LINCOLN® WELDERS

IM-453-A

December, 1992

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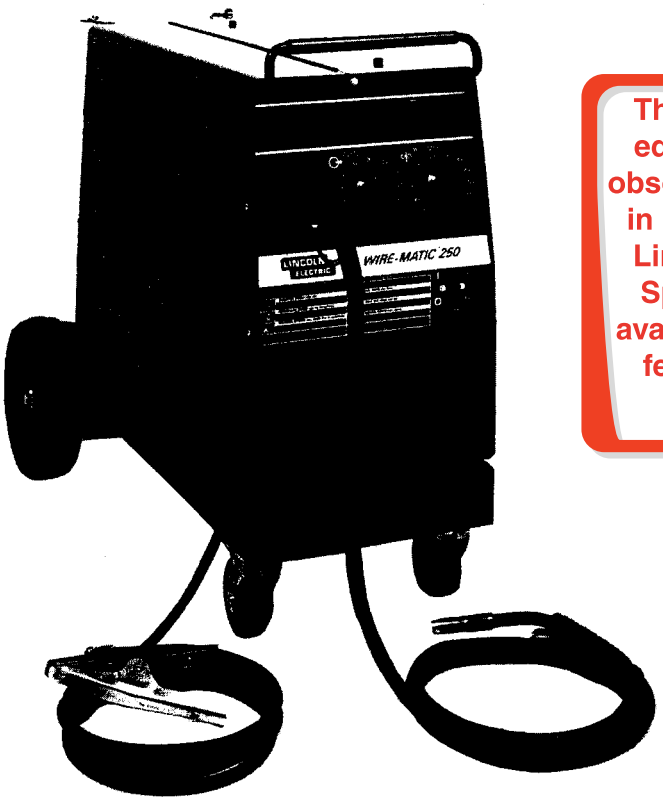
WM-250; 9799; 9800; 10003; 10004

OPERATING MANUAL

WIRE-MATIC™ 250



This manual covers equipment which is obsolete and no longer in production by The Lincoln Electric Co. Specifications and availability of optional features may have changed.

DAMAGE CLAIMS

When this equipment is shipped, title passes to the purchaser upon receipt by the carrier. Consequently, claims for material damaged in shipment must be made by the purchaser against the transportation company at the time the shipment is received.

SAFETY DEPENDS ON YOU

Lincoln arc welding equipment is designed and built with safety in mind. However, your overall safety can be increased by proper installation ... and thoughtful operation on your part. DO NOT INSTALL, OPERATE OR REPAIR THIS EQUIPMENT WITHOUT READING THIS OPERATING MANUAL AND THE ARC WELDING SAFETY PRECAUTIONS ON PAGES 2, 3, AND 4. And, most importantly, think before you act and be careful.

LINCOLN® ELECTRIC

THE LINCOLN ELECTRIC COMPANY

World's Leader in Welding and Cutting Products • Premier Manufacturer of Industrial Motors

Sales and Service through Subsidiaries and Distributors Worldwide

Cleveland, Ohio 44117-1199 U.S.A.

ARC WELDING SAFETY PRECAUTIONS

WARNING: PROTECT YOURSELF AND OTHERS FROM POSSIBLE SERIOUS INJURY OR DEATH.

ELECTRIC SHOCK can kill.

1. a. The electrode and work (or ground) circuits are electrically "hot" when the welder is on. Do not touch these "hot" parts with your bare skin or wet clothing. Wear dry, hole-free gloves to insulate hands.

   b. Insulate yourself from workpiece and ground using dry insulation. Make certain the insulation is large enough to cover your full area of physical contact with work and ground.

   In addition to the normal safety precautions, if welding must be performed under electrically hazardous conditions (in damp locations or while wearing wet clothing; on metal structures such as floors, gratings or scaffolds; when in cramped positions such as sitting, kneeling or lying, if there is a high risk of unavoidable or accidental contact with the workpiece or ground) use the following equipment:
   - Semiautomatic DC Constant Voltage Welder
   - DC Manual (Stick) Welder.
   - AC Welder with Reduced Voltage Control.

   c. In semiautomatic or automatic wire welding, the electrode, electrode reel, welding head, nozzle or semiautomatic welding gun are also electrically "hot".

   d. Always be sure the work cable makes a good electrical connection with the metal being welded. The connection should be as close as possible to the area being welded.

   e. Ground the work or metal to be welded to a good electrical (earth) ground.

   f. Maintain the electrode holder, work clamp, welding cable and welding machine in good, safe operating condition. Replace damaged insulation.

   g. Never dip the electrode in water for cooling.

   h. Never simultaneously touch electrically "hot" parts of electrode holders connected to two welders because voltage between the two can be the total of the open circuit voltage of both welders.

   i. When working above floor level, protect yourself from a fall should you get a shock.

   j. Also see Items 4c and 6.

ARC RAYS can burn.

2. a. Use a shield with the proper filter and cover plates to protect your eyes from sparks and the rays of the arc when welding or observing open arc welding. Headshield and filter lens should conform to ANSI Z87.1 standards.

   b. Use suitable clothing made from durable flame-resistant material to protect your skin and that of your helpers from the arc rays.

   c. Protect other nearby personnel with suitable non-flammable screening and/or warn them not to watch the arc nor expose themselves to the arc rays or to hot spatter or metal.

FUMES AND GASES can be dangerous.

3. a. Welding may produce fumes and gases hazardous to health. Avoid breathing these fumes and gases. When welding, keep your head out of the fume. Use enough ventilation and/or exhaust at the arc to keep fumes and gases away from the breathing zone. When welding on galvanized, lead or cadmium plated steel and other metals which produce toxic fumes, even greater care must be taken.

   b. Do not weld in locations near chlorinated hydrocarbon vapors coming from degreasing, cleaning or spraying operations. The heat and rays of the arc can react with solvent vapors to form phosgene, a highly toxic gas, and other irritating products.

   c. Shielding gases used for arc welding can displace air and cause injury or death. Always use enough ventilation, especially in confined areas, to insure breathing air is safe.

   d. Read and understand the manufacturer's instructions for this equipment and the consumables to be used, including the material safety data sheet (MSDS) and follow your employer's safety practices.

   e. Also see item 7b.

WELDING SPARKS can cause fire or explosion.

4. a. Remove fire hazards from the welding area. If this is not possible, cover them to prevent the welding sparks from starting a fire. Remember that welding sparks and hot materials from welding can easily go through small cracks and openings to adjacent areas. Have a fire extinguisher readily available.

   b. Where compressed gases are to be used at the job site, special precautions should be used to prevent hazardous situations. Refer to "Safety in Welding and Cutting" (ANSI Standard Z49.1) and the operating information for the equipment being used.

   c. When not welding, make certain no part of the electrode circuit is touching the work or ground. Accidental contact can cause overheating and create a fire hazard.

   d. Do not heat, cut or weld tanks, drums or containers until the proper steps have been taken to insure

that such procedures will not cause flammable or toxic vapors from substances inside. They can cause an explosion even though they have been "cleaned." For information purchase "Recommended Safe Practices for the Preparation for Welding and Cutting of Containers and Piping That Have Held Hazardous Substances", AWS F4.1-80 from the American Welding Society (see address below).

e. Vent hollow castings or containers before heating, cutting or welding. They may explode.

f. Sparks and spatter are thrown from the welding arc. Wear oil free protective garments such as leather gloves, heavy shirt, cuffless trousers, high shoes and a cap over your hair. Wear ear plugs when welding out of position or in confined places. Always wear safety glasses with side shields when in a welding area.

g. Connect the work cable to the work as close to the welding area as practical. Work cables connected to the building framework or other locations away from the welding area increase the possibility of the welding current passing through lifting chains, crane cables or other alternate circuits. This can create fire hazards or overheat lifting chains or cables until they fail.

h. Also see item 7c.

CYLINDER may explode if damaged.

5. a. Use only compressed gas cylinders containing the correct shielding gas for the process used and properly operating regulators designed for the gas and pressure used. All hoses, fittings, etc. should be suitable for the application and maintained in good condition.

b. Always keep cylinders in an upright position securely chained to an undercarriage or fixed support.

c. Cylinders should be located:
- Away from areas where they may be struck or subjected to physical damage.
- A safe distance from arc welding or cutting operations and any other source of heat, sparks, or flame.

d. Never allow the electrode, electrode holder, or any other electrically "hot" parts to touch a cylinder.

e. Keep your head and face away from the cylinder valve outlet when opening the cylinder valve.

f. Valve protection caps should always be in place and handtight except when the cylinder is in use or connected for use.

g. Read and follow the instructions on compressed gas cylinders, associated equipment, and CGA publication P-1, "Precautions for Safe Handling of Compressed Gases in Cylinders," available from the Compressed Gas Association, 1235 Jefferson Davis Highway, Arlington, VA 22202.

FOR ELECTRICALLY powered equipment.

6. a. Turn off input power using the disconnect switch at the fuse box before working on the equipment.

b. Install equipment in accordance with the U.S. National Electrical Code, all local codes and the manufacturer's recommendations.

c. Ground the equipment in accordance with the U.S. National Electrical Code and the manufacturer's recommendations.

FOR ENGINE powered equipment.

7. a. Turn the engine off before troubleshooting and maintenance work unless the maintenance work requires it to be running.

b. Operate engines in open, well-ventilated areas or vent the engine exhaust fumes outdoors.

c. Do not add the fuel near an open flame, welding arc or when the engine is running. Stop the engine and allow it to cool before refueling to prevent spilled fuel from vaporizing on contact with hot engine parts and igniting. Do not spill fuel when filling tank. If fuel is spilled, wipe it up and do not start engine until fumes have been eliminated.

d. Keep all equipment safety guards, covers and devices in position and in good repair. Keep hands, hair, clothing and tools away from V-belts, gears, fans and all other moving parts when starting, operating or repairing equipment.

e. In some cases it may be necessary to remove safety guards to perform required maintenance. Remove guards only when necessary and replace them when the maintenance requiring their removal is complete. Always use the greatest care when working near moving parts.

f. Do not put your hands near the engine fan. Do not attempt to override the governor or idler by pushing on the throttle control rods while the engine is running.

g. To prevent accidentally starting gasoline engines while turning the engine or welding generator during maintenance work, disconnect the spark plug wires, distributor cap or magneto wire as appropriate.

h. To avoid scalding, do not remove the radiator pressure cap when the engine is hot.

HAVE ALL INSTALLATION, OPERATION, MAINTENANCE AND REPAIR WORK performed by qualified people.

For more detailed information, it is strongly recommended that you purchase a copy of "Safety in Welding & Cutting — ANSI Standard Z49.1" from the American Welding Society, P.O. Box 351040, Miami, Florida 33135 or CSA Standard W117.2-1974.

PRÉCAUTIONS DE SÛRETÉ

Pour votre propre protection lire et observer toutes les instructions et les précautions de sûreté specifiques qui parraissent dans ce manuel aussi bien que les prècautions de sûreté générales suivantes:

Sûreté Pour Soudage A L'Arc

1. Protegez-vous contre la secousse électrique:
   a. Les circuits à l'électrode et à la piéce sont sous tension quand la machine à souder est en marche. Eviter toujours tout contact entre les parties sous tension et la peau nue ou les vètements mouillés. Porter des gants secs et sans trous pour isoler les mains.
   b. Faire trés attention de bien s'isoler de la masse quand on soude dans des endroits humides, ou sur un plancher metallique, ou des grilles metalliques, principalement dans les positions assis ou couché pour lesquelles une grande partie du corps peut être en contact avec la masse.
   c. Maintenir le porte-électrode, la pince de masse, le câble de soudage et la machine à souder en bon et sûr état de fonctionnement.
   d. Ne jamais plonger le porte-électrode dans l'eau pour le refroidir.
   e. Ne jamais toucher simultanément les parties sous tension des porte-électrodes connectés à deux machines à souder parce que la tension entre les deux pinces peut être le total de la tension à vide des deux machines.
   f. Si on utilise la machine à souder comme une source de courant pour soudage semi-automatique, ces précautions pour le porte-électrode s'applicuent aussi au pistolet de soudage.
2. Dans le cas de travail au dessus du niveau du sol, se protéger contre les chutes dans le cas ou on recoit un choc. Ne jamais enrouler le câble-électrode autour de n'importe quelle partie du corps.
3. Un coup d'arc peut être plus sévère qu'un coup de soliel, donc:
   a. Utiliser un bon masque avec un verre filtrant approprié ainsi qu'un verre blanc afin de se protéger les yeux du rayonnement de l'arc et des projections quand on soude ou quand on regarde l'arc.
   b. Porter des vêtements convenables afin de protéger la peau de soudeur et des aides contre le rayonnement de l'arc.
   c. Protéger l'autre personnel travaillant à proximité au soudage à l'aide d'écrans appropriés et non-inflammables.
4. Des gouttes de laitier en fusion sont émises de l'arc de soudage. Se protèger avec des vêtements de protection libres de l'huile, tels que les gants en cuir, chemise épaisse, pantalons sans revers, et chaussures montantes.
5. Toujours porter des lunettes de sécurité dans la zone de soudage. Utiliser des lunettes avec écrans lateraux dans les zones où l'on pique le laitier.
6. Eloigner les matériaux inflammables ou les recouvrir afin de prévenir tout risque d'incendie dû aux étincelles.
7. Quand on ne soude pas, poser la pince à une endroit isolé de la masse. Un court-circuit accidental peut provoquer un èchauffement et un risque d'incendie.
8. S'assurer que la masse est connectée le plus prés possible de la zone de travail qu'il est pratique de le faire. Si on place la masse sur la charpente de la construction ou d'autres endroits éloignés de la zone de travail, on augmente le risque de voir passer le courant de soudage par les chaines de levage, câbles de grue, ou autres circuits. Cela peut provoquer des risques d'incendie ou d'echauffement des chaines et des câbles jusqu'à ce qu'ils se rompent.
9. Assurer une ventilation suffisante dans la zone de soudage. Ceci est particulièrement important pour le soudage de tôles galvanisées plombées, ou cadmiées ou tout autre métal qui produit des fumeés toxiques.
10. Ne pas souder en présence de vapeurs de chlore provenant d'opérations de dégraissage, nettoyage ou pistolage. La chaleur ou les rayons de l'arc peuvent réagir avec les vapeurs dû solvant pour produire du phosgéne (gas fortement toxique) ou autres produits irritants.
11. Pour obtenir de plus amples renseignements sur la sûreté, voir le code "Code for safety in welding and cutting" CSA Standard W 117.2-1974.

PRÉCAUTIONS DE SÛRETÉ POUR LES MACHINES À SOUDER À TRANSFORMATEUR ET À REDRESSEUR

1. Relier à la terre le chassis du poste conformement au code de l'électricité et aux recommendations du fabricant. Le dispositif de montage ou la piece à souder doit être branché à une bonne mise à la terre.
2. Autant que possible, l'installation et l'entretien du poste seront effectués par un électricien qualifié.
3. Avant de faires des travaux à l'interieur de poste, la debrancher à l'interrupteur à la boite de fusibles.
4. Garder tous les couvercles et dispositifs de sûreté à leur place.

