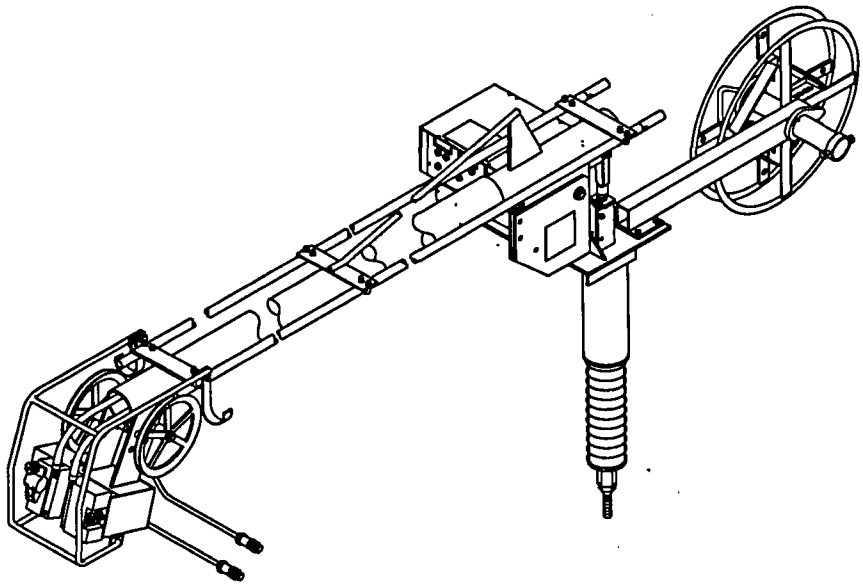
Miller®

March 1990 FORM: OM-1552A

Effective With Serial No. KA788188

MODEL: INTELLIMATIC™
DS-12M
DS-16M



OWNER'S MANUAL

IMPORTANT: Read and understand the entire contents of both this manual and the power source manual used with this unit, with special emphasis on the safety material throughout both manuals, 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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LIMITED WARRANTY

EFFECTIVE: MARCH 15, 1989

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

LIMITED WARRANTY – Subject to the terms and conditions hereof, Miller Electric Mfg. Co., Appleton, Wisconsin warrants to its Distributor/Dealer that all new and unused Equipment furnished by Miller is free from defect in workmanship and material as of the time and place of delivery by Miller. No warranty is made by Miller with respect to engines, trade accessories or other items manufactured by others. Such engines, trade accessories and other items are sold subject to the warranties of their respective manufacturers, if any. All engines are warranted by their manufacturer for one year from date of original purchase, except Tecumseh and Onan engines which have a two year warranty.

Except as specified below, Miller's warranty does not apply to components having normal useful life of less than one (1) year, such as spot welder tips, relay and contactor points, MILLERMATIC parts that come in contact with the welding wire including nozzles and nozzle insulators where failure does not result from defect in workmanship or material.

Miller shall be required to honor warranty claims on warranted Equipment in the event of failure resulting from a defect within the following periods from the date of delivery of Equipment to the original user:

1. Arc welders, power sources, robots, and components ..... 1 year
2. Load banks ..... 1 year
3. Original main power rectifiers ..... 3 years (labor – 1 year only)
4. All welding guns, feeder/guns and torches .... 90 days
5. All other Millermatic Feeders ..... 1 year
6. Replacement or repair parts, exclusive of labor . 60 days
7. Batteries ..... 6 months

provided that Miller is notified in writing within thirty (30) days of the date of such failure.

As a matter of general policy only, Miller may honor claims submitted by the original user within the foregoing periods.

In the case of Miller's breach of warranty or any other duty with respect to the quality of any goods, the exclusive remedies therefore shall be, at Miller's option (1) repair or (2) replacement or, where authorized in writing by Miller in appropriate cases, (3) the reasonable cost of repair or replacement at an authorized Miller service station or (4) payment of or credit for the purchase price (less reasonable depreciation based upon actual use) upon return of the goods at Customer's risk and expense. MILLER's option of repair or replacement will be F.O.B., Factory at Appleton, Wisconsin, or F.O.B. at a MILLER authorized service facility, therefore, no compensation for transportation costs of any kind will be allowed. Upon receipt of notice of apparent defect or failure, Miller shall instruct the claimant on the warranty claim procedures to be followed.

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

EXCEPT AS EXPRESSLY PROVIDED BY MILLER IN WRITING, MILLER PRODUCTS ARE INTENDED FOR ULTIMATE PURCHASE BY COMMERCIAL/INDUSTRIAL USERS AND FOR OPERATION BY PERSONS TRAINED AND EXPERIENCED IN THE USE AND MAINTENANCE OF WELDING EQUIPMENT AND *NOT* FOR CONSUMERS OR CONSUMER USE. MILLER'S WARRANTIES DO NOT EXTEND TO, AND NO RESELLER IS AUTHORIZED TO EXTEND MILLER'S WARRANTIES TO, ANY CONSUMER.

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 Description 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 data card or the nameplate.

Model _____

Serial or Style No. _____

Date of Purchase _____

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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 entrainer des blessures graves ou mème 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 laté-raux 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 accidently 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'ur, 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 gax 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 couvertures 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 lès robinets fermés, replacez 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 there-after. 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 raccordements 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 graisseux.

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 outergarments 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'usager

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 portez 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. REMPLACEZ 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 couvrefils 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 semblabes 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 THF 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'addresse donnee en 4.
6. ANSI Standard Z49.2, FIRE PREVENTION IN THE USE OF CUTTING AND WELDING PROCESSES distribué par l'addresse donnee en 4.
7. AWS Standard A6.0, WELDING AND CUTTING CONTAINERS WHICH HAVE COMBUSTIBLES distribué par l'addresse donnee 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'addresse donnée en 8
10. NFPA Standard 51B, CUTTING AND WELDING PROCESSES distribué par l'addresse 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.

The nameplate of this unit uses international symbols for labeling the front panel controls. The symbols also appear at the appropriate section in the text.

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

Model	DS-12M		DS-16M	
Electrode Wire Diameter Capacity	0.023 in. thru 1/8 in. (0.6 mm thru 3.2 mm)			
Standard Speed Range*	50 to 800 ipm (1.3 to 20.3 mpm)			
Control Circuit Voltage At Gun	15 Volts DC			
Boom Length	12 ft. (3.7 m)		16 ft. (4.9 m)	
Swing	360°			
Vertical Lift	Horizontal To 60° Above			
Maximum Height (With 4 Ft. Or 1.2 m Post) At Full Lift Of Boom	17 ft. (5.2 m)		21 ft. (6.4 m)	
Counterbalance (Patented)	Compression Spring Is Designed To Balance Boom At Any Angle. Pressure Adjustment Is Provided To Hold The Boom At Any Desired Angle Or To Limit The Vertical Lift At 40°, 50°, or 60°.			
Weight	Net	Ship	Net	Ship
	207 lbs. (94 kg)	318 lbs. (144 kg)	280 lbs. (127 kg)	411 lbs. (186 kg)

*Optional low speed motor range: 15 to 200 ipm (0.38-5 mpm);
Optional high speed motor range: 90 to 1400 ipm (2.3-36 mpm).

3-1. DESCRIPTION

This unit consists of a microprocessor-based, dual, digital wire feeder mounted on a SWINGARC boom. The boom is a patented design allowing both vertical lift and swing. Cables are routed through the boom from the wire feeder to the wire drive assembly.

The unit is a semiautomatic, constant speed, digital wire feeder with a programmable microprocessor-based control. The permanent magnet wire feed motor can feed wire alternately from two welding guns.

The wire feeder is capable of storing in memory and executing four complete and different wire feed welding programs for each welding gun. Each program consists of PREFLOW, RUN-IN, WELD, CRATER, BURNBACK, and POSTFLOW. Any sequence in a program can be timed. Two programs on either side of this dual feeder may be used together for dual schedule capabilities (two weld sequences in one program).

The preset welding voltage and wire speed parameters are maintained regardless of arc or load variations and ±10% line variation.

SECTION 4 – INSTALLATION OR RELOCATION

4-1. LOCATION

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 suitable location for this unit will allow room for the boom to swing horizontally in the desired arc and to pivot upward to the desired angle. Proper placement will also provide sufficient clearance from obstruction at the wire support end of the unit when the boom swings. The structure to which the unit is being installed should be of sufficient construction to support the weight of the unit when the boom is in the horizontal position.

4-2. BASE AND BOOM ASSEMBLY (Figure 4-1)

1. Existing Support (Customer Supplied)

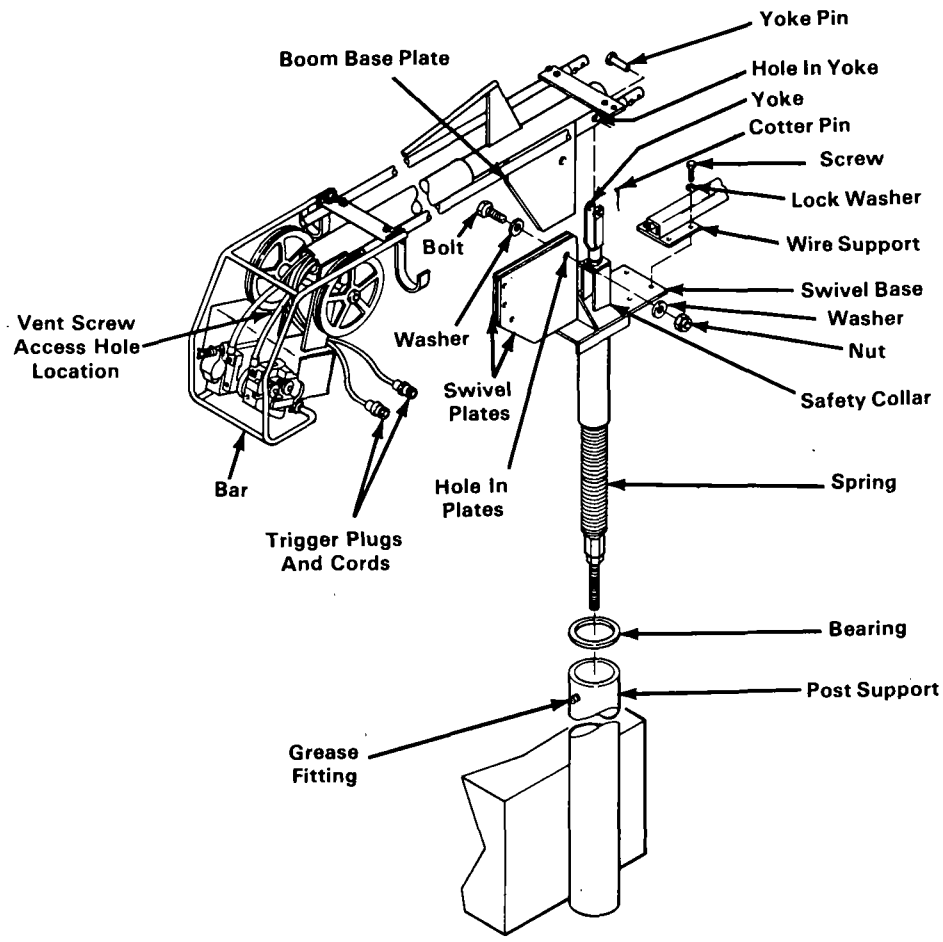


Figure 4-1. Base And Boom Assembly

WARNING: FALLING BOOM can cause serious personal injury and equipment damage.

- *Use 2-1/2 in. (63.5 mm) diameter, Schedule 40 pipe (wall thickness of 0.203 in. or 5.2 mm) as support pipe for 12 foot (3.7 m) booms.*
- *Use 5 in. (127 mm) diameter, Schedule 40 pipe (wall thickness of 0.258 in. or 6.6 mm) as support pipe for 16 foot (4.9 m) booms.*

a. Uncrate and remove all packing material from the unit.

b. Mount post support to the desired structure.

WARNING: FALLING BOOM can cause serious personal injury and equipment damage.

- *Securely mount unit to a structure that can support the weight of the unit when the boom is in the horizontal position.*

c. Complete Steps c thru g in Subsection 2. Post Support.

2. Post Support (Optional)

a. Uncrate and remove all packing material from the unit.

b. Mount post support to the desired structure.

WARNING: FALLING BOOM can cause serious personal injury and equipment damage.

- *Securely mount unit to a structure that can support the weight of the unit when the boom is in the horizontal position.*

c. Remove yoke pin, nut, washers, and bolt from yoke and swivel plates.

WARNING: RELEASE OF SPRING PRESSURE WITHOUT BOOM ATTACHED can cause serious personal injury and equipment damage.

- *Perform installation exactly as outlined in following step-by-step instructions.*
- *Do not remove safety collar until instructed to do so.*

d. Place bearing on top of post and insert swivel into post.

e. Place the boom base plate between the two swivel plates.

f. Slide washer onto bolt and insert through hole. Slide washer onto bolt and install nut onto bolt. Tighten nut; then back off nut 1/2 turn.

g. Insert pin through yoke, hole, and install cotter pin through pin.

CAUTION: EXCESSIVE FRICTION can damage equipment.

- *Every six months lubricate swivel to prevent wear.*

Excessive lubrication is not required or recommended.

3. Base Support (Optional)

IMPORTANT: *If an optional base support was purchased with the unit, mounting holes are provided for fastening the base support to the floor.*

WARNING: FALLING BOOM can cause serious personal injury and equipment damage.

- *For mounting base support use, as a minimum, 1/2 in. (12.7 mm) diameter, S.A.E. grade 5 bolts.*
- *Use equivalent strength, non-corrosive bolts if unit is mounted in an extremely damp environment.*

a. Uncrate and remove all packing material from the unit.

b. Fasten base support to the floor.

c. Complete Steps c thru g in Subsection 2. Post Support.

CAUTION: EXCESSIVE FRICTION can damage equipment.

- *Every six months lubricate swivel to prevent wear.*

Excessive lubrication is not required or recommended.

4. Swingpak Base (Optional)

a. Uncrate and remove all packing material from the Swingpak base.

WARNING: FALLING BOOM can cause serious personal injury and equipment damage.

- *Mount welding power source on Swingpak base before mounting Swingarc.*

b. Uncrate and remove all packing material from the Swingarc unit.

c. Complete Steps c thru g in Subsection 2. Post Support.

CAUTION: EXCESSIVE FRICTION can damage equipment.

- *Every six months lubricate swivel to prevent wear.*

Excessive lubrication is not required or recommended.

4-3. INSTALLATION OF WIRE SUPPORT (Figure 4-1)

1. Remove the securing screws and lock washers from the swivel base (see Figure 4-1).
2. Place the wire support over the holes in the swivel base.
3. Insert securing screws with lock washers and tighten.

4-4. INSTALLATION OF WIRE GUIDE EXTENSIONS (Figure 4-5)

1. Locate supplied wire guide extensions.
2. Loosen bolts on wire guide fittings, and insert ends of monocoil liners near cable tie into fittings. Be sure remaining ends of monocoil liners are flush with ends of hoses.
3. Tighten bolts to secure monocoil liners. Be sure not to crush the liners.

4-5. PULLEY ADJUSTMENT (Figure 4-1)

WARNING: ELECTRIC SHOCK can kill.

- *Do not touch live electrical parts.*
- *Shut down welding power source and wire feeder, and be sure that they cannot be accidentally energized before adjusting pulleys.*

Two positions are available for adjusting the boom pulleys up or down to provide minimum bend in the wires.

A. Adjustment During Installation

For small diameter wires (0.023 - 5/64 in. or 0.6 - 2.0 mm), place pulley shaft in upper holes. For larger diameter wires (3/32 - 1/8 in. or 2.4 - 3.2 mm), place pulley shaft in lower holes.

B. Adjustment After Installation

If a pulley adjustment is necessary because of a wire size change, proceed as follows;

1. Retract wire and change to new wire size.
2. Loosen nuts securing pulley shaft to boom.
3. Move shaft to desired position: Upper holes for small diameter wires, lower holes for larger diameter wires.
4. Tighten nuts to secure pulley shaft.
5. Thread welding wire according to Section 4-18.

4-6. DRIVE MOTOR VENT SCREW (Figure 4-1)

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 shroud.

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.

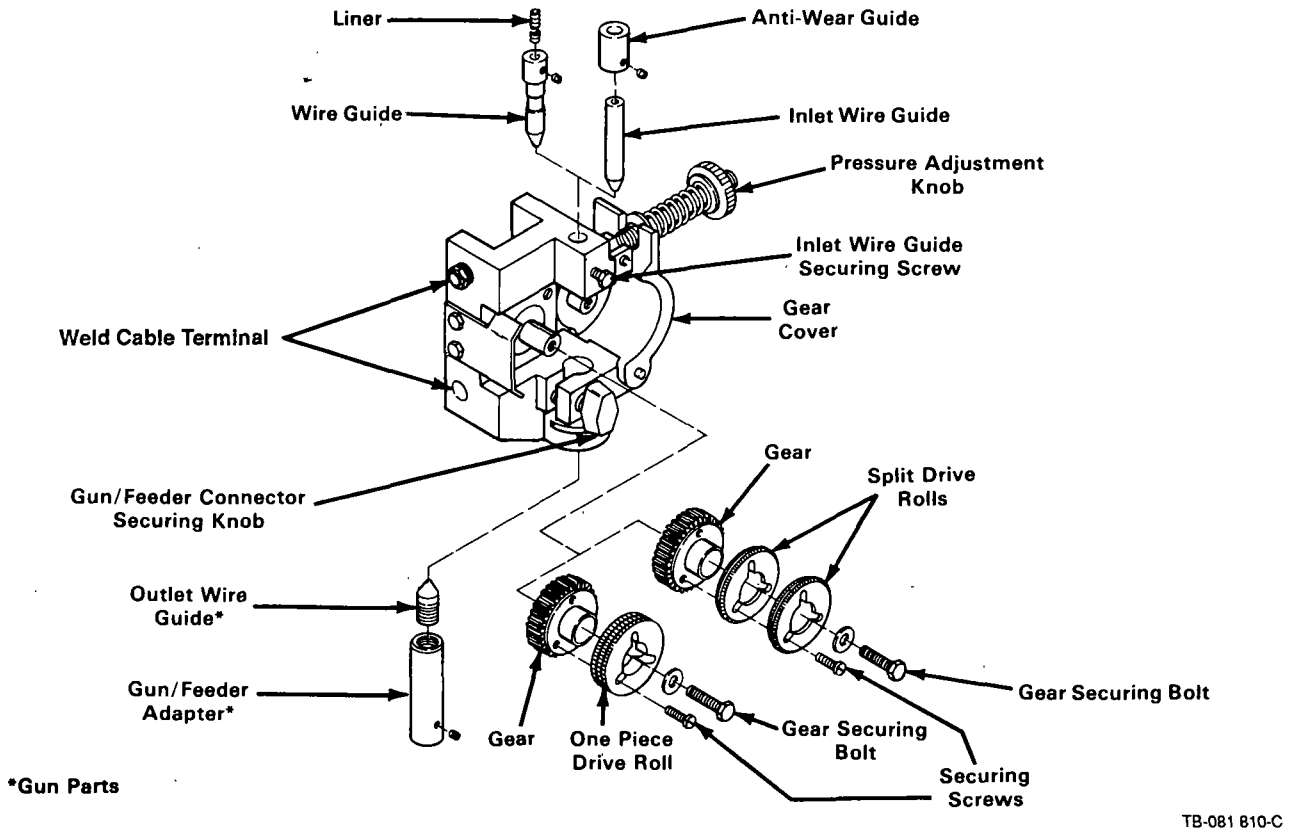


Figure 4-2. Drive Roll Installation

4-7. WIRE GUIDE AND DRIVE ROLL INSTALLATION (Figures 4-2 And 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 10-1.

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

A. Wire Guide Installation (Figure 4-2)

1. For .023 in. - 5/64 in. (0.6 - 2.0 mm) wire.
   a. Insert liner into inlet wire guide, and secure with setscrew.
   b. Loosen the inlet wire guide securing screw.

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

   c. Insert guide assembly into drive assembly. Secure by tightening screw.
2. For 3/32 - 1/8 in. (2.4 - 3.2 mm) wire.
   a. Remove anti-wear guide(s) from inlet wire guide.
   b. Loosen the inlet wire guide securing screw.

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

   c. Insert the inlet wire guide into drive assembly as illustrated in Figure 4-2. Secure by tightening screw.
   d. Install anti-wear guide(s) onto inlet wire guide, and secure with setscrew.

IMPORTANT: *The alignment of the drive roll and wire guide is factory set and should not require readjustment. If readjustment is needed, refer to Section 8-2.*

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

1. Loosen pressure adjustment knob, 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.

   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.
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.

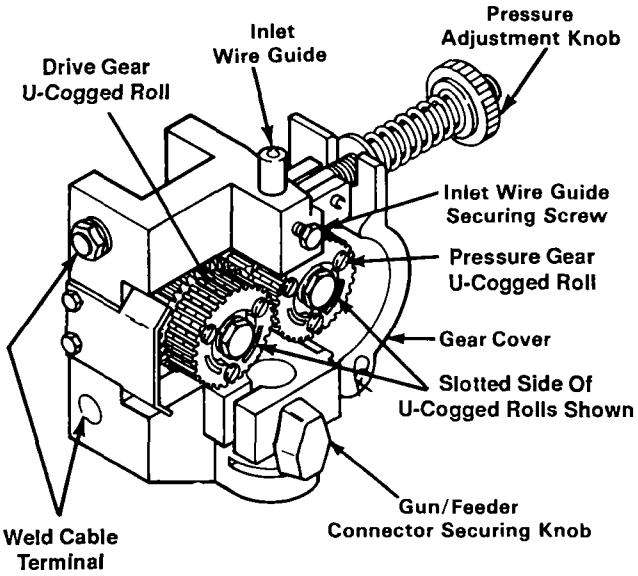


Figure 4-3. U-Cogged Drive Rolls Installation

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.*

4-8. CONNECTIONS TO DRIVE ASSEMBLY

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

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 4-5)

WARNING: ELECTRIC SHOCK can kill.

