OM-884 117 005G
February 2000

Processes

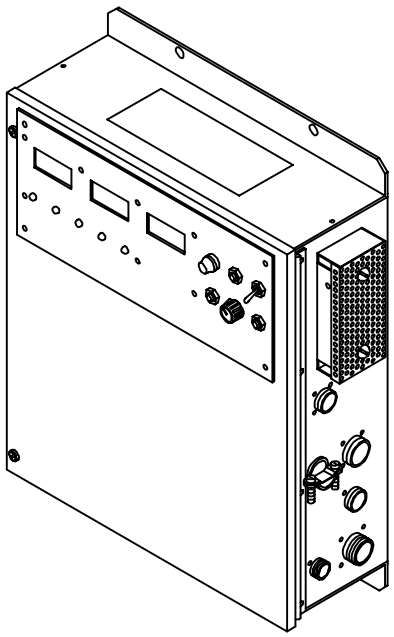
Automatic Welding

Description

DC CV 3 Phase

Automatic Welding Interface

A.B.B. Robot Interface Gas Control Hub And Spindle



OWNER'S MANUAL

Visit our website at
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.

ISO 9001 REGISTERED QUALITY SYSTEM

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

TRUE BLUE® WARRANTY

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.

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.**

Miller® The Power of Blue.

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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.

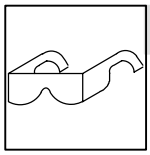
Arc rays from the welding process produce intense visible and invisible (ultraviolet and infrared) rays that can burn eyes and skin. Sparks fly off from the weld.

- 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.

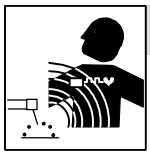
- Welding, chipping, wire brushing, and grinding cause sparks and flying metal. As welds cool, they can throw off slag.
- Wear approved safety glasses with side shields even under your welding helmet.

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.

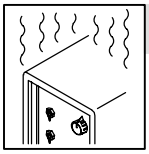
1-3. Additional Symbols For Installation, Operation, And Maintenance

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.

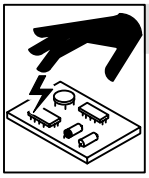
FALLING UNIT can cause injury.

- 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.

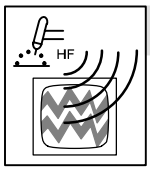
- Keep away from moving parts.
- Keep away from pinch points such as drive rolls.

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.

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.



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 àcourant électrique dans les zones humides, dans les endroits confinés ou là où on risque de tomber.
- Se servir d'une source électrique àcourant électrique UNIQUEMENT si le procédé de soudage le demande.
- Si l'utilisation d'une source électrique àcourant 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. Entretenir 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 dégraisseurs.
- 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.

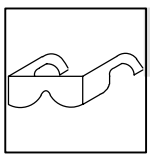
Le rayonnement de l'arc du procédé de soudage génère des rayons visibles et invisibles intenses (ultraviolets et infrarouges) susceptibles de provoquer des brûlures dans les yeux et sur la peau. Des étincelles sont projetées pendant le soudage.

- 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 sondre 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 dégeler des conduites gelées.
- En cas de non utilisation, enlever la baguette 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.

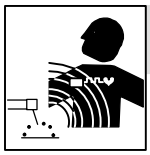
- Le soudage, l'écaillement, le passage de la pièce à la brosse en fil de fer, et le meulage génèrent des étincelles et des particules métalliques volantes. Pendant la période de refroidissement des soudures, elles risquent de projeter du laitier.
- Porter des lunettes de sécurité avec écrans latéraux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

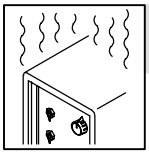
1-3. Dangers supplémentaires en relation avec l'installation, le fonctionnement et la maintenance

Risque D'INCENDIE OU D'EXPLOSION.

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

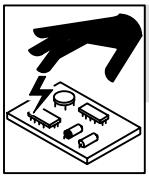
LA CHUTE DE L'APPAREIL peut blesser.

- 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 recommancer 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 imprimes.

DES ORGANES MOBILES peuvent provoquer des blessures.

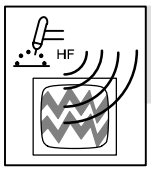
- Ne pas s'approcher des organes mobiles.
- Ne pas s'approcher des points de coincement tels que des rouleaux de commande.

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 frequence 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 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 Sandards, 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 ensembles 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 – INSTALLATION

2-1. Specifications

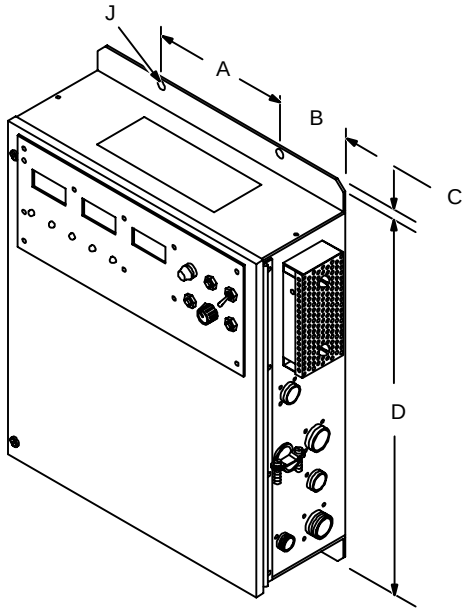
Component	Dimensions			Weight	
	Height	Width	Depth	Net	Ship
Robot Interface	22-1/2 in. (572 mm)	16-1/2 in.♦ (419 mm)	6-1/4 in.* (159 mm)	38 lbs. (17 kg)	Total 61 lbs. (27.7 kg)
Gas/Current Sensing Control	4-1/2 in. (108 mm)	5-1/2 in. (140 mm)	10-1/2 in. (267 mm)	5 lbs. (2.3 kg)	
Spool Support Assembly+	13-3/4 in. (349 mm)	8-3/4 in. (222 mm)	8-1/2 in. (216 mm)	6 lbs. (2.7 kg)	

♦ Add 2-1/4 in. (57 mm) for brake resistor.

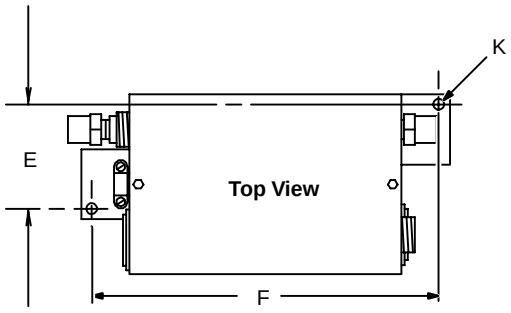
*Add 7/8 in. (22 mm) for front panel knob.

+Spool Support without optional wire reel.

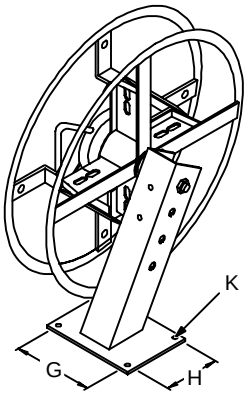
2-2. Mounting Hole Layout



Robot Interface



Gas Control

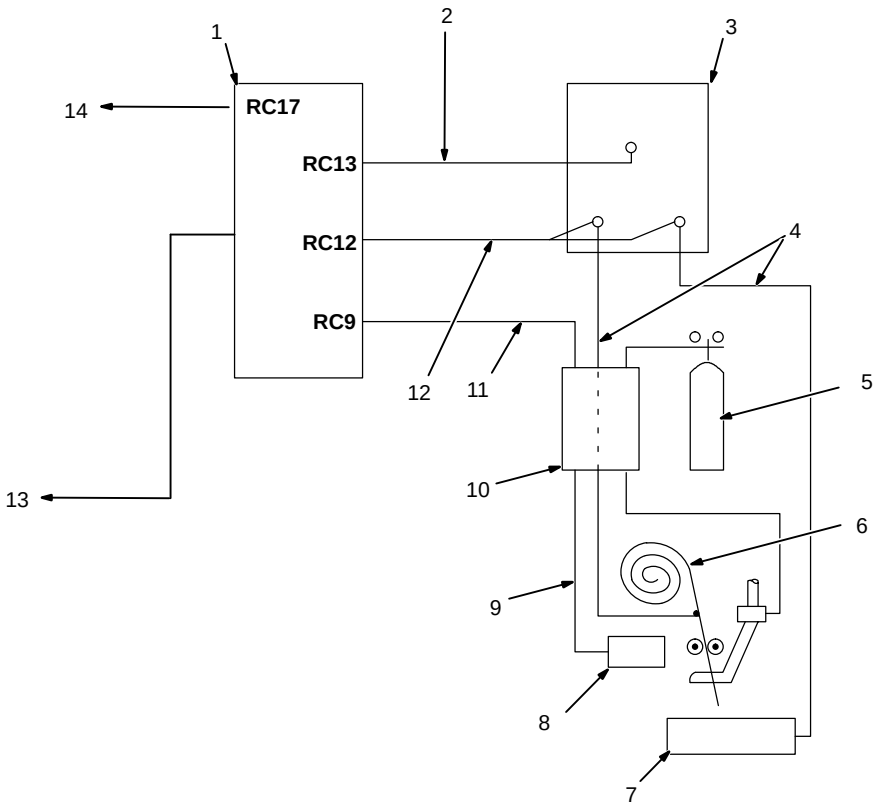


Spool Support Assembly
(Shown With Optional Wire Reel)

	Inches	Millimeters
A	8	203
B	4-1/4	108
C	1/2	13
D	21-1/2	546
E	2-7/8	73
F	9-7/8	251
G	3-1/2	89
H	2-1/2	64
J	1/2 Dia. 4 Holes	13 Dia. 4 Holes
K	5/16 Dia. 4 Holes	7.9 Dia. 4 Holes

ST-119 644-B / ST-110 320-A / ST-080486-C

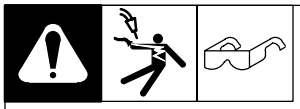
2-3. Connection Diagram

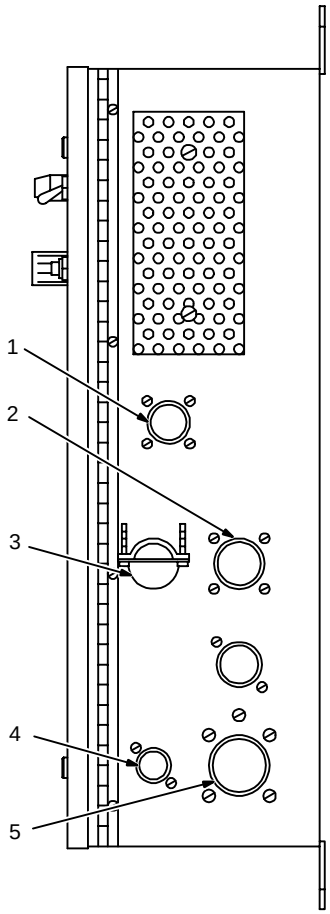


1 Robot Interface
2 115 Volts AC/Contactor And Output Control Cord
3 Welding Power Source
4 Weld Cables
5 Shielding Gas Supply
6 Electrode (Welding Wire)
7 Work
8 Wire Drive Assembly
9 Motor Control Cord
10 Gas Control
11 Gas Control Cord
12 Arc Sensing Cord
13 Arc Failure Connection Inside Robot Control Unit
14 Robot Interface Connections To Robot Control Unit

Ref. S-0290

2-4. Robot Interface Connections





1 Gas Control Receptacle RC9
2 115 Volts AC/Contactor Control Receptacle RC13 (See Section 2-8)

Locate 115 volts ac/contactor control cord, and connect 14-socket plug to receptacle RC13 on robot interface. To make connection, align keyway, insert plug, and tighten threaded collar.

Connect remaining end of cord to Remote 14 receptacle on welding power source.

Place welding power source Voltage switch in Remote 14 position.

3 Strain Relief
4 Arc Sensing Receptacle RC12 (See Section 2-7)
5 Welding Power Source Interface Receptacle RC17 (See Section 2-9)

Obtain proper cord and 24-pin Amphenol plug.