Wire-Matic™ 250

effective code 10,004 and above

The new units now offer a choice of "SLOW" or "FAST" run-in for the first 2 seconds of starting wire feeding. Previous units (below code 10,000) always start with "SLOW" run-in.

To set "FAST" run-in:

1. Turn front panel power switch OFF.
2. Turn wire feed speed to MAXIMUM.
3. Hold gun trigger CLOSED and turn power back ON.
4. When you have heard gas solenoid click **4** times; "FAST" setup is complete.

To set "SLOW" run-in:

1. Turn front panel power switch OFF.
2. Turn wire feed speed to MINIMUM.
3. Hold gun trigger closed and turn power back ON.
4. When you have heard gas solenoid click **2** times; "SLOW" setup is complete.

Once set, the run-in will stay in that mode until the unit is reprogrammed. No need to reprogram each time unit is powered up.

This improvement is made with the new S20311-4 ROM for the existing G2332-1 Control Board.

All other operation remains the same as described in IM-453.

September 1993

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PART A

PART B

PART A

1. PRODUCT DESCRIPTION

The Wire-Matic™ 250 is a complete semiautomatic constant voltage DC arc welding machine built to meet NEMA specifications. It combines a constant voltage power source and a constant speed wire feeder with a microcomputer-based controller to form a reliable high-performance welding system. A simple control scheme, consisting of continuous full range calibrated voltage and wire feed speed controls, provides versatility with ease of use.

An optional timer kit provides variable burnback control, spot and stitch functions, and a selectable 4-step trigger interlock. Also optional is an adjustable gas regulator and hose kit for use with CO_2 or argon blended gas.

Other features include a "drop-in" 2" (51 mm) O.D. wire reel spindle, an integral gas cylinder mounting undercarriage, a 12 ft (3.6 m) Magnum 250L GMAW gun and cable, a 10 ft (3.0 m) power cable with plug and mating receptacle, a 10 ft (3.0 m) work cable, and a work clamp.

2. RECOMMENDED PROCESSES AND EQUIPMENT

The K578 Wire-Matic 250 is recommended for GMA welding processes using 10 to 30 lb (4.5 to 13.6 kg) 2" (51 mm) I.D. spools or Readi-Reel® coils (with optional adapter) of .025" through .045" (0.6-1.2 mm) solid steel, .035" (0.9 mm) stainless, 3/64" (1.2 mm) aluminum and .045 (1.2 mm) Outershield®; as well as .035" (0.9 mm) and .045" (1.2 mm) Innershield® self-shielding electrodes.

The Wire-Matic is factory equipped to feed .035" (0.9 mm) and .045" (1.2 mm) electrodes and includes a 200A, 60% duty cycle (or 250A, 35% duty cycle) rated, 12 ft (3.6 m) GMAW gun and cable assembly equipped for these wire sizes. Use of GMAW processes requires use of the optional gas regulator and a supply of shielding gas.

3. SPECIFICATIONS

Type	K578-1 and K578-2		
Open Circuit Voltage	10 – 40V		
Output Range	30A/5V – 250A/26V		
Rated Output	145A/26V	200A/28V[1]	250A/26V
Duty Cycle	100%	60%	35%
Input Power (Single phase 60Hz) @ Rated Output (K578-1)	208/230V 36/33A	208/230V 44/40A	208/230V 53/49A
Input Power (Single phase 60 Hz) @ Rated Output (K578-2)	230/460/575V 34/17/14A	230/460/575V 42/21/17A	230/460/575V 50/25/20A
Wire Speed Range	50-600 IPM (1.27 – 15.2 m/minute)		
Weight (with gun)	220 lbs. (100 kg)		
H x W x D (in.) (mm)	28.2 x 18.8 x 40.1 [excluding 2.4" (61 mm) handle height] (719 x 480 x 1019)		
Operating Temp.	-20°C to 40°C		
Storage Temp.	± 40°C		

[1] NEMA Class 1 (60) Rating

PART B

1. INSTALLATION

1.1 Safety Precautions

WARNING: TURN THE INPUT POWER OFF AT THE DISCONNECT SWITCH BEFORE ATTEMPTING TO CONNECT THE INPUT POWER TO THE WIRE-MATIC 250.

- Only qualified personnel should perform this installation.
- Machine must be connected to system ground per the U.S. National Electrical Code and any applicable local codes.
- Turn the power switch on the Wire-Matic 250 "off" before connecting or disconnecting gun and cable, output cables or other equipment.

1.2 Uncrating the Wire-Matic 250

Remove the staples from the bottom edge of the carton and lift off. Cut the tape securing the two rear wheels to the wooden shipping pallet. Using a 1/2 inch (13 mm) wrench or socket, remove the two screws which attach the pallet to the bottom of the Wire-Matic 250.

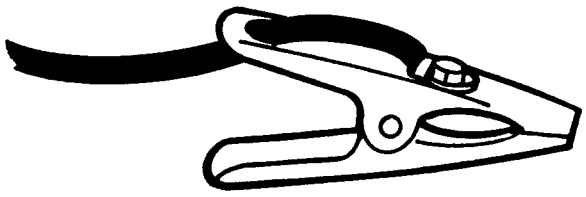
1.3 Location

Locate the welder in a dry location where there is free circulation of clean air into the louvers in the back and out the front. A location that minimizes the amount of smoke and dirt drawn into the rear louvers reduces the chance of dirt accumulation that can block air passages and cause overheating.

1.4 Work Clamp Installation

Attach the work clamp provided to the cable which extends from the front of the machine per the following:

1. Insert the lug on the end of the cable through the strain relief hole in the work clamp as shown below.
2. Fasten securely with the bolt and nut provided.



1.5 Input Power and Grounding Connections

⚠ WARNING

ELECTRIC SHOCK can kill.

- **Do not touch electrically live parts such as output terminals or internal wiring**

WARNING: ALL INPUT POWER MUST BE ELECTRICALLY DISCONNECTED BEFORE PROCEEDING.

1. Before starting the installation, check with the local power company if there is any question about whether your power supply is adequate for the voltage, amperes, phase, and frequency specified on the welder nameplate. Also be sure the planned installation will meet the U.S. National Electrical Code and local code requirements. This welder may be operated from a single phase line or from one phase of a two or three phase line.
2. Models that have multiple input voltages specified on the nameplate (e.g., 208/230) are shipped connected for the highest voltage. If the welder is to be operated on lower voltage, it must be reconnected according to the instructions on the inside of the removable panel near the top left side of the rear panel. These instructions are repeated below.

INPUT SUPPLY RECONNECT DIAGRAM FOR DUAL VOLTAGE MACHINES

⚠ WARNING

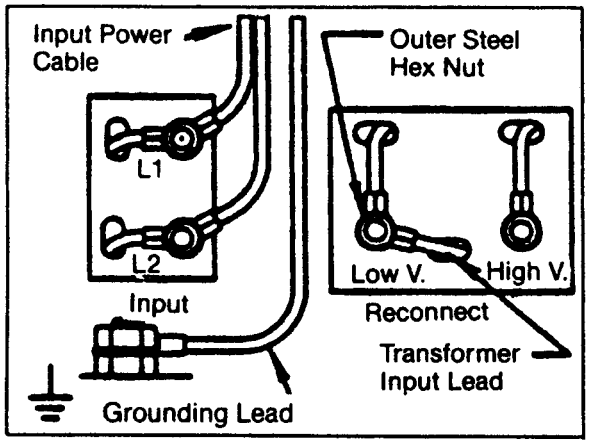
HIGH VOLTAGE can kill

- **Remove input power to the welder by unplugging the power cable before installing or servicing this machine.**
- **Do not touch electrically "HOT" parts such as output terminals or internal windings.**
- **Grounding screw (⏚) must be connected to a good earth ground through the cable plug per National Electrical Code.**
- **Do not operate with covers removed.**
- **Only qualified personnel should install or service this equipment.**

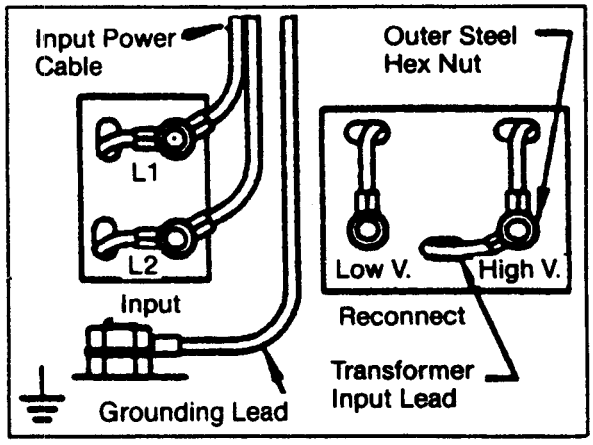
All machines are shipped from the factory connected for the higher of the two input voltages listed on the nameplate.

To change voltage connection proceed as follows:

1. Remove the outer steel hex nut from the terminal where the transformer input lead is connected.
2. Shift the transformer input lead to the terminal that the unit is to operate on and fasten securely with the hex nut removed in step 1. Make certain that brass nuts are tight.



Lower Voltage Connection



Higher Voltage Connection

S19070 12-90

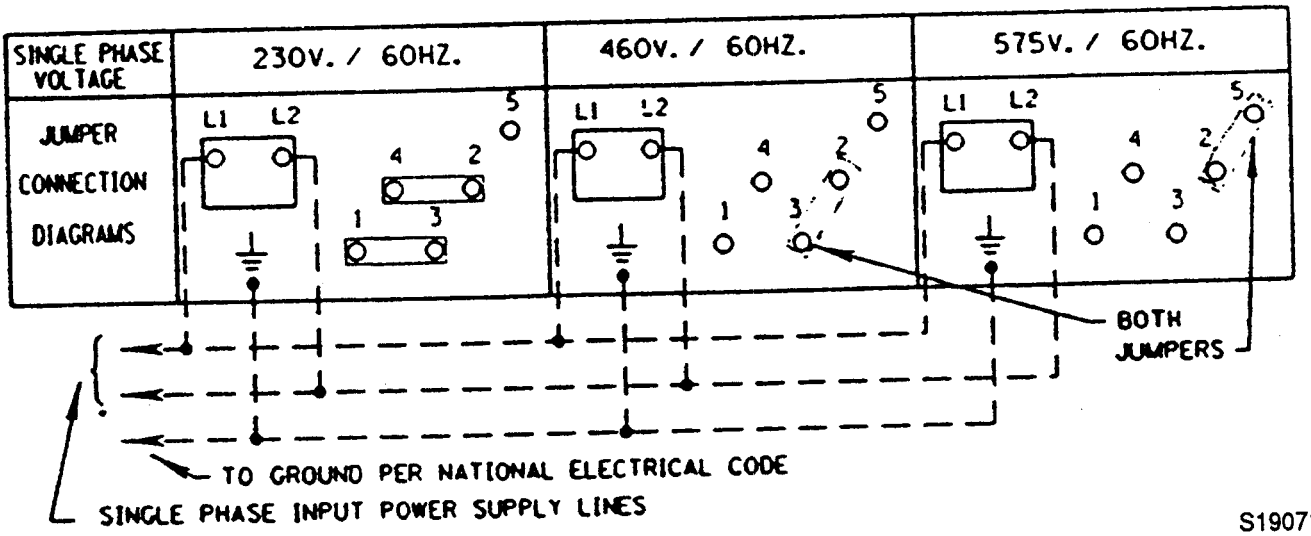
SINGLE PHASE INPUT SUPPLY RECONNECT DIAGRAM FOR 230/460/575 60 HZ MACHINES

WARNING

HIGH VOLTAGE can kill

- **Turn the input power off at the disconnect switch before installing or servicing this machine.**
- **Do not touch electrically "HOT" parts such as output terminals or internal windings.**
- **Grounding screw (⏚) must be connected to a good earth ground per National Electrical Code.**
- **Do not operate with covers removed.**
- **Only qualified personnel should install or service this equipment.**

1. All machines are shipped from the factory connected for the highest nameplated single phase input voltage. To change connections for a different input voltage, reconnect both copper jumpers per diagram below. Always connect jumpers between outer steel nut and inner brass nut on terminal studs.
2. Connect the input power to the input terminal studs L1 and L2 at the upper left corner of the panel. Connect lead lugs between outer steel nut and inner brass nut on terminal studs.
3. Connect a grounding lead to the ground stud (⏚) on the machine near the input terminal studs.



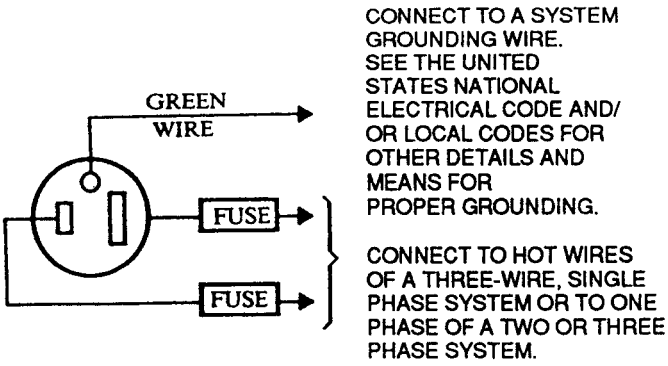
WARNING: MAKE CERTAIN THAT THE INPUT POWER IS ELECTRICALLY DISCONNECTED BEFORE REMOVING THE SCREW THAT HOLDS THE REMOVABLE REAR PANEL IN PLACE.

3. The 208/230 volt 60 Hz model Wire-Matic is shipped with a 10 ft input cable and plug connected to the welder. A matching receptacle is supplied with the machine. Mount the receptacle in a suitable location using the screws provided. Be sure it can be reached by the plug on the input cable attached to the welder. Mount with the grounding terminal at the top to allow the power cable to hang down without bending.

   The 230/460/575 volt 60 Hz model is not equipped with a plug, an input cable or a receptacle.

4. Using the following instructions have a qualified electrician connect the receptacle or cable to the input power lines and the system ground per the U.S. National Electrical Code and any applicable local codes. See the table for proper wire sizes. For long runs over 100 feet, larger copper wires should be used. Fuse the two hot lines with super lag type fuses as shown in the following diagram. The center contact in the receptacle is for the grounding connection. A green wire in the input cable connects this contact to the frame of the welder. This ensures proper grounding of the welder frame when the welder plug is inserted into the receptacle.

Input Voltage	Hertz	Type 75°C Wire in Conduit, Copper Cond. Awg Size.		Grounding Wire Copper Cond. AWG Size	Fuse Size (Super Lag)
		Runs to 100 Ft	Runs over 100 Ft		
208	60	8	6	10	60
230	60	10	8	10	60
460	60	14	12	10	30
575	60	14	12	10	25



1.6 Output Polarity Connection

WARNING: TURN THE WELDER POWER SWITCH OFF BEFORE CHANGING OUTPUT CONNECTION.

The welder, as shipped from the factory, is connected for electrode positive (+) polarity. This is the normal polarity for GMA welding.

