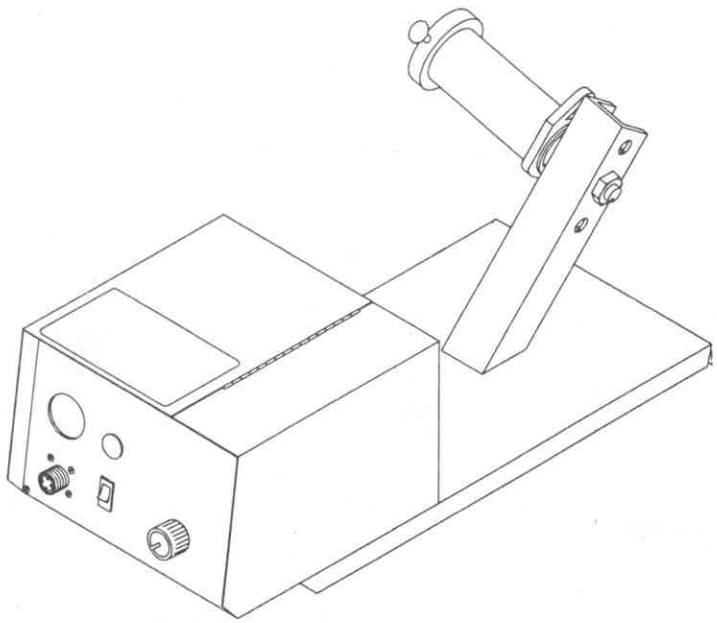
Miller®

March 1991 FORM: OM-1571B

Effective With Serial No. KB041147

MODEL: S-21E



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.

MILLER ELECTRIC Mfg. Co.
A Miller Group Ltd., Company

P.O. Box 1079
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Tel. 414-734-9821

SB-124 467

PRINTED IN U.S.A.

LIMITED WARRANTY

EFFECTIVE: AUGUST 6, 1990

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 warrantied by their manufacturer for two years from date of original purchase, except Deutz engines which have a one year, 2000 hour 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.

June 26, 1992 FORM: OM-1571B

ERRATA SHEET

After this manual was printed, refinements in equipment design occurred. This sheet lists exceptions to data appearing later in this manual.

AMENDMENT TO SECTION 4 – INSTALLATION OR RELOCATION

Amend the second paragraph of Section 4-1. LOCATION to read as follows:

A proper installation site should be selected for the wire feeder if the unit is to provide dependable service. Lead lengths must be considered when installing the unit. Three slots are provided in the base of the unit to fit over the lifting eye on welding power sources so equipped. Use slot that will allow wire feeder to sit securely on welding power source, and not cause the wire feeder, welding wire, or wire spool or reel to touch the gas cylinder, if one is used. Suitable space should be maintained around the unit for making necessary connections and for maintenance functions.

AMENDMENT TO SECTION 9 – PARTS LIST

Amend Parts List as follows:

**	Part No.	Replaced With	Description	Quantity
23-2	604 741	151 828	PIN, cotter hair .054 x .750 (included w/Hub & Spindle Assy)	1
23-29	137 304	089 572	CATCH, link-lock (Eff w/KC255137)	1
23-30	+122 313	+152 725	WRAPPER, (Eff w/KC255137)	1
23-35	072 292	154 098	SHAFT, spool support (included w/Hub & Spindle Assy)	1
23-62	137 460	152 728	CASE ASSEMBLY, (Eff w/KC255137)	1
23-	Added	141 700	RING, retaining ext .625 shaft x .052thk (included w/Hub & Spindle Assy)	1
23-	Added	151 828	PIN, cotter hair .054 x .750 (included w/Hub & Spindle Assy)	1
23-	Added	605 941	WASHER, flt stl .640 ID x 1.000 OD (included w/Hub & Spindle Assy)	1
24-	Added	089 573	PLATE, keeper link-lock (Eff w/KC255137)	1
24-	Added	136 339	COVER, opening meter (Eff w/KC255137)	1

**First digit represents page no – digits following dash represent item no.
+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.

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 – SAFETY RULES FOR OPERATION OF ARC WELDING POWER SOURCE

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 Material Safety Data Sheets (MSDSs) 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 and 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 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 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 and, if necessary, while wearing an air-supplied respirator.

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

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

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

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

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.

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

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.

*Trademark of Proctor & Gamble.

1-3. ARC WELDING

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

A. Burn Protection

Comply with precautions in 1-2.

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

1. Protective Clothing

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

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

2. Eye and Head Protection

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

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

Protect filter plate with a clear cover plate.

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

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

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 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.

To protect against shock:

Wear dry insulating gloves and body protection. 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 electrical resistance, and could enable dangerous and possibly lethal currents to flow through the body.

A voltage will exist between the electrode and any conducting object in the work circuit. 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.**

1. Grounding the Equipment

Arc welding equipment must be grounded according to the National Electrical Code, and the work must be grounded according to ANSI Z49.1 "Safety In Welding And Cutting."

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 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.

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.

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 N.W. LeJeune Rd, Miami, FL 33126.
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 Superintendent of Documents, U.S. Government Printing Office, Washington, D.C. 20402.
4. ANSI Standard Z87.1, SAFE PRACTICES FOR OCCUPATION AND EDUCATIONAL EYE AND FACE PROTECTION obtainable from the American National Standards Institute, 1430 Broadway, New York, NY 10018.
5. ANSI Standard Z41.1, STANDARD FOR MEN'S SAFETY-TOE FOOTWEAR obtainable from the American National Standards Institute, 1430 Broadway, New York, NY 10018.

6. ANSI Standard Z49.2, FIRE PREVENTION IN THE USE OF CUTTING AND WELDING PROCESSES obtainable from the American National Standards Institute, 1430 Broadway, New York, NY 10018.

7. AWS Standard A6.0, WELDING AND CUTTING CONTAINERS WHICH HAVE HELD COMBUSTIBLES obtainable from the American Welding Society, 550 N.W. LeJeune Rd, Miami, FL 33126.

8. NFPA Standard 51, OXYGEN-FUEL GAS SYSTEMS FOR WELDING, CUTTING, AND ALLIED PROCESSES obtainable from the National Fire Protection Association, Batterymarch Park, Quincy, MA 02269.

9. NFPA Standard 70, NATIONAL ELECTRICAL CODE obtainable from the National Fire Protection Association, Batterymarch Park, Quincy, MA 02269.

10. NFPA Standard 51B, CUTTING AND WELDING PROCESSES obtainable from the National Fire Protection Association, Batterymarch Park, Quincy, MA 02269.

11. CGA Pamphlet P-1, SAFE HANDLING OF COMPRESSED GASES IN CYLINDERS obtainable from the Compressed Gas Association, 1235 Jefferson Davis Highway, Suite 501, Arlington, VA 22202.

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 N.W. LeJeune Rd, Miami, FL 33126.

15. ANSI Standard Z88.2, PRACTICE FOR RESPIRATORY PROTECTION, obtainable from the 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

Input Power Requirements	Electrode Wire Diameter Capacity	Wire Spool Capacity	Electrode Wire Feed Speed	Weight	
				Net	Ship
24 VAC 3.5 Amps 50/60 Hz	.023 thru .045 in. (0.6 thru 1.1 mm)	10 to 20 lb. (4.5 to 9 kg) 8 in. (203 mm) spools up to 60 lb. (27.2 kg) coils	75-600 ipm (1.9-15.2 mpm) at 24 VAC	30 lbs. (13.6 kg)	33 lbs. (15 kg)

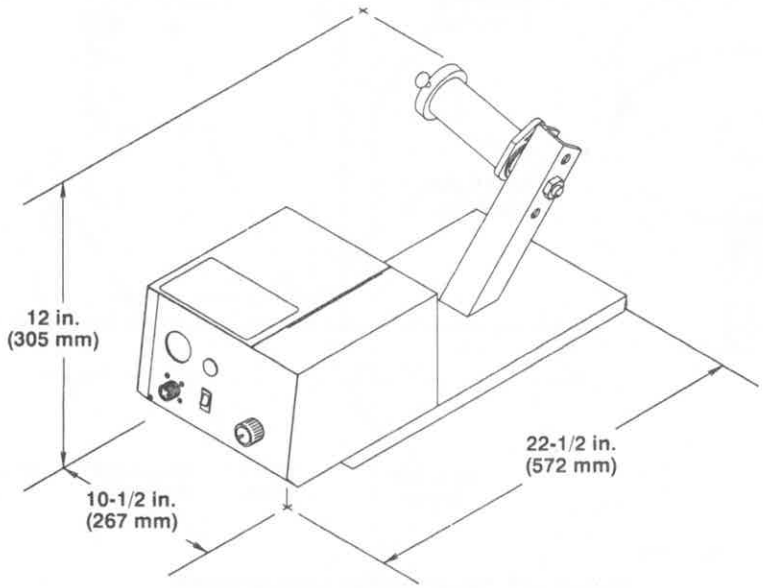


Figure 3-1. Overall Dimensions

3-1. DESCRIPTION

This unit is a semiautomatic constant speed wire feeder which operates on 24 volts ac. The feeder is designed for connection to a constant voltage (CV) type power source through a 14-pin connector. If 115 volts ac is the only power available for use with the feeder, the optional power supply adapter Model PSA 115/24 should be used to convert the power to 24 volts ac.

The case can be tightly latched to help keep out dust and dirt.

SECTION 4 – INSTALLATION OR RELOCATION

4-1. LOCATION (Figure 3-1)

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

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

4-2. DRIVE ROLL INSTALLATION (Figure 4-1)

WARNING: ELECTRIC SHOCK can kill.

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

Lockout/tagging procedures for wire feeder consist of disconnecting input power plug, and for welding power source 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. Stop engine, and disconnect negative (–) battery cable from battery on welding generators.

