OM-288360C 2023-11

Processes

MIG (GMAW) Welding

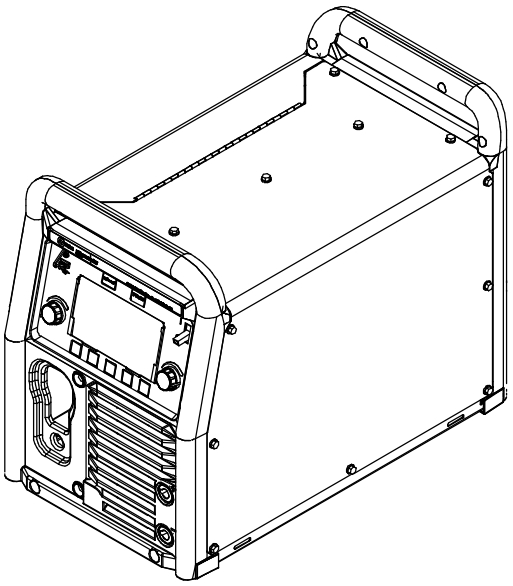
MIG (GMAW) Welding
Pulsed MIG (GMAW-P) Welding

Description

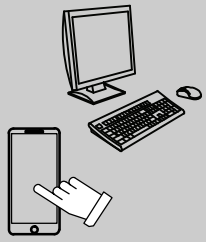
CV DC 1 Phase 3 Phase

Arc Welding Power Source

Millermatic® 355



OWNER'S MANUAL



For product information,
Owner's Manual translations,
and more, visit

www.MillerWelds.com

From Miller to You

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

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

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

This Owner's Manual is designed to help you get the most out of your Miller products. Please take time to read the Safety Precautions. They will help you protect yourself against potential hazards on the worksite. We've made installation and operation quick and easy. With Miller, you can count on years of reliable service with proper maintenance. And if for some reason the unit needs repair, there's a Troubleshooting section that will help you figure out what the problem is, and our extensive service network is there to help fix the problem. Warranty and maintenance information for your particular model are also provided.

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 on the web.**

TRUE BLUE® WARRANTY

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

Certified System™

ISO 9001 Quality

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

Miller®

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SECTION 1 – SAFETY PRECAUTIONS – READ BEFORE USING

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

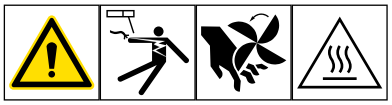
1-1. Symbol Usage

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 these 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 Principal Safety Standards. Read and follow all Safety Standards.

Only qualified persons should install, operate, maintain, and repair this equipment. A qualified person is defined as one who, by possession of a recognized degree, certificate, or professional standing, or who by extensive knowledge, training and experience, has successfully demonstrated the ability to solve or resolve problems relating to the subject matter, the work, or the project and has received safety training to recognize and avoid the hazards involved.

During operation, keep everybody, especially children, away.

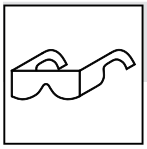
ELECTRIC SHOCK can kill.

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 weld output in damp, wet, or confined spaces, 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 and ground conductor for damage or bare wiring — replace immediately if damaged — bare wiring can kill.
- Turn off all equipment when not in use.
- Do not use worn, damaged, undersized, or repaired 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.
- Use only well-maintained equipment. Repair or replace damaged parts at once. Maintain unit according to manual.
- Do not touch electrode holders connected to two welding machines at the same time since double open-circuit voltage will be present.
- 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.
- Use GFCI protection when operating auxiliary equipment in damp or wet locations.

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.



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.

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.
- Ventilate the work area and/or use local forced ventilation at the arc to remove welding fumes and gases. The recommended way to determine adequate ventilation is to sample for the composition and quantity of fumes and gases to which personnel are exposed.
- If ventilation is poor, wear an approved air-supplied respirator.
- Read and understand the Safety Data Sheets (SDSs) and the manufacturer's instructions for adhesives, coatings, cleaners, consumables, coolants, degreasers, fluxes, and metals.
- Work in a confined space only if it is well ventilated, or while wearing an air-supplied respirator. Always have a trained watchperson 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.

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.

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 body protection made from leather or flame-resistant clothing (FRC). Body protection includes oil-free clothing such as leather gloves, heavy shirt, cuffless trousers, high shoes, and a cap.

WELDING can cause fire or explosion.

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

- 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 cut or weld on tire rims or wheels. Tires can explode if heated. Repaired rims and wheels can fail. See OSHA 29 CFR 1910.177 listed in Safety Standards.
- 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 (see Safety Standards).
- Do not weld where the atmosphere can 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 body protection made from leather or flame-resistant clothing (FRC). Body protection includes oil-free clothing 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.
- Read and understand the Safety Data Sheets (SDSs) and the manufacturer's instructions for adhesives, coatings, cleaners, consumables, coolants, degreasers, fluxes, and metals.

NOISE can damage hearing.

Noise from some processes or equipment can damage hearing.

- Wear approved ear protection if noise level is high.

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.

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. Do not stand in front of or behind the regulator when opening the valve.
- Keep protective cap in place over valve except when cylinder is in use or connected for use.
- Use the proper equipment, correct procedures, and sufficient number of persons to lift, move, and transport 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 Hazards For Installation, Operation, And Maintenance

FIRE OR EXPLOSION hazard.

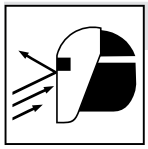
- Do not install or place unit on, over, or near combustible surfaces.
- Do not install unit near flammables.
- Do not overload building wiring — be sure power supply system is properly sized, rated, and protected to handle this unit.

FALLING EQUIPMENT can injure.

- Use lifting eye to lift unit only, NOT running gear, gas cylinders, or any other accessories.
- Use correct procedures and 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.

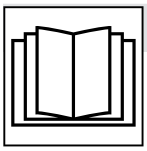
- Do not press gun trigger until instructed to do so.
- Do not point gun toward any part of the body, other people, or any metal when threading welding wire.

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 installation, 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 microprocessors, 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

⚠ **WARNING – This product can expose you to chemicals including lead, which are known to the state of California to cause cancer and birth defects or other reproductive harm.**

For more information, go to www.P65Warnings.ca.gov.

1-5. Principal Safety Standards

Safety in Welding, Cutting, and Allied Processes, American Welding Society standard ANSI Standard Z49.1. Website: http://www.aws.org.

Safe Practice For Occupational And Educational Eye And Face Protection, ANSI Standard Z87.1, from American National Standards Institute. Website: www.ansi.org.

Safe Practices for the Preparation of Containers and Piping for Welding and Cutting, American Welding Society Standard AWS F4.1. Website: http://www.aws.org.

National Electrical Code, NFPA Standard 70 from National Fire Protection Association. Website: www.nfpa.org.

Safe Handling of Compressed Gases in Cylinders, CGA Pamphlet P-1 from Compressed Gas Association. Website: www.cganet.com.

Safety in Welding, Cutting, and Allied Processes, CSA Standard W117.2 from Canadian Standards Association. Website: www.csagroup.org.

Standard for Fire Prevention During Welding, Cutting, and Other Hot Work, NFPA Standard 51B from National Fire Protection Association. Website: www.nfpa.org.

OSHA, Occupational Safety and Health Standards for General Industry, Title 29, Code of Federal Regulations (CFR), Part 1910.177 Subpart N, Part 1910 Subpart Q, and Part 1926, Subpart J. Website: www.osha.gov.

OSHA *Important Note Regarding the ACGIH TLV, Policy Statement on the Uses of TLVs and BEIs.* Website: www.osha.gov.

Applications Manual for the Revised NIOSH Lifting Equation from the National Institute for Occupational Safety and Health (NIOSH). Website: www.cdc.gov/NIOSH.

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1-6. EMF Information

Electric current flowing through any conductor causes localized electric and magnetic fields (EMF). The current from arc welding (and allied processes including spot welding, gouging, plasma arc cutting, and induction heating operations) creates an EMF field around the welding circuit. EMF fields can 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

⚠ 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.

AVIS – *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. Reportez-vous aux symboles et aux directives ci-dessous afin de connaître les mesures à prendre pour éviter tout 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 ce symbole, prendre garde et suivre les instructions afférentes pour éviter tout risque. Les consignes de sécurité présentées ci-après ne font que résumer l'information contenue dans les Normes de sécurité principales. Lire et suivre toutes les Normes de sécurité.

⚠ L'installation, l'utilisation, l'entretien et les réparations ne doivent être confiés qu'à des personnes qualifiées. Une personne qualifiée est définie comme celle qui, par la possession d'un diplôme reconnu, d'un certificat ou d'un statut professionnel, ou qui, par une connaissance, une formation et une expérience approfondies, a démontré avec succès sa capacité à résoudre les problèmes liés à la tâche, le travail ou le projet et a reçu une formation en sécurité afin de reconnaître et d'éviter les risques inhérents.

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

UNE DÉCHARGE ÉLECTRIQUE peut entraîner la mort.

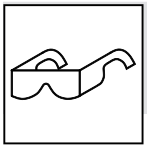
Le contact d'organes électriques sous tension peut provoquer des accidents mortels ou des brûlures graves. Le circuit de l'électrode et de la pièce est sous tension lorsque le courant est délivré à la sortie. Le circuit d'alimentation et les circuits internes de la machine sont également sous tension 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 utiliser de sortie de soudage CA dans des zones humides ou confinées ou s'il y a un risque de chute.
- 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).
- Brancher correctement la mise à la terre et utiliser cet appareil conformément à son manuel d'utilisateur et aux codes nationaux, provinciaux et municipaux.
- Toujours vérifier la mise à la terre — vérifier et assurez-vous que le conducteur de mise à la terre du cordon d'alimentation est bien raccordé à la borne de mise à la terre dans le boîtier de déconnexion 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 et le conducteur de mise à la terre afin de s'assurer qu'il n'est pas altéré ou dénudé -, le remplacer immédiatement s'il l'est -. Un fil dénudé 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, le 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.
- Utiliser une protection différentielle lors de l’utilisation d’un équipement auxiliaire dans des endroits humides ou mouillés.

LES PIÈCES CHAUDES peuvent provoquer des brûlures.

- Ne pas toucher des parties chaudes à mains nues.
- 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.



DES PIECES DE METAL ou DES SALETES peuvent provoquer des blessures dans les yeux.

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

LES 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. Pour déterminer la bonne ventilation, il est recommandé de procéder à un prélèvement pour la composition et la quantité de fumées et de gaz auxquelles est exposé le personnel.
- Si la ventilation est médiocre, porter un respirateur anti-vapeurs approuvé.
- Lire et comprendre les fiches de données de sécurité et les instructions du fabricant concernant les adhésifs, les revêtements, les nettoyants, les consommables, les produits de refroidissement, les dégraisseurs, les flux et les métaux.
- 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 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 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 approprié pour protéger visage et yeux pendant le soudage (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 une protection corporelle en cuir ou des vêtements ignifuges (FRC). La protection du corps comporte des vêtements sans huile, comme des gants de cuir, une chemise solide, des pantalons sans revers, des chaussures hautes et une casquette.

LE SOUDAGE peut provoquer un incendie ou une explosion.

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

- Déplacer toutes les substances inflammables à une distance de 10,7 m de l’arc de soudage. En cas d’impossibilité les recouvrir soigneusement avec des protections homologués.
- Ne pas souder dans un endroit là 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 couper ou souder des jantes ou des roues. Les pneus peuvent exploser s’ils sont chauffés. Les jantes et les roues réparées peuvent défaillir. Voir OSHA 29 CFR 1910.177 énuméré dans les normes de sécurité.
- Ne pas effectuer le soudage sur des conteneurs fermés tels que des réservoirs, tambours, ou conduites, à moins qu’ils n’aient été préparés correctement conformément à AWS F4.1 (voir les Normes de Sécurité).
- Ne pas souder là où l’air ambiant pourrait contenir des poussières, gaz ou émanations inflammables (vapeur d’essence, par exemple).

- Brancher le câble de masse sur la pièce le plus près possible de la zone de soudage pour éviter le transport du courant sur une longue distance par des chemins inconnus éventuels en provoquant des risques d'électrocution, 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 une protection corporelle en cuir ou des vêtements ignifuges (FRC). La protection du corps comporte des vêtements sans huile, comme des gants de cuir, une chemise solide, des pantalons sans revers, des chaussures hautes et une casquette.
- 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.
- 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.
- Lire et comprendre les fiches de données de sécurité et les instructions du fabricant concernant les adhésifs, les revêtements, les nettoyants, les consommables, les produits de refroidissement, les dégraisseurs, les flux et les métaux.

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 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.

Si des BOUTEILLES sont endommagées, elles pourront exploser.

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

- Protéger les bouteilles de gaz comprimé d'une chaleur excessive, des chocs mécaniques, 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.
- Tourner le dos à la sortie de vanne lors de l'ouverture de la vanne de la bouteille. Ne pas se tenir devant ou derrière lerégulateur lors de l'ouverture de la vanne.
- Maintenir le chapeau de protection sur la soupape, sauf en cas d'utilisation ou de branchement de la bouteille.
- Utilisez les équipements corrects, les bonnes procédures et suffisamment de personnes pour soulever, déplacer et transporter 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. Symboles de dangers supplémentaires en relation avec l'installation, le fonctionnement et la maintenance

Risque D'INCENDIE OU D'EXPLOSION.

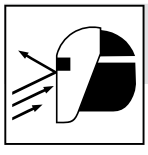
- Ne pas placer l'appareil sur, au-dessus ou à proximité de surfaces inflammables.
- Ne pas installer l'appareil à proximité de produits inflammables
- Ne pas surcharger l'installation électrique – s'assurer que l'alimentation est correctement dimensionné et protégé avant de mettre l'appareil en service.

LA CHUTE DE L'ÉQUIPEMENT peut provoquer des blessures.

- Utiliser l'anneau de levage uniquement pour soulever l'appareil, NON PAS les organes de roulement, les bouteilles de gaz ou tout autre accessoire.
- Utilisez les procédures correctes et des équipements d'une capacité appropriée pour soulever et supporter 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 Nº94– 110) lors du levage manuelle de pièces ou équipements lourds.

L'EMPLOI EXCESSIF peut SURCHAUFFER L'ÉQUIPEMENT.

- Laisser l'équipement refroidir ; respecter le facteur de marche nominal.
- Réduire le courant ou le cycle opératoire avant de recommencer le soudage.
- Ne pas obstruer les passages d'air du poste.



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 imprimes.

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.

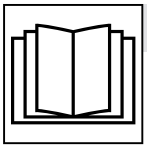
- Ne pas appuyer sur la gachette avant d'en avoir reçu l'instruction.
- Ne pas diriger le pistolet vers soi, d'autres personnes ou toute pièce mécanique en engageant le fil de soudage.

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 des pièces de remplacement provenant du fabricant.
- Effectuer l'installation, l'entretien et toute intervention selon les manuels d'utilisateurs, les normes nationales, provinciales et de l'industrie, ainsi que les codes municipaux.

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

⚠ **AVERTISSEMENT – Ce produit peut vous exposer à des produits chimiques tels que le plomb, reconnus par l'État de Californie comme cancérigènes et sources de malformations ou d'autres troubles de la reproduction.**

Pour plus d'informations, consulter www.P65Warnings.ca.gov.

2-5. Principales normes de sécurité

Safety in Welding, Cutting, and Allied Processes, American Welding Society standard ANSI Standard Z49.1. Website: http://www.aws.org.

Safe Practice For Occupational And Educational Eye And Face Protection, ANSI Standard Z87.1, from American National Standards Institute. Website: www.ansi.org.

Safe Practices for the Preparation of Containers and Piping for Welding and Cutting, American Welding Society Standard AWS F4.1. Website: http://www.aws.org.

National Electrical Code, NFPA Standard 70 from National Fire Protection Association. Website: www.nfpa.org.

Safe Handling of Compressed Gases in Cylinders, CGA Pamphlet P-1 from Compressed Gas Association. Website: www.cganet.com.

Safety in Welding, Cutting, and Allied Processes, CSA Standard W117.2 from Canadian Standards Association. Website: www. csa-group.org.

Standard for Fire Prevention During Welding, Cutting, and Other Hot Work, NFPA Standard 51B from National Fire Protection Association. Website: www.nfpa.org.

OSHA, Occupational Safety and Health Standards for General Industry, Title 29, Code of Federal Regulations (CFR), Part 1910.177 Subpart N, Part 1910 Subpart Q, and Part 1926, Subpart J. Website: www.osha.gov.

OSHA *Important Note Regarding the ACGIH TLV, Policy Statement on the Uses of TLVs and BEIs.* Website: www.osha.gov.

Applications Manual for the Revised NIOSH Lifting Equation from the National Institute for Occupational Safety and Health (NIOSH). Website: www.cdc.gov/NIOSH.

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2-6. Informations relatives aux CEM

Le courant électrique qui traverse tout conducteur génère des champs électromagnétiques (CEM) à certains endroits. Le courant issu d'un soudage à l'arc (et de procédés connexes, y compris le soudage par points, le gougeage, le découpage plasma et les opérations de chauffage par induction) crée un champ électromagnétique (CEM) autour du circuit de soudage. Les champs électromagnétiques produits peuvent causer interférence à certains implants médicaux, p. ex. les stimulateurs cardiaques. Des mesures de protection pour les porteurs d'implants médicaux doivent être prises: par exemple, des restrictions d'accès pour les passants ou une évaluation individuelle des risques 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.

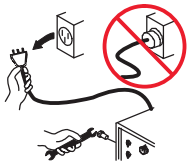
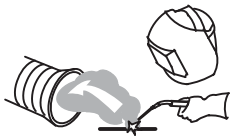
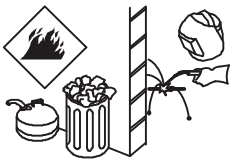
En ce qui concerne les implants médicaux :

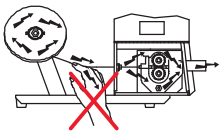
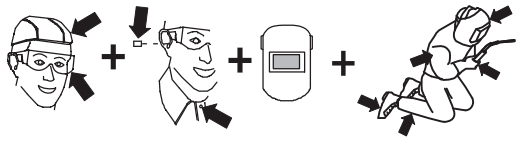
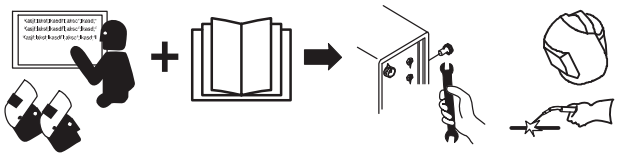
Les porteurs d'implants doivent d'abord consulter leur médecin avant de s'approcher des opérations de soudage à l'arc, de soudage par points, de gougeage, du coupage plasma ou de chauffage par induction. Si le médecin approuve, il est recommandé de suivre les procédures précédentes.

SECTION 3 – DEFINITIONS

3-1. Additional Safety Symbol Definitions

☞ *Some symbols are found only on CE products.*

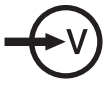
	Warning! Watch Out! There are possible hazards as shown by the symbols.
	Do not discard product (where applicable) with general waste. Reuse or recycle Waste Electrical and Electronic Equipment (WEEE) by disposing at a designated collection facility. Contact your local recycling office or your local distributor for further information.
	Wear dry insulating gloves. Do not touch electrode with bare hand. Do not wear wet or damaged gloves.
	Protect yourself from electric shock by insulating yourself from work and ground.
	Disconnect input plug or power before working on machine.
	Keep your head out of the fumes.
	Use forced ventilation or local exhaust to remove the fumes.
	Use ventilating fan to remove fumes.
	Keep flammables away from welding. Do not weld near flammables.

	Welding sparks can cause fires. Have a fire extinguisher nearby, and have a watchperson ready to use it.
	Do not weld on drums or any closed containers.
	Do not remove or paint over (cover) the label.
	Drive rolls can injure fingers.
	Welding wire and drive parts are at welding voltage during operation - keep hands and metal objects away.
	Pinch points can injure.
	Wear hat and safety glasses. Use ear protection and button shirt collar. Use welding helmet with correct shade of filter. Wear complete body protection made from leather or flame-resistant clothing (FRC). Body protection includes oil-free clothing such as leather gloves, heavy shirt, cuffless trousers, high shoes, and a cap.
	Become trained and read the instructions before working on the machine or welding.

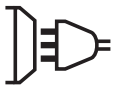
3-2. Miscellaneous Symbols And Definitions

A	Amperage
V	Voltage
U_0	Rated No-Load Voltage

⎓	Direct Current (DC)
∿	Alternating Current
U_1	Rated Supply Voltage

U_2	Conventional Load Voltage
I_2	Rated Welding Current
	Input Power Or Input Voltage

	Gas Input
IP	Input Protection Rating
	Single Phase
	Purge By Gas
	Wire Diameter
	Remote
	Three Phase
	Positive
	Negative

X	Duty Cycle
	Line Connection
	Suitable for Welding in an Environment with Increased Risk of Electric Shock
	Increase
Hz	Hertz
	Single Phase Static Frequency Converter-Transformer-Rectifier
	Wire Type
	Gas Metal Arc Welding (GMAW)
	Gas Metal Arc Welding (GMAW) MIG/Gun Control

	Self Shielded Flux Cored Arc Welding (FCAW)
	Wire Feed Spool Gun
	Gas Postflow
	Gas Preflow
	Cold Jog (Inch) Toward Workpiecel
	Pulse

SECTION 4 – SPECIFICATIONS

4-1. Serial Number And Rating Label Location

The serial number and rating information for this product is located on the back of unit. 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.

4-2. Software Licensing Agreement

The End User License Agreement and any third-party notices and terms and conditions pertaining to third-party software can be found at https://www.millerwelds.com/eula and are incorporated by reference herein.

4-3. Information About Default Weld Parameters And Settings

NOTICE – *Each welding application is unique. Although certain Miller Electric products are designed to determine and default to certain typical welding parameters and settings based upon specific and relatively limited application variables input by the end user, such default settings are for reference purposes only; and final weld results can be affected by other variables and application-specific circumstances. The appropriateness of all parameters and settings should be evaluated and modified by the end user as necessary based upon application-specific requirements. The end user is solely responsible for selection and coordination of appropriate equipment, adoption or adjustment of default weld parameters and settings, and ultimate quality and durability of all resultant welds. Miller Electric expressly disclaims any and all implied warranties including any implied warranty of fitness for a particular purpose.*

4-4. Unit Specifications

☞ *Do not use information in unit specifications table to determine electrical service requirements. See Sections 5-3 thru 5-4 for information on connecting input power.*

☞ *This equipment will deliver rated output at an ambient air temperature up to 104°F (40°C).*

Input Power	Rated Output	Max Output	Voltage Range	Max Open-Circuit Voltage	RMS Amps Input at Rated Load Output				KVA	KW
					208 V	240 V	460 V	575 V		
3–Phase	310 A at 29.5 VDC, 60% Duty Cycle*	400 A at 34VDC, 25% Duty Cycle*	12–34 V	95 VDC	32.3	28.8	18.2	15.4	15.3	11.5
1–Phase 460/575V	310 A at 29.5 VDC, 60% Duty Cycle*	400 A at 34VDC, 25% Duty Cycle*	12–34 V				35.6	32.3	15.0	11.1
1–Phase 208/240V	310 A at 29.5 VDC, 60% Duty Cycle*	350 A at 32VDC, 35% Duty Cycle*	12–32 V		69.6	62.5			15.0	11.1
*See Section 4-7 for Duty Cycle Rating.										

4-5. Environmental Specifications

A. IP Rating

IP Rating
IP23
This equipment is designed for outdoor use.

B. Temperature Specifications

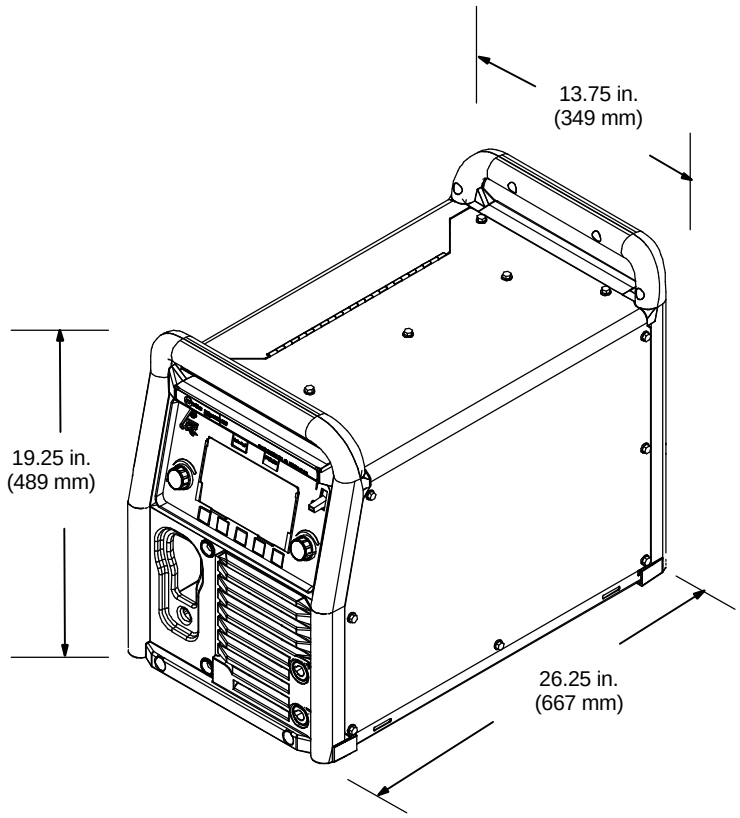
Operating Temperature Range*	Storage/Transportation Temperature Range
-22 to 122°F (-30 to 50°C)	-40 to 149°F (-40 to 65°C)

*Output is derated at temperatures above 104°F (40°C).

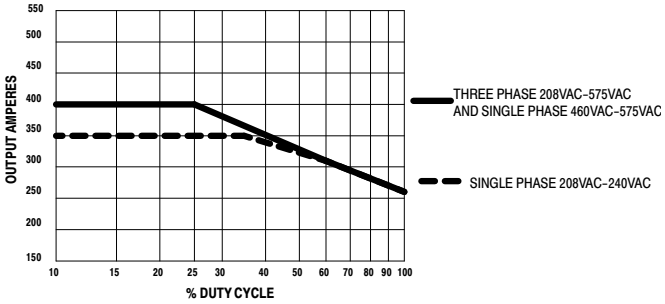
4-6. Dimensions And Weight

Weight

99 lbs (45 kg)



4-7. Duty Cycle And Overheating

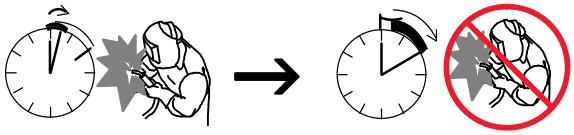


Duty cycle is the percentage of 10 minutes that unit can weld at rated load without overheating.

If unit overheats or duty cycle is exceeded, the output stops, a Help message is displayed, and cooling fans run. Wait fifteen minutes for unit to cool. Reduce amperage or duty cycle before welding.

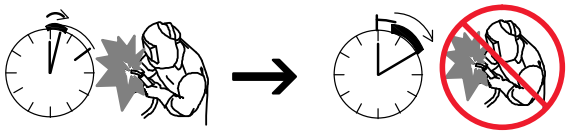
NOTICE – *Exceeding duty cycle can damage unit and void warranty.*

400 A @ 25% Duty Cycle For 3 Phase And 460/575 Single Phase Operation



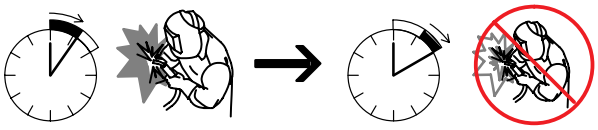
2.5 Minutes Welding — 7.5 Minutes Resting

350 A @ 35% Duty Cycle For 208/240 Single Phase Operation



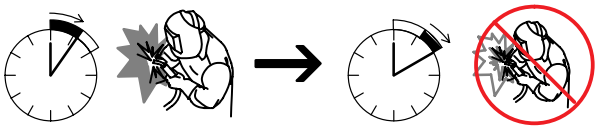
3.5 Minutes Welding — 6.5 Minutes Resting

310 A @ 60% Duty Cycle For 3 Phase And 460/575 Single Phase Operation

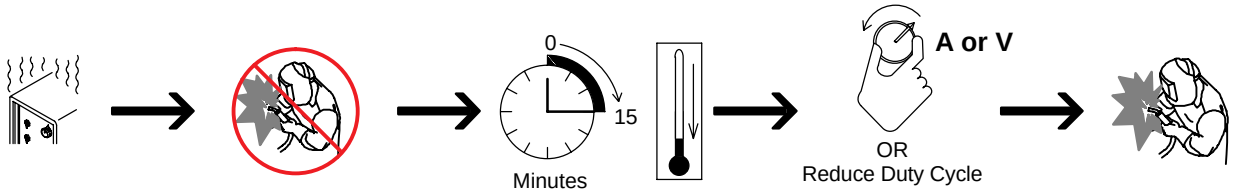


6 Minutes Welding — 4 Minutes Resting

310 A @ 60% Duty Cycle For 208/240 Single Phase Operation



6 Minutes Welding — 4 Minutes Resting

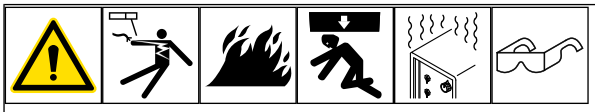


4-8. Static Characteristics

The static (output) characteristics of the welding power source can be described as *flat* during the GMAW process and *drooping* during the SMAW and GTAW processes. Static characteristics are also affected by control settings (including software), electrode, shielding gas, weldment material, and other factors. Contact the factory for specific information on the static characteristics of the welding power source.

