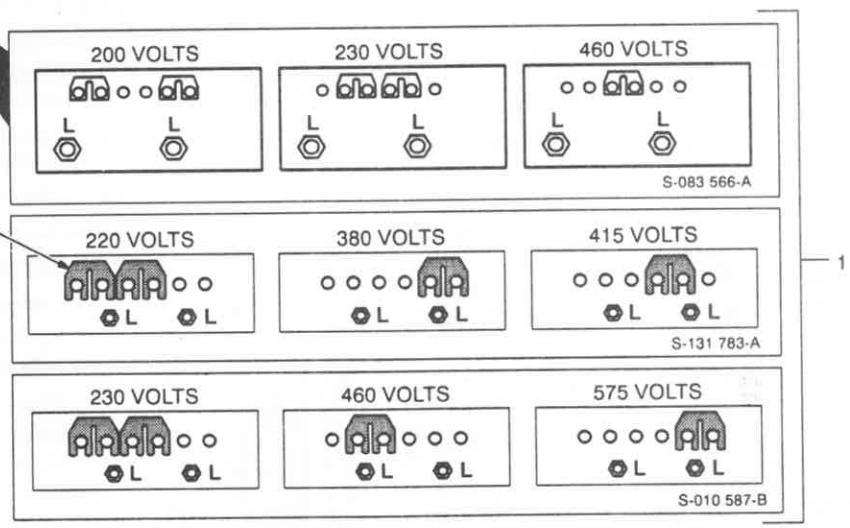
A. Positioning Jumper Links





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

Check input voltage available at site.

Remove 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 Terminal Board

3 Input Voltage Jumper Links

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

Reinstall side panel or go on to Figure 3-10.

Tools Needed:

3/8 in.

3/8 in.

ssb5.1* 2/92 – ST-152 976

Figure 3-9. Input Voltage Jumper Links Location

⚠ WARNING

WARNING: ELECTRIC SHOCK can kill.

- Do not use AC output in damp areas, if movement is confined, or if there is a danger of falling.
- Use AC output ONLY if required for the welding process.
- If AC output is required, use remote output control.
- Read Safety Precautions at beginning of this manual.

ARCING can damage switch.

- Do not change OUTPUT SELECTOR switch position while welding.

Arcing inside switch can damage contacts, causing switch to fail.

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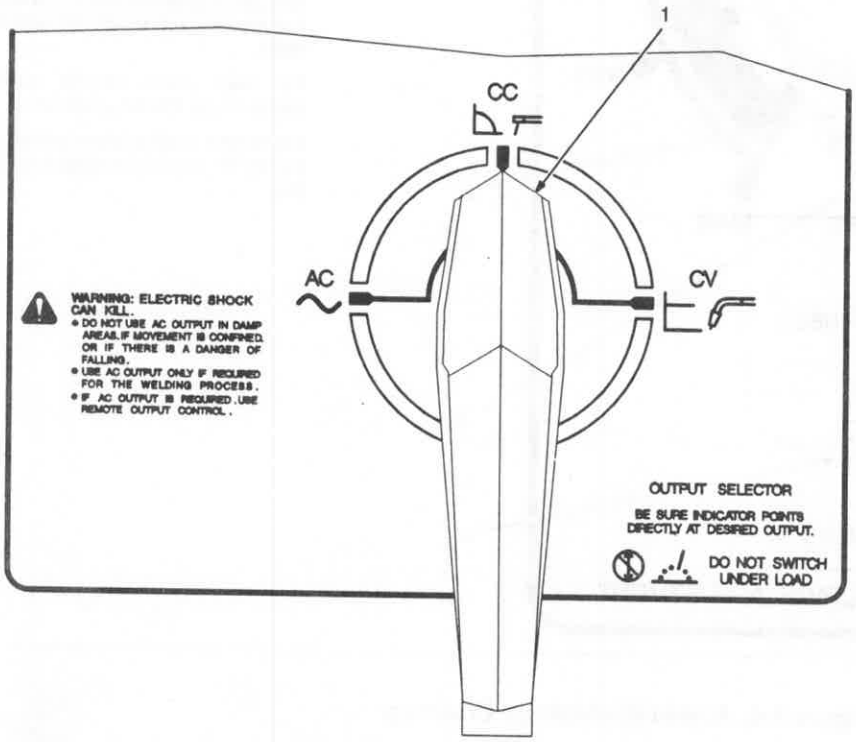


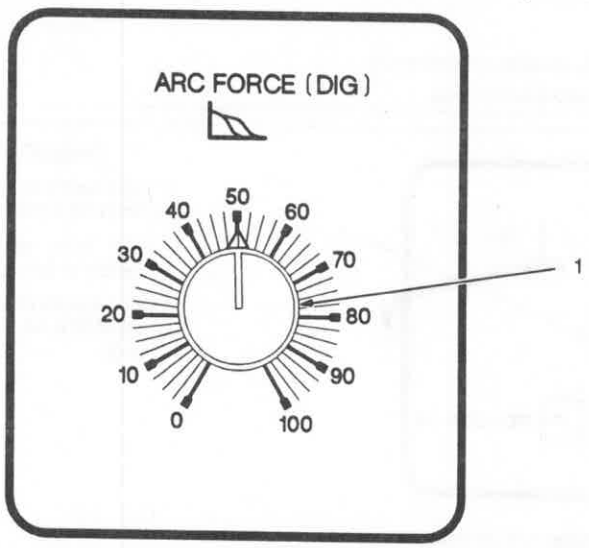
1 Output Selector Switch

Use switch to select type of weld output. Use constant current (DC CC or AC CC) positions for SMAW and GTAW. Use constant voltage (DC CV) position for GMAW and FCAW.

Switch position determines the operation of the AMPERAGE/VOLTAGE ADJUSTMENT control (see Figure 4-6) and the ARC FORCE (DIG) Control (see Figure 4-5).

Ref. ST-146 356

Figure 4-4. Output Selector Switch



1 Arc Force (Dig) Control

This control is used for SMAW welding and only works when OUTPUT SELECTOR switch (see Figure 4-4) is in either the AC or CC position.

Use control to help start an arc or make vertical or overhead welds (control increases short-circuit amperage).

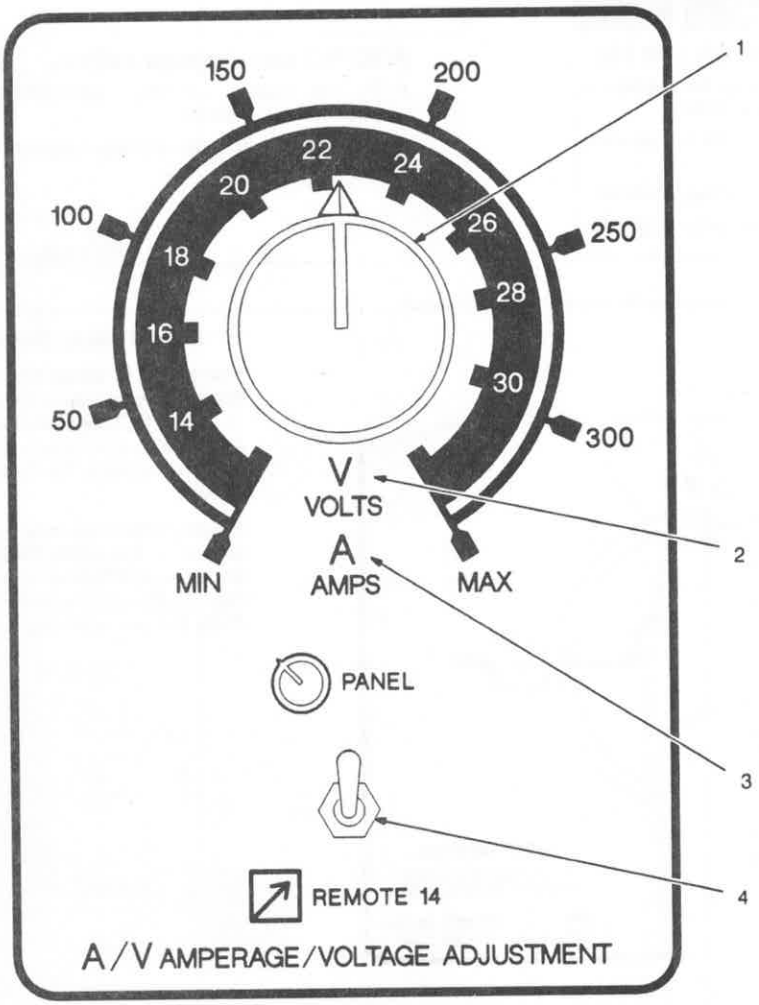
When set at 0, short-circuit amperage is the same as normal welding amperage.

