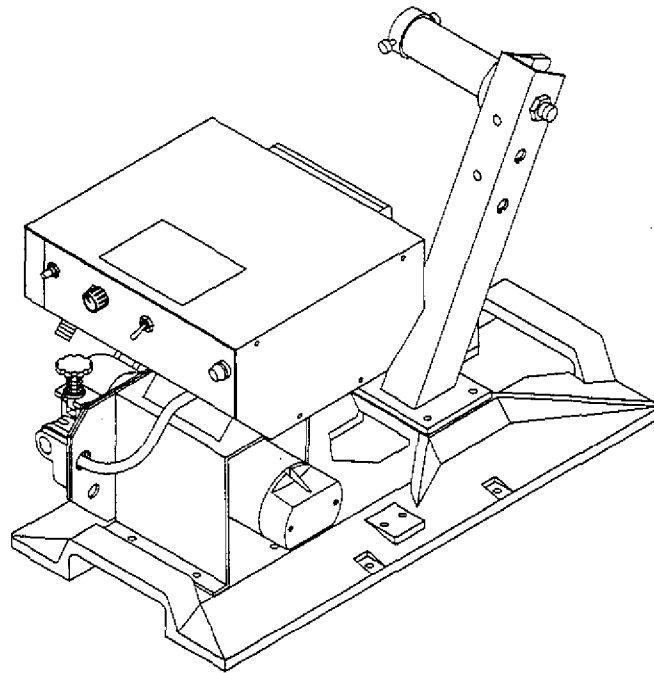




October 1991 FORM: OM-1526G

Effective With Serial No. KB029908

MODEL: S-52E
S-54E



OWNER'S MANUAL

IMPORTANT: Read and understand the entire contents of this manual, with special emphasis on the safety material throughout the manual, before installing, operating, or maintaining this equipment. This unit and these instructions are for use only by persons trained and experienced in the safe operation of welding equipment. Do not allow untrained persons to install, operate, or maintain this unit. Contact your distributor if you do not fully understand these instructions.

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RECEIVING-HANDLING

Before unpacking equipment, check carton for any damage that may have occurred during shipment. File any claims for loss or damage **with the delivering carrier**. Assistance for filing or settling claims may be obtained from the distributor and/or the equipment manufacturer's Transportation Department.

When requesting information about this equipment, always provide the Model Designation and Serial or Style Number.

Use the following spaces to record the Model Designation and Serial or Style Number of your unit. The information is located on the rating label or nameplate.

Model _____

Serial or Style No. _____

Date of Purchase _____

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SECTION 1 - SAFETY RULES FOR OPERATION OF ARC WELDING POWER SOURCE

SECTION 1 - RÈGLES DE SÉCURITÉ POUR LE FONCTIONNEMENT DU POSTE DE SOUDAGE À L'ARC

1-1. INTRODUCTION - We learn by experience. Learning safety through personal experience, like a child touching a hot stove is harmful, wasteful, and unwise. Let the experience of others teach you.

Safe practices developed from experience in the use of welding and cutting are described in this manual. Research, development, and field experience have evolved reliable equipment and safe installation, operation, and servicing practices. Accidents occur when equipment is improperly used or maintained. The reason for the safe practices may not always be given. Some are based on common sense, others may require technical volumes to explain. It is wiser to follow the rules.

Read and understand these safe practices before attempting to install, operate, or service the equipment. Comply with these procedures as applicable to the particular equipment used and their instruction manuals, for personal safety and for the safety of others.

Failure to observe these safe practices may cause serious injury or death. When safety becomes a habit, the equipment can be used with confidence.

These safe practices are divided into two Sections: 1 - General Precautions, common to arc welding and cutting; and 2 - Arc Welding (and Cutting) (only).

Reference standards: Published Standards on safety are also available for additional and more complete procedures than those given in this manual. They are listed in the Standards Index in this manual. ANSI Z49.1 is the most complete.

The National Electrical Code, Occupational Safety and Health Administration, local industrial codes, and local inspection requirements also provide a basis for equipment installation, use, and service.

1-2. GENERAL PRECAUTIONS

Different arc welding processes, electrode alloys, and fluxes can produce different fumes, gases, and radiation levels. In addition to the information in this manual, be sure to consult flux and electrode manufacturers for specific technical data and precautionary measures concerning their material.

A. Burn Prevention

Wear protective clothing - gauntlet gloves designed for use in welding, hat, and high safety-toe shoes. Button shirt collar and pocket flaps, and wear cuffless trousers to avoid entry of sparks and slag.

Wear helmet with safety goggles or glasses with side shields underneath, appropriate filter lenses or plates (protected by clear cover glass). This is a **MUST** for welding or cutting, (and chipping) to protect the eyes

1-1. INTRODUCTION - Contrairement à l'apprentissage de la vie, l'apprentissage de la sécurité par expérience personnelle, comme l'enfant qui touche un poêle chaud, est dangereux, imprudent et inutile. Instruisez-vous donc de l'expérience d'autrui.

Des méthodes de sécurité issues de l'expérience du soudage et du coupage sont décrites dans le manuel. La recherche, le progrès et l'expérience dans ce domaine ont développé un matériel fiable et des méthodes de sécurité pour l'installation, le fonctionnement et l'entretien. Des accidents se produisent lorsque le matériel est inadéquatement utilisé ou entretenu. La raison de ces méthodes de sécurité peut ne pas être toujours donnée. Certaines sont fondées sur le sens commun, d'autres demanderont à être expliquées par des livres techniques. Il est plus sage de suivre les règles.

Lisez et comprenez ces méthodes de sécurité avant d'essayer d'installer, de faire fonctionner ou de réparer l'appareil. Pour votre sécurité personnelle et celle d'autrui, conformez-vous à ces règles et aux manuels d'instructions.

Manquer d'observer ces méthodes de sécurité pourrait entraîner des blessures graves ou même la mort. Quand la sécurité devient une habitude, le matériel peut alors être utilisé en toute confiance.

Ces méthodes de sécurité sont divisées en deux sections: 1 - Précautions générales, communes au soudage et au coupage à l'arc, et 2 - Soudage à l'arc (et coupage) (uniquement).

Normes de référence: Des publications des normes américaines de sécurité sont aussi à votre disposition pour d'autres modes opératoires plus complets que ceux du présent manuel. Elles sont données dans l'Index des Normes de ces règles de sécurité. ANSI Z49-1 est la plus complète.

Les codes de l'ACNOR, les codes provinciaux et municipaux donnent aussi les exigences pour une installation, une utilisation et un entretien sûrs.

1-2. PRÉCAUTIONS GÉNÉRALES

Plusieurs procédés du soudage à l'arc, des électrodes alliés, et les flux peuvent produire des vapeurs, gaz, et niveaux de rayonnement différents. Pour tout renseignement supplémentaire à ce manuel, consultez aussi les fabricants des électrodes et des flux afin d'obtenir les renseignements techniques spécifiques et les mesures de précaution concernant leurs matériaux.

A. Prévention des brûlures

Portez des vêtements de protection - des gants à crispin spécialement désignés pour le soudage, un casque et des chaussures de sécurité. Boutonnez le col de votre chemise et les pattes de vos poches, et portez des pantalons sans revers pour éviter que des étincelles et du laitier ne s'y introduisent.

Portez un masque avec lunettes de sécurité ou avec écrans latéraux de protection, des lunettes filtrantes ou des couvre-lentilles (protégés par un verre clair). Pour le soudage ou le coupage (et le burinage), il est

from radiant energy and flying metal. Replace cover glass when broken, pitted, or spattered. See 1-3A.2.

Avoid oily or greasy clothing. A spark may ignite them.

Hot metal such as electrode stubs and workpieces should never be handled without gloves.

Medical first aid and eye treatment. First aid facilities and a qualified first aid person should be available for each shift unless medical facilities are close by for immediate treatment of flash burns of the eyes and skin burns.

Ear plugs should be worn when working on overhead or in a confined space. A hard hat should be worn when others work overhead.

Flammable hair preparations should not be used by persons intending to weld or cut.

B. Toxic Fume Prevention

Severe discomfort, illness or death can result from fumes, vapors, heat, or oxygen enrichment or depletion that welding (or cutting) may produce. Prevent them with adequate ventilation as described in ANSI Standard Z49.1 listed 1 in Standards index. NEVER ventilate with oxygen.

Lead -, cadmium -, zinc -, mercury -, and beryllium - bearing and similar materials, when welded (or cut) may produce harmful concentrations of toxic fumes. Adequate local exhaust ventilation must be used, or each person in the area as well as the operator must wear an air-supplied respirator. For beryllium, both must be used.

Metals coated with or containing materials that emit toxic fumes should not be heated unless coating is removed from the work surface, the area is well ventilated, or the operator wears an air-supplied respirator.

Work in a confined space only while it is being ventilated and, if necessary, while wearing an air-supplied respirator.

Gas leaks in a confined space should be avoided. Leaked gas in large quantities can change oxygen concentration dangerously. Do not bring gas cylinders into a confined space.

Leaving confined space, shut OFF gas supply at source to prevent possible accumulation of gases in the space if downstream valves have been accidentally opened or left open. Check to be sure that the space is safe before re-entering it.

Vapors from chlorinated solvents can be decomposed by the heat of the arc (or flame) to form PHOSGENE, a highly toxic gas, and other lung and eye irritating products. The ultraviolet (radiant) energy of the arc can also decompose trichloroethylene and perchloroethylene vapors to form phosgene. DO NOT WELD or cut where solvent vapors can be drawn into the welding or cutting atmosphere or where the radiant

OBLIGATOIRE de protéger ses yeux contre l'énergie de rayonnement et les éclats de métal. Remplacez le verre protecteur lorsqu'il est brisé, piqué ou qu'il a reçu des projections. Voir 1.3A.2.

Évitez de porter des habits imprégnés d'huile ou de graisse. Une étincelle pourrait les enflammer.

Ne manipulez jamais sans gants un métal chaud tel que des chutes d'électrode et des pièces à souder.

Premiers soins et traitement des yeux: Tout atelier devrait avoir à sa disposition un poste de premiers soins ainsi qu'une personne compétente, à moins qu'un service médical ne soit à proximité pour soigner immédiatement les brûlures des yeux et de la peau.

Portez des bouche-oreilles lorsque vous travaillez au plafond ou dans un espace restreint. Portez un casque lorsque d'autres personnes travaillent au plafond.

Les personnes devant souder ou couper ne doivent pas employer des préparations inflammables pour leurs cheveux.

B. Prévention des gaz toxiques

Les gaz, les vapeurs, la chaleur, un enrichissement ou un manque d'oxygène peuvent entraîner un malaise, une maladie ou même la mort. Remédiez-y par la ventilation décrite dans la Norme ANSI Z49.1 paragraphe 1 de l'Index des Normes. NE ventilez JAMAIS à l'oxygène.

En soudant ou en coupant, les plomb, cadmium, zinc, mercure et béryllium ou autres matériaux semblables peuvent créer des concentrations nocives de gaz toxiques. On doit avoir recours à une ventilation aspirante adéquate du local, ou alors toute personne sur les lieux, de même que le soudeur, doit porter un masque à adduction d'air. On doit employer les deux pour le béryllium.

Les métaux enrobés ou composés de matériaux émettant des gaz toxiques ne doivent pas être chauffés à moins que l'enrobage ne soit ôté de la surface à travailler, que le local ne soit bien ventilé, ou que le soudeur ne porte un masque à adduction d'air.

Ne travaillez dans un espace restreint que s'il est bien ventilé et, si nécessaire, portez un masque à adduction d'air.

On doit éviter les fuites de gaz dans un espace restreint. Les fuites de gaz en grande quantité peuvent transformer dangereusement la concentration d'oxygène. N'amenez pas de bouteilles de gaz dans un espace restreint.

En quittant un espace restreint, FERMEZ le robinet d'alimentation de gaz de la bouteille. Ainsi on pourra rentrer en toute sécurité dans la pièce, même si les robinets "aval" ont été ouverts par accident, ou si on les a laissés ouverts.

Les vapeurs de dissolvants chlorés peuvent être décomposées par la chaleur de l'arc (ou de la flamme) et former du PHOSGÈNE, gaz très toxique, et d'autres produits irritant les poumons et les yeux. L'énergie ultra-violette de l'arc peut aussi décomposer les vapeurs de trichloroéthylène et de perchloroéthylène pour former du phosgène. NE SOUDEZ PAS ou ne coupez pas dans des endroits où les vapeurs de dissolvants peuvent être attirées dans l'atmosphère de soudage ou de

energy can penetrate to atmospheres containing even minute amounts of trichloroethylene or perchloroethylene.

C. Fire and Explosion Prevention

Causes of fire and explosion are: combustibles reached by the arc, flame, flying sparks, hot slag or heated material; misuse of compressed gases and cylinders; and short circuits.

BE AWARE THAT flying sparks or falling slag can pass through cracks, along pipes, through windows or doors, and through wall or floor openings, out of sight of the goggled operator. Sparks and slag can fly 35 feet.

To prevent fires and explosion:

Keep equipment clean and operable, free of oil, grease, and (in electrical parts) of metallic particles that can cause short circuits.

If combustibles are in area, do NOT weld or cut. Move the work if practicable, to an area free of combustibles. Avoid paint spray rooms, dip tanks, storage areas, ventilators. If the work cannot be moved, move combustibles at least 35 feet away out of reach of sparks and heat; or protect against ignition with suitable and snug-fitting, fire-resistant covers or shields.

Walls touching combustibles on opposite sides should not be welded on (or cut). Walls, ceilings, and floor near work should be protected by heat-resistant covers or shields.

Fire watcher must be standing by with suitable fire extinguishing equipment during and for some time after welding or cutting if:

- a. appreciable combustibles (including building construction) are within 35 feet
- b. appreciable combustibles are further than 35 feet but can be ignited by sparks
- c. openings (concealed or visible) in floors or walls within 35 feet may expose combustibles to sparks
- d. combustibles adjacent to walls, ceilings, roofs, or metal partitions can be ignited by radiant or conducted heat.

Hot work permit should be obtained before operation to ensure supervisor's approval that adequate precautions have been taken.

After work is done, check that area is free of sparks, glowing embers, and flames.

An empty container that held combustibles, or that can produce flammable or toxic vapors when heated, must never be welded on or cut, unless container has first been cleaned as described in AWS Standard A6.0, listed 7 in Standards index.

This includes: a thorough steam or caustic cleaning (or a solvent or water washing, depending on the com-

coupage et où l'énergie de rayonnement peut pénétrer dans des atmosphères contenant des quantités même minuscules de trichloroéthylène ou de perchloroéthylène.

C. Prévention des incendies et des explosions

Les causes d'incendie et d'explosion sont les combustibles atteints par l'arc, la flamme, les étincelles, le laitier chaud ou les matériaux chauffés, le mauvais emploi des gaz comprimés et des bouteilles ainsi que les courts-circuits.

Sachez que les éclats d'étincelles ou la chute du laitier peuvent s'infiltrer dans les fissures, le long des tuyauteries, par les fenêtres et les portes et par les ouvertures des murs ou du sol, sans que le soudeur portant des lunettes ne les voie. Les étincelles et les scories peuvent voler jusqu'à 35 pieds.

Pour prévenir les incendies et les explosions: Veillez à ce que votre appareil soit propre et en état de marche, dénué d'huile et de graisse, et de particules de métal sur les pièces électriques qui pourraient entraîner des courts-circuits.

Si des combustibles se trouvent à proximité, ne soudez pas, ne coupez pas. Si possible, déplacez votre travail loin des combustibles. Évitez les ateliers de peinture au pistolet, les cuves d'immersion, les entrepôts, les ventilateurs. Si cela n'est pas possible, placez les combustibles à au moins 35 pieds des étincelles et de la chaleur et protégez-les des étincelles avec des couvertures ou des écrans protecteurs adéquats, bien ajustés et ignifugés.

On ne doit pas souder (ou couper) le côté opposé des murs touchant les combustibles. Les murs, plafonds et planchers proches du travail doivent être protégés par des couvertures ou écrans protecteurs ignifugés.

Un surveillant doit se tenir à proximité avec un matériel de lutte contre l'incendie adéquat, pendant et quelque temps après le soudage ou le coupage si:

- a. Des quantités appréciables de combustibles (y compris une construction en chantier) se trouvent à moins de 35 pieds.
- b. Des quantités appréciables de combustibles sont à plus de 35 pieds mais peuvent être enflammées par des étincelles.
- c. Des ouvertures (cachées ou visibles) sur les planchers ou les murs à moins de 35 pieds peuvent exposer des combustibles aux étincelles.
- d. Les combustibles adjacents aux murs, plafonds, toits ou cloisons métalliques peuvent être enflammés par une chaleur rayonnante ou transmise.

Avant de commencer, avisez le contremaître pour qu'il s'assure que les précautions adéquates soient prises.

Une fois le travail terminé, vérifiez qu'il n'y ait pas d'étincelles, de cendres ardentes ou de flammes dans le local.

On ne doit jamais souder ni couper sur un récipient ayant contenu des combustibles, ou pouvant produire des vapeurs inflammables ou toxiques à la chauffe, à moins que le récipient n'ait été lavé au préalable, comme décrit dans la Norme AWS A6.0, figurant au paragraphe 7 de l'Index des Normes.

Cela comprend: un nettoyage à fond à la vapeur ou au caustique (ou un lavage avec dissolvant ou eau selon la solubilité du combustible) suivi d'une purge et d'une in-

bustible's solubility) followed by purging and inerting with nitrogen or carbon dioxide, and using protective equipment as recommended in A6.0. Waterfilling just below working level may substitute for inerting.

A container with unknown contents should be cleaned (see paragraph above). Do NOT depend on sense of smell or sight to determine if it is safe to weld or cut.

Hollow castings or containers must be vented before welding or cutting. They can explode.

Explosive atmospheres. Never weld or cut where the air may contain flammable dust, gas, or liquid vapors (such as gasoline).

D. Compressed Gas Equipment

Standard precautions. Comply with precautions in this manual, and those detailed in CGA Standard P-1, **SAFE HANDLING OF COMPRESSED GASES IN CYLINDERS**, listed 11 in Standards index.

1. Pressure Regulators

Regulator relief valve is designed to protect only the regulator from overpressure; it is not intended to protect any downstream equipment. Provide such protection with one or more relief devices.

Never connect a regulator to a cylinder containing gas other than that for which the regulator was designed.

Remove faulty regulator from service immediately for repair (first close cylinder valve). The following symptoms indicate a faulty regulator:

Leaks - if gas leaks externally.

Excessive Creep - if delivery pressure continues to rise with downstream valve closed.

Faulty Gauge - if gauge pointer does not move off stop pin when pressurized, nor returns to stop pin after pressure release.

Repair. Do NOT attempt repair. Send faulty regulators for repair to manufacturer's designated repair center, where special techniques and tools are used by trained personnel.

2. Cylinders

Cylinders must be handled carefully to prevent leaks and damage to their walls, valves, or safety devices:

Avoid electrical circuit contact with cylinders including third rails, electrical wires, or welding circuits. They can produce short circuit arcs that may lead to a serious accident. (See 1-3C.)

ICC or DOT marking must be on each cylinder. It is an assurance of safety when the cylinder is properly handled.

jection d'azote ou de gaz carbonique, en utilisant un équipement de protection comme recommandé dans l'A6-0. L'atmosphère inerte peut être remplacée par un niveau d'eau arrivant au-dessous du travail à effectuer.

Vous devez laver un récipient dont la nature de contenu est inconnue (voir paragraphe ci-dessus). NE vous fiez PAS à l'odorat ou à la vue pour dire si l'on peut le souder ou le couper en toute sécurité.

Vous devez pratiquer un évent sur les pièces ou récipients creux avant de les souder ou couper: ils peuvent exploser.

Atmosphères explosives: Ne soudez ni ne coupez jamais dans des lieux où l'air peut contenir des poussières, gaz ou vapeurs liquides inflammables (tels que l'essence).

D. Gaz comprimé

Précautions générales: Suivez les précautions de ce manuel, et celles décrites à la Norme CGA P-1 (Précautions de sécurité pour la manipulation de gaz comprimés en bouteilles), paragraphe 11 de l'Index des Normes.