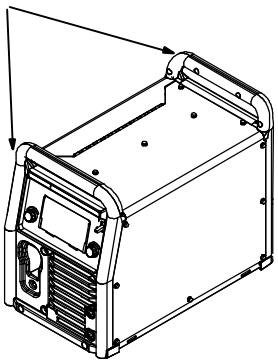
SECTION 5 – INSTALLATION

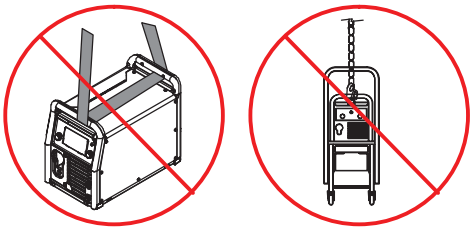
5-1. Selecting A Location



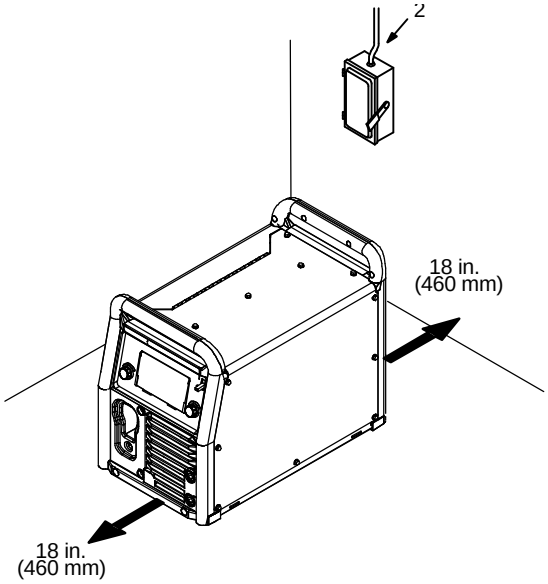
Movement

1





Location And Airflow



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

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

1 Lifting Handles

Use handles to lift unit.

2 Line Disconnect Device

Locate unit near correct input power supply.

5-2. Electrical Service Guide

Failure to follow these electrical service guide recommendations could create an electric shock or fire hazard. These recommendations are for an individual branch circuit sized for the rated output and duty cycle of one welding power source. In individual branch 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.

NOTICE – *Actual input voltage should not be 10% less than minimum and/or 10% more than maximum input voltages listed in table. If actual input voltage is outside this range, output may not be available.*

	50/60 Hz 1-Phase			
Rated Supply Voltage (V)	208	240	460	575
Rated Maximum Supply Current I_{1max} (A)	81.5	71.9	48.7	39.8
Rated Effective Supply Current I_{1eff} (A)	53.9	48.4	27.6	25.1
Maximum Recommended Standard Fuse Rating In Amperes [1]				
Time Delay Fuses [2]	90	80	60	45
Normal Operating Fuses [3]	100	100	70	50
Maximum Recommended Supply Conductor Length In Feet (Meters)[4]	92 (28)	82 (25)	163 (50)	255 (78)
Raceway Installation				
Minimum Supply Conductor Size In AWG (mm²) [5]	6 (16)	8 (10)	10 (6)	10 (6)
Minimum Grounding Conductor Size In AWG (mm²) [5]	6 (16)	8 (10)	10 (6)	10 (6)

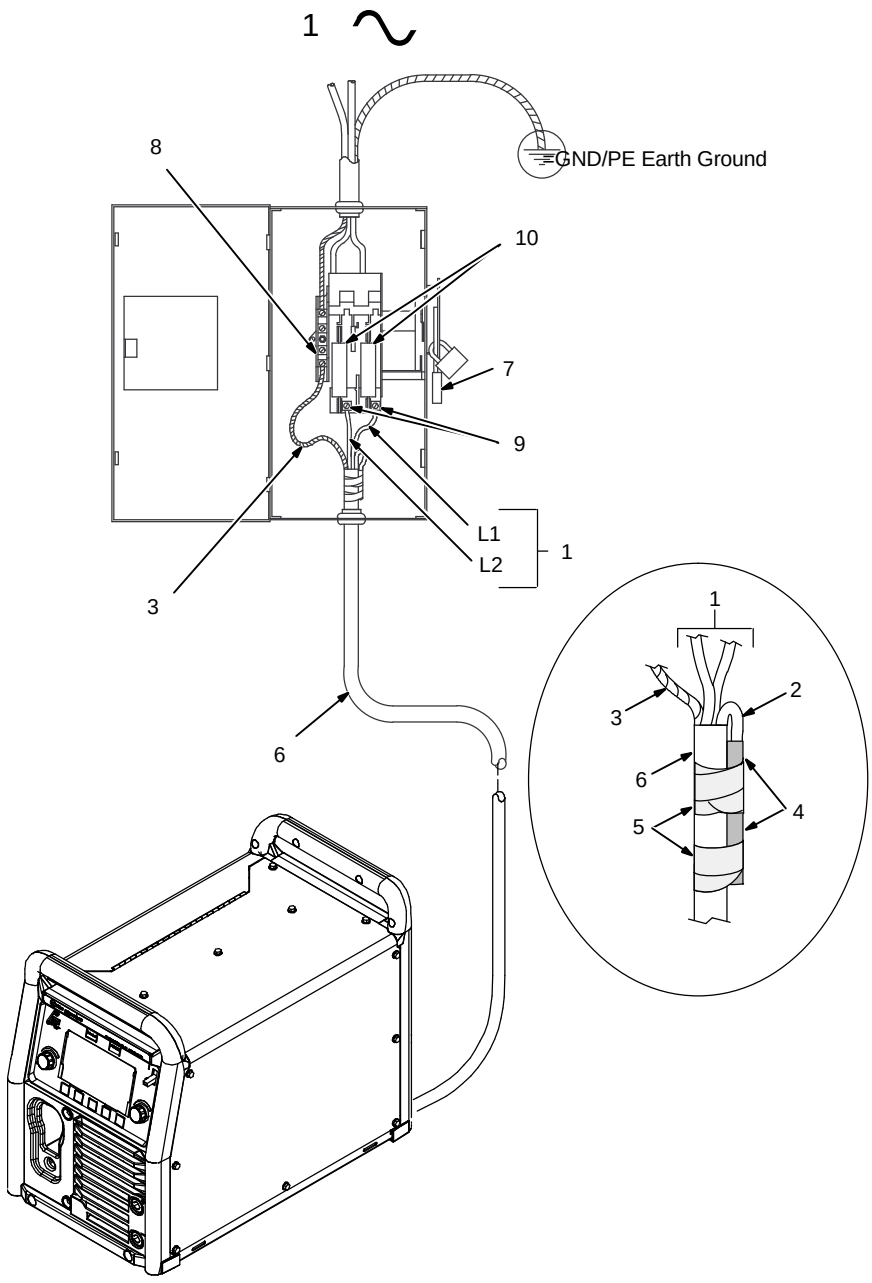
Reference: 2020 National Electrical Code (NEC) (including article 630)

	50/60 Hz 3-Phase			
Rated Supply Voltage (V)	208	240	460	575
Rated Maximum Supply Current I_{1max} (A)	43.4	39.8	25.7	22.0
Rated Effective Supply Current I_{1eff} (A)	25.1	22.4	14.2	12.0
Maximum Recommended Standard Fuse Rating In Amperes [1]				
Time Delay Fuses [2]	50	50	30	25
Normal Operating Fuses [3]	60	60	35	30
Maximum Recommended Supply Conductor Length In Feet (Meters)[4]	72 (22)	93 (28)	129 (39)	215 (66)
Raceway Installation				
Minimum Supply Conductor Size In AWG (mm²) [5]	10 (6)	10 (6)	14 (2.5)	14 (2.5)
Minimum Grounding Conductor Size In AWG (mm²) [5]	10 (6)	10 (6)	14 (2.5)	14 (2.5)

Reference: 2020 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 Maximum total length of copper input conductors in entire installation, raceway and/or flexible cord.
5 Raceway 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) and is based on allowable ampacities of insulated copper conductors having a temperature rating of 75°C (167°F) with not more than three single current-carrying conductors in a raceway.
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 Maximum total length of copper input conductors in entire installation, raceway and/or flexible cord.
5 Raceway 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) and is based on allowable ampacities of insulated copper conductors having a temperature rating of 75°C (167°F) with not more than three single current-carrying conductors in a raceway.

5-3. Connecting 1-Phase Input Power



⚠ 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 Black And White Input Conductor (L1 And L2)

2 Red Input Conductor

3 Green Or Green/Yellow Grounding Conductor

4 Insulation Sleeving

5 Electrical Tape

Insulate and isolate red conductor as shown.

6 Input Power Cord

7 Disconnect Device (switch shown in the OFF position)

8 Disconnect Device Grounding Terminal

9 Disconnect Device Line Terminals

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

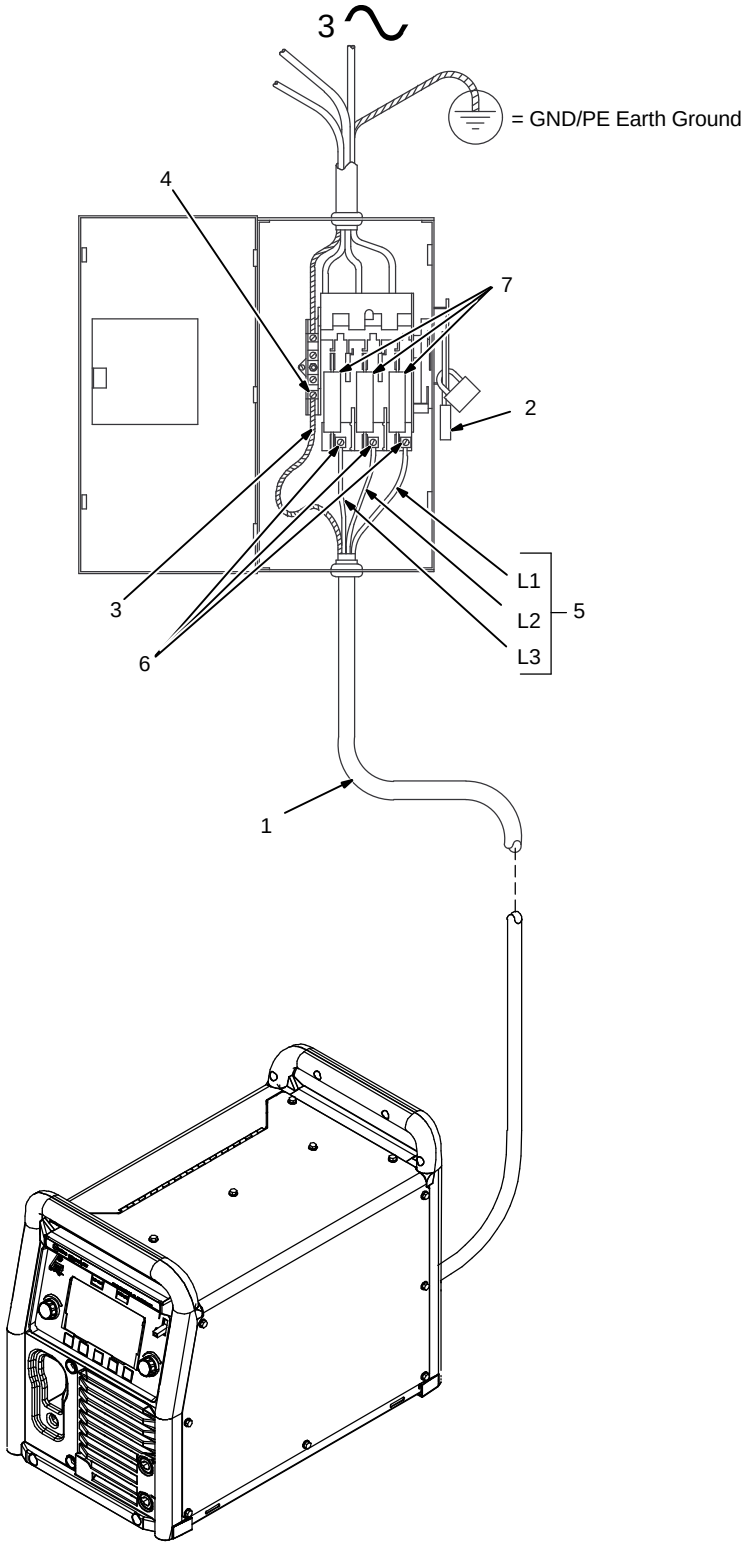
Connect input conductors L1 and L2 to disconnect device line terminals.

10 Over-Current Protection

Select type and size of over-current protection using Electrical Service Guide (fused disconnect switch shown).

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

5-4. Connecting 3-Phase Input Power



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.

For Three-Phase Operation

1 Input Power Cord

2 Disconnect Device (switch shown in the OFF position)

3 Green Or Green/Yellow Grounding Conductor

4 Disconnect Device Grounding Terminal

5 Input Conductors (L1, L2, And L3)

6 Disconnect Device Line Terminals

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

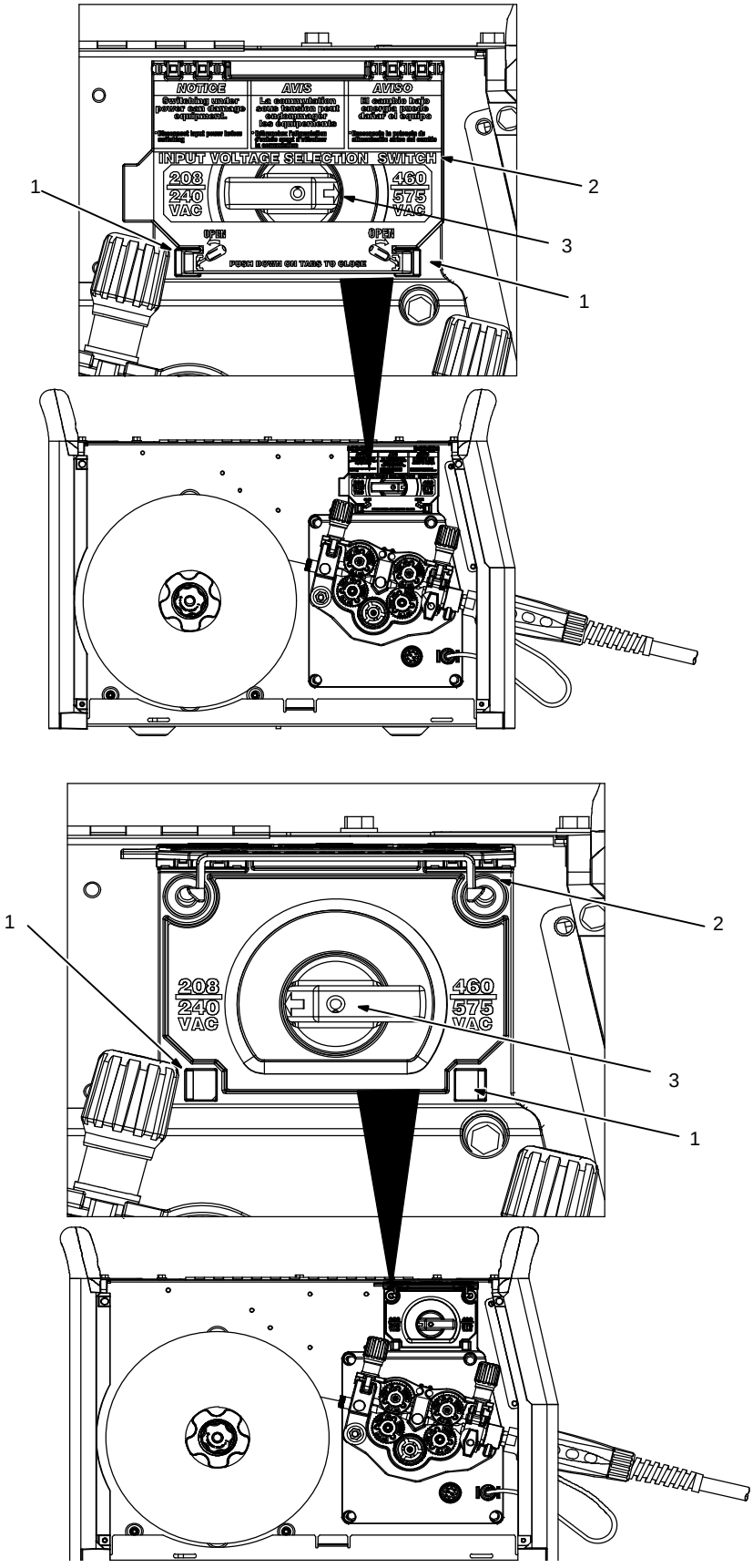
Connect input conductors L1, L2, and L3 to disconnect device line terminals.

7 Over-Current Protection

Select type and size of over-current protection using Electrical Service Guide (fused disconnect switch shown).

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

5-5. Selecting 208/240 Volts AC Input Voltage



Turn off unit before making connections.

Check input voltage available at site.

1 Screwdriver Slots

2 Switch Cover

3 Voltage Selection Switch

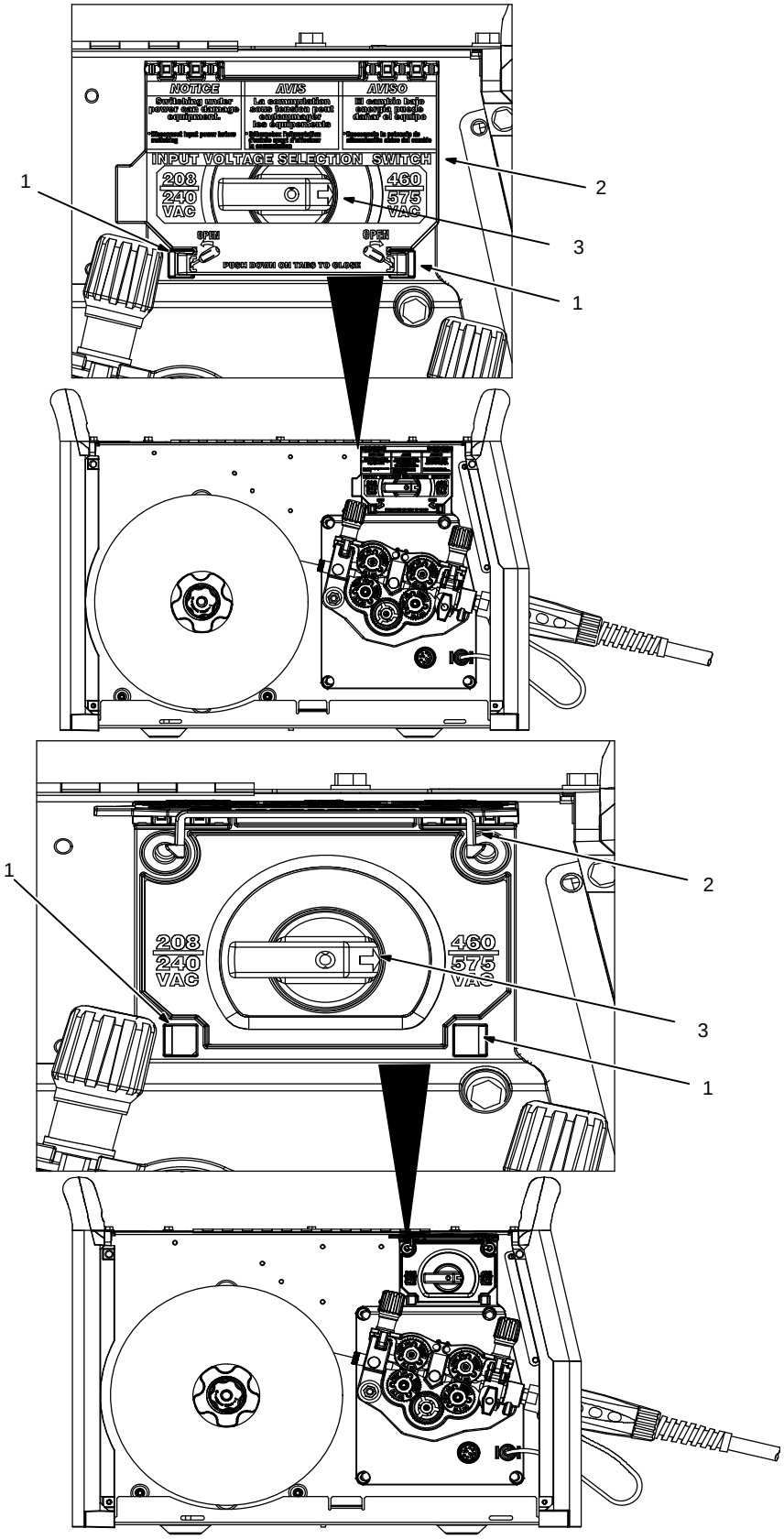
The input voltage that the machine is linked for is labeled next to the switch.

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

To change selection, insert flat blade screwdriver into slot and rotate screwdriver to open switch cover. Turn switch to required voltage range. Close and secure switch cover.

Arrow location on switch handle should match input voltage to machine.

5-6. Selecting 460/575 Volts AC Input Voltage



⚠ Turn off unit before making connections.

Check input voltage available at site.

1 Screwdriver Slots

2 Switch Cover

3 Voltage Selection Switch

The input voltage that the machine is linked for is labeled next to the switch.

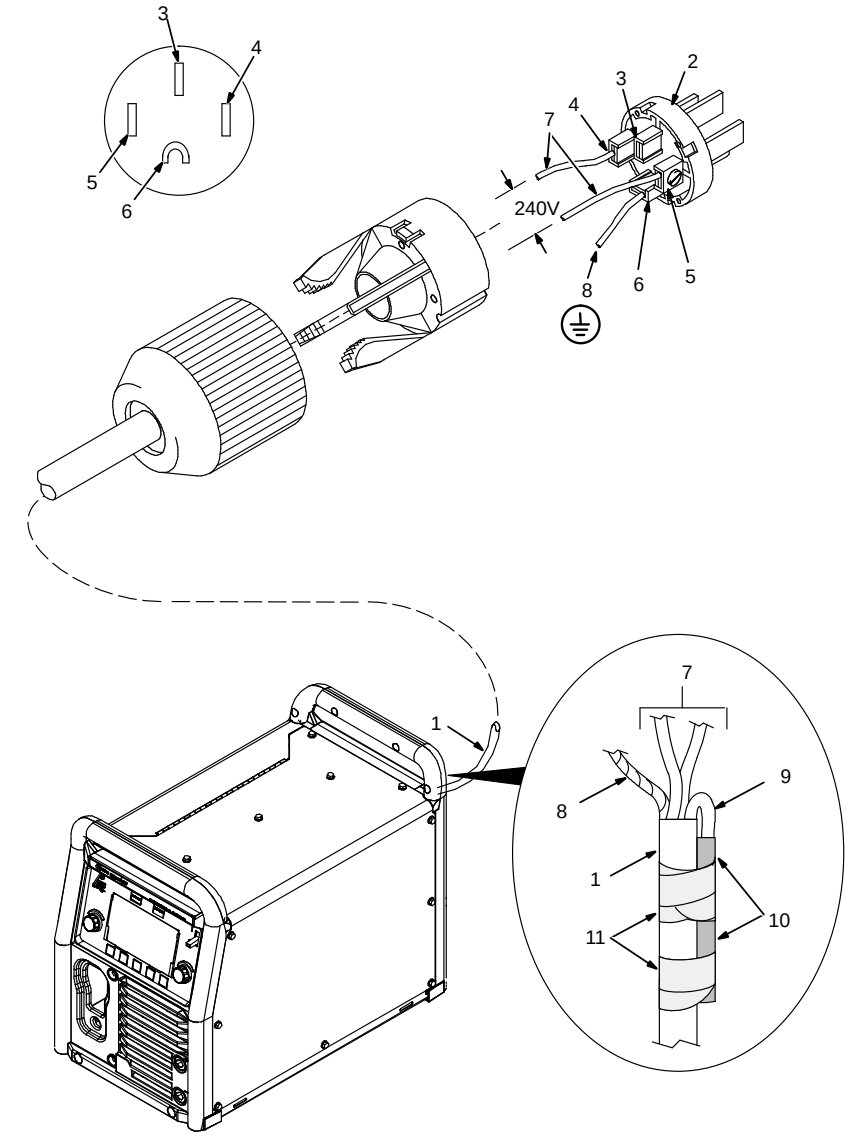
Check voltage selected for unit. Changing selection is only necessary if selected value does not match available input voltage.

To change selection, insert flat blade screwdriver into slot and rotate screwdriver to open switch cover. Turn switch to required voltage range. Close and secure switch cover.

Arrow location on switch handle should match input voltage to machine.

5-7. Wiring Optional 240 Volt Plug (119172) For Connection To Miller Welder/Generator With Split-Phase 240 Volt Auxiliary Power

Plug Front View



Ref. 120 813-D / 907734

1 Input And Grounding Conductors

2 Plug wired for 240 Volt, 2–wire Load

3 Neutral (Brass) Terminal and Prong **(Not Used)**

4 Load 1 (Brass) Terminal and Prong

5 Load 2 (Brass) Terminal and Prong

6 Ground (Brass) Terminal and Prong

7 Black and White Input Conductors

8 Green or Green/Yellow Ground Conductor

9 Red Input Conductor

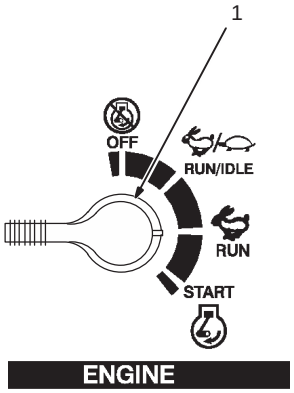
10 Insulation Sleeving

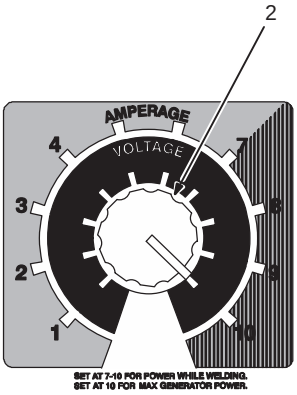
11 Electrical Tape

Insulate and isolate red conductor as shown.

Always connect green or green/yellow wire to ground terminal, never to a load terminal. Connect black (L1) and white (L2) wires to load terminals.

5-8. Generator Or Inverter Requirements





⚠ **Set Engine Control Switch to Run position, not Run/Idle.**

⚠ **Set generator Voltage/Amperage Control to 10 (or max) for maximum auxiliary power.**

For maximum output, Miller recommends a 19 kW or greater generator. Limited output will occur when used with a smaller generator.

Generator Settings, if applicable.

1 Engine Control Switch Setting

2 Generator Amperage/Voltage Control Setting

5-9. 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.*

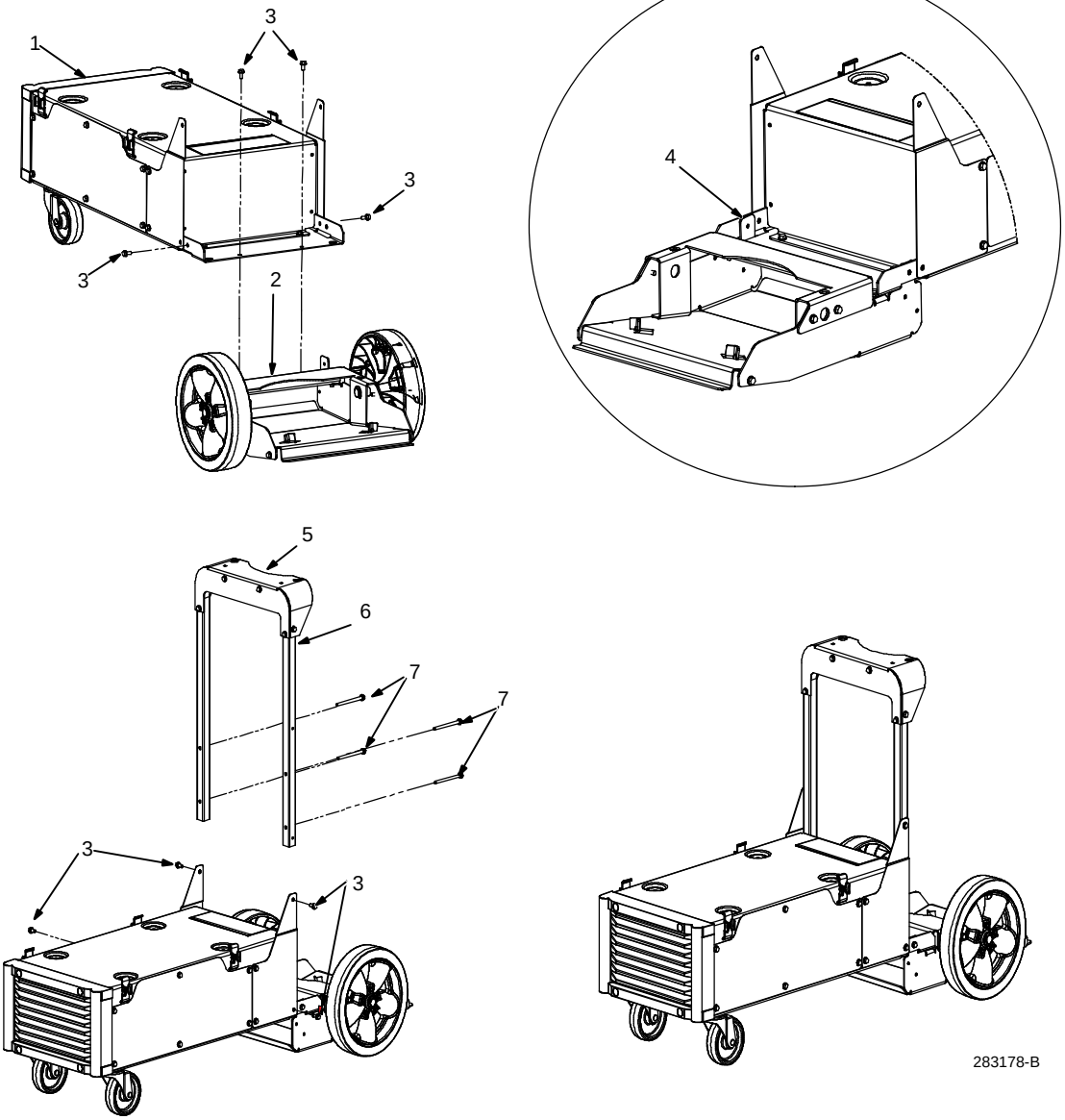
	Weld Cable Size and Total Cable (Copper) Length in Weld Circuit Not Exceeding*****							
	100 ft (30 m) or Less		**150 ft (45 m)**	**200 ft (60 m)**	**250 ft (70 m)**	**300 ft (90 m)**	**350 ft (105 m)**	**400 ft (120 m)**
Welding Amperes	**10 - 60% Duty Cycle AWG (mm²)**	**60 - 100% Duty Cycle AWG (mm²)**	**10 - 100% Duty Cycle AWG (mm²)**					
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)	2x2/0 (2x70)	2x2/0 (2x70)
300	1 (50)	1/0 (60)	2/0 (70)	3/0 (95)	4/0 (120)	2x2/0 (2x70)	2x3/0 (2x95)	2x3/0 (2x95)
350	1/0 (60)	2/0 (70)	3/0 (95)	4/0 (120)	2x2/0 (2x70)	2x3/0 (2x95)	2x3/0 (2x95)	2x4/0 (2x120)
400	1/0 (60)	2/0 (70)	3/0 (95)	4/0 (120)	2x2/0 (2x70)	2x3/0 (2x95)	2x4/0 (2x120)	2x4/0 (2x120)

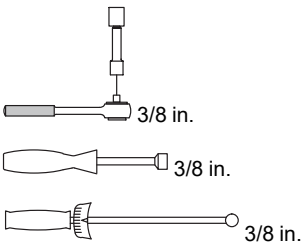
* This chart is a general guideline and may not suit all applications. If cable overheats, use next size larger cable.