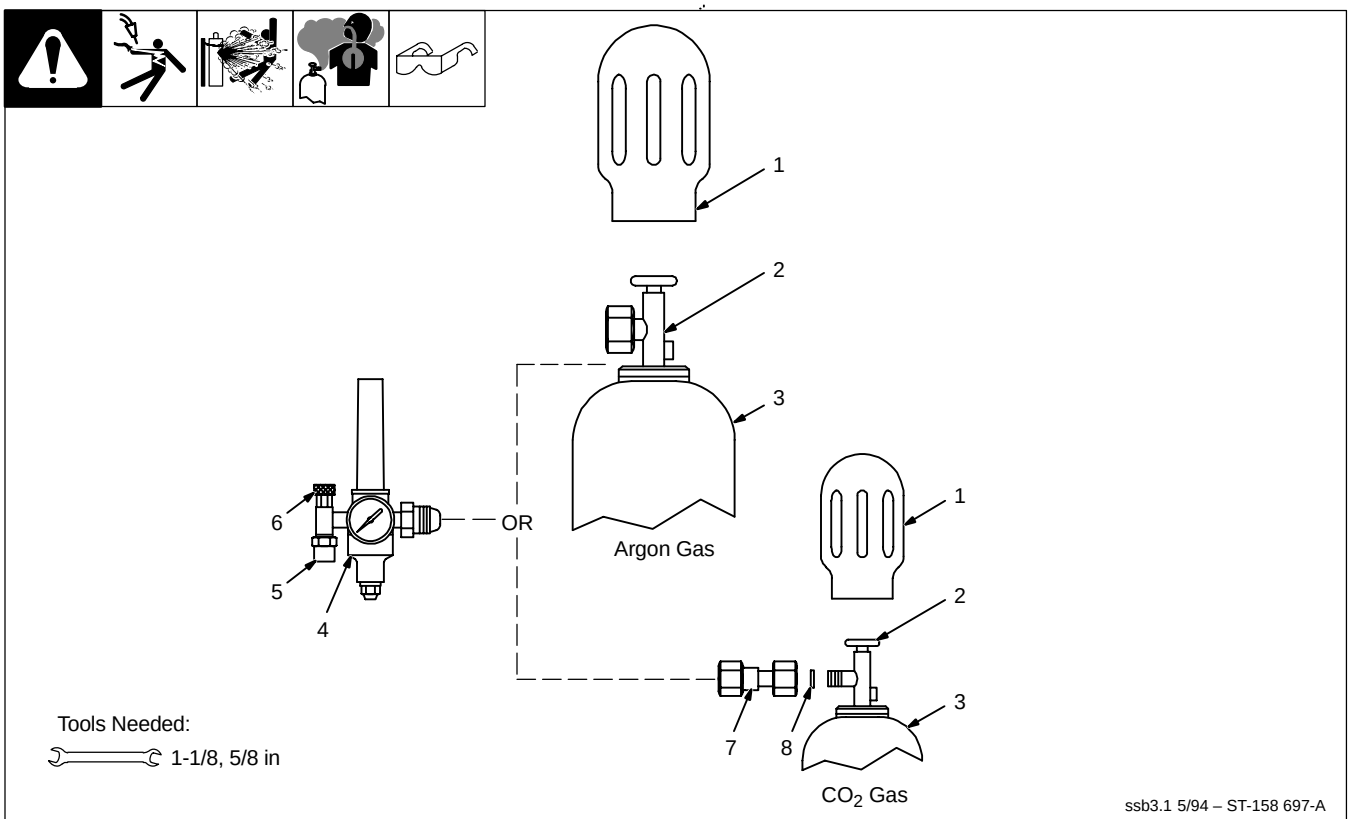
Connect conductors at one end of cord to appropriate sockets in plug.

Connect plug to RC17 on robot interface. To make connection, align keyway, insert plug, and tighten threaded collar.

Route and connect conductors at remaining end of cord to robot control unit.

ST-119 646-B

2-5. Shielding Gas Connection To Regulator/Flowmeter



Tools Needed:

1-1/8, 5/8 in

ssb3.1 5/94 – ST-158 697-A

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

1 Cap

2 Cylinder Valve

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

3 Cylinder

4 Regulator/Flowmeter

Install so face is vertical.

5 Gas Hose Connection

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

6 Flow Adjust

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

Make sure flow adjust is closed when opening cylinder to avoid damage to the flowmeter.

7 CO_2 Adapter

8 O-Ring

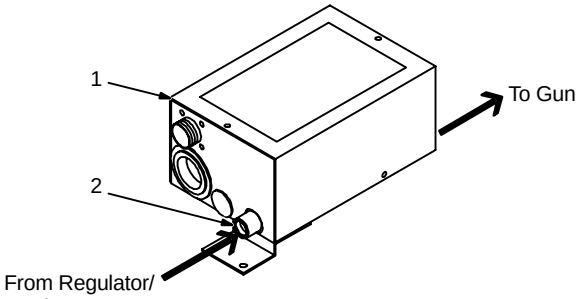
Install adapter with O-ring between regulator/flowmeter and CO_2 cylinder.

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

2-6. Shielding Gas Connections To Gas Control

1 Gas Control

2 Shielding Gas Valve Fitting

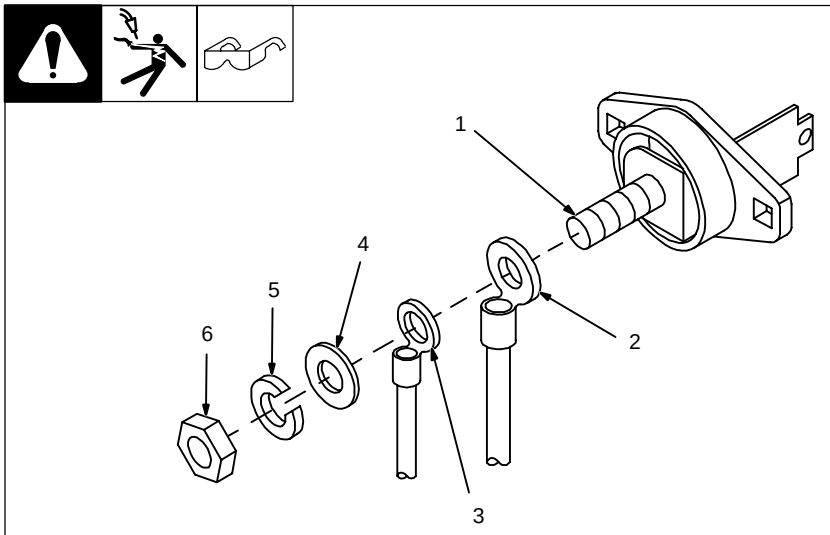


Tools Needed:

5/8 in

ST-080 485-A

2-7. Arc Sensing Connections



Locate arc sensing cord, and connect 4-socket plug to receptacle RC12 on robot interface. To make connection, align keyway, insert plug, and tighten threaded collar.

1 Positive Weld Output Terminal On Welding Power Source

2 Weld Cable Lug Location

3 Arc Sensing Lead Ring Terminal Location

Connect lead with ring terminal to welding power source Positive (+) weld output terminal as shown.

4 Flat Washer

5 Lock Washer

6 Nut

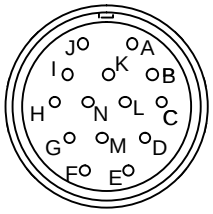
Connect lead with clamp to welding power source Negative (–) weld output terminal.

Tools Needed:

3/4 in

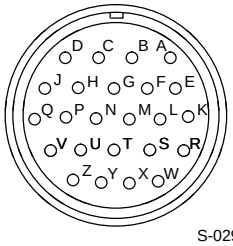
ST-121 083-A

2-8. 14-Pin Receptacle RC13 Information

REMOTE 14	Pin*	Pin Information
	I	115 volts ac with respect to socket G. Protected by fuse F1.
	J	Contact closure to I completes 115 volts ac contactor control circuit.
	G	Circuit common for 115 volts AC circuit.
	C	+10 volts dc input to voltage control with respect to socket D.
	D	Remote control circuit common.
	E	0 to +10 volts dc output command signal to welding power source.
	K	Chassis common.

*The remaining pins are not used.

2-9. 24-Socket Receptacle RC17 Information

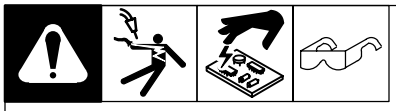


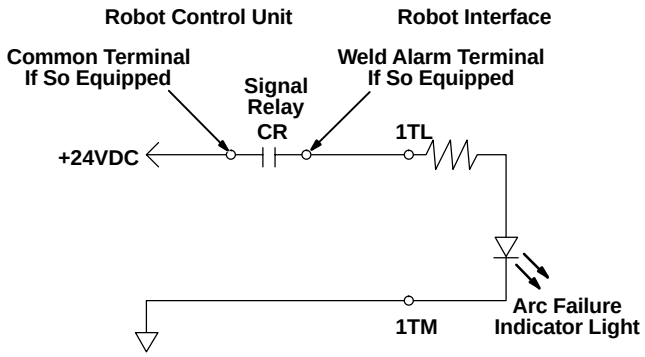
S-0291

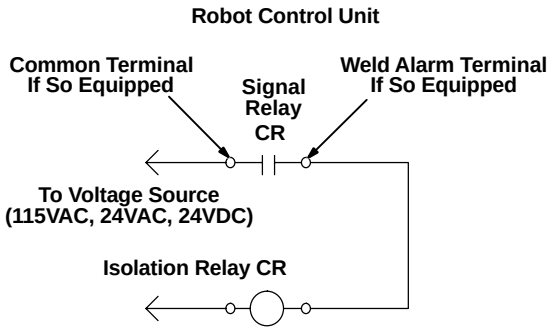
Socket*	Socket Information
A	Provides connection to 2TA; for customer use.
B	Current Detect output to robot control unit with respect to Socket D; isolated CR1 contacts rated 1A at 120 VAC.
D	Current Detect output to robot control unit with respect to Socket B; isolated CR1 contacts rated 1A at 120 VAC.
E	Contactor Control; +24 volts dc input from robot control unit with respect to Socket J (Circuit Common).
F	Jog Forward; +24 volts dc input from robot control unit with respect to Socket J (Circuit Common).
G	Gas Control; +24 volts dc input from robot control unit with respect to Socket J (Circuit Common).
H	Wire Stick Check; +24 volts dc input from robot control unit with respect to Socket J (Circuit Common).
J	Circuit Common for Sockets E, F, G, and H; all circuit voltages referenced to this point.
K	Jog Forward; momentary contact output to robot control unit with respect to Socket Q (Digital Common).
L	Set-Up and Weave Set-Up output to robot control unit with respect to Socket Q (Digital Common).
M	Weave Set-Up output to robot control unit with respect to Socket Q (Digital Common).
N	Wire Stick Signal output to robot control unit with respect to Socket Q (Digital Common); indicates wire is stuck to work; isolated CR2 contacts rated 1A at 120 VAC.
P	Weld Standby output to robot control unit with respect to Socket Q (Digital Common); indicates robot interface is in standby; isolated CR5 contacts rated 3A at 120 VAC.
Q	Digital Common for Sockets K, L, M, N, and P.
R	+ Peak Amps; 0-10 volts dc input from robot control unit with respect to Socket S (analog common) equals 0-500 amperes dc output.
S	Peak Amps; analog common for Socket R (+ Peak Amps).
W	Wire Feed Speed; analog common for Socket X (+ Wire Feed Speed).
X	+ Wire Feed Speed; 0-10 volts dc input from robot control unit with respect to Socket W (analog common) equals 0-1000 IPM.
Y	Arc Volts; analog common for Socket Z (+ Arc Volts).
Z	+ Arc Volts; 0-10 volts dc input from robot control unit with respect to Socket Y (analog common) equals 0-50 volts dc output.

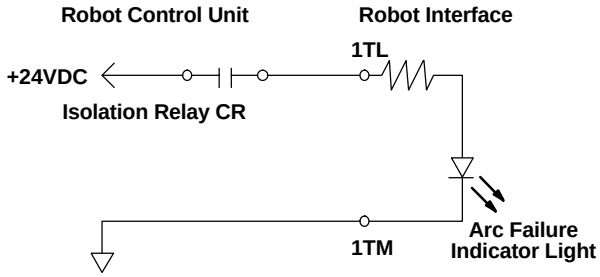
*The remaining sockets are not used.