1. Détendeurs de pression

La soupape de sûreté d'un détendeur est destinée à protéger seulement le détendeur de la surpression. Elle n'a pas pour but de protéger les boyaux et le chalumeau: on protège ceux-ci par des soupapes de retenue conçues spécialement pour cette fonction.

Ne montez jamais un détendeur sur une bouteille contenant un gaz différent de celui pour lequel le détendeur a été conçu.

Enlevez immédiatement un détendeur défectueux pour le faire réparer (d'abord, fermez le robinet de la bouteille). Les symptômes suivants dénotent la défectuosité du détendeur:

Fuites - si le gaz fuit extérieurement.

Ascension excessive - si la pression de débit continue à monter, le robinet du chalumeau étant fermé.

Manomètre défectueux - si l'aiguille du manomètre ne s'écarte pas de la goupille de butée lors de la mise en pression, ou ne revient pas sur la goupille après l'échappement de la pression.

Réparation. N'ESSAYEZ PAS de réparer vous-mêmes. Envoyez les détendeurs défectueux à réparer aux ateliers de réparation agréés du fabricant, où des techniques et des outils spéciaux sont utilisés par un personnel formé.

2. Bouteilles

Les bouteilles doivent être manipulées avec soin pour prévenir les fuites ou dégâts à leurs parois, robinets ou systèmes de sûreté. Évitez qu'un circuit électrique soit en contact avec les bouteilles, y compris les rails de contact, les fils électriques ou les circuits de soudage. Cela pourrait créer des arcs courts-circuits pouvant entraîner des accidents graves (Voir 1.3C.).

Chaque bouteille doit porter les inscriptions ICC ou DOT. C'est un gage de sécurité pourvu que la bouteille soit bien manipulée.

Identifying gas content. Use only cylinders with name of gas marked on them; do not rely on color to identify gas content. Notify supplier if unmarked. NEVER DEFACE or alter name, number, or other markings on a cylinder. It is illegal and hazardous.

Empties: Keep valves closed, replace caps securely; mark MT; keep them separate from FULLS and return promptly.

Prohibited use. Never use a cylinder or its contents for other than its intended use, NEVER as a support or roller.

Locate or secure cylinders so they cannot be knocked over.

Passageways and work areas. Keep cylinders clear of areas where they may be struck.

Transporting cylinders. With a crane, use a secure support such as a platform or cradle. Do NOT lift cylinders off the ground by their valves or caps, or by chains, slings, or magnets.

Do NOT expose cylinders to excessive heat, sparks, slag, and flame, etc. that may cause rupture. Do not allow contents to exceed 130°F. Cool with water spray where such exposure exists.

Protect cylinders particularly valves from bumps, falls, falling objects, and weather. Replace caps securely when moving cylinders.

Stuck valve. Do NOT use a hammer or wrench to open a cylinder valve that can not be opened by hand. Notify your supplier.

Mixing gases. Never try to mix any gases in a cylinder.

Never refill any cylinder.

Cylinder fittings should never be modified or exchanged.

3. Hose

Prohibited use. Never use hose other than that designed for the specified gas. A general hose identification rule is: red for fuel gas, green for oxygen, and black for inert gases.

Use ferrules or clamps designed for the hose (not ordinary wire or other substitute) as a binding to connect hoses to fittings.

No copper tubing splices. Use only standard brass fittings to splice hose.

Avoid long runs to prevent kinks and abuse. Suspend hose off ground to keep it from being run over, stepped on, or otherwise damaged.

Coil excess hose to prevent kinks and tangles.

Protect hose from damage by sharp edges, and by sparks, slag, and open flame.

Examine hose regularly for leaks, wear, and loose connections. Immerse pressured hose in water; bubbles indicate leaks.

Identification du gaz: N'utilisez que les bouteilles indiquant la nature du gaz; ne vous fiez pas à la couleur pour reconnaître la nature du gaz. Adressez-vous à votre fournisseur si cela n'est pas indiqué.

N'EFFACEZ ou ne modifiez JAMAIS les noms, numéros ou autres indications sur une bouteille. Cela est illégal et dangereux.

Vides: Maintenez les robinets fermés, remplacez bien les chapeaux; inscrivez "Vides"; séparez-les des "Pleines" et retournez-les rapidement.

Emploi interdit: N'utilisez une bouteille ou son contenu que pour ce à quoi elle est destinée, mais JAMAIS comme support ou rouleau.

Placez les bouteilles pour qu'elles ne tombent pas. Lorsqu'un détendeur (et un boyau) est monté sur elles, placez les ou attachez-les debout.

Passages et lieux de travail. Enlevez les bouteilles d'un endroit où l'on pourrait les frapper.

Transport des bouteilles. Avec une grue, utilisez un support fiable tel qu'une plate-forme ou un cadre. NE SOULEVEZ PAS des bouteilles du sol par leur robinet ou chapeau, ou avec des chaînes, élingues ou aimants.

N'EXPOSEZ PAS les bouteilles à une chaleur excessive, aux étincelles, au laitier et aux flammes, etc., pouvant causer leur rupture. Le contenant ne doit jamais dépasser 55°C. Refroidissez en pulvérisant de l'eau si nécessaire.

Protégez les bouteilles et particulièrement les soupapes contre les chocs, les chutes, les chutes d'objets et la température. Remettez bien les chapeaux lorsque vous déplacez les bouteilles.

Robinet coincé. N'UTILISEZ PAS un marteau ou une clé métallique pour ouvrir un robinet de bouteille que l'on ne peut pas ouvrir à la main. Avisez votre fournisseur.

Mélange de gaz. N'essayez jamais de mélanger des gaz dans une bouteille.

Ne rechargez jamais une bouteille. Les éléments de la bouteille ne doivent jamais être modifiés ou remplacés.

3. Boyau

Utilisation interdite. N'utilisez jamais un boyau autre que celui approprié au gaz indiqué. La règle générale d'identification est: rouge pour les gaz combustibles, vert pour l'oxygène, et noir pour les gaz inertes.

Utilisez des bagues ou colliers appropriés au boyau (et non du fil ordinaire ou autre substitution) pour brancher les boyaux à l'appareillage.

N'utilisez pas des raccords en cuivre. N'utilisez que des accessoires standard en laiton pour raccorder un boyau.

Utilisez une petite longueur de boyau. Cela évitera les noeuds et l'usure prématurée. Suspendez le boyau au-dessus du sol pour éviter qu'il ne soit écrasé, piétiné ou endommagé.

Enroulez le surplus de boyau pour éviter les noeuds et emmêlements. Évitez que le boyau ne soit endommagé par des tranchants, étincelles, laitier et flamme nue.

Repair leaky or worn hose by cutting area out and splicing (1-2D3). Do NOT use tape.

4. Proper Connections

Clean cylinder valve outlet of impurities that may clog orifices and damage seats before connecting regulator. Except for hydrogen, crack valve momentarily, pointing outlet away from people and sources of ignition. Wipe with a clean lintless cloth.

Match regulator to cylinder. Before connecting, check that the regulator label and cylinder marking agree, and that the regulator inlet and cylinder outlet match. NEVER CONNECT a regulator designed for a particular gas or gases to a cylinder containing any other gas.

Tighten connections. When assembling threaded connections, clean and smooth seats where necessary. Tighten. If connection leaks, disassemble, clean, and retighten using properly fitting wrench.

Adapters. Use a CGA adapter (available from your supplier) between cylinder and regulator, if one is required. Use two wrenches to tighten adapter marked RIGHT and LEFT HAND threads.

Regulator outlet (or hose) connections may be identified by right hand threads for oxygen and left hand threads (with grooved hex on nut or shank) for fuel gas.

5. Pressurizing Steps:

Drain regulator of residual gas through suitable vent before opening cylinder (or manifold valve) by turning adjusting screw in (clockwise). Draining prevents excessive compression heat at high pressure seat by allowing seat to open on pressurization. Leave adjusting screw engaged slightly on single-stage regulators.

Stand to side of regulator while opening cylinder valve.

Open cylinder valve slowly so that regulator pressure increases slowly. When gauge is pressurized (gauge reaches regulator maximum) leave cylinder valve in following position: For oxygen, and inert gases, open fully to seal stem against possible leak. For fuel gas, open to less than one turn to permit quick emergency shutoff.

Use pressure charts (available from your supplier) for safe and efficient, recommended pressure settings on regulators.

Check for leaks on first pressurization and regularly thereafter. Brush with soap solution (capful of Ivory Liquid* or equivalent per gallon of water). Bubbles indicate leak. Clean off soapy water after test; dried soap is combustible.

E. User Responsibilities

Remove leaky or defective equipment from service immediately for repair. See User Responsibility statement in equipment manual.

*Trademark of Proctor & Gamble

Vérifiez régulièrement les fuites, l'usure et les raccords lâches. Plongez le boyau sous pression dans de l'eau; les bulles indiqueront les fuites.

Réparation. Coupez la partie percée ou usée, et raccordez (1-2D3). N'UTILISEZ JAMAIS de ruban adhésif.

4. Branchements corrects

Avant de brancher le détendeur, nettoyez la sortie du robinet de la bouteille des impuretés qui peuvent obstruer les orifices et endommager les sièges. Sauf pour l'hydrogène, ouvrez momentanément le robinet, en éloignant la sortie des personnes et des sources inflammables. Essuyez avec un tissu propre et non gras.

Appareillez le détendeur à la bouteille. Avant de brancher, vérifiez que la marque du détendeur et la description de la bouteille concordent, et que l'orifice d'entrée du détendeur et l'orifice de sortie de la bouteille aillent ensemble. NE BRANCHEZ JAMAIS un détendeur conçu pour un gaz spécial (ou des gaz spéciaux) à une bouteille contenant d'autres gaz.

Serrez les branchements. Lorsque vous assemblez des branchements filetés, nettoyez et polissez les sièges où c'est nécessaire. Serrez. Si les branchements perdent, démontez-les, nettoyez et resserez avec une clef adéquate.

Adaptateurs. Placez, si besoin est, un adaptateur CGA (en vente chez votre fournisseur) entre la bouteille et le détendeur. Avec deux clefs, serrez l'adaptateur fileté À DROITE et À GAUCHE.

On peut reconnaître les branchements de sortie du détendeur (ou boyau) à l'aide du filetage à droite pour l'oxygène et à gauche (identifié par un écrou cannelé) pour les gaz combustibles.

5. Démarches de mise en pression

Purgez le détendeur de résidu de gaz avant d'ouvrir la bouteille (ou le robinet de canalisation) en serrant la vis de réglage (dans le sens des aiguilles d'une montre). Cette opération permet au siège de haute pression de s'ouvrir à la mise en pression, supprimant ainsi toute surchauffe de compression. Maintenez la vis de réglage des détendeurs à simple détente légèrement engagée. Avant d'ouvrir le robinet de la bouteille, assurez-vous que les boyaux sont branchés et que les soupapes aval sont fermées.

Tenez-vous latéralement au détendeur en ouvrant le robinet de la bouteille. Ouvrez-le lentement pour que la pression du détendeur monte progressivement. Lorsque le manomètre est mis sous pression (indique le maximum) le robinet de la bouteille de gaz inerte ou d'oxygène devra être ouvert à fond pour assurer l'étanchéité et celui de la bouteille de gaz combustible ouvert de moins d'un tour pour pouvoir le refermer rapidement en cas d'urgence.

Référez-vous aux tableaux de pression (distribués par votre fournisseur) pour un réglage recommandé de pression sûr et efficace sur les détendeurs. Vérifiez les fuites à la première mise en pression puis régulièrement, brossez avec une solution savonneuse (un bouchon d'Ivory Liquid* ou semblable par gallon d'eau). Les bulles indiquent une fuite. Enlevez l'eau savonneuse après examen; le savon sec est inflammable.

*Marque de Commerce de Proctor & Gamble

F. Leaving Equipment Unattended

Close gas supply at source and drain gas.

G. Rope Staging-Support

Rope staging-support should not be used for welding or cutting operation; rope may burn.

1-3. ARC WELDING - Comply with precautions in 1-1, 1-2, and this section. Arc Welding, properly done, is a safe process, but a careless operator invites trouble. The equipment carries high currents at significant voltages. The arc is very bright and hot. Sparks fly, fumes rise, ultraviolet and infrared energy radiates, weldments are hot, and compressed gases may be used. The wise operator avoids unnecessary risks and protects himself and others from accidents. Precautions are described here and in standards referenced in index.

A. Burn Protection

Comply with precautions in 1-2.

The welding arc is intense and visibly bright. Its radiation can damage eyes, penetrate lightweight clothing, reflect from light-colored surfaces, and burn the skin and eyes. Skin burns resemble acute sunburn, those from gas-shielded arcs are more severe and painful. **DON'T GET BURNED; COMPLY WITH PRECAUTIONS.**

1. Protective Clothing

Wear long-sleeve clothing (particularly for gas-shielded arc) in addition to gloves, hat, and shoes (1-2A). As necessary, use additional protective clothing such as leather jacket or sleeves, flame-proof apron, and fire-resistant leggings. Avoid outer garments of untreated cotton.

Bare skin protection. Wear dark, substantial clothing. Button collar to protect chest and neck and button pockets to prevent entry of sparks.

2. Eye and Head Protection

Protect eyes from exposure to arc. **NEVER** look at an electric arc without protection.

Welding helmet or shield containing a filter plate shade no. 12 or denser must be used when welding. Place over face before striking arc.

Protect filter plate with a clear cover plate.

Cracked or broken helmet or shield should **NOT** be worn; radiation can pass through to cause burns.

Cracked, broken, or loose filter plates must be replaced **IMMEDIATELY**. Replace clear cover plate when broken, pitted, or spattered.

E. Responsabilités de l'utilisateur

Ôtez immédiatement les parties percées ou défectueuses. Voir les Responsabilités de l'Usager du manuel de l'appareil.

F. Appareil laissé sans surveillance

Fermez l'alimentation de gaz à la source et purgez.

G. Liens et supports temporaires

Pour vos travaux de soudage ou de coupage, n'utilisez pas de la corde comme soutien, elle est inflammable.

1-3. SOUDAGE À L'ARC - Conformez-vous aux précautions des paragraphes 1.1 et 1.2 de cette section. Le soudage à l'arc bien exécuté est sûr, mais un soudeur négligent est un danger. Le poste de soudage transporte des courants élevés sous de fortes tensions. L'arc est très vif et chaud. Les étincelles volent, les vapeurs montent, l'énergie ultra-violette et infrarouge rayonnent, les soudures sont chaudes, et des gaz comprimés peuvent être utilisés. Le soudeur prudent évite les risques inutiles, se protège et protège autrui contre les accidents. Les précautions sont décrites ici et dans les normes données dans l'Index.

A. Protection contre les brûlures

Conformez-vous aux précautions du paragraphe 1.2. L'arc de soudage est intense et visiblement vif. Son rayonnement peut blesser les yeux, traverser les habits légers, se réfléchir sur les surfaces claires, et brûler la peau et les yeux. Les brûlures de la peau ressemblent à un gros coup de soleil. Celles d'arcs sous gaz protecteur sont plus graves et plus douloureuses. **NE VOUS BRÛLEZ PAS - SUIVEZ LES PRÉCAUTIONS.**

1. Vêtements de protection

Portez des vêtements à manches longues (surtout pour l'arc en atmosphère inerte) avec gants, masque et chaussures (1.2A.).

Si nécessaire portez en plus une veste ou des manches en cuir, un tablier et des guêtres ignifugés. De préférence ne portez pas de vêtements en coton non traité.

Protection de la peau. Portez des vêtements épais foncés. Boutonnez le col pour protéger la poitrine et le cou, et boutonnez les poches pour prévenir l'infiltration d'étincelles.

2. Protection des yeux et de la tête

Évitez que vos yeux soient exposés à l'arc. **NE** regardez **JAMAIS** un arc électrique sans protection.

Lorsque vous soudez, portez un écran ou masque avec verre filtrant teinté N° 12 ou plus foncé. Mettez-le sur le visage avant d'amorcer l'arc.

Protégez le verre filtrant d'un couvre-verre clair. **NE PORTEZ PAS** un masque fendu ou brisé; le rayonnement peut s'infiltrer et causer des brûlures.

Les verres filtrants fendus, brisés ou lâches doivent être remplacés **IMMÉDIATEMENT**. Remplacez un couvre-verre brisé, piqué ou taché par des projections.

Flash goggles with side shields **MUST** be worn under the helmet to give some protection to the eyes should the helmet not be lowered over the face before an arc is struck. Looking at an arc momentarily with unprotected eyes (particularly a high intensity gas-shielded arc) can cause a retinal burn that may leave a permanent dark area in the field of vision.

3. Protection of Nearby Personnel

Enclosed welding area. For production welding, a separate room or enclosed bay is best. In open areas, surround the operation with low-reflective, non-combustible screens or panels. Allow for free air circulation, particularly at floor level.

Viewing the weld. Provide face shields for all persons who will be looking directly at the weld.

Others working in area. See that all persons are wearing flash goggles.

Before starting to weld, make sure that screen flaps or bay doors are closed.

B. Toxic Fume Prevention

Comply with precautions in 1-2B.

Generator engine exhaust must be vented to the outside air. Carbon monoxide can kill.

C. Fire and Explosion Prevention

Comply with precautions in 1-2C.

Equipment's rated capacity. Do not overload arc welding equipment. It may overheat cables and cause a fire.

Loose cable connections may overheat or flash and cause a fire.

Never strike an arc on a cylinder or other pressure vessel. It creates a brittle area that can cause a violent rupture or lead to such a rupture later under rough handling.

D. Compressed Gas Equipment

Comply with precautions in 1-2D.

E. Shock Prevention

Exposed hot conductors or other bare metal in the welding circuit, or in ungrounded, electrically-HOT equipment can fatally shock a person whose body becomes a conductor. **DO NOT STAND, SIT, LIE, LEAN ON, OR TOUCH** a wet surface when welding, without suitable protection.

Vous devez porter des lunettes à écrans latéraux sous le masque pour protéger les yeux dans le cas où le masque ne serait pas abaissé sur le visage avant l'amorçage de l'arc. Regarder momentanément un arc sans protection (principalement un arc en atmosphère inerte à haute intensité) peut brûler la rétine et laisser un point sombre permanent dans le champ de vision.

3. Protection du personnel à proximité

Local de soudage fermé. Pour le soudage de production, il vaut mieux utiliser une salle séparée ou une baie fermée. Dans les locaux ouverts, entourez les travaux d'écrans ou panneaux peu réfléchissants et ininflammables. Laissez l'air circuler librement, particulièrement au niveau du sol.

Donnez des masques aux personnes qui regarderont directement la soudure.

Autres personnes travaillant sur les lieux. Veillez à ce que toutes les personnes portent les lunettes de protection.

Avant d'attaquer la soudure, assurez-vous que les rebords d'écran ou les portes soient fermés.

B. Prévention des gaz toxiques

Suivez les précautions du paragraphe 1.2B. L'échappement du moteur de la génératrice doit être ventilé à l'air extérieur. L'oxyde de carbone peut tuer.

C. Prévention des incendies et des explosions

Suivez les précautions 1.2C. Puissance nominale de l'appareil. Ne surchargez pas le poste de soudage à l'arc. Cela peut surchauffer les câbles et causer un incendie.

Les branchements lâches de câble peuvent surchauffer ou faire des étincelles et causer un incendie.

N'amorcez jamais un arc sur une bouteille ou autre récipient sous pression. Cela créerait un point de rupture entraînant à plus ou moins longue échéance l'explosion du réservoir.

D. Gaz comprimé

Suivez les précautions 1.2D.

E. Prévention des décharges électriques

Des conducteurs chargés ou métal nu incorporés au circuit de soudage ou à un appareil chargé sans mise à la terre peuvent donner une décharge fatale à la personne dont le corps devient conducteur. **NE SOUDEZ PAS DEBOUT, ASSIS, COUCHÉ, PENCHÉ** sur une surface humide ni en contact avec une telle surface sans protection appropriée.