**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.
( ) = mm² for metric use.

***For distances longer than those shown in this guide, see AWS Fact Sheet No. 39, Welding Cables, available from the American Welding Society at http://www.aws.org.

5-10. Optional Single Cylinder Running Gear Assembly Instructions





1 Running Gear Assembly, Front

2 Running Gear Assembly, Rear Single Cylinder

3 Screws 1/4–20 x 1/2 in.

4 Tabs, Rear Single Cylinder

5 Bracket, Upper Single Cylinder

6 Tubing, Running Gear Post

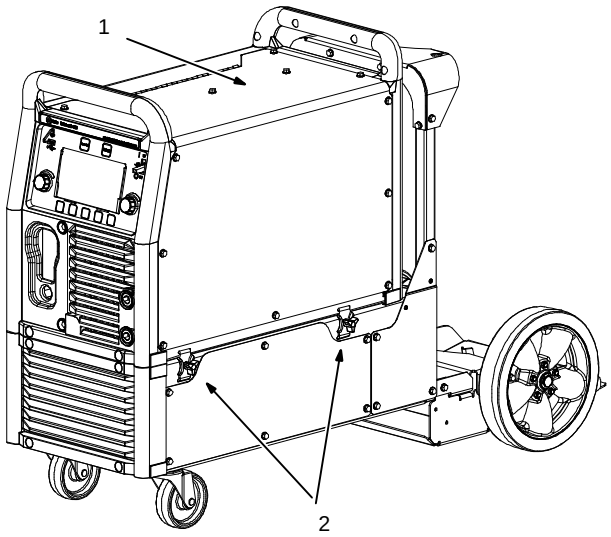
7 Screws 1/4-20 x 1 1/2 in

Block front casters to prevent movement. Slide front tabs from rear running gear assembly into bottom slots of front running gear assembly. Install two 1/4-20 x 1/2 in screws on sides of front running gear assembly but do not tighten. Rotate rear running gear assembly up so the top of the cylinder base pan is flush with the base of the front running gear assembly. Install two 1/4-20 x 1/2 in screws to attach front running gear assembly to rear running gear assembly. Torque four screws to 65 in lb (7.34 N·m).

Tabs must be located inside of flanges of front running gear assembly.

Install the running gear post tubing to the cart with four 1/4-20 x 1 1/2 in screws located in the rear. Install two 1/4-20 x 1/2 in screws located on each side. Torque screws to 65 in lb (7.34 N·m).

5-11. Attaching/Removing Unit From Optional Running Gear



Turn off unit and disconnect input power before performing any work on unit or running gear.

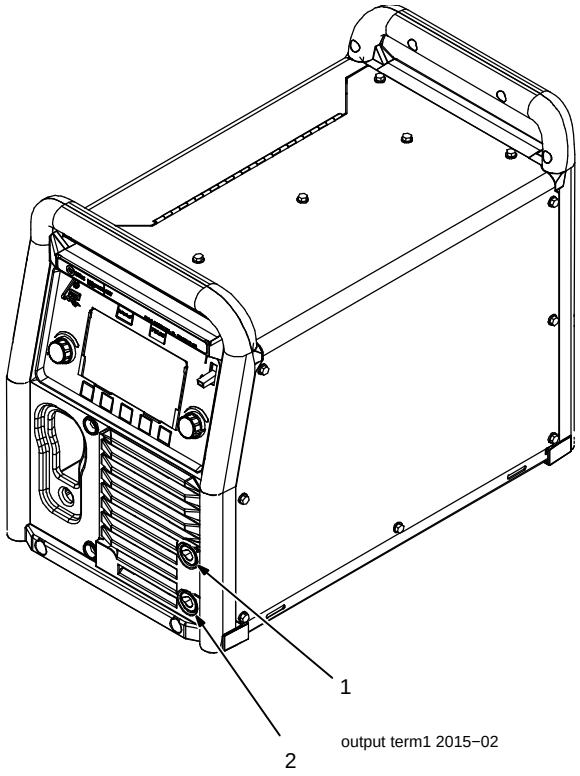
1 Power Source

2 Running Gear Latches

To mount the machine to the running gear, set the feet of the welder in the pockets on top of the running gear. Rotate the four latches into the vertical position and tighten thumb screws to secure the running gear to the machine.

To remove the machine, reverse the process. Loosen the thumb screws, pull out and rotate the latches to disengage the machine.

5-12. Weld Output Terminals



Turn off unit and disconnect input power before making connections.

Do not use worn, damaged, undersized, or repaired cables.

1 Positive (+) Weld Output Terminal

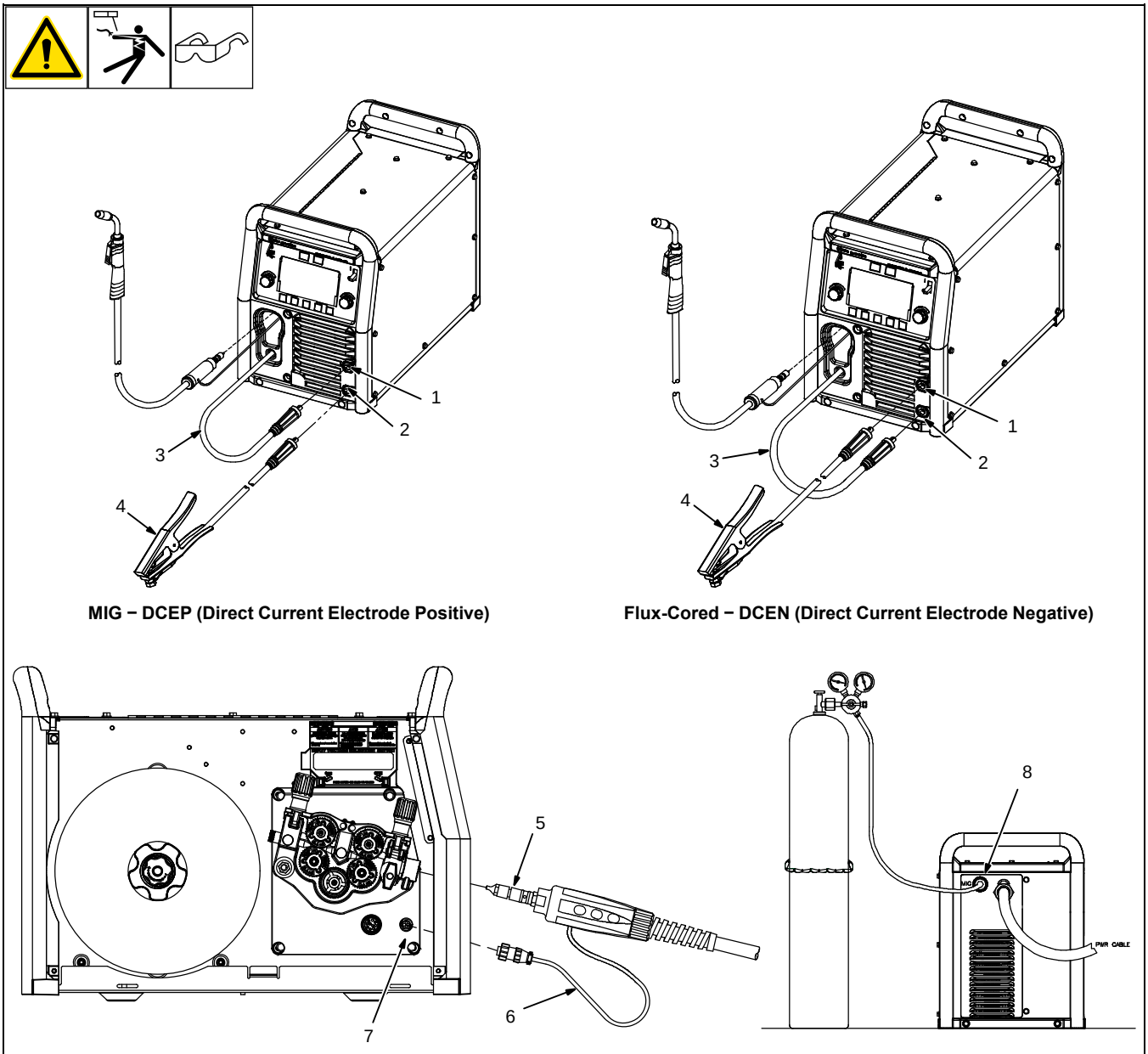
2 Negative (-) Weld Output Terminal

See Section 5– 14 for information on connecting to weld output terminals and standard connection diagrams.

5-13. Process/Polarity Table

Process	Polarity	Cable Connections	
		Wire Drive Assembly Cable	Work Cable
GMAW — Solid wire with shielding gas	DCEP — Reverse Polarity	Connect to positive (+) output receptacle	Connect to negative (-) output receptacle
FCAW—S — Self-shielding wire-no shielding gas	DCEN — Straight Polarity	Connect to negative (-) output receptacle	Connect to positive (+) output receptacle
FCAW—G — Flux-cored wire with shielding gas	DCEP — Reverse Polarity	Connect to positive (+) output receptacle	Connect to negative (-) output receptacle

5-14. MIG Welding Connections



MIG − DCEP (Direct Current Electrode Positive)

Flux-Cored − DCEN (Direct Current Electrode Negative)

⚠ **Turn off unit and disconnect input power before making connections.**

1 Positive Weld Output Receptacle

2 Negative Weld Output Receptacle

3 Wire Drive Assembly Cable

4 Work Clamp And Cable

Ensure all connections are tight.

5 Gun End

Connect gun end to drive assembly (see Section 5-16).

6 Trigger Control Cable

7 Four Pin Trigger Control Cable Receptacle

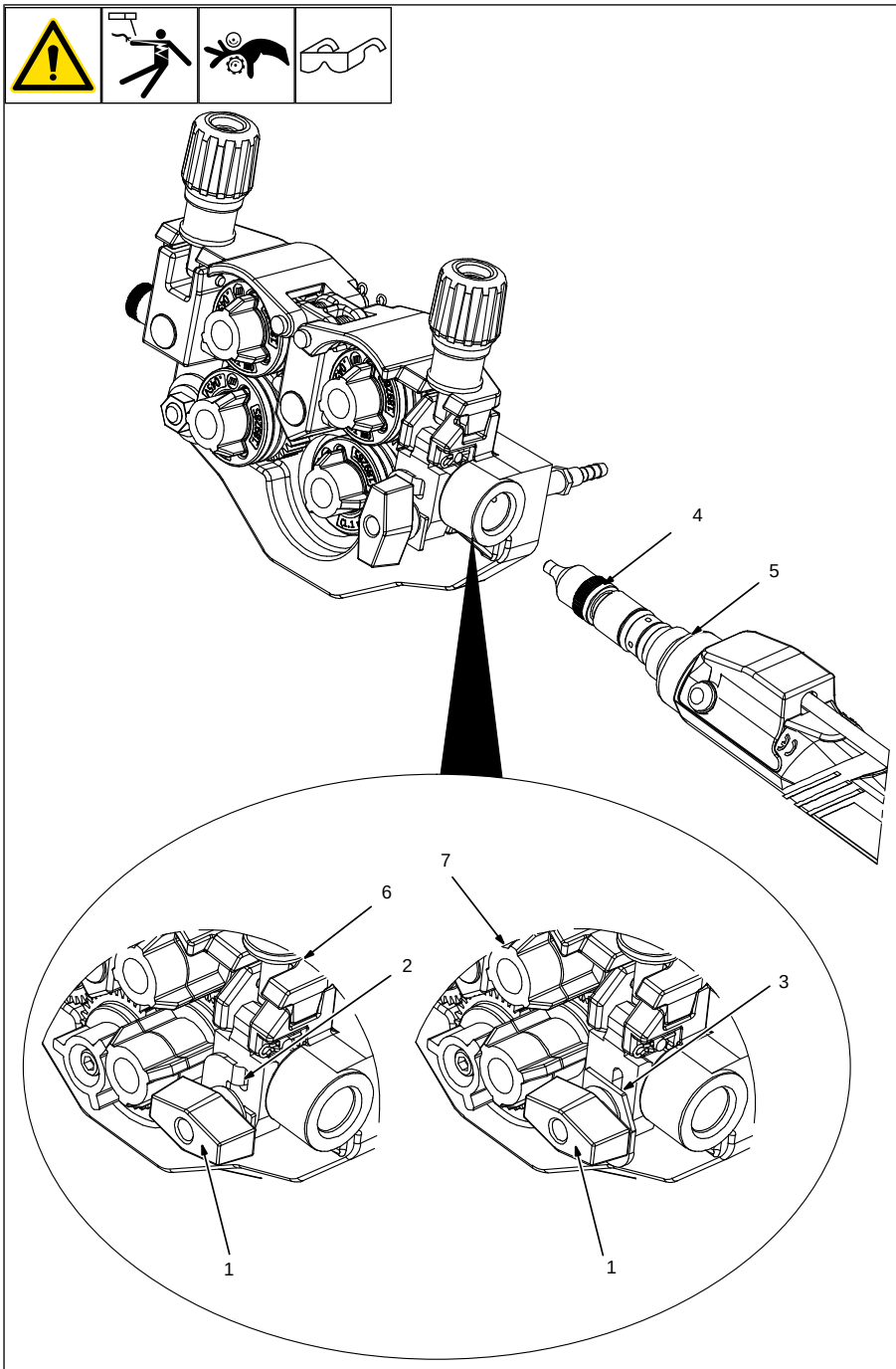
Route trigger control cable through MIG gun hole.

Connect plug on end of cable to four pin receptacle inside unit.

8 MIG Shielding Gas Connection

Use 75/25 mix, 90/10 mix or CO2 shielding gas for solid wire. Use Argon shielding gas for aluminum wire with spool gun (see Section 5-17).

5-15. Installing Welding Gun With Accumate



1 Power Clamp Knob

2 Gun Locking Tab

3 Gun Locking Tab Rotated 180 Degrees

4 Power Pin Groove

5 Gun Connection End

6 Installing Gun With Accu-Mate Connection

Loosen power clamp knob to allow power pin of gun to clear the gun locking tab.

Push power pin into power clamp as far as possible to align the groove in the power pin of the gun with the gun locking tab.

Secure gun by tightening power clamp knob.

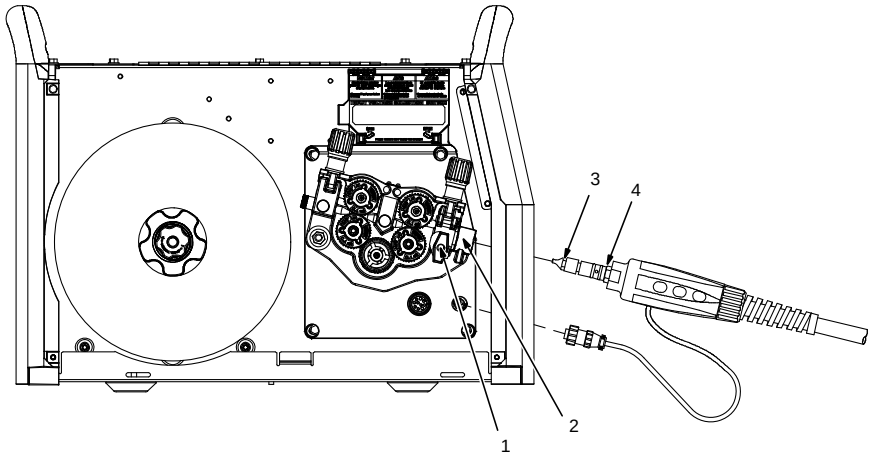
7 Installing Gun Without Accu-Mate Connection

When using a gun without the groove in the power pin, loosen power clamp knob and rotate gun locking tab 180 degrees. This prevents the locking tab from extending into the power pin gun connection.

Push power pin into power clamp as far as possible.

Secure gun by tightening power clamp knob.

5-16. MIG Gun Connection Inside Unit



1 Gun Securing Knob

2 Gun Block

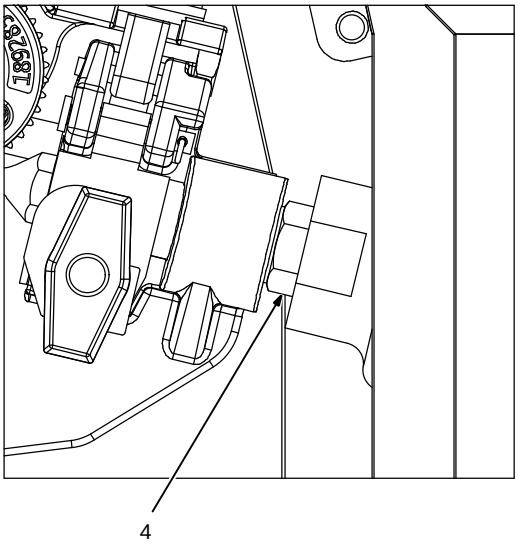
3 Gun Outlet Wire Guide

4 Gun End

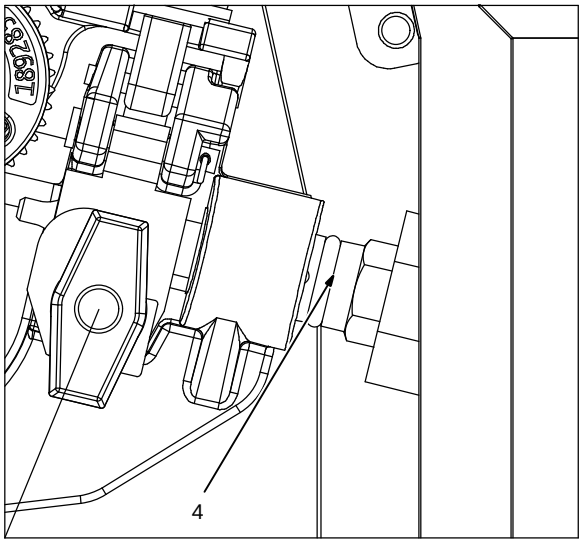
Loosen knob. Insert end of gun through opening in front panel until gun end bottoms against gun block. Tighten knob.

☞ *Be sure that gun end is tight against drive assembly.*

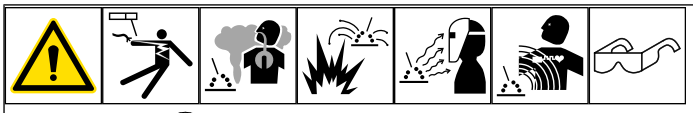
Correct

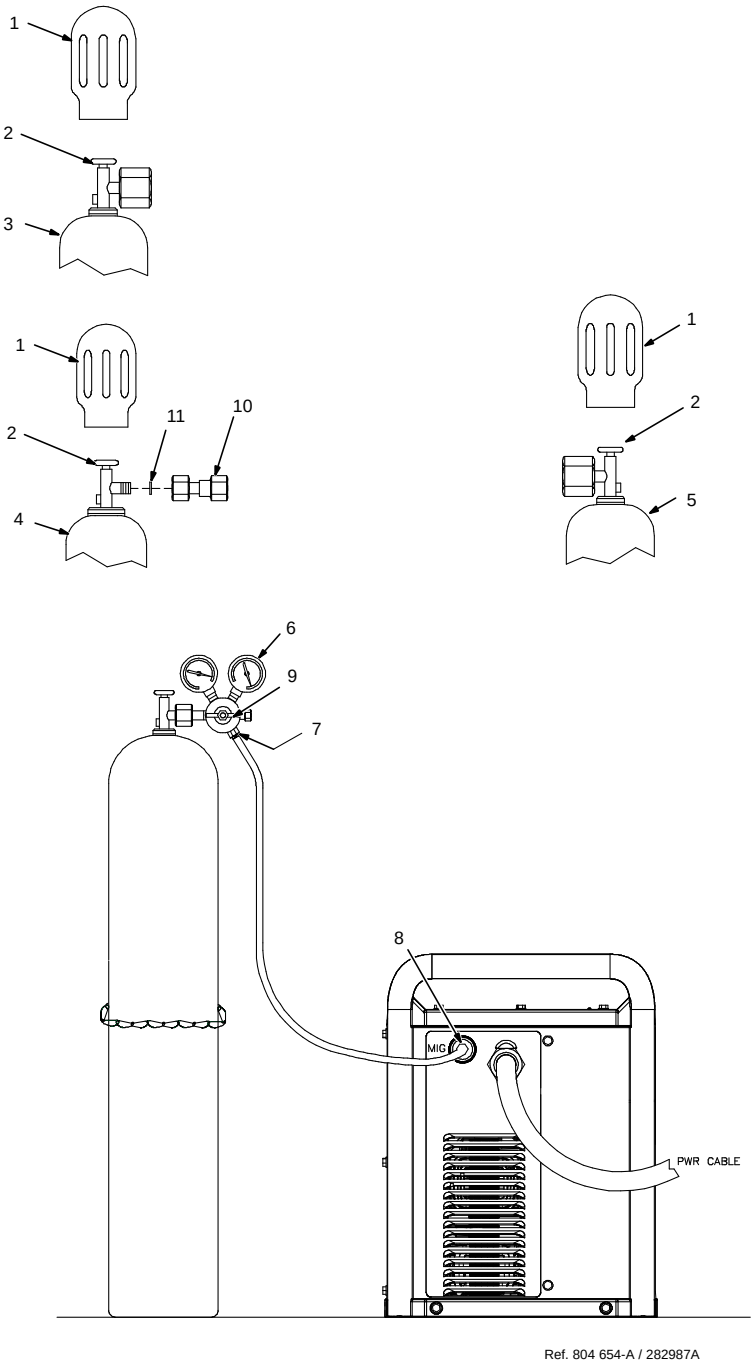


Incorrect



5-17. Connecting Shielding Gas Supply





Ref. 804 654-A / 282987A

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 Mixed Gas Cylinder
4 CO_2 Gas Cylinder
5 Argon Gas Cylinder
6 Regulator/Flowmeter

Install so face is vertical.

7 Regulator/Flowmeter Gas Hose Connection
8 Welding Power Source CO_2 And Mixed Gas Hose Connection

Connect gas hose between regulator/flowmeter gas hose connection, and the appropriate fitting for the gas type on rear of welding power source.

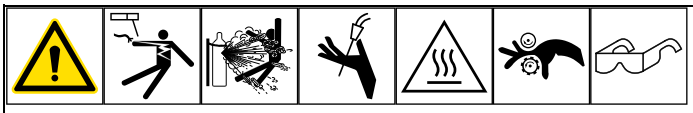
9 Flow Adjust

Obtain gas cylinder and chain to running gear, wall, or other stationary support so cylinder cannot fall and break off valve. Typical flow rate for CO_2. shielding gas and MIG (GMAW) welding is 15 to 30 CFH (cubic feet per hour) and mixed gas is 25 to 45 CFH.

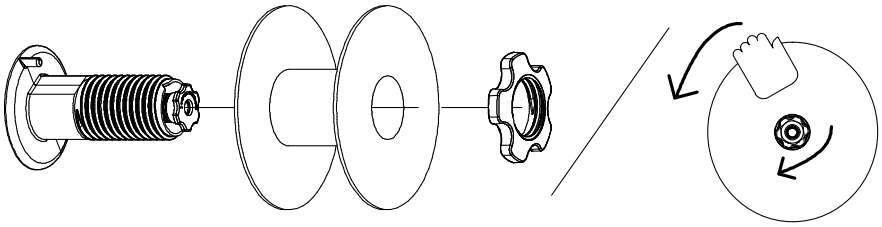
10 CO_2 Adapter (Customer Supplied)
11 O-Ring (Customer Supplied)

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

5-18. Installing Wire Spool And Adjusting Hub Tension

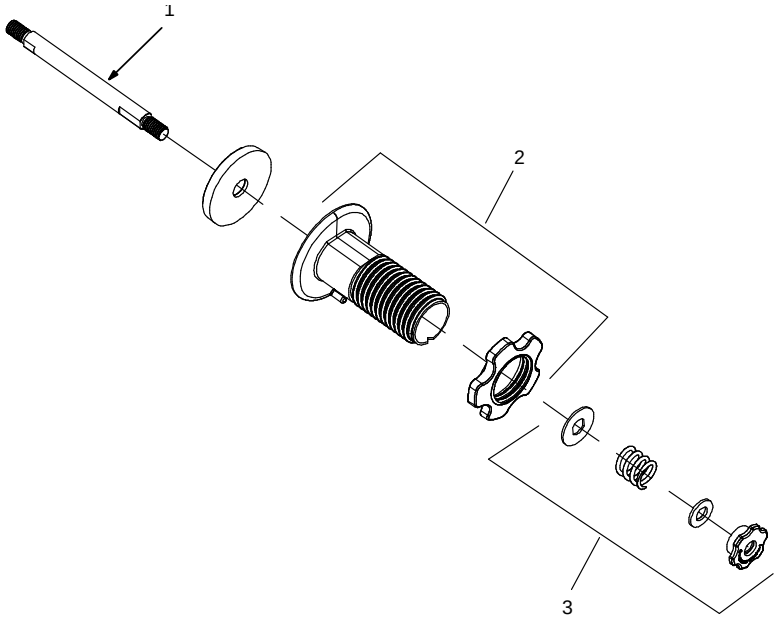


Installing 8 in. (203 mm) or 12 in. (304 mm) Wire Spool



Hand tighten knob clockwise. When a slight force is needed to turn spool, tension is set

Removing 8 in. (203 mm) or 12 in. (304 mm) Spool Hub And Spool Nut



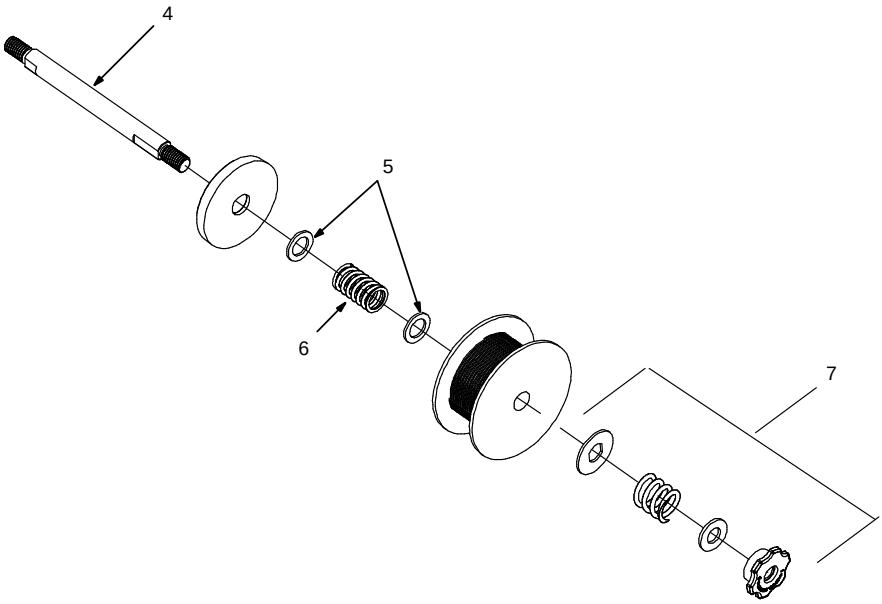
1 Spindle

2 Spool Hub And Nut—For 8 in. (203 mm) or 12 in. (304 mm) Spool Only

3 Spindle Hardware

Remove spindle hardware and retain. Remove spool hub and spool nut and retain for future use.

