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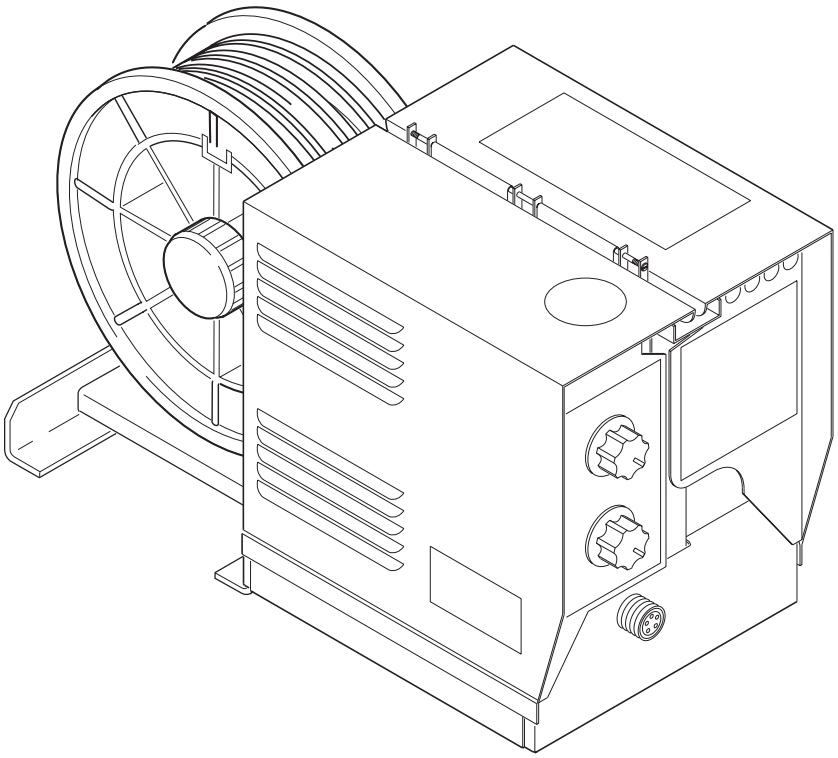
SVM132-A
May, 2002

LN-8 SEMIAUTOMATIC WIRE FEEDER

For use with code numbers: 9963, 9964

Safety Depends on You

Lincoln arc welding and cutting 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 MANUAL AND THE SAFETY PRECAUTIONS CONTAINED THROUGHOUT.** And, most importantly, think before you act and be careful.



SERVICE MANUAL

LINCOLN® ELECTRIC

• World's Leader in Welding and Cutting Products •
• Sales and Service through Subsidiaries and Distributors Worldwide •
Cleveland, Ohio 44117-1199 U.S.A. TEL: 216.481.8100 FAX: 216.486.1751 WEB SITE: www.lincolnelectric.com

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⚠ WARNING

⚠ CALIFORNIA PROPOSITION 65 WARNINGS ⚠

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

The Above For Diesel Engines

The engine exhaust from this product contains chemicals known to the State of California to cause cancer, birth defects, or other reproductive harm.

The Above For Gasoline Engines

ARC WELDING CAN BE HAZARDOUS. PROTECT YOURSELF AND OTHERS FROM POSSIBLE SERIOUS INJURY OR DEATH. KEEP CHILDREN AWAY. PACEMAKER WEARERS SHOULD CONSULT WITH THEIR DOCTOR BEFORE OPERATING.

Read and understand the following safety highlights. For additional safety 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. A Free copy of "Arc Welding Safety" booklet E205 is available from the Lincoln Electric Company, 22801 St. Clair Avenue, Cleveland, Ohio 44117-1199.

BE SURE THAT ALL INSTALLATION, OPERATION, MAINTENANCE AND REPAIR PROCEDURES ARE PERFORMED ONLY BY QUALIFIED INDIVIDUALS.

FOR ENGINE powered equipment.

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

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

1.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.

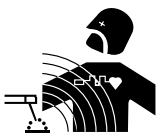
1.d. Keep all equipment safety guards, covers and devices in position and in good repair.Keep hands, hair, clothing and tools away from V-belts, gears, fans and all other moving parts when starting, operating or repairing equipment.

1.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.

1.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.

1.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.

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



ELECTRIC AND MAGNETIC FIELDS may be dangerous

2.a. Electric current flowing through any conductor causes localized Electric and Magnetic Fields (EMF). Welding current creates EMF fields around welding cables and welding machines

2.b. EMF fields may interfere with some pacemakers, and welders having a pacemaker should consult their physician before welding.

2.c. Exposure to EMF fields in welding may have other health effects which are now not known.

2.d. All welders should use the following procedures in order to minimize exposure to EMF fields from the welding circuit:

2.d.1. Route the electrode and work cables together - Secure them with tape when possible.

2.d.2. Never coil the electrode lead around your body.

2.d.3. Do not place your body between the electrode and work cables. If the electrode cable is on your right side, the work cable should also be on your right side.

2.d.4. Connect the work cable to the workpiece as close as possible to the area being welded.

2.d.5. Do not work next to welding power source.

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ELECTRIC SHOCK can kill.

3.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.

3.b. Insulate yourself from work 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 (Wire) Welder.**
- **DC Manual (Stick) Welder.**
- **AC Welder with Reduced Voltage Control.**

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

3.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.

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

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

3.g. Never dip the electrode in water for cooling.

3.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.

3.i. When working above floor level, use a safety belt to protect yourself from a fall should you get a shock.

3.j. Also see Items 6.c. and 8.

ARC RAYS can burn.

4.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. I standards.

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

4.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.

5.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 with electrodes which require special ventilation such as stainless or hard facing (see instructions on container or MSDS) or on lead or cadmium plated steel and other metals or coatings which produce highly toxic fumes, keep exposure as low as possible and below Threshold Limit Values (TLV) using local exhaust or mechanical ventilation. In confined spaces or in some circumstances, outdoors, a respirator may be required. Additional precautions are also required when welding on galvanized steel.**

5.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.

5.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.

5.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. MSDS forms are available from your welding distributor or from the manufacturer.

5.e. Also see item 1.b.

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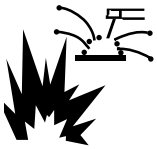


WELDING SPARKS can cause fire or explosion.

6.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. Avoid welding near hydraulic lines. Have a fire extinguisher readily available.

6.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.

6.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.

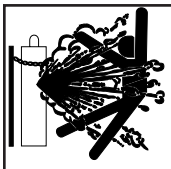
6.d. Do not heat, cut or weld tanks, drums or containers until the proper steps have been taken to insure that such procedures will not cause flammable or toxic vapors from substances inside. They can cause an explosion even though they have been “cleaned”. For information, purchase “Recommended Safe Practices for the Preparation for Welding and Cutting of Containers and Piping That Have Held Hazardous Substances”, AWS F4.1 from the American Welding Society (see address above).

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

6.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.

6.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.

6.h. Also see item 1.c.



CYLINDER may explode if damaged.

7.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.

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

7.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.

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

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

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

7.g. Read and follow the instructions on compressed gas cylinders, associated equipment, and CGA publication P-l, “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.

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

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

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

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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 précautions 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 vétements 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 defonctionnement.
   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 precautions 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 protéger 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 échauffement 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 particuliérement 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 du 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.

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TECHNICAL SPECIFICATIONS – LN-8

INPUT – VOLTAGE
115 VAC, 50/60 Hz @ 4.5 amps
WIRE FEED SPEED
50 in. to 600 in. per minute (1.25 to 15.24 m/min)

WIRE DIAMETERS	
ELECTRODE	**DIAMETER**
SOLID	0.030 in. through 3/32 in. (0.76 through 2.36 mm)
CORED	0.062 in. through 0.120 in. (1.57 through 3.05 mm)

TEMPERATURE RATING	
OPERATING	-4˚F to 104˚F (-20˚C to 40˚C)
STORAGE	-31˚F to 185˚F (-35˚C to 85˚C)

PHYSICAL DIMENSIONS

	LENGTH	WIDTH	HEIGHT	WEIGHT WIRE DRIVE UNIT ONLY	TOTAL WEIGHT LESS ELECTRODE
LN-8 WITH K303 (50-60 lb wire reel stand with dust cover over reel)	30.25 in. (768 mm) *	9.75 in. (248 mm) **	26.50 in. (673 mm)	36.0 lb (◊) (16.3 kg)	80.0 lb. (◊) (36.3 kg) ***
LN-8 WITH K377 (small stand equipped for Readi-Reel)	22.19 in. (564 mm)	9.44 in. (240 mm)	17.00 in. (432 mm)	36.0 lb (16.3 kg)	48.0 lb. (21.8 kg)
LN-8 WITH K378 (small stand equipped for 14 lb Innershield coil)	25.68 in. (652 mm)	9.44 in. (240 mm)	17.00 in. (432 mm)	36.0 lb (16.3 kg)	48.0 lb. (21.8 kg)

* Add 1.00 in. (25.4 mm) to length if door kit is attached.
** Add 0.50 in. (12.7 mm) to width if door kit is attached.
*** Add 7.31 lbs (3.32 kg) to total weight if door kit is attached.
(◊) Codes below 7926-33.5 lbs (15.2 kg) and 78.5 lbs (35.6 kg)

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MOUNTING LOCATION

The LN-8 can be operated as a free-standing unit, or it can be mounted to an undercarriage when portability is required. Refer to ***Accessories Section*** for available under carriage, mounting platform, or wire reel stands.

POWER SOURCE CONNECTIONS

Use the type of power source required for the specific welding application.

⚠ CAUTION

Never operate a Lincoln Squirt welder wire feeder with a power source that has a jumper from #2 to #4 on the terminal strip, or with a power source without a contactor. To do so would defeat the ground lead protector circuit and could result in overheating of the electrical ground circuit to the wire feeder.

A constant voltage power source is required for Innershield electrode and other open arc welding. It is often preferred for small, single pass submerged arc welds at fast travel speeds.

Formerly, a constant current power source was recommended for most submerged arc welding. With the innovation of the new DC power sources, a special mode (CV Sub-Arc) is available and is preferred for most submerged arc welding.

The LN-8N and LN-8NE, when shipped, can only be used with a constant voltage power source. These models can be converted to weld with a constant current power source with the installation of the proper conversion parts.

The LN-8S and LN-8SE, when shipped, can weld with either a constant voltage or constant current power source. Be sure that both the power source and the wire feeder are properly set for the required procedure.

Refer to the ***"Input Cable Connections"*** section when connecting the LN-8 to a Lincoln power source.

LN-8N AND LN-8NE

Use a constant voltage type power source. If the LN-8 has been converted to weld with a constant current power source, use the instructions for the LN-8S.

1. If using a multi-purpose power source, be sure it is set for constant voltage welding per the instructions in the power source operating manual.

2. Connect the LN-8 input cable to the power source exactly as specified on the appropriate connection diagram, see ***Table A.2***. Include any jumpers on the terminal strips as shown in the applicable diagram.