- *Do not touch live electrical parts.*
- *Do not touch electrode wire when gun trigger is pressed.*
- *Do not touch either electrode wire when either gun trigger is pressed.*
- *Isolate unused gun from workpiece.*

Both electrode wires are electrically energized when either gun trigger is pressed when using one welding power source.

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

Two four socket free-hanging receptacles extend out of the motor end of the boom for connecting the gun trigger plugs to the wire feeder. Connect the left gun to the free-hanging receptacle labeled LEFT TRIGGER, and the right gun to the remaining free-hanging receptacle as follows: align keyways, insert plugs, and rotate threaded collars fully clockwise.

C. Voltage Sensing Connections (Figure 4-4)

WARNING: ELECTRIC SHOCK can kill.

- *Do not touch live electrical parts.*
- *Shut down welding power source, and disconnect input power enploying lockout/tagging procedures before inspecting or installing.*

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.

EXCESSIVELY HIGH WELDING CURRENT can cause the electrode wire to vaporize.

- *Be sure the voltage sensing leads are connected properly.*

Connect the voltage sensing lead from the boom to the weld cable terminal on the wire drive housing as shown in Figure 4-4.

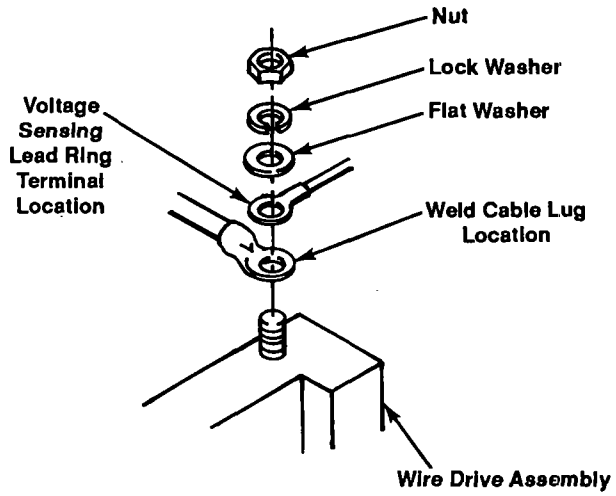


Figure 4-4. Voltage Sensing Lead And Weld Cable Locations

D. Shielding Gas (If Applicable)

An integral gas input fitting is provided on each 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.

E. 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.*

If water is required for one gun, connect the water input hose from the gun to the water output hose at the motor end of the boom. If water is required for both guns, the water output hose from the control divides at the motor end of the boom to accept connections from both water input hoses. Connect water return hose from gun(s) to adapter at appropriate weld terminal on wire 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.

F. 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 Left Contactor Control/115 Volts AC cord and plugs may be damaged.

Weld cable connection points on each wire drive assembly provide a junction point for connecting the weld cable from the gun (if so equipped) to the weld cable from the welding power source. Connect the weld cable from the gun(s), if applicable, to the weld cable terminal on the drive assemblies.

4-9. CONNECTIONS FROM BOOM TO CONTROL BOX (Figure 4-5)

A. Gun Trigger

Two receptacles, labeled TRIGGER, are provided on the front of the control box for making gun trigger control connections. Connect the left gun trigger control plug from boom, labeled LEFT TRIGGER, to control box left TRIGGER receptacle and the remaining gun trigger control plug from boom to control box right TRIGGER receptacle as follows: align keyways, insert plugs, and rotate threaded collars fully clockwise.

B. Shielding Gas

Two shielding gas output fittings are provided on the front of the control box for making the shielding gas output connections. Connect gas hose fittings from boom to the appropriate shielding gas output fittings on the gas valves. These fittings have 5/8-18 right-hand threads.

C. Motor Control

A motor control receptacle is provided on the rear of the control box for making motor control connections. Connect motor control plug from boom to motor control receptacle as follows: align keyways, insert plug, and rotate threaded collar fully clockwise.

D. Voltage Sensing

A VOLT SENSE receptacle is provided on the rear of the control box for making voltage sensing connections. Connect plug from boom to control box VOLT SENSE receptacle as follows: align keyway, insert plug, and rotate threaded collar fully clockwise.

4-10. CURRENT RELAY (REED SWITCH) (Figure 4-5)

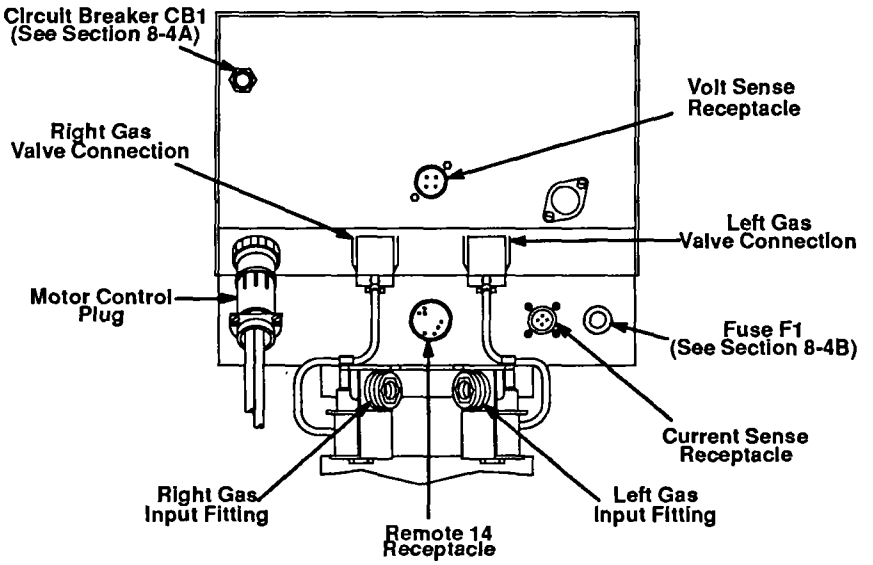
The weld cable must be routed through the current relay. Connect the plug to the 4-socket current sense receptacle on the rear panel of the wire feeder.

4-11. SHIELDING GAS CONNECTION (Figure 4-5)

IMPORTANT: *The following procedure explains connections to the shielding gas input fittings from one shielding gas source. If a different shielding gas is required for each welding gun, a separate hose can be connected from each shielding gas source to the appropriate input fitting on the rear of the control box. Do not install the "Y" adapter if connections are to be made from two separate shielding gas sources.*

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 connections to control box.

1. Install supplied "Y" adapter onto shielding gas input fittings on rear of control box.
2. Install gas fitting onto one end of shielding gas hose.
3. Connect end of hose with fitting to gas input fitting on "Y" adapter installed in Step 1.
4. Route and connect remaining end of hose to regulator/flowmeter on shielding gas supply.



Rear View Of Control Box

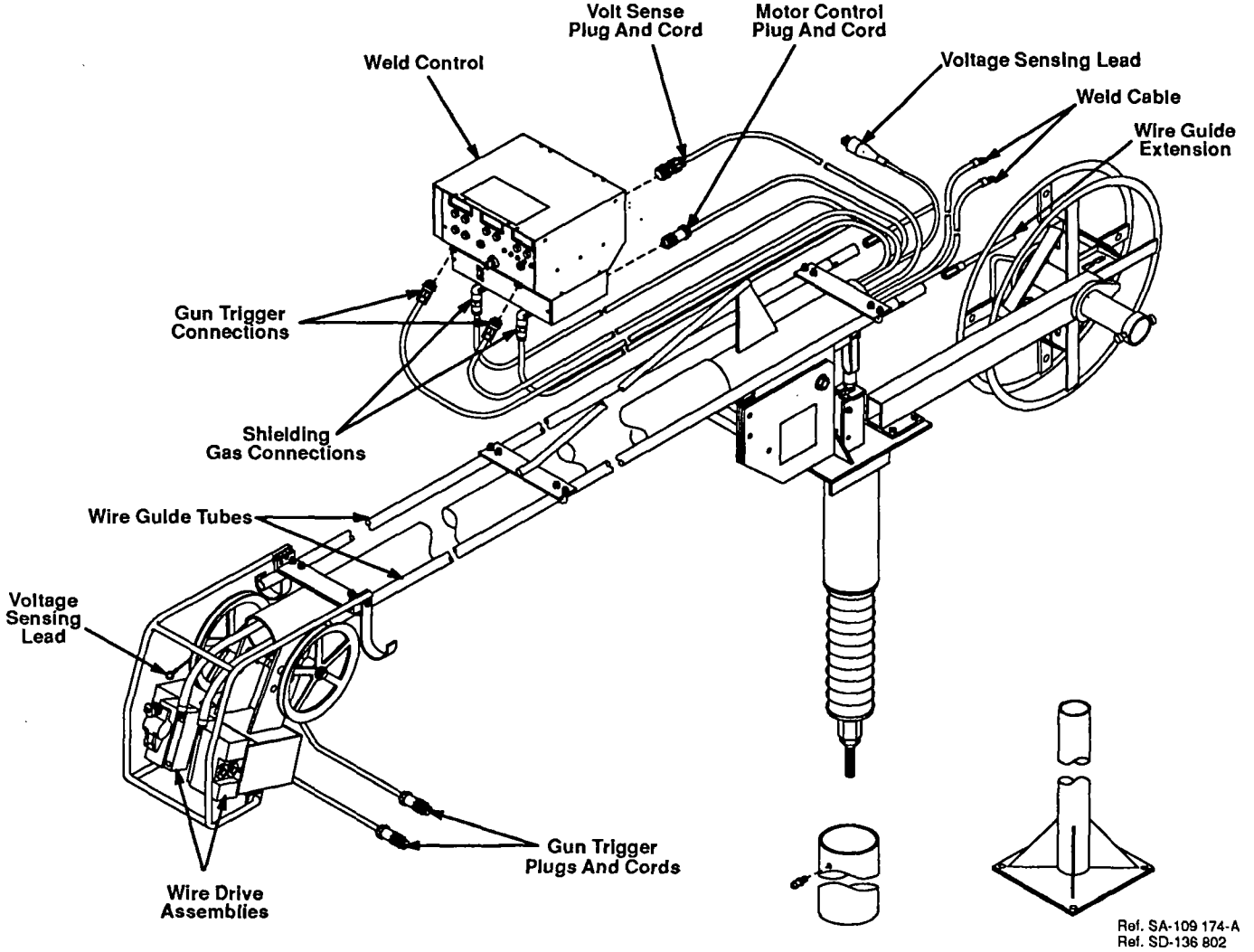


Figure 4-5. Control Box And Boom Connections

4-12. 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

Water is supplied to either one gun or both guns utilizing one water solenoid and the same input, output, and return hoses.

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

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. Connect hose to input fitting on water valve on rear of control box.
3. Route and connect remaining end of hose to water supply.
4. Locate and connect water hose fitting from boom to water output fitting provided on front of control box. This fitting has 5/8-18 left-hand threads.

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

If water is required for one gun only, follow Steps 5–7.

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

If water is required for both guns, follow Steps 8–10.

8. Install adapters onto both weld terminals on wire drive assembly.
9. Connect supplied water return hose "Y" assembly to adapters.
10. Route water out hose to a proper drain.

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 internal 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.

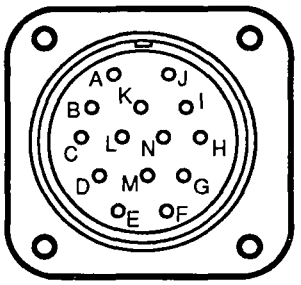
The control is shipped connected to supply water when the POWER switch is in the ON position. The water solenoid circuitry can be modified to supply water when the appropriate gun trigger is pressed. To make electrical reconnection of water solenoid, proceed as follows:

1. Remove control box wrapper.
2. Locate terminal strip 1T on bracket inside control box.
3. Right Side Only: To supply water on the right side when the right gun trigger is pressed, move lead 6 from terminal A on terminal strip 1T to terminal C.

   Left Side Only: To supply water on the left side when the left gun trigger is pressed, move lead 6 from terminal A on terminal strip 1T to terminal E.

   Either Side: To supply water on either side when the appropriate gun trigger is pressed, move lead 6 from terminal A on terminal strip 1T to terminal K.
4. Reinstall wrapper.

4-13. WELDING POWER SOURCE CONNECTIONS TO CONTROL BOX AND BOOM (Figures 4-5 And 4-6)



S-0004

Figure 4-6. Front View Of Remote 14 Receptacle With Socket Locations

A. Remote Control Receptacle Information And Connections (Figures 4-5 And 4-6)

REMOTE 14 receptacle RC1 is used to connect the wire feeder to the welding power source.

To make connections, align keyway, insert plug, and rotate threaded collar fully clockwise.

The following socket information is included in case the supplied cord is not suitable, and it is necessary to wire a plug or cord to interface with REMOTE 14 receptacle RC1.

Socket C: +10 volts dc with respect to socket D required from external source.

Socket D: Control circuit common for remote control device from external source.

Socket E: Output Signal; 0 volts equals machine minimum; +10 volts equals machine maximum.

Socket G: 115 volts ac circuit common.

Socket I: Requires 115 volts ac, 60 Hz, with respect to socket G (circuit common).

Socket J: A contact closure from socket I to socket J energizes the 115 volt contactor control circuit in the welding power source.

Socket K: Chassis ground.

IMPORTANT: *The remaining sockets in the receptacle are not used.*

B. Weld Cable

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 interconnecting cord and plugs may be damaged.

Two weld cables extend out of the control end of the boom for making weld output connections to the welding power source. Select and prepare weld cables according to information in the welding power source Owner's Manual.

For Electrode Positive/Reverse Polarity connections proceed as follows:

1. Connect supplied jumper cable between weld cable terminals on the two wire drive assemblies (see Figure 4-2).
2. Route weld cable of adequate size and capacity from the POSITIVE weld output terminal (see power source Owner's Manual), and make connection to the two weld cables extending out of the control end of the boom.
3. 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.
4. Route and connect voltage sensing lead with clamp attached from control box end of boom to workpiece.

4-14. INTERNAL PROGRAM OPTIONS (Figure 4-7)

IMPORTANT: *Follow the procedure in Subsection A when changing any DIP switch position. The microprocessor only checks the positions of the DIP switches after power to the wire feeder is turned off and back on.*

The wire feeder is equipped with eighteen internal DIP switches which calibrate the microprocessor. Figure 4-7 shows the DIP switch positions for the standard unit set at the factory. It may be necessary to change some DIP switch positions if different options are added or if different functions are desired.

A. Procedure For Changing DIP Switches

The DIP switches are located on the rear left side of Interface Board PC3 (third board behind front panel) inside the weld control (see Figure 4-7). To change DIP switch positions, proceed as follows:

WARNING: ELECTRIC SHOCK can kill.

- *Do not touch live electrical parts.*
- *Shut down wire feeder and welding power source, and disconnect interconnecting cord from the wire feeder before presetting DIP switches.*

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

- *Put on properly grounded wrist strap BEFORE changing DIP switch positions or handling circuit boards.*

1. Remove wire feeder wrapper.
2. Locate DIP switches on rear, left side of circuit Board PC3 (see Figure 4-7).
3. Reposition appropriate DIP switches using a pointed tool, such as the edge of a small screwdriver.
4. Reinstall wrapper.
5. Reconnect interconnecting cord.

B. DIP Switch Descriptions

1. No Arc Hours Reset/Arc Hours Reset

   A visual display of the accumulated arc hours can be obtained when the Key-Switch is in the SET position. With the DIP switch in the No Arc Hours Reset position, the weld control accumulates arc hours up to 999 hours before turning over to zero.

   In the Arc Hours Reset position, the accumulated arc hours may be reset at any time by de-

pressing the HOURS push button and either TIME Increase or Decrease push button.

2. Seconds/Cycle

   With the DIP switch in the Seconds position, sequence times are preset and displayed in seconds.

   In the Cycles position, times are preset and displayed in cycles.

3. Inches/Meters

   With the DIP switch in the Inches position, wire speed is preset and displayed in inches per minute.

   In the Meters position, wire speed is preset and displayed in meters per minute.

4. Error Blink Only/Error Shutdown

   With the DIP switch in the Error Blink Only position, a deviation of more the ±1 volt in actual welding voltage from preset voltage for more than 1.5 seconds, or a deviation of more than 2.5% of full speed in actual wire speed from preset wire speed for more than 1 second causes the appropriate numeric display to blink on-off indicating the deviation from preset parameters. This deviation can be the result of presetting a voltage beyond the range of the welding power source or the result of a wire feeding problem (incorrect drive roll tension, worn drive rolls, dirty gun liner, etc.).

   In the Error Shutdown position, a deviation from preset parameters as defined above causes the wire feeder to sequence immediately to CRATER, BURNBACK, and POSTFLOW to shutdown. A blinking numeric display indicates whether a voltage or wire feeding error occurred.

   To reset Error Blink Only or Error Shutdown, turn power to the unit off and back on and reset the parameter or correct wire feed problem before resuming operation.

5. No Timed Abort/Timed Abort

   With the DIP switch in the No Timed Abort position, the gun trigger can be released during a timed weld once the arc is started, and the wire feeder completes the timed program automatically. If the trigger is held closed throughout the timed weld program, the trigger must be released at the end of POSTFLOW before the next weld can be started.

   In the Timed Abort position, the gun trigger must be held closed for the duration of the timed weld. If the trigger is released before the timed completion, the wire feeder immediately sequences to BURNBACK and shutdown.

6. No Trigger Latch/Trigger Latch

   With the DIP switch in the Trigger Latch position, the gun trigger can be released during RUN-IN, or within the first 3 seconds of WELD and the wire feeder continues in the weld sequence until a momentary closure of the gun trigger sequences the wire feeder to CRATER. If the gun trigger is held closed throughout the first 3 seconds of the weld, the trigger does not latch and when released, sequences the wire feeder to CRATER as in a normal weld. If trigger latch is set and the arc is not started within three seconds after the start of RUN-IN; the wire feeder displays an Arc error.

7. No Trigger Dual Schedule/Trigger Dual Schedule

   With the DIP switch in the Trigger Dual Schedule position, a momentary release of the gun trigger while welding (less than 0.4 second) switches weld schedules when both weld schedules are untimed.

8. DSS-9M Switch/No DDS-9M Switch

   Place the DIP switch in the DSS-9M position only if the DSS-9M dual schedule option is to be used.

9. Single/Dual

   Place the DIP switch in the Dual position, factory set position.

10. Flash Error Enable/Flash Error Disable

    Place the DIP switch in the Flash Error Disable position to disable the Error Blink Only/Error Shutdown function. Place the DIP switch in the Flash Error Enable position to allow normal operation of the Error Blink Only/Error Shutdown function.

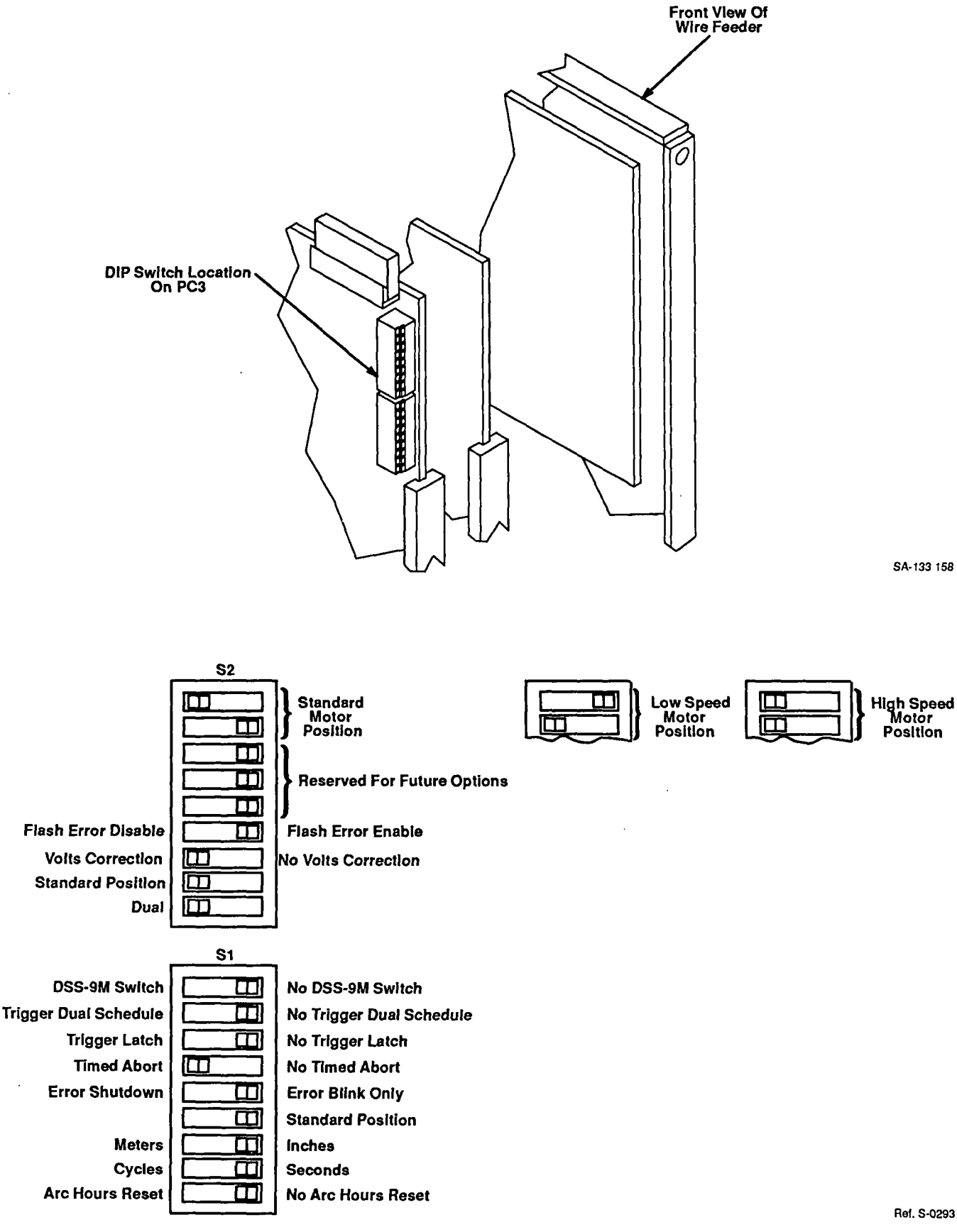
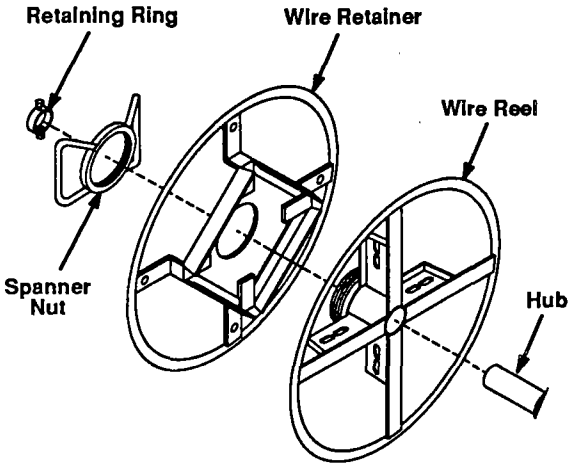


Figure 4-7. DIP Switches



Ref. TB-081 755-A
Ref. SC-127 308

Figure 4-8. Wire Installation

4-15. WELDING WIRE INSTALLATION

A. Installation Of Spool-Type Wire (Figure 4-8)

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

B. Installation Of Optional Wire Reel And Reel-Type Wire (Figure 4-8)

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

C. Adjustment Of Hub Tension (Figure 8-3)

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.