If negative (–) polarity is required, interchange the connection of the two cables located in the wire drive compartment near the front panel. The negative lead is the lead closest to the front panel (where the leads come out of the floor of the compartment) and should be reconnected to the brass conductor block of the gun connector. The positive lead is stamped (+) on its terminal and should be reconnected to the work lead stud.

1.7 Gun and Cable

The Magnum 250L gun and cable provided with the Wire-Matic 250 is factory installed with a liner for .035-.045" (0.9-1.2 mm) electrode and an .035" (0.9 mm) contact tip. Install the .045 tip (also provided) if this wire size is being used. For other wire sizes, see Section 1.9.2.

WARNING: TURN THE WELDER POWER SWITCH OFF BEFORE INSTALLING GUN AND CABLE.

1. Lay the cable out straight.
2. Unscrew wing screw on conductor block inside wire feed compartment until tip of screw no longer protrudes into gun opening as seen from front of machine.
3. Insert the brass connector on end of gun cable into conductor block through opening in front panel. Make sure connector is fully inserted and tighten wing screw.
4. Connect the gun trigger connector from the gun and cable to the mating receptacle on the front panel. Make sure that the keyways are aligned, insert and tighten retaining ring.

NOTE: If a gun and cable other than the Magnum 250L is used, it must conform to connector specifications and the gun trigger switch must be capable of switching 5 milliamps at 15 volts DC – resistive.

CAUTION: The gun trigger switch connected to the gun trigger control cable must be a normally open, momentary switch. The terminals of the switch must be insulated from the welding circuit. Improper operation of or damage to the Wire-Matic 250 might result if this switch is common to an electrical circuit other than the Wire-Matic 250 trigger circuit.

1.8 Shielding Gas (For Gas Metal Arc Welding Processes)

Customer must provide cylinder of appropriate type shielding gas for the process being used, a proper gas flow regulator and an inlet gas hose.

The optional K586-1 Adjustable Gas Regulator and Hose Kit, for CO2 or Argon blend gas, is recommended for use with the Wire-Matic 250.

Install shielding gas supply as follows, or per S20317 instructions included with the K586-1 kit:

WARNING: GAS UNDER PRESSURE IS EXPLOSIVE. ALWAYS KEEP GAS CYLINDERS IN AN UPRIGHT POSITION AND ALWAYS KEEP CHAINED TO UNDERCARRIAGE OR STATIONARY SUPPORT. SEE AMERICAN NATIONAL STANDARD Z-49.1, "SAFETY IN WELDING AND CUTTING" PUBLISHED BY THE AMERICAN WELDING SOCIETY.

1. Set gas cylinder in rear platform of Wire-Matic 250. Hook chain in place to secure cylinder to rear of welder.
2. Remove the cylinder cap. Inspect the cylinder valves for damaged threads, dirt, dust, oil or grease. Remove dust and dirt with a clean cloth.

   DO NOT ATTACH THE REGULATOR IF OIL, GREASE OR DAMAGE IS PRESENT! Inform your gas supplier of this condition. Oil or grease in the presence of high pressure oxygen is explosive.
3. Stand to one side away from the outlet and open the cylinder valve for an instant. This blows away any dust or dirt which may have accumulated in the valve outlet.

WARNING: BE SURE TO KEEP YOUR FACE AWAY FROM THE VALVE OUTLET WHEN "CRACKING" THE VALVE.

4. Inspect the regulator for damaged threads, dirt, dust, oil or grease. Remove dust and dirt with a clean cloth.

DO NOT USE THE REGULATOR IF OIL, GREASE OR DAMAGE IS PRESENT! Have an authorized repair station clean the regulator or repair any damage.

5. Attach the flow regulator to the cylinder valve and tighten the union nut(s) securely with a wrench.

   NOTE: If connecting to 100% CO_2 cylinder, insert regulator adapter (provided with K586-1 kit) between regulator and cylinder valve. If adapter is equipped with a plastic washer, be sure it is seated for connection to the CO_2 cylinder.

6. Attach one end of the inlet gas hose to the outlet fitting of the flow regulator, the other end to the Wire-Matic 250 rear fitting, and tighten the union nuts securely with a wrench.
7. Before opening the cylinder valve, turn the regulator adjusting knob counter-clockwise until the adjusting spring pressure is released.
8. Open the cylinder valve slowly a fraction of a turn. When the cylinder pressure gauge pointer stops moving, open the valve fully.

WARNING: NEVER STAND DIRECTLY IN FRONT OF OR BEHIND THE FLOW REGULATOR WHEN OPENING THE CYLINDER VALVE. ALWAYS STAND TO ONE SIDE.

9. The K586-1 flow regulator is adjustable. Set it for the flow rate recommended for the procedure and process being used before making the weld.

1.9 Wire Size Conversion Parts

The Wire-Matic 250 is rated to feed .025 through .045" (0.6-1.2 mm) solid or cored electrode sizes.

The following drive rolls and Magnum 250L gun and cable parts are available to feed different sizes and types of electrodes.

1.9.1 Drive Rolls

See Section 2.4 for installation

Steel Wire Sizes:	Part No.
.025-.035" (0.6-0.9 mm)	M14932
.030-.045" (0.8-1.2 mm)	M15809
.045" Cored (1.2 mm)	S14541-052 (2 reqd)
Aluminum Wire Sizes:	
3/64" (1.2 mm)	S17092-3/64A

1.9.2 Magnum 250L Gun and Cable Parts

(See Section 3.3 for replacement parts and instructions)

1.10 Timer Kit Installation (Optional K585-1)

The timer kit adds selectable 4-step trigger interlock, spot and stitch functions and manual adjustment of burnback time. Install as follows, or per the S20274 instructions included with the kit:

WARNING: Remove all input power to the Wire-Matic 250 before proceeding.

1. Verify that the following items have been included in the kit:
   A. Timer board and panel assembly.
   B. Two sheet metal screws.
   C. Wiring harness.
2. Prepare for kit installation by turning the power switch off and disconnecting power from the machine.
3. Remove the top cover panel from the front of the machine by removing the two screws which secure it using a screwdriver, a 5/16" nut driver, or another suitable tool.
4. Reaching through the exposed panel opening, attach the rectangular 8-pin plug connector on the timer kit wiring harness to the available mating receptacle connector on the upper left corner of the printed circuit board inside the machine. Be sure that the latch on the connector is aligned with that on the board and insert it until the latch engages.
5. Confirm that the remaining connector on the opposite end of the wiring harness is firmly attached to the mating connector on the printed circuit board on the timer kit panel, and that the latch is engaged.
6. Align the timer panel for installation and carefully insert the printed circuit board and wiring harness through the opening in the front panel. Make sure the wiring harness is not pinched between panels or between printed circuit board and front panel.
7. Secure the timer assembly with either the two supplied screws or with the original screws. The installation is now complete. Refer to Section 2.10 for operating instructions.

1.11 Spool Gun Module Installation (Optional K531-2 Kit)

WARNING: Remove all input power to the Wire-Matic 250 before proceeding.

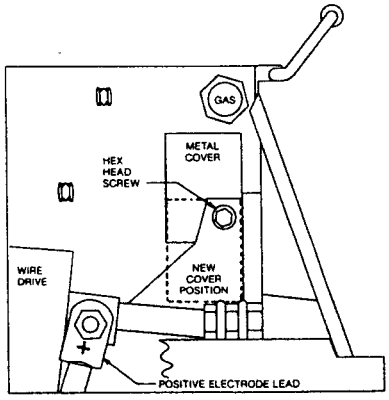
1. Remove the Wire-Matic 250 gun and cable.

   NOTE: If the cable is not removed, the tip of the gun will be electrically hot while using the Spool Gun, also, the Wire-Matic 250 gun trigger, if pulled, will activate the Spool Gun.

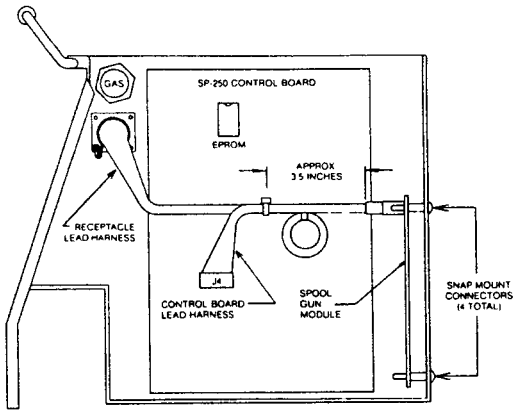
2. Remove the six screws that hold the case side on (1 in front, 2 at rear, 3 under the door in the hinge). Lift the top up and over the lip of the center divider panel, then while pulling the case

side away from the unit, slide it out of the slots in the base.

3. Find the four snap connectors mounted to the side panel of the P.C. board compartment.
4. Position the spool gun module over the snap mount connectors making sure the lead plug connectors are placed at the top.
5. Gently press the board onto the connectors, making sure all connectors snap into place.
6. On the wire drive of the Wire-Matic 250, remove the hex-head screw from beneath the gas connection, releasing the small metal cover.



7. Slide the metal cover out from behind the motor bracket. Flip the cover over so the screw hole is in the top right corner, then re-install as a spacer plate with the hex-head screw.
8. Find the receptacle lead harness included in the kit. Insert the panel receptacle into the hole from the Control board side of the panel, making sure the panel receptacle key is in the twelve o'clock position.
9. Fasten the panel receptacle to the case with the three #6-32 x 3/8" self-tapping screws provided. Insert the screws from the wire drive side, through the sheet metal, into the receptacle mounting holes.
10. Plug the 10 pin connector plug on the other end of the connector harness into the 10 pin connector (J12) at the top of the Spool Gun Module board.
11. Find the Control board lead harness with the two 8 pin plugs included in the kit. Connect either end into the unused 8 pin connector (J4) on the Wire-Matic 250 control board and the other end into the 8 pin connector (J11) at the top of the Spool Gun Module board.
12. Using the cable tie included in the installation kit, tie the two harnesses together approximately 3.5 inches (89 mm) from the end of the connector attached to the Spool Gun Module board.

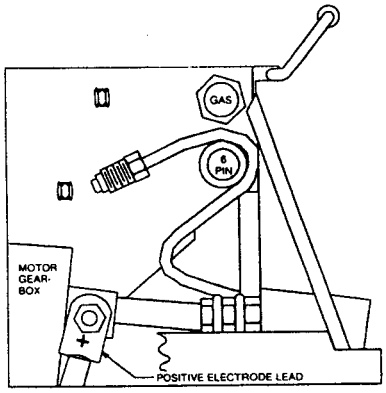


13. Slip case side into the slots in the base, make sure the lip of the case side is lifted over the top edge of the center panel during installation. Fasten down with the six screws removed in Step 2.

Spool Gun Installation

1. Thread the end of the spool gun cable assembly through the opening in the louvers provided for the work lead.
2. Remove the Wire-Matic 250 gas line connector from the connector in the wire compartment. Screw the spool gun 6 pin plug into the 6 pin connector just below the gas line connector. Then attach the spool gun gas hose to the gas connector. Tighten snugly, being careful not to strip the brass threads.

   NOTE: IF USING A K469 SPOOL GUN WITH 4 PIN PLUG, USE THE K518 ADAPTER.
3. Thread the removed Wire-Matic 250 gas line between the new gas hose and spool gun cable. Push the Wire-Matic 250 gas hose up until it wedges between the cable connector and gas connector, make sure the Wire-Matic 250 gas hose brass connector does not touch the wire drive unit.



4. With Wire-Matic 250 connected for electrode positive, (refer to Section 1.6), remove the positive electrode lead from its connection on the wire drive. Then reconnect with the spool gun electrode lead on the bolt under the positive electrode lead so the spool gun electrode lead is sandwiched between the positive electrode lead terminal and

the wire drive contact surface. Tighten snugly being careful not to strip the threads.

5. Refer to the Instruction Manual included with the K487 or K469 Spool Gun for more detail in Spool Gun set-up and operation.

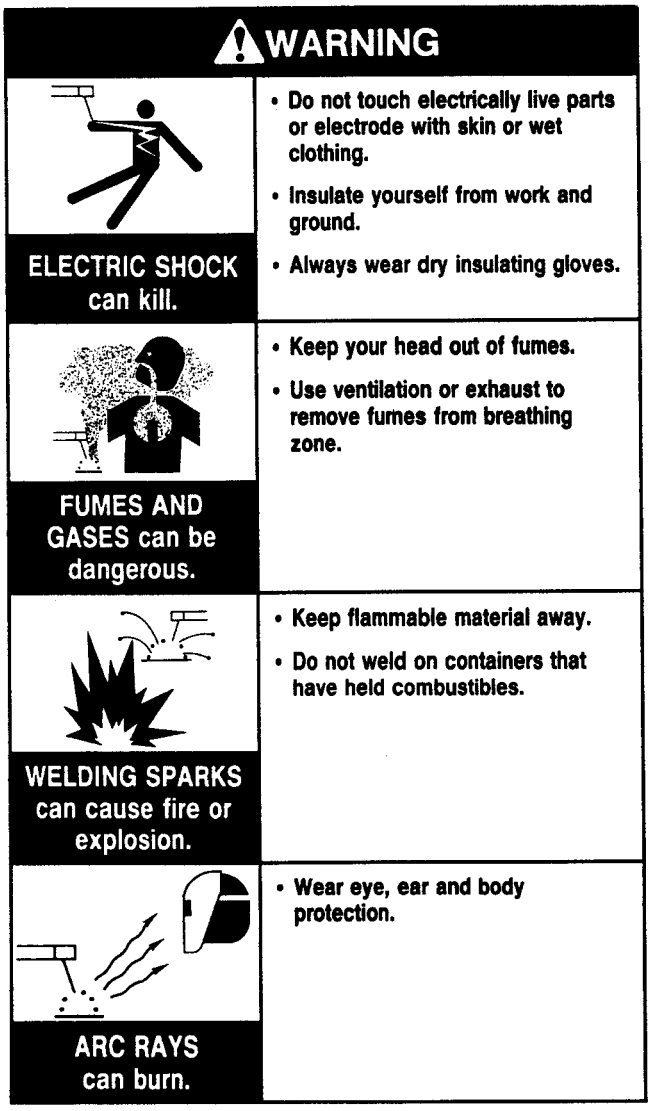
Removal of Spool Gun

WARNING: Remove all input power to the Wire-Matic 250 before proceeding.

1. To return to normal Wire-Matic 250 welding, turn input power off, and remove the spool gun electrode lead, gas hose and plug. Reattach the Wire-Matic 250 gas line and the Magnum 250L gun and cable.

2. OPERATING INSTRUCTIONS

2.1 Safety Precautions



2.2 Duty Cycle

The Wire-Matic 250 is rated at the following duty cycles.

Duty Cycle[1]	Amps	Volts
100%	145	26
60%	200	28
35%	250	26

[1] Based upon 10 minute time period (i.e. for 60% duty cycle it is 6 minutes on and 4 minutes off).

2.3 Description of Controls

Power Switch

Place the lever in the "ON" position to energize the Wire-Matic 250. When the power is on, the red LED pilot light, next to the power switch, will be lit.

Voltage Control

Which is a continuous control that gives full range adjustment of power source output voltage. It can be adjusted while welding over the rated 12 to 28 volt range.