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

Select setting best suited for application. Numbers around control are for reference only.

Set control at 0 for GTAW welding.

Figure 4-5. Arc Force (Dig) Control



1 Amperage/Voltage Adjustment Control

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

2 Voltage (V) Scale

3 Amperage (A) Scale

4 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 position (see Section 3-6).

Figure 4-6. Amperage/Voltage Controls

⚠ 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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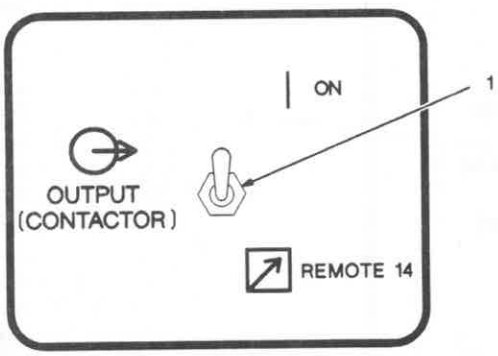


1 Output(Contactor) Switch

Use switch to select way of controlling unit output.

For front panel control, place switch in ON position.

For remote control, place switch in REMOTE 14 position (see Section 3-6).

⚠ **Weld output terminals are energized when switch is ON and POWER is ON.**

Figure 4-7. Output(Contactor) Control Switch

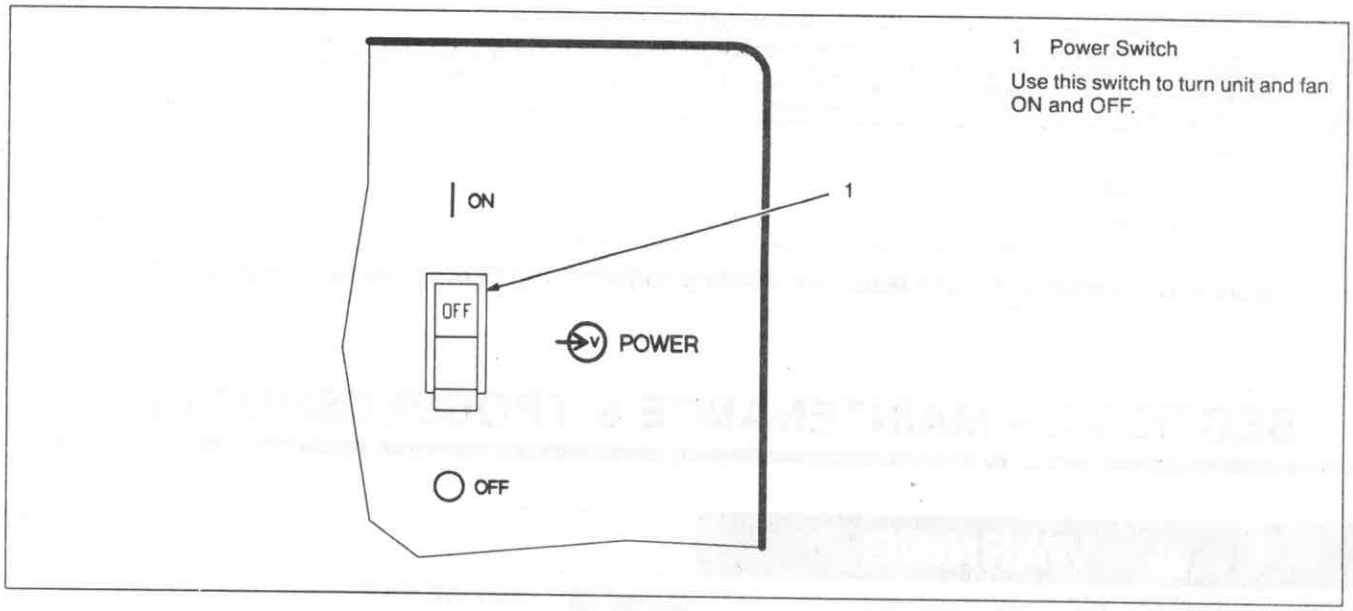


Figure 4-8. Power Switch

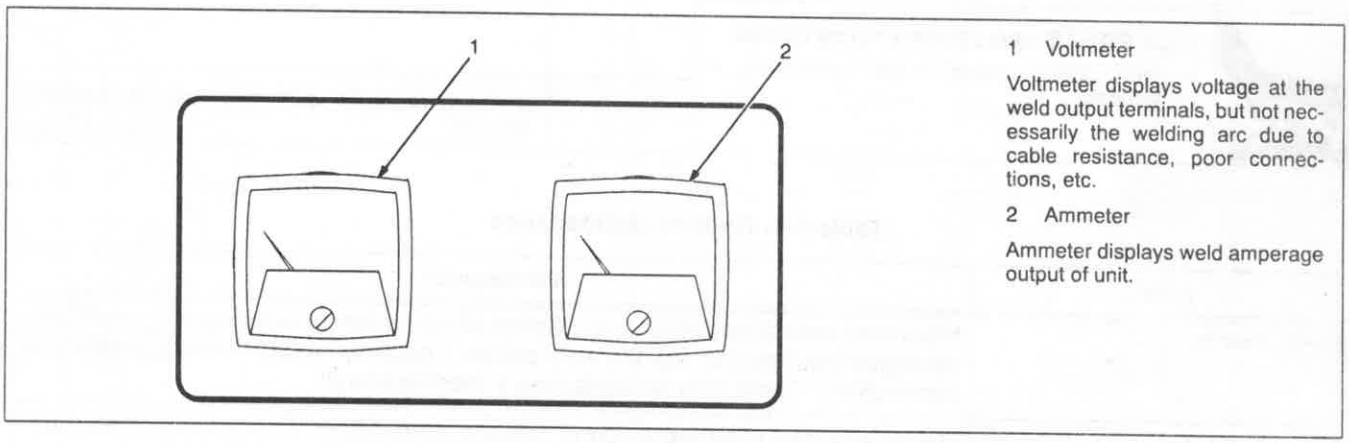


Figure 4-9. Voltmeter And Ammeter (Optional)

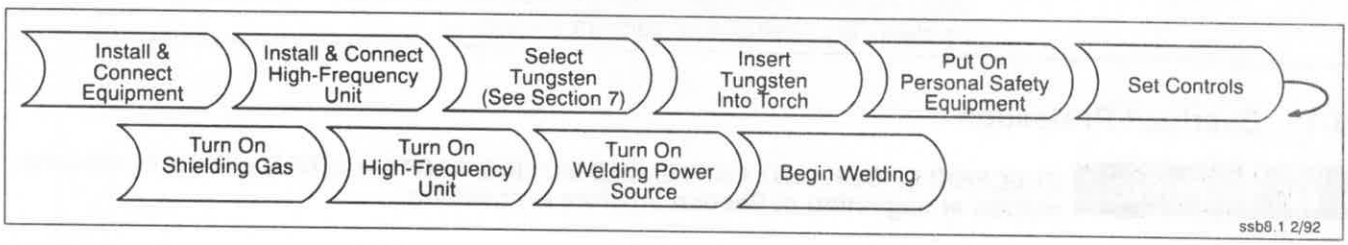


Figure 4-10. Sequence Of Gas Tungsten Arc Welding (GTAW)

