



OM-267

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September 1996

Processes



Stick (SMAW) Welding



MIG (GMAW) Welding



Flux Cored (FCAW) Welding



TIG (GTAW) Welding



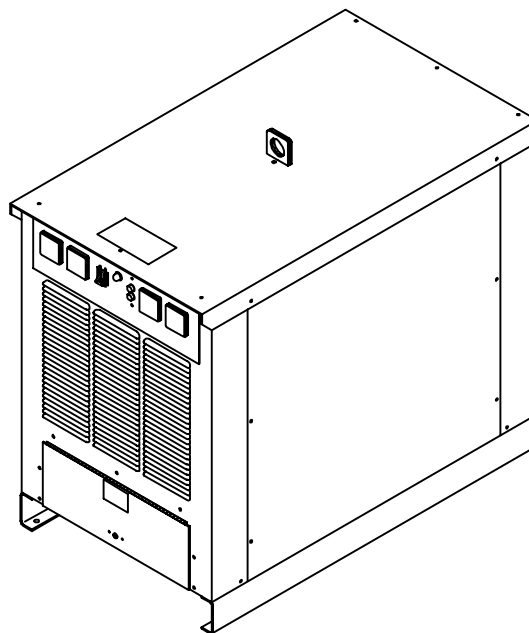
Air Carbon Arc (CAC-A)
Cutting and Gouging

Description

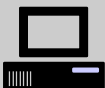


Arc Welding Power Source For Use
With A MOG System

GPS-1000, 1500A, And 1500V



OWNER'S MANUAL



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www.MillerWelds.com

From Miller to You

Thank you and congratulations on choosing Miller. Now you can get the job done and get it done right. We know you don't have time to do it any other way.

That's why when Niels Miller first started building arc welders in 1929, he made sure his products offered long-lasting value and superior quality. Like you, his customers couldn't afford anything less. Miller products had to be more than the best they could be. They had to be the best you could buy.



Today, the people that build and sell Miller products continue the tradition. They're just as committed to providing equipment and service that meets the high standards of quality and value established in 1929.

This Owner's Manual is designed to help you get the most out of your Miller products. Please take time to read the Safety precautions. They will help you protect yourself against potential hazards on the worksite. We've

made installation and operation quick and easy. With Miller you can count on years of reliable service with proper maintenance. And if for some reason the unit needs repair, there's a Troubleshooting section that will help you figure out what the problem is. The parts list will then help you to decide which exact part you may need to fix the problem. Warranty and service information for your particular model are also provided.



Miller is the first welding equipment manufacturer in the U.S.A. to be registered to the ISO 9001 Quality System Standard.

Miller Electric manufactures a full line of welders and welding related equipment. For information on other quality Miller products, contact your local Miller distributor to receive the latest full line catalog or individual catalog sheets. **To locate your nearest distributor or service agency call 1-800-4-A-Miller, or visit us at www.MillerWelds.com on the web.**



Working as hard as you do – every power source from Miller is backed by the most hassle-free warranty in the business.

Miller offers a Technical Manual which provides more detailed service and parts information for your unit. To obtain a Technical Manual, contact your local distributor. Your distributor can also supply you with Welding Process Manuals such as SMAW, GTAW, GMAW, and GMAW-P.



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The following terms are used interchangeably throughout this manual:
TIG = GTAW
Stick = SMAW

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SECTION 1 – SAFETY PRECAUTIONS - READ BEFORE USING

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1-1. Symbol Usage



Means Warning! Watch Out! There are possible hazards with this procedure! The possible hazards are shown in the adjoining symbols.

▲ Marks a special safety message.

☞ Means "Note"; not safety related.



This group of symbols means Warning! Watch Out! possible ELECTRIC SHOCK, MOVING PARTS, and HOT PARTS hazards. Consult symbols and related instructions below for necessary actions to avoid the hazards.

1-2. Arc Welding Hazards

▲ The symbols shown below are used throughout this manual to call attention to and identify possible hazards. When you see the symbol, watch out, and follow the related instructions to avoid the hazard. The safety information given below is only a summary of the more complete safety information found in the Safety Standards listed in Section 1-4. Read and follow all Safety Standards.

▲ Only qualified persons should install, operate, maintain, and repair this unit.

▲ During operation, keep everybody, especially children, away.



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

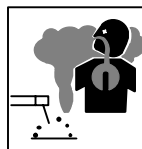
live when power is on. In semiautomatic or automatic wire welding, the wire, wire reel, drive roll housing, and all metal parts touching the welding wire are electrically live. Incorrectly installed or improperly grounded equipment is a hazard.

- Do not touch live electrical parts.
- Wear dry, hole-free insulating gloves and body protection.
- Insulate yourself from work and ground using dry insulating mats or covers big enough to prevent any physical contact with the work or ground.
- 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 if present on unit.
- Disconnect input power or stop engine before installing or servicing this equipment. Lockout/tagout input power according to OSHA 29 CFR 1910.147 (see Safety Standards).
- Properly install and ground this equipment according to its Owner's Manual and national, state, and local codes.
- Always verify the supply ground – check and be sure that input power cord ground wire is properly connected to ground terminal in disconnect box or that cord plug is connected to a properly grounded receptacle outlet.
- When making input connections, attach proper grounding conductor first – double-check connections.
- Frequently inspect input power cord for damage or bare wiring – replace cord immediately if damaged – bare wiring can kill.
- Turn off all equipment when not in use.
- Do not use worn, damaged, undersized, or poorly spliced cables.
- Do not drape cables over your body.

- If earth grounding of the workpiece is required, ground it directly with a separate cable – do not use work clamp or work cable.
- Do not touch electrode if you are in contact with the work, ground, or another electrode from a different machine.
- Use only well-maintained equipment. Repair or replace damaged parts at once. Maintain unit according to manual.
- Wear a safety harness if working above floor level.
- Keep all panels and covers securely in place.
- Clamp work cable with good metal-to-metal contact to workpiece or worktable as near the weld as practical.
- Insulate work clamp when not connected to workpiece to prevent contact with any metal object.
- Do not connect more than one electrode or work cable to any single weld output terminal.

SIGNIFICANT DC VOLTAGE exists after removal of input power on inverters.

- Turn Off inverter, disconnect input power, and discharge input capacitors according to instructions in Maintenance Section before touching any parts.



FUMES AND GASES can be hazardous.

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

- Keep your head out of the fumes. Do not breathe the fumes.
- If inside, ventilate the area and/or use exhaust at the arc to remove welding fumes and gases.
- If ventilation is poor, use an approved air-supplied respirator.
- Read the Material Safety Data Sheets (MSDSs) and the manufacturer's instructions for metals, consumables, coatings, cleaners, and degreasers.
- Work in a confined space only if it is well ventilated, or while wearing an air-supplied respirator. Always have a trained watch-person nearby. Welding fumes and gases can displace air and lower the oxygen level causing injury or death. Be sure the breathing air is safe.
- 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.
- 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.



ARC RAYS can burn eyes and skin.

Arc rays from the welding process produce intense visible and invisible (ultraviolet and infrared) rays that can burn eyes and skin. Sparks fly off from the weld.

- Wear a welding helmet fitted with a proper shade of filter to protect your face and eyes when welding or watching (see ANSI Z49.1 and Z87.1 listed in Safety Standards).
- Wear approved safety glasses with side shields under your helmet.
- Use protective screens or barriers to protect others from flash and glare; warn others not to watch the arc.
- Wear protective clothing made from durable, flame-resistant material (leather and wool) and foot protection.



WELDING can cause fire or explosion.

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

- Protect yourself and others from flying sparks and hot metal.
- Do not weld where flying sparks can strike flammable material.
- Remove all flammables within 35 ft (10.7 m) of the welding arc. If this is not possible, tightly cover them with approved covers.
- Be alert that welding sparks and hot materials from welding can easily go through small cracks and openings to adjacent areas.
- Watch for fire, and keep a fire extinguisher nearby.
- Be aware that welding on a ceiling, floor, bulkhead, or partition can cause fire on the hidden side.
- Do not weld on closed containers such as tanks, drums, or pipes, unless they are properly prepared according to AWS F4.1 (see Safety Standards).
- 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.
- Do not use welder to thaw frozen pipes.
- Remove stick electrode from holder or cut off welding wire at contact tip when not in use.
- Wear oil-free protective garments such as leather gloves, heavy shirt, cuffless trousers, high shoes, and a cap.
- Remove any combustibles, such as a butane lighter or matches, from your person before doing any welding.



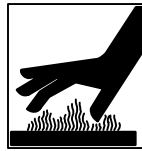
FLYING METAL can injure eyes.

- Welding, chipping, wire brushing, and grinding cause sparks and flying metal. As welds cool, they can throw off slag.
- Wear approved safety glasses with side shields even under your welding helmet.



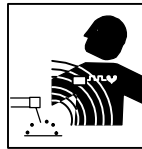
BUILDUP OF GAS can injure or kill.

- Shut off shielding gas supply when not in use.
- Always ventilate confined spaces or use approved air-supplied respirator.



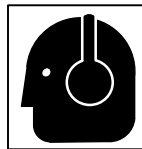
HOT PARTS can cause severe burns.

- Do not touch hot parts bare handed.
- Allow cooling period before working on gun or torch.



MAGNETIC FIELDS can affect pacemakers.

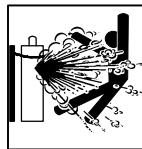
- Pacemaker wearers keep away.
- Wearers should consult their doctor before going near arc welding, gouging, or spot welding operations.



NOISE can damage hearing.

Noise from some processes or equipment can damage hearing.

- Wear approved ear protection if noise level is high.



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.

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

1-3. Additional Symbols For Installation, Operation, And Maintenance



FIRE OR EXPLOSION hazard.

- Do not install or place unit on, over, or near combustible surfaces.
- Do not install unit near flammables.
- Do not overload building wiring – be sure power supply system is properly sized, rated, and protected to handle this unit.



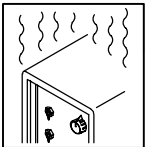
MOVING PARTS can cause injury.

- Keep away from moving parts such as fans.
- Keep all doors, panels, covers, and guards closed and securely in place.



FALLING UNIT can cause injury.

- Use lifting eye to lift unit only, NOT running gear, gas cylinders, or any other accessories.
- Use equipment of adequate capacity to lift and support unit.
- If using lift forks to move unit, be sure forks are long enough to extend beyond opposite side of unit.



OVERUSE can cause OVERHEATING

- Allow cooling period; follow rated duty cycle.
- Reduce current or reduce duty cycle before starting to weld again.
- Do not block or filter airflow to unit.



STATIC (ESD) can damage PC boards.

- Put on grounded wrist strap BEFORE handling boards or parts.
- Use proper static-proof bags and boxes to store, move, or ship PC boards.



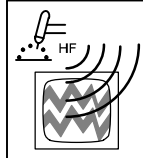
MOVING PARTS can cause injury.

- Keep away from moving parts.
- Keep away from pinch points such as drive rolls.



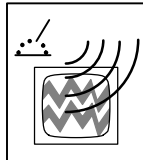
WELDING WIRE can cause injury.

- Do not press gun trigger until instructed to do so.
- Do not point gun toward any part of the body, other people, or any metal when threading welding wire.



H.F. RADIATION can cause interference.

- High-frequency (H.F.) can interfere with radio navigation, safety services, computers, and communications equipment.
- Have only qualified persons familiar with electronic equipment perform this installation.
- The user is responsible for having a qualified electrician promptly correct any interference problem resulting from the installation.
- If notified by the FCC about interference, stop using the equipment at once.
- Have the installation regularly checked and maintained.
- Keep high-frequency source doors and panels tightly shut, keep spark gaps at correct setting, and use grounding and shielding to minimize the possibility of interference.



ARC WELDING can cause interference.

- Electromagnetic energy can interfere with sensitive electronic equipment such as computers and computer-driven equipment such as robots.
- Be sure all equipment in the welding area is electromagnetically compatible.
- To reduce possible interference, keep weld cables as short as possible, close together, and down low, such as on the floor.
- Locate welding operation 100 meters from any sensitive electronic equipment.
- Be sure this welding machine is installed and grounded according to this manual.
- If interference still occurs, the user must take extra measures such as moving the welding machine, using shielded cables, using line filters, or shielding the work area.

1-4. 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.

1-5. EMF Information

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

Welding current, as it flows through welding cables, will cause electromagnetic fields. There has been and still is some concern about such fields. However, after examining more than 500 studies spanning 17 years of research, a special blue ribbon committee of the National Research Council concluded that: "The body of evidence, in the committee's judgment, has not demonstrated that exposure to power-frequency electric and magnetic fields is a human-health hazard." However, studies are still going forth and evidence continues to be examined. Until the final conclusions of the research are reached, you may wish to minimize your exposure to electromagnetic fields when welding or cutting.

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

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

About Pacemakers:

Pacemaker wearers consult your doctor first. If cleared by your doctor, then following the above procedures is recommended.

SECTION 1 – CONSIGNES DE SECURITE – LIRE AVANT UTILISATION

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1-1. Signification des symboles



Signifie Mise en garde ! Soyez vigilant ! Cette procédure présente des risques de danger ! Ceux-ci sont identifiés par des symboles adjacents aux directives.

▲ Identifie un message de sécurité particulier.

Signifie NOTA ; n'est pas relatif à la sécurité.



Ce groupe de symboles signifie Mise en garde ! Soyez vigilant ! Il y a des risques de danger reliés aux CHOCS ÉLECTRIQUES, aux PIÈCES EN MOUVEMENT et aux PIÈCES CHAUDES. Reportez-vous aux symboles et aux directives ci-dessous afin de connaître les mesures à prendre pour éviter tout danger.

1-2. Dangers relatifs au soudage à l'arc

▲ Les symboles présentés ci-après sont utilisés tout au long du présent manuel pour attirer votre attention et identifier les risques de danger. Lorsque vous voyez un symbole, soyez vigilant et suivez les directives mentionnées afin d'éviter tout danger. Les consignes de sécurité présentées ci-après ne font que résumer l'information contenue dans les normes de sécurité énumérées à la section 1-4. Veuillez lire et respecter toutes ces normes de sécurité.

▲ L'installation, l'utilisation, l'entretien et les réparations ne doivent être confiés qu'à des personnes qualifiées.

▲ Au cours de l'utilisation, tenir toute personne à l'écart et plus particulièrement les enfants.



UN CHOC ÉLECTRIQUE peut tuer.

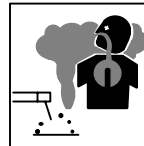
Un simple contact avec des pièces électriques peut provoquer une électrocution ou des blessures graves. L'électrode et le circuit de soudage sont sous tension dès que l'appareil est sur ON. Le circuit d'entrée et les circuits internes de l'appareil sont également sous tension à ce moment-là. En soudage semi-automatique ou automatique, le fil, le dévidoir, le logement des galets d'entraînement et les pièces métalliques en contact avec le fil de soudage sont sous tension. Des matériels mal installés ou mal mis à la terre présentent un danger.

- Ne jamais toucher les pièces électriques sous tension.
- Porter des gants et des vêtements de protection secs ne comportant pas de trous.
- S'isoler de la pièce et de la terre au moyen de tapis ou d'autres moyens isolants suffisamment grands pour empêcher le contact physique éventuel avec la pièce ou la terre.
- Ne pas se servir de source électrique à courant électrique dans les zones humides, dans les endroits confinés ou là où on risque de tomber.
- Se servir d'une source électrique à courant électrique UNIQUEMENT si le procédé de soudage le demande.
- Si l'utilisation d'une source électrique à courant électrique s'avère nécessaire, se servir de la fonction de télécommande si l'appareil en est équipé.
- Couper l'alimentation ou arrêter le moteur avant de procéder à l'installation, à la réparation ou à l'entretien de l'appareil. Déverrouiller l'alimentation selon la norme OSHA 29 CFR 1910.147 (voir normes de sécurité).
- Installer et mettre à la terre correctement cet appareil conformément à son manuel d'utilisation et aux codes nationaux, provinciaux et municipaux.
- Toujours vérifier la terre du cordon d'alimentation – Vérifier et s'assurer que le fil de terre du cordon d'alimentation est bien raccordé à la borne de terre du sectionneur ou que la fiche du cordon est raccordée à une prise correctement mise à la terre.
- En effectuant les raccordements d'entrée fixer d'abord le conducteur de mise à la terre approprié et contre-vérifier les connexions.
- Vérifier fréquemment le cordon d'alimentation pour voir s'il n'est pas endommagé ou dénudé – remplacer le cordon immédiatement s'il est endommagé – un câble dénudé peut provoquer une électrocution.
- Mettre l'appareil hors tension quand on ne l'utilise pas.
- Ne pas utiliser des câbles usés, endommagés, de grosseur insuffisante ou mal épissés.
- Ne pas enrouler les câbles autour du corps.
- Si la pièce soudée doit être mise à la terre, le faire directement avec un câble distinct – ne pas utiliser le connecteur de pièce ou le câble de retour.

