



OM-254 915B

2012-08

**Processes**



MIG (GMAW) Welding

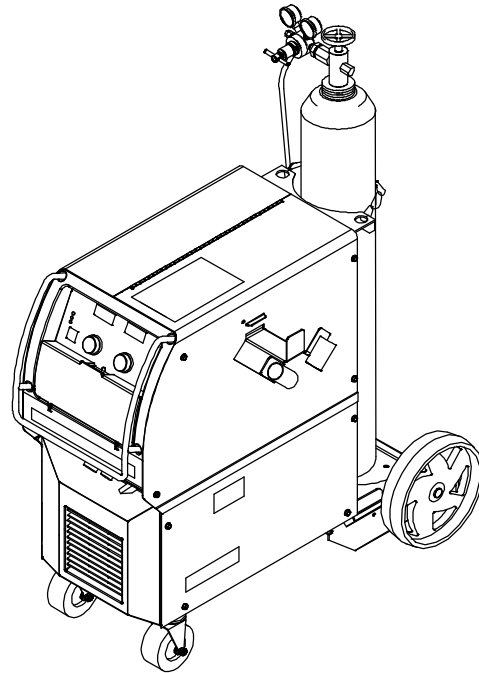
Pulsed MIG (GMAW-P)

**Description**



Arc Welding Power Source  
and Wire Feeder

# Millermatic<sup>®</sup> 350P Aluminum



Visit our website at  
[www.MillerWelds.com](http://www.MillerWelds.com)

## OWNER'S MANUAL

File: MIG (GMAW)



# From Miller to You

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*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 the 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 9001:2000 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 specification sheets. **To locate your nearest distributor or service agency call 1-800-4-A-Miller, or visit us at [www.MillerWelds.com](http://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.



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# SECTION 1 – SAFETY PRECAUTIONS - READ BEFORE USING

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 Protect yourself and others from injury — read, follow, and save these important safety precautions and operating instructions.

## 1-1. Symbol Usage

 **DANGER!** – Indicates a hazardous situation which, if not avoided, will result in death or serious injury. The possible hazards are shown in the adjoining symbols or explained in the text.

 Indicates a hazardous situation which, if not avoided, could result in death or serious injury. The possible hazards are shown in the adjoining symbols or explained in the text.


**NOTICE** – Indicates statements not related to personal injury.

 Indicates special instructions.



This group of symbols means Warning! Watch Out! 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 1-5. 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.
- Additional safety precautions are required when any of the following electrically hazardous conditions are present: in damp locations or while wearing wet clothing; on metal structures such as floors, gratings, or scaffolds; when in cramped positions such as sitting, kneeling, or lying; or when there is a high risk of unavoidable or accidental contact with the workpiece or ground. For these conditions, use the following equipment in order presented: 1) a semiautomatic DC constant voltage (wire) welder, 2) a DC manual (stick) welder, or 3) an AC welder with reduced open-circuit voltage. In most situations, use of a DC, constant voltage wire welder is recommended. And, do not work alone!
- 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, ground, and operate 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.
- Keep cords dry, free of oil and grease, and protected from hot metal and sparks.
- 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 touch electrode if you are in contact with the work, ground, or another electrode from a different machine.
- Do not touch electrode holders connected to two welding machines at the same time since double open-circuit voltage will be present.
- 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. Disconnect cable for process not in use.

### SIGNIFICANT DC VOLTAGE exists in inverter welding power sources AFTER removal of input power.

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



### HOT PARTS can burn.

- Do not touch hot parts bare handed.
- Allow cooling period before working on equipment.
- To handle hot parts, use proper tools and/or wear heavy, insulated welding gloves and clothing to prevent burns.



### 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 local forced ventilation at the arc to remove welding fumes and gases.
- If ventilation is poor, wear an approved air-supplied respirator.
- Read and understand 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 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 an approved welding helmet fitted with a proper shade of filter lenses to protect your face and eyes from arc rays and sparks 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, glare and sparks; warn others not to watch the arc.
- Wear protective clothing made from durable, flame-resistant material (leather, heavy cotton, or wool) and foot protection.

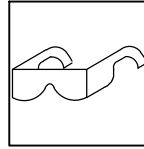


### WELDING can cause fire or explosion.

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 explosions. 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.

- Remove all flammables within 35 ft (10.7 m) of the welding arc. If this is not possible, tightly cover them with approved covers.
- Do not weld where flying sparks can strike flammable material.
- Protect yourself and others from flying sparks and hot metal.
- 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 containers that have held combustibles, or on closed containers such as tanks, drums, or pipes unless they are properly prepared according to AWS F4.1 and AWS A6.0 (see Safety Standards).
- Do not weld where the atmosphere may contain flammable dust, gas, or liquid vapors (such as gasoline).
- 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, sparks, 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.
- After completion of work, inspect area to ensure it is free of sparks, glowing embers, and flames.
- Use only correct fuses or circuit breakers. Do not oversize or bypass them.
- Follow requirements in OSHA 1910.252 (a) (2) (iv) and NFPA 51B for hot work and have a fire watcher and extinguisher nearby.



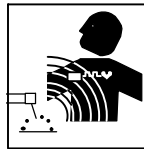
### FLYING METAL or DIRT can injure eyes.

- 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.



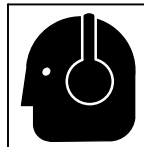
### BUILDUP OF GAS can injure or kill.

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



### ELECTRIC AND MAGNETIC FIELDS (EMF) can affect Implanted Medical Devices.

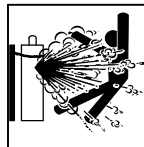
- Wearers of Pacemakers and other Implanted Medical Devices should keep away.
- Implanted Medical Device wearers should consult their doctor and the device manufacturer before going near arc welding, spot welding, gouging, plasma arc cutting, or induction heating operations.



### 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.

Compressed 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, physical damage, 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 compressed 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.
- Use the right equipment, correct procedures, and sufficient number of persons to lift and move cylinders.
- Read and follow instructions on compressed gas cylinders, associated equipment, and Compressed Gas Association (CGA) publication P-1 listed in Safety Standards.

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



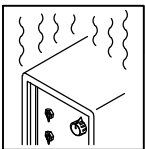
#### FIRE OR EXPLOSION hazard.

- 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.



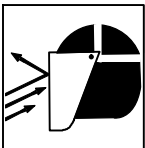
#### FALLING EQUIPMENT can injure.

- 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.
- Keep equipment (cables and cords) away from moving vehicles when working from an aerial location.
- Follow the guidelines in the Applications Manual for the Revised NIOSH Lifting Equation (Publication No. 94-110) when manually lifting heavy parts or equipment.



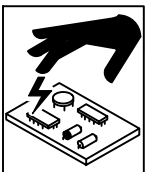
#### OVERUSE can cause OVERHEATING

- 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.



#### FLYING SPARKS can injure.

- Wear a face shield to protect eyes and face.
- Shape tungsten electrode only on grinder with proper guards in a safe location wearing proper face, hand, and body protection.
- Sparks can cause fires — keep flammables away.



#### 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.



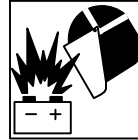
#### MOVING PARTS can injure.

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



#### WELDING WIRE can injure.

- 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.



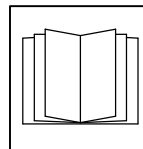
#### BATTERY EXPLOSION can injure.

- Do not use welder to charge batteries or jump start vehicles unless it has a battery charging feature designed for this purpose.



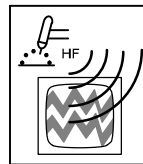
#### MOVING PARTS can injure.

- Keep away from moving parts such as fans.
- Keep all doors, panels, covers, and guards closed and securely in place.
- Have only qualified persons remove doors, panels, covers, or guards for maintenance and troubleshooting as necessary.
- Reinstall doors, panels, covers, or guards when maintenance is finished and before reconnecting input power.



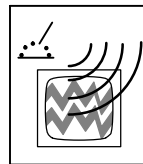
#### READ INSTRUCTIONS.

- Read and follow all labels and the Owner's Manual carefully before installing, operating, or servicing unit. Read the safety information at the beginning of the manual and in each section.
- Use only genuine replacement parts from the manufacturer.
- Perform maintenance and service according to the Owner's Manuals, industry standards, and national, state, and local codes.



#### 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. California Proposition 65 Warnings

 **Welding or cutting equipment produces fumes or gases which contain chemicals known to the State of California to cause birth defects and, in some cases, cancer. (California Health & Safety Code Section 25249.5 et seq.)**

 **This product contains chemicals, including lead, known to the state of California to cause cancer, birth defects, or other reproductive harm. Wash hands after use.**

## 1-5. Principal Safety Standards

*Safety in Welding, Cutting, and Allied Processes*, ANSI Standard Z49.1, is available as a free download from the American Welding Society at <http://www.aws.org> or purchased from Global Engineering Documents (phone: 1-877-413-5184, website: [www.global.ihs.com](http://www.global.ihs.com)).

*Safe Practices for the Preparation of Containers and Piping for Welding and Cutting*, American Welding Society Standard AWS F4.1, from Global Engineering Documents (phone: 1-877-413-5184, website: [www.global.ihs.com](http://www.global.ihs.com)).

*Safe Practices for Welding and Cutting Containers that have Held Combustibles*, American Welding Society Standard AWS A6.0, from Global Engineering Documents (phone: 1-877-413-5184, website: [www.global.ihs.com](http://www.global.ihs.com)).

*National Electrical Code*, NFPA Standard 70, from National Fire Protection Association, Quincy, MA 02269 (phone: 1-800-344-3555, website: [www.nfpa.org](http://www.nfpa.org) and [www.sparky.org](http://www.sparky.org)).

*Safe Handling of Compressed Gases in Cylinders*, CGA Pamphlet P-1, from Compressed Gas Association, 14501 George Carter Way, Suite 103, Chantilly, VA 20151 (phone: 703-788-2700, website: [www.cganet.com](http://www.cganet.com)).

*Safety in Welding, Cutting, and Allied Processes*, CSA Standard W117.2, from Canadian Standards Association, Standards Sales, 5060

Spectrum Way, Suite 100, Ontario, Canada L4W 5N5 (phone: 800-463-6727, website: [www.csa-international.org](http://www.csa-international.org)).

*Safe Practice For Occupational And Educational Eye And Face Protection*, ANSI Standard Z87.1, from American National Standards Institute, 25 West 43rd Street, New York, NY 10036 (phone: 212-642-4900, website: [www.ansi.org](http://www.ansi.org)).

*Standard for Fire Prevention During Welding, Cutting, and Other Hot Work*, NFPA Standard 51B, from National Fire Protection Association, Quincy, MA 02269 (phone: 1-800-344-3555, website: [www.nfpa.org](http://www.nfpa.org)).

OSHA, Occupational Safety and Health Standards for General Industry, Title 29, Code of Federal Regulations (CFR), Part 1910, Subpart Q, and Part 1926, Subpart J, from U.S. Government Printing Office, Superintendent of Documents, P.O. Box 371954, Pittsburgh, PA 15250-7954 (phone: 1-866-512-1800) (there are 10 OSHA Regional Offices—phone for Region 5, Chicago, is 312-353-2220, website: [www.osha.gov](http://www.osha.gov)).

*Applications Manual for the Revised NIOSH Lifting Equation*, The National Institute for Occupational Safety and Health (NIOSH), 1600 Clifton Rd, Atlanta, GA 30333 (phone: 1-800-232-4636, website: [www.cdc.gov/NIOSH](http://www.cdc.gov/NIOSH)).

## 1-6. EMF Information

Electric current flowing through any conductor causes localized electric and magnetic fields (EMF). Welding current creates an EMF field around the welding circuit and welding equipment. EMF fields may interfere with some medical implants, e.g. pacemakers. Protective measures for persons wearing medical implants have to be taken. For example, restrict access for passers—by or conduct individual risk assessment for welders. All welders should use the following procedures in order to minimize exposure to EMF fields from the welding circuit:

1. Keep cables close together by twisting or taping them, or using a cable cover.
2. Do not place your body between welding cables. Arrange cables to one side and away from the operator.
3. Do not coil or drape cables around your body.

4. Keep head and trunk as far away from the equipment in the welding circuit as possible.
5. Connect work clamp to workpiece as close to the weld as possible.
6. Do not work next to, sit or lean on the welding power source.
7. Do not weld whilst carrying the welding power source or wire feeder.

### About Implanted Medical Devices:

Implanted Medical Device wearers should consult their doctor and the device manufacturer before performing or going near arc welding, spot welding, gouging, plasma arc cutting, or induction heating operations. If cleared by your doctor, then following the above procedures is recommended.



# SECTION 2 – CONSIGNES DE SÉCURITÉ – LIRE AVANT UTILISATION

fre\_som\_2011-10

**⚠** Pour écarter les risques de blessure pour vous-même et pour autrui — lire, appliquer et ranger en lieu sûr ces consignes relatives aux précautions de sécurité et au mode opératoire.

## 2-1. Symboles utilisés

**⚠** **DANGER!** – Indique une situation dangereuse qui si on l'évite pas peut donner la mort ou des blessures graves. Les dangers possibles sont montrés par les symboles joints ou sont expliqués dans le texte.

**⚠** Indique une situation dangereuse qui si on l'évite pas peut donner la mort ou des blessures graves. Les dangers possibles sont montrés par les symboles joints ou sont expliqués dans le texte.

**NOTE** – Indique des déclarations pas en relation avec des blessures personnelles.

 Indique des instructions spécifiques.



Ce groupe de symboles veut dire Avertissement! Attention! DANGER DE CHOC ELECTRIQUE, PIECES EN MOUVEMENT, et PIECES CHAUDES. Consulter les symboles et les instructions ci-dessous y afférant pour les actions nécessaires afin d'éviter le danger.

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

**⚠** Les symboles représentés ci-dessous sont utilisés dans ce manuel pour attirer l'attention et identifier les dangers possibles. En présence de l'un de ces symboles, prendre garde et suivre les instructions afférentes pour éviter tout risque. Les instructions en matière de sécurité indiquées ci-dessous ne constituent qu'un sommaire des instructions de sécurité plus complètes fournies dans les normes de sécurité énumérées dans la Section 2-5. Lire et observer toutes les normes de sécurité.

**⚠** Seul un personnel qualifié est autorisé à installer, faire fonctionner, entretenir et réparer cet appareil.

**⚠** Pendant le fonctionnement, maintenir à distance toutes les personnes, notamment les enfants de l'appareil.



### UNE DÉCHARGE ÉLECTRIQUE peut entraîner la mort.

Le contact d'organes électriques sous tension peut provoquer des accidents mortels ou des brûlures graves. Le circuit de l'électrode et de la pièce est sous tension lorsque le courant est délivré à la sortie. Le circuit d'alimentation et les circuits internes de la machine sont également sous tension lorsque l'alimentation est sur Marche. Dans le mode de soudage avec du fil, le fil, le dérouleur, le bloc de commande du rouleau et toutes les parties métalliques en contact avec le fil sont sous tension électrique. Un équipement installé ou mis à la terre de manière incorrecte ou impropre constitue un danger.

- Ne pas toucher aux pièces électriques sous tension.
- Porter des gants isolants et des vêtements de protection secs et sans trous.
- S'isoler de la pièce à couper et du sol en utilisant des housses ou des tapis assez grands afin d'éviter tout contact physique avec la pièce à couper ou le sol.
- 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.
- D'autres consignes de sécurité sont nécessaires dans les conditions suivantes : risques électriques dans un environnement humide ou si l'on porte des vêtements mouillés ; sur des structures métalliques telles que sols, grilles ou échafaudages ; en position coincée comme assise, à genoux ou couchée ; ou s'il y a un risque élevé de contact inévitable ou accidentel avec la pièce à souder ou le sol. Dans ces conditions, utiliser les équipements suivants,

dans l'ordre indiqué : 1) un poste à souder DC à tension constante (à fil), 2) un poste à souder DC manuel (électrode) ou 3) un poste à souder AC à tension à vide réduite. Dans la plupart des situations, l'utilisation d'un poste à souder DC à fil à tension constante est recommandée. En outre, ne pas travailler seul !

- 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).
- Installez, mettez à la terre et utilisez correctement cet équipement conformément à son Manuel d'Utilisation et aux réglementations nationales, gouvernementales et locales.
- 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.
- Les câbles doivent être exempts d'humidité, d'huile et de graisse ; protégez-les contre les étincelles et les pièces métalliques chaudes.
- Vérifier fréquemment le cordon d'alimentation afin de s'assurer qu'il n'est pas altéré ou à nu, le remplacer immédiatement s'il l'est. Un fil à nu peut entraîner la mort.
- L'équipement doit être hors tension lorsqu'il n'est pas utilisé.
- 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, la faire directement avec un câble distinct.
- Ne pas toucher l'électrode quand on est en contact avec la pièce, la terre ou une électrode provenant d'une autre machine.
- Ne pas toucher des porte électrodes connectés à deux machines en même temps à cause de la présence d'une tension à vide doublée.
- 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 si l'on doit travailler au-dessus du sol.
- S'assurer que tous les panneaux et couvercles sont correctement en place.
- 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.
- Ne pas raccorder plus d'une électrode ou plus d'un câble de masse à une même borne de sortie de soudage. Débrancher le câble pour le procédé non utilisé.

## Il reste une TENSION DC NON NÉGLIGEABLE dans les sources de soudage onduleur UNE FOIS l'alimentation coupée.

- 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 PIÈCES CHAUDES peuvent provoquer des brûlures.

- Ne pas toucher à mains nues les parties chaudes.
- Prévoir une période de refroidissement avant de travailler à l'équipement.
- Ne pas toucher aux pièces chaudes, utiliser les outils recommandés et porter des gants de soudage et des vêtements épais pour éviter les brûlures.



### LES FUMÉES ET LES GAZ peuvent être dangereux.

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

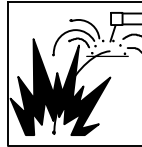
- Eloigner votre tête des fumées. Ne pas respirer les fumées.
- À l'intérieur, ventiler la zone et/ou utiliser une ventilation forcée au niveau de l'arc pour l'évacuation des fumées et des gaz de soudage.
- Si la ventilation est médiocre, porter un respirateur anti-vapeurs approuvé.
- Lire et comprendre les spécifications de sécurité des matériaux (MSDS) et les instructions du fabricant concernant les métaux, les consommables, les revêtements, les nettoyants et les dégraissants.
- 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 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.

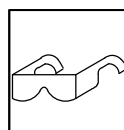
- Porter un casque de soudage approuvé muni de verres filtrants appropriés pour protéger visage et yeux pour protéger votre visage et vos yeux pendant le soudage ou pour regarder (voir ANSI Z49.1 et Z87.1 énuméré dans les normes de sécurité).
- Porter des lunettes de sécurité avec écrans latéraux même sous votre casque.
- Avoir recours à des écrans protecteurs ou à des rideaux pour protéger les autres contre les rayonnements les éblouissements et les étincelles ; prévenir toute personne sur les lieux de ne pas regarder l'arc.
- Porter des vêtements confectionnés avec des matières résistantes et ignifuges (cuir, coton lourd ou laine) et des bottes de protection.



### 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 soudage. 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.

- 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 homologuées.
- Ne pas souder dans un endroit où des étincelles peuvent tomber sur des substances inflammables.
- Se protéger et d'autres personnes de la projection d'étincelles et de métal chaud.
- 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 et AWS A6.0 (voir les Normes de Sécurité).
- Ne soudez pas si l'air ambiant est chargé de particules, gaz, ou vapeurs inflammables (vapeur d'essence, par exemple).
- Brancher le câble de masse sur la pièce la 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, d'étincelles 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.
- Une fois le travail achevé, assurez-vous qu'il ne reste aucune trace d'étincelles incandescentes ni de flammes.
- Utiliser exclusivement des fusibles ou coupe-circuits appropriés. Ne pas augmenter leur puissance; ne pas les ponter.
- Une fois le travail achevé, assurez-vous qu'il ne reste aucune trace d'étincelles incandescentes ni de flammes.
- Utiliser exclusivement des fusibles ou coupe-circuits appropriés. Ne pas augmenter leur puissance; ne pas les ponter.
- Suivre les recommandations dans OSHA 1910.252(a)(2)(iv) et NFPA 51B pour les travaux à chaud et avoir de la surveillance et un extincteur à proximité.



### DES PIÈCES DE METAL ou DES SALETES peuvent provoquer des blessures dans 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.



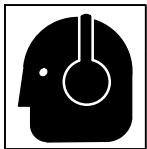
### LES ACCUMULATIONS DE GAZ risquent de provoquer des blessures ou même la mort.

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



### Les CHAMPS ÉLECTROMAGNÉTIQUES (CEM) peuvent affecter les implants médicaux.

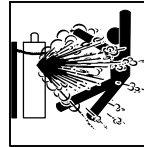
- Les porteurs de stimulateurs cardiaques et autres implants médicaux doivent rester à distance.
- Les porteurs d'implants médicaux doivent consulter leur médecin et le fabricant du dispositif avant de s'approcher de la zone où se déroule du soudage à l'arc, du soudage par points, du gougeage, de la découpe plasma ou une opération de chauffage par induction.



### LE BRUIT peut endommager l'ouïe.

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

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



### LES BOUTEILLES peuvent exploser si elles sont endommagées.

Les bouteilles de gaz comprimé 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.

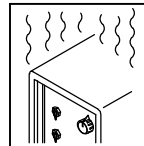
- Protéger les bouteilles de gaz comprimé d'une chaleur excessive, des chocs mécaniques, des dommages physiques, du laitier, des flammes ouvertes, des étincelles et des arcs.
- Placer les bouteilles debout en les fixant dans un support stationnaire ou dans un porte-bouteilles pour les empêcher de tomber 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 comprimé, régulateurs, tuyaux et raccords convenables pour cette application spécifique; les maintenir ainsi que les éléments associés en bon état.
- Détourner votre visage du détendeur-régulateur lorsque vous ouvrez la soupape de la bouteille.
- Le couvercle du détendeur doit toujours être en place, sauf lorsque la bouteille est utilisée ou qu'elle est reliée pour usage ultérieur.
- Utiliser les équipements corrects, les bonnes procédures et suffisamment de personnes pour soulever et déplacer les bouteilles.
- Lire et suivre les instructions sur les bouteilles de gaz comprimé, l'équipement connexe et le dépliant P-1 de la CGA (Compressed Gas Association) mentionné dans les principales normes de sécurité.

## 2-3. 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 protégée avant de mettre l'appareil en service.



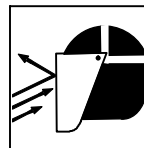
### L'EMPLOI EXCESSIF peut SURCHAUFFER L'ÉQUIPEMENT.

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



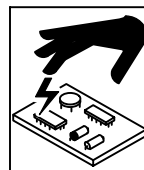
### LA CHUTE DE L'ÉQUIPEMENT peut provoquer des blessures.