2-10. Arc Failure Light Connections









☞ *Arc Failure light on robot interface front panel turns on and off by a signal from robot control unit. Obtain proper length of 18 gauge/2-conductor cord for this connection.*

For robot control units when 24 vdc is used:

1 Route cord through strain relief on right side panel of robot interface, and make proper connections to 1TL and 1TM.

2 Route and connect remaining end of cord to weld alarm terminal and ground connection at the robot control unit.

3 Connect +24 vdc to common relay contact terminal.

For robot control units when 115 or 24 vac, or 24 vdc is used:

1 Route cord through strain relief on right side panel of robot interface, and make proper connections to 1TL and 1TM.

2 Obtain a 115 or 24 vac, or 24 vdc isolation relay CR1, and install into robot control.

3 Route and connect remaining end of cord to one side of the normally-open robot control relay contact and ground.

4 Connect +24 vdc to remaining side of normally-open robot control relay contact.

5 Connect a lead from one side of robot control coil to weld alarm terminal.

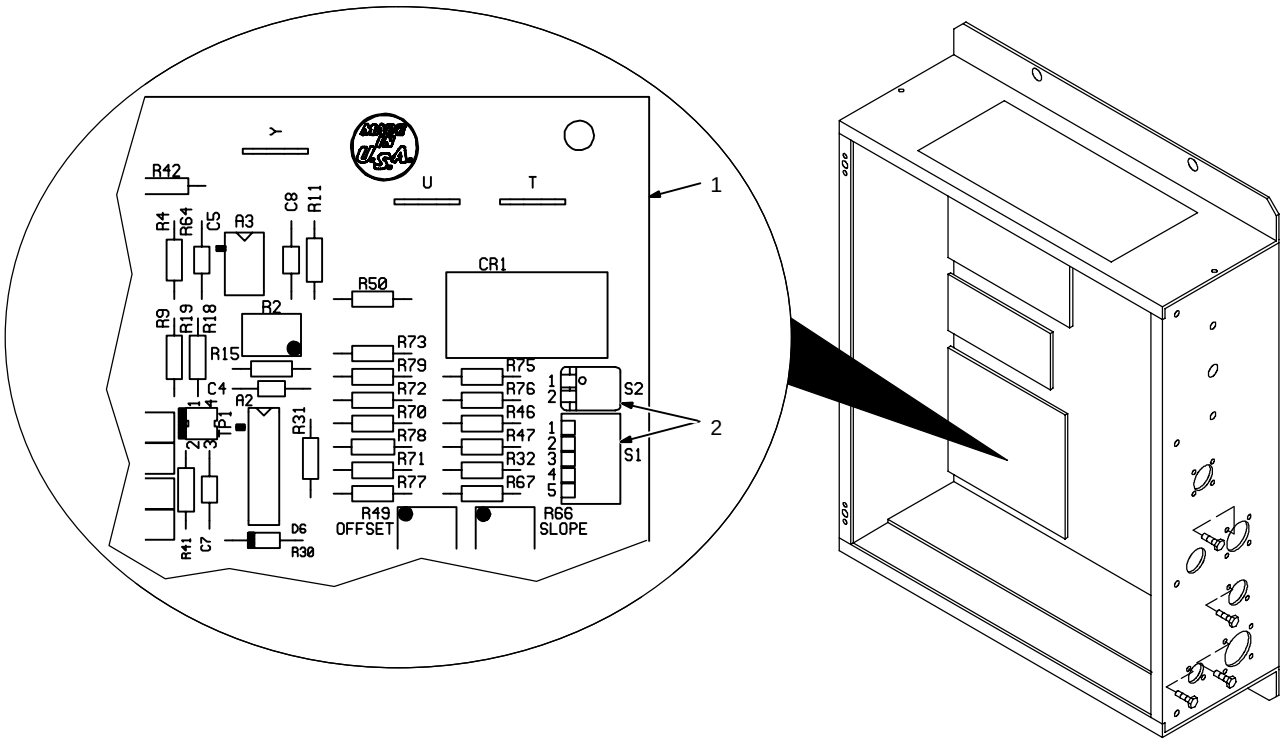
6 Connect proper voltage source (115 vac, 24 vac, or 24 vdc) between common terminal and remaining side of robot control relay coil.

Tools Needed:

S-0292

2-11. Matching Digital Voltage Control (DVC) Board To Welding Power Source

1 DVC Board PC1
2 DIP Switch



DVC SWITCH SETTINGS

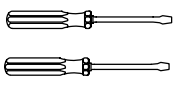
	S2		S1				
	1	2	1	2	3	4	5
DELTAWELD 300				ON	ON		ON
DELTAWELD 451, 450		O			ON		ON
DELTAWELD 651, 650		O			ON	ON	
MAXTRON 300, 400					ON		ON
MAXTRON 450	ON		ON			ON	
XMT 200/300	ON			ON		ON	
ARC PAK 350	ON			ON		ON	
SHOPMASTER 300				ON	ON		ON
DIMENSION 400		ON	Δ	Δ			ON
PULSTAR 450			ON				

O – On For Optional Soft Start. Turn Off S1 -3.
Δ – On For Optional Hot Start.

S-150 864-C

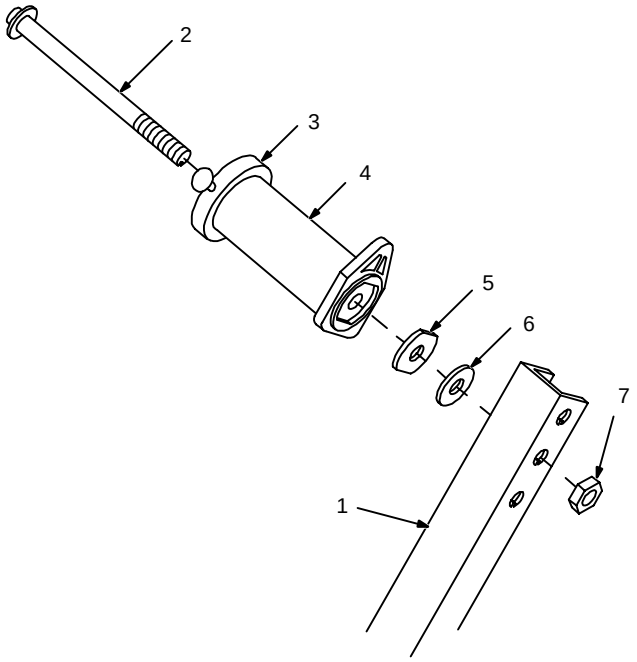
Tools Needed:

Non-Conductive



Ref. ST-119 647-C / SB-152 372 / S-150 864-C

2-12. Hub Assembly Installation



1 Spool Support
2 Hub Support Shaft
3 Retaining Ring
4 Hub Assembly
5 Brake Washer
6 Fiber Washer
7 Hex Nut

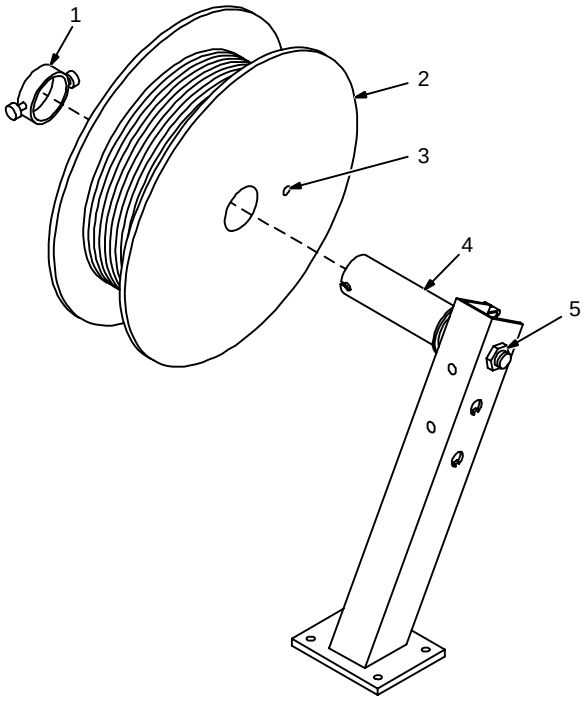
Install hub assembly as shown. Tighten hex nut until a slight drag is felt while turning hub.

Tools Needed:

9/16 in

ST-126 870-A

2-13. Installing Spool-Type Wire And Adjusting Hub Tension



1 Retaining Ring
2 Wire Spool
3 Hole In Spool
4 Hub

Remove retaining ring and slide spool onto hub. Turn spool until hub pin fits hole in spool. Reinstall retaining ring.

5 Tension Adjustment Nut

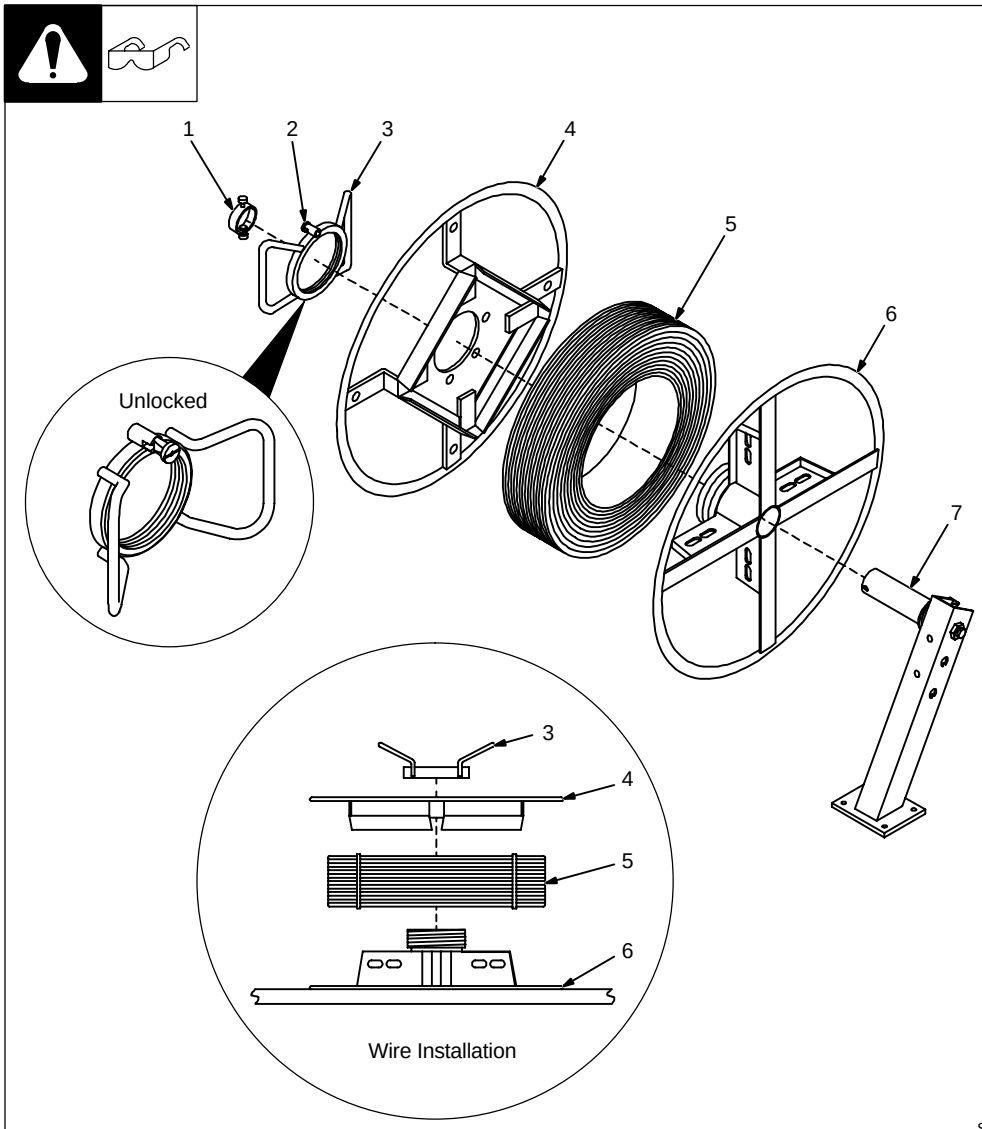
Grasp spool in one hand and turn while using a wrench to adjust hex nut. When a slight force is needed to turn spool, tension is set.