3. Connect a work lead of sufficient size and length per Table A.1, between the appropriate output terminal on the power source and the work. Ensure the connection to the work makes tight metal-to-metal contact.

TABLE A.1 – WORK LEAD SPECIFICATIONS

Current Amps 60% Duty Cycle	Copper Work Cable Length		
	25 ft (7.5 m)	50 ft (15 m)	100 ft (45 m)
300	0	0	000
400	00	00	0000
500	00	000	0000
600	000	000	Two 000

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LN-8S AND LN-8SE (AND CONVERTED LN-8N AND LN-8NE)

1. Use either a constant voltage or constant current type power source as required for the application. Ensure the power source is properly set for constant voltage or constant current welding, as appropriate, per the instructions in the power source operating manual.

2. Set the LN-8 wire feeder for a constant voltage or constant current power source as appropriate per the following:

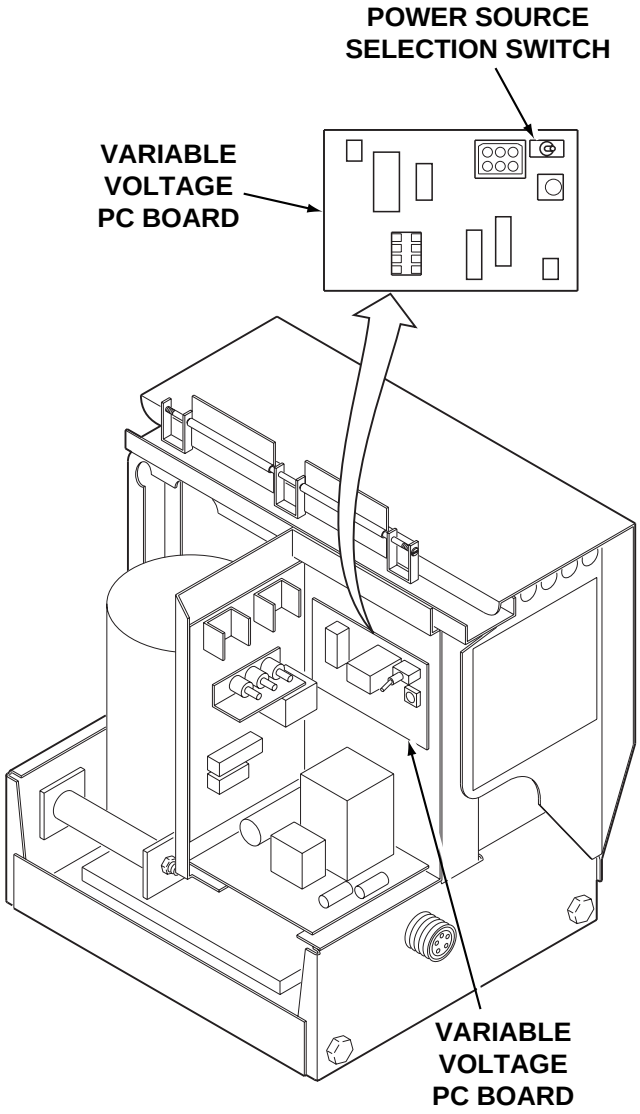
   a. There are two nameplates on the front of the wire feeder, one mounted on top of the other. Be sure the 'Constant Current Power Source' nameplate is on top when using a constant current power source. When connected to a constant voltage power source, be sure the 'Constant Voltage Power Source' nameplate is on top.

   b. Turn the power to the wire feeder off. Open the door to the control section and switch the power source selection switch to constant current 'CC' or constant voltage 'CV' as appropriate. See Figure A.1.

3. Connect the LN-8 input cable to the power source exactly as specified in the wire connection diagrams in ***Table A.2***. Include any jumpers on the terminal strips as shown in the connection diagrams.

4. Connect a work lead of sufficient size and length, per ***Table A.1***, between the appropriate output terminal on the power source and the work. Ensure the connection to the work makes tight metal-to-metal contact.

FIGURE A.1 – POWER SOURCE SELECTION SWITCH



POWER SOURCE CONNECTION DIAGRAMS

Table A.2 – LN-8 Power Source Connection Diagrams

Figure No.	Power Source
A.2	Connection of LN-8 to an Idealarc® R3S-400, 600 or 800 (with LVC) (Discontinued)
A.3	Connection of LN-8 to an Idealarc R3S-400, 600 or 800 (without LVC) (Discontinued)
A.4	Connection of LN-8 to a SAM Motor-Generator or Engine Driven Welder
A.5	Connection of LN-8 to R3S-250 and R3S-325
A.6	Connection of LN-8 to DC-600
A.7	Connection of LN-8 to DC-250, 400 and CV/CVI Power Sources
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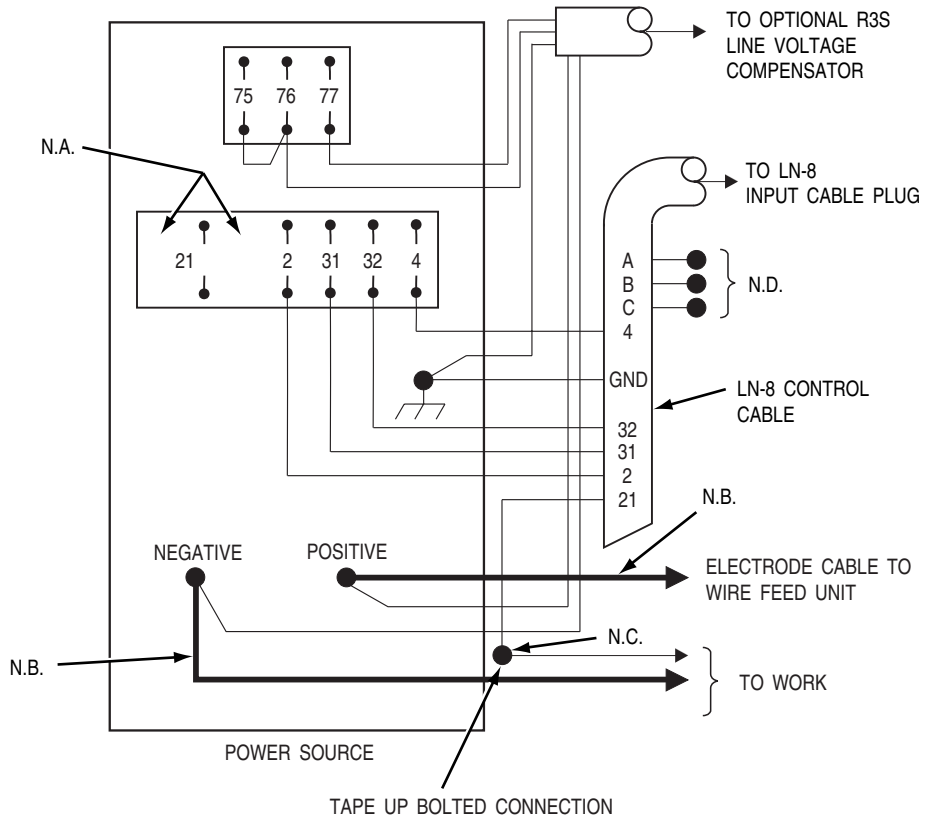
A.9	K318 Duel Process Contactor Kit DC-400, CV-400, and CVI-500 Connection to LN-8 for Opposite Polarity Operation
A.10	Power Sources other than Lincoln Electric

FIGURE A.2 – CONNECTION OF LN-8 TO AN IDEALARC R3S-400, 600 OR 800 (WITH LVC) (DISCONTINUED)

WARNING	TURN OFF INPUT POWER TO THE WELDING POWER SOURCE USING THE DISCONNECT SWITCH BEFORE WORKING ON THIS EQUIPMENT.
ELECTRIC SHOCK CAN KILL	



THE ABOVE DIAGRAM SHOWS THE ELECTRODE CONNECTED FOR POSITIVE POLARITY. TO CHANGE POLARITY, TURN OFF THE POWER, REVERSE THE ELECTRODE AND "TO WORK" LEADS AT THE POWER SOURCE, AND REVERSE THE "CONTROL SWITCH" AT THE POWER SOURCE.

CONNECT THE LN-8 CONTROL CABLE GROUND LEAD TO THE FRAME TERMINAL MARKED ⏚ NEAR THE POWER SOURCE TERMINAL STRIP OR TO AN UNPAINTED FRAME SCREW. THE POWER SOURCE MUST BE PROPERLY GROUNDED.

N.A. ON EARLIER R3S-400, -600, AND -800 MACHINES, TERMINALS #67 AND #1 WERE ALSO ON THE TERMINAL STRIP.

N.B. WELDING CABLES MUST BE OF PROPER CAPACITY FOR THE CURRENT AND DUTY CYCLE OF IMMEDIATE AND FUTURE APPLICATIONS.

N.C. EXTEND LEAD #21 USING #14 OR LARGER INSULATED WIRE PHYSICALLY SUITABLE FOR THE INSTALLATION. AN S16586-[ ] REMOTE VOLTAGE SENSING WORK LEAD IS AVAILABLE FOR THIS PURPOSE. CONNECT IT DIRECTLY TO THE WORK PIECE, KEEPING IT ELECTRICALLY SEPARATE FROM THE WELDING WORK LEAD CIRCUIT AND CONNECTION. FOR CONVENIENCE, THIS EXTENDED LEAD #21 SHOULD BE TAPED TO THE WELDING WORK LEAD. (THIS EXTENDED #21 LEAD CONNECTION REPLACES THE NEED TO EMPLOY THE REMOTE WORK LEAD ACCESSORY ON LN-8 METER KITS WHICH HAVE A DIRECT WORK LEAD JACK).

N.D. LN-8 LEADS A, B, AND C (#75, #76, AND #77 ON OLDER LN-8 CONTROL CABLES) ARE TAPED UP WHEN THE R3S LINE VOLTAGE COMPENSATOR IS CONNECTED. ARC VOLTAGE IS CONTROLLED BY THE LINE VOLTAGE COMPENSATOR RHEOSTAT. THERE WILL BE NO ADJUSTMENTS OF VOLTAGE BY THE LN-8 VOLTAGE CONTROL.

