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**Processes**

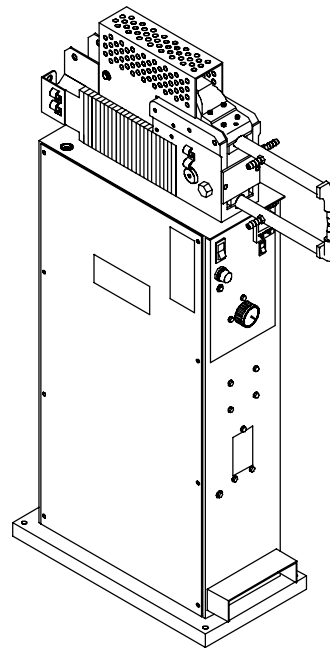


Resistance Spot  
Welding

**Description**



# SSW-2020ATT, And SSW-2040ATT



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

## OWNER'S MANUAL

File: Spot 

# From Miller to You

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

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

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

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

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



Miller is the first welding equipment manufacturer in the U.S.A. to be registered to the ISO 9001:2000 Quality System Standard.

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



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



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# SECTION 1 – SAFETY PRECAUTIONS - READ BEFORE USING

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Protect yourself and others from injury — read and follow these precautions.

## 1-1. Symbol Usage



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



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

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

 Indicates special instructions.



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

## 1-2. Resistance Spot Welding Hazards



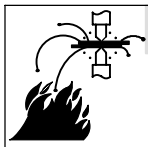
The symbols shown below are used throughout this manual to call attention to and identify possible hazards. When you see the symbol, watch out, and follow the related instructions to avoid the hazard. The safety information given below is only a summary of the more complete safety information found in the Safety Standards listed in Section 1-5. Read and follow all Safety Standards.



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



During operation, keep everybody, especially children, away.



### SPOT WELDING can cause fire or explosion.

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.

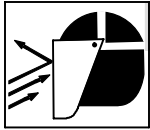
- Remove all flammables within 35 ft (10.7 m) of the weld. If this is not possible, tightly cover them with approved covers.
- Do not spot weld where flying sparks can strike flammable material.
- Protect yourself and others from flying sparks and hot metal.
- Be alert that welding sparks can easily go through small cracks and openings to adjacent areas.
- Watch for fire, and keep a fire extinguisher nearby.
- Do not weld on closed containers such as tanks, drums, or pipes, unless they are properly prepared according to AWS F4.1 (see Safety Standards).
- Do not weld where the atmosphere may contain flammable dust, gas, or liquid vapors (such as gasoline).
- 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.
- Do not exceed the equipment rated capacity.
- 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.



### ELECTRIC SHOCK can kill.

Touching live electrical parts can cause fatal shocks or severe burns. The input power circuit and machine internal circuits are also live when power is on. Incorrectly installed or improperly grounded equipment is a hazard.

- Do not touch live electrical parts.
- Wear dry, hole-free insulating gloves and body protection.
- 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, see ANSI Z49.1 listed in Safety Standards. And, do not work alone!
- Disconnect input power before installing or servicing this equipment. Lockout/tagout input power according to OSHA 29 CFR 1910.147 (see Safety Standards).
- Properly install and ground this equipment according to this 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 the 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. Check ground conductor for continuity.
- Turn off all equipment when not in use.
- For water-cooled equipment, check and repair or replace any leaking hoses or fittings. Do not use any electrical equipment if you are wet or in a wet area.
- Use only well-maintained equipment. Repair or replace damaged parts at once.
- Wear a safety harness if working above floor level.
- Keep all panels, covers, and guards securely in place.



### FLYING SPARKS can cause injury.

Very often sparks fly off from the joint area.

- Wear approved face shield or safety goggles with side shields.

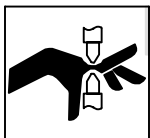
- Wear protective garments such as oil-free, flame-resistant leather gloves, heavy shirt, cuffless trousers, high shoes, and a cap. Synthetic material usually does not provide such protection.
- Protect others in nearby areas by using approved flame-resistant or noncombustible fire curtains or shields. Have all nearby persons wear safety glasses with side shields.



### HOT PARTS can cause severe burns.

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

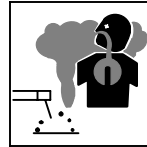
- To handle hot parts, use proper tools and/or wear heavy, insulated welding gloves and clothing to prevent burns.



### MOVING PARTS can cause injury.

The tong tips, tongs, and linkages move during operation.

- Keep away from moving parts.
- Keep away from pinch points.
- Do not put hands between tips.
- Keep all guards and panels securely in place.
- OSHA and/or local codes may require additional guarding to suit the application.



### FUMES AND GASES can be hazardous.

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

- Keep your head out of the fumes. Do not breathe the fumes.
- If inside, ventilate the area and/or use local forced ventilation at the arc to remove welding fumes and gases.
- If ventilation is poor, wear an approved air-supplied respirator.
- Read and understand the Material Safety Data Sheets (MSDSs) and the manufacturer's instructions for metals, consumables, coatings, cleaners, and degreasers.
- Work in a confined space only if it is well ventilated, or while wearing an air-supplied respirator. Always have a trained 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.

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



### FIRE OR EXPLOSION hazard.

- Do not install or place unit on, over, or near combustible surfaces.
- Do not install or operate unit near flammables.

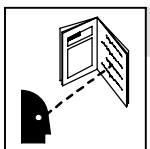
- Do not overload building wiring – be sure power supply system is properly sized, rated, and protected to handle this unit.



### FALLING EQUIPMENT can cause injury.

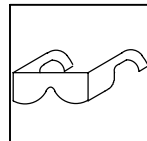
- Use equipment of adequate capacity to lift the unit.
- Have two people of adequate physical strength lift portable units.

- Secure unit during transport so it cannot tip or fall.



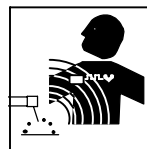
### READ INSTRUCTIONS.

- Read Owner's Manual before using or servicing unit.
- Use only genuine replacement parts from the manufacturer.



### FLYING METAL or DIRT can injure eyes.

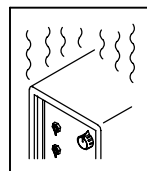
- Wear approved safety glasses with side shields or wear face shield.



### MAGNETIC FIELDS 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.




### OVERUSE can cause OVERHEATING.


- Allow cooling period; follow rated duty cycle.
- Reduce duty cycle before starting to weld again.

## 1-4. California Proposition 65 Warnings


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

 Battery posts, terminals and related accessories contain lead and lead compounds, chemicals known to the State of California to cause cancer and birth defects or other reproductive harm. Wash hands after handling.

For Gasoline Engines:

 Engine exhaust contains chemicals known to the State of California to cause cancer, birth defects, or other reproductive harm.

For Diesel Engines:

 Diesel engine exhaust and some of its constituents are known to the State of California to cause cancer, birth defects, and other reproductive harm.

## 1-5. Principal Safety Standards

*Safety in Welding, Cutting, and Allied Processes*, ANSI Standard Z49.1, from Global Engineering Documents (phone: 1-877-413-5184, website: [www.global.ihs.com](http://www.global.ihs.com)).

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

*National Electrical Code*, NFPA Standard 70, from National Fire Protection Association, P.O. Box 9101, Quincy, MA 02269-9101 (phone: 617-770-3000, website: [www.nfpa.org](http://www.nfpa.org) and [www.sparky.org](http://www.sparky.org)).

*Code for Safety in Welding and Cutting*, CSA Standard W117.2, from Canadian Standards Association, Standards Sales, 5060 Mississauga, Ontario, Canada L4W 5NS (phone: 800-463-6727 or in Toronto 416-747-4044, website: [www.csa-international.org](http://www.csa-international.org)).

*Safe Practice For Occupational And Educational Eye And Face Protection*, ANSI Standard Z87.1, from American National Standards Institute, 25 West 43rd Street, New York, NY 10036-8002 (phone: 212-642-4900, website: [www.ansi.org](http://www.ansi.org)).

*Standard for Fire Prevention During Welding, Cutting, and Other Hot Work*, NFPA Standard 51B, from National Fire Protection Association, P.O. Box 9101, Quincy, MA 02269-9101 (phone: 617-770-3000, website: [www.nfpa.org](http://www.nfpa.org)).

## 1-6. EMF Information

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

Welding current, as it flows through welding cables, will cause electromagnetic fields. There has been and still is some concern about such fields. However, after examining more than 500 studies spanning 17 years of research, a special blue ribbon committee of the National Research Council concluded that: "The body of evidence, in the committee's judgment, has not demonstrated that exposure to power-frequency electric and magnetic fields is a human-health hazard."

However, studies are still going forth and evidence continues to be examined.

**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

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**!** Se protéger, ainsi que toute autre personne travaillant sur les lieux, contre les étincelles et le métal chaud.

## 2-1. Signification des symboles



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



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

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

 Indique des instructions spécifiques.



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

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



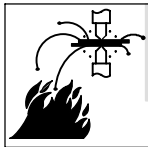
Les symboles présentés ci-après sont utilisés tout au long du présent manuel pour attirer votre attention et identifier les risques de danger. Lorsque vous voyez un symbole, soyez vigilant et suivez les directives mentionnées afin d'éviter tout danger. Les consignes de sécurité présentées ci-après ne font que résumer l'information contenue dans les normes de sécurité énumérées à la section 2-5. Veuillez lire et respecter toutes ces normes de sécurité.



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



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

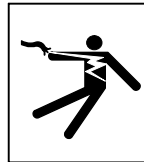


**LE SOUDAGE PAR POINTS peut provoquer un incendie ou une explosion.**

Des étincelles peuvent être projetées de la soudure. La projection d'étincelles ainsi que les pièces et équipements chauds peuvent provoquer des incendies, des brûlures et des incendies. 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.

- Déplacez toute matière inflammable se trouvant dans un périmètre de 10 m de la pièce à souder. Si cela est impossible, couvrez-les de housses approuvées et bien ajustées.
- Ne soudez pas par points dans un endroit où des étincelles peuvent tomber sur des substances inflammables.
- Protégez-vous, ainsi que toute autre personne travaillant sur les lieux, contre les étincelles et le métal chaud.
- Des étincelles du soudage peuvent facilement passer dans d'autres zones en traversant de petites fissures et des ouvertures.
- Afin d'éliminer tout risque de feu, soyez vigilant et gardez toujours un extincteur à portée de main.
- Ne soudez pas par points sur un récipient fermé tel un réservoir, un bidon ou conduites, à moins qu'ils n'aient été préparés correctement conformément à AWS F4.1 (voir les normes de sécurité).
- Ne soudez pas si l'air ambiant est chargé de particules, gaz, ou vapeurs inflammables (vapeur d'essence, par exemple).
- Avant de souder, retirez toute substance combustible de vos poches telles qu'un briquet au butane ou des allumettes.
- Une fois le travail achevé, assurez-vous qu'il ne reste aucune trace d'étincelles incandescentes ni de flammes.
- Ne dépassez pas la puissance permise de l'équipement.

- Utiliser exclusivement des fusibles ou coupe-circuits appropriés. Ne pas augmenter leur puissance; ne pas les ponter.
- Suivre les consignes de OSHA 1910.252 (a) (2) (iv) et de NFPA 51B pour travaux de soudage et prévoir un détecteur d'incendie et un extincteur à proximité.



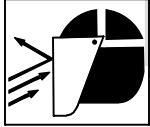
**UNE DÉCHARGE ÉLECTRIQUE peut entraîner la mort.**

Le fait de toucher à une pièce électrique sous tension peut donner une décharge fatale ou entraîner des brûlures graves. L'alimentation d'entrée et les circuits internes de l'appareil sont également actifs lorsque le poste est sous tension. Un poste

incorrectement installé ou inadéquatement mis à la terre constitue un danger.

- Ne touchez pas aux pièces électriques sous tension.
- Portez des gants isolants et des vêtements de protection secs et sans trous.
- 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, voir ANSI Z49.1 énumérées dans les normes de sécurité. En outre, ne pas travailler seul !
- Coupez l'alimentation d'entrée avant d'installer l'appareil ou d'effectuer l'entretien. Verrouillez ou étiquetez la sortie d'alimentation selon la norme OSHA 29 CFR 1910.147 (reportez-vous aux Principales normes de sécurité).
- Installez le poste correctement et mettez-le à la terre conformément aux consignes de ce manuel et aux normes nationales, provinciales et locales.
- Toujours vérifier la terre du cordon d'alimentation - Vérifier et s'assurer que le fil de terre du cordon d'alimentation est bien raccordé à la borne de terre du sectionneur ou que la fiche du cordon est raccordée à une prise correctement mise à la terre.
- Avant d'effectuer les connexions d'alimentation, vous devez connecter en premier lieu le fil de terre - contrôlez les connexions.
- Les câbles doivent être exempts d'humidité, d'huile et de graisse; protégez-les contre les étincelles et les pièces métalliques chaudes.
- Assurez-vous régulièrement que les câbles d'alimentation et de masse ne sont pas endommagés ou dénudés par endroit. Remplacez-les immédiatement si c'est le cas : un câble dénudé peut provoquer la mort. Contrôlez la continuité de la mise à la terre.
- L'équipement doit être hors tension lorsqu'il n'est pas utilisé.

- Dans le cas d'équipements refroidis par eau, contrôlez les conduites et raccords; remplacez-les s'ils présentent des fuites. N'utilisez pas d'équipement électrique si vous êtes mouillé ou dans une zone humide.
- Utilisez uniquement un équipement en bonne condition. Réparez ou remplacez immédiatement toute pièce endommagée.
- Portez un harnais de sécurité si vous devez travailler au-dessus du sol.
- Maintenez en place les panneaux, couvercles et protections de sécurité.



### LES ÉTINCELLES VOLANTES risquent de provoquer des blessures.

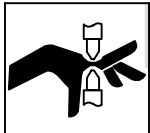
Des étincelles peuvent jaillir de la soudure.