Wire Speed Control

This controls the wire speed from 50 to 600 inches per minute (1.2 to 15.2 m/min). The control can be preset on the dial to the setting specified on the Procedure Decal on the inside of the wire compartment door. Wire speed is not affected when changes are made in the voltage control.

2.4 Wire Drive Roll

The drive roll provided with the Wire-Matic has two grooves, one for .030-.035" (0.8-0.9 mm) solid steel electrode, and the other for .045" (1.2 mm) solid steel electrode. The welder is shipped with the drive roll installed in the .030-.035" (0.8-0.9 mm) position as indicated by the stencilling on the exposed side of the drive roll. If .045" (1.2 mm) electrode is to be used or one of the optional drive rolls (see Section 1.10) is required, then the drive roll must be reversed or changed per the following instructions. This information also appears on the Procedure Decal on the door inside the wire compartment.

PROCEDURE FOR CHANGING DRIVE ROLL

Different wire sizes may require changing the drive roll. The applicable wire sizes are stamped on the drive roll. Dual groove rolls must be installed so the side with the proper wire size stamp faces out.

1. Turn off the power Source.
2. Release the pressure on the idle roll by swinging the pressure arm off the idle roll arm.
3. Remove the wire from the drive system.
4. Remove the wing screw from the drive roll. Turn the drive roll over or change to another roll as required. Reinstall the wing screw.

5. Be sure the gun liner and contact tip are properly sized for wire being used. (See Section 1.9).

2.5 To Start the Welder

Turn the "Power Switch" switch to "ON". This lights the red LED pilot light. With the desired voltage and wire speed selected, operate the gun trigger for welder output and to energize the wire feed motor.

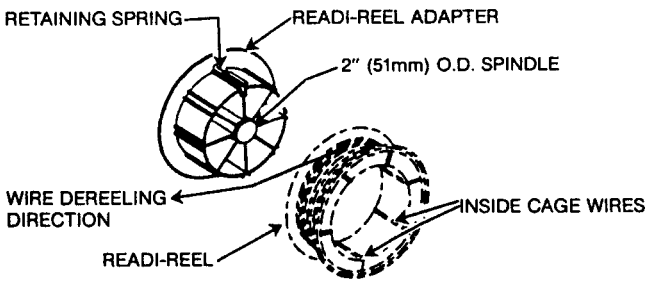
2.6 Fan Control

The fan motor is thermostatically controlled to provide cooling for the transformer and other components only when required. Even though the power switch is on, the fan motor will not run when the machine does not require fan cooling, such as when first turned on, or when welding at low current or duty cycle procedures.

2.7 Wire Reel Loading

To mount a 22-30 lb. (10-14 kg) Readi-Reel® package using the optional Readi-Reel Adapter (K363P)

1. Pull the spindle up out of the Wire-Matic 250 spindle mounting clips (V-brackets). Snap the spindle into the Readi-Reel adapter so the spindle drive pin is engaged with the hole provided in the Adapter.
2. Rotate the spindle and adapter so the retaining spring is at the 12 o'clock position.
3. Position the Readi-Reel so that it will rotate in a **counterclockwise** direction (as viewed from retaining spring side of Adapter) when wire is dereeled from the **top** of the coil as shown below:



4. Set one of the Readi-Reel inside cage wires on the slot in the retaining spring tab.
5. Lower the Readi-Reel to depress the retaining spring and align the other inside cage wires with the grooves in the molded adapter.
6. Slide cage all the way onto the adapter until the retaining spring "pops up" fully.

WARNING: CHECK TO BE SURE THE RETAINING SPRING HAS FULLY RETURNED TO THE LOCKING POSITION AND HAS *SECURELY* LOCKED THE READI-REEL CAGE IN PLACE. RETAINING SPRING MUST REST ON THE CAGE NOT THE WELDING ELECTRODE.

7. Check that the mating surfaces of the spindle hubs and spindle mounting clips (V-brackets) are clear of dirt and debris and that the adapter is fully engaged onto the spindle.
8. Lower the loaded spindle into the spindle mounting clips (V-brackets) so wire dereels from top of coil toward wire drive.

NOTE: The retaining spring side of the adapter should be facing the center (inner) panel of the Wire-Matic 250.

To remove Read-Reel from Adapter, depress the retaining spring tab with thumb while pulling the Readi-Reel cage from the molded adapter with both hands. It is not necessary to remove the adapter from the spindle.

To mount 10 to 30 lb spools: (8" and 12" diameter):

1. Remove the optional Readi-Reel adapter from the 2 inch dia. spindle, if installed.
2. Be sure that the mating surfaces of the spindle hubs and spindle mounting clips (V-brackets) are clear of dirt and debris.
3. Place the spool on the spindle making certain the brake driving pin enters one of the holes in the back side of the spool.
4. Lower the loaded spindle into the spindle mounting clips (V-brackets) so the wire dereels from the top of the reel toward the wire drive.

NOTE: The Wire-Matic 250 Spindle was designed to mount 12" (300 mm) and 8" (200 mm) diameter spools meeting international spool size specifications. If the spool being used is too narrow to keep the brake driving pin engaged with the spool pin hole, a 2" (51 mm) I.D. shim washer could be used between the spool and the spindle retaining clip to take up the space.

2.8 Feeding Electrode

WARNING: When inching, the electrode and drive mechanism are electrically "hot" relative to work and ground and remain "hot" several seconds after the gun trigger is released.

NOTE: Check that drive rolls and gun parts are proper for the wire size and type being used. (Refer to Section 1.9.)

1. Turn the Readi-Reel or spool until the free end of the electrode is accessible.
2. While tightly holding the electrode, cut off the bend end and straighten the first six inches. Cut off the first inch. (If the electrode is not properly straightened, it may not feed properly into the outgoing guide tube or welding gun causing a "birdnest".)
3. Push the wire through the ingoing guide tube, then press the gun trigger and push the electrode into the drive roll. If the electrode fails to thread itself into the outgoing guide tube of the wire drive, open the quick release idle roll arm, thread the electrode manually, and reclose the arm.
4. Inch the electrode through the gun.

   NOTE: Due to the low speed starting feature of the Wire-Matic 250, the wire will feed at low speed for 2 seconds while inching, then come up to the set speed.

2.9 Idle Roll Pressure Setting

The idle roll pressure wing screw is set at the factory backed out 2-1/2 turns from full pressure. This is an approximate setting. The optimum idle roll pressure varies with type of wire, wire diameter, surface conditions, lubrication, and hardness. As a general rule, hard wires may require greater pressure, and soft, or aluminum wire, may require less pressure than the factory setting. The optimum idle roll setting can be determined as follows:

1. Press end of gun against a solid object that is electrically isolated from the welder output and press the gun trigger for several seconds.
2. If the wire "birdnests", jams or breaks at the drive roll, the idle roll pressure is too great. Back the wing screw out 1/2 turn, run new wire through gun, and repeat above steps.
3. If the only result was drive roll slippage, loosen the wing screw on the conductor block and pull the gun cable forward about 6" (15 cm). There should be a slight waviness in the exposed wire. If there is not waviness, the pressure is too low. Tighten the wing screw 1/4 turn, reinstall the gun cable and repeat the above steps.

2.10 Operating Instructions for Timer Kit

If the optional Timer Kit (K585-1) is installed, select the desired mode with the selector switch:

A. **Normal Welding** mode provides weld power only while the trigger switch is depressed. This is the same operation as when the Timer Kit is not installed.

B. **4-Step Trigger** mode eliminates the need to hold the gun trigger while welding. It operates in 4 steps:
   1. Close trigger and establish welding arc.
   2. Release trigger and continue welding.
   3. Reclose trigger near end of weld.
   4. Release trigger again to stop welding.

   If the arc is broken while using this feature, the machine will reset to the "trigger off" condition automatically.

C. **Spot** mode is used for tack welding parts into position or for spot plug welds to hold thin sheet metal together prior to stitch or continuous welding. To use this feature, adjust the Spot/Stitch On-Time (0-5 seconds) as appropriate to obtain the desired results. Closing the trigger initiates a single timed spotweld cycle.

D. **Stitch** mode is used to weld thin material where warpage and burnthrough are a problem. To use this feature, adjust Spot//Stitch On-Time and Stitch Off-Time (0-5 seconds each) as appropriate to obtain desired results. Closing the trigger initiates repetitive timed weld cycles for as long as trigger is held closed.

Burnback Time control provides manual adjustment of the burnback time (0-250 milliseconds) for any selected welding mode. This control should be set as low as possible without the wire "sticking" in the puddle after each weld. Too long of a burnback time may form a "ball" on the end of the wire, or may "flash back" to the gun tip.

2.11 Application of Timed Weld Modes

Welding with the Spot and Stitch modes provided by the Timer Kit is described below:

2.11.1 SPOT WELD MODE is used to make spot plug welds when continuous welds are not needed or to hold thin sheet metal together prior to stitch welding or continuous welding. Plug welds are made by using a punch to make a 3/16" (5 mm) diameter hole in the top sheet and arc welding through the hole into the back sheet.

To make spot plug welds, punch 3/16" (5 mm) holes in the top sheet. Set the Spot/Stitch On-Time control to approximately 1.2 seconds and set the procedure for the metal thickness to be welded. Install spot weld nozzle (if available) on gun and press it against the top sheet so the top and bottom sheets are tight together. Close trigger and ho9ld it closed until the arc goes out. If a spot weld nozzle is not used, smoother welds will result by moving the welding wire in a small circle during the weld.

2.11.2 STITCH WELD MODE is used to weld thin material where warpage and burnthrough are a problem. Proper adjustment of Spot/Stitch On-Time and Stitch Off-Time and arc travel speed permits welding thin sheet metal with small welds, minimum distortion, and no burnthrough.

Spot/Stitch On-Time sets welding time. Start with a dial setting of 0.5 seconds. Raise setting

to increase penetration and weld size; lower setting to reduce burnthrough and distortion.

Stitch Off-Time sets off time between welds. Start with a dial setting of 0.5 seconds. Raise setting to reduce burnthrough; lower setting to make weld flatter and smoother.

To weld, set the procedure for the metal thickness to be welded. Close trigger and hold it closed for length of seam. Hold gun in one place during ON time and move gun just beyond edge of molten metal during OFF time.

NOTE: For smoothest welds on thinner metal, point gun slightly toward direction of travel.

2.12 Making a Weld

1. Check that the electrode polarity is correct for the process being used, then turn the power switch ON.
2. Set desired arc voltage and wire speed for the particular electrode wire, material type and thickness, and gas (for GMAW) being used. Use the Application Chart on the door inside the wire compartment as a quick reference for some common welding procedures.
3. If Timer Kit is installed, select the desired mode as described in Section 2.10. Refer to Section 2.11 for additional welding information pertaining to Spot and Stitch modes.
4. Inch the electrode through the gun and cable and then cut the electrode within approximately 3/8" (10 mm) of the end of the contact tip [3/4" (20 mm) Outershield®].
5. If welding gas is to be used, turn on the gas supply and set the required flow rate (typically 25-35 CFH; 12-16 liters/min).
6. When using Innershield electrode, the gas nozzle may be removed from the insulation on the end of the gun. This will give improved visibility and eliminate the possibility of the gas nozzle overheating.
7. Connect work cable to metal to be welded. Work clamp must make good electrical contact to the work. The work must also be grounded as stated in "Arc Welding Safety Precautions".

WARNING: WHEN USING AN OPEN ARC PROCESS, IT IS NECESSARY TO USE CORRECT EYE, HEAD, AND BODY PROTECTION.

8. Position electrode over joint. End of electrode may be lightly touching the work.
9. Lower welding helmet, close gun trigger, and begin welding. Hold the gun so the contact tip to work distance is about 3/8 inch (10 mm) [3/4" (20 mm) for Outershield].
10. To stop welding, release the gun trigger and then pull the gun away from the work after the arc goes out.
11. When no more welding is to be done, close valve on gas cylinder (if used), momentarily operate gun trigger to release gas pressure, and turn off Wire-Matic 250.

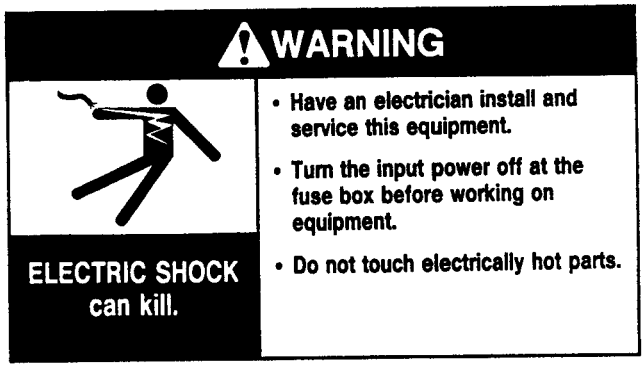
2.13 Making a Weld with the Spool Gun Module

With the Spool Gun properly installed and the power switch on, set the Wire-Matic 250 voltage and wire speed controls to the desired settings.
NOTE: The wire speed calibrated dial markings are not accurate when used for setting spool gun speed.

The wire speed knob position provides the set speed for the K469 spool gun and the maximum set speed for the K487 spool gun (with the remote control in gun handle at maximum). The remote control turned to minimum will give you approximately 50% of the maximum set WFS.

3. MAINTENANCE

3.1 Safety Precautions



3.2 Routine Maintenance

3.2.1 General Maintenance

In extremely dusty locations, dirt may clog the air passages causing the welder to run hot. Blow dirt out of the welder with low-pressure air at regular intervals to eliminate excessive dirt and dust build-up on internal parts.

The fan motors have sealed ball bearings which require no service.

3.2.2 Welding Thermal Overload Protection

The Wire-Matic 250 has built-in protective thermostats that respond to excessive temperature. They open the wire feed and welder output circuits if the machine exceeds the maximum safe operating temperature because of a frequent overload, or high ambient temperature plus overload. The thermostats automatically reset when the temperature reaches a safe operating level.

3.2.3 Overcurrent Protection

The machine will automatically reduce the output if the load on the machine exceeds 260 to 280 amperes. This protects the welding power SCR's from excessive short circuit currents and from exceeding their temperature rating before the thermostats can react.

3.2.4 Input Line Voltage Protection

HIGH LINE VOLTAGE — If the line voltage exceeds 121% of rated input voltage, the output will be reduced to the lower level to protect voltage rating of the capacitor bank.

LOW LINE VOLTAGE — You may not be able to get maximum output from the machine if the line voltage is less than rated input. The unit will continue to weld, but the output will be less than what is set.

3.2.5 Wire Feed Overload Protection

The Wire-Matic has solid state overload protection of the wire drive motor. If the motor becomes overloaded, the protection circuitry turns off the wire feed speed and gas solenoid. Check for proper size tip, liner, and drive rolls, for any obstructions or bends in the gun cable, and any other factors that would impede the wire feeding. To resume welding, simply pull the trigger.

3.2.6 Drive Rolls and Guide Tubes

After every coil of wire, inspect the wire drive mechanism. Clean it as necessary by blowing with low pressure compressed air. Do not use solvents for cleaning the idle roll because it may wash the lubricant out of the bearing. All drive rolls are stamped with the wire sizes they will feed. If a wire size other than that stamped on the roll is used, the drive roll must be changed.