Tools Needed:

9/16 in

ST-161 001

2-14. Installing Optional Reel-Type Wire



1 Retaining Ring
2 Lock
3 Spanner Nut
4 Wire Retainer
5 Welding Wire
6 Wire Reel
7 Hub

Remove retaining ring. Pull lock and turn. Remove spanner nut, wire retainer, and wire reel from hub.

To install wire lay wire reel on flat surface and install wire as shown.

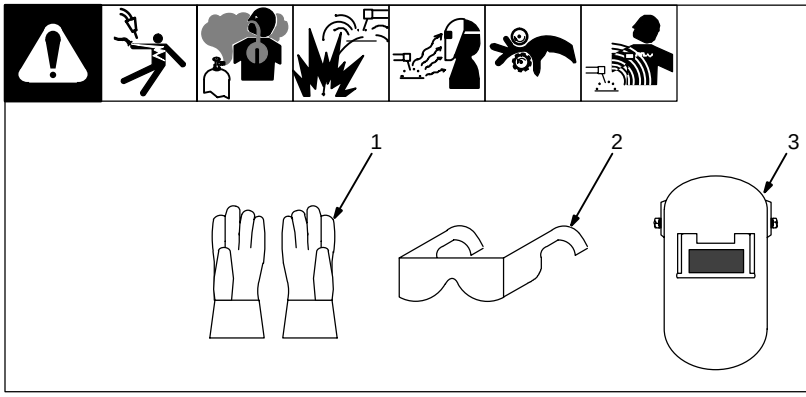
Tighten spanner nut until lock is in position over hole in wire retainer. Pull lock and turn to insert locking pin into wire retainer.

Slide wire reel assembly onto hub. Turn assembly until hub pin is seated in hole in reel. Reinstall retaining ring.

ST-161 000-A / ST-152 463 / Ref. ST-157 999-A

SECTION 3 – OPERATION

3-1. Safety Equipment

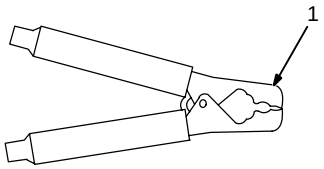


Wear the following while welding:

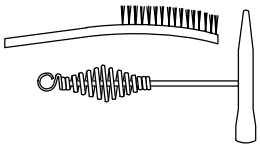
1 Dry, Insulating Gloves
2 Safety Glasses With Side Shields
3 Welding Helmet With Correct Shade Of Filter (See ANSI Z49.1)

sb3.1 1/94

3-2. Work Clamp



Tools Needed:



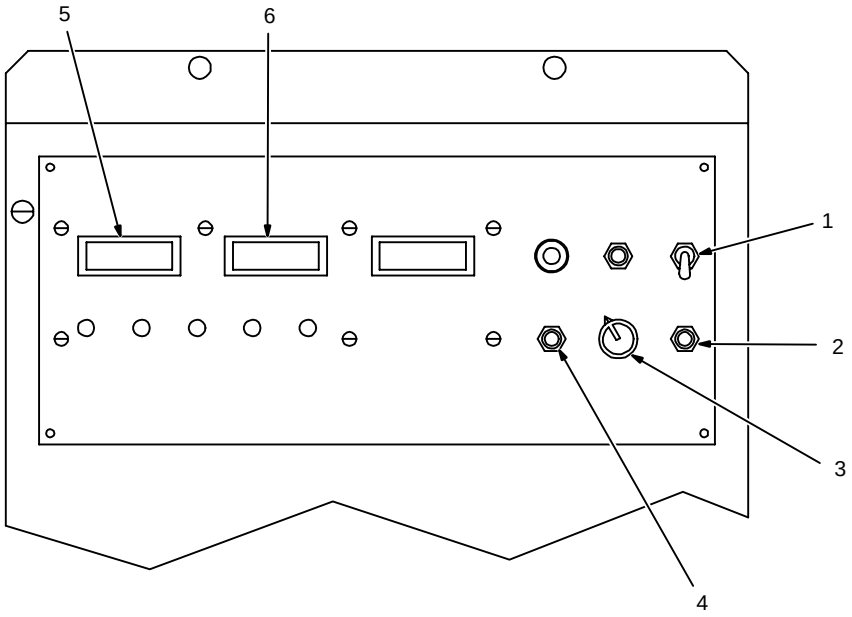
1 Work Clamp

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

3-3. Front Panel Controls



1 Power Switch

Use this switch to turn unit On and Off.

2 Purge Push Button

Momentarily energizes gas solenoid to purge air from gun shielding gas line, or to adjust shielding gas regulator.

3 Run/Set-Up Selector Switch

Selector switch has three positions: RUN, SET-UP, and SET-UP WEAVE. Consult robot Owner's Manual or robot manufacturer for Selector switch functions.

4 Jog Push Button

Jog push button is a momentary-contact switch. Consult robot Owner's Manual or robot manufacturer for Jog push button functions.

5 Voltmeter

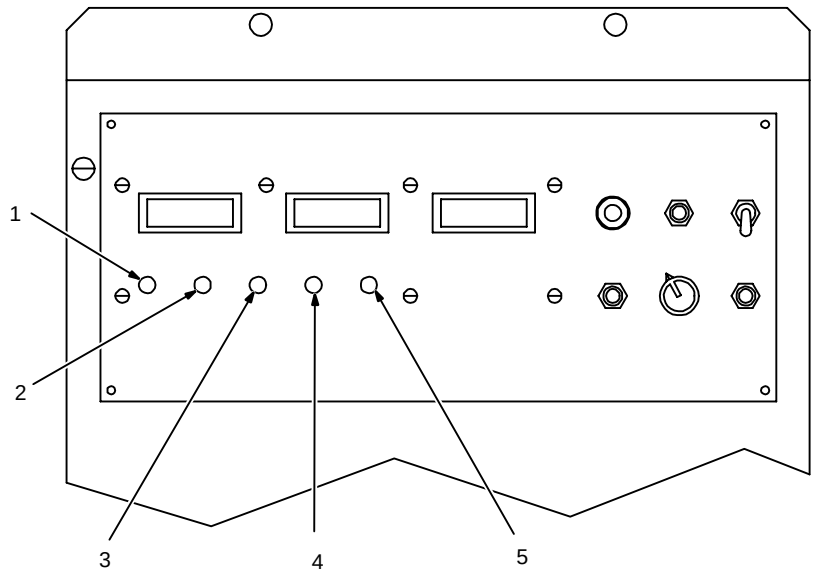
Voltmeter displays weld voltage to nearest tenth of a volt while welding and preset voltage while idling.

6 Wire Speed IPM Meter

Wire speed meter displays preset wire feed speed to the nearest inch per minute while welding and idling. Actual and preset wire feed speed are the same due to the wire feed speed feedback circuit.

Ref. ST-119 645-A

3-4. Indicator Lights



1 Gas Indicator Light

Gas sight turns on when the gas valve is energized to indicate shielding gas flow.

2 Contactor Indicator Light

Contactor light turns on when the welding power source contactor is energized to indicate that weld output is available.

3 Wire Feed Indicator Light

WIRE FEED light turns on when the wire drive motor is energized to indicate that wire is feeding.

4 Current Indicator Light

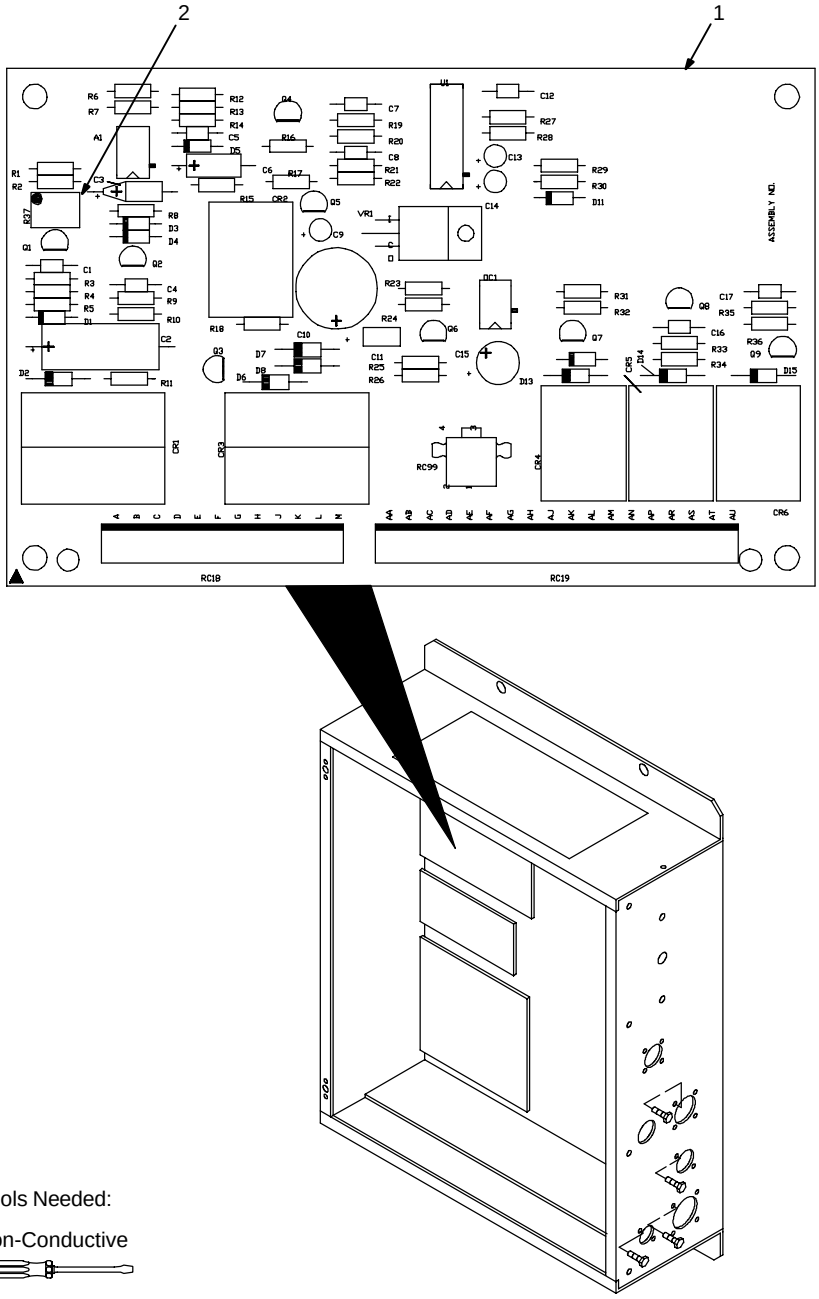
Current light turns on when the current detect relay is energized to indicate that an arc is established.

5 Arc Failure Indicator Light

Arc Failure light turns on only when properly connected according to instructions in Section 2-10, and there is an arc outage while welding.

Ref. ST-119 645-A

3-5. Burnback Control



Burnback circuitry keeps welding wire from sticking to workpiece after arc is extinguished. This circuitry keeps weld output on welding wire from 0 to 0.25 seconds after wire has stopped feeding. This delay action permits welding wire to burn back to a point where it neither sticks to workpiece or contact tip.

To adjust burnback time, open front access door.

1 Interface Board PC3

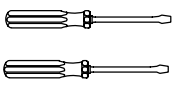
2 Potentiometer R37

Rotate R37 clockwise to increase burnback time.

Close and secure front access door.