- Ne pas toucher l'électrode quand on est en contact avec la pièce, la terre ou une électrode provenant d'une autre machine.
- N'utiliser qu'un matériel en bon état. Réparer ou remplacer sur-le-champ les pièces endommagées. Entretien l'appareil conformément à ce manuel.
- Porter un harnais de sécurité quand on travaille en hauteur.
- Maintenir solidement en place tous les panneaux et capots.
- Fixer le câble de retour de façon à obtenir un bon contact métal-métal avec la pièce à souder ou la table de travail, le plus près possible de la soudure.
- Isoler la pince de masse quand pas mis à la pièce pour éviter le contact avec tout objet métallique.

Il y a DU COURANT CONTINU IMPORTANT dans les convertisseurs après la suppression de l'alimentation électrique.

- Arrêter les convertisseurs, débrancher le courant électrique, et décharger les condensateurs d'alimentation selon les instructions indiquées dans la partie entretien avant de toucher les pièces.



LES FUMÉES ET LES GAZ peuvent être dangereux.

Le soudage génère des fumées et des gaz. Leur inhalation peut être dangereux pour votre santé.

- Eloigner votre tête des fumées. Ne pas respirer les fumées.
- A l'intérieur, ventiler la zone et/ou utiliser un échappement au niveau de l'arc pour l'évacuation des fumées et des gaz de soudage.
- Si la ventilation est insuffisante, utiliser un respirateur à alimentation d'air homologué.
- Lire les spécifications de sécurité des matériaux (MSDSs) et les instructions du fabricant concernant les métaux, les consommables, les revêtements, les nettoyants et les dégraissateurs.
- Travailler dans un espace fermé seulement s'il est bien ventilé ou en portant un respirateur à alimentation d'air. Demander toujours à un surveillant dûment formé de se tenir à proximité. Des fumées et des gaz de soudage peuvent déplacer l'air et abaisser le niveau d'oxygène provoquant des blessures ou des accidents mortels. S'assurer que l'air de respiration ne présente aucun danger.
- Ne pas souder dans des endroits situés à proximité d'opérations de dégraissage, de nettoyage ou de pulvérisation. La chaleur et les rayons de l'arc peuvent réagir en présence de vapeurs et former des gaz hautement toxiques et irritants.
- Ne pas souder des métaux munis d'un revêtement, tels que l'acier galvanisé, plaqué en plomb ou au cadmium à moins que le revêtement n'ait été enlevé dans la zone de soudure, que l'endroit soit bien ventilé, et si nécessaire, en portant un respirateur à alimentation d'air. Les revêtements et tous les métaux renfermant ces éléments peuvent dégager des fumées toxiques en cas de soudage.



LES RAYONS DE L'ARC peuvent provoquer des brûlures dans les yeux et sur la peau.

Le rayonnement de l'arc du procédé de soudage génère des rayons visibles et invisibles intenses (ultraviolets et infrarouges) susceptibles de provoquer des brûlures dans les yeux et sur la peau. Des étincelles sont projetées pendant le soudage.

- Porter un casque de soudage muni d'un écran de filtre approprié pour protéger votre visage et vos yeux pendant le soudage ou pour regarder (voir ANSI Z49.1 et Z87.1 énuméré dans les normes de sécurité).
- Porter des protections approuvés pour les oreilles si le niveau sonore est trop élevé.
- Utiliser des écrans ou des barrières pour protéger des tiers de l'éclair et de l'éblouissement; demander aux autres personnes de ne pas regarder l'arc.
- Porter des vêtements de protection constitué dans une matière durable, résistant au feu (cuir ou laine) et une protection des pieds.



LE SOUDAGE peut provoquer un incendie ou une explosion.

Le soudage effectué sur des conteneurs fermés tels que des réservoirs, tambours ou des conduites peut provoquer leur éclatement. Des étincelles peuvent être projetées de l'arc de soudure. La projection d'étincelles, des pièces chaudes et des équipements chauds peut provoquer des incendies et des brûlures. Le contact accidentel de l'électrode avec des objets métalliques peut provoquer des étincelles, une explosion, un surchauffement ou un incendie. Avant de commencer le soudage, vérifier et s'assurer que l'endroit ne présente pas de danger.

- Se protéger et d'autres personnes de la projection d'étincelles et de métal chaud.
- Ne pas souder dans un endroit là où des étincelles peuvent tomber sur des substances inflammables.
- Déplacer toutes les substances inflammables à une distance de 10,7 m de l'arc de soudage. En cas d'impossibilité les recouvrir soigneusement avec des protections homologués.
- Des étincelles et des matériaux chauds du soudage peuvent facilement passer dans d'autres zones en traversant de petites fissures et des ouvertures.
- Surveiller tout déclenchement d'incendie et tenir un extincteur à proximité.
- Le soudage effectué sur un plafond, plancher, paroi ou séparation peut déclencher un incendie de l'autre côté.
- Ne pas effectuer le soudage sur des conteneurs fermés tels que des réservoirs, tambours, ou conduites, à moins qu'ils n'aient été préparés correctement conformément à AWS F4.1 (voir les normes de sécurité).
- Brancher le câble sur la pièce le plus près possible de la zone de soudage pour éviter le transport du courant sur une longue distance par des chemins inconnus éventuels en provoquant des risques d'électrocution et d'incendie.
- Ne pas utiliser le poste de soudage pour dégelier des conduites gelées.
- En cas de non utilisation, enlever la bague d'électrode du porte-électrode ou couper le fil à la pointe de contact.
- Porter des vêtements de protection dépourvus d'huile tels que des gants en cuir, une chemise en matériau lourd, des pantalons sans revers, des chaussures hautes et un couvre chef.
- Avant de souder, retirer toute substance combustible de vos poches telles qu'un allumeur au butane ou des allumettes.



DES PARTICULES VOLANTES peuvent blesser les yeux.

- Le soudage, l'écaillage, le passage de la pièce à la brosse en fil de fer, et le meulage génèrent des étincelles et des particules métalliques volantes. Pendant la période de refroidissement des soudures, elles risquent de projeter du laitier.
- Porter des lunettes de sécurité avec écrans latéraux ou un écran facial.



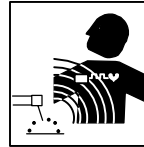
LES ACCUMULATIONS DE GAZ risquent de provoquer des blessures ou même la mort.

- Fermer l'alimentation du gaz protecteur en cas de non utilisation.
- Veiller toujours à bien aérer les espaces confinés ou se servir d'un respirateur d'adduction d'air homologué.



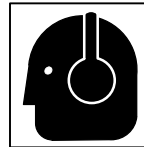
DES PIÈCES CHAUDES peuvent provoquer des brûlures graves.

- Ne pas toucher des parties chaudes à mains nues
- Prévoir une période de refroidissement avant d'utiliser le pistolet ou la torche.



LES CHAMPS MAGNÉTIQUES peuvent affecter les stimulateurs cardiaques.

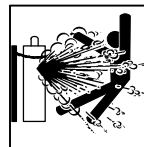
- Porteurs de stimulateur cardiaque, restez à distance.
- Les porteurs d'un stimulateur cardiaque doivent d'abord consulter leur médecin avant de s'approcher des opérations de soudage à l'arc, de gougeage ou de soudage par points.



LE BRUIT peut affecter l'ouïe.

Le bruit des processus et des équipements peut affecter l'ouïe.

- Porter des protections approuvés pour les oreilles si le niveau sonore est trop élevé.



Si des BOUTEILLES sont endommagées, elles pourront exploser.

Des bouteilles de gaz protecteur contiennent du gaz sous haute pression. Si une bouteille est endommagée, elle peut exploser. Du fait que les bouteilles de gaz font normalement partie du procédé de soudage, les manipuler avec précaution.

- Protéger les bouteilles de gaz comprimé d'une chaleur excessive, des chocs mécaniques, du laitier, des flammes ouvertes, des étincelles et des arcs.
- Placer les bouteilles debout en les fixant dans un support stationnaire ou dans un porte-bouteilles pour les empêcher de tomber ou de se renverser.
- Tenir les bouteilles éloignées des circuits de soudage ou autres circuits électriques.
- Ne jamais placer une torche de soudage sur une bouteille à gaz.
- Une électrode de soudage ne doit jamais entrer en contact avec une bouteille.
- Ne jamais souder une bouteille pressurisée – risque d'explosion.
- Utiliser seulement des bouteilles de gaz protecteur, régulateurs, tuyaux et raccords convenables pour cette application spécifique; les maintenir ainsi que les éléments associés en bon état.
- Ne pas tenir la tête en face de la sortie en ouvrant la soupape de la bouteille.
- Maintenir le chapeau de protection sur la soupape, sauf en cas d'utilisation ou de branchement de la bouteille.
- Lire et suivre les instructions concernant les bouteilles de gaz comprimé, les équipements associés et les publications P-1 CGA énumérées dans les normes de sécurité.

1-3. Dangers supplémentaires en relation avec l'installation, le fonctionnement et la maintenance



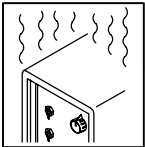
Risque D'INCENDIE OU D'EXPLOSION.

- Ne pas placer l'appareil sur, au-dessus ou à proximité de surfaces inflammables.
- Ne pas installer l'appareil à proximité de produits inflammables
- Ne pas surcharger l'installation électrique – s'assurer que l'alimentation est correctement dimensionnée et protégé avant de mettre l'appareil en service.



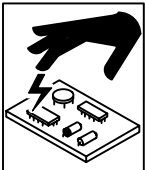
LA CHUTE DE L'APPAREIL peut blesser.

- Utiliser l'anneau de levage uniquement pour soulever l'appareil, NON PAS les chariot, les bouteilles de gaz ou tout autre accessoire.
- Utiliser un engin d'une capacité appropriée pour soulever l'appareil.
- En utilisant des fourches de levage pour déplacer l'unité, s'assurer que les fourches sont suffisamment longues pour dépasser du côté opposé de l'appareil.



L'EMPLOI EXCESSIF peut SURCHAUFFER L'ÉQUIPEMENT.

- Prévoir une période de refroidissement, respecter le cycle opératoire nominal.
- Réduire le courant ou le cycle opératoire avant de recommencer le soudage.
- Ne pas obstruer les passages d'air du poste.



LES CHARGES ÉLECTROSTATIQUES peuvent endommager les circuits imprimés.

- Établir la connexion avec la barrette de terre avant de manipuler des cartes ou des pièces.
- Utiliser des pochettes et des boîtes antistatiques pour stocker, déplacer ou expédier des cartes de circuits imprimés.



DES ORGANES MOBILES peuvent provoquer des blessures.

- Ne pas s'approcher des organes mobiles.
- Ne pas s'approcher des points de coincement tels que des rouleaux de commande.



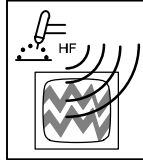
LES FILS DE SOUDAGE peuvent provoquer des blessures.

- Ne pas appuyer sur la gachette avant d'en avoir reçu l'instruction.
- Ne pas diriger le pistolet vers soi, d'autres personnes ou toute pièce mécanique en engageant le fil de soudage.



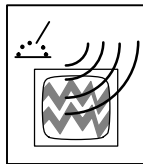
DES ORGANES MOBILES peuvent provoquer des blessures.

- Rester à l'écart des organes mobiles comme le ventilateur.
- Maintenir fermés et fixement en place les portes, panneaux, recouvrements et dispositifs de protection.



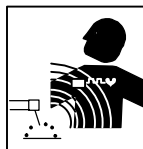
LE RAYONNEMENT HAUTE FRÉQUENCE (H.F.) risque de provoquer des interférences.

- Le rayonnement haute fréquence peut provoquer des interférences avec les équipements de radio-navigation et de communication, les services de sécurité et les ordinateurs.
- Demander seulement à des personnes qualifiées familiarisées avec des équipements électroniques de faire fonctionner l'installation.
- L'utilisateur est tenu de faire corriger rapidement par un électricien qualifié les interférences résultant de l'installation.
- Si le FCC signale des interférences, arrêter immédiatement l'appareil.
- Effectuer régulièrement le contrôle et l'entretien de l'installation.
- Maintenir soigneusement fermés les portes et les panneaux des sources de haute fréquence, maintenir les éclateurs à une distance correcte et utiliser une terre et un blindage pour réduire les interférences éventuelles.



LE SOUDAGE À L'ARC risque de provoquer des interférences.

- L'énergie électromagnétique risque de provoquer des interférences pour l'équipement électronique sensible tel que les ordinateurs et l'équipement commandé par ordinateur tel que les robots.
- Veiller à ce que tout l'équipement de la zone de soudage soit compatible électromagnétiquement.
- Pour réduire la possibilité d'interférence, maintenir les câbles de soudage aussi courts que possible, les grouper, et les poser aussi bas que possible (ex. par terre).
- Veiller à souder à une distance de 100 mètres de tout équipement électronique sensible.
- Veiller à ce que ce poste de soudage soit posé et mis à la terre conformément à ce mode d'emploi.
- En cas d'interférences après avoir pris les mesures précédentes, il incombe à l'utilisateur de prendre des mesures supplémentaires telles que le déplacement du poste, l'utilisation de câbles blindés, l'utilisation de filtres de ligne ou la pose de protecteurs dans la zone de travail.



LES CHAMPS MAGNÉTIQUES peuvent affecter les stimulateurs cardiaques.

- Porteurs de stimulateur cardiaque, restez à distance.
- Les porteurs d'un stimulateur cardiaque doivent d'abord consulter leur médecin avant de s'approcher des opérations de soudage à l'arc, de gougeage ou de soudage par points.

1-4. Principales normes de sécurité

Safety in Welding and Cutting, norme ANSI Z49.1, de l'American Welding Society, 550 N.W. Lejeune Rd, Miami FL 33126

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

Recommended Safe Practice for the Preparation for Welding and Cutting of Containers That Have Held Hazardous Substances, norme AWS F4.1, de l'American Welding Society, 550 N.W. Lejeune Rd, Miami FL 33126

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

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

Règles de sécurité en soudage, coupage et procédés connexes, norme CSA W117.2, de l'Association canadienne de normalisation, vente de normes, 178 Rexdale Boulevard, Rexdale (Ontario) Canada M9W 1R3.

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

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

1-5. Information sur les champs électromagnétiques

Données sur le soudage électrique et sur les effets, pour l'organisme, des champs magnétiques basse fréquence

Le courant de soudage, pendant son passage dans les câbles de soudage, causera des champs électromagnétiques. Il y a eu et il y a encore un certain souci à propos de tels champs. Cependant, après avoir examiné plus de 500 études qui ont été faites pendant une période de recherche de 17 ans, un comité spécial ruban bleu du National Research Council a conclu: "L'accumulation de preuves, suivant le jugement du comité, n'a pas démontré que l'exposition aux champs magnétiques et champs électriques à haute fréquence représente un risque à la santé humaine". Toutefois, des études sont toujours en cours et les preuves continuent à être examinées. En attendant que les conclusions finales de la recherche soient établies, il vous serait souhaitable de réduire votre exposition aux champs électromagnétiques pendant le soudage ou le coupage.

Afin de réduire les champs électromagnétiques dans l'environnement de travail, respecter les consignes suivantes :

- 1 Garder les câbles ensemble en les torsadant ou en les attachant avec du ruban adhésif.
- 2 Mettre tous les câbles du côté opposé de l'opérateur.
- 3 Ne pas courber pas et ne pas entourer pas les câbles autour de votre corps.
- 4 Garder le poste de soudage et les câbles le plus loin possible de vous.
- 5 Relier la pince de masse le plus près possible de la zone de soudure.