For instructions on replacing or changing drive roll, see Section 2.4 or instruction decal inside the Wire-Matic 250 door.

3.2.7 Drop-In Reel Spindle and Clips

Before each time a coil of wire is loaded onto the Wire-Matic 250 drop-in spindle, inspect the mating surfaces of the spindle hubs and the spindle mounting clips (V-brackets) and, if necessary, wipe or blow out any dirt and debris which may have deposited on these surfaces.

3.3 Gun and Cable Maintenance

3.3.1 Cable Cleaning

Clean cable liner after using approximately 300 pounds (136 kg) of electrode. Remove the cable from the wire feeder and lay it out straight on the floor. Remove the contact tip from the gun. Using an air hose and only partial pressure, gently blow out the cable liner from the gas diffuser end.

CAUTION: Excessive pressure at the start may cause the dirt to form a plug.

Flex the cable over its entire length and again blow out the cable. Repeat this procedure until no further dirt comes out.

3.3.2 Gun Tubes and Nozzles

a. Replace worn contact tips as required.

b. Remove spatter from inside of gas nozzle and from tip after each 10 minutes of arc time or as required.

3.3.3 Contact Tip and Gas Nozzle Installation

a. Choose the correct size contact tip for the electrode being used (wire size is stenciled on the side of the contact tip) and screw it snugly into the gas diffuser.

b. Be sure the nozzle insulator is fully screwed onto the gun tube and does not block the gas holes in the diffuser.

c. Slip the appropriate gas nozzle onto the nozzle insulator. Either a standard .50" (12.7 mm) or optional .62" (15.9 mm) I.D. slip-on gas nozzle may be used and should be selected based on the welding application.

Adjust the gas nozzle as appropriate for the GMAW process to be used. Typically, the contact tip end should be flush to .12" (3.2 mm) extended for the short-circuiting transfer process and .12" (3.2 mm) recessed for spray transfer.

3.3.4 Liner Removal and Replacement

NOTE: Changing the liner for a **different** wire size requires replacement of the gas diffuser per the table below to properly secure the different liner.

Diameter of Electrodes Used	Replacement Liner Part Number	Size Stencilled on End of Liner Bushing	Gas Diffuser Part No. (and Stencil)
.025-.030" Steel (0.6-0.8 mm)	M16087-2	.030 (0.8 mm)	S19418-2
.035-.045" Steel (0.9-1.2 mm)	M16087-1	.045 (1.2 mm)	S19418-1
3/64" Aluminum, (1.2 mm)	M16107-1	(Plastic Liner)	S19418-1

Liner Removal, Installation, and Trimming Instructions for Magnum 250L

NOTICE: The variation in cable lengths prevents the interchangeability of liners between guns. Once a liner has been cut for a particular gun, it should not be installed in another gun unless it can meet the liner cutoff length requirement. Liners are shipped with the jacket of the liner extended the proper amount.

1. Remove the gas nozzle and nozzle insulator to locate the set screw in the gas diffuser which is used to hold the old liner

in place. Loosen the set screw with a 5/64" (2.0 mm) Allen wrench.

2. Remove the gas diffuser from the gun tube.
3. Lay the gun and cable out straight on a flat surface. Loosen the set screw located in the brass connector at the feeder end of the cable and pull the liner out of the cable.
4. Insert a new untrimmed liner into the connector end of the cable. Be sure the liner bushing is stencilled appropriately for the wire size being used.
5. Fully seat the liner bushing into the connector. Tighten the set screw on the brass cable connector. The gas diffuser, at this time, should not be installed onto the end of the gun tube.
6. With the gas nozzle and nozzle insulator removed from the gun tube, be sure the cable is straight, and then trim the liner to the length shown in FIGURE 1. Remove any burrs from the end of the liner.

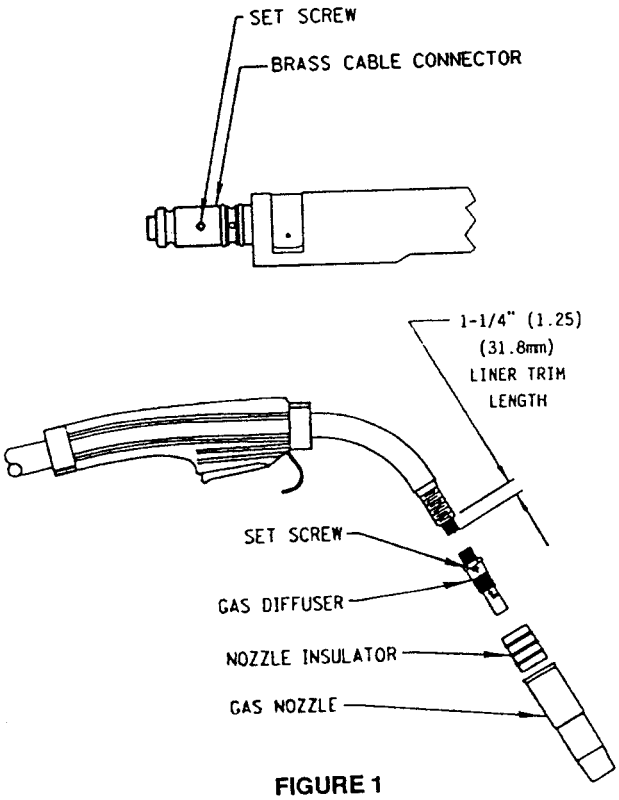


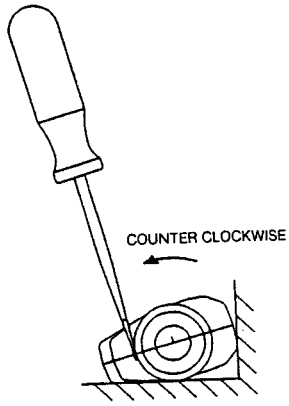
FIGURE 1

7. Screw the gas diffuser onto the end of the gun tube and securely tighten. Be sure the gas diffuser is correct for the liner being used. (See table and diffuser stencil.)
8. Tighten the set screw in the side of the gas diffuser against the cable liner using a 5/64" (2.0 mm) Allen wrench.

CAUTION: This screw should only be gently tightened. Overtightening will split or collapse the liner and cause poor wire feeding.

3.3.5 Gun Handle Disassembly

The internal parts of the gun handle may be inspected or serviced if necessary.
The gun handle consists of two halves that are held together with a collar on each end. To open up the handle, turn the collars approximately 60 degrees counterclockwise (the same direction as removing a right hand thread) until the collar reaches a stop. Then pull the collar off the gun handle. If the collars are difficult to turn, position the gun handle against a corner, place a screwdriver against the tab on the collar and give the screwdriver a sharp blow to turn the collar past an internal locking rib.



3.3.6 Accessories and Expendable Replacement Parts for Magnum 250L Gun and Cable Assemblies

Description	Part Number	English Size	Metric Size
Cable Liner For 15' (4.5 m) or shorter Cable	M16087-2 M16087-1 * M16107-1 •	.025-.030" .035-.045" 3/64" (Alum. Wire)	0.6-0.8 mm 0.9-1.2 mm 1.2mm
Contact Tips Standard Duty	S19391-6 S19391-7 S19391-1 * S19391-2 *	.025" .030" .035" .045"	0.6 mm 0.8 mm 0.9 mm 1.2 mm
Heavy Duty	S19392-1 S19292-2	.035" .045"	0.9 mm 1.2 mm
Tapered	S19393-5 S19393-6 S19393-1 S19393-2	.025" .030" .035" .045"	0.6 mm 0.8 mm 0.9 mm 1.2 mm
Gas Diffuser Assembly	S19418-2 S19418-1 *	.025-.030" .035-.045"	0.6-0.8 mm 0.9-1.2 mm
Gas Nozzles Adjustable Slip-On (requires Nozzle Insulator Assembly	M16093-2 * M16093-1	1/2" 5/8"	12.7 mm 15.9 mm
Nozzle Insulator Assy.	S19417-1 *		
Gasless Nozzle (For Innershield)	M16938		
Gun Tube Assemblies Standard (60°) 45°	S18920 * S19890 •		

* Included with Wire-Matic 250

• 5356 alloy aluminum wire and 45° gun tube are recommended to alleviate potential soft wire feeding problems with push-type wire feeding.

3.3.7 Avoiding Wire Feeding Problems

Wire feeding problems can be avoided by observing the following gun handling procedures:

a. Do not kink or pull cable around sharp corners.

b. Keep the electrode cable as straight as possible when welding or loading electrode through cable.

c. Do not allow dolly wheels or trucks to run over cables.

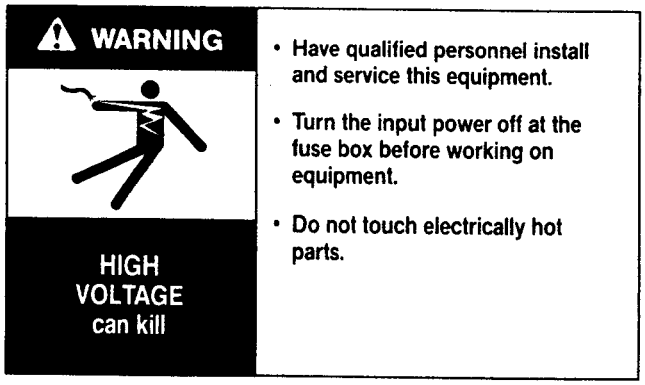
d. Keep cable clean by following maintenance instructions.

e. Use only clean, rust-free electrode. The Lincoln electrodes have proper surface lubrication.

f. Replace contact tip when the arc starts to become unstable or the contact tip end is fused or deformed.

g. Keep drop-in spindle and spindle mounting clip contacting surfaces clear of dirt and debris.

3.4 Troubleshooting Guide



3.4.1 Problems

PROBLEM	POSSIBLE CAUSE	WHAT TO DO
1. Rough wire feeding or wire not feeding but drive rolls turning.	a. Gun cable kinked and/or twisted.	a. Inspect gun cable and replace if necessary.
	b. Wire jammed in gun cable.	b. Remove wire from gun and cable – feed in new wire. Note any obstructions in gun and cable. Replace gun and cable if necessary.
	c. Incorrect position of drive roll with two grooves.	c. See Section 2.4 for proper installation of drive roll.
	d. Drive roll loose.	d. Remove, clean, install and tighten.
	e. Gun cable dirty.	e. Clean cable or replace liner.
	f. Worn drive roll.	f. Replace.
	g. Electrode rusty and/or dirty.	g. Replace.
	h. Worn nozzle or cable liner.	h. Replace.
	i. Partially flashed or melted contact tip.	i. Replace contact tip.
	j. Incorrect idle roll pressure.	j. Set idle roll pressure per Section 2.8.
	k. Rough turning and/or bouncing reel spindle.	k. Clean drop-in reel spindle and spindle mounting clips per Section 3.2.7.
2. Variable or "hunting" arc.	a. Wrong size, worn and/or melted contact tip.	a. Replace tip – remove any spatter on end of tip.
	b. Worn work cable or poor work connection.	b. Inspect – repair or replace as necessary.
	c. Loose electrode connections.	c. Be sure electrode lead is tight, gun cable tight in wire feeder contact block, gun nozzle and gun tip tight.
	d. Wrong polarity.	d. Check connection at output studs for polarity required by welding process.

PROBLEM	POSSIBLE CAUSE	WHAT TO DO
3. Poor arc striking with sticking or "blast-offs", weld porosity, narrow and ropy looking bead, or electrode, stubbing into plate while welding.	a. Improper procedures or techniques. b. Improper gas shielding.	a. See "Gas Metal Arc Welding Guide" (GS-100). b. Clean gas nozzle. Make certain that gas diffuser is not restricted. Make certain that gas cylinder is not empty or turned off. Make certain gas solenoid valve is operating and gas flow rate is proper. Remove gun liner and check rubber seal for any sign of deterioration or damage. Be sure set screw in brass connector is in place and tightened against the liner bushing.
4. Tip seizes in diffuser.	a. Tip overheating due to prolonged or excessive high current and/or duty cycle welding.	a. Do not exceed current and duty cycle rating of gun. A light application of high temperature antiseize lubricant (such as Lincoln E2606 Graphite Grease) may be applied to tip threads.
5. Unit shuts off while welding.	a. See Problem 1 on previous page. b. Defective wire feed motor or gearbox.	a. Correct problems. b. Replace.
6. No wire feed, although arc voltage is present.	a. Defective wire feed motor or control PC board.	a. Disconnect wire drive plug P5 from PC board. Measure voltage across 541(+) pin 9 of J5 and 539(–) pin 8 of J5 on PC board with trigger closed. If voltage is ≥ 24 VDC, then replace motor/gearbox. If ≤ 24 VDC, replace control PC board (see Procedure for Replacing PC Boards).
7. No control of wire feed.	a. Defective wire feed motor tach or control PC board.	a. Measure voltage across 555(+) pin 1 of J5 and 206B(–) pin 2 of J5 on PC board with motor running. If 1.5 ≤ voltage ≤ 3.5, then replace control PC board (see Procedure for Replacing PC Boards). If not, then replace wire feed motor/gearbox.
8. No wire feed and no arc voltage. Pilot light indicates input power to Wire-Matic 250.	a. Protection circuit actuated due to overload or short. b. Faulty gun trigger switch or damaged control cable connected to gun trigger. c. Defective control PC board. d. System fault.	a. Allow machine to cool down and reduce on time and/or wire feed speed. b. Repair. c. See Procedure for Replacing PC Boards if no fault is detected in trigger-thermostat circuit. d. Turn power off. Wait a few seconds. Turn power back on.
9. Output voltage and wire feed present either continuously or pulsing with gun trigger off.	a. Gun trigger circuit not electrically isolated.	a. Gun trigger circuit is grounded or shorted to electrode.

PROBLEM	POSSIBLE CAUSE	WHAT TO DO
10. Gas does not flow.	a. Solenoid or control PC board is defective.	a. Measure voltage across pins 3(+) and 4(–) of J8 on control PC board with trigger closed and solenoid removed. If ≥ 12 VDC, replace solenoid. If not, see Procedure for replacing PC Boards.
11. Poor welding characteristics and/or cannot obtain full rated output of 200 amps at 28 volts.	a. Improper settings for wire feed speed and volts. b. High or low line voltage or current overload condition. c. Capacitor(s) in power source output circuit failed. A failure is indicated if the small vent plug on top of a capacitor is raised or blown out. d. One SCR has failed. e. Defective control PC board. f. Open in feed back circuit.	a. Correct settings. b. Check input line voltage and proper wiring at input reconnect panel. Also that weld procedure is within rating of machine. c. Replace entire bank of capacitors. Do **not** replace individual capacitors. **WARNING:** The liquid electrolyte in these capacitors is toxic. Avoid contact with any portion of your body. Clean up vented electrolyte using rubber gloves and a water dampened cloth. Any electrolyte which gets on skin, clean with soap and water. d. Check and replace SCR bridge if defective. e. See Procedure for Replacing PC Boards. f. Check wiring and PC board wiring harness plugs.