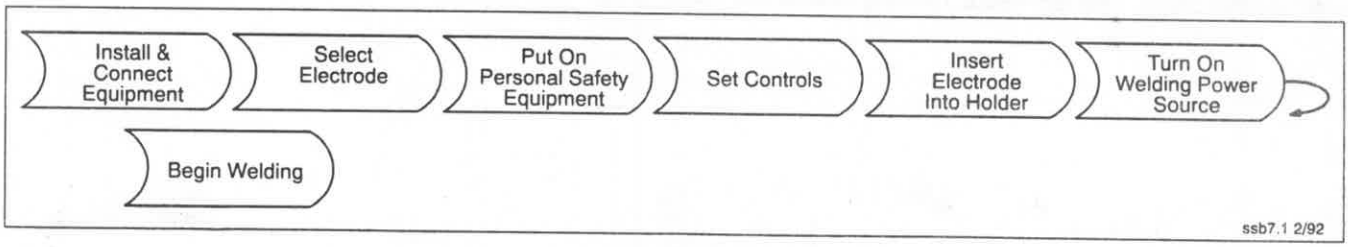


Figure 4-11. Sequence Of Shielded Metal Arc Welding (SMAW)

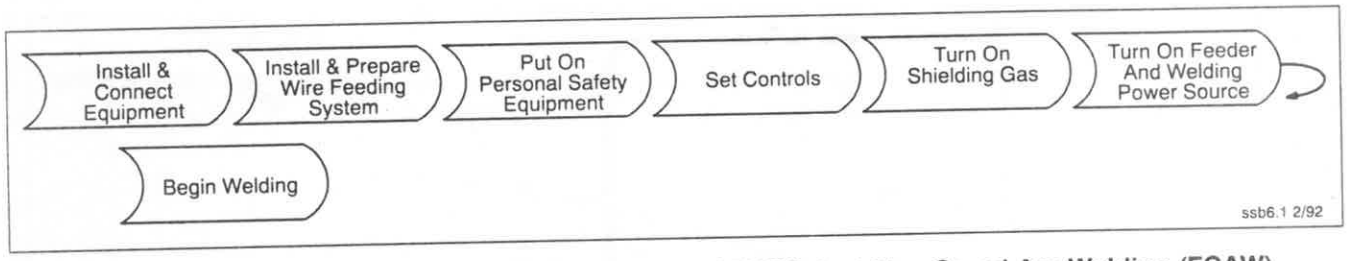


Figure 4-12. Sequence Of Gas Metal Arc Welding (GMAW) And Flux Cored Arc Welding (FCAW)

SECTION 5 – MAINTENANCE & TROUBLESHOOTING

⚠ WARNING

ELECTRIC SHOCK can kill.

- Do not touch live electrical parts.
- Turn OFF welding power source, and disconnect input power before inspecting, maintaining, or servicing.

HOT PARTS can cause severe burns.

- Allow cooling period before maintaining or servicing.

MOVING PARTS can cause injury.

- Keep away from moving parts.

Maintenance to be performed only by qualified persons.

swarn8.1 10/91

Table 5-1. Routine Maintenance

Time	Maintenance
Every month	More than normal equipment use: Check all labels (see 6 month entry), repair any damaged insulation or replace weld cables if necessary. Clean and tighten cable connections. Clean internal parts (see 6 months entry).
Every 3 months	Repair any damaged insulation or replace weld cables if necessary. Clean and tighten cable connections.
Every 6 months	Replace any labels that are unreadable or damaged (see Section 8 for part number). Remove unit outer enclosure to blow out or vacuum dust and dirt inside using a clean, dry airstream or vacuum suction.

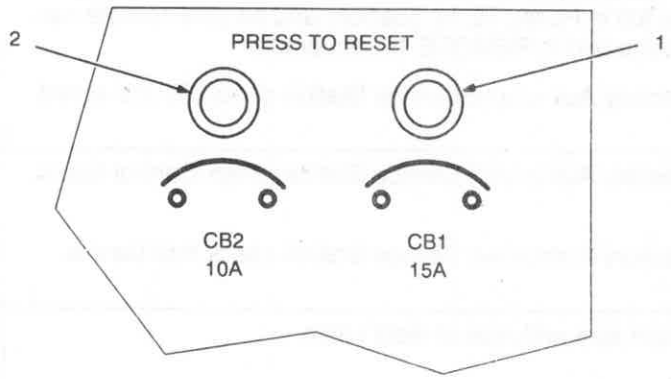
5-1. Overload Protection

⚠ WARNING **ELECTRIC SHOCK, HOT PARTS, AND MOVING PARTS HAZARDS. Read safety information at beginning of Section 5 before proceeding.**

A. Overheating

Thermostat TP1 protects the unit from damage due to overheating. If main transformer T1 gets too hot, TP1 opens and weld output stops. The fan keeps running to cool the transformer. Wait several minutes before trying to weld.

B. Circuit Breakers CB1 And CB2



See Figure 3-5 for circuit breaker location behind access door.

1 Circuit Breaker CB1

CB1 protects the 115 volts ac winding of transformer T1 from overload. If CB1 opens, the 115 volts ac output to the REMOTE 14 receptacle and 115 VOLTS AC duplex receptacle stops.

2 Circuit Breaker CB2

CB2 protects the 24 volts ac windings of transformer T1 from overload. If CB2 opens, the 24 volts ac output to the REMOTE 14 receptacle stops.

Press button to reset a breaker. Close access door.

Ref. S-143 930

Figure 5-1. Circuit Breakers CB1 And CB2

5-2. Troubleshooting

⚠ WARNING

ELECTRIC SHOCK can kill.

- Do not touch live electrical parts.
- Turn OFF welding power source, and disconnect input power before inspecting, maintaining, or servicing.

HOT PARTS can cause severe burns.

- Allow cooling period before inspecting or servicing.

MOVING PARTS can cause injury.

- Keep away from moving parts.

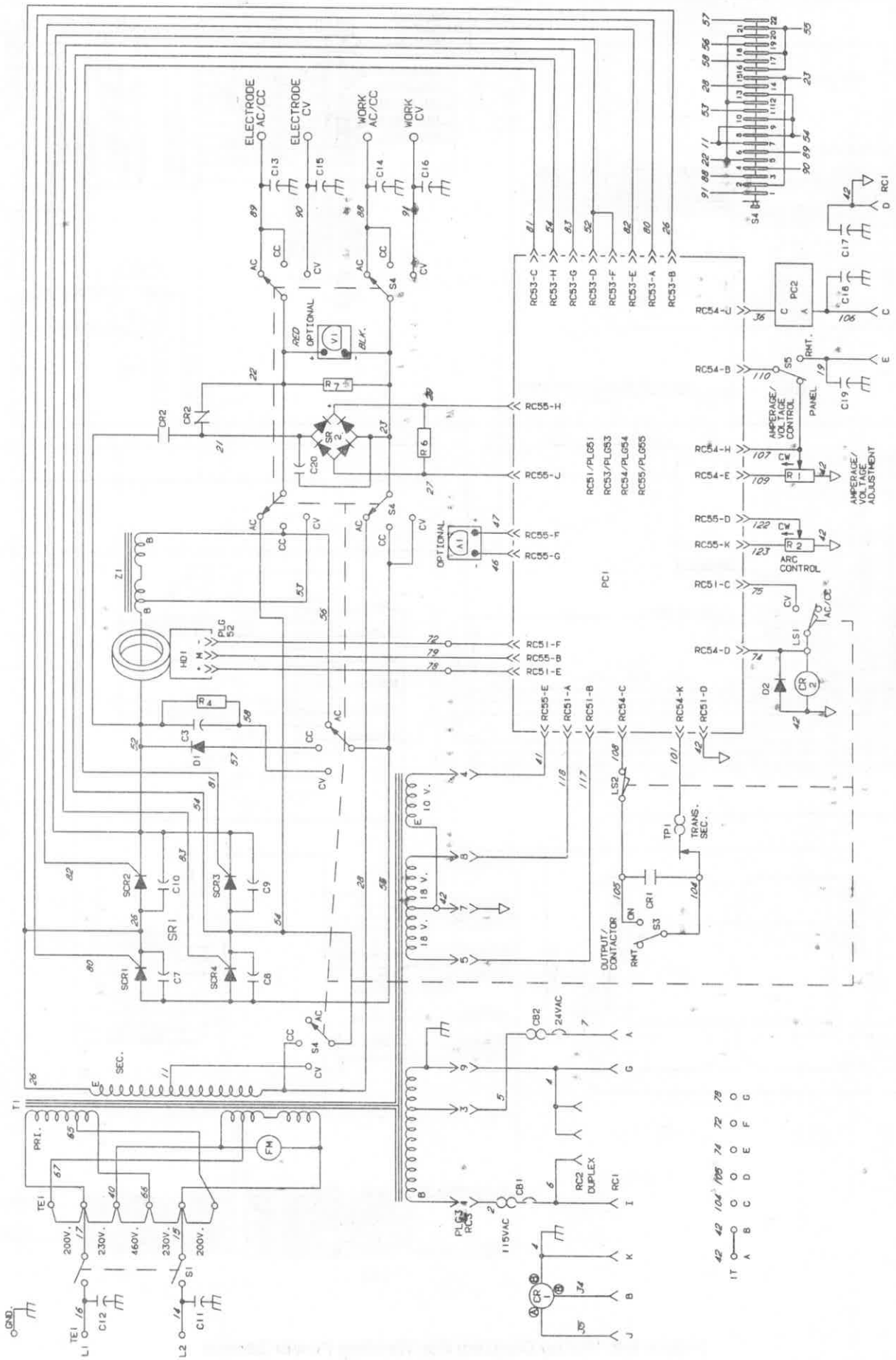
Troubleshooting to be performed only by qualified persons.