- Portez une visière ou des lunettes de sécurité avec des écrans latéraux approuvés.
- Portez un équipement de protection: gants en cuir résistant au feu, chemise épaisse, pantalon sans revers, chaussures de sécurité et casquette. Les matériaux synthétiques ne garantissent pas une bonne protection.
- Protégez les autres occupants du local à l'aide d'un rideau ou d'un écran ignifuge approprié. Assurez-vous que ces personnes portent des lunettes de sécurité avec protections latérales.



### DES PIÈCES CHAUDES peuvent provoquer des brûlures graves.

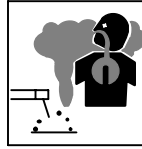
- Ne pas toucher des parties chaudes à mains nues.
- Prévoir une période de refroidissement avant d'utiliser le pistolet ou la torche.
- Ne pas toucher aux pièces chaudes, utiliser les outils recommandés et porter des gants de soudage et des vêtements épais pour éviter les brûlures.



### DES ORGANES MOBILES peuvent provoquer des blessures.

Pendant le soudage, les bras et électrodes se déplacent.

- Ne pas s'approcher des organes mobiles.
- Ne pas s'approcher des points de coincement.
- Ne placez pas les mains entre les électrodes.
- Maintenez en place les panneaux et protections de sécurité.
- Les applications peuvent nécessiter des protections supplémentaires d'après les codes de sécurité locales.



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

Le soudage génère des fumées et des gaz. Leur inhalation peut être dangereuse pour la santé.

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

## 2-3. Dangers supplémentaires en relation avec l'installation, le fonctionnement et la maintenance



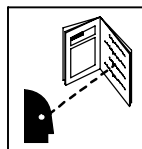
### Risque D'INCENDIE OU D'EXPLOSION.

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



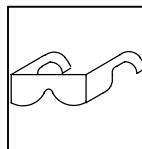
### LA CHUTE DE L'ÉQUIPEMENT peut blesser.

- Utiliser un engin d'une capacité appropriée pour soulever l'appareil.
- Faites déplacer les équipements portables par deux personnes dotées d'une force suffisante.
- Durant le transport, immobilisez l'appareil pour éviter qu'il ne bascule.



### LIRE LES INSTRUCTIONS.

- Lire le manuel d'utilisation avant d'utiliser ou d'intervenir sur l'appareil.
- N'utiliser que les pièces de rechange recommandées par le constructeur.



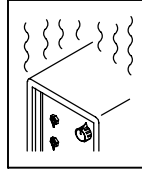
### DES PIÈCES DE MÉTAL ou DES SALETÉS peuvent provoquer des blessures aux yeux.

- Porter des lunettes de sécurité à coques latérales ou un écran facial.



### LES CHAMPS MAGNETIQUES peuvent affecter des implants médicaux.

- Porteur de simulateur cardiaque ou autre implants médicaux, rester à distance.
- 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.



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

- Prévoir une période de refroidissement; respecter le cycle opératoire nominal.
- Réduire le facteur de marche avant de poursuivre le soudage.

## 2-4. Proposition californienne 65 Avertissements

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

**⚠ Les batteries, les bornes et autres accessoires contiennent du plomb et des composés à base de plomb, produits chimiques dont l'État de Californie reconnaît qu'ils provoquent des cancers et des malformations congénitales ou autres problèmes de procréation. Se laver les mains après manipulation.**

Pour les moteurs à essence :

**⚠ Les gaz d'échappement des moteurs contiennent des produits chimiques dont l'État de Californie reconnaît qu'ils provoquent des cancers et des malformations congénitales ou autres problèmes de procréation.**

Pour les moteurs diesel :

**⚠ Les gaz d'échappement des moteurs diesel et certains de leurs composants sont reconnus par l'État de Californie comme provoquant des cancers et des malformations congénitales ou autres problèmes de procréation.**

## 2-5. Principales normes de sécurité

*Safety in Welding, Cutting, and Allied Processes*, ANSI Standard Z49.1, de Global Engineering Documents (téléphone : 1-877-413-5184, site Internet : [www.global.ihs.com](http://www.global.ihs.com)).

OSHA, Occupational Safety and Health Standards for General Industry, Title 29, Code of Federal Regulations (CFR), Part 1910, Subpart Q, and Part 1926, Subpart J, de U.S. Government Printing Office, Superintendent of Documents, P.O. Box 371954, Pittsburgh, PA 15250-7954 (téléphone : 1-866-512-1800) (il y a 10 bureaux régionaux--le téléphone de la région 5, Chicago, est 312-353-2220, site Internet : [www.osha.gov](http://www.osha.gov)).

*National Electrical Code*, NFPA Standard 70, de National Fire Protection Association, P.O. Box 9101, Quincy, MA 02269-9101 (téléphone : 617-770-3000, site Internet : [www.nfpa.org](http://www.nfpa.org) et [www.sparky.org](http://www.sparky.org)).

*Code for Safety in Welding and Cutting*, CSA Standard W117.2, de Canadian Standards Association, Standards Sales, 5060 Mississauga, Rexdale, Ontario, Canada L4W 5NS (téléphone : 800-463-6727 ou à Toronto 416-747-4044, site Internet : [www.csa-international.org](http://www.csa-international.org)).

*Safe Practice For Occupational And Educational Eye And Face Protection*, ANSI Standard Z87.1, de American National Standards Institute, 25 West 43rd Street, New York, NY 10036-8002 (téléphone : 212-642-4900, site Internet : [www.ansi.org](http://www.ansi.org)).

*Standard for Fire Prevention During Welding, Cutting, and Other Hot Work*, NFPA Standard 51B, de National Fire Protection Association, P.O. Box 9101, Quincy, MA 02269-9101 (téléphone : 617-770-3000, site Internet : [www.nfpa.org](http://www.nfpa.org)).

## 2-6. Information sur les champs électromagnétiques

Considérations sur le soudage et les effets de basse fréquence et des champs magnétiques et électriques.

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

cours et les preuves continuent à être examinées. En attendant que les conclusions finales de la recherche soient établies, il vous serait souhaitable de réduire votre exposition aux champs électromagnétiques pendant le soudage ou le coupage.

### 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.

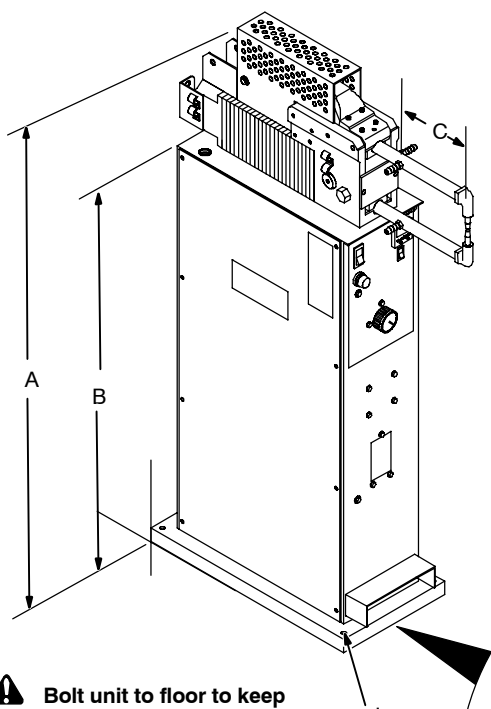
# SECTION 3 – INSTALLATION

## 3-1. Specifications

ATT Models	Input Voltage 50/60 Hz AC 1-Phase	Input Amps	Work Capacity Combined Thickness Mild Steel	Rated Output At Listed Duty Cycle*	Rated Output Amperes At Listed Tong Length			Open-Circuit Voltage
					6 in (152 mm)	12 in (305 mm)	18 in (457 mm)	
SSW-2020	230	90	1/4 in (6.3 mm)	20 kVA 40%	12,500	10,500	9000	3.80
SSW-2040	460	45	1/4 in (6.3 mm)	20 kVA 40%	12,500	10,500	9000	3.80

\*Based on 10 second time period; means unit can weld for 4 seconds out of each 10 second time period.

## 3-2. Dimensions And Weight



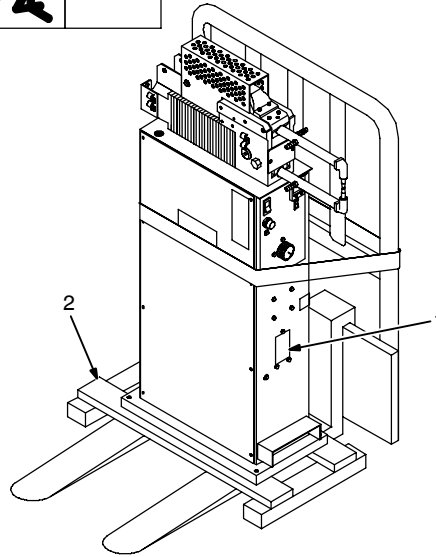
**⚠ Bolt unit to floor to keep it from falling over.**

Dimensions	
A	49 in (1245 mm)
B	37-1/8 in (943 mm)
C	*
D	10-7/8 in (276 mm)
E	9-1/2 in (241 mm)
F	11/16 in (18 mm)
G	19-1/2 in (495 mm)
H	20-7/8 in (530 mm)
I	11/16 in (18 mm)
J	1/2 in (13 mm) Dia. 4 Holes
Weight	
SSW-2020, 2040	185 lb (84 kg)

\*Dimension depends upon length of tongs.  
See Parts List for sizes.

Ref. 802 751

### 3-3. Moving The Spot Welder



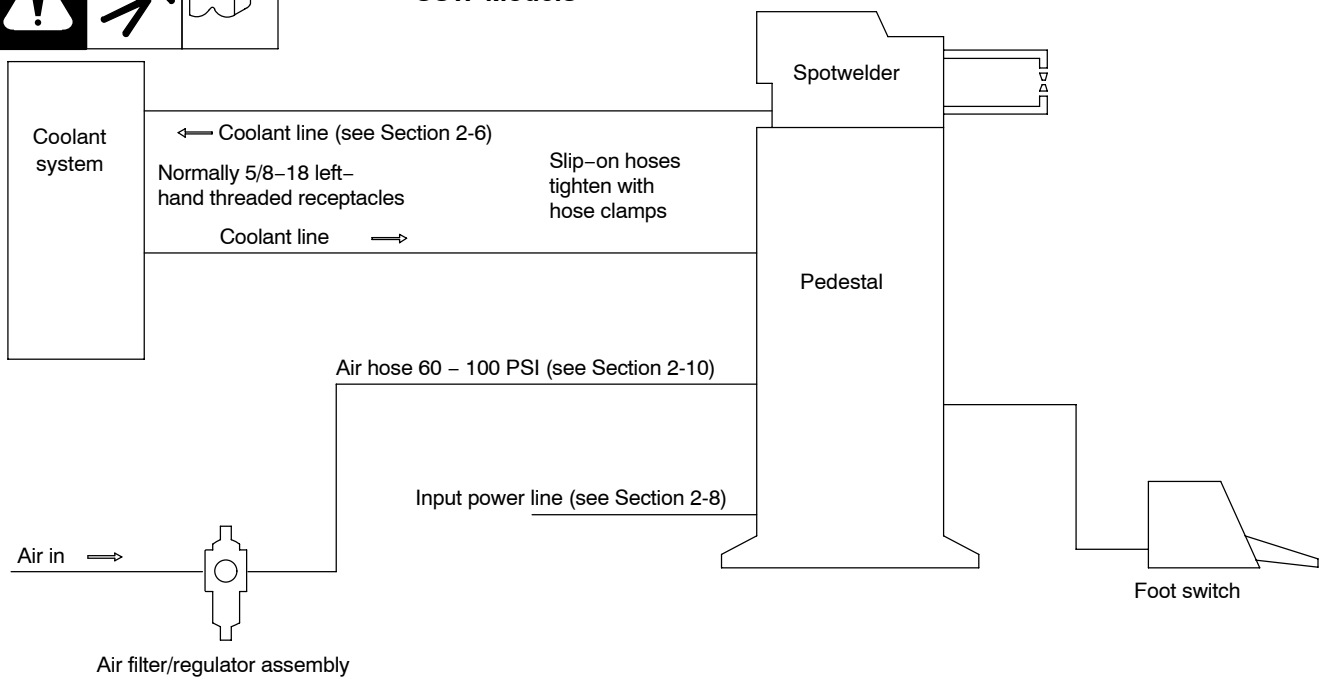
- 1 Rating Label  
Locate unit near correct input power supply.
- 2 Skid  
Place unit on skid and secure with straps.