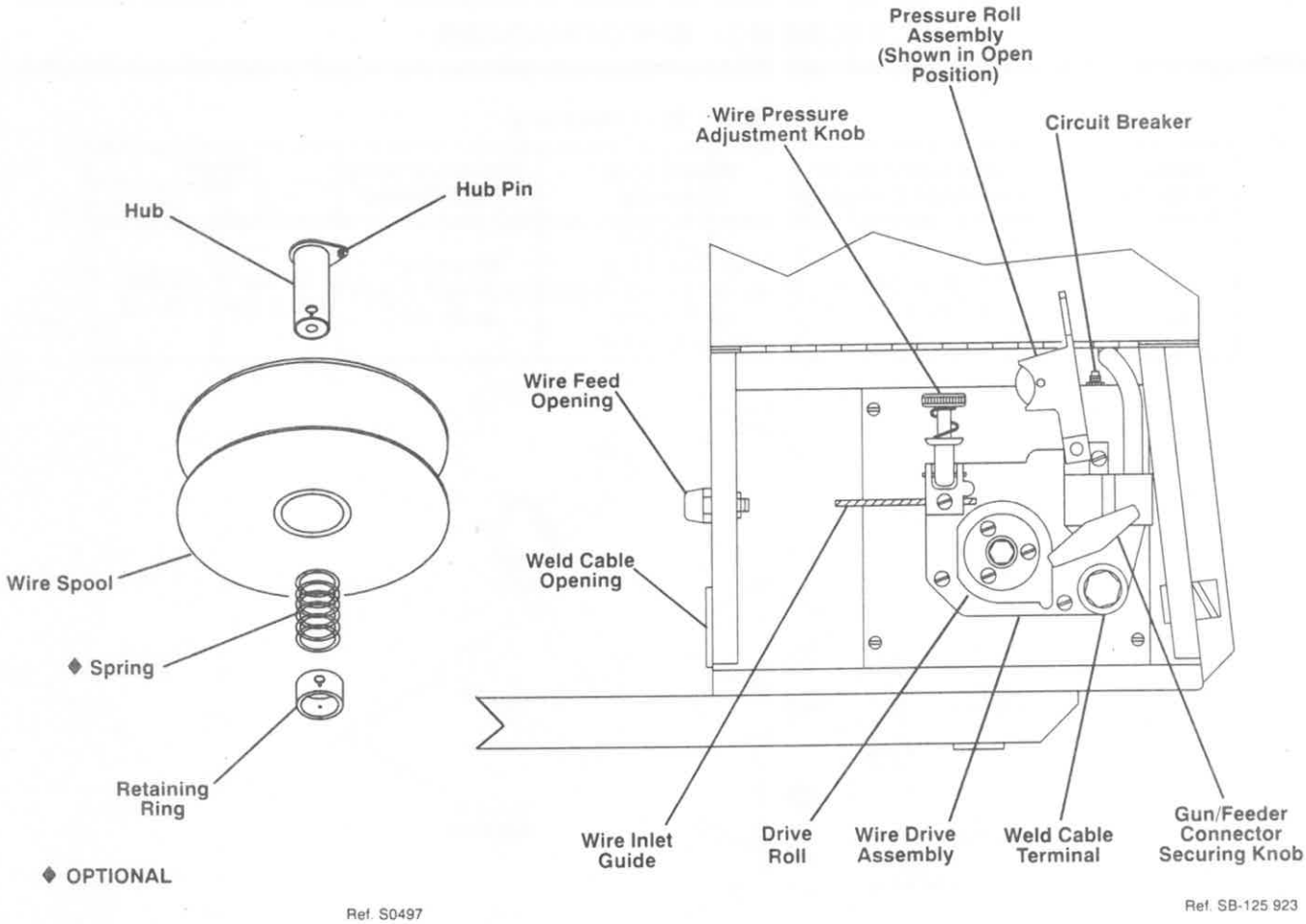


Figure 4-1. Wire Feeder Components

It is necessary to install the required drive rolls when setting up this unit and also when changing wire sizes.

IMPORTANT: *Base drive roll selection on the following recommendations:*

The dual-grooved drive roll provided with the feeder accommodates .023 through .045 in. (0.6 through 1.1 mm) wire. This drive roll has both a "V" groove and a "V" knurled groove. Use the "V" groove for feeding .023 and .030 in. (0.6 and 0.76 mm) wire. Use the "V" knurled groove for feeding .035 and .045 in. (0.89 and 1.1 mm) wire. The wire size for each groove is stamped on the side of the drive roll. When the drive roll is installed in the feeder, the wire size stamp for the unused groove will be visible.

The 50 Series wire feeder style drive rolls may be used with this feeder, but, due to the flat idler pressure roll used, a knurled drive roll is recommended when feeding .035 and .045 (.089 and 1.1 mm) wire.

WARNING: ELECTRIC SHOCK can kill.

- *Do not store metallic objects in this compartment. The motor drive assembly is electrically hot whenever the welding circuit is energized.*

  Loose metal objects in this compartment may create an electrical path between the weld output circuit and any metal surfaces or components resulting in electric shock.

IMPORTANT: *Both types of 50 Series style drive rolls can be reversed for reuse when they become worn. Reverse rolls to position unused groove(s) to feed wire. The dual-grooved drive roll provided with this feeder can be reversed, but only to feed a different size wire.*

1. Unlatch and open left case access door.
2. Loosen pressure adjustment knob, and pivot knob free of pressure arm.
3. Pivot pressure arm away to expose drive roll carrier.
4. For dual-grooved roll supplied with feeder:
   a. Choose the proper groove.
   b. Slide drive roll onto drive roll mounting hub with chosen groove toward inside of machine. The wire size for the unused groove will be visible after installation.
   c. Align the drive roll with holes.
   d. Insert securing screws, and tighten.

5. For 50 Series style one-piece drive rolls:
   a. Slide drive roll onto drive roll mounting hub.
   b. Align drive roll with holes.
   c. Insert securing screws, and tighten.
6. For 50 Series style split drive rolls:
   a. Align holes on pair of split drive rolls.
   b. Insert securing screw.
   c. Slide drive rolls onto drive roll mounting hub.
   d. Align drive rolls with holes.
   e. Insert securing screws, and tighten.

IMPORTANT: *Horizontal alignment of the drive roll on the drive roll mounting hub with the wire guide is factory set and should not require readjustment. If readjustment becomes necessary, see Section 7-2.*

7. Close and secure left case access door.

4-3. WELDING GUN CONNECTIONS (Figures 4-1 And 5-1)

WARNING: ELECTRIC SHOCK can kill.

- *Do not touch live electrical parts.*
- *Shut down wire feeder and welding power source, and disconnect input power employing lockout/tagging procedures before working on feeder.*

Lockout/tagging procedures for wire feeder consist of disconnecting input power plug, and for welding power source 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. Stop engine, and disconnect negative (–) battery cable from battery on welding generators.

IMPORTANT: *A hole is provided in the nameplate for installation of a gun requiring an opening for an external gas line. Remove snap-in blank before installation.*

A. Gun Connector To Drive Assembly (Figure 4-1)

1. Unlatch and open left case access door.
2. Loosen gun/feeder connector securing knob on the wire drive housing.
3. Insert gun/feeder connector through the access hole in the front panel.
4. Insert gun/feeder connector into drive housing with the outlet wire guide as close to the drive rolls as possible without touching, and tighten the securing knob.
5. Close and secure left case access door.

B. Gun Trigger (Figure 5-1)

TRIGGER RECEPTACLE

Connect gun trigger plug to trigger receptacle on the front panel as follows: align keyways, insert gun plug into trigger receptacle, and rotate threaded collar fully clockwise.

4-4. SHIELDING GAS INSTALLATION (Figures 4-2 And 4-3)

WARNING: PRESSURIZED CYLINDERS can rupture causing serious personal injury and loss of life; FALLING CYLINDERS can cause serious injury and equipment damage.

- *Keep cylinders away from welding or other electrical circuits.*
- *Never allow a welding electrode to touch any cylinder.*
- *Always fasten cylinder securely to running gear bracket, a wall, or other stationary support.*

A. Gas Cylinder (Customer Supplied)

Chain the cylinder to a wall or other stationary support to prevent the cylinder from falling over and breaking off the valve. If optional power source running gear is used, secure gas cylinder to running gear with supplied chain.

B. Regulator/Flowmeter (Customer Supplied)

1. With the cylinder securely installed, remove the cylinder cap, stand to one side of cylinder valve, and open valve slightly. When gas flows from cylinder, close valve. This procedure blows out dust or dirt that may have accumulated around the valve seat.

IMPORTANT: *A gasket should be installed to prevent leaks. Do not use lubricants or sealing agents.*

2. The regulator/flowmeter must be properly equipped with a stem, nut connectors, and gasket for use with either CO_2 cylinders or inert gas type cylinders.
3. Install gas regulator/flowmeter onto gas cylinder valve; keep the face of the regulator/flowmeter gauge in vertical position, and tighten stem nut securely to gas cylinder valve.
4. A shielding gas fitting is provided on the rear of the wire feeder. Obtain a suitable hose with 5/8-18 right- hand fitting. Attach one end of the gas hose to this fitting. Attach the other end of the gas hose to the regulator/flowmeter.

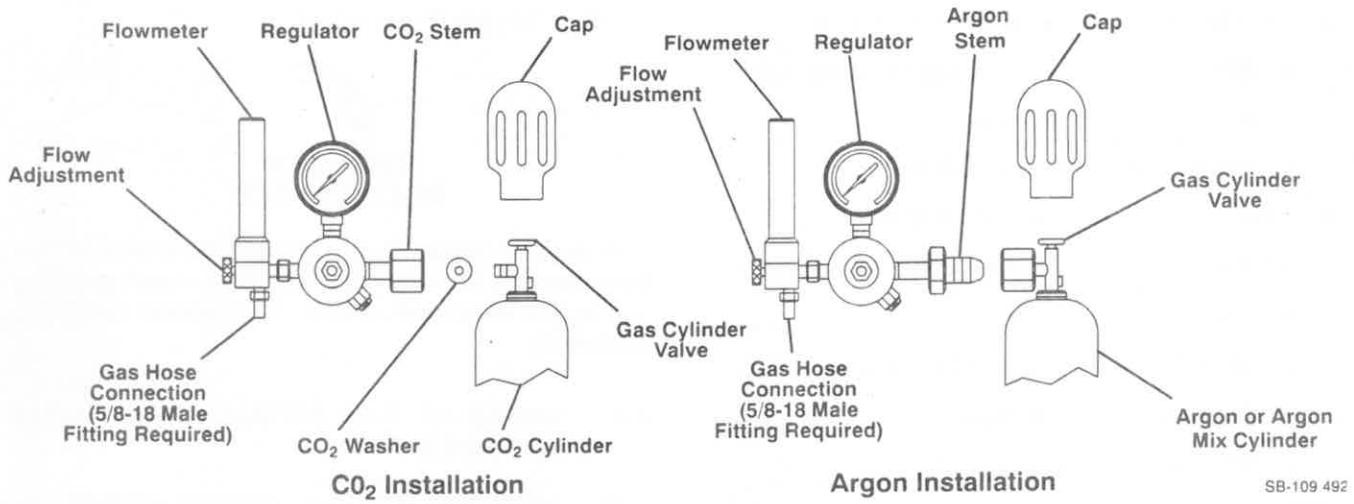


Figure 4-2. Typical Regulator/Flowmeter Installation

4-5. 14-PIN PLUG CONNECTION (Figures 4-3 And 4-4)

The 14-pin plug PLG1, on the end of the interconnecting cord, provides a junction point for connecting the wire feeder to a welding power source. This connection provides 24 volt ac power, and contactor control when used with a constant voltage (CV) power source with a 14-pin receptacle. To make connections, align keyway, insert plug, and rotate threaded collar fully clockwise.