To protect against shock:

Keep body and clothing dry. Never work in damp area without adequate insulation against electrical shock. Stay on a dry duckboard, or rubber mat when dampness or sweat can not be avoided. Sweat, sea water, or moisture between body and an electrically HOT part - or grounded metal - reduces the body surface electrical resistance, enabling dangerous and possibly lethal currents to flow through the body.

1. Grounding the Equipment

When arc welding equipment is grounded according to the National Electrical Code, and the work is grounded according to ANSI Z49.1 "Safety In Welding And Cutting," a voltage may exist between the electrode and any conducting object. Examples of conducting objects include, but are not limited to, buildings, electrical tools, work benches, welding power source cases, workpieces, etc. **Never touch the electrode and any metal object unless the welding power source is off.**

When installing, connect the frames of each unit such as welding power source, control, work table, and water circulator to the building ground. Conductors must be adequate to carry ground currents safely. Equipment made electrically HOT by stray current may shock, possibly fatally. Do NOT GROUND to electrical conduit, or to a pipe carrying ANY gas or a flammable liquid such as oil or fuel.

Three-phase connection. Check phase requirements of equipment before installing. If only 3-phase power is available, connect single-phase equipment to only two wires of the 3-phase line. Do NOT connect the equipment ground lead to the third (live) wire, or the equipment will become electrically HOT - a dangerous condition that can shock, possibly fatally.

Before welding, check ground for continuity. Be sure conductors are touching bare metal of equipment frames at connections.

If a line cord with a ground lead is provided with the equipment for connection to a switchbox, connect the ground lead to the grounded switchbox. If a three-prong plug is added for connection to a grounded mating receptacle, the ground lead must be connected to the ground prong only. If the line cord comes with a three-prong plug, connect to a grounded mating receptacle. Never remove the ground prong from a plug, or use a plug with a broken off ground prong.

2. Electrode Holders

Fully insulated electrode holders should be used. Do NOT use holders with protruding screws.

3. Connectors

Fully insulated lock-type connectors should be used to join welding cable lengths.

Pour vous protéger contre les décharges électriques, maintenez votre corps et vêtements secs. Ne travaillez jamais dans un endroit humide sans isolation adéquate contre les décharges électriques. Lorsque vous ne pouvez éviter l'humidité ou la sueur, placez-vous sur un caillebotis sec ou un tapis en caoutchouc. La sueur, l'eau de mer, ou l'humidité entre le corps et une pièce CHARGÉE, ou une pièce de métal à la masse, réduisent la résistance électrique de la surface du corps, permettant l'entrée de courants dangereux, voire mortels.

1. Mise à la terre de l'appareil

Lorsque l'appareil de soudage à l'arc est mise à la terre suivant la norme National Electrical Code, et la masse est mise à la terre suivant la norme ANSI Z49.1 "Safety in Welding and Cutting," une tension peut exister entre l'électrode et un objet conducteur. Certaines de ces objets sont par exemple (mais pas seulement), des bâtiments, des outils électriques, des établis, des châssis de postes de soudure, des pièces d'ouvrage, etc. **Ne jamais touchez l'électrode ou des objets en métal avant d'avoir mis le poste de soudure à l'arrêt.**

À l'installation, branchez les châssis de chaque élément (source de courant, commande, établi et circuit d'eau) à la terre. Les conducteurs doivent pouvoir conduire les courants telluriques en toute sécurité. L'appareil chargé par les courants vagabonds peut donner une décharge risquant d'être mortelle. **NE BRANCHEZ PAS VOTRE PRISE DE TERRE** à une conduite électrique, ou à un tuyau de gaz ou de liquide inflammable tel que l'huile ou un combustible.

Connexion triphasée. Avant l'installation vérifiez la phase nécessaire à l'appareil. Si seul le triphasé est disponible, ne branchez l'appareil monophasé qu'à deux des fils de la ligne triphasée. **NE BRANCHEZ PAS** le conducteur de terre de l'appareil au troisième fil (sous tension), autrement l'appareil serait chargé: condition dangereuse pouvant donner une décharge fatale.

Avant le soudage, vérifiez si la prise de terre est uniforme. En branchant, assurez-vous que les conducteurs touchent le métal nu du châssis de l'appareil.

Lorsqu'un appareil doit être alimenté à partir d'un coffret d'alimentation, le conducteur de terre doit être relié à celui-ci.

Si vous avez en plus une fiche à trois broches pour la terre, ne branchez le conducteur de terre qu'à la broche de terre. Si le cordon d'alimentation a une fiche à trois broches, reliez-le à une prise femelle tripolaire reliée à la terre. N'enlevez jamais la broche de terre d'une fiche ou n'utilisez jamais une fiche dont la broche de terre serait brisée.

2. Pince-électrodes

Utilisez des pince-électrodes bien isolées. **N'UTILISEZ PAS** des pince-électrodes avec vis saillantes.

3. Connecteurs

Utilisez des connecteurs à verrouillage bien isolés pour assembler de longs câbles.

4. Cables

Frequently inspect cables for wear, cracks and damage. **IMMEDIATELY REPLACE** those with excessively worn or damaged insulation to avoid possibly – lethal shock from bared cable. Cables with damaged areas may be taped to give resistance equivalent to original cable.

Keep cable dry, free of oil and grease, and protected from hot metal and sparks.

5. Terminals And Other Exposed Parts.

Terminals and other exposed parts of electrical units should have insulating covers secured before operation.

6. Electrode

- a. *Equipment with output on/off control (contactor)*

Welding power sources for use with the gas metal arc welding (GMAW), gas tungsten arc welding (GTAW) and similar processes normally are equipped with devices that permit on-off control of the welding power output. When so equipped the electrode wire becomes electrically HOT when the power source switch is ON and the welding gun switch is closed. Never touch the electrode wire or any conducting object in contact with the electrode circuit unless the welding power source is off.

- b. *Equipment without output on/off control (no contactor)*

Welding power sources used with shielded metal arc welding (SMAW) and similar processes may not be equipped with welding power output on-off control devices. With such equipment the electrode is electrically HOT when the power switch is turned ON. Never touch the electrode unless the welding power source is off.

7. Safety Devices

Safety devices such as interlocks and circuit breakers should not be disconnected or shunted out.

Before installation, inspection, or service, of equipment, shut OFF all power and remove line fuses (or lock or red-tag switches) to prevent accidental turning ON of power. Disconnect all cables from welding power source, and pull all 115 volts line-cord plugs.

Do not open power circuit or change polarity while welding. If, in an emergency, it must be disconnected, guard against shock burns, or flash from switch arcing.

Leaving equipment unattended. Always shut OFF and disconnect all power to equipment.

Power disconnect switch must be available near the welding power source.

4. Câbles

Vérifiez fréquemment l'usure, les fissures et l'altération des câbles. **REPLACEZ IMMÉDIATEMENT** ceux dont l'isolation serait trop usée ou altérée pour prévenir les décharges mortelles provoquées par un câble dénudé. Vous pouvez enrouler les parties endommagées de ruban adhésif en épaisseur suffisante pour donner une résistance de câble neuf. Maintenez les câbles secs, dépourvus d'huile et de graisse et mettez-les à l'abri du métal chaud et des étincelles.

5. Têtes de câbles et autres parties dénudées

Avant la mise en marche, les têtes de câbles et autres parties dénudées d'un appareil électrique doivent être munies de leurs couvre-fils isolants.

6. Électrode

- a. *Appareil équipé d'une commande marche/arrêt (contacteur)*

En général, les postes de soudure utilisés pour le soudage à l'arc sous protection gazeuse avec électrode fusible (GMAW), ou avec électrode tungstène (GTAW) et des procès semblables sont équipés d'une commande marche/arrêt de la puissance de sortie. Lorsque l'interrupteur est en position "MARCHE" et l'interrupteur du pistolet est fermé, le fil d'électrode devient chargé. Ne touchez jamais le fil électrode ou tout autre objet conducteur faisant contact avec le circuit d'électrode sans couper le courant au poste de soudure.

- b. *Appareil non-équipé d'une commande marche/arrêt (sans contacteur)*

Les postes de soudure utilisés pour le soudage à l'arc avec électrode enrobée (SMAW) et des procès semblables peuvent être non-équipés d'une commande marche/arrêt de la puissance de sortie. Lorsque l'interrupteur est en position "MARCHE" l'électrode devient chargé. Ne touchez jamais l'électrode sans couper le courant au poste de soudure.

7. Dispositif de sécurité

Le dispositif de sécurité-verrouillage et coupe-circuit ne doit pas être débranché ou déshunté.

Avant l'installation, l'inspection ou la réparation de l'appareil, mettez l'alimentation sur ARRÊT et enlevez les fusibles généraux (ou verrouillez les interrupteurs) pour éviter une remise en MARCHE accidentelle. Débranchez tous les câbles de la source de courant ainsi que les prises des cordons d'alimentation en 115 volts.

Lors du soudage, n'ouvrez pas le circuit d'alimentation et ne changez pas la polarité. S'il est débranché au cours d'une urgence, faites attention aux brûlures de décharge ou aux jaillissements d'étincelles.

Appareil laissé sans surveillance. Mettez toujours sur ARRÊT et débranchez l'appareil.

F. Protection For Wearers Of Electronic Life Support Devices (Pacemakers)

Magnetic fields from high currents can affect pacemaker operation. Persons wearing electronic life support equipment (pacemaker) should consult with their doctor before going near arc welding, gouging, or spot welding operations.

1-4. STANDARDS BOOKLET INDEX - For more information, refer to the following standards or their latest revisions and comply as applicable:

1. ANSI Standard Z49.1, SAFETY IN WELDING AND CUTTING obtainable from the American Welding Society, 550 Le Jeune Rd, P.O. Box 351040, Miami, FL 33135.
2. NIOSH, SAFETY AND HEALTH IN ARC WELDING AND GAS WELDING AND CUTTING obtainable from the Superintendent of Documents, U.S. Government Printing Office, Washington, D.C. 20402.
3. OSHA, SAFETY AND HEALTH STANDARDS, 29CFR 1910, obtainable from the U.S. Government Printing Office, Washington, D.C. 20402.
4. ANSI Standard Z87.1, SAFE PRACTICES FOR OCCUPATION AND EDUCATIONAL EYE AND FACE PROTECTION obtainable from the American National Standards Institute, 1430 Broadway, New York, NY 10018.
5. ANSI Standard Z41.1, STANDARD FOR MEN'S SAFETY -TOE FOOTWEAR obtainable from the American National Standards Institute, 1430 Broadway, New York, NY 10018
6. ANSI Standard Z49.2, FIRE PREVENTION IN THE USE OF CUTTING AND WELDING PROCESSES obtainable from the American National Standards Institute, 1430 Broadway, New York, NY 10018.
7. AWS Standard A6.0, WELDING AND CUTTING CONTAINERS WHICH HAVE HELD COMBUSTIBLES obtainable from the American Welding Society, 550 Le Jeune Rd., P.O. Box 351040, Miami, FL 33135.
8. NFPA Standard 51, OXYGEN - FUEL GAS SYSTEMS FOR WELDING AND CUTTING obtainable from the National Fire Protection Association, 470 Atlantic Avenue, Boston, MA 02210.
9. NFPA Standard 70-1978, NATIONAL ELECTRICAL CODE obtainable from the National Fire Protection Association, 470 Atlantic Avenue, Boston, MA 02210.
10. NFPA Standard 51B, CUTTING AND WELDING PROCESSES obtainable from the National Fire Protection Association, 470 Atlantic Avenue, Boston, MA 02210.

L'interrupteur d'arrêt doit toujours se trouver à proximité de la source de courant.

F. Protection pour toute personne portant des appareils électroniques de sauvetage (appareil pour le règlement de battement de coeur)

Inducteurs de courant élevé peuvent nuire le fonctionnement d'un appareil pour le "règlement de battement de coeur." Toute personne portant un appareil électronique de sauvetage (appareil pour le règlement de battement de coeur), devrait consulter un docteur avant d'approcher toute opération de soudage à l'arc, à la gouge ou à point.

1-4. INDEX DES NORMES - Pour plus de renseignements, référez-vous aux normes de l'ACNOR ou aux normes américaines suivantes:

1. ANSI Standard Z49.1, SAFETY IN WELDING AND CUTTING distribué par l'American Welding Society, 550 Le Jeune Rd., P.O. Box 351040 Miami, FL 33135
2. NIOSH, SAFETY AND HEALTH IN ARC WELDING AND GAS WELDING AND CUTTING distribué par le Superintendent of Documents, U.S. Government Printing Office, Washington D.C. 20402
3. OSHA, SAFETY AND HEALTH STANDARDS, 29CFR 1910, distribué par U.S. Department of Labor, Washington D.C. 20210
4. ANSI Standard Z87.1, SAFE PRACTICES FOR OCCUPATION AND EDUCATIONAL EYE AND FACE PROTECTION distribué par l'American National Standards Institute, 1430 Broadway, New York, NY 10018
5. ANSI Standard Z41.1, STANDARD FOR MEN'S SAFETY - TOE FOOTWEAR distribué par l'adresse donnée en 4.
6. ANSI Standard Z49.2, FIRE PREVENTION IN THE USE OF CUTTING AND WELDING PROCESSES distribué par l'adresse donnée en 4.
7. AWS Standard A6.0, WELDING AND CUTTING CONTAINERS WHICH HAVE COMBUSTIBLES distribué par l'adresse donnée en 1.
8. NFPA Standard 51, OXYGEN - FUEL GAS SYSTEMS FOR WELDING AND CUTTING distribué par la National Fire Protection Association, 470 Atlantic Avenue, Boston, MA 02210
9. NFPA Standard 70-1978, NATIONAL ELECTRICAL CODE distribué par l'adresse donnée en 8
10. NFPA Standard 51B, CUTTING AND WELDING PROCESSES distribué par l'adresse donnée en 8

11. CGA Pamphlet P-1, **SAFE HANDLING OF COMPRESSED GASES IN CYLINDERS** obtainable from the Compressed Gas Association, 500 Fifth Avenue, New York, NY 10036.
 12. CSA Standard W117.2, **CODE FOR SAFETY IN WELDING AND CUTTING** obtainable from the Canadian Standards Association, Standards Sales, 178 Rexdale Boulevard, Rexdale, Ontario, Canada M9W 1R3.
 13. NWSA booklet, **WELDING SAFETY BIBLIOGRAPHY** obtainable from the National Welding Supply Association, 1900 Arch Street, Philadelphia, PA 19103.
 14. American Welding Society Standard AWSF4.1 "Recommended Safe Practices for the Preparation for Welding and Cutting of Containers and Piping That Have Held Hazardous Substances", obtainable from the American Welding Society, 550 Le Jeune Rd., P.O. Box 351040, Miami, FL 33135.
 15. ANSI Standard Z88.2 "Practice for Respiratory Protection" obtainable from the American National Standards Institute, 1430 Broadway, New York, NY 10018.
11. CGA Pamphlet P-1, **SAFE HANDLING OF COMPRESSED GASES IN CYLINDERS** distribué par la Compressed Gas Association, 500 Fifth Avenue, New York, NY 10036.
 12. CSA Standard W117.2, **CODE FOR SAFETY IN WELDING AND CUTTING** distribué par la Canadian Standards Association, Standards Sales, 178 Rexdale Boulevard, Rexdale, Ontario, Canada M9W 1R3.
 13. NWSA booklet, **WELDING SAFETY BIBLIOGRAPHY** distribué par la National Welding Supply Association, 1900 Arch Street Philadelphia, PA 19103.
 14. American Welding Societe Standard AWSF4.1 "Recommended Safe Practices for the Preparation for Welding and Cutting of Containers and Piping That Have Held Hazardous Substances", distribué par l'American Welding Societe, 550 Le Jeune Rd., P.O. Box 351040, Miami, FL 33135
 15. ANSI Standard Z88.2 "Practice For Respiratory Protection" distribué par l'American National Standards Institute, 1430 Broadway, New York, NY 10018.

SECTION 2 – SAFETY PRECAUTIONS AND SIGNAL WORDS

2-1. GENERAL INFORMATION AND SAFETY

A . General

Information presented in this manual and on various labels, tags, and plates on the unit pertains to equipment design, installation, operation, maintenance, and troubleshooting which should be read, understood, and followed for the safe and effective use of this equipment.

B . Safety

The installation, operation, maintenance, and troubleshooting of arc welding equipment requires practices and procedures which ensure personal safety and the safety of others. Therefore, this equipment is to be installed, operated, and maintained only by qualified persons in accordance with this manual and all applicable codes such as, but not limited to, those listed at the end of Section 1 – Safety Rules For Operation Of Arc Welding Power Source.

2-2. SAFETY ALERT SYMBOL AND SIGNAL WORDS

The following safety alert symbol and signal words are used throughout this manual to call attention to and identify different levels of hazard and special instructions.



This safety alert symbol is used with the signal words **WARNING** and **CAUTION** to call attention to the safety statements.



WARNING statements identify procedures or practices which must be followed to avoid serious personal injury or loss of life.



CAUTION statements identify procedures or practices which must be followed to avoid minor personal injury or damage to this equipment.

IMPORTANT statements identify special instructions necessary for the most efficient operation of this equipment.

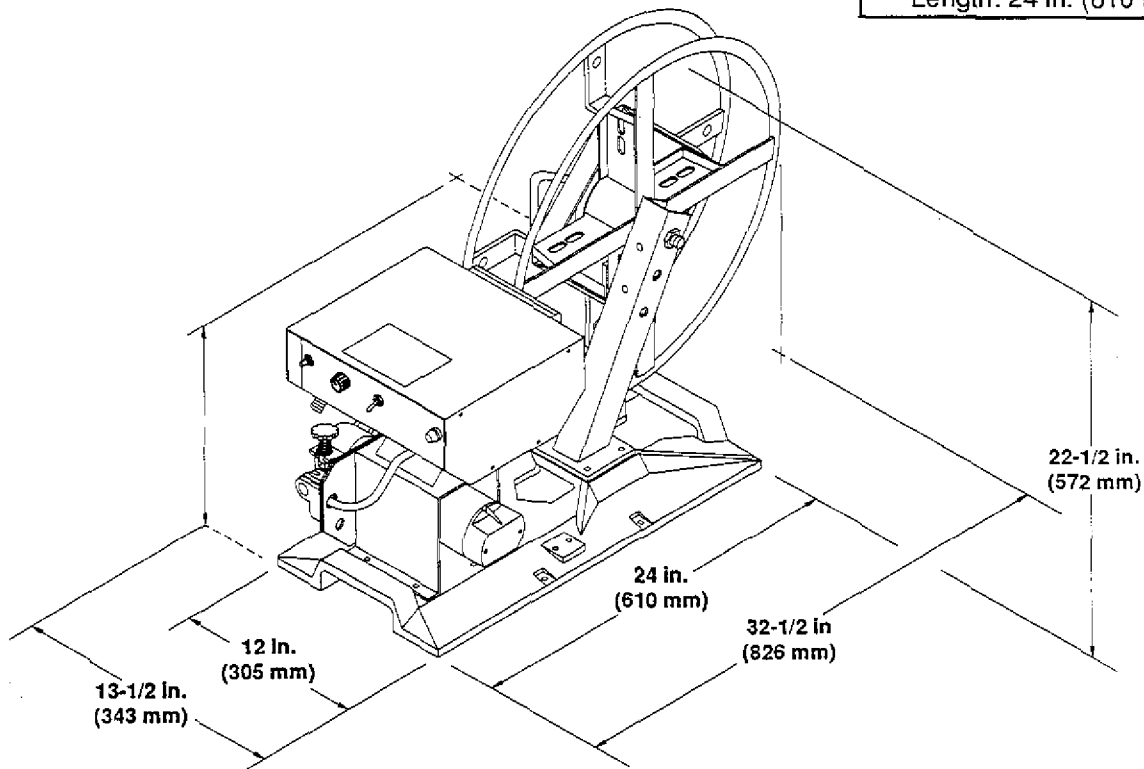
SECTION 3 – SPECIFICATIONS

Table 3-1. Specifications

Input Power Requirements	Electrode Wire Diameter Capability	Speed Range	Control Circuit Voltage At Gun	Weight*	
				Net	Ship
115 Volts AC At 3 Amperes 50/60 Hz	.023-1/8 in. (0.6-3.2 mm)	70-750 ipm (1.8-19 mpm)	24 Volts AC	50 lbs. (23 kg)	53 lbs. (24 kg)

*Add 2 lbs. (1 kg) for 4 drive roll model.