Consignes relatives aux stimulateurs cardiaques :

Les personnes qui portent un stimulateur cardiaque doivent avant tout consulter leur docteur. Si vous êtes déclaré apte par votre docteur, il est alors recommandé de respecter les consignes ci-dessus.

SECTION 2 – SPECIFICATIONS

Table 2-1. Welding Power Source

Specification	Description	
Type Of Output	Direct Current/Constant Voltage (DC/CV)	
Welding Processes	Shielded Metal Arc (SMAW), Gas Metal Arc (GMAW), Flux Cored Arc (FCAW), Gas Tungsten Arc Welding (GTAW), Air Carbon Arc (CAC-A) Gouging, Stress Relieving, Resistance Heating	
Overall Dimensions	See Figure 3-3	
	1000 Amp	1500 Amp
Rated Weld Output	1000 Amperes, 76 Volts DC At 100% Duty Cycle (See Section 2-2)	1500 Amperes, 76 Volts DC At 100% Duty Cycle (See Section 2-2)
Type Of Input Power	Three-Phase; 230, 460, Or 575 Volts AC; 60 Hz	Three-Phase; 230, 460, Or 575 Volts AC; 60 Hz
Input Amperes At Rated Output	224 A At 230 V, 112 A At 460 V, 90 A At 575 V	334 A At 230 V, 167 A At 460 V, 134 A At 575 V
Input Amperes While Idling	8 A At 230 V, 4 A At 460 V, 3.2 A At 575 V	10.8 A At 230 V, 5.4 A At 460 V, 4.3 A At 575 V
KVA/KW Used At Rated Output	89 kVA/85 kW	131 kVA/133 kW
KVA/KW Used While Idling	3.2 kVA/0.96 kW	4.3 kVA/1.3 kW
Max. Open-Circuit Voltage	85 Volts DC	85 Volts DC
Weight	Net: 896 lb (406 kg); Ship 986 lb (447 kg)	Net: 1068 lb (484 kg); Ship 1158 lb (525 kg)

2-1. Volt-Ampere Curve

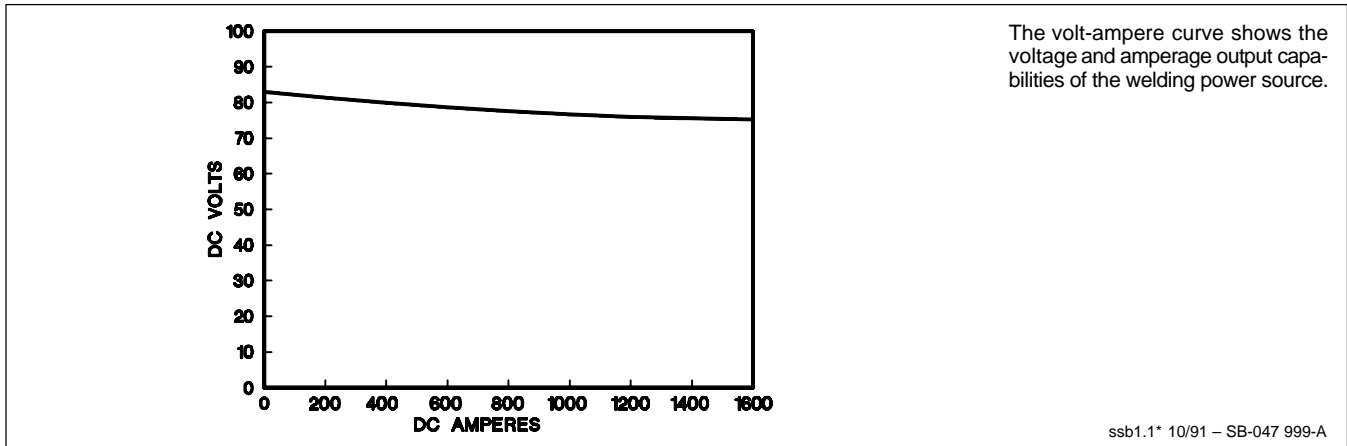


Figure 2-1. Volt-Ampere Curve

2-2. Duty Cycle

CAUTION

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

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

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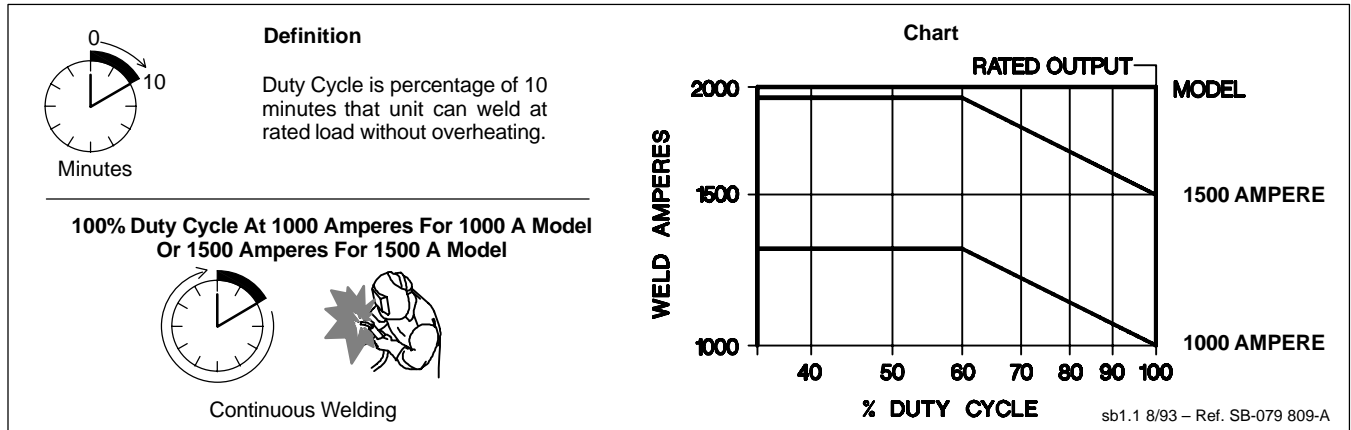


Figure 2-2. Duty Cycle

SECTION 3 – INSTALLATION

3-1. Typical Connections

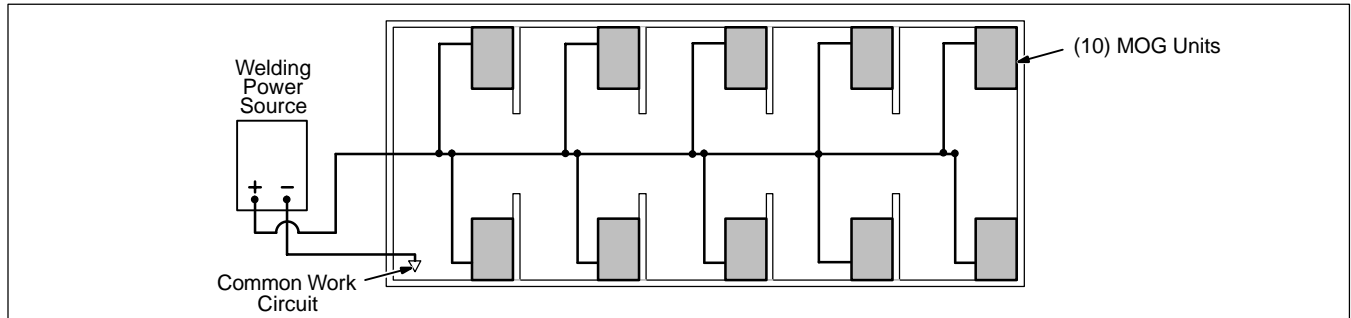
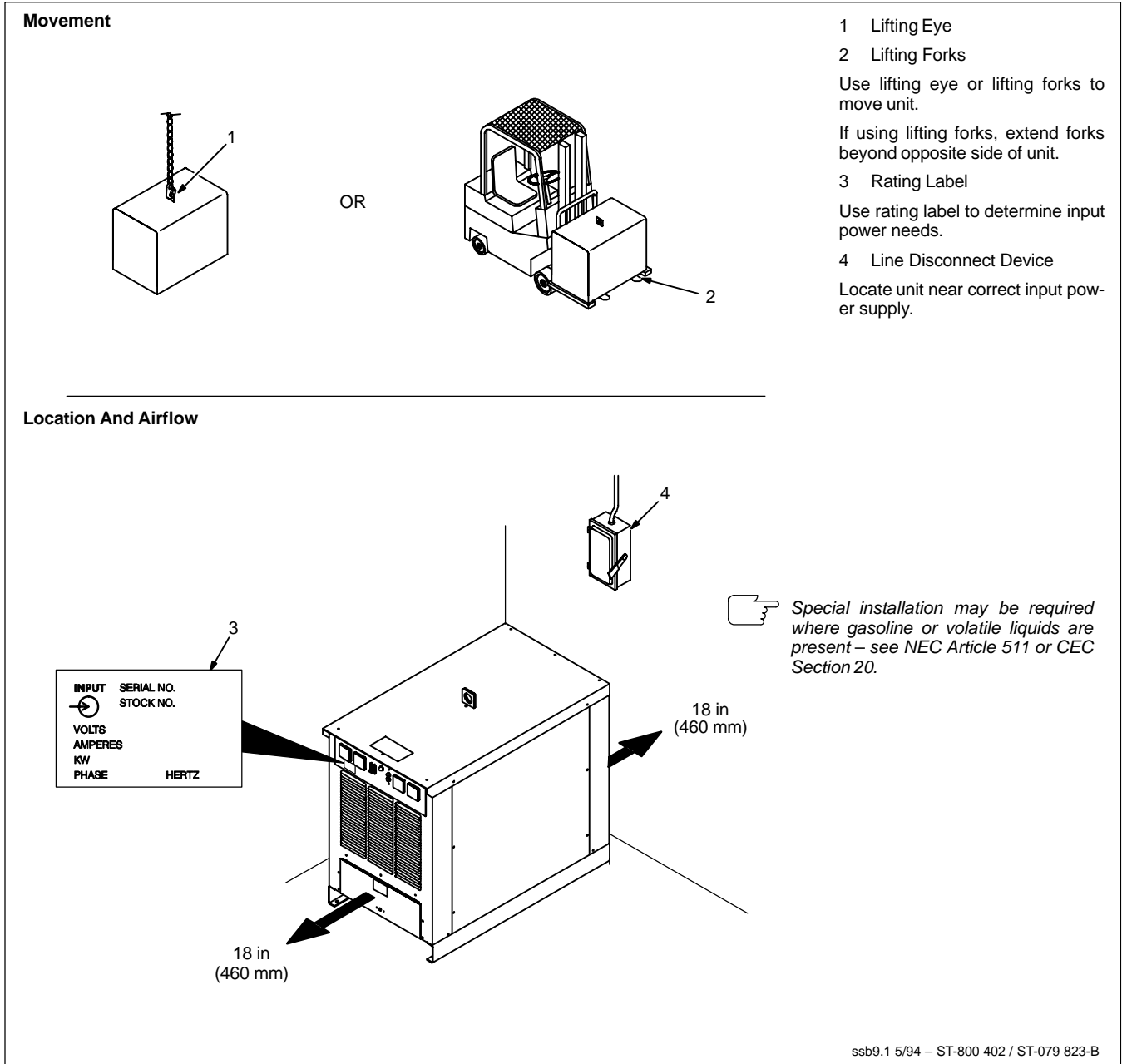


Figure 3-1. Typical Connections

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

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

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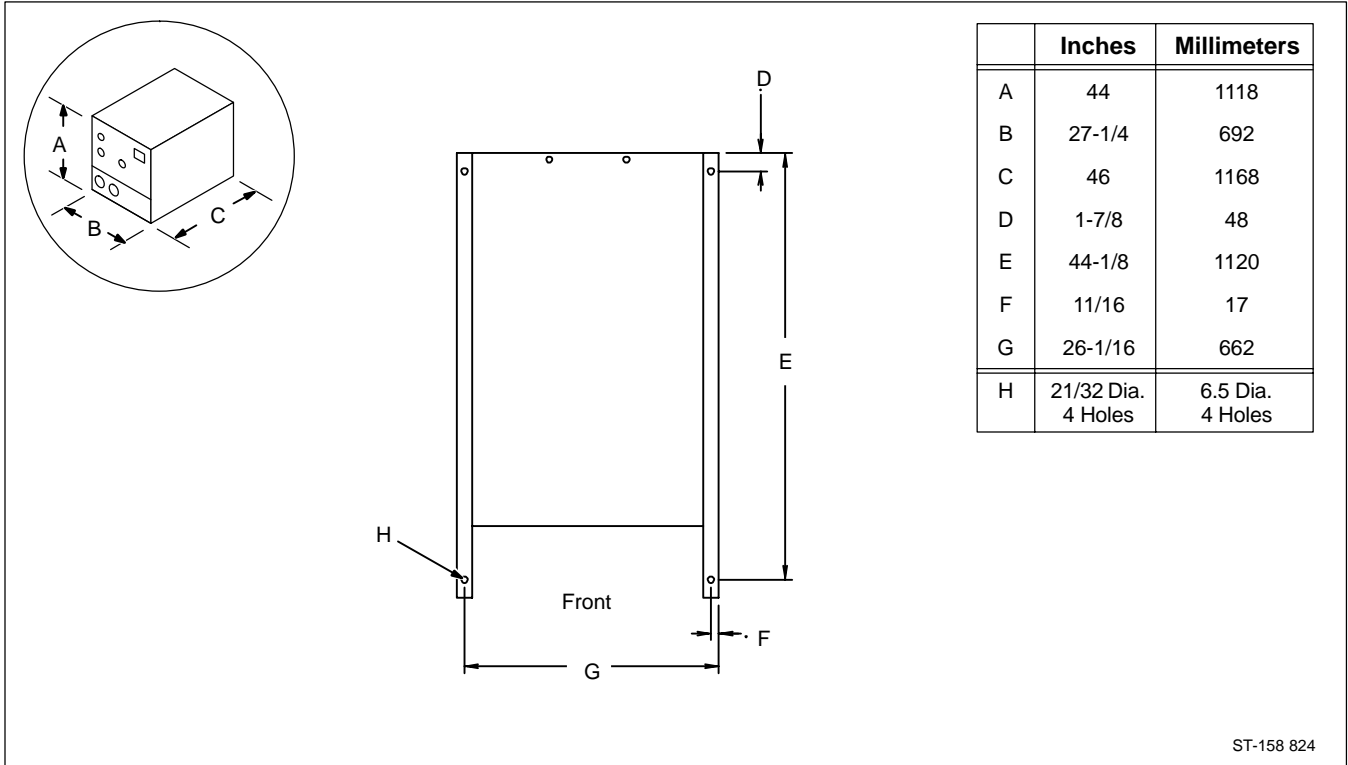


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Figure 3-2. Movement And Location Of Welding Power Source

NOTE 

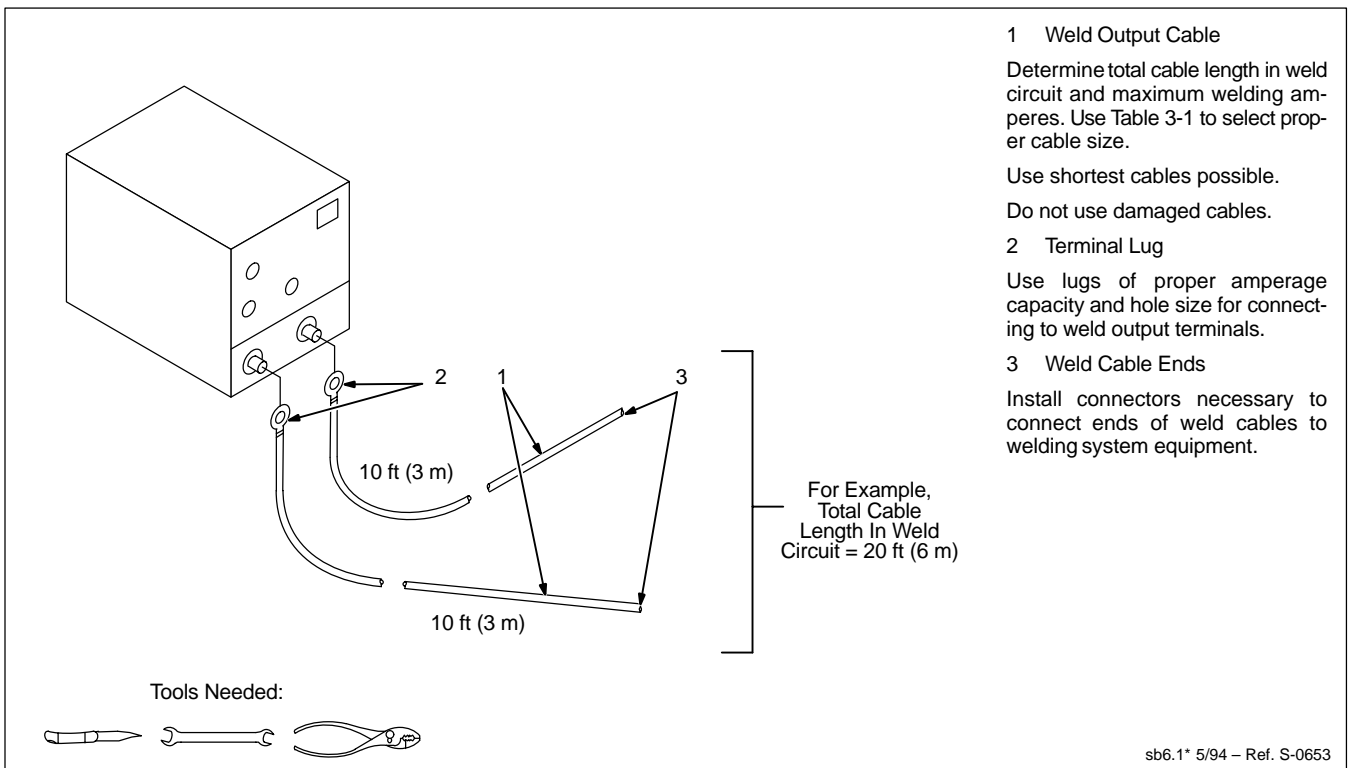
Overall dimensions (A, B, and C) include lifting eye, handles, hardware, etc.