swarn9.1 10/91

Table 5-2. Welding Trouble

Trouble	Remedy	Section
No weld output; unit completely inoperative.	Place line disconnect switch in ON position.	3-8
	Check and replace line fuse(s).	3-8
	Check for proper input power connections.	3-8
	Check for proper jumper link position.	3-8
No weld output; fan on.	If remote control is not used, place OUTPUT(CONTACTOR) switch in ON position. If remote control is used, place switch in REMOTE 14 position, and be sure remote control is connected to REMOTE 14 receptacle.	
	Check, repair, or replace remote control.	
	Unit overheated. Allow unit to cool with fan ON.	5-1
	Have Factory Authorized Service Station check Control board PC1.	

Trouble	Remedy	Section
No control of weld output.	If remote control is not used, place AMPERAGE/VOLTAGE control switch in PANEL position. If remote control is used, place switch in REMOTE 14 position, and be sure remote control is connected to REMOTE 14 receptacle. Have Factory Authorized Service Station check Control board PC1.	
Unit provides only maximum or minimum weld output.	Have Factory Authorized Service Station check Control board PC1. Have Factory Authorized Service Station check Hall Device HD1.	
Erratic or improper weld output.	Use proper size and type of weld cable. Clean and tighten all weld connections. Check wire feeder installation according to its owner's manual. Be sure OUTPUT SELECTOR switch is in proper position for welding process. Have Factory Authorized Service Station check Control board PC1. Have Factory Authorized Service Station check Hall Device HD1.	3-3 3-3 Figure 4-4
No 115 volts ac output at 115 VOLTS AC duplex receptacle or REMOTE 14 receptacle.	Reset circuit breaker CB1.	5-1
No 24 volts ac output at REMOTE 14 receptacle.	Reset circuit breaker CB2.	5-1
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. Properly prepare tungsten.	
Wandering arc – poor control of direction of arc.	Reduce gas flow rate. Select proper size tungsten. Properly prepare tungsten.	 7-1 7-2
Fan not operating.	Check for and remove anything blocking fan movement. Check fan motor for open or shorted fan leads.	



SC-148 766

Diagram 6-1. Circuit Diagram For Welding Power Source

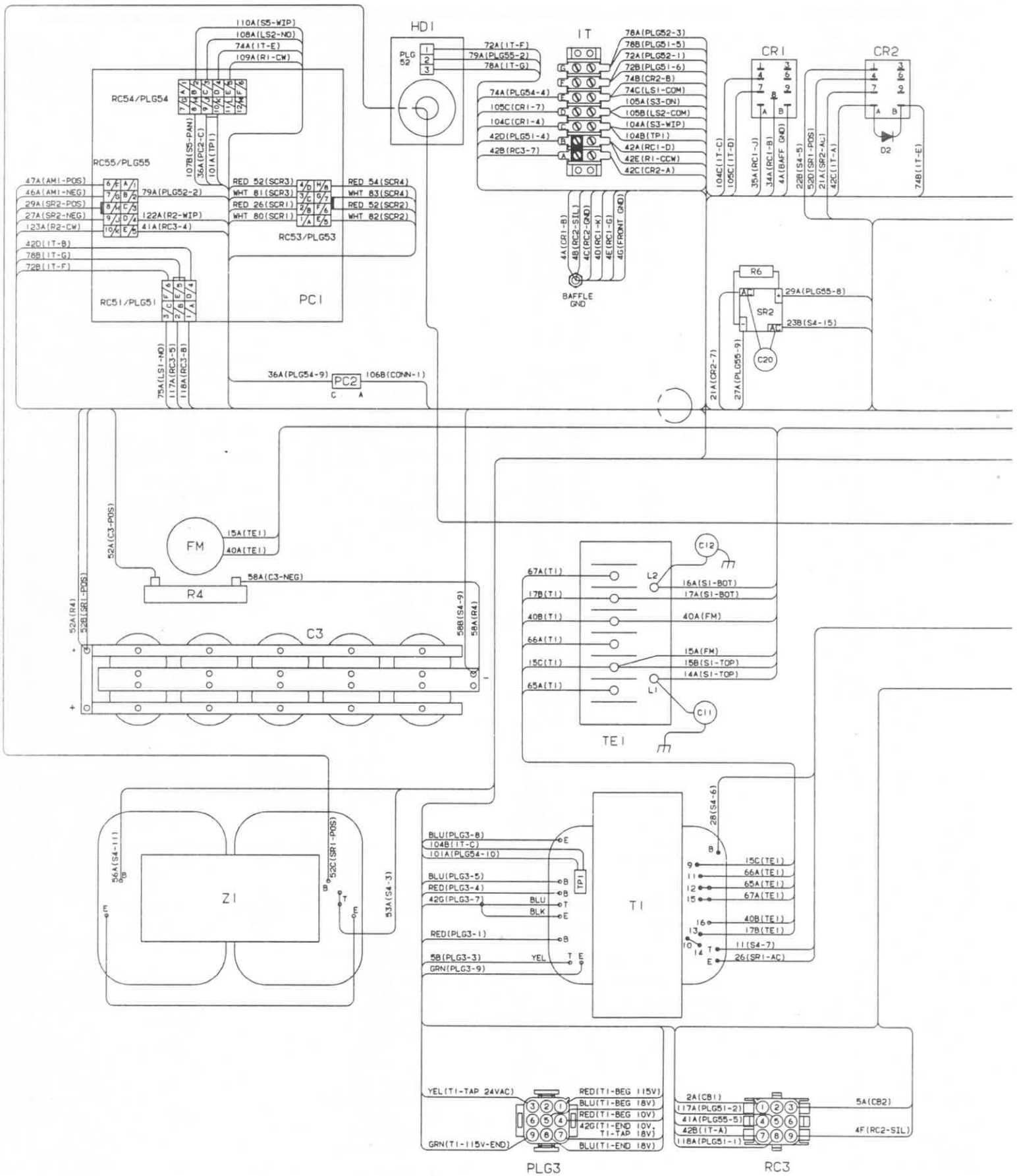
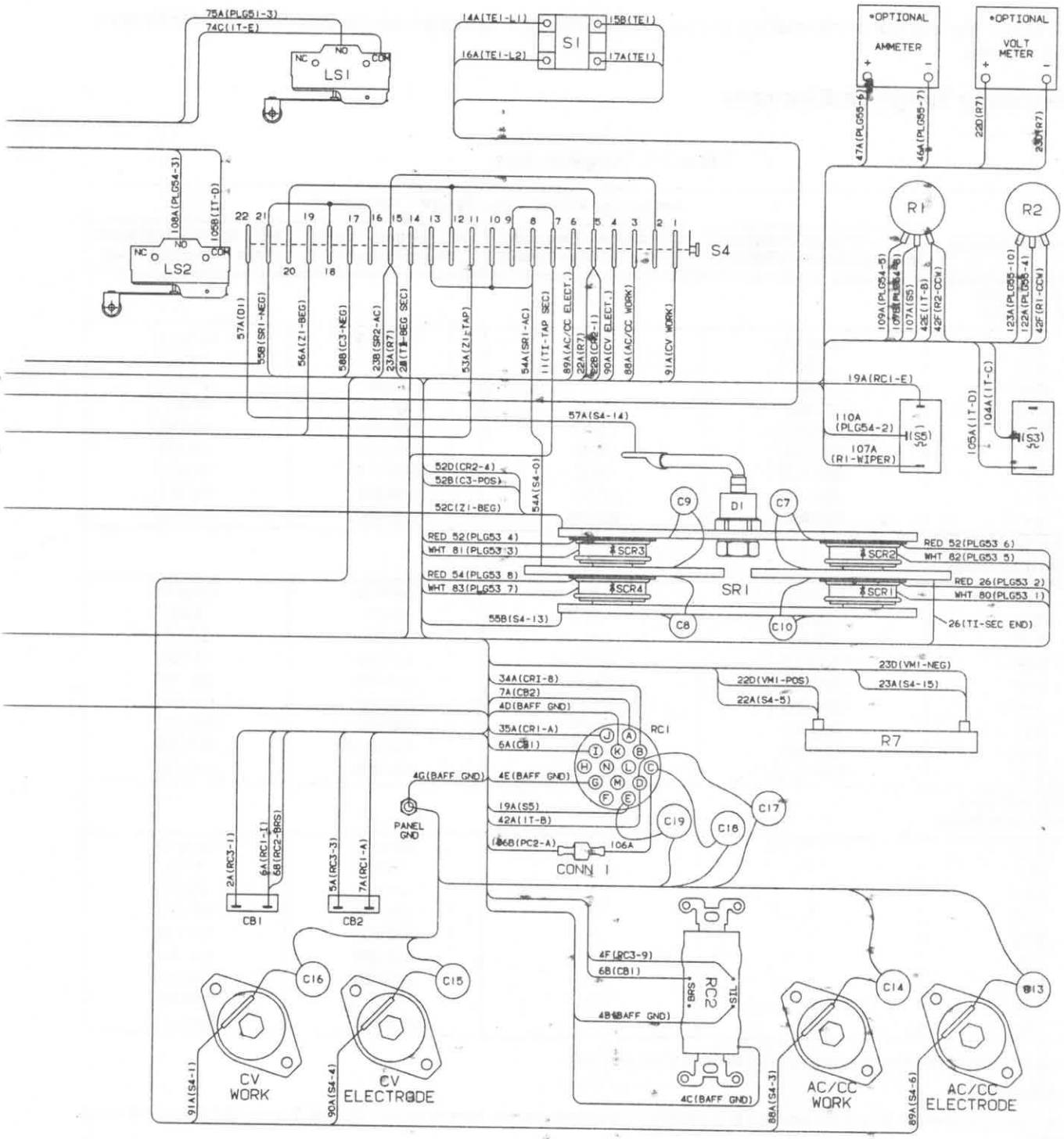