Dimensions Without Wire Reel
Height: 15-1/4 in. (387 mm)
Width: 13-1/4 in. (337 mm)
Length: 24 in. (610 mm)



TC 045 318-F

Figure 3-1. Wire Feeder Dimensions

3-1. DESCRIPTION

The S-52E and S-54E model wire feeders are of the constant wire feed speed type and are designed to be used with a constant voltage welding power source. The S-52E models use a two drive roll system, and the S-54E models use a four drive roll system.

All necessary equipment and controls are provided with the wire feeder to supply welding wire and shielding gas to the gun.

An optional burnback control and/or water valve can be provided.

SECTION 4 – INSTALLATION OR RELOCATION

4-1. LOCATION (Figure 3-1)

The service life and efficiency of this unit and associated components are reduced when they are subjected to high levels of dust, dirt, moisture, corrosive vapors, and extreme heat.

A proper installation site should be selected for the wire feeder if the unit is to provide dependable service. Lead lengths must be considered when installing the unit. A slot is provided in the base of the unit to fit over the lifting eye on welding power sources so equipped. Suitable space should be maintained around the unit for making necessary connections and for maintenance functions.

4-2. HUB INSTALLATION (Figure 4-1)

The hub assembly is supplied with the wire feeder. Remove the hub assembly from the feeder carton, and install it as follows:

1. Remove hex nut from end of hub support shaft.
2. Align keyway and insert hub support shaft through selected hole in hub support. Wire spool size determines hole selection.
3. Reinstall hex nut onto support shaft. Tighten hex nut until a slight drag is felt while turning hub.

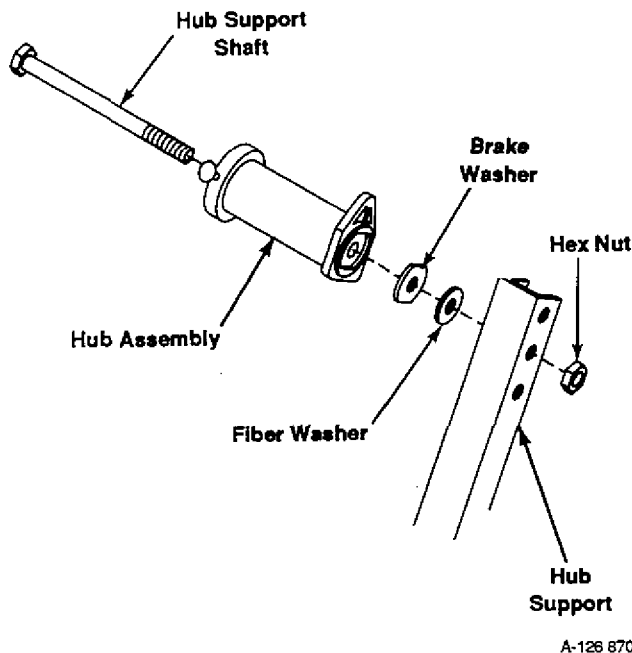


Figure 4-1. Hub And Reel Assemblies Installation

4-3. WIRE GUIDE AND DRIVE ROLL INSTALLATION (Figure 4-2 And Figure 4-3)

Upon initial installation, or as a result of changes in wire size and type, it is necessary to install the required drive rolls and wire guides. Select drive rolls according to Table 9-1 or Table 9-2.

After obtaining the appropriate drive rolls and wire guides, proceed as follows:

A. Wire Guide Installation

1. Loosen the wire guide securing screw(s).

IMPORTANT: *Wire guides should be installed so that the tip(s) of the guide is as close to the drive roll as possible without touching.*

2. Install wire guides as illustrated in Figure 4-2 and Figure 4-3. Adjust after installing drive rolls, and secure by tightening securing screws.

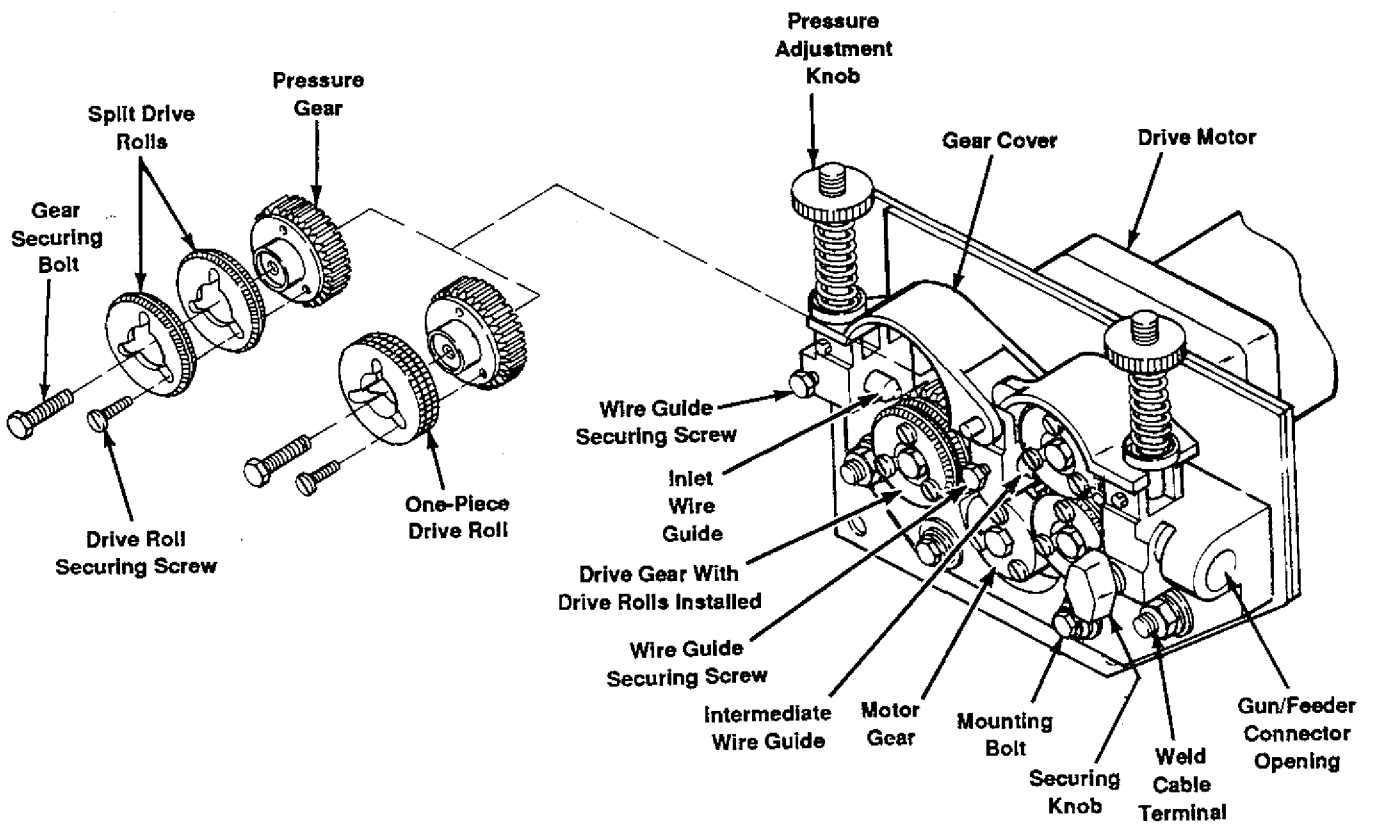
B. Drive Roll Installation (Figure 4-2 And Figure 4-3)

1. Loosen pressure adjustment knob(s), and pivot free of the cover.
2. Pivot gear cover away to expose pressure gear.
3. Loosen and remove the three securing screws on each gear.
4. For one piece drive rolls: slide a drive roll onto the drive gear and pressure gear with holes aligned and secure with screws.
5. For split drive rolls: align holes on each pair of split drive rolls, insert a securing screw, and slide a drive roll onto the drive gear and pressure gear with screw in line with one of the threaded holes. Insert remaining screws and tighten.

To ensure proper gripping of U-Cogged drive rolls, install all rolls either showing the side with slots or showing the side without slots. Line up the blunted teeth on the pressure gear rolls directly over the spaces between the teeth on the drive gear roll.

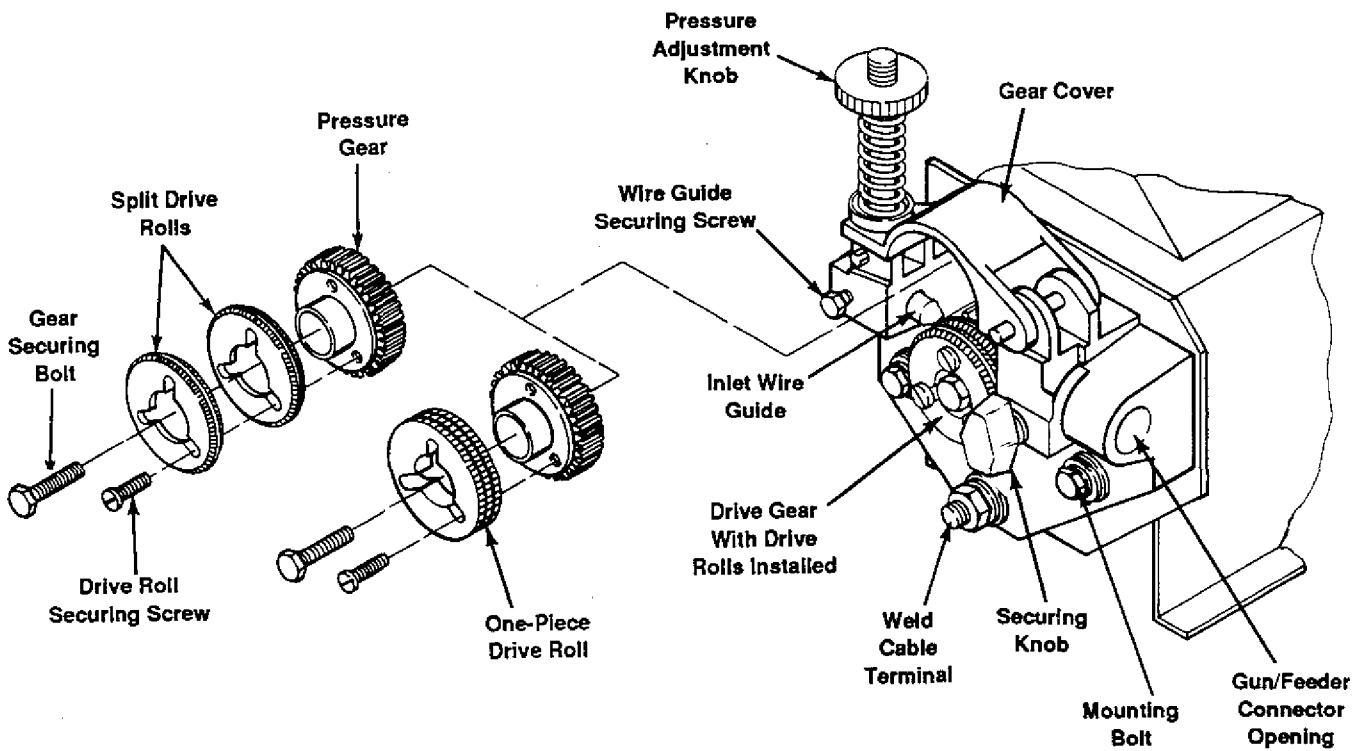
IMPORTANT: *Both one-piece and split drive rolls are of the double usage type. When the grooves become worn, reverse the one-piece rolls or reverse the split roll halves to locate the unused grooves in position to feed the wire.*

IMPORTANT: *The alignment of the wire drive assembly is factory set and should not require readjustment. If readjustment of the drive rolls and wire guide is needed on a two drive roll model, refer to Section 7-2. If readjustment of the motor gear and drive gears is needed on a four drive roll model, refer to Section 7-3.*



TB-070 887-A

Figure 4-2. Drive Roll And Wire Guide Installation On Four Drive Roll Units



TB-047 931-D

Figure 4-3. Drive Roll And Wire Guide Installation On Two Drive Roll Units

4-4. WELDING GUN CONNECTIONS

A. Gun Connector To Drive Assembly (Provides Weld Power And Shielding Gas) (Figure 4-2 And Figure 4-3)

IMPORTANT: The outlet guide is provided as part of the gun or gun adapter assembly.

1. Loosen the gun/feeder connector securing knob.

IMPORTANT: The outlet guide should be installed so that tip of guide is as close to the drive rolls as possible without touching.

2. Insert the gun/feeder connector, or gun/feeder adapter if required, which includes installed outlet guide, into drive assembly opposite inlet guide.

3. Tighten gun/feeder connector securing knob.

B. Gun Trigger (Figure 4-4)

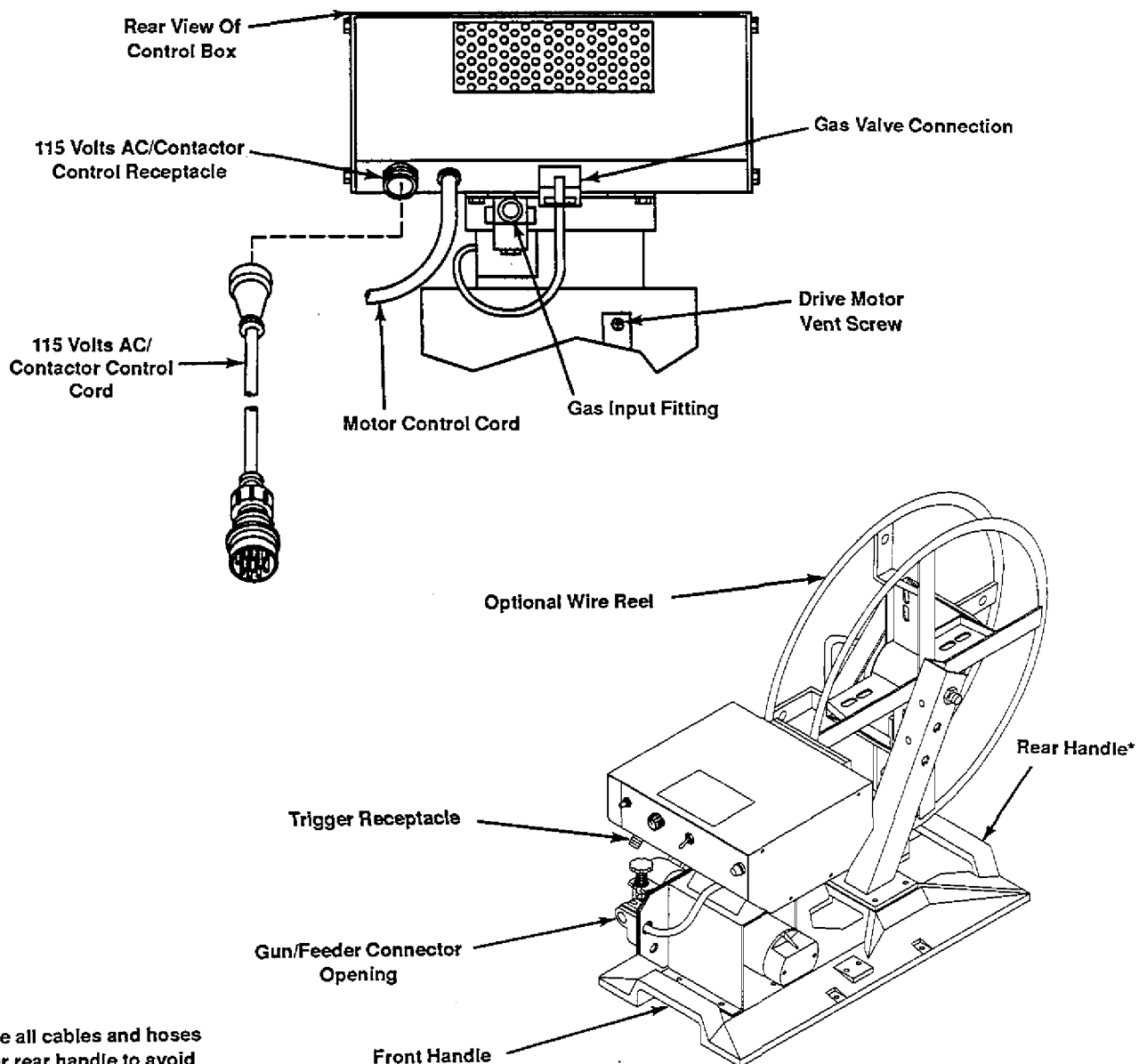


WARNING: ELECTRIC SHOCK can kill.

- Do not touch live electrical parts.
- Do not touch electrode wire when gun trigger is pressed.

The welding wire and all metal parts in contact with it carry weld output when the welding power source contactor is energized.

The TRIGGER receptacle is provided on front of control box for making gun trigger control connections. To make connections, align keyways, insert plug from gun into TRIGGER receptacle, and rotate threaded collar fully clockwise.



*Route all cables and hoses under rear handle to avoid contact with welding wire.

TA-047 904-D
TC-045 318-F

Figure 4-4. Wire Feeder Installation

C. Shielding Gas (If Applicable)

An integral gas input fitting is provided on the wire drive assembly for guns utilizing this type of connection. If the gun requires a separate shielding gas connection, disconnect the hose from the gas fitting on drive assembly, install proper fittings or connectors, and connect to gas hose from gun.

D. Water (If Applicable)



CAUTION: OVERHEATING of Gas Metal Arc Welding (GMAW) gun can damage gun.

- *If using a water-cooled gun and recirculating coolant system, do not make connections from the coolant system to water valve. Instead, make connections directly from the coolant system to gun hoses.*

Connect the gun water input hose to the water output fitting on the front of the control box. Connect the water return hose from the gun to the adapter at the weld terminal on the drive assembly.

Reducing bushings are provided to accept 5/8-18 left-hand fittings. If the reducing bushings are removed, 7/8-14 left-hand fittings are present.

E. Weld Cable (If Applicable)



WARNING: ELECTRIC SHOCK can kill.

- *Do not touch live electrical parts.*
- *Shut down wire feeder and welding power source and disconnect input power employing lockout/tagging procedures before making weld cable connections.*

Lockout/tagging procedures consist of padlocking line disconnect switch in open position, removing fuses from fuse box, or shutting off and red-tagging circuit breaker or other disconnecting device.

ARCING can damage weld cable terminal.

- *Clean weld cable terminal before connecting weld cable if necessary.*
- *Tighten terminal nut securely.*

Loose or dirty connections can cause erratic weld output.

WELD OUTPUT present on grounded wire feeder parts can cause equipment damage.

- *Do not allow welding cable to touch grounded feeder parts.*

If the welding cable lug or exposed welding cable is in contact with any grounded feeder components during operation, the 115 Volts AC/Contactor Control cord and plugs may be damaged.

Connect the weld cable from the gun, if applicable, to the weld cable terminal on the drive assembly. (Use front weld cable terminal on four drive roll models.)

4-5. SHIELDING GAS CONNECTION (Figure 4-4)

Obtain a shielding gas hose of proper size, type, and length and a gas fitting with 5/8-18 right-hand threads to make shielding gas connection to control box. Proceed as follows:

1. Install gas fitting onto one end of shielding gas hose.
2. Route end of gas hose with fitting through the handle on the base of the wire feeder, and connect hose to gas input fitting on gas valve on rear of control box.
3. Route and connect remaining end of hose to regulator/flowmeter on shielding gas supply.

4-6. DRIVE MOTOR VENT SCREW (Figure 4-4)

The drive motor is provided with a vent screw which must be removed before operating the wire feeder. The screw can be removed through the hole provided in the motor mounting bracket.



CAUTION: PRESSURE IN WIRE DRIVE MOTOR GEAR BOX will damage motor.

- *Remove vent screw before operation.*

Warranty is void if the vent screw is not removed before operation.

4-7. WATER CONNECTIONS (Optional)



CAUTION: OVERHEATING of Gas Metal Arc Welding (GMAW) gun can damage gun.