ST-158 824

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

3-3. Selecting And Preparing Weld Output Cables



sb6.1* 5/94 - Ref. S-0653

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*							
	50 ft Or Less (15m)	100 ft (30m)	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 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	2	2	1	1/0	2/0	3/0	4/0	4/0
250	1	1	1/0	2/0	3/0	4/0	2-2/0	2-2/0
300	1/0	1/0	2/0	3/0	4/0	2-2/0	2-3/0	2-3/0
350	2/0	2/0	3/0	4/0	2-2/0	2-3/0	2-3/0	2-4/0
400	2/0	2/0	3/0	4/0	2-2/0	2-3/0	2-4/0	2-4/0
500	4/0	4/0	4/0	2-2/0	2-3/0	2-4/0	1000	1000
600	4/0	4/0	2-2/0	2-3/0	2-4/0	1000	1000	2-750
700	4/0	2-2/0	2-3/0	2-4/0	1000	1000	2-750	2-750
800	2-2/0	2-2/0	2-3/0	2-4/0	1000	2-750	2-750	2-1000
900	2-3/0	2-3/0	2-4/0	1000	1000	2-750	2-1000	2-1000
1000	2-3/0	2-3/0	2-4/0	1000	2-7500	2-750	2-1000	2-1000
1250	2-4/0	2-4/0	750	2-750	2-750	2-1000	2-1000	
1500	500	750	1000	2-750	2-1000	2-1000		
1750	750	1000	2-750	2-1000	2-1000			
2000	750	1000	2-750	2-1000				

*Weld cable size (AWG and MCM) is based on either a 4 volts or less drop or a current density of at least 300 circular mils per ampere.

S-0008-B

3-4. Connecting To Weld Output Terminals

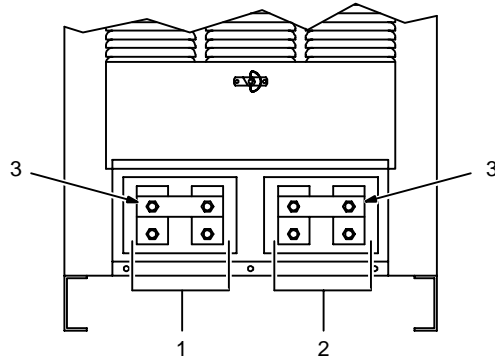
⚠ WARNING

ELECTRIC SHOCK can kill; TWO TIMES NORMAL OUTPUT VOLTAGE can result from certain connections.

- Do not touch live electrical parts.
- Turn Off welding power source, and disconnect input power before making any weld output connections.
- Connect weld cables only to matching output terminals (Positive A and Negative A or Positive B and Negative B) unless bus bars are installed.

If the Positive A output terminal is connected to the Negative B output terminal and the bus bars are not installed, twice the normal output voltage will be present between terminals Negative A and Positive B. The same is true if Negative A output terminal is connected to Positive B output terminal—twice the normal output voltage will be present between Positive A and Negative B.

- Do not connect weld terminals together if bus bars are installed.
- If bus bars are not removed and output terminals are connected together, the unit is short-circuited.
- Consult all applicable safety codes before installing weld cables.



- 1 Positive (+) Weld Output Terminals
- 2 Negative (-) Weld Output Terminals
- 3 Bus Bars

All units shipped with bus bars installed.

For Electrode Positive (DCEP), connect end of one cable to Positive (+) terminal, and remaining end to MOG input terminal.

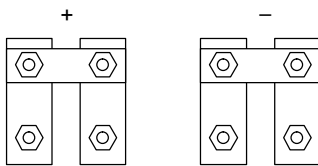
Connect end of other cable to Negative (-) output terminal, and remaining end to common work circuit.

For Electrode Negative (DCEN), reverse cable connections.

Close door.

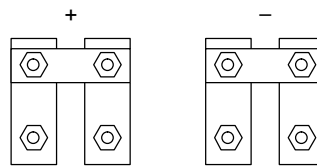
All units shipped with bus bars installed.

For 1000 Amp Models



1000 Amps Available Between Positive And Negative Terminals

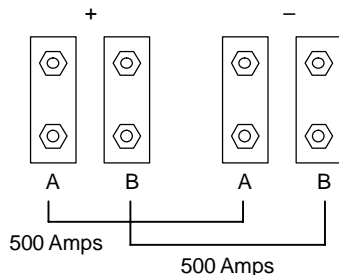
For 1500 Amp Models



1500 Amps Available Between Positive And Negative Terminals

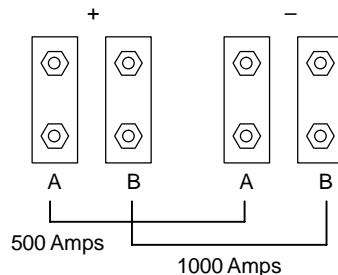
Weld Output Connections With Bus Bars Installed

For 1000 Amp Models

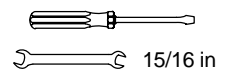


Weld Output Connections With Bus Bars Removed

For 1500 Amp Model



Tools Needed:





Two times normal output voltages hazard. Read WARNING at beginning of section, and have only qualified persons make weld output connections.

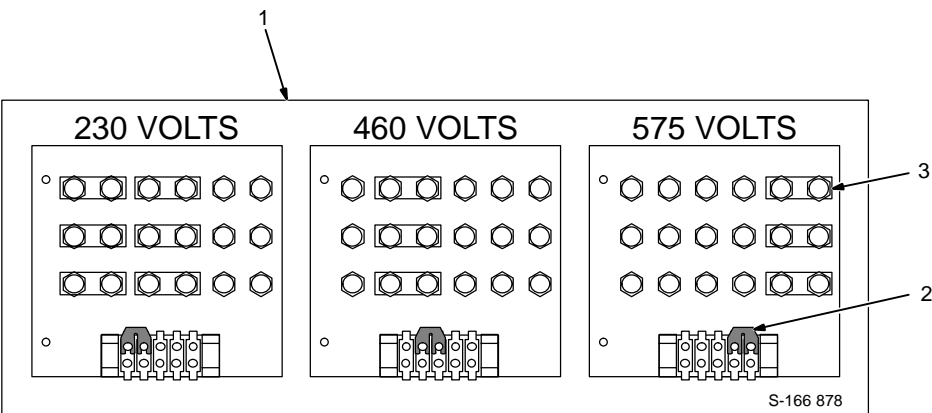
Ref. ST-079 824-B / Ref. S-0041

Figure 3-5. Weld Output Connections

3-5. Connecting Input Power

 <b style="font-size: 24pt;">WARNING	
	<p>ELECTRIC SHOCK can kill.</p> <ul style="list-style-type: none"> • 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 (Multi-Voltage Models Only)



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

Check input voltage available at site.

Remove right side panel to check jumper links.


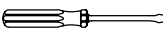
1 Input Voltage Label
 Look at jumper links and compare link position with unit label.

2 Input Voltage Jumper Links
 3 Bus Bars

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

For 1500V models, go on to Figure 3-7. For all other models, install right side panel, or go on to Figure 3-8.


Tools Needed:

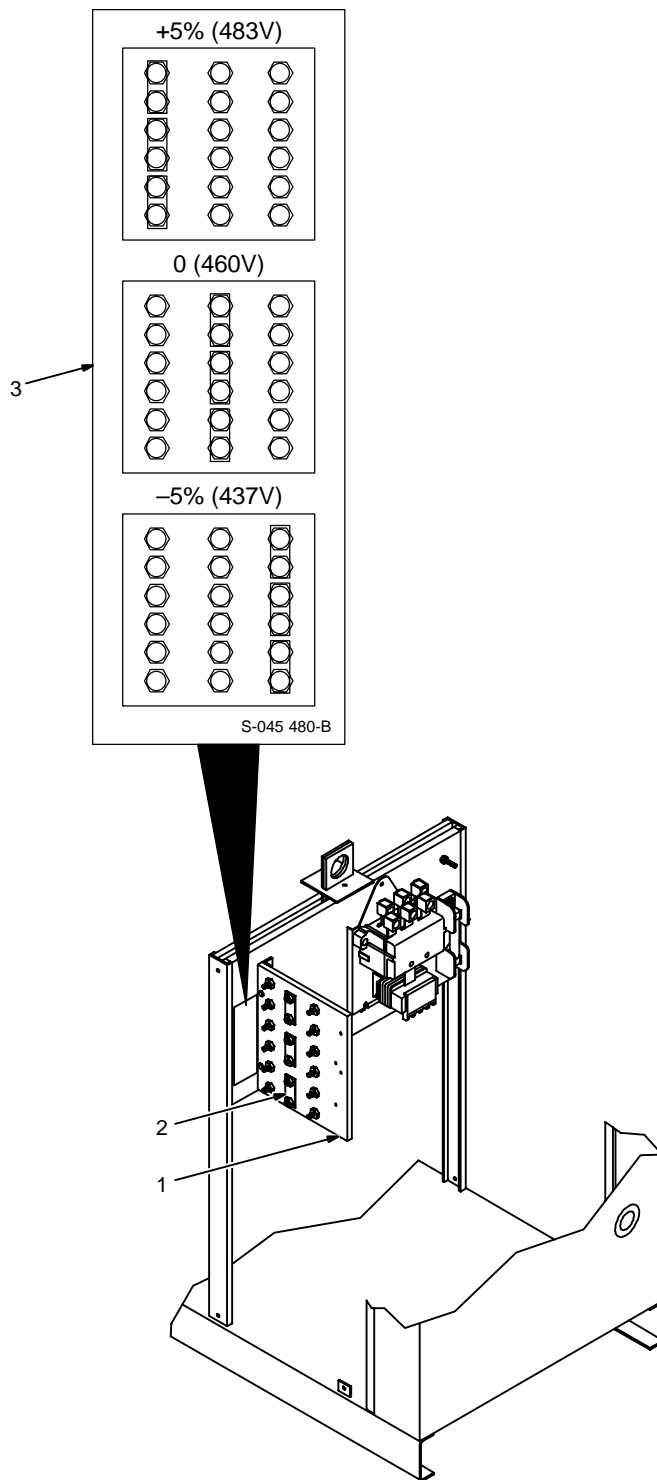
-  3/8 in
- 

ssb5.1* 2/92 – Ref. ST-079 825-D

Figure 3-6. Input Voltage Jumper Links Location

B. 1500 V Model Connections For Input Voltage Compensation

 All three bus bars must be positioned for the same percentage of compensation.



The 1500 V power source is able to compensate for high or low incoming line voltage.

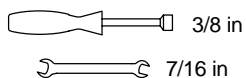
Remove right side panel

- 1 Line Compensation Board
- 2 Bus Bars
- 3 Line Compensation Label

Unit is shipped with bus bars set for 0% line compensation. If + or - 5% line compensation is required, set bus bars as shown.

Install right side panel, and go on to Figure 3-8.

Tools Needed:



Ref. ST-158 826

Figure 3-7. Connections For Input Voltage Compensation

C. Connecting Input Power

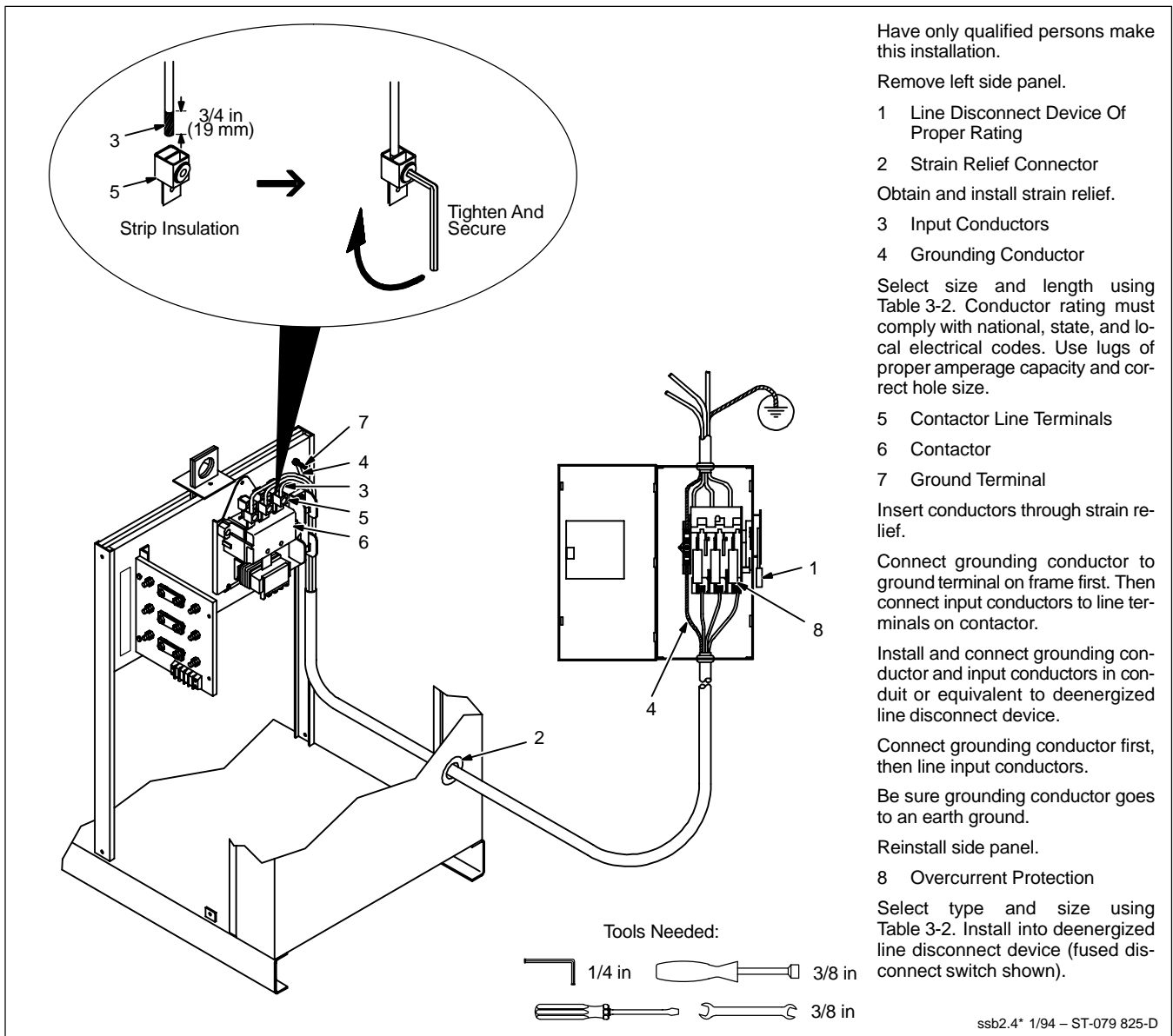


Figure 3-8. Input Power Connections

Table 3-2. Electrical Service Requirements*

	1000 Ampere Models			1500 Ampere Models		
	230	460	575	230	460	575
Input Voltage	230	460	575	230	460	575
Input Amperes At Rated Output	224	112	90	334	167	134
Recommended Standard Fuse Or Circuit Breaker Rating In Amperes¹	350	175	125	500	250	200
Input Conductor Size In AWG/Kcmil²	4/0	2	3	400	2/0	1/0
Maximum Input Conductor Length In Feet (Meters)³	205 (63)	297 (91)	377 (115)	211 (64)	373 (114)	498 (152)
Grounding Conductor Size In AWG/Kcmil⁴	3	6	6	2	4	6

* These values are calculated from the 1996 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).