- Utiliser l'anneau de levage uniquement pour soulever l'appareil, NON PAS les chariots, les bouteilles de gaz ou tout autre accessoire.
- Utiliser un équipement de levage de capacité suffisante pour lever 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.
- Tenir l'équipement (câbles et cordons) à distance des véhicules mobiles lors de toute opération en hauteur.
- Suivre les consignes du Manuel des applications pour l'équation de levage NIOSH révisée (Publication N°94-110) lors du levage manuel de pièces ou équipements lourds.



### LES ÉTINCELLES PROJETÉES peuvent provoquer des blessures.

- Porter un écran facial pour protéger le visage et les yeux.
- Affûter l'électrode au tungstène uniquement à la meuleuse dotée de protecteurs. Cette manœuvre est à exécuter dans un endroit sûr lorsque l'on porte l'équipement homologué de protection du visage, des mains et du corps.
- Les étincelles risquent de causer un incendie – éloigner toute substance inflammable.



### 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.



### Les PIÈCES MOBILES peuvent causer 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 gâchette 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.



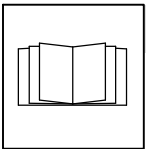
### L'EXPLOSION DE LA BATTERIE peut provoquer des blessures.

- Ne pas utiliser l'appareil de soudage pour charger des batteries ou faire démarrer des véhicules à l'aide de câbles de démarrage, sauf si l'appareil dispose d'une fonctionnalité de charge de batterie destinée à cet usage.



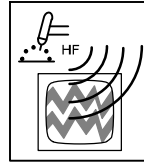
### Les PIÈCES MOBILES peuvent causer des blessures.

- S'abstenir de toucher des organes mobiles tels que des ventilateurs.
- Maintenir fermés et verrouillés les portes, panneaux, recouvrements et dispositifs de protection.
- Lorsque cela est nécessaire pour des travaux d'entretien et de dépannage, faire retirer les portes, panneaux, recouvrements ou dispositifs de protection uniquement par du personnel qualifié.
- Remettre les portes, panneaux, recouvrements ou dispositifs de protection quand l'entretien est terminé et avant de rebrancher l'alimentation électrique.



### LIRE LES INSTRUCTIONS.

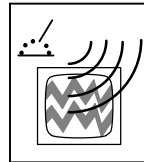
- Lire et appliquer les instructions sur les étiquettes et le Mode d'emploi avant l'installation, l'utilisation ou l'entretien de l'appareil. Lire les informations de sécurité au début du manuel et dans chaque section.
- N'utiliser que les pièces de rechange recommandées par le constructeur.
- Effectuer l'entretien en respectant les manuels d'utilisation, les normes industrielles et les codes nationaux, d'état et locaux.



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

- Le rayonnement haute fréquence (H.F.) 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.

## 2-4. Proposition californienne 65 Avertissements



Les équipements de soudage et de coupage produisent des fumées et des gaz qui contiennent des produits chimiques dont l'État de Californie reconnaît qu'ils provoquent des malformations congénitales et, dans certains cas, des cancers. (Code de santé et de sécurité de Californie, chapitre 25249.5 et suivants)



Ce produit contient des produits chimiques, notamment du plomb, dont l'État de Californie reconnaît qu'ils provoquent des cancers, des malformations congénitales ou d'autres problèmes de procréation. *Se laver les mains après utilisation.*

## 2-5. Principales normes de sécurité

*Safety in Welding, Cutting, and Allied Processes*, ANSI Standard Z49.1, is available as a free download from the American Welding Society at <http://www.aws.org> or purchased from Global Engineering Documents (phone: 1-877-413-5184, website: [www.global.ihs.com](http://www.global.ihs.com)).

*Safe Practices for the Preparation of Containers and Piping for Welding and Cutting*, American Welding Society Standard AWS F4.1, from Global Engineering Documents (phone: 1-877-413-5184, website: [www.global.ihs.com](http://www.global.ihs.com)).

*Safe Practices for Welding and Cutting Containers that have Held Combustibles*, American Welding Society Standard AWS A6.0, from Global Engineering Documents (phone: 1-877-413-5184, website: [www.global.ihs.com](http://www.global.ihs.com)).

*National Electrical Code*, NFPA Standard 70, from National Fire Protection Association, Quincy, MA 02269 (phone: 1-800-344-3555, website: [www.nfpa.org](http://www.nfpa.org) and [www.sparky.org](http://www.sparky.org)).

*Safe Handling of Compressed Gases in Cylinders*, CGA Pamphlet P-1, from Compressed Gas Association, 14501 George Carter Way, Suite 103, Chantilly, VA 20151 (phone: 703-788-2700, website: [www.cganet.com](http://www.cganet.com)).

*Safety in Welding, Cutting, and Allied Processes*, CSA Standard W117.2, from Canadian Standards Association, Standards Sales, 5060

Spectrum Way, Suite 100, Ontario, Canada L4W 5NS (phone: 800-463-6727, website: [www.csa-international.org](http://www.csa-international.org)).

*Safe Practice For Occupational And Educational Eye And Face Protection*, ANSI Standard Z87.1, from American National Standards Institute, 25 West 43rd Street, New York, NY 10036 (phone: 212-642-4900, website: [www.ansi.org](http://www.ansi.org)).

*Standard for Fire Prevention During Welding, Cutting, and Other Hot Work*, NFPA Standard 51B, from National Fire Protection Association, Quincy, MA 02269 (phone: 1-800-344-3555, website: [www.nfpa.org](http://www.nfpa.org)).

OSHA, Occupational Safety and Health Standards for General Industry, Title 29, Code of Federal Regulations (CFR), Part 1910, Subpart Q, and Part 1926, Subpart J, from U.S. Government Printing Office, Superintendent of Documents, P.O. Box 371954, Pittsburgh, PA 15250-7954 (phone: 1-866-512-1800) (there are 10 OSHA Regional Offices—phone for Region 5, Chicago, is 312-353-2220, website: [www.osha.gov](http://www.osha.gov)).

*Applications Manual for the Revised NIOSH Lifting Equation*, The National Institute for Occupational Safety and Health (NIOSH), 1600 Clifton Rd, Atlanta, GA 30333 (phone: 1-800-232-4636, website: [www.cdc.gov/NIOSH](http://www.cdc.gov/NIOSH)).

## 2-6. Informations relatives aux CEM

Le courant électrique qui traverse tout conducteur génère des champs électromagnétiques (CEM) à certains endroits. Le courant de soudage crée un CEM autour du circuit et du matériel de soudage. Les CEM peuvent créer des interférences avec certains implants médicaux comme des stimulateurs cardiaques. Des mesures de protection pour les porteurs d'implants médicaux doivent être prises: Limiter par exemple tout accès aux passants ou procéder à une évaluation des risques individuels pour les soudeurs. Tous les soudeurs doivent appliquer les procédures suivantes pour minimiser l'exposition aux CEM provenant du circuit de soudage:

1. Rassembler les câbles en les torsadant ou en les attachant avec du ruban adhésif ou avec une housse.
2. Ne pas se tenir au milieu des câbles de soudage. Disposer les câbles d'un côté et à distance de l'opérateur.
3. Ne pas courber et ne pas entourer les câbles autour de votre corps.

4. Maintenir la tête et le torse aussi loin que possible du matériel du circuit de soudage.
5. Connecter la pince sur la pièce aussi près que possible de la soudure.
6. Ne pas travailler à proximité d'une source de soudage, ni s'asseoir ou se pencher dessus.
7. Ne pas souder tout en portant la source de soudage ou le dévidoir.



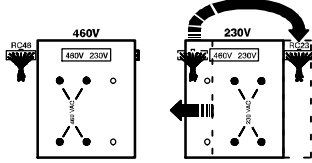
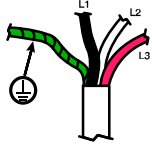


### En ce qui concerne les implants médicaux :

Les porteurs d'implants doivent d'abord consulter leur médecin avant de s'approcher des opérations de soudage à l'arc, de soudage par points, de gougeage, du coupage plasma ou de chauffage par induction. Si le médecin approuve, il est recommandé de suivre les procédures précédentes.














# SECTION 3 – DEFINITIONS

## 3-1. Manufacturer’s Warning Label Definitions

	<p>Warning! Watch Out! There are possible hazards as shown by the symbols.</p> <p style="text-align: right;">Safe1 2012-05</p>
	<p>Beware of electric shock from wiring.</p> <p style="text-align: right;">Safe94 2012-08</p>
	<p>Move relinking board as shown on inside label to match input voltage at job site. Double-check all connections, relinking board position, and input voltage before applying power.</p> <p style="text-align: right;">Safe96 2012-06</p>
	<p>For single phase operation, insulate and isolate red conductor. Include extra length in grounding conductor and connect grounding conductor first. Connect black, white, and red wires (L1, L2, L3) to line terminals.</p> <p style="text-align: right;">Safe97 2012-05</p>
	<p>Falling unit can cause injury and damage. Do not move unit where two wheels are at a different height and unit could tip – avoid tipping. Be careful when moving unit over uneven surfaces.</p> <p style="text-align: right;">Safe98 2012-05</p>
	<p>Drive rolls can injure fingers.</p> <p style="text-align: right;">Safe32 2012-05</p>

## 3-2. Miscellaneous Symbols And Definitions

	<p>Input Power Or Input Voltage</p>		<p>Cold Jog (Inch) Toward Workpiece</p>		<p>Purge by Gas</p>		<p>Protective Earth (Ground)</p>
	<p>Gun Control</p>		<p>On</p>		<p>Off</p>		<p>Increase</p>
	<p>Press</p>		<p>Arc Control</p>		<p>Output</p>		

# SECTION 4 – SPECIFICATIONS



## 4-1. Specifications

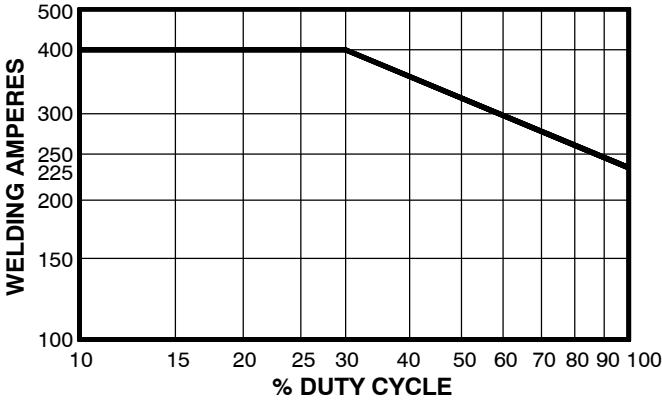
Rated Output		Max. Open Circuit Voltage	60 Hz	Amps Input at Rated Output				
				200 V	230 V	460 V	KVA	KW
300 A at 32 VDC, 60% Duty Cycle	350 A at 32 VDC, 40% Duty Cycle	90	Single-Phase	69 (1.7*)	61 (1.5*)	30 (0.75*)	13.1	11.2
			Three-Phase	34 (1.7*)	30 (1.5*)	15 (0.75*)	11.6	11.5

\* While idling

Wire Type and Diameter	Wire Feed Speed	Dimensions	Net Weight
<b>Aluminum</b>	50–800 IPM (1.3–20.3 m/min) (depending on welding gun)	H: 34 in. (864 mm) W: 19 in. (483 mm) D: 41 in. (1041 mm)	181 lb (82 kg)
.035 – .047 in. (0.9 – 1.2 mm)			
Operating Temperature Range: -20C to +40C		Storage Temperature Range: -30C to + 50C	

## 4-2. Duty Cycle And Overheating

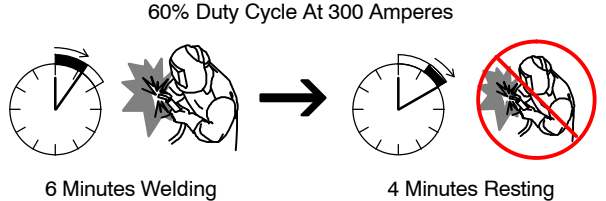


Duty Cycle is percentage of 10 minutes that unit can weld at rated load without overheating.

If unit overheats, thermistors open, output stops, and cooling fan runs. Wait fifteen minutes for unit to cool. Reduce amperage or voltage, or duty cycle before welding.

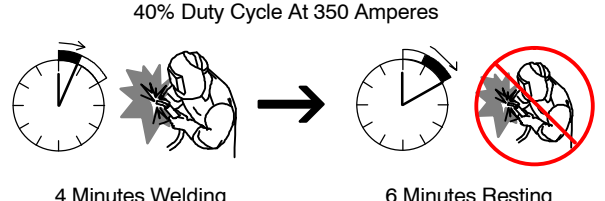
**NOTICE** – Exceeding duty cycle can damage unit and void warranty.

60% Duty Cycle At 300 Amperes



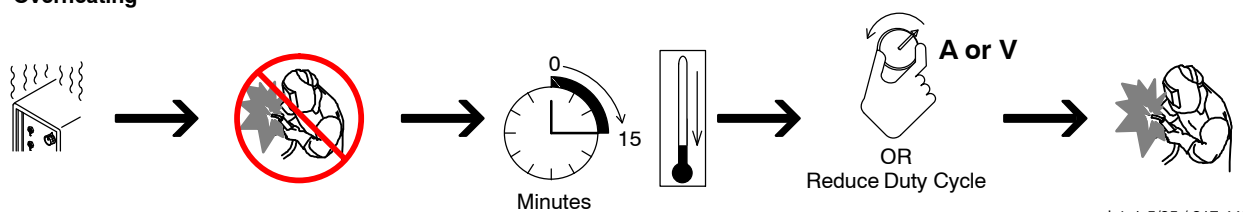
6 Minutes Welding      4 Minutes Resting

40% Duty Cycle At 350 Amperes



4 Minutes Welding      6 Minutes Resting

**Overheating**

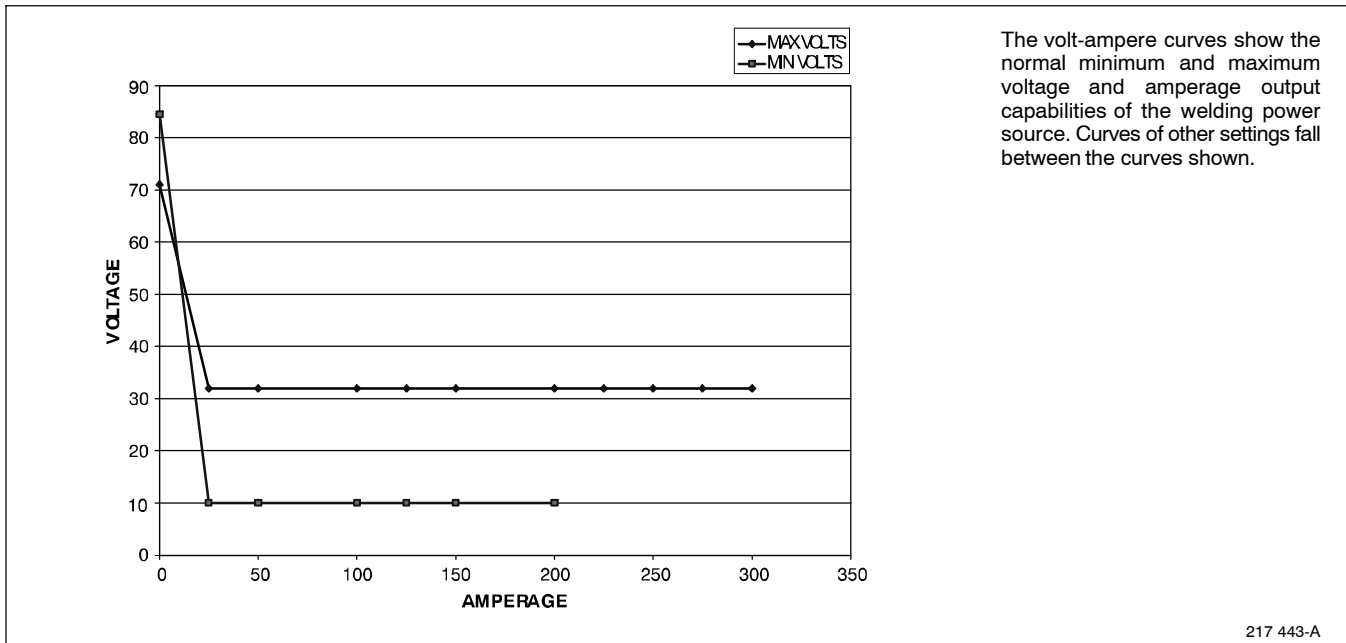


Minutes      OR      Reduce Duty Cycle

sduy1 5/95 / 217 442-A



### 4-3. Volt-Ampere Curve



### 4-4. Millermatic 350P Aluminum Differences vs Standard Millermatic 350/350P

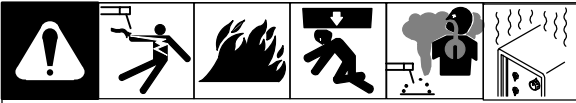
1. Aluminum Only – The Millermatic 350P Aluminum has been optimized for Aluminum welding. Steel, Stainless Steel, and Metal Core wire types are not intended to be used with the Millermatic 350P Aluminum.
2. New .040" wire diameter – The .040" wire diameter has been added to all Aluminum programs to provide the user with more wire options.
3. Torque motor vs. Constant Speed motor – One of the major improvements to the Millermatic 350P Aluminum is the new torque motor. The new torque motor virtually eliminates all feeding problems, downtime related to aluminum shaving, birds nesting, and destroyed liners.
4. Gun Calibration vs. Motor Calibration – The Millermatic 350P relied on precisely matching the speeds of the push motor and the pull motor. Variations in each of the motors resulted in wire feeding issues. The new torque motor eliminates many of the feeding issues. However, for optimum performance Miller has added a Gun calibration routine to the Millermatic 350P Aluminum. This new routine allows the welding machine to learn the physical characteristics of the gun and adjust its operation to provide the most ideal feeding scenario. See Section 6-15 for more detailed information on Gun Calibration.
5. SUP is gone – The new torque motor eliminates the need for SUP value in the Millermatic 350P Aluminum.
6. Jog/Purge Button – For increased ease of use the Millermatic 350P Aluminum has a Jog/Purge button. With the press of a button the user can Jog wire or Purge gas. See section 6-7 for more information on the Jog feature. See Section 6-8 for more information on the Purge feature.
7. Trigger Hold – The new Millermatic 350P Aluminum includes a Trigger Hold feature to reduce wear and tear on the user. Long continuous welds can now be made without the need for constant trigger pressure. See section 6-10 for more information on the Trigger Hold feature.
8. Trigger Schedule Select – The new Millermatic 350P Aluminum includes dual schedule which allows an operator to switch between two pre-programmed weld settings by the quick tap of the trigger. For more information on this feature see Section 6-16.
9. Synergic MIG – Synergic MIG gives the non-Pulse operators the ability to apply synergic control to the welding output based on the wire feed speed.
10. Electronic Wire Spool Brake – Allows wire spool to free spool while welding which provides optimum wire free delivery. When the gun trigger is released, the brake engages.

## SECTION 5 – INSTALLATION

### 5-1. Serial Number And Rating Label Location

The serial number and rating information for this product is located on the back. Use rating label to determine input power requirements and/or rated output. For future reference, write serial number in space provided on back cover of this manual.

### 5-2. Selecting A Location



#### Movement

**⚠** Do not move or operate unit where it could tip.

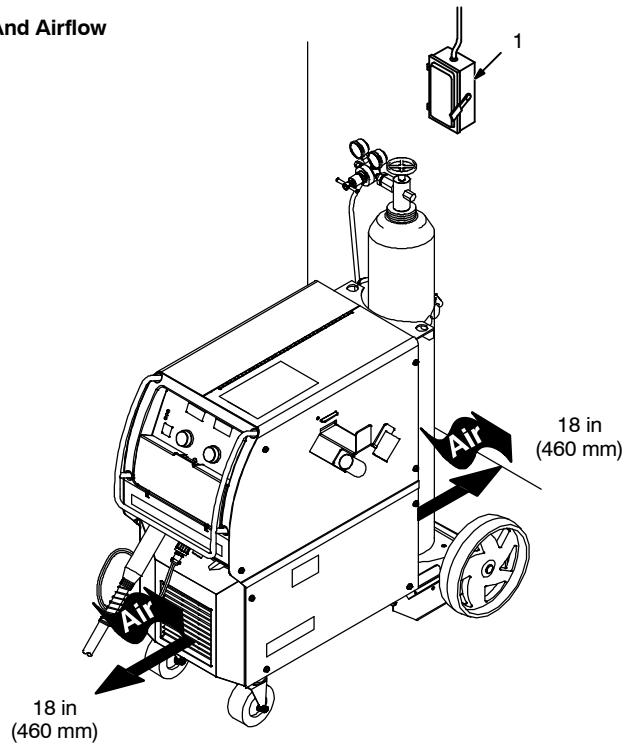


1 Line Disconnect Device

Locate unit near correct input power supply.

**⚠** Special installation may be required where gasoline or volatile liquids are present – see NEC Article 511 or CEC Section 20.



#### Location And Airflow



Ref. 804653-B

### 5-3. Weld Output Terminals And Selecting Cable Sizes

**NOTICE** – The Total Cable Length in Weld Circuit (see table below) is the combined length of both weld cables. For example, if the power source is 100 ft (30 m) from the workpiece, the total cable length in the weld circuit is 200 ft (2 cables x 100 ft). Use the 200 ft (60 m) column to determine cable size.

  Weld Output Terminals  Turn off power before connecting to weld output terminals.  Do not use worn, damaged, undersized, or poorly spliced cables.	Weld Cable Size** and Total Cable (Copper) Length in Weld Circuit Not Exceeding***									
	100 ft (30 m) or Less		150 ft (45 m)	200 ft (60 m)	250 ft (70 m)	300 ft (90 m)	350 ft (105 m)	400 ft (120 m)		
	Welding Amperes	10 – 60% Duty Cycle AWG (mm <sup>2</sup> )	60 – 100% Duty Cycle AWG (mm <sup>2</sup> )	10 – 100% Duty Cycle AWG (mm <sup>2</sup> )						
100	4 (20)	4 (20)	4 (20)	3 (30)	2 (35)	1 (50)	1/0 (60)	1/0 (60)		
150	3 (30)	3 (30)	2 (35)	1 (50)	1/0 (60)	2/0 (70)	3/0 (95)	3/0 (95)		
200	3 (30)	2 (35)	1 (50)	1/0 (60)	2/0 (70)	3/0 (95)	4/0 (120)	4/0 (120)		
250	2 (35)	1 (50)	1/0 (60)	2/0 (70)	3/0 (95)	4/0 (120)	2 ea. 2/0 (2x70)	2 ea. 2/0 (2x70)		
300	1 (50)	1/0 (60)	2/0 (70)	3/0 (95)	4/0 (120)	2 ea. 2/0 (2x70)	2 ea. 3/0 (2x95)	2 ea. 3/0 (2x95)		
350	1/0 (60)	2/0 (70)	3/0 (95)	4/0 (120)	2 ea. 2/0 (2x70)	2 ea. 3/0 (2x95)	2 ea. 3/0 (2x95)	2 ea. 4/0 (2x120)		
400	1/0 (60)	2/0 (70)	3/0 (95)	4/0 (120)	2 ea. 2/0 (2x70)	2 ea. 3/0 (2x95)	2 ea. 4/0 (2x120)	2 ea. 4/0 (2x120)		
500	2/0 (70)	3/0 (95)	4/0 (120)	2 ea. 2/0 (2x70)	2 ea. 3/0 (2x95)	2 ea. 4/0 (2x120)	3 ea. 3/0 (3x95)	3 ea. 3/0 (3x95)		


\* This chart is a general guideline and may not suit all applications. If cable overheats, use next size larger cable.