The pins on plug PLG1 are defined in relation to both the power source and wire feeder. The welding power source provides six functions to the wire feeder. The pins are designated as follows:

Pin A: Up to 10 amperes of 24 volts ac, 60 Hz, with respect to socket G (circuit common); protected by fuse in welding power source.

Pin B: 24 volts ac input power to energize the weld contactor. The feeder sends back 24 volts ac by means of a contact closure from pin A to pin B.

Pin G: 24 volts ac circuit common; also connected to welding power source chassis.

IMPORTANT: *The remaining pins in the receptacle are not used by the feeder.*

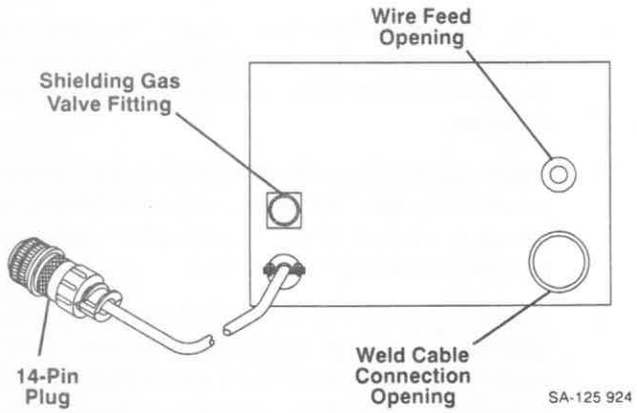


Figure 4-3. Rear Panel View

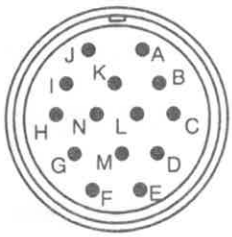


Figure 4-4. Front View Of 14-Pin Plug With Pin Locations

4-6. WELDING WIRE INSTALLATION (Figure 4-5)

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 working on feeder.*

Lockout/tagging procedures for wire feeder consist of disconnecting input power plug, and for welding power source 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. Stop engine, and disconnect negative (–) battery cable from battery on welding generators.

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.

IMPORTANT: *If it should become necessary to replace any part of the hub assembly, see hub assembly reinstallation instruction in Section 7-3.*

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

1. Remove retaining ring from hub.
2. Slide wire spool on hub so that wire feeds off the bottom of the spool.
3. Rotate wire spool until hole in spool slides over pin in hub and seats against back flange of the hub.
4. Insert optional compression spring if required.
5. Reinstall retaining ring to secure wire spool on hub.

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

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 bottom 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.

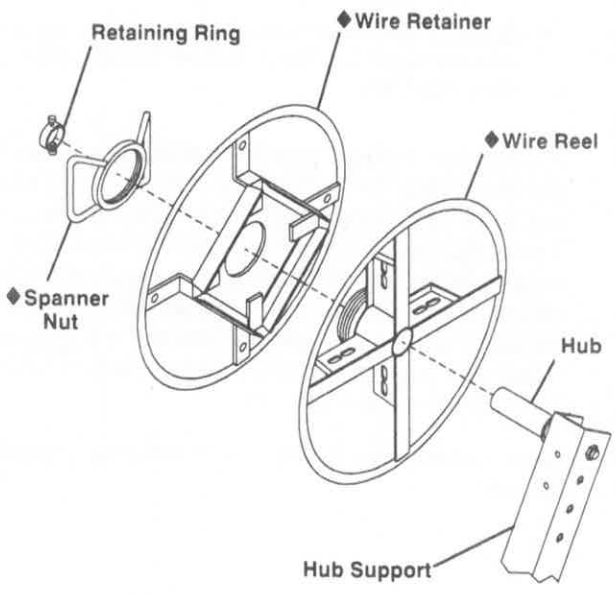


Figure 4-5. Optional Wire Reel And Reel-Type Wire Installation

4-7. WELDING WIRE THREADING

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

- *Do not touch live electrical parts.*
- *Keep clear of pinch points.*
- *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 depress 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.*

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.*

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.

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 4-6.
2. Cut off any portion of the free end of the wire which is not straight. Be sure that the cut end is free from rough surfaces to permit proper feeding.
3. Adjust hub tension according to Section 4-8 if necessary.
4. Loosen the pressure adjustment knob on the wire drive housing, and pivot the pressure arm open.
5. Feed the wire through the inlet wire guide, past the drive rolls, and on into the gun. Feed approximately 4 inches (102 mm) of wire into the gun.
6. Close the pressure lever, and secure with pressure adjustment knob making sure the welding wire is in the drive roll groove and properly aligned with the inlet and outlet guides (outlet guide is part of gun).
7. Tighten the pressure adjustment knob to obtain the proper clamping pressure on the welding wire. Do not overtighten. Further adjustment can be made when the wire feeder is put into operation.

4-8. ADJUST THE HUB TENSION (Figure 4-1)

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.

Check the hub tension by slowly pulling the wire toward the drive roll. The wire should unwind freely, but have sufficient tension to keep the wire taut and prevent backlash when wire feeding stops. If adjustment is necessary, loosen or tighten the hex nut on the end of the hub support shaft accordingly.

4-9. WELDING CABLE CONNECTION

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 for wire feeder consist of disconnecting input power plug, and for welding power source 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. Stop engine, and disconnect negative (–) battery cable from battery on welding generators.

1. Unlatch and open left case access door.
2. Route weld cable through weld cable connection opening on rear of unit (see Figures 4-1 and 4-3).
3. Connect end of cable to terminal on bottom of drive assembly. Be sure that terminal is clean and bolt is secure.
4. Close and secure left case access door.

4-10. FEEDING WELDING WIRE

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

- *Do not touch live electrical parts.*
- *Keep away from pinch points.*
- *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 depress 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.*

1. Be sure wire is installed as instructed in Section 4-7.
2. Be sure gun is installed according to Section 4-3 of this manual and the gun Owner's Manual.
3. 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.
4. Lay gun cable assembly out flat and straight (no coils in the cable/conduit).
5. Energize the welding power source.
6. Place the wire feeder POWER switch in the ON position.

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

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

7. Press the gun trigger (see WARNING block at beginning of the Section). Wire feeds if drive roll pressure is properly adjusted to prevent slippage. If wire slippage is noticed, adjust hub tension according to Section 4-8. If excessive pressure is required, check gun contact tube and gun liner for correct size or obstructions. Release the trigger when welding wire extends approximately one inch (25 mm) out of gun tip.
8. Shut down wire feeder and welding power source.

SECTION 5 – OPERATOR CONTROLS

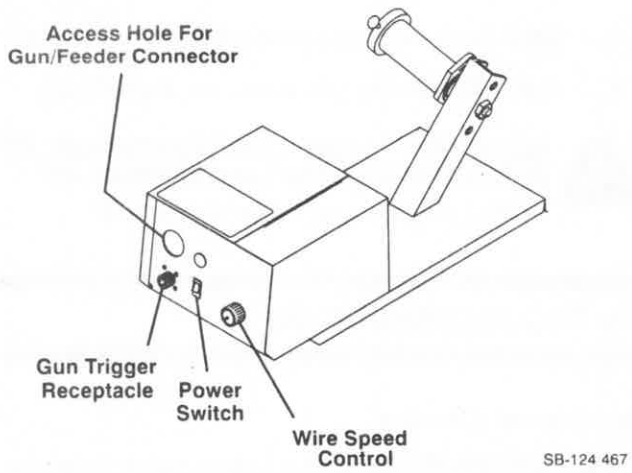


Figure 5-1. Control Panel View

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

POWER

The POWER switch functions as the ON/OFF switch for the wire feeder.

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

WIRE SPEED

The WIRE SPEED control adjusts the wire feed speed in inches per minute within the wire speed range. Rotating the WIRE SPEED control clockwise increases wire feed speed. The scale is calibrated in inches per minute.

SECTION 6 – SEQUENCE OF OPERATION

6-1. GAS METAL ARC (GMAW) AND FLUX CORED ARC (FCAW) WELDING

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

- *Do not touch live electrical parts.*
- *Keep case closed while operating.*

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

ARC RAYS can burn eyes and skin; NOISE can damage hearing.

- *Wear correct eye, ear, and body protection.*

FUMES AND GASES can seriously harm your health.

- *Ventilate to keep from breathing fumes and gases.*
- *If ventilation is inadequate, use approved breathing device.*

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

- *Watch for fire.*
- *Keep a fire extinguisher nearby, and know how to use it.*
- *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.*

WELDING WIRE can cause puncture wounds.

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

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

1. Install and connect unit according to Section 4.
2. Wear dry insulating gloves and clothing.
3. Connect work clamp to clean, bare metal at workpiece.
4. Rotate WIRE SPEED control to desired position (see Section 5-2).

WARNING: ELECTRIC SHOCK can kill.

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

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

5. Energize the welding power source or generator.
6. Place the POWER switch in the ON position
7. Turn on shielding gas at the source, if applicable.
8. Wear welding helmet with proper filter lens according to ANSI Z49.1.
9. Hold tip of gun approximately 1/2 in. (13 mm) from workpiece, and depress gun trigger. Current flows, gas flows, and wire feeds. If wire slippage is noticed, adjust drive roll pressure according to Section 4-7.

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

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

6-2. SHUTTING DOWN

1. Stop welding.
2. Place POWER switch in the OFF position.
3. Shut down welding power source or generator.
4. Turn off shielding gas at source, if applicable.