Installing 4 in. (102 mm) Wire Spool



4 Spindle

5 Washer, Flat

Order two additional flat washers (Part No. 605941).

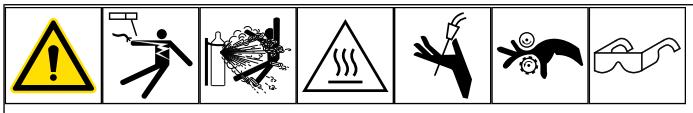
6 Spring, Compression

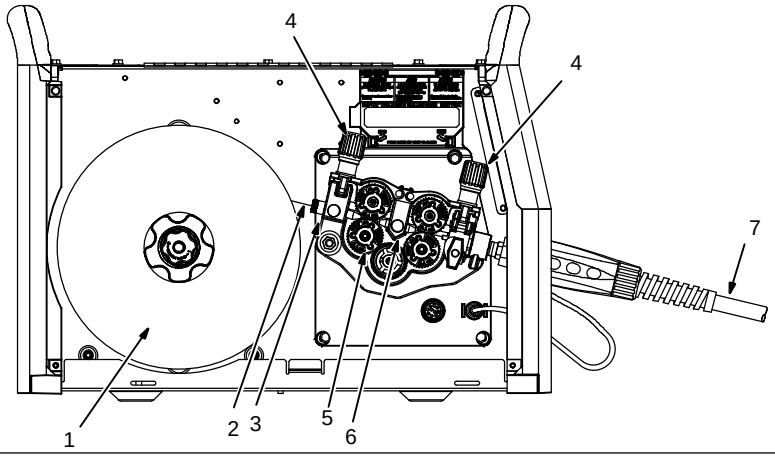
Order one additional spring (Part No. 186437).

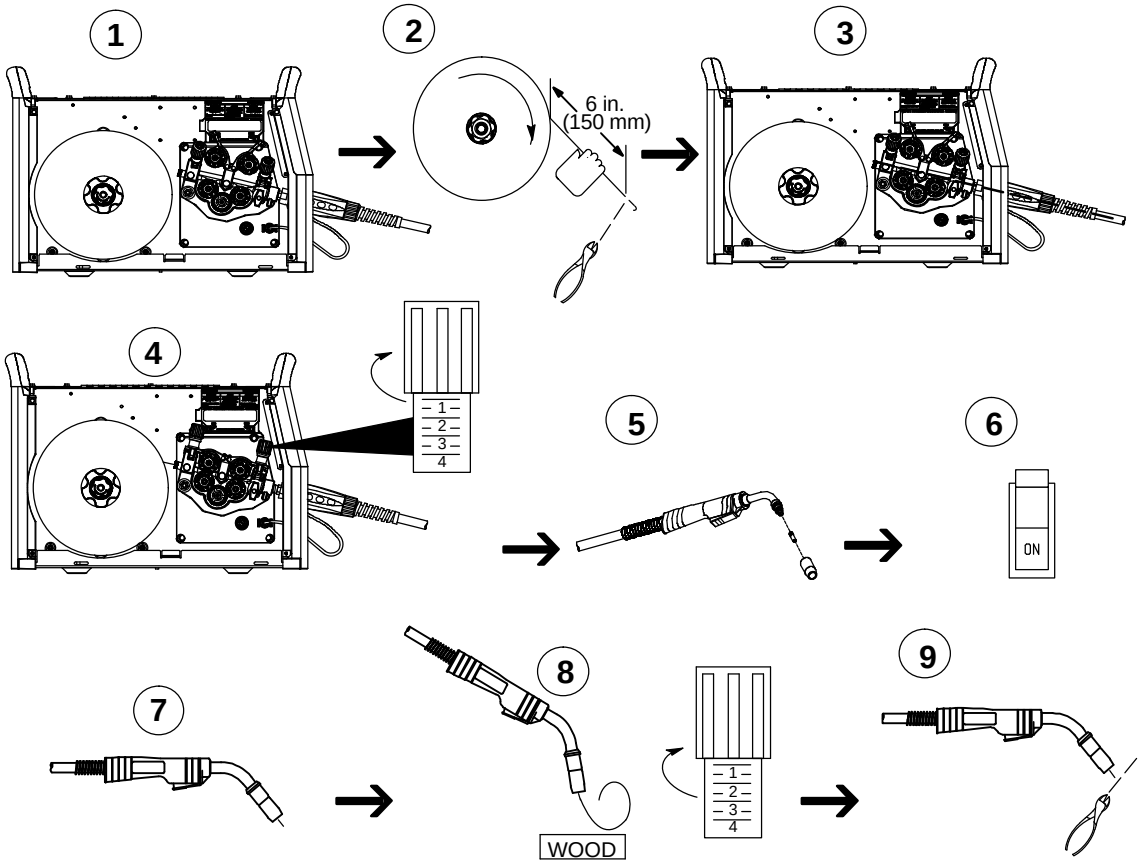
7 Spindle Hardware

Install Spindle hardware on spindle in exact order as shown and tighten slightly.

5-19. Threading Welding Wire







1 Wire Spool
2 Welding Wire
3 Inlet Wire Guide
4 Pressure Adjustment Knob
5 Drive Roll (4)
6 Intermediate Wire Guide
7 Gun Conduit Cable

Lay gun cable out straight.

Step 1. Open pressure assembly.
Step 2. Pull and hold wire; cut off end.

☞ *Hold wire tightly to keep it from unraveling.*

Step 3. Push wire through guides into gun; continue to hold wire.

Step 4. Close and tighten front and rear pressure assemblies, and let go of wire.

☞ *Use pressure indicator scale to set a desired drive roll pressure. Begin with a setting of 2. If necessary, make additional adjustments after trying this initial setting.*

Step 5. Remove gun nozzle and contact tip.

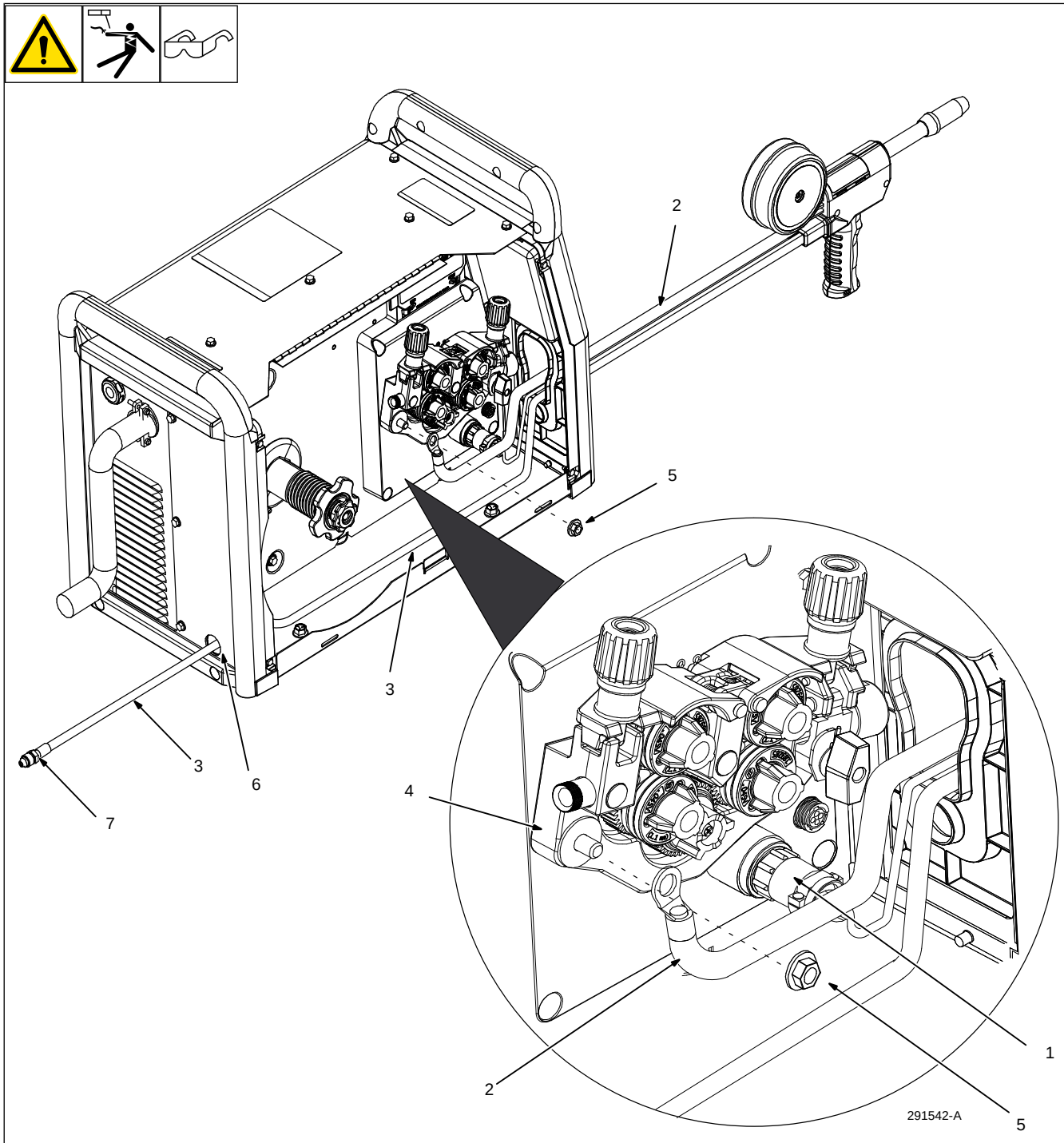
Step 6. Turn On.

Step 7. Press gun trigger until wire comes out of gun. Reinstall contact tip and nozzle.

Step 8. Feed wire to check drive roll pressure.

Step 9. Cut off wire. Close and latch door.

5-20. Connecting Spoolmatic® 15A Or 30A Or Spoolmate 200 Gun



5/8 in

1 Gun Trigger Plug

2 Weld Cable

3 Shielding Gas Hose

Route gun trigger plug, weld cable and gas hose through opening in panel.

Insert plug into receptacle, and tighten threaded collar.

4 Drive Casting

5 .375–16 Nut (167788)

Remove the nut from the drive casting. Use nut to connect spoolgun weld cable to drive casting.

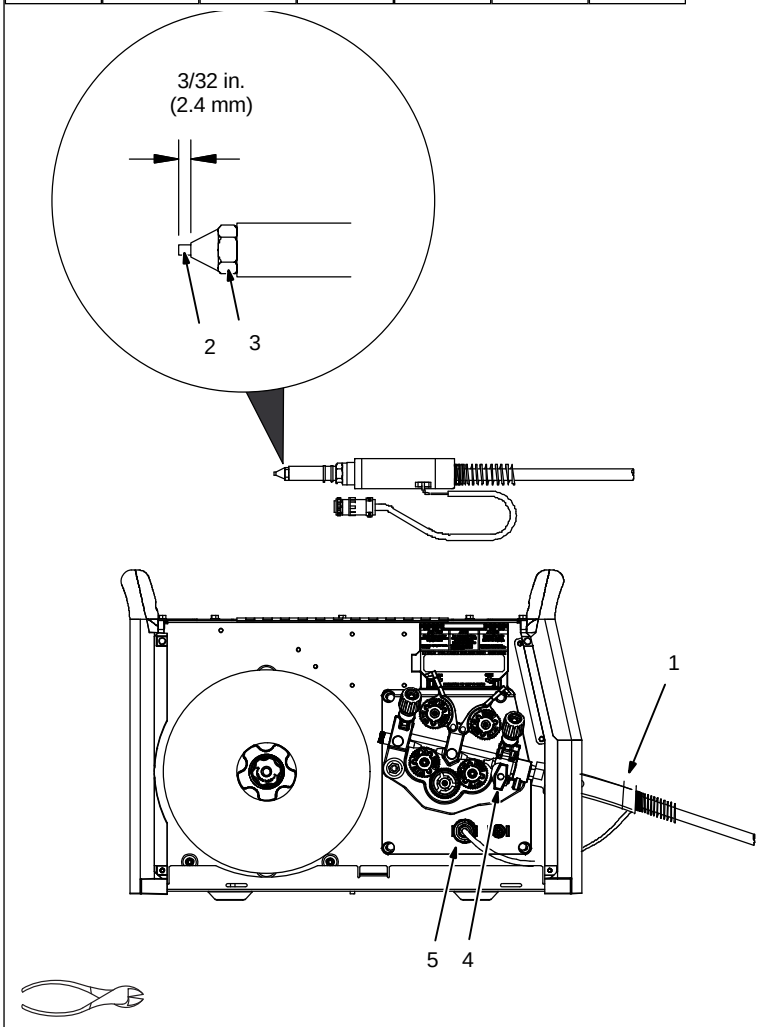
6 Gas Hose Routing Hole

To route gas hose through rear panel, drill 1 in. hole through bottom of rear plastic bezel. Align drill with pilot dimple in plastic bezel visible from inside wire drive compartment.

7 Gas Hose Fitting

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

5-21. Connecting Push/Pull Gun



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

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.

4 Gun Securing Knob

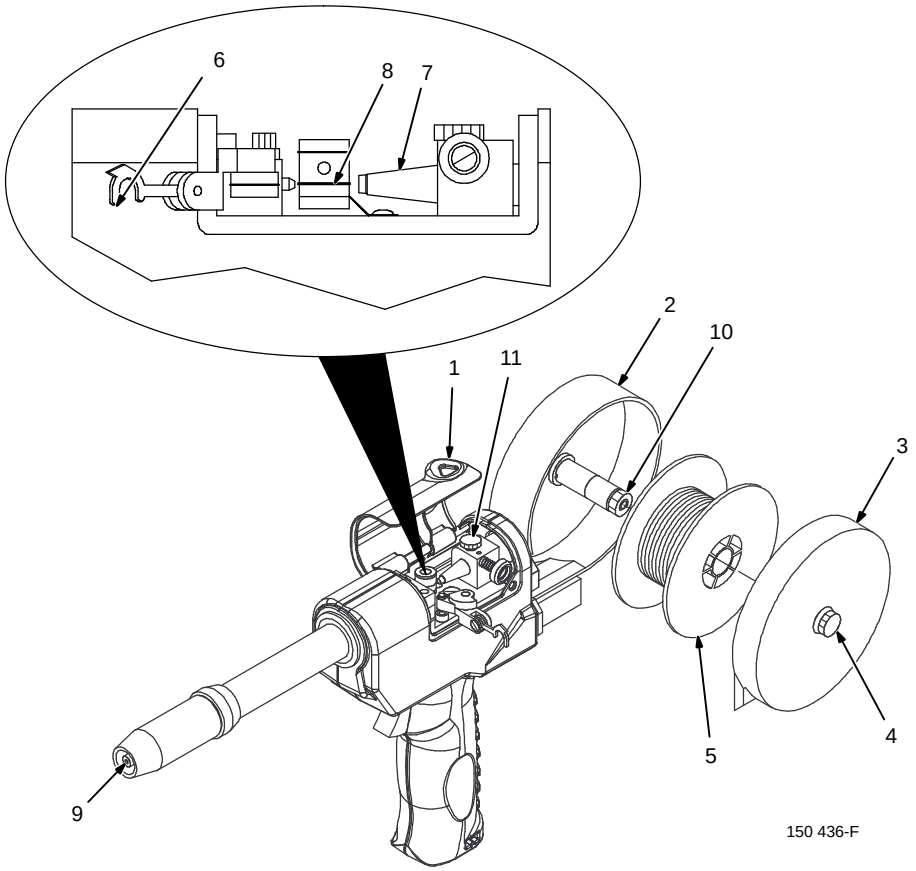
Loosen securing knob. Insert gun end through opening until it bottoms against drive assembly (make sure gun end does not touch drive rolls). Tighten knob.

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

5 10 Pin Gun Trigger Plug

Insert plug into receptacle, and tighten threaded collar.

5-22. Threading Welding Wire For Spoolmatic 15/30A



1 Cover

2 Canister

3 Canister Cover

4 Thumbscrew (Canister Cover)

Loosen thumbscrew, and remove cover.

5 Wire Spool

Loosen wire from spool, cut off bent wire, and pull 6 in (150 mm) of wire off spool.

6 Pressure Roll Assembly

Lift arm and open pressure roll assembly.

7 Canister Inlet Guide

8 Drive Roll Groove

For wire sizes .035 in. (0.9 mm) and smaller use small groove, and .047 in. (1.2 mm) and 1/16 in (1.6 mm) use large groove.

9 Contact Tip

Thread wire through canister inlet guide, along drive roll groove, and out contact tip.

Install spool so wire feeds off bottom.

10 Spool Brake Thumbnut

If necessary, turn thumbnut counterclockwise slightly to install spool.

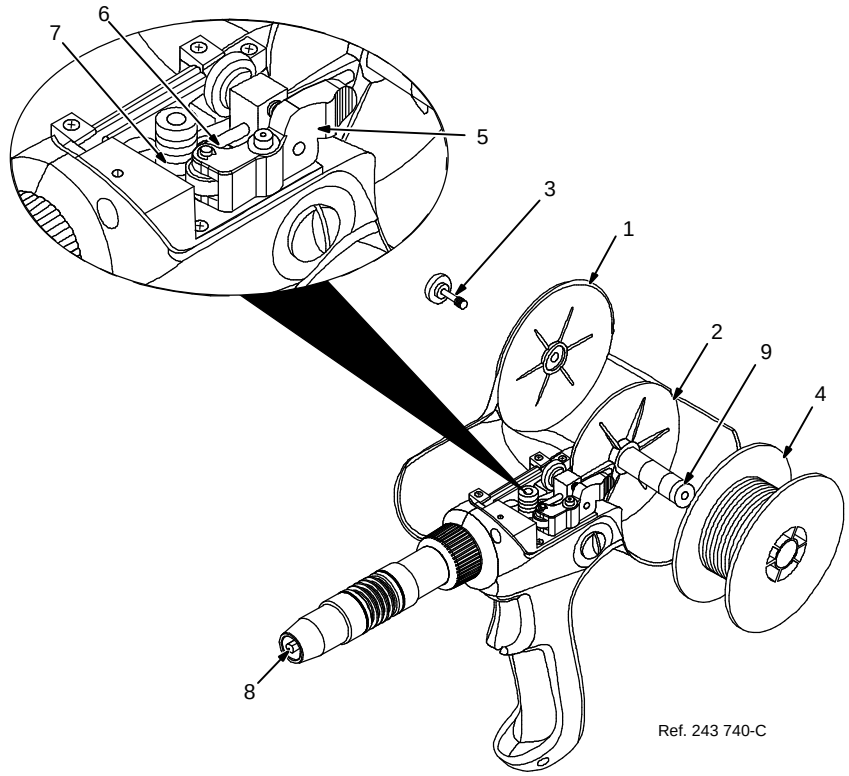
11 Thumbscrew (Canister Rotation)

Loosen thumbscrew to rotate canister.

Close and secure pressure roll assembly

Reinstall top cover and canister cover.

5-23. Threading Welding Wire For Spoolmate 200



Ref. 243 740-C

1 Cover

2 Canister

3 Thumbscrew (Cover)

Loosen thumbscrew, and rotate cover open.

4 Wire Spool

Loosen wire from spool, cut off bent wire, and pull 6 in (150 mm) of wire off spool.

5 Pressure Roll Assembly

Press arm inward to open pressure roll assembly.

6 Wire Inlet Guide

7 Drive Roll Groove

8 Contact Tip

Thread wire through wire inlet guide, along drive roll groove, and out contact tip.

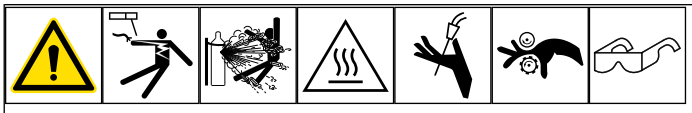
Install spool so wire feeds off top.

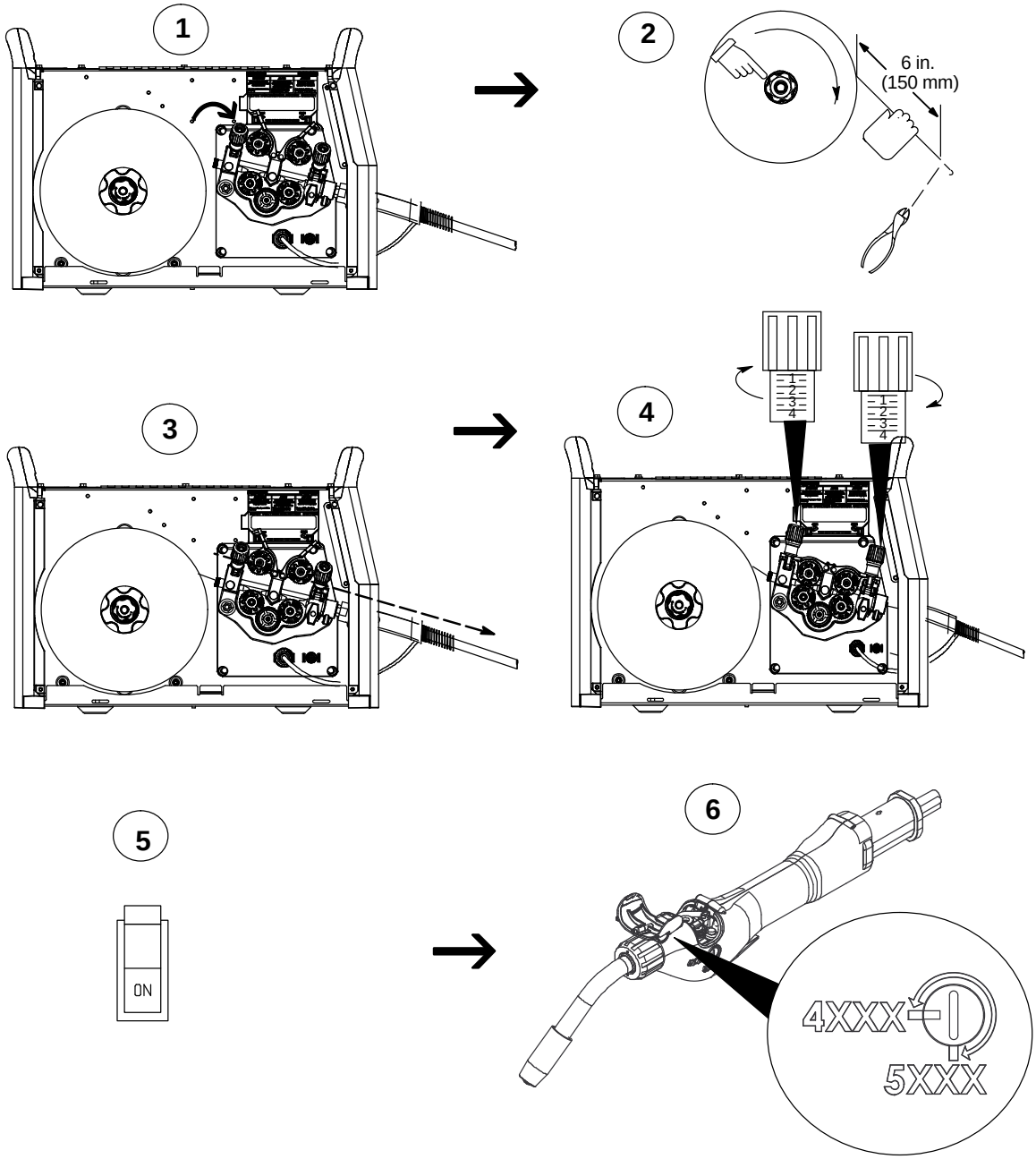
9 Spool Brake Thumbnut

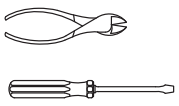
If necessary, turn thumbnut counterclockwise slightly to install spool.

Close cover and secure with thumbscrew.

5-24. Threading Welding Wire For Push/Pull Gun







Step 1. Open pressure assembly.

Step 2. Pull and hold wire; cut off end.

☞ *Hold wire tightly to keep it from unraveling.*

Step 3. Push wire through guides into gun; continue to hold wire.

Step 4. Close front pressure assembly. Tighten front knob enough to prevent slipping. Then close rear pressure assembly and adjust to 1/2 turn less than front assembly. Let go of wire.

☞ *Use pressure indicator scale to set a desired drive roll pressure. Begin with a setting of 2. If necessary, make additional adjustments after trying this initial setting.*

Step 5. Turn on power switch.

Step 6. Open top cover and open pressure roll assembly.

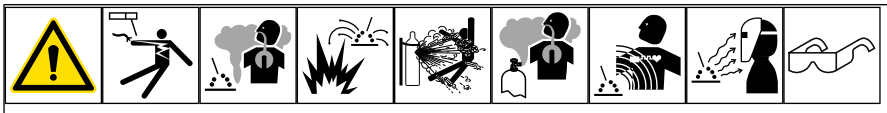
Remove nozzle and contact tip.

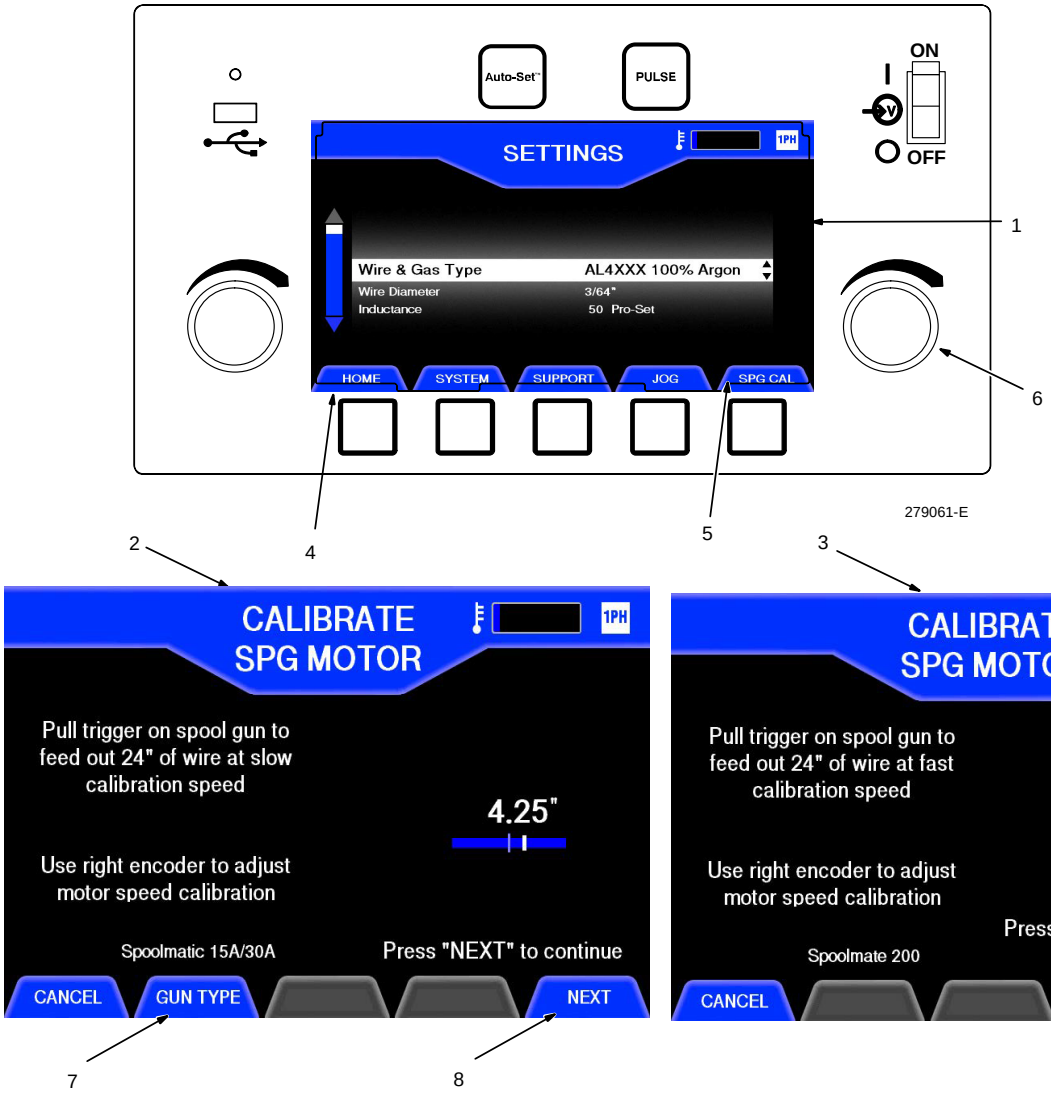
Press gun trigger until about 4 in. (102 mm) of wire is sticking out front of gun. Install nozzle and contact tip.

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.

☞ *XR-Aluma-Pro and XR-Aluma-Pro Lite gun drive roll pressure should be set to match the alloy being used.*

5-25. Calibrating Spoolgun





☞ *Spoolmatic 15/30A and Spoolmate 200 motors are unique to this welding power source. Motor calibration is necessary any time a different Spoolmatic 15/30A or Spoolmate 200 is connected to the Millermatic 355.*

1 Settings Menu

2 Slow Speed Calibration Menu

3 Fast Speed Calibration Menu

4 Home

5 Spg Cal (Spoolgun Cal)

6 Right Knob

7 Gun Type

8 Next

9 Save

Connect spoolgun to unit. Cut wire flush at nozzle

Follow instructions in Section 6-5 to enter the setup menu.

☞ *SPG CAL will only be displayed as the fifth tab when a spoolgun is connected.*

Press **SPG CAL** to access slow speed calibration menu.

Press **Gun Type** to select the spoolgun being used.

To begin the slow speed calibration, pull the spoolgun trigger. The wire will feed and automatically stop.