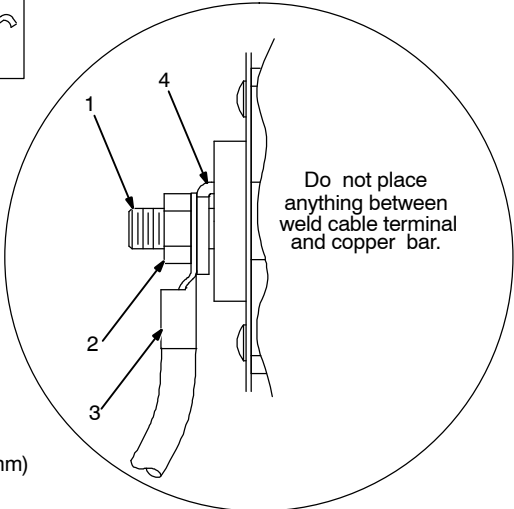
\*\*Weld cable size (AWG) is based on either a 4 volts or less drop or a current density of at least 300 circular mils per ampere. ( ) = mm<sup>2</sup> for metric use

\*\*\*For distances longer than those shown in this guide, call a factory applications rep. at 920-735-4505 (Miller) or 1-800-332-3281 (Hobart)

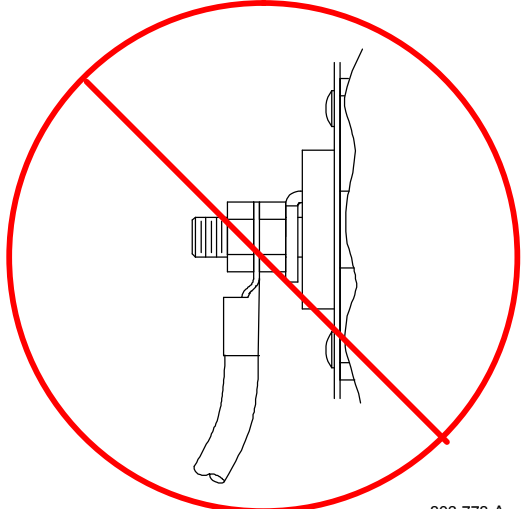
Ref. S-0007-G 2009-08

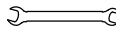
## 5-4. Connecting To Weld Output Terminals






Do not place anything between weld cable terminal and copper bar.




Tools Needed:  
 3/4 in. (19 mm)

**Correct Installation**

**Incorrect Installation**

 **Turn off power before connecting to weld output terminals.**

 **Failure to properly connect weld cables may cause excessive heat and start a fire, or damage your machine.**


- 1 Weld Output Terminal
- 2 Supplied Weld Output Terminal Nut
- 3 Weld Cable Terminal
- 4 Copper Bar

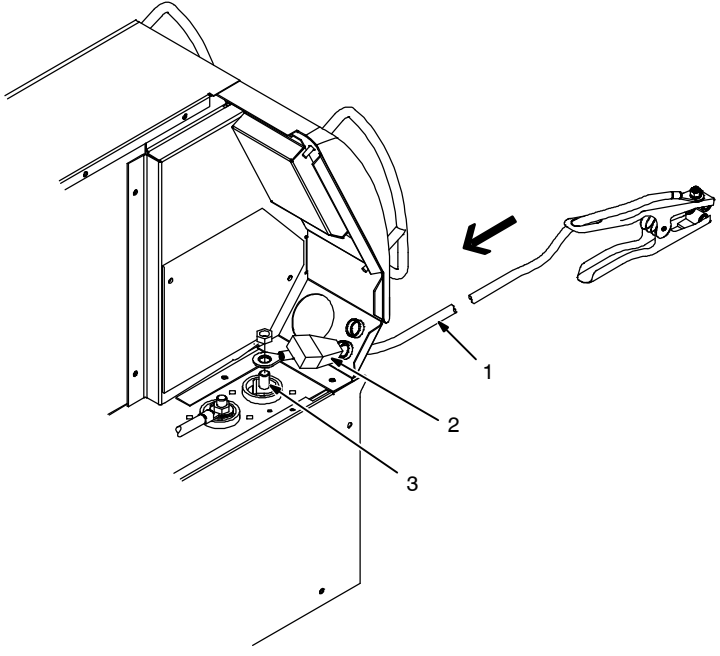
Remove supplied nut from weld output terminal. Slide weld cable terminal onto weld

output terminal and secure with nut so that weld cable terminal is tight against copper bar. **Do not place anything between weld cable terminal and copper bar. Make sure that the surfaces of the weld cable terminal and copper bar are clean.**

803 778-A

## 5-5. Installing Work Clamp



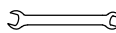


- 1 Work Cable
- 2 Boot
- 3 Negative (-) Output Terminal

Route cable through front panel opening. Slide boot onto work cable.

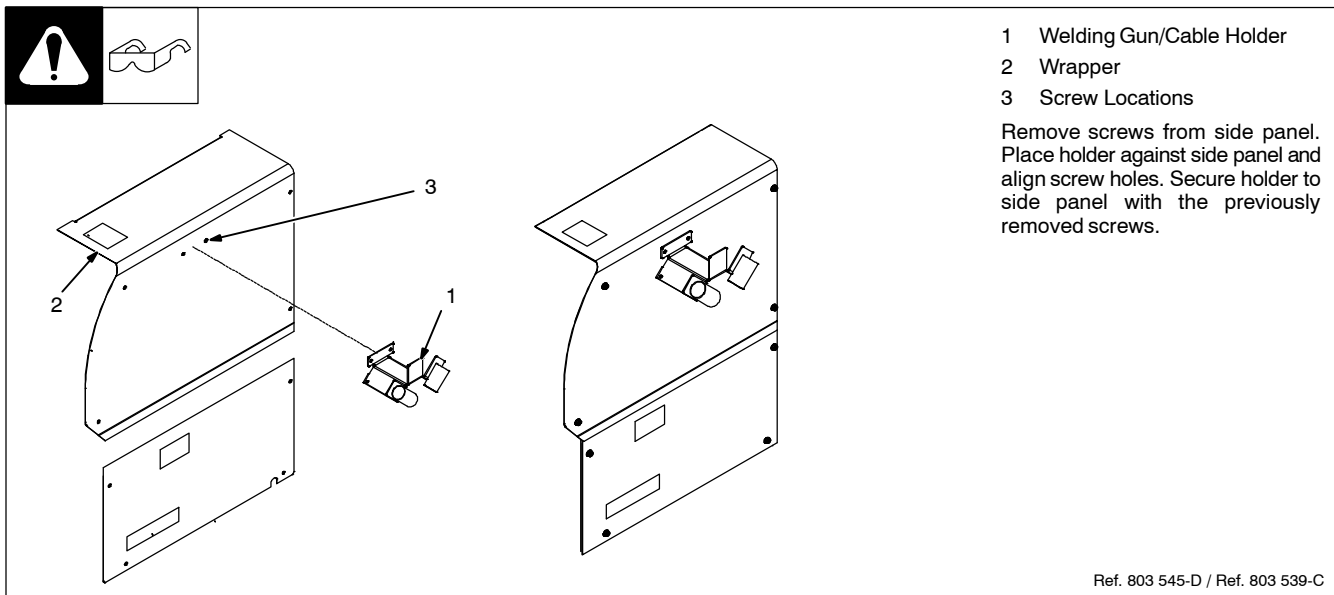
Connect cable to terminal and cover connection with boot.

Close door.

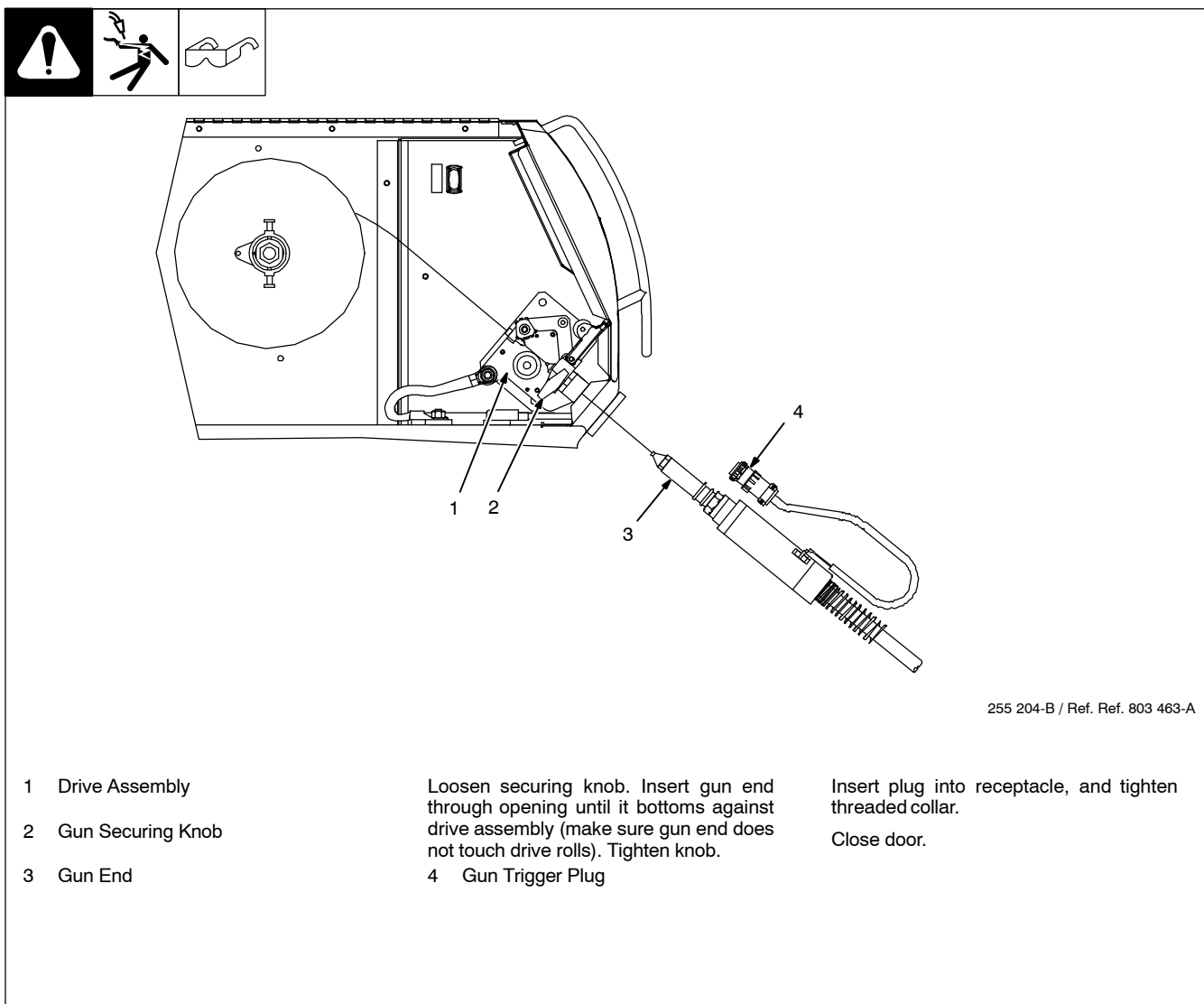
Tools Needed:  
 3/4 in.

Ref. 803 540-E

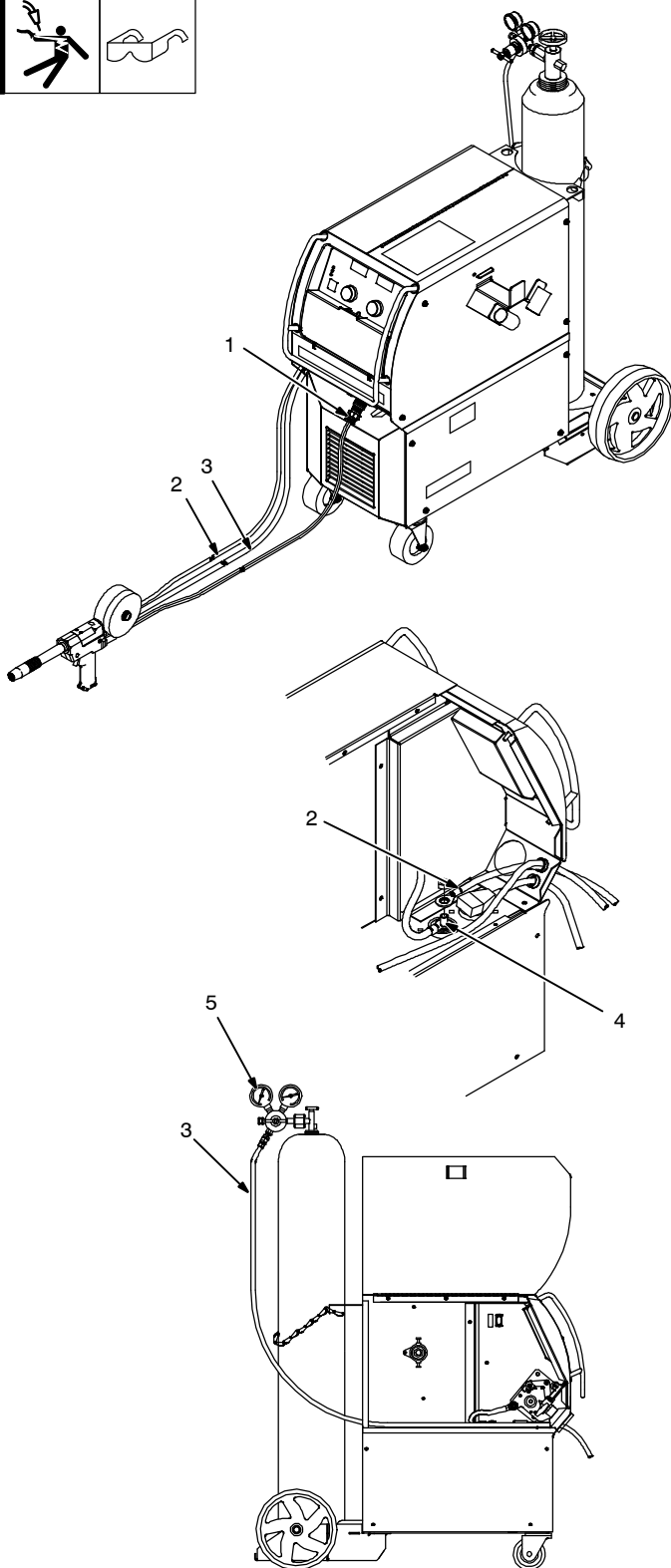
## 5-6. Installing Welding Gun/Cable Holder



## 5-7. Installing Spool Gun Or Push/Pull Gun (See Sections 5-8 And 5-9)



## 5-8. Connecting Spoolmatic® 15A Or 30A Gun



1 Gun Trigger Plug  
Insert plug into receptacle, and tighten threaded collar.

2 Weld Cable

3 Shielding Gas Hose

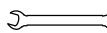
Route weld cable and gas hose through opening in front panel.

4 Positive Weld Output Terminal  
Connect weld cable to weld output terminal.

5 Regulator/Flowmeter

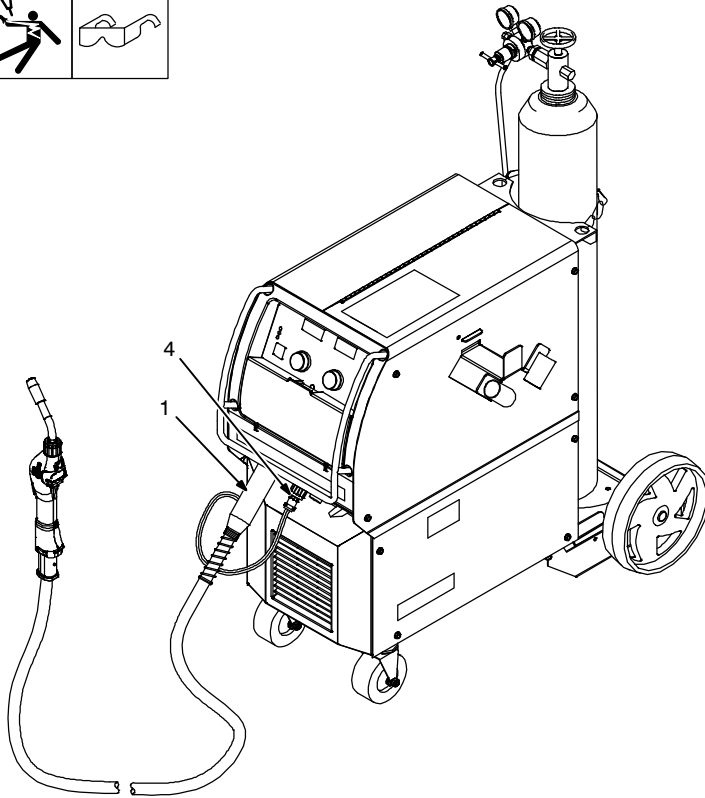
Route shielding gas hose through wire drive compartment, out opening in rear panel, and up to regulator/flowmeter. Connect gas hose to regulator/flowmeter.

Tools Needed:

 3/4, 5/8 in.

255 359-B

## 5-9. Connecting XR-A Gun, XR-A Python, Or XR-A Aluma-Pro, Or XR-A Aluma-Pro Lite



- 1 Gun End
- 2 Gun Liner
- 3 Wire Outlet Guide


Trim excess liner from end of gun so no more than 3/32 in. (2.4 mm) of liner extends past wire outlet guide.

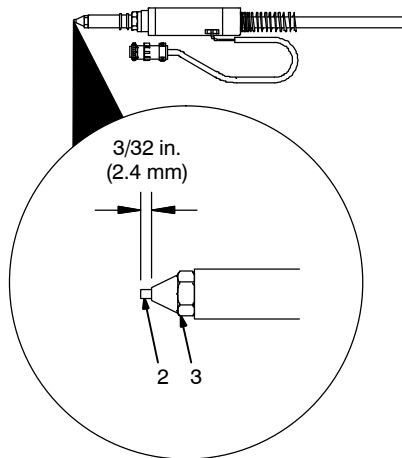
Connect gun end to drive assembly (see Section 5-7).

Be sure to change drive rolls to the proper size and type.

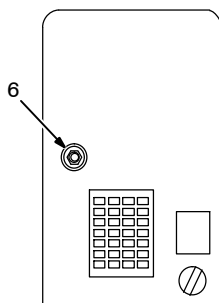
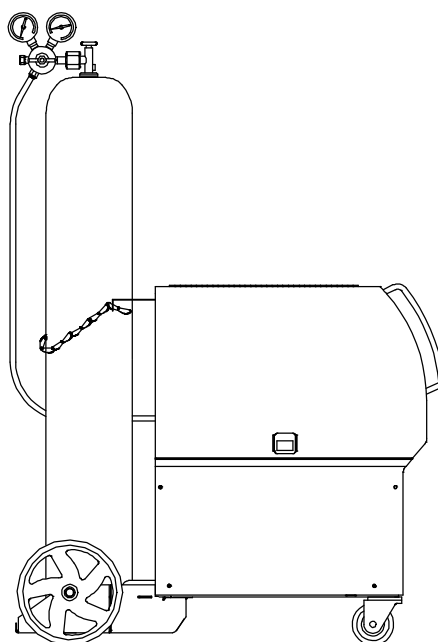
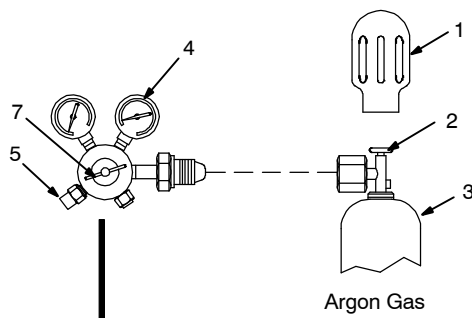
- 4 Gun Trigger Plug

Insert plug into receptacle, and tighten threaded collar.

 Be sure to trim liner to proper extension.



## 5-10. Installing Gas Supply



Rear Panel

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 Regulator/Flowmeter Gas Hose Connection

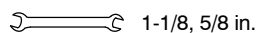
- 6 Welding Power Source Gas Hose Connection

Connect supplied gas hose between regulator/flowmeter gas hose connection, and fitting on rear of welding power source.

- 7 Flow Adjust

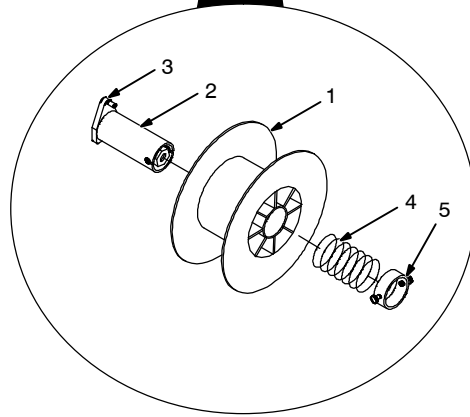
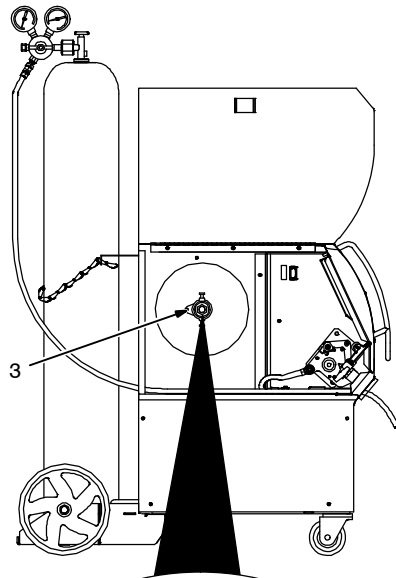
Typical flow rate is 30 to 35 cfh (cubic feet per hour). Check wire manufacturer's recommended flow rate.

**Tools Needed:**





## 5-11. Installing Wire Spool



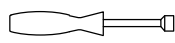
- 1 Wire Spool
- 2 Hub
- 3 Hub Pin
- 4 Compression Spring  
Optional - For 8 Inch Spool  
(Part No. 057745).
- 5 Retaining Ring

Slide spool onto hub so wire feeds off top. Turn spool until hub pin fits hole in back of spool (notch on hub aligns with hub pin for guidance). Reinstall retaining ring.

Adjust hub tension until a slight force is needed to turn spool.

Thread welding wire (see Section 5-17 or 5-18).

### Tools Needed:



7/16 in.

255 371-B / Ref. 805 023-A



## 5-12. Electrical Service Guide

**!** Failure to follow these electrical service guide recommendations could create an electric shock or fire hazard. These recommendations are for a dedicated circuit sized for the rated output and duty cycle of the welding power source. In dedicated circuit installations, the National Electrical Code (NEC) allows the receptacle or conductor rating to be less than the rating of the circuit protection device. All components of the circuit must be physically compatible. See NEC articles 210.21, 630.11, and 630.12.