3.4.2 Procedure for Replacing PC Boards

Before replacing a PC board which is suspected of being defective, visually inspect the PC board in question for any **electrical** or **mechanical** damage to any of its components and conductors on the back of the board.

a. If there is **no** visible damage to the PC board, install a new one and see if this remedies the problem. If the problem is remedied, reinstall the **old** PC board to see if the problem still exists. If the **old** PC board also remedies the problem:

1. Check the PC board harness connector pins for corrosion, contamination, or looseness.
2. Check leads in the plug harness for loose or intermittent connection.

b. If PC board is visibly damaged **electrically**, before possibly subjecting the new PC board to the same cause of failure, check for possible shorts, opens, or grounds caused by:

1. Frayed or pinched lead insulation.
2. Poor lead termination, such as a poor contact or a short to adjacent connection or surface.
3. Shorted or open motor leads, or other external leads.
4. Foreign matter or interference behind the PC boards.

c. If PC board is visibly damaged **mechanically**, inspect for cause, then remedy before installing a replacement PC board.

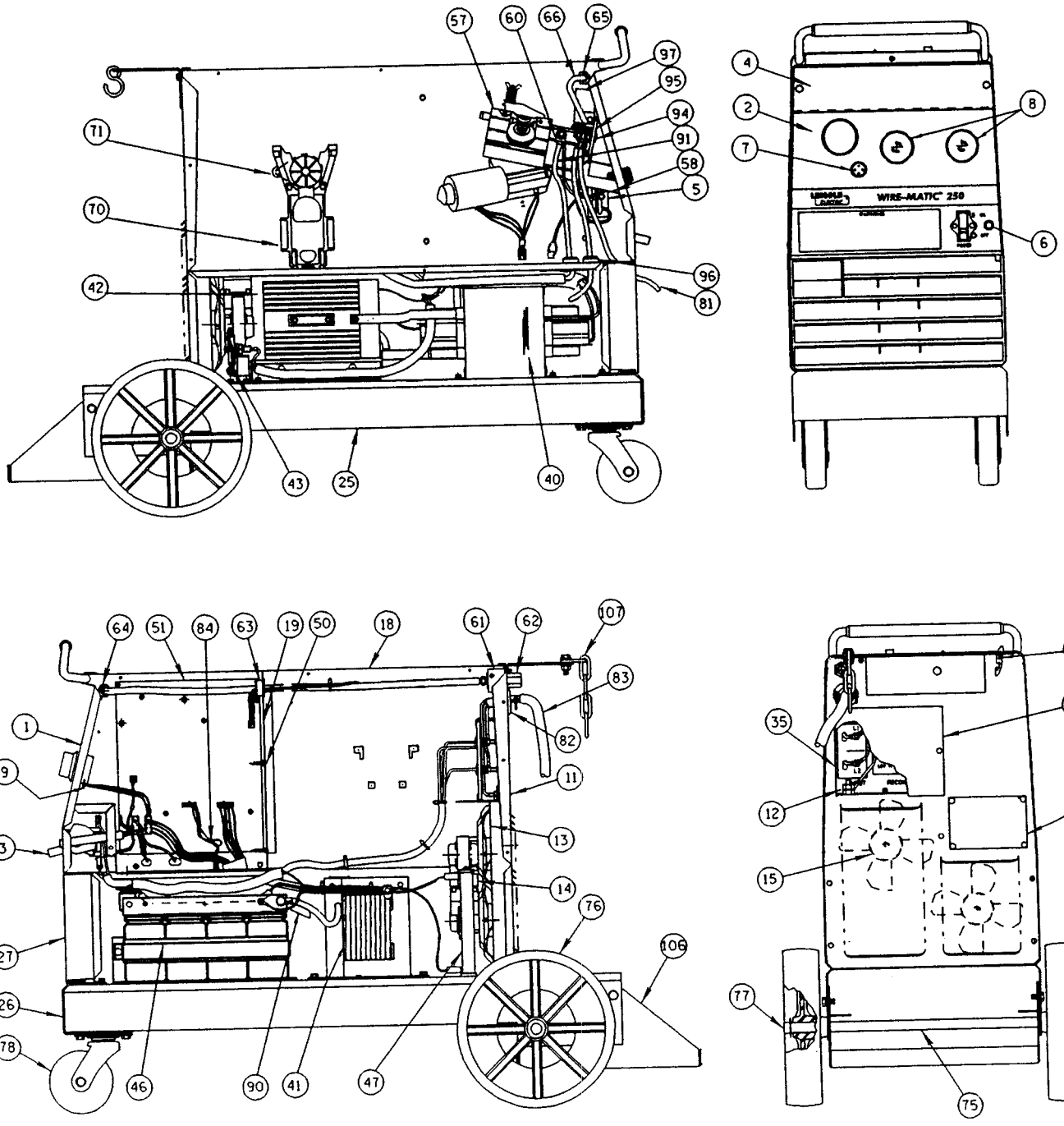
If there is damage to the PC board or if replacing PC board corrects problem, return it to the local Lincoln Electric Field Service Shop.

3.4.3 Procedure for Making Lead Connections When Replacing SCR Bridge Rectifier Assembly

If any lead connection to the rectifier aluminum heat sinks is disconnected, take the following steps before reconnecting:

1. Clean mating surfaces of aluminum sink and connecting lead.
2. Apply thin uniform coating of **Dow Corning 340** compound or equivalent to entire sink area where the connecting lead will come in contact with it.
3. Reconnect, placing the pretinned surface of the lead against the coated area of the heat sink. Place a flatwasher under the connecting screw head and a flatwasher and a lockwasher under the nut with the lockwasher against the nut, tighten to a minimum of 70 in. lbs torque.

WIRE-MATIC 250



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Parts List P-218-C

* Items With * Not Illustrated.

ITEM	PART NAME & DESCRIPTION	PART NO.	NO. REQ'D
1	Front Panel Welded Assembly	M16677	1
*	Self Tapping Screw	S8025-65	2
2	Nameplate	L8643-1	1
3	Power Switch	S7670	1
*	Switch Bezel	S19569	1
*	Self Tapping Screw	S8025-77	2
*	SEMS Screw	T10082-4	4
*	#10-24 Hex Nut	CF000010	4
4	Cover Plate Assembly	M16665	1
*	Self Tapping Screw	S8025-92	2
5	RF Bypass Filter	S19131-1	1
6	Pilot Light	T13534-9	1
7	Trigger Receptacle	S20300	1
*	Self Tapping Screw	S8025-96	4
8	Felt Washer	T14034	2
*	Spacer	T7028-241	2
*	Knob	T10491-3	2
9	Plug and Rheostat Assembly	M16688	1
*	Potentiometer Spacer	S18280	2
11	Rear Panel Assembly	M16707	1
*	Self Tapping Screw	S8025-70	2
12	Thread Forming Screw	S9225-17	1
*	Lock Washer	T9860-6	2
*	1/4-20 Hex Nut	CF000017	1
13	Fan Baffle	L7902	1
*	Self Tapping Screw	S8025-65	4
14	Motor	M13539-1	2
*	SEMS Screw	T10082-27	4
15	Fan	M13525	2
18	Divider Panel	G2191-1	1
*	Self Tapping Screw	S8025-70	4
*	Self Tapping Screw	S8025-65	1
*	Button Plug	T13597-2	1
19	P.C. Board Partition	L7897	1
*	Self Tapping Screw	S8025-70	3
*	Thread Forming Screw	S9225-4	1
20 *	Right Side Panel Assembly	M16035-2	1
*	Self Tapping Screw	S8025-65	1
21 *	Left Side Panel	L8686	1
*	Self Tapping Screw	S8025-65	1
*	Self Tapping Screw	S8025-70	4
25	Base	G2193	1
26	Base Front	G1980-1	1
27	Louver Panel	G2016	1
*	Self Tapping Screw	S8025-78	1
30 *	Door and Hinge Assembly	M15897-1	3
*	Self Tapping Screw	S8025-65	1
31	Rear Nameplate (Dual Voltage)	S19083-7	1
31	Rear Nameplate (Triple Voltage)	S19083-8	1
*	Fastener Button	T14659-2	4
35	Reconnect Panel Connection (Reference) (Dual Voltage)	S20273	1
35	Reconnect Panel Connection (Triple Voltage)	M16428	1
*	Self Tapping Screw	S8025-4	2
36	Reconnect Access Door	M15826	1
*	Self Tapping Screw	S8025-65	1
40	Transformer and Harness Assembly (Dual Voltage)	L8422-1	1
40	Transformer and Harness Assembly (Triple Voltage)	L8427	1
*	Self Tapping Screw	S8025-70	4

ITEM	PART NAME & DESCRIPTION	PART NO.	NO. REQ'D
41	Choke Assembly	L8416	1
*	Thread Forming Screw	S9225-8	2
42	SCR Bridge Assembly	L7817	1
*	Self Tapping Screw	S8025-70	4
43	Fan Sensor Assembly	M15968	1
*	Self Tapping Screw	S8025-70	2
46	Capacitor Blank and Shunt	M16657	1
	Assembly, Includes:		
*	Shunt	S6602-26	1
*	Self Tapping Screw	S8025-70	2
*	Plain Washer	S9262-27	2
47	Resistor	S10404-96	1
*	#10-24 x 7.50 Round Head Screw	CF000191	1
*	#10-24 Hex Nut	CF000010	1
*	Plain Washer	S9262-27	1
*	Lock Washer	E106A-1	1
*	Insulating Washer	T4479-A	2
50	Snap-In Support P.C. Board	S19300-2	4
51	Control P.C. Board Assembly	G2332-1	1
*	Expansion Nut	S14020-3	8
*	Self Tapping Screw	S8025-71	8
57	Wire Drive Assembly	See P-218-D	1
*	1/4-20 x 1.00 Round Head Screw	CF000150	1
*	Fiber Washer	S10773-5	1
*	Plain Washer	S9262-23	1
*	Lock Washer	E106A-2	1
*	Self Tapping Screw	S8025-48	2
*	Flange Bushing	S16645-1	1
58	Wire Drive Insulation	S19064	1
60	3/8-16 x .75 Hex Head Cap Screw	CF000034	1
*	Lock Washer	T9860-4	1
*	Plain Washer	S9262-120	1
61	Solenoid Assembly	M15817	1
*	Self Tapping Screw	S8025-70	1
62	Female Connector	T11591-3	1
63	Grommet	T14614-1	1
64	Connector (Brass)	T14557-3	1
*	Lock Washer	T9695-8	1
*	1/2-13 Hex Jam Nut	CF000054	1
65	Inert Arc Nut	T15007-1	1
*	Hose Nipple	T15008	1
66	Gas Hose	T10642-177	1
70	Spindle Mounting Clip	M15821	2
71	Wire Reel Spindle	M15828	1
75	Axle	M8809-112	1
76	Wheel	S13127-2	2
77	Push Nut	T12570-2	2
78	Caster	S11124-5	2
*	Thread Forming Screw	S9225-26	8
81	Work Lead	S11609-15	1
82	Cable Clamp	T9639-3	1
83	Input Cord (Dual Voltage Only)	S13699-8	1
84	RF Toroid Assembly	S19785	1
90	Aluminum Lead	S19123	1
91	Flex Lead	S19323-2	1
92 *	Cable Hanger (Dual Voltage Only)	T13496-2	1
94	Carriage Bolt	T11827-48	1
*	3/8-16 Hex Jam Nut	CF000121	2
*	Heavy Hex Jam Nut (Brass)	T10940-3	1
*	Lock Washer	E106A-16	1
95	Stud Insulation	S20267	1

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Parts List P-218-C (Continued)

* Items With * Not Illustrated.

ITEM	PART NAME & DESCRIPTION	PART NO.	NO. REQ'D
*	Self Tapping Screw	S8025-48	2
96	Strain Relief Bushing	T9274-3	2
97	Receptacle Cover	S19136	1
106	Cylinder Platform	L8312	1
*	Thread Forming Screw	S9225-26	2
107	Chain	T14564-1	1
*	5/16-18 x 1.00 Hex Head Cap Screw	CF000062	1
*	Plain Washer	S9262-121	1
*	Lock Washer	E106A-14	1
*	5/16-18 Hex Nut	CF000029	1
108	S Hook	T14686	1
	Items Not Illustrated:		
	Warning Decal	T13086-61	1
	Decal - Ground	T13259	1
	Decal - Earth Ground Connector	T13260-4	1
	Decal - 3 Year Warranty	S19633-2	1
	Reel Installation Decal	T13086-93	1
	Misc. Mountings	S20281	1

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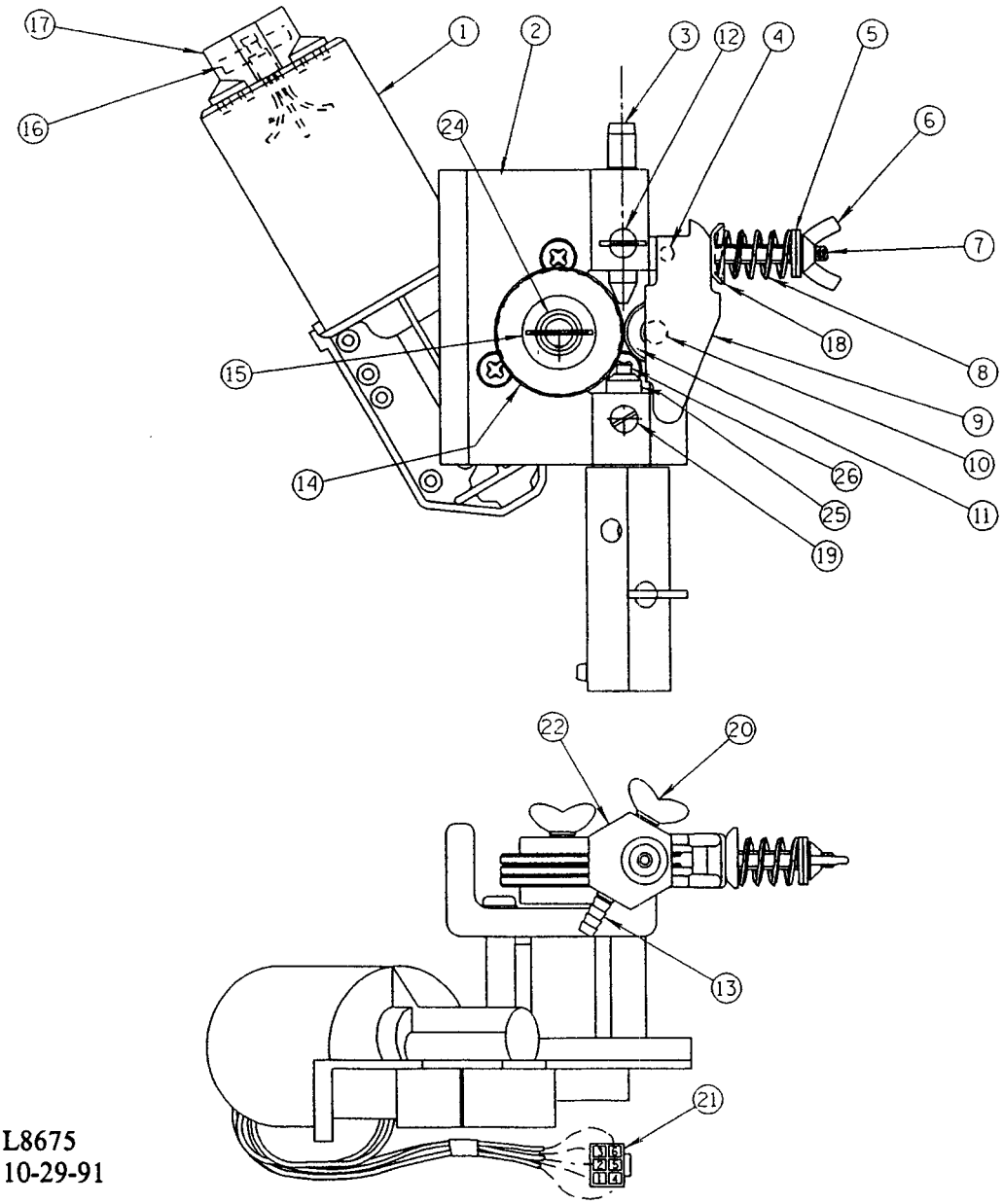
WIRE DRIVE ASSEMBLY



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* Items With * Not Illustrated.

