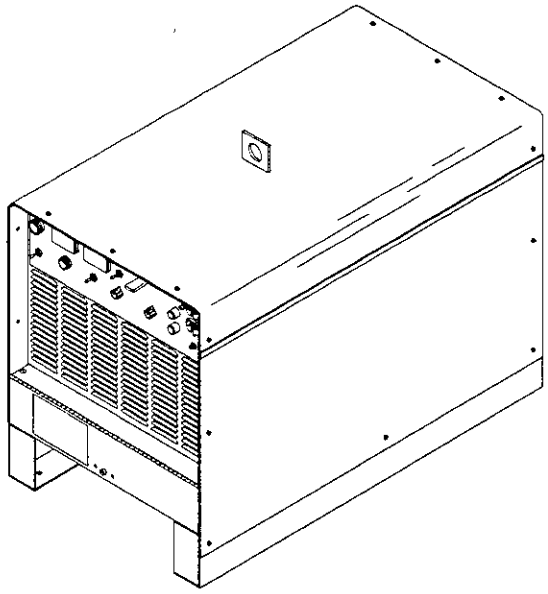
Miller®

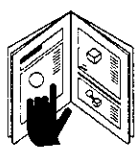
April 1993 Form: OM-274J
Effective With Serial No. KD358812

OWNER'S MANUAL

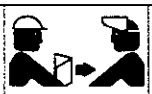


Pulstar 450®

- Constant Voltage Non-Pulsed Or Pulsed DC Arc Welding Power Source
- For Pulsed And Non-Pulsed GMAW, And FCAW Welding
- 450 Amperes, 38 Volts DC At 100% Duty Cycle
- Uses Three-Phase Input Power
- 24/115 VAC, Short Circuit, Incorrect Input, And Overheating Protection
- Background Voltage And Peak Amperage Controls
- 14-Pin And 10-Pin Remote Control Receptacles



- 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

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PRINTED IN USA

MILLER'S TRUE BLUE™ LIMITED WARRANTY

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

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

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

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

MILLER shall honor warranty claims on warranted equipment listed below in the event of such a failure within the warranty time periods. All warranty time periods start on the date that the equipment was delivered to the original retail purchaser, and are as follows:

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

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

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

1. Items furnished by MILLER, but manufactured by others, such as engines or trade accessories. These items are covered by the manufacturer's warranty, if any.
2. Consumable components; such as contact tips, cutting nozzles, contactors and relays.
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.

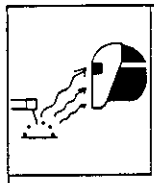
In welding, as in most jobs, exposure to certain hazards occurs. Welding is safe when precautions are taken. The safety information given below is only a summary of the more complete safety information that will be found in the Safety Standards listed on the next page. Read and follow all Safety Standards.

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



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

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

NOISE

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

ARC RAYS

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

FUMES AND GASES can be hazardous to your health.

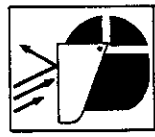
Welding produces fumes and gases. Breathing these fumes and gases can be hazardous to your health.

1. Keep your head out of the fumes. Do not breathe the fumes.
2. If inside, ventilate the area and/or use exhaust at the arc to remove welding fumes and gases.
3. If ventilation is poor, use an approved air-supplied respirator.
4. Read the Material Safety Data Sheets (MSDSs) and the manufacturer's instruction for metals, consumables, coatings, and cleaners.
5. Work in a confined space only if it is well ventilated, or while wearing an air-supplied respirator. Shielding gases used for welding can displace air causing injury or death. Be sure the breathing air is safe.
6. Do not weld in locations near degreasing, cleaning, or spraying operations. The heat and rays of the arc can react with vapors to form highly toxic and irritating gases.
7. Do not weld on coated metals, such as galvanized, lead, or cadmium plated steel, unless the coating is removed from the weld area, the area is well ventilated, and if necessary, while wearing an air-supplied respirator. The coatings and any metals containing these elements can give off toxic fumes if welded.

WELDING can cause fire or explosion.

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

1. Protect yourself and others from flying sparks and hot metal.
2. Do not weld where flying sparks can strike flammable material.
3. Remove all flammables within 35 ft (10.7 m) of the welding arc. If this is not possible, tightly cover them with approved covers.
4. Be alert that welding sparks and hot materials from welding can easily go through small cracks and openings to adjacent areas.
5. Watch for fire, and keep a fire extinguisher nearby.
6. Be aware that welding on a ceiling, floor, bulkhead, or partition can cause fire on the hidden side.
7. Do not weld on closed containers such as tanks or drums.
8. Connect work cable to the work as close to the welding area as practical to prevent welding current from traveling long, possibly unknown paths and causing electric shock and fire hazards.
9. Do not use welder to thaw frozen pipes.
10. Remove stick electrode from holder or cut off welding wire at contact tip when not in use.
11. Wear oil-free protective garments such as leather gloves, heavy shirt, cuffless trousers, high shoes, and a cap.



FLYING SPARKS AND HOT METAL can cause injury.

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

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

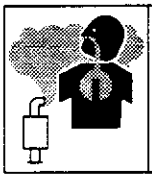
CYLINDERS can explode if damaged.

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

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

⚠ WARNING

ENGINES can be hazardous.



ENGINE EXHAUST GASES can kill.

Engines produce harmful exhaust gases.

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

ENGINE FUEL can cause fire or explosion.

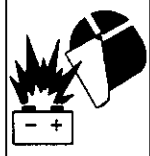
Engine fuel is highly flammable.

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

MOVING PARTS can cause injury.

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

1. Keep all doors, panels, covers, and guards closed and securely in place.
2. Stop engine before installing or connecting unit.
3. Have only qualified people remove guards or covers for maintenance and troubleshooting as necessary.
4. To prevent accidental starting during servicing, disconnect negative (–) battery cable from battery.
5. Keep hands, hair, loose clothing, and tools away from moving parts.
6. Reinstall panels or guards and close doors when servicing is finished and before starting engine.



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

Batteries contain acid and generate explosive gases.

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

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

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

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

PRINCIPAL SAFETY STANDARDS

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

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

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

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

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

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

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

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

PRÉCAUTIONS DE SÉCURITÉ EN SOUDAGE À L'ARC

MISE EN GARDE

LE SOUDAGE À L'ARC est dangereux.

PROTÉGEZ-VOUS, AINSI QUE LES AUTRES, CONTRE LES BLESSURES GRAVES POSSIBLES OU LA MORT. NE LAISSEZ PAS LES ENFANTS S'APPROCHER, NI LES PORTEURS DE STIMULATEUR CARDIAQUE (A MOINS QU'ILS N'AIENT CONSULTÉ UN MÉDECIN).

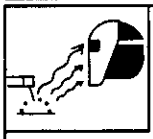
Le soudage, comme la plupart des activités industrielles, expose à certains risques. Le soudage n'est pas dangereux lorsqu'on prend des précautions. Les consignes de sécurité suivantes ne font que résumer l'information contenue dans les normes énumérées ci-après. Lisez et respectez toutes ces normes.

SEULES DES PERSONNES QUALIFIÉES DOIVENT FAIRE DES TRAVAUX D'INSTALLATION, DE RÉPARATION, D'ENTRETIEN ET D'ESSAI.

L'ÉLECTROCUTION peut être mortelle.

Une décharge électrique peut vous tuer ou vous brûler gravement. L'électrode et le circuit de soudage sont sous tension au démarrage. Le circuit d'entrée et les circuits internes des matériels sont aussi sous tension dès la mise en marche. En soudage automatique ou semi-automatique avec fil, ce dernier, le support de roquette, le logement des galets d'entraînement et toutes les pièces métalliques en contact avec le fil de soudage sont sous tension. Des matériels mal installés ou mal mis à la terre sont dangereux.

1. Ne touchez pas à des pièces sous tension.
2. Portez des gants et des vêtements isolants, secs et non troués.
3. Isolez-vous de la tôle à souder et de la mise à la terre au moyen de petits tapis isolants ou autres.
4. Déconnectez la prise d'entrée des matériels ou arrêtez leur moteur avant de les installer ou d'en faire l'entretien.
5. Veillez à installer ces matériels et à les mettre à la terre selon le manuel d'utilisation et les codes nationaux, provinciaux et locaux applicables.
6. Arrêtez tous les matériels après utilisation.
7. N'utilisez pas de câbles usés, endommagés, mal épissés ou de calibre trop petits.
8. N'enroulez pas de câbles autour de votre corps.
9. Mettez à la terre la tôle à souder au moyen d'une bonne prise de terre.
10. Ne touchez pas à l'électrode si vous êtes en contact avec le circuit de soudage (terre).
11. N'utilisez que des matériels en bon état. Réparez ou remplacez sur-le-champ les pièces endommagées.
12. Portez un harnais de sécurité si vous travaillez en hauteur.
13. Fermez solidement tous les panneaux et les capots.



Le RAYONNEMENT DE L'ARC peut brûler les yeux et la peau; le BRUIT peut endommager l'ouïe.

L'arc de soudage produit une chaleur et des rayons ultraviolets intenses, susceptibles de brûler les yeux et la peau. Le bruit causé par certains procédés peut endommager l'ouïe.

1. Portez un casque de soudeur avec écran filtrant de teinte appropriée (consultez la norme ANSI Z49 indiquée ci-après), pour vous protéger le visage et les yeux lorsque vous soudez ou que vous observez l'exécution d'une soudure.
2. Portez des lunettes de sécurité approuvées. Des écrans latéraux sont recommandées.
3. Entourez l'aire de soudage de rideaux ou de cloisons de protection contre les coups d'arc ou l'éblouissement; avertissez les observateurs de ne pas regarder l'arc.
4. Portez des vêtements en tissus ignifuge durable (laine et cuir) et des chaussures de sécurité.
5. Portez un casque antibruit ou des bouchons d'oreille approuvés si le niveau de bruit est élevé.

Les VAPEURS ET LES FUMÉES sont dangereuses pour la santé.

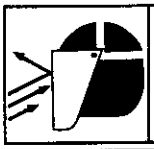
Le soudage dégage des vapeurs et des fumées qu'il est dangereux de respirer.

1. Écartez le visage pour éviter de respirer les fumées.
2. À l'intérieur, assurez-vous que l'aire de soudage est bien ventilée ou que les fumées et les vapeurs sont aspirées à l'arc.
3. Si la ventilation est mauvaise, portez un respirateur à adduction d'air approuvé.
4. Lisez les fiches signalétiques et les consignes du fabricant relatives aux métaux, aux produits consummables, aux revêtements et aux produits nettoyants.
5. Ne travaillez dans un espace confiné que s'il est bien ventilé; sinon, portez un respirateur à adduction d'air. Les gaz protecteurs de soudage peuvent déplacer l'oxygène de l'air et causer des blessures ou la mort. Assurez-vous que l'air est propre à la respiration.
6. Ne soudez pas à proximité d'opérations de dégraissage, de nettoyage ou de pulvérisation. La chaleur et les rayons de l'arc peuvent réagir avec des vapeurs et former des gaz hautement toxiques et irritants.
7. Ne soudez pas de tôles galvanisées ou plaquées en plomb ou en cadmium sans les avoir grattées à fond, car ces métaux, et tout revêtement qui en contient, peuvent alors dégager des fumées toxiques. Assurez-vous d'une bonne ventilation et portez un respirateur à adduction d'air si c'est nécessaire.

Le SOUDAGE peut causer un incendie ou une explosion.

L'arc produit des étincelles et des projections. Avec la chaleur intense dégagée par la tôle et les matériels, elles peuvent causer un incendie et des brûlures. Le contact accidentel de l'électrode avec un objet métallique peut provoquer des étincelles, un échauffement ou un incendie.

1. Protégez-vous, ainsi que les autres, contre les étincelles et les projections.
2. Ne soudez pas dans un endroit où des étincelles peuvent atteindre des matériaux inflammables.
3. Enlevez toutes les matières inflammables dans un rayon de 10,7 mètres autour de l'arc, ou couvrez-les soigneusement avec des bâches approuvées.
4. Méfiez-vous des étincelles et des éclats brûlants, susceptibles de pénétrer dans des aires adjacentes par de petites ouvertures ou fissures.
5. Méfiez-vous des incendies et gardez un extincteur à portée de la main.
6. N'oubliez pas qu'une soudure sur un plafond, un plancher, une cloison ou une paroi peut en enflammer l'autre côté.
7. Ne soudez pas un récipient fermé, comme un réservoir ou un tonneau.
8. Connectez le câble de soudage le plus près possible de la tôle de soudage pour empêcher le courant de suivre un parcours long et inconnu, et prévenir ainsi les risques d'électrocution et d'incendie.
9. Ne faites pas dégeler des tuyaux avec un chalumeau.
10. Videz votre carquois porte-électrodes ou coupez le fil au tube-contact après le soudage.
11. Portez des vêtements protecteurs non huileux, tels des gants en cuir, une chemise épaisse, un pantalon sans revers, des chaussures montantes et un casque.



LES ÉTINCELLES ET LES PROJECTIONS BRULANTES peuvent causer des blessures.

Le piquage et le meulage produisent des éclats de métal. En refroidissant, la soudure peut projeter du laitier.

1. Portez un écran facial ou des lunettes à coques approuvées. Des écrans latéraux sont recommandés.
2. Portez des vêtements de protection individuelle appropriés.

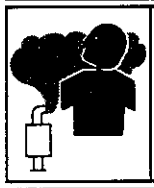
Les BOUTEILLES endommagées peuvent exploser.

Les bouteilles contiennent des gaz protecteurs sous haute pression. Des bouteilles endommagées peuvent exploser. Comme les bouteilles font normalement partie du procédé de soudage, traitez-les avec soin.

1. Les bouteilles doivent être protégées contre les sources de chaleur intense, les chocs et les arcs de soudage.
2. Enchaînez verticalement les bouteilles à un support ou à un cadre fixe pour les empêcher de tomber ou d'être renversées.
3. Éloignez les bouteilles de tout circuit électrique ou de soudage.
4. Empêchez tout contact entre une bouteille et une électrode.
5. N'utilisez que des bouteilles de gaz protecteur, des détendeurs, des flexibles et des raccords conçus pour chaque application spécifique; ces matériels et les pièces connexes doivent être en bon état.
6. Ne mettez pas le visage devant le robinet de bouteille en l'ouvrant.
7. Remettez le chapeau de bouteille après utilisation.
8. Lisez et respectez les consignes relatives aux bouteilles de gaz comprimé et aux matériels connexes, ainsi que la publication P-1 de la CGA, énumérées dans les normes ci-dessous.

MISE EN GARDE

Les MOTEURS peuvent être dangereux.



Les GAZ D'ÉCHAPPEMENT DES MOTEURS PEUVENT ÊTRE MORTELS.

Les moteurs produisent des gaz d'échappement nocifs.

1. Utilisez des machines à l'extérieur dans des aires ouvertes et bien ventilées.
2. Si vous utilisez des machines dans un endroit confiné, les fumées d'échappement doivent être envoyées à l'extérieur, loin des prises d'air du bâtiment.

Le CARBURANT peut causer un incendie ou une explosion.

Le carburant est hautement inflammable.

1. Arrêtez le moteur avant de vérifier le niveau de carburant ou de faire le plein.
2. Ne faites pas le plein en fumant ou proche d'une source d'étincelles ou d'une flamme nue.
3. Si c'est possible, laissez le moteur refroidir avant de faire le plein de carburant ou d'en vérifier le niveau au début du soudage.
4. Ne faites pas le plein de carburant à ras bord : prévoyez de l'espace pour son expansion.
5. Faites attention de ne pas renverser de carburant. Nettoyez tout carburant renversé avant de faire démarrer le moteur.

Des PIÈCES EN MOUVEMENT peuvent causer des blessures.

Des pièces en mouvement, telles des ventilateurs, des rotors et des courroies peuvent couper les doigts et les mains, ou accrocher des vêtements amples.

1. Assurez-vous que les portes, les panneaux, les capots et les protecteurs sont bien fermés.
2. Avant d'installer ou de connecter un système, arrêtez-en le moteur.
3. Seules des personnes qualifiées doivent démonter des protecteurs ou des capots pour faire l'entretien ou le dépannage nécessaire.
4. Pour empêcher un démarrage accidentel d'un système pendant l'entretien, débranchez le câble d'accumulateur à la borne négative.
5. N'approchez pas les mains ou les cheveux de pièces en mouvement; elles peuvent aussi accrocher des vêtements amples et des outils.
6. Réinstallez les capots ou les protecteurs et fermez les portes après des travaux d'entretien et avant de faire démarrer le moteur.

Des ÉTINCELLES peuvent FAIRE EXPLOSER UN ACCUMULATEUR; L'ÉLECTROLYTE D'UN ACCUMULATEUR peut brûler la peau et les yeux.

Les accumulateurs contiennent de l'électrolyte et dégagent des vapeurs explosives.

1. Portez toujours un écran facial en travaillant sur un accumulateur.
2. Arrêtez le moteur avant de connecter ou de déconnecter des câbles d'accumulateur.
3. N'utilisez que des outils anti-étincelles pour travailler sur un accumulateur.
4. N'utilisez pas un poste de soudage pour charger un accumulateur ou connecter provisoirement un véhicule.
5. Utilisez la polarité correcte (+ et -) de l'accumulateur.

La VAPEUR ET LE LIQUIDE DE REFROIDISSEMENT BRÛLANT SOUS PRESSION peuvent brûler la peau et les yeux.

Le liquide de refroidissement d'un radiateur peut être brûlant et sous pression.

1. N'ôtez pas le bouchon de radiateur tant que le moteur n'a pas refroidi.
2. Mettez des gants et posez un torchon sur le bouchon pour l'ôter.
3. Laissez la pression s'échapper avant d'ôter complètement le bouchon.

PRINCIPALES NORMES DE SÉCURITÉ

Safety in Welding and Cutting, norme ANSI Z49.1, American Welding Society, 550, N.W. LeJeune Rd., Miami FL 33128.

Safety and Health Standards, OSHA 29 CFR 1910, 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, norme AWS F4.1, American Welding Society, 550, N.W. LeJeune Rd., Miami FL 33128.

National Electrical Code, norme 70 NFPA, National Fire Protection Association, Batterymarch Park, Quincy, MA 02269.

Safe Handling of Compressed Gases in Cylinders, document P-1, Compressed Gas Association, 1235 Jefferson Davis Highway, Suite 501, Arlington, Va 22202.

Code for Safety in Welding and Cutting, norme CSA W117.2, Association canadienne de normalisation, Standards Sales, 176 Rexdale Boulevard, Rexdale, Ontario, Canada M9W 1R3.