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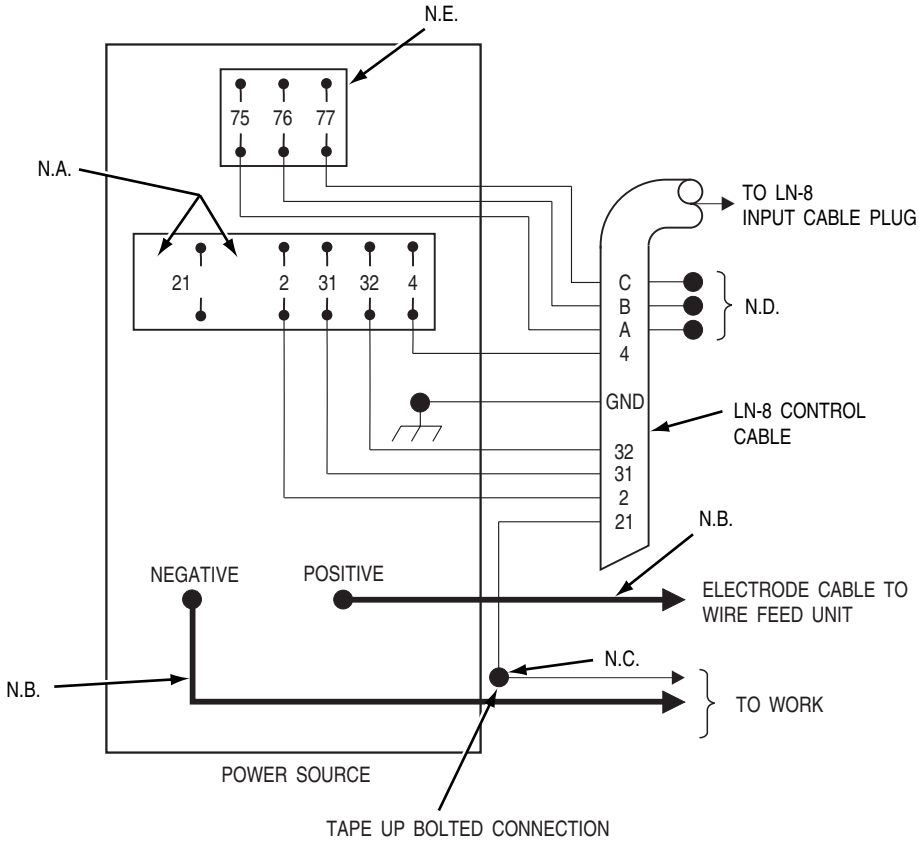
FIGURE A.3 – CONNECTION OF LN-8 TO AN IDEALARC R3S-400, 600 OR 800 (WITHOUT LVC) (DISCONTINUED)

WARNING	TURN OFF INPUT POWER TO THE WELDING POWER SOURCE USING THE DISCONNECT SWITCH BEFORE WORKING ON THIS EQUIPMENT.
ELECTRIC SHOCK CAN KILL	



THE ABOVE DIAGRAM SHOWS THE ELECTRODE CONNECTED FOR POSITIVE POLARITY. TO CHANGE POLARITY, TURN OFF THE POWER, REVERSE THE ELECTRODE AND "TO WORK" LEADS AT THE POWER SOURCE, AND REVERSE THE "CONTROL SWITCH" AT THE POWER SOURCE.

CONNECT THE LN-8 CONTROL CABLE GROUND LEAD TO THE FRAME TERMINAL MARKED ⏚ NEAR THE POWER SOURCE TERMINAL STRIP OR TO AN UNPAINTED FRAME SCREW. THE POWER SOURCE MUST BE PROPERLY GROUNDED.

N.A. ON EARLIER R3S-400, -600, AND -800 MACHINES, TERMINALS #67 AND #1 WERE ALSO ON THE TERMINAL STRIP.

N.B. WELDING CABLES MUST BE OF PROPER CAPACITY FOR THE CURRENT AND DUTY CYCLE OF IMMEDIATE AND FUTURE APPLICATIONS.

N.C. EXTEND LEAD #21 USING #14 OR LARGER INSULATED WIRE PHYSICALLY SUITABLE FOR THE INSTALLATION. AN S16586-[ ] REMOTE VOLTAGE SENSING WORK LEAD IS AVAILABLE FOR THIS PURPOSE. CONNECT IT DIRECTLY TO THE WORK PIECE, KEEPING IT ELECTRICALLY SEPARATE FROM THE WELDING WORK LEAD CIRCUIT AND CONNECTION. FOR CONVENIENCE, THIS EXTENDED LEAD #21 SHOULD BE TAPED TO THE WELDING WORK LEAD. (THIS EXTENDED #21 LEAD CONNECTION REPLACES THE NEED TO EMPLOY THE REMOTE WORK LEAD ACCESSORY ON LN-8 METER KITS WHICH HAVE A DIRECT WORK LEAD JACK).

N.D. IF USING AN OLDER LN-8 CONTROL CABLE (PRIOR TO USE OF A, B, AND C MARKING): CONNECT LEAD #75 TO #75 ON THE TERMINAL STRIP, CONNECT LEAD #76 TO #76 ON THE TERMINAL STRIP, AND CONNECT LEAD #77 TO #77 ON THE TERMINAL STRIP.

N.E. UPPER TERMINAL STRIP (#75, #76 AND #77) MAY NOT APPEAR ON OLDER R3S MACHINES. LEADS A, B, AND C SHOULD BE TAPED UP. THERE WILL BE NO ADJUSTMENT OF VOLTAGE BY THE LN-8 VOLTAGE CONTROL.

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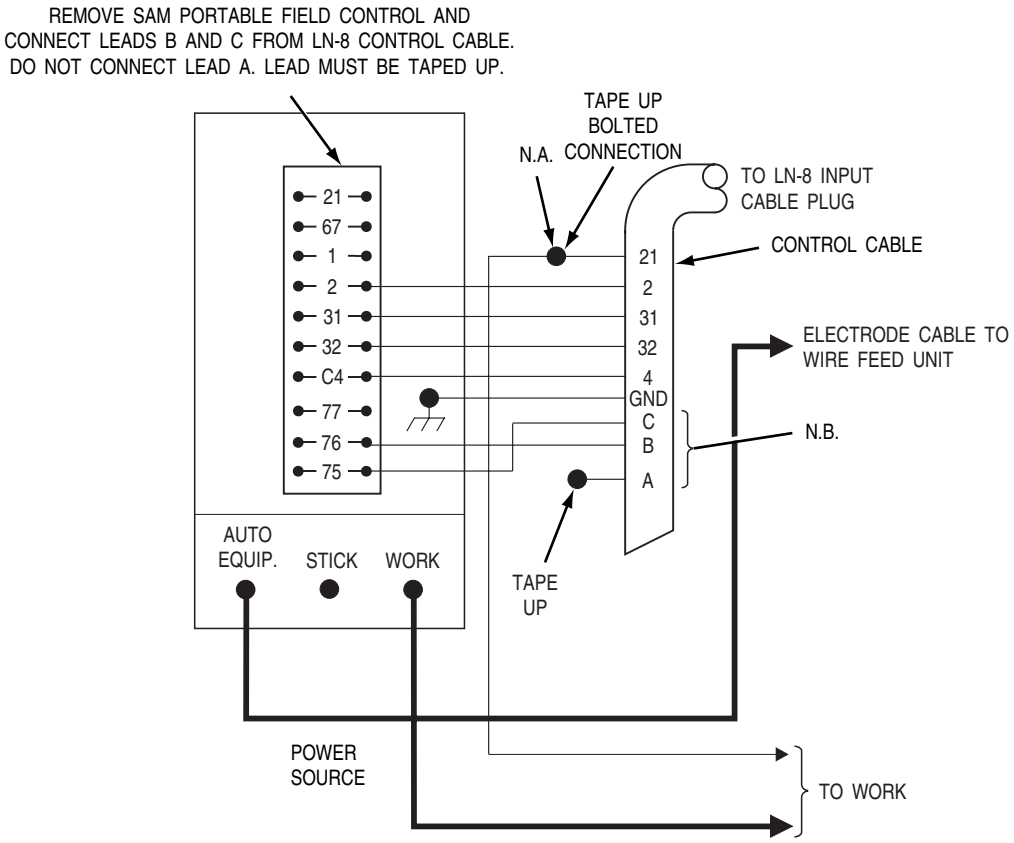
FIGURE A.4 – CONNECTION OF LN-8 TO A SAM MOTOR-GENERATOR OR ENGINE DRIVEN WELDER

WARNING	TURN OFF INPUT POWER TO THE WELDING POWER SOURCE USING THE DISCONNECT SWITCH BEFORE WORKING ON THIS EQUIPMENT.
ELECTRIC SHOCK CAN KILL	



CONNECT THE LN-8 CONTROL CABLE GROUND LEAD TO THE FRAME TERMINAL MARKED ⏚ NEAR THE POWER SOURCE TERMINAL STRIP OR TO AN UNPAINTED FRAME SCREW. THE POWER SOURCE MUST BE PROPERLY GROUNDED.

N.A. EXTEND LEAD #21 USING #14 OR LARGER INSULATED WIRE PHYSICALLY SUITABLE FOR THE INSTALLATION. AN S16586-[ ] REMOTE VOLTAGE SENSING WORK LEAD IS AVAILABLE FOR THIS PURPOSE. CONNECT IT DIRECTLY TO THE WORK PIECE, KEEPING IT ELECTRICALLY SEPARATE FROM THE WELDING WORK LEAD CIRCUIT AND CONNECTION. FOR CONVENIENCE, THIS EXTENDED LEAD #21 SHOULD BE TAPED TO THE WELDING WORK LEAD. (THIS EXTENDED #21 LEAD CONNECTION REPLACES THE NEED TO EMPLOY THE REMOTE WORK LEAD ACCESSORY ON LN-8 METER KITS WHICH HAVE A DIRECT WORK LEAD JACK).

N.B. IF USING AN OLDER LN-8 CONTROL CABLE (PRIOR TO USE OF A, B, AND C MARKING): CONNECT LEAD #76 TO #76 ON TERMINAL STRIP, CONNECT LEAD #77 TO #75 ON THE TERMINAL STRIP, AND TAPE UP LEAD #75.

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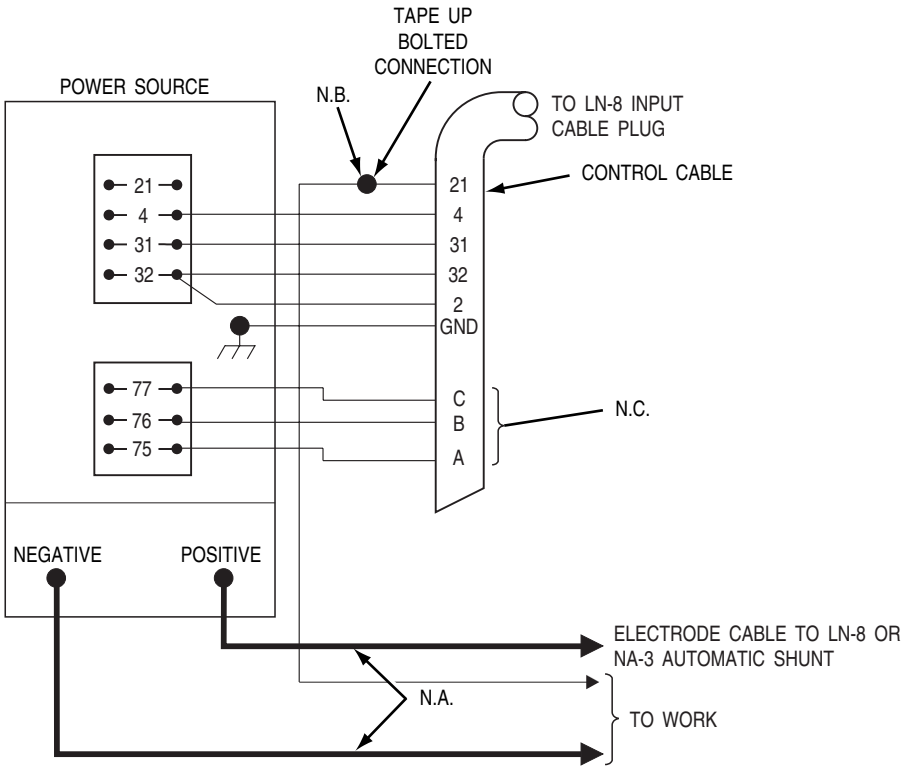
FIGURE A.5 – CONNECTION OF LN-8 TO R3S-250 AND R3S-325

WARNING	TURN OFF INPUT POWER TO THE WELDING POWER SOURCE USING THE DISCONNECT SWITCH BEFORE WORKING ON THIS EQUIPMENT.
 ELECTRIC SHOCK CAN KILL	



THE ABOVE DIAGRAM SHOWS THE ELECTRODE CONNECTED FOR POSITIVE POLARITY. TO CHANGE POLARITY, TURN OFF THE POWER, REVERSE THE ELECTRODE AND "TO WORK" LEADS AT THE POWER SOURCE, AND REVERSE THE 'CONTROL SWITCH' AT THE POWER SOURCE.