Cut wire flush at nozzle and measure runout. If wire length is not 24 in., use right knob to enter the amount that the wire was short/long.

Pull spoolgun trigger again to verify the adjustment. Repeat these steps until satisfied with accuracy.

Press **Next** to access fast speed calibration.

To begin the fast speed calibration, pull the spoolgun trigger. The wire will feed wire and automatically stop.

Cut wire flush at nozzle and measure runout. If wire length is not 24 in., use right knob to enter the amount that the wire was short/long.

Pull spoolgun trigger again to verify the adjustment. Repeat these steps until satisfied with accuracy.

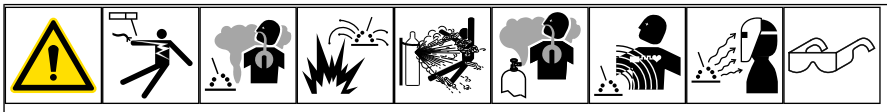
Press **Save** to complete the calibration procedure and be returned back to the settings menu.

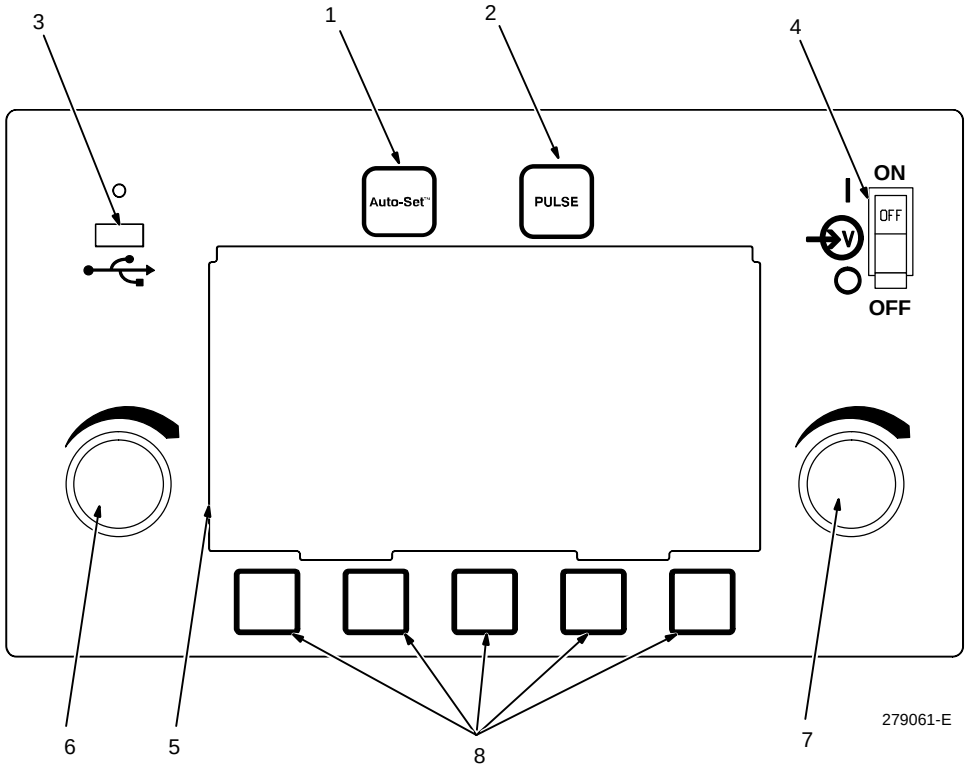
Press **Home** to return to weld mode.

Notes

SECTION 6 – OPERATION

6-1. Controls





1 Auto-Set Button

Press to turn Auto-Set On or Off.

2 Pulse Button

Press to turn Pulse On or Off in the MIG process.

3 USB Port

Use for software upgrade and collecting error codes.

The USB port can be used to charge cell phones and similar devices.

With the use of the optional Demo Cable kit (289696), the User Interface can be powered without the need to connect to wall power.

4 Power Switch

Use switch to turn unit On or Off.

5 Color LCD Display

6 Left Knob

Use left knob to adjust voltage in MIG mode, Arc length in Pulsed MIG mode, or change parameter values in Set-up mode.

7 Right Knob

Use right knob to adjust wire feed speed or change parameter values in Set-up mode.

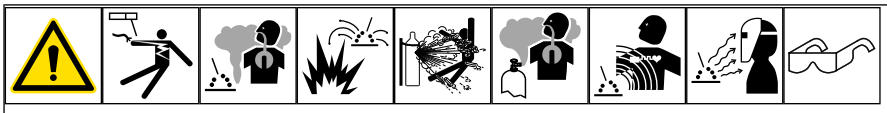
8 Soft Keys

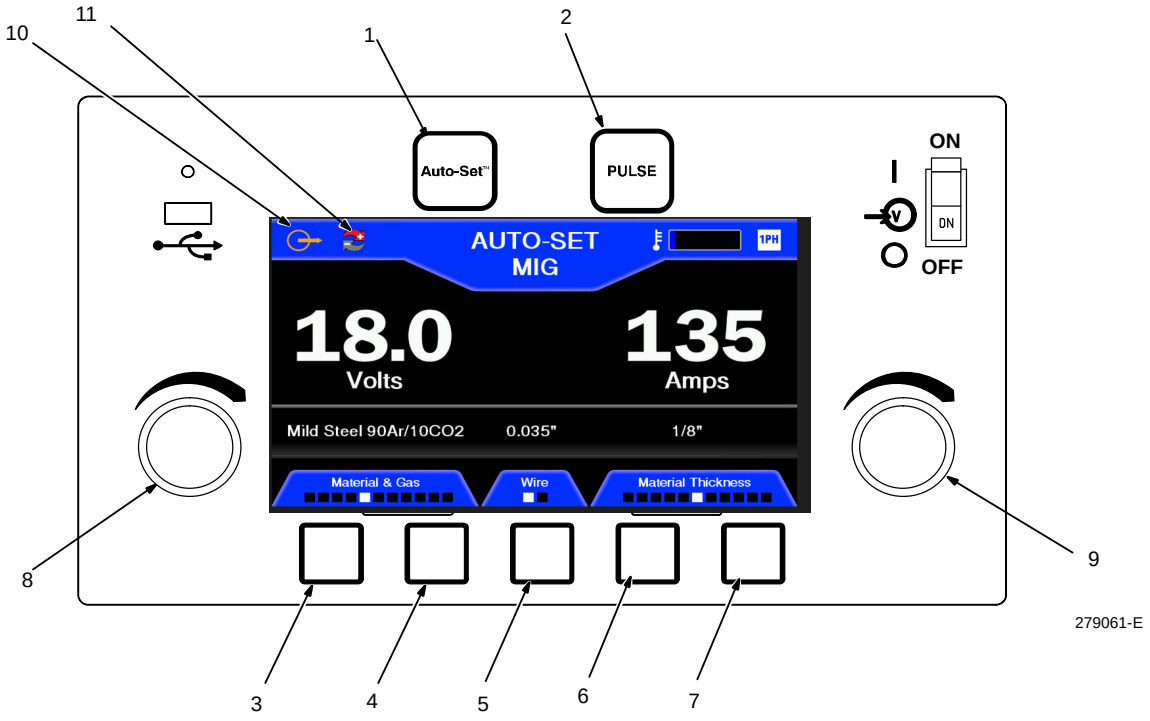
Multiple functions depending on which screen is being displayed.

6-2. Special Features

MIG Mode	In MIG mode, the left knob is used to adjust welding voltage within a range of 12 to 32 volts in low range (208–240 volts) single phase. The voltage range will be 12 to 34 volts in high range (460–575 volts) single phase. The voltage range will be 12–34 volts for all input voltages on three phase. The right knob is used to adjust wire feed speed within a range of 50 to 800 IPM.
Pulsed MIG Mode Voltage Adjustment	In Pulsed MIG mode there is no manual voltage adjustment; instead, voltage is synergically aligned with the proper wire feed speed. Arc Length adjustment is used to adjust actual arc length, which automatically adjusts the voltage. See P. chart in section 6-8 for proper wire feed speed adjustment according to wire size and type.
Jog Mode	If gun trigger is pressed and held for more than 3 seconds without striking an arc, unit will automatically shut off weld power, shielding gas and ramp wire feed speed to Jog speed. Trigger error will be displayed after preset length of wire is fed, dependent on MIG gun selected.
Weld Status	When trigger is released on a MIG gun, spool gun, or push-pull gun, the last actual amperage and voltage are shown on the display for 5 seconds. If a programmed value requires adjustment after the arc is extinguished and during the 5-second display of actual values, turning either knob will cause actual values in the displays to be replaced by programmed values for adjustment purposes.
MIG Gun-On-Demand	MIG guns, spool guns, and push-pull guns can be used with this unit. To switch from one gun to another, momentarily press the trigger on the desired unused gun to make it the active gun. Once the trigger is pressed, the unit will recall stored data and the display will show the last programmed values for that particular gun. If the unit is powered down and back on again, the gun last used will become the current active gun.
Output Foldback	When operating the Millermatic 355 on single phase 208 or 240 power, the output for the machine is limited to 350 amps. This limited output could cause the machine to foldback to 350 amps when welding at higher settings or thicker materials. When the foldback occurs, the weld parameters will turn RED indicating that the machine has folded back to 350 amps. Reducing the weld settings or changing the input power to single phase 460/575 volts or any three phase input power will correct the issue.

6-3. Using Auto-Set™ Elite





1 Auto-Set Button

Press to turn Auto-Set On or Off.

2 Pulse Button

Press to turn Pulse On or Off..

3 Material/Gas Left Button

4 Material/Gas Right Button

Press to select material and gas. Left button moves cursor to the left, right button moves cursor to the right.

5 Diameter Button

Selects the size of the wire.

6 Material Thickness Left Button

7 Material Thickness Right Button

Use to select material thickness. Left button moves cursor to the left, right button moves cursor to the right.

8 Left Knob

Use left knob to fine tune voltage in MIG mode or arc length in Pulsed MIG mode

9 Right Knob

Use right knob to fine tune wire feed speed.

☞ *When using a spoolgun or push-pull gun in Auto-Set, either the potentiometer on the gun or the right knob on the front panel can be used to control wire feed speed.*

10 Welding Output Icon

When visible, indicates weld output is on.

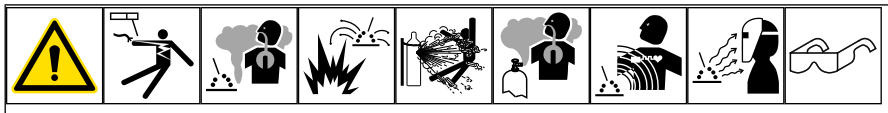
11 Improper Weld Polarity Icon

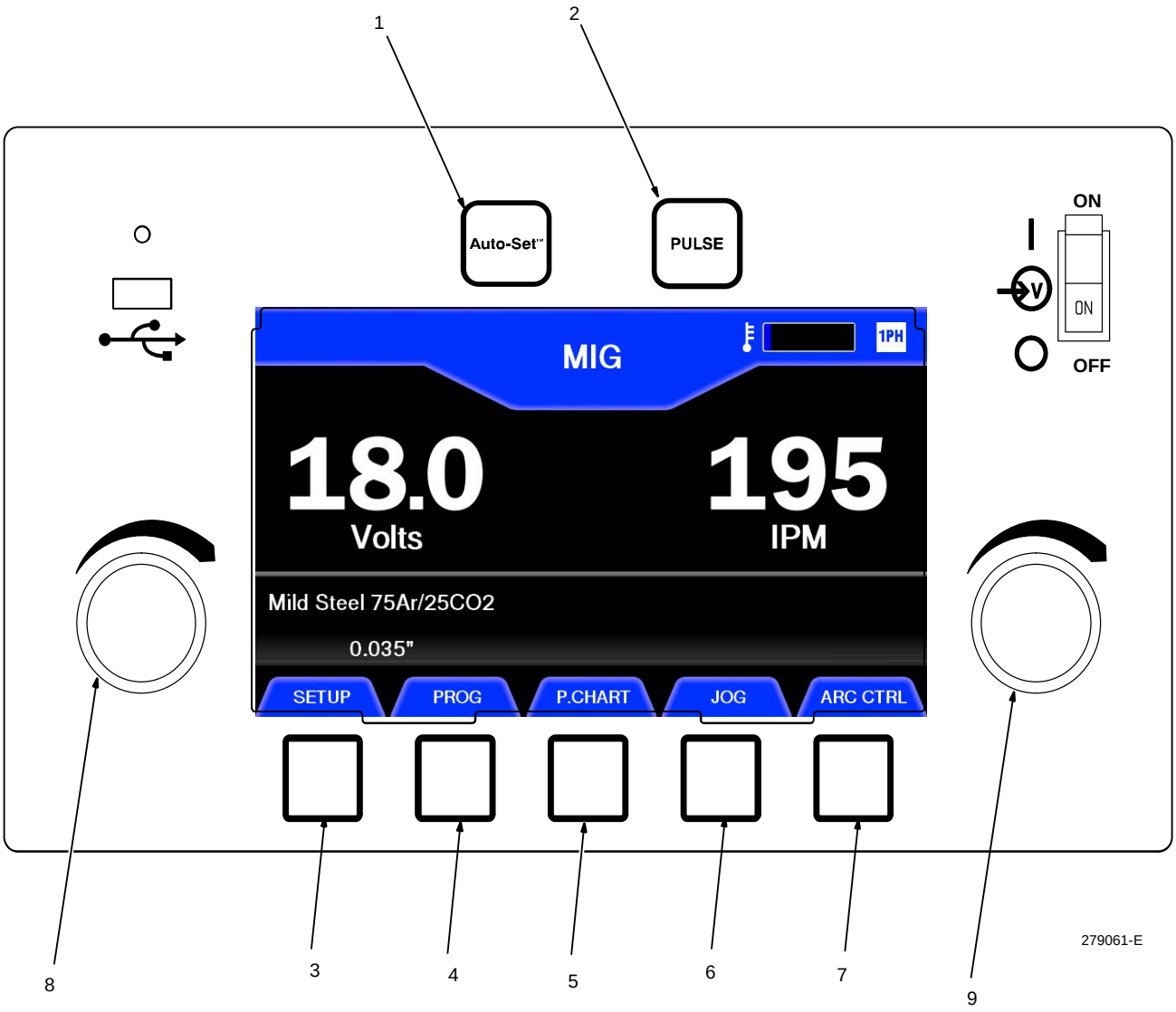
When visible, indicates electrode and work cables need to be switched.

12 Bullseye Indicator

Represents factory default settings.

6-4. Using Manual Mode





1 Auto-Set Button

Press to turn Auto-Set On or Off.

2 Pulse Button

Press to turn Pulse On or Off..

3 Set-Up Button

Press Setup to optimize arc performance or to add timers to weld sequence.

4 Program Button

Press Program to save favorite weld programs, up to four programs per weld process. See Section 6-7.

5 P. Chart Button

Press to access electronic parameter chart. See section 6-8.

6 Jog Button

Feed wire without turning on weld output and energizing gas solenoid.

7 Arc Control Button

Reference Inductance Control in Section 6-5 when using Manual MIG mode. Reference Arc Control in Section 6-10 when using Pulse MIG Manual mode.

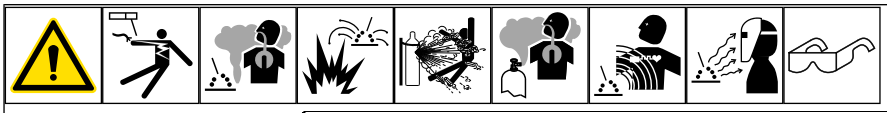
8 Left Knob

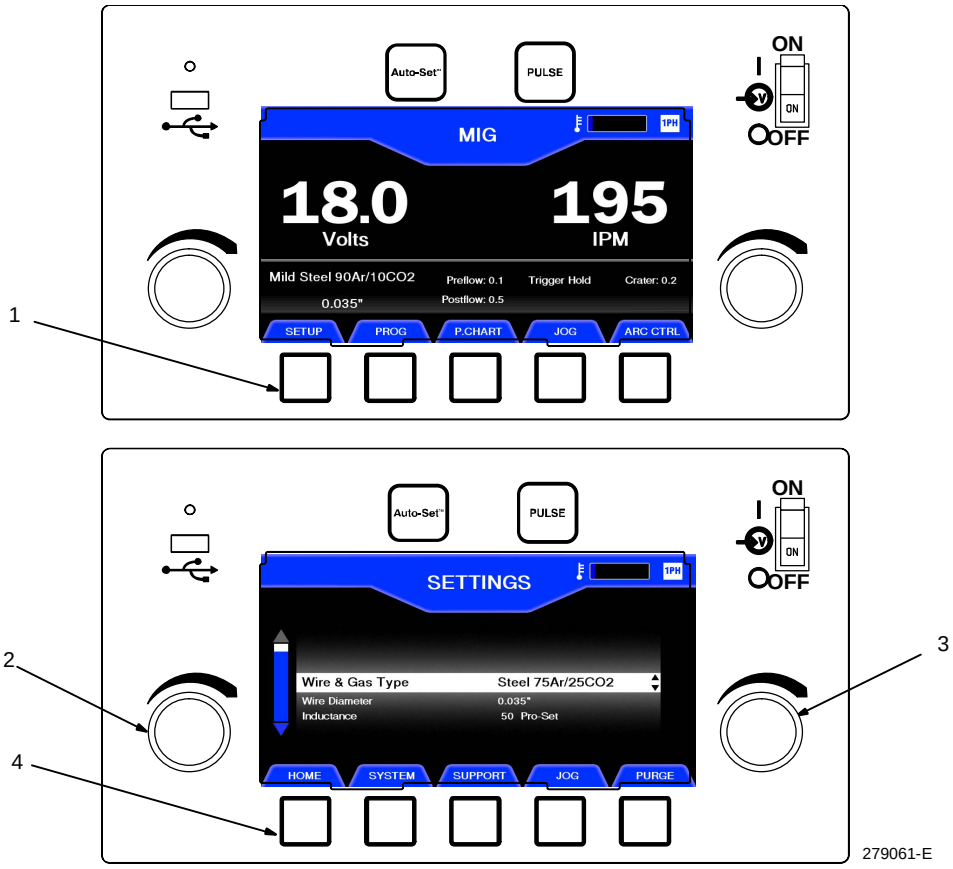
Use left knob to adjust voltage in MIG mode or arc length in Pulsed MIG mode.

9 Right Knob

Use right knob to adjust wire feed speed

6-5. Manual MIG Set-Up Mode





1 Setup Button

2 Left Knob

3 Right Knob

4 Home Button

To enter the Setup menu from the Manual Mode home screen, press Setup.

Once in the Setup menu, rotate the left knob to find a particular item, and rotate the right knob to change setting or status.

Occasionally, you will see the text **Pro-Set**. Pro-Set highlights in blue, the recommended factory setting for easy set-up and recall.

Press Home to save settings and return to welding mode.

Items that can be adjusted from this menu are:

Wire and Gas Type: Optimize arc starts and weld performance by selecting the wire type and gas being used.

Wire Diameter: Optimize arc starts and weld performance by selecting the wire diameter that matches the wire being used.

Inductance: Changes the fluidity of the weld puddle. Increasing inductance produces a flatter bead or more fluid puddle. Decreasing inductance produces a higher crown and stiffer arc. Inductance settings range from 0 to 99. Inductance can also be adjusted from the home screen. The Pro-Set default is 50.

Preflow: The amount of time that the shielding gas will flow after the trigger is depressed and before the welding arc can start. Preflow settings range from Disabled to 5 seconds.

Postflow: The amount of time that the shielding gas will flow after the arc has been shut off. Postflow settings range from Disabled to 5 seconds.

Run-In: The speed of the wire prior to the welding arc being struck. Auto is the default setting. The other options are Disabled or Manual. Manual settings range from 5 to 150% of the welding wire feed speed.

FasTack: Enabling FasTack reduces arc start time by automatically increasing the run-in speed when doing repetitive arc starts. FasTack automatically uses a slower wire feed speed when the wire is cool and a faster wire feed speed when the wire is hot. Default setting is Disabled.

Start Mode: Operators can select either from Auto or Manual. **"Auto"** uses factory default parameters. **"Manual"** mode allows the operator the ability to adjust **Start Time, Ramp Down Time** and **Arc Length** to customize their arc.

Crater: The amount of time the welding arc stays on after the welding gun trigger is released. This feature is used to fill the void or crater at the end of the weld. Crater settings range from 0.1 to 5 seconds

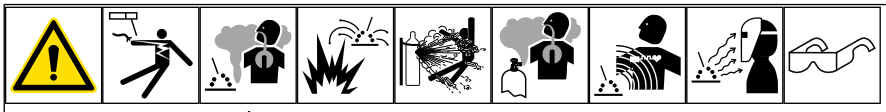
Trigger Hold: The HOLD time is the minimum amount of time the trigger must be held for the trigger hold to become active. The maximum trigger hold time is always 4.0 seconds after the Trigger Hold Delay. For example, if the trigger hold is set to 2.0 seconds, the trigger hold window is from 2.0 to 6.0 seconds.

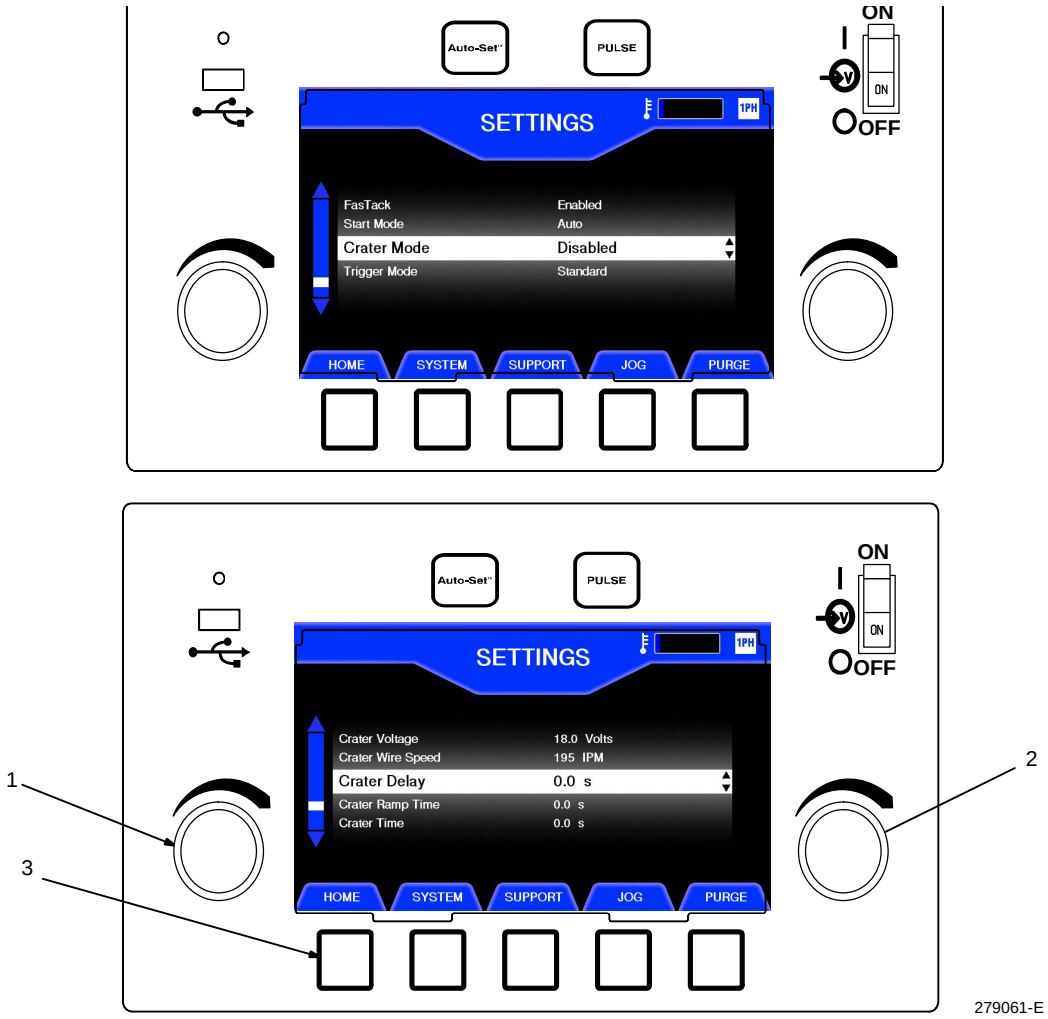
Spot Timer: To enable the Spot Timer ensure Trigger Hold feature is disabled. The amount of time that the arc can be active before it shuts off automatically. Spot timer setting range is from Disabled to 120 seconds. Spot timer is reset upon release of welding gun trigger.

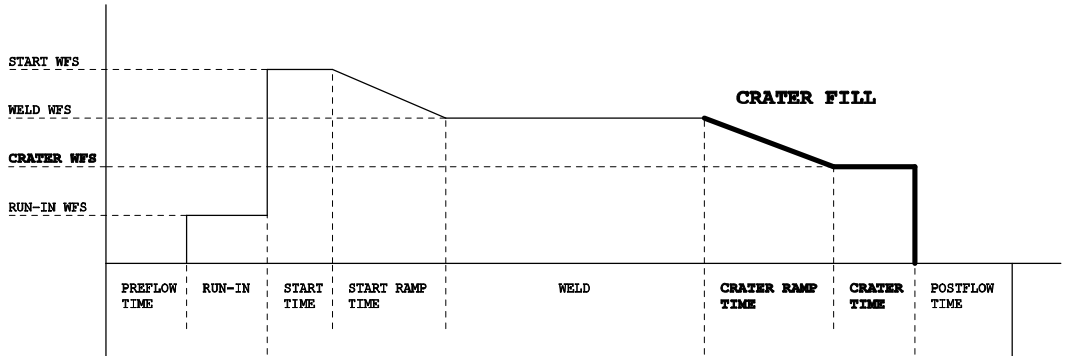
Stitch Timer: Used in conjunction with the spot timer and while the trigger is continuously depressed. Controls the amount of time that the arc will be inactive after the spot timer times out. Stitch time setting range is from 1 to 120 seconds.

Set Up Push Motor Torque (SUP): This feature is only displayed when an AlumaPro Lite gun is connected to the welding power source. The SUP setting adjusts the over torque limit of the push motor inside the welding power source. The range is 0 to 250, and the default value is 130. The AlumaPro Lite SUP value can be found on the back end of the gun. Set the SUP value on the machine to match the value on the gun.

6-6. Setting Crater Time







1 Left Knob

2 Right Knob

3 Home Button

The crater setting is the amount of time the welding arc stays on after the welding gun trigger is released. This feature is used to fill the void or "crater" at the end of the weld.

In the Setup menu, rotate the left knob to highlight **Crater**, and rotate the right knob to select **Manual**.

The following Crater variables can be adjusted:

Crater Time: Time range is 0.1 to 5 seconds.

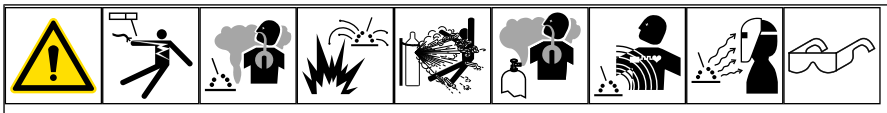
Crater Voltage (MIG settings) or **Arc Length** (Pulse settings): Voltage range is 10 to 32 volts. Arc length range is 0 to 99.

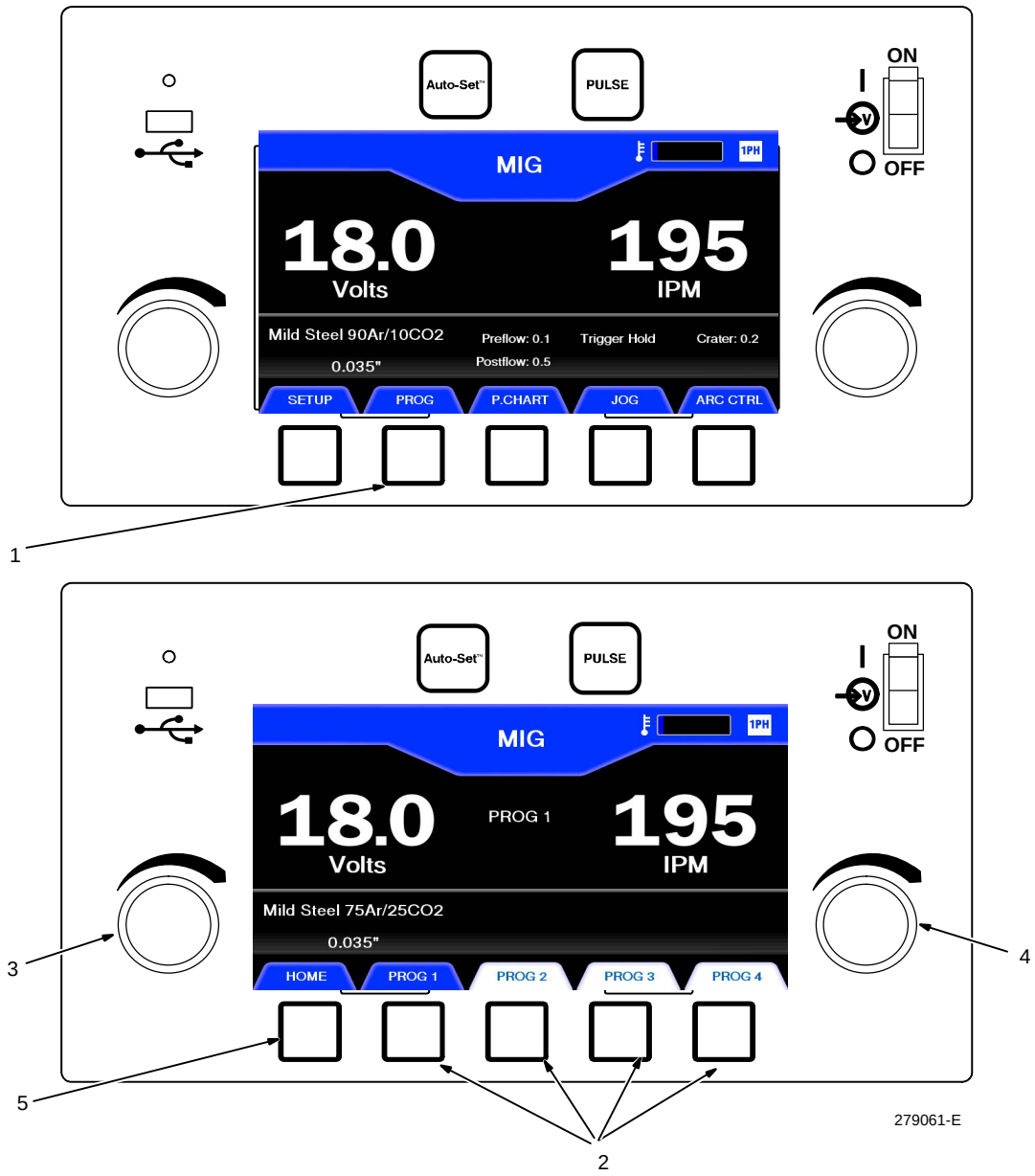
Crater Wire Feed Speed: Wire feed speed range is 50 to 800 ipm.