Tools Needed:

Non-Conductive



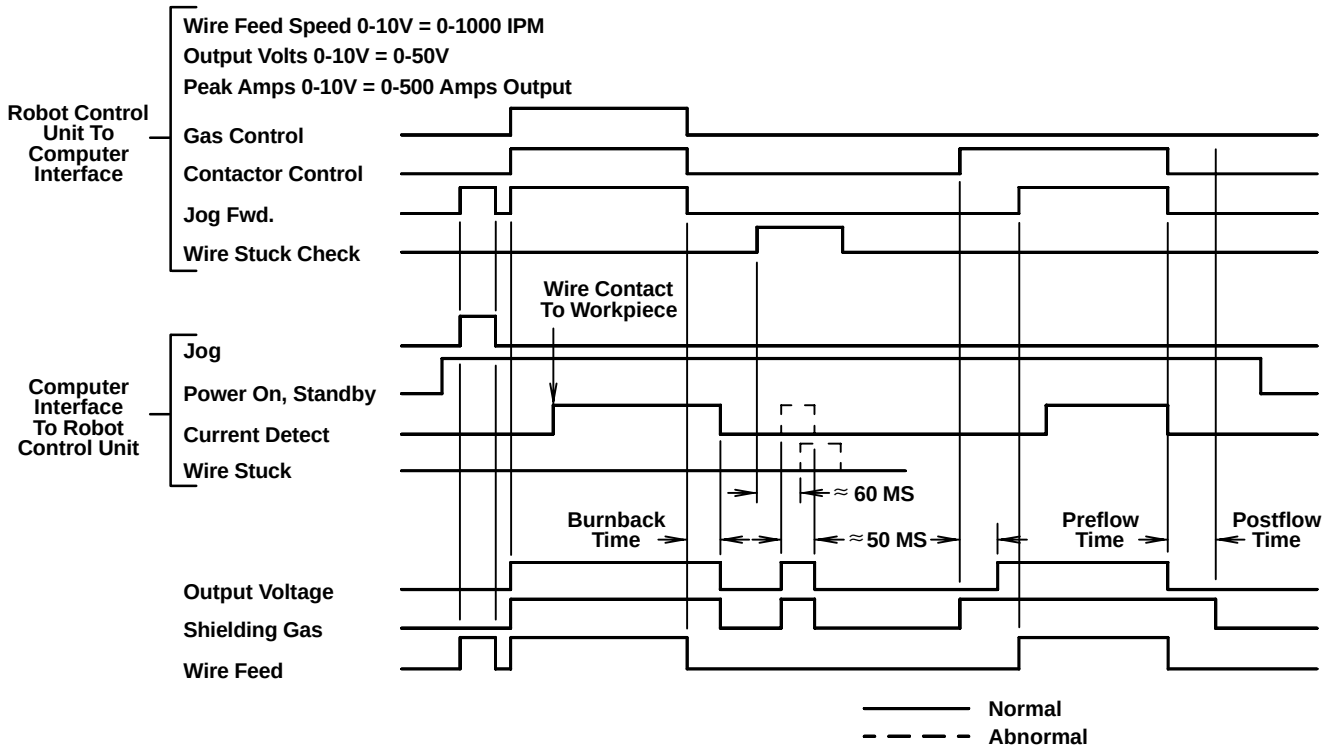
Ref. ST-119 647-C / SB-191 630

SECTION 4 – SEQUENCE OF OPERATION

4-1. Input/Output Signals

Robot interface receives input signals for contactor control, gas control, jog, welding volts, and wire speed. It also receives a signal to initiate a check to see if wire is stuck to workpiece at end of a weld.

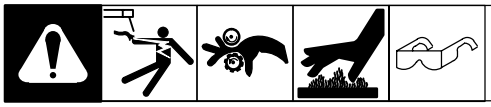
Robot interface sends output signals to robot control unit for current sense, wire stuck, and weld standby.



ST-094 382-B

SECTION 5 – MAINTENANCE & TROUBLESHOOTING

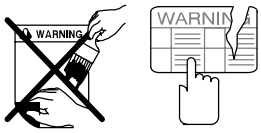
5-1. Routine Maintenance



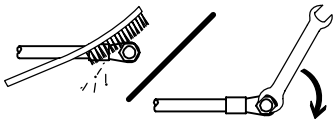
▲ **Disconnect power before maintaining.**

3 Months

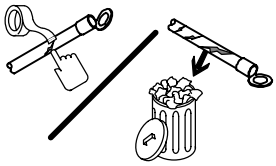
Replace unreadable labels.



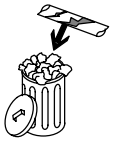
Clean and tighten weld terminals.



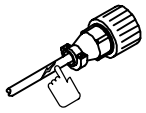
Repair or replace cracked weld cable.



Replace cracked parts.

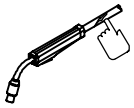


Check 14-pin cord.



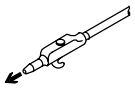
Check gas hose and fittings.

Check gun cable.

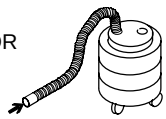


6 Months

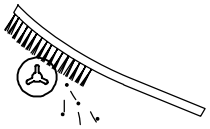
Blow out or vacuum inside. During heavy service, clean monthly.



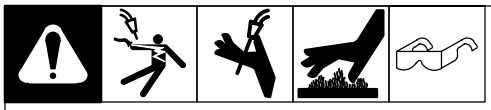
OR

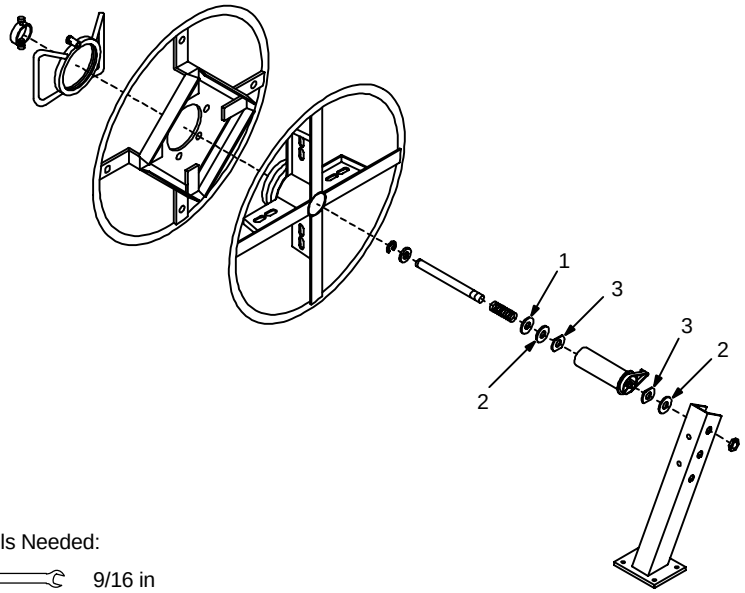


Clean drive rolls.



5-2. Replacing The Hub Assembly





Turn Off weld control and welding power source. Retract wire onto spool and remove. Take hub apart as shown.

1 Keyed Washer

2 Fiber Washer

3 Brake Washer

Replace worn or broken parts (see Parts List), and slide parts onto shaft in order shown.

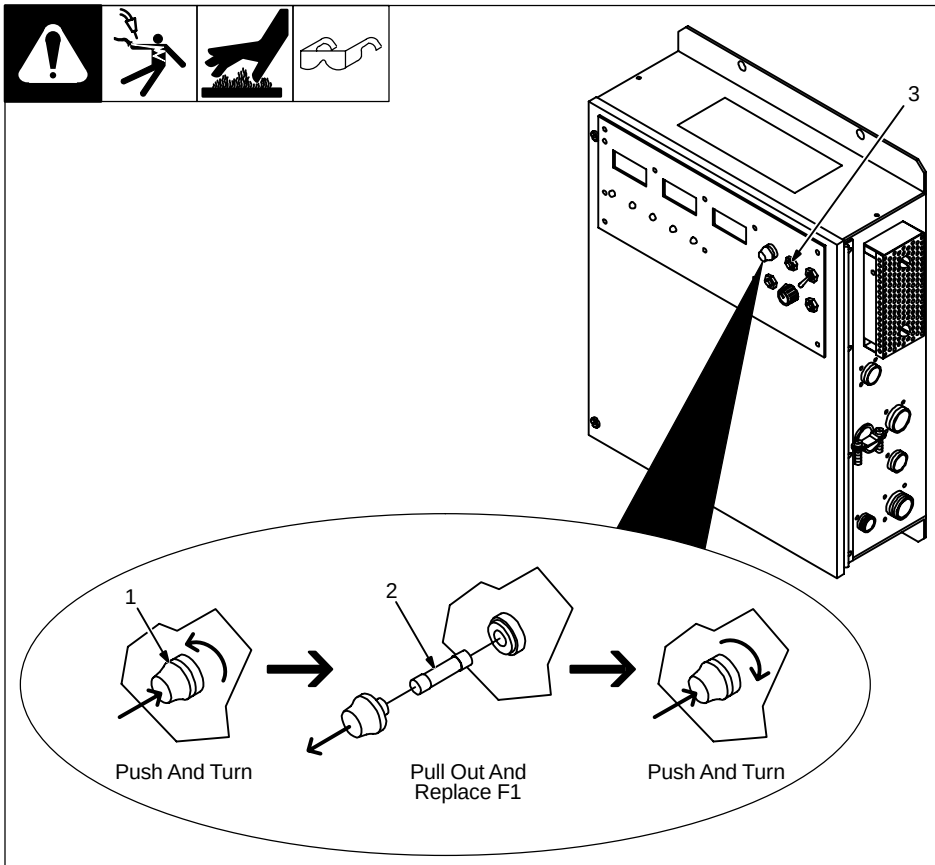
Tighten tension adjustment nut until a slight force is needed to turn hub. Install welding wire (see Section 2-13 or 2-14).

Tools Needed:

9/16 in

Ref. ST-045 315-L

5-3. Overload Protection



If fuse F1 opens, the robot interface shuts down. To check or change F1, proceed as follows:

1 Fuse Holder Cover

2 Fuse F1 (See Parts List For Rating)

3 Circuit Breaker CB1

CB1 protects the wire feed motor from overload. If CB1 opens, the wire feed motor stops. Check for jammed wire, binding drive gear, or misaligned drive rolls. Correct problem.

Allow cooling period and manually reset breaker.

Ref. ST-800 185-A / ST-119 644-B

5-4. Display Board PC4 Meter Check

Check points are provided on display board PC4 for checking power supply and input command to meters.

To make checks at display board, open front access door.