CONNECT THE LN-8 CONTROL CABLE GROUND LEAD TO THE FRAME TERMINAL MARKED ⏚ NEAR THE POWER SOURCE TERMINAL STRIP OR TO AN UNPAINTED FRAME SCREW. THE POWER SOURCE MUST BE PROPERLY GROUNDED.

N.A. WELDING CABLES MUST BE OF PROPER CAPACITY FOR THE CURRENT AND DUTY CYCLE OF IMMEDIATE AND FUTURE APPLICATIONS.

N.B. EXTEND LEAD #21 USING #14 OR LARGER INSULATED WIRE PHYSICALLY SUITABLE FOR THE INSTALLATION. AN S16586-[ ] REMOTE VOLTAGE SENSING WORK LEAD IS AVAILABLE FOR THIS PURPOSE. CONNECT IT DIRECTLY TO THE WORK PIECE, KEEPING IT ELECTRICALLY SEPARATE FROM THE WELDING WORK LEAD CIRCUIT AND CONNECTION. FOR CONVENIENCE, THIS EXTENDED LEAD #21 SHOULD BE TAPED TO THE WELDING WORK LEAD. (THIS EXTENDED #21 LEAD CONNECTION REPLACES THE NEED TO EMPLOY THE REMOTE WORK LEAD ACCESSORY ON LN-8 METER KITS WHICH HAVE A DIRECT WORK LEAD JACKET.)

N.C. IF USING AN OLDER LN-8 CONTROL CABLE (PRIOR TO USE OF A, B, AND C MARKING), CONNECT LEAD #75 TO #75 ON THE TERMINAL STRIP, LEAD #76 TO #76 ON THE TERMINAL STRIP, AND CONNECT LEAD #77 TO #77 ON THE TERMINAL STRIP.

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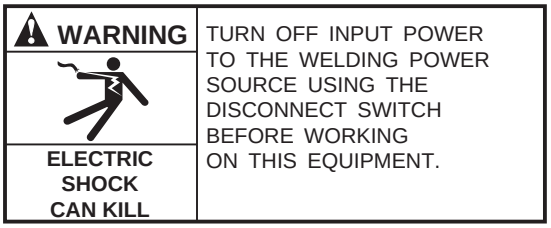
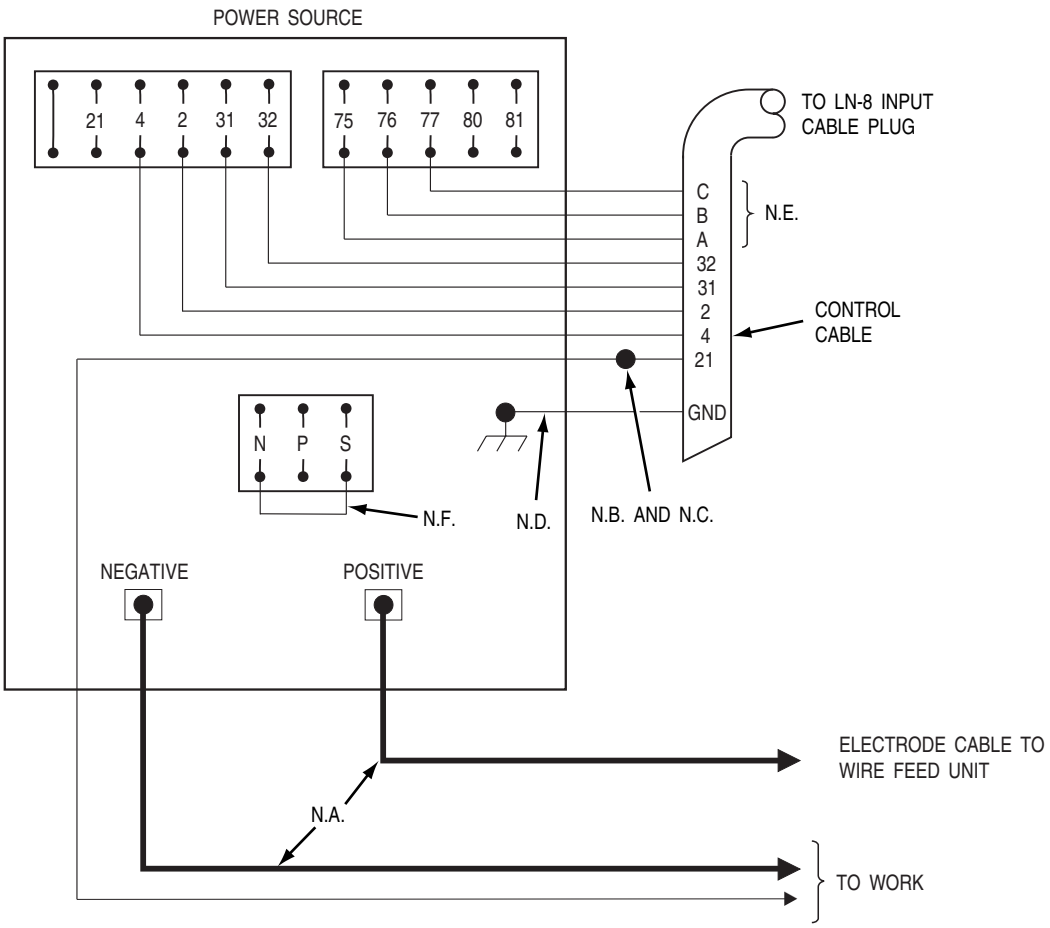
FIGURE A.6 – CONNECTION OF LN-8 TO DC-600





THE ABOVE DIAGRAM SHOWS THE ELECTRODE CONNECTED POSITIVE. TO CHANGE POLARITY, TURN OFF THE POWER, REVERSE THE ELECTRODE AND "TO WORK" LEADS AT THE POWER SOURCE, AND POSITION THE SWITCH ON THE POWER SOURCE TO PROPER POLARITY.

N.A. WELDING CABLES MUST BE OF PROPER CAPACITY FOR THE CURRENT AND DUTY CYCLE OF IMMEDIATE AND FUTURE APPLICATIONS.

N.B. EXTEND LEAD #21 USING #14 OR LARGER INSULATED WIRE PHYSICALLY SUITABLE FOR THE INSTALLATION. AN S16586-[ ] REMOTE VOLTAGE SENSING WORK LEAD IS AVAILABLE FOR THIS PURPOSE. CONNECT IT DIRECTLY TO THE WORK PIECE, KEEPING IT ELECTRICALLY SEPARATE FROM THE WELDING WORK LEAD CIRCUIT AND CONNECTION. FOR CONVENIENCE, THIS EXTENDED LEAD #21 SHOULD BE TAPED TO THE WELDING WORK LEAD. (THIS EXTENDED #21 LEAD CONNECTION REPLACES THE NEED TO EMPLOY THE REMOTE WORK LEAD ACCESSORY ON LN-8 METER KITS WHICH HAVE A DIRECT WORK LEAD JACK.)

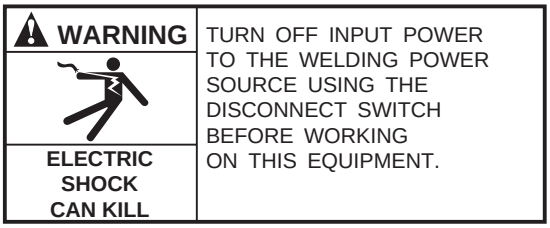
N.C. TAPE UP BOLTED CONNECTION.

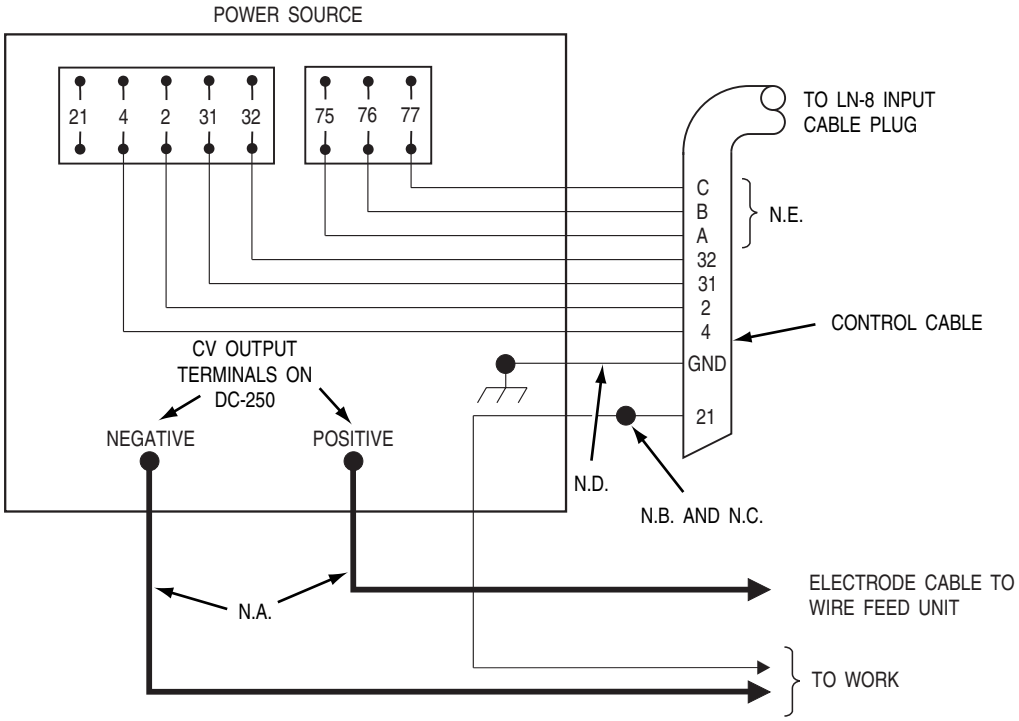
N.D. CONNECT THE LN-8 CONTROL CABLE GROUND LEAD TO THE FRAME TERMINAL MARKED ⏚ NEAR THE POWER SOURCE TERMINAL STRIP OR TO AN UNPAINTED FRAME SCREW. THE POWER SOURCE MUST BE PROPERLY GROUNDED.