Crater Delay: This setting is for spot or stitch welding without crater fill if the arc time is less than the set time. Time range is 0 to 5 seconds. (If crater delay is set for 2 seconds, weld operation will not go into crater if gun trigger is released before 2 seconds).

Crater Ramp Time: Time range is from 0.1 to 5 seconds.

6-7. Manual Program Mode





1 Program Button

2 Program Soft Keys

3 Left Knob

4 Right Knob

5 Home Button

The unit can store four programs. The programs have default setting saved when the machines come from the factory.

Saving Programs In Manual Mode

To enter the Program menu from the Manual Mode home screen, press the Program button.

White Program tabs will appear above four of the soft keys.

Determine where you would like to save the settings. Push and hold that Program soft key for two seconds. The display will show "Saved" when the program has been successfully saved.

Saving Programs From Auto-Set Mode

Program mode cannot be accessed from Auto-Set mode. To save settings, note the weld parameters and return to Manual mode to access Program mode.

Recalling Programs

Push the Program button to select desired program. The selected Program tab will turn blue and the proper setting will be displayed.

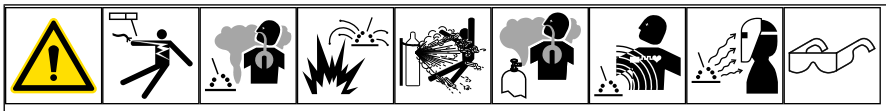
Weld parameters may be changed while using the program with the left and right knobs. If the settings are changed, the program tab will turn white and the lettering will turn black. To save the new settings, press and hold the Program button again for two seconds.

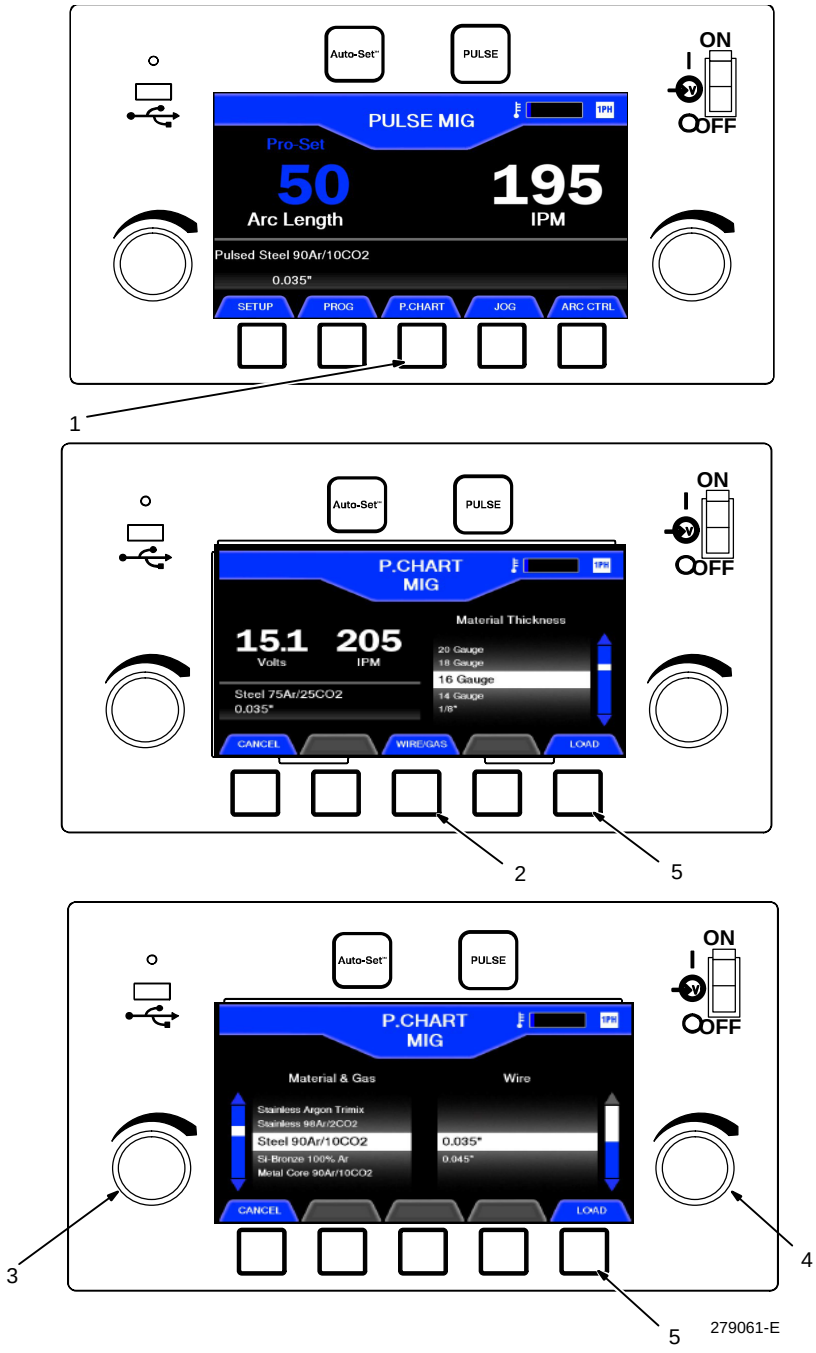
If you change the setting but do not wish to save it, press the Program button again to recall the original settings.

Exiting Program Mode

Press the Home button to exit Program mode and return to Manual mode.

6-8. P. Chart (Electronic Parameter Chart)





When using Manual Mode, refer to the electronic parameter chart on the front display for suggested starting parameters.

1 P. Chart Button

2 Wire/Gas Button

3 Left Knob

4 Right Knob

5 Load Button

To access the electronic parameter chart, press the middle P. Chart button.

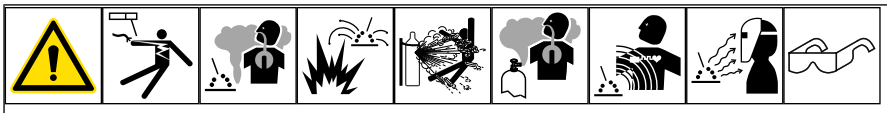
Press the middle Wire/Gas button to access to wire, gas type and wire diameter.

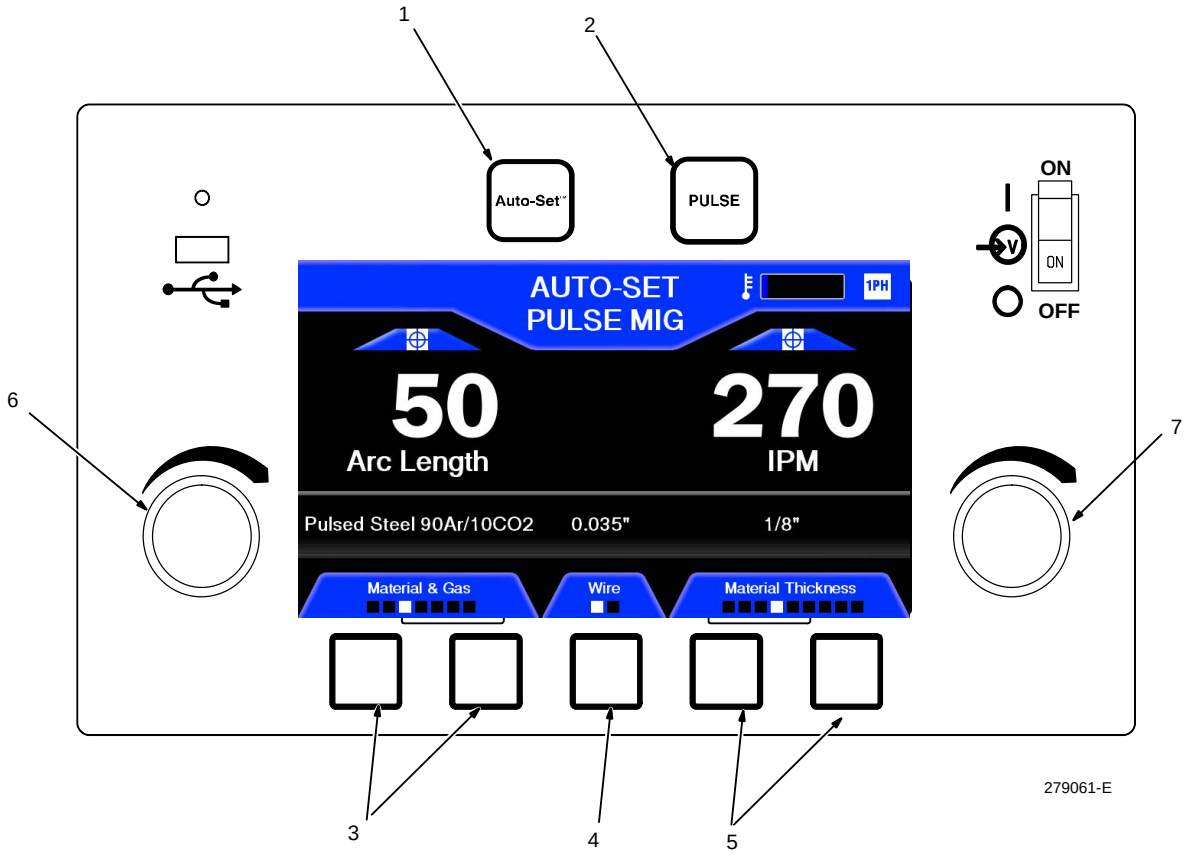
Rotate left knob to select wire and gas type being used.

Rotate right knob to select wire diameter and press the Load button.

Rotate right knob to select material thickness and press the Load button to save and start welding.

6-9. Pulsed MIG Auto-Set™ Mode





1 Auto-Set Button

2 Pulse Button

Press Auto-Set and Pulse buttons.

3 Wire and Gas Buttons

Use soft keys to select wire and gas for Pulsed MIG.

4 Wire Diameter

Use soft key to select wire diameter.

5 Material Thickness

Use soft keys to move cursor to left or right to select material thickness.

6 Left Knob

Use left knob to fine tune arc length. Arc length defaults to 50.

7 Right Knob

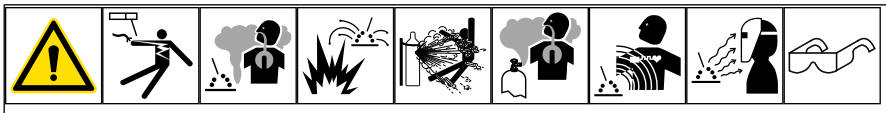
Use right knob to fine tune wire feed speed.

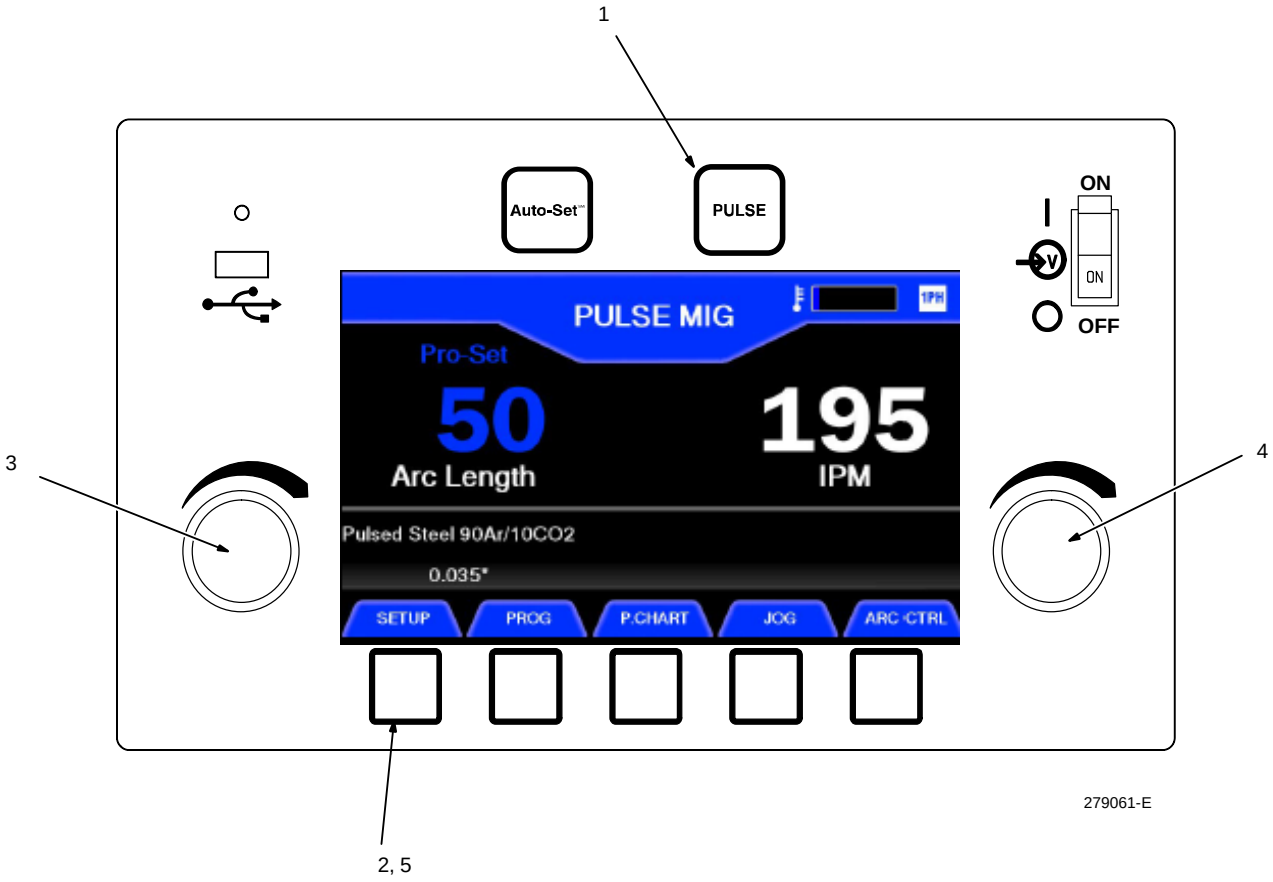
Arc Length

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

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.

6-10. Pulsed MIG Manual Mode





1 Pulse Button

2 Set-Up Button

3 Left Knob

4 Right Knob

5 Home Button

Press Pulse and Set Up buttons

In the Setup menu, rotate left knob to highlight material and gas. Rotate right knob to select material and gas being used.

Rotate left knob to highlight wire diameter. Rotate right knob to select wire diameter being used.

Press Home to return to welding mode.

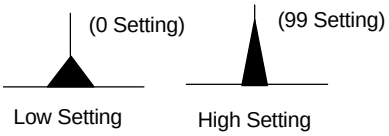
Operation

Adjust right knob for proper wire feed speed and adjust left knob to change arc length if required. Arc length will default to 50. Refer to electronic parameter chart (P. Chart) for proper Wire Speed setting for metal and metal thickness being welded. All Pulse MIG programs are set up with the gases listed in the Pulse MIG welding chart. If alternate gases are used, adjust arc length and/or arc control to adjust arc characteristics. Occasionally, you will see the text **Pro-Set.** Pro-Set highlights in blue, recommended factory settings for easy set-up and recall.

Arc Length

Arc length can be adjusted from 0-99. Adjusting the arc length will vary the length of the welding arc cone. Pro Set default is 50

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.

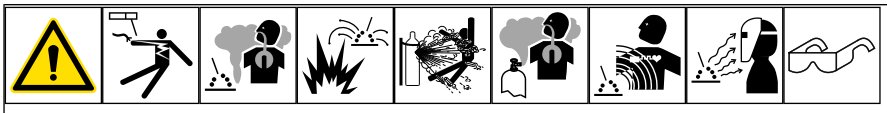


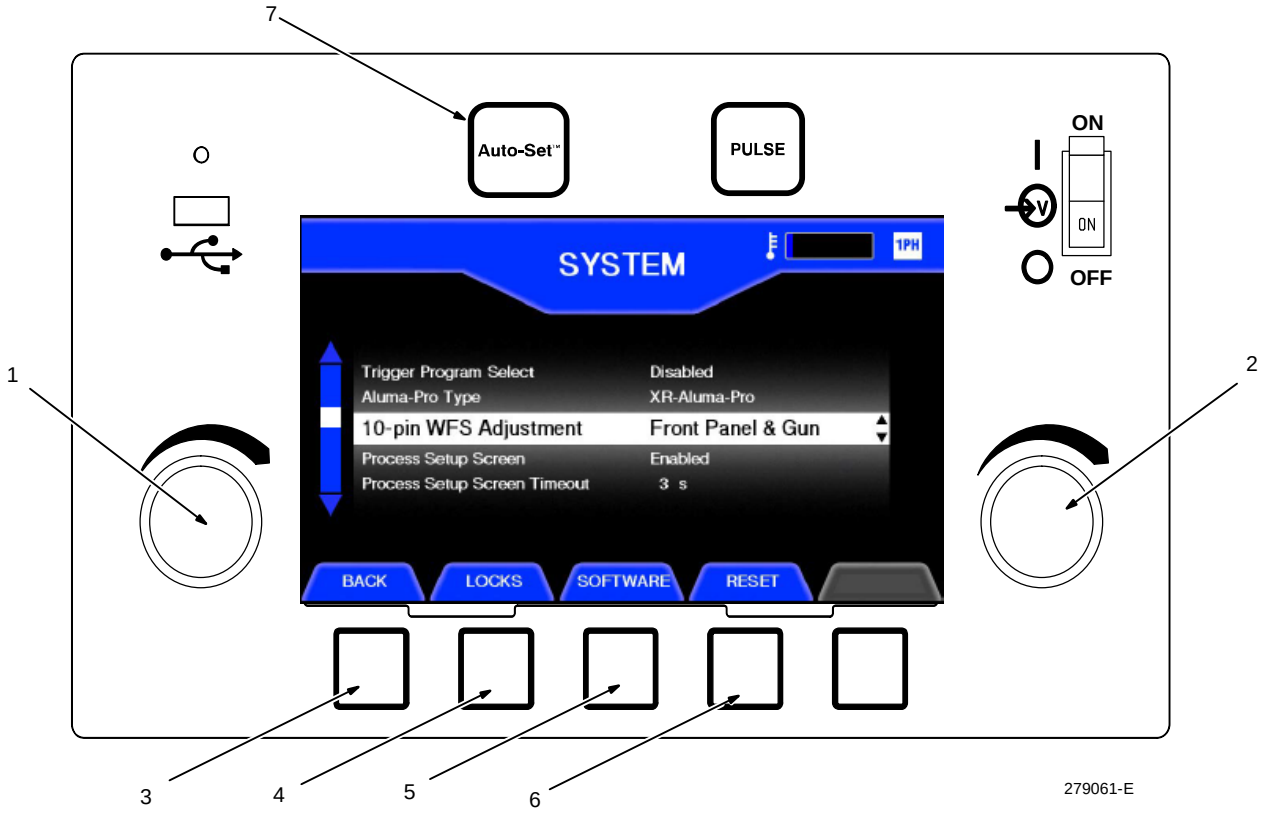
Arc Control

Arc Control can be adjusted either from the Home screen or in the Setup menu. Press Setup button to enter Setup menu. Rotate left knob to select Arc Control. The setting can be adjusted from 0 to 50. All Pulse MIG welding programs are designed with a default setting of 25. Using the right knob to adjust the Arc Control setting will vary the width of the welding arc cone. Pro Set default is 25.

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

6-11. System





From the system setting screen, the operator can enable the Trigger Program Select feature, adjust the amount of time that the Process Select screen is displayed, enable Program Locks and Limits, view system software information, restore the unit back to factory default settings and select optional welding guns.

Access the system information screen from the manual MIG screen by pressing Setup and then System.

1 Left Knob

2 Right Knob

Once in the Set-Up menu, press the system button to access these system settings, rotate the left knob to find a particular item, and rotate the right knob to change the setting or status.

Trigger Program Select

Trigger Program Select allows the operator to change the programs by tapping the trigger to eliminate the need to go back to the machine to change the program on any MIG, Push/Pull or Spoolgun to increase productivity. Tapping the gun trigger the number of times to match the program that you want to select. Tap one to select program 1, tap twice to select program 2. Default setting is disabled.

Aluma-Pro Type: (Only displayed when a Miller XR Push/Pull gun is connected to the Millermatic 355) - The Millermatic 355 is compatible with 3 styles of Miller Push/Pull guns and the MK Python gun. To optimize arc performance, select the gun option that matches the gun being used, XR-AlumaPro, XR- AlumaPro Lite or XR-Pistol Pro. Only when using the XR-AlumaPro Lite, does the SUP value on the gun need to be entered into the machine. For the XR-AlumaPro Lite the SUP value setting is entered via the Set Up menu. When using a MK Python, the Python is automatically detected, and the **Aluma-Pro Type** option is not displayed in the setup menu (Section 6-5). Default setting is XR-Aluma-Pro.

☞ *Miller does not manufacture Python guns and cannot guarantee the continued support of them by the manufacturer.*

10 Pin WFS Adjustment: (Only displayed when a Push/Pull or Spoolgun is connected to the Millermatic 355). — There are two options for controlling the wire feed speed. The wire feed speed control can either be adjusted by the control in the handle of the gun and the front panel of the machine or only at the front panel and disable the control from the gun. Default is Front Panel and Gun.

Process Set-Up Screen

To help you set up gas and polarity for the machines multiple options, your Millermatic 355 features an intuitive color display screen. The Process Setting screen illustrates how to properly configure the machine for the different processes and wire combinations. Default setting is enabled.

Process Setup Screen Timeout

The length of time that the Process Setup screen is displayed. When enabled the time can be adjusted from 1–30 seconds. Default time is 3 seconds.

System Screen

The system screen displays four or five tabs above the soft keys, depending on which welding gun is connected.

3 Back

Press soft key to return to Set-Up screen.

4 Locks

5 Software

Press soft key to display the system software versions. This information is used by the factory authorized service agents.

License: Press soft key to display Miller Licensing Agreement.

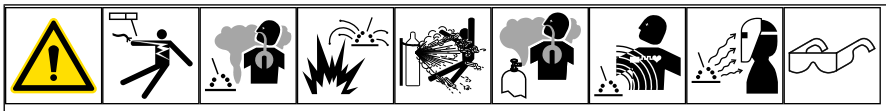
6 Reset

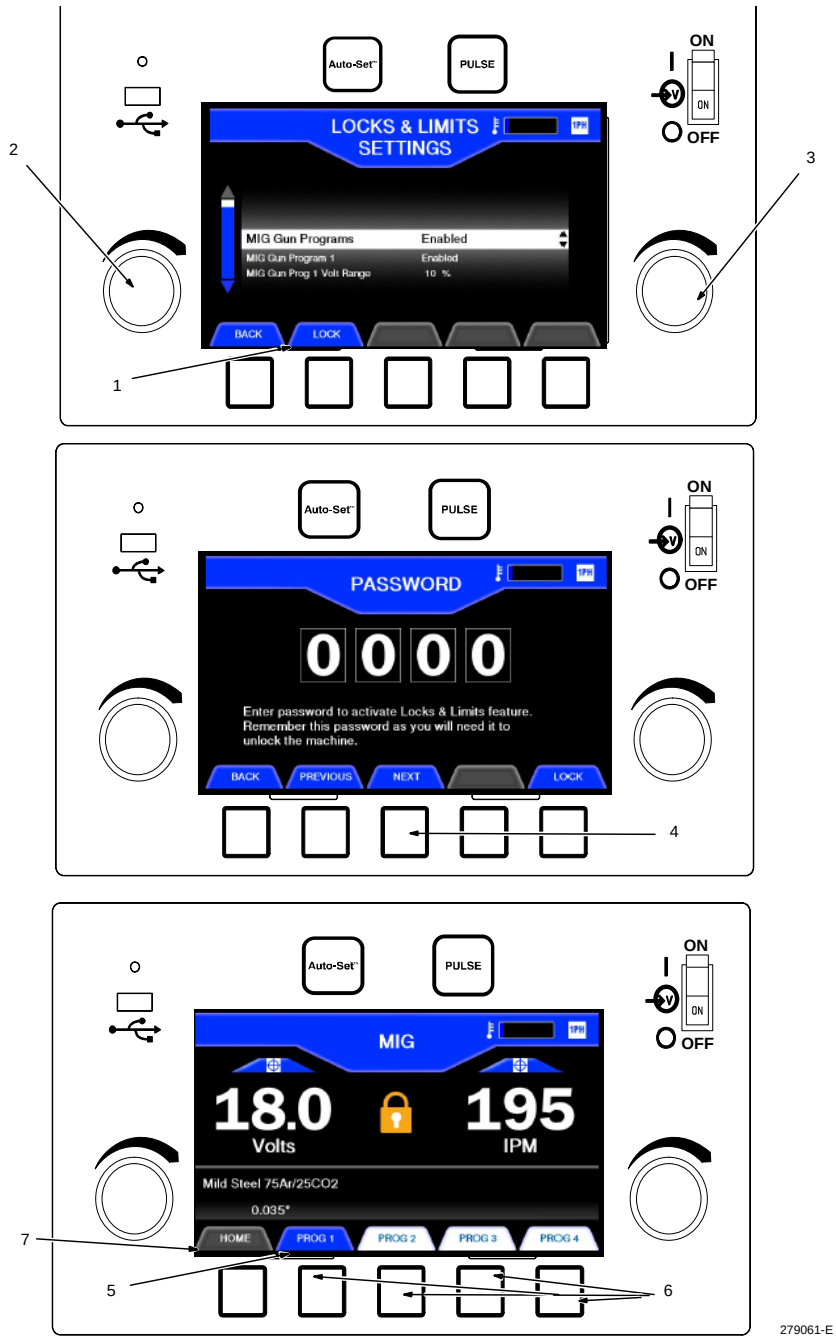
Press soft key to reset unit to original factory settings.

7 Auto-Set Button

Press to turn Auto-Set On or Off.

6-12. System Sub Menu





279061-E

1 Lock Button

2 Left Knob

3 Right Knob

4 Next Soft Key

5 Program Button

6 Program Soft Keys

7 Home Button

Locks and Limits allows supervisory control of programmed settings for either MIG gun (4 pin) or Spoolgun/Push Pull gun (10 pin) programs. Each program has the ability to limit machine output voltage/ Arc length and wire feed speed. Following are the steps to access and activate the Lock feature.

Press Locks button.

Rotate left knob to select MIG gun Programs

Rotate right knob to select Enable

Rotate left knob to select MIG gun Program numbers that will be locked

Ensure function is enabled, otherwise rotate right knob to enable.

This feature enables supervisors to lock programmed settings or allow the welder adjustability of between 5 to 20% in 5% increments within set limits. Selecting a limit of 0% completely locks the weld parameters. Following are the display prompts to set the desired limits.

Once the limits have been set, a four digit password will need to be created.

Have supervisor or manager contact Miller Service if password is lost.

Press Lock button

Rotate right knob to select first digit and press next button.

Rotate right knob to select second digit, press next button and repeat this process to enter values for all four digits.

Press Lock button

The machine will then return to the Program mode and the Padlock will appear to indicate that the program is locked.

To return to manual mode press home and reenter supervisory password.

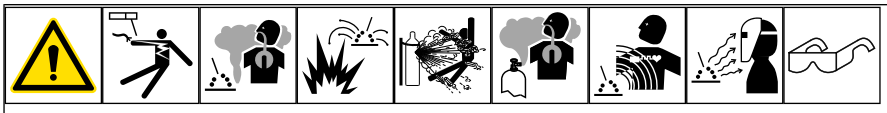
Press Unlock button to return welder to manual mode.