SECTION 4 – OPERATION

 WARNING			
	ELECTRIC SHOCK can kill. <ul style="list-style-type: none"> 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. 		ARC RAYS can burn eyes and skin; NOISE can damage hearing. <ul style="list-style-type: none"> Wear welding helmet with correct shade of filter. Wear correct eye, ear, and body protection.
	FUMES AND GASES can be hazardous to your health. <ul style="list-style-type: none"> 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. 		MOVING PARTS can cause injury. <ul style="list-style-type: none"> Keep away from moving parts. Keep all doors, panels, covers, and guards closed and securely in place.
	WELDING can cause fire or explosion. <ul style="list-style-type: none"> 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. 		MAGNETIC FIELDS FROM HIGH CURRENTS can affect pacemaker operation. <ul style="list-style-type: none"> 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. <small>swarn6.1 10/91</small>	

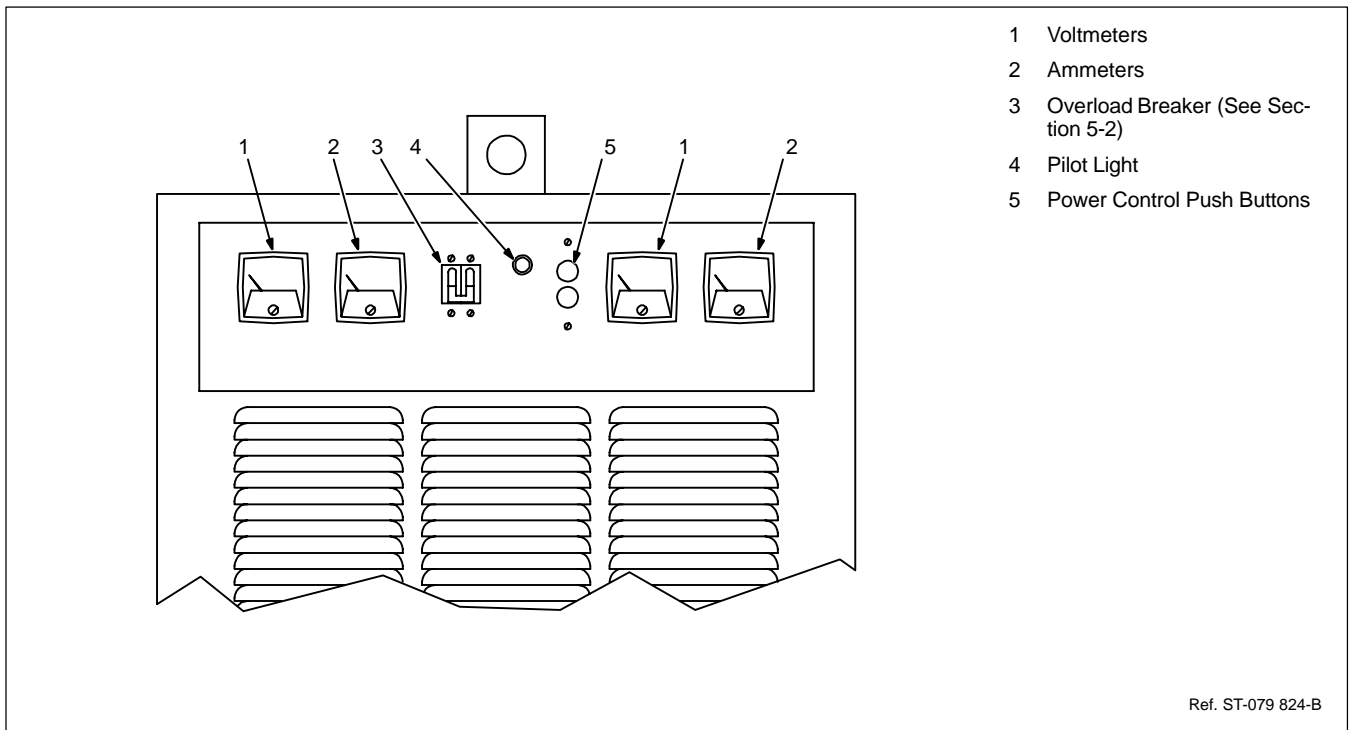


Figure 4-1. Controls

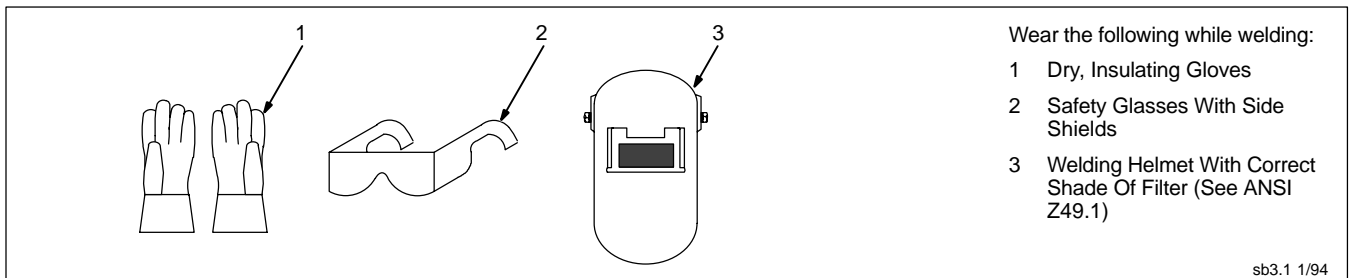


Figure 4-2. Safety Equipment

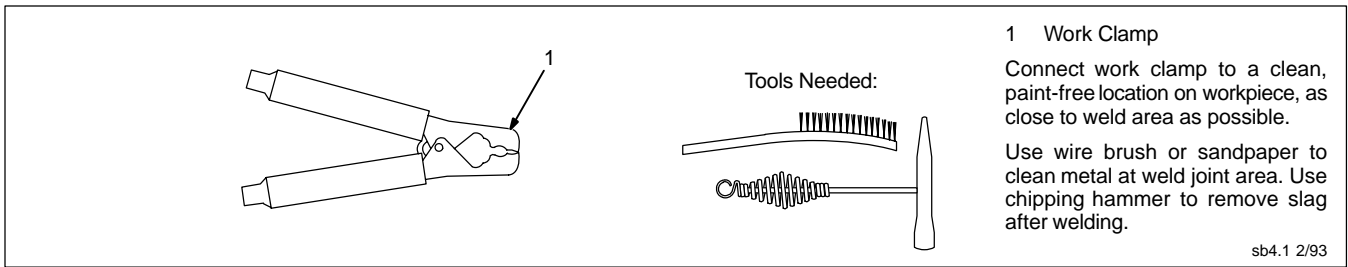


Figure 4-3. Work Clamp

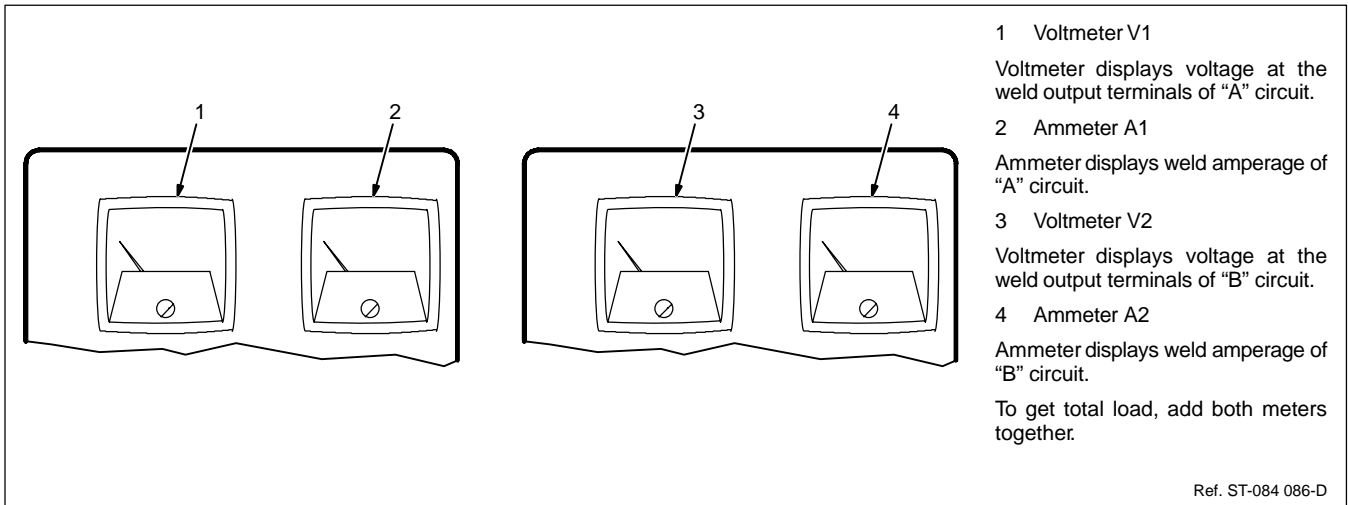


Figure 4-4. Voltmeter And Ammeter

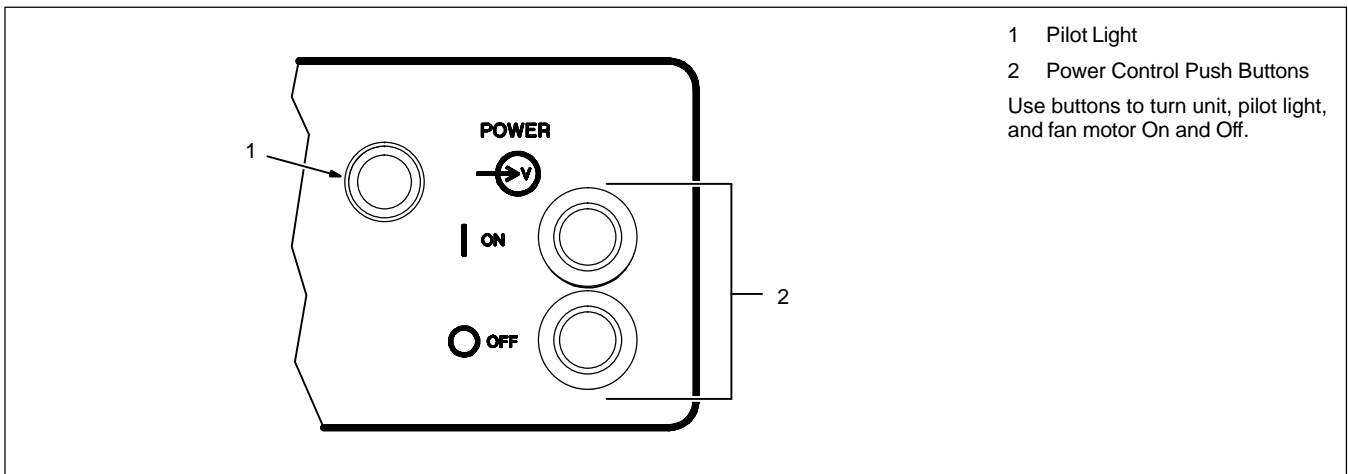


Figure 4-5. Power Control Push Buttons And Pilot Light

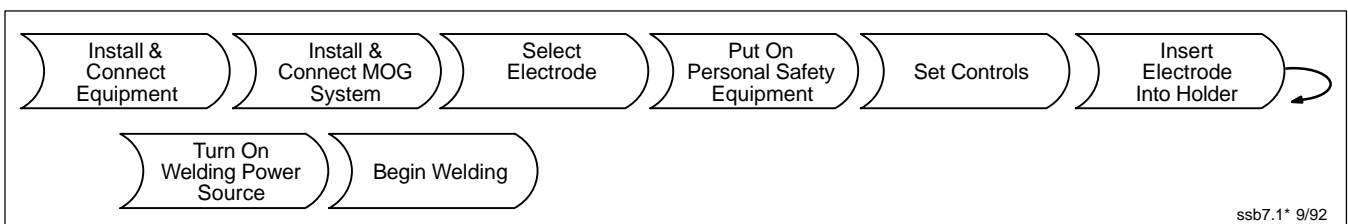
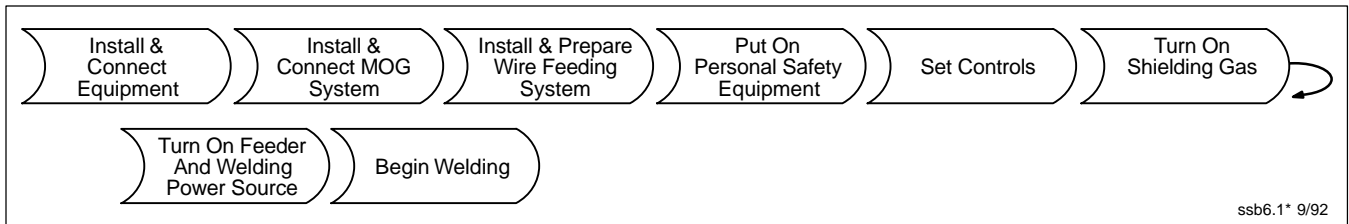


Figure 4-6. Sequence Of Shielded Metal Arc Welding (SMAW)



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Figure 4-7. Sequence Of Gas Metal Arc Welding (GMAW)

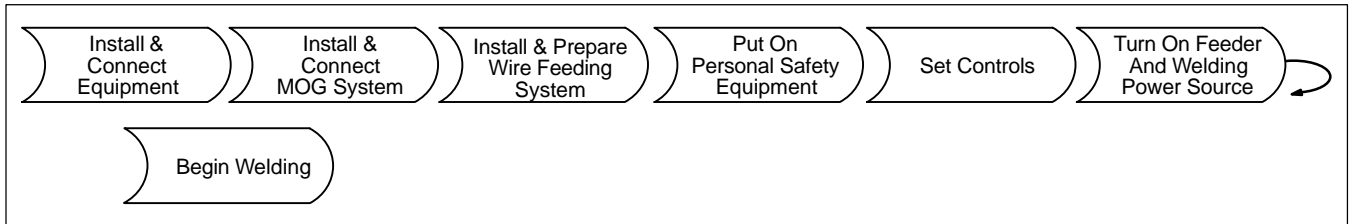
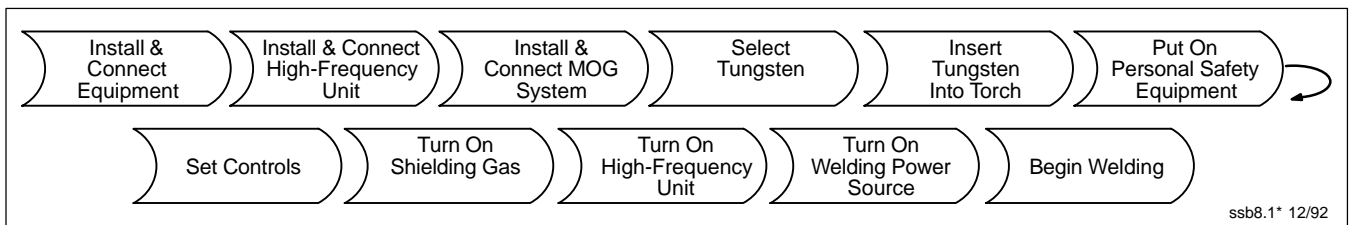


Figure 4-8. Sequence Of Flux Cored Arc Welding (FCAW)



ssb8.1* 12/92

Figure 4-9. Sequence Of Gas Tungsten Arc Welding (GTAW)

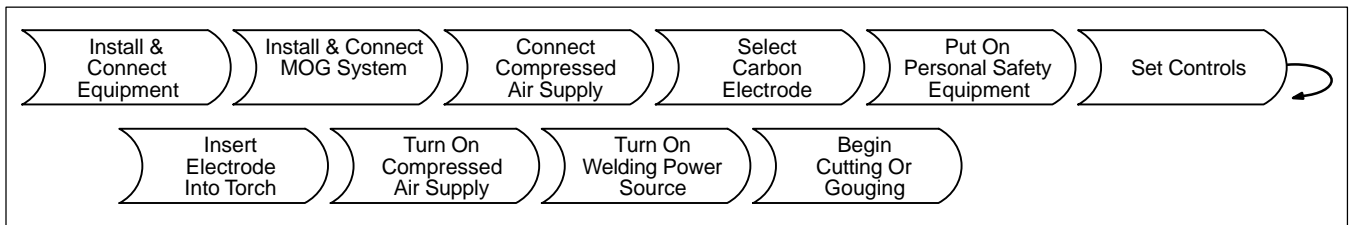


Figure 4-10. Sequence Of Air Carbon Arc Cutting And Gouging (CAC-A)

SECTION 5 – MAINTENANCE & TROUBLESHOOTING

⚠ WARNING		
	ELECTRIC SHOCK can kill. <ul style="list-style-type: none"> 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. <ul style="list-style-type: none"> Allow cooling period before maintaining or servicing. 	
		Maintenance to be performed only by qualified persons.
		swarn8.1 2/93

5-1. Routine Maintenance

3 Months

See Section 7

Replace Unreadable Labels

Tape Or Replace Cracked Cables

3-4

Clean And Tighten Weld Terminals

⚠ Turn Off all power before maintaining.