- *If using a water-cooled gun and recirculating coolant system, do not make connections from the coolant system to water valve; instead, make connections directly from the coolant system to gun hoses.*

A. Optional Water Connection

Obtain a water hose of proper size, type, and length and a water fitting with 5/8-18 left-hand threads to make water connection to control box. Proceed as follows:

1. Install water fitting onto one end of water hose.
2. Route end of hose with fitting through the handle on the base of the wire feeder, and connect hose to input fitting on water valve on rear of control box.
3. Route and connect remaining end of hose to water supply.

Obtain adapter for the weld terminal on the wire drive assembly, and water hose of proper size, type, and length with proper fittings to connect to adapter. Proceed as follows:

4. Install adapter onto weld terminal at the wire drive assembly.
5. Connect water hose to adapter.
6. Route water hose to a proper drain.

IMPORTANT: The water valve is energized as soon as the control POWER switch is placed in the ON position.

B. Electrical Reconnection Of Water Solenoid



WARNING: ELECTRIC SHOCK can kill.

- Do not touch live electrical parts.
- Shut down wire feeder and welding power source and disconnect input power employing lockout/tagging procedures before making weld cable connections.

Lockout/tagging procedures consist of padlocking line disconnect switch in open position, removing fuses from fuse box, or shutting off and red-tagging circuit breaker or other disconnecting device.

The control is shipped connected to supply water when the POWER switch is in the ON position. The water solenoid circuitry can be modified to supply water when the gun trigger is pressed. To make electrical reconnection of water solenoid, proceed as follows:

1. Remove control box wrapper.
2. Locate terminal strip 1T on bottom panel of control box. See Figure 9-2 for 1T location.
3. Move lead 35 from terminal A on terminal strip 1T to terminal B.
4. Reinstall wrapper.

4-8. WELDING POWER SOURCE/WIRE FEEDER CONNECTIONS (Figure 4-4)

A. 115 Volts AC/Contactor Control Connections



WARNING: ELECTRIC SHOCK can kill; MOVING PARTS can cause injury.

- Do not touch live electrical parts.
- Keep away from moving parts.

The control will be electrically hot internally and ready to operate as soon as the 115 volts ac/contacter control plug is connected to the REMOTE 14 receptacle and the welding power source is energized.



CAUTION: IMPROPER VOLTAGE APPLIED TO WELDING POWER SOURCE CONTACTOR can damage wire feeder and welding power source.

- Be sure welding power source contactor control circuitry requires external supply of 115 vac for contactor control.

This wire feeder supplies 115 volts ac to the welding power source for contactor control.

A 10 ft. (3 m) cable is provided for 115 volts ac power and contactor control connections between control box and welding power source. To make connections, proceed as follows:

1. Route the cable through the handles on base of wire feeder, and connect plug to matching receptacle on the rear of control box as follows: align keyways, insert plug, and rotate threaded collar fully clockwise.

2. Route remaining end of cord to suitable remote control receptacle on welding power source. Connect plug to receptacle as follows: align keyway, insert plug, and rotate threaded collar fully clockwise.

IMPORTANT: If the supplied control cord does not match the welding power source remote control receptacle, obtain the necessary adapter cord from your welding equipment distributor.

The following pin information is included in case the supplied cord is not suitable, and it is necessary to wire a plug or cord to interface with the 115 Volts AC/Contactor Control receptacle.

Pin 1: 115 volts ac; 60 Hz with respect to Pin 4.

Pin 2: 115 volts contactor control voltage supplied between Pins 2 and 4.

Pin 3: Machine chassis.

Pin 4: 115 volts ac circuit common.

B. Weld Cable



ELECTRIC SHOCK can kill.

- Do not touch live electrical parts.
- Shut down wire feeder and welding power source and disconnect input power employing lockout/tagging procedures before making weld cable connections.

Lockout/tagging procedures consist of padlocking line disconnect switch in open position, removing fuses from fuse box, or shutting off and red-tagging circuit breaker or other disconnecting device.

ARCING can damage weld cable terminal.

- Clean weld cable terminal before connecting weld cable if necessary.
- Tighten terminal nut securely.

Loose or dirty connections can cause erratic weld output.

WELD OUTPUT present on grounded wire feeder parts can cause equipment damage.

- Do not allow welding cable to touch grounded feeder parts.

If the welding cable lug or exposed welding cable is in contact with any grounded feeder components during operation, the 115 Volts AC/Contactor Control cord and plugs may be damaged.

Select and prepare weld cable according to information in welding power source Owner's Manual.

For Electrode Positive/Reverse Polarity connections proceed as follows:

1. Route weld cable under the handle on base of wire feeder, and connect cable to weld cable terminal. Be sure cable does not interfere with wire feed
2. Connect remaining end of cable to the Positive (+) weld output terminal on welding power source (see welding power source Owner's Manual.)

- Route and connect another weld cable of adequate size and capacity from the Negative (–) weld output terminal (see power source Owner's Manual) to workpiece.

IMPORTANT: For Electrode Negative/Straight Polarity connections, reverse cable connections to weld output terminals; electrode becomes negative.

4-9. WELDING WIRE INSTALLATION

A. Installation Of Spool-Type Wire (Figure 4-1)

- Remove retaining ring.
- Slide spool of wire onto hub so that wire feeds off bottom of spool.
- Rotate spool until hole in spool aligns with pin in hub. Slide spool onto hub until it seats against back flange of the hub.
- Reinstall retaining ring onto hub.

B. Installation Of Optional Wire Reel And Reel-Type Wire (Figure 4-5)

- Remove retaining ring and, if applicable, wire reel assembly from hub.
- Lay wire reel assembly flat on a table or floor.
- Remove spanner nut from wire reel assembly.
- Remove wire retainer, and install wire onto wire reel. Be sure that wire feeds off bottom of reel.
- Reinstall wire retainer and spanner nut onto wire reel.
- Slide wire reel assembly onto hub, and rotate assembly until hub guide pin is seated in reel.
- Reinstall retaining ring onto hub.

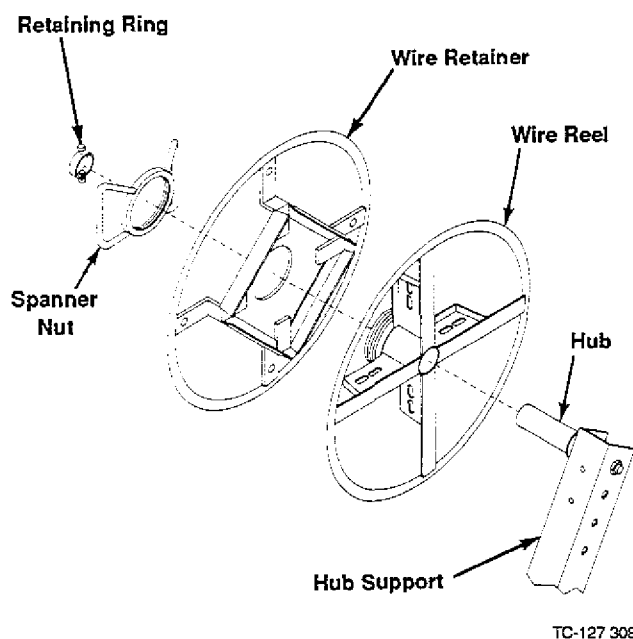


Figure 4-5. Optional Wire Reel And Reel-Type Wire Installation

C. Adjustment Of Hub Tension (Figure 4-1)

Check the hub tension by slowly rotating the wire spool or reel. The wire should unwind freely, but hub tension should be sufficient to keep wire taut and prevent backlash when the wire feed stops. If adjustment is required, loosen or tighten the hex nut on the end of the hub support shaft accordingly.

4-10. WELDING WIRE THREADING



WARNING: ELECTRIC SHOCK can kill; MOVING PARTS can cause injury.

- Do not touch live electrical parts.
- Keep away from moving parts.
- Do not energize welding power source or wire feeder until instructed to do so.

The welding wire and all metal parts in contact with it are energized while welding.

WELDING WIRE can cause puncture wounds; HOT SURFACES can burn skin.

- Do not press gun trigger until instructed to do so.
- Do not point gun toward any part of the body, any conductive surface, or other personnel when threading welding wire.
- Allow gun to cool before touching.



CAUTION: LOOSE WELDING WIRE can cause injury.

- Keep a firm hold on the wire during installation, removal, and threading operations.

Spooled wire has a tendency to unravel rapidly when loosened from the spool.

- Install the wire as instructed in Section 4-9.
- Cut off any portion of the free end of the wire which is not straight. If necessary, straighten wire to remove cast. Be sure that the cut end is free from rough surfaces to permit proper feeding.
- Adjust hub tension according to Section 4-9C if necessary.
- Loosen knob(s) on the drive roll pressure adjustment(s), pivot pressure adjustment(s) free of the cover(s), and pivot pressure gear assembly(ies) away to an open position.
- Manually feed wire through the inlet wire guide and intermediate wire guide, if applicable, and on into the outlet wire guide. Feed approximately 4 in. (102 mm) of wire into the outlet wire guide.

IMPORTANT: If the U-Cogged drive rolls do not align properly when the gear cover is closed, pivot the gear cover away from the drive gear, and rotate pressure gear one tooth (see Section 4-3).

- Pivot the pressure gear assembly(ies) closed making sure the teeth on the pressure gear(s) mesh with the teeth on the drive gear(s). The welding wire must be in the grooves of the drive rolls. (See Sec-

tion 7-2 if wire does not feed in the grooves of the drive rolls.)

7. Pivot the pressure adjustment knob(s) until the washer(s) on the pressure adjustment(s) is seated on top of the gear cover(s).
8. Turn the pressure adjustment knob(s) in a clockwise direction until the drive rolls are tight against the welding wire. Do not overtighten. Further adjustment to attain desired clamping pressure can be made after the welding power source(s) and wire feeder are put into operation.
9. Lay gun cable assembly out flat and straight (no coils in the cable/conduit).
10. Energize the welding power source.
11. Place the wire feeder POWER switch in the ON position.



WARNING: ELECTRIC SHOCK can kill; TANGLED WELDING WIRE can touch case causing welding power source open-circuit voltage to be present on case if gun trigger is pressed.

- Do not touch wire feeder case if gun trigger is pressed and wire does not feed.
- If wire stops feeding, turn off welding power source, and determine the cause.
- Correct any hub tension, jammed wire, or gun liner damage problems before trying to continue welding.

12. Press the gun trigger (see WARNING block at beginning of this Section). Wire feeds if drive roll pressure is properly adjusted to prevent slippage. If wire slippage is noticed, turn pressure adjustment knob clockwise in 1/4 turn increments until wire slippage stops. If excess pressure is required, check gun contact tube and gun liner for correct size or obstructions. Release the gun trigger when welding wire extends approximately 1 in. (25 mm) out of gun tip.
13. Shut down wire feeder and welding power source.

SECTION 5 – OPERATOR CONTROLS

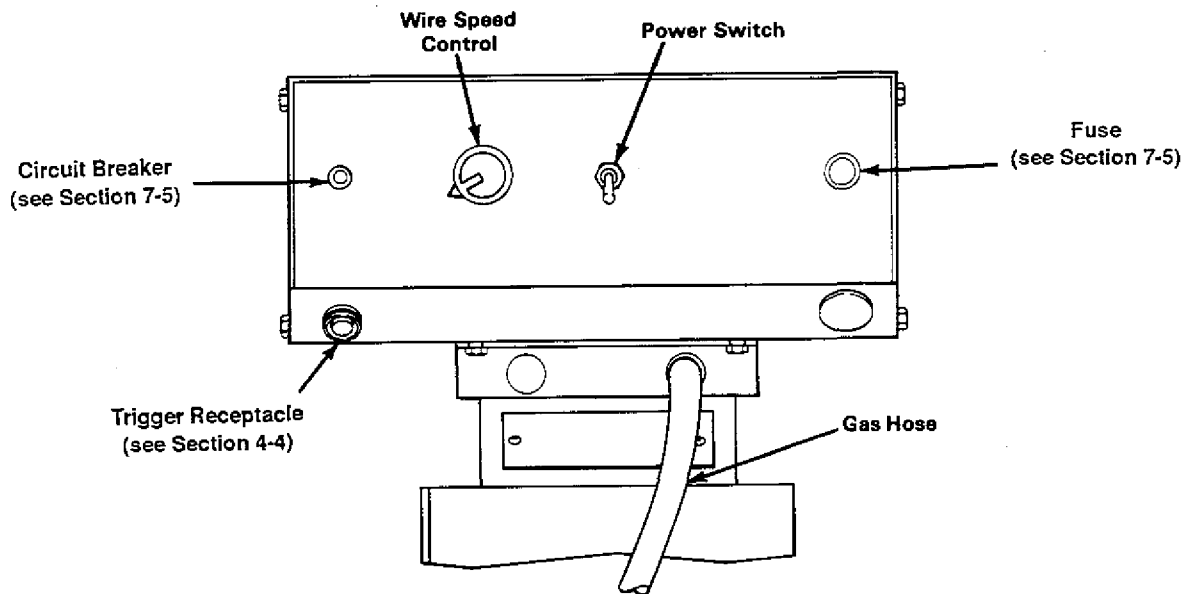


Figure 5-1. Operator Controls

5-1. POWER SWITCH (Figure 5-1)

Placing the POWER switch in the ON position applies 115 volts ac to the unit. Placing the POWER switch in the OFF position shuts down the wire feeder.

IMPORTANT: The welding power source must be energized before the POWER switch can be used to energize the wire feeder.

5-2. WIRE SPEED CONTROL (Figure 5-1)

The WIRE SPEED control provides a means of selection the rate at which welding wire feeds into the weld. Rotating the WIRE SPEED control clockwise increases the wire feed speed.

A ten-turn WIRE SPEED control provides a means of selecting the rate at which welding wire feeds into the weld. Rotating the WIRE SPEED control clockwise increases the wire feed speed.

5-3. BURNBACK CONTROL (Optional)

The burnback circuitry in this control keeps the welding wire from sticking to the workpiece after the gun trigger is released. The burnback capability in this wire feeder keeps weld output present on the welding wire from 0 to 15 cycles (0 to 0.25 seconds) after the wire has stopped feeding, depending on the setting of the BURNBACK control. This delay action permits the welding wire to burn back to a point where it neither sticks to the workpiece nor the contact tube. If the welding wire sticks to the workpiece, rotate the BURNBACK control clockwise.

SECTION 6 – SEQUENCE OF OPERATION

6-1. GAS METAL ARC WELDING (GMAW)



WARNING: ELECTRIC SHOCK can kill; MOVING PARTS can cause serious injury; IMPROPER AIRFLOW AND EXPOSURE TO ENVIRONMENT can damage internal parts.

- Do not touch live electrical parts.
- Keep away from moving parts.
- Keep all covers and panels in place while operating.

Warranty is void if the welding power source is operated with any portion of the outer enclosure removed.

ARC RAYS, SPARKS, AND HOT SURFACES can burn eyes and skin; NOISE can damage hearing.

- Wear correct eye, ear, and body protection.

FUMES AND GASES can seriously harm your health.

- Keep your head out of the fumes.
- Ventilate to keep from breathing fumes and gases.
- If ventilation is inadequate, use approved breathing device.

WELDING WIRE can cause puncture wounds.

- Do not point gun toward any part of the body, any conductive surface, or other personnel.

HOT METAL, SPATTER, AND SLAG can cause fire and burns.

- Watch for fire.
- Keep a fire extinguisher nearby, and know how to use it.
- Do not use near flammable material.
- Allow work and equipment to cool before handling.

MAGNETIC FIELDS FROM HIGH CURRENTS can affect pacemaker operation.

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

See Section 1 - Safety Rules For Operation Of Arc Welding Power Source for basic welding safety information.

1. Make all connections and thread welding wire as instructed in Section 4.
2. Energize welding power source.
3. Place POWER switch on control in the ON position.
4. Rotate the WIRE SPEED control to the desired setting (see Section 5-2).
5. Wear dry insulating gloves and clothing.
6. Connect work clamp to clean, bare metal at workpiece.
7. Select and obtain proper welding wire, and thread as instructed in Section 4-10.
8. Turn on the shielding gas at the source.
9. Wear welding helmet with proper filter lens according to ANSI Z49.1.
10. Hold the tip of the gun approximately 1/2 inch (13 mm) from the workpiece.



WARNING: ELECTRIC SHOCK can kill.

- Do not touch live electrical parts.
- Do not touch welding wire or any metal part in contact with it while welding.

The welding wire and all metal parts in contact with it carry weld output when the welding power source contactor is energized.

11. Press the gun trigger. Gas flows and wire feeds if drive roll pressure is properly adjusted to prevent slippage. If wire slippage is noticed, adjust drive roll pressure according to Section 4-10.



WARNING: ELECTRIC SHOCK can kill; TANGLED WELDING WIRE can touch case causing welding power source open-circuit voltage to be present on case if gun trigger is pressed.

- Do not touch wire feeder case if gun trigger is pressed and wire does not feed.
- If wire stops feeding, turn off welding power source, and determine the cause.
- Correct any hub tension, jammed wire, or gun liner damage problems before trying to continue welding.

6-2. SHUTTING DOWN

1. Shut down wire feeder and welding power source.
2. Turn off shielding gas at the source.
3. Turn off all associated equipment.



WARNING: HIGH CONCENTRATION OF SHIELDING GAS can harm health or kill.

- Shut off gas supply when not in use.

SECTION 7 – MAINTENANCE & TROUBLESHOOTING

7-1. ROUTINE MAINTENANCE (Table 7-1)

IMPORTANT: *Every six months inspect the labels on this unit for legibility. All precautionary labels must be maintained in a clearly readable state and replaced when necessary. See Parts List for part number of precautionary labels.*



WARNING: ELECTRIC SHOCK can kill.

- Do not touch live electrical parts.
- Shut down wire feeder and welding power source, and disconnect input power employing lockout/tagging procedures before inspecting, maintaining, or servicing.

Lockout/tagging procedures consist of padlocking line disconnect switch in open position, removing fuses from fuse box, or shutting off and red-tagging circuit breaker or other disconnecting device.

MOVING PARTS can cause serious injury.

- Keep away from moving parts.

HOT SURFACES can cause severe burns.

- Allow cooling period before servicing.

Maintenance to be performed only by qualified persons.

Table 7-1. Maintenance Schedule

FREQUENCY*	MAINTENANCE
Every month.	Units in heavy service environments: Check labels, hoses, and cables; clean internal parts and drive rolls.
Every 6 months.	Check all labels (see IMPORTANT block, Section 7-1). Inspect gun and cables (see Section 7-1B). Clean drive rolls (see Section 7-1C).

*Frequency of service is based on units operated 40 hours per week. Increase frequency of maintenance if usage exceeds 40 hours per week.

A. Internal Cleaning



WARNING: Read and follow safety information at beginning of entire Section 7-1 before proceeding.

Every six months, blow out or vacuum dust and dirt from the inside of the wire feeder. Remove the outer enclosure, and use a clean, dry airstream or vacuum suction for the cleaning operation. If dirty or dusty conditions are present, clean the unit monthly.

B. Inspection And Upkeep



WARNING: Read and follow safety information at beginning of entire Section 7-1 before proceeding.

Every six months, inspect the gun, hoses, and cables. If dusty or dirty conditions are present, inspect the unit monthly. Inspection should consist of the following:

1. Inspect gun for broken areas, cracks, and loose parts; tighten, repair, and replace as required.
2. Repair or replace, as required, all hose and cable; give particular attention to frayed and cracked insulation and areas where hose and cables enter equipment.
3. Remove grease and grime from components, moisture from electrical parts and cable.



CAUTION: FLYING DIRT AND METAL PARTICLES can injure personnel and damage equipment.

- Point gun liner only in a safe direction away from personnel and equipment when cleaning with compressed air.

4. Blow out the gun wire guide liner with compressed air when changing wire. This will remove any metal chips and dirt that may have accumulated.

C. Cleaning Of Drive Rolls



WARNING: Read and follow safety information at beginning of entire Section 7-1 before proceeding.

MOVING PARTS can cause serious injury.

- Keep away from moving parts.

HIGH ROTATIONAL SPEED may cause damage to drive rolls and injure personnel.