N.E. IF USING AN OLDER LN-8 CONTROL CABLE (PRIOR TO USE OF A, B, AND C MARKING): CONNECT LEAD #75 TO #75 ON TERMINAL STRIP, CONNECT LEAD #76 TO #76 ON TERMINAL STRIP, AND CONNECT LEAD #77 TO #77 ON TERMINAL STRIP.

N.F. FOR DC-600 CODES BELOW 8200, CONNECT A JUMPER FROM 'N' TO 'S' ON LN-8 ONLY. THERE IS NO NPS TERMINAL STRIP ON CODES ABOVE 8200.

FIGURE A.7 – CONNECTION OF LN-8 TO DC-250, 400 AND CV/CVI POWER SOURCES





THE ABOVE DIAGRAM SHOWS THE ELECTRODE CONNECTED POSITIVE. TO CHANGE POLARITY, TURN OFF THE POWER, REVERSE THE ELECTRODE AND "TO WORK" LEADS AT THE POWER SOURCE, AND POSITION THE SWITCH ON THE POWER SOURCE AND WIRE FEEDER (IF EQUIPPED) TO PROPER POLARITY. ALSO REFER TO THE FOLLOWING NOTE:

NOTE: IF LEAD #21 IS TO BE CONNECTED TO THE TERMINAL STRIP, CONNECT TO TERMINAL #21 THAT MATCHES WORK POLARITY. THIS CONNECTION MUST BE CHANGED WHENEVER THE ELECTRODE POLARITY IS CHANGED. THIS DOES NOT APPLY TO DC-400 BELOW CODE 9200 WITH POLARITY SWITCH.

N.A. WELDING CABLES MUST BE OF PROPER CAPACITY FOR THE CURRENT AND DUTY CYCLE OF IMMEDIATE AND FUTURE APPLICATIONS.

N.B. EXTEND LEAD #21 USING #14 OR LARGER INSULATED WIRE PHYSICALLY SUITABLE FOR THE INSTALLATION. AN S16586-[ ] REMOTE VOLTAGE SENSING WORK LEAD IS AVAILABLE FOR THIS PURPOSE. CONNECT IT DIRECTLY TO THE WORK PIECE, KEEPING IT ELECTRICALLY SEPARATE FROM THE WELDING WORK LEAD CIRCUIT AND CONNECTION. FOR CONVENIENCE, THIS EXTENDED LEAD #21 SHOULD BE TAPED TO THE WELDING WORK LEAD. (IF THE LENGTH OF THE WORK LEAD CIRCUIT IS SHORT, AND CONNECTIONS CAN BE EXPECTED TO BE RELIABLE, THEN CONTROL CABLE LEAD #21 DOES NOT NEED TO BE EXTENDED AND CAN BE DIRECTLY CONNECTED TO TERMINAL #21 ON THE TERMINAL STRIP. NOTE THAT THIS IS NOT THE PREFERRED CONNECTION BECAUSE IT ADDS ERROR TO THE WIRE FEEDER VOLTMETER READING.)

N.C. TAPE UP BOLTED CONNECTION.

N.D. CONNECT THE LN-8 CONTROL CABLE GROUND LEAD TO THE FRAME TERMINAL MARKED ⏚ NEAR THE POWER SOURCE TERMINAL STRIP. THE POWER SOURCE GROUNDING TERMINAL STRIP (MARKED ⏚ AND LOCATED NEAR THE POWER SOURCE INPUT POWER CONNECTIONS) MUST BE PROPERLY CONNECTED TO ELECTRICAL GROUND PER THE POWER SOURCE OPERATING MANUAL.

N.E. IF USING AN OLDER LN-8 CONTROL CABLE (PRIOR TO USE OF A, B, AND C MARKING): CONNECT LEAD #75 TO #75 ON TERMINAL STRIP, CONNECT LEAD #76 TO #76 ON TERMINAL STRIP, AND CONNECT LEAD #77 TO #77 ON THE TERMINAL STRIP.

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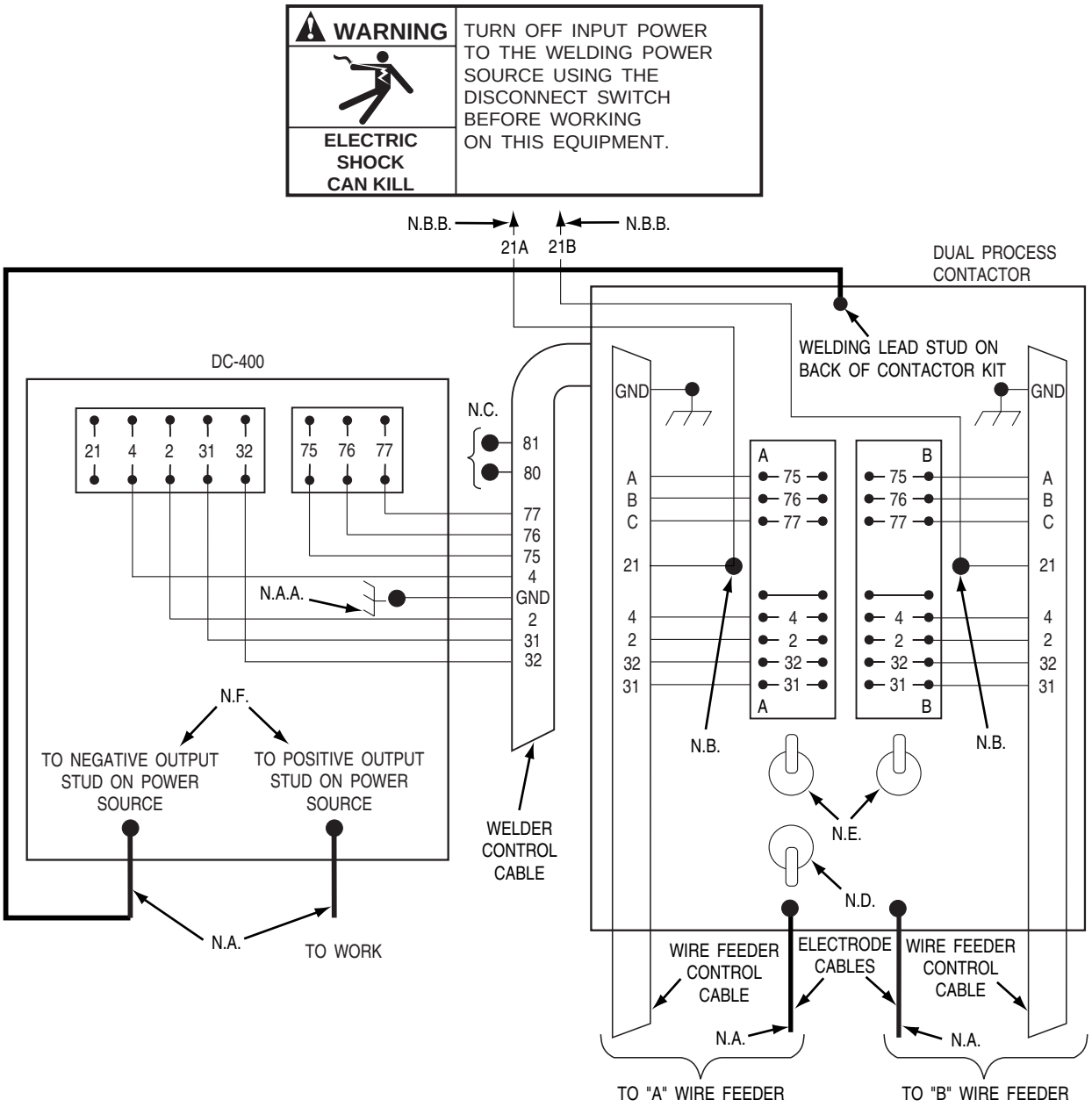
FIGURE A.8 – K318 DUAL PROCESS CONTACTOR KIT DC-400, CV-400 AND CVI-500 CONNECTION TO LN-8 FOR SAME POLARITY OPERATION



FOR 50 HZ OPERATION, DISCONNECT BOTH BROWN LEADS FROM TERMINAL 31B AND TAPE UP EACH LEAD. UNTAPE BOTH RED LEADS AND CONNECT TO 31B.

N.A.A. CONNECT THE LN-8 CONTROL CABLE GROUND LEAD TO THE FRAME TERMINAL MARKED ⏚ NEAR THE POWER SOURCE TERMINAL STRIP OR TO AN UNPAINTED FRAME SCREW. THE POWER SOURCE MUST BE PROPERLY GROUNDED.

N.B.B. EXTEND LEAD #21A & #21B USING #14 OR LARGER INSULATED WIRE PHYSICALLY SUITABLE FOR THE INSTALLATION. AN S16586-[] REMOTE VOLTAGE SENSING WORK LEAD IS AVAILABLE FOR THIS PURPOSE. CONNECT IT DIRECTLY TO THE WORK PIECE KEEPING IT ELECTRICALLY SEPARATE FROM THE WELDING LEAD CIRCUIT AND CONNECTION. FOR CONVENIENCE, THESE EXTENDED #21A AND #21B LEADS SHOULD BE TAPED TO THE WELDING WORK LEAD. EACH LEAD MUST BE CONNECTED DIRECTLY TO THE WORK AND LEADS MUST NOT BE CONNECTED TOGETHER.

N.A. WELDING CABLES MUST BE OF PROPER CAPACITY FOR THE CURRENT AND DUTY CYCLE OF IMMEDIATE AND FUTURE APPLICATIONS.

N.B. BOLT AND TAPE CONNECTIONS.