	60 Hz Single Phase			60 Hz Three Phase		
	200	230	460	200	230	460
<b>Input Voltage (V)</b>	200	230	460	200	230	460
<b>Input Amperes (A) At Rated Output</b>	69	61	30	34	30	15
<b>Max Recommended Standard Fuse Rating In Amperes<sup>1</sup></b>						
<b>Time-Delay Fuses<sup>2</sup></b>	80	70	35	40	35	15
<b>Normal Operating Fuses<sup>3</sup></b>	100	90	40	50	45	20
<b>Min Input Conductor Size In AWG<sup>4</sup></b>	6	8	10	10	10	14
<b>Max Recommended Input Conductor Length In Feet (Meters)</b>	101 (31)	86 (26)	229 (70)	86 (26)	114 (35)	178 (54)
<b>Min Grounding Conductor Size In AWG<sup>4</sup></b>	8	8	10	10	10	14

Reference: 2011 National Electrical Code (NEC) (including article 630)

- 1 If a circuit breaker is used in place of a fuse, choose a circuit breaker with time-current curves comparable to the recommended fuse.
- 2 "Time-Delay" fuses are UL class "RK5" . See UL 248.
- 3 "Normal Operating" (general purpose - no intentional delay) fuses are UL class "K5" (up to and including 60 amps), and UL class "H" ( 65 amps and above).
- 4 Conductor data in this section specifies conductor size (excluding flexible cord or cable) between the panelboard and the equipment per NEC Table 310.15(B)(16). If a flexible cord or cable is used, minimum conductor size may increase. See NEC Table 400.5(A) for flexible cord and cable requirements.

# Notes

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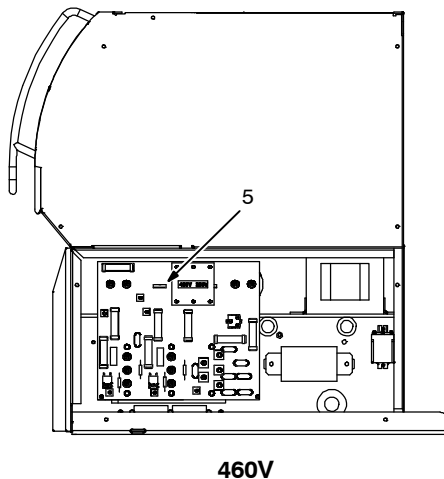
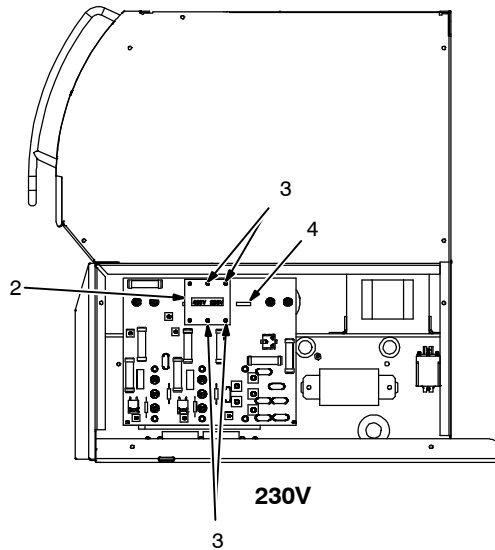
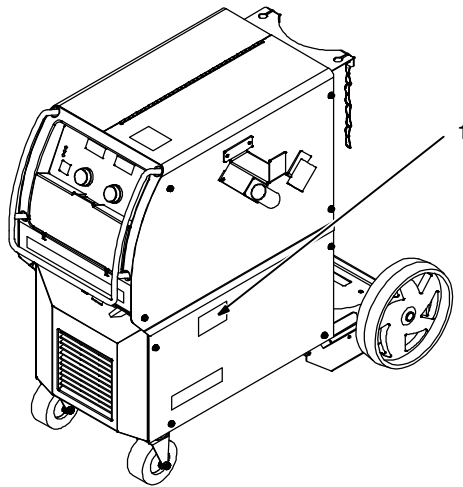
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
## 5-13. Selecting Input Voltage




 Be sure to reinstall all four screws securing relinking board in place.



 Turn Off welding power source, disconnect input power, and check voltage on input capacitors according to Section 7-6 before proceeding.

 Check input voltage available at site.

 Incorrect linking can damage unit and void the warranty.

1 Voltage Selection View Window

Check voltage selected in unit. Changing selection is only necessary if selected value does not match available input voltage.

2 Relinking Board PC6

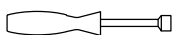
3 Mounting Screws

4 Receptacle RC23 (Connection For 230 VAC Or 208 VAC Input Power)

5 Receptacle RC46 (Connection For 460 VAC Input Power)

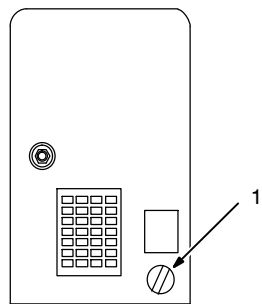
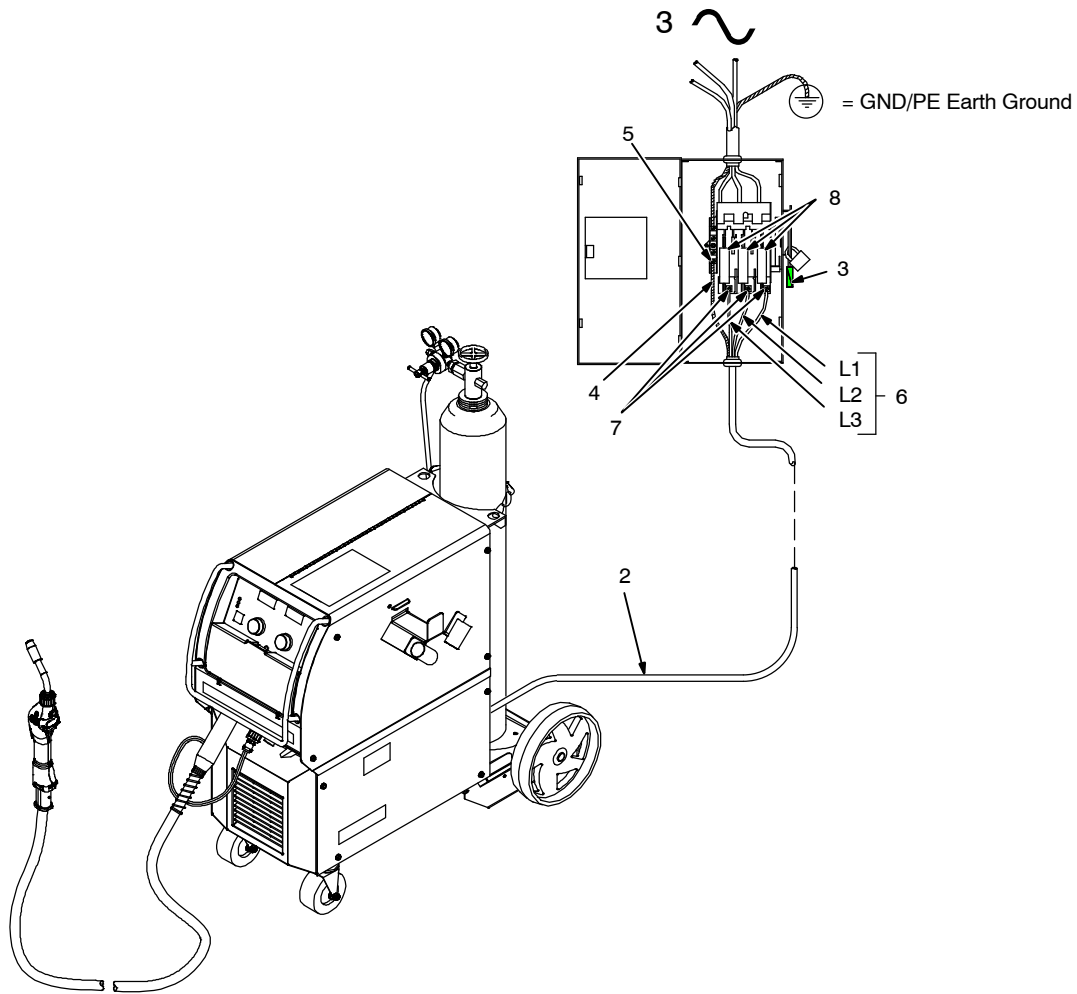
Move relinking board as needed and connect plug PLG32 (in unit) to RC23 or RC46 according to input power voltage.

Tools Needed:



5/16 in.

## 5-14. Connecting 3-Phase Input Power



**Rear Panel**

Tools Needed:



## 5-14. Connecting 3-Phase Input Power (Continued)



**⚠** Installation must meet all National and Local Codes - have only qualified persons make this installation.

**⚠** Disconnect and lockout/tagout input power before connecting input conductors from unit.

**⚠** Always connect green or green/yellow conductor to supply grounding terminal first, and never to a line terminal.

See rating label on unit and check input voltage available at site.

### For Three-Phase Operation

- 1 Input Power Cord Strain Relief
  - 2 Input Power Cord
  - 3 Disconnect Device (switch shown in the OFF position)
  - 4 Green Or Green/Yellow Grounding Conductor
  - 5 Disconnect Device Grounding Terminal
  - 6 Input Conductors (L1, L2 And L3)
  - 7 Disconnect Device Line Terminals
- Connect green or green/yellow grounding

conductor to disconnect device grounding terminal first.

Connect input conductors L1, L2, and L3 to disconnect device line terminals.

### 8 Over-Current Protection

Select type and size of over-current protection using Section 5-12 (fused disconnect switch shown).

Close and secure door on disconnect device. Follow established lockout/tagout procedures to put unit in service.

input2 2012-05

## Notes

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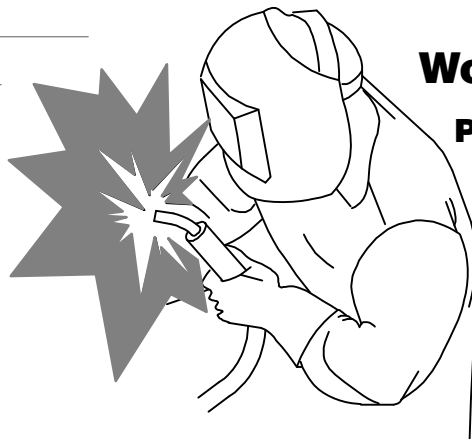
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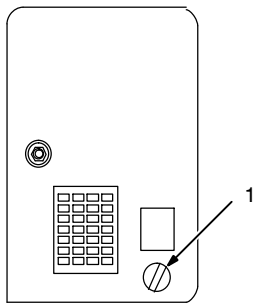
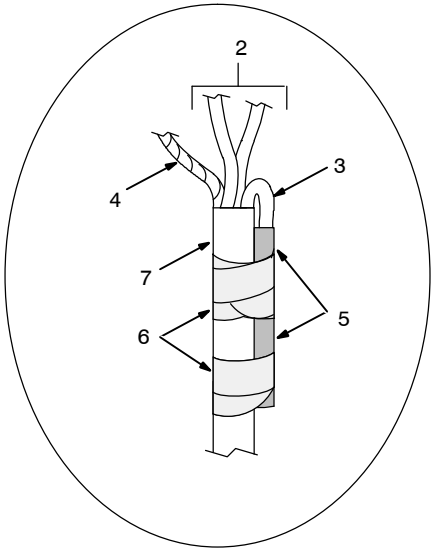
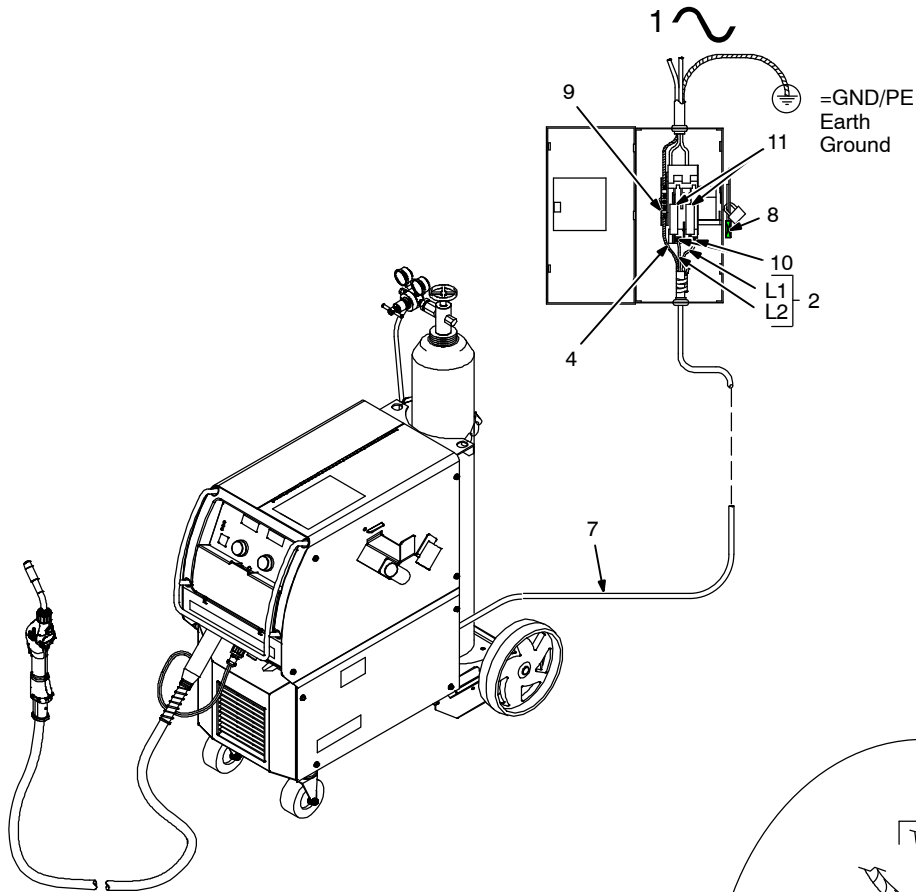
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**Work like a Pro!**

**Pros weld and cut safely. Read the safety rules at the beginning of this manual.**

## 5-15. Connecting 1-Phase Input Power



Rear Panel

Tools Needed:



## 5-15. Connecting 1-Phase Input Power (Continued)



**⚠ Installation must meet all National and Local Codes - have only qualified persons make this installation.**

**⚠ Disconnect and lockout/tagout input power before connecting input conductors from unit. Follow established procedures regarding the installation and removal of lockout/tagout devices.**

**⚠ Always connect green or green/yellow conductor to supply grounding terminal first, and never to a line terminal.**

See rating label on unit and check input voltage available at site.

- 1 Input Power Cord Strain Relief
  - 2 Black And White Input Conductor (L1 And L2)
  - 3 Red Input Conductor
  - 4 Green Or Green/Yellow Grounding Conductor
  - 5 Insulation Sleeveing
  - 6 Electrical Tape
- Insulate and isolate red conductor as shown.
- 7 Input Power Cord.
  - 8 Disconnect Device (switch shown in the OFF position)
  - 9 Disconnect Device Grounding Terminal

### 10 Disconnect Device Line Terminals

Connect green or green/yellow grounding conductor to disconnect device grounding terminal first.

Connect input conductors L1 and L2 to disconnect device line terminals.

### 11 Over-Current Protection

Select type and size of over-current protection using Section 5-12 (fused disconnect switch shown).

Close and secure door on disconnect device. Follow established lockout/tagout procedures to put unit in service.

input1 2012-05

## Notes

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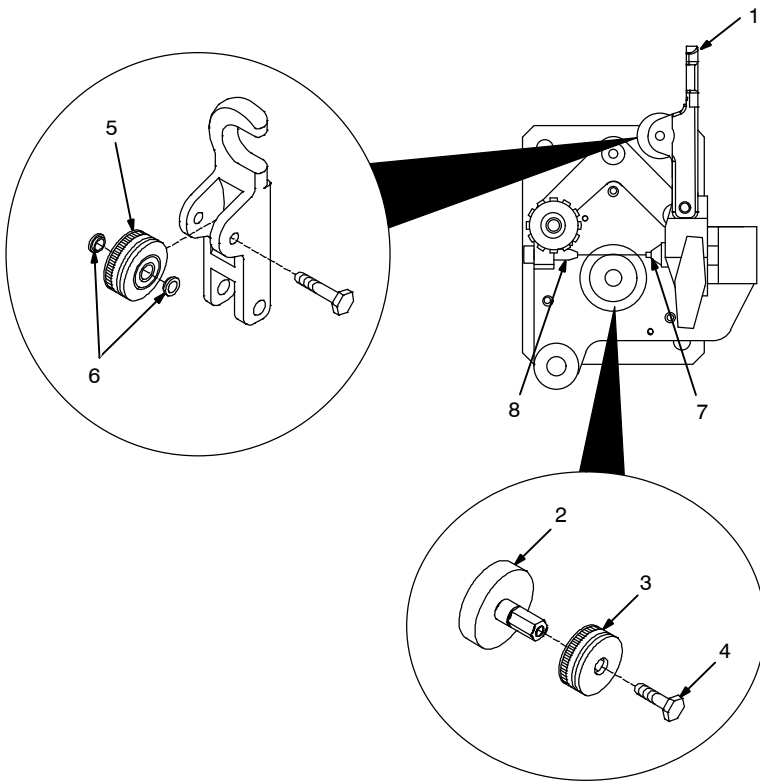
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**Work like a Pro!**  
**Pros weld and cut safely. Read the safety rules at the beginning of this manual.**

## 5-16. Changing Drive Rolls



Retract wire onto spool.

- 1 Pressure Roll Assembly
- 2 Drive Motor Shaft
- 3 Drive Roll
- 4 Screw
- 5 Drive Roll Idler
- 6 Shoulder Washer (2)

Remove drive roll, idler, and shoulder washers if changing wire size.

Install new drive roll, idler, and shoulder washers as shown.

Use wire brush to clean idler.

- 7 Outlet Guide
- 8 Wire Inlet Guide

Check inlet and outlet guides, and replace if worn.

Pull inlet guide toward rear of feeder to remove. Install new guide.

Drive roll and idler are available for the following wire size ranges:

.035 in. wire size

.040 in. wire size

3/64 in. wire size

See Section 9-1 for more information on replacement drive rolls.

When changing wire size, change machine drive roll and idler.

Tools Needed:



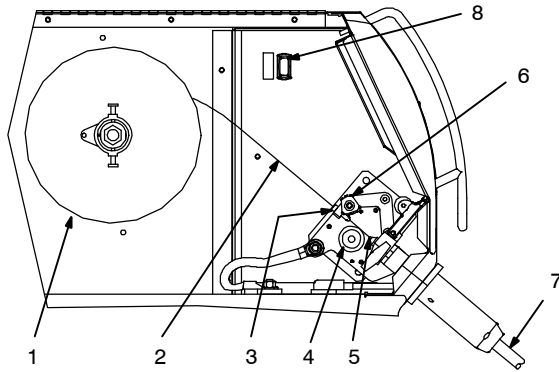
805 350-A



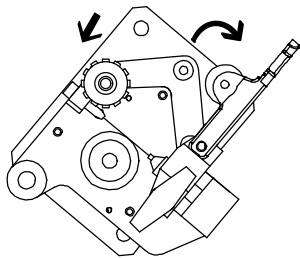
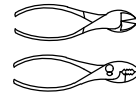
## 5-17. Threading Welding Wire



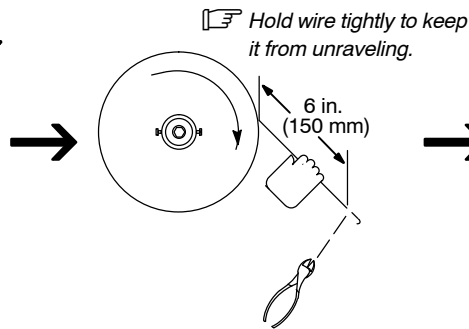
- 1 Wire Spool
  - 2 Welding Wire
  - 3 Inlet Wire Guide
  - 4 Drive Roll
  - 5 Wire Conduit
  - 6 Pressure Adjustment Knob
  - 7 Gun Conduit Cable
  - 8 Jog/Purge Switch
- Lay gun cable out straight.



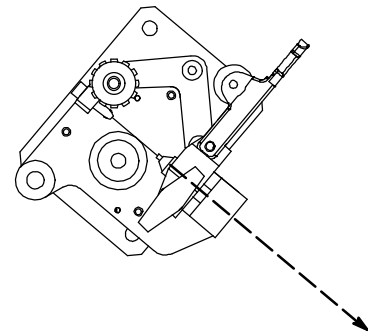
Tools Needed:



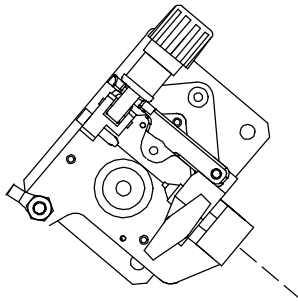
Open pressure assembly.  
Install proper size drive rolls.



Pull and hold wire; cut off end.



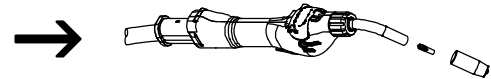
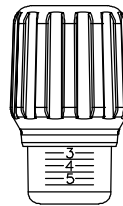
Push wire thru inlet guide, along  
drive roll groove, and into wire  
conduit; continue to hold wire.



Close and tighten pressure  
assembly according to Tension  
Setting chart, and let go of wire.

Tension Settings

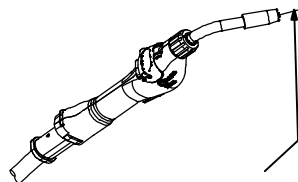
Wire Size	Setting
0.035 in.	1-2
0.040 in.	3-4
3/64 in.	



Remove gun nozzle and contact tip.



Turn On.



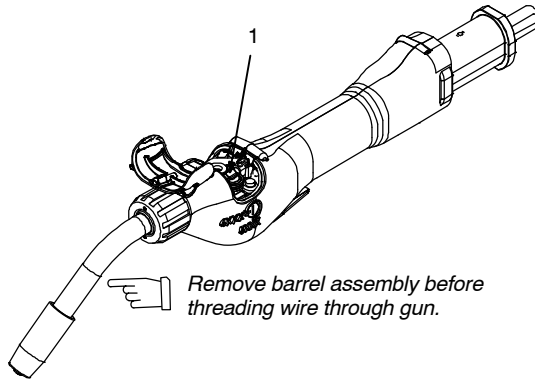
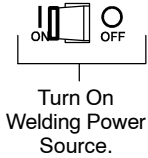
Press gun trigger or jog switch until wire comes  
out of gun. Reinstall contact tip and nozzle.  
Close and latch door on power source.


## 5-18. Threading Welding Wire Through XR Guns



**⚠** Welding wire is electrically live when gun trigger is used to jog wire.

### For XR-A Edge Gun:



 Refer to Section 5-17 for instructions on feeding wire through welding power source.