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

- *Shut off gas supply when not in use.*

SECTION 7 – MAINTENANCE & TROUBLESHOOTING

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

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

WARNING: ELECTRIC SHOCK can kill.

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

Lockout/tagging procedures for wire feeder consist of disconnecting input power plug, and for welding power source 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. Stop engine, and disconnect negative (–) battery cable from battery on welding generators.

- *Allow gun and unit to cool before touching.*
- *Do not depress gun trigger while performing maintenance on gun.*

Troubleshooting to be performed only by qualified persons.

Table 7-1. Maintenance Schedule

Frequency*	Maintenance
Every Month	Units in heavy service environments: Check labels, weld cables, clean internal parts and drive rolls.
Every 6 Months	Check all labels (see IMPORTANT block, Section 7-1). Inspect gun and cables (Section 7-1B). Clean drive rolls (Section 7-1C).

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

A. Internal Cleaning

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

Every month, blow our 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.

B. Inspection and Upkeep

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

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

1. Unlatch and open left case access door.
2. Inspect gun for broken areas, cracks, and loose parts; tighten, repair, and replace as required.
3. 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.
4. 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.*

5. 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.
6. Close and secure left case access door.

C. Cleaning Of Drive Rolls

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

MOVING PARTS can cause serious injury.

- *Keep away from moving parts.*

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

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

It is necessary to remove the drive rolls for proper cleaning of the wire grooves (see Section 4-2 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.
2. Using wire brush, remove the buildup of wire particles in the wire grooves.
3. Reinstall drive rolls according to Section 4-2.
4. Resume operation.

7-2. ALIGNING DRIVE ROLL AND WIRE GUIDE (Figure 7-1)

WARNING: ELECTRIC SHOCK can kill.

- *Do not touch live electrical parts.*
- *Shut down wire feeder and welding power source, and disconnect input power employing lockout/tagging procedures before working on feeder.*

Lockout/tagging procedures for wire feeder consist of disconnecting input power plug, and for welding power source 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. Stop engine, and disconnect negative (–) battery cable from battery on welding generators.

MOVING PARTS can cause serious injury.

- *Keep away from moving parts.*

HOT SURFACES can cause severe burns.

- *Allow cooling period before servicing.*

Maintenance to be performed only by qualified persons.

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

Behind the drive roll mounting hub is a spring washer. To obtain proper alignment of the drive roll with the wire guide, rotate drive roll mounting hub securing bolt, and move drive roll in or out until groove in drive roll lines up with wire guide (see Figure 7-1).

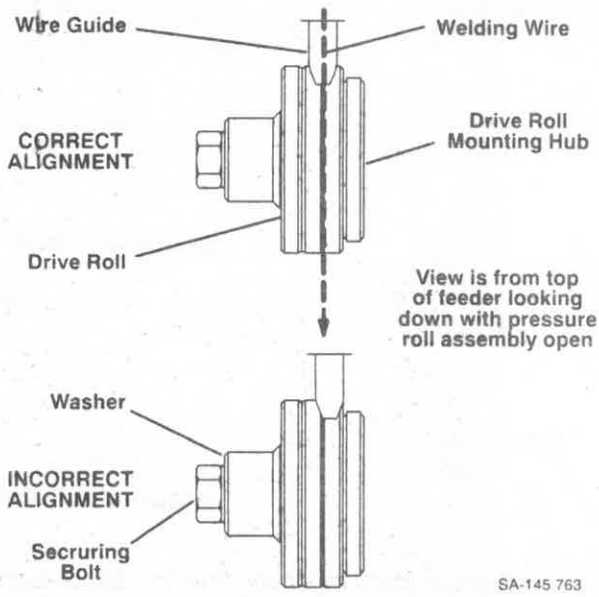


Figure 7-1. Drive Roll/Wire Guide Alignment

7-3. REINSTALLATION OF HUB ASSEMBLY (Figure 7-2)

WARNING: ELECTRIC SHOCK can kill.

- *Do not touch live electrical parts.*
- *Shut down wire feeder and welding power source, and disconnect input power employing lockout/tagging procedures before working on feeder.*

Lockout/tagging procedures for wire feeder consist of disconnecting input power plug, and for welding power source 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. Stop engine, and disconnect negative (–) battery cable from battery on welding generators.

If it should become necessary to replace any part of the assembly, obtain part and proceed as follows to reinstall the assembly.

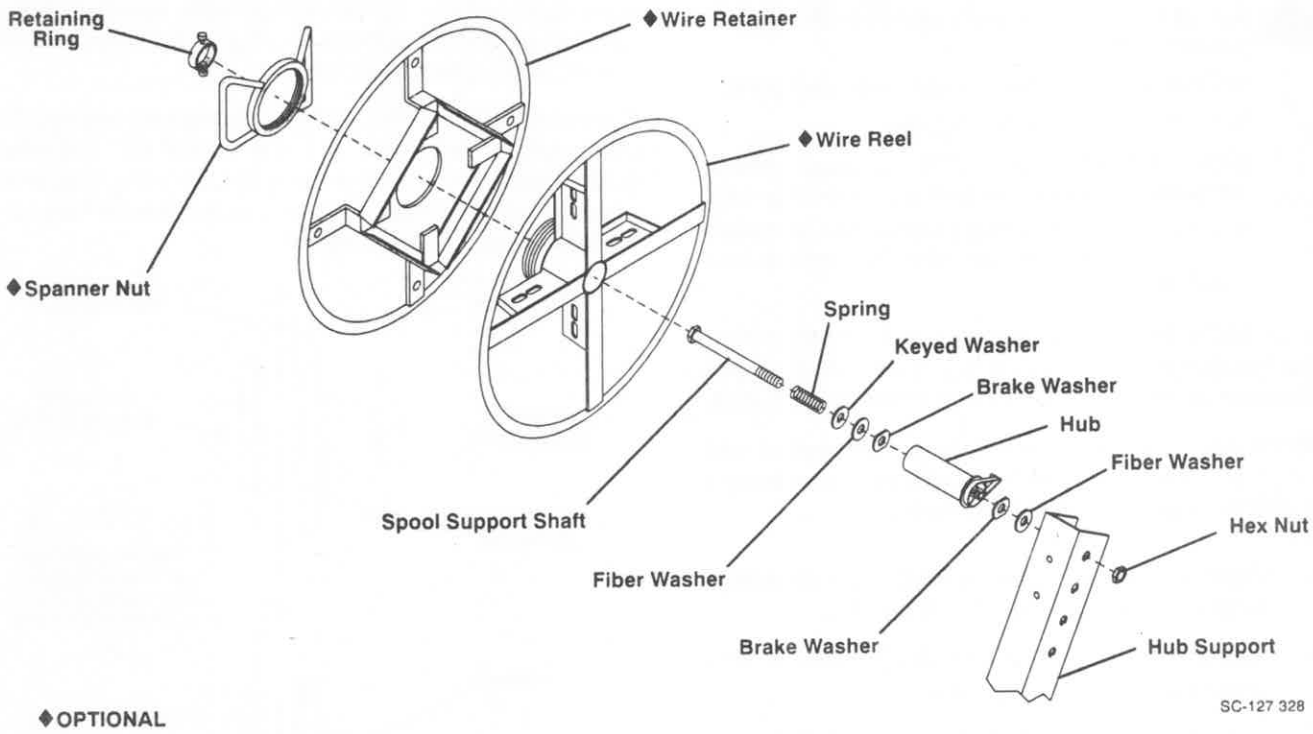


Figure 7-2. Reinstallation Of Hub Assembly

1. Slide the following items onto the spool 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. Wire Reel
   i. Wire Retainer
   j. Spanner Nut
   k. Retaining Ring
2. Rotate bolt into support shaft. Bolt should be rotated only until a slight drag is felt while turning hub.
3. Install retaining ring on hub.

7-4. BRUSH INSPECTION AND REPLACEMENT

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 working on feeder.*

Lockout/tagging procedures for wire feeder consist of disconnecting input power plug, and for welding power source 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. Stop engine, and disconnect negative (–) battery cable from battery on welding generators.

1. Remove two brush caps located on end of the drive motor.
2. Remove brushes.
3. Examine brushes. Replace brushes if they are chipped or broken or if less than 1/4 in. (6.4 mm) of brush material remains.
4. Install brushes, and secure with caps.

7-5. OVERLOAD PROTECTION

Circuit breaker CB1 provides protection to the feeder circuits. CB1 is located towards the front of the unit, behind the left case access door. If the motor should overload or the circuit fail, the breaker would trip and shut down the wire feeder. If CB1 opens, correct the problem and manually reset the breaker.

To reset CB1, proceed as follows:

1. Unlatch and open left case access door.
2. Locate CB1, and reset (see Figure 4-1).
3. Close and secure left case access door.

7-6. 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 working on feeder.*

Lockout/tagging procedures for wire feeder consist of disconnecting input power plug, and for welding power source 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. Stop engine, and disconnect negative (–) battery cable from battery on welding generators.

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

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

INCORRECT INSTALLATION or misaligned plugs can damage circuit board.

- *Be sure that plugs are properly installed and aligned.*

EXCESSIVE PRESSURE can break circuit board.

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

7-7. TROUBLESHOOTING (Table 7-2)

WARNING: ELECTRIC SHOCK can kill.

- *Do not touch live electrical parts.*
- *Shut down wire feeder and welding power source, and disconnect input power employing lockout/tagging procedures before working on feeder.*

Lockout/tagging procedures for wire feeder consist of disconnecting input power plug, and for welding power source 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. Stop engine, and disconnect negative (–) battery cable from battery on welding generators.

MOVING PARTS can cause serious injury.

- *Keep clear of 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.