Safe Practices for Occupation and Educational Eye and Face Protection, norme ANSI Z87.1, American National Standards Institute, 1430 Broadway, New York, NY 10018.

Cutting and Welding Processes, norme 51B NFPA, National Fire Protection Association, Batterymarch Park, Quincy, MA 02269.

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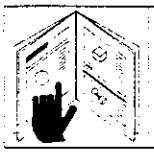
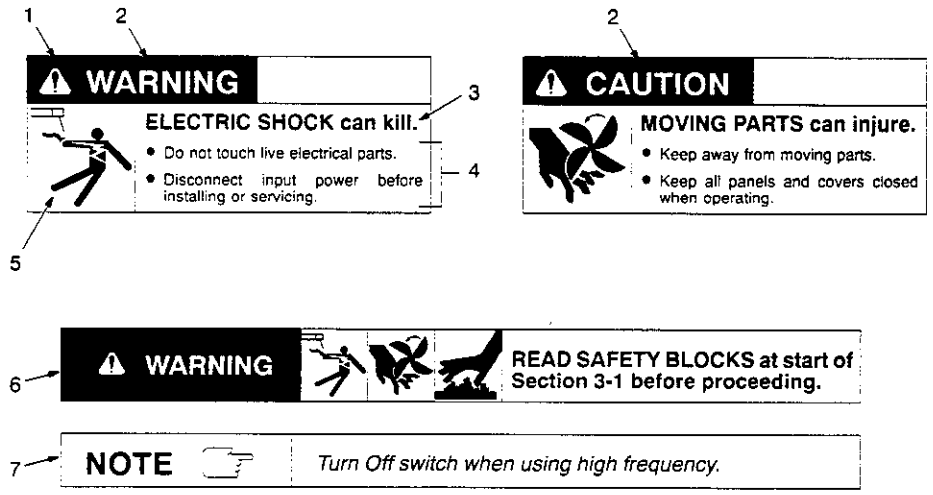
SECTION 1 – SAFETY INFORMATION



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



1 Safety Alert Symbol

2 Signal Word

WARNING means possible death or serious injury can happen.

CAUTION means possible minor injury or equipment damage can happen.

3 Statement Of Hazard And Result

4 Safety Instructions To Avoid Hazard

5 Hazard Symbol (If Available)

6 Safety Banner

Read safety blocks for each symbol shown.

7 NOTE

Special instructions for best operation – not related to safety.

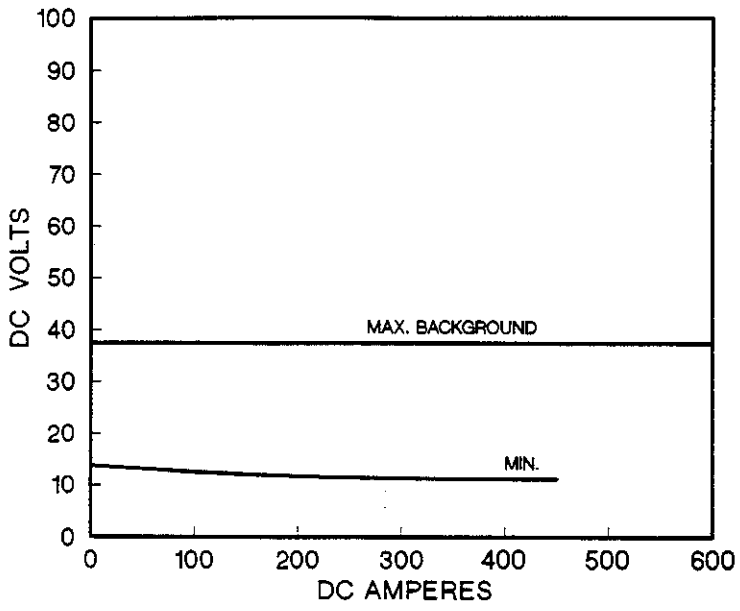
Figure 1-1. Safety Information

SECTION 2 – SPECIFICATIONS

Table 2-1. Welding Power Source

Specification	Description
Type Of Output	Constant Voltage Non-Pulsed Or Pulsed DC
Rated Weld Output	450 Amperes, 38 Volts DC At 100% Duty Cycle (See Section 2-2)
Type Of Input Power	Three-Phase; 200, 230, 460, Or 575 Volts AC; 60 Hz
Input Amperes At Rated Output	81 A At 200 V, 70 A At 230 V, 35 A At 460 V, 28 A At 575 V
KVA/KW Used At Rated Output	28 kVA/23 kW
Max. Open-Circuit Voltage	80 Volts DC
Welding Processes	Gas Metal Arc (GMAW), Flux Cored Arc (FCAW), Gas Metal Arc Welding-Pulsed (GMAW-P)
Overall Dimensions	See Figure 3-2
Weight	Net: 590 lb (268 kg); Ship: 605 lb (274 kg)
Options	See Rear Cover

2-1. Volt-Ampere Curves (Non-Pulsed Mode)



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.

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Figure 2-1. Volt-Ampere Curves

2-2. Duty Cycle

⚠ CAUTION

EXCEEDING DUTY CYCLE RATINGS will damage unit.

- Do not exceed indicated duty cycles.

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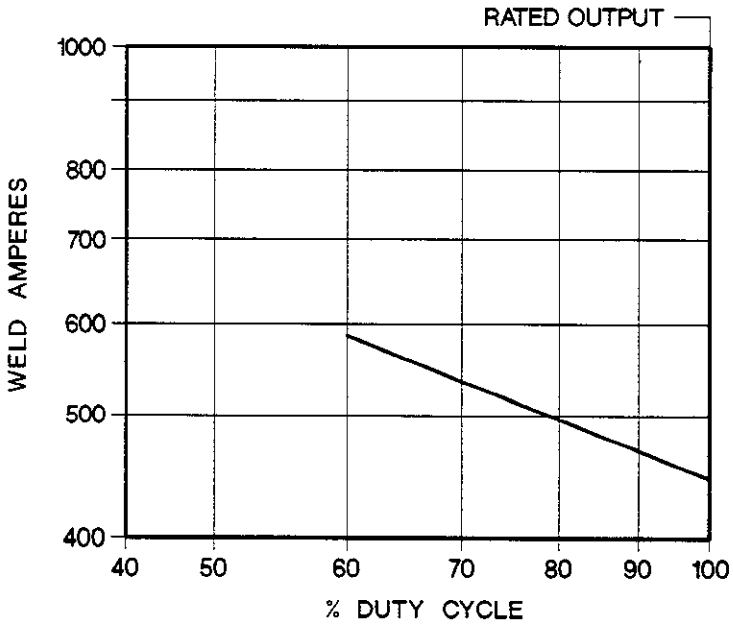

Duty cycle is how long the unit can operate within a ten minute period without causing overheating or damage.

This unit is rated at 100% duty cycle allowing continuous operation at rated load.

sb1.1 2/92 – Ref. SB-081 693-C

Figure 2-2. Duty Cycle Chart

SECTION 3 – INSTALLATION

3-1. 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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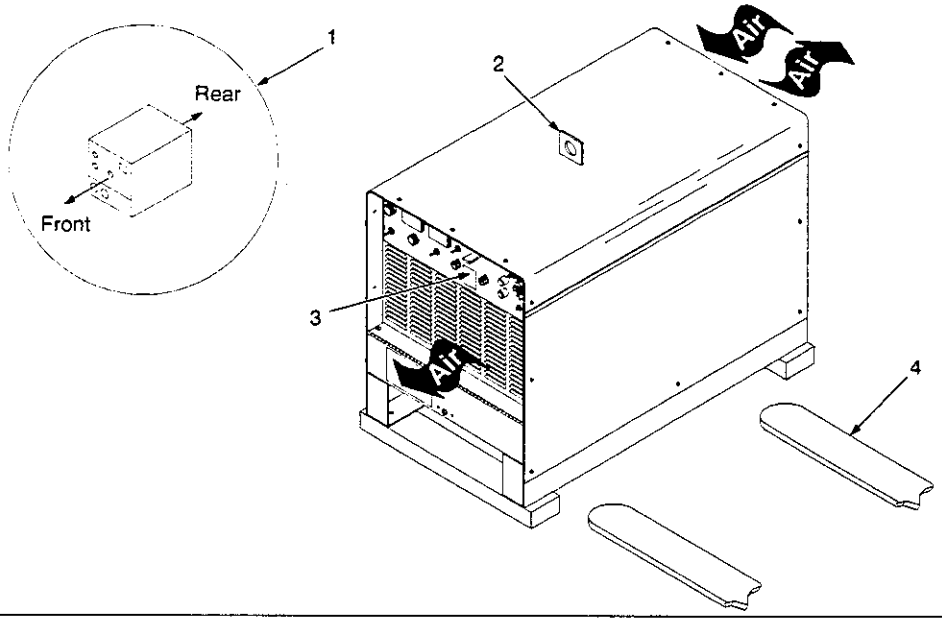

1 18 in (460 mm) Open Space On Front And Rear Sides For Good Airflow

2 Lifting Eye

Use lifting eye to move unit.

3 Rating Label

Locate unit near correct input power supply.

4 Lifting Forks

If using lifting forks, extend forks out opposite side of unit.

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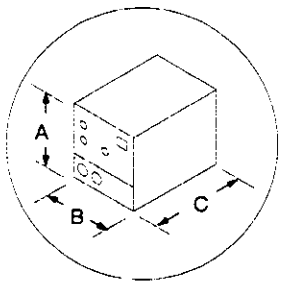
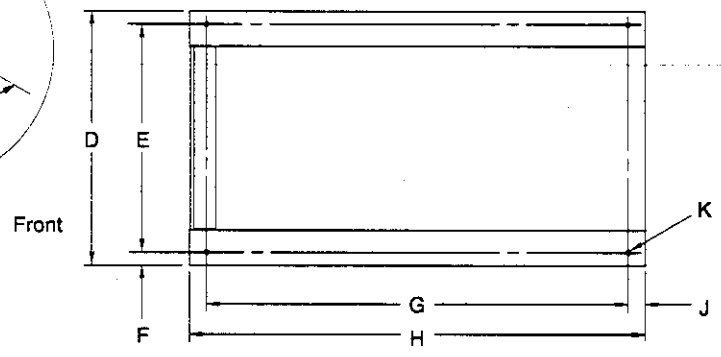
Figure 3-1. Location and Movement Of Welding Power Source





	Inches	Millimeters
A	30-1/4	768
B	22-1/4	565
C	40	1016
D	22-1/4	565
E	20	508
F	1-1/8	28.6
G	37	840
H	40	1016
J	1-1/2	38
K	7/16 Dia 4 Holes	11 Dia 4 Holes

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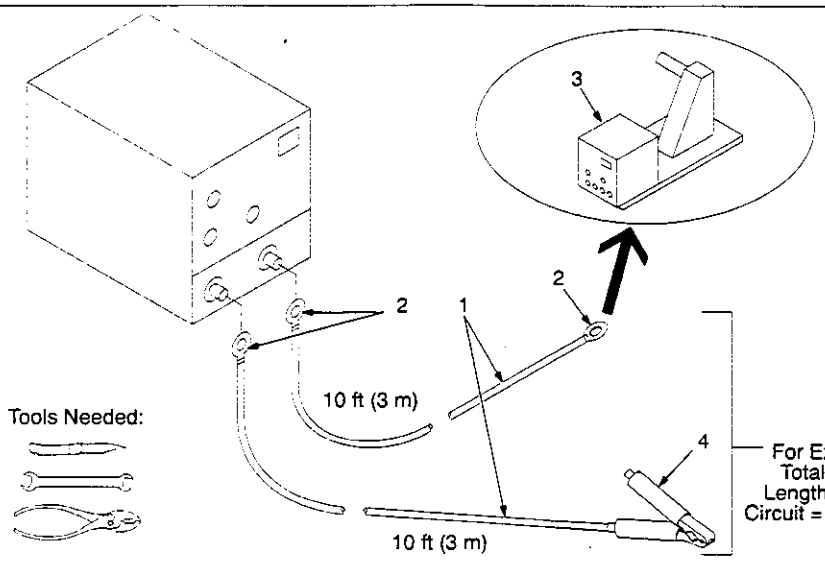
Figure 3-2. Overall Dimensions And Base Mounting Hole Layout

3-2. Selecting And Preparing Weld Output Cables



1 Weld Output Cable

Determine total cable length in weld circuit and maximum welding amperes. Use Table 3-1 to select proper cable size.

Use shortest cables possible.

Do not use damaged cables.

2 Terminal Lug

Use lugs of proper amperage capacity and hole size for connecting to work clamp, wire feeder, and weld output terminals.

3 Wire Feeder

Install according to manufacturer's instructions.

4 Work Clamp

Install onto work cable.

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Figure 3-3. Selecting And Preparing Weld Output Cables

Table 3-1. Weld Cable Size*

Welding Amperes	Total Cable (Copper) Length In Weld Circuit Not Exceeding							
	100 ft (30 m) Or Less		150 ft (45 m)	200 ft (60 m)	250 ft (70 m)	300 ft (90 m)	350 ft (105 m)	400 ft (120 m)
	10 To 60% Duty Cycle	60 Thru 100% Duty Cycle	10 Thru 100% Duty Cycle					
100	4	4	4	3	2	1	1/0	1/0
150	3	3	2	1	1/0	2/0	3/0	3/0
200	3	2	1	1/0	2/0	3/0	4/0	4/0
250	2	1	1/0	2/0	3/0	4/0	2-2/0	2-2/0
300	1	1/0	2/0	3/0	4/0	2-2/0	2-3/0	2-3/0
350	1/0	2/0	3/0	4/0	2-2/0	2-3/0	2-3/0	2-4/0
400	1/0	2/0	3/0	4/0	2-2/0	2-3/0	2-4/0	2-4/0
500	2/0	3/0	4/0	2-2/0	2-3/0	2-4/0	3-3/0	3-3/0
600	3/0	4/0	2-2/0	2-3/0	2-4/0	3-3/0	3-4/0	3-4/0

*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. S-0007-C

3-3. 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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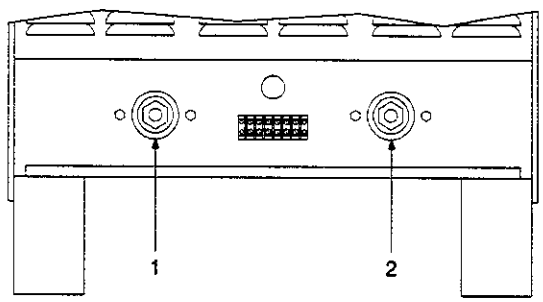


Tools Needed:

3/4 in

Open lower panel access door.

1 Positive (+) Weld Output Terminal

2 Negative (–) Weld Output Terminal

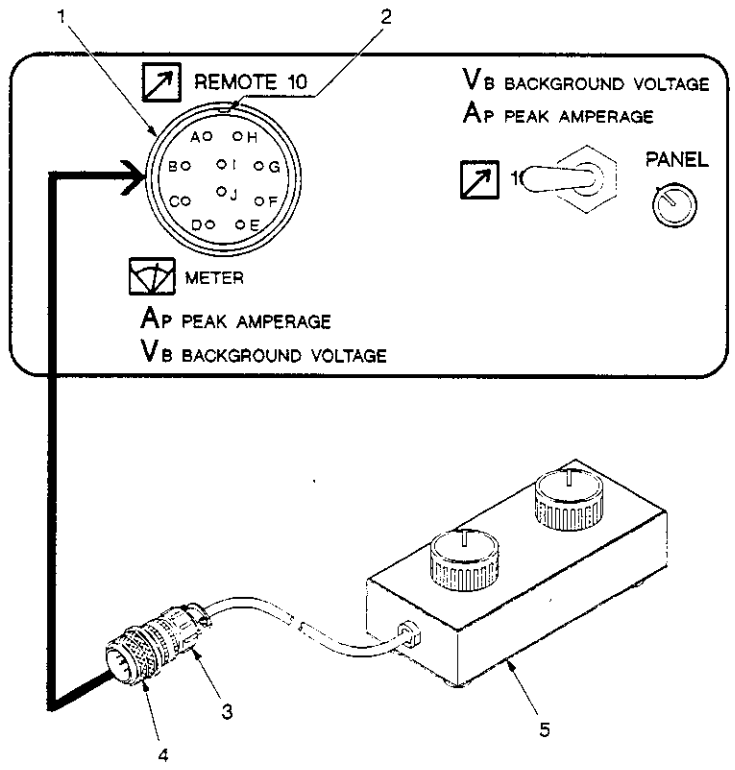
For Electrode Positive (DCEP), connect work cable to negative (–) terminal and wire feeder cable to positive (+) terminal.

For Electrode Negative (DCEN), reverse cable connections.

Close door. Ref. ST-085 482-C

Figure 3-4. Weld Output Connections

3-4. Remote 10 Receptacle Information And Connections



1 Remote 10 Receptacle RC1
2 Keyway
3 Plug
4 Threaded Collar

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

5 Remote Pendant Control

Socket Information:

A 4.8 volts dc peak current reference voltage (factory set).

B Control circuit common (all circuit voltages referenced to this point).

C 0-4.8 volts dc peak current remote control command (100 amperes output per volt of command).

D 0-3.8 volts dc background voltage remote control command (10 volts output per volt of command).

E Actual peak current signal (1 volt per 100 amperes output current).

F Approximate negative weld output terminal potential.

G In pulse mode, G is connected to J.

J In pulse mode, J is connected to G.