4-16. SAFETY COLLAR REMOVAL (Figure 4-1)

WARNING: RELEASE OF SPRING PRESSURE WITHOUT BOOM ATTACHED can cause serious personal injury and equipment damage.

- *Perform installation exactly as outlined in the following step-by-step instructions.*
- *Do not remove safety collar until instructed to do so.*
- *Retain safety collar for future disassembly use.*

A safety collar is provided on top of the post to maintain spring pressure and prevent vertical movement during installation. The collar is required whenever the boom is disassembled or relocated. To remove the safety collar, proceed as follows:

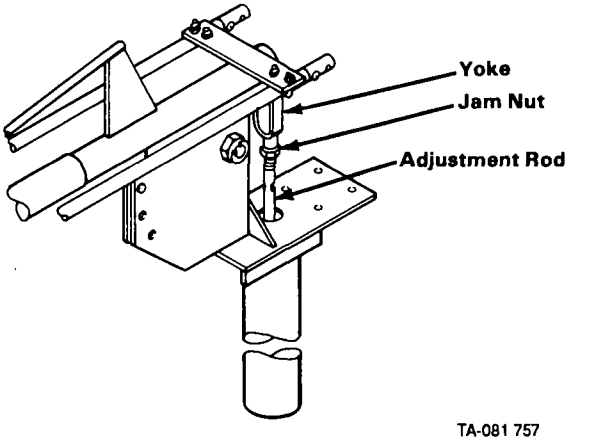
1. Grasp boom and pull down slightly. The boom should be pulled down only far enough to remove the pressure which is applied to the safety collar.
2. Remove the safety collar, and retain for future use.
3. The boom should now balance in any position from horizontal to 60 degrees above horizontal. If the boom does not balance properly, proceed to Section 4-17.

4-17. BOOM ADJUSTMENTS (Figure 4-9)

A. Weight Lift Adjustment

WARNING: FALLING BOOM can cause serious personal injury and equipment damage.

- *Maintain full threads on adjustment rod through the yoke.*



TA-081 757

Figure 4-9. Boom Adjustments

The amount of weight which the boom can retract into the upright position when released can be varied by adjusting the jam nut and adjustment rod located at the base of the boom. If heavier guns are installed on the end of the boom making it necessary to increase the amount of weight that the boom can lift, loosen the jam nut and rotate the adjustment rod so that the adjustment

rod threads into the yoke. When the proper adjustment is obtained, tighten the jam nut against the base of the yoke. If lighter guns are used, rotate the adjustment rod so that the adjustment rod threads out of the yoke.

B. Locking Knob

By rotating the Locking Knob, located on the side of the swivel plate, in a clockwise direction, the boom may be held in any desired position. Rotating the Locking Knob in a counterclockwise direction will permit the boom to free travel. Changing the position of the Locking Knob to the other threaded holes provided along the side of the swivel plate limits the lift of the boom to 50 degrees or 40 degrees respectively during free travel.

4-18. 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.

1. Install the wire as instructed in Section 4-15.
2. 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.
3. Adjust hub tension according to Section 4-15C if necessary.
4. Manually route the wire through the wire guide tube on the side of the boom, over the wire pulley, and to the drive assembly.
5. If necessary because of wire size change, adjust boom pulley(s) for minimum wire bend according to Section 4-5.
6. 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.
7. 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 4-7).*

8. 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 Section 8-2 if wire does not feed in the grooves of the drive rolls.)
9. Pivot the pressure adjustment knob(s) until the washer(s) on the pressure adjustment(s) is seated on top of the gear cover(s).
10. 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.
11. Lay gun cable assembly out flat and straight (no coils in the cable/conduit).
12. Repeat Steps 1 thru 11 on the remaining side.
13. Energize the welding power source.
14. Place the KEY SWITCH in the RUN position and 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.*

15. Press the JOG switch (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 JOG switch when welding wire extends approximately 1 in. (25 mm) out of gun tip.
16. Repeat Step 15 for the remaining welding gun.
17. Shut down wire feeder and welding power source.

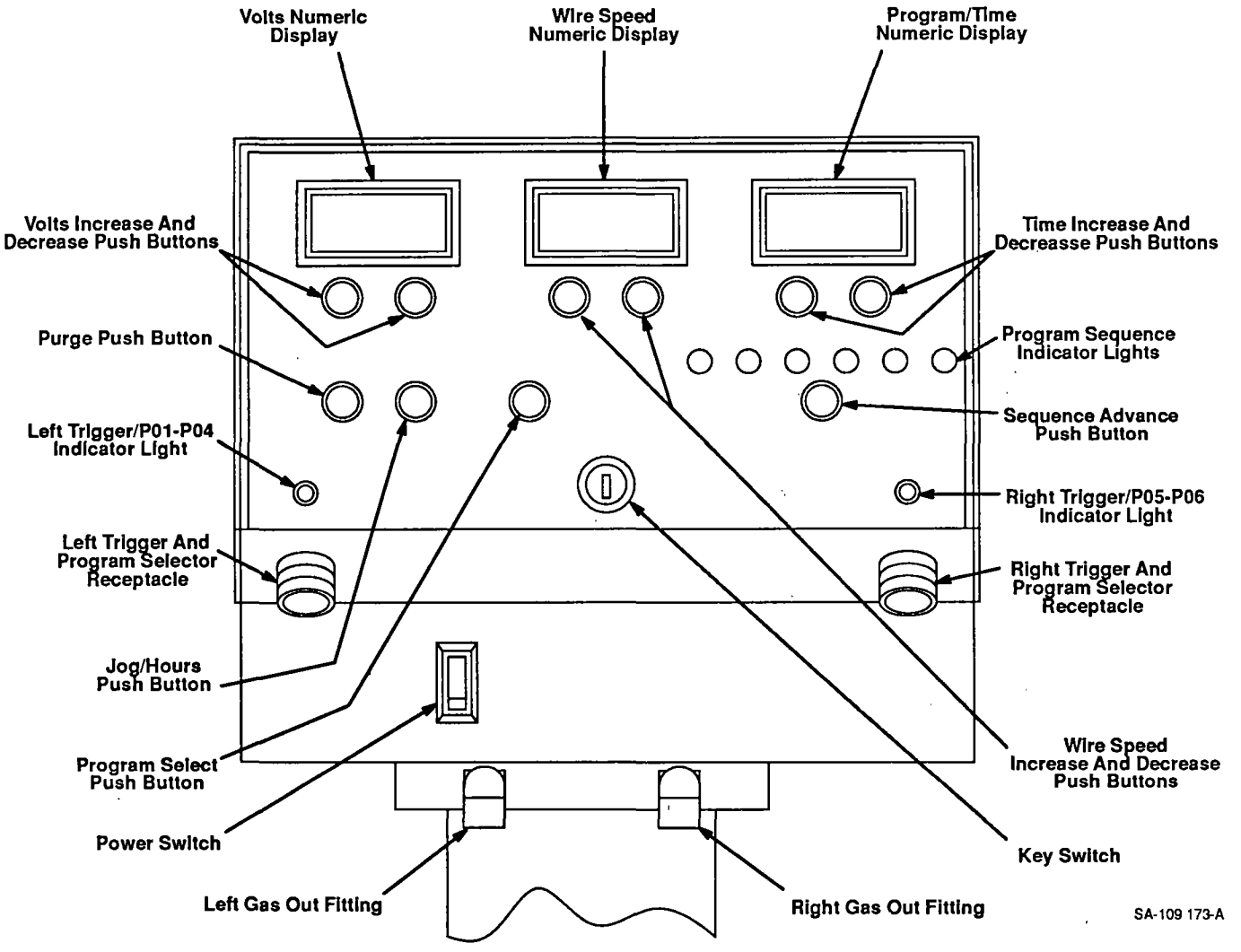


Figure 5-1. Front Panel View

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

The Power switch provides on/off control of the power connected to the wire feeder through receptacle RC1. Placing the Power switch in the ON position energizes the wire feeder and places the unit in a ready-to-weld status. 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. KEY-SWITCH (Figure 5-1)

The Key-Switch has two positions, the SET position and the RUN position. In the SET position, welding parameters can be preset and changed during set-up and while welding. In the RUN position, welding parameters cannot be changed. The RUN position is the normal operating Key-Switch position after welding parameters have been preset.

The key can be removed only in the RUN position.

5-3. PROGRAM SELECT PUSH BUTTON (Figure 5-1)

The PROGRAM SELECT push button provides a means of selecting Programs 1, 2, 3, or 4 for the left gun and Programs 5, 6, 7, or 8 for the right gun. To select a program for presetting the program sequence parameters or to select a starting program for welding, depress the PROGRAM SELECT push button. Each time the push button is depressed, the wire feeder advances to the next program. The program selected will be visually displayed on the PROGRAM/TIME numeric display.

5-4. PURGE PUSH BUTTON (Figure 5-1)

The PURGE push button provides a means of purging the gas line. Depressing the push button energizes the gas solenoid and purges the shielding gas line.

5-5. SEQUENCE ADVANCE PUSH BUTTON (Figure 5-1)

The SEQUENCE ADVANCE push button provides a means of sequencing through a welding program for reviewing and setting program sequence parameters. The Program Sequence Indicator lights turn on to indicate the sequence step. To advance to the next sequence step, depress the SEQUENCE ADVANCE push button.

5-6. PROGRAM SEQUENCE INDICATOR LIGHTS (Figure 5-1)

The Program Sequence Indicator lights consist of PREFLOW, RUN-IN, WELD, CRATER, BURNBACK, and POSTFLOW. These Indicator lights represent the six program sequence steps of a complete welding program. When the wire feeder is in one of these sequence steps, the appropriate Indicator light turns on.

5-7. JOG/HOURS PUSH BUTTON (Figure 5-1)

A. JOG Push Button Function

When the Key-Switch is in the RUN position, the JOG push button provides a means of jogging the welding wire. To jog the welding wire, depress the JOG push button.

When the Key-Switch is in either the SET or RUN position, the JOG push button provides a means of changing the JOG wire speed. To change the JOG wire speed, depress the WIRE SPEED Increase or Decrease push button while the JOG push button is held closed. The wire speed is displayed on the WIRE SPEED numeric display.

IMPORTANT: *Jogging the welding wire with the gun trigger can cause the wire feeder to shut down.*

B. HOURS Push Button Function

When the Key-Switch is in the SET position, the HOURS push button provides a visual display of accumulated arc hours (up to 999 hours) on the TIME numeric display. Depress and hold the HOURS push button to display accumulated arc hours. (The JOG wire speed will also be displayed on the WIRE SPEED numeric display.) If the arc hours reset option has been selected, the accumulated arc hours may be reset by depressing the TIME Increase or Decrease push button while the accumulated arc hours are displayed.

5-8. VOLTS NUMERIC DISPLAY (Figure 5-1)

The VOLTS numeric display provides a visual display of the welding voltage.

5-9. VOLTS INCREASE AND DECREASE PUSH BUTTONS (Figure 5-1)

The VOLTS Increase and Decrease push buttons provide a means of presetting the desired voltage parameters for RUN-IN, WELD, and CRATER when the Key-Switch is in the SET position. The voltage can be preset from 10.0 to 50.0 volts and is displayed on the VOLTS numeric display. The voltage automatically presets to 18.0 volts after the memory is cleared. The push buttons do not function when the Key-Switch is in the RUN position.

Depressing the VOLTS Increase push button increases the voltage parameter; depressing the VOLTS Decrease push button decreases the voltage parameter.

IMPORTANT: *If the VOLTS Increase or Decrease push button is held closed, the parameter changes at an accelerating rate.*

5-10. WIRE SPEED NUMERIC DISPLAY (Figure 5-1)

The WIRE SPEED numeric display provides a visual display of the wire speed parameters for each program sequence step. The wire speed parameters can be preset and displayed from 50 to 800 inches per minute (ipm) or from 1.3 to 20.3 meters per minute (mpm) depending on the position of the Inches/Meters DIP switch (see Section 4-14B, Item 3).

The JOG wire speed is also displayed when the JOG push button is depressed.

5-11. WIRE SPEED INCREASE AND DECREASE PUSH BUTTONS (Figure 5-1)

The WIRE SPEED Increase and Decrease push buttons provide a means of presetting the desired wire speed parameters for JOG, and for RUN-IN, WELD, and CRATER when the Key-Switch is in the SET position. The wire speed can be preset from 50 to 800 inches per minute (ipm) or from 1.3 to 20.3 meters per minute (mpm) depending on the position of the Inches/Meters DIP switch (see Section 4-14B, Item 3). The wire speed automatically presets to 200 ipm (5.08 mpm) when the memory is cleared. Except for JOG, the push buttons do not function when the Key-Switch is in the RUN position.

Depressing the WIRE SPEED Increase push button increases the wire speed parameter; depressing the WIRE SPEED Decrease push button decreases the wire speed parameter. To preset JOG wire speed, depress the JOG push button and either the WIRE SPEED Increase or Decrease push button.

5-12. PROGRAM/TIME NUMERIC DISPLAY (Figure 5-1)

The PROGRAM/TIME numeric display provides a visual display of which program is presently selected and the time parameter for the indicated sequence step. When power is first applied to the wire feeder and after switching to a new program, the display will show the program number for about two seconds. For example, Program 1 is displayed as P01. It then displays the selected time parameter for the indicated sequence step. If no time parameter is entered, the program number continues to display. To display the program number when the time parameter is displayed, advance to the next sequence step.

5-13. TIME INCREASE AND DECREASE PUSH BUTTONS (Figure 5-1)

These buttons are located directly below the PROGRAM/TIME numeric display. They provide a means of presetting or changing the time parameters for the six

program sequence steps. The Key-Switch must be in the SET position.

IMPORTANT: *If either the TIME Increase or Decrease push button is held closed, the parameter changes at an accelerating rate.*

5-14. LEFT AND RIGHT TRIGGER INDICATOR LIGHTS

The LEFT indicator light turns on when the left gun and programs 1 through 4 are selected. The RIGHT indicator light turns on when the right gun and programs 5 through 8 are selected.

SECTION 6 – PRESETTING SEMIAUTOMATIC WELDING PROGRAMS

Table 6-1. Program Steps

	Preflow	Run-In	Weld	Crater	Burnback	Postflow
Volts	–	10-50	10-50	10-50	**	–
Wire Speed	–	50-800 ipm (1.3 - 20.3 mpm)+	50-800 ipm (1.3 - 20.3 mpm)*	50-800 ipm (1.3 - 20.3 mpm)	–	–
Time	0-999 sec. (0-999 cycles)	0-999 sec. (0-999 cycles)	0-999 sec. (0-999 cycles)++	0-999 sec. (0-999 cycles)	0-999 sec. (0-999 cycles)	0-999 sec. (0-999 cycles)

+Standard motor speed. Optional motors available.
++ Zero means continuous in weld sequence only.
*Zero wire speed brakes the motor.
** Burnback voltage same as preset Crater voltage.

6-1. DEFINITION OF TERMS

1. **Weld Program:** The series of steps (PREFLOW, RUN-IN, WELD, CRATER, BURNBACK, and POSTFLOW) making up a complete welding program.
2. **Dual Scheduling:** Switching between two weld conditions when both weld conditions are untimed.
3. **Trigger Latch:** The gun trigger can be released during RUN-IN, or within the first 3 seconds of WELD sequence. The wire feeder remains in WELD sequence until the trigger is depressed. It then advances to CRATER.
4. **Trigger Select:** Select the starting program using the gun trigger. When the gun trigger is momentarily depressed, the wire feeder switches to the next program that has at least 0.2 seconds of preset PREFLOW. The starting program must also have at least 0.2 seconds of preset PREFLOW time.
5. **Sequencing:** Advancing step by step through a welding program.
6. **Standby:** Idle condition where the wire feeder is in a ready-to-weld status. The numeric displays show the preset WELD parameters. The weld contactor is off, and the gun trigger is released.
7. **Shutdown:** Condition of no output – weld contactor and wire feed motor off. Shutdown is further indicated by a blinking VOLTS or WIRE SPEED numeric display in the event of a voltage or wire speed error (see Section 4-14B, Item 4) or by an Arc error in the case where no arc has been started within three seconds of energizing the weld contactor. Attempting to thread the welding wire with the gun trigger can cause the wire feeder to shutdown. This feature helps prevent unwanted arcs due to accidental trigger operation.

6-2. PRESETTING SEMIAUTOMATIC WELDING PROGRAMS (Table 6-1)

WARNING: ELECTRIC SHOCK can kill; MOVING PARTS can cause serious injury; WELDING WIRE can cause puncture wounds.

- *Do not touch live electrical parts.*
- *Keep clear of pinch points.*
- *Open drive roll housing to release pressure on wire.*
- *Do not point gun toward any part of the body, any conductive surface, or other personnel.*

IMPORTANT: *PREFLOW time must be preset for at least 0.2 second for using Trigger Select feature.*

1. Energize the welding power source.
2. Place the wire feeder Power switch in the ON position. This applies power to the wire feeder and initiates a check of the numeric displays and the Indicator lights. This check involves turning on all numeric displays and Indicator lights for one second for visual inspection. Next, a diagnostic check of the memory and system inputs is performed by the microprocessor. If a problem is indicated on the displays, see Section 8-7.
3. Turn Key-Switch to the SET position.
4. Depress PROGRAM SELECT push button to select Programs 1 through 8. The numeric displays show the WELD parameters stored in memory for Programs 1 through 8.
5. Depress SEQUENCE ADVANCE push button to advance to PREFLOW. The PREFLOW Indicator light turns on. The PROGRAM/TIME numeric display shows the PREFLOW time stored in memory.

IMPORTANT: *Momentarily depressing the SEQUENCE ADVANCE push button advances the welding sequence at a rate of one step per closure. Holding the SEQUENCE ADVANCE push button closed advances the welding sequence at a rate of one step per second.*

6. Depress TIME Increase or Decrease push button to preset PREFLOW time. If PREFLOW is not required, decrease PREFLOW time to zero.

IMPORTANT: *If the TIME Increase or Decrease push button is held closed, the parameter changes at an accelerating rate.*

7. Depress SEQUENCE ADVANCE push button to RUN-IN. The RUN-IN Indicator light turns on. The VOLTS, WIRE SPEED, and PROGRAM/TIME numeric displays show the RUN-IN parameters stored in memory.
8. Depress TIME Increase or Decrease push button to preset RUN-IN time. Depress VOLTS Increase or Decrease push button to preset RUN-IN voltage. Depress WIRE SPEED Increase or Decrease push button to preset RUN-IN wire speed. If RUN-IN is not required, decrease RUN-IN time to zero.

IMPORTANT: *RUN-IN voltage and wire speed must be preset even if no RUN-IN time is preset because these values are used until the arc is struck.*

9. Depress SEQUENCE ADVANCE push button to advance to WELD. The WELD Indicator light turns on. The VOLTS, WIRE SPEED, and PROGRAM/TIME numeric displays show the WELD parameters stored in memory.

IMPORTANT: *For continuous (untimed) welds, set zero time for WELD sequence.*

10. Depress VOLTS Increase or Decrease push button to preset WELD voltage. Depress WIRE SPEED Increase or Decrease push button to preset WELD wire speed. Depress TIME Increase or Decrease push button to preset WELD time if a timed weld will be made. If a continuous weld is desired, preset WELD time to zero.
11. Depress SEQUENCE ADVANCE push button to advance to CRATER. The CRATER Indicator light turns on. The VOLTS, WIRE SPEED, and PROGRAM/TIME numeric displays show the CRATER parameters stored in memory.
12. Depress TIME Increase or Decrease push button to preset CRATER time. Depress VOLTS Increase or Decrease push button to preset CRATER voltage. Depress WIRE SPEED Increase or Decrease push button to preset CRATER wire speed. If CRATER is not required, decrease CRATER time to zero.

IMPORTANT: *BURNBACK voltage is the same as CRATER voltage. Therefore, if BURNBACK will be required, CRATER voltage must be preset.*

13. Depress SEQUENCE ADVANCE push button to advance to BURNBACK. The BURNBACK Indicator light turns on. The PROGRAM/TIME numeric display shows the BURNBACK time stored in memory.
14. Depress TIME Increase or Decrease push button to preset BURNBACK time. If BURNBACK is not required, decrease BURNBACK time to zero.
15. Depress SEQUENCE ADVANCE push button to advance to POSTFLOW. The POSTFLOW Indicator light turns on. The PROGRAM/TIME numeric display shows the POSTFLOW time stored in memory.
16. Depress TIME Increase or Decrease push button to preset POSTFLOW time. If POSTFLOW is not required, decrease POSTFLOW time to zero.