6 Months

OR

Blow Out Or Vacuum Inside

During Heavy Service, Clean Monthly

Fan Motor Sealed Bearings – No Oil Needed

ST-079 823-B

Figure 5-1. Maintenance

5-2. Overload Protection

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

A. Circuit Breaker CB

1 Circuit Breaker

Circuit breaker CB, labeled Overload, protects the welding power source output circuit from overload. If CB opens, weld output from the welding power source stops. Reduce welding load, and reset breaker.

Ref. ST-084 086-D

Figure 5-2. Circuit Breaker CB

B. Fuse F1

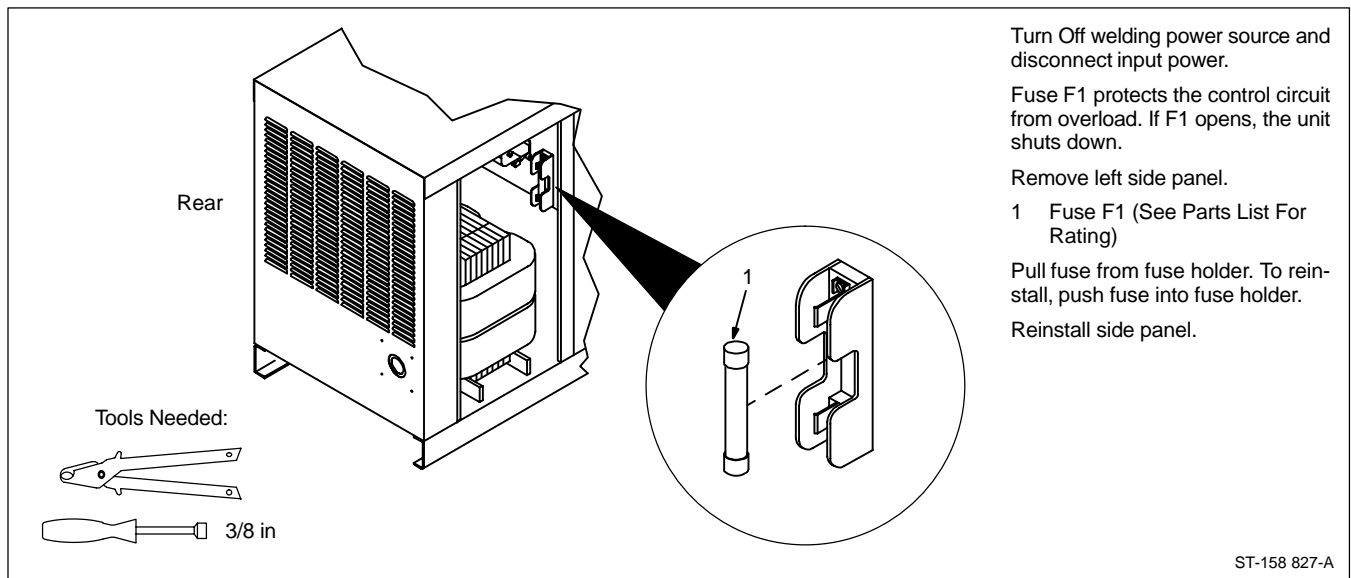


Figure 5-3. Fuse F1 Location

C. Overheating

NOTE

When unit overheats and thermostat opens, Power Control On push button will not operate until unit is cool and thermostat is closed.

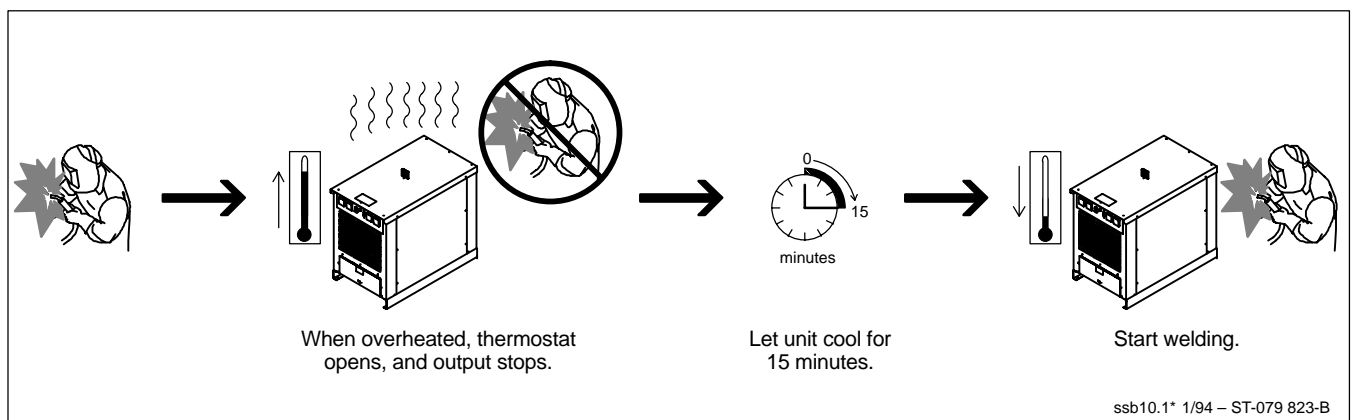


Figure 5-4. Overheating

5-3. Troubleshooting





 WARNING			
	<p>ELECTRIC SHOCK can kill.</p> <ul style="list-style-type: none"> Do not touch live electrical parts. Turn Off welding power source, and disconnect input power before inspecting, maintaining, or servicing. 		<p>MOVING PARTS can cause injury.</p> <ul style="list-style-type: none"> Keep away from moving parts.
	<p>HOT PARTS can cause severe burns.</p> <ul style="list-style-type: none"> Allow cooling period before servicing. 	<p>Troubleshooting to be performed only by qualified persons.</p>	
		swarn9.1 2/93	

Table 5-1. Welding Trouble

Trouble	Remedy	Section
<p>No weld output; unit completely inoperative; pilot light not on.</p>	Place line disconnect switch in the On position.	3-5C
	Check and replace open line fuses(s).	3-5C
	Press Power Control On button.	Figure 4-5
	Thermostat TP1 open; allow a cooling period of approximately fifteen minutes.	5-2C
	Reset Overload circuit breaker CB, if necessary.	5-2A
	Check and replace fuse F1, if necessary.	5-2B
<p>Weld output available; fan does not run.</p>	Check fan motor and replace, if necessary.	--
	Check for anything blocking fan blades.	--
<p>Limited output and low open-circuit voltage.</p>	Check and replace open line fuse(s).	3-5C
	Check for proper input voltage compensation bus bar position.	3-5B
	Check and replace contactor W, if necessary.	--
<p>Erratic or improper weld output.</p>	Select correct size weld cables according to Table 3-1.	--
	Check for proper jumper link position.	3-5
	Check for proper input voltage compensation bus bar position.	3-5B
	Clean and tighten weld cable connections.	5-1

SECTION 6 – ELECTRICAL DIAGRAMS

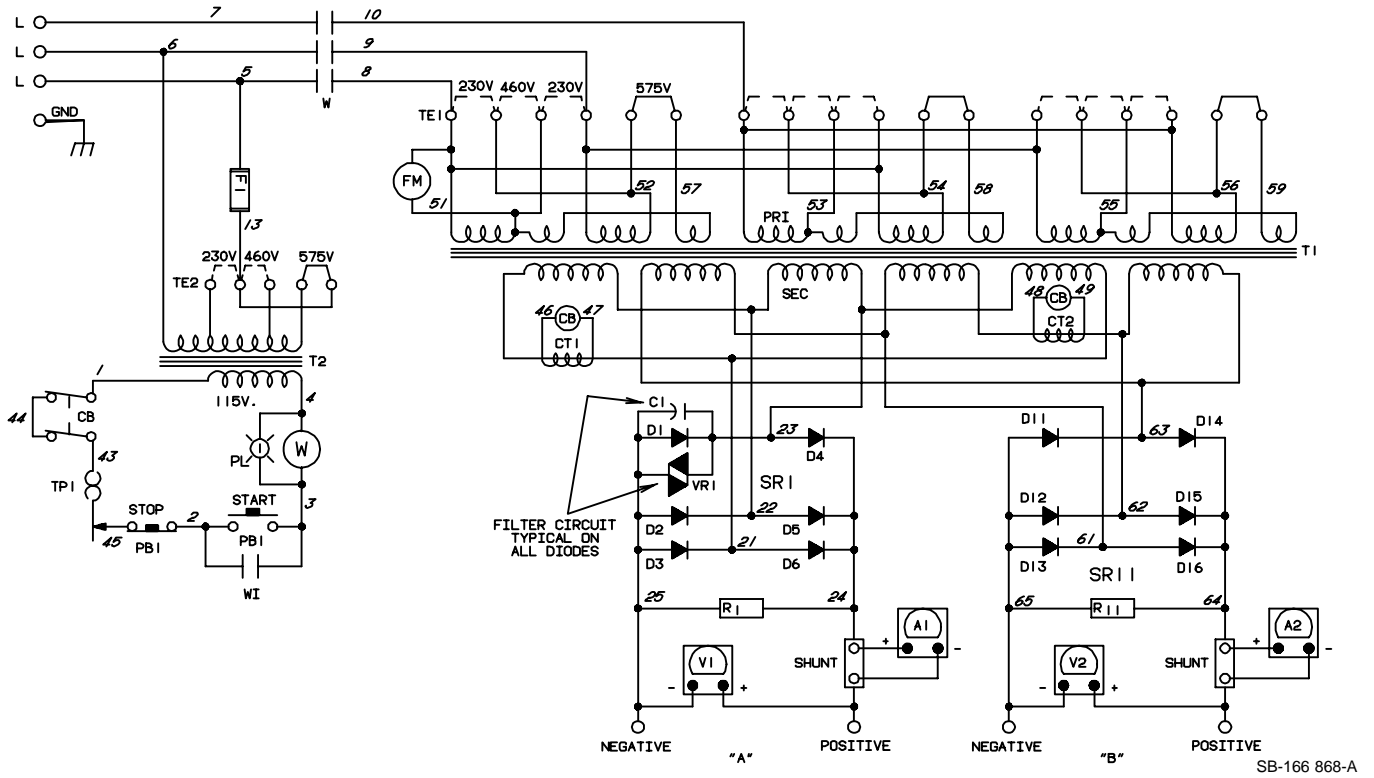


Figure 6-1. Circuit Diagram For 1000 Ampere Model Welding Power Source

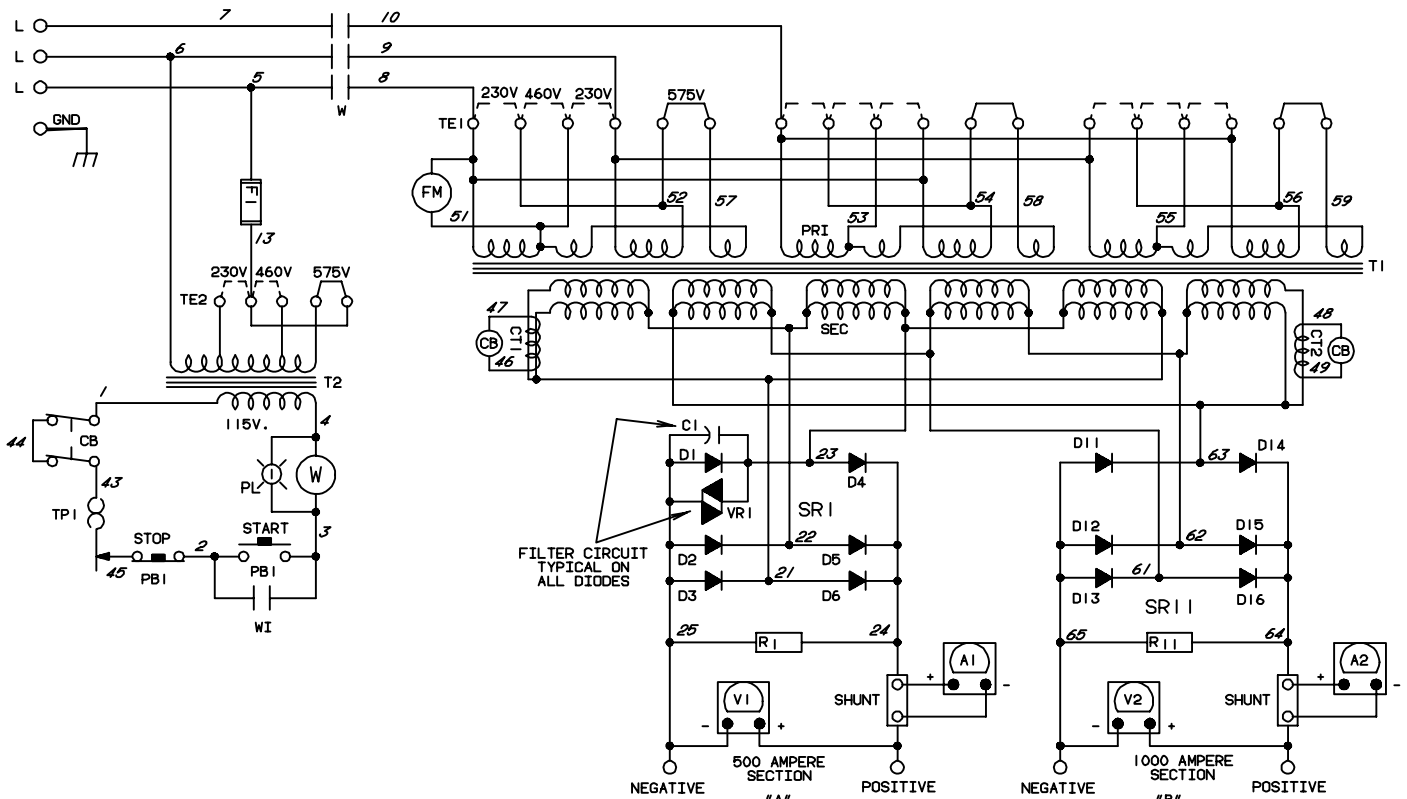
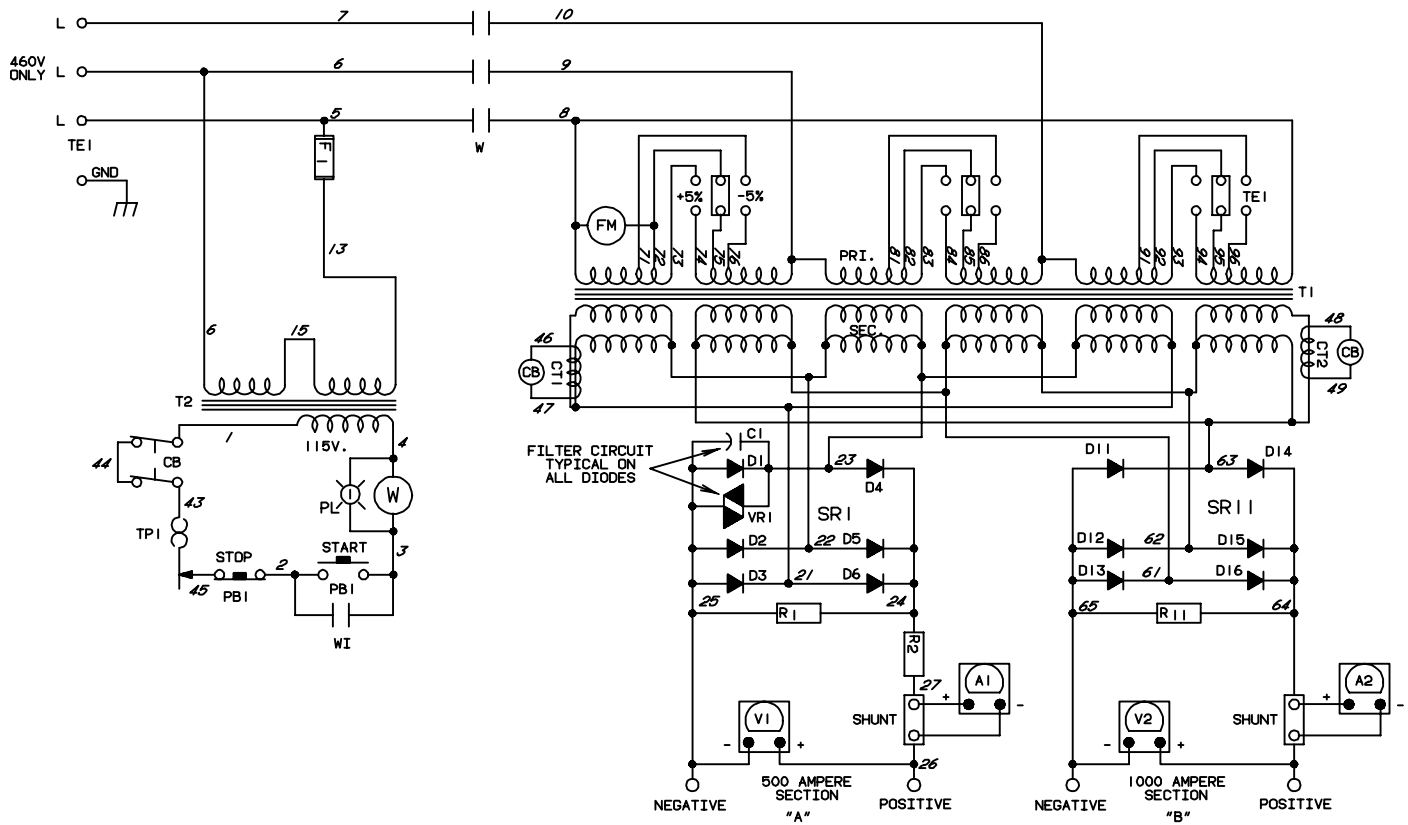