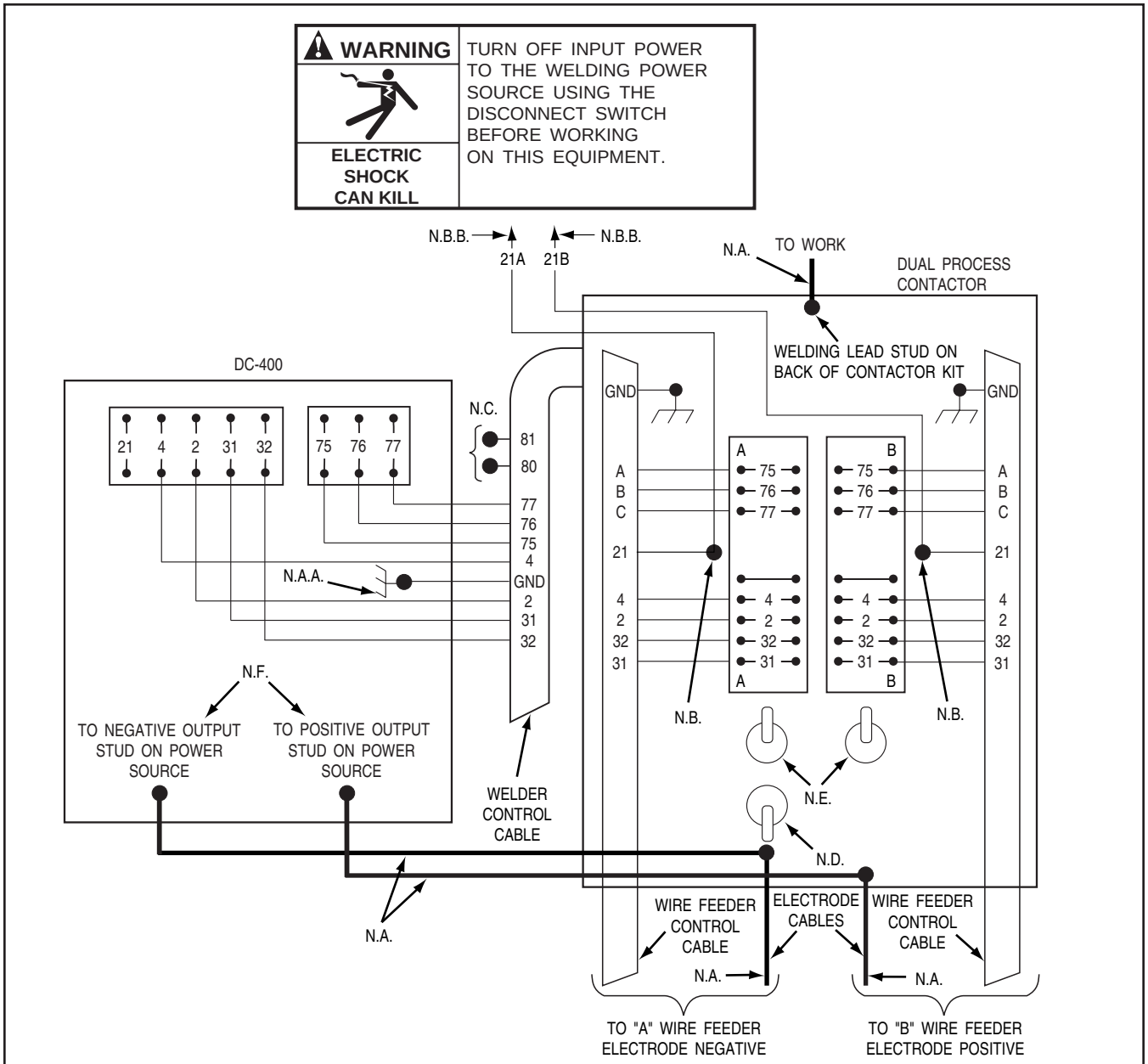
N.C. TAPE UP SEPARATELY.

N.D. PUT TRANSFER SWITCH IN "SAME POLARITY ON FEEDERS" POSITION.

N.E. MODE SWITCHES ON CONTACTOR KIT ARE NOT FUNCTIONAL WHEN USED WITH THE POWER SOURCE.

N.F. CONNECTION SHOWN FOR NEGATIVE POLARITY. FOR POSITIVE POLARITY REVERSE ELECTRODE AND WORK CABLES CONNECTED TO POWER SOURCE OUTPUT STUDS.

FIGURE A.9 – K318 DUAL PROCESS CONTACTOR KIT DC-400, CV-400 AND CVI-500 CONNECTION TO LN-8 FOR OPPOSITE POLARITY OPERATION



FOR 50 HZ OPERATION, DISCONNECT BOTH BROWN LEADS FROM TERMINAL 31B AND TAPE UP EACH LEAD. UNTAPE BOTH RED LEADS AND CONNECT TO 31B.

N.A.A. CONNECT THE LN-8 CONTROL CABLE GROUND LEAD TO THE FRAME MARKED ⏚ NEAR THE POWER SOURCE TERMINAL STRIP OR TO AN UNPAINTED FRAME SCREW. THE POWER SOURCE MUST BE PROPERLY GROUNDED.

N.B.B. EXTEND LEAD #21A AND #21B USING #14 OR LARGER INSULATED WIRE PHYSICALLY SUITABLE FOR THE INSTALLATION. AN S16586-[] REMOTE VOLTAGE SENSING WORK LEAD IS AVAILABLE FOR THIS PURPOSE. CONNECT IT DIRECTLY TO THE WORK PIECE, KEEPING IT ELECTRICALLY SEPARATE FROM THE WELDING WORK LEAD CIRCUIT AND CONNECTION. FOR CONVENIENCE, THESE EXTENDED #21A AND #21B LEADS SHOULD BE TAPED TO THE WELDING WORK LEAD. EACH LEAD MUST BE CONNECTED DIRECTLY TO THE WORK AND LEADS MUST NOT BE CONNECTED TOGETHER.

N.A. WELDING CABLES MUST BE OF PROPER CAPACITY FOR THE CURRENT AND DUTY CYCLE OF IMMEDIATE AND FUTURE APPLICATIONS.

N.B. BOLT AND TAPE CONNECTIONS.

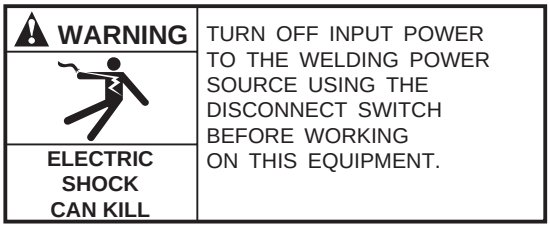
N.C. TAPE UP SEPARATELY.

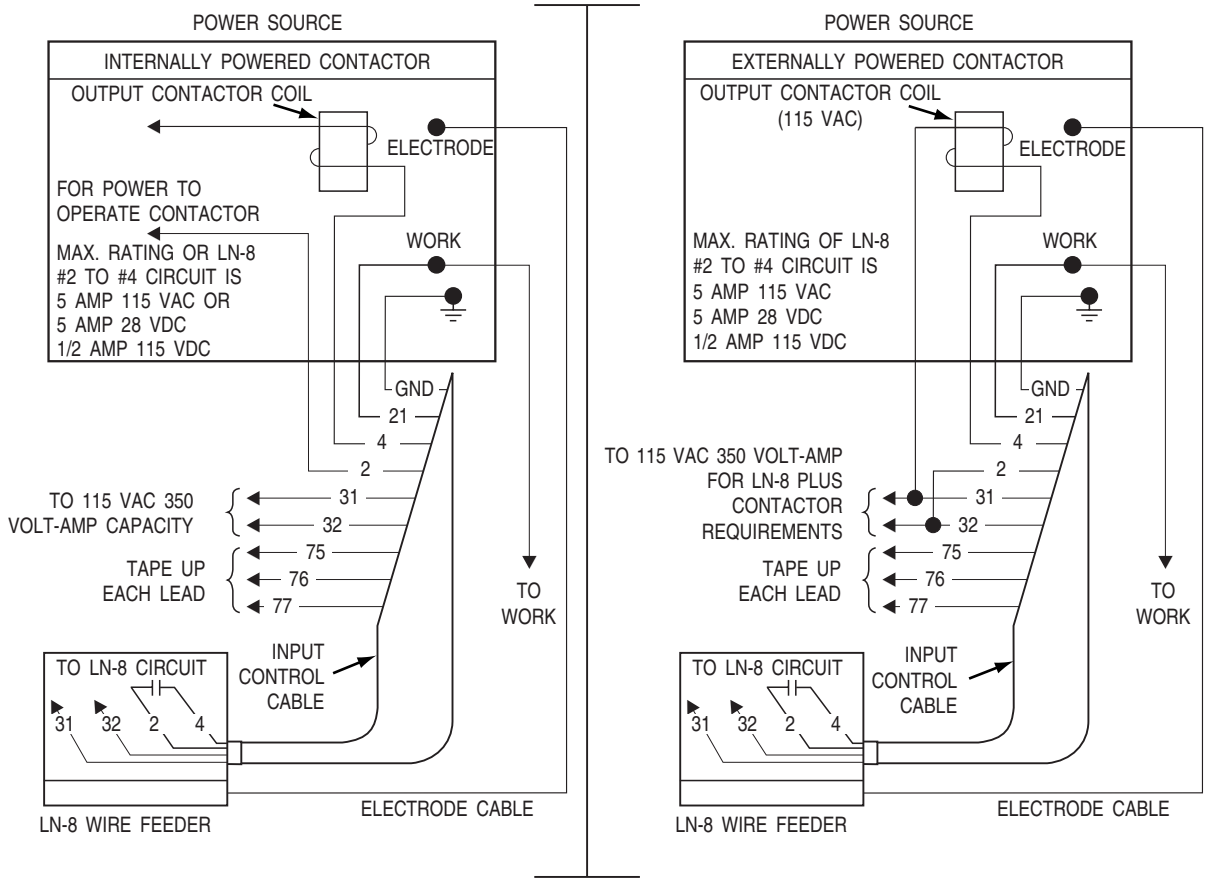
N.D. PUT TRANSFER SWITCH IN "OPPOSITE POLARITY ON FEEDERS" POSITION.

N.E. MODE SWITCHES ON CONTACTOR KIT ARE NOT FUNCTIONAL WHEN USED WITH THE POWER SOURCE.

N.F. TO MAKE "A" FEEDER POSITIVE POLARITY AND "B" FEEDER NEGATIVE POLARITY, REVERSE ELECTRODE CABLES CONNECTED TO POWER SOURCE OUTPUT STUDS.

FIGURE A.10 – FOR POWER SOURCES OTHER THAN LINCOLN ELECTRIC





REFER TO THE POWER SOURCE WIRING DIAGRAM TO FIND THE TYPE OF CONTACTOR CIRCUIT.

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INPUT CABLE CONNECTIONS

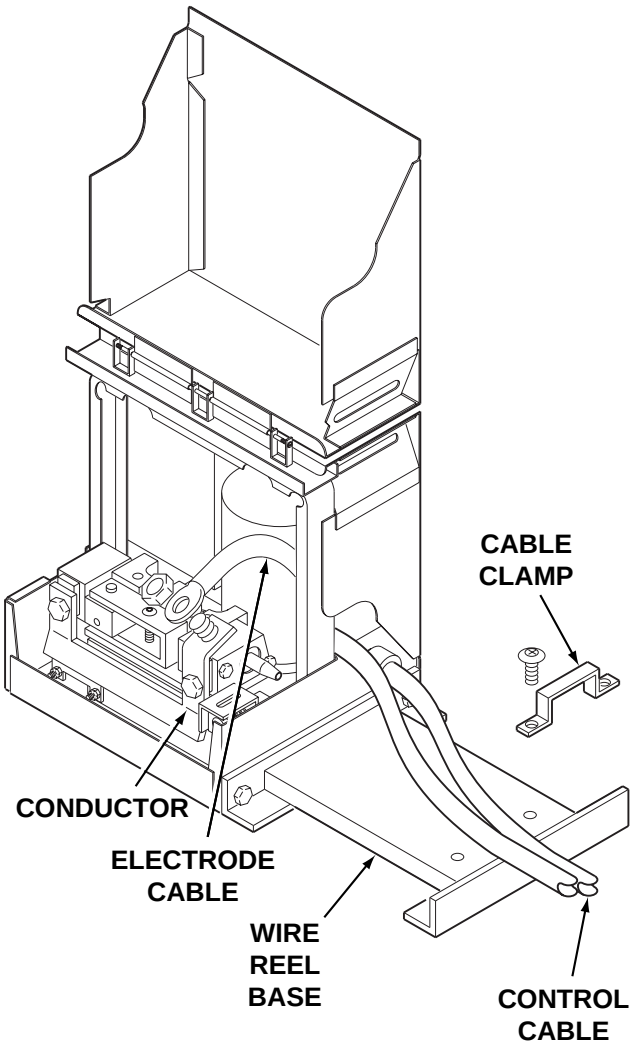
For connecting an LN-8 to a specific Lincoln Electric power source, use the appropriate steps in one of these paragraphs and refer to the connection diagrams listed on ***Table A.2*** for the applicable power source. ***Table A.2*** lists each figure number with its corresponding power source.