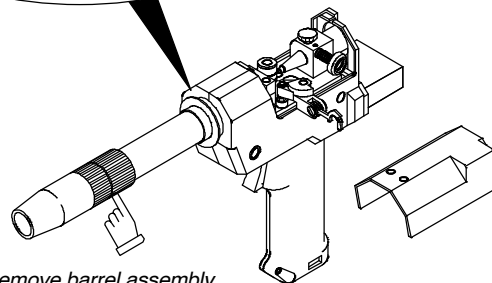
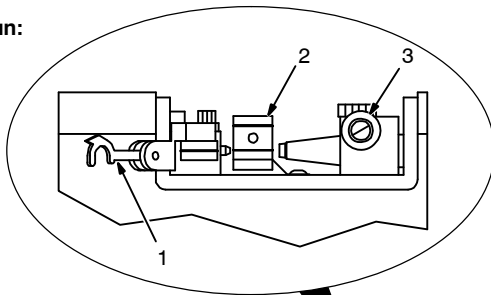
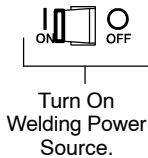
- 1 Pressure Roll Assembly  
Lay gun cable out straight.

Open top cover, and open pressure roll assembly. If not already done, remove gun barrel assembly.

Press gun trigger until about 4 in. (102 mm) of wire is sticking out front of gun. Insert wire into barrel liner and tighten barrel assembly. Install correct size contact tube and install collet nut.

Close top cover on gun. Press trigger switch until about 6 in. (152 mm) of wire is sticking out end of contact tip. Cut off wire. Close and latch door.

### For XR-A Pistol Gun:



- 1 Pressure Roll Assembly
- 2 Drive Roll
- 3 Thumbscrew

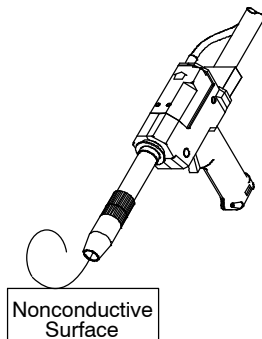
Lay gun cable out straight. Open top cover, and lift pressure arm and open pressure roll assembly. If not already done, remove gun barrel assembly.

Manually thread wire along drive roll groove. Close pressure roll assembly. Press gun trigger until about 4 in. (102 mm) of wire is sticking out front of gun. Insert wire into barrel liner and tighten barrel assembly. Install correct size contact tube and install collet nut. Reinstall gun cover.

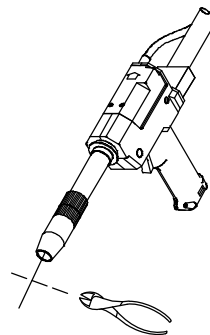
- 4 Pressure Adjustment Knob

See final pressure adjustment at bottom of page.

### For XR-A Pistol Gun:



Feed wire to check drive roll pressure. Tighten knob enough to prevent slipping.



Cut off wire. Close and latch door.

Tools Needed:



 Do not exceed midrange setting.

**⚠** Turn welding power source Off.

## SECTION 6 – OPERATION

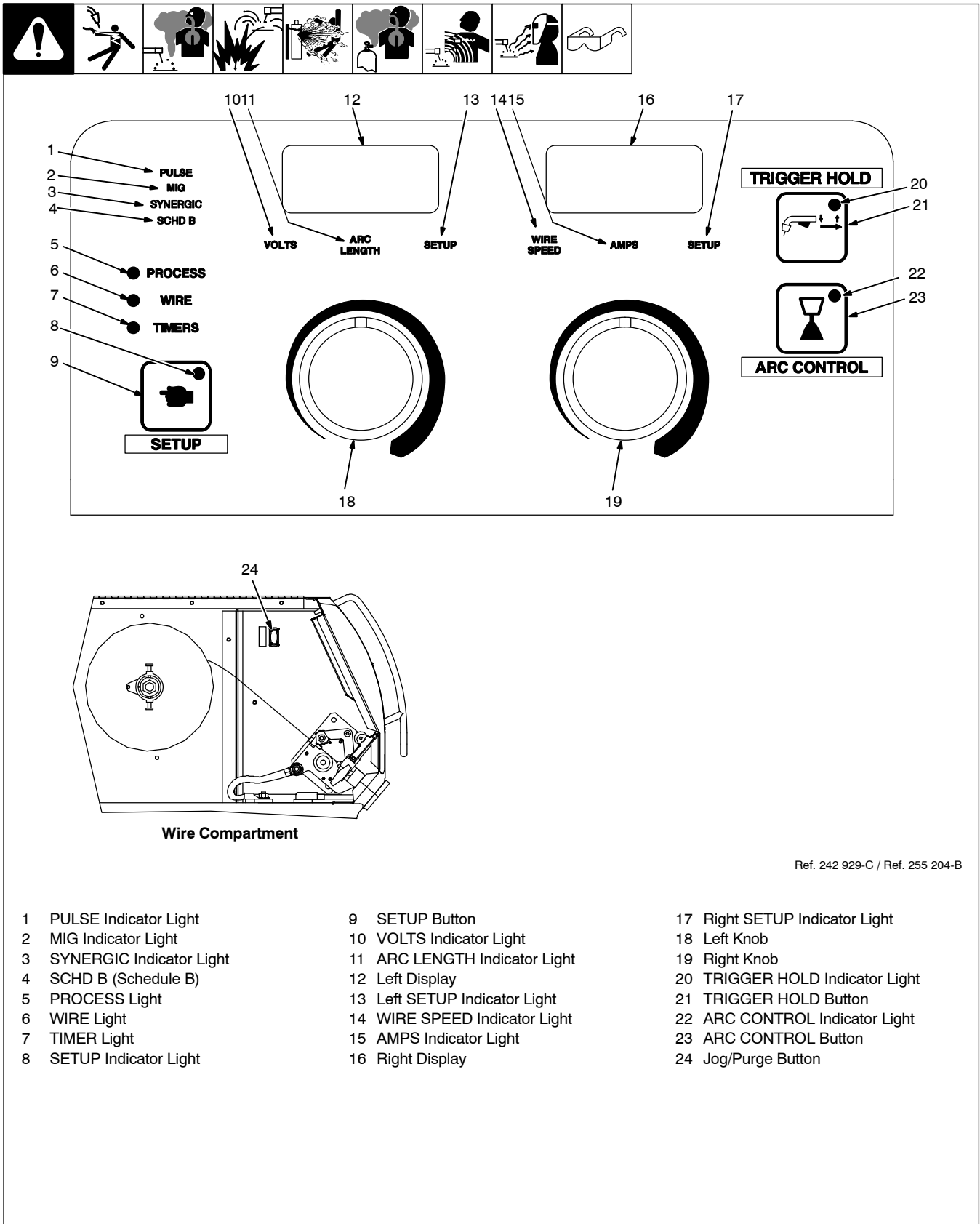
### 6-1. Operational Terms

The following is a list of terms and their definitions as they apply to this interface unit:

#### General Terms:


<b>Arc Length</b>	Distance from end of wire electrode to workpiece.
<b>Crater</b>	Provides voltage/arc length, wire feed speed and time values for modified arc end.
<b>Dual Schedule</b>	Allows selecting a pair of weld parameter settings that can be used together.
<b>Gun Calibration</b>	Gun calibration routine allows the welding machine to learn the physical characteristics of the gun and adjust its operation to provide the most ideal feeding scenario.
<b>Hot Start</b>	Provides more power at the beginning of the weld to eliminate incomplete fusion and increase penetration.
<b>Inductance</b>	In short circuit GMAW welding, an increase in inductance will decrease the number of short circuit transfers per second (provided no other changes are made) and increase the arc-on time. The increased arc-on time makes the welding puddle more fluid.
<b>Jog</b>	Method for feeding wire without contactor or gas valve being energized.
<b>MIG (Gas Metal Arc Welding)</b>	CV weld process with individual settings of voltage and wire speed.
<b>Postflow</b>	The amount of time that the shielding gas will flow after the arc has been shut off.
<b>Preflow</b>	The amount of time that the shielding gas will flow after the trigger is pressed and before the welding arc will be allowed to be active.
<b>Pulse MIG (GMAW)</b>	CC weld process with factory taught data using peak and background current, pulse width and pulses per second. Adaptive pulse control methods modulate one or more of the taught data parameters to regulate or maintain a fixed arc length.
<b>Purge</b>	Method for energizing the gas valve to purge gas lines before welding and to preset gas pressure at the regulator.
<b>Run-In</b>	Allows setting a welding wire feed speed before arc initiation. After arc initiation, the wire feed speed is controlled by the Wire Speed control setting.
<b>SharpArc</b>	In pulse, this adjustment changes the arc cone by adjusting the preprogrammed factory pulse data. In MIG, this adjustment changes inductance.
<b>Synergic</b>	Refers to the system's ability to match the power setting to the set wire feed speed using a single knob control. In synergic Pulsed MIG, the pulse parameters are automatically increased or decreased to match the power output to the set wire speed.
<b>Synergic MIG (GMAW)</b>	Synergic refers to the unit's ability to use preprogrammed pulse parameters to determine the actual pulse settings of Peak Amperage, Background Amperage, Pulse Frequency and Pulse Width at any specific wire feed speed setting.
<b>Trigger Hold</b>	This feature reduces welder fatigue by allowing continuous welding without holding the trigger.
<b>Welding Process</b>	MIG, Synergic MIG, Pulse MIG

## 6-2. Controls



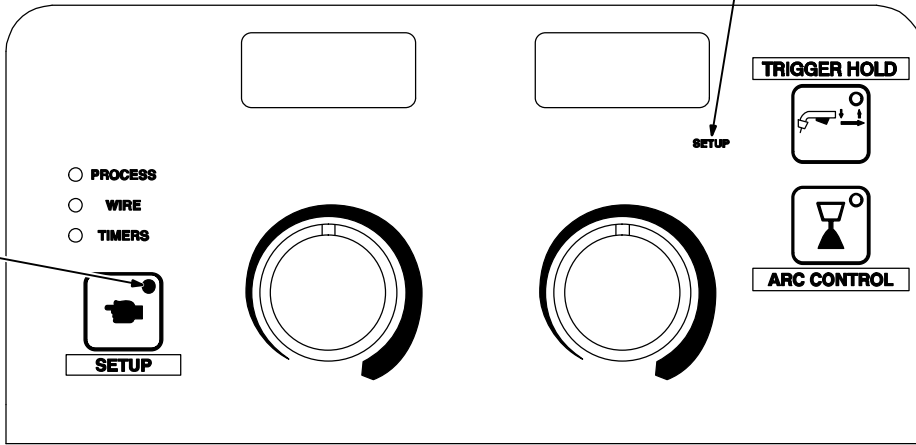
## 6-3. Setup Button

### 6-3-1. Gun




1 Lit Indicators

This menu allows the user to select a gun to configure such as Python, Aluma-Pro, or XR-A.



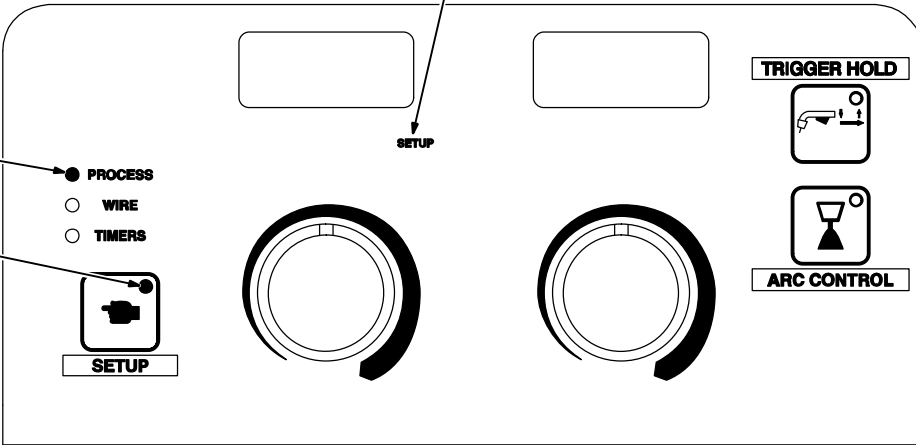
Ref. 242 929-C

### 6-3-2. Process



1 Lit Indicators

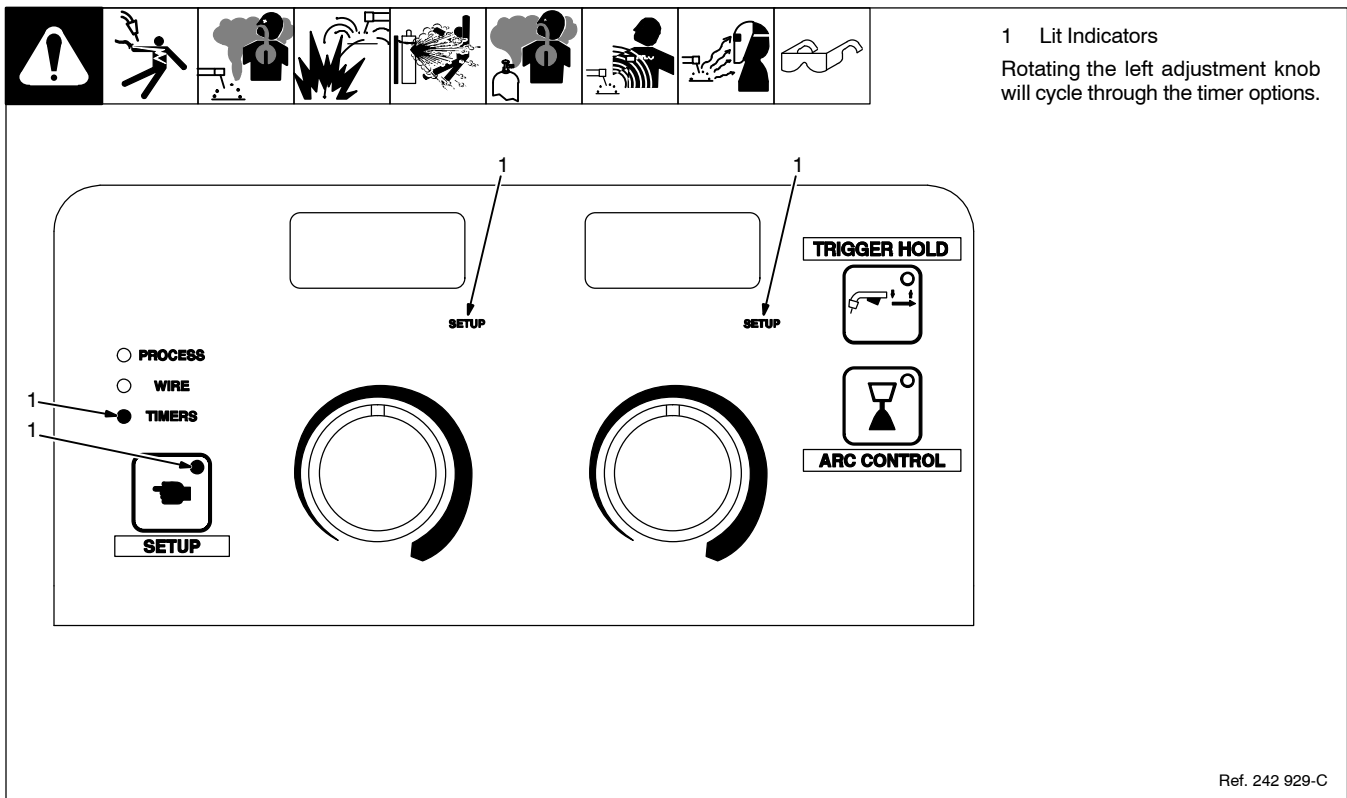
This menu allows the user to select a welding process.



Ref. 242 929-C



## 6-3-4. Timers



### 6-3-4-1. Run-in

In this menu the user can adjust the wire feed speed prior to the welding arc being established. This setting is a percentage of the wire feed speed the unit is set to for welding. For example, if the wire feed speed to set to 200 IPM and the run-in is set to 50% then the run-in wire feed speed will be 100 IPM.

### 6-3-4-2. Preflow

In this menu the user can adjust the amount of time that the shielding gas will flow after the trigger is pressed and before the wire starts feeding. This setting is in seconds.

### 6-3-4-3. Postflow

In this menu the user can adjust the amount of time that the shielding gas will flow after the arc has been extinguished. This setting is in seconds.

### 6-3-4-4. Spot Timer

This menu allows the user to adjust the spot time. The spot time is the length of time for the weld sequence. The weld will end when the set time has expired or the trigger has been released, whichever occurs first. The spot timer is reset when the trigger is released. This time is in seconds.

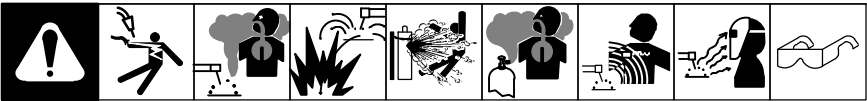
### 6-3-4-5. Trigger Hold Delay

In this menu, the user can adjust the trigger hold delay. Trigger hold delay is the minimum amount of time the trigger must be held for the trigger to become active. See section 6-10 for more information on the trigger hold feature. This time is in seconds.

### 6-3-4-6. Right Display Preferences

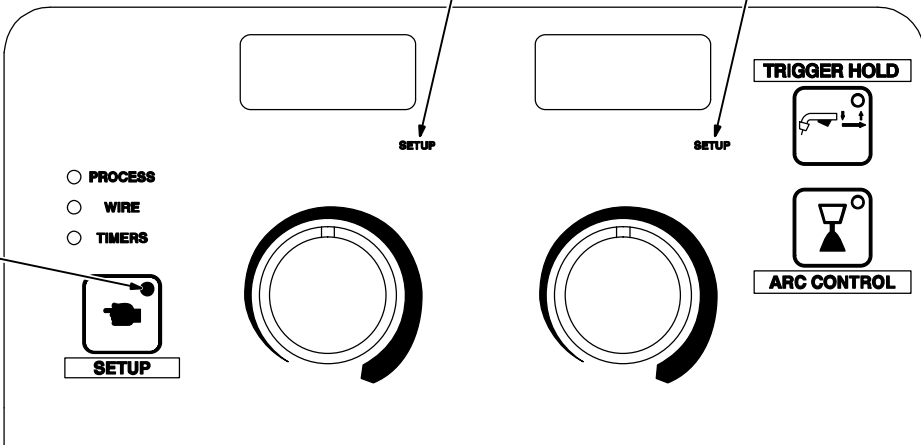
In this menu the user can select the type of information displayed while welding. The options are "WFS" for wire feed speed or "AMPS" for welding current. For more information on welding display status see section 6-9.

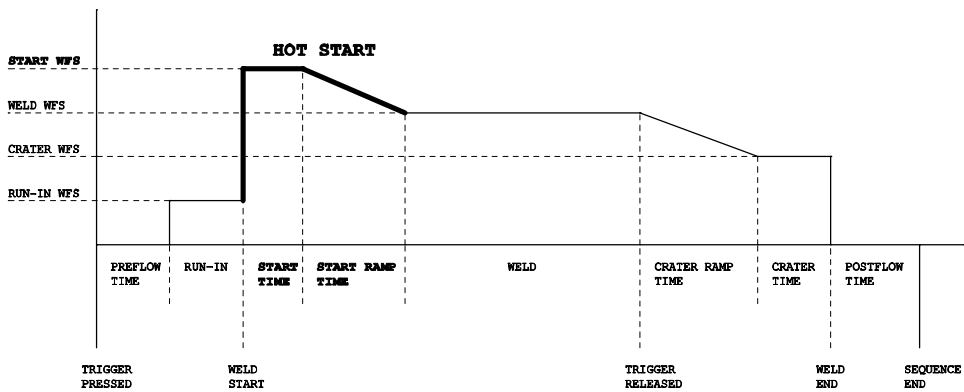
### 6-3-5. Hot Start (Pulse Mode Only)



1 Lit Indicators

To enable this feature the user must first access the system menu and turn the "ALST" feature to "ON". For more information on the system menu see Section 6-14. For more information about the hot start function see section 4-14. Once "ALST" is turned "ON" the left adjustment knob is used to cycle through the hot start parameters.





Ref. 242 929-C

#### 6-3-5-1. Start Power

In this menu the user can adjust the percentage of weld power applied during the start period. The start wire feed speed and all other pulse parameters are calculated to obtain the high heat input desired for a quality aluminum start.

#### 6-3-5-2. Start Time

In this menu the user can adjust the amount of time the start power is applied. This time is in seconds.

#### 6-3-5-3. Starting Arc Length

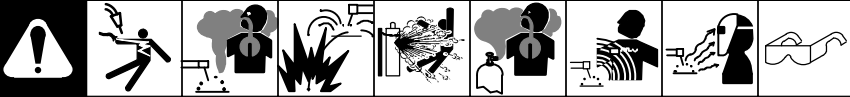
In this menu the user can select the desired arc length for the starting time.

#### 6-3-5-4. Start Ramp Time

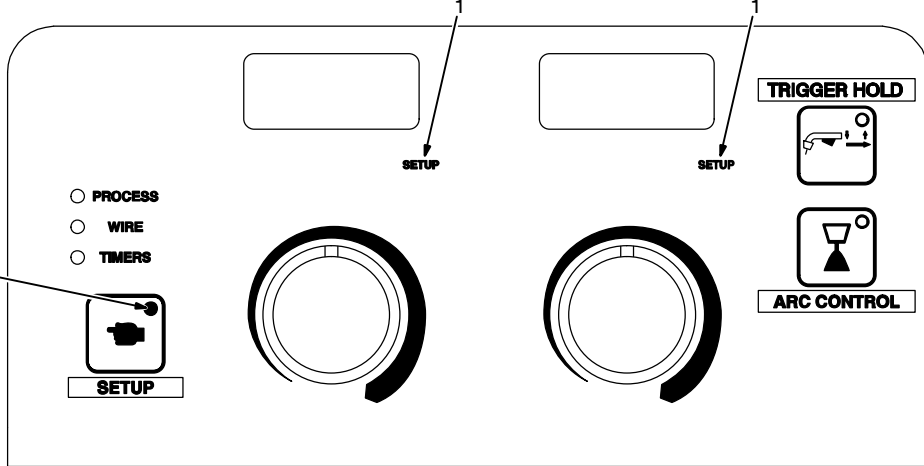
In this menu the user can select the amount of time required to ramp from the hot start power and arc length to the desired welding wire feed speed and arc length. This time is in seconds.