802 752

### 3-4. Overview Of System Connections

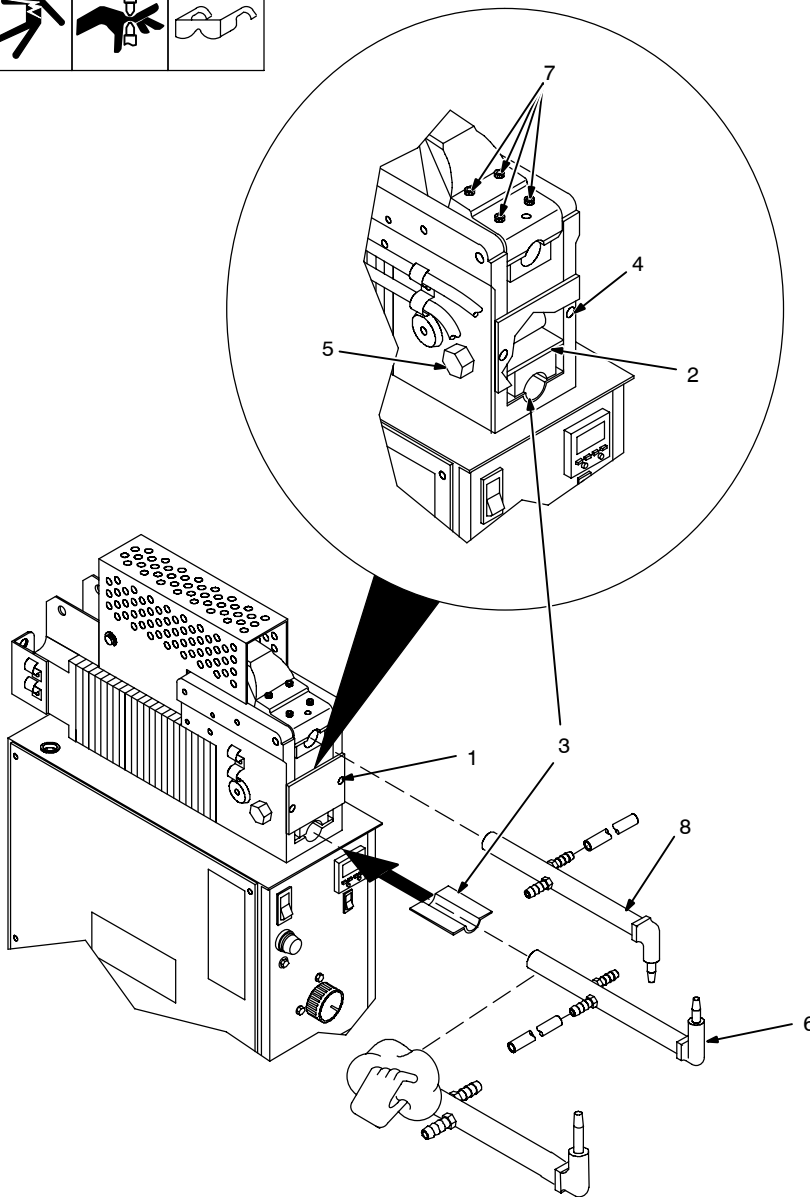


#### SSW Models



802 792-A

### 3-5. Installing Or Cleaning Tongs



**⚠ Turn off unit and disconnect input power.**

*Be sure tong ends are clean and not corroded before installing. Clean tongs with fine steel wool.*

#### Bottom Tong Installation:

- 1 Spatter Guard
- 2 Insulating Strip

Check to see that insulating strip is not cracked.

**⚠ Electric shock hazard and possible transformer damage from incorrect part. Do not replace polyester glass insulating strip with a metal strip – use only proper parts from Parts List.**

- 3 Bottom Tong Insulation

Make sure bottom insulation is in place.

- 4 Setscrew

Loosen setscrew.

- 5 Cam Nut

Turn nut counterclockwise to release pressure on bottom tong.

- 6 Bottom Tong

Slide tong into bottom tongue holder as far as possible, and position so that tip is pointing straight up.

Turn cam nut clockwise to secure tong in holder.

Tighten setscrew to lock cam in place.

#### Top Tong Installation:

- 7 Top Tong Securing Screws

Loosen the four screws.

- 8 Top Tong

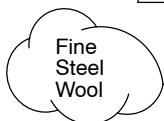
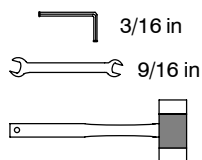
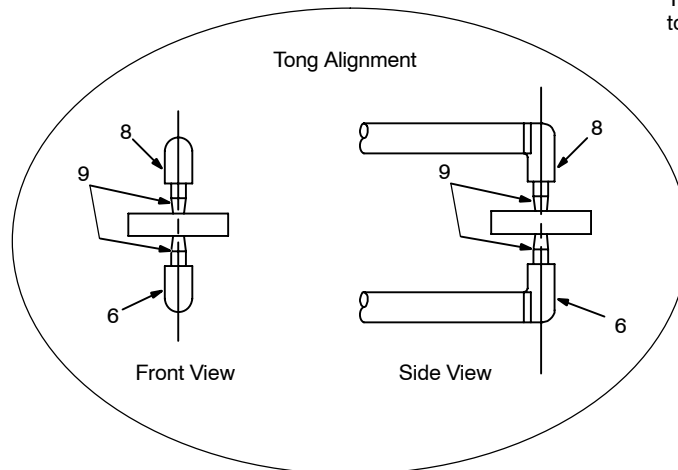
- 9 Tips

Slide tong into top tongue holder as far as necessary, so that tip mates with bottom tip when tongs are closed.

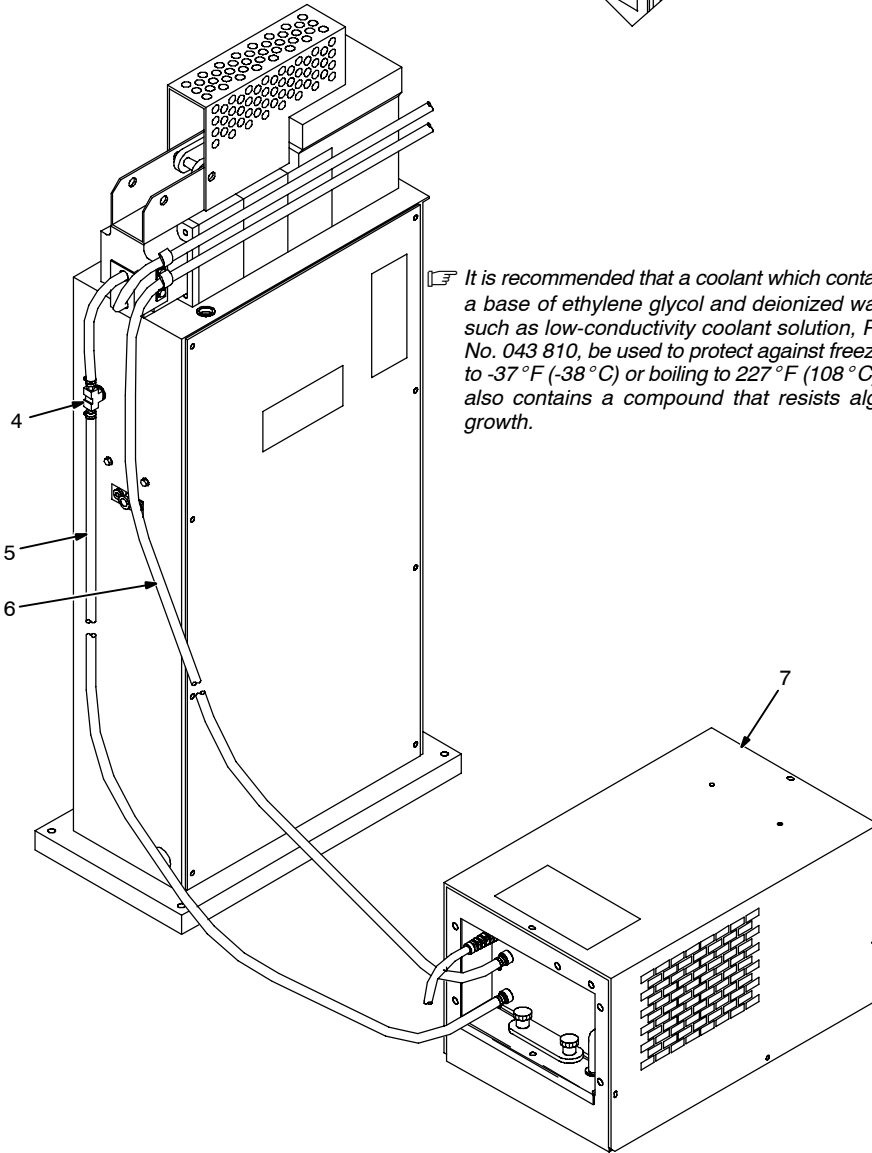
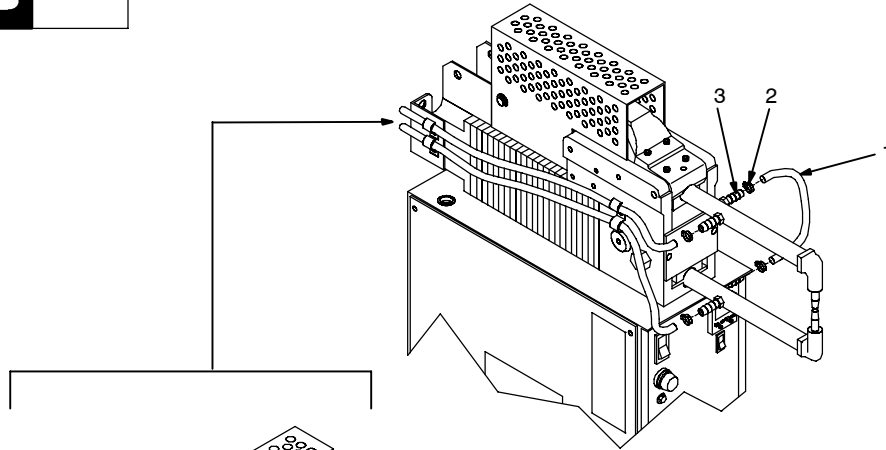
Adjust tong positions to line up centers of tips as shown.

Tighten securing screws to lock tong in place.

**⚠ OSHA and/or local codes may require additional guarding to suit the application.**



### 3-6. Coolant Connections



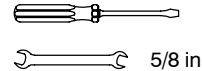
**⚠ Turn off power and coolant supply until installation is complete.**

- 1 Tong Coolant Hose
- 2 Hose Clamp
- 3 Barbed Fitting
- 4 Coolant-In Fitting
- 5 Coolant-In Hose
- 6 Coolant-Out Hoses
- 7 Coolant System

Connect hoses to coolant system (see coolant system owner's manual).

**ℹ** This unit is equipped with a water control pressure switch to insure proper cooling. If there is not enough pressure to close the switch, the unit will not weld. For proper operation, coolant supply must have a minimum pressure of 30 psi (207 kPa), a maximum temperature of 86° F (30° C), and a flow rate of 2.5 to 3 qt/min (2.4 to 2.8 L/min).

**ℹ** It is recommended that a coolant which contains a base of ethylene glycol and deionized water such as low-conductivity coolant solution, Part No. 043 810, be used to protect against freezing to -37° F (-38° C) or boiling to 227° F (108° C). It also contains a compound that resists algae growth.



Ref. 802 755 / Ref. 802 758-A

### 3-7. Air Connections

See manufacturer's instructions supplied with filter/regulator (FR) assembly for complete installation and preparation instructions.

**⚠ Turn off power and air supply until installation is complete.**

- 1 Air Hoses (Customer Supplied)

Obtain two hoses of correct size, type, and length. Air-In fittings on control boxes have 1/4 in pipe threads.

- 2 Air Filter

Connect one hose to air supply and other end to input fitting on the regulator.

- 3 Regulator Plug
- 4 Regulator
- 5 Pressure Gauge

Remove appropriate regulator plug and install pressure gauge.

Set regulator so air pressure is in the 60 to 100 psi (414 to 689 kPa) range.

- 6 Air-In Fitting

Connect one end of remaining hose to regulator output fitting, and connect other end to Air-In fitting.

Ref. 802 761-A

### 3-8. Electrical Service Guide

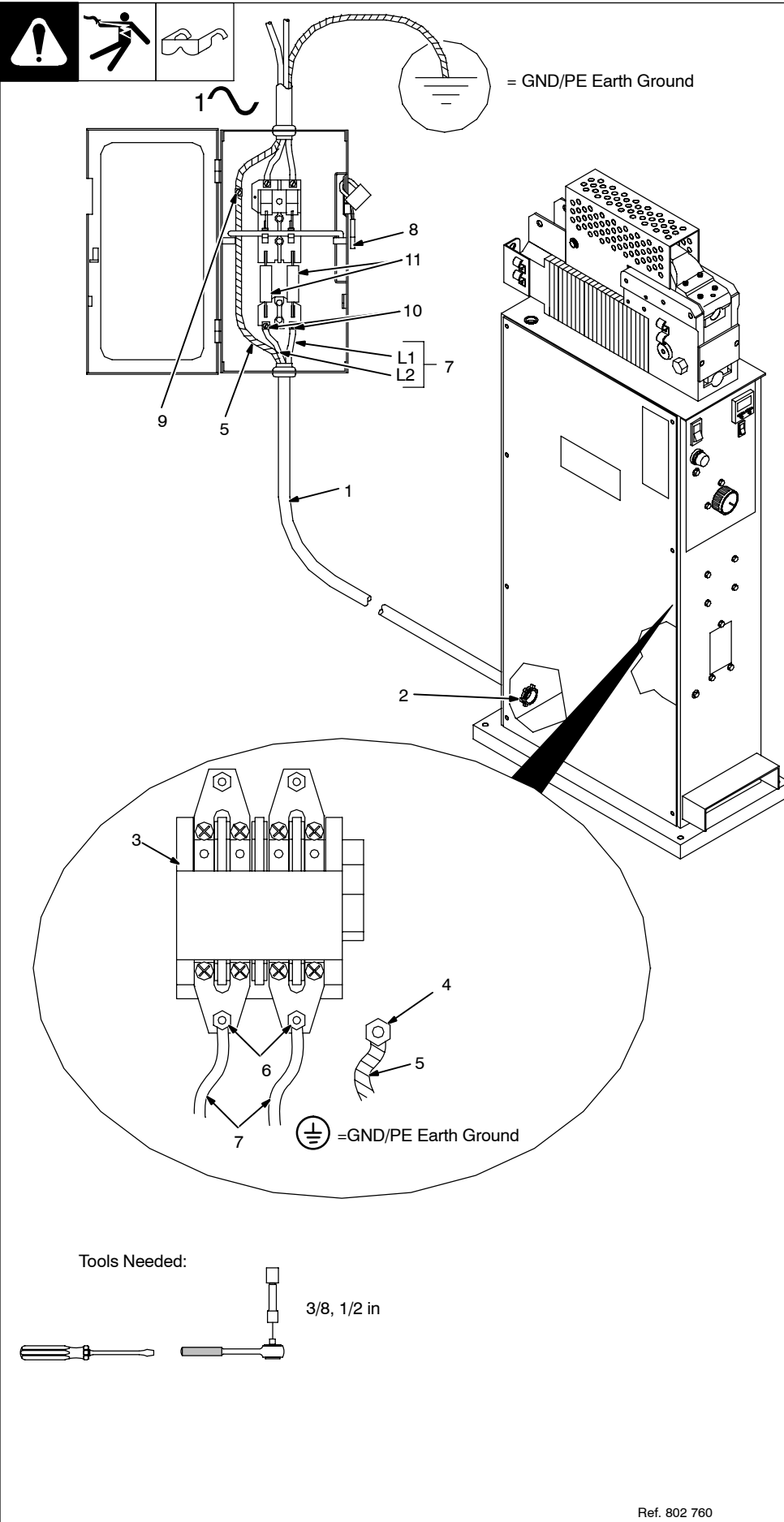
**⚠ Failure to follow these electrical service guide recommendations could create an electric shock or fire hazard. These recommendations are for a dedicated branch circuit sized for the rated output and duty cycle of the welding power source.**