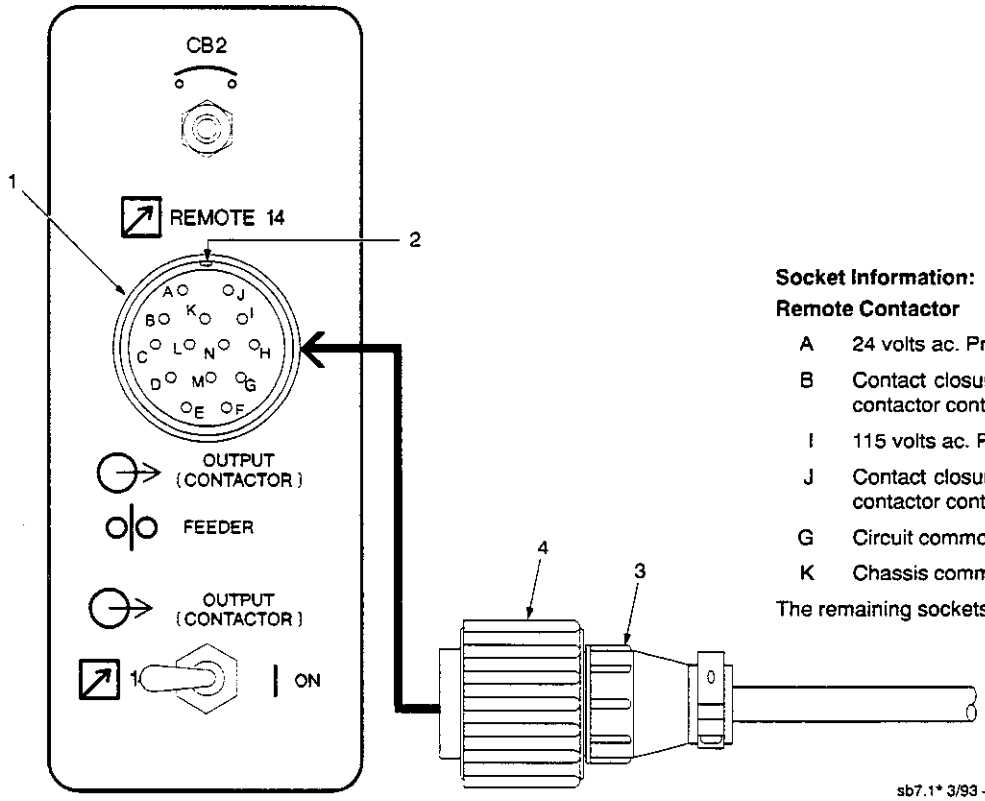
H Positive output signal. In pulse mode, H is internal background voltage. In standard mode, H is total welding power source voltage.

I 3.8 volts dc background voltage reference (factory set).

Ref. ST-130 111-A / Ref. S-0166-A / ST-162 711

Figure 3-5. Remote 10 Connections

3-5. Remote 14 Receptacle Information And Connections



1 Remote 14 Receptacle RC6
2 Keyway
3 Plug
4 Threaded Collar

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

Socket Information:

Remote Contactor

A 24 volts ac. Protected by circuit breaker CB2.

B Contact closure to pin A completes 24 volts ac contactor control circuit.

I 115 volts ac. Protected by circuit breaker CB1.

J Contact closure to pin I completes 115 volts ac contactor control circuit.

G Circuit common for 24 and 115 volts ac circuits.

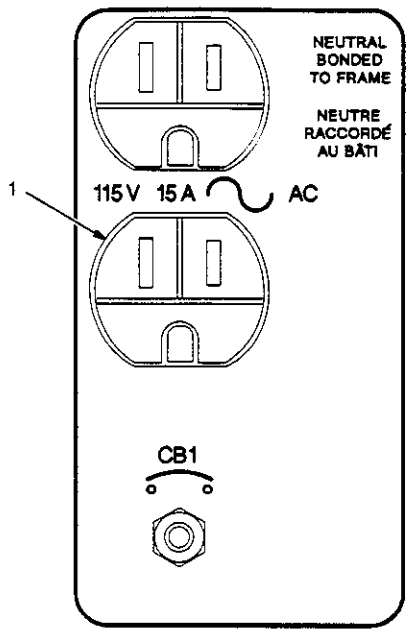
K Chassis common.

The remaining sockets are not used.

sb7.1* 3/93 – Ref. ST-130 111-A / Ref. S-0004-A / S-0750

Figure 3-6. Remote 14 Connections

3-6. 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.

This receptacle is protected by circuit breaker CB1 (see Section 5-2).

Power output is shared between this receptacle and the Remote 14 receptacle (see Section 3-5).

Ref. ST-130 111-A

Figure 3-7. Connecting To 115 Volts AC Duplex Receptacle

3-7. Remote Voltage Sensing Connections

⚠ WARNING

ELECTRIC SHOCK can kill.

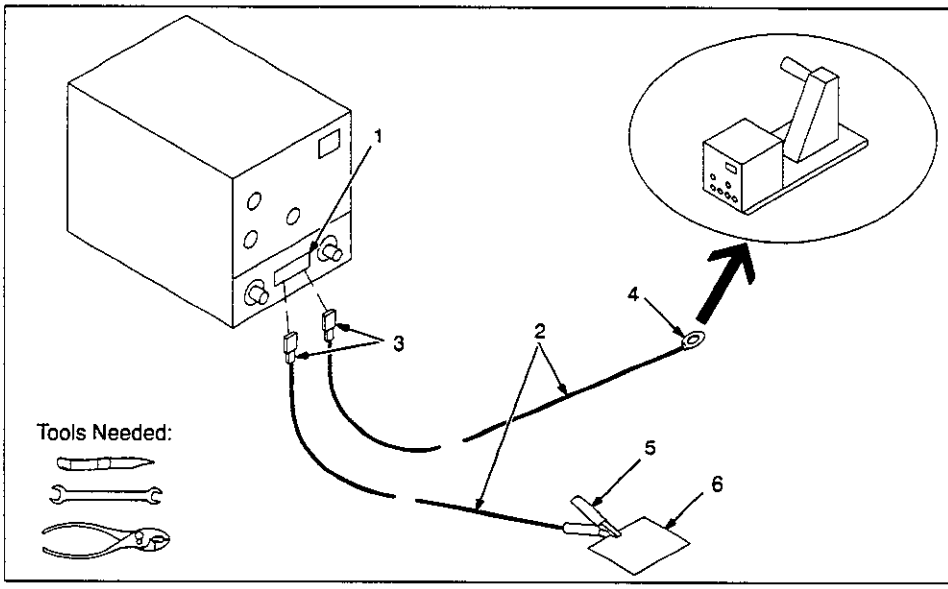
- Do not touch live electrical parts.
- Turn Off welding power source, and disconnect input power before inspecting or installing.

EXCESSIVELY HIGH WELDING AMPERAGE can cause electrode wire to vaporize.

- Be sure jumper links on terminal strip 1T are properly positioned for type of voltage sensing desired (see Figure 3-9).
- Be sure remote voltage sensing leads are connected for proper polarity.

In the absence of a voltage feedback signal, or if the polarity of the feedback signal is incorrect, weld output goes to unit maximum.

A. Selecting And Preparing Voltage Sensing Leads



Remote voltage sensing allows for exact voltage measurement at the welding arc, and display of this voltage on the voltmeter. This may be needed when over 100 feet of weld cable is used.

1 Terminal Strip 1T

2 18 Gauge Lead

Determine total lead length from connection diagram.

Obtain and install connectors onto leads as shown.

3 No. 6 Spade Lug

4 1/2 in Ring Terminal

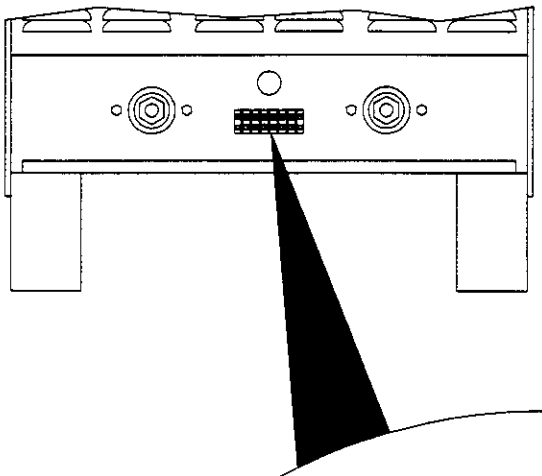
5 Universal 25 Amp Clamp

6 Workpiece

S-0787-A

Figure 3-8. Selecting And Preparing Voltage Sensing Leads

B. Remote Voltage Sensing Connections



Open lower front access door.

1 Terminal Strip 1T

2 Jumper Links

Move jumper links to remote voltage sensing position.

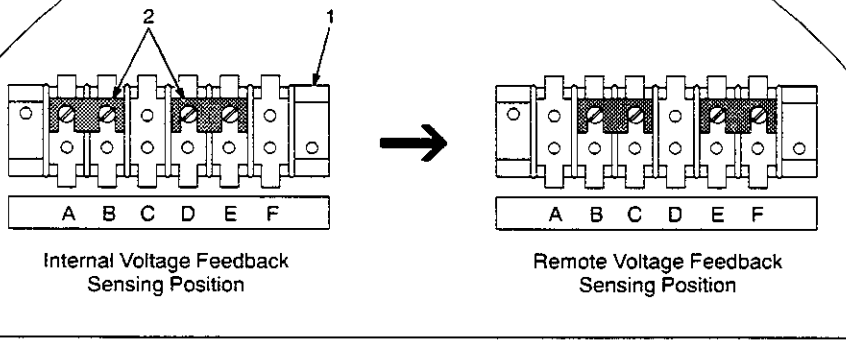
Make connections to terminal strip 1T for Electrode Positive (DCEP) as shown. For Electrode Negative (DCEN), switch lead connections at 1T.

3 Weld Cable Terminal Of Wire Feeder

4 Weld Cable

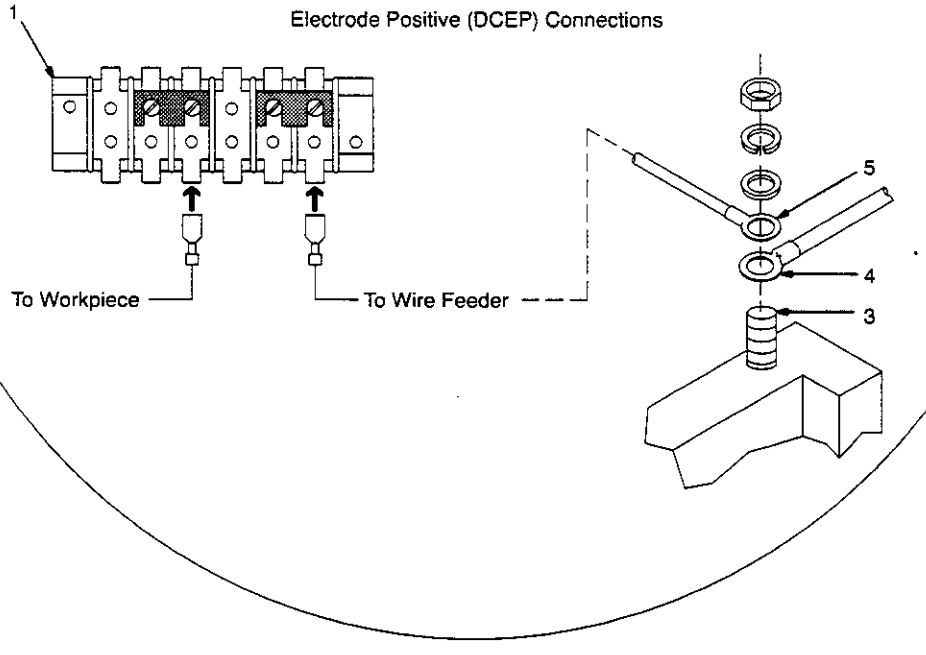
5 Voltage Sensing Lead

Close door.



Internal Voltage Feedback Sensing Position

Remote Voltage Feedback Sensing Position



Tools Needed:

Ref. ST-085 482-C / S-0278-A

Figure 3-9. Remote Voltage Sensing Connections

3-8. 0 To +10 Volts DC Command Modification

⚠ WARNING

ELECTRIC SHOCK can kill

- Do not touch live electrical parts.
- Turn Off welding power source, and disconnect input power before inspecting or installing.

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.

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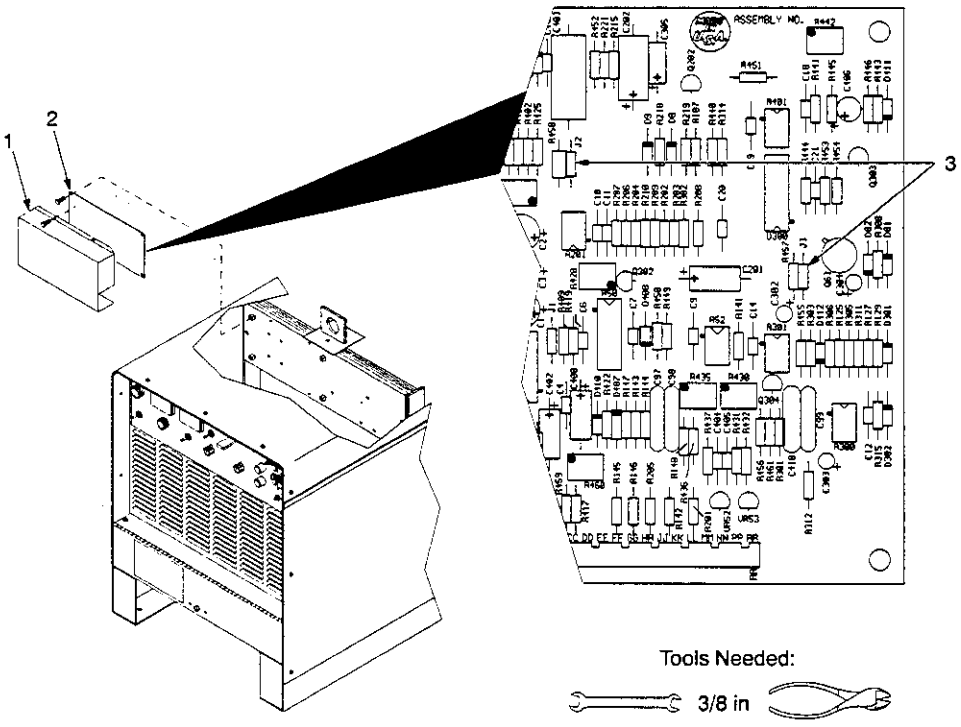


The control circuit is factory set to send 0 (zero) to +4.8 volts dc command signals to the remote output control (Section 3-4). If the remote control requires 0 to +10 volts dc command signals, proceed as follows:

Remove cover and left side panel.

1 Circuit Board Cover

2 Control Board PC1

Remove cover, disconnect plugs from PC1, and remove PC1.

3 Jumpers J2 And J3

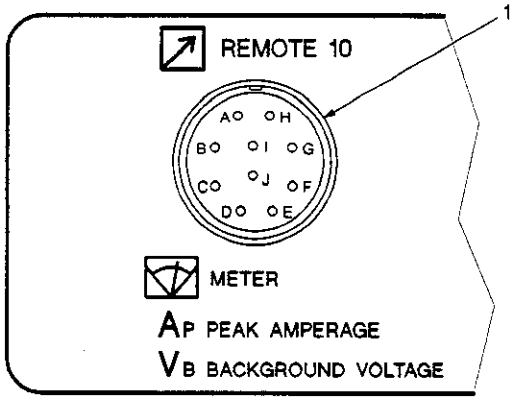
Cut jumpers J2 and J3.

Reconnect plugs to PC1. Reinstall PC1.

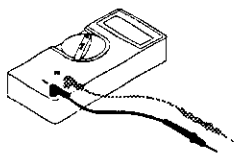
Tools Needed:

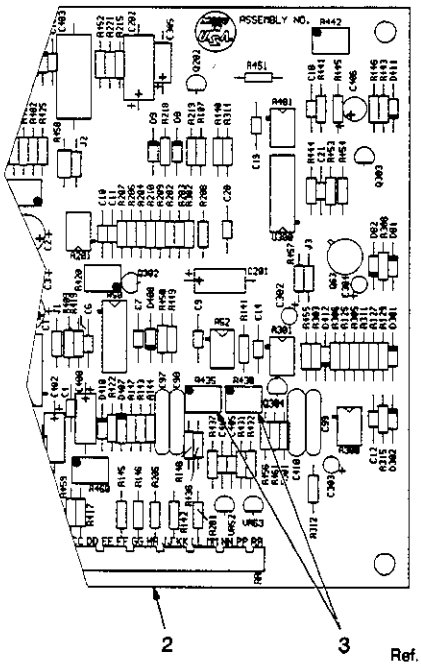
ST-161 360 / Ref. SB-154 959

Figure 3-10. Cutting Jumpers On Control Board PC1



Tools Needed:





Be sure PC1 plugs are secure before recalibrating. Set meter on 20 volts dc scale.

1 Remote 10 Receptacle RC1

2 Control Board PC1

3 Potentiometers R430 And R435

Remove compound from screws of R430 and R435.

Connect negative (–) meter lead to RC1 socket B, and positive (+) lead to RC1 socket I. Turn on unit.

Adjust R430 until meter displays 10 volts dc. Turn off unit.

Reconnect positive (+) lead to RC1 socket A. Turn on unit.

Adjust R435 until meter displays 10 volts dc. Turn off unit.

Disconnect meter, and reinstall PC1 cover. Reinstall left side panel and top cover.

Ref. ST-130 111-A / Ref. S-0166-A / Ref. SB-154 959

Figure 3-11. Recalibrating Control Board PC1

3-9. 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.

Open rear access panel to check jumper links.

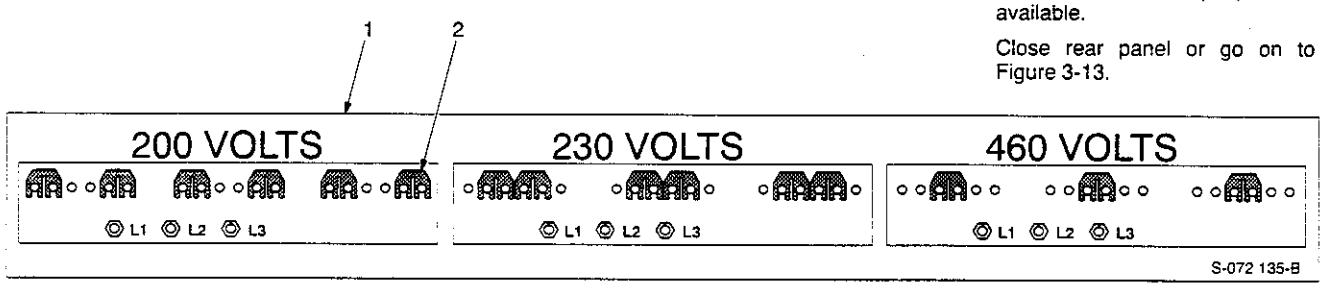
1 Input Voltage Label – Only One Is On Unit

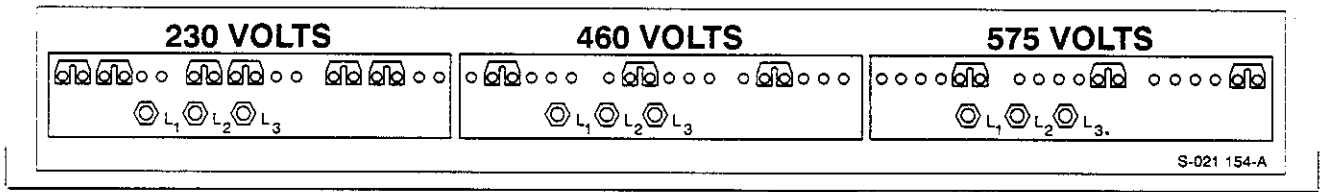
Look at jumper links and compare link position with unit label.