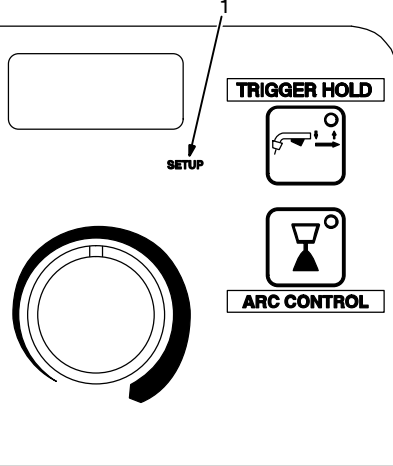
### 6-3-6. Crater Fill



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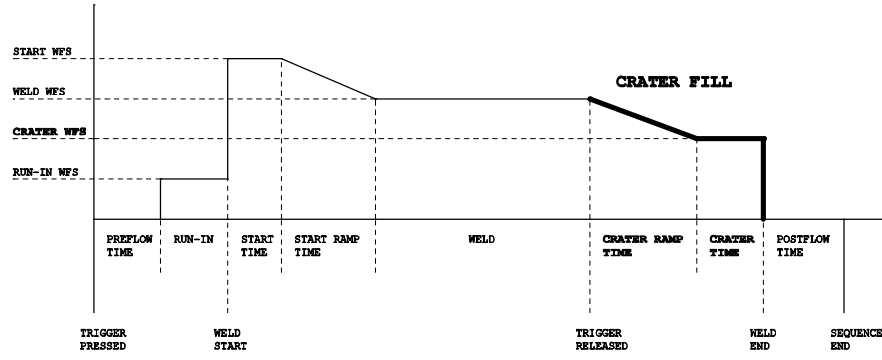


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1 Lit Indicators

To enable this feature the user must first access the system menu and turn the "CRTR" feature to "ON". For more information on the system menu see section 6-14. For more information about the crater function see section 6-18.



Ref. 242 929-C

#### 6-3-6-1. Crater Select

This menu allows the user to turn the crater feature on and off for a particular gun type (i.e. spool gun vs. push-pull gun).

#### 6-3-6-2. Crater Wire Feed Speed

This menu allows the user to adjust the wire feed speed used during crater. The setting is in IPM.

#### 6-3-6-3. Crater Time










This menu allows the user to adjust the time spent welding with the crater settings. This time is in seconds.

#### 6-3-6-4. Crater Arc Length Or Voltage

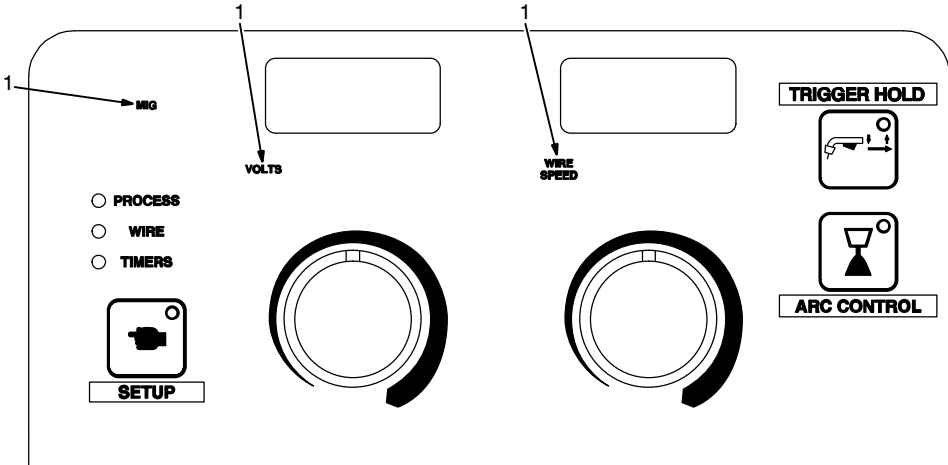
This menu allows the user to adjust the arc length or voltage (depending on welding process) while welding with the crater settings.

The crater ramp time is not configurable by the user, this time is dependant on changing the wire feed speed and is minimized by the system.

## 6-4. MIG Mode

1 Lit Indicators



When the **MIG** light (2) is illuminated, the unit is in MIG Welding mode.

### SETUP

To enter **MIG** welding mode, depress the **SETUP** (6) button once to go to **GUN** selection. Rotate the right knob (9) to select the gun being used. Select *MIG* for standard MIG gun, or select *XR-R*, *PYTH*, *ALPR* for push pull guns, or *SPL* for spoolgun.

Depress **SETUP** (6) a second time to illuminate the **PROCESS** (3) light. Rotate right knob (9) until *MIG* is displayed (for MIG only units *NOT USED* will be displayed).

Depress **SETUP** (6) button again to illuminate the **WIRE** (4) light. Adjust left knob (8) to select wire type, adjust right knob (9) to select wire size.

Depress **SETUP** (6) button again to illuminate **TIMERS** (5) light. For description of the **TIMERS**, refer to **TIMERS** menu (see Section 6-3-4)

If crater fill function menus are enabled, **TIMERS** light will stay on to allow for adjustment of crater parameters and timers (see Section 6-3-4).


Depress **SETUP** (6) button again to exit menus and enter **MIG** welding mode.

### OPERATION


Adjust welding Voltage with left knob (8) and Wire Feed Speed on the gun.

### ARC CONTROL

MIG welding mode: Depress **ARC CONTROL** (7) button to enter Arc control menu and **INDU** will appear on the left display and the corresponding setting will appear on the right display. Adjust right knob (9) to adjust inductance setting. In MIG welding mode the Arc control is an inductance control from 0-99. Changing the inductance will change the fluidity of the puddle.




Low Inductance  
Weld Bead  
(0 setting)



High Inductance  
Weld Bead  
99 setting

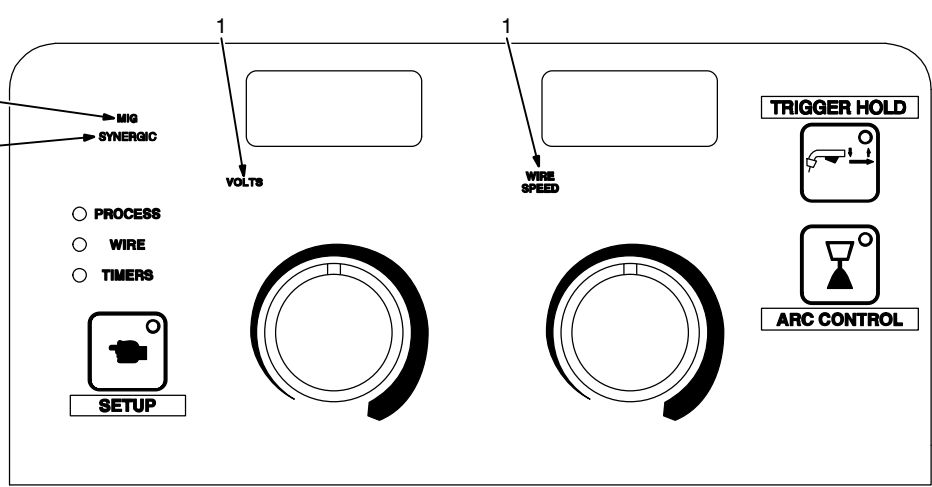
Ref. 242 929-C

## 6-5. Synergic MIG Mode



1 Lit Indicators

Synergic MIG Mode is a convenient and helpful extension to regular MIG mode. In Synergic MIG mode, the voltage is calculated as a function of the wire feed speed. Therefore, as the user adjusts the wire feed speed up and down the voltage tracks up and down to keep these values in the ideal welding condition. Additionally, if the user desires more or less voltage, it can be adjusted within a limited window. The newly adjusted low or high voltage will be maintained when the wire feed speed is adjusted, so if the user likes the voltage a little higher, it will stay a little higher as the user changes the wire feed speed. All major setup is the same as MIG mode with the exception of the process selection. Following the second setup button press select the “SNRG” “MIG” process for Synergic MIG Mode.



Ref. 242 929-C

# Notes

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
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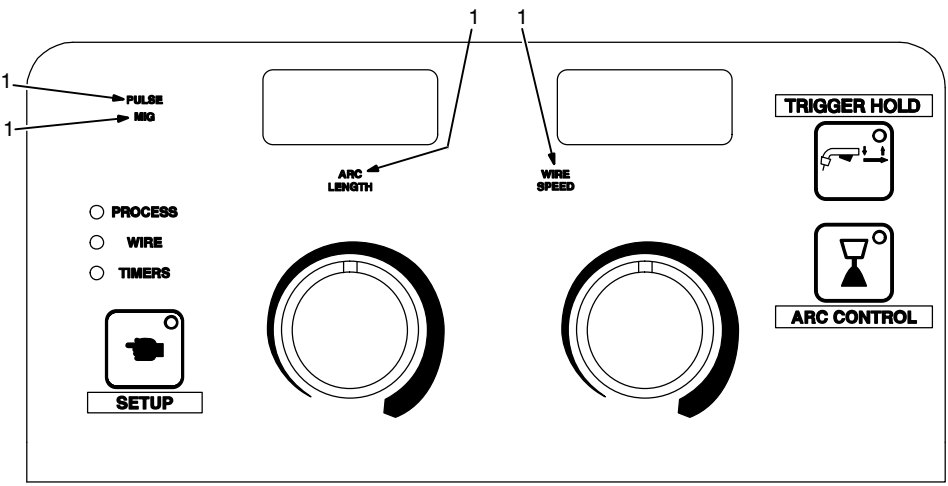
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## 6-6. Pulse MIG Mode

1 Lit Indicators



Ref. 242 929-C

When **PULSE** and **MIG** are illuminated, the unit is in Pulse MIG Welding mode.

### SETUP

To enter Pulse MIG welding mode, depress the **SETUP** (6) button once to go to **GUN** selection. Rotate the right knob (9) to select the gun being used. Select **MIG** for standard MIG gun, or select **XR-R**, **EDGE**, **PYTH RLPR** for push pull guns, or **SPL** for spoolgun.

Depress **SETUP** (6) a second time to illuminate the **PROCESS** (3) light. Rotate right knob (9) until **PULS** is displayed.

Depress **SETUP** (6) button again to illuminate the **WIRE** (4) light. Adjust left knob (8) to select wire type, adjust right knob (9) to select wire size.

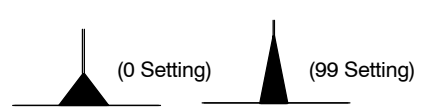
Depress **SETUP** (6) button again to exit **WIRE** menu and enter **TIMERS** (5) menu. The **TIMERS** (5) light will illuminate. For description of the **TIMERS**, refer to **TIMERS** menu (see Section 6-3-4).

If crater fill function menus are enabled, **TIMERS** light will stay on to allow for adjustment of crater parameters and timers (see Section 6-18).

Depress **SETUP** (6) button again to exit menus and enter **PULSE** welding mode.

### OPERATION

Arc length can be adjusted from 0-99. All Pulse MIG programs are set with a value of 50. Adjusting the Arc Length will vary the length of the welding arc cone.



(0 Setting)                      (99 Setting)

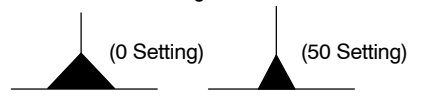
Low Setting                      High Setting

If a gas is used other than what is listed on the **Pulse MIG** welding program chart, the Arc Length can be adjusted to help customize your arc to the gas being used.

Wire feed speed is adjusted on the gun.

### ARC CONTROL

When in Pulse MIG welding mode, depress **ARC CONTROL** (7) button to enter Arc Control menu for sharp arc. SHRP will appear on the left display and the corresponding setting will appear on the right display. The setting can be adjusted from 0-50 and all **Pulse MIG** welding programs are designed with a setting of 25. Adjusting the Sharp Arc setting will vary the width of the welding arc cone.



(0 Setting)                      (50 Setting)


Low Setting                      High Setting

If a gas is used other than what is listed on the Pulse MIG welding program chart, the Sharp Arc can be adjusted to help customize your arc to the gas being used.

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## 6-8. Purge Mode



**1 PURG GAS – Purge Mode**

The Millermatic 350P Aluminum is equipped with a Jog/Purge switch located in the wire compartment. Pressing the Purge button allows shielding gas to flow. This feature allows the user to purge gas lines and to preset gas pressure at the regulator before welding. Purge mode is indicated by “PURG” in the left display and “GAS” in the right display.


**PURG**

1


**GAS**

1

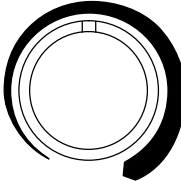
**TRIGGER HOLD**

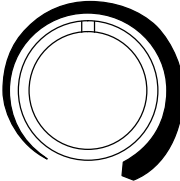


- PROCESS
- WIRE
- TIMERS




**SETUP**





**ARC CONTROL**

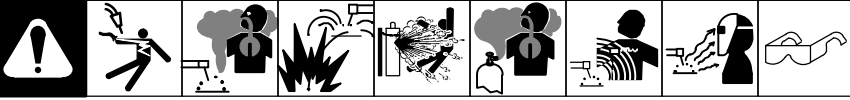


Ref. 242 929-C

## 6-9. Weld Display Status

Before welding the Left and Right Displays will show Arc Length or Volts, and Wire feed speed depending on weld process. The indicator lights beneath each display will indicate what is being displayed. While welding the displays will show welding volts and current, the indicator lights under each display will change to volts and amps respectively. In addition, for approximately 5 seconds after the trigger is released the actual voltage and current will be held on the display. If a user turns either knob or WFS adjustment on the gun within the 5 second hold window the displays will revert back to Arc Length or Volts, and Wire feed speed depending on weld process.

## 6-10. Trigger Hold Feature

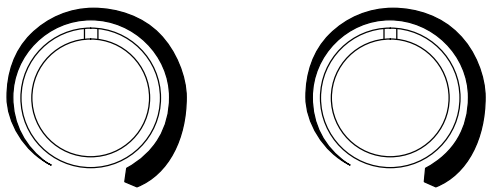


○ PROCESS


○ WIRE

○ TIMERS


**SETUP**



**TRIGGER HOLD**



**ARC CONTROL**

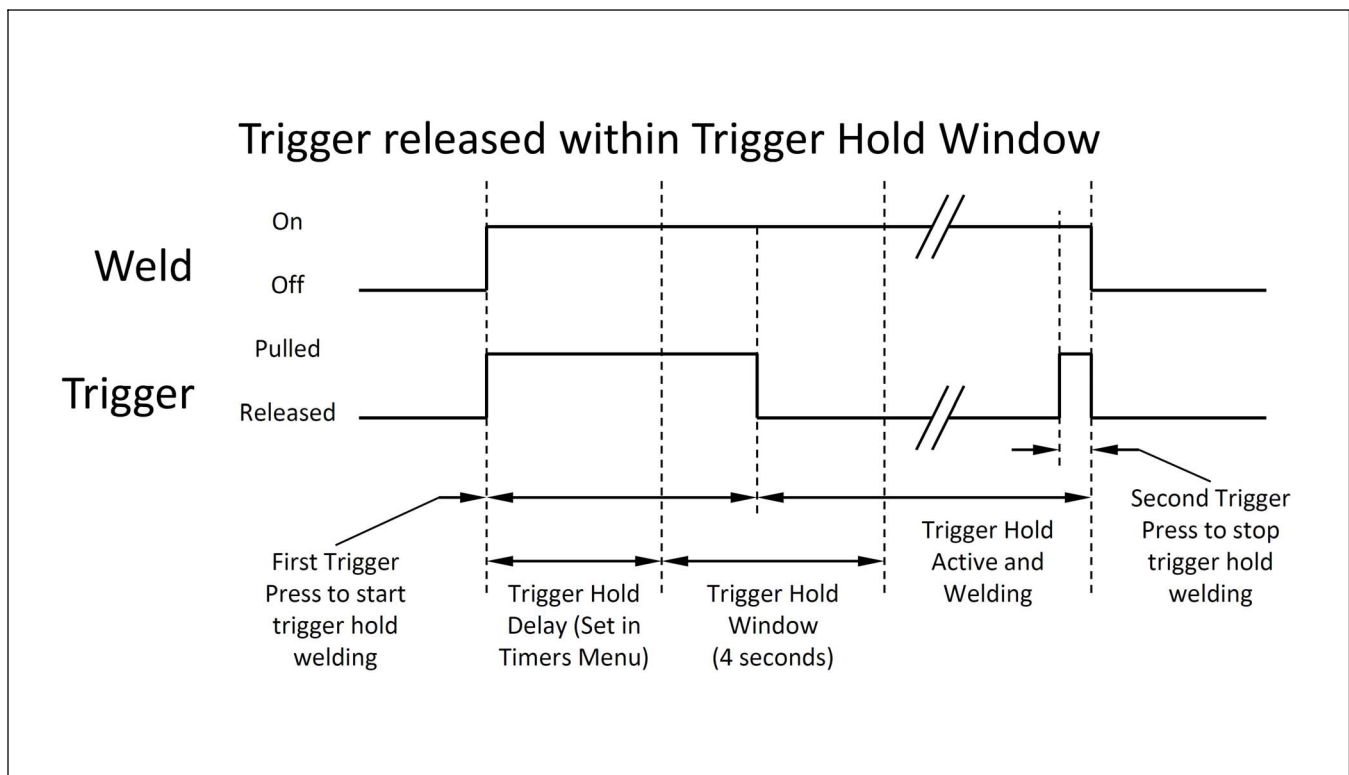


1 Lit Indicator

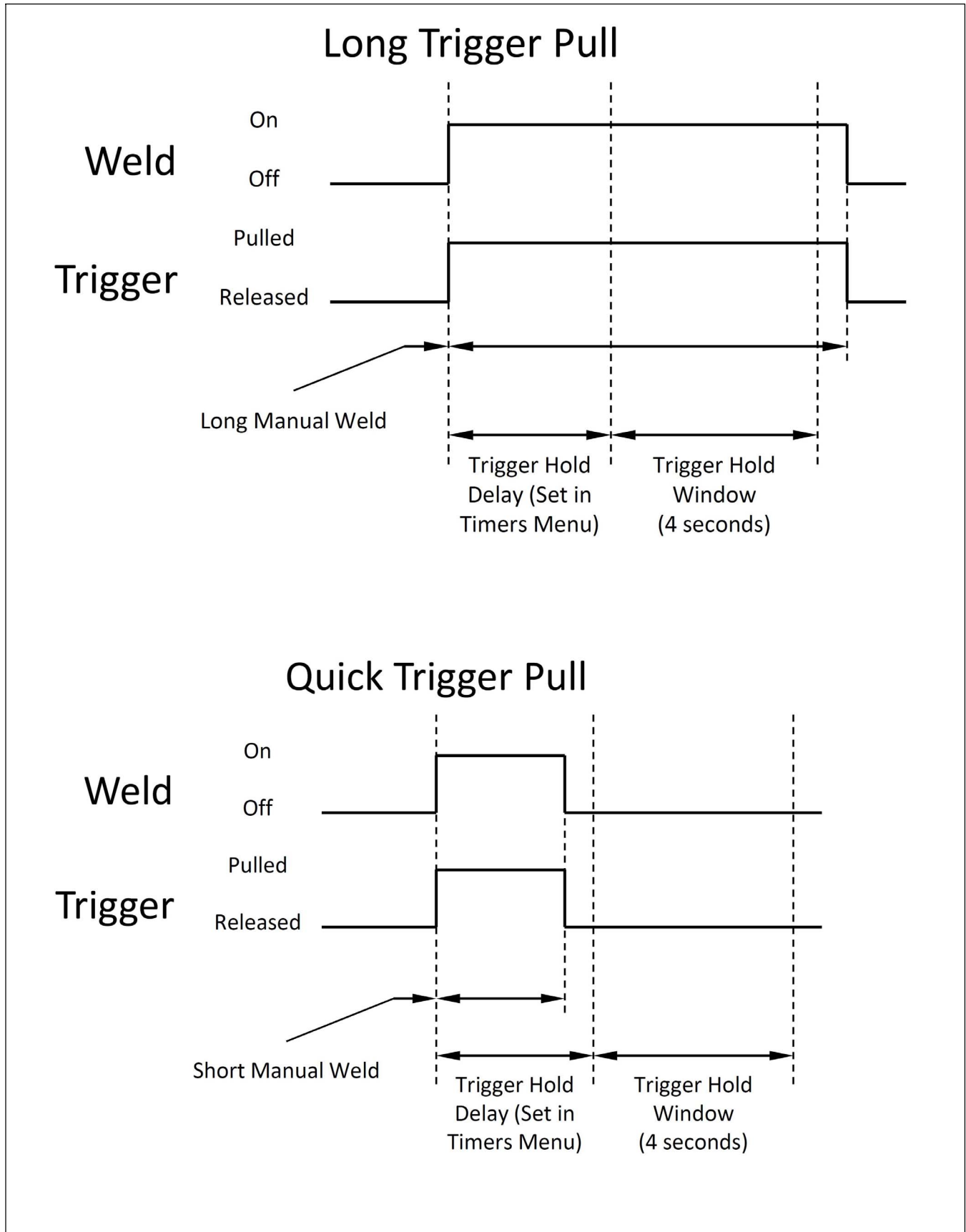
The trigger hold feature is enabled and disabled by pressing the Trigger Hold Button. The Trigger Hold Indicator Light indicates the feature is on or off. An additional trigger hold setting appears in the TIMERS menu; the Trigger Hold Delay, displayed as "HOLD". The HOLD time is the minimum amount of time the trigger must be held for the trigger hold to become active. There is a built in maximum trigger hold time which the trigger must be released within for trigger hold to become active. The maximum trigger hold time is always 4.0 seconds after the Trigger Hold Delay. For example, if the trigger hold delay is set to 2.0 seconds, and trigger hold window is from 2.0 to 6.0 seconds. If the trigger is released inside this window the weld will continue until the trigger is pressed and released a second time. If the trigger is released outside this window (i.e. less than 2 seconds or more than 6 seconds) the weld will stop immediately.

Ref. 242 929-C

## 6-11. Trigger Hold Timing Chart




## 6-12. Trigger Pulls That Will Not Actuate Trigger Hold






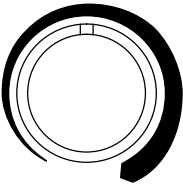
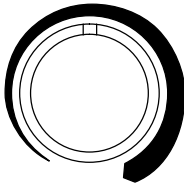
## 6-13. Arc Control




- PROCESS
- WIRE
- TIMERS




SETUP

SETUP



TRIGGER HOLD



ARC CONTROL

1 Lit Indicator

The arc control menu allows the user to adjust the inductance or sharp arc (depending on welding process). While MIG welding, changing the inductance will change the fluidity of the puddle. While Pulse welding, changing the SharpArc will vary the width of the welding cone. For more detailed information on the effects of Arc Control on a particular welding process see the following sections: MIG 6-4, Synergic MIG 6-5, and Pulse MIG 6-6.