Parts List P-218-D

ITEM	PART NAME & DESCRIPTION	PART NO.	NO. REQ'D
1	Drive Motor	M15813	1
2	Face Plate	M15873	1
*	Pan Head Screw	T14731-18	3
*	Lock Washer	E106A-2	3
3	Guide Tube	T13467-052	1
4	Roll Pin	T9967-48	1
5	Plain Washer	S9262-98	2
6	Wing Nut	T9968-1	1
7	Clevis	S18442	1
8	Spring	T11862-41	1
9	Idle Roll Arm	L7562	1
10	Idle Roll Shaft	S18436	1
11	Bearing	M9300-55	1
12	Wing Screw	T9078-3	1

ITEM	PART NAME & DESCRIPTION	PART NO.	NO. REQ'D
13	Hose Nipple	T14557-7	1
14	Drive Roll	M15809	1
15	Drive Hub	S18951	2
16	Ring Magnet	S18011-1	1
17	Tach Sensor	M15955	1
18	Pressure Washer	S19130	1
19	Slotted Head Set Screw	S11604-58	1
20	Wing Screw	T15046-1	1
21	Connector	S18249-6	1
22	Connector Block	S20268	1
24	Wing Screw Assembly	S19552	1
25	Connector Tube	S20269	1
26	Guide Tube	S20285	1

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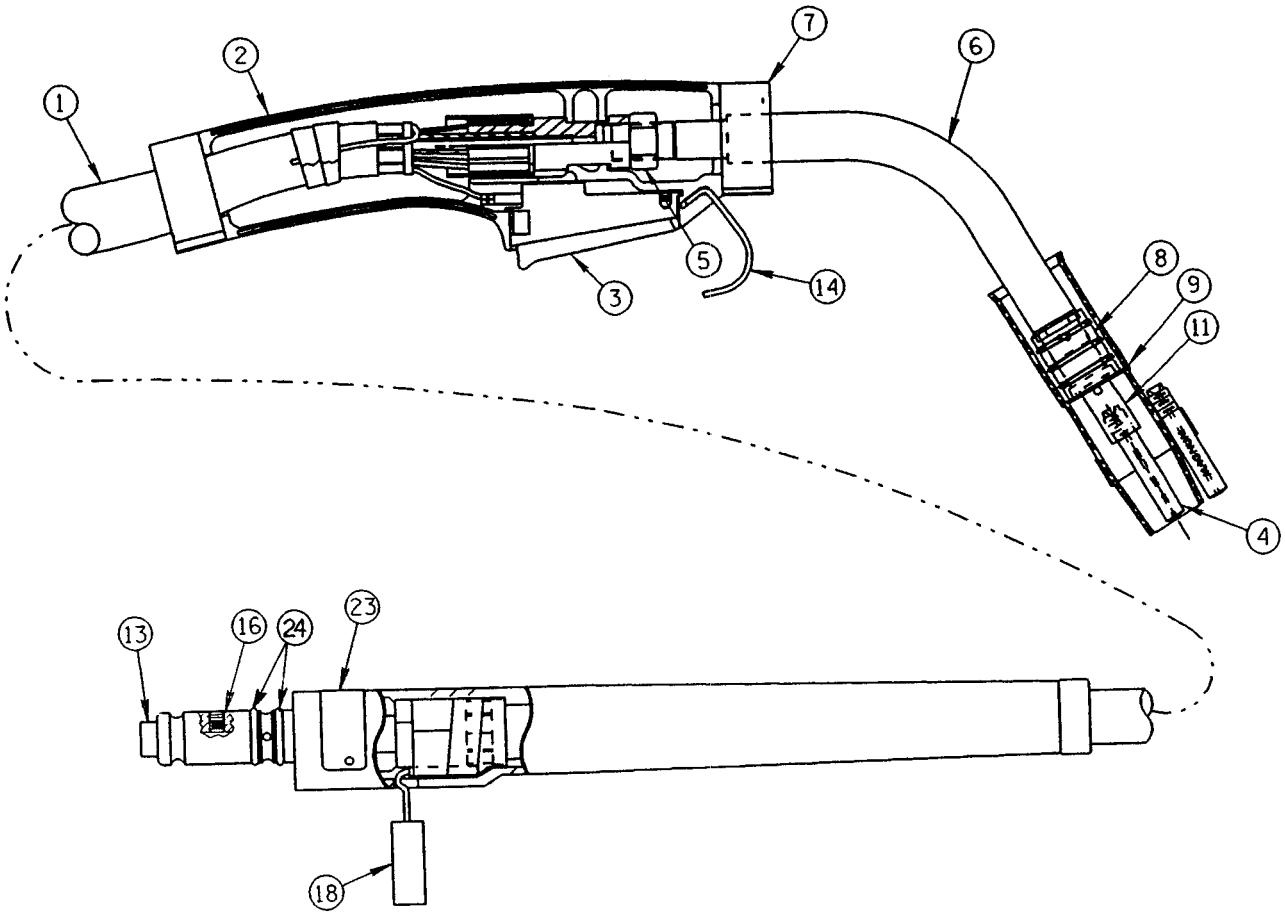
MAGNUM 250L GUN AND CABLE



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Parts List P-202-H.3

* Items With * Not Illustrated.

ITEM	PART NAME & DESCRIPTION	PART NO.	NO. REQ'D
1	Cable Assembly: Magnum 250L 10 Ft	K533-1	1
2	Magnum 250L 12 Ft Magnum 250L 15 Ft Gun Handle (Left)	K533-2 K533-3 G2217	1 1 1
* 3	Gun Handle (Right) Trigger Assembly	G2216 S18932	1 1
4	Contact Tip (.025)	S19391-6	1
4	Contact Tip (.030)	S19391-7	1
4	Contact Tip (.035-.045) (Standard)	S19391-1	1
*	Contact Tip (.035-.045) (Heavy Duty)	S19391-2	1
5	Locking Nut	S19580	1
6	Gun Tube Assembly	S19756	1
7	Collar	S19074	2
8	Slip-On Nozzle Insulator	S19417-1	1
9	Gas Nozzle	M16093-2	1
11	Gas Diffuser Assembly:		
*	.035-.045	S19418-1	1
*	.025-.030	S19418-2	1
13	Liner Assembly:		
*	.035-.045/15 Ft	M16087-1	1
*	.025-.030/15 Ft	M16087-2	1
*	3/64 (For Aluminum Wire)	M16107-1	1
14	Hook	S19241	1
16	Set Screw	S11604-51	1
18 *	Control Wire Cord	M16700	1
23	Cup	S19732	1
24	"O" Ring	T13483-8	2
	Not Illustrated: Cable Boot	M16324	1

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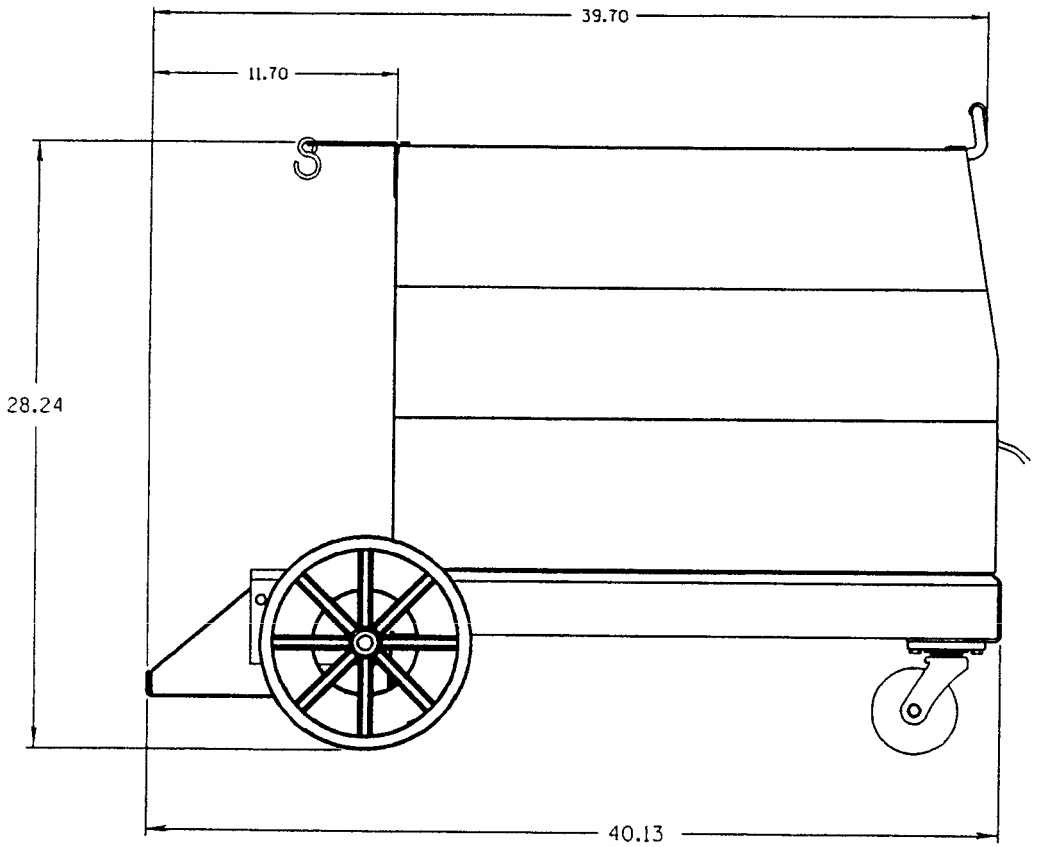
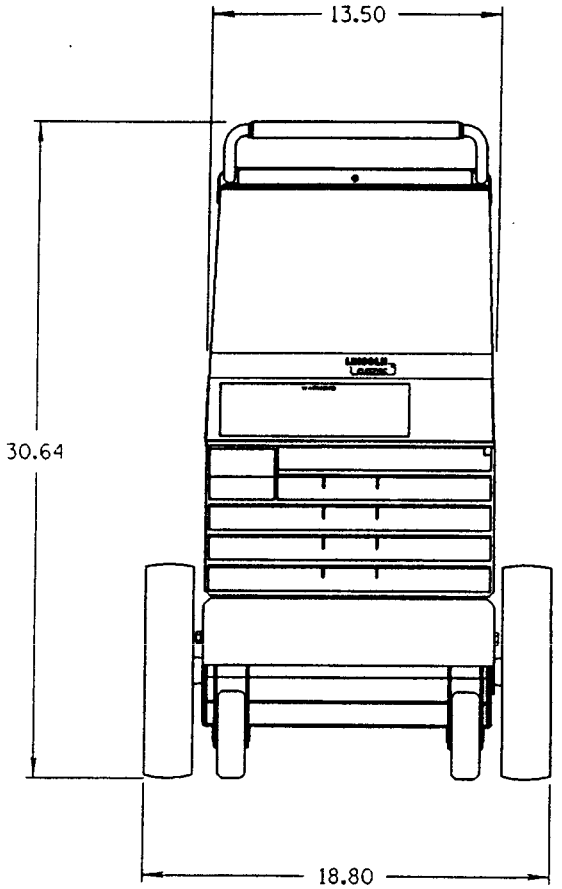