SECTION 7 – SEQUENCE OF OPERATION

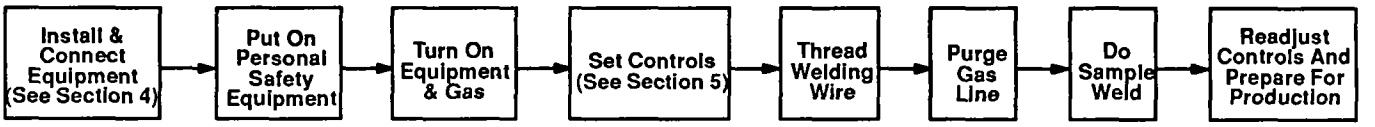


Figure 7-1. Sequence Of Operation

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 all covers and panels in place while operating.*

Warranty is void if the wire feeder is operated with any portion of the outer enclosure opened or 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 operation.

7-1. NORMAL WELDING WITHOUT DUAL SCHEDULING (Figure 7-2)

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

IMPORTANT: *See Section 6-1 for definition of terms.*

1. Install and connect unit according to Section 4.
2. Energize the welding power source.
3. Place the wire feeder Power switch in the ON position.
4. Turn Key-Switch to the RUN or SET position.
5. Preset welding programs according to Section 6.
6. To select starting program, depress PROGRAM SELECT push button or momentarily depress gun trigger.
7. Wear dry insulating gloves and clothing, and wear welding helmet with proper filter lens according to ANSI Z49.1.
8. Connect work clamp to clean, bare metal at workpiece.
9. Turn on shielding gas supply.
10. Depress the PURGE push button to purge the gas line, if required.

IMPORTANT: *Jogging the welding wire with the gun trigger can cause wire feeder to shut down.*

11. If Key-Switch is in the RUN position, depress the JOG push button to jog the welding wire if necessary.

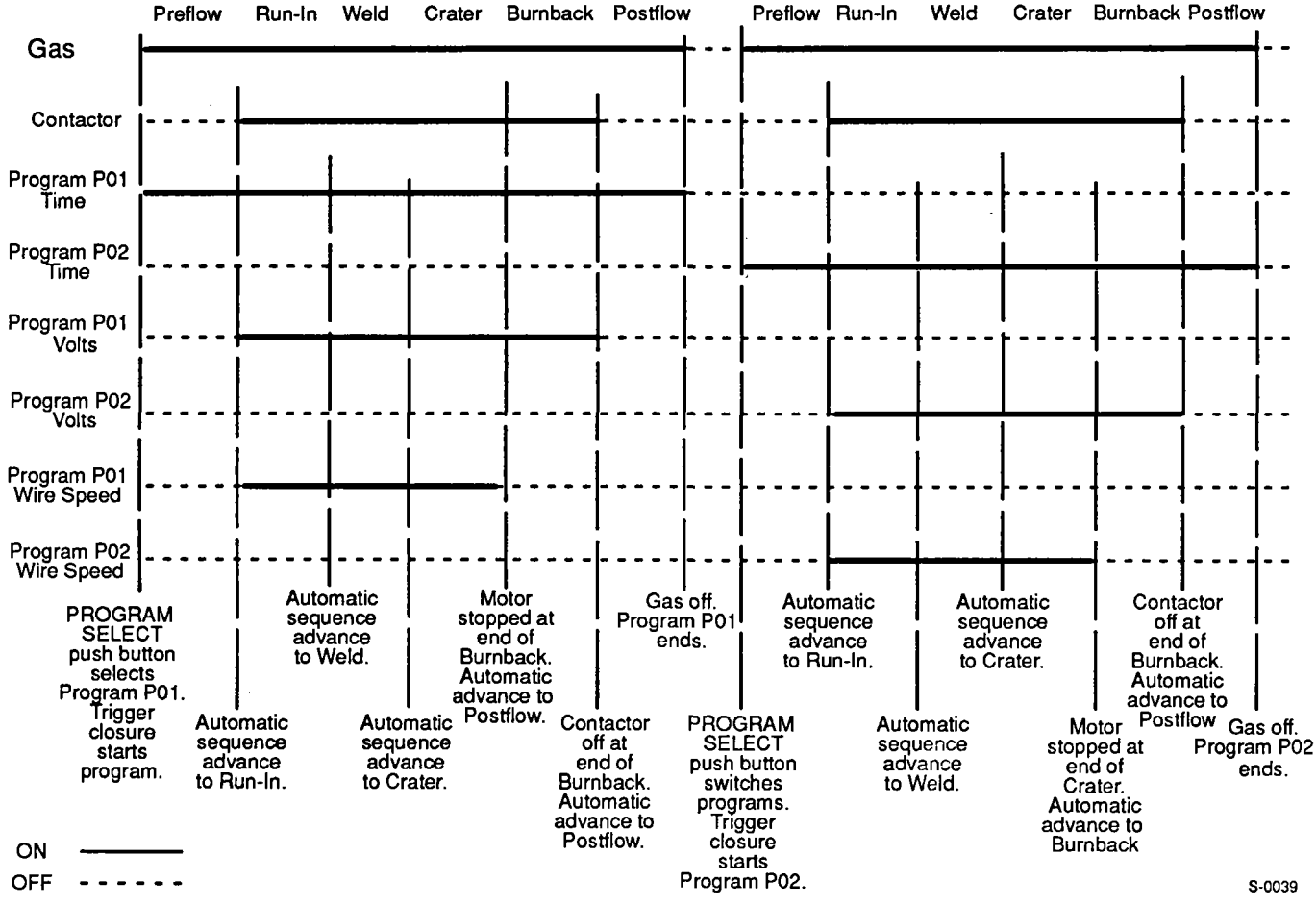


Figure 7-2. Time Welds Example

WARNING: ELECTRIC SHOCK can kill.

- *Do not touch live electrical parts.*
- *Do not touch either electrode wire when either gun trigger is pressed.*
- *Isolate unused gun from workpiece or grounded objects.*

Both electrode wires are electrically energized when either gun trigger is pressed when using one welding power source.

Both welding wires and all metal parts in contact with them carry weld output when the welding power source contactor is energized.

12. Depress the gun trigger to start the weld. If a WELD time has been set, the wire feeder advances through all six weld sequences. If no WELD time has been set, the wire feeder advances through PREFLOW, RUN-IN, and to the WELD sequence. It remains in the WELD sequence until the trigger is released. The wire feeder then advances to the CRATER sequence.
13. Release gun trigger during PREFLOW, RUN-IN, or within the first second of WELD time to set trigger latch if this option is present (untimed welds).
14. Figure 7-2 shows an example of two complete timed welding sequences, programs P01 and P02.

IMPORTANT: *If the arc is not started within three seconds after the contactor is energized, the wire feeder shuts down and displays an Arc error. Turn wire feeder power switch OFF and back ON to resume operation.*

7-2. DUAL SCHEDULING USING THE GUN TRIGGER (Figure 7-3)

WARNING: Read and follow safety Information at beginning of entire Section 7 before proceeding.

IMPORTANT: *See Section 6-1 for definition of terms.*

IMPORTANT: *Optional DSS-9M Switch cannot be used in combination with Trigger Dual Scheduling.*

Dual Scheduling allows switching between two weld conditions by momentarily depressing the gun trigger. This unit allows Dual Scheduling between the following programs: P01-P02, P03-P04 with the Left Trigger, and P05-P06, P07-P08 with the Right Trigger.

1. Install and connect unit according to Section 4.
2. DIP switch must be in the Trigger Dual Schedule Position (see Section 4-14).
3. Energize the welding power source.
4. Place the wire feeder Power switch in the ON position.
5. Turn Key-Switch to the RUN or SET.

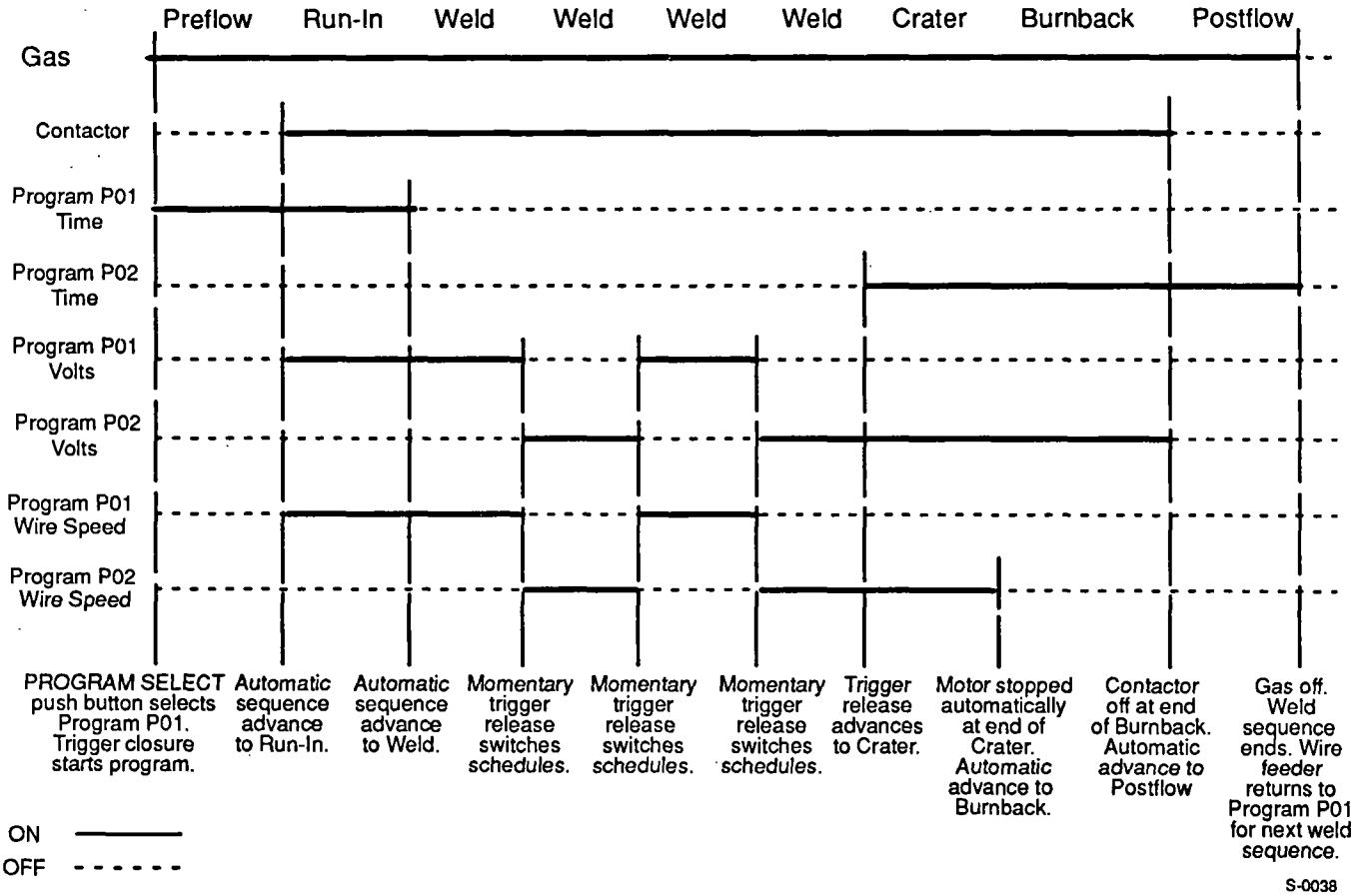


Figure 7-3. Trigger Dual Scheduling Example

6. Preset welding programs according to Section 6.
7. To select starting program, depress PROGRAM SELECT push button or momentarily depress gun trigger.
8. Wear dry insulating gloves and clothing, and wear welding helmet with proper filter lens according to ANSI Z49.1.
9. Connect work clamp to clean, bare metal at workpiece.
10. Turn on shielding gas supply.
11. Depress the PURGE push button to purge the gas line, if required.

IMPORTANT: *Jogging the welding wire with the gun trigger can cause wire feeder to shutdown.*

12. If Key-Switch is in the RUN position, depress the JOG push button to jog the welding wire if necessary.
13. Depress gun trigger to start the weld.

IMPORTANT: *If the arc is not started within three seconds after the contactor is energized, the wire feeder will display an Arc error. Turn wire feeder power switch OFF and back ON to resume operation. No scheduling can be done until one second after WELD time has begun.*

14. Momentarily release the gun trigger to switch weld parameters. Each momentary release of the gun trigger again switches weld parameters.
15. Releasing the trigger for more than 0.4 second advances the wire feeder to CRATER and the wire feeder automatically advances through the welding sequence. When sequence ends, the wire feeder returns to the starting program.

IMPORTANT: *If the gun trigger is closed again before the welding sequence has finished, the wire feeder immediately returns to RUN-IN of the starting program. When the gun trigger is released at the end of the weld, a 0.4 second wire overrun occurs.*

SECTION 8 – MAINTENANCE AND TROUBLESHOOTING

8-1. ROUTINE MAINTENANCE

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.*

A. Internal Cleaning

WARNING: Read and follow safety information at beginning of entire Section 8-1 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 dusty or dirty conditions are present, clean the unit monthly.

Table 8-1. 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 8-1.). Inspect gun and cables (Section 8-1B). Clean drive rolls (Section 8-1C).

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

B. Inspection And Upkeep

WARNING: Read and follow safety information at beginning of entire Section 8-1 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 8-1 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 4-7 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 4-7).
2. Using a wire brush, remove the buildup of wire particles in the wire grooves.
3. Reinstall drive rolls according to Section 4-7.
4. Resume operation.

8-2. ALIGNING DRIVE ROLLS AND WIRE GUIDES (Figure 8-1 And Figure 8-2)

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.*

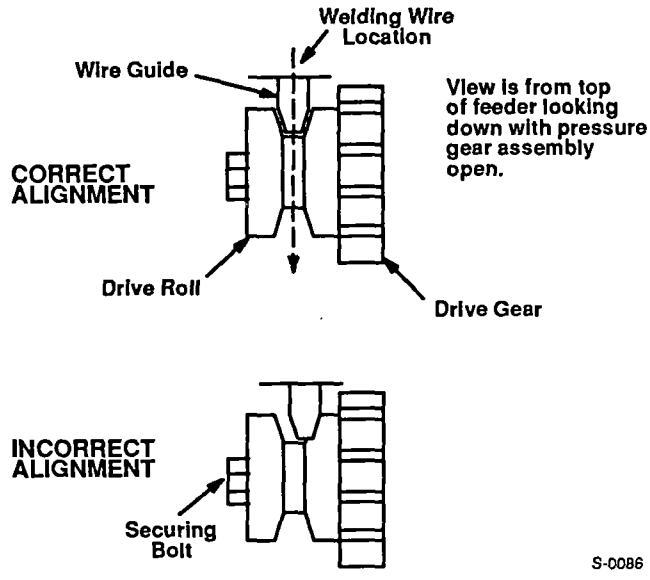


Figure 8-1. Wire Guide/Drive Roll Alignment

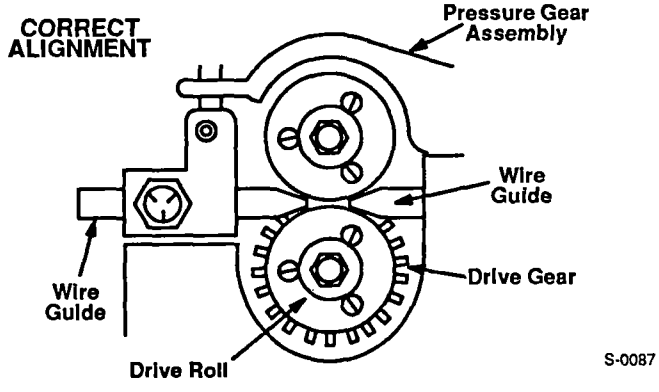


Figure 8-2. Wire Guide/Drive Housing Alignment

The drive rolls and wire guide(s) must be aligned for wire to feed properly. Compare drive roll and wire guide(s) position with Figure 1 and Figure 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 8-1).

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.
2. Slide the wire drive housing up or down until wire guides line up with grooves in drive roll and pressure roll (see Figure 8-2).
3. Tighten housing mounting bolts and weld cable terminal nut.

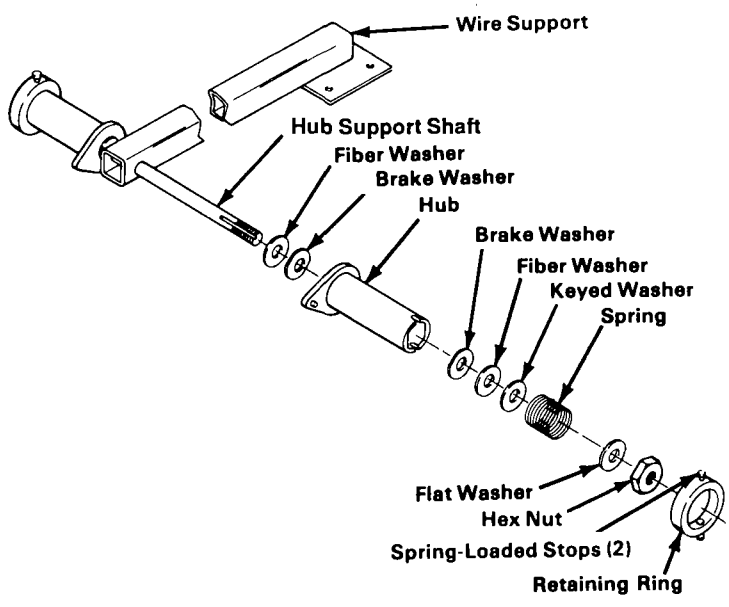


Figure 8-3. Hub Assembly

8-3. REINSTALLATION OF HUB ASSEMBLY (Figure 8-3)

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

1. Slide the following items onto the hub support shaft in order given:
   a. Fiber Washer
   b. Brake Washer
   c. Hub
   d. Brake Washer
   e. Fiber Washer
   f. Keyed Washer
   g. Spring
   h. Flat Washer
2. Rotate hex nut onto support shaft. Hex nut should be rotated until a slight drag is felt while turning hub.
3. Install welding wire according to Section 4-15. If not installing welding wire at this time, place retaining ring onto hub assembly.

8-4. OVERLOAD PROTECTION

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

WARNING: Read and follow safety information at beginning of entire Section 8-5 before proceeding.

Circuit breaker CB1 protects the drive motors 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

WARNING: Read and follow safety information at beginning of entire Section 8-5 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.

8-5. BRUSH INSPECTION AND REPLACEMENT (Figure 8-4 And Figure 8-5)

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.

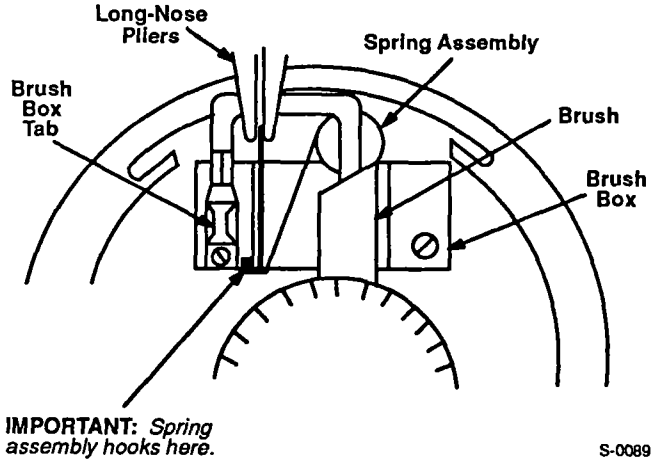


Figure 8-4. View Of Spring Assembly And Brush From Armature End Of Motor

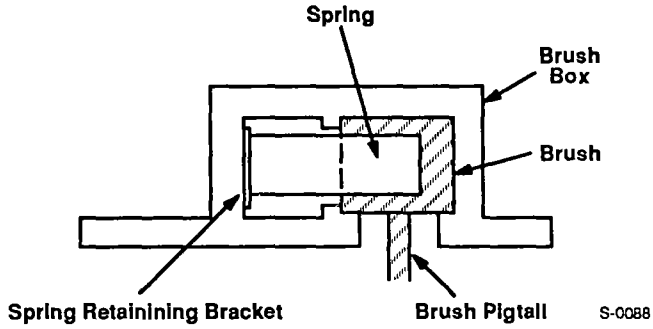


Figure 8-5. View Of Spring Assembly And Brush When Brush Cap Is Opened

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.
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 8-5.
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 8-4 and Figure 8-5.
12. Replace and latch the brush cap.
13. Reconnect power to all equipment and resume operation.

8-6. DRIVE SHAFT INSPECTION AND MAINTENANCE

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.

Drive shaft cleaning and inspection should be performed on a periodic basis, depending on the type and conditions of service. Inspect the drive shafts for free movement by rotating the drive gears in the direction of wire travel. If either drive gear does not turn freely, clean the drive shafts and clutch assemblies in the large spur drive gear and repack with a good quality gear grease. Use the procedure outlined below to remove the drive shafts. Where operating conditions are severe, more frequent inspections should be made.

1. Retract wire past drive housings.
2. Disconnect welding guns.
3. Remove drive gears in both drive roll housings.
4. Remove motor gear guard.
5. Remove right drive roll housing.
6. Remove drive shafts and large spur drive gear.

CAUTION: SOLVENTS CONTAINING PHENOL OR FORMIC ACID can damage plastic gears.