- Do not allow drive rolls to rotate at high speed if compressed air is used for cleaning the drive roll assembly.

It is necessary to remove the drive rolls for proper cleaning of the wire grooves (see Section 4-3 for removal and installation instructions). Use a wire brush to clean rolls.

IMPORTANT: Failure to properly maintain the drive rolls can result in a buildup of wire particles which decreases the efficiency of the wire feeding operation.

1. Remove the three drive roll securing screws from each drive roll, and remove drive rolls (see Section 4-3).
2. Using a wire brush, remove the buildup of wire particles in the wire grooves.
3. Reinstall drive rolls according to Section 4-3.
4. Resume operation.

7-2. ALIGNING DRIVE ROLLS AND WIRE GUIDES ON TWO DRIVE ROLL MODELS (Figure 7-1 And Figure 7-2)



WARNING: ELECTRIC SHOCK can kill.

- Do not touch live electrical parts.
- Shut down wire feeder and welding power source, and disconnect input power employing lockout/tagging procedures before inspecting, maintaining, or servicing.

Lockout/tagging procedures consist of padlocking line disconnect switch in open position, removing fuses from fuse box, or shutting off and red-tagging circuit breaker or other disconnecting device.

MOVING PARTS can cause serious injury.

- Keep away from moving parts.

HOT SURFACES can cause severe burns.

- Allow cooling period before servicing.

The drive rolls and wire guides must be aligned for wire to feed properly. Alignment is factory set and should not require readjustment. To check alignment, compare drive roll and wire guide positions with Figure 7-1 and Figure 7-2. If alignment is necessary, proceed as follows:

A. Horizontal Alignment

1. Behind the drive gear are spring washers. Turn drive gear securing bolt in or out until groove in drive roll lines up with wire guide (see Figure 7-1).

B. Vertical Alignment

The wire drive housing is made with mounting holes of sufficient clearance to provide adjustment of the wire guides up or down in relation to the drive rolls.

1. Loosen housing mounting bolts and weld cable terminal nut. See Figure 4-3 for locations.
2. Slide the wire drive housing up or down until wire guides line up with grooves in drive roll and pressure roll (see Figure 7-2).
3. Tighten housing mounting bolts and weld cable terminal nut.

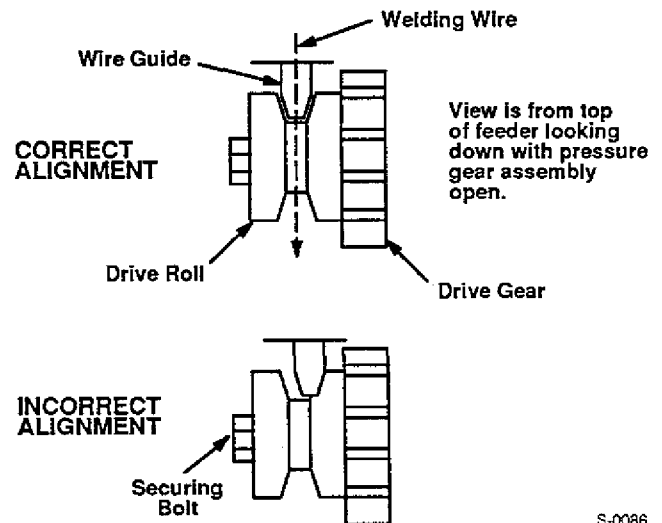


Figure 7-1. Wire Guide/Drive Roll Alignment

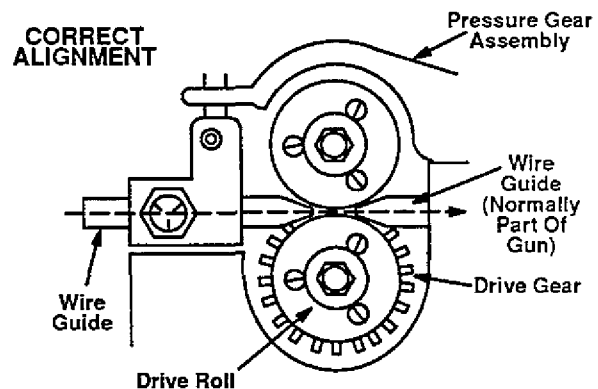


Figure 7-2. Wire Guide/Drive Housing Alignment

7-3. ALIGNING MOTOR GEAR AND DRIVE GEARS ON FOUR DRIVE ROLL MODELS (Figure 4-2)



WARNING: ELECTRIC SHOCK can kill.

- Do not touch live electrical parts.
- Shut down wire feeder and welding power source, and disconnect input power employing lockout/tagging procedures before inspecting, maintaining, or servicing.

Lockout/tagging procedures consist of padlocking line disconnect switch in open position, removing fuses from fuse box, or shutting off and red-tagging circuit breaker or other disconnecting device.

MOVING PARTS can cause serious injury.

- Keep away from moving parts.

HOT SURFACES can cause severe burns.

- Allow cooling period before servicing.

Horizontal and vertical alignment of the motor gear with the drive gears is factory set and should not require readjustment. If readjustment becomes necessary, proceed as follows:

A. Horizontal Adjustment

1. Behind the motor gear are spring washers. Turn motor gear securing bolt in or out until motor gear is horizontally aligned with drive gears.

B. Vertical Alignment

The wire drive housing is made with mounting holes of sufficient clearance to provide adjustment of the housing up or down in relation to the motor gear.



CAUTION: IMPROPER CLEARANCE between motor gear and drive gears can result in equipment damage.

- Maintain 0.003 in. (0.076 mm) clearance between motor gear and drive gears.

If proper clearance is not maintained, the gears may wear severely, bind, break, or cause erratic wire feed.

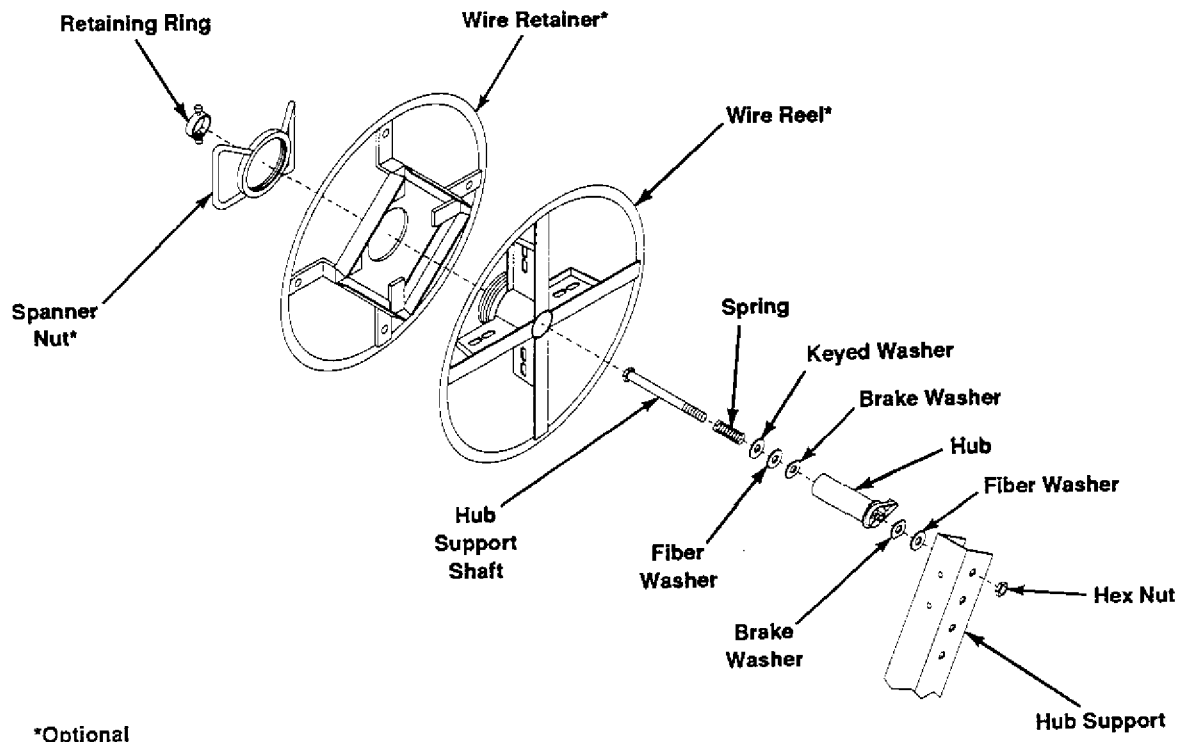
1. Loosen housing mounting bolts and weld cable terminal nuts.
2. Slide wire drive housing away from motor gear and insert a piece of standard writing paper (approximate thickness: 0.003 in.; 0.076 mm) between gears.
3. Slide wire drive housing toward motor gear so paper is held in place but can be removed without tearing.

4. Tighten housing mounting bolts and weld cable terminal nuts, and remove paper.

7-4. REINSTALLATION OF HUB ASSEMBLY (Figure 7-3)

If it becomes necessary to replace part or all of the hub assembly, reinstall the new hub assembly as follows:

1. Remove hub assembly from hub support, and disassemble discarding worn or broken parts.
2. Slide the following items onto the hub support shaft in order given:
 - a. Spring
 - b. Keyed Washer
 - c. Fiber Washer
 - d. Brake Washer
 - e. Hub
 - f. Brake Washer
 - g. Fiber Washer
3. Align keyway, and insert hub support shaft through selected hole in hub support.
4. Install hex nut onto hub support shaft. Tighten hex nut until a slight drag is felt while turning hub.
5. Install welding wire according to Section 4-9.



Ref. TC-127 328

Figure 7-3. Hub And Reel Assemblies

7-5. OVERLOAD PROTECTION (Figure 5-1)



WARNING: ELECTRIC SHOCK can kill.

- Do not touch live electrical parts.
- Shut down wire feeder and welding power source, and disconnect input power employing lockout/tagging procedures before inspecting, maintaining, or servicing.

Lockout/tagging procedures consist of padlocking line disconnect switch in open position, removing fuses from fuse box, or shutting off and red-tagging circuit breaker or other disconnecting device.

INCORRECT FUSE can damage unit.

- Use only replacement fuse of same size, type, and rating (see Parts List).

A. Circuit Breaker CB1 (Figure 5-1)



WARNING: Read and follow safety information at beginning of entire Section 7-5 before proceeding.

Circuit breaker CB1 protects the drive motor from damage due to overload. If CB1 should open, the wire feeder would immediately stop operating.

Should a motor overload occur and trip CB1, proceed as follows:

1. Check for jammed wire or clogged gun liner, and correct problem. If motor overload happens often, repair or replace the motor or liner.
2. Check for binding drive gear or misaligned drive rolls, and correct problem.
3. Manually reset CB1; it may be necessary to allow a cooling period before the breaker can be reset.
4. Resume operation.

B. Control Fuse F1 (Figure 5-1)



WARNING: Read and follow safety information at beginning of entire Section 7-5 before proceeding.

Fuse F1 protects the unit from overload. If fuse F1 should open, the wire feeder would completely shut down. To replace F1, proceed as follows:

1. Depress and rotate fuse holder cover counterclockwise.
2. Pull out fuse with cover when fuse holder cover is free.
3. Insert new fuse into fuse holder cover.
4. Install new fuse with fuse holder cover back into unit.
5. Depress and rotate fuse holder cover clockwise until cover is secure.

7-6. BRUSH INSPECTION AND REPLACEMENT (Figure 7-4 and Figure 7-5)



WARNING: ELECTRIC SHOCK can kill.

- Do not touch live electrical parts.
- Shut down wire feeder and welding power source and disconnect input power employing lockout/tagging procedures before inspecting, maintaining, or servicing.

Lockout/tagging procedures consist of padlocking line disconnect switch in open position, removing fuses from fuse box, or shutting off and red-tagging circuit breaker or other disconnecting device.

DISASSEMBLY OF MOTOR FIELD MAGNETS can result in personal injury and equipment damage.

- Limit drive motor repairs to brush replacement.

The field magnets are very strong. If disassembly is attempted, injury to fingers and hands may result from the rotor being drawn back into the motor. The field magnets are matched sets and operation may be affected if the magnets are tampered with. Warranty is void if the motor is tampered with.

1. Open brush cap by sliding screwdriver under catch and lifting. Remove brush cap.
2. Grasp spring retaining bracket with long-nose pliers.
3. Push spring retaining bracket in slightly and move towards brush. This should release the spring assembly and it can be removed.

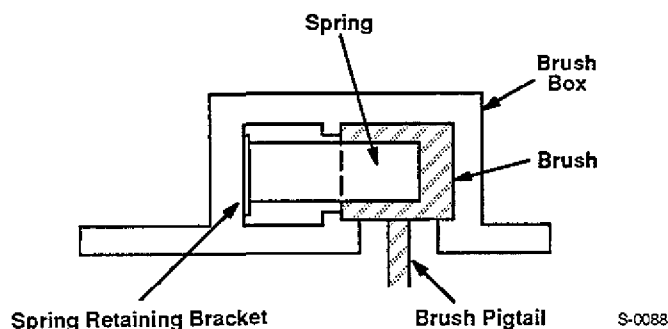
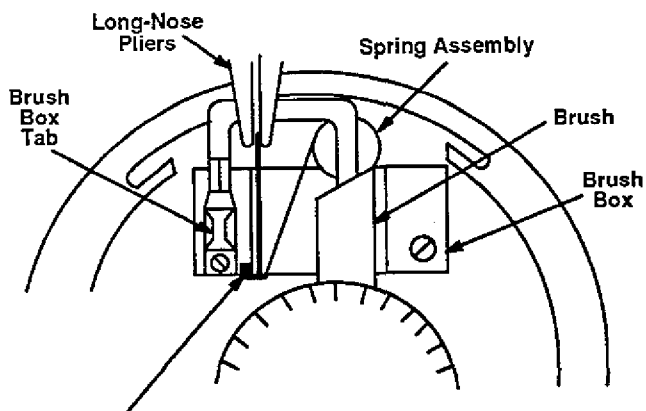


Figure 7-4. View Of Spring Assembly And Brush When Brush Cap Is Opened

4. Pull brush out using brush pigtail.
5. If the brushes are less than 1/4 in. (6.4 mm) long, replacement is necessary. Disconnect brush pigtail from brush box tab and remove brush.
6. Connect new brush pigtail to brush box tab.
7. Route pigtail through slot in brush box. Be sure that the pigtail will not come into contact with a metal surface.
8. Insert brush into brush box. Be sure that the low end of the bevel on the top of the brush is towards the spring.

9. Using long-nose pliers, insert spring assembly beside brush sliding the spring retaining bracket along the brush box wall. The spring retaining bracket hooks on the brush box wall as illustrated in Figure 7-5.
10. If the spring retaining bracket is in place, it will be against the brush box wall when pliers are released.
11. Be sure that the spring is in the proper position as shown in Figure 7-4 and Figure 7-5.
12. Replace and latch the brush cap.
13. Reconnect power to all equipment and resume operation.



IMPORTANT: Spring assembly hooks here.

S-0089

Figure 7-5. View Of Spring Assembly And Brush From Armature End Of Motor

7-7. CIRCUIT BOARD PRECAUTIONS



WARNING: ELECTRIC SHOCK can kill.

- Do not touch live electrical parts.
- Shut down wire feeder and welding power source, and disconnect input power employing lockout/tagging procedures before inspecting, maintaining, or servicing.

Lockout/tagging procedures consist of padlocking line disconnect switch in open position, removing fuses from fuse box, or shutting off and red-tagging circuit breaker or other disconnecting device.



CAUTION: ELECTROSTATIC DISCHARGE (ESD) can damage circuit boards.

- Put on properly grounded wrist strap BEFORE handling circuit boards.
- Transport circuit boards in proper static-shielding carriers or packages.
- Perform work only at a static-safe work area.

INCORRECT INSTALLATION or misaligned plugs can damage circuit board.

- Be sure that plugs are properly installed and aligned.

EXCESSIVE PRESSURE can break circuit board.

- Use only minimal pressure and gentle movement when disconnecting or connecting board plugs and removing or installing board.

7-8. TROUBLESHOOTING (Table 7-2)



WARNING: ELECTRIC SHOCK can kill.

- Do not touch live electrical parts.
- Shut down wire feeder and welding power source, and disconnect input power employing lockout/tagging procedures before inspecting, maintaining, or servicing.

Lockout/tagging procedures consist of padlocking line disconnect switch in open position, removing fuses from fuse box, or shutting off and red-tagging circuit breaker or other disconnecting device.

MOVING PARTS can cause serious injury.

- Keep away from moving parts.

HOT SURFACES can cause severe burns.

- Allow cooling period before servicing.

Troubleshooting to be performed only by qualified persons.

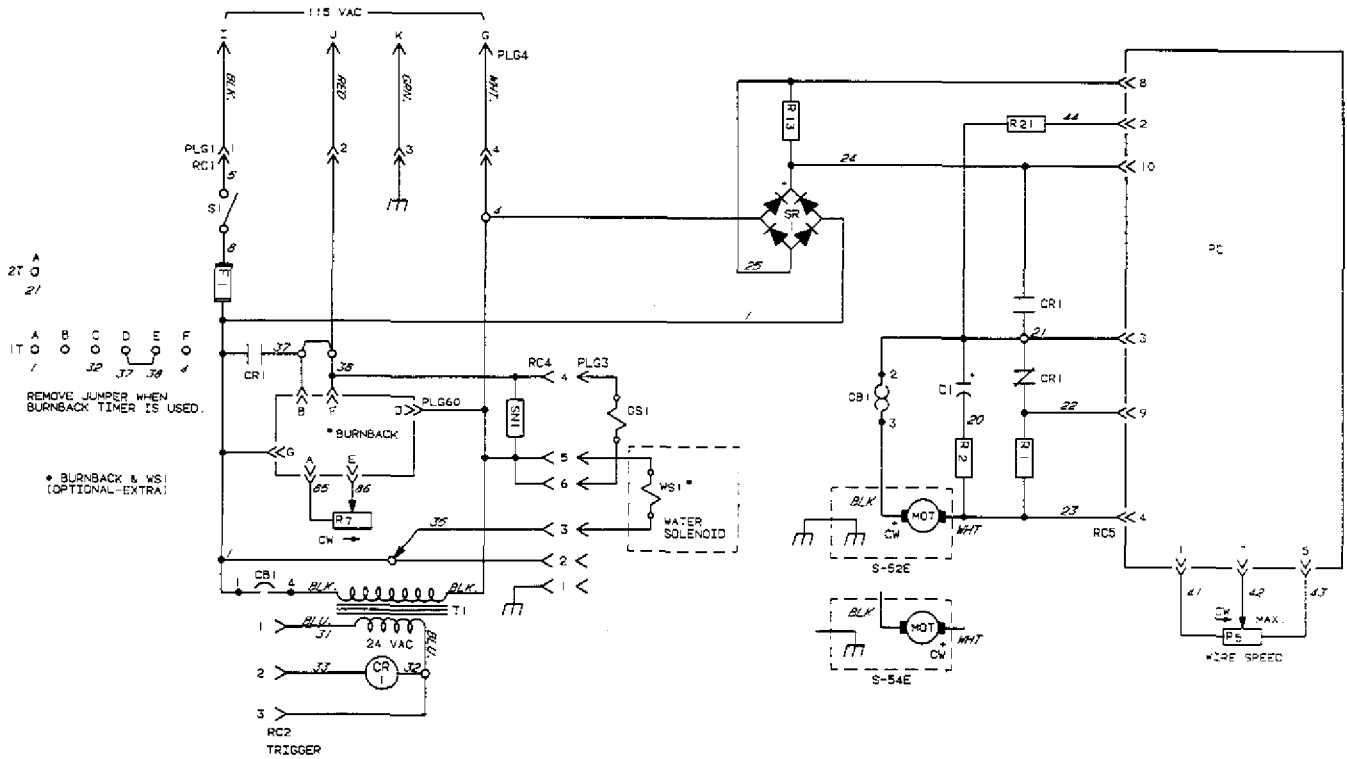
It is assumed that the unit was properly installed according to Section 4 of this manual, the operator is familiar with the function of controls, the wire feeder was working properly, and that the trouble is not related to the welding process. The following table is designed to diagnose and provide remedies for some of the troubles that may develop in this wire feeder.