IMPORTANT: *Ensure that all connections to the feeder and welding power source are secure and that all switches are in the proper position for the welding applications before beginning troubleshooting procedures.*

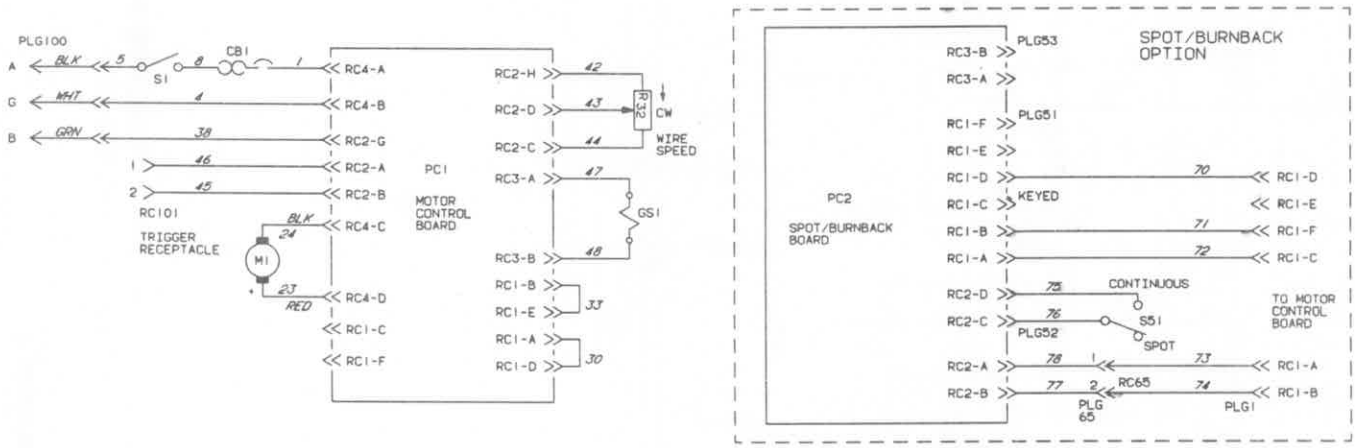
CAUTION: DISASSEMBLY OF MOTOR FIELD MAGNETS can result in personal injury and equipment damage.

- *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.

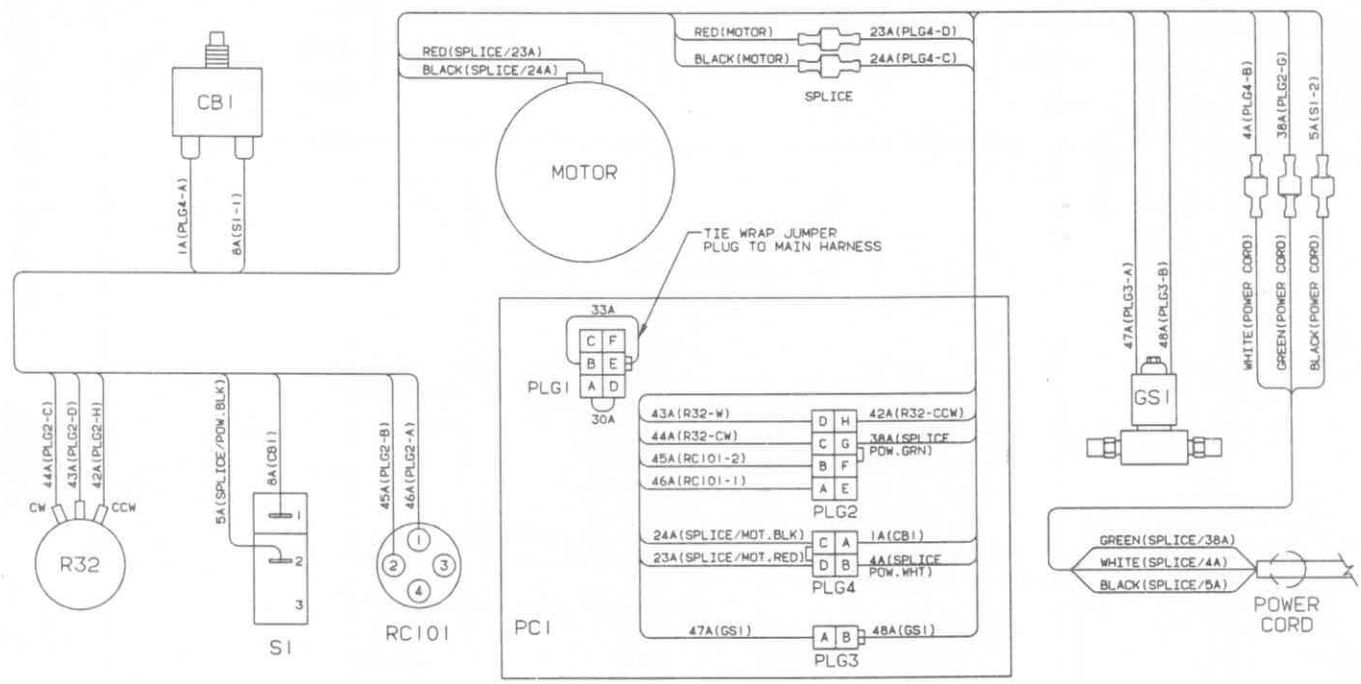
Table 7-2. Troubleshooting

TROUBLE	CAUSE	REMEDY
Wire does not feed.	Circuit breaker CB1.	Reset CB1 (see Section 7-5).
	Loose or improperly made gun trigger connection.	Check gun trigger connection (see Section 4-3).
	Gun Trigger.	See gun Owner's Manual.
	Motor.	Replace Motor.
	Circuit board PC1.	See Section 7-6, and contact nearest Factory Authorized Service Station.
Wire feeds erratically.	Pressure on drive roll is insufficient.	Rotate pressure adjustment knob counter-clockwise in 1/4 turn increments until the wire stops slipping (see Section 4-2).
	Drive roll wrong size for wire size used.	Change to correct size drive roll (see Section 4-2).
	Drive rolls worn.	Replace drive rolls (see Section 4-2).
	Dirt in drive rolls.	Clean drive rolls (see Section 7-1C).
	Circuit board PC1.	See Section 7-6, and contact nearest Factory Authorized Service Station.
Gun nozzle opening restricted.	Weld spatter or foreign matter accumulation.	Carefully remove any weld spatter or foreign matter which may accumulate around the nozzle opening. Use a hardwood stick, never a metal tool.
Wire does not feed until trigger is pulled but continues to feed after trigger is released.	Welding gun is shorted between one of the trigger leads and weld cable.	Replace welding gun.
The gas valve in the feeder is rattling loudly along with possible erratic or slow wire feed speed.	Welding gun is shorted between one of the trigger leads and weld cable.	Replace welding gun.
Wire does not feed.	Welding gun shorted.	Replace welding gun.