Ref. 242 929-C

## Notes

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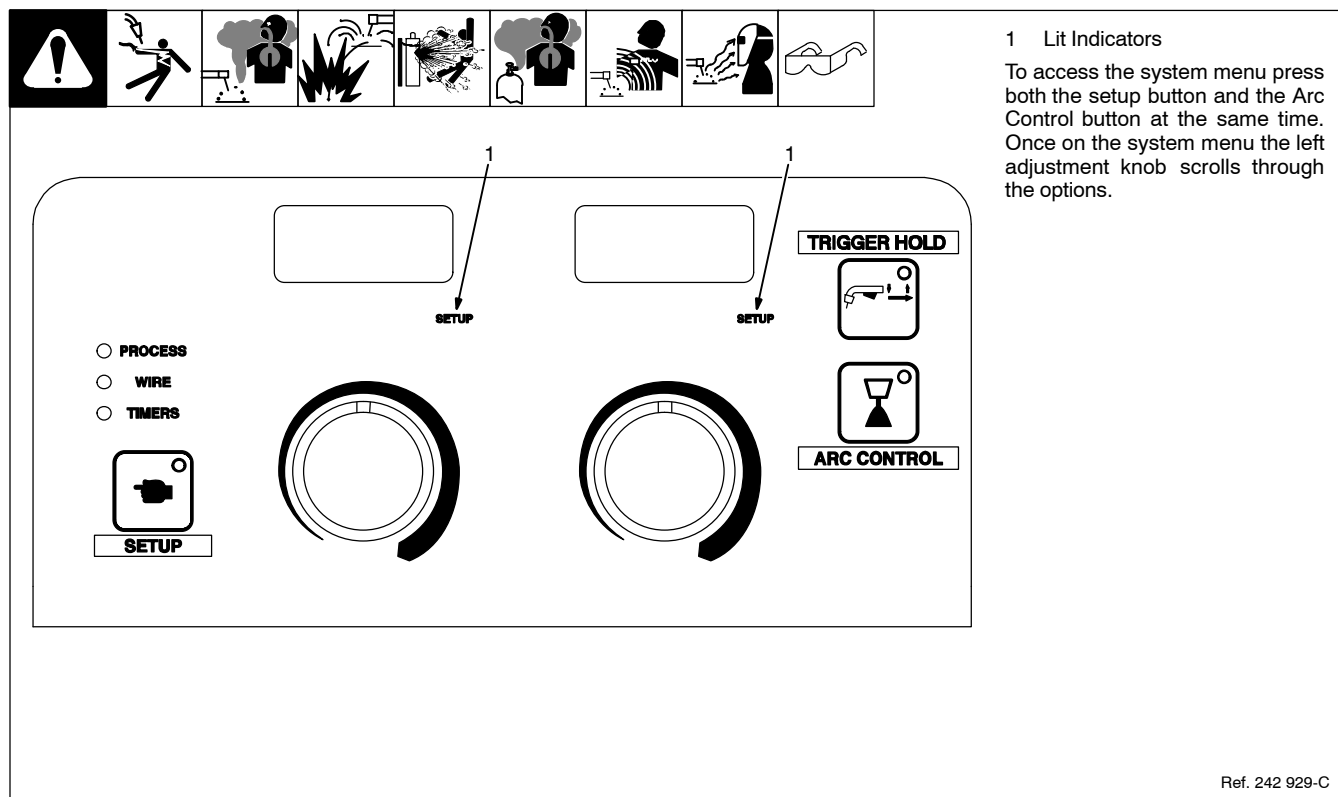
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## 6-14. System Menu



### 6-14-1. Arc Hours

This menu reports the arc time in hours. "HRS" "XX.X"

### 6-14-2. Arc Starts

This menu reports the number of arc starts. "ARCS" "XXXX"

### 6-14-3. User Interface Software Version

This menu reports the software version of the User Interface Board. "IXXX" "XXXX"

### 6-14-4. Control Software Version

This menu reports the software version of the Control Board. "CXXX" "XXXX"

### 6-14-5. Gun Calibration

This menu allows the user to run gun calibration. See Section 6-15 for more information. "G.CAL" "XXXX"

### 6-14-6. Hot Start Enable (Pulse only)

This menu allows the user to enable the hot start feature. Hot start can be turned on ("ON"), turned off ("OFF"), or turned to automatic settings ("AUTO"). The automatic settings are the preset factory recommended parameters. For more detailed information on Hot Start see Section 6-17.

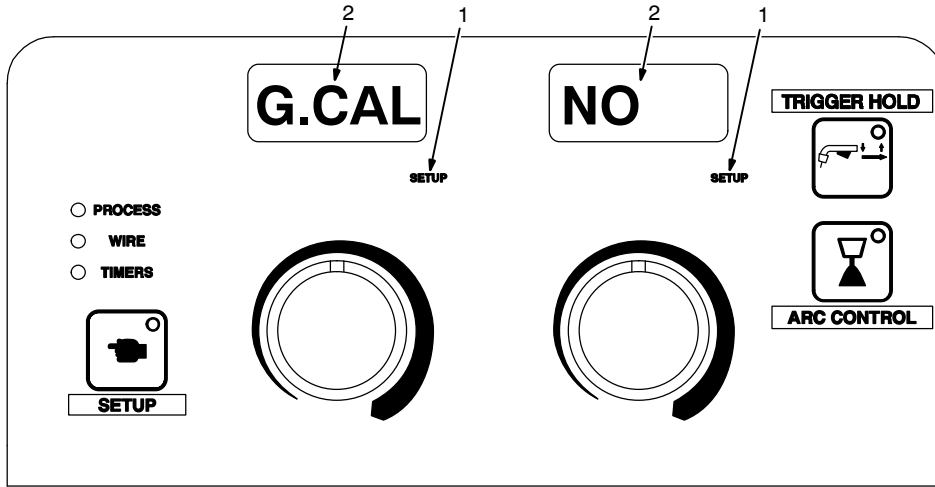
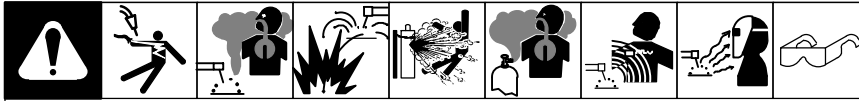
### 6-14-7. Crater Fill Enable

This menu allows the user to enable and disable the crater fill feature. For more information see Section 6-18.

### 6-14-8. Trigger Schedule Select

This menu allows the user to enable and disable the dual schedule feature. For more information see Section 6-16.

## 6-15. Gun Calibration



- 1 Lit Indicators
- 2 G.CAL NO – Gun Calibration

Gun calibration is used to improve wire feed speed accuracy. A gun calibration is recommended during installation or when changing guns. To perform a calibration, connect the gun to the machine and thread the wire all the way through the contact tip. Set the drive roll tension to "5XXX", the high tension setting to ensure the drive rolls will not slip. Next press and hold the trigger. The machine will begin to feed wire, but the power will be off. The wire will first feed at a slower speed and then at a higher speed. The machine will display "G.CAL HOLD" while the calibration is in progress. When the calibration has successfully completed the display will read "G.CAL DONE" for 2 seconds or until the trigger is released. If the calibration routine is unable to complete successfully, wire feeding will stop and the display will show an error message.

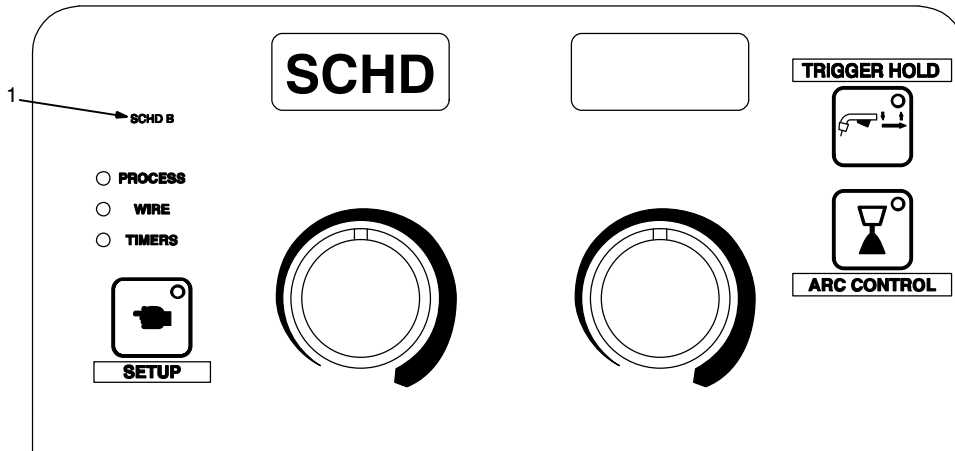
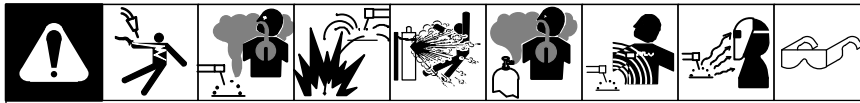
### G.CAL ERR.1

Indicates a gun calibration wire restriction error. This error occurs if the detected wire speed during a calibration is too slow. This error will not prevent the feeder from operating, but wire speed accuracy may be compromised.

### G.CAL ERR.2

Indicates a gun calibration wire slip error. This error occurs if the detected wire speed during a calibration is too fast. This error will not prevent the feeder from operating, but wire speed accuracy may be compromised.

## 6-16. Trigger Schedule Select



### 1 Lit Indicator

The Trigger Schedule Select is an advanced feature that allows changing between two sets of weld parameters. To activate the Trigger Select feature, simultaneously depress both the blue set-up and arc control buttons. Rotate the left control knob clockwise to select "SCHD". Rotate the right control knob to select "TRIG". Now push the Setup button or pull the trigger to return to the main menu.

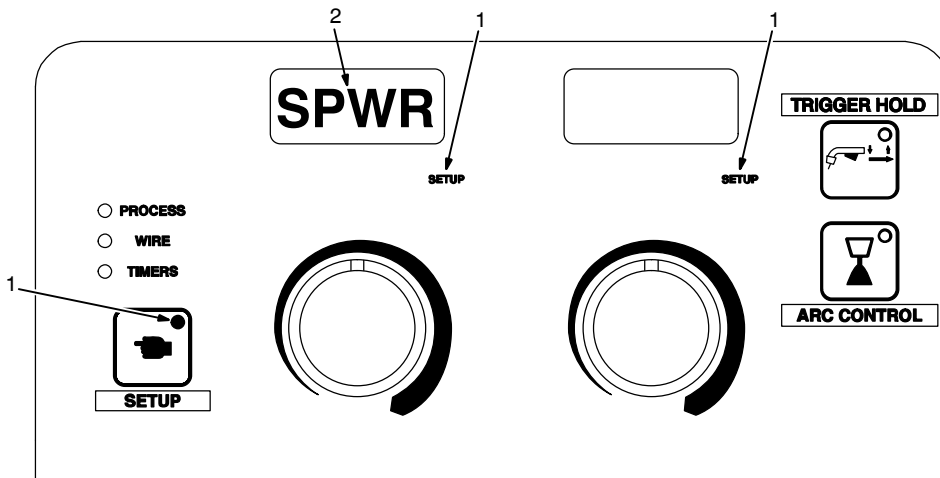
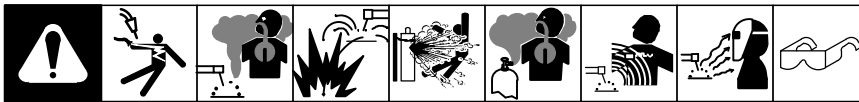
Now set the second weld parameter or "Schedule B". Quickly pull and release (pop) the gun trigger to illuminate the "Schedule B" indicator located on the top left side of the front panel. Since the gun, wire type and diameter is already known, it is only necessary to select a welding process and the settings. For MIG, select volts and wirefeed speed. For Synergic MIG, select wirefeed speed and voltage. For Synergic Pulse MIG, select Arc Length and wirefeed speed.

For "Schedule B", the wirefeed speed is set using the right control knob on the power source, not the gun.

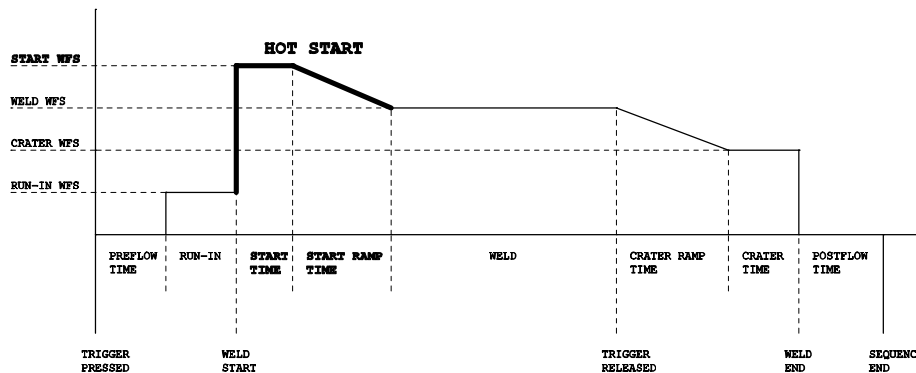
Now that "Schedule B" parameters are set, simply "tap" the gun trigger to toggle between the two programs.

Ref. 242 929-C

## 6-17. Hot Start (Pulse Mode Only)



Ref. 242 929-C



- 1 Lit Indicators
- 2 SPWR – Hot Start

The Millermatic 350P Aluminum is equipped with a hot start feature. To begin controlling this feature the user must access the system menu by pressing both the setup button and arc control button at the same time. Once in the system menu rotate the left adjustment knob until "ALST" appears on the left display. There are three hot start settings: Auto, Off, and On. "Auto" uses factory default settings for the hot start parameters. "Off" disables the hot start feature. "On" allows manual control of the hot start settings.



When hot start is in the "On" setting the

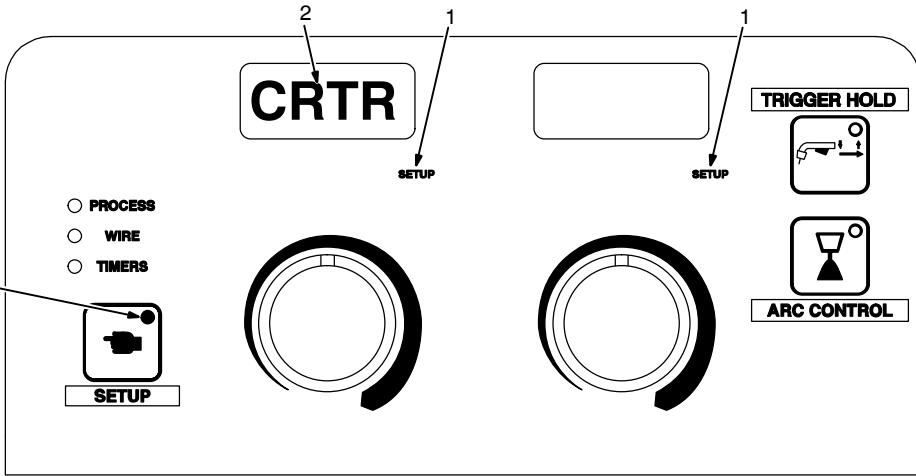
user must manually configure the hot start settings as follows. Five presses of the setup button should bring the user to a menu indicated by "SPWR" on the left display. This represents the start power. The start power is a percentage of the welding power. Rotate the right adjustment knob until the power level is as high as desired. Rotating the left adjustment knob will take the user to the next menu labeled "STMR". This represents the start time in seconds; use the right adjustment knob to set this time as desired. During this time the higher start power will be applied. Rotating the left adjustment knob again will take the user to the next menu labeled "STRL". This represents the hot start period arc length; use

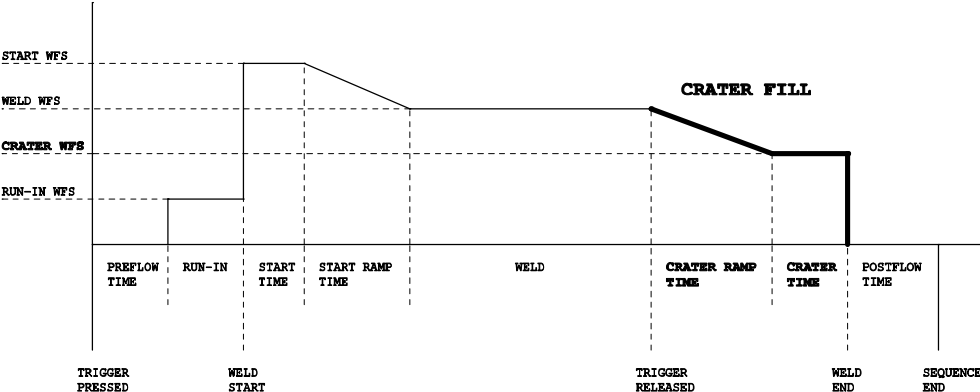
the right adjustment knob to set the desired arc length. Rotating the left adjustment knob one last time brings the user to the final menu labeled "RMPT". This represents the hot start ramp time in seconds; rotate the right adjustment knob to set this time as desired. The ramp time is the transition time from hot start to normal welding. Pressing the setup button once more will complete setup of the hot start parameters.

The two parameters that will have the largest influence on hot start are the start power and the start time. These two parameters will determine how much heat is provided and for how long at the beginning of the weld.

## 6-18. Crater Fill





Ref. 242 929-C

1 Lit Indicators

2 CRTR – Crater Fill

The Millermatic 350P Aluminum is equipped with a crater fill feature. To begin controlling this feature the user must access the system menu by pressing both the setup button and the arc control button at the same time. Once in the system menu rotate the left adjustment knob until “CRTR” appear on the left display. There are two crater settings: On and Off. “On” allows manual control of the crater settings. “Off” disables the crater feature.

When crater is “On” in the system menu, the user must manually configure the crater settings as follows. Press the Setup

Button until the display reads “CRTR”. Crater can be enabled and disabled for each gun type (i.e. spool gun or push-pull gun). The right adjustment knob will enable or disable the crater sequence for the active gun type. Rotate the left adjustment knob to the next menu labeled “WFS”. This represents the wire feed speed during the crater fill period. Rotate the right adjustment knob to select the desired wire feed speed. Rotate the left adjustment knob to the next menu labeled “VOLT” (MIG and Synergic MIG modes) or “ARCL” (Pulse mode). This menu represents the welding voltage or arc length (depending on process) during the crater fill period. Rotate the right knob to select the desired voltage/arc length. Rotate the left adjustment knob

to the final menu labeled “TDLY”. This menu represents the delay time to skip the crater fill sequence, in seconds. If the arc time is less than the TDLY time the following trigger pull will be normal weld output, not a crater fill sequence. For example, if TDLY is set for 2.0 seconds, weld operation will not go into crater if the trigger is released before 2.0 seconds has elapsed. Pressing the setup button once more will complete setup of the crater fill parameters.

The crater fill sequence described by the crater fill settings will execute immediately following the weld once the trigger has been released (assuming the TDLY time has been satisfied).

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**Table 4-1. Recommended Crater Fill Parameters (Wire Feed Speed/Voltage Or Arc Length/Time)**

MIG Setting Example				Pulse Setting Example										
Wire Speed / 90		Volts / 13.5		Time / 1.0		Wire Speed / 90			Arc Length / 30			Time / 1.0		
Welding Process	Suggested Wire Types	Suggested Shielding Gases	Wire Sizes (Dia)	Material Thickness										
				1/2 in. (12.7 mm)	3/8 in. 99.5 mm)	1/4 in. (6.4 mm)	3/16 in. (4.8 mm)	1/8 in. (3.2 mm)	14 ga (2.0 mm)	16 ga (1.6 mm)	18 ga (1.2 mm)	19 ga (1.05 mm)		
MIG	4XXX	100% Ar	0.035 in. (0.9 mm)	300/22/2.0	300/22/2.0	200/12/1.25	200/12/1.25	150/11/1.25	200/11/0.90	---	---	---		
			0.047 in. (1.2 mm)	190/21.5/1.15	190/21.5/1.15	190/21.5/1.15	200/19.5/1.25	215/17/1.0	---	---	---	---		
	5XXX	100% Ar	0.035 in. (0.9 mm)	---	---	250/19.5/1.25	250/17/1.25	250/17/1.25	---	---	---	---		
			0.047 in. (1.2 mm)	180/18.5/1.25	180/18.5/1.25	180/18.5/1.25	180/16/1.25	180/16/1.25	---	---	---	---		
Pulse	4XXX	100% Ar	0.035 in. (0.9 mm)	100/35/2.0	100/35/2.0	100/35/2.0	100/35/2.0	100/35/1.5	100/20/1.5	100/25/1.2	100/25/1.2	100/35/1.0		
			0.047 in. (1.2 mm)	75/20/1.5	75/20/1.5	75/20/1.5	75//20/1.5	75/20/1.5	75/20/1.5	75/20/1.0	75/20/1.0	---		
	5XXX	100% Ar	0.035 in. (0.9 mm)	---	---	120/30/1.75	120/30/1.5	120/30/1.5	120/30/1.0	120/30/1.0	120/30/1.0	120/30/1.0		
			0.047 in. (1.2 mm)	---	---	105/30/1.5	105/30/1.05	105/30/1.25	106/30/1.0	105/30/1.0	105/30/0.75	---		

**6-19. System Reset**









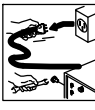


1 Lit Indicators  
 2 SRST – System Reset



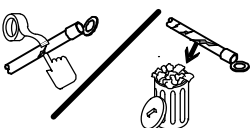

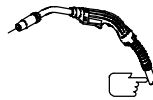

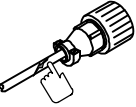
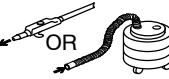


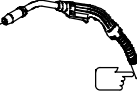
A system reset function is available to return the machine to the original factory settings. To access the system reset menu turn on the welder. While the machine is in its startup routine and the text “MILLERMATIC 350P ALUMINUM” is scrolling across the screen press and hold the setup button until the left setup indicator light illuminates. Next rotate the right adjustment knob until the Right Display reads “ON”. To trigger the system reset press the setup button again. System reset is complete once the “MILLERMATIC 350P ALUMINUM” text has scrolled across the screen again. If the system reset menu is entered inadvertently and a system reset is not desired, rotate the right adjustment knob until the Right Display reads “OFF” and press the setup button again.


Ref. 242 929-C

# SECTION 7 – MAINTENANCE & TROUBLESHOOTING

## 7-1. Routine Maintenance

									<p> <b>Disconnect power before maintaining.</b></p>
<p> <i>Maintain more often during severe conditions.</i></p>									

		✓ = Check * To be done by Factory Authorized Service Agent	◇ = Change	● = Clean	☆ = Replace	Reference			
Every 3 Months		☆ Damaged Or Unreadable Labels		☆ Repair Or Replace Cracked Weld Cable		● Clean And Tighten Weld Terminals		✓ Check Gun Cable	
		☆ Damaged Gas Hose		☆ Cracked Or Damaged Cord					
Every 6 Months	 OR 	● Inside Unit		● Clean Drive Rolls					
	After Each Spool Of Wire		● Gun Liner						

 When using a 16 lb spool of wire per day, blow out gun liner after each spool of wire.

## 7-2. Overheating

Thermistors RT1 and RT2 protect the unit from damage due to overheating. If output diode heatsink or IGBT heatsink gets too hot, RT1 and/or RT2 opens and output stops. The fan keeps running to cool the unit. Wait several minutes before trying to weld.