- *Do not use solvents containing phenol or formic acid.*

7. Clean clutch/bearings inside gear and the drive shaft. Dry thoroughly, and grease.
8. Reinstall drive shafts in spur drive gears and drive roll housing and secure housing to mounting bracket. Do not tighten mounting screw.
9. Reinstall drive gears on drive shafts. Check for proper alignment of drive roll housing on drive shaft by rotating drive gears in the direction of wire travel. If the drive gear does not turn freely, adjust the position of the drive roll housing until the drive shaft is allowed free movement. Tighten mounting screws and recheck for free movement.
10. Reinstall motor gear cover.
11. Reconnect welding guns and rethread welding wire.
12. Resume operation.

8-7. DIAGNOSTIC DISPLAYS (Table 8-2)

When the wire feeder goes to Standby after power is applied, the microprocessor performs a self-diagnostic check. If a problem is discovered, the numeric displays indicate the type of problem (see Table 8-2).

Table 8-2. Self-Diagnostic Checks

TROUBLE	PROBABLE CAUSE	REMEDY
Err Pro	Weld program.	Sequence Advance through the program to locate fault and reprogram. If all events in the sequence show 10 volts, 50 ipm 0 time, reprogram entire sequence. If Err Pro occurs frequently, replace battery on microprocessor board (see Section 8-8).
Err PC2	Prom Program-Processor Board PC2.	Replace PC2 (see Section 8-10).
Err A-b	Programs 1/2, 3/4, 5/6 or 7/8 selected or using four-schedule switch without selecting option.	Check switch and associated wiring for wiring errors or short circuits.
Err Por Sr	Power source error or volt sense error.	See welding power source Owner's Manual. Check volt sense pickup points.
Err TAC	Tachometer not working or motor stopped.	If motor does not run, reset CB1 on wire feeder or power source. If motor runs, check motor tachometer and associated circuitry.
Err cur	Motor current overload.	Jammed wire or clogged gun liner. If this fault occurs frequently, repair or replace the motor or liner.
Err diP	Motor DIP SWITCHES both off.	Set DIP switches to correct pattern (see Section 4-14).
Err Arc	Arc not established.	Check if current relay cable is connected and in proper working order (see Section 4-10).

8-8. MICROPROCESSOR BATTERY

The wire feeder is equipped with a 2/3 A size lithium battery, located on the microprocessor board inside the control box. The battery will maintain programs stored in memory for approximately six years. If Err Pro is displayed often, the battery may need replacement. Contact the nearest Factory Authorized Service Station.

8-9. CLEARING THE WELD PROGRAM MEMORY (RAM)

The weld program memory or Random Access Memory (RAM) can be cleared. It is helpful to clear memory before entering different weld programs or before making numerous changes to an existing program. Clearing the memory avoids the possibility of having parts of the old program appear in a new program.

To clear the weld program memory (RAM), proceed as follows:

WARNING: ELECTRIC SHOCK can kill.

- *Do not touch live electrical parts.*
- *Shut down the 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.

CLEARING MEMORY ERASES ALL PROGRAMS in wire feeder memory.

- *Do not clear memory unless all programs can safely be deleted.*

It is not possible to erase or clear one program from memory.

1. Remove wire feeder wrapper.
2. Locate DIP switches. Note position of motor speed DIP switches (see Section 4-14).
3. Reposition both motor speed DIP switches toward the circuit board.
4. Reinstall wrapper, and apply power to the unit. The display shows Err diP.
5. Shut down wire feeder and welding power source. See precautionary information at beginning of procedure.
6. Remove wire feeder wrapper.
7. Reposition motor speed DIP switches to proper position for motor.
8. Reinstall wrapper, and apply power to the unit. The display shows Err Pro.
9. Enter new weld programs into memory.

8-10. CIRCUIT BOARD HANDLING 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.*

8-11. ENCODER DISK CLEANING AND TACHOMETER CIRCUIT BOARD PC5 REPLACEMENT (Figure 8-6)

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.*

BENT OR DISTORTED ENCODER DISC can cause erratic motor operation.

- *Use care when handling encoder disc.*
- *Do not use bent or distorted encoder disc.*

IMPROPER ALIGNMENT can cause erratic motor operation.

- *Be sure encoder disc and optical encoder are properly aligned.*

IMPORTANT: *Retain all hardware removed during this procedure for reinstallation.*

A. Encoder Disc Cleaning

WARNING: Read and follow safety information at beginning of entire Section 8-11 before proceeding.

1. Disconnect motor plug from rear of wire feeder control box.
2. Remove cover from end of motor.
3. Prevent armature extension shaft from turning, remove encoder disc securing hardware, and remove encoder disc.
4. Clean encoder disc using solvent.
5. Using a cotton swab dipped in solvent, clean optical encoder where mounted encoder disc extends into it.
6. Reinstall encoder disc so that encoder disc is centered inside the optical encoder on the circuit board. Be sure encoder disc is correctly seated on raised portion of armature extension shaft.
7. Prevent armature extension shaft from turning, and tighten encoder disc securing hardware.
8. Reinstall cover on end of motor.
9. Connect motor plug to receptacle on rear of control box as follows: align keyways, insert plug, and rotate threaded collar fully clockwise.

B. Tachometer Circuit Board PC5 Replacement

WARNING: Read and follow safety information at beginning of entire Section 8-11 before proceeding.

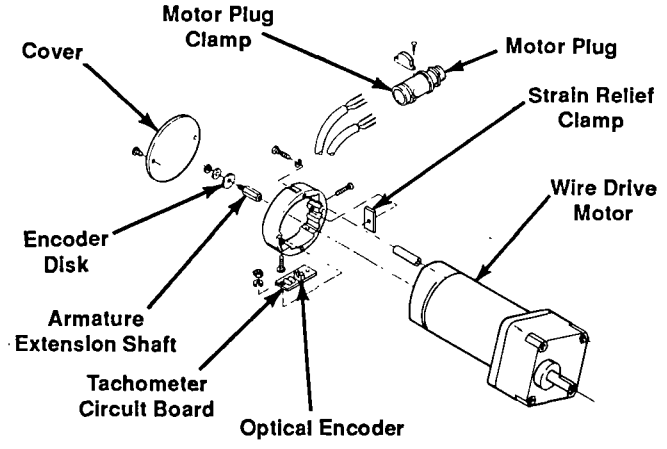


Figure 8-6. Tachometer Board PC5 Replacement

1. Disconnect motor plug from rear of wire feeder control box.
2. Remove cover from end of motor.
3. Prevent armature extension shaft from turning, remove encoder disc securing hardware, and remove encoder disc.
4. Remove the tachometer circuit board securing hardware.
5. Remove strain relief clamp holding motor and tachometer cables.
6. Disassemble motor plug clamp.
7. Separate tachometer cable from motor cable, and remove leads in tachometer cable from motor plug using extraction tool MILLER Part No. 048471 or AMP Part No. 305183 to avoid damaging the plug.
8. Inset new tachometer cable through motor plug clamp.
9. Insert leads from new tachometer cable into motor plug as follows:

   Black lead to hole 7
   Green lead to hole 8
   White lead to hole 9

IMPORTANT: *Be sure that terminals on leads are inserted fully into plug.*

10. Reinstall clamp onto plug.
11. Install new tachometer circuit board in place of old board. Do not tighten hardware.
12. Reinstall strain relief clamp securing motor and tachometer cords.
13. Install new encoder disc. Prevent armature extension shaft from turning while securing encoder disc hardware.
14. Align tachometer circuit board so that the encoder disc is centered inside the optical encoder on the circuit board (does not touch either side of optical encoder).
15. Tighten circuit board hardware to maintain alignment.
16. Reinstall cover on end of motor.
17. Connect motor plug to receptacle on rear of control box as follows: align keyways, insert plug, and rotate threaded collar fully clockwise.

8-12. TROUBLESHOOTING

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 8-3. Troubleshooting

TROUBLE	PROBABLE CAUSE	REMEDY
Wire feeder completely inoperative.	Power switch S1.	Place S1 in the ON position.
	Control fuse F1.	Check and replace F1 according to Section 8-4.
	Interconnecting cord plug is not secure in receptacle RC1	Insert plug fully into interface receptacle RC1, and rotate threaded collar fully clockwise (see Section 4-13).
Depressing gun trigger does not energize wire feeder.Electrode wire is not energized and shielding gas does not flow.	Plug from gun trigger cable(s) is not secure in TRIGGER receptacle(s).	Insert plug fully into TRIGGER receptacle and rotate threaded collar fully clockwise (see Section 4-9).
	Gun trigger or gun trigger cord.	Check trigger and cord for continuity and replace if necessary.
	Circuit breaker CB1.	Reset CB1 according to Section 8-4.
	Welding power source.	See TROUBLESHOOTING section in welding power source Owner's Manual.
Wire feeds, shielding gas flows, but electrode wire is not energized.	Welding power source.	See TROUBLESHOOTING section in welding power source Owner's Manual.
Wire feeds erratically.	Obstruction in gun contact tube or liner.	Clear obstruction in gun contact tube or liner.
	Incorrect pressure on drive rolls.	Rotate pressure adjustment knob(s) clockwise in1/4 turn increments until wire slippage stops. If excess pressure is required, check gun contact tube for obstructions.
	Drive roll is too large for wire size being used.	Change to proper size drive roll (see Section 4-7).
	Worn drive roll.	Replace drive roll (see Section 4-7).
	Dirt in drive roll.	Clean drive roll as instructed in Section 8-1.
	Drive rolls misaligned.	Align drive rolls so that wire feeds in groove of drive rolls (see Section 8-2).
	Hub assembly.	Check hub assembly (see Section 8-3).
Motor runs slowly.	Excessive motor load or binding drive gear.	Reduce load or readjust drive gear (see Section 4-7).
	Low line voltage.	Correct low line voltage.
	High frequency getting into motor interconnecting cord.	Relocate high frequency source.
Less than 0.5 volts displayed on VOLTS numeric display.	Voltage sense leads.	Voltage sense leads not connected, open, or connected incorrectly (see Sections 4-8C and 4-9D).
Motor is completely inoperative, or runs at full speed.	Encoder disc dirty.	Check and clean encoder disc (see Section 8-11).
	Tachometer circuit board PC5.	Replace circuit board (see Sections 8-10 and 8-11).

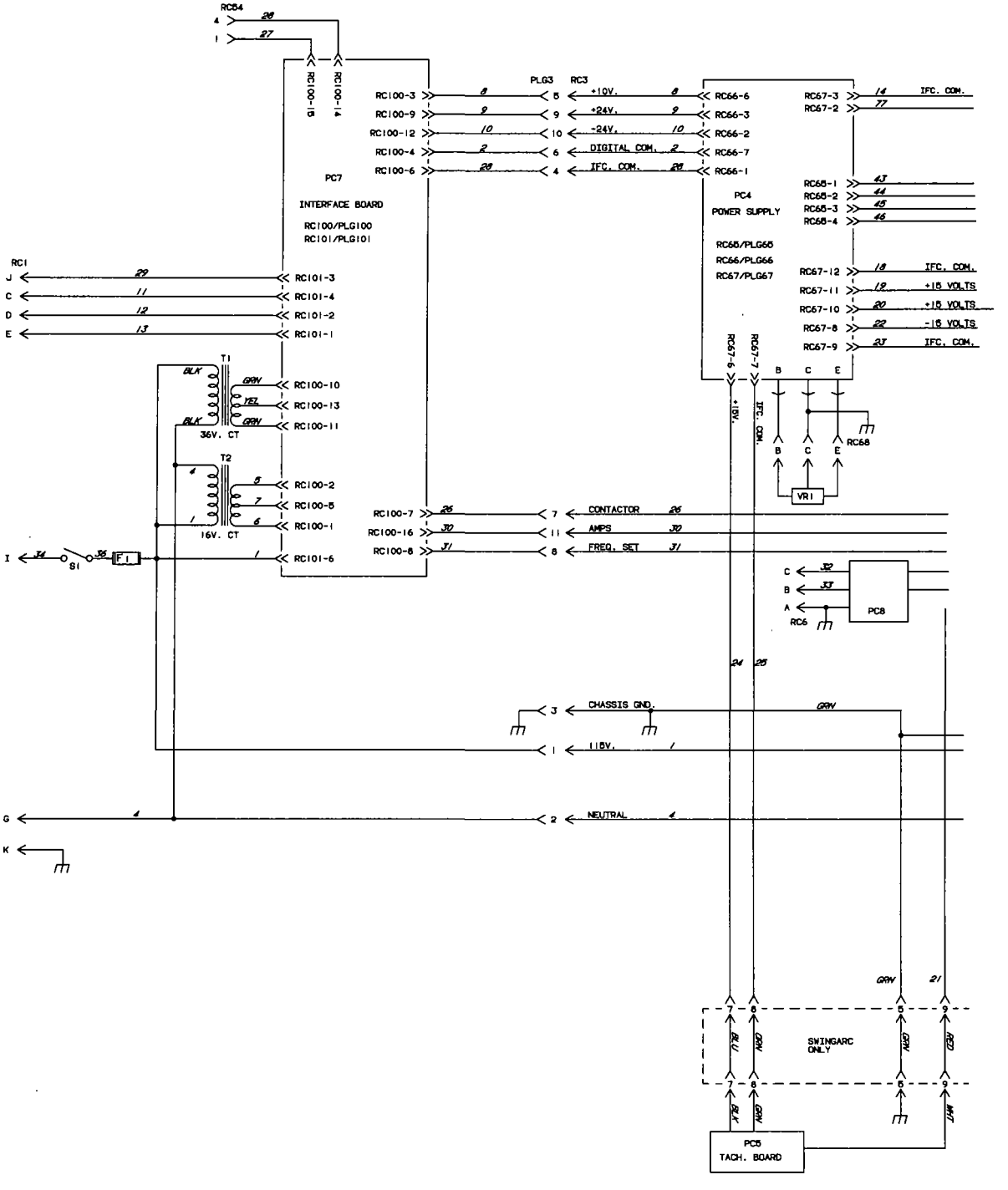
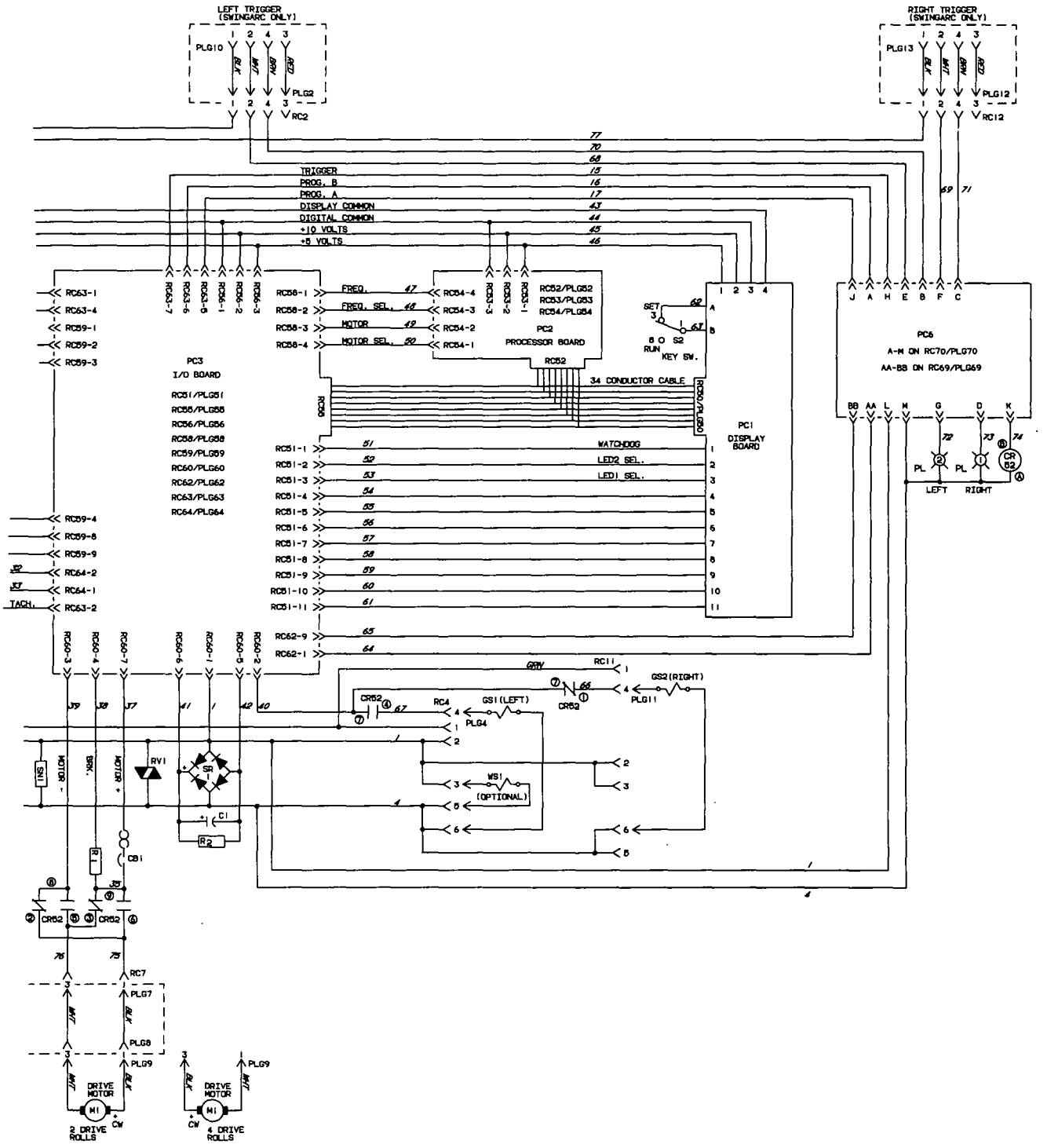