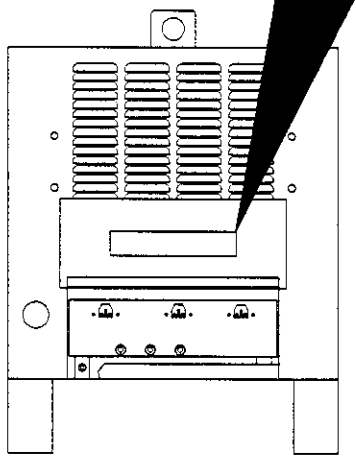
2 Input Voltage Jumper Links

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

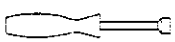
Close rear panel or go on to Figure 3-13.







Tools Needed:

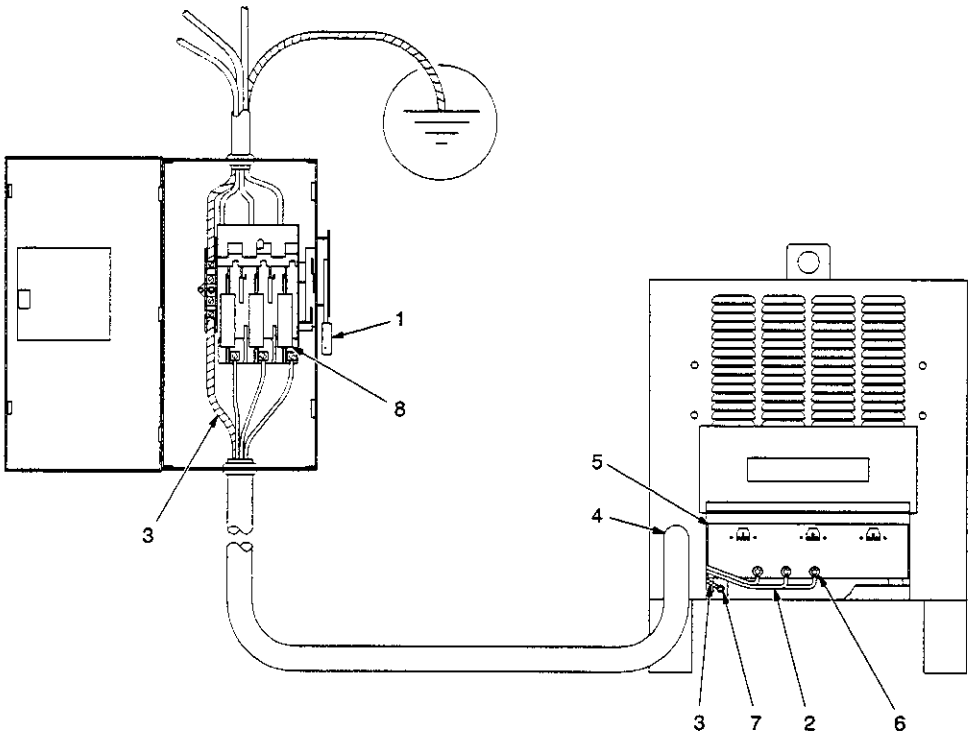


3/8 in

ssb5.1 2/92 – ST-161 260

Figure 3-12. Input Voltage Jumper Links Location

B. Connecting Input Power



Have only qualified persons make this installation.

Open rear panel access door.

1 Line Disconnect Device Of Proper Rating

2 Input Conductors

3 Grounding Conductor

Select size and length using Table 3-2. Conductor rating must comply with national, state, and local electrical codes. Use lugs of proper amperage capacity and correct hole size.

4 Strain Relief Connector

Insert conductors through strain relief.

5 Input Terminal Board

6 Line Terminals

7 Ground Terminal

Connect grounding conductor and input conductors to line terminals and to ground terminal.

Install and connect grounding conductor and input conductors in conduit or equivalent to deenergized line disconnect device.

Be sure grounding conductor goes to an earth ground.

Close rear panel access door.

8 Overcurrent Protection

Select type and size using Table 3-2. Install into deenergized line disconnect device (fused disconnect switch shown).

Tools Needed:

3/8, 7/16, 1/2 in

ssb2.4* 3/93 – ST-048 933-D

Figure 3-13. Input Power Connections

Table 3-2. Electrical Service Requirements*

Input Voltage	200	230	460	575
Input Amperes At Rated Output	81	70	35	28
Recommended Standard Fuse Or Circuit Breaker Rating In Amperes[1]	125	110	50	40
Input Conductor Size In AWG/Kcmil[2]	4	4	8	10
Max Input Conductor Length In Feet (Meters)[3]	128 (39)	170 (52)	290 (88)	300 (92)
Grounding Conductor Size In AWG/Kcmil[4]	6	6	10	10

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

1 Recommended fuse or circuit breaker size is that closest to 150% of rated input amperage of the welding power source. Article 630-12(a) of NEC allows fuse or circuit breaker sizing up to 200% of rated input amperage.

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

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

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

S-0092-F

⚠ WARNING

ELECTRIC SHOCK can kill.

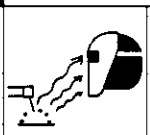
- Always wear dry insulating gloves.
- Insulate yourself from work and ground.
- Do not touch live electrical parts.
- Keep all panels and covers securely in place.

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.

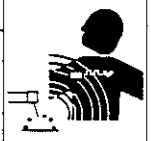


ARC RAYS can burn eyes and skin; NOISE can damage hearing.

- 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.

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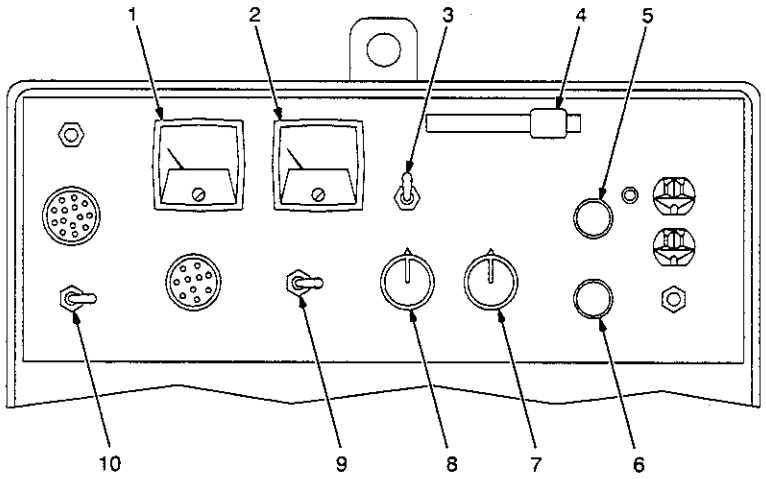
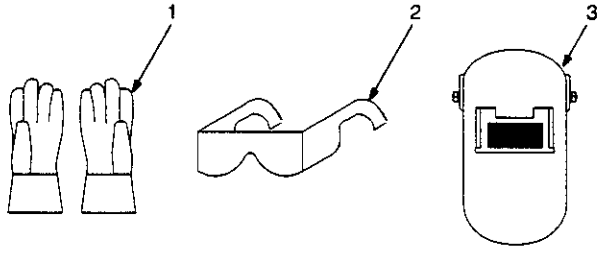


1 Voltmeter
2 Ammeter
3 Weld Amperage Switch
4 Mode Selector Switch
5 Power On Push Button
6 Power Off Push Button
7 Background Voltage Adjustment Control
8 Peak Amperage Adjustment Control
9 V_B Background Voltage/A_P Peak Amperage Switch
10 Output(Contactor) Switch

Ref. ST-085 482-C

Figure 4-1. Controls



1 Insulating Gloves
2 Safety Glasses With Side Shields
3 Welding Helmet

Wear dry insulating gloves, safety glasses with side shields, and a welding helmet with a correct shade of filter (see ANSI Z49.1).

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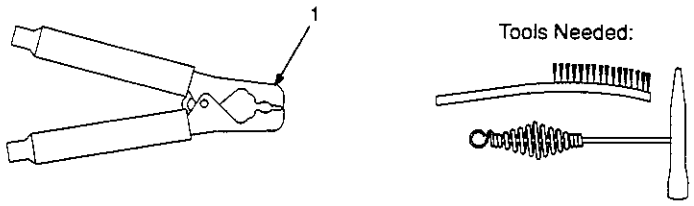
Figure 4-2. Safety Equipment



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.

sb4.1 2/93

Figure 4-3. Work Clamp

⚠ CAUTION

ARCING can damage switch.

- Do not change Mode Selector switch position while welding.

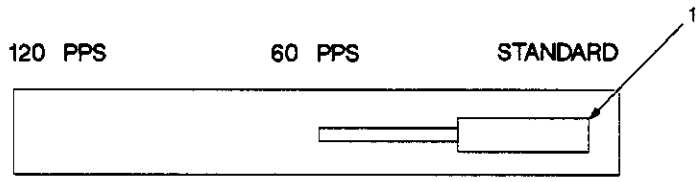
Arcing inside switch can damage contacts, causing switch to fail.

INCOMPLETE SWITCH LEVER MOVEMENT can damage unit.

- Place switch lever fully to left or right positions for 120 PPS or Standard mode operation.

Partial switch engagement may overload and damage switch contacts.

warn5.1* 2/93



1 Mode Selector Switch

Use switch to select pulsed weld output or standard weld output.

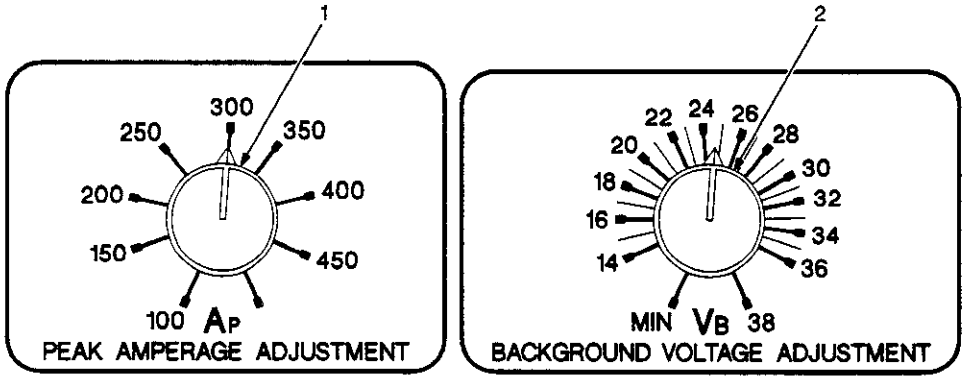
60 PPS position provides 60 pulses of peak current per second. 120 PPS position provides 120 pulses of peak current per second output. 120 PPS position provides hotter weld puddle than 60 PPS position.

Built-in arc sustainer senses amperage output in pulsed mode and supplies minimum amperage level to sustain welding arc.

In Standard position, weld output set by Background Voltage Adjustment control (see Figure 4-5).

Ref. ST-130 111-A

Figure 4-4. Mode Selector Switch



1 Peak Amperage Adjustment Control

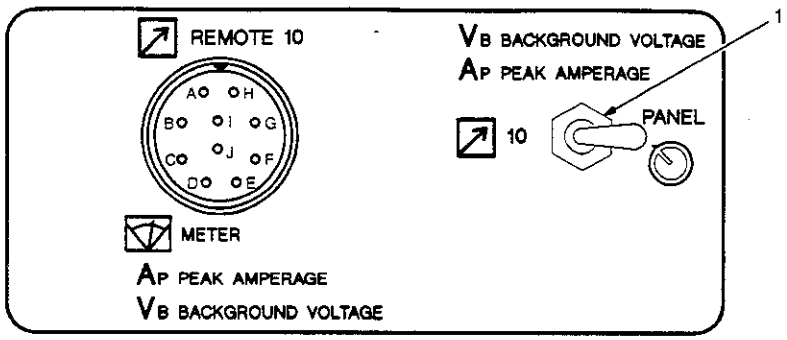
This control only works when Mode selector switch is in a PPS position (see Figure 4-4).

Use control to select peak current level during pulsed welding. The peak current level is a percentage of maximum output current of the welding power source. The scale around the control is in amperes.

2 Background Voltage Adjustment Control

Use control to select background voltage level. The background voltage is a percentage of maximum output voltage of the welding power source. The scale around the control is in volts.

Figure 4-5. Peak Amperage And Background Voltage Controls



1 Background Voltage/Peak Amperage Control Switch

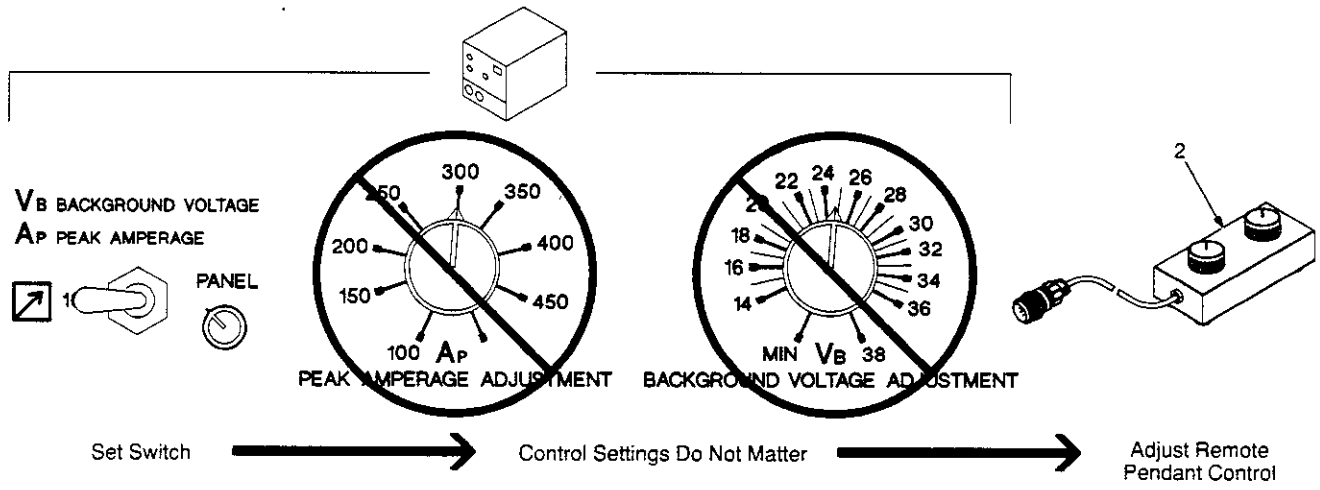
Use switch to select way of controlling background voltage and peak amperage adjustment.

For front panel control, place switch in Panel position.

For remote control, place switch in Remote 10 position. See Example below.

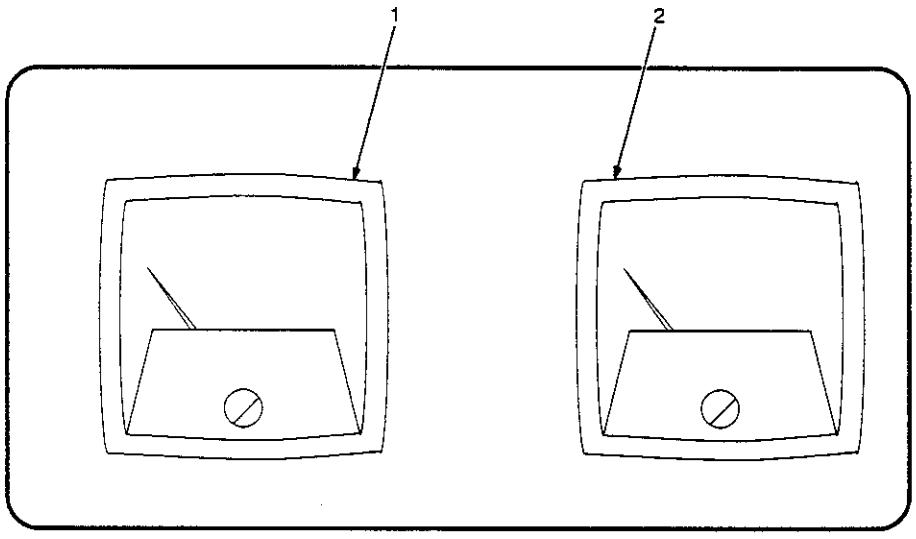
2 Remote Pendant Control

EXAMPLE Of Full Remote Background Voltage/Peak Amperage Control



Ref. ST-130 111-A / ST-162 711

Figure 4-6. Background Voltage/Peak Amperage Control Switch



1 Voltmeter

Voltmeter displays average voltage of the background and peak pulses when in the pulse mode, but not necessarily voltage at the welding arc due to cable resistance, poor connections, etc.

2 Ammeter

Ammeter displays weld amperage output of unit.

3 Weld Amperage Switch

When switch is in Average position, ammeter displays average amperage output.

To display peak amperage on ammeter, hold switch in Peak amperage position. Release switch to return to Average position.

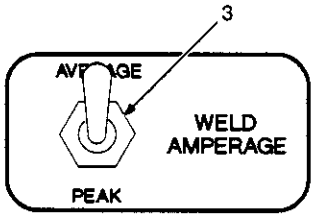


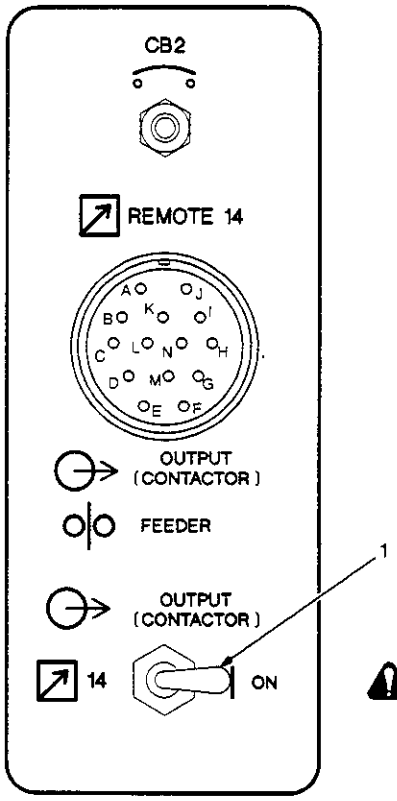
Figure 4-7. Ammeter, Voltmeter, And Weld Amperage Switch

⚠ 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.

swarn7.1 10/91



1 Output (Contactor) Switch

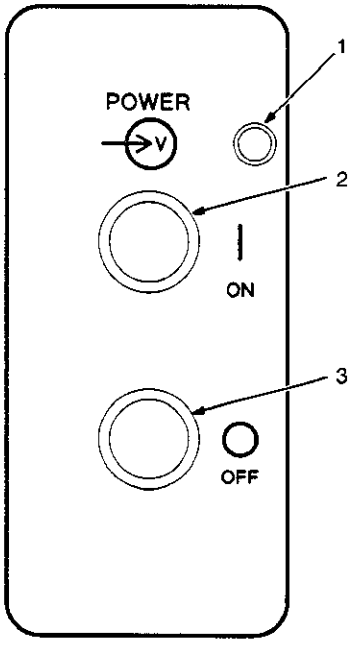
Use switch to select way of controlling unit output.