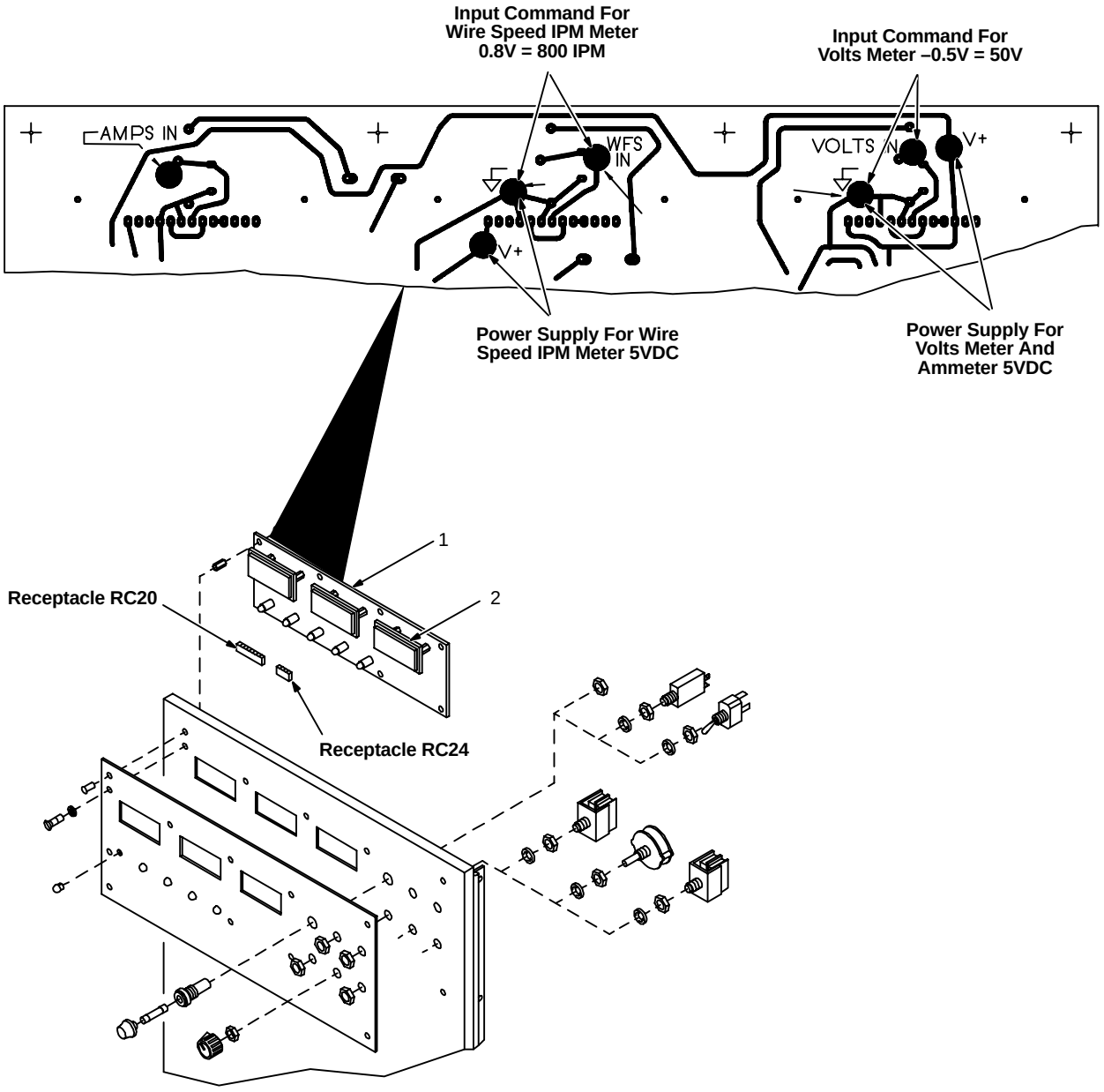
1 Display Board PC4

2 Meter

CB1 protects the wire feed motor from overload. If CB1 opens, the wire feed motor stops. Check for jammed wire, binding drive gear, or misaligned drive rolls. Correct problem.

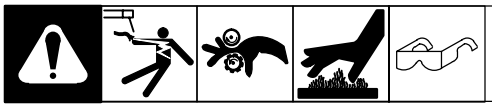
Allow cooling period and manually reset breaker.

REAR VIEW OF DISPLAY BOARD PC4



Ref. ST-117 838-B / Ref. ST-119 647-C

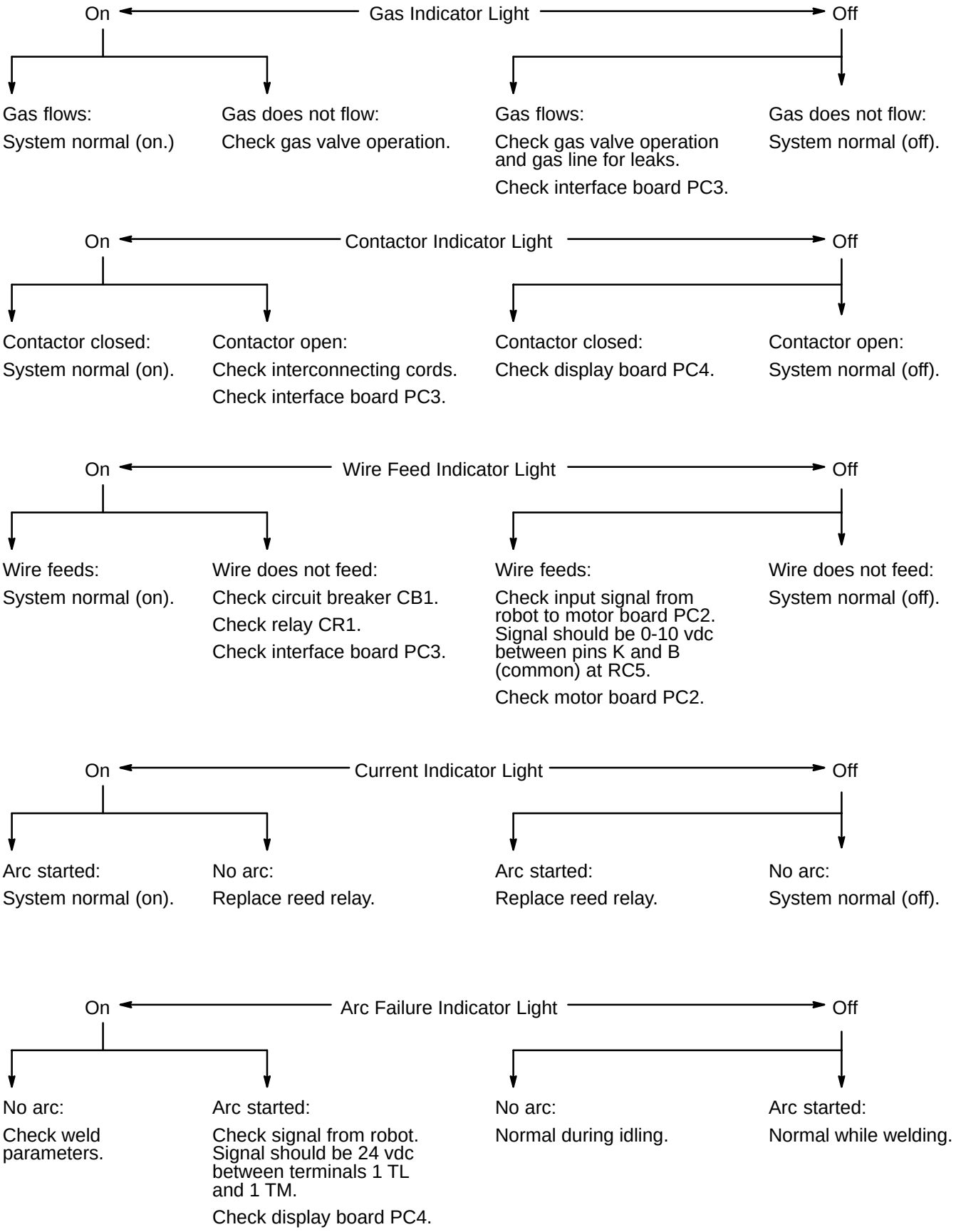
5-5. Troubleshooting



▲ **Disconnect power before troubleshooting**

Trouble	Remedy
No arc voltage control.	Check and secure output control connections (see Section 2-4).
	Check and secure arc sensing connections (see Section 2-7).
	Check robot command voltage at Isolation Board PC5. Command voltage should be 0-10 vdc between sockets Y (common) and Z at RC17.
	Check robot peak command current at Isolation Board PC5. Peak command current should be 0-10 vdc between sockets R and S (common) at RC17.
Robot moves when welding wire is stuck.	Check wire stick connection from robot for leads connected to sockets H and N at RC17.
Wire speed (IPM) meter goes to zero.	Check robot command voltage at Motor Board PC2. Signal should be 0-10 vdc between pins K and B (common) at RC5.
	Have nearest Factory Factory Authorized Service Station check motor board PC2.
Unit does not operate.	Check and replace main fuse F1 (see Section 5-3).
No meter display.	Have nearest Factory Factory Authorized Service Station check display board PC4.
No wire feed.	Check motor overload circuit breaker CB1 and reset (see Section 5-3).
	Check input signal from robot to Motor Board PC2. Signal should be 0-10 vdc between pins K and B (common) on RC5.
	Check and replace relay CR1 if necessary.
	Have nearest Factory Factory Authorized Service Station check display board PC2.
Wire feeds at maximum only.	Have nearest Factory Factory Authorized Service Station check tach board PC7 (see motor/drive assembly Owner's Manual).