Diagram 9-1. Circuit Diagram For Wire Feeder



Circuit Diagram No. SD-130 424

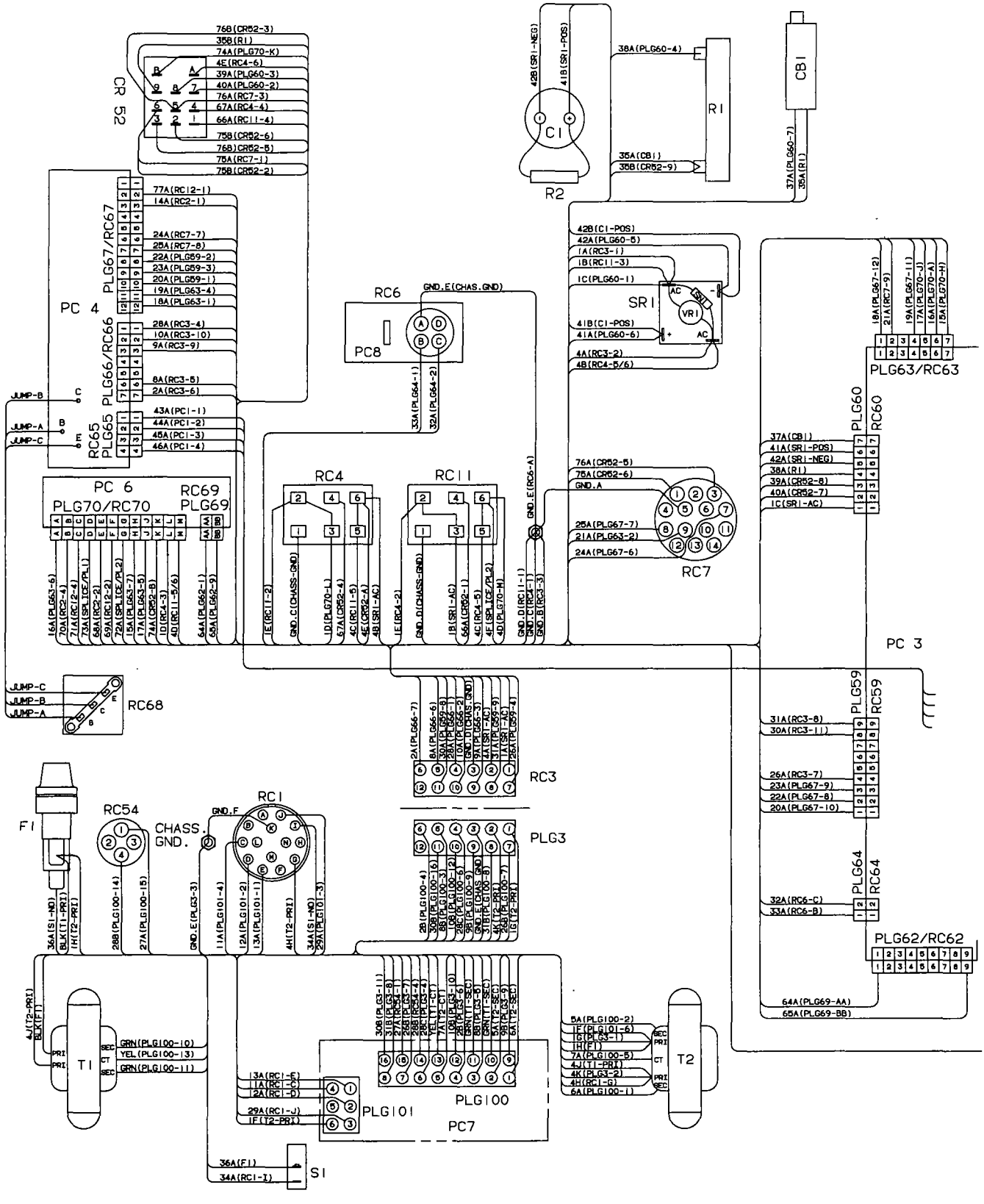
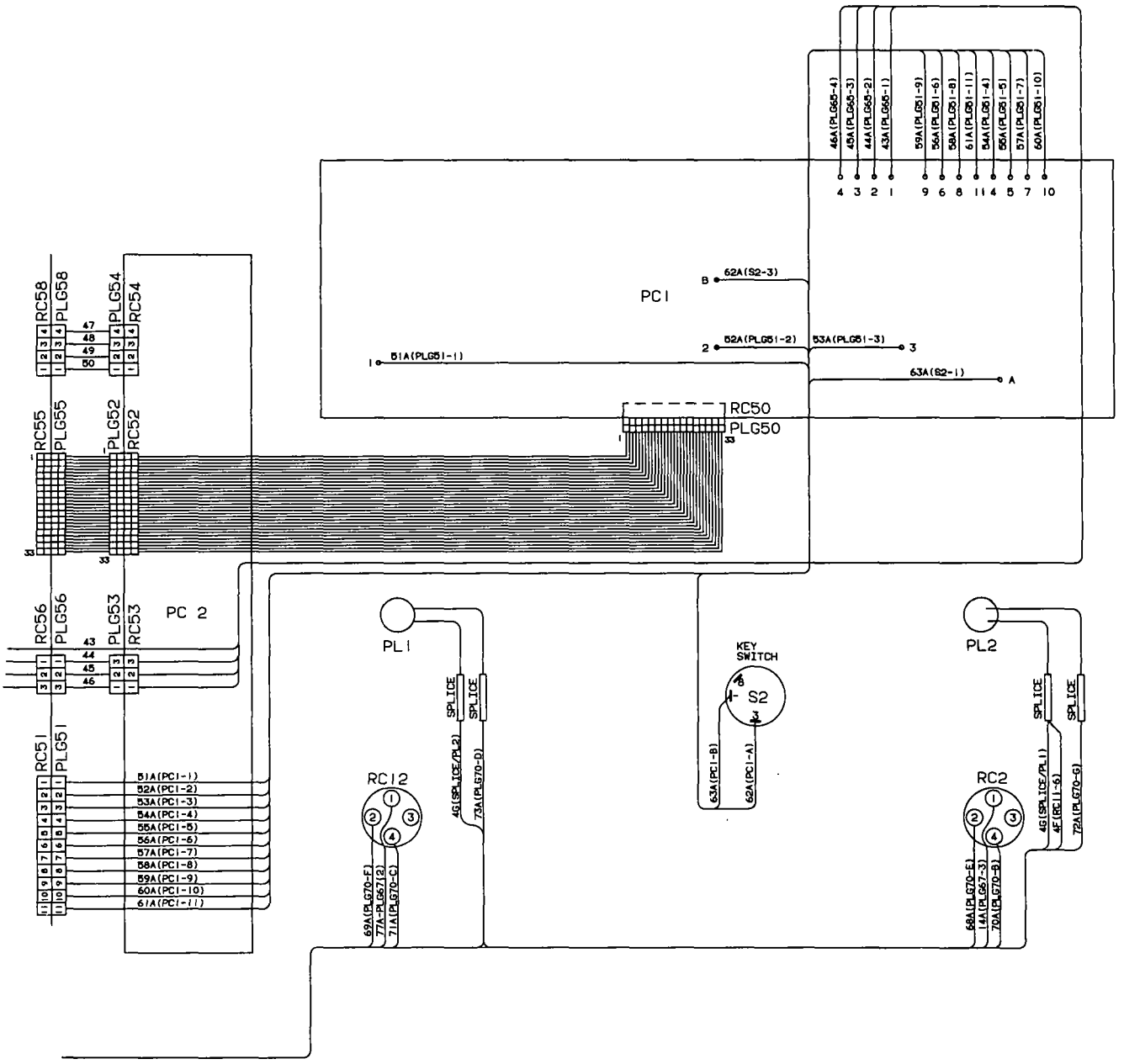
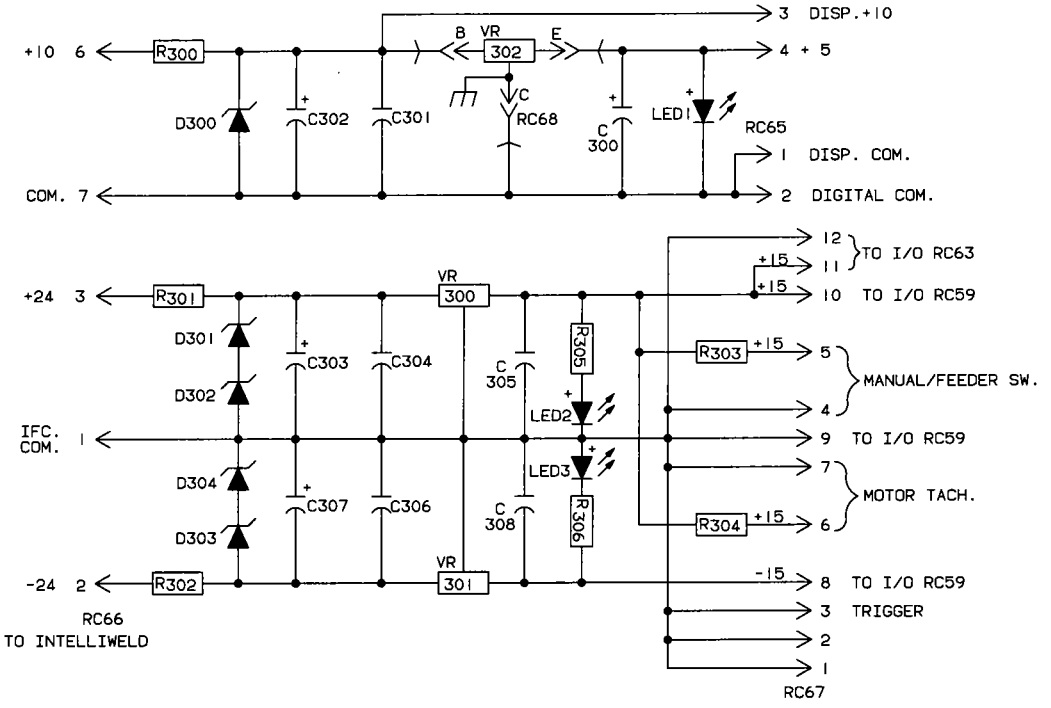


Diagram 9-2. Wiring Diagram

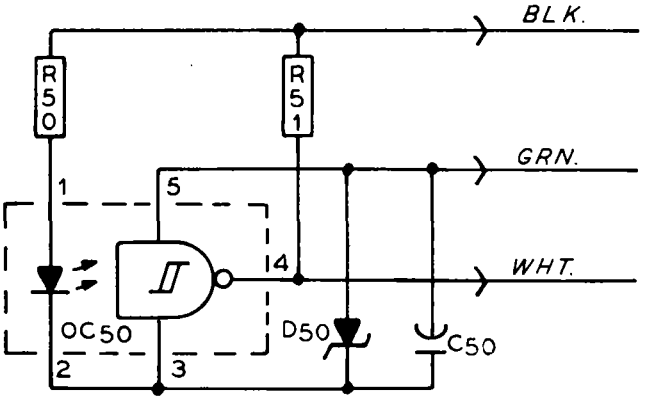


Wiring Diagram No. SD-130 757



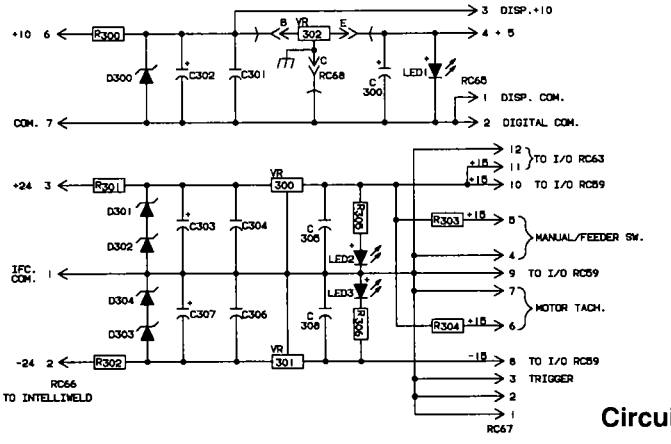
Circuit Diagram No. SA-107 741

Diagram 9-3. Circuit Diagram For Power Supply Board PC4



Circuit Diagram No. A-094 456

Diagram 9-4. Circuit Diagram For Tachometer Board PC5



Circuit Diagram No. SA-107 764

Diagram 9-5. Circuit Diagram For Relay Board PC6

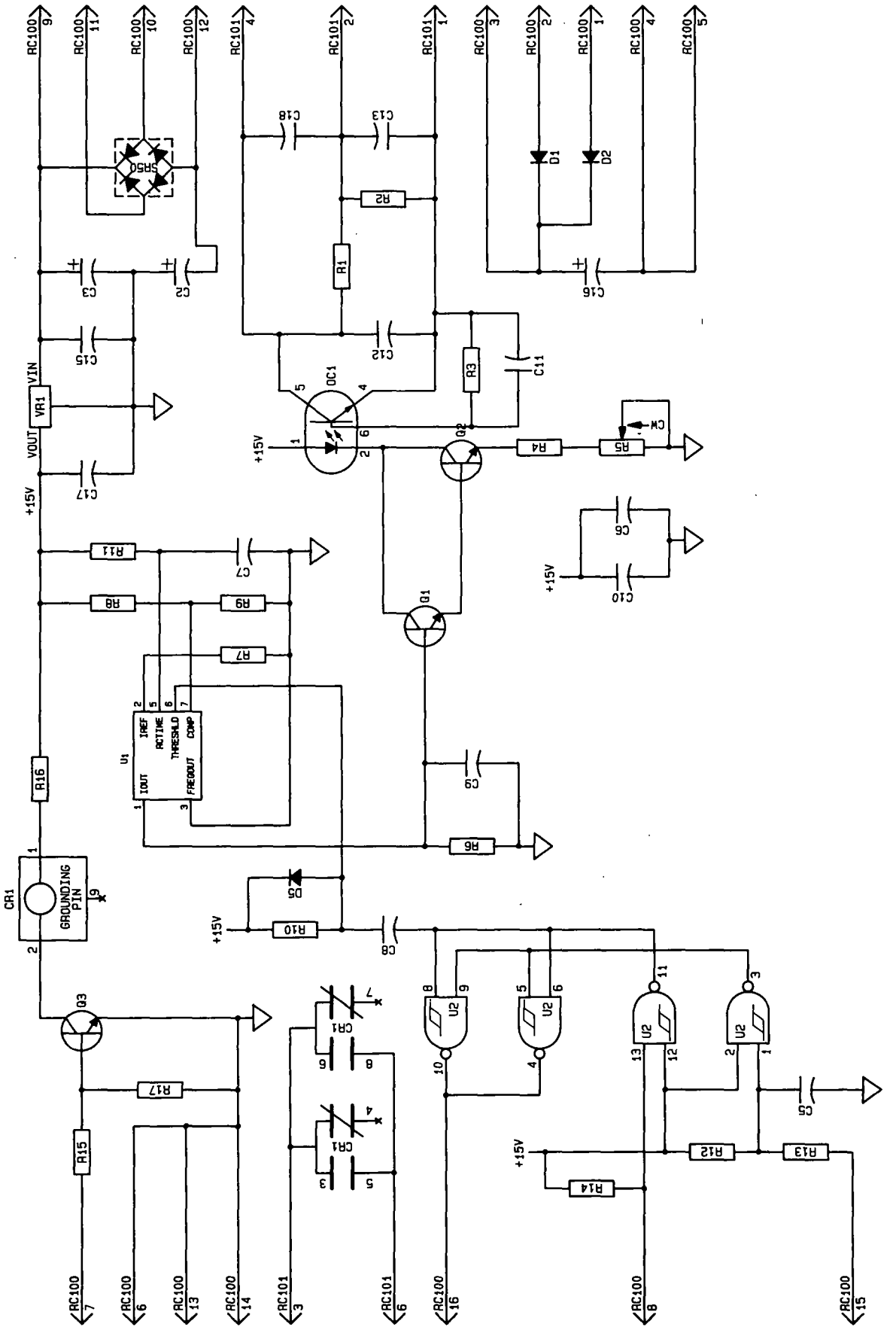


Diagram 9-6. Circuit Diagram For Interface Board PC7

Circuit Diagram No. B-134 020

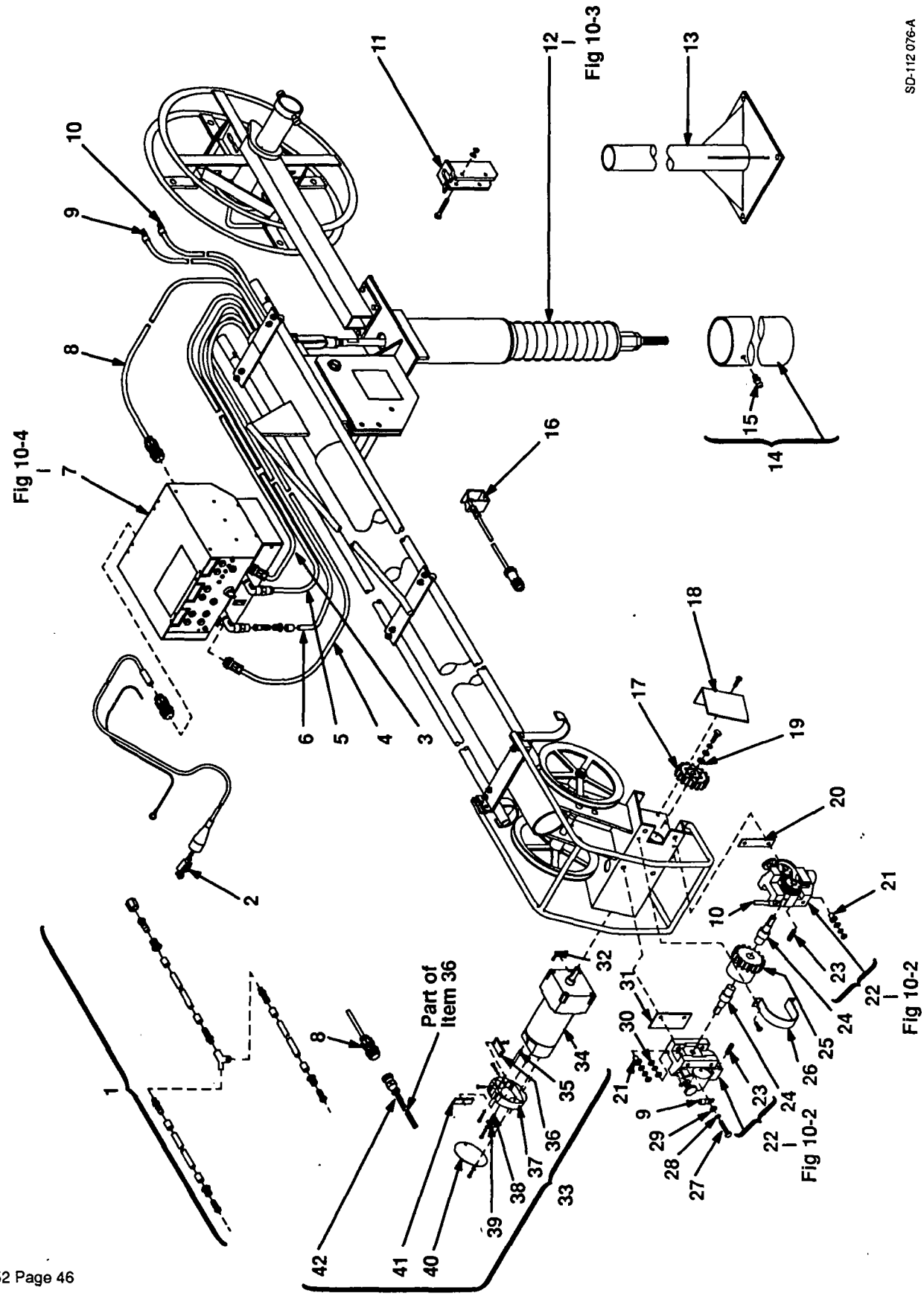


Figure 10-1. Main Assmebly

Item No.	Dia. Mkgs.	Part No.	Description	Quantity Model 12M	Quantity Model 16M
			Figure 10-1. Main Assembly		
1		080 418	HOSE, gas (consisting of)	1	1
		056 851	· FITTING, hose-brs barbed nipple 3/16TBG	3	3
		010 606	· FITTING, hose-brs nut 5/8-18RH	3	3
		056 108	· FITTING, hose-brs ferrule .425 ID x 23/32 lg	6	6
		604 550	· HOSE, No. 1 x 3/16 (order by ft)	11ft	11ft
		073 433	· FITTING, brs-barbed M 3/16TBG x 1/4NPT	2	2
		044 858	· FITTING, pipe-brs Y short 1/8NPT INL x 1/4N	1	1
		073 432	· FITTING, brs-barbed M 3/16TBG x 1/8NPT	1	1
		051 297	· ADAPTER	1	1
2		049 989	CABLE, volt-sensing (consisting of)	1	1
		604 109	· WIRE, lead 16ga (order by ft)	19ft	19ft
		600 750	· TERMINAL, ring-tongue 1/2 stud	1	1
		601 228	· CLAMP, universal 25A	1	1
		600 768	· TERMINAL, ring-tongue No. 10 stud	1	1
		600 848	· WIRE, lead 12ga (order by ft)	35ft	35ft
		601 226	· INSULATOR, clamp	1	1
		605 570	· TUBING, No. 5 (order by ft)	19ft	19ft
		039 828	· CLAMP, cable AN-3057-6	1	1
	PLG6	073 686	· PLUG, 4 skt MS-3106A-14S-2S	1	1
3		049 012	CABLE, trigger-right (consisting of)	1	
3		048 618	CABLE, trigger-right (consisting of)		1
4		047 684	CABLE, trigger-left (consisting of)	1	
4		047 685	CABLE, trigger-left (consisting of)		1
		079 531	· CLAMP, cable 29/64dia	2	2
	PLG10,13	080 328	· RECEPTACLE w/SOCKETS, free-hanging (consisting of)	1	1
		079 534	· · TERMINAL, female	4	4
		605 156	· CABLE, No. 18 4/c (order by ft)	16ft	20ft
	PLG2,12	079 878	· HOUSING PLUG & PINS, (consisting of)	1	1
		079 535	· · TERMINAL, male	4	4
5		079 202	HOSE, gas-right (consisting of)	1	
5		079 204	HOSE, gas-right (consisting of)		1
6		003 160	HOSE, gas-left (consisting of)	1	
6		003 159	HOSE, gas-left (consisting of)		1
		056 851	· FITTING, hose-brs barbed nipple 3/16TBG	1	1
		010 606	· FITTING, hose-brs nut 5/8-18RH	1	1
		056 108	· FITTING, hose-brs ferrule .425 ID x 23/32 lg	1	1
		604 550	· HOSE, No. 1 x 3/16 (order by ft)	17ft	21ft
		074 481	· LABEL, left	2	2
7		131 130	CONTROL BOX, (Fig 10-4)	1	1
8		083 687	CABLE, motor (consisting of)	1	
8		083 693	CABLE, motor (consisting of)		1
	PLG7	047 636	· HOUSING PLUG & PINS, (consisting of)	1	1
		079 535	· · TERMINAL, male	14	14
		079 739	· CLAMP	1	1
		073 139	· CABLE, No. 16 6/c (order by ft)	15ft	19ft
	PLG8	071 892	· RECEPTACLE w/SOCKETS, (consisting of)	1	1
		079 534	· · TERMINAL, female	14	14
		079 706	· CLAMP, cable	1	1
9		080 415	CABLE, weld 26ft left (consisting of)	1	
9		080 940	CABLE, weld 30ft left (consisting of)		1
10		078 992	CABLE, weld 26ft right (consisting of)	1	
10		078 993	CABLE, weld 30ft right (consisting of)		1
		600 323	· CABLE, weld-copper No. 3 (order by ft)	26ft	30ft
		077 455	· TERMINAL, ring-tongue 1/2 stud	1	1
		600 742	· TERMINAL, ring-tongue 3/8 stud	1	1
11		079 628	BRACKET, spring-retaining	1	
11		080 947	BRACKET, spring-retaining		1
12		Fig 10-3	BOOM	1	1

Item No.	Dia. Mkgs.	Part No.	Description	Quantity Model 12M	16M
			Figure 10-1. Main Assembly (Continued)		
13		♦079 591	PIPE POST, 4ft w/base-12ft boom (consisting of)	1	
13		♦079 214	PIPE POST, 6ft w/base-12ft boom (consisting of)	1	
13		♦078 264	PIPE POST, 4ft w/base-16ft boom		1
13		♦079 216	PIPE POST, 6ft w/base-16ft boom		1
14		♦075 390	PIPE POST, 4ft w/o base-12ft boom (consisting of)	1	
14		♦079 215	PIPE POST, 6ft w/o base-12ft boom (consisting of)	1	
14		♦075 078	PIPE POST, 4ft w/o base-16ft boom		1
14		♦079 217	PIPE POST, 6ft w/o base-16ft boom		1
15		080 157	· FITTING, grease 1/8NPT	1	
15		080 157	FITTING, grease 1/8NPT		1
16		049 260	RELAY, current (consisting of)	1	1
		079 878	· HOUSING PLUG & PINS, (consisting of)	1	1
		079 535	· · TERMINAL, male 1pin sz 16 18-14 wire	4	4
17		080 408	GEAR, spur 33 tooth 1/2 bore keyed	1	1
18		080 412	GUARD, motor gear	1	1
19		080 419	SPACER, 1 OD x 17/32	1	1
20		080 416	INSULATOR, housing	1	1
21		072 010	WASHER, shldr nyl .437 OD x .316 ID	4	4
22		Fig 10-2	WIRE DRIVE & GEARS, (consisting of)	2	2
23		079 633	· FITTING, hose-brs barbed nipple 3/16TBG	1	1
24		080 409	SHAFT, drive-clutch	2	2
25		080 404	GEAR, spur drive	1	1
26		080 411	GUARD, drive-gear	1	1
27		601 965	SCREW, cap-hex hd 3/8-16 x 1	2	2
28		602 213	WASHER, lock-split 3/8	4	4
29		010 910	WASHER, flat-SAE 3/8	4	4
30		601 872	NUT, hex-full 3/8-16	1	1
31		080 417	INSULATOR, housing	1	1
32		056 068	KEY, 1/8 x 1/8 x 1/2	1	1
33		047 553	MOTOR ASSEMBLY, (consisting of) or	1	1
33		♦094 030	MOTOR ASSEMBLY, high speed (consisting of)	1	1
34	MOT	♦080 802	· MOTOR, gear 1/8HP 115VDC 2000rpm (consisting of) or	1	1
34	MOT	070 247	· MOTOR, gear 1/8HP 115VDC 2000rpm high speed (consisting of)	1	1
		080 283	· · COVER, brush	2	2
		080 282	· · SPRING, brush	2	2
		*080 281	· · BRUSH	2	2
35		049 033	· SPACER, housing-tachometer	2	2
36	PC5	110 738	· CIRCUIT CARD, tach (consisting of)	1	1
	C50	073 739	· · CAPACITOR, cer 0.1uf 50VDC	1	1
	D50	094 934	· · DIODE, zener 5.1V 400MW	1	1
	OC50	094 268	· · IC, interface 963N51	1	1
	R50	052 140	· · RESISTOR, CF 0.5W 330 ohm	1	1
	R51	039 328	· · RESISTOR,CF 0.25W 1.5K ohm	1	1
		094 464	· · CABLE, tach 15 in	1	1
37		049 029	· HOUSING, tachometer-feedback	1	1
38		049 031	· SHAFT, extension-armature	1	1
39		110 733	· OPTICAL ENCODER DISK	1	1
40		049 030	· COVER, housing-tachometer-feedback	1	1
41		049 032	· CLAMP, strain-relief	1	1
42		081 630	· CABLE, motor 17 in	1	1
		079 739	· CLAMP, cable	1	1
		047 636	· HOUSING PLUG & PINS, (consisting of)	1	1
		079 535	· · TERMINAL, male	14	14

*Recommended Spare Parts.
♦OPTIONAL
BE SURE TO PROVIDE MODEL AND SERIAL NUMBER WHEN ORDERING REPLACEMENT PARTS.