Figure 6-2. Wiring Diagram For Welding Power Source


75A(PLG51-3)
74C(IT-E)
LS1
14A(TE1-L1)
16A(TE1-L2)
S1
15B(TE1)
17A(TE1)
*OPTIONAL
AMMETER
*OPTIONAL
VOLT METER
47A(PLG55-6)
46A(PLG55-7)
220(R7)
230(R7)
108A(PLG54-3)
105B(IT-D)
LS2
S4
R1
R2
109A(PLG54-5)
107A(S5)
42E(IT-B)
42F(R2-CCW)
123A(PLG55-10)
122A(PLG55-4)
42F(R1-CCW)
57A(D1)
55B(SR1-NEG)
56A(Z1-BEG)
58B(C3-NEG)
23B(SR2-AC)
23A(R7)
28(TI-BEG SEC)
53A(Z1-TAP)
54A(SR1-AC)
11(TI-TAP SEC)
89A(AC/CC ELECT.)
22A(R7)
28B(CR2-1)
90A(CV ELECT.)
88A(AC/CC WORK)
91A(CV WORK)
19A(RC1-E)
110A (PLG54-2)
107A (R1-WIPER)
S5
S3
105A(IT-D)
104A(IT-C)
57A(S4-14)
52D(CR2-4)
52B(C3-POS)
52C(Z1-BEG)
54A(S4-0)
C9
D1
C7
RED 52(PLG53 4)
WHT 81(PLG53 3)
SCR3
SCR2
RED 52(PLG53 6)
WHT 82(PLG53 5)
RED 54(PLG53 8)
WHT 83(PLG53 7)
SCR4
SR1
SCR1
RED 26(PLG53 2)
WHT 80(PLG53 1)
55B(S4-13)
C8
C10
26(TI-SEC END)
23D(VM1-NEG)
23A(S4-15)
22D(VM1-POS)
22A(S4-5)
R7
34A(CR1-8)
7A(CB2)
4D(BAFF GND)
35A(CR1-A)
6A(CB1)
RC1
4G(BAFF GND)
4E(BAFF GND)
19A(S5)
42A(IT-B)
106B(PC2-A)
106A
CONN 1
C17
C19
C18
PANEL GND
2A(RC3-1)
6A(RC1-1)
6B(RC2-BRS)
5A(RC3-3)
7A(RC1-A)
CB1
CB2
4F(RC3-9)
6B(CB1)
RC2
*BRS
*SIL
4B(BAFF GND)
4C(BAFF GND)
C16
C15
C14
C13
CV WORK
CV ELECTRODE
AC/CC WORK
AC/CC ELECTRODE
91A(S4-1)
90A(S4-4)
88A(S4-3)
89A(S4-6)

SECTION 7 – TUNGSTEN ELECTRODE

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

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

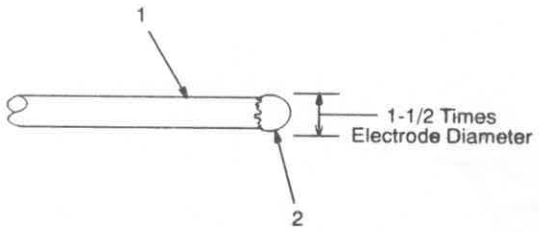
♦Typical argon shielding gas flow rates are 15 to 35 cfh (cubic feet per hour).