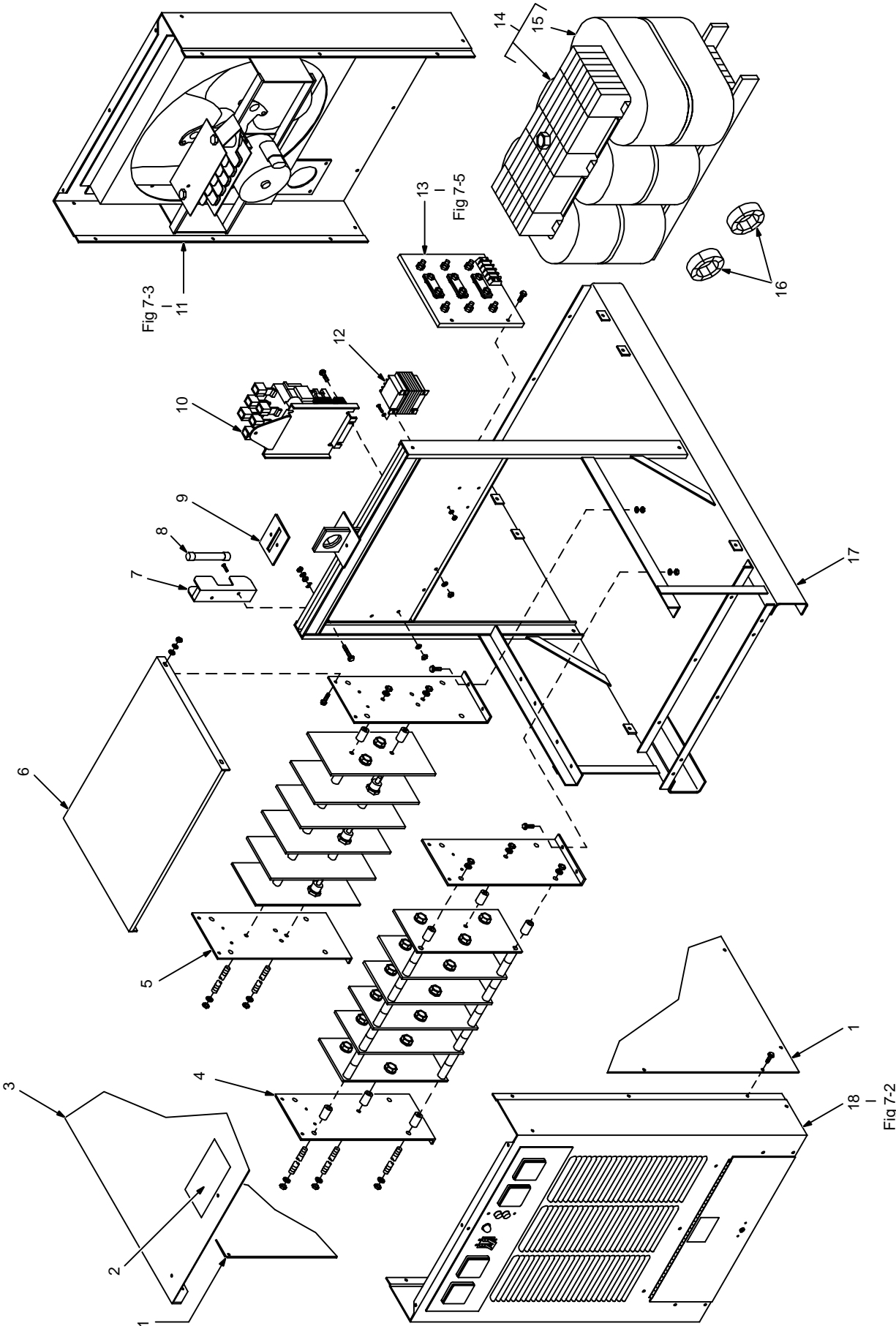
Figure 6-2. Circuit Diagram For 1500 Ampere Model Welding Power Source



SB-088 039-A

Figure 6-3. Circuit Diagram For 1500 Ampere Model Welding Power Source With Voltage Compensation

SECTION 7 – PARTS LIST



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Figure 7-1. Main Assembly (1500 Model Illustrated)

Item No.	Dia. Mkgs.	Part No.	Description	Quantity		
				1000	1500A	1500V
Figure 7-1. Main Assembly						
1		120 495	PANEL, side	2	2	2
2		134 327	LABEL, warning general precautionary	1	1	1
3		+070 555	COVER, top	1	1	1
		109 035	LABEL, warning electric shock can kill	1	1	1
4	SR11	045 586	RECTIFIER, si diode (consisting of)	1	1	1
	C11-16	031 689	CAPACITOR, rectifier	6	6	6
	D11-16	037 157	DIODE, rect 275A 250V SP	18	18	18
	R11	026 036	RESISTOR, WW fxd 5W 2K ohm	1	1	1
	VR11-16	035 227	VARISTOR, 8 joule 150V	6	6	6
5	SR1,11	079 827	RECTIFIER, si diode (consisting of)	2		
5	SR1	079 827	RECTIFIER, si diode (consisting of)	1	1	1
	C1-6,11-16	031 689	CAPACITOR, rectifier	6		
	C1-6	031 689	CAPACITOR, rectifier	6	6	6
	D1-6,11-16	037 157	DIODE, rect 275A 250V SP	12		
	D1-6	037 157	DIODE, rect 275A 250V SP	12	12	12
	R1,11	026 036	RESISTOR, WW fxd 5W 2K ohm	1		
	R1	026 036	RESISTOR, WW fxd 5W 2K ohm	1	1	1
	VR1-6,11-16	035 227	VARISTOR, 8 joule 150V	6		
	VR1-6	035 227	VARISTOR, 8 joule 150V	6	6	6
6		059 563	BAFFLE, air top rect	1	1	1
7		070 404	HOLDER, fuse crtg 30A 600V 1P	1	1	1
8	F1	*012 639	FUSE, crtg 6A 600V (230/460/575)	1	1	1
8	F1	*088 384	FUSE, crtg 1A 600V			1
9		026 627	GASKET, lifting eye cover	1		1
10	W	099 044	CONTACTOR, size 3-1/2 3P 110-120/220-240VAC (consisting of)	1		1
		048 599	COIL, cntor 115/230V size 3-1/2	1		1
	WI	048 731	INTERLOCK, cntor NO size 3-1/2	1		1
10	W	004 104	CONTACTOR, def prp 210A 3P 120/240VAC (consisting of)	1		1
		004 259	COIL, cntor 120VAC	1		1
11		Fig 7-3	PANEL, rear w/components	1	1	1
12	T2	090 473	TRANSFORMER, kVA 1/2 115-230/460/575	1	1	1
12	T2	036 630	TRANSFORMER, control 100VA 230/460V			1
13	TE1	038 841	TERMINAL, pri (230/460/575) (Fig 7-5)	1	1	1
13	TE1	044 098	TERMINAL, pri (Fig 7-5)			1
14	T1	092 772	TRANSFORMER, pwr main 460/575 (consisting of)	1		
14	T1	092 787	TRANSFORMER, pwr main 460/575 (consisting of)		1	
14	T1	092 788	TRANSFORMER, pwr main 460 (consisting of)			1
15		092 303	COIL, pri/sec 460/575	6		
15		130 162	COIL, pri/sec 460/575		6	
15		130 164	COIL, pri/sec 460			6
	TP1	026 181	THERMOSTAT, NC	6	6	6
16	CT1,2	080 075	TRANSFORMER, current 310/5	2	2	2
17		070 644	BASE	1	1	1
18		Fig 7-2	PANEL, front w/components	1	1	1
		079 917	LABEL, caution if the positive output etc	1	1	1

+When ordering a component originally displaying a precautionary label, the label should also be ordered.

*Recommended Spare Parts.

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

Item No.	Dia. Mkgs.	Part No.	Description	Quantity		
				1000	1500A	1500V

Figure 7-2. Panel, Front w/Components (Fig 7-1 Item 18)

1			NAMEPLATE, (order by model and serial number)	1	1	1
2		+070 556	PANEL, front (Eff w/JB491570)	1	1	1
3	CB	034 945	CIRCUIT BREAKER, man reset 2P 5A 240VAC	1	1	1
4	PB1	011 636	SWITCH, PB start-stop 10A 550VAC	1	1	1
5	Shunt	079 388	SHUNT, meter 50MV 800A	2	1	1
6	Shunt	072 425	SHUNT, meter 50MV 1500A	1	1	1
7		Fig 7-4	BRACKET & TERMINAL BOARD	1	1	1
8		605 583	CATCH, spring loaded door	1	1	1
9		105 630	LABEL, electric shock can kill	1	1	1
10	A1,2	059 118	METER, amp dc 50MV 0-800 scale	2		
10	A2	044 104	METER, amp dc 50MV 0-1.5K scale	1		1
11	V1,2	025 638	METER, volts dc 0-100 scale	2	2	2
12		027 631	HOUSING, light ind slide base 125V	1	1	1
13	PL1	*027 629	BULB, incand slide base 120V	1	1	1
14		027 628	LENS, light ind red clear	1	1	1
15	A1	059 118	METER, amp dc 50MV 0-800 scale	1		1