Dia. Mkgs.	Part No.	Description	Quantity
		Figure 10-2. Wire Drive & Gears (Fig 10-1 Item 22)	
1	082 036	GUIDE, inlet wire	2
2	082 050	LINER, monocoil inlet wire	2
3	604 612	SCREW, set-skt hd 8-32 x 1/8	2
4	045 233	GUIDE, anti wear	2
5	081 801	WIRE DRIVE, (consisting of)	2
6	085 243	· KNOB, adjust tension	1
7	010 231	· SPRING, cprsn .770 OD x .105 wire	1
8	085 244	· WASHER, cupped 21/64 ID x 13/16	1
9	085 242	· FASTENER, pinned	1
10	010 224	· PIN, spring-cprsn 3/16 x 1	1
11	601 925	· SCREW, cap-hex hd 1/4-20 x 1/2	1
12	604 741	· PIN, cotter-hair 0.042 x 15/16	2
13	079 669	· LEVER, mtg-pressure gear	1
14	079 634	· PIN, hinge	1
15	010 193	· TUBING, 3/8 OD x 18ga wall x 1/4	2
16	048 336	· COVER, stop	2
17	080 413	· RETAINER, bearing	1
18	079 772	· KNOB	1
19	604 538	· WASHER, flat-SAE 5/16 (as req'd)	1
20	080 403	· HOUSING, adapter-gun/feeder	1
21	028 342	· BEARING, ball	1
22	053 842	GEAR, spur-insulated w/bearing	2
23	605 518	SCREW, cap-hex hd 1/4-20 x 1-1/4	2
24	079 626	SCREW, fillister hd 10-32 x 7/8	12
25	602 241	WASHER, flat-SAE 1/4	2
26	000 418	SCREW, cap-hex hd 1/2-20 x 1/2 slflkg	2
27	093 664	GEAR, spur	2
	092 865	KEY, 1/8 x 1/8 x 3/4	2
28	079 625	WASHER, spring - 5/16 shakeproof	4
29	080 410	GUARD, drive roll	1

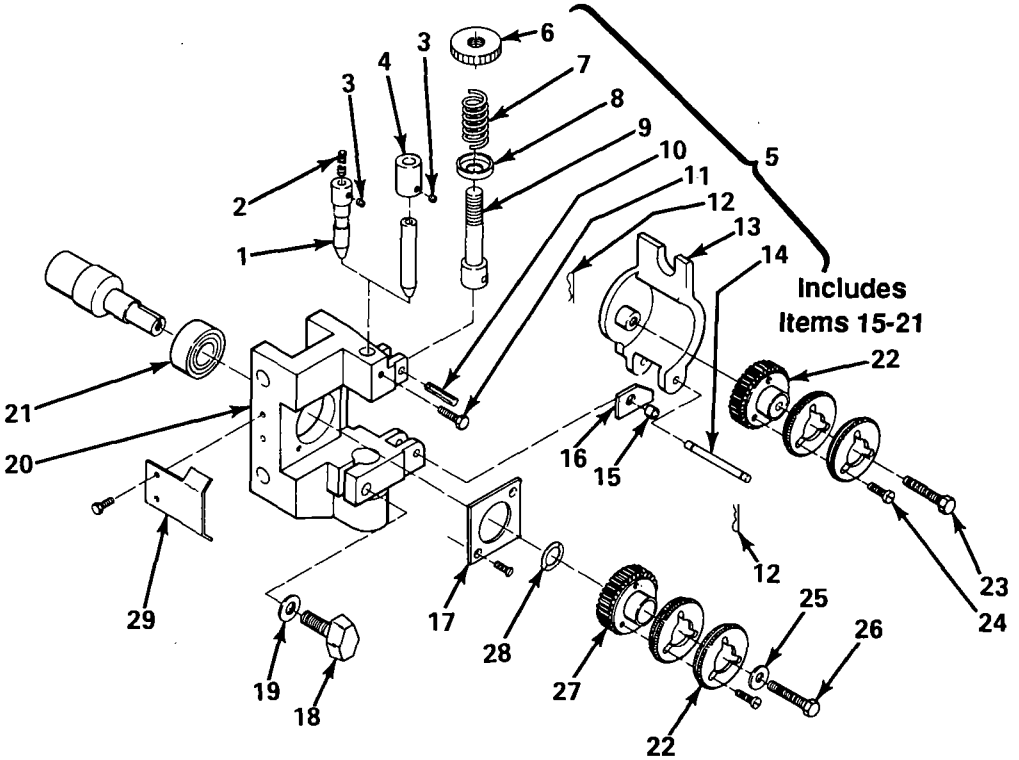


Figure 10-2. Wire Drive & Gears

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

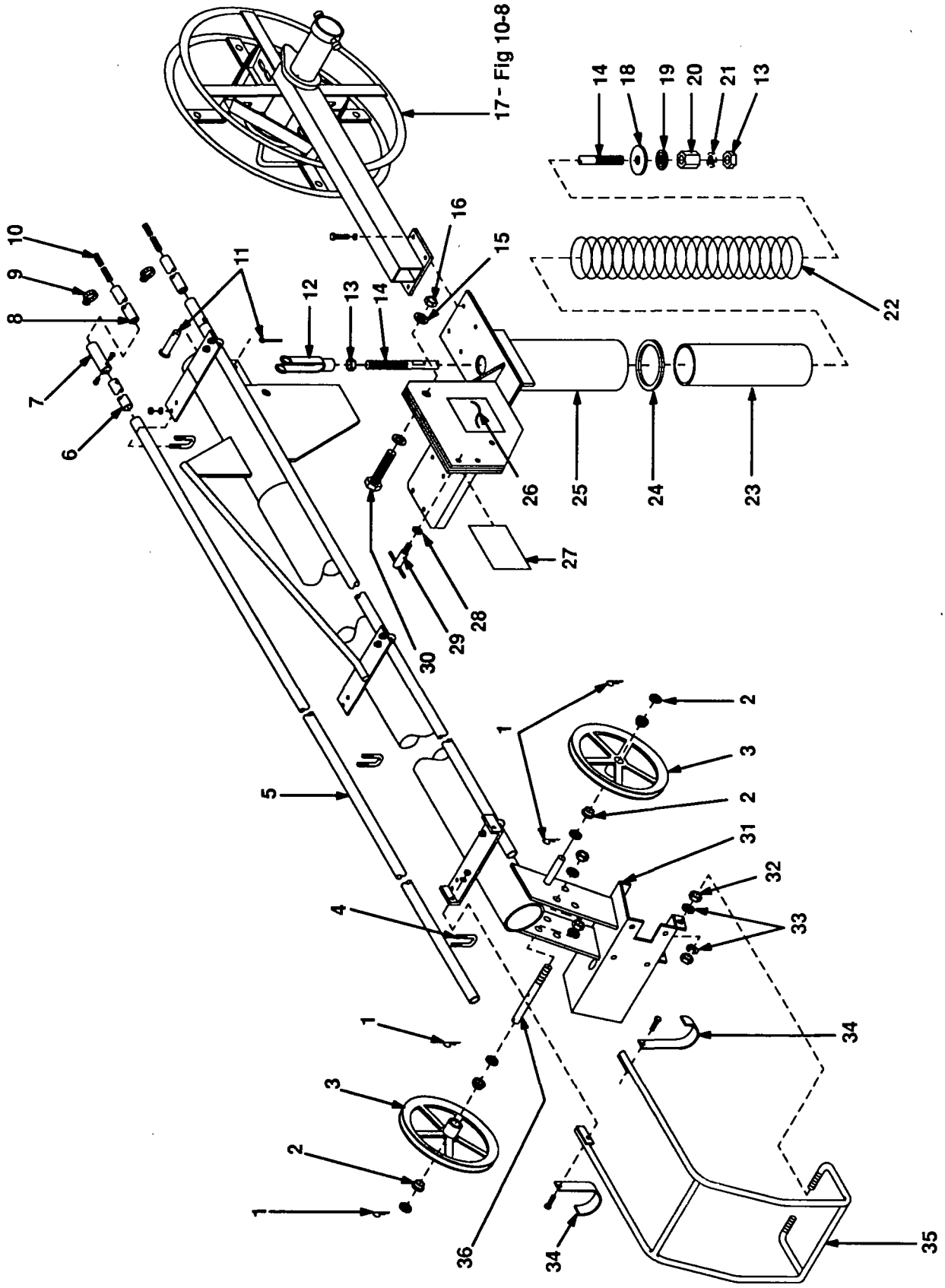


Figure 10-3. Boom

Item No.	Part No.	Description	Quantity Model 12M	Quantity Model 16M
		Figure 10-3. Boom (Fig 10-1 Item 12)		
1	010 313	PIN, cotter-hair 0.072 x 1.437	4	4
2	079 622	WASHER, shldr nyl .622 OD x .386 ID	4	4
3	079 621	PULLEY, V single groove	2	2
4	079 632	BOLT, U 1-5/8 high x 1-1/8 wide x 1/4	8	10
5	079 667	PIPE, 1/2 x 133-3/4	2	
5	080 812	PIPE, 1/2 x 181-3/4		2
6	079 665	GUIDE, wire	2	
6	080 811	GUIDE, wire		2
7	079 664	GUIDE, inlet	2	2
8	071 126	HOSE, nprn brd No 1 x .375 (order by ft)	1ft	1ft
9	605 538	CABLE TIE	2	2
10	045 390	LINER, monocoil 3/32-1/8 wire x 9	2	2
11	007 280	PIN, clevis 5/8-18 x 1-7/8	1	
11	073 742	PIN, clevis 3/4 OD x 2.156		1
12	007 279	CLEVIS	1	
12	073 741	CLEVIS		1
13	601 883	NUT, hex jam 5/8-18	2	
13	605 884	NUT, hex full 3/4-16 (top of shaft)		1
13	079 029	NUT, hex full 3/4-16 (bottom of shaft)		1
14	007 995	SHAFT, boom-counter balance	1	
14	075 462	SHAFT, boom-counter balance		1
15	602 250	WASHER, flat-SAE 3/4	2	2
16	079 020	NUT, hex-elastic stop 3/4-16	1	1
17	Fig 10-8	SUPPORT, hub & reel	2	2
18	010 911	WASHER, flat-SAE 5/8	1	
18	075 102	WASHER, shield 3 in square		1
19	073 663	BEARING, ball	1	
19	024 605	BEARING, ball		1
20	075 100	NUT, 5/8-18 x 1-1/4 special	1	
20	075 101	NUT, 3/4-16 x 1-1/4 special		1
21	602 219	WASHER, lock-ext tooth 5/8	1	
21	079 030	WASHER, lock-ext tooth 3/4		1
22	080 449	SPRING, 2 OD x 1 ID x 12	3	
22	080 723	SPRING, 3-3/8 OD x 37-3/4		1
23	075 421	SPACER, spring-boom	1	
24	075 403	BEARING, thrust-boom	1	
25	+072 091	BASE, swivel-boom	1	
25	+072 083	BASE, swivel-boom		1
26	080 656	LABEL, caution heavy spring etc	1	1
27	123 154	LABEL, warning electric shock etc	1	1
28	602 246	WASHER, flat 1/2	1	1
29	047 224	KNOB, T bar	1	1
30	073 666	BOLT, hex-hd 3/4-16 x 2-3/4	1	1
31	082 964	BOOM, dual 12ft	1	
31	082 965	BOOM, dual 16ft		1
32	601 872	NUT, hex full 3/8-16	4	4
33	602 213	WASHER, lock-split 3/8	4	4
34	079 631	BRACKET, hanger-gun	2	2
35	079 643	GUARD, motor-protector	1	1
36	082 970	SHAFT, pulley	2	2

+When ordering a component originally displaying a precautionary label, the label should also be ordered.
BE SURE TO PROVIDE MODEL AND SERIAL NUMBER WHEN ORDERING REPLACEMENT PARTS.

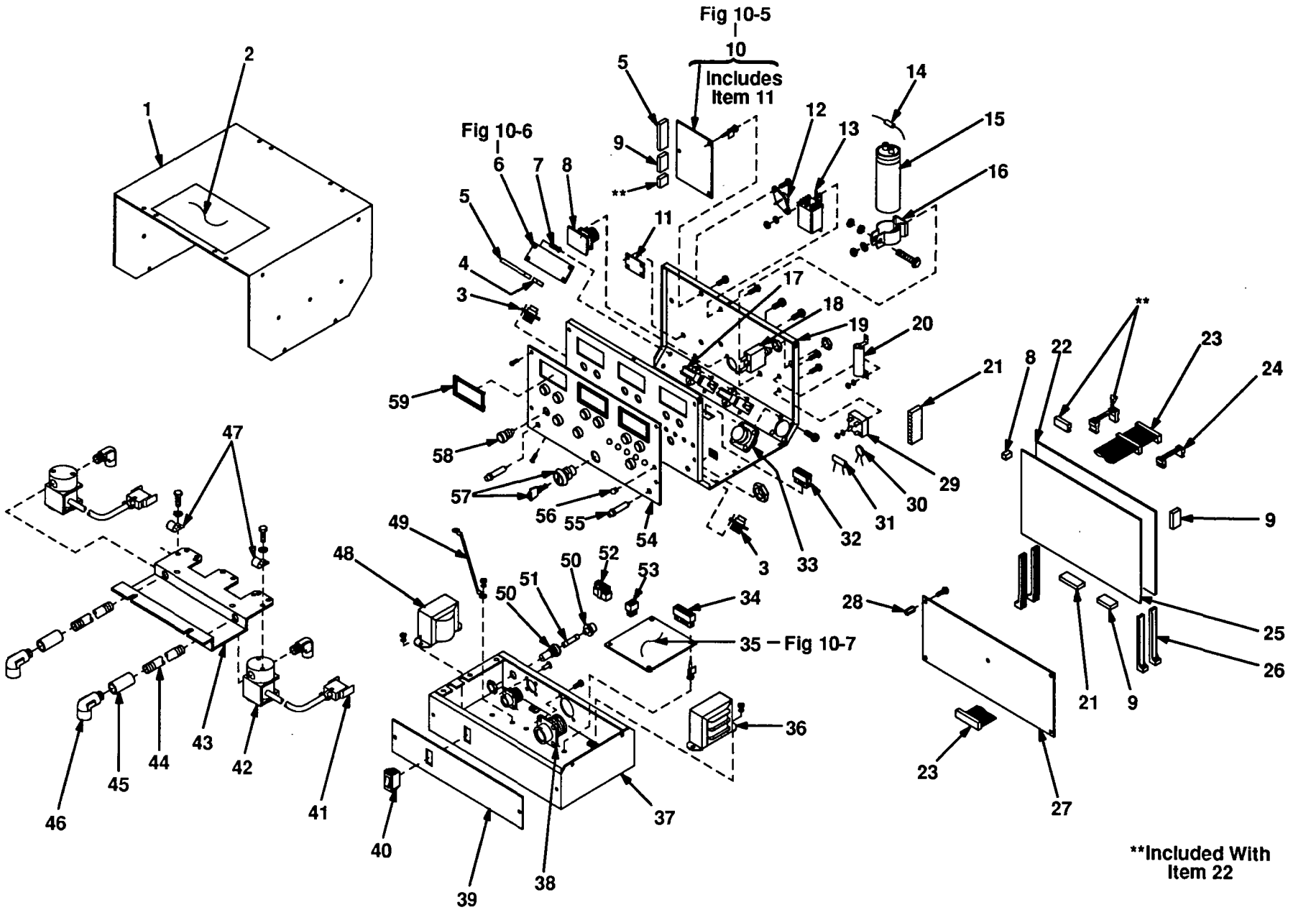


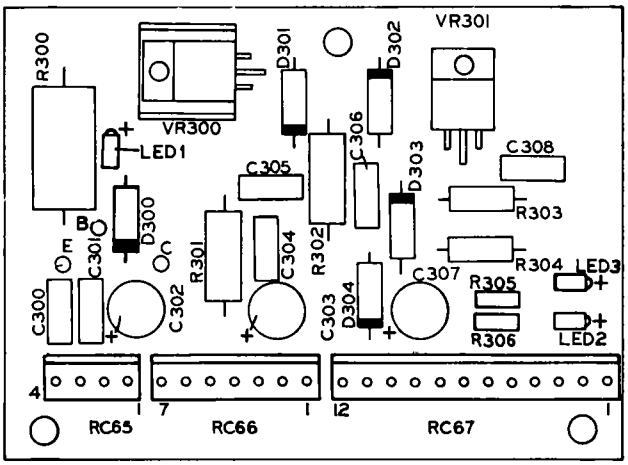
Figure 10-4. Control Box

Item No.	Dia. Mkgs.	Part No.	Description	Quantity
		131 068	**Figure 10-4. Control Box (Fig 10-1 Item 7)**	
1		+047 101	WRAPPER	1
2		123 154	LABEL, warning general precautionary	1
3	RC2,12,54	048 282	RECEPTACLE w/SOCKETS, free hanging (consisting of)	3
		079 534	· TERMINAL, female 1skt 14-18 wire	4
4	PLG69	135 557	HOUSING PLUG & SOCKETS, (consisting of)	1
		079 747	· TERMINAL, contact hdr 24-18 wire	2
5	PLG67,70	135 559	HOUSING PLUG & SOCKETS, (consisting of)	2
		079 747	· TERMINAL, contact hdr 24-18 wire	12
6	PC6	107 735	CIRCUIT CARD, relay (Fig 10-6)	1
7		110 375	STAND-OFF SUPPORT, PC card No. 6	11
8	RC6	130 801	RECEPTACLE w/COMPONENTS	1
9	PLG60,63,66	135 558	HOUSING PLUG & SOCKETS, (consisting of)	3
		079 747	· TERMINAL, cont hdr 24-18 wire	7
10	PC4	107 721	CIRCUIT CARD, power supply (Fig 10-5) (consisting of)	1
11	PC68	039 696	· SOCKET, transistor	1
12	VR1	083 723	IC, linear 78H05	1
13	CR52	039 498	RELAY, encl 120VAC 3PDT	1
14	R2	030 724	RESISTOR, C 1W 100K ohm	1
15	C1	089 978	CAPACITOR, elctlt 850uf 200VDC	1
16		010 926	HANGER, minerallic No. 2	1
17	RC4,11	056 266	CONNECTOR, female 6 cont 7.5A	2
18	CB1	090 272	CIRCUIT BREAKER, man reset 1P 1.5A 115VAC	1
19		129 894	CASE SECTION, front/bottom/rear	1
20	R1	030 651	RESISTOR, WW fxd 25W 10 ohm	1
21	PLG59,62	135 560	HOUSING PLUG & SOCKETS, (consisting of)	2
		079 747	TERMINAL, cont hdr 24-18 wire	9
22	PC3	121 472	CIRCUIT CARD, I/O	1
23	PLG50,52,55	090 274	CABLE, ribbon 34posn	1
24	PLG54,58	090 462	JUMPER, wire interconnecting	2
25	PC2	130 823	CIRCUIT CARD, processor w/proms	1
26		089 056	GUIDE, PC card	4
27	PC1	130 741	CIRCUIT CARD, display	1
28		073 756	STAND-OFF, No. 6-32 x .625 lg	6
29	SR1	035 704	RECTIFIER, integ 30A 600V	1
30	RV1	046 685	VARISTOR, .6W 175VDC	1
31	SN1	110 079	SNUBBER, polye MF .5uf 200VDC 100 ohm	1
32	RC3	135 561	HOUSING PLUG & PINS, (consisting of)	2
		114 656	· TERMINAL, male 1 pin 24-18 wire	12
33	RC7	047 637	HOUSING RECEPTACLE & SOCKETS, (consisting of)	1
		079 534	· TERMINAL, female 1skt 14-18 wire	14
34	PLG100	131 052	HOUSING RECEPTACLE & SOCKETS, (consisting of)	1
		113 746	· TERMINAL, female 1skt 24-18 wire	16
35	PC7	134 023	CIRCUIT CARD, interface (Fig 10-7)	1
36	T2	084 199	TRANSFORMER, sig 16VCT 3.5A	1
37		129 980	CASE SECTION, front/bottom/rear/sides	1
		059 712	CLIP, component .437 dia	1
38	RC1	094 480	RECEPTACLE, 14 pin 97-4102A-20-27P	1
		048 144	TERMINAL, male 1 pin plug keying	2
39			NAMEPLATE, microprocessor (order by model & serial number)	1
40	S1	111 997	SWITCH, rocker SPST 10A 250VAC	1
41	PLG4,11	056 265	CONNECTOR, male 6cont 10A	2
42	GS1,2	035 601	VALVE, 115VAC 2 way 1/4 IPS port 1/8orf	2
43		046 724	BRACKET, mtg control box	1
44		079 573	FITTING, pipe galv nipple .250NPT x 6.000	2
45		602 934	FITTING, pipe galv coupling .250 NPSC	2
46		010 296	FITTING, hose brs elb M 1/4 NPT x .625-18RH	4
47		010 141	CLAMP, nyl .250 clp dia	2
48	T1	035 759	TRANSFORMER, control mintr 115/36VCT	1

Item No.	Dia. Mkgs.	Part No.	Description	Quantity
		131 068	***Figure 10-4. Control Box (Fig 10-1 Item 7) (Continued)***	
49		130 213	STRAIN RELIEF, control box	1
50		046 432	HOLDER, fuse mintr	1
51	F1	*012 663	FUSE, mintr gl sol-blo 3A	1
52	PLG3	130 203	HOUSING PLUG & SOCKETS, (consisting of)	1
		113 746	· TERMINAL, female 1skt 18-24 wire	12
53	PLG101	115 093	HOUSING PLUG & SOCKETS, (consisting of)	1
		113 746	· TERMINAL, female 1skt 18-24 wire	6
54			NAMEPLATE, (order by model & serial number)	1
55	PL1,2	027 645	LIGHT, ind red lens 125VAC	2
56		089 032	LENS, led 4341 red	6
57	S2	089 079	SWITCH, key sgl posn	1
58		089 186	ACTUATOR, switch	10
		605 321	NUT, stl hex .437	10
		602 222	WASHER, lock stl int tooth .437	10
59		071 230	BEZEL/FILTER, blk bezel/red filter	3

+When ordering a component originally displaying a precautionary label, the label should also be ordered.
*Recommended Spare Parts.
BE SURE TO PROVIDE MODEL AND SERIAL NUMBER WHEN ORDERING REPLACEMENT PARTS.