*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

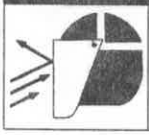
2 Balled End

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

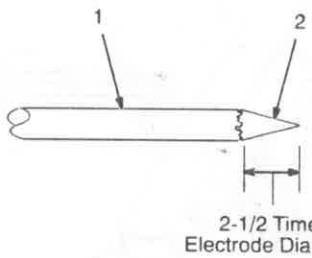
⚠ CAUTION



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.

warn2.1 9/91

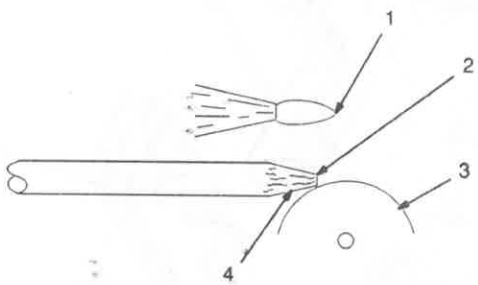


1 Tungsten Electrode

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

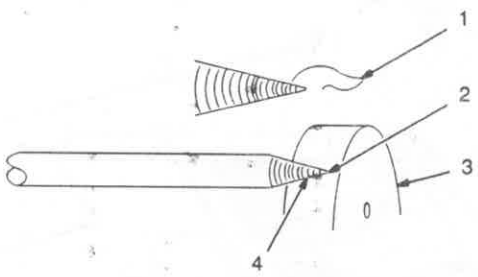
2 Flat

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

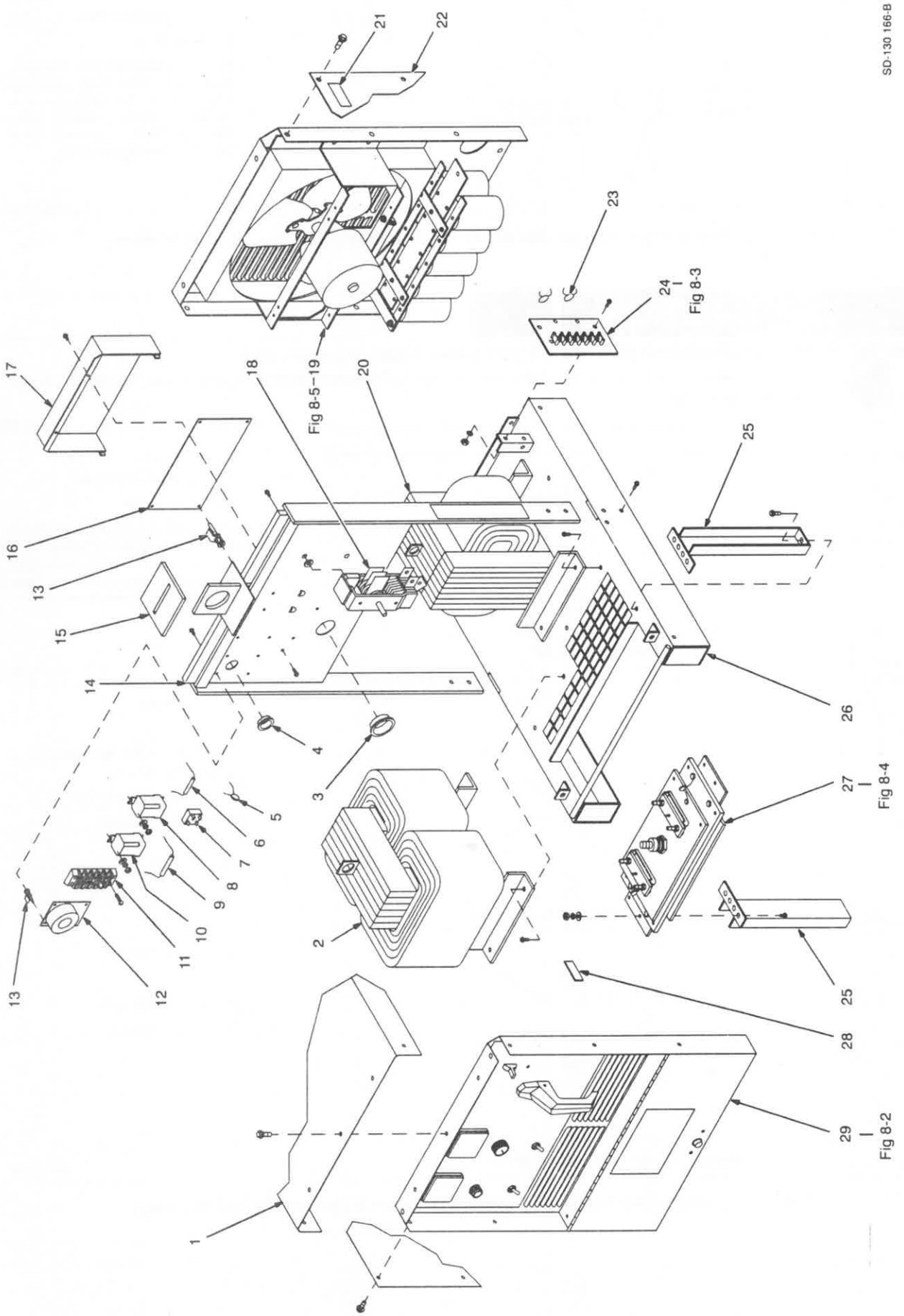


Figure 8-1. Main Assembly

Replace Coils At Factory Or Factory Authorized Service Station

Item No.	Dia. Mkgs.	Part No.	Description	Quantity
			Figure 8-1. Main Assembly	
1		114 741	COVER, top	1
2	Z1	126 211	REACTOR	1
3		010 494	BUSHING, snap-in nyl 1.375 ID	1
4		057 358	BUSHING, snap-in nyl 1.000 ID	1
5	C20	119 834	CAPACITOR	1
6	D2	026 202	DIODE, rect 1A 400V SP	1
7	SR2	035 704	RECTIFIER, integ 40A 800V	1
8	CR2	059 267	RELAY, encl 12VDC DPDT	1
9	R6	117 803	RESISTOR, WW fxd 10W 1K ohm	1
10	CR1	134 163	RELAY, encl 24/120VAC DPDT	1
11	1T	116 005	BLOCK, term 10A 7P	1
		108 023	LINK, jumper term blk 10A	1
12	HD1	124 684	TRANSDUCER, current 300A	1
	PLG52	130 204	HOUSING PLUG & SOCKETS, (consisting of)	1
		114 066	. . . . TERMINAL, female 1skt 20-14 wire	3
13		110 375	STAND-OFF SUPPORT, PC card No. 6 screw	9
14		146 350	FRAME, lifting	1
15		026 627	GASKET, lifting eye cover	1
16	PC1	132 281	CIRCUIT CARD, control 50Hz	1
16	PC1	130 377	CIRCUIT CARD, control 60Hz	1
	PLG51	115 093	HOUSING PLUG & SOCKETS, (consisting of)	1
		113 746	. . . . TERMINAL, female 1skt 24-18 wire	6
	PLG53	115 092	HOUSING PLUG & SOCKETS, (part of rectifier) (consisting of)	1
		113 746	. . . . TERMINAL, female 1skt 24-18 wire	8
	PLG54	130 203	HOUSING PLUG & SOCKETS, (consisting of)	1
		113 746	. . . . TERMINAL, female 1skt 24-18 wire	12
	PLG55	115 091	HOUSING PLUG & SOCKETS, (consisting of)	1
		113 746	. . . . TERMINAL, female 1skt 24-18 wire	10
17		128 063	COVER, circuit card	1
18	S4	146 352	SWITCH, changeover (consisting of)	1
	LS1,2	133 145	. . . . SWITCH, limit	2
		010 199	TUBING, stl .275 ID x .048 wall x 1 in	2
19		Fig 8-5	PANEL, rear w/components	1
20	T1	148 774	TRANSFORMER, power main 200/230/460 (consisting of)	1
20	T1	148 771	TRANSFORMER, power main 220/380/415 (consisting of)	1
20	T1	148 777	TRANSFORMER, power main 230/460/575 (consisting of)	1
		148 775	. . . . COIL, pri/sec 200/230/460	1
		148 772	. . . . COIL, pri/sec 220/380/415	1
		148 778	. . . . COIL, pri/sec 230/460/575	1
	TP1	020 520	. . . . THERMOSTAT, NC	1
21		109 035	LABEL, warning electric shock	1
22		+114 751	PANEL, side	2
23	C11,12	111 634	CAPACITOR ASSEMBLY	1
24	TE1	034 587	TERMINAL ASSEMBLY, pri 1ph triple voltage (Fig 8-3)	1
25		114 722	BRACKET, mtg rectifier	2
26		126 210	BASE	1
27	SR1	126 209	RECTIFIER, si diode (Fig 8-4)	1
28	PC2	131 527	CIRCUIT CARD, snubber	1
29		Fig 8-2	PANEL, front w/components	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.