	<b>20 KVA Single Phase</b>	
<b>Input Voltage</b>	230	460
<b>Input Amperes At Rated Output</b>	90	45
<b>Max Recommended Standard Fuse Rating In Amperes <sup>1</sup></b>		
<b>Time-Delay <sup>2</sup></b>	110	50
<b>Normal Operating <sup>3</sup></b>	125	70
<b>Min Input Conductor Size In AWG/Kcmil <sup>4</sup></b>	6	10
<b>Max Recommended Input Conductor Length In Feet (Meters)</b>	78 (24)	131 (40)
<b>Min Grounding Conductor Size In AWG/Kcmil <sup>4</sup></b>	6	10

Reference: 2005 National Electrical Code (NEC)

- 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".
- 3 "Normal Operating" (general purpose - no intentional delay) fuses are UL class "K5" (up to and including 60 amp), and UL class "H" (65 amp and above).
- 4 Conductor data in this section specifies conductor size (excluding flexible cord or cable) between the panelboard and the equipment per NEC Table 310.16. If a flexible cord or cable is used, minimum conductor size may increase. See NEC Table 400.5(A) for flexible cord and cable requirements.

### 3-9. Connecting 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.**

**⚠ 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.

Remove left side panel.

1 Input Power Conductors (Customer Supplied Cord)

Select size and length of conductors using Section 3-8. Conductors must comply with national, state, and local electrical codes. If applicable, use lugs of proper amperage capacity and correct hole size.

#### Welding Power Source Input Power Connections

2 Strain Relief

Route conductors (cord) through strain relief and tighten.

3 Contactor

4 Machine Grounding Terminal

5 Green Or Green/Yellow Grounding Conductor

Connect green or green/yellow grounding conductor to welding power source grounding terminal first.

6 Welding Power Source Line Terminals

7 Input Conductors L1 And L2

Connect input conductors L1 and L2 to welding power source line terminals.

Reinstall side panel.

#### Disconnect Device Input Power Connections

8 Disconnect Device (switch shown in OFF position)

9 Disconnect Device (Supply) Grounding Terminal

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

10 Disconnect Device Line Terminals

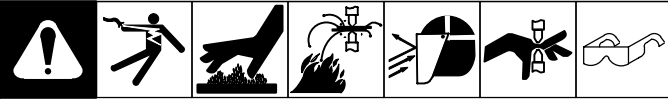
Connect input conductors L1 And L2 to disconnect device line terminals.

11 Over-Current Protection

Select type and size of over-current protection using Section 3-8 (fused disconnect switch shown).

Close and secure door on line disconnect device. Remove lockout/tagout device, and place switch in the On position.

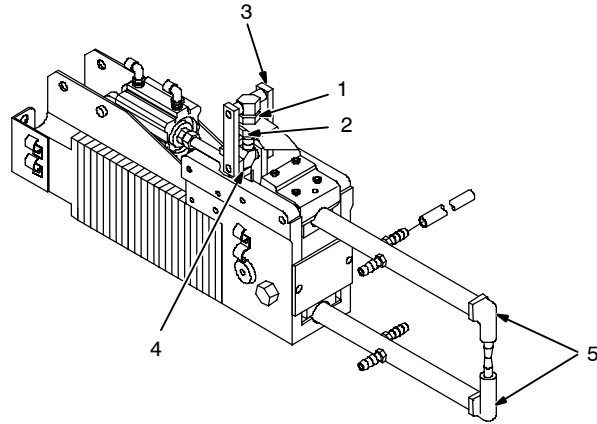
### 3-10. Adjusting Tong Pressure



**⚠ Turn off power before making adjustments.**

- 1 Top Nut
- 2 Bottom Nut
- 3 Top Linkage
- 4 Bottom Linkage
- 5 Tongs

13/16 in

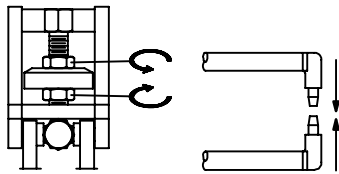


*Tong pressure must be checked and/or set before operation. Correct tong pressure is necessary to create a quality weld and to prevent damage to tips.*

*Too much tong pressure causes the weld nugget to dimple and material to splash out around the nugget area.*

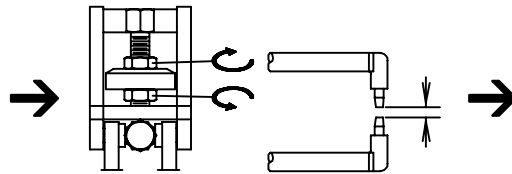
*If tong pressure is too weak, parts are loose when the tongs are closed, severe arcing occurs between workpieces, and no weld can be made.*

**Step 1**



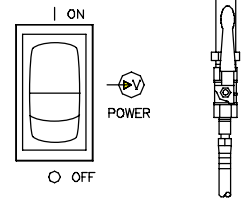
Loosen both nuts and push tong tips together.

**Step 2**



Begin to tighten top nut. This causes tong tips to open. Stop when opening is a little less than thickness of material to be welded. Tighten bottom nut.

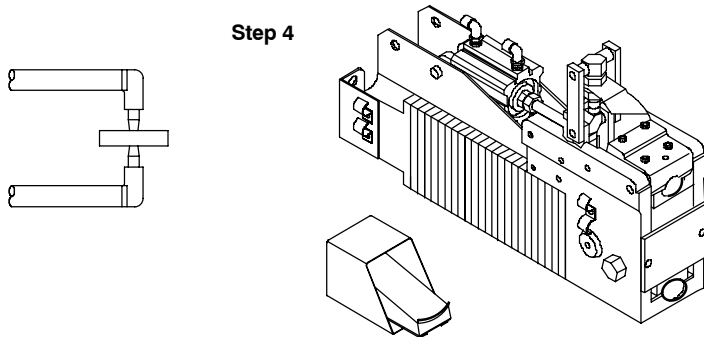
**Step 3**



Set controls.

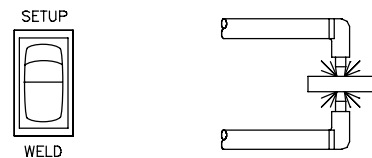
Air Supply On

**Step 4**



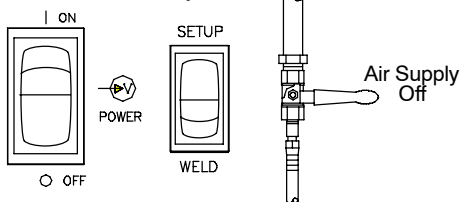
Place material to be welded between tong tips, and press remote foot control (see Section 4-1).

**Step 5**



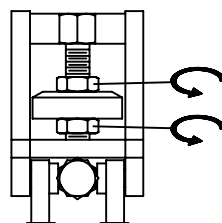
If tong pressure appears correct, place Weld switch in Weld position and try a sample weld according to Section 4-1.

**Step 6**



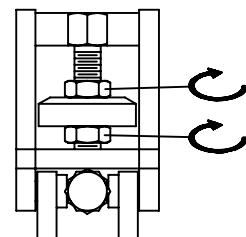
Set controls. If tong pressure is correct, stop here. If further adjustment is required, go to next step.

**Step 7**



To **INCREASE** tong pressure, loosen top nut 1/4 turn. Tighten bottom nut, turn air and Power On, and go to Step 4.

**Step 8**

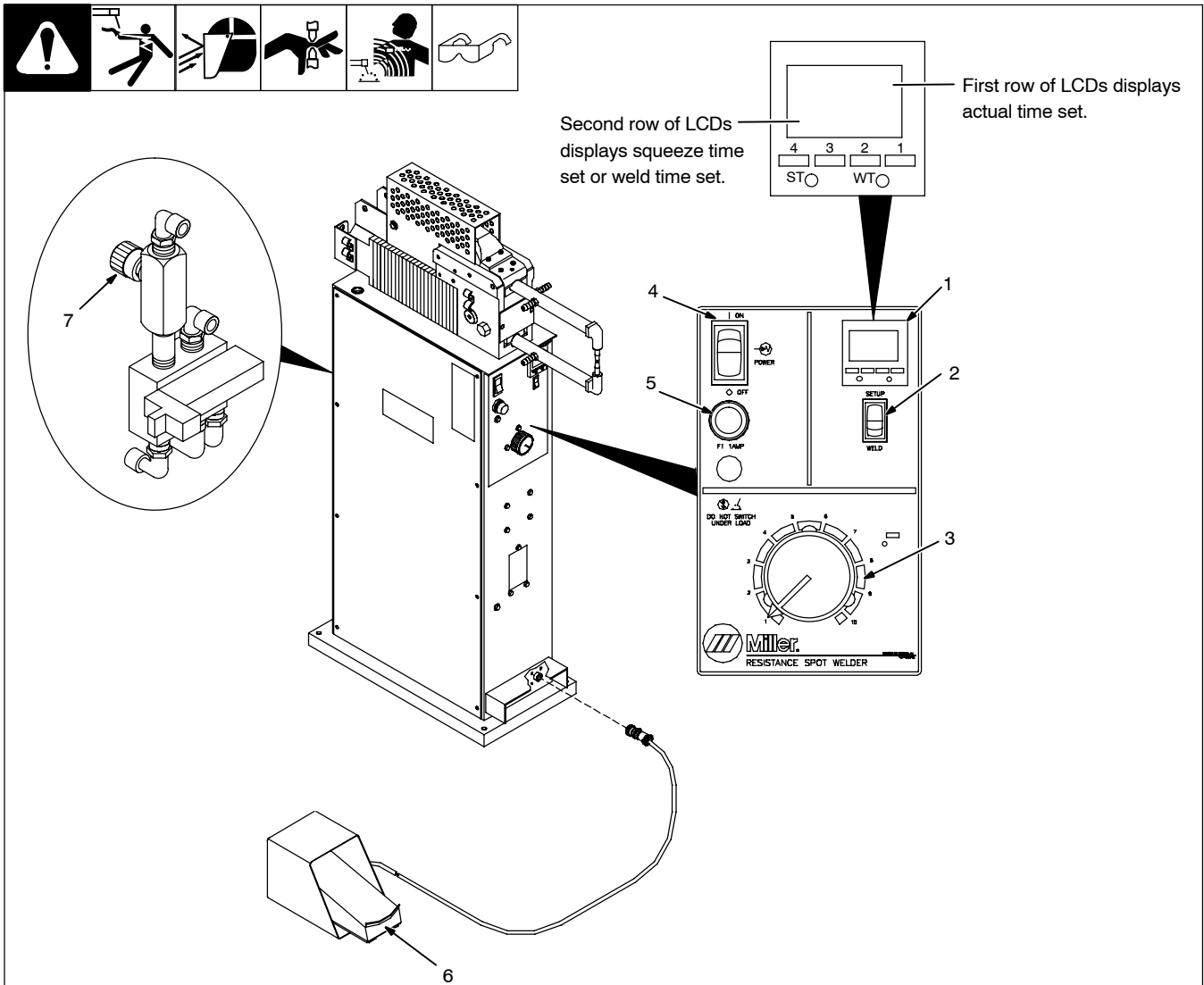


To **DECREASE** tong pressure, loosen bottom nut 1/4 turn. Tighten top nut, turn air and Power On, and go to Step 4.

Ref. 802 762-A / Ref. 161 768-B

# SECTION 4 – OPERATION

## 4-1. Controls



802 751 / 200 264-A / Ref. 802 765-C

### 1 Time Control

**Squeeze Time (ST)** - Use control to set enough time for tongs to close and apply full pressure to the work before weld amperage starts. Push ST button, then use buttons 3, 2, 1 to select squeeze time from 0 to 9.99 seconds. Squeeze time begins when the Remote Foot Switch or Start Switch is pressed.

**Weld Time (WT)** - Push WT button, then use buttons 3, 2, 1 to select spot weld time from 0 to 9.99 seconds.

Weld time begins at the end of the squeeze time cycle.

### 2 Weld Switch

Use control to check tong pressure and alignment without weld amperage present at the tongs. When the switch is in the Set Up position, pressing the Remote Foot Switch

closes the tongs without starting weld amperage. When the switch is in the Weld position, tongs have weld amperage present after the squeeze time has ended.

### 3 Weld Amperage Control

Turn clockwise to increase current. Changing the weld current value does not affect the duty cycle rating. The scale is for reference only.

### 4 Power/Pilot Light/Supplementary Protector Switch

Use switch to turn On power and pilot light. See Section 5-2 for supplementary protector operation.

### 5 Fuse F1

See Section 5-2.

### 6 Remote Foot Switch

Use remote foot switch to close tongs and start squeeze time.

If switch is released before squeeze time ends, the tongs open, and the unit resets for another weld cycle.

If switch is held until squeeze time ends and weld time starts, the switch may be released, and the tongs will stay closed until weld time ends.