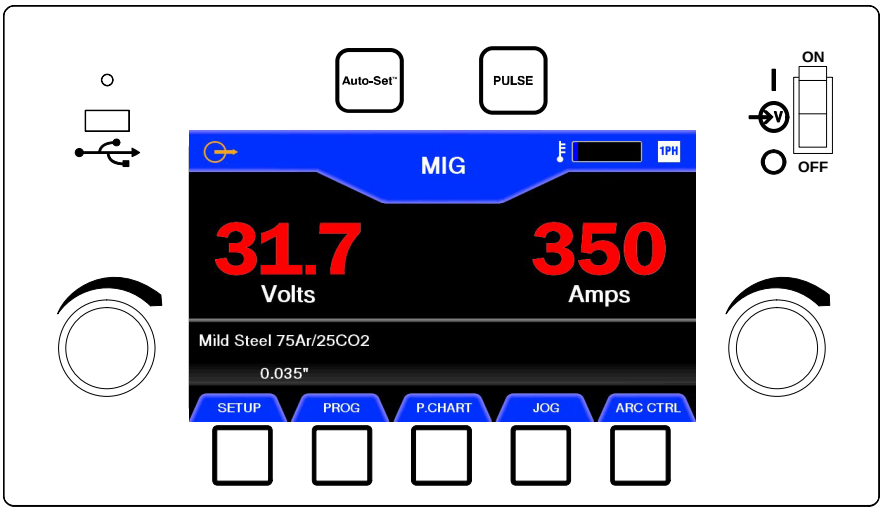
The unit can store four programs. The programs have default setting saved when the machines come from the factory.

Exiting Program Mode

Press the Home button to exit Program mode and return to Manual mode.

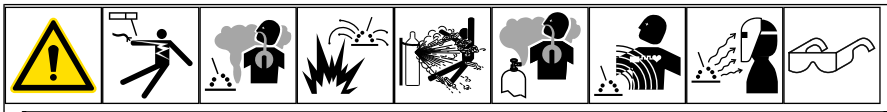
6-13. Foldback

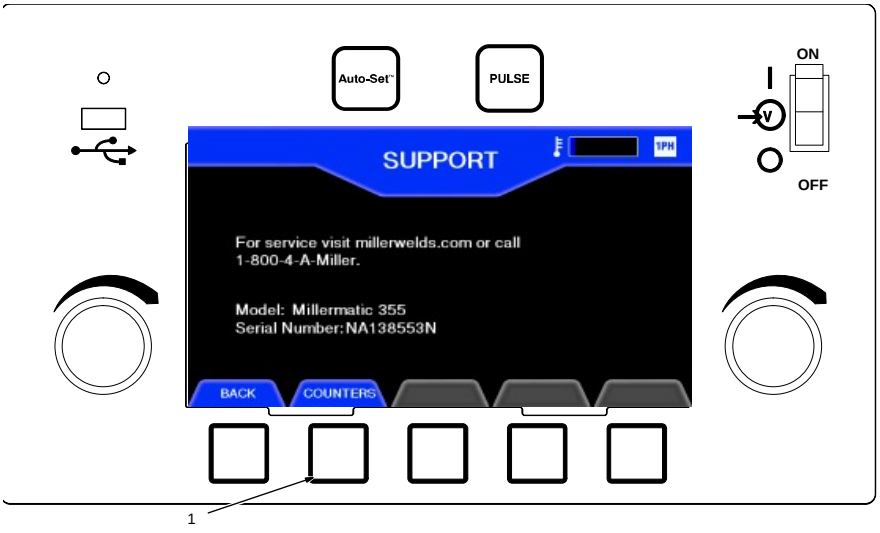




When the screen shows the weld parameters in RED, it indicates the machine is in a foldback condition. Reduce the settings or change the input power from single phase 208/240 volts to single phase 460/575 volts or any three phase input power.

6-14. Support





The support screen allows the operator to quickly access the Miller website and phone number to obtain more product information or get service support.

Access the Support screen from the manual MIG screen by pressing Set-up, then Support. See section 6-5.

1 Counters

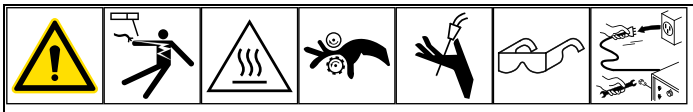
Press soft key to access timer logs with a USB thumb drive. In the counters menu, there are two options:

Reset Log: Press soft key to reset all system timers.

Save Log: Insert USB thumb drive into USB port on front of welder. Press soft key to download all system timers to the drive. This system information can then be loaded into an Excel spreadsheet.

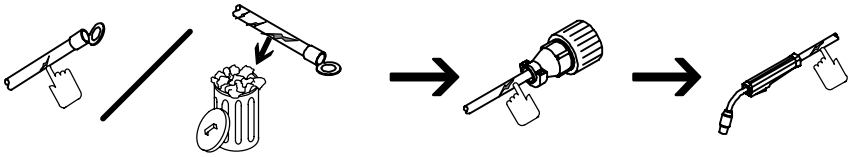
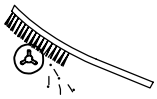
SECTION 7 – MAINTENANCE AND TROUBLESHOOTING

7-1. Routine Maintenance

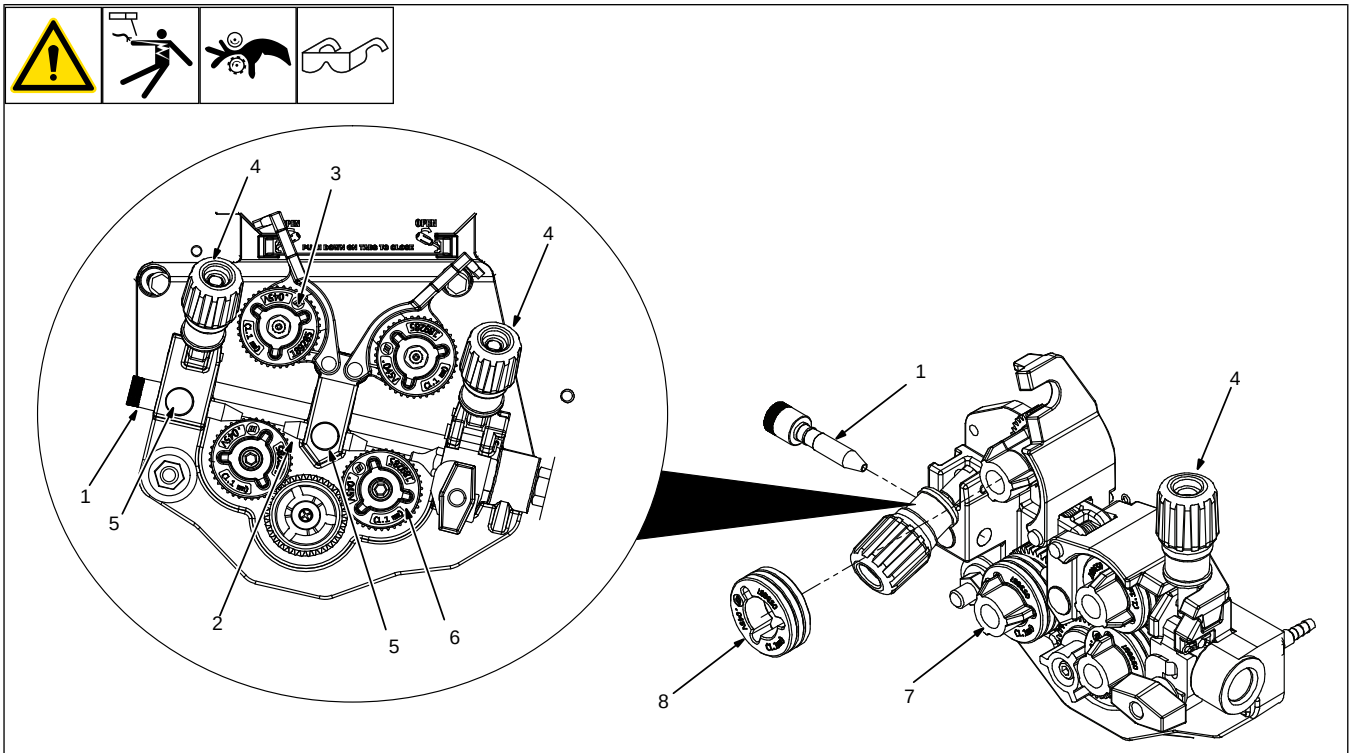


⚠ **Disconnect power before maintaining.**

☞ *Maintain more often during severe conditions.*

	✓ = Check	◇ = Change	❍ = Clean	☆ = Replace
Every 3 Months	 ☆ Damaged Or Unreadable Labels	 ☆Cracked Weld Cables		
Every 6 Months	 ❍ Inside Unit	 ❍ Clean Drive Rolls		

7-2. Installing Wire Guides And Drive Rolls



Installing Wire Guides

1 Inlet Wire Guide

2 Intermediate Wire Guide

3 Upper Drive Roll Carrier

4 Drive Roll Pressure Adjustment Knob

5 Wire Guide Securing Button

Open upper drive roll carriers by grasping drive roll pressure adjustment knob and pull out and down. Carrier will spring open. Repeat for other carrier.

Insert inlet wire guide into wire entry as shown. Push into place to secure. Repeat procedure for intermediate guide.

To remove wire guides, push on wire guide securing button and remove guide.

Installing Drive Rolls

6 Drive Roll Carrier

7 Drive Roll Retaining Nut

8 Drive Roll

With upper drive roll carriers open, slide drive roll onto carrier. Rotate drive roll retaining nut one click to secure in place. Repeat procedure for remaining drive rolls.

To remove drive rolls reverse procedure.

Aligning Wire Guide And Drive Rolls

Self-aligning drive rolls do not require any manual adjustment.

Cleaning Drive Rolls

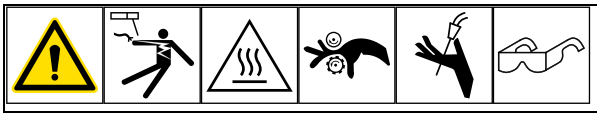
Remove drive rolls, and clean grooves using a wire brush.

Close drive assembly cover.

7-3. Overheating

Thermistors PRI-TEMP-FB,OP-HS-TEMP, MAG-TEMP,and the thermistors contained within the inverter module PM1 protect the unit from damage due to overheating. If the output diode heat sink, output inductor L2, main transformer, and/or inverter module PM1 gets too hot, they command the weld controller to disable the output. The fan keeps running to cool the unit. Wait several minutes before trying to weld.

7-4. Error Messages



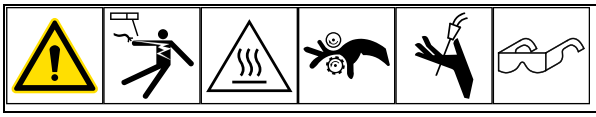
Message	Error	Remedy
Overtemp-Please wait while the welder cools down.	Internal temperature of welder has exceeded the maximum limit.	Wait for unit to cool down (reference temperature gauge on front panel). If the fan is not running, contact Miller Electric authorized service location.
Trigger error-Release MIG gun trigger to clear error.	MIG gun or spool gun trigger is engaged on power up.	Release 4-pin trigger to clear error.
	MIG gun trigger is held during jog for more than 17 feet of wire.	
	Spool gun trigger is held during jog for more than 10 seconds.	
	MIG gun or spool gun trigger is engaged for more than 1 second after the arc is broken.	
	After an overtemp error, the MIG or spool gun trigger is held after the welder has completed cooling.	
	MIG gun or spool gun trigger is engaged while the process is changed to Flux Cored or a MIG process.	
	MIG gun or spool gun trigger lead voltage exceeds 9 volts caused by the electrode being shorted to the trigger lead.	Fix or replace damaged gun.
	MIG gun or spool gun trigger leads are shorted together.	
10–Pin Trigger Fault—Release Trigger	10–pin gun detection error.	Reconnect 10–pin gun.
	Unrecognized 10–pin accessory.	Verify supported 10–pin gun.
		Contact Miller authorized service location.
Trigger Error-Release Spool Gun trigger/Release Push-Pull trigger to clear error.	The 10-pin trigger is engaged on power up.	Release the 10-pin trigger.
	Trigger held too long during jog mode. Spool gun for more than 10 seconds. Push-pull gun for more than 37 feet of wire.	
	Trigger is engaged for more than 1 second after the arc is broken.	
	After an overtemp error, the trigger is held after the welder has completed cooling.	
	Trigger is engaged while another process is selected.	
	The trigger leads re shorted.	
Gun Error XR Edge, XR-A, AlumaPro Plus	System parameters do not support this equipment.	Replace with compatible MIG gun.
Shorted output-First remove short, then pull trigger to clear error.	The welding wire came into contact with the workpiece while jogging wire.	Remove short and pull trigger, or wait 30 seconds to clear error.
	MIG gun or spool gun contact tip came into contact with the workpiece while welding.	
	The weld voltage is less than 10 volts for more than 0.2 seconds while welding.	
	Output rectifier is damaged.	Contact Miller Electric authorized service location.
	The control board is damaged.	
Motor error-Motor has drawn too much current. * Internal motor has stalled * Internal motor has drawn too much current * Remote motor has stalled * Motor tach is running too slow or is damaged.	Too much pressure on pressure adjust knob.	Reduce pressure on the pressure adjust knob.
	Spool hub tension knob set too high.	Reduce pressure on spool hub tension knob.
	The gun liner is obstructed.	Clear obstruction or replace gun liner.
	The gun contact tip is obstructed.	Clear obstruction or replace contact tip.
	The welding wire is entangled.	Untangle welding wire.
	The control board is damaged.	Contact Miller Electric authorized service location.

Message	Error	Remedy
Fan error-Either the top fan or the bottom fan or both are running too slow or is damaged.	The fan blades are obstructed.	Clear obstruction from fan.
	The fan wiring harness is disconnected.	Contact Miller Electric authorized service location.
	The fan is damaged.	
	The control board is damaged.	
Thermal error-Inverter module thermistor is shorted.	The inverter module thermistor is reading too high for a valid temperature.	Contact Miller Electric authorized service location
	The control board is damaged.	
Thermal error-Inverter module thermistor open.	Ambient temperature is too cold for valid reading.	Place unit in environment warmer than –30°F (–22°C).
	The inverter module thermistor is reading too low for a valid temperature.	Contact Miller Electric authorized service location.
	The control board is damaged.	
Thermal error-Main transformer is shorted	The main transformer thermistor is reading too high for a valid temperature.	Contact Miller Electric authorized service location.
	The control board is damaged.	
Thermal error-Main transformer is open.	Ambient temperature is too cold for valid reading.	Place unit in environment warmer than –30°F (–22°C).
	The main transformer thermistor is reading too low for a valid temperature.	Contact Miller Electric authorized service location.
	The control board is damaged.	
Thermal error-Output Inductor magnetics thermistor is shorted.	The secondary magnetics thermistor is reading too high for a valid temperature.	Contact Miller Electric authorized service location
	The control board is damaged.	
Thermal error-Output Inductor magnetics thermistor is open.	Ambient temperature is too cold for valid reading.	Place unit in environment warmer than –30°F (–22°C).
	The secondary magnetics thermistor is reading too low for a valid temperature.	Contact Miller Electric authorized service location.
	The control board is damaged.	
Thermal error-Output heatsink thermistor is open.	The output heatsink thermistor is reading too low for a valid temperature.	Place unit in environment warmer than –30°F (–22°C).
	The control board is damaged.	Contact Miller Electric authorized service location.
Thermal error-Output heatsink thermistor is shorted.	Ambient temperature is too hot for valid reading.	Contact Miller Electric Mfg. authorized service location.
	The output heatsink thermistor is reading too high for a valid temperature.	
	The control board is damaged.	
Primary error, Vbus top high or Primary error, Vbus bottom high	Primary link switch is in the wrong position with 460/575V position.	Turn off unit and switch Primary Link Switch to 460/575V position.
	The control board is damaged.	Contact Miller Electric authorized service location
Primary error, Vbus top low or Primary error, Vbus bottom low	Primary link switch is in the wrong position with 208/240V position.	Turn off unit and switch Primary Link Switch to 208/240V position.
	The control board is damaged.	Contact Miller Electric authorized service location
Primary error, Vbus Balance	System has detected a problem with an internal capacitor.	Cycle input power to the system and try again.
	The control board is damaged.	Contact Miller Electric authorized service location
Primary error, Precharge	The unit has detected a problem at system start-up.	Turn system power off, wait two minutes, and re-apply power.
	System power has been applied too frequently.	
	The control board is damaged.	Contact Miller Electric authorized service location
Primary error, Current Sensor 1	The control board is damaged.	Contact Miller Electric authorized service location

Message	Error	Remedy
Power Supply error +15V or –15V Primary	The control board is damaged.	Contact Miller Electric authorized service location.
Primary error, Incorrect Link Position Detected	The input voltage detected does not match the range selected by the Primary Link Switch.	Turn off unit. See sections 5-5or 5-6of this manual to properly set the Primary Link Switch.
	The primary link switch is damaged.	Contact Miller Electric authorized service location.
	The control board is damaged.	
Primary error, change in number of phases detected.	One line of a 3 phase installation has either been lost or is intermittent.	Contact qualified person to check input wiring and fuses going to system.
	If connected to a known single phase installation, the control board is damaged.	Contact Miller Electric authorized service location.
	The control board is damaged.	
Over voltage-Cycle power to clear error.	Primary voltage is above 288 volts.	Reduce primary voltage below 288 volts.
Under voltage-Cycle power to clear error.	The primary voltage is below 150 volts.	Increase primary voltage above 150 volts.
Network error-Inverter Communication is down.	The two microcontrollers on the control board are no longer communicating.	Cycle power to clear error. If this error persists after a power cycle, contact Miller Electric Mfg. authorized service location.
Network error-Primary Communication is down.		
Network error-Communication between UI and control board is down.	The wiring harness between the control board and interface board is damaged.	Contact Miller Electric Mfg. authorized service location.
	The primary control board is damaged.	
	The interface board is damaged.	
Cable error — Connect wire feed housing cable to clear error.	The wire feed housing cable is not attached to either the positive stud or negative stud of the power source.	Connect wire drive assembly cable to either the positive or negative stud.
	The control board is damaged.	Contact Miller Electric authorized service location
Power Supply error, +15V or —15V Secondary	The control board is damaged.	Contact Miller Electric authorized service location
Transformer Saturation error — Release trigger to clear OR cycle power to clear.	Main transformer has detected an overcurrent condition.	Cycle power to clear error. If this problem persists, contact Miller Electric Mfg. authorized service location.
Missing UI Membrane Switch Overlay.	UI is not detected as being plugged in.	Contact Miller Electric Mfg. authorized service location.
UI Membrane Switch Overlay doesn't match arc controller program	Detected UI membrane is not detected as matching the type reported by the main control board.	Contact Miller Electric Mfg. authorized service location.
Overvoltage Protection Trip	The system has detected a high voltage condition on the weld output terminals.	Cycle primary power to clear the error.
	The control board is damaged.	Contact Miller Electric authorized service location
Secondary Current Sensor Fault	The output current sensor is either damaged or not connected properly.	Contact Miller Electric authorized service location
	The control board is damaged.	
Invalid Weld Program Data	Software Upgrade error	Perform software upgrade (repeat). Contact Miller Electric authorized service location
All stored programs are disabled because of primary power limitations.	Machine has incompatible input voltage for stored programs.	Connect input power to proper power.
		Check input power for correct number of phases.
		Disable Locks and Limits.
		Contact Miller Electric authorized service location
Locks and Limits configuration only supports a push-pull/spool gun.	Incorrect push-pull/spool gun connected to support programs (all MIG gun programs are disabled).	Connect proper spool gun to support program.
		Disable Locks and Limits.
		Contact Miller Electric authorized service location
	Depress trigger on MIG gun while spool gun is connected.	Do not pull trigger on MIG gun. Depress trigger on spool gun to clear error.
		Disable Locks and Limits.
		Contact Miller Electric authorized service location

Message	Error	Remedy
Locks and Limits configuration does not support a push-pull/spool gun.	Connected a push-pull gun.	Disconnect push-pull gun and utilize correct MIG gun.
		Disable Locks and Limits.
		Contact Miller Electric authorized service location
	Depressed trigger on spool gun.	Do not pull trigger on spool gun. Depress trigger on MIG gun to clear error.
		Disable Locks and Limits.
		Contact Miller Electric authorized service location
CAN Data Version Incompatible	The UI and the Control are not compatible, perhaps due to a partial firmware upgrade.	Restart the Firmware upgrade process.
		Contact Miller Electric Mfg. authorized service location.

7-5. Troubleshooting



Trouble	Remedy
No weld output; unit completely inoperative.	Place line disconnect switch in On position.
	Check and replace line fuse(s), if necessary, or reset supplementary protector.
	Be sure power cord is plugged in and that receptacle is receiving input power.
No weld output; unit is on.	Check and secure loose weld cable(s) into receptacle(s).
	Check and correct poor connection of work clamp to workpiece.
Erratic or improper welding arc or output.	Use proper size and type of weld cable (see your Distributor).
	Clean and tighten weld connections.
	Verify electrode polarity; check and correct poor connections to workpiece.
Fan not operating.	Unit not warmed up enough to require fan cooling.
	Check for and remove anything blocking fan movement.
	Have Factory Authorized Service Agent check fan motor and control circuitry.
Weld settings turn RED, see section 6–2 for more details.	Machine is operating on single phase 208 VAC or 240 VAC. Machine is folding output back to 350 Amps.
	Lower weld settings to reduce weld output.
	Rewire and relink machine to either single phase 460/575 VAC or any three phase power.

Notes

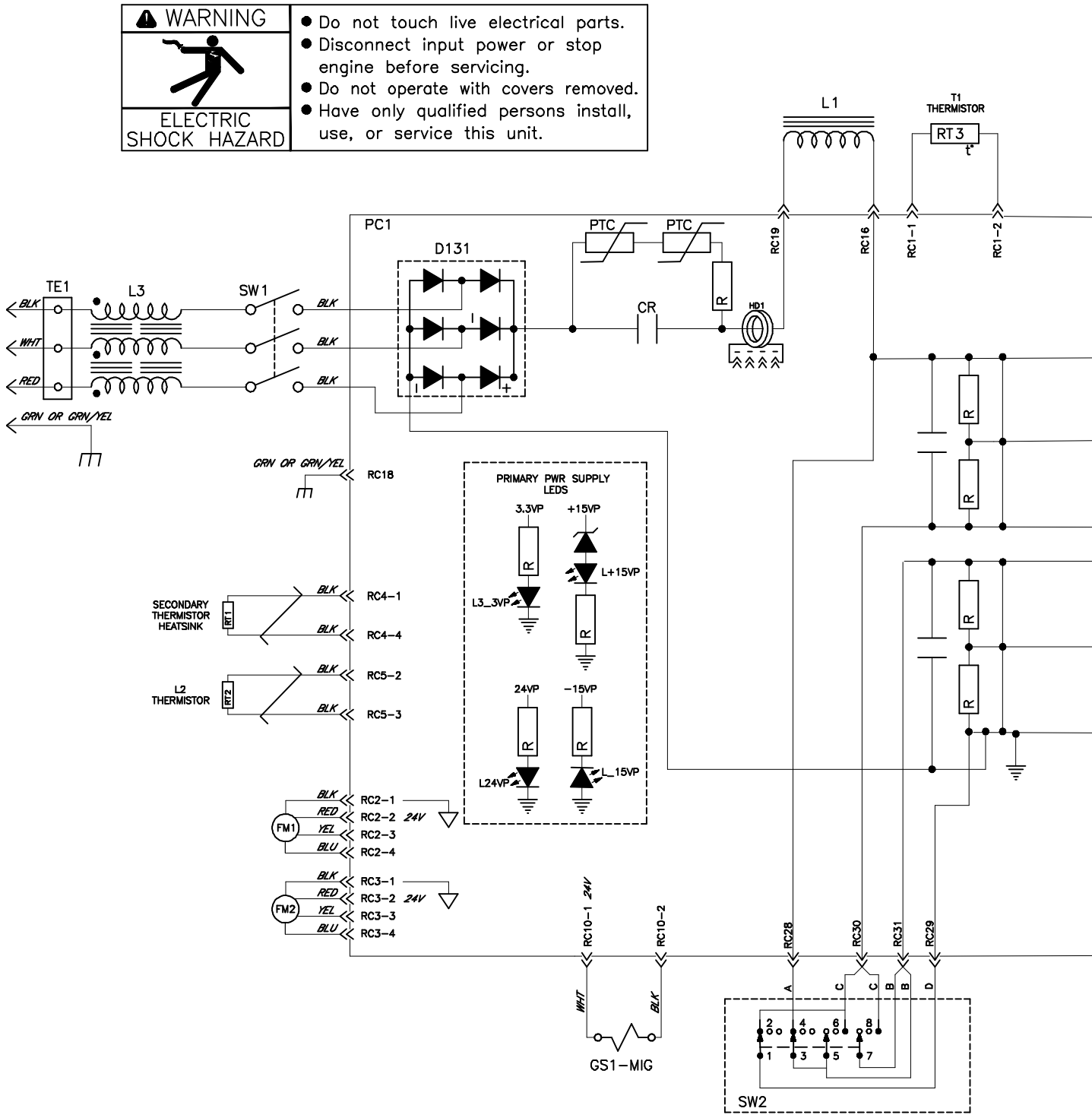
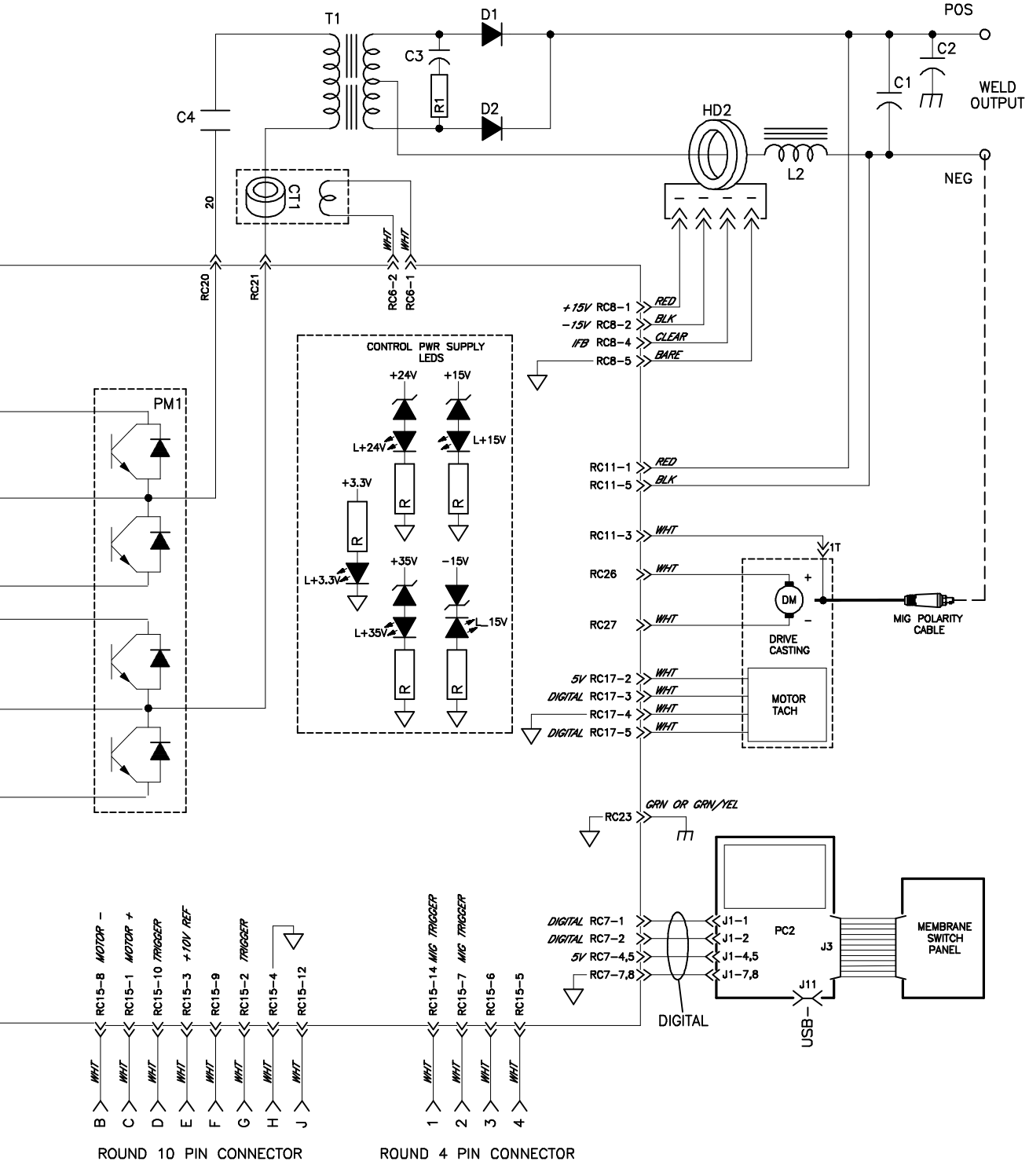
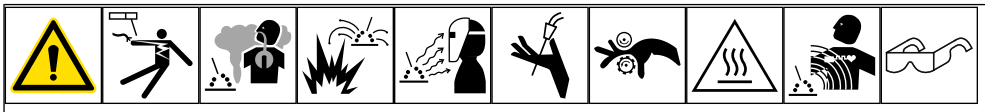