LN-8N AND LN-8S

The input cable consists of an electrode cable and a multi-conductor control cable. The control cable has a polarized plug on the wire feeder end. To connect the cables, refer to Figure A.11 and perform these steps:

1. Connect the polarized plug of the control cable to the mating connector on the back of the wire feeder.

FIGURE A.11 – INPUT CONTROL CABLE AND ELECTRODE CABLE CONNECTIONS



2. Remove the screws holding the cable clamp located near the rear of the wire reel base. Put the control cable and electrode cable under the clamp and install the screws. On cables with more than one electrode cable, leave the junction between the two or more cables and the single 4/0 stub behind the clamp so only the single electrode lead is under the clamp.

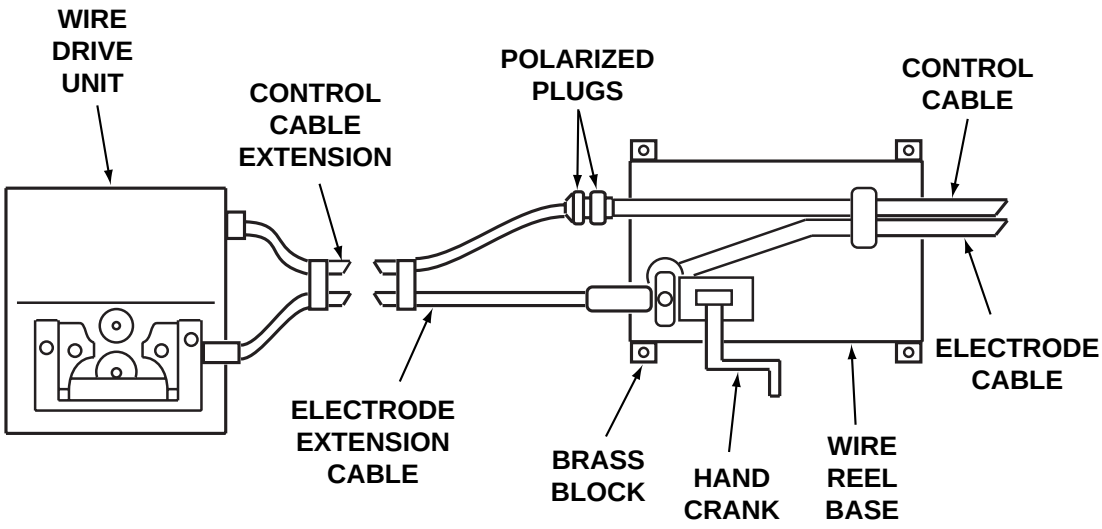
3. Pass the single electrode cable through the holes provided in the back corner of the control section and fasten it to the tab on the conductor above the rear brass block of the wire feeder.

LN-8NE AND LN-8SE

The extension unit consists of a wire reel mount with a hand crank and either a 22-1/2 or 45 ft (6.9 or 13.7 m) extension cable assembly. The cable is rated at 450 amps, 50% duty cycle. For higher currents install a parallel length of 1/0 cable per step 10. The extension cable can be used for 0.068 through 0.120 in. (1.7 through 3.0 mm) flux-cored electrode and 5/64 through 3/32 in. (2.0 through 2.4 mm) solid electrode. The 22-1/2 ft. (6.9 m) cables can also be used for 1/16 in. (1.6 mm) solid electrodes. To connect the cables, perform these steps:

1. When shipped, the hand crank on the wire reel mount is equipped to feed 1/16 through 0.120 in. (1.6 through 3.0 mm) electrode.

FIGURE A.12 – INPUT CONTROL CABLE AND ELECTRODE CABLE EXTENSIONS



2. The standard cable setup consists of an electrode cable and a control cable with a polarized plug on the wire feeder end. Position the control cable with the polarized plug at the wire reel base. Refer to Figure A.12.

3. Connect the electrode cable to the brass block on the hand crank assembly using the screw provided.

4. Position the 22-1/2 or 45 ft (6.9 or 13.7 m) control cable extension so the polarized connector with the threads on its O.D. is at the wire reel base.

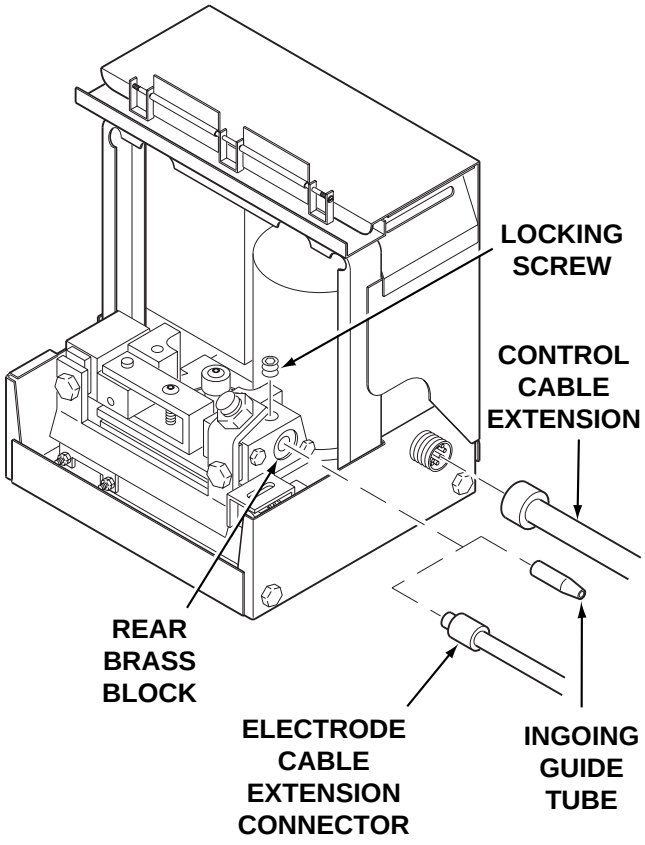
5. Connect the polarized connectors of the control cable together.

6. Place both the control and electrode cables under the clamp on the wire reel base and tighten the screws.

7. Insert the connector on the electrode cable extension into the brass block of the hand crank assembly and tighten with a 3/16 in. Allen wrench.

8. At the wire feeder, connect the polarized plug of the control cable extension into the mating receptacle on the back of the wire feeder. Refer to Figure A.13.

FIGURE A.13 – CABLE EXTENSION CONNECTIONS TO WIRE FEEDER



9. Remove the ingoing guide tube from the rear brass block of the wire feeder and plug the connector of the electrode cable extension into the brass block. Tighten the locking screw with a 3/16 in. Allen wrench. The guide tube is not used when the extension assembly is installed.

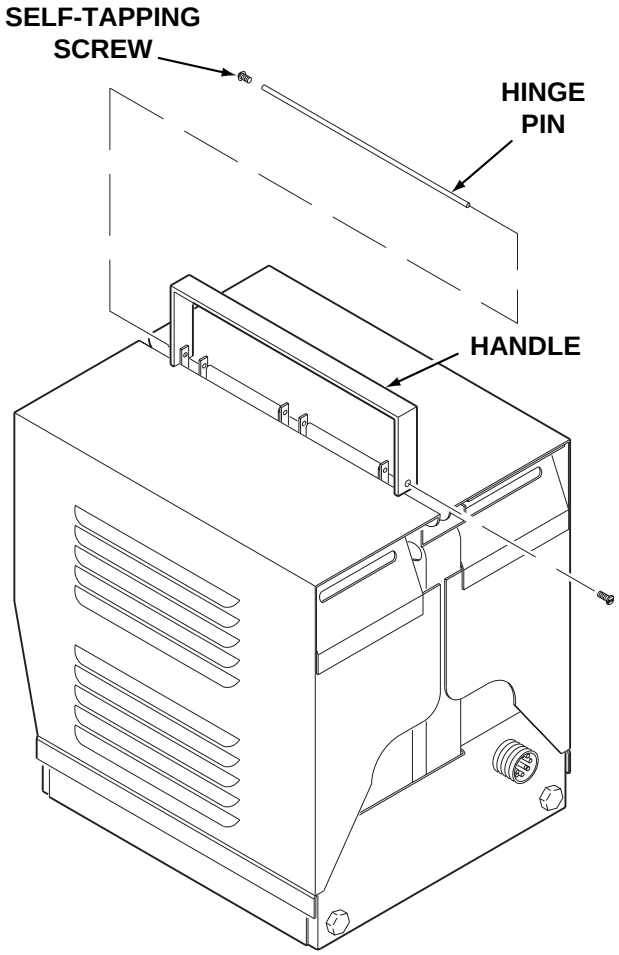
10. If using over 450 amperes, connect a length of 1/0 cable between the brass block on the wire reel base and the tab on the rear brass block of the wire feeder. Tape this cable to the extension assembly. Proper cable lengths are:

    - For a 22-1/2 ft (6.9 m) extension use 23-1/2 ft (7.2 m) - order M5906-106
    - For 45 ft (13.7 m) extension use 46 ft (14 m) - order M5906-104

11. To mount the wire feeder handle provided with the extension unit, remove the two self-tapping screws that hold the hinge pin in the top of the wire feeder. Push the hinge pin out, leaving the covers intact. Place the handles into the slots provided and push the hinge pin back into the assembly making sure that the pin goes through the holes in the handle. Put the two self-tapping screws back into their respective positions. Refer to Figure A.14.

12. If the extension is being used with a K306 Wire Reel Flux Tank assembly, the hose attached to the bottom of the flux tank may have to be shortened. This hose is 64 ft (19.5 m) long, and is the correct length for use with the 45 ft (13.7 m) extension. If a 22-1/2 ft (6.9 m) extension is to be used, cut 22-1/2 ft (6.9 m) off the flux hose to give the correct length of 41-1/2 ft (12.6 m). (The conductor cable is 22-1/2 ft (6.9 m) long, tip to tip, and can be used to measure the length of hose cut off.) If the flux hose is taped to the extension cables or gun cable, it should be done in such a manner as not to deform or collapse the hose.