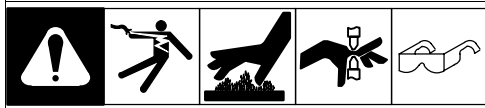
If workpiece is to be left between tongs after weld time ends, switch must be held for whatever hold time is desired after welding ends.

### 7 Speed Adjustment Knob

Turn knob counterclockwise to increase speed at which tongs close.

# SECTION 5 – MAINTENANCE AND TROUBLESHOOTING

## 5-1. Maintenance



**⚠ Disconnect input power before maintaining.**

*📅 During heavy service, maintain monthly.*

🕒	✓ = Check * To be done by Factory Authorized Service Agent	◇ = Change	● = Clean	☆ = Replace	Reference
Every 3 Months	 ● - Oil unit	 ✓ - Inspect Tips		 ✓ ☆	Section 5-3

## 5-2. Overload Protection



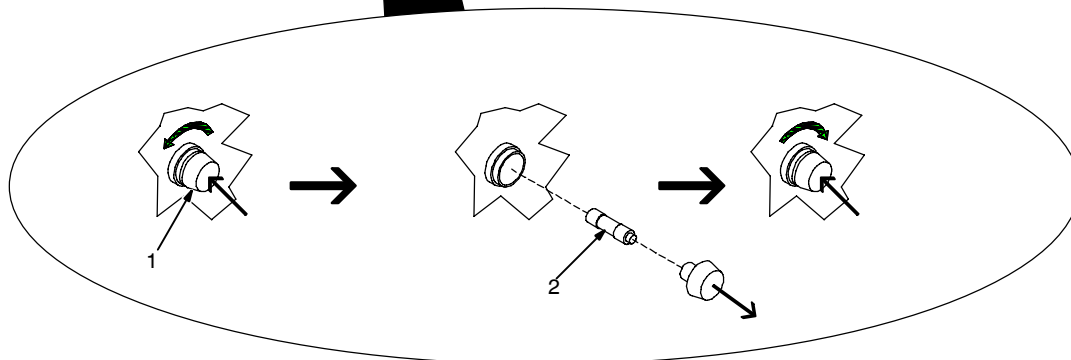
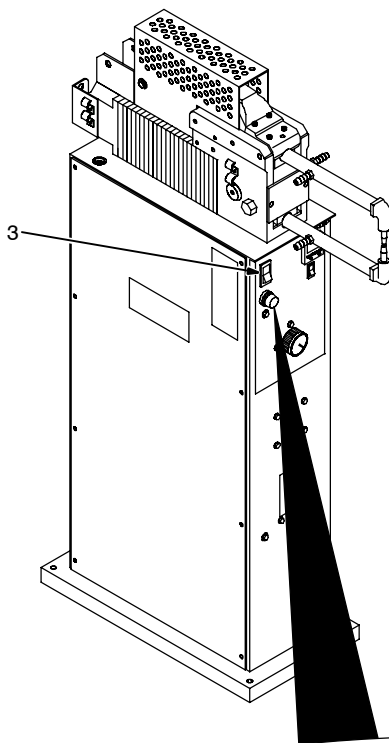
**⚠ Turn Off power before checking fuse.**

Fuse F1 and Power/pilot light/supplementary protector switch S1 protect the control circuitry.

If either the fuse or the supplementary protector opens, the unit shuts down. Turn switch On to reset protector. To replace a fuse, proceed as shown:

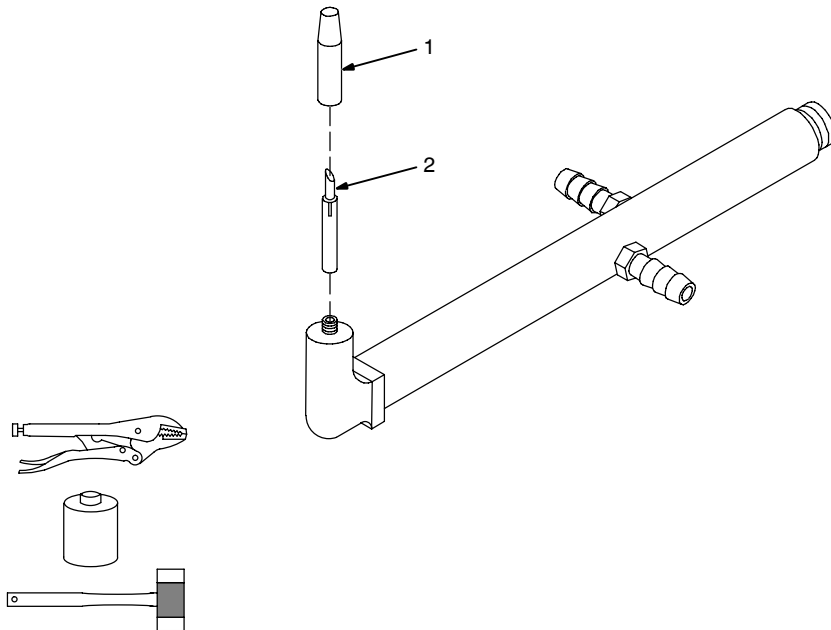
- 1 Fuse Holder Cover
- 2 Fuse (See Parts List)
- 3 Power/Pilot Light /Supplementary Protector Switch

If a fuse continues to open, or the supplementary protector continues to trip, contact Factory Authorized Service Agent.



## 5-3. Installing Or Dressing Tips

### A. Installing Tips



**⚠ Turn off power before removing tips.**

- 1 Tip
- 2 Telescoping Tube

#### Removal:

Tips have a Morse Taper and a press fit.

*Use a vice grip pliers to rotate and loosen tips. Once loose, pull tips straight out.*

**NOTICE** – Do not move tips from side to side when removing or telescoping tube will snap off.

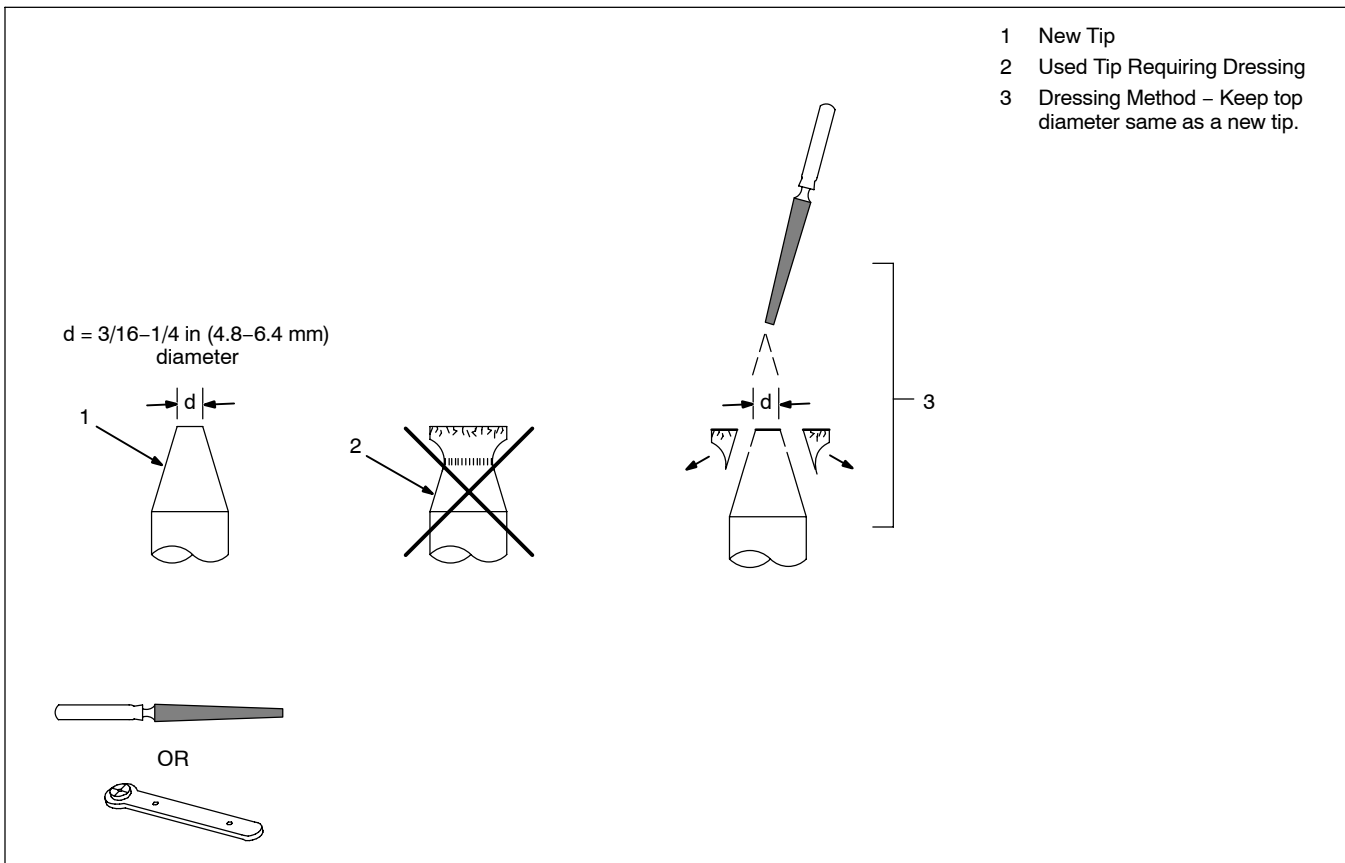
#### Installation:

Coat taper area of tip with pipe sealant compound. Pull telescoping tube all the way up, but not out. Use a plastic or leather hammer to tap tip into seat. Run water through tong to check for leaks.


Repeat if necessary.

ST-801 437

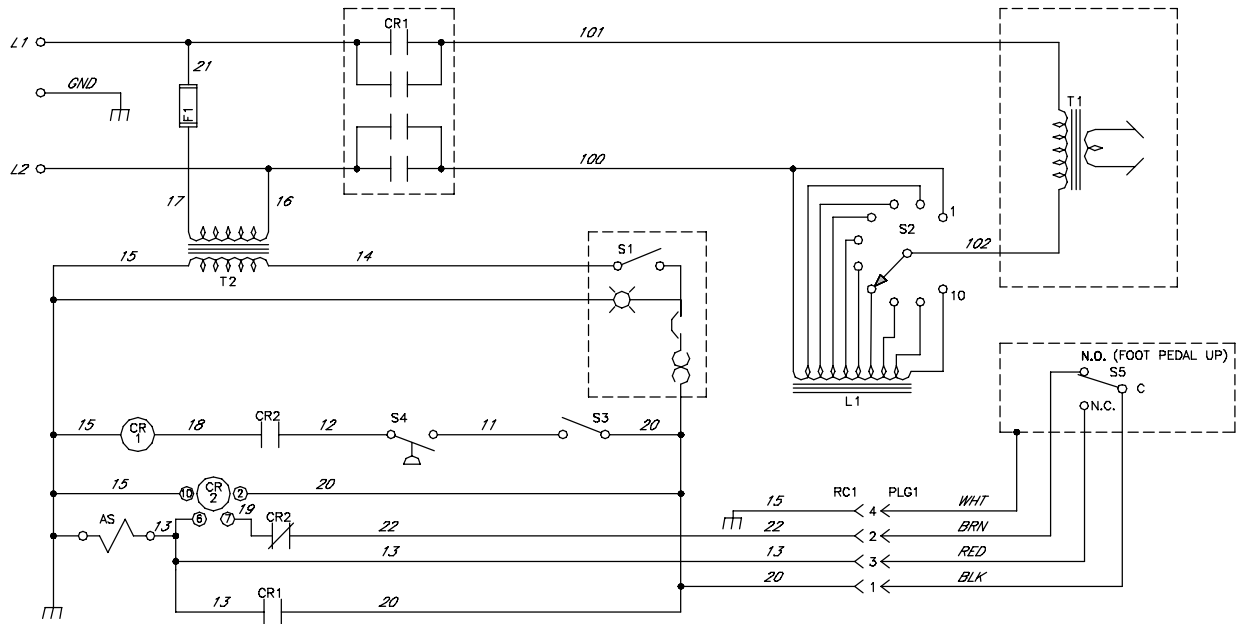
### B. Dressing Tips



## 5-4. Troubleshooting

	
Trouble	Remedy
No weld output; pilot light Off.	Check line fuses, and replace if necessary (see Section 3-9).
	Check fuse F1 and/or Power/pilot light/circuit breaker switch S1, and replace if necessary (see Section 5-2).
	Turn On Power/pilot light/supplementary protector switch S1.
No weld output, pilot light on.	Check for proper coolant supply pressure (see Section 3-6).
	Place Weld Switch S3 in the Weld position (see Section 4-1).
	Have Factory Authorized Service Agent check contactor W.
Low weld output; pilot light On.	Dress or replace tips (see Section 5-3).
	Remove and clean ends of tongs and tong holders (see Section 3-5).
	Adjust tong pressure (see Section 3-10).
Longer than normal Weld Time required.	Dress or replace tong tips (see Section 5-3).
	Clean workpieces.
	Adjust tong pressure (see Section 3-10).
	Check input line voltage.
Burn through at point of weld.	Shorten weld time (see Section 4-1).
	Adjust tong pressure (see Section 3-10).
	Dress or replace tong tips (see Section 5-3).
	Realign tips (see Section 3-5).
Tongs close too slowly.	Check air pressure at source and at regulator (see Section 3-7).
	Have Factory Authorized Service Agent check and replace air valve, if necessary.