For weld output, place switch in On position.

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

Weld output terminals are energized when switch is On and power is On.

Figure 4-8. Output (Contactor) Control Switch



1 Pilot Light

2 Power On Push Button

Press button to turn On unit and pilot light.

3 Power Off Push Button

Press button to turn Off unit, pilot light, and fan if it is running (see Section 5-2).

Figure 4-9. Power Push Button And Pilot Light

⚠ WARNING

BUILDUP OF SHIELDING GAS can harm health or kill.

- Shut off shielding gas supply when not in use.

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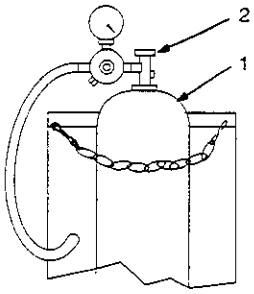

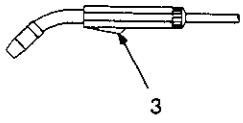

1 Shielding Gas Cylinder

2 Valve

3 Gun Trigger

Open valve on cylinder just before welding.

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

Close valve on cylinder when finished welding.

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Figure 4-10. Shielding Gas

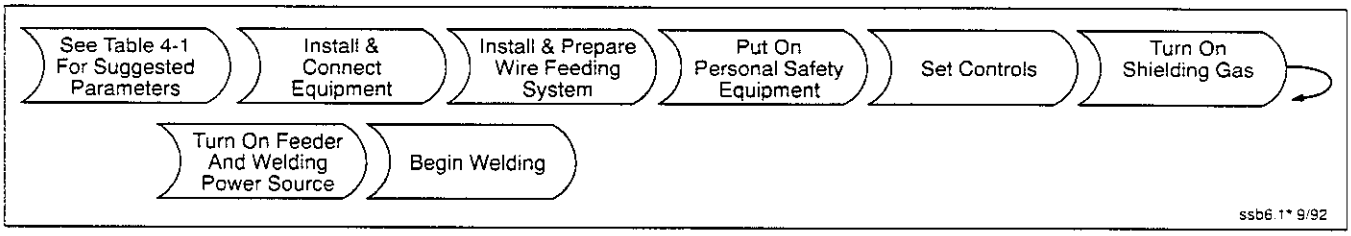

Figure 4-11. Sequence Of Gas Metal Arc Welding – Pulsed (GMAW-P)

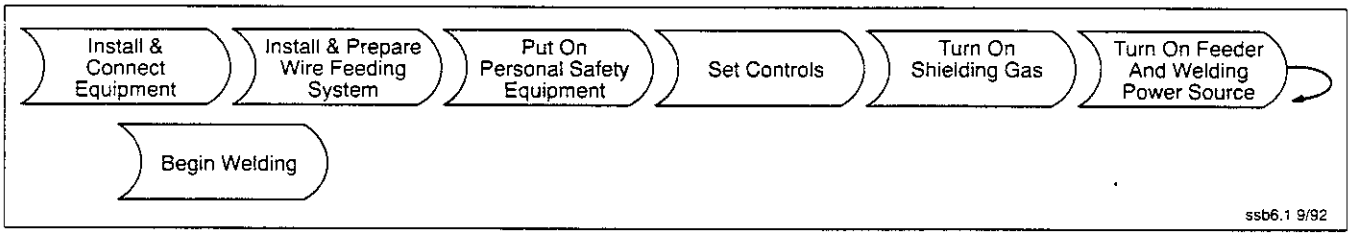

Figure 4-12. Sequence Of Gas Metal Arc Welding (GMAW)

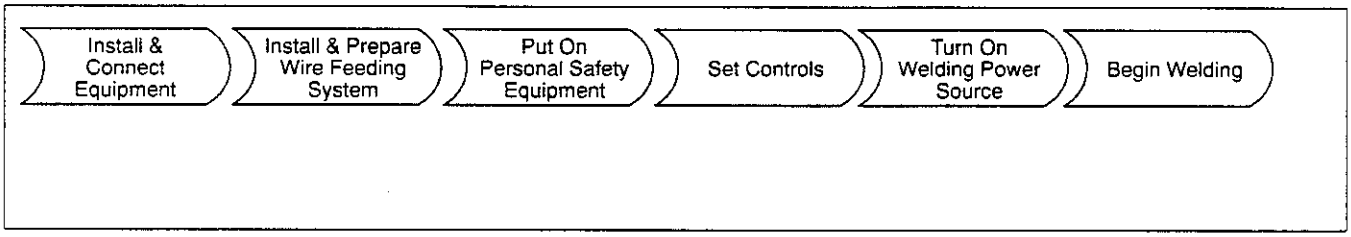

Figure 4-13. Sequence Of Flux Cored Arc Welding (GMAW)

Table 4-1. Suggested Weld Parameters For Gas Metal Arc Welding – Pulsed (GMAW-P)

NOTE ☞ *All joints are T-fillets. Values represent starting parameters; adjust according to joint design and alloy type.*

Material Thickness In Inches		Gauge	Gas	CFH	Wire Size	Electrode/ Wire Size Type	Pulse Freq. PPS	Wire Feed Speed IPM	Background Voltage Setting	Peak Amperage Setting*	Meter Reading Average	
											Volts	Amps
ALUMINUM												
1/16	Horiz		Argon	25	.030	4043	60	208	18.7	200	41	18.7
1/8	Horiz		Argon	25	.030	4043	60	576	24.6	195	137	24.6
1/4	Horiz		Argon	25	.030	4043	120	747	25	210	192	25
3/8	Horiz		Argon	25	.030	4043	120	801	27.3	250	217	27.3
1/8	Horiz		Argon	25	.030	5356	60	576	22	190	117	22
3/16	Horiz		Argon	25	.030	5356	60	807	24	190	160	24
1/16	Horiz		Argon	25	.030	5356	120	384	17.5	190	69	17.5
1/4	Horiz		Argon	25	.030	5356	120	1104	24.3	300	188	24.3
1/16	Horiz		Argon	25	.035	4043	60	168	17.5	220	44	17.5
1/8	VertUp		Argon	25	.035	4043	60	330	20.5	260	107	20.5
3/16	VertUp		Argon	25	.035	4043	60	330	20.5	260	107	20.5
1/4	Horiz		Argon	25	.035	4043	60	408	22.4	315	135	22.4
1/2	VertUp		Argon	25	.035	4043	60	438	23.7	235	146	23.7
1/8	VertUp		Argon	25	.035	4043	120	300	20.8	285	94	20.8
3/16	Horiz		Argon	25	.035	4043	120	423	21.1	365	125	21.1
1/4	Horiz		Argon	30	3/64	4043	60	258	23	255	158	23
1/8	Horiz		Argon	30	3/64	4043	120	186	20.5	315	94	20.5
3/16	VertUp		Argon	30	3/64	4043	120	210	20	340	102	20
1/16	Horiz		Argon	30	3/64	5356	60	133.5	16.8	290	53	16.8
1/8	Horiz		Argon	30	3/64	5356	60	357	21.8	195	170	21.8
1/16	Horiz		Argon	30	3/64	5356	120	186	17	240	70	17
1/4	Horiz		Argon	30	3/64	5356	120	333.5	23.4	280	145	23.4
1/8	Horiz		Argon	35	1/16	4043	60	115	18.2	255	106	18.2
1/8	Horiz		Argon	35	1/16	4043	60	135	19.4	190	130	19.4
1/4	Horiz		Argon	35	1/16	4043	60	175	21.6	190	191	21.6
1/18	Horiz		Argon	35	1/16	4043	120	100	17.5	285	84	17.5
1/4	VertUp		Argon	35	1/16	4043	120	125	20.2	250	123	20.2
1/4	Horiz		Argon	35	1/16	4043	120	140	20.6	190	142	20.6
1/4	Horiz		Argon	35	1/16	4043	120	155	21.6	190	154	21.6
STEEL												
3/64	VertUp	18	98Ar20x	25	.030		60	88	14.6	225	37	14.6
1/16	Horiz	16	98Ar20x	25	.030		60	125	16.1	245	54	16.1
1/8	VertUp	10	98Ar20X	25	.030		60	250	19.3	270	98	19.3
3/64	Horiz	18	98Ar20x	25	.030		120	160	16.4	235	59	16.4
1/16	VertUp	16	98Ar20x	25	.030		120	210	18	260	77	18
3/8	VertUp		98Ar20x	25	.030		120	320	21	330	120	21
3/64	Horiz	18	98Ar20x	25	.035		60	100	17.2	310	52	17.2
1/8	VertUp	10	98Ar20x	25	.035		60	145	18.8	375	80	18.8
1/4	VertUp		98Ar20x	25	.035		60	200	20.6	400	112	20.6
3/8	VertUp		98Ar20x	25	.035		60	270	21.9	305	146	21.9
1/16	Horiz	16	98Ar20x	25	.035		120	125	19	260	71	19
1/8	Horiz	10	98Ar20x	25	.035		120	135	18.2	260	79	18.2
3/8	VertUp		98Ar20x	25	.035		120	170	19.2	300	95	19.2
1/2	VertUp		98Ar20x	25	.035		120	260	21.6	315	128	21.6
1/8	Horiz	10	98Ar20x	25	.045		120	130	19.7	385	126	19.7
3/8	Horiz		98Ar20x	25	.045		120	195	22.3	260	183	22.3
1+	VertUp		98Ar20x	25	.045		120	150	20.7	390	145	20.7

Material Thickness In Inches		Gauge	Gas	CFH	Wire Size	Electrode/ Wire Size Type	Pulse Freq. PPS	Wire Feed Speed IPM	Background Voltage Setting	Peak Amperage Setting*	Meter Reading Average	
											Volts	Amps
STAINLESS STEEL												
3/64	VertUp	18	98Ar20x	25	.030	308L	60	120	15.8	230	42	15.8
1/8	Horiz		98Ar20x	25	.030	308L	60	230	18.2	325	66	18.2
1/4	Horiz		98Ar20x	25	.030	308L	60	330	20.9	410	90	20.9
1/2	VertUp		98Ar20x	25	.030	308L	60	380	23	425	107	23
3/64	Horiz	18	98Ar20x	25	.030	308L	120	160	16.9	185	57	16.9
1/8	VertUp		98Ar20x	25	.030	308L	120	200	17.8	210	69	17.8
1/4	VertUp		98Ar20x	25	.030	308L	120	250	18.8	235	88	18.8
1/16	Horiz	16	98Ar20x	25	.035	308L	60	125	17.6	270	57	17.6
7/64	VertUp		98Ar20x	25	.035	308L	60	150	19	310	71	19
7/64	Horiz		98Ar20x	25	.035	308L	60	175	19.6	340	80	19.6
1/4	VertUp		98Ar20x	25	.035	308L	60	225	22	340	117	22
1/16	Horiz	16	98Ar20x	25	.035	308L	120	135	19.5	240	66	19.5
1/4	VertUp		98Ar20x	25	.035	308L	120	170	19.3	250	79	19.3
1/4	Horiz		98Ar20x	25	.035	308L	120	275	22.1	215	123	22.1
1/8	Horiz	10	98Ar20x	25	.045	308L	60	185	22.5	230	162	22.5
1/4	VertUp		98Ar20x	25	.045	308L	60	185	22.5	230	162	22.5
3/8	VertUp		98Ar20x	25	.045	308L	120	190	21	390	141	21
1/4	Horiz		98Ar20x	25	.045	308L	120	255	23	430	177	23
STAINLESS STEEL Base, NICKEL Wire												
1/4	VertDn		Argon	35	.045	ERNI-3	60	161	22.2	200	159	22.2
1/4	Horiz		Argon	35	.045	ERNI-3	60	161	22.2	200	162	22.2
STAINLESS STEEL Base, ALUMINUM BRONZE Wire												
1/8	VertUp	10	Argon	40	1/16		60	100	22.8	300	143	22.8
MILD STEEL Base, SILICON BRONZE Wire, SQUARE BUTT JOINT (not T-fillet)												
	Horiz	20	Argon	45	.035		60	338	20.5	360	107	20.5

*For best arc characteristics: Use as much background voltage as possible with no more peak amperage than necessary. These settings will produce an intermittent spray transfer at a low average heat.

NOTE ☞ *Electrode extension and travel speeds are sometimes critical; experimentation will be necessary. (Average electrode extension 5/8 in; travel speeds vary extensively.)*

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.

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5-1. Routine Maintenance

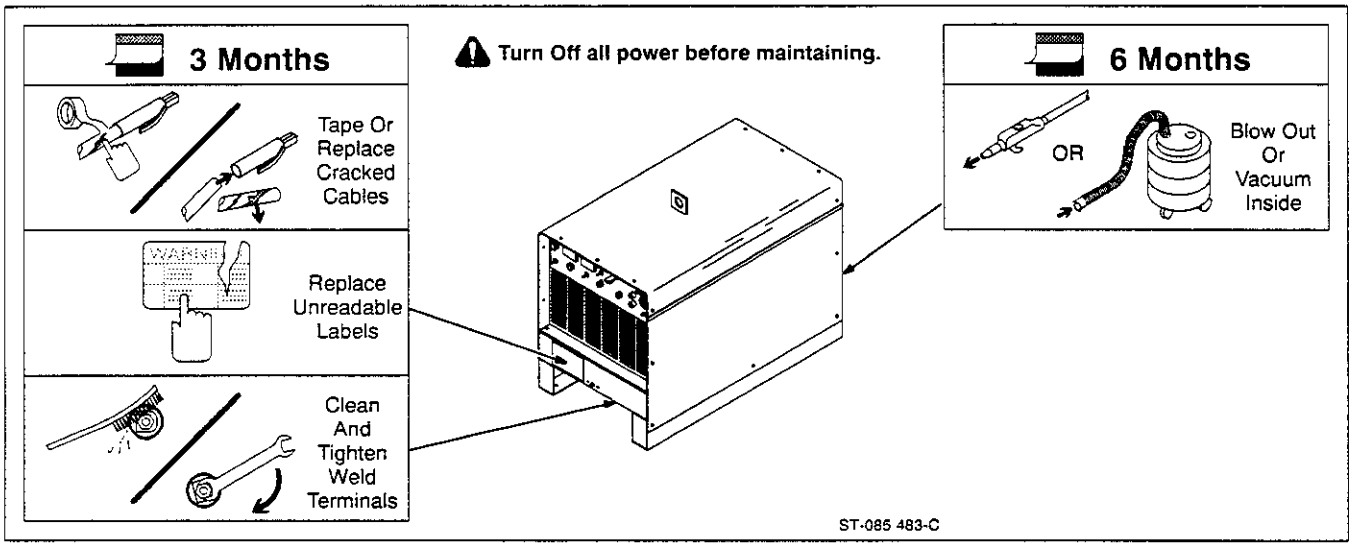


Figure 5-1. Maintenance Schedule

5-2. Overload Protection

⚠ WARNING

READ SAFETY BLOCKS at start of Section 5 before proceeding.

A. Overheating

Thermostat TP1 protects the unit from damage due to overheating. If main rectifier SR1 gets too hot, TP1 opens and weld output stops. Wait approximately 15 minutes before trying to weld.

B. Fan Control

When the Output (Contactor) switch and Power switch are in the On position, fan runs all the time.

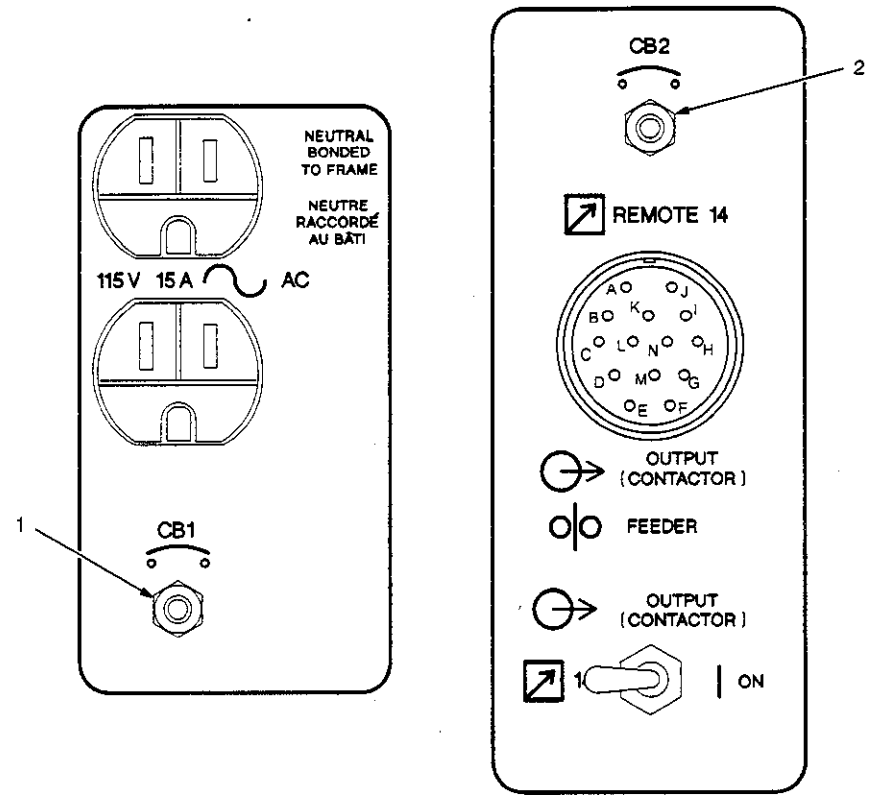
When Output (Contactor) switch is in Remote 14 position and Power switch is in On position, fan runs while welding and for 15 seconds after welding stops.

If main transformer T1 or main rectifier SR1 get too hot, thermostats TP4 and TP5 close and the fan runs until TP4 and TP5 open, or the unit is turned Off.

C. Short Circuit Shutdown

If contact tube is shorted and sticks to workpiece, the unit output decreases. To regain full output, release gun trigger, turn Off unit, and remove contact tube from workpiece. Check contact tube and replace if damaged. Turn On unit to continue operation.