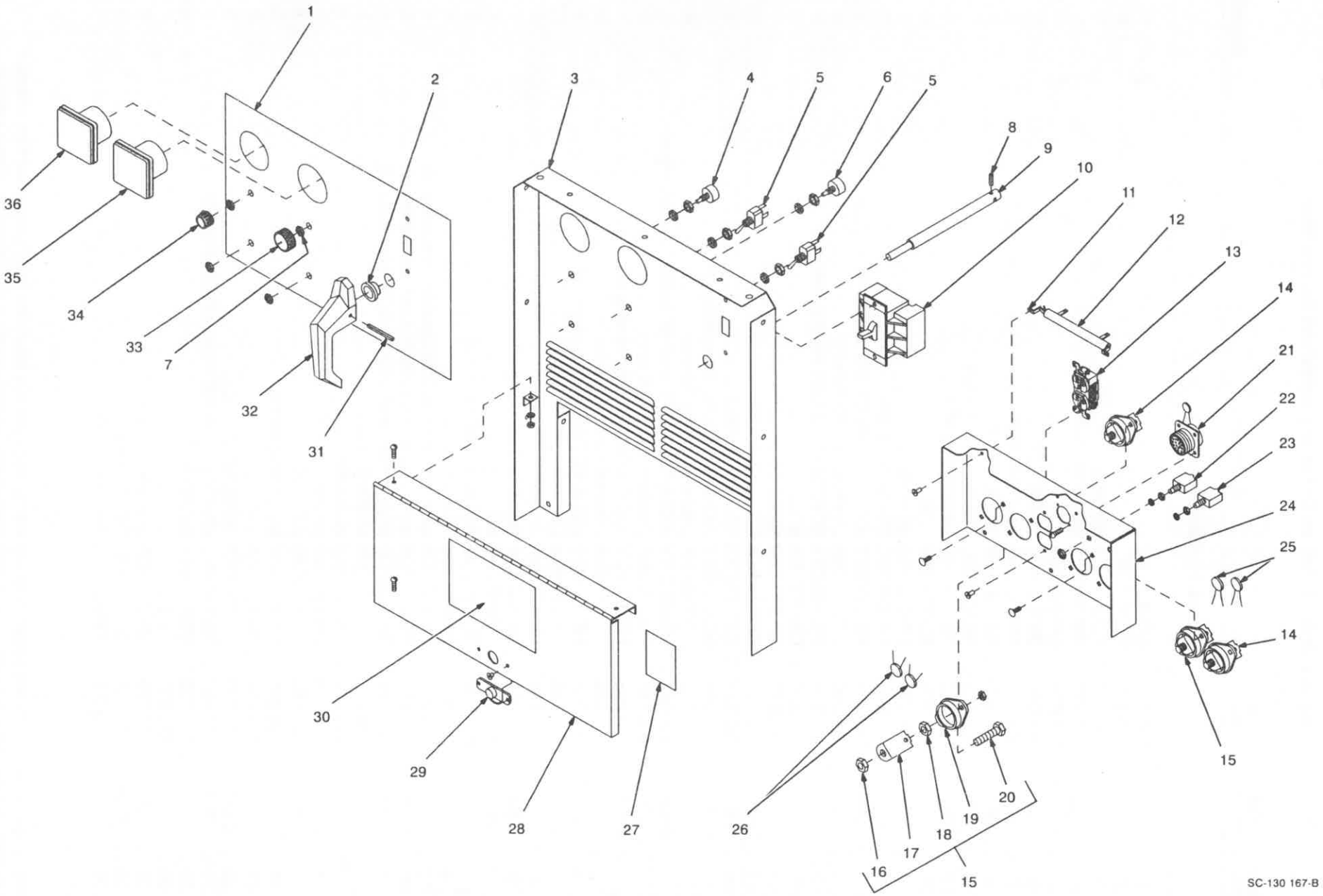


Figure 8-2. Panel, Front w/Components

Item No.	Dia. Mkgs.	Part No.	Description	Quantity
			Figure 8-2. Panel, Front w/Components (Fig 8-1 Item 29)	
1			NAMEPLATE, (order by model and serial number)	1
2		109 013	BUSHING, snap-in nyl .375 ID x .562mtg hole	1
3		146 353	PANEL, front	1
4	R2	035 897	POTENTIOMETER, C sltd sft 1/T 2W 1000 ohm	1
5	S3,5	011 609	SWITCH, tgl SPDT 15A 125V	2
6	R1	072 462	POTENTIOMETER, w/shaft lock (consisting of)	1
7		072 590	LOCK, shaft pot .375-32 x .250dia shaft	1
8		106 398	PIN, spring CS .156 x .625	1
9		142 364	EXTENSION, handle switch	1
10	S1	045 834	SWITCH, tgl DPST 60A 600VAC	1
11		605 742	CLIP, mtg resistor .500 ID	2
12	R7	140 756	RESISTOR, WW fxd 180W 25 ohm	1
13	RC2	604 176	RECEPTACLE, str dx grd 2P3W 15A 125V	1
		073 690	PLUG, str grd armd 2P3W 15A 125V	
14	Work	039 046	TERMINAL, pwr output black (consisting of)	2
15	Electrode	039 047	TERMINAL, pwr output red (consisting of)	2
16		601 879	NUT, stl hex full fnsh .500-13	1
17		039 044	BUS BAR, term bd	1
18		601 880	NUT, stl hex jam .500-13	1
19		039 045	TERMINAL BOARD, black	1
19		039 049	TERMINAL BOARD, red	1
20		601 976	SCREW, cap stl hexhd .500-13 x 1.500	1
21	RC1/C17-19	151 143	RECEPTACLE/CAPACITOR, w/leads	1
22	CB2	083 432	CIRCUIT BREAKER, man reset 1P 10A 250V	1
23	CB1	093 995	CIRCUIT BREAKER, man reset 1P 15A 250V	1
24		142 798	PANEL, front lower	1
25	C13,14	144 141	CAPACITOR ASSEMBLY	1
26	C15,16	144 140	CAPACITOR ASSEMBLY	1
27		127 363	LABEL, warning electrical shock	1
28		+114 759	DOOR, access front	1
29		605 583	CATCH, spr loaded door	1
30		134 327	LABEL, warning general precautionary	1
31		010 647	PIN, spring CS .156 x 1.250	1
32		098 279	HANDLE, switch selector mode	1
33		097 924	KNOB, pointer	1
34		097 922	KNOB, pointer	1
35	A	♦126 184	METER, amp AC/DC 50MV 0-400 scale	1
36	V	♦126 183	METER, volt AC/DC 0-100/0-90 scale	1

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

Item No.	Part No.	Description	Quantity
	034 587	**Figure 8-3. Terminal Assembly, Pri (Fig 8-1 Item 24)**	
1	601 835	NUT, brs hex 10-32reg	12
2	601 836	NUT, brs hex .250-20 jam hvy	4
3	010 915	WASHER, flat brs .250 ID x .625 OD x .031thk	4
4	083 426	TERMINAL BOARD, pri	1
5	038 888	STUD, pri board brs .250-20 x 1.500	2
6	038 887	STUD, pri board brs 10-32 x 1.375	6
7	010 913	WASHER, flat brs .187 ID	6
8	038 618	LINK, jumper term bd pri	2