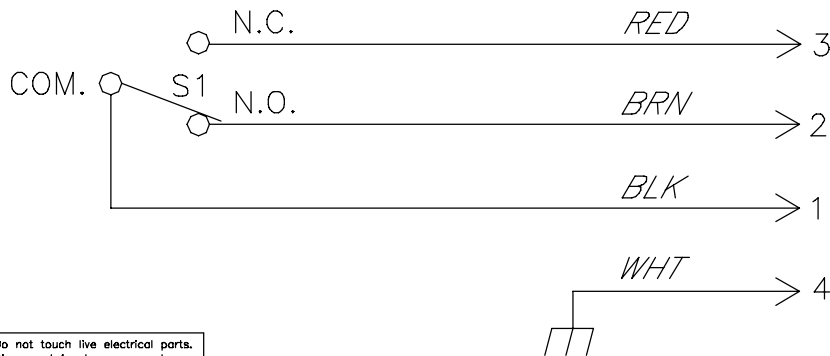
# SECTION 6 – ELECTRICAL DIAGRAMS



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

199 202

**Figure 6-1. Circuit Diagram For Stationary Models**



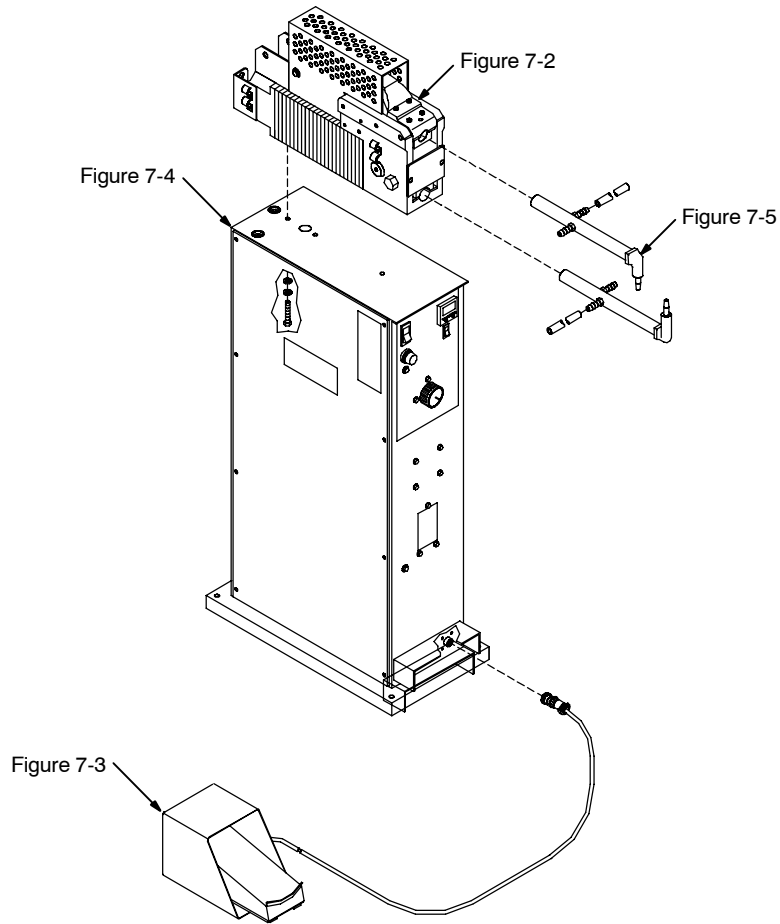
<p><b>WARNING</b> ELECTRIC SHOCK HAZARD</p>	<ul style="list-style-type: none"> <li>Do not touch live electrical parts.</li> <li>Disconnect input power or stop engine before servicing.</li> <li>Do not operate with covers removed.</li> <li>Have only qualified persons install, use, or service this unit.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

200 302-A

**Figure 6-2. Circuit Diagram For Foot Control**

# SECTION 7 – PARTS LIST

☞ Hardware is common and not available unless listed.



**Figure 7-1. Main Assembly**

802 764

Part No.	Description	Quantity	
		Model	SSW
<b>Figure 7-1. Main Assembly</b>			
.. 209 661	.. FILTER/REGULATOR .....		1
.. Fig 7-2	.. RESISTANCE SPOT WELDER, air .....		1
.. Fig 7-4	.. PEDESTAL, air operated .....		1
.. Fig 7-3	.. RFSW-10/20 .....		1
.. Fig 7-5	.. TONGS, (Optional) .....		1
.. 603 105	.. HOSE, nprn brd No. 1 x .312 ID (order by ft) .....		7ft
.. 010 323	.. CLAMP, hose .250 -.625clp dia .....		8

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

☐ Hardware is common and not available unless listed.

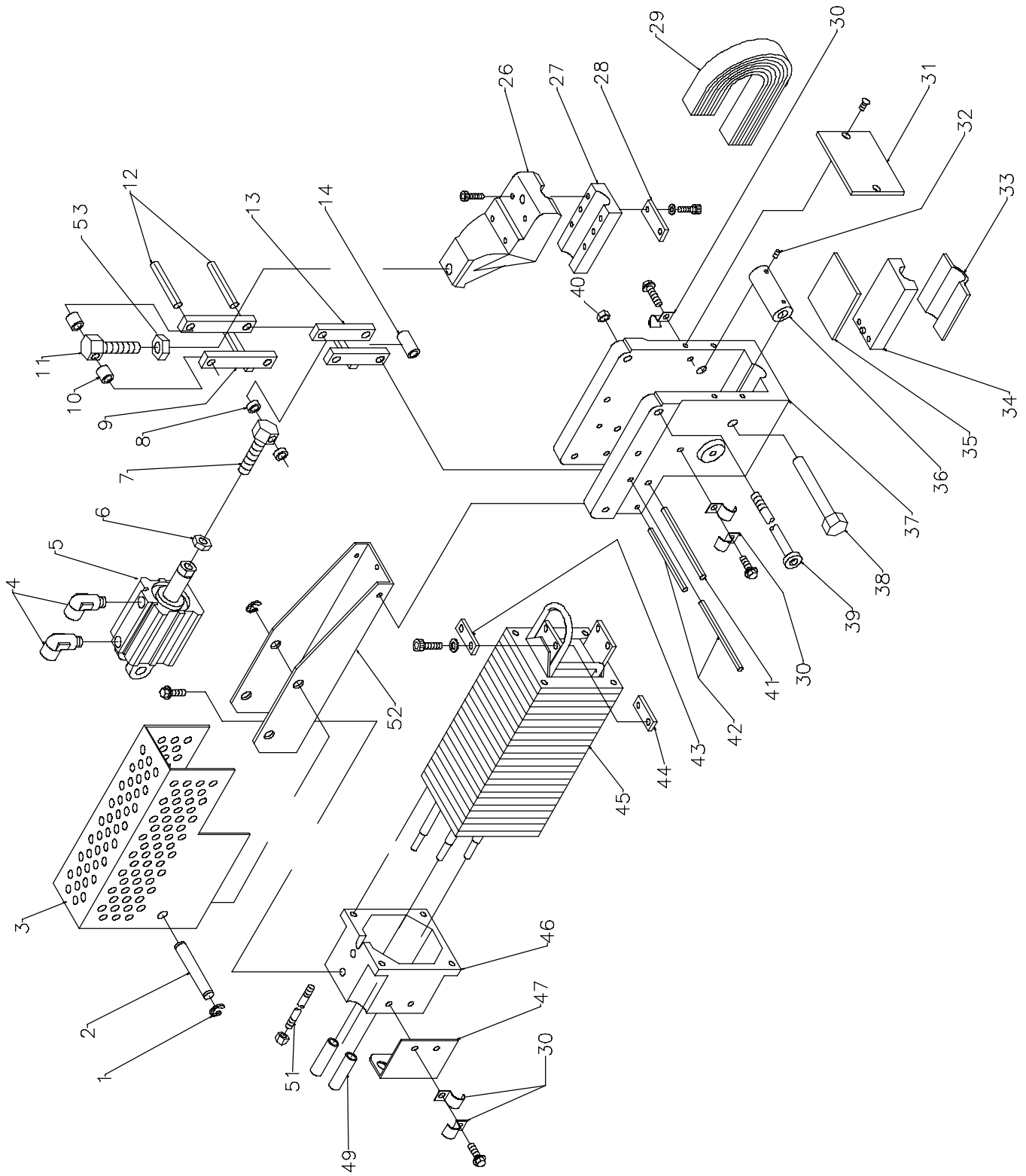


Figure 7-2. Resistance Spot Welder, Air

Item No.	Dia. Mkgs.	Part No.	Description	Model	Quantity	
					SSW-	2020ATT 2040ATT

**Figure 7-2. Resistance Spot Welder, Air (Figure 7-1)**

1	000 365	RING, rtng ext .390 shaft grv x .042 E	2
2	110 524	PIN, cylinder air	1
3	198 639	GUARD, spot welder	1
4	199 115	FITTING, pipe brs	2
5	199 104	CYLINDER, air	1
6	601 881	NUT, stl hex jam .500-20	3
7	010 749	SCREW, .500-20 x 1.562hexhd stl	1
8	010 748	TUBING, stl .625 OD x 12ga wall x .203	2
9	010 746	LINKAGE, upper	1
10	010 736	TUBING, stl .625 OD x 12ga wall x .203	2
11	010 726	SCREW, adj pressure	1
12	010 720	PIN, spring CS .375 x 2.750	2
13	010 747	LINKAGE, lower	1
14	010 738	TUBING, stl .625 OD x 12ga wall x 1.187	1
26	017 671	HOLDER, tong top	1
27	010 723	CLAMP, tong top	1
28	010 744	BAR, clamping	1
29	010 724	BRAID SET, tong	1
30	601 117	CLAMP, stl plain half .500 dia x .281 mtg hole	4
31	110 534	SPLATTER BOARD	1
32	112 480	SCREW, set .250-28 x .375 cup pt sch stl	2
33	110 530	INSULATION, tong bottom	1
34	110 529	CLAMP, tong bottom	1
35	110 533	STRIP, polyest gl .125 x 2.750 x 3.312	1
36	110 536	CAM, tong	1
37	110 903	HOUSING, front transformer	1
38	110 535	CAM, pin tong	1
39	213 081	SCREW, 3/8 x 4-1/2 soc shoulder	1
40	204 608	NUT, 312-18 .50 hex .34 h stl pld elastic stop nut	2
41	602 317	PIN, spring .375 x 4.000	1
42	110 898	PIN, spring .250 x 4.000	2
43	110 531	BAR, tong braid clamping	1
44	110 532	BAR, tong braid clamping	1
45	T1 121 319	TRANSFORMER, power main (230V)	1
45	T1 121 320	TRANSFORMER, power main (460V)	1
46	110 527	CAP, transformer rear	1
47	010 739	SHIELD, tube coolant	1
49	026 834	TUBING, fbr vulc .312 ID x .437 OD	2
51	010 034	STUD, .250-28 x 11.000	4
52	110 539	BRACKET, mtg cylinder air	1
53	601 881	NUT, 500-20 .75 Hex .31H Stl Pld	1

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

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


Item No.	Dia. Mkgs.	Part No.	Description	Quantity
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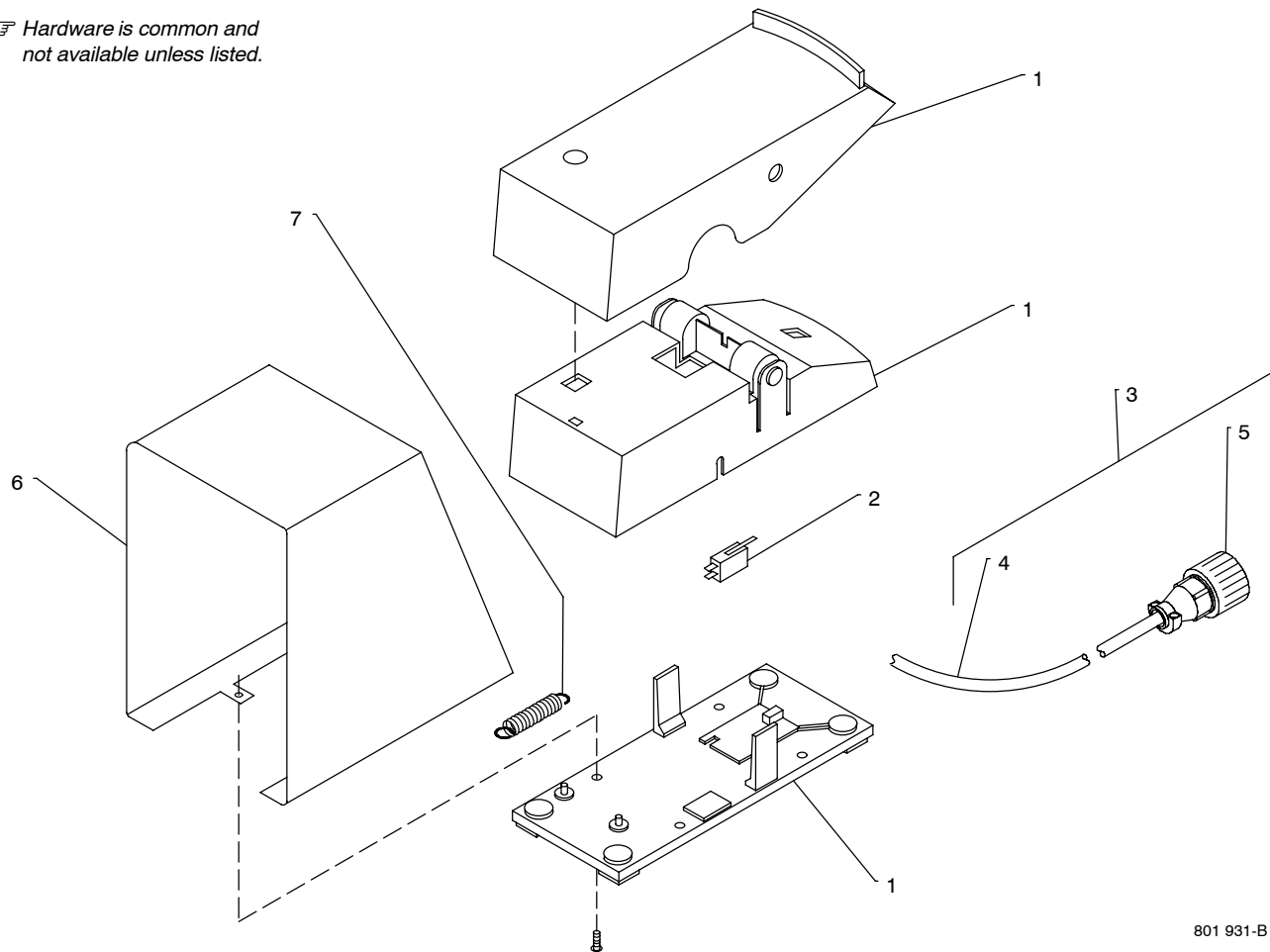
195 784

**Figure 7-3. RFSW-10/20 (Figure 7-1)**

1		185 929	PEDAL/HOUSING/BOTTOM PLATE	1
2	S1	183 629	SWITCH, limit 10A 125/250V	1
3		200 288	CABLE, control (consisting of)	1
4		605 156	CABLE, port 20ga 5/c ( order by ft)	6ft
5	PLG1	079 878	HOUSING PLUG & PINS (service kit)	1
6		187 078	COVER, guard	1
7		182 626	SPRING, ext	1

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

 Hardware is common and not available unless listed.