Use this table in conjunction with the circuit diagram while performing troubleshooting procedures. If the trouble is not remedied after performing these procedures, the nearest Factory Authorized Service Station should be contacted. In all cases of equipment malfunction, the manufacturer's recommendations should be strictly followed.

Table 7-2. Troubleshooting

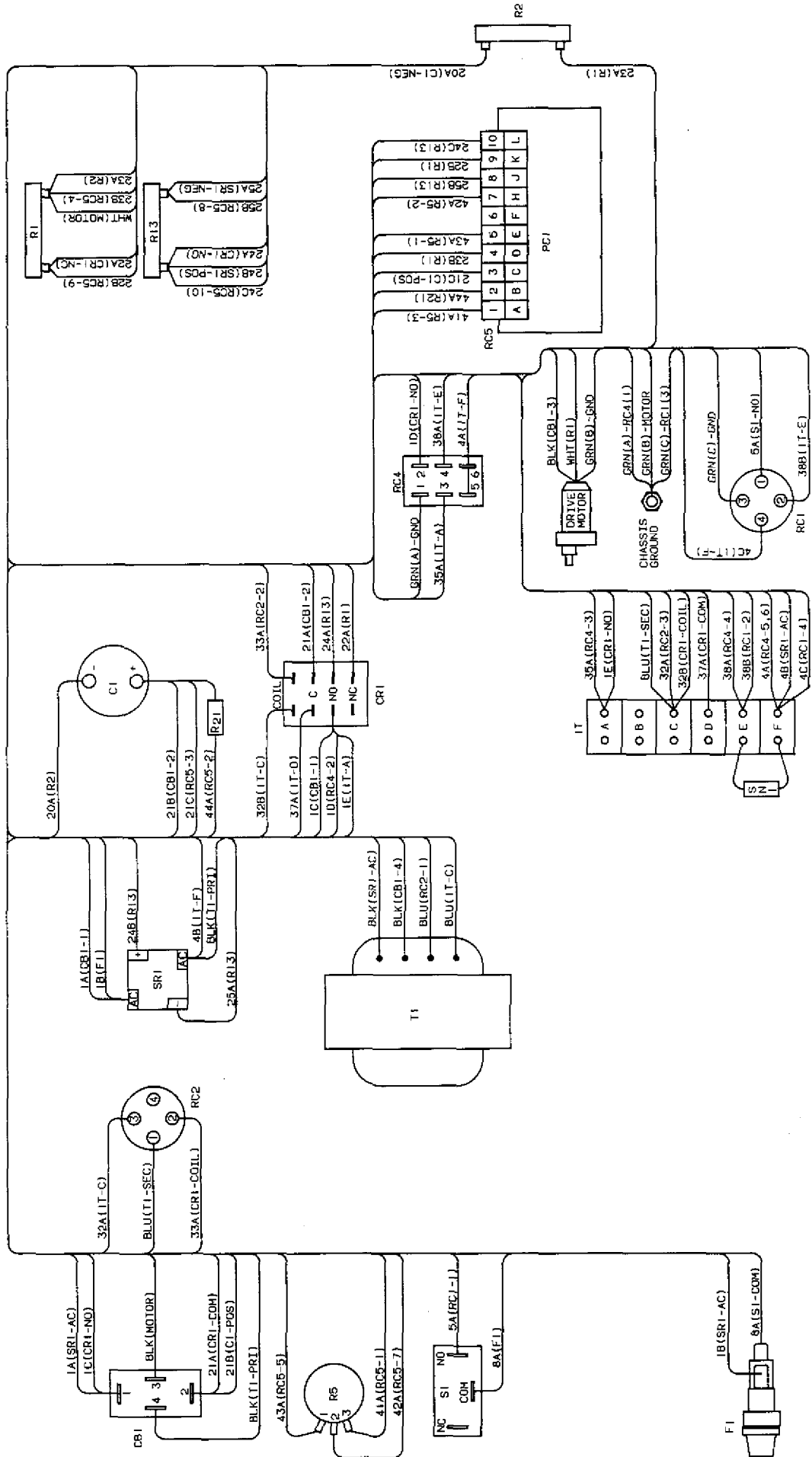
TROUBLE	PROBABLE CAUSE	REMEDY
Pressing gun trigger will not energize wire feeder. Electrode wire is not energized, and shielding gas does not flow.	POWER switch S1.	Place S1 in the ON position. Check S1 for continuity, and replace S1 if necessary.
	115 volts ac/contactor control connections are not secure.	Secure PLG1 in receptacle RC1, or secure PLG4 in receptacle on welding power source (see Section 4-8).
	Plug from gun trigger control cord is not secure in TRIGGER receptacle RC2.	Secure gun trigger plug in RC2 (see Section 4-4).
	Gun trigger or gun trigger cord.	Check trigger and cord for continuity and replace if necessary.
	Circuit breaker CB1.	Reset CB1 according to Section 7-5.
	Fuse F1.	Check and replace F1 according to Section 7-5.
	Relay CR1.	Check and replace CR1 if necessary.
	Welding power source.	See Troubleshooting Section in welding power source Owner's Manual.
Wire feeds, shielding gas flows, but electrode wire is not energized.	Contactor control connection.	Check interconnecting cord connections. If secure, check cord for continuity and repair or replace.
	Welding power source.	See Troubleshooting Section in welding power source Owner's Manual.
Wire feeds erratically.	Incorrect size contact tube or liner.	Check and replace necessary parts.
	Obstruction in gun contact tube or liner.	Clear obstruction in gun contact tube or gun liner.
	Incorrect pressure on drive rolls.	Adjust drive roll pressure according to Section 4-10
	Incorrect size of drive roll (does not match wire).	Change to proper size drive roll (see Section 4-3).
	Worn drive roll.	Replace drive roll (see Section 4-3).
	Dirt in drive roll or incorrect hub tension.	Clean drive roll as instructed in Section 7-1; check hub tension according to Section 4-9C.
	Drive rolls misaligned.	Align drive rolls so that wire feeds in groove of drive rolls (see Section 7-2).
Motor runs slowly.	Hub assembly.	Check hub assembly (see Section 7-4).
	Excessive motor load or binding drive gear.	Reduce load or readjust drive gear (see Section 7-3).
Motor is completely inoperative, or runs at full speed.	Low line voltage.	Correct low line voltage.
	Circuit board.	Replace circuit board according to Section 7-7.

SECTION 8 – ELECTRICAL DIAGRAMS



Circuit Diagram No. B-126 394

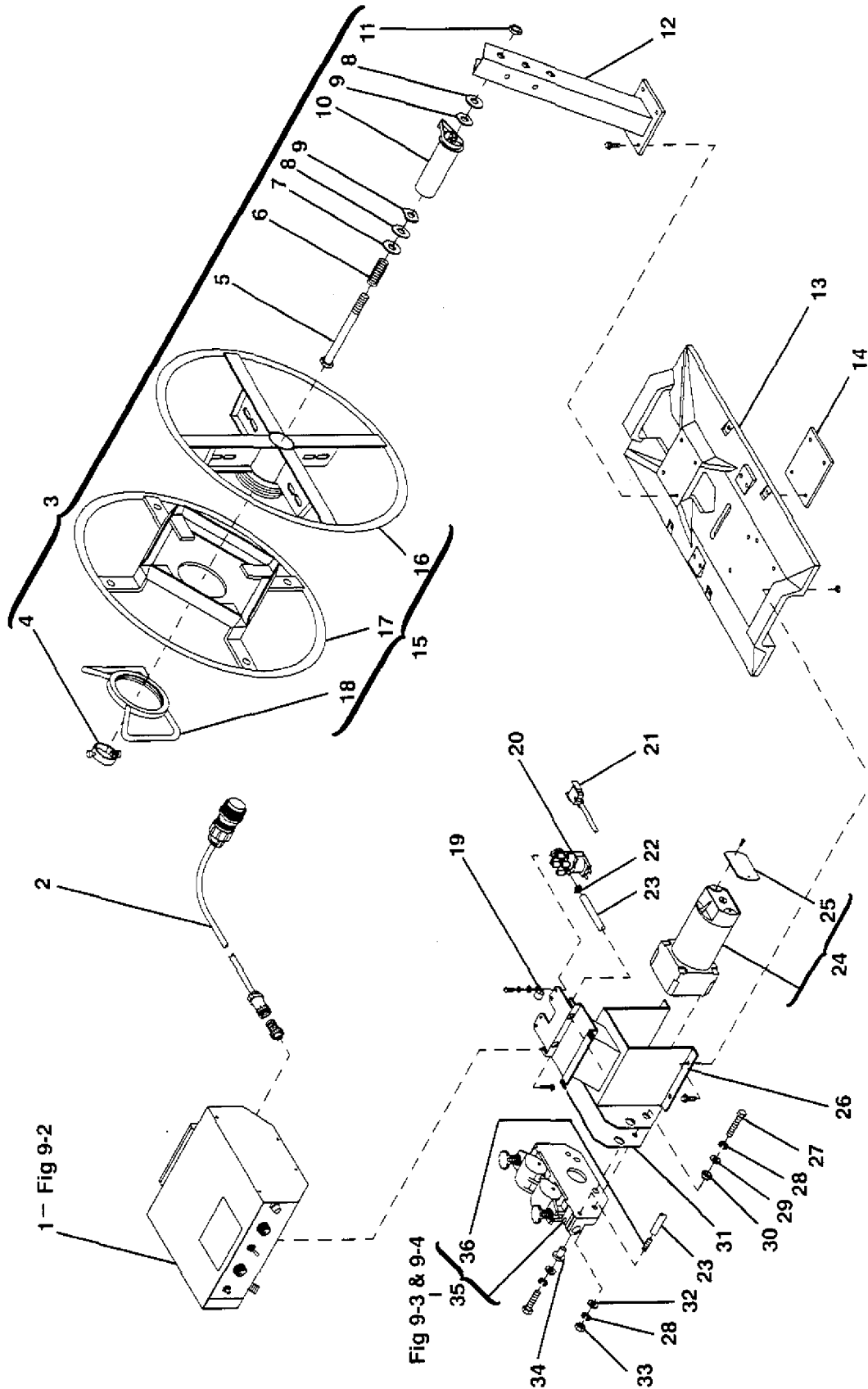
Diagram 8-1. Circuit Diagram



Wiring Diagram No. C-119 608-B

Diagram 8-2. Wiring Diagram

SECTION 9 - PARTS LIST



SD-046 317-H

Figure 9-1. Main Assembly (S-54E Illustrated)

Item No.	Dia. Mkgs.	Part No.	Description	Quantity
Figure 9-1. Main Assembly				
1		046 760	CONTROL BOX, (Fig 9-2)	1
2		110 436	CABLE, interconnecting (consisting of)	1
	PLG1	048 284	HOUSING PLUG & SOCKETS, (consisting of)	1
		079 534	TERMINAL, female 1skt 18-14 wire	4
		079 531	CLAMP, cable strain relief sz 11	1
		604 571	CABLE, port No. 18 4/c (order by ft)	10ft
		143 922	CLAMP, cable strain relief	1
	PLG4	141 162	HOUSING PLUG & PINS, (consisting of)	1
		134 731	TERMINAL, male 1 pin 18-14 wire	14
3		072 094	HUB & SPINDLE, (consisting of)	1
4		058 427	RING, retaining spool	1
5		072 292	SHAFT, spool support	1
6		010 233	SPRING, cprsn .970 OD x .120 wire x 1.250	1
7		057 971	WASHER, flat stl keyed 1.500dia x .125thk	1
8		010 191	WASHER, fbr .656 ID x 1.500 OD x .125thk	2
9		058 628	WASHER, brake stl	2
10		058 428	HUB, spool	1
11		135 205	NUT, stl slfkg hex reg .625-11	1
12		072 369	SUPPORT, spindle	1
13		044 937	BASE	1
14		072 298	PLATE, mtg spindle support	1
15		◆108 008	REEL, wire (consisting of)	1
16		124 900	SUPPORT, reel spool	1
17		124 905	RETAINER, spool support	1
18		124 904	NUT, spanner spool support	1
19		010 141	CLAMP, nyl .250clp dia	1
20	GS1	124 105	VALVE, 115VAC 2 way custom port 1/8 orf	1
21	PLG3	056 265	CONNECTOR, male 6cont 10A	1
22		089 120	CLAMP, hose .375-.450clp dia	1
23		604 550	HOSE, nprn brd No. 1 x .187 ID (order by ft)	2ft
24	M	080 802	MOTOR, gear 1/8hp 115VDC 2000RPM (consisting of)	1
		080 283	COVER, brush	2
		114 898	RIVET, brush cover	1
		080 282	SPRING, brush	2
		*080 281	BRUSH	1
25		114 897	COVER, front shield	1
26		046 753	BRACKET, mtg motor (S-52E)	1
26		046 617	BRACKET, mtg motor (S-54E)	1
27		079 624	SCREW, cap stl hexhd slfkg .375-16 x 2.250	2
28		602 213	WASHER, lock stl split .375	4
29		010 910	WASHER, flat stl SAE .375	2
30		075 150	WASHER, shldr nyl 1.000 OD x .375 ID	2
31		079 635	INSULATOR, motor (S-52E)	1
31		046 615	INSULATOR, motor (S-54E)	1
			NAMEPLATE, (order by model and serial No.)	1
32		602 243	WASHER, flat stl std .375	2
33		601 872	NUT, stl hex full fnsh .375-16	2
34		072 010	WASHER, shldr nyl .437 OD x .316 ID x .187	2
35		Fig 9-3	WIRE DRIVE & GEARS, (S-52E) (consisting of)	1
35		Fig 9-4	WIRE DRIVE & GEARS, (S-54E) (consisting of)	1
36		144 172	FITTING, brs barbed M 3/16tbg x .250-20	1

◆OPTIONAL

*Recommended Spare Parts.

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

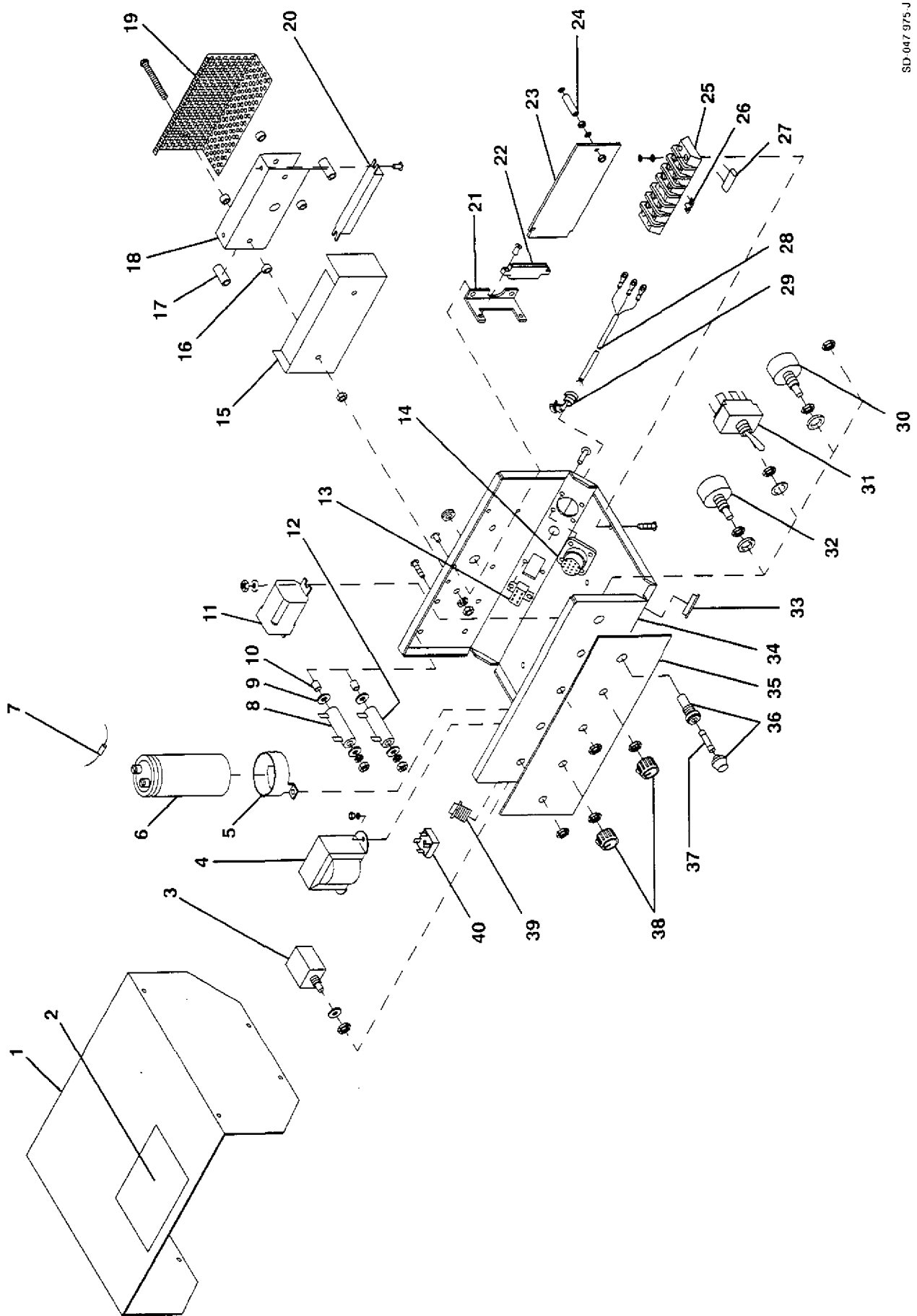


Figure 9-2. Control Box

Item No.	Dia. Mkgs.	Part No.	Description	Quantity
046 760 Figure 9-2. Control Box (Fig 9-1 Item 1)				
1		+049 289	WRAPPER	1
2		134 327	LABEL, warning general precautionary	1
3	CB1	011 991	CIRCUIT BREAKER, man reset 1P 1.5A 250V	1
4	T1	036 135	TRANSFORMER, control 115-24VAC	1
5		006 426	CLAMP, capacitor 2.000	1
6	C1	031 692	CAPACITOR, elect 750uf 200VDC	1
7	R21	030 940	RESISTOR, C .5W 2K ohm	1
8	R13	079 497	RESISTOR, WW fxd 25W 2K ohm	1
9		073 914	WASHER, centering .437dia	4
10		010 301	BUSHING, al .140 ID x .250 OD x .312	2
11	CR1	109 006	RELAY, encl 24VAC DPDT	1
12	R1	030 651	RESISTOR, WW fxd 25W 10 ohm	1
		604 311	GROMMET, rbr .250 ID x .375mtg hole	1
13	RC4	056 266	CONNECTOR, female 6cont 7.5A	1
14	RC1	048 283	RECEPTACLE w/PINS, (consisting of)	1
		079 535	TERMINAL, male 1 pin 18-14 wire	4
15		079 683	HEAT SINK, resistor	1
16		010 193	TUBING, stl .375 OD x 18ga wall x .250	6
17		010 199	TUBING, stl .275 ID x .048 wall x 1.000	2
18		030 949	HEAT SINK, resistor	1
19		056 170	SHIELD, resistor	1
20	R2	030 941	RESISTOR, WW fxd 100W 5 ohm	1
21		045 139	BRACKET, mtg connector	1
22	RC5	111 029	HOUSING, term hdr 10skt	1
23	PC1	057 314	CIRCUIT CARD, control motor	1
24		045 812	BUSHING, al .141 ID x .250 OD x 1.000	1
25	1T	038 772	BLOCK, term 20A 6P	1
26		601 219	LINK, jumper term blk 20A	1
27	SN1	110 158	SNUBBER	1
28		007 826	CABLE, port No. 18 3/c (order by ft)	3ft
29		010 476	BUSHING, strain relief .625 ID x .570mtg hole	1
30	R7	◆073 562	POTENTIOMETER, C sltd sft 1/T 2W 10K ohm	1
31	S1	011 609	SWITCH, tgl SPDT 15A 125VAC	1
32	R5	030 943	POTENTIOMETER, C std sft 1/T 2W 15K ohm	1
33		047 838	BLANK, snap in nyf 1.000mtg hole	1
34		046 709	CASE SECTION, base/front/rear	1
35			NAMEPLATE, (order by model and serial No.)	1
36		046 432	HOLDER, fuse mintr .250 x 1.250 panel mtg	1
37	F1	*073 426	FUSE, mintr gl slo-blo 5A	1
38		097 922	KNOB, pointer (1 used w/optional 047 945 Burnback)	2
39	RC2	048 282	RECEPTACLE w/SOCKETS, (consisting of)	1
		079 534	TERMINAL, female 1skt 18-14 wire	4
40	SR1	035 704	RECTIFIER, integ 40A 800V	1