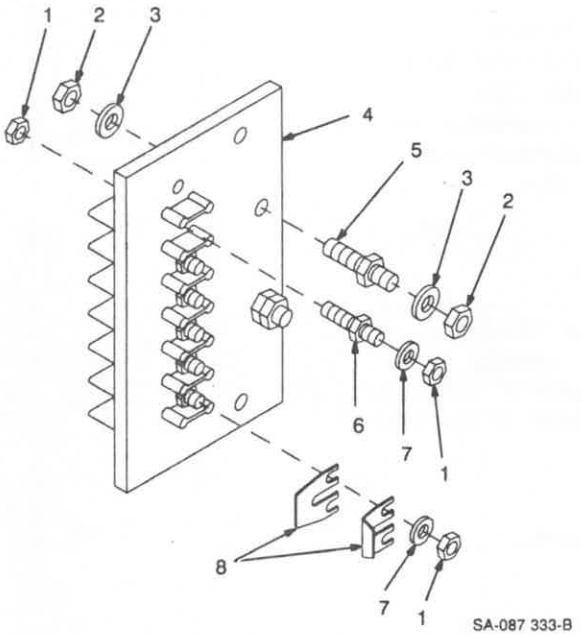


Figure 8-3. Terminal Assembly, Pri

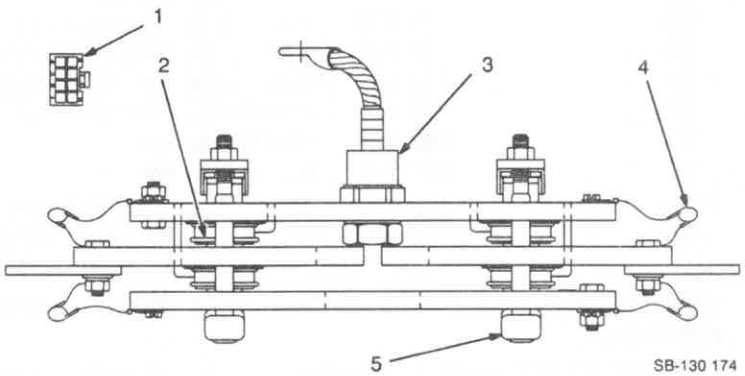


Figure 8-4. Rectifier, Si Diode

Item No.	Dia. Mkgs.	Part No.	Description	Quantity
		126 209	**Figure 8-4. Rectifier, Si Diode (Fig 8-1 Item 27)**	
1	PLG53	115 092	HOUSING PLUG & SOCKETS, (consisting of)	1
		113 746	TERMINAL, female 1skt 24-18 wire	8
2	SCR1-4	132 147	THYRISTOR, SCR 865A 300V	4
3	D1	037 956	DIODE, rect 275A 300V SP	1
		028 516	PIN, spring CS .125 x .250	8
4	C7-10	031 689	CAPACITOR, rectifier	4
5		083 884	CLAMP, thyristor rectifier	2

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

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

Figure 8-5. Panel, Rear w/Components (Fig 8-1 Item 19)

1		124 275	CHAMBER, plenum 14 in	1
2		032 604	BLADE, fan 14 in 3wg 19deg .375 bore CCW	1
3		114 752	PANEL, rear	1
4		126 206	BRACKET, mtg capacitors	2
5		080 509	GROMMET, scr No. 8/10 panel hole .312sq .375 high	6
6		126 207	BUS BAR, capacitors	2
7		128 647	BUS BAR, capacitors	1
8	C3	109 833	CAPACITOR, elctlt 30000uf 50VDC	10
9		128 648	BUS BAR, capacitors	1
10	R4	119 998	RESISTOR, WW fxd 300W 5 ohm	1
11	FM	116 190	MOTOR, 1/12HP 230V 1550RPM	1

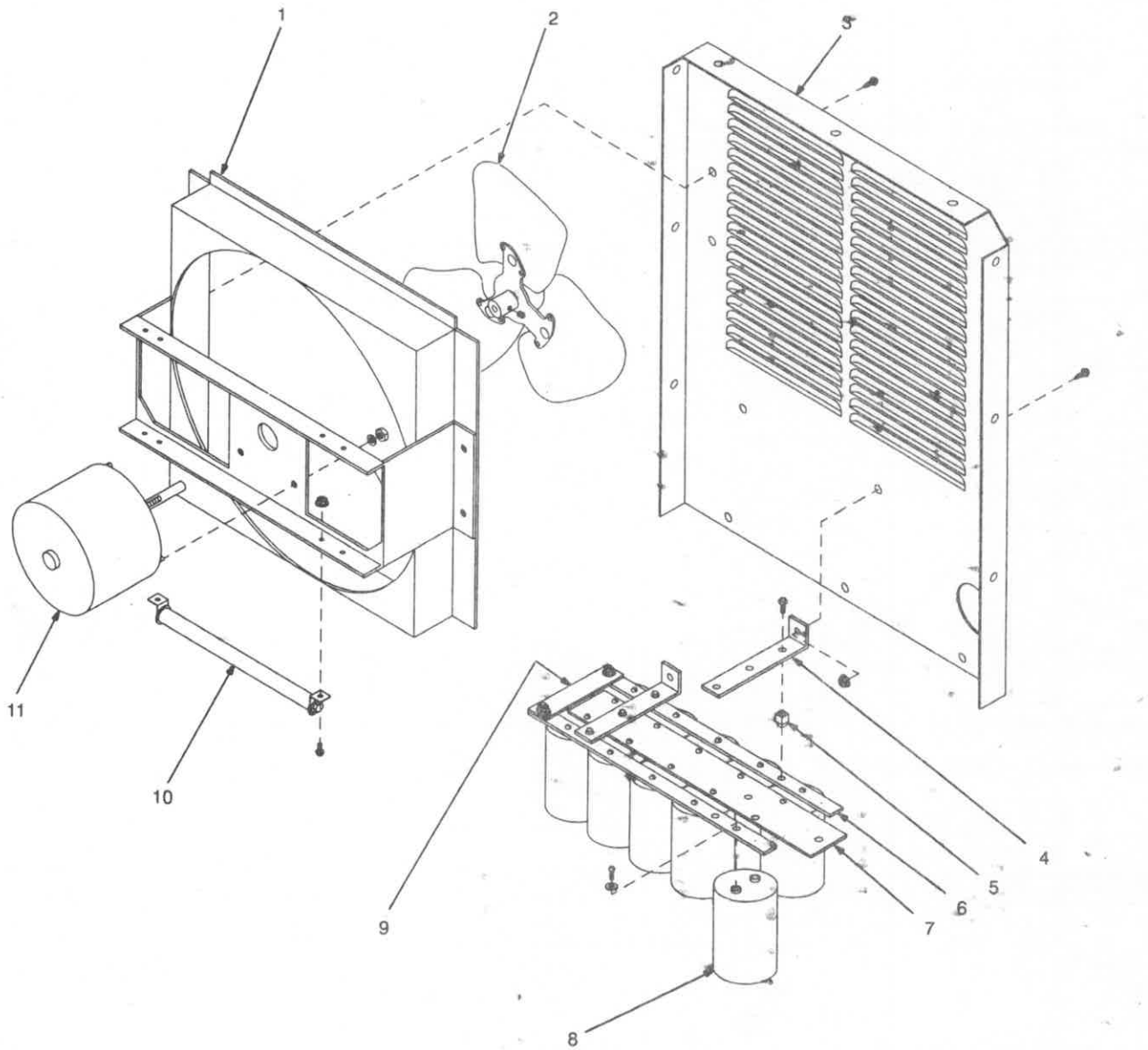


Figure 8-5. Panel, Rear w/Components

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

OPTIONS AND ACCESSORIES

VOLTMETER AND AMMETER
(#042 314 Factory)
(#042 315 Field)
Analog AC/DC combination

RFC-14 FOOT CONTROL
(#129 339)
Foot current and contactor control. 20 ft. (6 m) cord and 14-pin Amphenol 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 Amphenol plug.

FTC-14 REMOTE CONTACTOR AND CURRENT CONTROL
(#129 338)
Fastens to TIG torch handle. Includes 28 ft. (8.5 m) cord and 14-pin Amphenol plug.

RMLS-14 SWITCH
(#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.

EXTENSION CORDS FOR 14-PIN AMPHENOL
(#122 972) 10 ft .(3 m)
(#122 973) 25 ft. (7.6 m)
(#122 974) 50 ft. (15.2 m)
(#122 975) 75 ft. (22.9 m)

ADAPTER CORD
(#041 948)
1 ft. (305 mm) cord with 14-pin Amphenol plug and 2-pin and 3-pin Hubbell connections. Connects power source to Miller wire feeder interconnecting cord.

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

No. 22 RUNNING GEAR
(#042 258)
Includes two 10 in. (254 mm) wheels and two 5 in. (127 mm) casters and a two-compartment rack for gas cylinder(s) or Watermate™ coolant system.