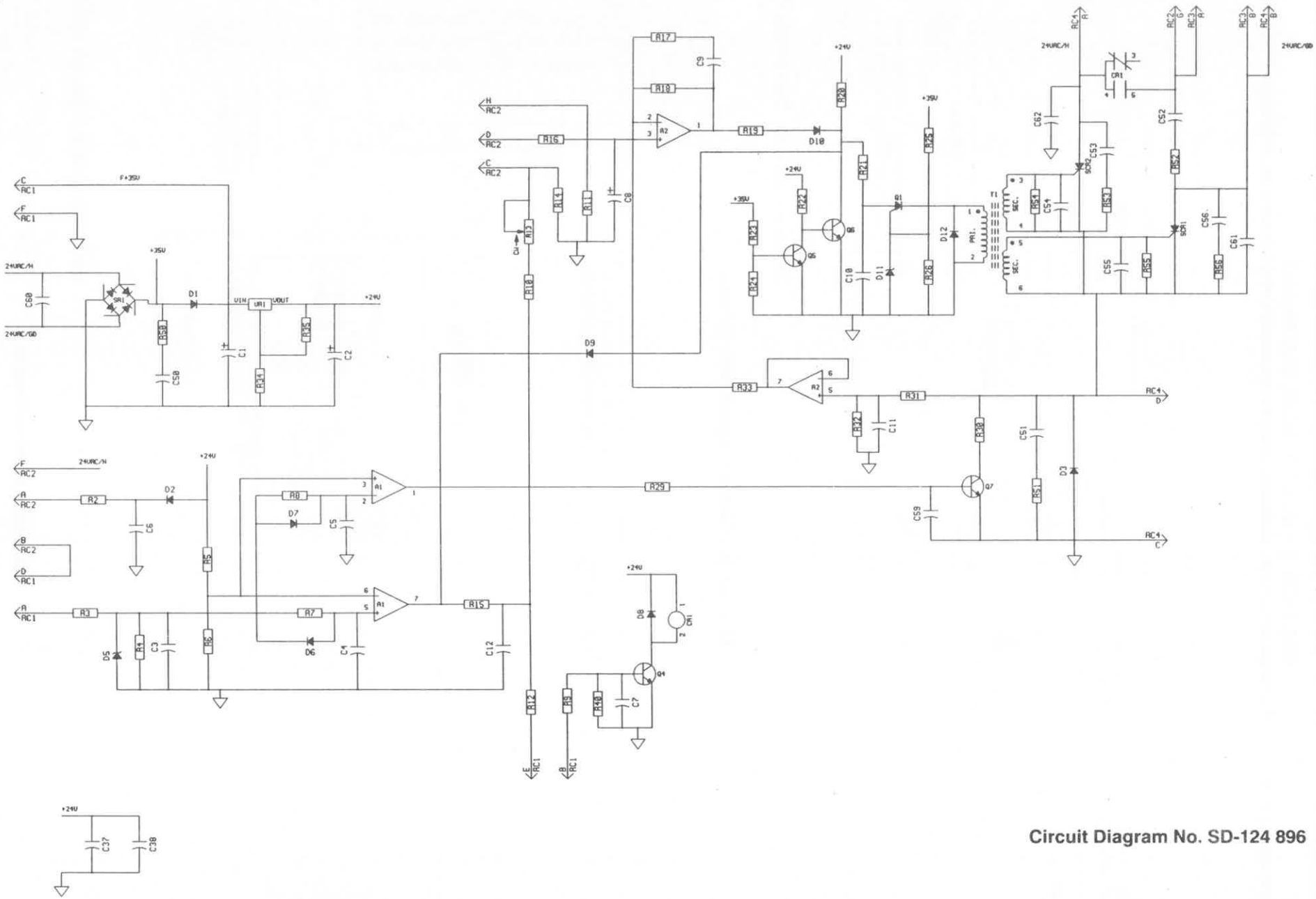
Circuit Diagram No. SB-124 895-B

Diagram 8-1. Circuit Diagram With Options



Wiring Diagram No. SB-124 816-B

Diagram 8-2. Wiring Diagram



Circuit Diagram No. SD-124 896

Diagram 3. Circuit Diagram For Motor Control Board PC1

SECTION 9 – PARTS LIST

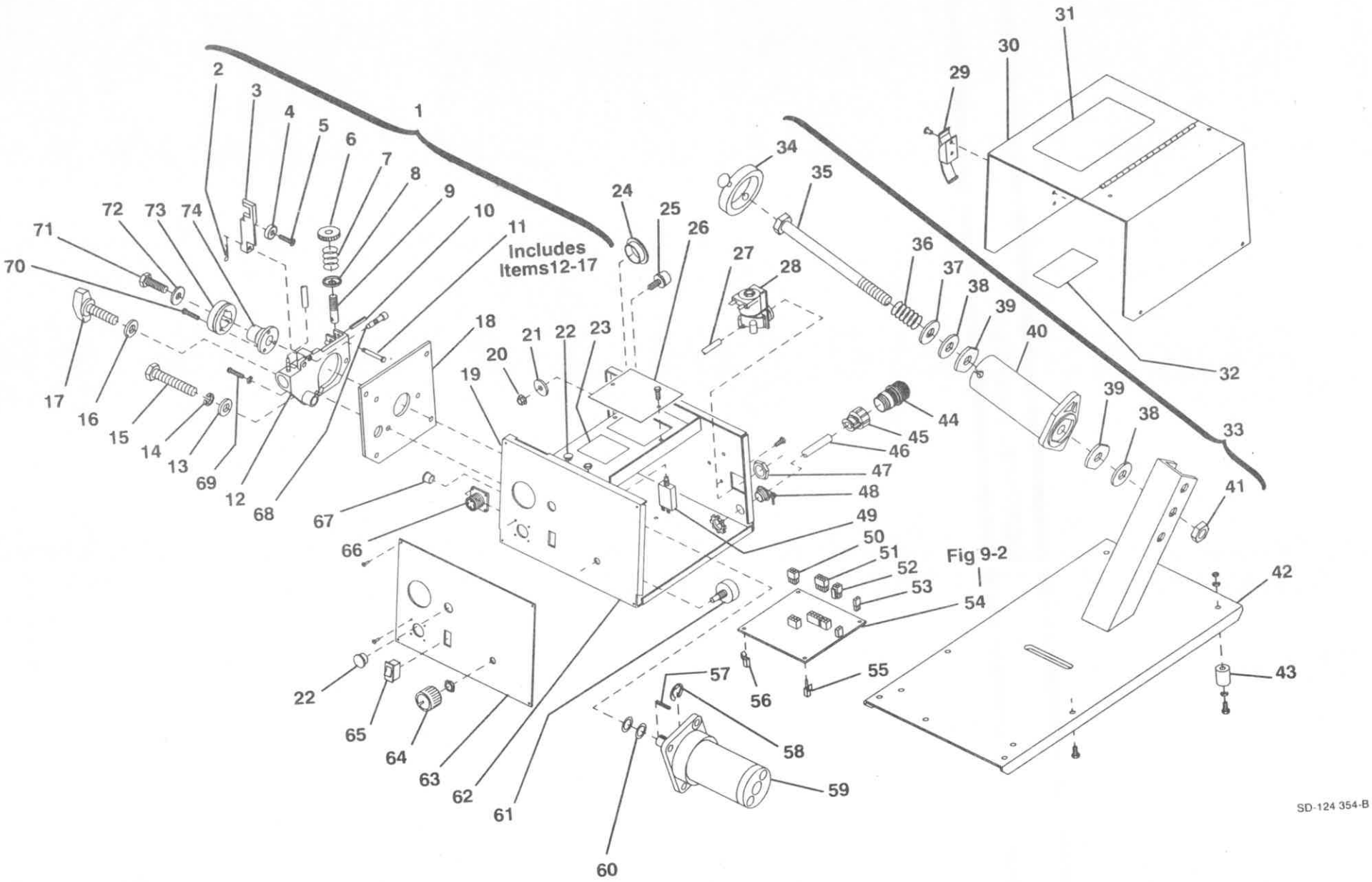


Figure 9-1. Main Assembly

Item No.	Dia. Mkgs.	Part No.	Description	Quant
			Figure 9-1. Main Assembly	
1		127 232	DRIVE ASSEMBLY, wire (consisting of)	1
2		604 741	· PIN, cotter hair .042 x .937	1
3		112 031	· LEVER, pressure roll	1
4		111 523	· BEARING, ball rdl sgl row .315 x .866 x .275	1
5		114 415	· SCREW, mach stl phflh 10-24 x .625	1
6		092 237	· KNOB, adjustment tension	1
7		089 477	· SPRING, cprsn .770 OD .100 wire x .715	1
8		085 244	· WASHER, cupped stl .328 ID x .812 OD x .125 lg	1
9		089 562	· FASTENER, pinned	1
10		010 224	· PIN, spring CS .187 x 1.000	1
11		090 416	· PIN, hinge	1
12		124 817	· HOUSING, wire drive	1
13		602 243	· WASHER, flat stl std .375	1
14		602 213	· WASHER, lock stl split .375	1
15		601 966	· SCREW, cap stl hexhd .375-16 x 1.250	1
16		604 538	· WASHER, flat stl SAE .312	1
17		124 778	· KNOB, plstc T 1.000 lg x .312-18 x 2.000 bar	1
18		130 365	INSULATOR, housing drive	1
19		090 440	INSULATOR, cover housing	1
20		601 880	NUT, stl hex jam .500-13	1
21		010 291	WASHER, flat nylafil .625 ID x 1.250 OD x .125thk	1
22		107 983	BLANK, snap in nyl .500 mtg hole	1
23		071 602	LABEL, caution HF will damage	2
24		010 494	BUSHING, snap in nyl 1.375 ID x 1.750mtg hole	1
25		131 181	WIRE GUIDE & NUT, inlet	1
26			PLATE, ident control panel (order by model and serial number)	1
27				
28	GS1	604 550	HOSE, nprn brd No. 1 x .187 ID (order by ft)	1
29		125 785	VALVE, 24VAC 2 way custom port 1/8 orf	1ft
30		137 304	LATCH, door	1
31		+122 313	WRAPPER	1
32		134 464	LABEL, warning general precautionary	1
		090 439	LABEL, warning electric shock can kill	1
33		126 873	BUMPER, polyurethane polymer .500sq adh backed	1
34		072 094	HUB & SPINDLE ASSEMBLY (consisting of)	1
35		058 427	· RING, retaining spool	1
36		072 292	· SHAFT, spool support	1
37		010 233	· SPRING, cprsn .970 OD x .120 wire x 1.250	1
38		057 971	· WASHER, flat stl keyed 1.500 dia x .125thk	1
39		010 191	· WASHER, fbr .656 ID 1.500 OD x .125thk	1
40		058 628	· WASHER, brake stl	2
41		058 428	· HUB, spool	2
42		135 205	· NUT, stl slflkg hex reg .625-11	1
43		137 461	BASE	1
44	RC100	134 306	FOOT, rubber 1.250dia x 1.375 high	1
		141 162	HOUSING PLUG & PINS, (consisting of)	4
45		134 731	· TERMINAL, male 1 pin 18-14 wire	1
46		143 922	CLAMP, cable strain relief sz 17 & 20	14
47		007 826	CABLE, port No. 18 3/c (order by ft)	1
		605 227	NUT, nyl hex jam .750NPST	11ft
48		120 304	BLANK, snap-in nyl .250mtg hole	1
49	CB1	115 104	CONNECTOR, clamp cable .500	3
50		123 745	CIRCUIT BREAKER, man reset 1P 4A 250VAC	1
		115 093	HOUSING PLUG & SOCKETS, (consisting of)	1
51		113 746	· TERMINAL, female 1skt 24-18 wire	1
		115 092	HOUSING PLUG & SOCKETS, (consisting of)	6
52		113 746	· TERMINAL, female 1skt 24-18 wire	1
		115 094	HOUSING PLUG & SOCKETS, (consisting of)	8
		113 746	· TERMINAL, female 1skt 24-18 wire	1
				4

Item No.	Dia. Mkgs.	Part No.	Description	Quantity
			Figure 9-1. Main Assembly (Continued)	
53		131 054	HOUSING RECEPTACLE & SOCKETS, (consisting of)	1
		113 746	· TERMINAL, female 1skt 24-18 wire	2
54	PC1	123 148	CIRCUIT CARD, motor control (Fig 9-2)	1
55		110 375	STAND-OFF SUPPORT, PC card No. 6 screw	2
56		123 810	STAND-OFF SUPPORT, PC card No. 6 screw	2
57		092 865	KEY, stl .122/.123 x .750	1
58		605 308	RING, retaining	1
59	M1	122 741	MOTOR, gear 24VDC 122RPM (consisting of)	1
		*136 745	· BRUSH & SPRING ASSEMBLY	2
60		079 625	WASHER, spring stl .500 shakeproof	2
61	R32	073 562	POTENTIOMETER, C 1/T 2W 10K ohm	1
62		137 814	CASE ASSEMBLY	1
63			NAMEPLATE (order by model and serial number)	1
64		097 922	KNOB, pointer	1
65	S1	111 997	SWITCH, rocker SPST 10A 250VAC	1
66	RC101	048 282	RECEPTACLE w/SOCKETS, (consisting of)	4
		079 534	· TERMINAL, female 1skt 18-14 wire	1
67		057 084	BUSHING, snap-in nyl .250 ID x .375mtg hole	1
68		058 549	GUIDE, wire inlet 1/16	3
69		605 758	SCREW, mach stl rdh 10-32 x 1.000	3
70		079 626	SCREW, mach stl filh 10-32 x .875	1
71		000 418	SCREW, cap stl hexhd slflkg .250-20 x .500	1
72		602 241	WASHER, flat stl SAE .250	1
73		124 818	ROLL, drive combination large	1
73		♦087 130	ROLL, drive V groove .023 wire	2
73		♦053 695	ROLL, drive V groove .030 wire	2
73		♦079 726	ROLL, drive VK groove .035 wire	1
73		♦079 728	ROLL, drive VK groove .045 wire	1
73		124 820	HUB, mtg roll drive	
74		♦108 008	REEL, wire 60 lb (Fig 9-3)	