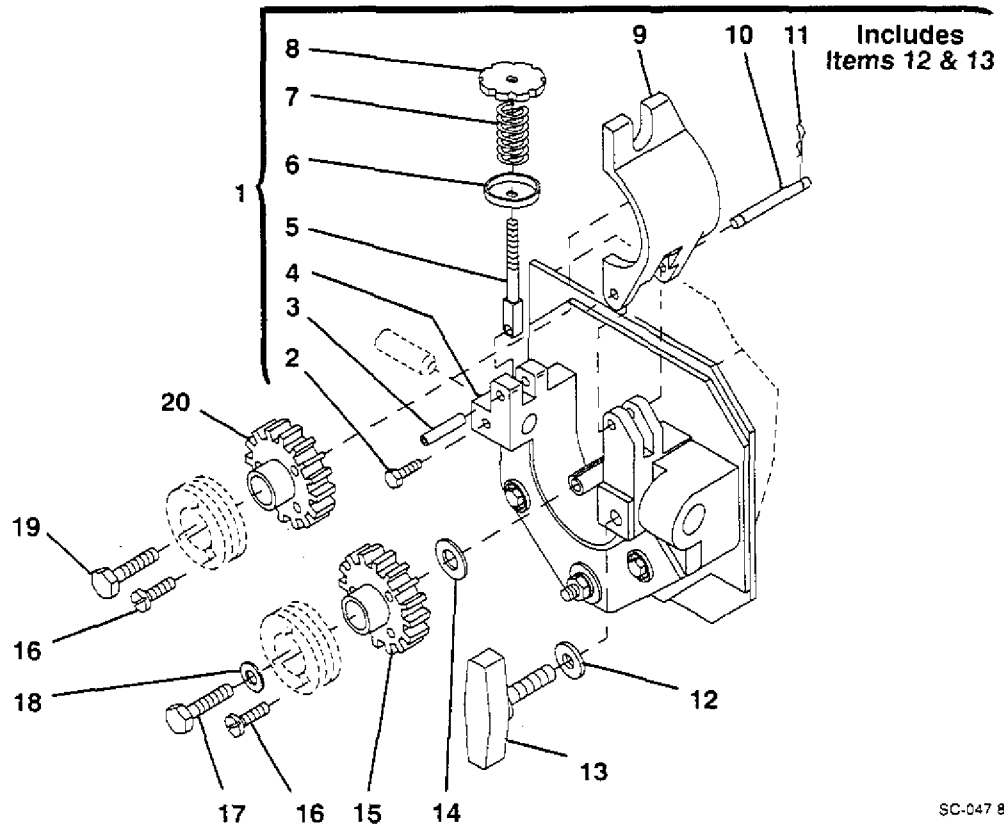
*Recommended Spare Parts.

◆Part of Optional 047 945 Burnback.

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

Item No.	Part No.	Description	Quantity
Figure 9-3. Wire Drive & Gears (S-52E) (Fig 9-1 Item 35)			
1	047 859	WIRE DRIVE, (consisting of)	1
2	601 925	SCREW, cap stl hexhd .250-20 x .500	1
3	010 224	PIN, spring CS .187 x 1.000	1
4	079 671	HOUSING, adapter gun/feeder	1
5	085 242	FASTENER, pinned	1
6	085 244	WASHER, cupped stl .328 ID x .812 OD x .125	1
7	010 231	SPRING, cprsn .770 OD x .105 wire x 1.225	1
8	085 243	KNOB, adj tension	1
9	079 669	LEVER, mtg pressure gear	1
10	079 634	PIN, hinge	1
11	604 741	PIN, cotter hair .042 x .937	1
12	604 538	WASHER, flat stl SAE .312	1
13	079 772	KNOB	1
14	079 625	WASHER, spring stl .500 shakeproof	2
15	053 841	GEAR, spur insulated w/key (consisting of)	1
	092 865	KEY, stl .1215/.1230 x .750	1
16	079 626	SCREW, mach stl filh 10-32 x .875	6
17	000 418	SCREW, cap stl hexhd slflkg .250-20 x .500	1
18	602 241	WASHER, flat stl SAE .250	2
19	605 518	SCREW, cap stl hexhd .250-20 x 1.250	1
20	053 842	GEAR, spur insulated w/bearing	1

For Drive Roll &
Wire Guide Kits
See Table 9-1



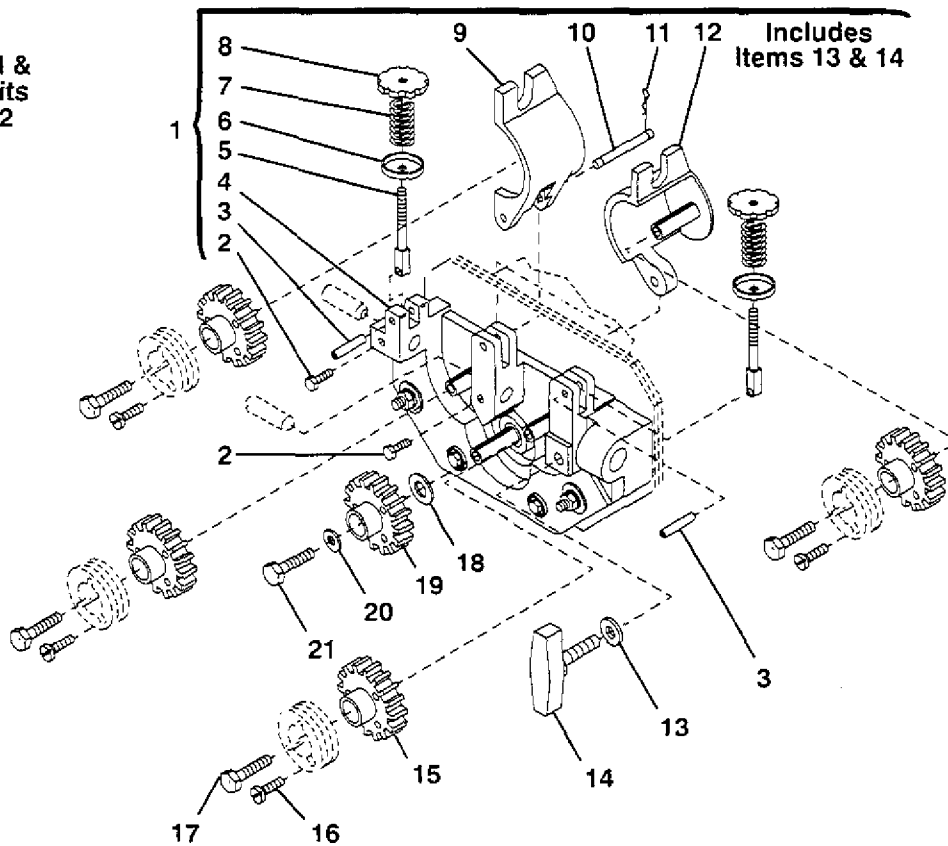
SC-047 870-E

Figure 9-3. Wire Drive & Gears (S-52E)

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

Item No.	Part No.	Description	Quantity
Figure 9-4. Wire Drive & Gears (S-54E) (Fig 9-1 Item 35)			
1	046 779	WIRE DRIVE, (consisting of)	1
2	601 925	SCREW, cap stl hexhd .250-20 x .500	2
3	010 224	PIN, spring CS .187 x 1.000	2
4	046 621	HOUSING, adapter gun/feeder	1
5	085 242	FASTENER, pinned	1
6	085 244	WASHER, cupped stl .328 ID x .812 OD x .125	2
7	010 231	SPRING, cprsn .770 OD x .105 wire x 1.225	2
8	085 243	KNOB, adj tension	2
9	079 669	LEVER, mtg pressure gear	1
10	079 634	PIN, hinge	1
11	604 741	PIN, cotter hair .042 x .937	1
12	046 619	LEVER, mtg pressure gear	1
13	604 538	WASHER, flat stl SAE .312	1
14	079 772	KNOB	1
15	053 842	GEAR, spur insulated w/bearing	4
16	079 626	SCREW, mach stl filh 10-32 x .875	15
17	605 518	SCREW, cap stl hexhd .250-20 x 1.250	4
18	079 625	WASHER, spring stl .500 shakeproof	2
19	053 841	GEAR, spur insulated w/key (consisting of)	1
	092 865	KEY, stl .1215/.1230 x .750	1
20	602 241	WASHER, flat stl SAE .250	2
21	000 418	SCREW, cap stl hexhd slflkg .250-20 x .500	1

For Drive Roll & Wire Guide Kits See Table 9-2



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Figure 9-4. Wire Drive & Gears (S-54E)

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

Table 9-1. Drive Roll & Wire Guide Kits (2 Drive Roll)

IMPORTANT: Base selection of drive rolls upon the following recommended usages:

1. V-Grooved rolls for hard wire.
2. U-Grooved rolls for soft and soft shelled cored wires.
3. U-Cogged rolls for extremely soft shelled wires (usually hard surfacing types).
4. V-Knurled rolls for hard shelled cored wires.
5. Drive roll types may be mixed to suit particular requirements (example: V-Knurled roll in combination with U-Grooved).

Wire Diameter			Kit No.	Drive Roll		Inlet Wire Guide
Fraction	Decimal	Metric		Part No.	Type	
.023/.025 in.	.023/.025 in.	0.6 mm	087 131	087 130	V-Grooved	056 192
.030 in.	.030 in.	0.8 mm	079 594	053 695	V-Grooved	056 192
.035 in.	.035 in.	0.9 mm	079 595	053 700	V-Grooved	056 192
.045 in.	.045 in.	1.2 mm	079 596	053 697	V-Grooved	056 193
.052 in.	.052 in.	1.3 mm	079 597	053 698	V-Grooved	056 193
1/16 in.	.062 in.	1.6 mm	079 598	053 699	V-Grooved	056 195
.035 in.	.035 in.	0.9 mm	044 749	072 000	U-Grooved	056 192
.045 in.	.045 in.	1.2 mm	079 599	053 701	U-Grooved	056 193
.052 in.	.052 in.	1.3 mm	079 600	053 702	U-Grooved	056 193
1/16 in.	.062 in.	1.6 mm	079 601	053 706	U-Grooved	056 195
5/64 in.	.079 in.	2.0 mm	079 602	053 704	U-Grooved	056 195
3/32 in.	.094 in.	2.4 mm	079 603	053 703	U-Grooved	056 196
7/64 in.	.110 in.	2.8 mm	079 604	053 705	U-Grooved	056 196
1/8 in.	.126 in.	3.2 mm	079 605	053 707	U-Grooved	056 197
.035 in.	.035 in.	0.9 mm	079 606	132 958	V-Knurled	056 192
.045 in.	.045 in.	1.2 mm	079 607	132 957	V-Knurled	056 193
.052 in.	.052 in.	1.3 mm	079 608	132 956	V-Knurled	056 193
1/16 in.	.062 in.	1.6 mm	079 609	132 955	V-Knurled	056 195
5/64 in.	.079 in.	2.0 mm	079 610	132 960	V-Knurled	056 195
3/32 in.	.094 in.	2.4 mm	079 611	132 961	V-Knurled	056 196
7/64 in.	.110 in.	2.8 mm	079 612	132 962	V-Knurled	056 196
1/8 in.	.126 in.	3.2 mm	079 613	132 963	V-Knurled	056 197
.045 in.	.045 in.	1.2 mm	083 318	083 489	U-Cogged	056 193
.052 in.	.052 in.	1.3 mm	083 317	083 490	U-Cogged	056 193
1/16 in.	.062 in.	1.6 mm	079 614	053 708	U-Cogged	056 195
5/64 in.	.079 in.	2.0 mm	079 615	053 710	U-Cogged	056 195
3/32 in.	.094 in.	2.4 mm	079 616	053 709	U-Cogged	056 196
7/64 in.	.110 in.	2.8 mm	079 617	053 711	U-Cogged	056 196
1/8 in.	.126 in.	3.2 mm	079 618	053 712	U-Cogged	056 197

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Table 9-2. Drive Roll & Wire Guide Kits (4 Drive Roll)

IMPORTANT: Base selection of drive rolls upon the following recommended usages:

1. V-Grooved rolls for hard wire.
2. U-Grooved rolls for soft and soft shelled cored wires.
3. U-Cogged rolls for extremely soft shelled wires (usually hard surfacing types).
4. V-Knurled rolls for hard shelled cored wires.
5. Drive roll types may be mixed to suit particular requirements (example: V-Knurled roll in combination with U-Grooved).

Wire Diameter			Kit No.	Drive Roll		Wire Guide	
Fraction	Decimal	Metric		Part No.	Type	Inlet	Intermediate
.023/.025 in.	.023/.025 in.	0.6 mm	087 132	087 130	V-Grooved	056 192	056 206
.030 in.	.030 in.	0.8 mm	046 780	053 695	V-Grooved	056 192	056 206
.035 in.	.035 in.	0.9 mm	046 781	053 700	V-Grooved	056 192	056 206
.045 in.	.045 in.	1.2 mm	046 782	053 697	V-Grooved	056 193	056 207
.052 in.	.052 in.	1.3 mm	046 783	053 698	V-Grooved	056 193	056 207
1/16 in.	.062 in.	1.6 mm	046 784	053 699	V-Grooved	056 195	056 209
.035 in.	.035 in.	0.9 mm	044 750	072 000	U-Grooved	056 192	056 206
.045 in.	.045 in.	1.2 mm	046 785	053 701	U-Grooved	056 193	056 207
.052 in.	.052 in.	1.3 mm	046 786	053 702	U-Grooved	056 193	056 207
1/16 in.	.062 in.	1.6 mm	046 787	053 706	U-Grooved	056 195	056 209
5/64 in.	.079 in.	2.0 mm	046 788	053 704	U-Grooved	056 195	056 209
3/32 in.	.094 in.	2.4 mm	046 789	053 703	U-Grooved	056 196	056 210
7/64 in.	.110 in.	2.8 mm	046 790	053 705	U-Grooved	056 196	056 210
1/8 in.	.126 in.	3.2 mm	046 791	053 707	U-Grooved	056 197	056 211
.035 in.	.035 in.	0.9 mm	046 792	132 958	V-Knurled	056 192	056 206
.045 in.	.045 in.	1.2 mm	046 793	132 957	V-Knurled	056 193	056 207
.052 in.	.052 in.	1.3 mm	046 794	132 956	V-Knurled	056 193	056 207
1/16 in.	.062 in.	1.6 mm	046 795	132 955	V-Knurled	056 195	056 209
5/64 in.	.079 in.	2.0 mm	046 796	132 960	V-Knurled	056 195	056 209
3/32 in.	.094 in.	2.4 mm	046 797	132 961	V-Knurled	056 196	056 210
7/64 in.	.110 in.	2.8 mm	046 798	132 962	V-Knurled	056 196	056 210
1/8 in.	.126 in.	3.2 mm	046 799	132 963	V-Knurled	056 197	056 211
.045 in.	.045 in.	1.2 mm	083 319	083 489	U-Cogged	056 193	056 207
.052 in.	.052 in.	1.3 mm	083 320	083 490	U-Cogged	056 193	056 207
1/16 in.	.062 in.	1.6 mm	046 800	053 708	U-Cogged	056 195	056 209
5/64 in.	.079 in.	2.0 mm	046 801	053 710	U-Cogged	056 195	056 209
3/32 in.	.094 in.	2.4 mm	046 802	053 709	U-Cogged	056 196	056 210
7/64 in.	.110 in.	2.8 mm	046 803	053 711	U-Cogged	056 196	056 210
1/8 in.	.126 in.	3.2 mm	046 804	053 712	U-Cogged	056 197	056 211

Dia. Mkgs.	Part No.	Description	Quantity
Parts For Optional Equipment			
	047 945	BURNBACK CONTROL, (consisting of)	1
	118 170	CIRCUIT CARD, timer	1
R7	073 562	POTENTIOMETER, C sltd sft 1/T 2W 10K ohm	1
	097 922	KNOB, pointer	1
	097 132	STAND-OFF, No. 6-32 x .375 lg	2
PLG60	135 558	HOUSING PLUG & SOCKETS, (consisting of)	1
	079 747	TERMINAL, cont hdr 24-18 wire	7
	048 027	PLUG, connector keying	1
	604 645	NUT, stl hex .375-32	1
	046 529	WATER CONTROL KIT, (consisting of)	1
WS1	035 601	VALVE, 115VAC 2 way 1/4 IPS port 1/8 orf	1
	079 573	FITTING, pipe galv nipple L .250NPT x 6.000	1
	602 934	FITTING, pipe galv coupling .250NPSC	1
	010 295	FITTING, pipe brs elb M 1/4NPT x .625-18LH	2
	046 563	ADAPTER, term water/electrode	1
	000 571	HOSE, water (consisting of)	1
	134 834	HOSE, SAE .187 ID x .410 OD (order by ft)	10ft
	056 851	FITTING, hose brs barbed nipple 3/16tbg	2
	010 607	FITTING, hose brs nut .625-18 LH	2
	056 108	FITTING, hose brs ferrule .425 ID x .718 L	2
	008 657	FITTING, hose brs bushing rdc .625-18 LH/.875	1
	048 471	TOOL, extraction pin	1

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

ACCESSORIES

TRIGGER HOLD CONTROLS

TH-1. Stock No. 044 042

Allows operator to make extended welds without holding the gun trigger.

PRE-FLOW/POST-FLOW TIMER CONTROL

Stock No. 044 936

A 0 to 5 second adjustable timer to control gas flow prior to arc initiation and at completion of weld.

WIRE STRAIGHTENER

Stock No. 092 130

For .035" (0.9 mm) through .045" (1.1 mm) wire.

Stock No. 044 232

For 1/16" (1.6 mm) through 1/8" (3.2 mm) wire.

Reduces the cast in wire to increase service life of gun liner and contact tubes.

25 FT. (7.6 m) EXTENSION CABLE

Stock No. 047 813

Connects to existing 10' (3 m) 115 volt and contactor control cable. Permits feeder to be located 35' (10.7 m) from the power source.

HANGING BAIL

Stock No. 058 435

Suspends the feeder over the work area.

WATER CONTROL KIT

Stock No. 046 529 (Factory)

046 530 (Field)

For use with water-cooled guns.

NOTE: Not recommended when using a recirculating system such as Radiator 1 and 2.

REEL AND SPOOL COVERS

Stock No. 058 256

for 60 lb. (27 kg) coil.

Stock No. 057 607

for 12" (304 mm) spool.

WIRE REEL ASSEMBLY

Stock No. 056 416

For 60 lb. (27.2 kg) coil of wire.

FEEDER CART

Stock No. 046 564

TURNTABLE ASSEMBLY

Stock No. 072 463

Allows rotation of feeder as operator changes work positions. This reduces strain and bending on gun cable.

CARRYING CART

Stock No. 056 301

34" (863 mm) High — Lower Shelf 9" (228 mm). Shipped disassembled.

CS-3 SPOT CONTROL

Stock No. 044 935

Provides up to 5 seconds of spot weld time in two ranges. Time starts with depression of gun trigger switch. Burnback control to .25 seconds.

BURNBACK CONTROL

Stock No. 047 945 (Factory)

047 946 (Field)

Recommended for use with automatic set-ups to allow the wire to burnback from the puddle at the completion of the weld.

SPOOL ADAPTOR

Stock No. 047 141

For use with 14 lb. (6.3 kg) spool of Lincoln self-shielding wire.

INTERFACE CONTROL

Stock No. 045 031

Connects Miller feeders to Lincoln and Hobart constant potential power sources requiring a continuity set of contacts for contactor control.