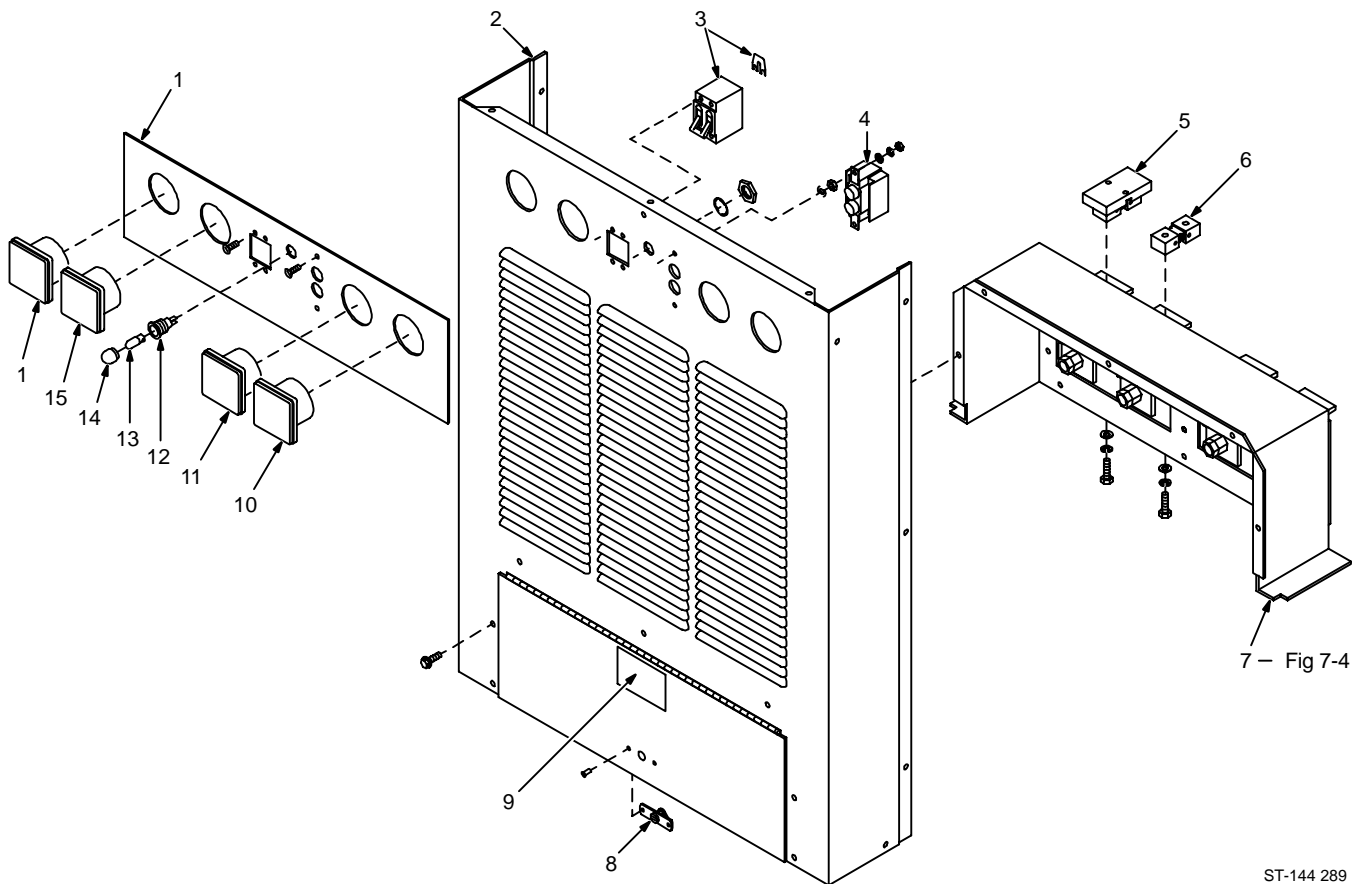


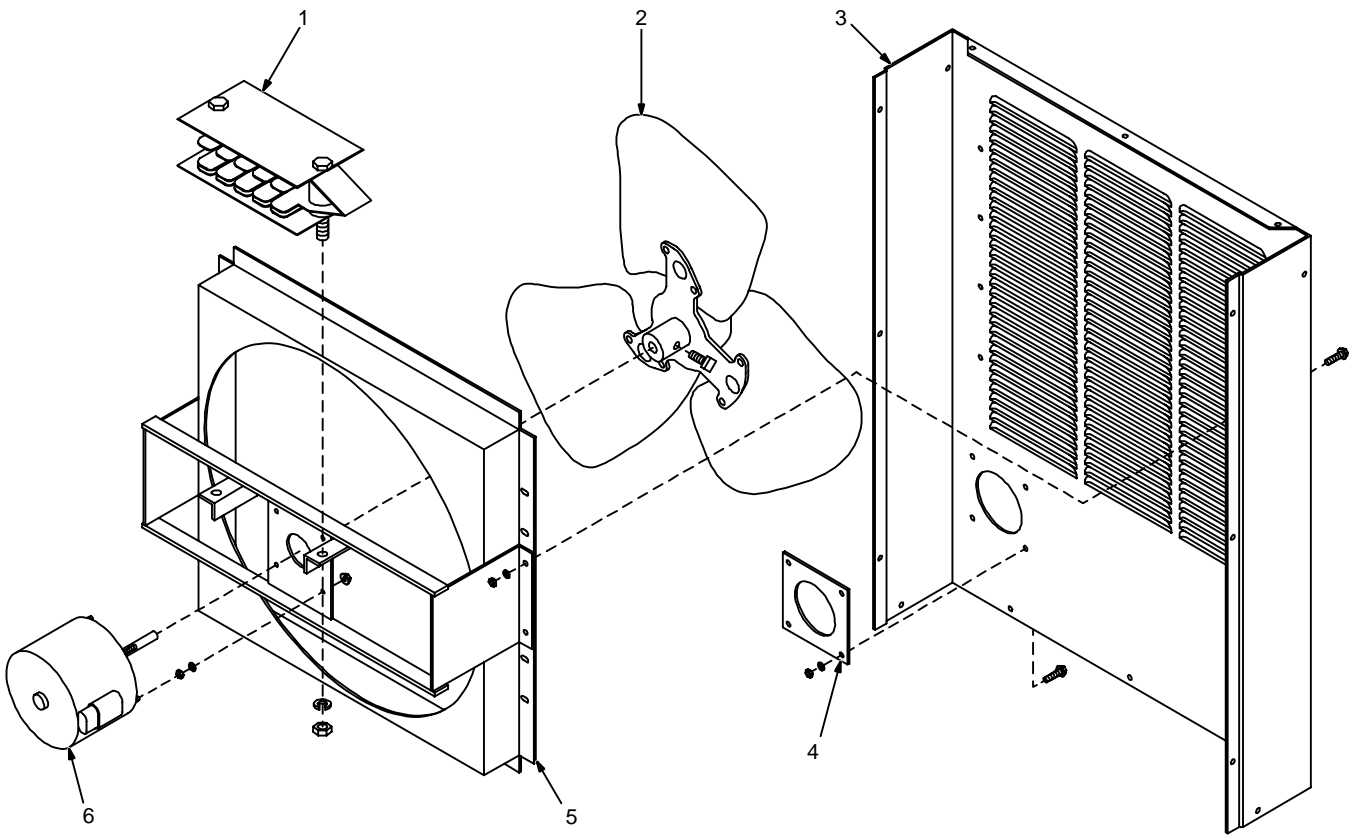
Figure 7-2. Panel, Front w/Components (1500 Model Illustrated)

+When ordering a component originally displaying a precautionary label, the label should also be ordered.

*Recommended Spare Parts.

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

Item No.	Dia. Mkgs.	Part No.	Description	Quantity		
				1000	1500A	1500V
Figure 7-3. Panel, Rear w/Components (Fig 7-1 Item 11)						
1	R2	083 640	RESISTOR, grid	1	1	1
2		032 616	BLADE, fan 20 in 3wg 21deg .500 bore CW	1	1	1
3		070 558	PANEL, rear	1	1	1
4		120 496	PLATE, adapter pwr cord	1	1	1
5		059 585	WIND TUNNEL, 20 in	1		
5		083 637	WIND TUNNEL, 20 in	1	1	1
6	FM	032 605	MOTOR, cap perm SP 1/4hp 230VAC 1625rpm	1	1	1



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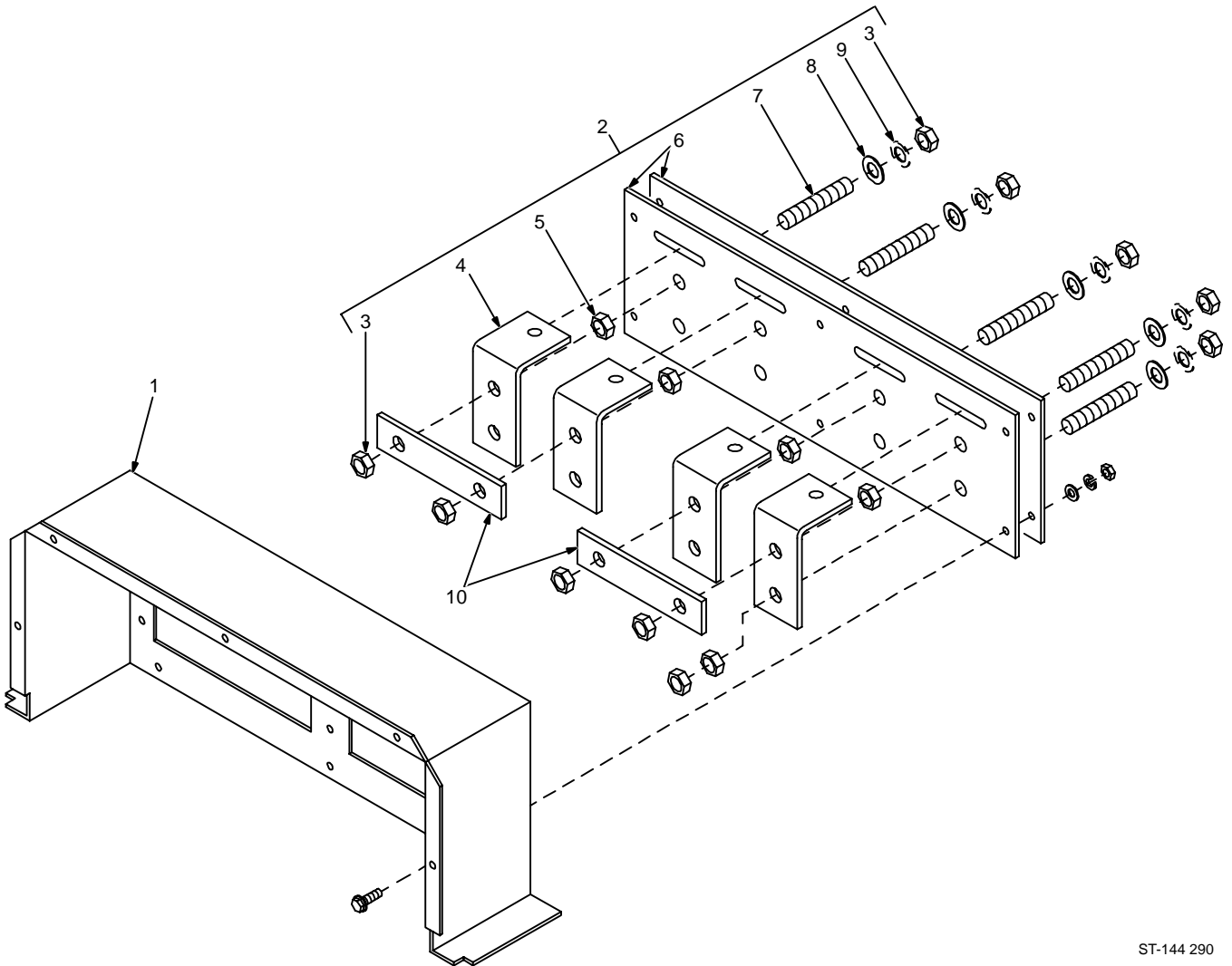
Figure 7-3. Panel, Rear w/Components (1500 Model Illustrated)

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

Item No.	Part No.	Description	Quantity
----------	----------	-------------	----------

Figure 7-4. Bracket & Terminal Board (Fig 7-2 Item 7)

...	1	059 616	BRACKET, mtg term assembly pwr output	1
...	2	059 567	TERMINAL, pwr output (consisting of)	1
...	3	601 841	NUT, brs hex jam .625-11	16
...	4	038 032	BUS BAR, neg and pos sec	4
...	5	601 842	NUT, brs hex full .625-11	8
...	6	059 566	TERMINAL BOARD, pwr output	2
...	7	038 909	STUD, brs .625-11 x 3.000	8
...	8	602 249	WASHER, flat stl SAE .625	8
...	9	602 219	WASHER, lock stl external tooth .625	8
...	10	059 983	BUS BAR, jumper secondary	2

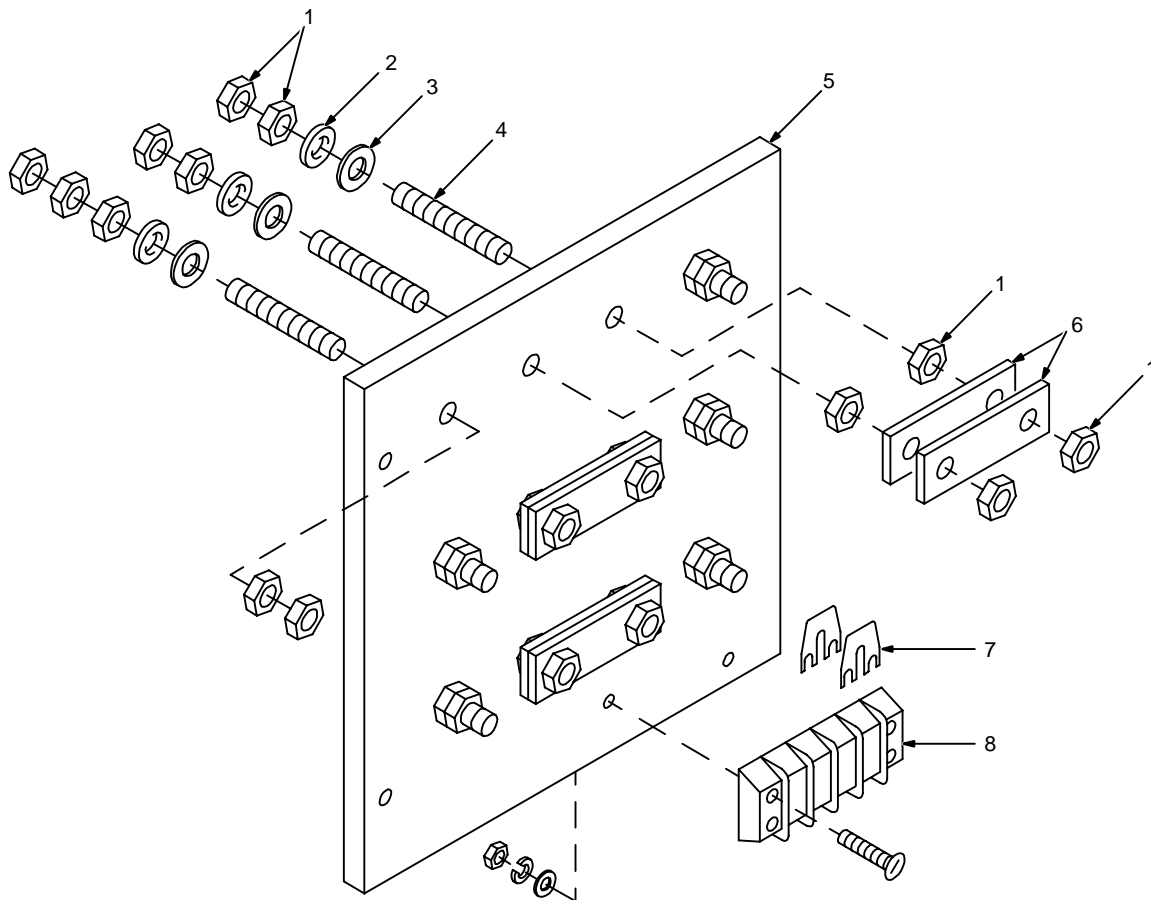


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Figure 7-4. Bracket & Terminal Board

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

Item No.	Dia. Mkgs.	Part No.	Description	Quantity
Figure 7-5. Terminal, Primary (Fig 7-1 Item 13)				038 841 044 098
1		601 838	NUT, brs hex .375-16 jam	48 42
2		602 221	WASHER, lock stl internal tooth .375	18 18
3		010 910	WASHER, flat stl SAE .375	18 18
4		038 804	STUD, brs .375-16 x 2.500	18 18
5		038 980	TERMINAL BOARD, pri	1 1
6		038 898	LINK, term connecting	6 3
7		038 620	LINK, jumper term blk 30A	1 1
8	TE2	038 622	BLOCK, term 30A 5P	1 1



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Figure 7-5. Terminal, Primary

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

TRUE BLUE® WARRANTY

Effective January 1, 2000

(Equipment with a serial number preface of "LA" or newer)

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

Warranty Questions?

Call
1-800-4-A-MILLER
for your local
Miller distributor.

Your distributor also gives
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You always get the fast,
reliable response you
need. Most replacement
parts can be in your
hands in 24 hours.

Support

Need fast answers to the
tough welding questions?
Contact your distributor.
The expertise of the
distributor and Miller is
there to help you, every
step of the way.

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

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

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

1. 5 Years Parts – 3 Years Labor
 - * Original main power rectifiers
 - * Inverters (input and output rectifiers only)
2. 3 Years — Parts and Labor
 - * Transformer/Rectifier Power Sources
 - * Plasma Arc Cutting Power Sources
 - * Semi-Automatic and Automatic Wire Feeders
 - * Inverter Power Supplies
 - * Intelligig
 - * Engine Driven Welding Generators
(NOTE: Engines are warranted separately by the engine manufacturer.)
3. 1 Year — Parts and Labor
 - * DS-2 Wire Feeder
 - * Motor Driven Guns (w/exception of Spoolmate 185 & Spoolmate 250)
 - * Process Controllers
 - * Positioners and Controllers
 - * Automatic Motion Devices
 - * RFCS Foot Controls
 - * Induction Heating Power Sources
 - * Water Coolant Systems
 - * HF Units
 - * Grids
 - * Maxstar 140
 - * Spot Welders
 - * Load Banks
 - * Miller Cyclomatic Equipment
 - * Running Gear/Trailers
 - * Plasma Cutting Torches (except APT & SAF Models)
 - * 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.)
4. 6 Months — Batteries
5. 90 Days — Parts
 - * MIG Guns/TIG Torches
 - * Induction Heating Coils and Blankets

- * APT, ZIPCUT & PLAZCUT Model Plasma Cutting Torches
- * Remote Controls
- * Accessory Kits
- * Replacement Parts (No labor)
- * Spoolmate 185 & Spoolmate 250
- * Canvas Covers

Miller's True Blue® Limited Warranty shall not apply to:

1. **Consumable components; such as contact tips, cutting nozzles, contactors, brushes, slip rings, relays or parts that fail due to normal wear.**
2. 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.
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.





Owner's Record

Please complete and retain with your personal records.

Model Name Serial/Style Number

Purchase Date (Date which equipment was delivered to original customer.)

Distributor

Address

City

State Zip



For Service

Call 1-800-4-A-Miller or see our website at www.MillerWelds.com to locate a DISTRIBUTOR or SERVICE AGENCY near you.

Always provide Model Name and Serial/Style Number.

Contact your Distributor for:

- Welding Supplies and Consumables
- Options and Accessories
- Personal Safety Equipment
- Service and Repair
- Replacement Parts
- Training (Schools, Videos, Books)
- Technical Manuals (Servicing Information and Parts)
- Circuit Diagrams
- Welding Process Handbooks

Contact the Delivering Carrier for:

File a claim for loss or damage during shipment.

For assistance in filing or settling claims, contact your distributor and/or equipment manufacturer's Transportation Department.

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