D. Circuit Breakers CB1 And CB2



1 Circuit Breaker CB1

CB1 protects the 115 volts ac winding of main transformer T1.

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 winding of main transformer T1.

If CB2 opens, the 24 volts ac output to Remote 14 receptacle stops.

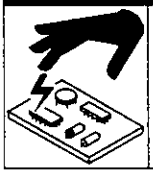
Press button to reset a breaker.

Ref. ST-130 111-A

Figure 5-2. Circuit Breakers CB1 And CB2

E. Fuse Link F1

⚠ CAUTION



STATIC ELECTRICITY can damage parts on circuit boards.

- Put on grounded wrist strap BEFORE handling boards or parts.

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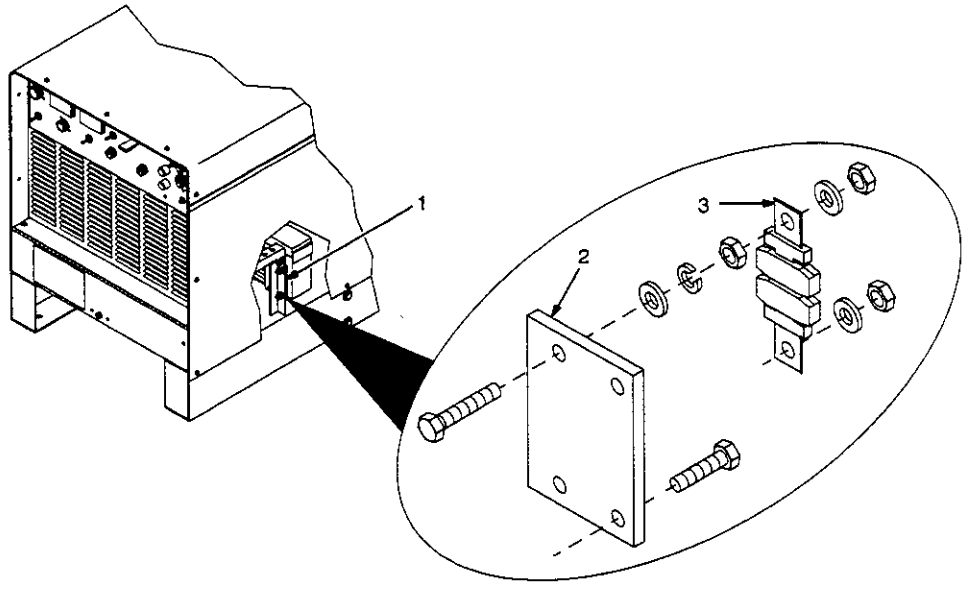

Turn Off welding power source and disconnect input power.

Remove right side panel.

1 Rectifier SR1 Bracket

2 Fuse Mounting Strip

3 Fuse Link F1 (See Parts List For Rating)

Remove F1 from mounting strip. To reinstall, mount with hardware as shown.

Reinstall side panel.

ST-161 352

Figure 5-3. Fuse Link F1 Location

5-3. 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 servicing.

MOVING PARTS can cause injury.

- Keep away from moving parts.

Troubleshooting to be performed only by qualified persons.

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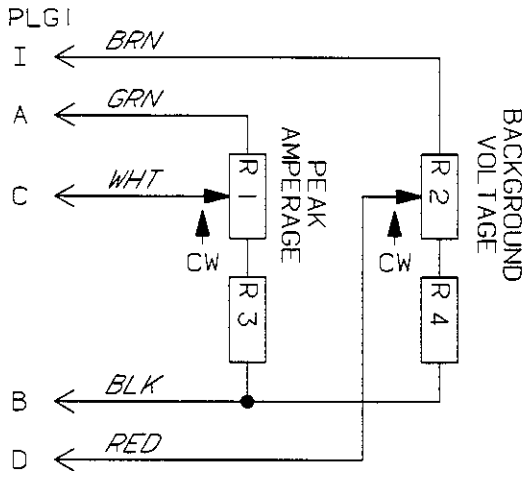
Table 5-1. Welding Trouble

Trouble	Remedy	Section
No weld output; unit does not work; pilot light PL1 not on.	Place line disconnect device in On position.	3-9B
	Check and replace line fuse(s) or reset circuit breaker(s).	3-9B
	Check for proper input power connections.	3-9B
	Check for proper jumper link position.	3-9A
	Unit overheated. Allow fifteen minute cooling period.	5-2A
	Have Factory Authorized Service Station/Service Distributor check contactor W.	--
No weld output; unit does not work; pilot light PL1 is on.	Place Output (Contactor) switch in On position, or move switch to Remote 14 position and connect remote contactor to Remote 14 receptacle.	3-5, Figure 4-8
	Have Factory Authorized Service Station/Service Distributor check control board PC1.	--
Limited output and low open-circuit voltage.	Check and replace line fuse(s) or reset circuit breaker(s).	3-9B
	Check for proper input power connections.	3-9B
	Check for proper jumper link position.	3-9A
Erratic weld current.	Increase setting of Background Voltage Adjustment control.	Figure 4-5
	Use proper size and type of weld cable.	3-2
	Clean and tighten weld connections.	3-3
	Check wire feeder installation according to its owner's manual.	--
	Check and replace fuse link F1, if necessary.	5-2E
	Have Factory Authorized Service Station/Service Distributor check control board PC1 and main rectifier SR1.	--
Excessively high weld current in pulsed mode.	Have Factory Authorized Service Station/Service Distributor check hall device HD1 and control board PC1.	--

Trouble	Remedy	Section
Low weld current in pulsed mode.	Check and replace line fuse(s) or reset circuit breaker(s).	3-9B
	Be sure Mode Selector switch is not placed between positions.	--
	Have Factory Authorized Service Station/Service Distributor check hall device HD1 and control board PC1.	--
High weld output; voltage control does not vary output.	Have Factory Authorized Service Station/Service Distributor check control board PC1.	--
No 115 volts ac output at 115 volts ac duplex receptacle or Remote 14 receptacle.	Reset circuit breaker CB1.	5-2D
No 24 volts ac output at Remote 14 receptacle.	Reset circuit breaker CB2.	5-2D

SECTION 6 – ELECTRICAL DIAGRAMS



SA-091 010-A

Figure 6-1. Circuit Diagram For Remote Pendant Control RPC-2A (Optional)

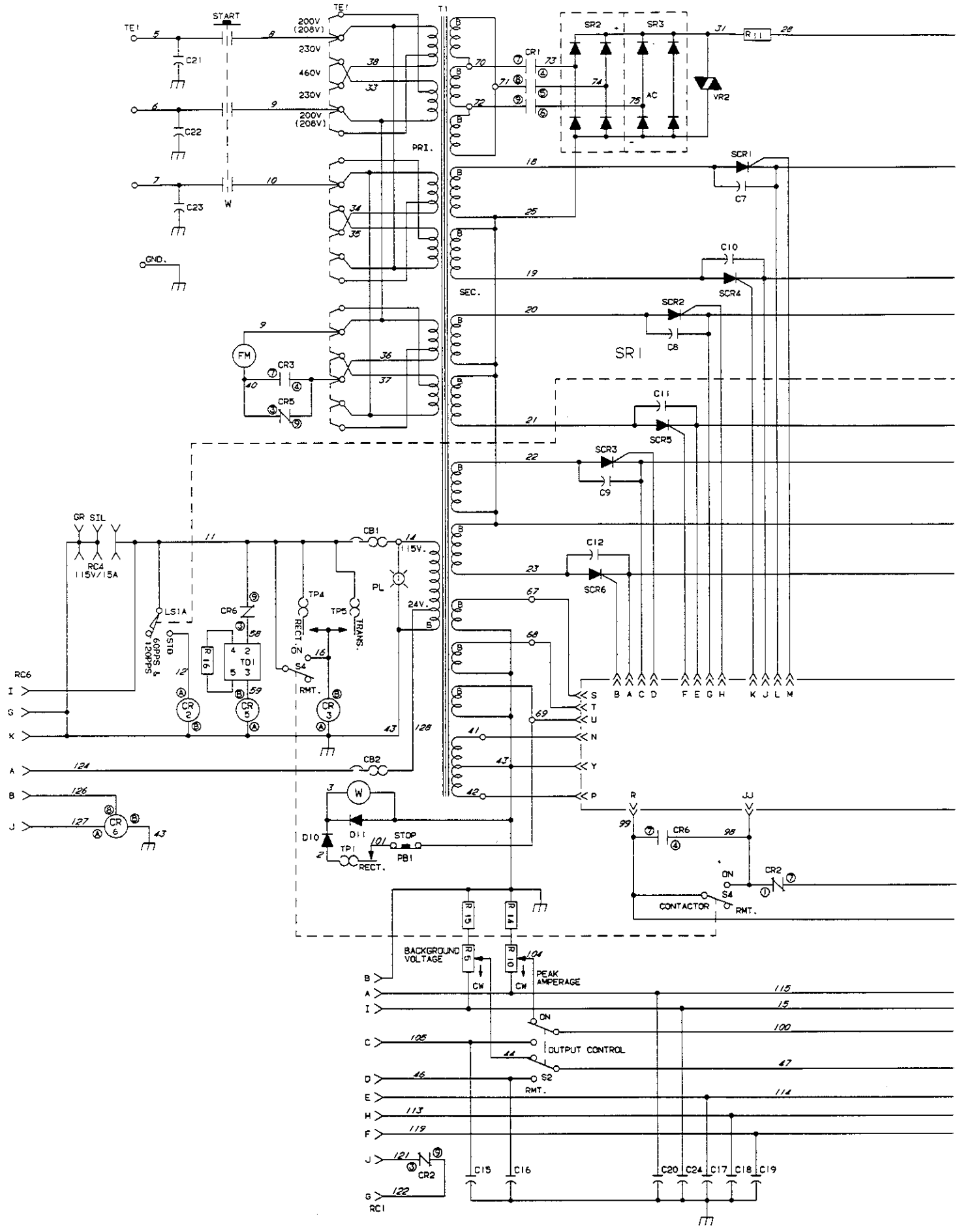
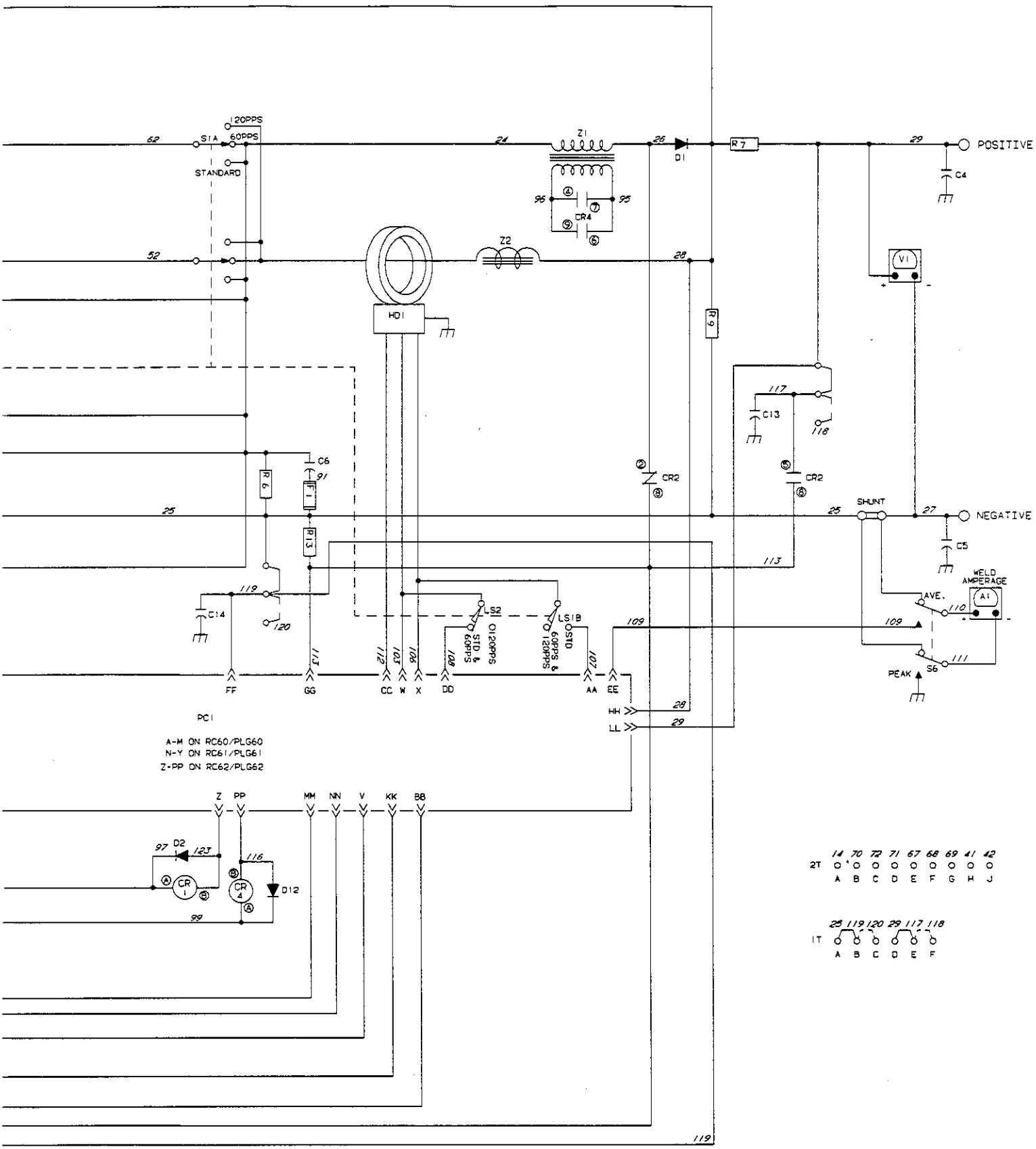


Figure 6-2. Circuit Diagram For Welding Power Source


120PPS
60PPS
S1A
STANDARD
62
52
Z1
Z2
24
26
D1
R7
29
POSITIVE
C4
96
95
CR4
HD1
28
R9
V1
117
C13
118
CR2
CR2
C6
91
F1
R6
R13
25
SHUNT
25
27
NEGATIVE
C5
113
WELD AMPERAGE
A1
AVE.
110
109
109
119
C14
120
LS2
STD & 60PPS
LS1B
STD 120PPS & 60PPS
S6
111
PEAK
FF
GG
CC
W
X
DD
AA
EE
HH
LL
PC1
A-M ON RC60/PLG60
N-Y ON RC61/PLG61
Z-PP ON RC62/PLG62
Z
PP
MM
NN
V
KK
BB
97
D2
123
116
CR 1
CR 4
D12
99
2T
14 70 72 71 67 68 69 41 42
A B C D E F G H J
1T
25 119 120 29 117 118
A B C D E F
119