Dia. Mkgs.	Part No.	Description	Quantity
PC4	**107 721**	**Figure 10-5. Circuit Card, Power Supply (Fig 10-4 Item 10)**	
C300,301,304-306,308	073 739	CAPACITOR, cer .1uf 50VDC	6
C302	071 229	CAPACITOR, elctlt 470uf 16V	1
C303,307	039 482	CAPACITOR, elctlt 100uf 35VDC	2
D300-304	084 134	SUPPRESSOR, transient 15V	5
HS1	072 944	HEAT SINK	1
LED1-3	089 027	LED, 555-2007	3
R300	089 318	RESISTOR, WW fxd 5W 1 ohm	1
R301,302	030 725	RESISTOR, WW fxd 3W 5 ohm	2
R303	030 025	RESISTOR, C .5W 100 ohm	1
R304	035 819	RESISTOR, CF .50W 10 ohm	1
R305,306	035 887	RESISTOR, CF .25W 3.3K ohm	2
RC65	079 793	TERMINAL, hdr 4 pin	1
RC66	048 105	TERMINAL, hdr 7 pin	1
RC67	079 759	TERMINAL, hdr 12 pin	1
VR300	039 696	SOCKET, transistor	1
VR301	083 772	IC, linear 7815	1
	046 932	IC, linear 7915	1



Ref. B-107 722-C

Figure 10-5. Circuit Card, Power Supply PC4

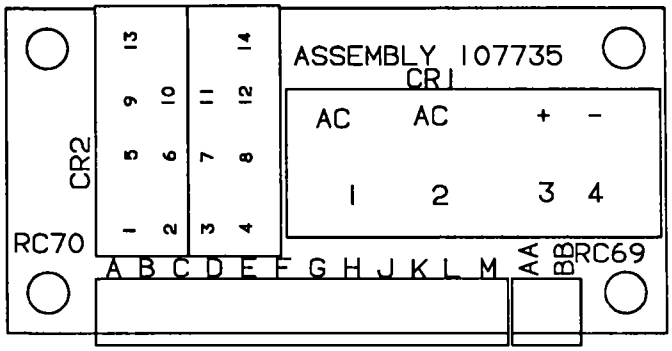


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Figure 10-6. Circuit Card, Relay PC6

Dia. Mkgs.	Part No.	Description	Quantity
PC6	**107 735**	**Figure 10-6. Circuit Card, Relay (Fig 10-4 Item 6)**	
CR1	095 542	RELAY, solid state 3-15VDC	1
CR2	093 558	RELAY, encl 120VAC 4PDT	1
	091 861	SOCKET, relay	1
	079 844	SPRING, holddown-relay	1
RC69	082 799	TERMINAL, header 2 pin	1
RC70,	079 759	TERMINAL, header 12 pin	1

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

Dia. Mkgs.	Part No.	Description	Quantity
PC7	**134 023**	**Figure 10-7. Circuit Card, Interface (Fig 10-4 Item 35)**	
C2,3	083 973	CAPACITOR, elctlt 1000uf 35VDC	2
C5,6,9,10,15,17	122 723	CAPACITOR, cer mono .1uf 50VDC	6
C7,8	089 025	CAPACITOR, cer mono 470pf 100VDC	2
C11,12	000 340	CAPACITOR, cer disc .01uf 50VDC	2
C13,18	121 684	CAPACITOR, polye MF .47uf 100V	2
C16	109 500	CAPACITOR, elctlt 1000uf 35VDC	1
CR1	129 681	RELAY, encl 12VDC DPDT	1
D1,2	070 250	DIODE, rect 3A 600V	2
D5	028 351	DIODE, sig .020A 75V SP	1
OC1	047 034	IC, interface 4N26	1
Q1-3	037 200	TRANSISTOR, NPN 200MA 40V	3
R1	039 331	RESISTOR, CF .25W 4.7K ohm	1
R2,15	091 799	RESISTOR, CF .25W 8.2K ohm	2
R10	035 888	RESISTOR, CF .25W 2.2K ohm	1
R3	081 833	RESISTOR, CF .25W 2.7 meg ohm	1
R4	078 431	RESISTOR, C .25W 330 ohm	1
R5	082 178	POTENTIOMETER, cermet trmr 25/T .5W 10K ohm	1
R6	044 789	RESISTOR, CF .25W 100K ohm	1
R7	089 173	RESISTOR, MF .25W 4.99K ohm	2
R8,12	035 827	RESISTOR, CF .25W 10K ohm	2
R9	035 885	RESISTOR, CF .25W 68K ohm	1
R11	089 172	RESISTOR, MF .25W 6.81K ohm	1
R13	035 825	RESISTOR, CF .25W 1K ohm	1
R14	035 820	RESISTOR, CF .50W 470 ohm	1
R16	035 823	RESISTOR, CF .25W 100 ohm	1
R17	035 886	RESISTOR, CF .25W 22K ohm	1
	092 648	RESISTOR, WW fxd zero ohm	1
RC100	114 425	TERMINAL, hdr 16 pin	1
RC101	114 654	TERMINAL, hdr 6 pin	1
SR50	035 841	RECTIFIER, integ 1.5A 200V	1
U1	089 068	IC, interface 331	1
U2	090 597	IC, digital 4093	1
VR1	081 832	IC, linear 78M15	1

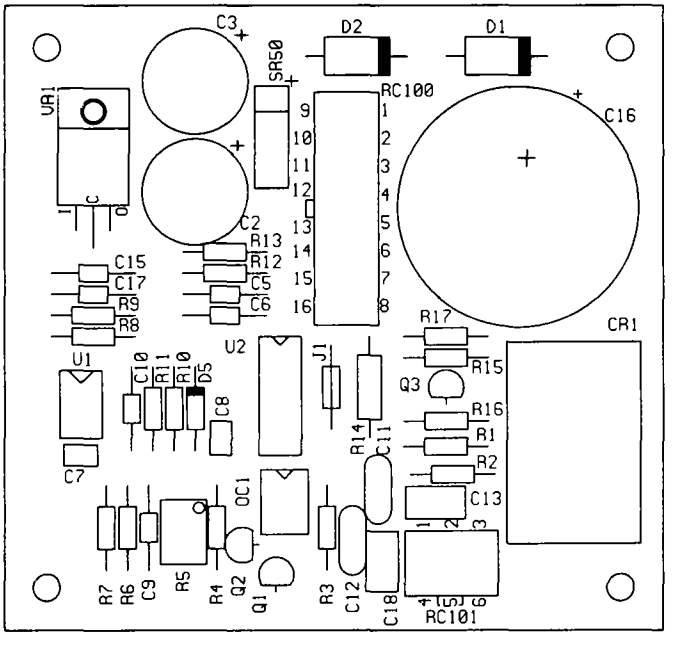

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Figure 10-7. Circuit Card, Interface PC7

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

Dia. Mkgs.	Part No.	Description	Quantity
		Figure 10-8. Support, Hub & Reel (Fig 10-3 Item 17)	
1	058 427	RING, retaining-spool	2
2	135 205	NUT, stl slflkg hex reg .625-11	2
3	605 941	WASHER, flat-41/64 ID x 1 OD	2
4	010 233	SPRING, cprsn	2
5	057 971	WASHER, flat-keyed 1-1/2dia	2
6	010 191	WASHER, fiber 5/8 ID x 1-1/2 OD X 1/8	4
7	058 628	WASHER, steel-brake	4
8	058 428	HUB, spool	2
9	080 393	SUPPORT, reel	1
10	♦108 008	REEL, wire (consisting of)	1
11	124 900	· SUPPORT, reel support	1
12	124 905	· RETAINER, spool support	1
13	124 904	· NUT, spanner spool support	1

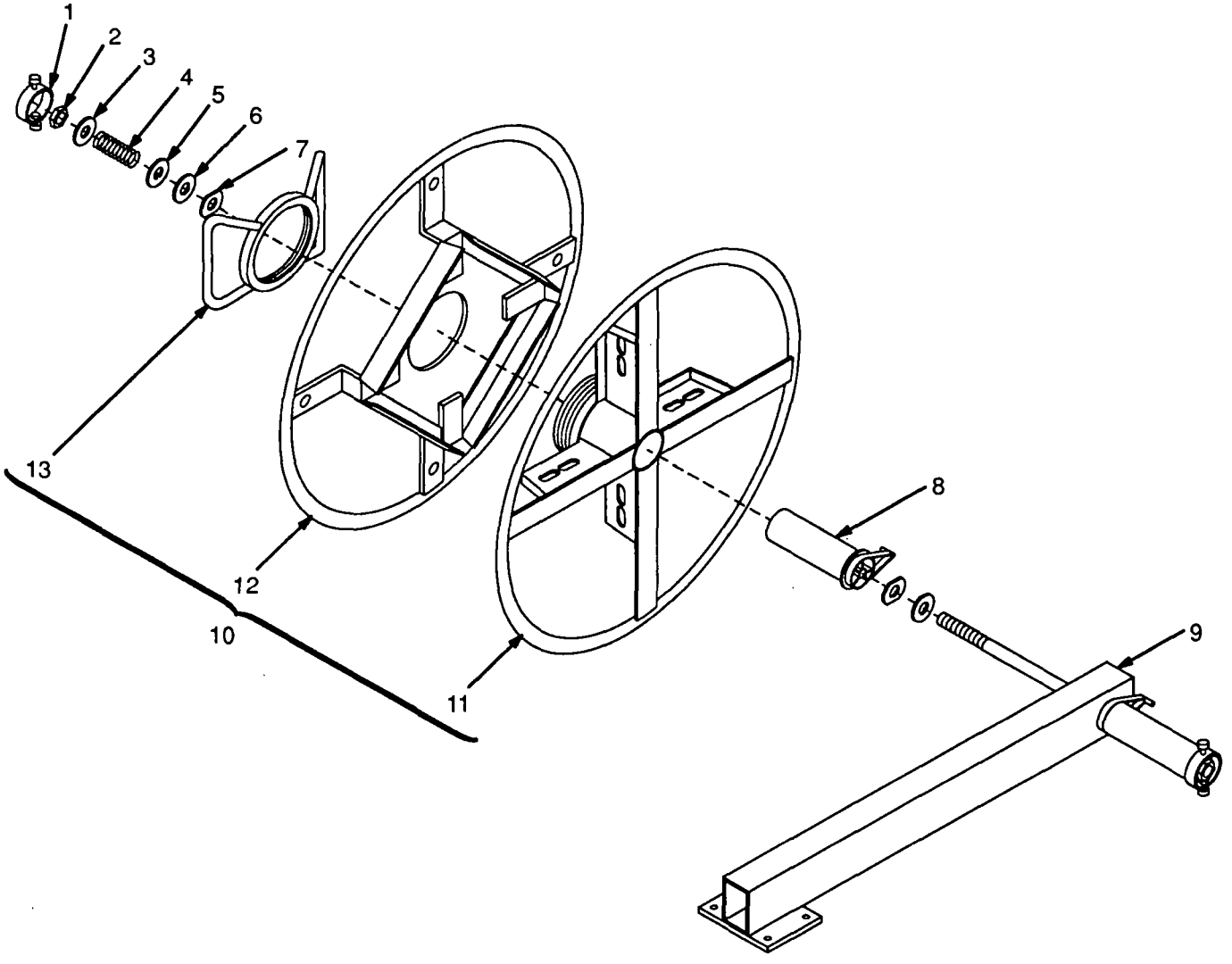

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Figure 10-8. Support, Hub & Reel

♦OPTIONAL

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

Table 10-1. Drive Roll & Wire Guide Kits

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. *Split 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	079 726	V-Knurled	056 192	056 206
.045 in.	.045 in.	1.2 mm	046 793	079 728	V-Knurled	056 193	056 207
.052 in.	.052 in.	1.3 mm	046 794	079 727	V-Knurled	056 193	056 207
1/16 in.	.062 in.	1.6 mm	046 795	056 771	V-Knurled	056 195	056 209
5/64 in.	.079 in.	2.0 mm	046 796	056 773	V-Knurled	056 195	056 209
3/32 in.	.094 in.	2.4 mm	046 797	056 774	V-Knurled	056 196	056 210
7/64 in.	.110 in.	2.8 mm	046 798	056 775	V-Knurled	056 196	056 210
1/8 in.	.126 in.	3.2 mm	046 799	056 776	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

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*When ordering replacement parts, all kits listed with the exception of the V-Knurled kits are one-piece drive rolls. Four drive rolls are required for the one-piece drive kits and eight drive rolls for the split V-Knurled kits.

MOUNTING EQUIPMENT FOR BOOMS

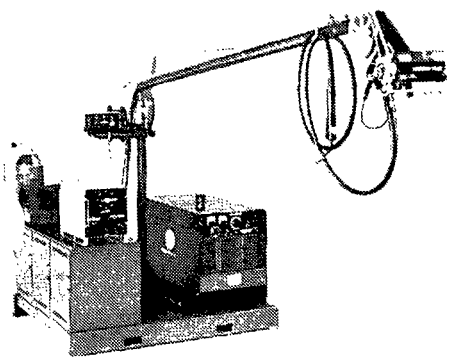
VINGPAK BASES

SWINGPAK-12
(#085 276)
For 12 ft. (3.7 m) boom

SWINGPAK-16
(#085 934)
For 16 ft. (4.9 m) boom

NOTE: A pipe post with a base plate is required and must be ordered separately. (Refer to chart at bottom of page.)

The Swingpak base will accommodate a power source, Swingarc™, MPG-395B Grid, Radiator 1 or 2 water coolant system, gas cylinder, and the AFT-100 flux tank for Submerged Arc Welding. The base plate is solid to help better organize components and cables. A locker with three compartments offers a convenient place to store helmets, gloves, tools, etc. The entire unit can be moved with a fork lift truck.



CBC CARTS

The CBC cart is designed to provide mobility and a neat, orderly arrangement of welding equipment. The CBC-8 is the standard model with 8 in. (203 mm) diameter by 2 in. (51 mm) wide wheels. A CBC-8HD heavy-duty model has been designed for use on rough or uneven surfaces and features 12 in. (305 mm) diameter by 3 in. (76 mm) wide wheels.

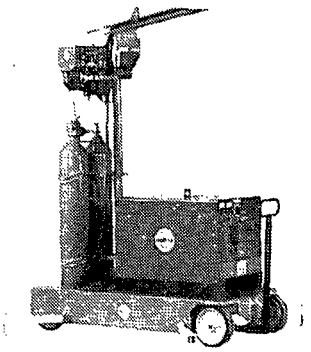
Both models will accept a power source, 12 ft. (3.7 m) Swingarc, and two gas cylinders or the AFT-100 flux tank for Submerged Arc Welding.

The 16 ft. (4.9 m) Swingarc cannot be mounted on a CBC cart.

NOTE: To mount a 12 ft. (3.7 m) Swingarc on a CBC-8 cart, a 6 ft. (1.8 m) Pipe Post is required (#079 215).

FEATURES

- 2000 lb. (907 kg) load capacity.
- Multi-position boom.
- Telescoping outriggers for improved stability.
- Wide front wheel stance and automotive type steering.
- Convenient towing handle.
- Mounting facilities for many Miller power sources.

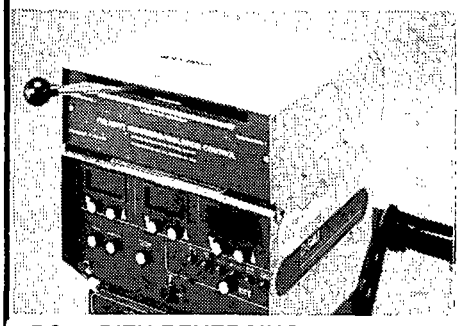


Illustrated is a CBC-8HD cart, dual 12 ft. (3.7 m) Swingarc, Deltaweld™ power source, and gas cylinders.

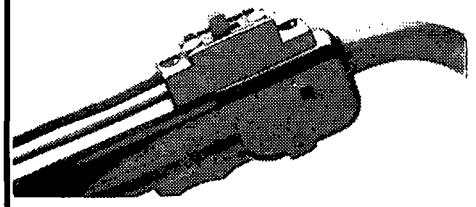
PIPE POSTS

PIPE POSTS	For 12 ft. Boom (3.6 m) 18 in. (457 mm) Base Plate	For 16 ft. (4.9 m) Boom 24 in. (610 mm) Base Plate
4 ft. (1.2 m) no base	**(#075 390)**	**(#075 078)**
4 ft. (1.2 m) w/base	**(#079 591)***	**(#078 264)***
6 ft. (1.8 m) no base	**(#079 215)**	**(#079 217)**
6 ft. (1.8 m) w/base	**(#079 214)***	**(#079 216)***

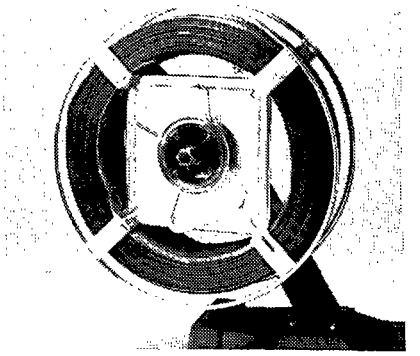
OPTIONS AND ACCESSORIES



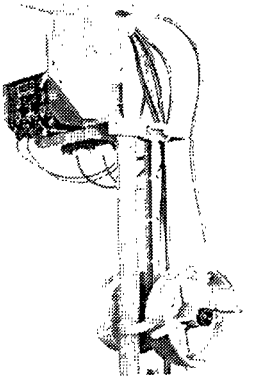
POLARITY REVERSING/ ISOLATION CONTROL
(#041 894)
A dual function control designed for use with dual wire feeders or any application where electrical isolation and/or polarity reversing capabilities are required. For example, one wire of a dual feeder can be electrically cold while welding with the other. The wires can also be run on opposite or the same polarity (straight and/or reverse). Both functions can be performed at the same time.



DSS-9 REMOTE DUAL SCHEDULE SWITCH
For 10 ft. (3 m) gun **(#041 792)**
For 15 ft. (4.6 m) gun **(#041 793)**
A two-position slide switch which attaches to the gun handle and is used to select the desired welding condition when two programs are used together for dual schedule purposes. The standard gun trigger operates the power supply contactor.



WIRE REEL ASSEMBLY
(#108 008)
For 60 lb. (27 kg) coil of wire.



ADJUSTABLE SPOOL CARRIER
(#096 075 Field)
Designed for use with 6 ft. (1.8 m) pipe post only. Replaces the standard spool assembly, allowing the spools or coils of wire to be positioned lower for easier loading and unloading. Not recommended for use with Swingarc™ mounted on CBC-8 cart.

WATER CONTROL KITS
For use with water-cooled gun. Consists of solenoid valve, tube, and fittings.

For 16 ft. (4.9 m) Boom

SINGLE OR ONE SIDE OF DUAL
(#046 533 Factory)
(#046 537 Field)

BOTH SIDES OF A DUAL
(#046 534 Factory)
(#046 538 Field)

For 12 ft. (3.7 m) Boom

SINGLE OR ONE SIDE OF DUAL
(#046 531 Factory)
(#046 535 Field)

BOTH SIDES OF A DUAL
(#046 532 Factory)
(#046 536 Field)

NOTE: Not recommended when using a recirculating system such as Radiator, Watermate, or Coolmate water coolant systems.

WATER COOLANT SYSTEMS
For use with water-cooled guns.

Radiator 1	**115 VAC**	**(#041 398)**
Radiator 2	**230 VAC**	**(#041 399)**
Watermate™ 1	**115 VAC**	**(#041 852)**
Watermate™ 2	**230 VAC**	**(#041 853)**
Coolmate™ 4	**115 VAC**	**(#042 288)**
Coolmate™ 4	**230 VAC**	**(#042 289)**

Refer to Literature Index No. AY/7.2 for additional coolant system information.