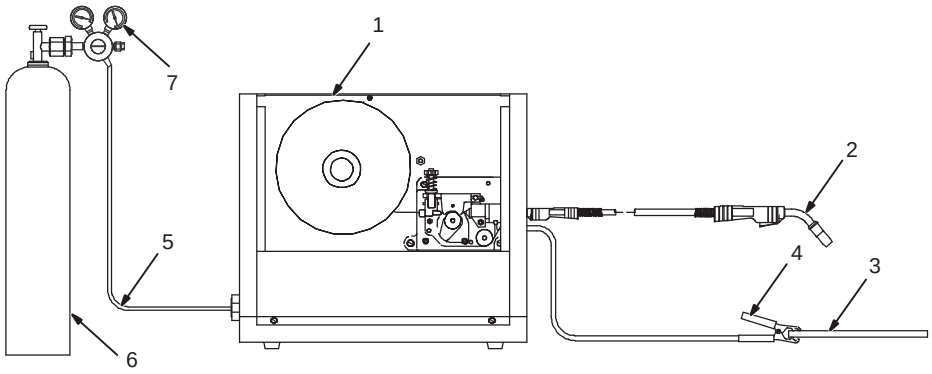
Figure 8-1. Circuit Diagram


T1
D1
D2
C3
R1
C4
C1
C2
POS
WELD OUTPUT
NEG
HD2
L2
CT1
20
WHT
WHT
RC20
RC21
RC6-2
RC6-1
+15V RC8-1 RED
-15V RC8-2 BLK
IFB RC8-4 CLEAR
RC8-5 BARE
CONTROL PWR SUPPLY LEDS
+24V
+15V
L+24V
L+15V
+3.3V
L+3.3V
+35V
-15V
L+35V
L-15V
R
PM1
RC11-1 RED
RC11-5 BLK
RC11-3 WHT
1T
RC26 WHT
RC27 WHT
DM
DRIVE CASTING
MIG POLARITY CABLE
5V RC17-2 WHT
DIGITAL RC17-3 WHT
RC17-4 WHT
DIGITAL RC17-5 WHT
MOTOR TACH
RC23 GRN OR GRN/YEL
DIGITAL RC7-1
DIGITAL RC7-2
5V RC7-4,5
RC7-7,8
J1-1
J1-2
J1-4,5
J1-7,8
PC2
J3
MEMBRANE SWITCH PANEL
J11
USB
DIGITAL
RC15-8 MOTOR -
RC15-1 MOTOR +
RC15-10 TRIGGER
RC15-3 +10V REF
RC15-9
RC15-2 TRIGGER
RC15-4
RC15-12
RC15-14 MIG TRIGGER
RC15-7 MIG TRIGGER
RC15-6
RC15-5
WHT
B
C
D
E
F
G
H
J
1
2
3
4
ROUND 10 PIN CONNECTOR
ROUND 4 PIN CONNECTOR

SECTION 9 – GMAW WELDING (MIG) GUIDELINES

9-1. Typical GMAW (MIG) Process Connections

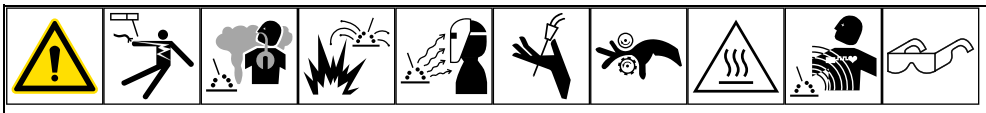


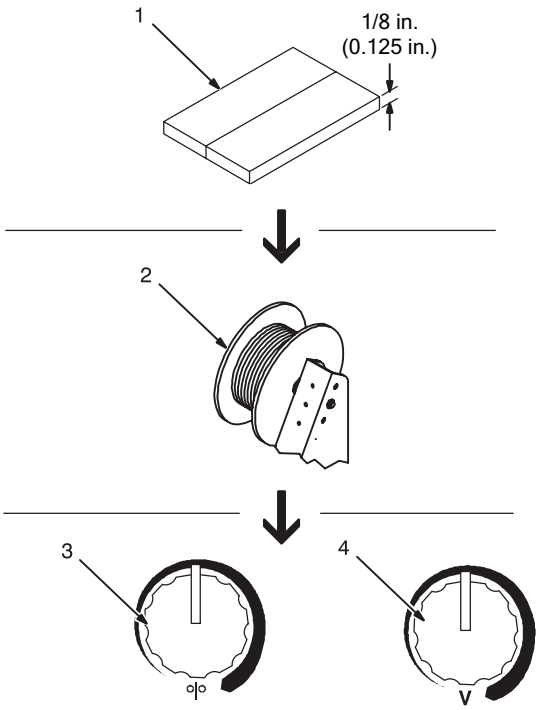


⚠ **Weld current can damage electronic parts in vehicles. Disconnect both battery cables before welding on a vehicle. Place work clamp as close to the weld as possible.**

1 Wire Feeder/Welding Power Source
2 Gun
3 Workpiece
4 Work Clamp
5 Gas Hose
6 Shielding Gas Cylinder
7 Regulator/Flowmeter

9-2. Typical GMAW (MIG) Process Control Settings





☞ *These settings are guidelines only. Material and wire type, joint design, fitup, position, shielding gas, etc. affect settings. Test welds to be sure they comply to specifications.*

1 Material Thickness

Material thickness determines weld parameters.

Convert material thickness to amperage (A):

0.001 in. (0.025 mm) = 1 ampere
0.125 in. (3.17 mm) ÷ 0.001 = 125 A

2 Select Wire Size

See table below.

3 Select Wire Feed Speed (Amperage)

Wire feed speed (amperage) controls weld penetration. See table below.

4 Select Voltage

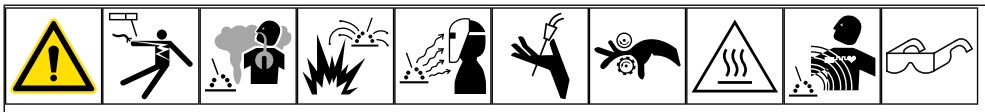
Voltage controls height and width of weld bead.

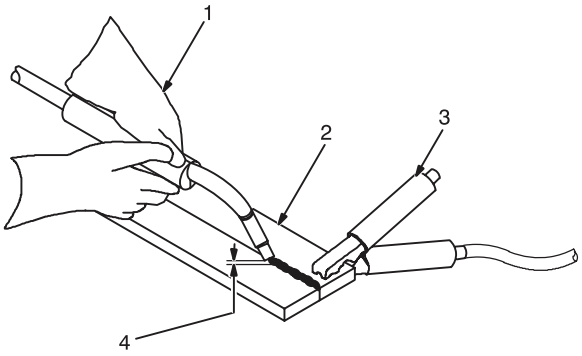
Low Voltage: wire stubs into work
High Voltage: arc is unstable (spatter)

Set voltage midway between high and low voltage and adjust as needed for the weld.

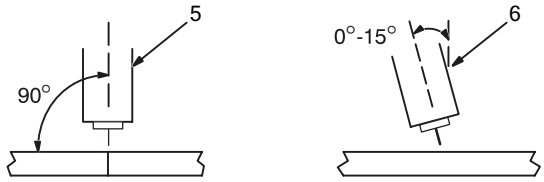
Wire Size	Amperage Range	Recommended Wire Feed Speed	Wire Feed Speed *
0.023 in. (0.58 mm)	30-90 A	3.5 ipm (89 mmpm) per amp	3.5 x 125 A = 437 ipm (11.11 mpm)
0.030 in. (0.76 mm)	40-145 A	2 ipm (51 mmpm) per amp	2 x 125 A = 250 ipm (6.35 mpm)
0.035 in. (0.89 mm)	50-180 A	1.6 ipm (41 mmpm) per amp	1.6 x 125 A = 200 ipm (5.08 mpm)
0.045 in. (1.14 mm)	75–250 A	1 ipm (25 mmpm) per amp	1 x 125 A = 125 ipm (3.17 mpm)
*125 A based on 1/8 in. (3.17 mm) material thickness.		ipm = inches per minute; mmpm = millimeters per minute; mpm = meters per minute	

9-3. Holding And Positioning Welding Gun

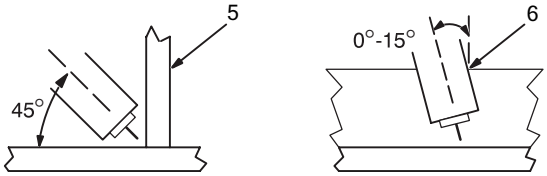




Groove Welds



Fillet Welds



☞ *Wire is energized when gun trigger is pressed. Before lowering helmet and pressing trigger, be sure wire is no more than 1/2 in. (13 mm) past end of contact tip, and tip of wire is positioned correctly on seam.*

1 Hold Gun and Control Gun Trigger

Use both hands to stabilize the gun.

2 Workpiece

3 Work Clamp

4 Contact Tip To Work Distance (Stickout)

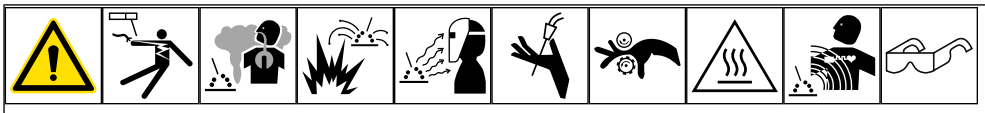
Short Circuit: 1/4 to 1/2 in. (6 to 13 mm)

Spray Transfer: 1/2 to 3/4 in. (13 to 14 mm)

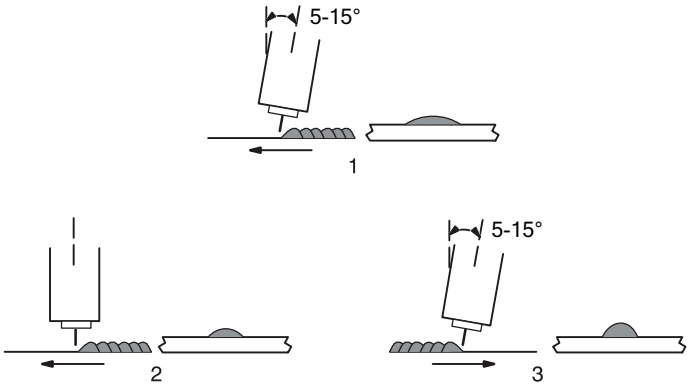
5 End View Of Work Angle

6 Side View Of Travel Angle

9-4. Conditions That Affect Weld Bead Shape



Gun Angles and Weld Bead Profiles



☞ *Weld bead shape depends on gun angle, direction of travel, contact to work distance (stickout), travel speed, thickness of base metal, wire feed speed (weld current), and voltage.*

1 Push

2 Perpendicular

3 Drag

4 Short

5 Normal

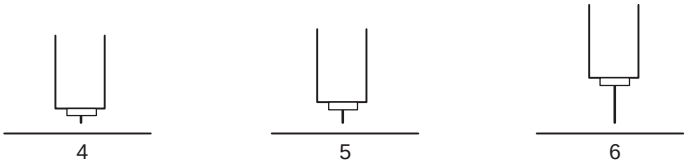
6 Long

7 Slow

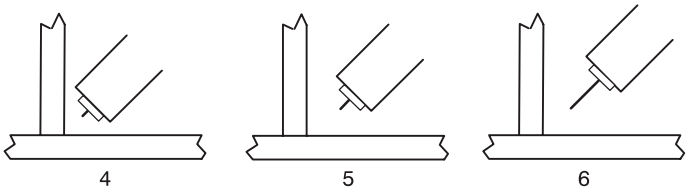
8 Normal

9 Fast

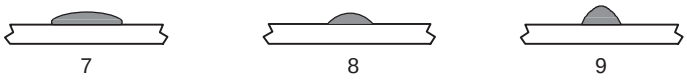
Contact Tip To Work Distance (Stickout)



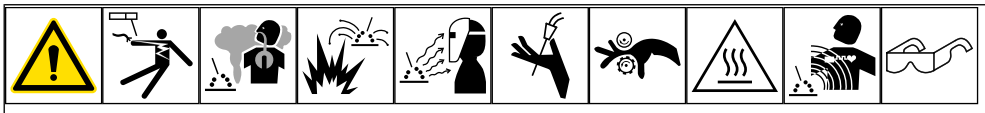
Fillet Weld Contact Tip To Work Distance (Stickout)

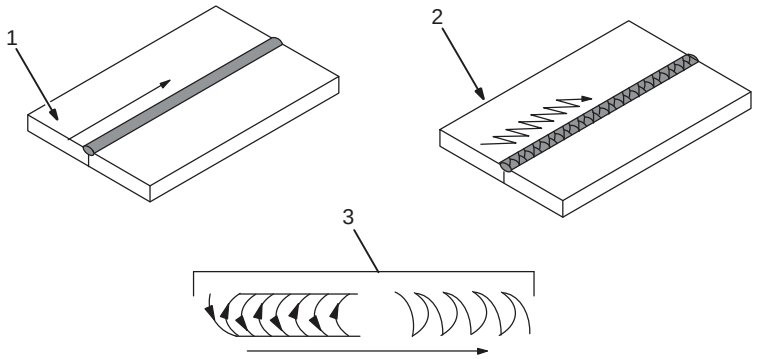


Travel Speed



9-5. Gun Movement During Welding





☞ *Normally, a single stringer bead is satisfactory for most narrow groove weld joints; however, for wide groove weld joints or bridging across gaps, a weave bead or multiple stringer beads works better.*

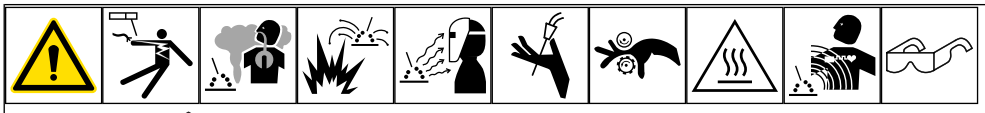
1 Stringer Bead - Steady Forward Movement Along Weld Joint

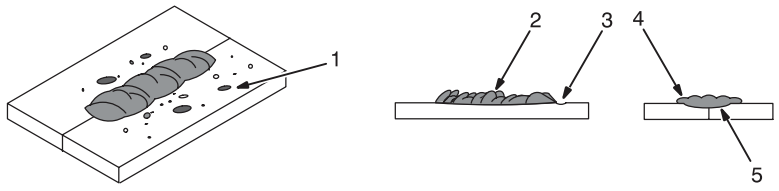
2 Weave Bead - Side To Side Movement Along Weld Joint

3 Weave Patterns

Use weave patterns to cover a wide area in one pass of the electrode.

9-6. Poor Weld Bead Characteristics





1 Large Spatter Deposits

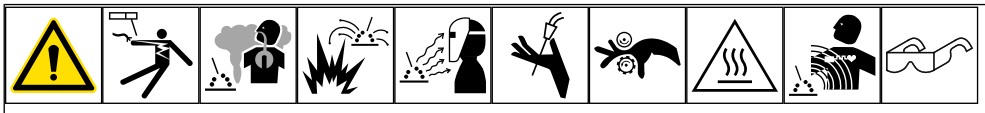
2 Rough, Uneven Bead

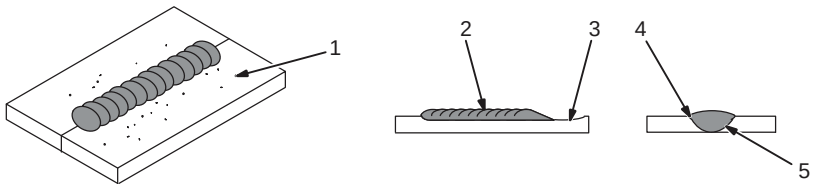
3 Large Crater At End of Weld

4 Overlap Present

5 Little To No Penetration

9-7. Good Weld Bead Characteristics





1 Little To No Micro Spatter

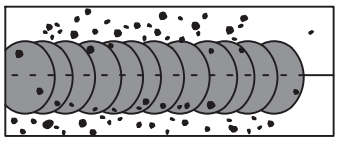
2 Uniform Bead

3 Little To No Crater At End Of Weld

4 No Overlap

5 Adequate Penetration Into Base Metal

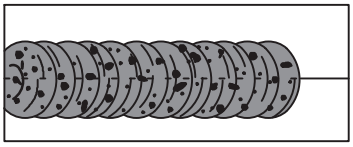
9-8. Troubleshooting – Excessive Spatter



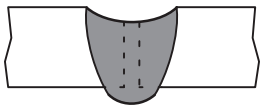
Excessive Spatter - metal particles expelled during welding that do not form a part of the weld.

Possible Causes	Corrective Actions
Wire feed speed too high.	Select lower wire feed speed.
Voltage too high.	Select lower voltage range.
Electrode extension (stickout) too long.	Use shorter contact tip to work distance (stickout).
Workpiece dirty.	Remove all grease, oil, moisture, rust, paint, undercoating, and dirt from work surface before welding.
Insufficient shielding gas at welding arc.	Increase flow of shielding gas at regulator/flowmeter and/or prevent drafts near welding arc.
Dirty wire.	Use clean, dry wire.
	Eliminate pickup of oil or lubricant on wire from feeder or liner.

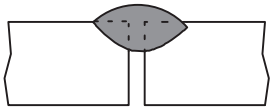
9-9. Troubleshooting – Porosity

	Porosity - small cavities or holes resulting from gas pockets in weld metal.
Possible Causes	**Corrective Actions**
Insufficient shielding gas at welding arc.	Increase flow of shielding gas at regulator/flowmeter and/or prevent drafts near welding arc.
	Remove spatter from gun nozzle.
	Check gas hoses for leaks.
	Ensure proper contact tip to work distance.
	Hold gun near bead at end of weld until molten metal solidifies.
Wrong gas.	Use welding grade shielding gas; change to different gas.
Dirty wire.	Use clean, dry wire.
	Eliminate pick up of oil or lubricant on wire from feeder or liner.
Workpiece dirty.	Remove all grease, oil, moisture, rust, paint, coatings, and dirt from work surface before welding.
	Use a more highly deoxidizing wire (contact supplier).
Excessive contact tip to work distance	Ensure proper contact tip to work distance

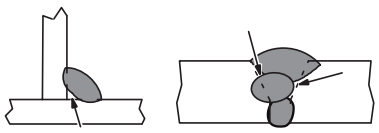
9-10. Troubleshooting – Excessive Penetration

	Excessive Penetration - weld metal melting through base metal.
Possible Causes	**Corrective Actions**
Excessive heat input.	Select lower voltage and reduce wire feed speed.
	Increase travel speed.

9-11. Troubleshooting – Incomplete Joint Penetration

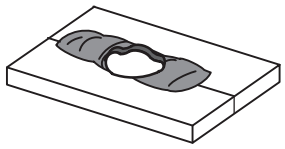
	Incomplete Joint Penetration - weld metal does not extend through the joint thickness.
Possible Causes	**Corrective Actions**
Improper joint preparation.	Joint preparation and design must provide access to bottom of groove while maintaining proper contact tip to work distance.
Improper weld technique.	Maintain proper work and travel angles.
	Keep wire on leading edge of weld puddle.
	Maintain proper contact tip to work distance.
Insufficient heat input.	Select higher wire feed speed and/or select higher voltage.
	Reduce travel speed.

9-12. Troubleshooting – Incomplete Fusion

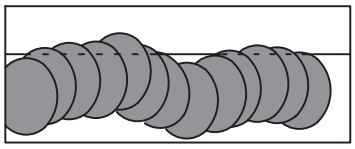
	Incomplete Fusion - failure of weld metal to fuse completely with base metal or a preceding weld bead.
Possible Causes	**Corrective Actions**
Workpiece dirty.	Remove all grease, oil, moisture, rust, paint, undercoating, and dirt from work surface before welding.
Insufficient heat input.	Select higher voltage and/or adjust wire feed speed.
Improper welding technique.	Place bead in proper location(s) in joint during welding.
	Pause on groove side walls when using weaving technique.
	Keep wire on leading edge of weld puddle.

	Maintain proper work and travel angles.

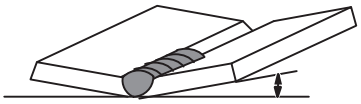
9-13. Troubleshooting – Burn-Through

	Burn-Through - a hole caused by excessive penetration.
Possible Causes	**Corrective Actions**
Excessive heat input.	Select lower voltage and reduce wire feed speed.
	Increase and/or maintain steady travel speed.

9-14. Troubleshooting – Waviness Of Bead

	Waviness Of Bead - weld metal that is not parallel and does not cover joint formed by base metal.
Possible Causes	**Corrective Actions**
Excessive contact tip to work distance.	Ensure proper contact tip to work distance.
Unsteady hand.	Support hand on solid surface or use two hands.

9-15. Troubleshooting – Distortion

	Distortion - contraction of weld metal during welding that forces base metal to move. Illustration: Base metal moves in the direction of the weld bead.
Possible Causes	**Corrective Actions**
Excessive heat input.	Use restraint (clamp) to hold base metal in position.
	Make tack welds along joint before starting welding operation.
	Select lower voltage range and/or reduce wire feed speed.
	Increase travel speed.
	Weld in small segments and allow cooling between welds.

9-16. Common MIG Shielding Gases

This is a general chart for common gases and where they are used. Many different combinations (mixtures) of shielding gases have been developed over the years. The most commonly used shielding gases are listed in the following table.

Gas	Application								
	Spray Arc Steel	**Short Circuiting Steel**	**GMAW-P Steel**	**Spray Arc Stainless Steel**	**Short Circuiting Stainless Steel**	**GMAW-P Stainless Steel**	**Spray Arc Aluminum**	**Short Circuiting Aluminum**	**GMAW-P Aluminum**
Argon							All Positions	All Positions	All Positions
Argon + 2% O_2	Flat & Horizontal Fillet		All Positions	Flat & Horizontal Fillet					
Argon + 2% CO_2				Flat & Horizontal Fillet	All Positions	All Positions			
Argon + 5% CO_2	Flat & Horizontal Fillet		All Positions						
Argon + 10% CO_2	Flat & Horizontal Fillet	All Positions	All Positions						
Argon + 25% CO_2		All Positions							
CO_2		All Positions							
Helium							All Positions*		
Argon + Helium							All Positions*		
90% HE + 7-1/2% AR + 2-1/2% CO_2					All Positions				
65% AR + 33% HE + 2% CO_2						All Positions			

* Heavy Thicknesses

9-17. Troubleshooting Guide For Semiautomatic Welding Equipment

Problem	Probable Cause	Remedy
Wire feed motor operates, but wire does not feed.	Too little pressure on drive rolls.	Increase pressure setting on drive rolls.
	Incorrect drive rolls.	Check size stamped on drive rolls, replace to match wire size and type if necessary.
	Spool hub tension too high.	Decrease brake pressure on wire spool.
	Restriction in the gun and/or assembly.	Check and replace cable, gun, and contact tip if damaged. Check size of contact tip and cable liner, replace if necessary.
Wire curling up in front of the wire feed rolls (bird nesting).	Too much pressure on drive rolls.	Decrease spool hub tension.
	Incorrect liner or gun contact tip size.	Check size of contact tip and check liner length and diameter, replace if necessary.
	Gun end not inserted into drive housing properly.	Loosen gun securing bolt in drive housing and push gun end into housing just enough so it does not touch drive rolls.
	Dirty or damaged (kinked) liner.	Replace liner.
Wire feeds, but no gas flows (GMAW).	Gas cylinder empty.	Replace empty gas cylinder.
	Gas nozzle plugged.	Clean or replace gas nozzle.
	Gas cylinder valve not open or flowmeter not adjusted.	Open gas valve at cylinder and adjust flow rate.
	Restriction in gas line.	Check gas hose between flowmeter and wire feeder, and gas hose in gun and cable assembly.
	Loose or broken wires to gas solenoid.	Have Factory Authorized Service Agent repair wiring.
	Gas solenoid valve not operating.	Have Factory Authorized Service Agent replace gas solenoid valve.
	Incorrect primary voltage connected to welding power source.	Check primary voltage and relink welding power source for correct voltage.
Welding arc not stable.	Wire slipping in drive rolls.	Adjust pressure setting on drive rolls. Replace worn drive rolls if necessary.
	Wrong size gun liner.	Match liner to wire size and type.
	Incorrect voltage setting for selected wire feed speed on welding power source.	Readjust welding parameters.
	Loose connections at the gun weld cable or work cable.	Check and tighten all connections.
	Gun in poor shape or loose connection inside gun.	Repair or replace gun as necessary.
	Wrong size contact tip or worn out contact tip.	Match contact tip to wire size and type. Replace contact tip as necessary.

Notes

TRUE BLUE® WARRANTY

Miller

Effective January 1, 2023 (Equipment with a serial number preface of ND or newer)
This limited warranty supersedes all previous Miller warranties and is exclusive with no other guarantees or warranties expressed or implied.

LIMITED WARRANTY - Subject to the terms and conditions below, Miller Electric Mfg. LLC, Appleton, Wisconsin, warrants to authorized distributors 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. Notifications submitted as online warranty claims must provide detailed descriptions of the fault and troubleshooting steps taken to diagnose failed parts. Warranty claims that lack the required information as defined in the Miller Service Operation Guide (SOG) may be denied by Miller.

Miller shall honor warranty claims on warranted equipment listed below in the event of a defect within the warranty coverage time periods listed below. Warranty time periods start on the delivery date of the equipment to the end-user purchaser.

1 5 Years Parts — 3 Years Labor

- Original Main Power Rectifiers Only to Include SCRs, Diodes, and Discrete Rectifier Modules in non-inverter products

2 4 Years Parts (No Labor)

- Auto-Darkening ClearLight 2.0 Helmet Lenses

3 3 Years — Parts and Labor Unless Specified

- Auto-Darkening Helmet Lenses (No Labor)
- Engine Driven Welder/Generators (Including EnPak) **(NOTE: Engines are Warranted Separately by the Engine Manufacturer.)**
- Insight Welding Intelligence Products (Except External Sensors)
- Inverter Power Sources
- Plasma Arc Cutting Power Sources
- Process Controllers
- Semi-Automatic and Automatic Wire Feeders
- Transformer/Rectifier Power Sources

4 2 Years — Parts and Labor

- Auto-Darkening Weld Masks (No Labor)
- Fume Extractors - Filtair 215, Capture 5, and Industrial Collector Series

5 1 Year — Parts and Labor Unless Specified

- ArcReach Heater
- AugmentedArc, LiveArc, and MobileArc Welding Systems
- Automatic Motion Devices
- Bernard BTB Air-Cooled MIG Guns (No Labor)
- CoolBelt, PAPR Blower, and PAPR Face Shield (No Labor)
- Desiccant Air Dryer System
- 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.)**
- RFCS Foot Controls (Except RFCS-RJ45)
- Fume Extractors - Filtair 130, MWX and SWX Series, ZoneFlow Extraction Arms and Motor Control Box
- HF Units
- ICE/XT Plasma Cutting Torches (No Labor)
- Induction Heating Power Sources, Coolers **(NOTE: Digital Recorders are Warranted Separately by the Manufacturer.)**
- Insight Sensors
- Load Banks
- Motor-Driven Guns (except Spoolmate Spoolguns)
- Positioners and Controllers
- Racks (For Housing Multiple Power Sources)
- Running Gear/Trailers
- Subarc Wire Drive Assemblies
- Supplied Air Respirator (SAR) Boxes and Panels
- TIG Torches (No Labor)
- Tregaskiss Guns (No Labor)
- Water Cooling Systems
- Wireless Remote Foot/Hand Controls and Receivers
- Work Stations/Weld Tables (No Labor)

6 6 Months — Parts

- 12 Volt Automotive-Style Batteries

7 90 Days — Parts

- Accessories (Kits)
- ArcReach Heater Quick Wrap and Air Cooled Cables
- Canvas Covers
- Induction Heating Coils and Blankets, Cables, and Non-Electronic Controls
- MDX Series MIG Guns
- M-Guns
- MIG Guns, Subarc (SAW) Torches, and External Cladding Heads
- Remote Controls and RFCS-RJ45
- Replacement Parts (No labor)
- Spoolmate Spoolguns

Miller's True Blue® 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.
4. Defects caused by accident, unauthorized repair, or improper testing.

MILLER PRODUCTS ARE INTENDED FOR COMMERCIAL AND INDUSTRIAL USERS TRAINED AND EXPERIENCED IN THE USE AND MAINTENANCE OF WELDING EQUIPMENT.

The exclusive remedies for warranty claims are, at Miller's option, either: (1) repair; or (2) replacement; or, if approved in writing by Miller, (3) the pre-approved 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 use). Products may not be returned without Miller's written approval. Return shipment shall be at customer's risk and expense.

The above remedies are F.O.B. Appleton, WI, or Miller's authorized service facility. Transportation and freight are the customer's responsibility. TO THE EXTENT PERMITTED BY LAW, THE REMEDIES HEREIN ARE THE SOLE AND EXCLUSIVE REMEDIES REGARDLESS OF THE LEGAL THEORY. IN NO EVENT SHALL MILLER BE LIABLE FOR DIRECT, INDIRECT, SPECIAL, INCIDENTAL OR CONSEQUENTIAL DAMAGES (INCLUDING LOSS OF PROFIT) REGARDLESS OF THE LEGAL THEORY. ANY WARRANTY NOT PROVIDED HEREIN AND ANY IMPLIED WARRANTY, GUARANTY, OR REPRESENTATION, INCLUDING ANY IMPLIED WARRANTY OF MERCHANTABILITY OR FITNESS FOR PARTICULAR PURPOSE, ARE EXCLUDED AND DISCLAIMED BY MILLER.

Some US states do not allow limiting the duration of an implied warranty or the exclusion of certain damages, so the above limitations may not apply to you. This warranty provides specific legal rights, and other rights may be available depending on your state. In Canada, some provinces provide additional warranties or remedies, and to the extent the law prohibits their waiver, the limitations set out above may not apply. This Limited Warranty provides specific legal rights, and other rights may be available, but may vary by province.

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? The expertise of the distributor and Miller is there to help you, every step of the way.

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 Protective Equipment (PPE)
- Service and Repair Replacement Parts
- Training (Schools, Videos, Books)
- Welding Process Handbooks

To locate a Distributor or Service Agency visit 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.

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For International Locations Visit
www.MillerWelds.com

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