5-6. Use Of Indicator Lights For Troubleshooting



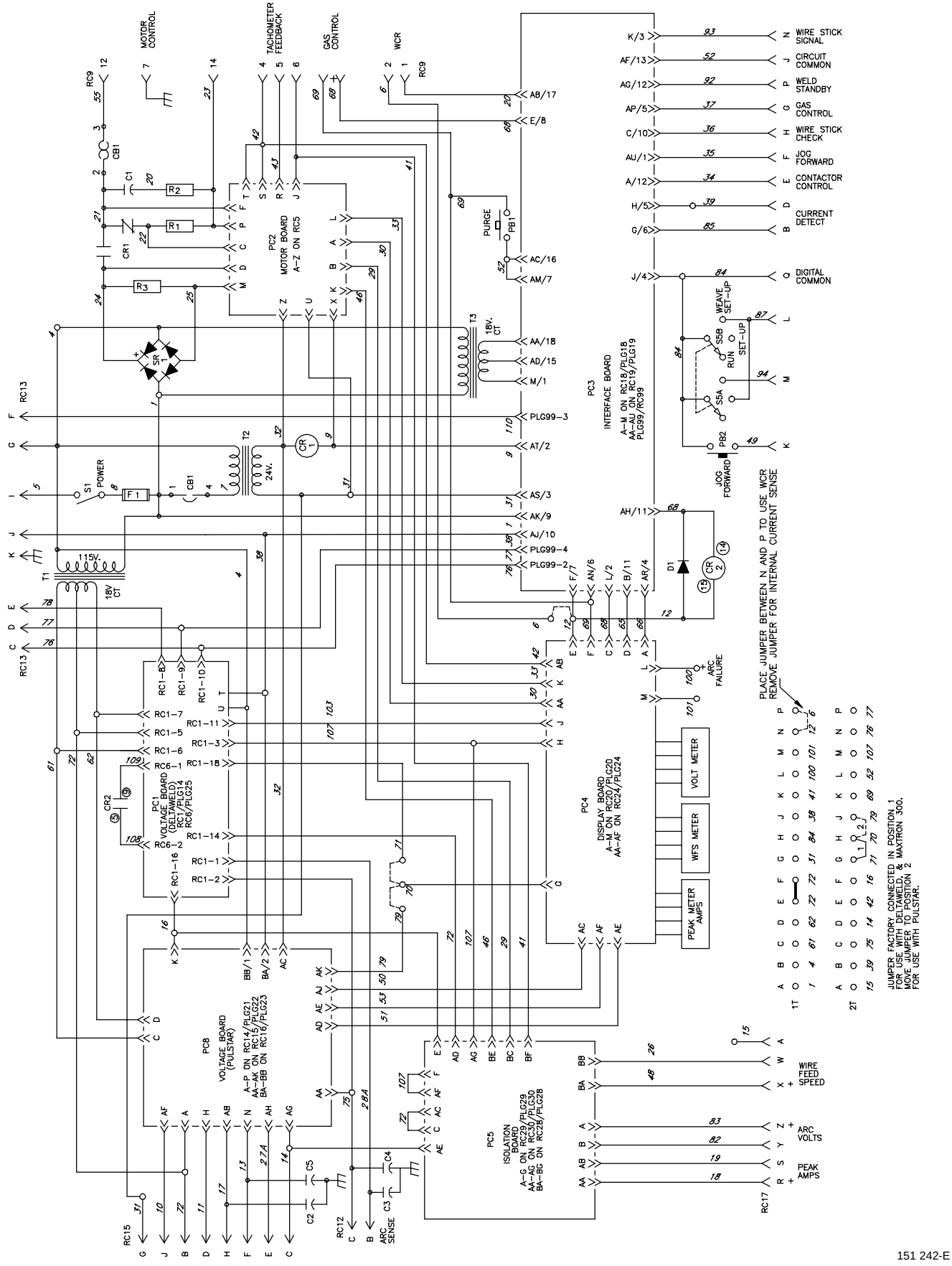


Figure 6-1. Circuit Diagram For Robot Interface

SECTION 7 – PARTS LIST

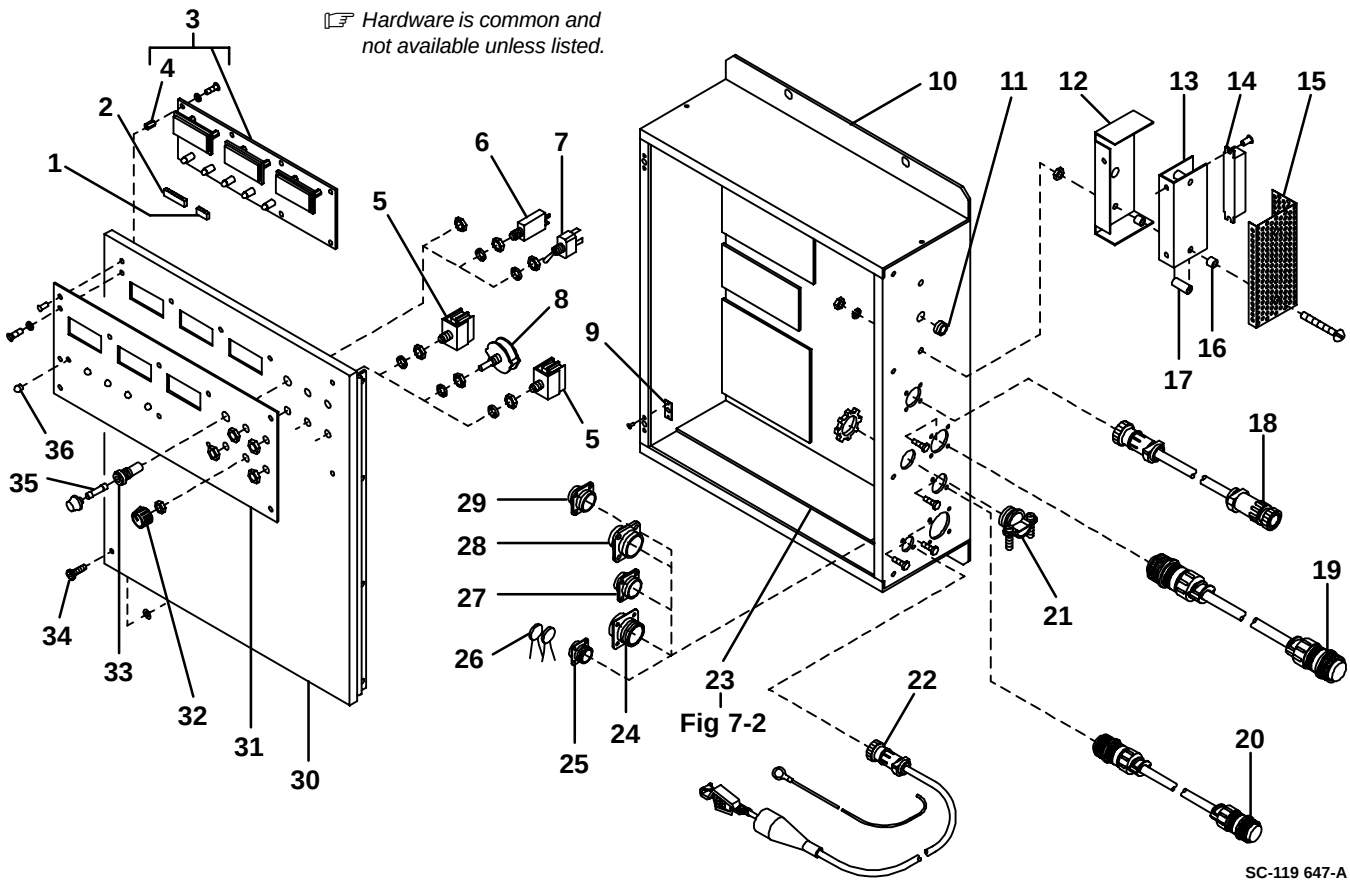


Figure 7-1. Control Box

Item No.	Dia. Mkgs.	Part No.	Description	Quantity
			Figure 7-1. Control Box	
1	PLG24	167 361	CONNECTOR & SOCKETS	1
2	PLG20	165 573	CONNECTOR & SOCKETS	1
3	PC4	149 339	CIRCUIT CARD, meter (consisting of)	1
4		073 756	STAND-OFF, No. 6-32 x .625 lg	7
5	PB1,2	021 105	SWITCH, PB	2
6	CB1	011 991	CIRCUIT BREAKER, man reset 1P 1.5A 250V	1
7	S1	011 609	SWITCH, tgl SPDT 15A 125V	1
8	S5	086 895	SWITCH, rotary	1
9		073 487	NUT, speed No. 2	2
10		132 481	CABINET, control	1
11		057 084	BUSHING, snap-in .250 ID x .375mtg hole	1
12		079 683	HEAT SINK, resistor	1
13		030 949	HEAT SINK	1
14	R2	030 941	RESISTOR, WW fxd 100W 5 ohm	1
15		056 170	SHIELD, resistor	1
16		010 193	TUBING, .375 OD x 18ga wall x .250	4
17		010 199	TUBING, .275 ID x .048 wall x 1	2
18		109 041	CABLE, interconnecting (consisting of)	1
	PLG9	047 636	HOUSING PLUG & PINS,	1
		079 739	CLAMP, cable strain relief sz 17 .703 OD	2
		096 813	CABLE, 18ga 15/c (order by ft)	18ft
	PLG16	048 598	HOUSING PLUG & SOCKETS,	1

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

Figure 7-1. Control Box (Continued)

19		175 115	CABLE, interconnecting (consisting of)	1
		152 370	HOUSING PLUG & SOCKETS, (consisting of)	1
		079 739	CONNECTOR, circ clamp str rlf	1
		110 015	CABLE, port No. 18 7/c (order by ft)	10ft
		141 162	HOUSING PLUG & PINS, (consisting of)	1
		079 739	CONNECTOR, circ clamp str rlf	1
		116 964	CLAMP, cable 97-3057-1012	2
		110 015	CABLE, port No. 18 7/c (order by ft)	10ft
		111 123	HOUSING PLUG & SOCKETS	1
20		089 870	CABLE, interconnecting (consisting of)	1
		039 716	PLUG, 10 pin MS-3106A-18-1P	1
		073 332	CLAMP, cable 97-3057-10	2
		073 140	CABLE, No.18 10/c (order by ft)	10ft
	PLG15	089 647	PLUG, 10skt MS-3106A-18-1S	1
21		010 916	CONNECTOR, clamp .750	1
22		049 989	CABLE, volt-sensing (consisting of)	1
	PLG12	073 686	PLUG, 4skt 97-3106A-14S-2S	1
		039 828	CLAMP, cable AN-3057-6	1
		600 848	WIRE, strd 12ga (order by ft)	35ft
		604 109	WIRE, strd 16ga (order by ft)	19ft
		601 226	INSULATOR, vinyl clamp	1
		601 228	CLAMP, universal 25A	1
		600 750	TERMINAL, ring tongue 1/2 stud	1
23		Fig 8-2	CONTROL PANEL	1
24	RC17	094 592	RECEPTACLE, 24skt MS-3102A-24-28S	1
25	RC12	076 624	RECEPTACLE, 4 pin MS-3102A-14S-2P	1
26	C2-5	028 291	CAPACITOR, cer disc .1uf 500VDC	4
27	RC15	089 646	RECEPTACLE, 10 pin MS-3102A-18-1P	1
28	RC13	094 480	RECEPTACLE, 14 pin MS-3102A-20-27P	1
29	RC9	047 637	HOUSING RECEPTACLE & SOCKETS,	1
30		+116 969	DOOR, access cabinet	1
		045 852	CLIP, component .687dia mtg adh back	2
		134 327	LABEL, warning general precautionary	1
31			NAMEPLATE, (order by model and serial number)	1
32		097 922	KNOB, pointer	1
33		046 432	HOLDER, fuse	1
34		010 855	RETAINER, screw No. 2	2
		010 853	FASTENER, screw No. 2	2
35	F1	*012 655	FUSE, mintr gl 10A 250V	1
36		089 032	LENS, red 4341	5
		071 006	CABLE, motor (consisting of)	1
		047 636	HOUSING PLUG & PINS,	1
		079 739	CLAMP, cable strain relief sz 17 .703 OD	2
		073 139	CABLE, No. 16 6/c (order by ft)	10ft
		071 892	RECEPTACLE w/SOCKETS,	1
		048 144	TERMINAL, male plug keying	2
		056 462	HOSE, gas	1

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

To maintain the factory original performance of your equipment, use only Manufacturer's Suggested Replacement Parts. Model and serial number required when ordering parts from your local distributor.

☞ *Hardware is common and not available unless listed.*

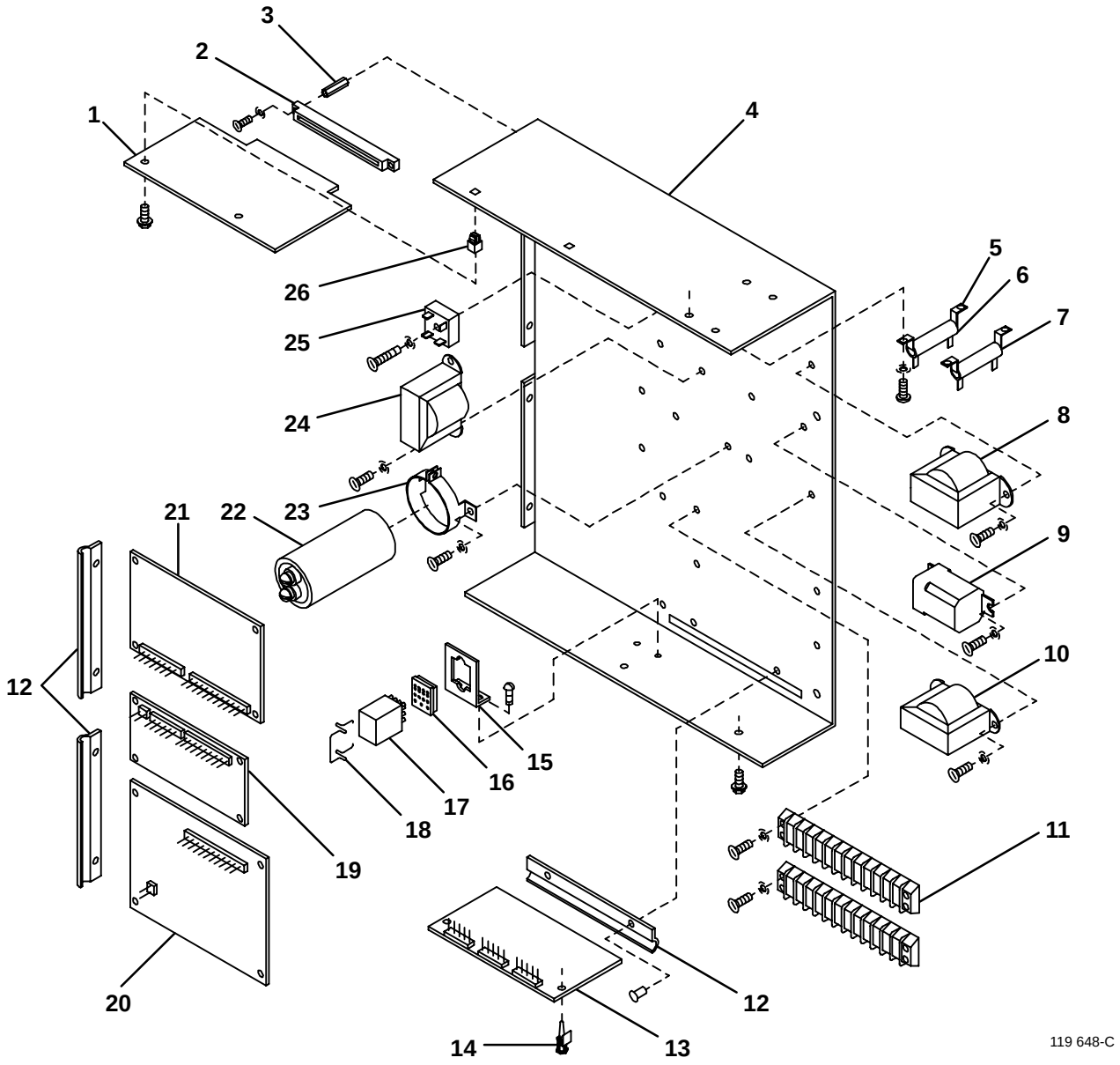


Figure 7-2. Control Panel, w/Components

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

Figure 7-2. Control Panel, w/Components (Fig 7-1 Item 23)