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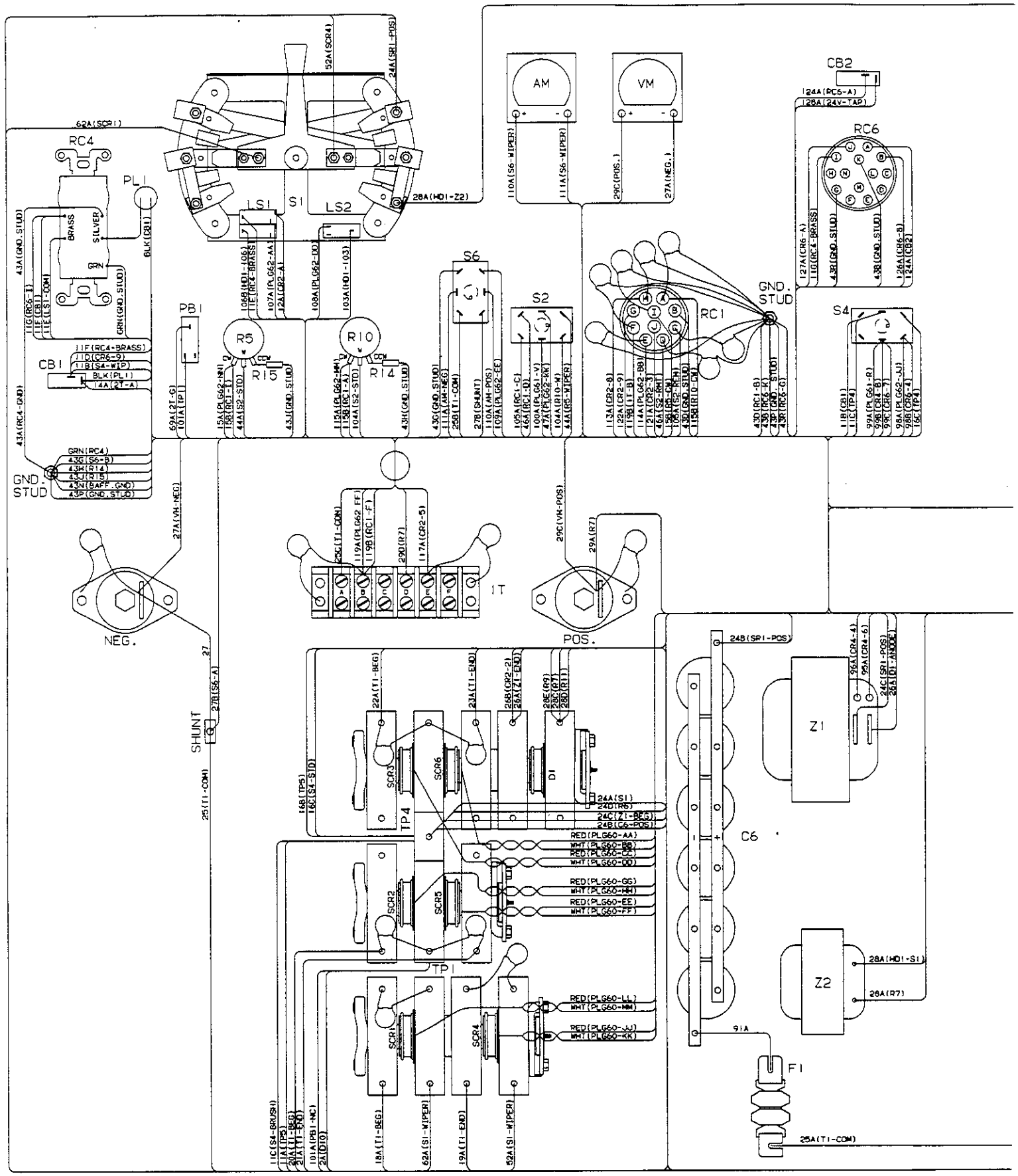
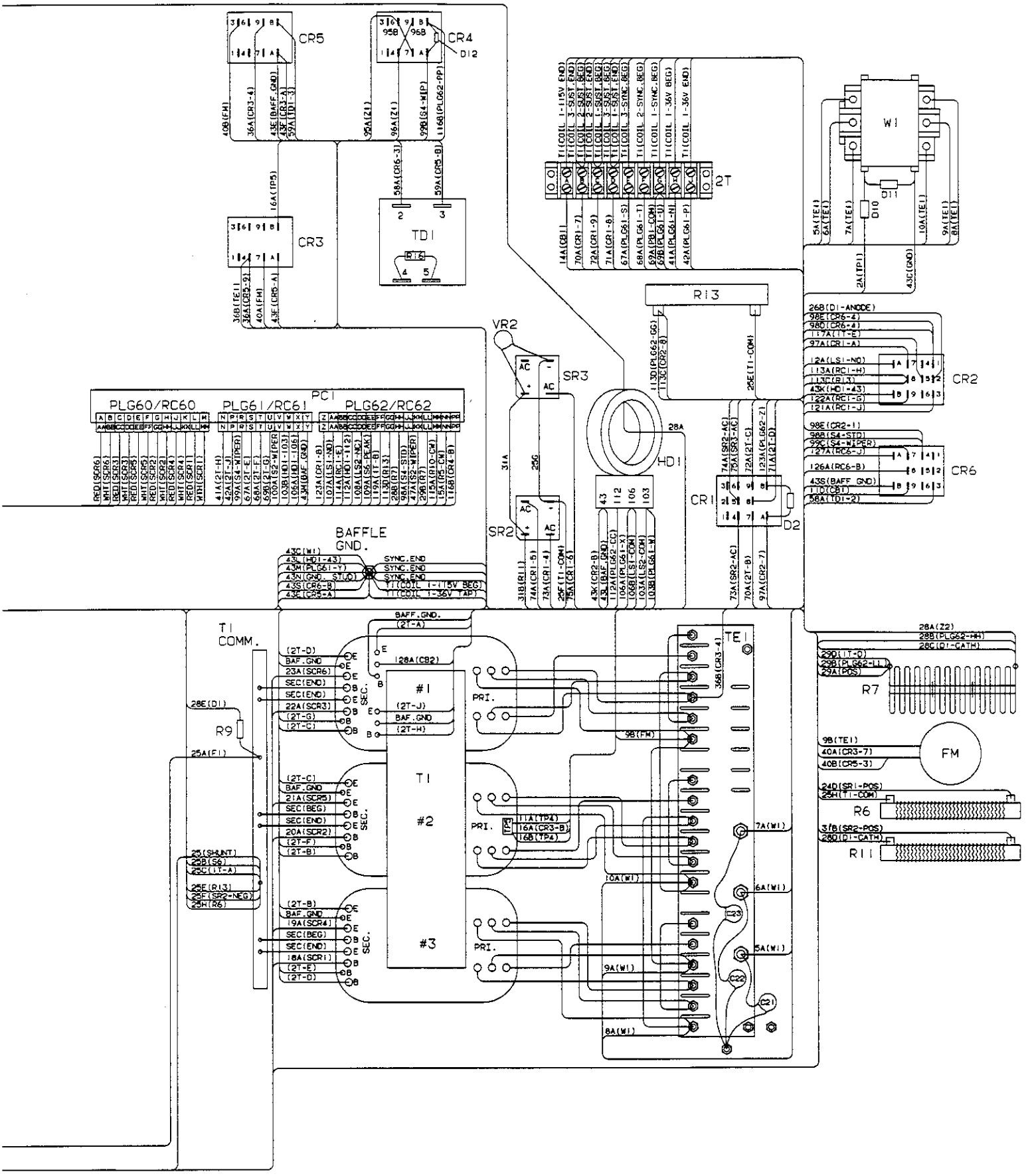


Figure 6-3. Wiring Diagram For Welding Power Source


CR5
CR4
CR3
CR2
CR6
CR1
D2
TD1
T1
#1
#2
#3
PRI.
SEC.
TE1
W1
R13
VR2
SR3
SR2
HD1
PC1
PLG60/RC60
PLG61/RC61
PLG62/RC62
BAFFLE GND.
BAFF.GND.
T1 COMM.
R9
R7
R6
R11
FM
D10
D11
D12

SD-161 448

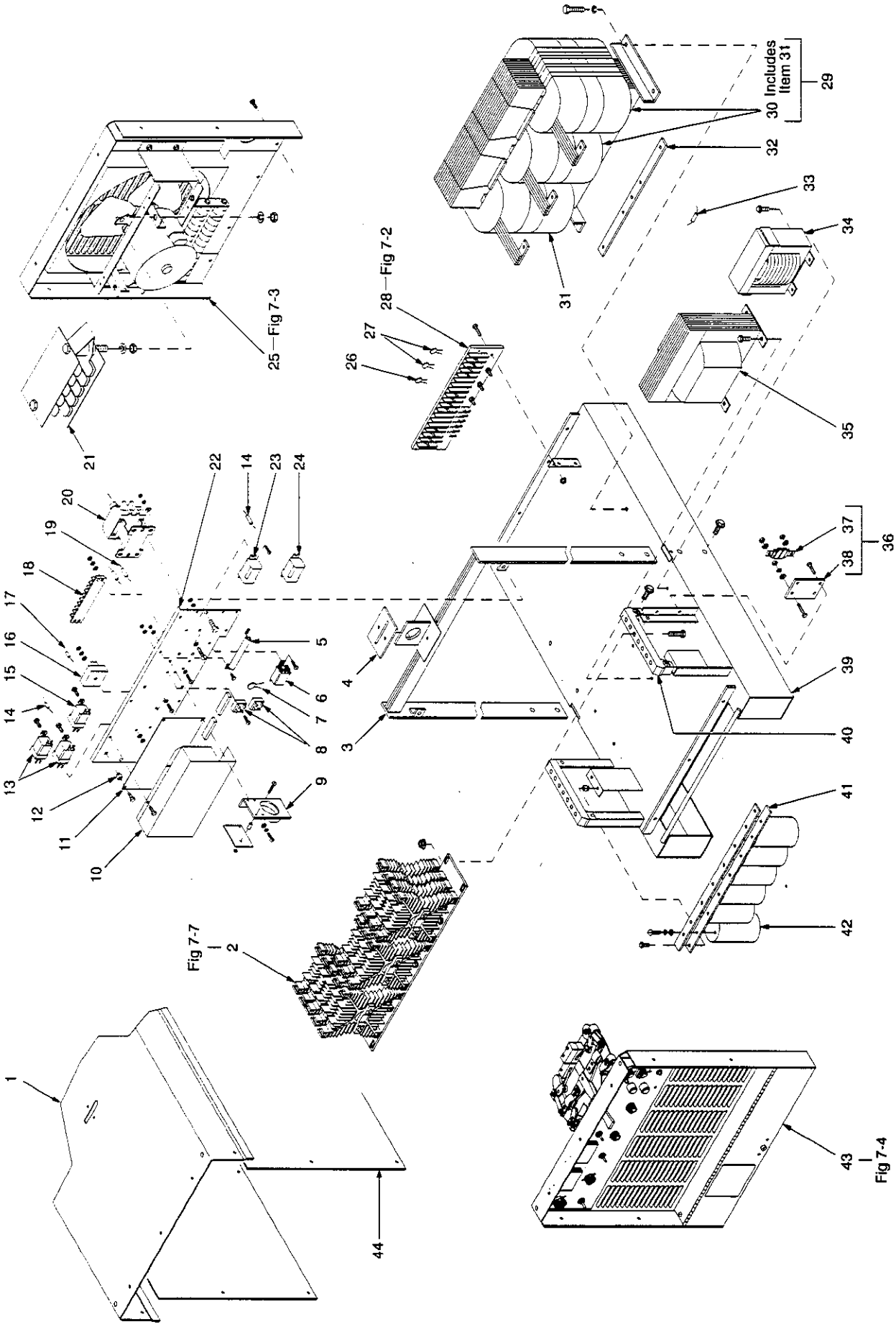


Figure 7-1. Main Assembly

Item No.	Dia. Mkgs.	Part No.	Description	Quantity
			Figure 7-1. Main Assembly	
1		005 194	COVER, top	1
2	SR1	140 120	RECTIFIER, SCR main (Fig 7-7)	1
3		091 055	FRAME, upright base front	1
4		026 627	GASKET, lifting eye	1
5	R13	091 805	RESISTOR, WW fxd 50W 100 ohm	1
6	CR2,6	039 498	RELAY, encl 120VAC 3PDT	1
7	VR2	047 183	VARISTOR, 50 joule 232V	1
8	SR2,3	035 704	RECTIFIER, integ 40A 800V	2
9	HD1	086 115	SENSOR, current	1
10		128 063	COVER, circuit card	1
11	PC1	154 958	CIRCUIT CARD, control	1
	PLG62	141 642	CONNECTOR & SOCKETS, (consisting of)	1
		081 378	CONNECTOR, rect skt 22-18ga Amp 102100-6	16
	PLG61	090 469	CONNECTOR, rect 10skt plug Amp1-87159-0	1
		081 378	CONNECTOR, rect skt 22-18ga Amp 102100-6	10
12		080 509	GROMMET, scr No. 8-10	9
13	CR3,5	059 266	RELAY, encl 120VAC DPDT	2
14	D2,12	109 068	DIODE	2
15	CR4	106 462	RELAY, encl 24VDC DPDT	1
16	TD1	114 494	TIMER, delay	1
17	R16	032 819	RESISTOR, C .5W 390K ohm	1
18	2T	038 601	BLOCK, term 30A 9P	1
19	D10,11	082 456	DIODE ASSEMBLY	1
20	W	137 900	KIT, contactor	1
21	R7	026 520	RESISTOR, grid	1
22		130 779	PANEL, mtg components	1
23	CR1	000 770	RELAY, encl 24VDC 3PDT	1
24	CR6	134 163	RELAY, encl 24/120VAC DPDT	1
25		Fig 7-3	PANEL, rear w/components	1
26	C23	137 771	CAPACITOR	1
27	C21,22	137 674	CAPACITOR	2
28	TE1	038 145	TERMINAL ASSEMBLY, pri (dual voltage) (Fig 7-2)	1
28	TE1	038 138	TERMINAL ASSEMBLY, pri (triple voltage) (Fig 7-2)	1
29	T1	134 025	TRANSFORMER, pwr main (200/230/460) (consisting of)	1
30		087 404	COIL, pri/sec center & RH	2
31		134 031	COIL, pri/sec LH	1
29	T1	134 027	TRANSFORMER, pwr main (230/460/575) (consisting of)	1
30		087 627	COIL, pri/sec center & RH	2
31		134 033	COIL, pri/sec LH	1
	TP5	084 680	THERMOSTAT, NO	1
32		086 191	BUS BAR, jumper	1
33	R9	074 121	RESISTOR, C 2W 3.3K ohm	1
34	Z2	086 189	CHOKE, current peak	1
35	Z1	132 038	STABILIZER	1
36		131 374	PANEL, fuse (consisting of)	1
37	F1	*027 267	FUSE, link 300A 250V	1
38		092 724	STRIP, mtg fuse	1
39		139 786	BASE	1
40		138 378	BRACKET, mtg rectifier	2
41		085 527	BUS BAR, connecting capacitors	2
42	C6	085 273	CAPACITOR, elctlt 16000uf 60VDC	6
43		Fig 7-4	PANEL, front w/components	1
44		005 195	PANEL, side	2

Item No.	Dia. Mkgs.	Part No.	Description	Quantity
			Figure 7-1. Main Assembly (Continued)	
			041 798 RPC-2A (Optional)	
		086 181	COVER, control box	1
		086 182	CASE SECTION	1
	PLG1	039 716	CONNECTOR, circ 10 pin plug Amphenol MS-3106A-18-1P	1
		052 246	CABLE, power 5/c (order by ft)	20ft
		073 332	CONNECTOR, circ clamp str rlf sz 18 Amphenol AN-3057-10	1
	R1,2	035 897	POTENTIOMETER, C 1T 2W 1000 ohm	2
		097 924	KNOB, pointer	2
	R3	005 208	RESISTOR, C .5W 270 ohm	1
	R4	030 033	RESISTOR, C .5W 470 ohm	1
		019 663	MOUNT, 15/16 OD x 3/8	4
		010 476	BUSHING, strain relief .625 ID x .570mtg hole	1
			NAMEPLATE (order by model and serial number)	1
		604 311	GROMMET, rbr .250 ID x .375mtg hole	1

*Recommended Spare Parts.
BE SURE TO PROVIDE MODEL AND SERIAL NUMBER WHEN ORDERING REPLACEMENT PARTS.

Item No.	Part No.	Description	Quantity	
		Figure 7-2. Terminal Assembly, Pri (Fig 7-1 Item 28)	038 145	038 138
1	601 835	NUT, brs hex regular 10-32	24	36
2	038 058	TERMINAL BOARD	1	1
3	038 887	STUD, pri bd brs 10-32 x 1.375	12	18
4	010 913	WASHER, flat brs .218 ID x .460 OD	12	18
5	038 618	LINK, jumper	6	6
6	601 836	NUT, brs hex .250-20	6	6
7	010 915	WASHER, flat brs .250 ID x .625 OD	6	6
8	038 888	STUD, pri bd brs .250-20 x 1.500	3	3

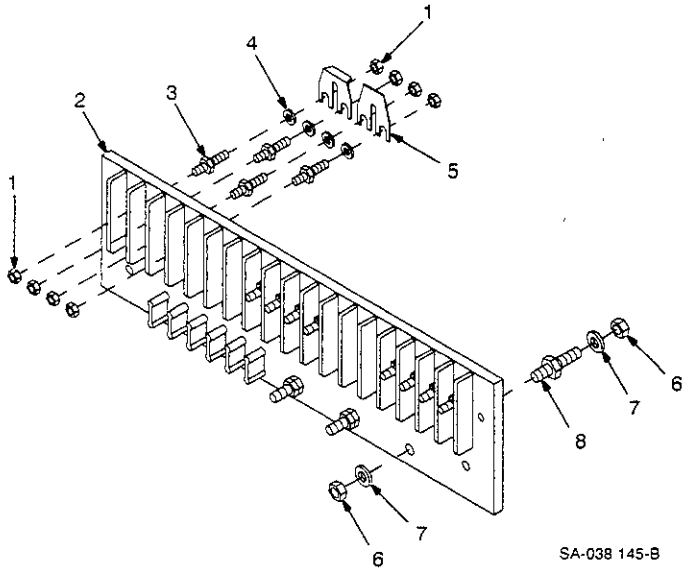


Figure 7-2. Terminal Assembly, Pri

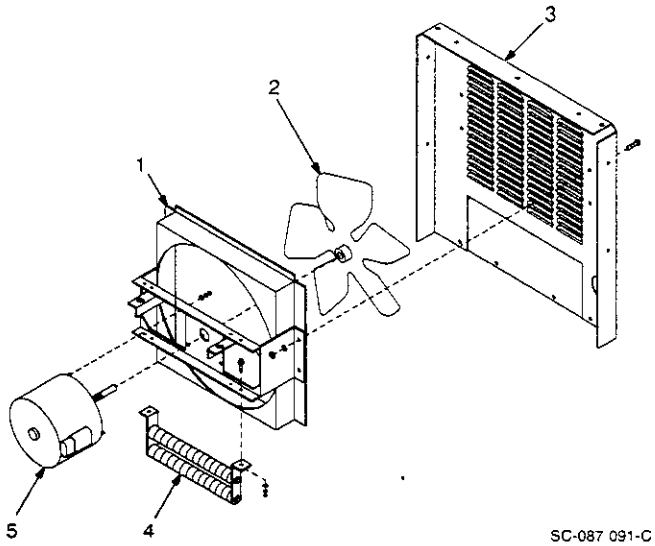


Figure 7-3. Panel, Rear w/Components

Item No.	Dia. Mkgs.	Part No.	Description	Quantity
			Figure 7-3. Panel, Rear w/Components (Fig 7-1 Item 25)	
1		132 259	CHAMBER, plenum 14 in	1
2		605 799	BLADE, fan 14 in 5 wing 30deg	1
3		018 144	PANEL, rear	1
4	R6,11	126 409	RESISTOR, WW fxd 300W 5 ohm	1
5	FM	032 605	MOTOR, 1/4hp 230VAC 1625RPM	1