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

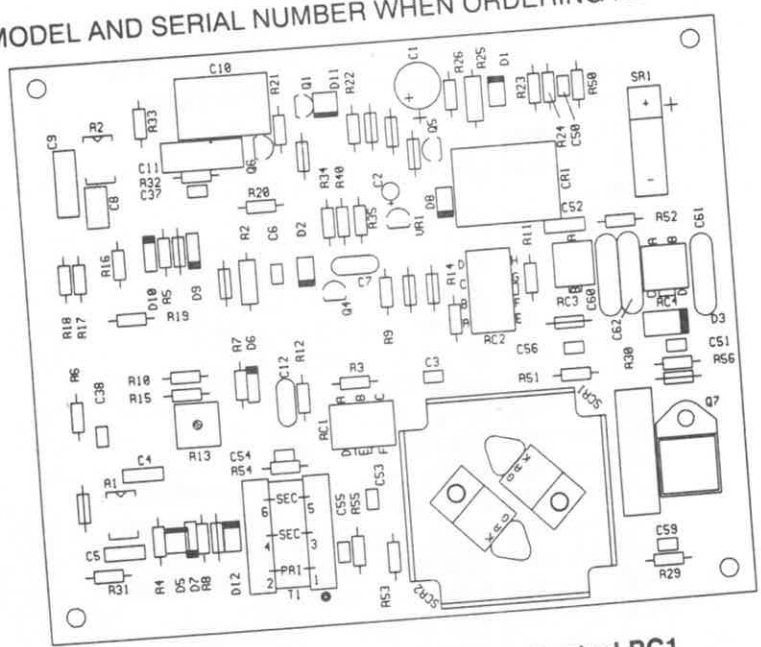


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Figure 9-2. Circuit Card, Motor Control PC1

SECTION 9 – PARTS LIST

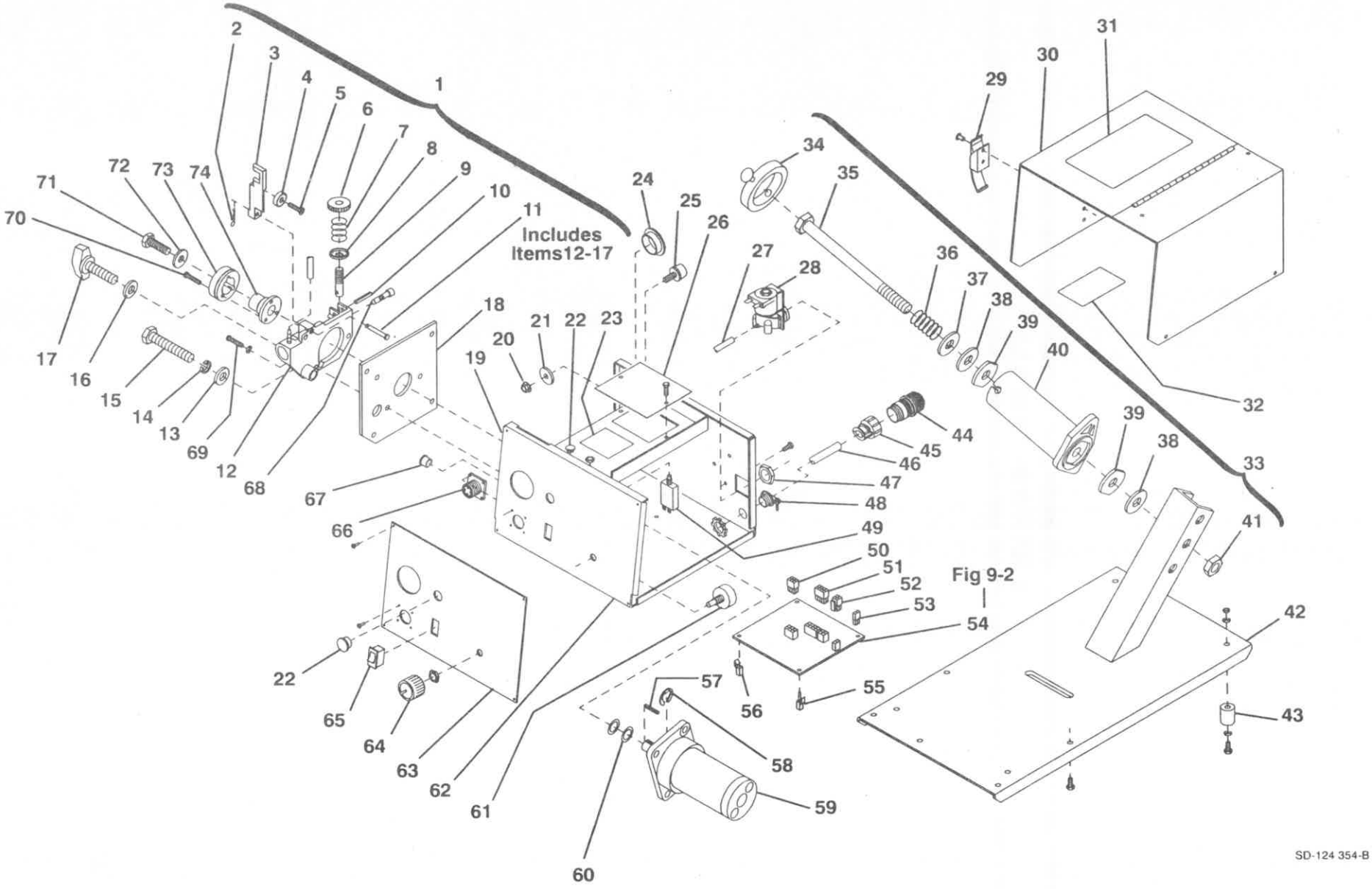

Figure 9-1. Main Assembly

Item No.	Dia. Mkgs.	Part No.	Description	Quantity
			Figure 9-1. Main Assembly	
1		127 232	DRIVE ASSEMBLY, wire (consisting of)	1
2		604 741	· PIN, cotter hair .042 x .937	1
3		112 031	· LEVER, pressure roll	1
4		111 523	· BEARING, ball rdl sgl row .315 x .866 x .275	1
5		114 415	· SCREW, mach stl phflh 10-24 x .625	1
6		092 237	· KNOB, adjustment tension	1
7		089 477	· SPRING, cprsn .770 OD .100 wire x .715	1
8		085 244	· WASHER, cupped stl .328 ID x .812 OD x .125 lg	1
9		089 562	· FASTENER, pinned	1
10		010 224	· PIN, spring CS .187 x 1.000	1
11		090 416	· PIN, hinge	1
12		124 817	· HOUSING, wire drive	1
13		602 243	· WASHER, flat stl std .375	1
14		602 213	· WASHER, lock stl split .375	1
15		601 966	· SCREW, cap stl hexhd .375-16 x 1.250	1
16		604 538	· WASHER, flat stl SAE .312	1
17		124 778	· KNOB, plstc T 1.000 lg x .312-18 x 2.000 bar	1
18		130 365	INSULATOR, housing drive	1
19		090 440	INSULATOR, cover housing	1
20		601 880	NUT, stl hex jam .500-13	1
21		010 291	WASHER, flat nylafil .625 ID x 1.250 OD x .125thk	1
22		107 983	BLANK, snap in nyl .500 mtg hole	2
23		071 602	LABEL, caution HF will damage	1
24		010 494	BUSHING, snap in nyl 1.375 ID x 1.750mtg hole	1
25		131 181	WIRE GUIDE & NUT, inlet	1
26			PLATE, ident control panel (order by model and serial number)	1
27		604 550	HOSE, nprn brd No. 1 x .187 ID (order by ft)	1ft
28	GS1	125 785	VALVE, 24VAC 2 way custom port 1/8 orf	1
29		137 304	LATCH, door	1
30		+122 313	WRAPPER	1
31		134 464	LABEL, warning general precautionary	1
32		090 439	LABEL, warning electric shock can kill	1
		126 873	BUMPER, polyurethane polymer .500sq adh backed	1
33		072 094	HUB & SPINDLE ASSEMBLY (consisting of)	1
34		058 427	· RING, retaining spool	1
35		072 292	· SHAFT, spool support	1
36		010 233	· SPRING, cprsn .970 OD x .120 wire x 1.250	1
37		057 971	· WASHER, flat stl keyed 1.500 dia x .125thk	1
38		010 191	· WASHER, fbr .656 ID 1.500 OD x .125thk	2
39		058 628	· WASHER, brake stl	2
40		058 428	· HUB, spool	1
41		135 205	· NUT, stl slflkg hex reg .625-11	1
42		137 461	BASE	1
43		134 306	FOOT, rubber 1.250dia x 1.375 high	4
44	RC100	141 162	HOUSING PLUG & PINS, (consisting of)	1
		134 731	· TERMINAL, male 1 pin 18-14 wire	14
45		143 922	CLAMP, cable strain relief sz 17 & 20	1
46		007 826	CABLE, port No. 18 3/c (order by ft)	11ft
47		605 227	NUT, nyl hex jam .750NPST	1
		120 304	BLANK, snap-in nyl .250mtg hole	3
48		115 104	CONNECTOR, clamp cable .500	1
49	CB1	123 745	CIRCUIT BREAKER, man reset 1P 4A 250VAC	1
50		115 093	HOUSING PLUG & SOCKETS, (consisting of)	1
		113 746	· TERMINAL, female 1skt 24-18 wire	6
51		115 092	HOUSING PLUG & SOCKETS, (consisting of)	1
		113 746	· TERMINAL, female 1skt 24-18 wire	8
52		115 094	HOUSING PLUG & SOCKETS, (consisting of)	1
		113 746	· TERMINAL, female 1skt 24-18 wire	4