801 931-B

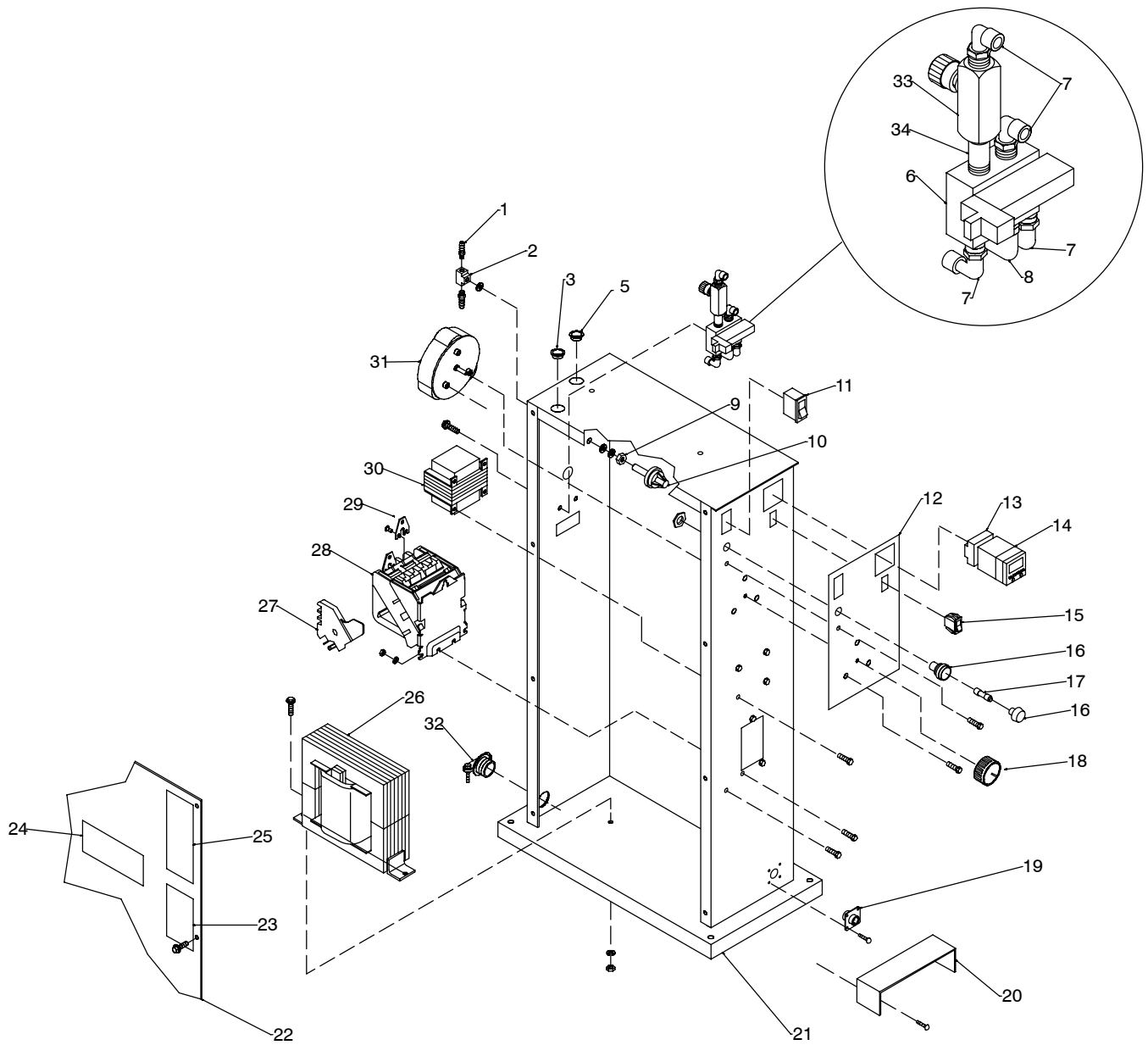
**Figure 7-3. RFSW-10/20**

# Notes

## DECIMAL EQUIVALENTS

	$\frac{1}{64}$	.015625
	$\frac{2}{64}$	.03125
	$\frac{3}{64}$	.046875
$\frac{1}{16}$	$\frac{4}{64}$	.0625
	$\frac{5}{64}$	.078125
	$\frac{6}{64}$	.09375
	$\frac{7}{64}$	.109375
$\frac{1}{8}$	$\frac{8}{64}$	.125
	$\frac{9}{64}$	.140625
	$\frac{10}{64}$	.15625
	$\frac{11}{64}$	.171875
$\frac{3}{16}$	$\frac{12}{64}$	.1875
	$\frac{13}{64}$	.203125
	$\frac{14}{64}$	.21875
	$\frac{15}{64}$	.234375
$\frac{1}{4}$	$\frac{16}{64}$	.25
	$\frac{17}{64}$	.265625
	$\frac{18}{64}$	.28125
	$\frac{19}{64}$	.296875
$\frac{5}{16}$	$\frac{20}{64}$	.3125
	$\frac{21}{64}$	.328125
	$\frac{22}{64}$	.34375
	$\frac{23}{64}$	.359375
$\frac{3}{8}$	$\frac{24}{64}$	.375
	$\frac{25}{64}$	.390625
	$\frac{26}{64}$	.40625
	$\frac{27}{64}$	.421875
$\frac{7}{16}$	$\frac{28}{64}$	.4375
	$\frac{29}{64}$	.453125
	$\frac{30}{64}$	.46875
	$\frac{31}{64}$	.484375
$\frac{1}{2}$	$\frac{32}{64}$	.5
	$\frac{33}{64}$	.515625
	$\frac{34}{64}$	.53125
	$\frac{35}{64}$	.546875
$\frac{9}{16}$	$\frac{36}{64}$	.5625
	$\frac{37}{64}$	.578125
	$\frac{38}{64}$	.59375
	$\frac{39}{64}$	.609375
$\frac{5}{8}$	$\frac{40}{64}$	.625
	$\frac{41}{64}$	.640625
	$\frac{42}{64}$	.65625
	$\frac{43}{64}$	.671875
$\frac{11}{16}$	$\frac{44}{64}$	.6875
	$\frac{45}{64}$	.703125
	$\frac{46}{64}$	.71875
	$\frac{47}{64}$	.734375
$\frac{3}{4}$	$\frac{48}{64}$	.75
	$\frac{49}{64}$	.765625
	$\frac{50}{64}$	.78125
	$\frac{51}{64}$	.796875
$\frac{13}{16}$	$\frac{52}{64}$	.8125
	$\frac{53}{64}$	.828125
	$\frac{54}{64}$	.84375
	$\frac{55}{64}$	.859375
$\frac{7}{8}$	$\frac{56}{64}$	.875
	$\frac{57}{64}$	.890625
	$\frac{58}{64}$	.90625
	$\frac{59}{64}$	.921875
$\frac{15}{16}$	$\frac{60}{64}$	.9375
	$\frac{61}{64}$	.953125
	$\frac{62}{64}$	.96875
	$\frac{63}{64}$	.984375
1	$\frac{64}{64}$	1.

☞ Hardware is common and not available unless listed.



802 765-C

Figure 7-4. Pedestal, Air Operated (SSW Models)

Item No.	Dia. Mkgs.	Part No.	Description	Model	Quantity	
					SSW-	2020ATT 2040ATT


**Figure 7-4. Pedestal, Air Operated (Figure 7-1)**

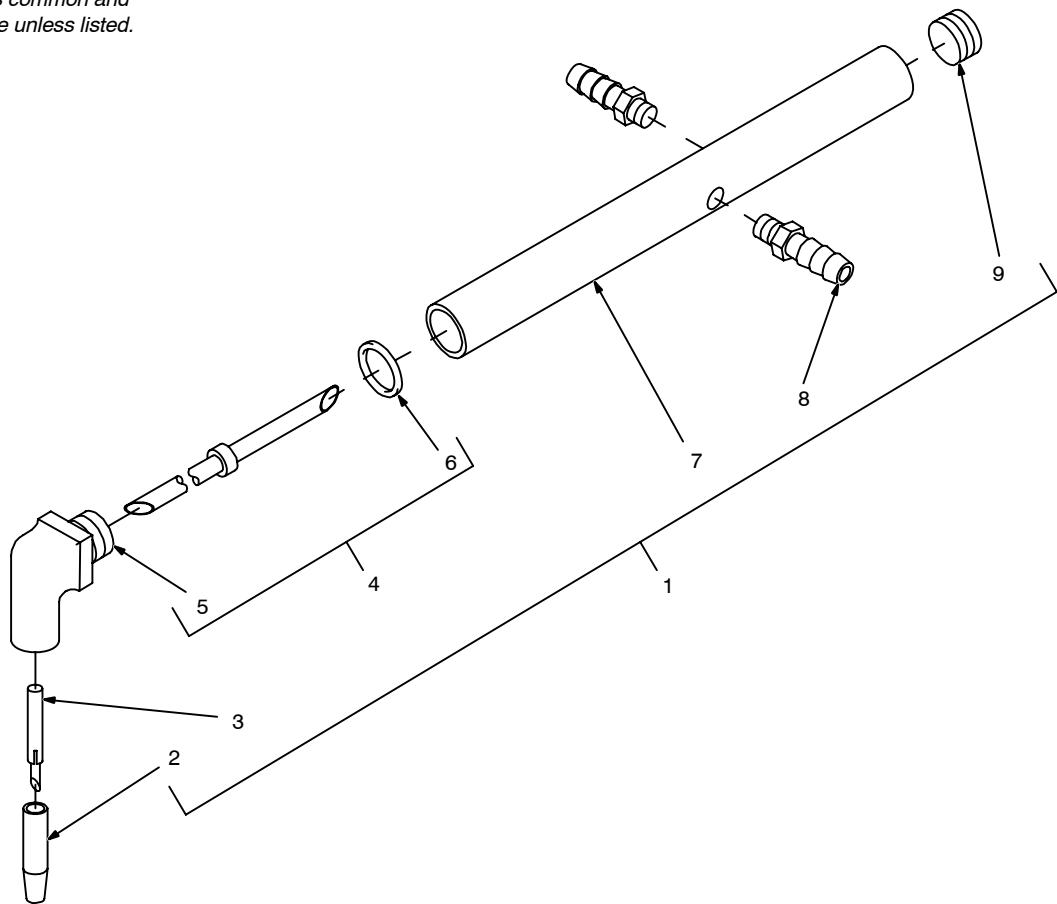
1		053 525	FITTING, brs barbed M 5/16tbg x 1/8NPT		2
		603 105	HOSE, nprn brd No. 1 x .312 ID (order by ft)		2ft
		010 323	CLAMP, hose .250-.625dia		2
2		602 965	FITTING, pipe brs tee 1/8NPT		1
3		030 170	BUSHING, snap-in nyl .750 ID x 1.000mtg hole		2
5		057 357	BUSHING, snap-in nyl .937 ID x 1.125mtg hole		1
6	AS1	199 109	VALVE, 115 VAC 2way (5)1/4 nptf piping ports (consisting of)		1
7		199 115	FTG, pipe brs qcon elbow male 1/4 npt		3
8		010 678	FTG, pipe brs elbow st 1/4 NPTL		1
9		602 243	WASHER, flat stl .375		1
		605 787	WASHER, lock stl intl tooth .500		1
		010 910	WASHER, flat stl SAE .375		1
10	S5	177 123	SWITCH, pressure oil 4psi NO cont		1
11	S1	198 637	SUPPLEMENTARY PROTECTOR/SWITCH 1 amp lighted 120VAC		1
12		200 264	NAMEPLATE		1
13		199 247	SOCKET, relay 11 pin scr term		1
14	TD1	198 636	TIMER, digital al 0-9.99 sec 120 VAC 60 Hz cycle timer		1
15	S3	196 575	SWITCH, rocker SPST 10A 250VAC on-none-off .250 qc		1
16		044 747	HOLDER, fuse crtg 30A 600V		1
17	F1	*128 430	FUSE, crtg 1A 600V		1
18		097 926	KNOB, pointer		1
19	RC1	048 282	RECEPTACLE w/skts (service kit)		1
20		202 219	GUARD		1
21		198 635	CABINET, pedestal		1
22		+110 551	PANEL, side pedestal		1
23		201 063	LABEL, warning electric shock can kill, install		1
24		193 776	LABEL, MILLER 6.093 x 2.593 horizontal		1
25		143 140	LABEL, warning general precautionary		1
26	Z	199 200	REACTOR, (230V)		1
26	Z	199 201	REACTOR, (460V)		1
27	W1	213 446	INTERLOCK, cntor NO size 3-1/2		1
28	W	034 909	CONTACTOR, 4P 115/230V (consisting of)		1
		034 910	COIL		1
		*034 911	KIT, point		4
29		035 049	LINK, connecting contactor term		4
30	T2	202 208	TRANSFORMER, control 100VA 230/460V		1
31	S2	011 632	SWITCH, rotary 10 pos 50A 300V		1
32		604 102	CONN, clamp cable 1.00 in		1
33		035 627	VALVE, air		1
34		222487	NIPPLE, pipe 1/4 X 1.0 in		1

\*Recommended Spare Parts.