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

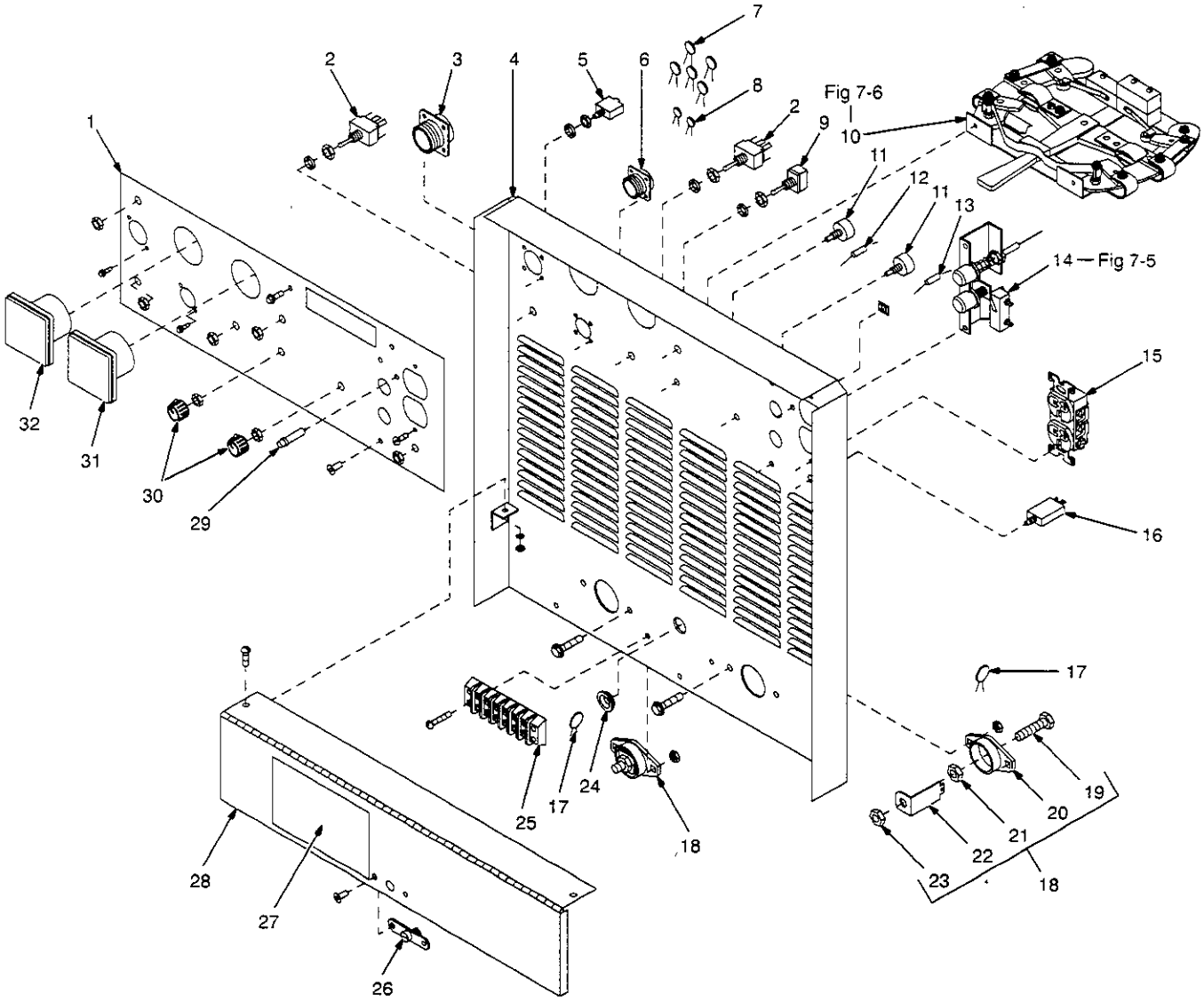


Figure 7-4. Panel, Front w/Components

Item No.	Dia. Mkgs.	Part No.	Description	Quantity
			Figure 7-4. Panel, Front w/Components (Fig 7-1 Item 43)	
1			NAMEPLATE (order by model and serial number)	1
2	S2,4	011 611	SWITCH, tgl DPDT 15A 125V	2
3	RC6	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 14skt rcpt 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	
4		158 295	PANEL, front	1
5	CB2	083 432	CIRCUIT BREAKER, man reset 1P 10A 250V	1
6	RC1	039 718	CONNECTOR, circ 10skt rcpt Amphenol M-3102A-18-1S	1
		039 716	CONNECTOR, circ 10 pin plug Amphenol MS-3106A-18-1P	
		073 332	CONNECTOR, circ clamp str rlf sz 18 Amphenol AN-3057-10	
7	C15-17,20,24	129 764	CAPACITOR	5
8	C18,19	140 814	CAPACITOR	2
9	S6	118 681	SWITCH, tgl DPDT 15A 125VAC	1
10	S1	111 905	SWITCH, mode 3posn (Fig 7-6)	1
11	R5,10	035 897	POTENTIOMETER, C 1T 2W 1000 ohm	2
12	R14	005 208	RESISTOR, C .5W 270 ohm	1
13	R15	030 033	RESISTOR, C .5W 470 ohm	1
14	PB1	046 746	SWITCH, PB (Fig 7-5)	1
15	RC4	604 176	RECEPTACLE, str dx grd 2P3W 15A 125V	1
		073 690	PLUG, str grd armd 2P3W 15A 125V Arrow Hart 5965V	
16	CB1	020 278	SWITCH, circuit breaker 15A	1
17	C4,5	087 337	CAPACITOR	2
18		039 046	TERMINAL, pwr output black (consisting of)	1
18		039 047	TERMINAL, pwr output red (consisting of)	1
19		601 976	SCREW, cap stl hexhd .500-13 x 1.500	1
20		039 045	TERMINAL BOARD, black	1
20		039 049	TERMINAL BOARD, red	1
21		601 880	NUT, stl hex jam .500-13	1
22		039 044	BUS BAR	1
23		601 879	NUT, stl hex full fnsh .500-13	1
24		025 338	BUSHING, nyl 23/32 x 5/8mtg hole	1
25	1T	038 772	BLOCK, term 20A 6P	1
		601 219	LINK, jumper term block	2
	C13,14	090 974	CAPACITOR	2
26		605 583	CATCH, spring loaded door	1
27		134 327	LABEL, warning general precautionary	1
28		+109 449	DOOR, access front	1
29	PL1	027 645	LIGHT, ind red lens 125VAC	1
30		097 922	KNOB, pointer	2
31	A	118 900	METER, Amp DC 50MV 0-600 scale	1
32	V	119 006	METER, Volt DC 0-100 scale	1
		023 562	CLAMP, hose .312-.875dia clp	1

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

Item No.	Part No.	Description	Quantity
	046 746	**Figure 7-5. Switch, Push Button (Fig 7-4 Item 14)**	
1	059 885	BUTTON, push reset red	1
2	018 606	SPRING, compression	1
3	045 546	PUSH BUTTON SET, w/cable & housing	1
4	081 008	BRACKET, mtg switch PB	1
5	027 878	SWITCH, limit leaf actuating	1

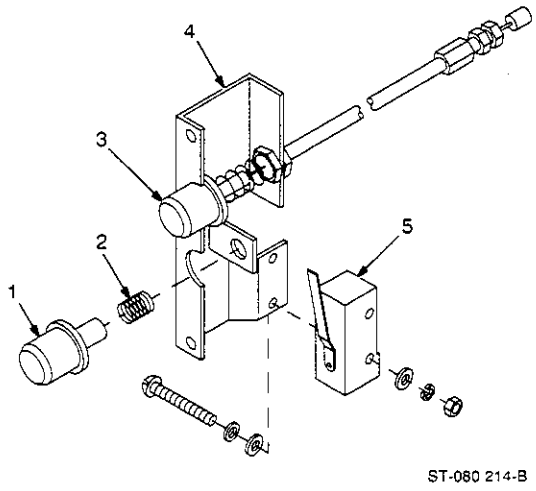


Figure 7-5. Switch, Push Button

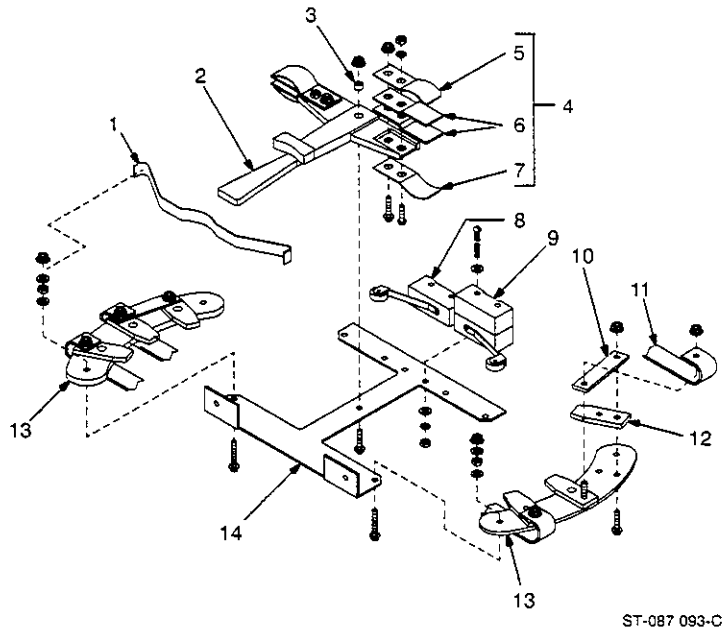


Figure 7-6. Switch, Mode 3 Position

Item No.	Dia. Mkgs.	Part No.	Description	Quantity
		111 905	**Figure 7-6. Switch, Mode 3 Position (Fig 7-4 Item 10)**	
1		005 558	SPRING, selector	1
2		072 027	LEVER	1
3		072 082	BUSHING, stl .265 ID x .484 OD	1
4		011 645	CONTACT ASSEMBLY, movable (consisting of)	2
5		011 074	SPRING, pressure contact	1
6		011 953	CONTACT	2
7		011 075	SPRING, pressure contact	1
8	LS2	603 946	SWITCH, micro	1
9	LS1	109 810	SWITCH, limit 15A 125V	1
10		086 184	BUS BAR	2
11		070 204	BUS BAR	2
12		011 644	CONTACT, stationary	6
13		072 028	GUIDE, contact	2
14		072 026	BRACKET, mtg	1

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

Item No.	Dia. Mkgs.	Part No.	Description	Quantity
		140 120	**Figure 7-7. Rectifier, SCR Main (Fig 7-1 Item 2)**	
1		082 694	CLAMP	2
2		048 779	HEAT SINK	10
3		028 516	PIN, spring compression	14
4	SCR 2,3 5,6	048 736	THYRISTOR, 300A 200V	4
5		045 034	HEAT SINK	2
6	C7-12	048 420	CAPACITOR, rectifier	6
7	PLG60	081 379	CONNECTOR, rect 12skt plug Amp 1-87159-2	1
		081 378	CONNECTOR, rect skt 22-18ga Amp 102100-2	12
8	D1	086 353	DIODE, 800A 300V	1
9		139 115	STRIP, mtg rectifier	2
10		035 409	STRIP, mtg	2
11	SCR1,4	112 940	THYRISTOR, 600A 200V	2
12		138 773	STIFFENER, rectifier	2
13		086 354	CLAMP	1
	TP1	012 786	THERMOSTAT, NC	1
	TP4	021 548	THERMOSTAT, NO	1
		144 036	BUS BAR, tab connecting	1
		048 775	BUS BAR, tab connecting	4

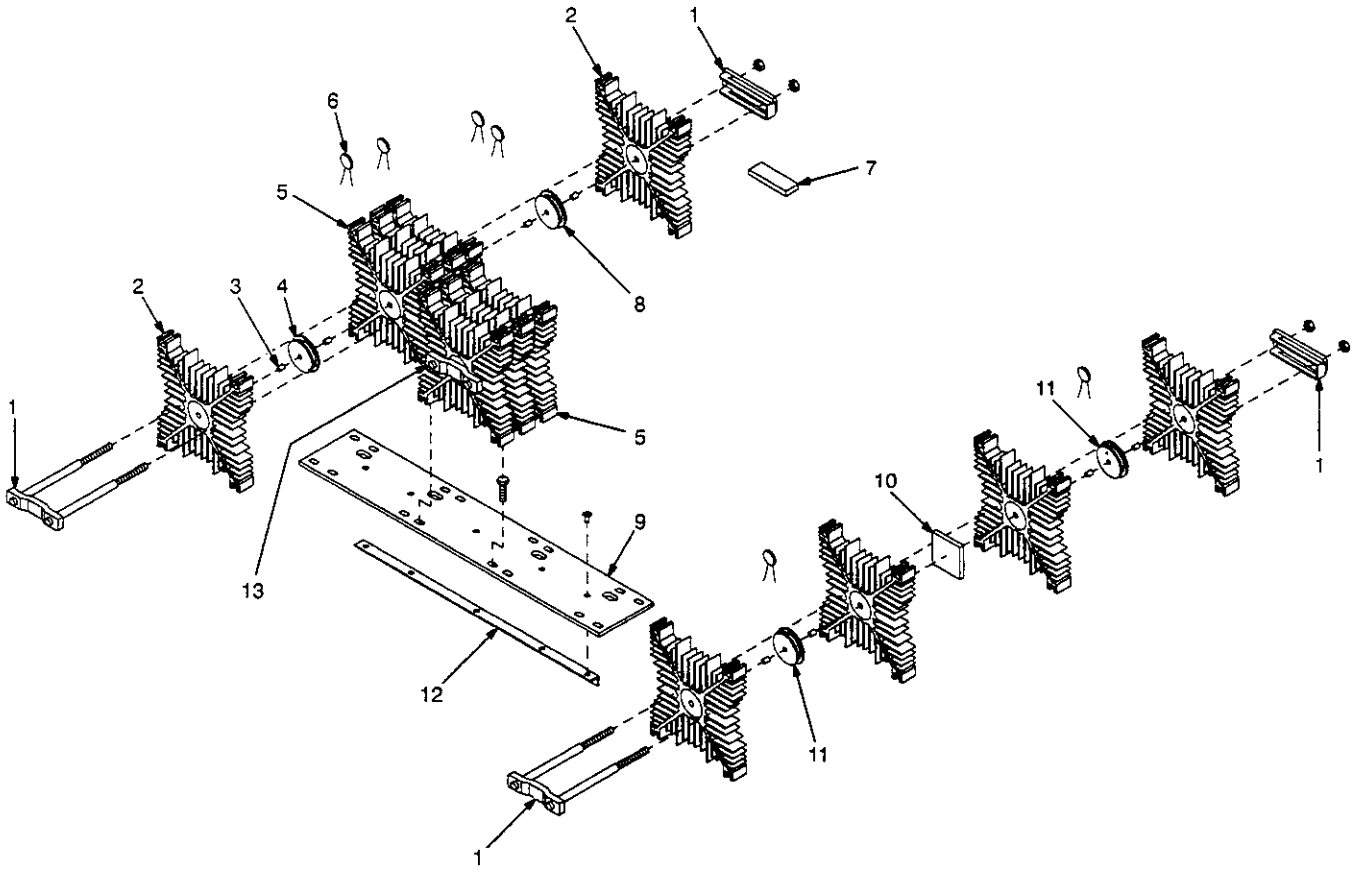


Figure 7-7. Rectifier, SCR Main

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

OPTIONS AND ACCESSORIES

DSS-8 DUAL SCHEDULE SWITCH

For 10 ft. (3 m) gun. **(#079 691)**
For 15 ft. (4.6 m) gun **(#079 693)**
Two-position trigger switch fastens to the gun handle. Operates the power source contactor and selects desired schedule. For use with DDSC-P1 or DSC-PS.

DSS-8PS DUAL SCHEDULE SWITCH

10 ft. (3 m) gun **(#041 804)**
15 ft. (4.6 m) gun **(#041 805)**
Functions same as the DSS-8 switch.

DSS-9 DUAL SCHEDULE SWITCH

For 10 ft. (3 m) gun. **(#071 832)**
For 15 ft. (4.6 m) gun. **(#071 833)**
A two-position slide switch fastens to the gun handle and is used to select the desired schedule. The standard gun trigger operates the power source contactor.

RDC-PS-1 REMOTE DIGITAL CONTROL

(#041 758) For use with digital feeders only. Presets background voltage and peak amperage for use with a single digital wire feeder or one wire on a dual digital wire feeder. Meter displays actual condition while welding.

LOCKING COVER
(#094 692)
Secures control knobs.

DDSC-P1 DIGITAL DUAL SCHEDULE CONTROL
(For use with digital feeders only.)

(#041 757) For use with digital wire feeders to set a second welding schedule. Two controls are required to set two schedules on each wire of a dual wire feeder. The DDSC-PI must be used in conjunction with either an RDC-PS-1 or RDC-PS-2. A DSS-8 or DSS-9 switch is required to operate this control and must be ordered separately.

Note: Cannot be used with Pulset control.

LOCKING COVER
(#094 693)
Secures control knobs.

RDC-PS-2 REMOTE CONTROL
(For use with digital feeders only.)

(#041 759) Provides the same functions as RDC-PS-1. For dual digital wire feeders.

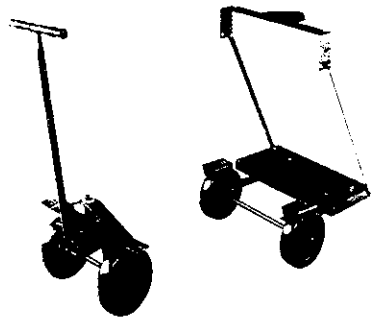
LOCKING COVER
(#045 504)
Secures control knobs.

RPC-2A REMOTE PENDANT CONTROL
(#041 798)
Adjusts background voltage and peak amperage. Includes 20 ft. (6 m) cord and plug.

POLARITY REVERSING/ ISOLATION CONTROL
(#041 894)
A dual function control designed for use with dual wire feeders or any application where electrical isolation and/or polarity reversing capabilities are required. For example, one wire of a dual feeder can be electrically cold while welding with the other. The wires can also be run on opposite or the same polarity (straight and reverse). Both functions can be performed at the same time.

25 ft. (7.6 m) EXTENSION CABLE
(#047 813)
Connects to existing 10 ft. (3 m) 115 volt and contactor control cable. Permits feeder to be located 35 ft. (10.7 m) from the power source.

Note: Additional cable is necessary when extending a feeder with an RDC-PS-1, RDC-PS-2 or Pulset Control. (#041 803) 25 ft. (7.6 m) cable.



No. 20 RUNNING GEAR
(#041 581)
Four 8 in. (203 mm) poly/rubber blend wheels with 30 in. (762 mm) towing handle. All running gear is shipped unassembled.

No. 5CR CYLINDER RACK
(#041 584)
Use with No. 20 running gear.

OPTIONS AND ACCESSORIES

PULSET CONTROL
(#042 110)

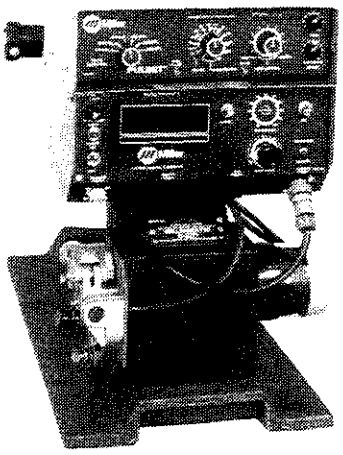
DSC-PS DUAL SCHEDULE CONTROL
(For use with Pulset control only.)

(#041 987) The Pulset Control is designed to take the guess work out of pulsed welding. It is used with the Miller Pulstar 450 power source and a Miller digital wire feeder. Weld parameters (peak amperage, background voltage, and wire feed speed) for 2 popular sizes of mild steel, stainless steel, and aluminum wire have been preprogrammed into the Pulset's memory system. Programs for welding .035 and .045 stainless steel and mild steel and .047 and .062 aluminum wire can be selected with six position switch.

The arc can be fine tuned with an arc power control and an arc length control providing the optimum welding condition.

If a different arc start condition is required, a Start Power adjustment and Start Time adjustment is provided. A dual schedule control which provides easy programming and selection of two different weld parameters on the same wire, is available as an option.

For maximum flexibility the Pulset controls the power source in either the pulsed or nonpulsed mode. When operating in the nonpulsed mode the unit controls output voltage. Wire speed is adjusted with the speed control on the wire feeder. Systems already in the field which have digital wire feeders, can easily be fitted with the Pulset.



Non-digital feeders are not compatible and cannot be used.

The manufacturer makes no warranties, express or implied, that welds made using the synergic parameters of this equipment will meet the requirements of application.