1	PC2	071 642	CIRCUIT CARD, motor speed dig	1
2	RC5	117 374	CONNECTOR, edge mod-fork 22 skt	1
3		009 335	STAND-OFF, No. 4-40 x 5/8	2
4		112 473	PANEL, mtg components	1
5		605 741	CLIP, mtg resistor 5/16 ID	4
6	R3	079 497	RESISTOR, WW fxd 25W 2K ohm	1
7	R1	030 651	RESISTOR, WW fxd 25W 10 ohm	1
8	T2	116 847	TRANSFORMER, control	1
9	CR1	109 006	RELAY, encl 24VAC DPDT	1
10	T1	116 848	TRANSFORMER, control	1
11	1T,2T	038 856	BLOCK, term 20A 14P	2
		601 219	LINK, jumper	2
12		110 391	GUIDE, mtg circuit card	3
13	PC5	118 550	CIRCUIT CARD, isolation/amp	1
	PLG28-30	135 787	HOUSING PLUG & SOCKETS,	1
14		110 375	STAND-OFF SUPPORT, PC card No. 6 screw	8
15		049 970	BRACKET, mtg relay	1
16		027 811	SOCKET, relay 14 pin	1
17	CR2	095 521	RELAY, encl 24VDC 4PDT	1
18		079 844	SPRING, holddown relay	1
19	PC8	116 528	CIRCUIT CARD, voltage	1
	PLG21	081 380	TERMINAL, header 14 pin	1
		081 378	TERMINAL, female 1skt 22-18 wire	14
	PLG22	090 469	TERMINAL, header 10 pin	1
		081 378	TERMINAL, female 1skt 22-18 wire	10
	PLG23	135 557	HOUSING PLUG & SOCKETS	1
20	PC1	152 371	CIRCUIT CARD, voltage control	1
	PLG14	165 896	CONNECTOR & SOCKETS	1
	PLG25	131 054	HOUSING RECEPTACLE & SOCKETS	1
21	PC3	+191 627	CIRCUIT CARD, interface	1
	PLG18	135 559	HOUSING PLUG & SOCKETS,	1
	PLG19	165 896	CONNECTOR & SOCKETS	1
22	C1	031 692	CAPACITOR, elctlt 750uf 200VDC	1
23		006 426	CLAMP, capacitor 2 in dia	1
24	T3	116 849	TRANSFORMER, control	1
		042 452	CLIP, component .687dia mtg adh back	2
25	SR1	035 704	RECTIFIER, integ 30A 600V	1
26		083 147	GROMMET, scr 8-10 push in	2

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

To maintain the factory original performance of your equipment, use only Manufacturer's Suggested Replacement Parts. Model and serial number required when ordering parts from your local distributor.

Item No.	Dia. Mkgs.	Part No.	Description	Quantity
1		072 094	HUB & SPINDLE, (consisting of)	1
2		058 427	RING, retaining spool	1
3		185 072	SHAFT, support spool	1
4		010 233	SPRING, cprsn	1
5		057 971	WASHER, flat stl keyed 1.500dia x .125thk	1
6		010 191	WASHER, fbr .656 ID x 1.500 OD x .125thk	2
7		058 628	WASHER, brake	2
8		058 428	HUB, spool	1
9		135 205	NUT, stl slflkg hex reg .625-11 w/nyl insert	1
10		+092 989	SUPPORT, spindle (consisting of)	1
		134 464	LABEL, warning general precautionary	1
11		♦108 008	REEL, wire (consisting of)	1
12		124 900	SUPPORT, reel support	1
13		168 104	RETAINER, spool support (consisting of)	1
		166 594	LABEL, caution falling wire reel can cause damage	1
14		168 103	NUT, spanner retaining	1

Figure 7-3. Hub & Spindle Assembly

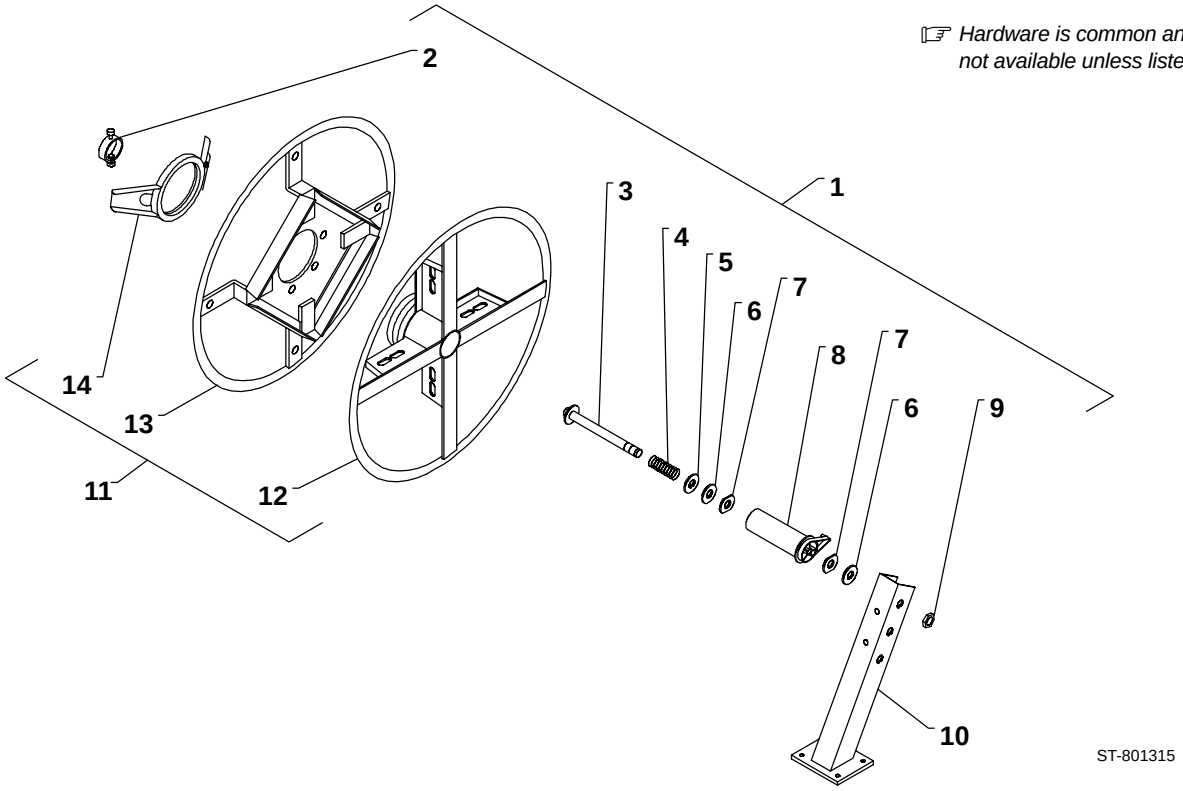


Figure 7-3. Hub & Spindle Assembly

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

To maintain the factory original performance of your equipment, use only Manufacturer's Suggested Replacement Parts. Model and serial number required when ordering parts from your local distributor.

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

Figure 7-4. Control Box, Gas

1		134 327	LABEL, warning general precautionary	1
2		+079 682	WRAPPER	1
3	REED	140 786	SWITCH, reed	1
4		109 021	CASE SECTION, bottom/front/sides	1
5		115 104	CONNECTOR, clamp cable 1/2 in	1
6		010 494	BUSHING, snap 1.375 ID x 1.750mtg hole	2
7		057 358	BUSHING, snap ID x 1.37mtg hole	2
8		010 604	FITTING, hose brs bushing .250NPT x .625-18	2
9		602 934	FITTING, pipe coupling .250NPT	1
10		079 573	FITTING, pipe nipple L .250NPT x 6	1
11		079 574	BRACKET, mtg component	2
12	RC7	047 637	HOUSING RECEPTACLE & SOCKETS,	1
13	D1	109 938	DIODE, rect 1A 400V SP	1
14	5T	038 839	BLOCK, term 20A 5P	1
15	GS1	109 293	VALVE, 24VDC 2 way 1/4 IPS port 1/8 orf	1
16	RC16	090 246	RECEPTACLE w/PINS,	1

☞ *Hardware is common and not available unless listed.*

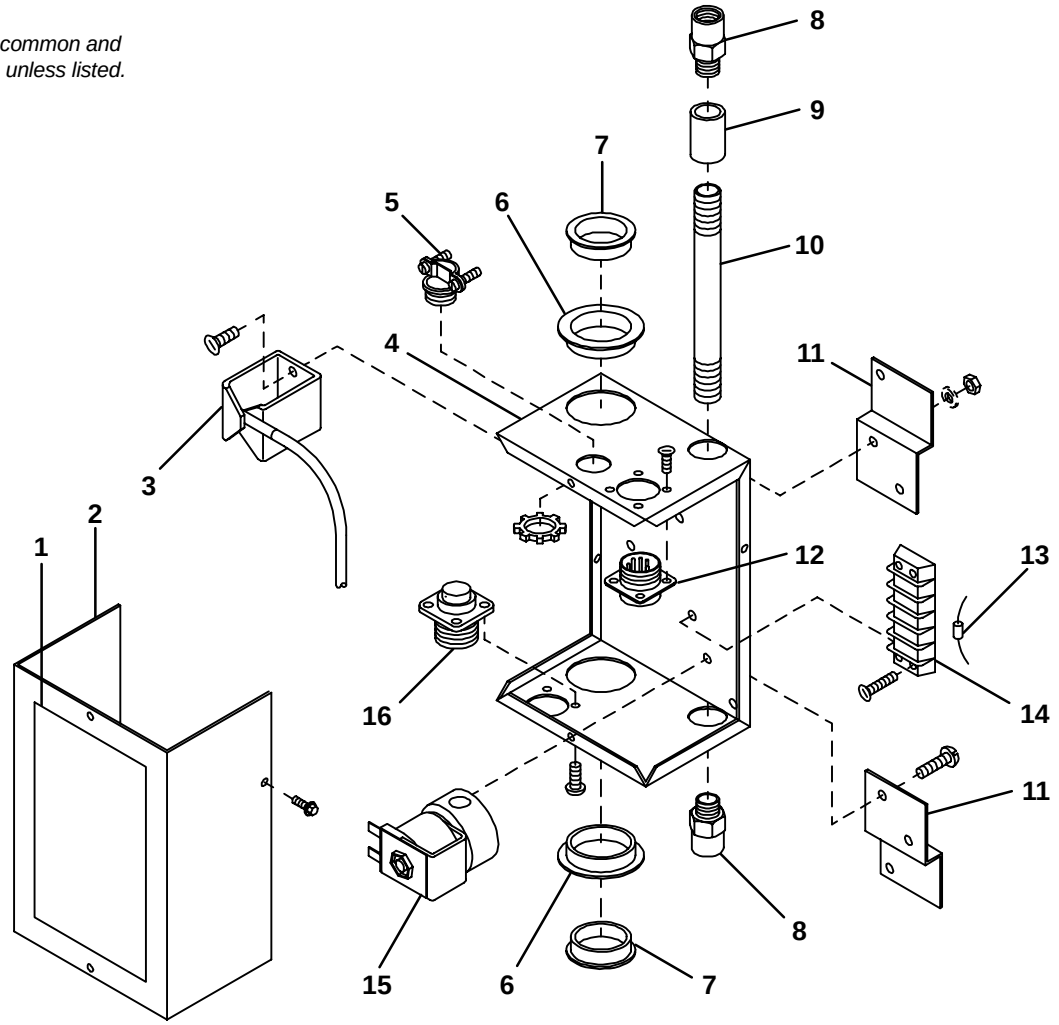


Figure 7-4. Control Box, Gas

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

To maintain the factory original performance of your equipment, use only Manufacturer's Suggested Replacement Parts. Model and serial number required when ordering parts from your local distributor.

Notes

Warranty Questions?

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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.

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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
   * Intellitig
   * 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.

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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.

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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

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

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