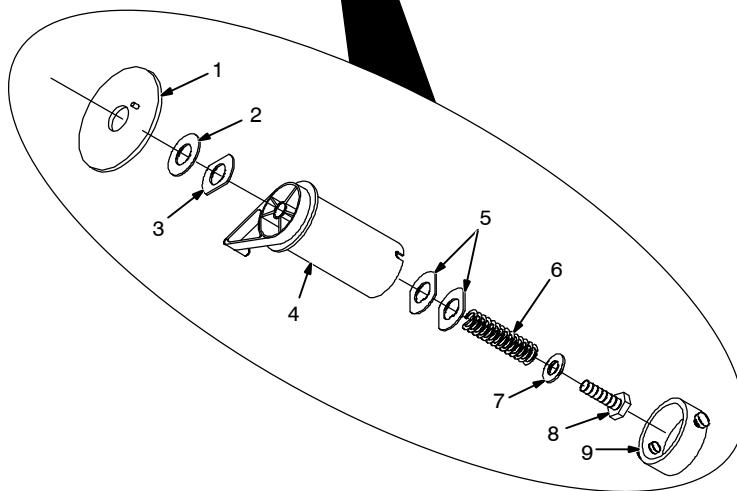
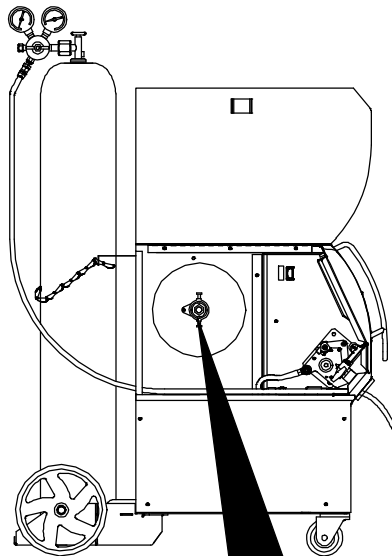
## 7-3. Ground Clamp And Gun Connections

Clean and tighten ground clamp and gun connections. Be sure that ground clamp is connected to a clean, paint-free surface on the workpiece.





## 7-5. Replacing Hub Assembly



Remove gun top cover and release pressure arm.

Retract wire onto spool and remove spool. Take hub apart as shown.

- 1 Plastic Brake Washer
- 2 Fiber Washer
- 3 Brake Washer
- 4 Hub
- 5 Keyed Washer
- 6 Spring
- 7 Flat Washer
- 8 Cap Screw
- 9 Retaining Ring

Replace broken or worn parts and slide parts onto shaft as shown.

Adjust hub tension and thread welding wire. Close and latch door.

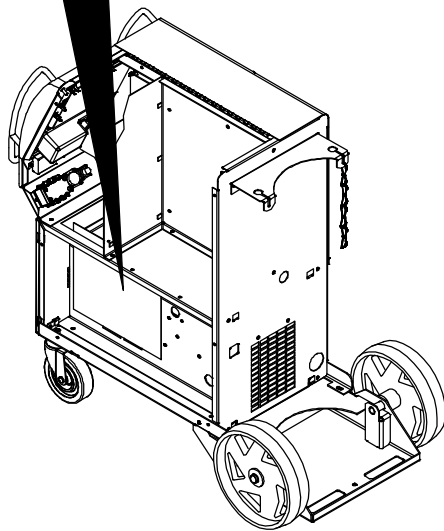
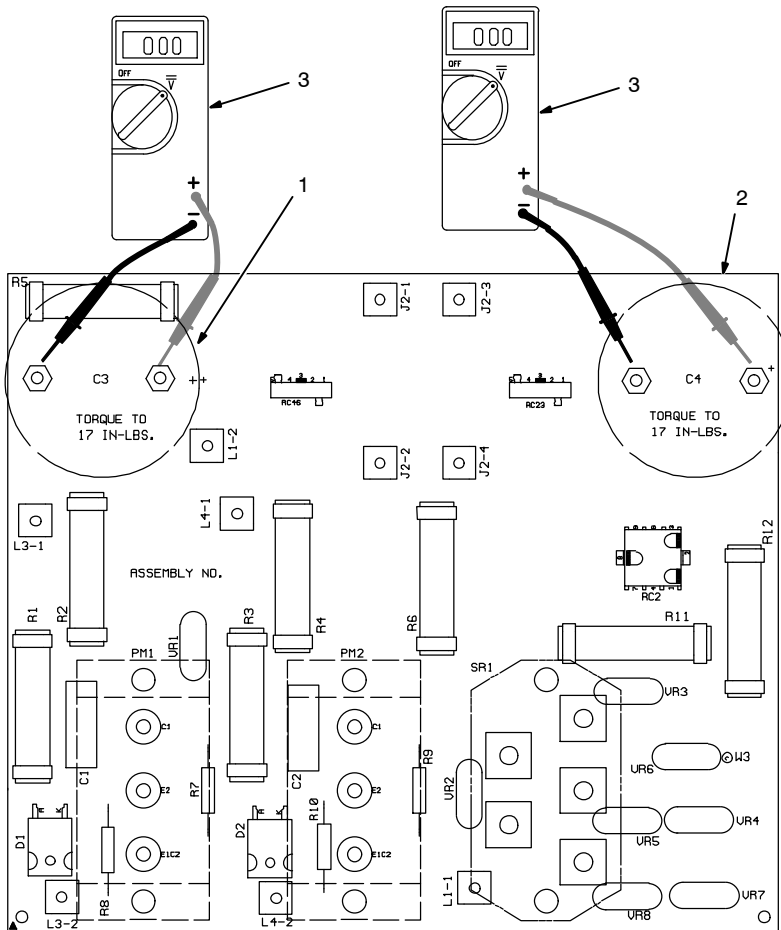
Close gun pressure roll assembly and reinstall gun cover.

Tools Needed:

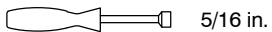


Ref. 255 371-B / Ref. 255 371-B

## 7-6. Measuring Input Capacitor Voltage



Tools Needed:



**⚠ Turn Off welding power source, and disconnect input power.**

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

Turn Off welding power source and disconnect input power.

Remove case.

1 Input Capacitor C3 Terminals

2 Input Capacitor C4 Terminals

3 Voltmeter

Check input capacitors as shown.

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

Proceed with job inside unit.  
Reinstall case when finished.

### 7-7. Help And Information Displays

V	A
HELP	0

V	A
G.CAL	ERR.1

V	A
HELP	1

V	A
G.CAL	ERR.2

V	A
HELP	2

V	A
JOG	XXX



Displays a jog wire feed speed.


V	A
HELP	3

V	A
HELP	4

V	A
HELP	6

V	A
HELP	7

V	A
HELP	8

 All directions are in reference to the front of the unit. All circuitry referred to is located inside the unit.

- **Help 0**

Indicates overheating on left side of unit (displays flash between OVER TEMP and HELP 0). Unit will shutdown until internal temperature drops within operational range.

- **Help 1**

Turn off primary input power and check input voltage per primary voltage rating of welder, and correct if necessary. If HELP 1 persists, this indicates a communication error between control board PC1 and user interface board. Contact nearest Factory Authorized Service Agent.

- **Help 2**

Indicates overheating on right side of unit (displays flash between OVER TEMP and HELP 2). Unit will shutdown until internal temperature drops within operational range.

- **Help 3**

Indicates gun trigger was pulled and held during power up. Release gun trigger and clear fault condition. Also, this display can indicate no open circuit voltage detected when gun trigger is pulled and no arc detected within 3 seconds. Turn off primary input power and contact a Factory Authorized Service Agent.

- **Help 4**

Indicates gun trigger was pulled and held for 2 minutes without a welding arc established or there is a direct short between contact tip or wire and the workpiece. Release gun trigger and clear fault condition.

- **Help 6**

Indicates a malfunction in wire feed system and/or external drive motor over-current condition (spool gun or push-pull gun). Check for proper spool brake adjustment or obstructions in wire feed system. Clean or replace liner, wire guides, or contact tip.

- **Help 7**

Indicates input voltage malfunction (voltage too high or too low) causing unit to automatically shut down. Turn off input primary power and check input voltage per primary voltage rating of welder. Unit will operate once input voltage is within specification and power to unit is turned off and back on.

- **Help 8**

Indicates open circuit voltage is out of range. Turn off primary input power and contact a Factory Authorized Service Agent.

- **G.CAL ERR.1**

Indicates a gun calibration wire restriction error. This error occurs if the detected wire speed during a calibration is too slow. This error will not prevent the feeder from operating, but wire speed accuracy may be compromised.

- **G.CAL ERR.2**

Indicates a gun calibration wire slip error. This error occurs if the detected wire speed during a calibration is too fast. This error will not prevent the feeder from operating, but wire speed accuracy may be compromised.

- **Jog XXX (Wire Feed Speed)**

Indicates trigger is pressed, but no arc is detected. Wire feed speed goes to Jog wire feed speed after 3 seconds.

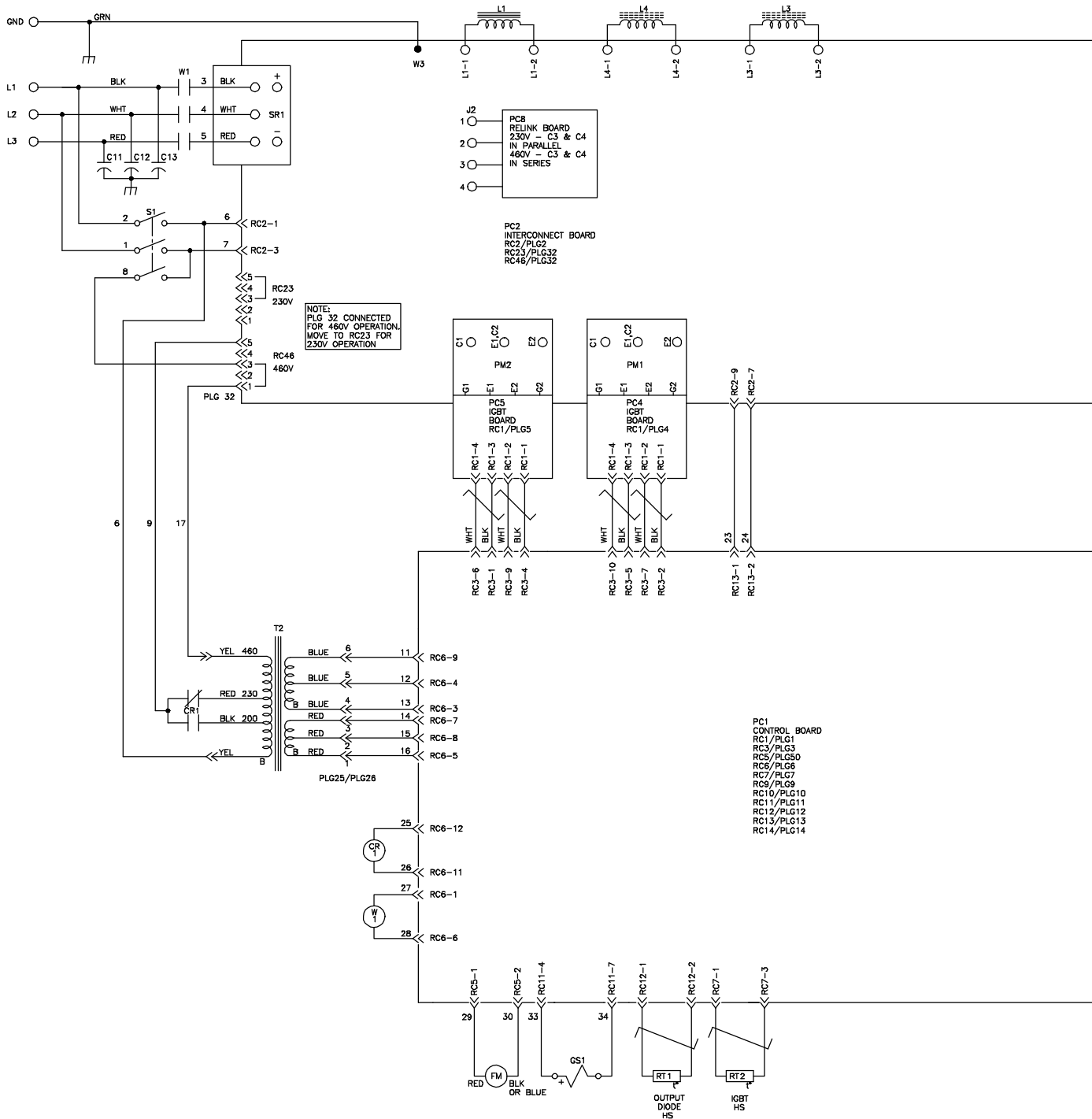
## 7-8. Troubleshooting



Trouble	Remedy
No weld output; wire does not feed.	Be sure line disconnect switch is On (see Section 5-14 or 5-15).
	Replace building line fuse or reset circuit breaker if open (see Section 5-14 or 5-15).
	Secure gun trigger connections (see Section 5-7).
	Have Factory Authorized Service Agent check Power switch.
	Have Factory Authorized Service Agent check all board connections and main control board.
No weld output; wire feeds.	Thermistor RT1 or RT2 open (overheating). Allow fan to run; the unit will be enabled when it has cooled and temperatures are within acceptable limits (see Section 4-2 and 7-2).
	Connect work clamp to get good metal to metal contact.
	Replace contact tip (see gun Owner's Manual).
	Have Factory Authorized Service Agent check main control board and main rectifier.
Low weld output.	Connect unit to proper input voltage or check for low line voltage (see Section 5-14 or 5-15).
	Have Factory Authorized Service Agent check main control board and user interface board.
Low, high, or erratic wire speed.	Readjust front panel settings (see Section 6-2).
	Change to correct size drive rolls (see Section 7-4).
	Readjust drive roll pressure (see Section 5-17).
	Replace inlet guide, contact tip, and/or liner if necessary (see gun Owner's Manual).
	Have Factory Authorized Service Agent check input voltage.
	Have Factory Authorized Service Agent check main control board.
No wire feed.	Turn Wire Speed control to higher setting (see Section 6-2).
	Clear obstruction in gun contact tip or liner (see gun Owner's Manual).
	Readjust drive roll pressure (see Section 5-17).
	Change to correct size drive rolls (see Section 7-4).
	Rethread welding wire (see Section 5-17).
	Check gun trigger and leads. Repair or replace gun if necessary.
	Have Factory Authorized Service Agent check main control board and user interface board.
	H -- message appears on voltmeter and ammeter displays to indicate thermistor RT1 or RT2 is open and unit is in an overheated condition (see Section 7-7).
Gun Calibration G. Cal ERR.1	Straighten gun cable.
	Check drive roll pressure in wire feeder and gun (see Section 7-4).
	Verify proper wire size is selected.
	Check and replace liner if necessary.
	Have Factory Authorized Service Agent check tach feedback.
Gun Calibration G. Cal ERR.2	Verify wire is fed thru contact tip.
	Check drive roll pressure in wire feeder and gun (see Section 7-4).
	Verify drive roll size is correct.
	Have Factory Authorized Service Agent check tach feedback.



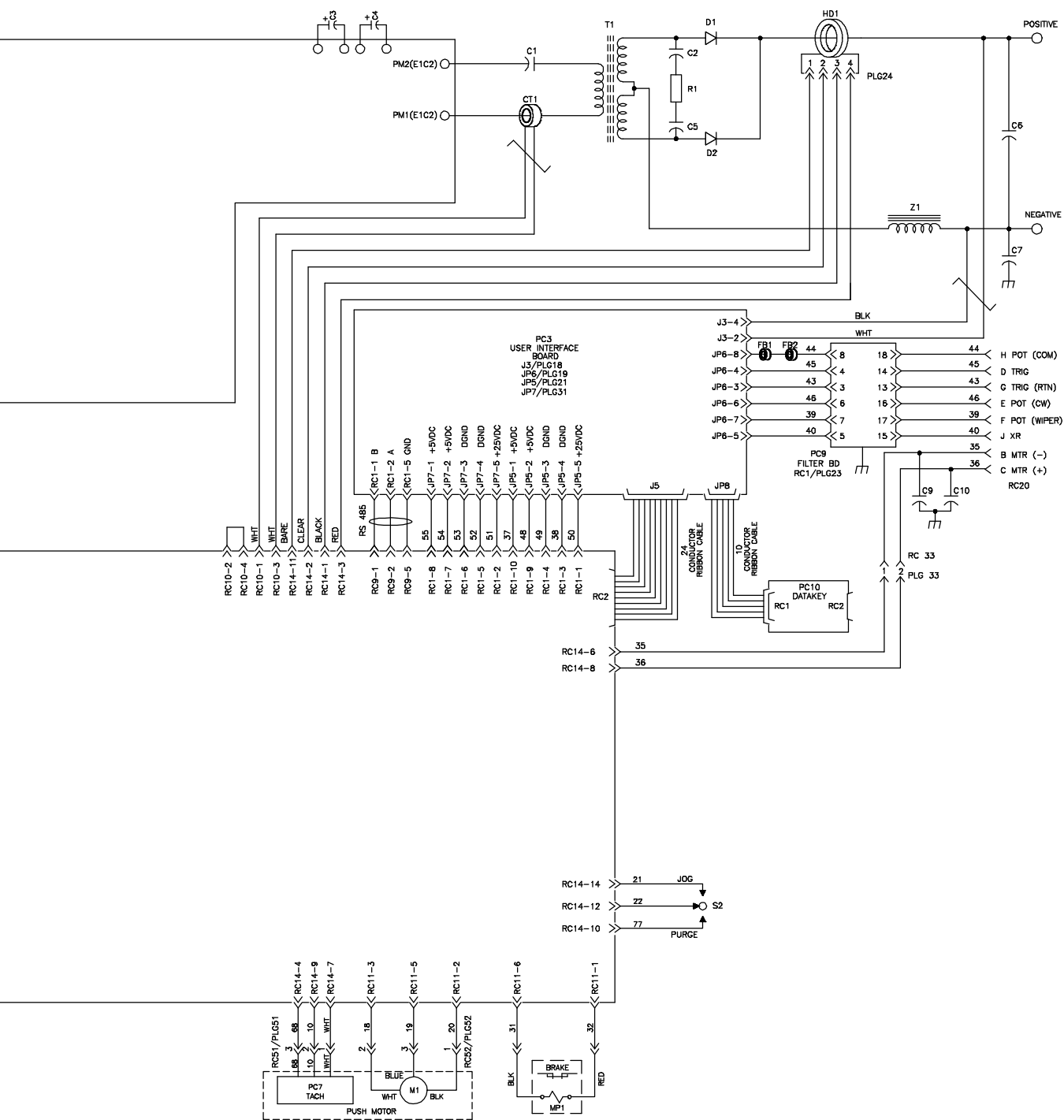
# SECTION 8 – ELECTRICAL DIAGRAM



	<p><b>WARNING</b></p> <ul style="list-style-type: none"> <li>Do not touch live electrical parts.</li> <li>Disconnect input power or stop engine before servicing.</li> <li>Do not operate with covers removed.</li> <li>Have only qualified persons install, use, or service this unit.</li> </ul>
	<p><b>ELECTRIC SHOCK HAZARD</b></p>

Figure 8-1. Circuit Diagram For Welding Power Source





# SECTION 9 – PARTS LIST

## 9-1. Drive Roll Kits And Wire Guides

Wire Diameter			Kit No.	Inlet Wire Guide
Fraction	Decimal	Metric		
.030/.035 in.	.030/.035 in.	0.8/.09	196 301	058 549
.040 in.	.040 in.	1.0 mm	194 118	058 549
3/64 in.	.047 in.	1.2 mm	194 119	058 549

**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.**

# TRUE BLUE<sup>®</sup>

## WARRANTY

Effective January 1, 2012

(Equipment with a serial number preface of MC 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  
you ...

### Service

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 delivery date of the equipment to the original end-user purchaser, and not to exceed one year after the equipment is shipped to a North American distributor or eighteen months after the equipment is shipped to an International distributor.

1. 5 Years Parts — 3 Years Labor
  - \* Original Main Power Rectifiers Only to Include SCRs, Diodes, and Discrete Rectifier Modules
2. 3 Years — Parts and Labor
  - \* Engine Driven Welding Generators  
**(NOTE: Engines are Warranted Separately by the Engine Manufacturer.)**
  - \* Inverter Power Sources (Unless Otherwise Stated)
  - \* Plasma Arc Cutting Power Sources
  - \* Process Controllers
  - \* Semi-Automatic and Automatic Wire Feeders
  - \* Smith 30 Series Flowgauge and Flowmeter Regulators (No Labor)
  - \* Transformer/Rectifier Power Sources
  - \* Water Coolant Systems (Integrated)
3. 2 Years — Parts
  - \* Auto-Darkening Helmet Lenses (No Labor)
4. 1 Year — Parts and Labor Unless Specified
  - \* Automatic Motion Devices
  - \* CoolBelt and CoolBand Blower Unit (No Labor)
  - \* External Monitoring Equipment and Sensors
  - \* Field Options  
(NOTE: Field options are covered for the remaining warranty period of the product they are installed in, or for a minimum of one year — whichever is greater.)
  - \* Flowgauge and Flowmeter Regulators (No Labor)
  - \* RFCS Foot Controls (Except RFCS-RJ45)
  - \* Fume Extractors
  - \* HF Units
  - \* ICE/XT Plasma Cutting Torches (No Labor)
  - \* Induction Heating Power Sources, Coolers  
**(NOTE: Digital Recorders are Warranted Separately by the Manufacturer.)**
  - \* Load Banks
  - \* Motor Driven Guns (w/exception of Spoolmate Spoolguns)
  - \* PAPR Blower Unit (No Labor)
  - \* Positioners and Controllers
  - \* Racks
  - \* Running Gear/Trailers
  - \* Spot Welders
  - \* Subarc Wire Drive Assemblies
  - \* Water Coolant Systems (Non-Integrated)
  - \* Weldcraft-Branded TIG Torches (No Labor)
  - \* Wireless Remote Foot/Hand Controls and Receivers
  - \* Work Stations/Weld Tables (No Labor)
5. 6 Months — Parts
  - \* Batteries
  - \* Bernard Guns (No Labor)
  - \* Tregaskiss Guns (No Labor)

6. 90 Days — Parts
  - \* Accessory (Kits)
  - \* Canvas Covers
  - \* Induction Heating Coils and Blankets, Cables, and Non-Electronic Controls
  - \* M-Guns
  - \* MIG Guns and Subarc (SAW) Guns
  - \* Remote Controls and RFCS-RJ45
  - \* Replacement Parts (No labor)
  - \* Roughneck Guns
  - \* Spoolmate Spoolguns

Miller's True Blue<sup>®</sup> Limited Warranty shall not apply to:

1. **Consumable components; such as contact tips, cutting nozzles, contactors, brushes, relays, work station table tops and welding curtains, or parts that fail due to normal wear. (Exception: brushes and relays are covered on all engine-driven products.)**
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

**Contact 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

To locate a Distributor or Service Agency visit [www.millerwelds.com](http://www.millerwelds.com) or call 1-800-4-A-Miller

Contact the Delivering Carrier to:

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.

### Miller Electric Mfg. Co.

An Illinois Tool Works Company  
1635 West Spencer Street  
Appleton, WI 54914 USA

### International Headquarters—USA

USA Phone: 920-735-4505 Auto-Attended  
USA & Canada FAX: 920-735-4134  
International FAX: 920-735-4125

For International Locations Visit  
[www.MillerWelds.com](http://www.MillerWelds.com)