Item No.	Dia. Mkgs.	Part No.	Description	Quantity
			Figure 9-1. Main Assembly (Continued)	
53		131 054	HOUSING RECEPTACLE & SOCKETS, (consisting of)	1
		113 746	· TERMINAL, female 1skt 24-18 wire	2
54	PC1	123 148	CIRCUIT CARD, motor control (Fig 9-2)	1
55		110 375	STAND-OFF SUPPORT, PC card No. 6 screw	2
56		123 810	STAND-OFF SUPPORT, PC card No. 6 screw	2
57		092 865	KEY, stl .122/.123 x .750	1
58		605 308	RING, retaining	1
59	M1	122 741	MOTOR, gear 24VDC 122RPM (consisting of)	1
		*136 745	· BRUSH & SPRING ASSEMBLY	2
60		079 625	WASHER, spring stl .500 shakeproof	2
61	R32	073 562	POTENTIOMETER, C 1/T 2W 10K ohm	1
62		137 814	CASE ASSEMBLY	1
63			NAMEPLATE (order by model and serial number)	1
64		097 922	KNOB, pointer	1
65	S1	111 997	SWITCH, rocker SPST 10A 250VAC	1
66	RC101	048 282	RECEPTACLE w/SOCKETS, (consisting of)	1
		079 534	· TERMINAL, female 1skt 18-14 wire	4
67		057 084	BUSHING, snap-in nyl .250 ID x .375mtg hole	1
68		058 549	GUIDE, wire inlet 1/16	1
69		605 758	SCREW, mach stl rdh 10-32 x 1.000	3
70		079 626	SCREW, mach stl filh 10-32 x .875	3
71		000 418	SCREW, cap stl hexhd slflkg .250-20 x .500	1
72		602 241	WASHER, flat stl SAE .250	1
73		124 818	ROLL, drive combination large	1
73		♦087 130	ROLL, drive V groove .023 wire	1
73		♦053 695	ROLL, drive V groove .030 wire	1
73		♦079 726	ROLL, drive VK groove .035 wire	2
73		♦079 728	ROLL, drive VK groove .045 wire	2
74		124 820	HUB, mtg roll drive	1
		♦108 008	REEL, wire 60 lb (Fig 9-3)	1

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

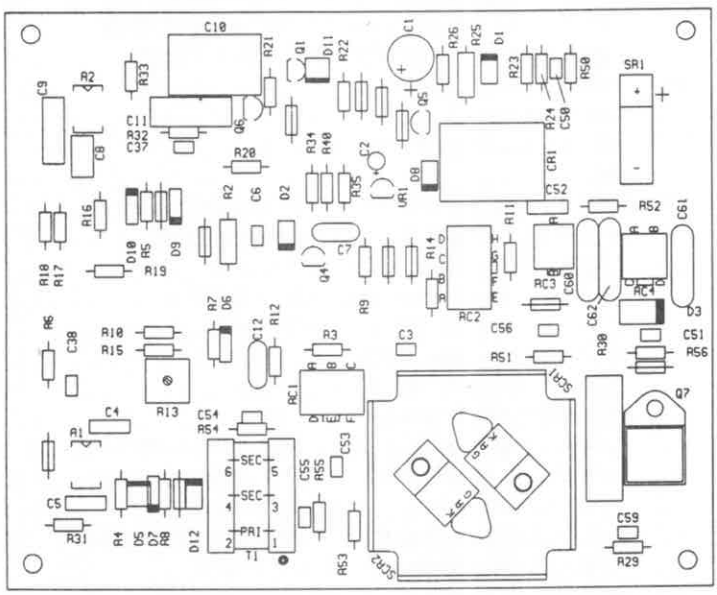

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Figure 9-2. Circuit Card, Motor Control PC1

Dia. Mkgs.	Part No.	Description	Quantity
PC1	**123 148**	**Figure 9-2. Circuit Card, Motor Control (Fig 9-1 Item 54)**	
A1,2	009 159	IC, linear 358	2
C1	039 482	CAPACITOR, elctlt 100uf 35VDC	1
C2	039 481	CAPACITOR, elctlt 3.3uf 50VDC	1
C3,6,37,38,50 51,53-56,59	122 723	CAPACITOR, cer mono .1uf 50VDC	11
C4,5,8	119 198	CAPACITOR, polye MF .33uf 100V	3
C7,12	000 340	CAPACITOR, cer disc .01uf 50VDC	2
C9	077 206	CAPACITOR, polye film .0047uf 100V	1
C10	031 693	CAPACITOR, polye film .33uf 100VDC	1
C11	035 522	CAPACITOR, polye film .047uf 100V	1
C52	119 197	CAPACITOR, polye MF .1uf 100V	1
C60-62	053 991	CAPACITOR, cer disc .05uf 500VDC	3
CR1	099 018	RELAY, encl 24VDC SPDT	1
D1,2,8,12	026 202	DIODE, rect 1A 400V SP	4
D3	087 294	DIODE, fast recovery 3A 400V	1
D5	037 250	DIODE, zener 24V 1W SP	1
D6,7,9,10	028 351	DIODE, sig .020A 75V	4
D11	032 210	DIODE, zener 10V 1W	1
Q1	039 355	TRANSISTOR, UJT 15MA 40V	1
Q4-6	037 200	TRANSISTOR, NPN 200MA 40V	3
Q7	121 129	TRANSISTOR, NPN 10A 100V	1
R2	028 284	RESISTOR, C .5W 27K ohm	1
R3,5,7,8	093 037	RESISTOR, MF .25W 47.5K ohm	4
R4,31	044 789	RESISTOR, MF .25W 100K ohm	2
R6,22	072 559	RESISTOR, MF .25W 22.1K ohm	2
R9,17,33	000 885	RESISTOR, MF .25W 10K ohm	3
R10	035 829	RESISTOR, MF .25W 1.5K ohm	1
R11	035 888	RESISTOR, CF .25W 2.2K ohm	1
R12,14,24,26,40	072 560	RESISTOR, MF .25W 1K ohm	5
R13	006 424	POTENTIOMETER, cermet trmr 1/T .5W 2K ohm	1
R15,35	035 828	RESISTOR, MF .25W 243 ohm	2
R16	052 143	RESISTOR, MF .25W 162K ohm	1
R18	093 041	RESISTOR, MF .25W 150K ohm	1
R19	093 030	RESISTOR, MF .25W 15K ohm	1
R20	052 139	RESISTOR, MF .25W 39.2K ohm	1
R21	039 106	RESISTOR, CF .25W 470 ohm	1
R23	108 437	RESISTOR, CF .25W 4.75K ohm	1
R25	030 105	RESISTOR, C .5W 680 ohm	1
R29	084 205	RESISTOR, MF .25W 3.32K ohm	1
R30	030 098	RESISTOR, WW fxd 5W 1 ohm	1
R32	072 677	RESISTOR, MF .25W 33.2K ohm	1
R34	108 436	RESISTOR, MF .25W 4.32K ohm	1
R50,53,56	605 919	RESISTOR, C .25W 47 ohm	3
R51,52,54,55	605 918	RESISTOR, C .25W 100 ohm	4
	092 648	RESISTOR, WW fxd zero ohm	12
RC1	114 654	TERMINAL, hdr 6 pin	1
RC2	113 749	TERMINAL, hdr 8 pin	1
RC3	117 038	TERMINAL, hdr 2 pin	1
RC4	113 748	TERMINAL, hdr 4 pin	1
SCR1,2	080 508	THYRISTOR, SCR 8.5A 200V	2
SR1	121 131	RECTIFIER, integ 8A 100V	1
T1	111 910	TRANSFORMER, pulse	1
VR1	091 256	I C, linear 317L	1

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

Item No.	Part No.	Description	Quantity
	108 008	**Figure 9-3. Reel, Wire 60 lb (Fig 9-1)**	
1	124 904	NUT, spanner spool support	1
2	124 905	RETAINER, spool support	1
3	124 900	SUPPORT, reel spool	1

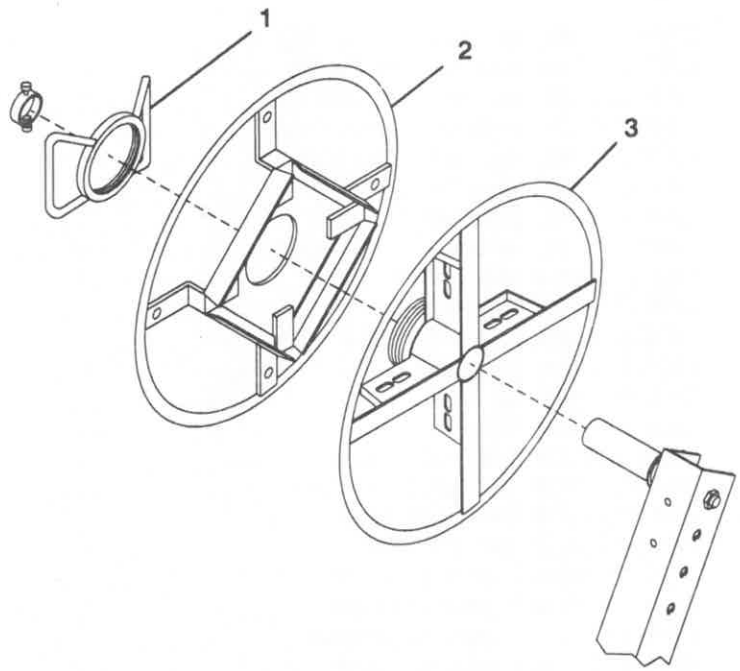

Figure 9-3. Reel, Wire 60 lb

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

OPTIONS AND ACCESSORIES

FEEDER CART
(#046 564)

PSA 115/24 VAC
(#122 199)
Required when using with power sources having only 115 VAC available. Mounts at power source and includes a 5 ft. (1.5 m) 115 VAC cord and contactor cord with Hubbell connectors. A simple modification in the PSA control also allows it to be used with competitive constant voltage power sources requiring a contact closure for contactor control. The PSA includes a 14-pin receptacle for direct connection of the standard interconnecting cord and optional extension cords. Bracket included for side mounting to the power source. NOTE: When using the PSA control, the optional remote voltage control is not functional.

REEL AND SPOOL COVERS
(#058 256)
For 60 lb. (27.2 kg) coil.
(#057 607)
For 12 in. (304 mm) spool.

HANGING BAIL
(#058 435)
Suspends feeder over the work area.

WIRE REEL ASSEMBLY
(#108 008)
For 60 lb. (27.2 kg) coil of wire.

TURNTABLE ASSEMBLY
(#123 610)
Allows rotation of feeder as operator changes work positions. This reduces strain and bending on gun cable.

CARRYING CART
(#056 301)
Height: 34 in. (863 mm)
Lower Tray Height: 9 in. (228 mm)
Shipped disassembled.

SPOOL ADAPTER
(#047 141)
For use with 14 lb. (6.4 kg) spool of Lincoln self-shielding wire.

SPOT/BURNBACK CONTROL
(#121 562)
Installs inside feeder. Provides up to 5 seconds of spot weld time in two ranges. Time starts with depression of gun trigger switch. Burnback control up to 0.25 seconds. Can be used in the spot or continuous mode.