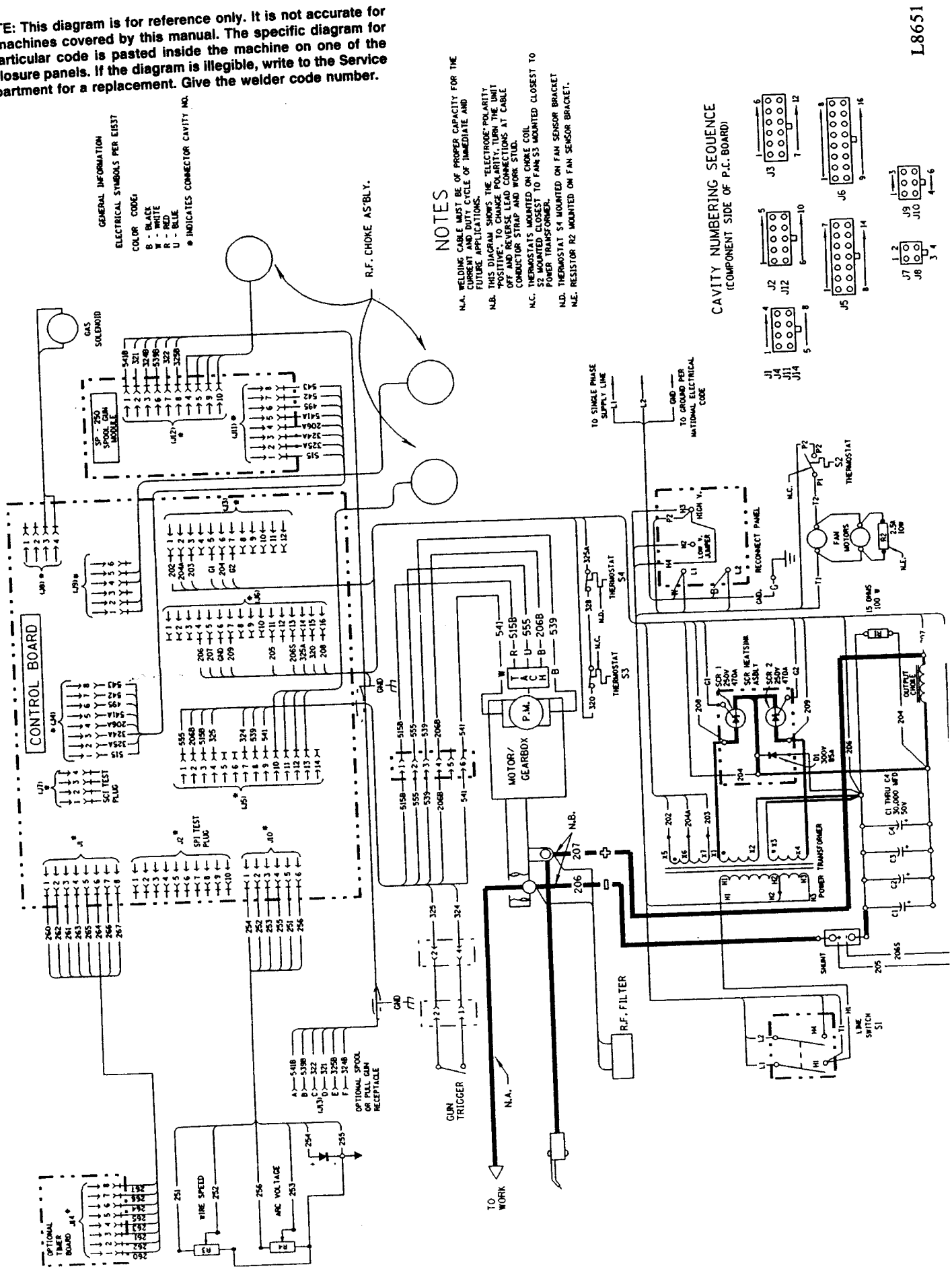


M16352
5-31-91

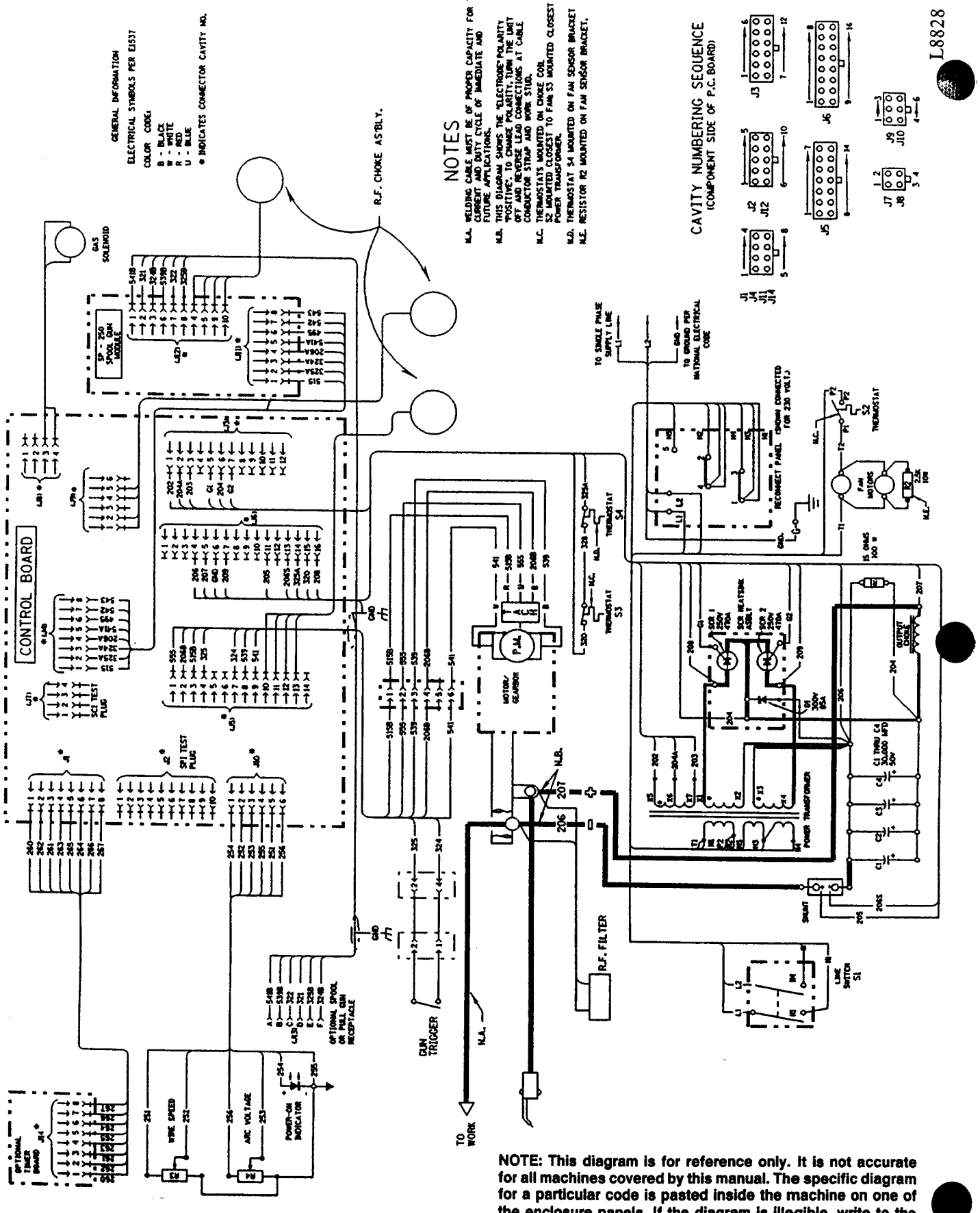
Dimension Print for Wire-Matic 250

NOTE: This diagram is for reference only. It is not accurate for all machines covered by this manual. The specific diagram for a particular code is pasted inside the machine on one of the enclosure panels. If the diagram is illegible, write to the Service Department for a replacement. Give the welder code number.

WIRING DIAGRAM 208/230V



WIRING DIAGRAM 230/460/575V



NOTE: This diagram is for reference only. It is not accurate for all machines covered by this manual. The specific diagram for a particular code is pasted inside the machine on one of the enclosure panels. If the diagram is illegible, write to the Service Department for a replacement. Give the welder code number.

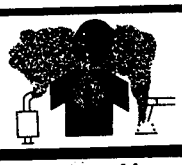
⚠			
WARNING	● Do not touch electrically live parts or electrode with skin or wet clothing. ● Insulate yourself from work and ground.	● Keep flammable materials away.	● Wear eye, ear and body protection.
Spanish **AVISO DE PRECAUCION**	● No toque las partes o los electrodos bajo carga con la piel o ropa mojada. ● Aislese del trabajo y de la tierra.	● Mantenga el material combustible fuera del área de trabajo.	● Protéjase los ojos, los oídos y el cuerpo.
French **ATTENTION**	● Ne laissez ni la peau ni des vêtements mouillés entrer en contact avec des pièces sous tension. ● Isolez-vous du travail et de la terre.	● Gardez à l'écart de tout matériel inflammable.	● Protégez vos yeux, vos oreilles et votre corps.
German **WARNUNG**	● Berühren Sie keine stromführenden Teile oder Elektroden mit Ihrem Körper oder feuchter Kleidung! ● Isolieren Sie sich von den Elektroden und dem Erdboden!	● Entfernen Sie brennbarres Material!	● Tragen Sie Augen-, Ohren- und Körperschutz!
Portuguese **ATENÇÃO**	● Não toque partes elétricas e electrodos com a pele ou roupa molhada. ● Isole-se da peça e terra.	● Mantenha inflamáveis bem guardados.	● Use proteção para a vista, ouvido e corpo.
Japanese **注意事項**	● 通電中の電気部品、又は溶材にヒフやぬれた布で触れないこと。 ● 施工物やアースから身体が絶縁されている様にして下さい。	● 燃えやすいものの側での溶接作業は絶対にしてはなりません。	● 目、耳及び身体に保護具をして下さい。
Chinese **警 告**	● 皮肤或濕衣物切勿接觸帶電部件及銲條。 ● 使你自己與地面和工件絶緣。	● 把一切易燃物品移離工作場所。	● 佩戴眼、耳及身體勞動保護用具。
Korean **위 험**	● 전도체나 용접봉을 젖은 헝겁 또는 피부로 절대 접촉치 마십시요. ● 모재와 접지를 접촉치 마십시요.	● 인화성 물질을 접근 시키지 마시요.	● 눈, 귀와 몸에 보호장구를 착용하십시요.
Arabic **تحذير**	● لا تلمس الاجزاء التي يسري فيها التيار الكهربائي أو الالكترود بجلد الجسم أو بالملابس المبللة بالماء. ● ضع عازلا على جسمك خلال العمل.	● ضع المواد القابلة للاشتعال في مكان بعيد.	● ضع أدوات وملابس واقية على عينيك وأذنيك وجسمك.

READ AND UNDERSTAND THE MANUFACTURER'S INSTRUCT ION FOR THIS EQUIPMENT AND THE CONSUMABLES TO BE USED AND FOLLOW YOUR EMPLOYER'S SAFETY PRACTICES.

SE RECOMIENDA LEER Y ENTENDER LAS INSTRUCCIONES DEL FABRICANTE PARA EL USO DE ESTE EQUIPO Y LOS CONSUMIBLES QUE VA A UTILIZAR, SIGA LAS MEDIDAS DE SEGURIDAD DE SU SUPERVISOR.

LISEZ ET COMPRENEZ LES INSTRUCTIONS DU FABRICANT EN CE QUI REGARDE CET EQUIPMENT ET LES PRODUITS A ETRE EMPLOYES ET SUIVEZ LES PROCEDURES DE SECURITE DE VOTRE EMPLOYEUR.

LESEN SIE UND BEFOLGEN SIE DIE BETRIEBSANLEITUNG DER ANLAGE UND DEN ELEKTRODENEINSATZ DES HERSTELLERS. DIE UNFALLVERHÜTUNGSVORSCHRIFTEN DES ARBEITGEBERS SIND EBENFALLS ZU BEACHTEN.



● Keep your head out of fumes. ● Use ventilation or exhaust to remove fumes from breathing zone.	● Turn power off before servicing.	● Do not operate with panel open or guards off.	WARNING
● Los humos fuera de la zona de respiración. ● Mantenga la cabeza fuera de los humos. Utilice ventilación o aspiración. para gases.	● Desconectar el cable de alimentación de poder de la máquina antes de iniciar cualquier servicio.	● No operar con panel abierto o guardas quitadas.	Spanish AVISO DE PRECAUCION
● Gardez la tête à l'écart des fumées. ● Utilisez un ventilateur ou un aspirateur pour ôter les fumées des zones de travail.	● Débranchez le courant avant l'entretien.	● N'opérez pas avec les panneaux ouverts ou avec les dispositifs de protection enlevés.	French ATTENTION
● Vermeiden Sie das Einatmen von Schweißrauch! ● Sorgen Sie für gute Be- und Entlüftung des Arbeitsplatzes!	● Strom vor Wartungsarbeiten abschalten! (Netzstrom völlig öffnen; Maschine anhalten!)	● Anlage nie ohne Schutzgehäuse oder Innenschutzverkleidung in Betrieb setzen!	German WARNUNG
● Mantenha seu rosto da fumaça. ● Use ventilação e exhaustão para remover fumo da zona respiratória.	● Não opere com as tampas removidas. ● Desligue a corrente antes de fazer serviço. ● Não toque as partes elétricas nuas.	● Mantenha-se afastado das partes moventes. ● Não opere com os painels abertos ou guardas removidas.	Portuguese ATENÇÃO
● ヒュームから頭を離すようにして下さい。 ● 換気や排煙に十分留意して下さい。	● メンテナンス・サービスに取りかかる際には、まず電源スイッチを必ず切って下さい。	● パネルやカバーを取り外したままで機械操作をしないで下さい。	Japanese 注意事項
● 頭部遠離煙霧。 ● 在呼吸區使用通風或排風器除煙。	● 維修前切斷電源。	● 儀表板打開或沒有安全罩時不準作業。	Chinese 警 告
● 얼굴로부터 용접가스를 멀리하십시요. ● 호흡지역으로부터 용접가스를 제거하기 위해 가스제거기나 통풍기를 사용하십시요.	● 보수전에 전원을 차단하십시요.	● 판넬이 열린 상태로 작동치 마십시요.	Korean 위 험
● ابعد رأسك بعيداً عن الدخان. ● استعمل التهوية أو جهاز ضغط الدخان للخارج لكي تبعد الدخان عن المنطقة التي تتنفس فيها.	● اقطع التيار الكهربائي قبل القيام بأية صيانة.	● لا تشغل هذا الجهاز اذا كانت الاغطية الحديدية الواقية ليست عليه.	Arabic تحذير

LEIA E COMPREENDA AS INSTRUÇÕES DO FABRICANTE PARA ESTE EQUIPAMENTO E AS PARTES DE USO, E SIGA AS PRÁTICAS DE SEGURANÇA DO EMPREGADOR.

使う機械や溶材のメーカーの指示書をよく読み、まず理解して下さい。そして貴社の安全規定に従って下さい。

請詳細閱讀並理解製造廠提供的說明以及應該使用的銀焊材料，並請遵守貴方的有関勞動保護規定。

이 제품에 동봉된 작업지침서를 숙지하시고 귀사의 작업자 안전수칙을 준수하시기 바랍니다.

اقرأ بتمعن وافهم تعليمات المصنع المنتج لهذه المعدات والمواد قبل استعمالها واتبع تعليمات الوقاية لصاحب العمل.

LIMITED WARRANTY

STATEMENT OF WARRANTY:

The Lincoln Electric Company (Lincoln) warrants to the original purchaser (end-user) of new equipment that it will be free of defects in workmanship and material.

This warranty is void if Lincoln finds that the equipment has been subjected to improper care or abnormal operation.

WARRANTY PERIOD:

All warranty periods date from the date of shipment to the original purchaser and are as follows:

Three Years:
Transformer Welders
Motor-generator Welders
Semiautomatic Wire Feeders
Plasma-cutting Power Source
Engine Driven Welders (except engine and engine acce
sories) with operating speed under 2,000 RPM

Two Years:
Engine Driven Welders (except engine and en e ac
sories) with operating speed over 2,000 RPM

All engine and engine accessories are warr ed b the engine or engine accessory manufacturer and a ot c ve by this warranty.

Equipment not listed above such a guns and cable assemblies, automatic wire feeders and field stalled pt al equipment is warranted for one year.

TO OBTAIN WARRANTY COVERAGE:

You are required to notify Lincoln Electric, your Lincoln Distributor, Lincoln Service Center or Field ervice Shop of any defect within the warranty period. Writte ot tion is recommended.

WARRANTY REPAIR:

If Lincoln's inspection the quipm confirm e existence of a defect covered this wa nty, the defect will orrected by repair or repla ment a nc 's option.

WARRANT CO TS:

You m bear th os of shipping the equipme o a Lincoln Ser e Center Fi d Service Shop as well as turn shipment t ou fr m at lo cation.

IM TANT WARRANTY LIMITA ONS:

- Lin oln will accept res nsibility for repairs made without its autho ation.
- Lincoln sh not be lia for consequential damages (such as los s of bus ness,) caused by the defect or reasonable del in co rectin e defect.
- Linc n's liab y under this warranty shall not exceed the st of co cting the defect.
- This w ten warranty is the **only** express warranty provided by l coln with respect to its products. Warranties implied by l such as the Warranty of Merchantability are limited to the uration of this limited warranty for the equipment involved.

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3 YEAR
WARRANTY
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Eff. Dec. '92

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