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

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

 Hardware is common and not available unless listed.



027 777-A

**Figure 7-5. Tongs**

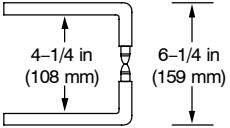
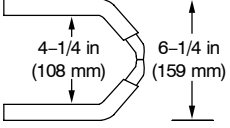
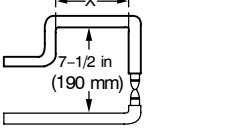
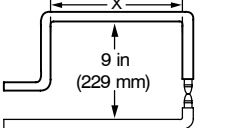
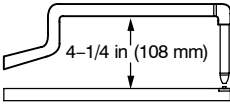
Item No.	Part No.	Description	Holder 45 or 90 Deg	Quantity					
				No. 1 Morse Taper			No. 2 Morse Taper		
				6"	12"	18"	6"	12"	18"

**Figure 7-5. Tongs (Optional)**

1	027 778	TONG, 6 in (consisting of)	90 deg	2						
1	027 777	TONG, 12 in (consisting of)	90 deg	2						
1	027 776	TONG, 18 in (consisting of)	90 deg	2						
1	027 781	TONG, 12 in (consisting of)	90 deg	2						
1	027 780	TONG, 18 in (consisting of)	90 deg	2						
1	027 770	TONG, 6 in (consisting of)	45 deg	2						
1	027 769	TONG, 12 in (consisting of)	45 deg	2						
1	027 768	TONG, 18 in (consisting of)	45 deg	2						
1	027 774	TONG, 6 in (consisting of)	45 deg	2						
1	027 772	TONG, 18 in (consisting of)	45 deg	2						
2		TIPS, (see chart)								
3	010 755	TUBE, telescoping	90 deg	1	1	1	1	1	1	1
3	031 554	TUBE, telescoping	45 deg	1	1	1	1	1	1	1
4	010 501	TUBE ASSEMBLY, tong (consisting of)	90 deg	1						
4	010 502	TUBE ASSEMBLY, tong (consisting of)	90 deg	1						
4	010 503	TUBE ASSEMBLY, tong (consisting of)	90 deg		1					
4	027 758	TUBE ASSEMBLY, tong (consisting of)	90 deg		1					
4	027 757	TUBE ASSEMBLY, tong (consisting of)	90 deg		1					
4	027 756	TUBE ASSEMBLY, tong (consisting of)	90 deg		1					
4	027 766	TUBE ASSEMBLY, tong (consisting of)	45 deg	1						
4	027 765	TUBE ASSEMBLY, tong (consisting of)	45 deg	1						
4	027 764	TUBE ASSEMBLY, tong (consisting of)	45 deg	1						
4	027 762	TUBE ASSEMBLY, tong (consisting of)	45 deg	1						
4	027 761	TUBE ASSEMBLY, tong (consisting of)	45 deg	1						
4	027 760	TUBE ASSEMBLY, tong (consisting of)	45 deg	1						
5	010 734	HOLDER, tip	90 deg	1	1	1				
5	010 735	HOLDER, tip	90 deg				1	1	1	1
5	010 753	HOLDER, tip	45 deg	1	1	1				
5	010 754	HOLDER, tip	45 deg				1	1	1	1
6	603 090	O-RING, .625 ID x .812 OD	All	1	1	1	1	1	1	1
7	010 498	TUBE, connecting 6 in tong	All	1			1			
7	010 499	TUBE, connecting 12 in tong	All		1			1		
7	010 500	TUBE, connecting 18 in tong	All			1				1
8	053 525	FITTING, brs-barbed M 5/16tbg x 1/8NPT	All	2	2	2	2	2	2	2
9	010 758	FITTING, pipe brs skt hd 3/8NPT	All	1	1	1	1	1	1	1











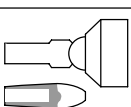

**To maintain the factory original performance of your equipment, use only Manufacturer's Suggested Replacement Parts. Model and serial number required when ordering parts from your local distributor.**

**Tongs and Tips (Must be ordered separately from spot welders. One pair of tips are supplied with each set of tongs.)**

TONGS	TONG LENGTH			TIPS INCLUDED
	6 in (150 mm)	12 in (304 mm)	18 in (457 mm)	
 <p>STANDARD 90° No. 1 Morse Taper No. 2 Morse Taper</p>	#040 218 —	#040 219 —	#040 220 #041 001	(18 in tongs include 040298) #040 223 #040 308
 <p>STANDARD 45° No. 1 Morse Taper No. 2 Morse Taper</p>	— —	#041 004 —	#041 005 #040 296	#040 851 #040 225
 <p>TT-6W No. 2 Morse Taper</p>	—	—	#041 838	#040 308
 <p>TT-9W No. 2 Morse Taper</p>	—	—	#041 840	#040 308
 <p>SW-12</p>	—	#071 465	—	No. 1 Pointed #071 466 Top Flat Threaded #071 467 Bottom

**Notes for tongs and tips:**

- Tongs and tips shown to the left can be used with all PSW and SSW model spot welders. Recommended max. tong length is 18 in (457 mm).
- Tong throat-height dimension for standard 90° and 45° tongs is 4-1/4 in (108 mm). Throat length is measured from the center of the spot tips to the front water hose connection. X = tong length.
- One set of tips is supplied with each set of tongs.
- Tips are made of RWMA Class 2 alloy.
- Maximum welding capabilities are obtained with minimum tong length.
- MT = Morse Taper.
- No. 1 Morse Taper has smaller diameter than No. 2 Morse Taper.

TIPS	QUANTITY	WHERE USED
 <p>No. 1 MT (Pointed) #040 223</p>	2 tips	Standard No. 1 Tongs, 90°
 <p>No. 1 MT (Offset) #040 224</p>	2 tips	Standard No. 1 Tongs, 90°
 <p>No. 2 MT (Pointed) #040 308</p>	2 tips	Standard No. 2 Tongs, 90° TT-6W Tongs TT-9W Tongs
 <p>No. 1 MT (Offset) #040 851</p>	2 tips	Standard No. 1 Tongs, 45°
 <p>No. 1 MT (Offset) #040 226</p>	2 tips	Standard No. 1 Tongs, 90°
 <p>No. 1 MT (Offset) #040 298</p>	2 tips	Standard No. 1 Tongs, 90°
 <p>No. 2 MT (Offset) #040 225</p>	2 tips	Standard No. 2 Tongs, 45°
 <p>No. 1 MT (Pointed) #071 466</p>	1 tip for top tong	SW-12 Tong
 <p>Threaded (Flat) #071 343</p>	1 tip for bottom tong	SW-12 Tong (optional)
 <p>Threaded (Flat) #071 467</p>	1 tip for bottom tong	SW-12 Tong
 <p>No. 1 MT (Flat Swivel Tip) Matching Pointed Tip #040 216</p>	2 tips	Standard No. 1 Tongs, 90°
 <p>Adapter (adapts No. 1 Morse Taper Tip to No. 2 receptacle) #040 227</p>	2 adapters	Standard No. 2 Tongs, 90° TT-6W Tongs (top) TT-9W Tongs (top)





# TRUE BLUE® WARRANTY

Effective January 1, 2008

(Equipment with a serial number preface of LJ or newer)

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

## Warranty Questions?

Call  
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for your local  
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You always get the fast,  
reliable response you  
need. Most replacement  
parts can be in your  
hands in 24 hours.

### Support

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

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

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

Miller shall honor warranty claims on warranted equipment listed below in the event of such a failure within the warranty time periods. All warranty time periods start on the delivery date of the equipment to the original end-user purchaser, and not to exceed one year after the equipment is shipped to a North American distributor or eighteen months after the equipment is shipped to an International distributor.

1. 5 Years Parts — 3 Years Labor
  - \* Original main power rectifiers only to include SCRs, diodes, and discrete rectifier modules
2. 3 Years — Parts and Labor
  - \* Transformer/Rectifier Power Sources
  - \* Plasma Arc Cutting Power Sources
  - \* Process Controllers
  - \* Semi-Automatic and Automatic Wire Feeders
  - \* Inverter Power Sources (Unless Otherwise Stated)
  - \* Water Coolant Systems (Integrated)
  - \* Intelligit
  - \* Engine Driven Welding Generators  
**(NOTE: Engines are warranted separately by the engine manufacturer.)**
3. 1 Year — Parts and Labor Unless Specified
  - \* Motor Driven Guns (w/exception of Spoolmate Spoolguns)
  - \* Positioners and Controllers
  - \* Automatic Motion Devices
  - \* RFCS Foot Controls
  - \* Induction Heating Power Sources, Coolers, and Electronic Controls/Recorders
  - \* Water Coolant Systems (Non-Integrated)
  - \* Flowgauge and Flowmeter Regulators (No Labor)
  - \* HF Units
  - \* Grids
  - \* Spot Welders
  - \* Load Banks
  - \* Arc Stud Power Sources & Arc Stud Guns
  - \* Racks
  - \* Running Gear/Trailers
  - \* Plasma Cutting Torches (except APT & SAF Models)
  - \* Field Options  
(NOTE: Field options are covered under True Blue® for the remaining warranty period of the product they are installed in, or for a minimum of one year — whichever is greater.)
  - \* Bernard-Branded Mig Guns (No Labor)
  - \* Weldcraft-Branded TIG Torches (No Labor)
  - \* Subarc Wire Drive Assemblies
4. 6 Months — Batteries
5. 90 Days — Parts
  - \* MIG Guns and Subarc (SAW) Guns

- \* Induction Heating Coils and Blankets, Cables, and Non-Electronic Controls
- \* APT & SAF Model Plasma Cutting Torches
- \* Remote Controls
- \* Accessory (Kits)
- \* Replacement Parts (No labor)
- \* Spoolmate Spoolguns
- \* Canvas Covers

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

1. **Consumable components; such as contact tips, cutting nozzles, contactors, brushes, slip rings, relays or parts that fail due to normal wear. (Exception: brushes, slip rings, and relays are covered on Bobcat, Trailblazer, and Legend models.)**
2. Items furnished by Miller, but manufactured by others, such as engines or trade accessories. These items are covered by the manufacturer's warranty, if any.
3. Equipment that has been modified by any party other than Miller, or equipment that has been improperly installed, improperly operated or misused based upon industry standards, or equipment which has not had reasonable and necessary maintenance, or equipment which has been used for operation outside of the specifications for the equipment.

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

In the event of a warranty claim covered by this warranty, the exclusive remedies shall be, at Miller's option: (1) repair; or (2) replacement; or, where authorized in writing by Miller in appropriate cases, (3) the reasonable cost of repair or replacement at an authorized Miller service station; or (4) payment of or credit for the purchase price (less reasonable depreciation based upon actual use) upon return of the goods at customer's risk and expense. Miller's option of repair or replacement will be F.O.B., Factory at Appleton, Wisconsin, or F.O.B. at a Miller authorized service facility as determined by Miller. Therefore no compensation or reimbursement for transportation costs of any kind will be allowed.

TO THE EXTENT PERMITTED BY LAW, THE REMEDIES PROVIDED HEREIN ARE THE SOLE AND EXCLUSIVE REMEDIES. IN NO EVENT SHALL MILLER BE LIABLE FOR DIRECT, INDIRECT, SPECIAL, INCIDENTAL OR CONSEQUENTIAL DAMAGES (INCLUDING LOSS OF PROFIT), WHETHER BASED ON CONTRACT, TORT OR ANY OTHER LEGAL THEORY.

ANY EXPRESS WARRANTY NOT PROVIDED HEREIN AND ANY IMPLIED WARRANTY, GUARANTY OR REPRESENTATION AS TO PERFORMANCE, AND ANY REMEDY FOR BREACH OF CONTRACT TORT OR ANY OTHER LEGAL THEORY WHICH, BUT FOR THIS PROVISION, MIGHT ARISE BY IMPLICATION, OPERATION OF LAW, CUSTOM OF TRADE OR COURSE OF DEALING, INCLUDING ANY IMPLIED WARRANTY OF MERCHANTABILITY OR FITNESS FOR PARTICULAR PURPOSE, WITH RESPECT TO ANY AND ALL EQUIPMENT FURNISHED BY MILLER IS EXCLUDED AND DISCLAIMED BY MILLER.

Some states in the U.S.A. do not allow limitations of how long an implied warranty lasts, or the exclusion of incidental, indirect, special or consequential damages, so the above limitation or exclusion may not apply to you. This warranty provides specific legal rights, and other rights may be available, but may vary from state to state.

In Canada, legislation in some provinces provides for certain additional warranties or remedies other than as stated herein, and to the extent that they may not be waived, the limitations and exclusions set out above may not apply. This Limited Warranty provides specific legal rights, and other rights may be available, but may vary from province to province.





# Owner's Record

Please complete and retain with your personal records.

Model Name

Serial/Style Number

Purchase Date

(Date which equipment was delivered to original customer.)

Distributor

Address

City

State

Zip



## For Service

**Contact a DISTRIBUTOR or SERVICE AGENCY near you.**

Always provide Model Name and Serial/Style Number.

Contact your Distributor for:

Welding Supplies and Consumables

Options and Accessories

Personal Safety Equipment

Service and Repair

Replacement Parts

Training (Schools, Videos, Books)

Technical Manuals (Servicing Information and Parts)

Circuit Diagrams

Welding Process Handbooks

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

Contact the Delivering Carrier to:

File a claim for loss or damage during shipment.

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

### Miller Electric Mfg. Co.

An Illinois Tool Works Company  
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