FIGURE A.14 – WIRE FEEDER HANDLE INSTALLATION



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GUN AND CABLE ASSEMBLIES

GENERAL

The LN-8 is used with various guns. In all cases, the gun is shipped connected to the cable and is ready to weld. Use the gun recommended for the wire type (solid or cored) and size to be used. See the paragraph on ***Welding Guns*** in the ***Accessories Section*** for more information on the different types of guns.

GUN CABLE CONNECTIONS

Lay the cable out straight. Insert the male end of the welding conductor cable into the brass block on the front of the LN-8. Make sure it is in all the way and tighten the locking screw with a 3/16 in. Allen wrench. Keep this connection clean and bright. Connect the control cable polarized plug into the receptacle next to the coupling.

HANDLING PROCEDURES

1. Do not kink or pull the cable around sharp corners.
2. Keep the electrode cable as straight as practical when welding or starting the electrode through the cable.
3. Do not allow dolly wheels or trucks to run over the cables.
4. Keep the cable clean by following the maintenance instructions.
5. Use only clean, rust-free electrode wire.
6. Replace contact tip when the arc starts to become unstable or the contact tip end is fused or deformed.

LN-8S AND LN-8SE CONTINUOUS FLUX FEED (SUBMERGED ARC)

Connect the loose end of the hose to the tube at the back end of the welding gun. Tighten the hose clamp. If the hose is taped to the gun cable, be sure it is not collapsed or deformed as this could cause flux feeding problems.

The air for the automatic flux feeding system is obtained from the regular plant compressed air system, providing the plant system pressure is between 60 and 120 psi (414 and 827 kPa). The tank is equipped with a pressure regulator to reduce the input pressure to the 30 psi (207 kPa) required for the flux feeding system. This pressure is set at the factory before the machine is shipped. When the LN-8SE with the 22-1/2 or 45 ft. (6.9 or 13.7 m) extension is used, and the flux hose is long, set the air pressure at 45 psi (310 kPa) for 1/2 in. (12 mm) I.D. hose, and 55 psi (379 kPa) for 3/8 in. (9.5 mm) I.D. hose. Exact pressure is indicated on the pressure gage. Air consumption is normally less than 1.5 cubic feet (4.2 cubic meters) per minute of welding.

Connect the input air hose to the street elbow located at the right side of the flux tank. A quick disconnect should be installed between the elbow and the input hose.

The air tank is equipped with a water and dirt separator. Water separated from the input air feeds down through the long flux filled tube located at the input connection. It is exhausted from the system through the coiled tube below the flux tank. There is always a small amount of air and possibly water coming out of the end of this tube.

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Read and understand this entire section before operating your machine.

SAFETY INSTRUCTIONS

⚠ WARNING

ELECTRIC SHOCK can kill.

- Do not touch electrically live parts such as output terminals or internal wiring.
- Insulate yourself from the work and ground.
- Always wear dry insulating gloves.

FUMES AND GASES can be dangerous.

- Keep your head out of fumes.
- Use ventilation or exhaust to remove fumes from breathing zone.

WELDING, CUTTING and GOUGING SPARKS can cause fire or explosion

- Keep flammable material away.
- Do not weld, cut or gouge on containers that have held combustibles.

ARC RAYS can burn.

- Wear eye, ear and body protection.

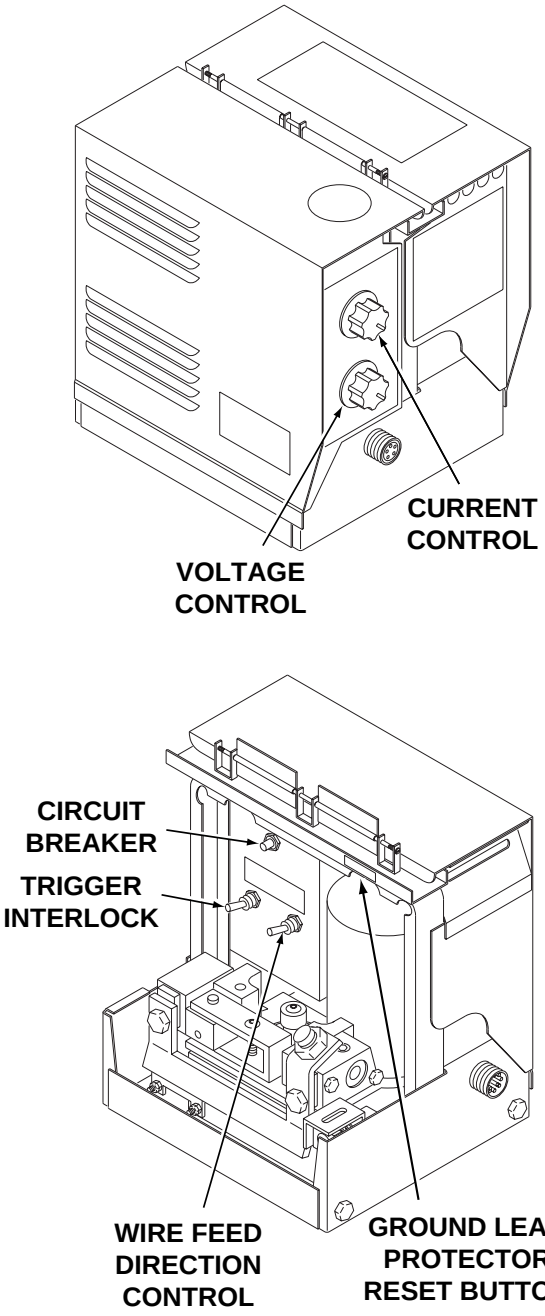
Only qualified personnel should operate this equipment. Observe all safety information throughout this manual.

CONTROLS AND THEIR FUNCTIONS

CONSTANT CURRENT CONTROLS

Operator controls for welding using a constant current power source are illustrated in Figure B.1. Refer to the figure and the following explanations of the controls.

FIGURE B.1 – CONSTANT CURRENT CONTROLS



CURRENT CONTROL. Adjusts welding current by controlling power source output.

VOLTAGE CONTROL. Adjusts arc voltage by controlling wire feed speed.

TRIGGER INTERLOCK. With the switch in the OFF position, the wire feed motor runs and the welding circuit is energized only when the gun trigger is pressed. The operator must hold the trigger in from the start to the finish of the weld. To stop the arc, the operator releases the trigger and raises the gun from the work. With the switch in the ON position, the operator holds the trigger until the arc is established, then the trigger can be released. When the welding is completed, the operator raises the gun from the work to break the arc.

WIRE FEED DIRECTION CONTROL. The direction the electrode passes through the wire feeder is controlled by this switch. The electrode is fed through the wire feeder in the same direction that the switch is pointing.

CIRCUIT BREAKER. Protects the circuit from severe wire feed motor overloads and short circuits. Press to reset.

GROUND LEAD PROTECTOR RESET BUTTON. The ground lead protector guards the ground lead in the control cable from damage that can occur when the electrode circuit touches the wire feeder frame while the gun trigger is pressed. This button resets the ground lead protector circuit.

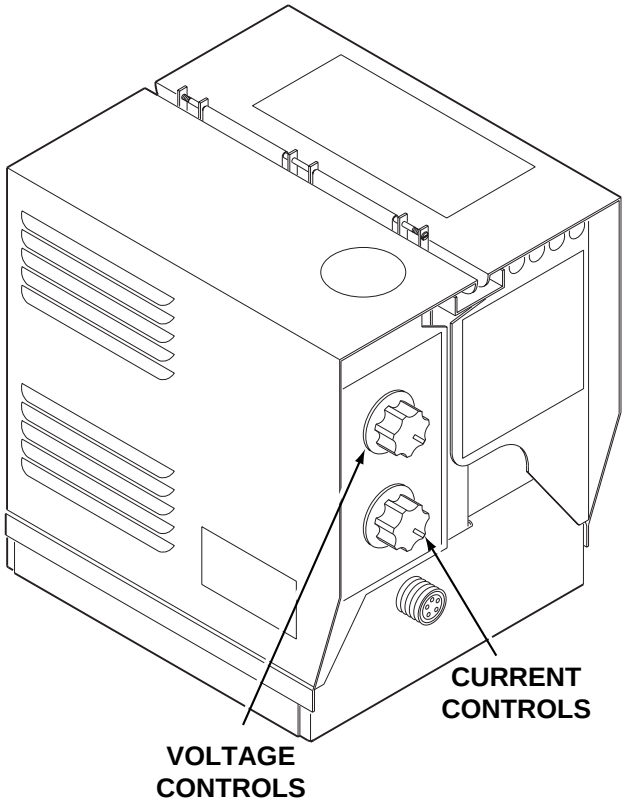
CONSTANT VOLTAGE CONTROLS

Operator controls for welding using a constant voltage power source that differ from the constant current controls are illustrated in Figure B.2. Refer to the figure and the following explanations of the controls.

VOLTAGE CONTROL. Adjusts arc voltage by controlling power source output voltage.

CURRENT CONTROL. Adjusts wire feed speed to control welding current.

FIGURE B.2 – CONSTANT VOLTAGE CONTROLS



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CIRCUIT PROTECTION

FIELD CIRCUIT FUSE. This 1/2 amp slow blow fuse, located on the Relay PC board, protects the field circuit. It will blow if the field shorts or if one of the field circuit components on the Relay PC board fails.

MOTOR THERMAL PROTECTION. The temperature sensing thermal protector mounted in the motor opens the relay circuit when the motor overheats because of excessive loading or frequent triggering. This protects the motor without nuisance tripping. The thermal protector automatically resets itself after the motor cools sufficiently (may take 10-15 minutes). Reset time can be shortened by cooling the motor with an air hose or fan.

CIRCUIT BREAKER. The 5 amp circuit breaker located above the drive rolls normally trips only when an overload occurs because of excessive loading in the wire feed cable, or a defective motor or control component. After allowing a minute for cooling, push the reset button and weld. If it trips again, be sure the wire feed cable is clean and the proper size for the wire diameter being fed. If it still trips, look for a defective electrical component.

AVOIDING GROUND LEAD PROTECTOR (GLP) ACTIVATION

The frame of the LN-8 wire feed unit and the drive motor are grounded to the frame of the power source by a lead in the control cable. An overload protector prevents welding current from damaging this lead if the electrode circuit touches the wire feeder frame while the gun trigger is pressed.

When the protector is tripped, the welding contactor in the power source will not close when the gun trigger is pressed.

DO NOT allow the electrode to contact the case of the wire feeder or the uninsulated part of the wire reel stand when the gun trigger is activated.

Be sure that all work lead connections to the work make tight metal-to-metal contact.

DO NOT allow excess input cable or work cable to be placed closer than three feet from the wire feeder.

DO NOT coil excess input cable assembly or use a coiled assembly as shipped from the factory. Instead, loop the excess cable length back and forth in three to six foot straight lengths. Coiling the input cable results in a transformer action between the electrode conductor cable and the ground lead in the multiconductor control cable. This transformer action can cause a current to flow in the ground lead which will falsely activate the GLP circuit.

To reset the GLP circuit, press the white button above the drive motor and to the right of the circuit breaker.

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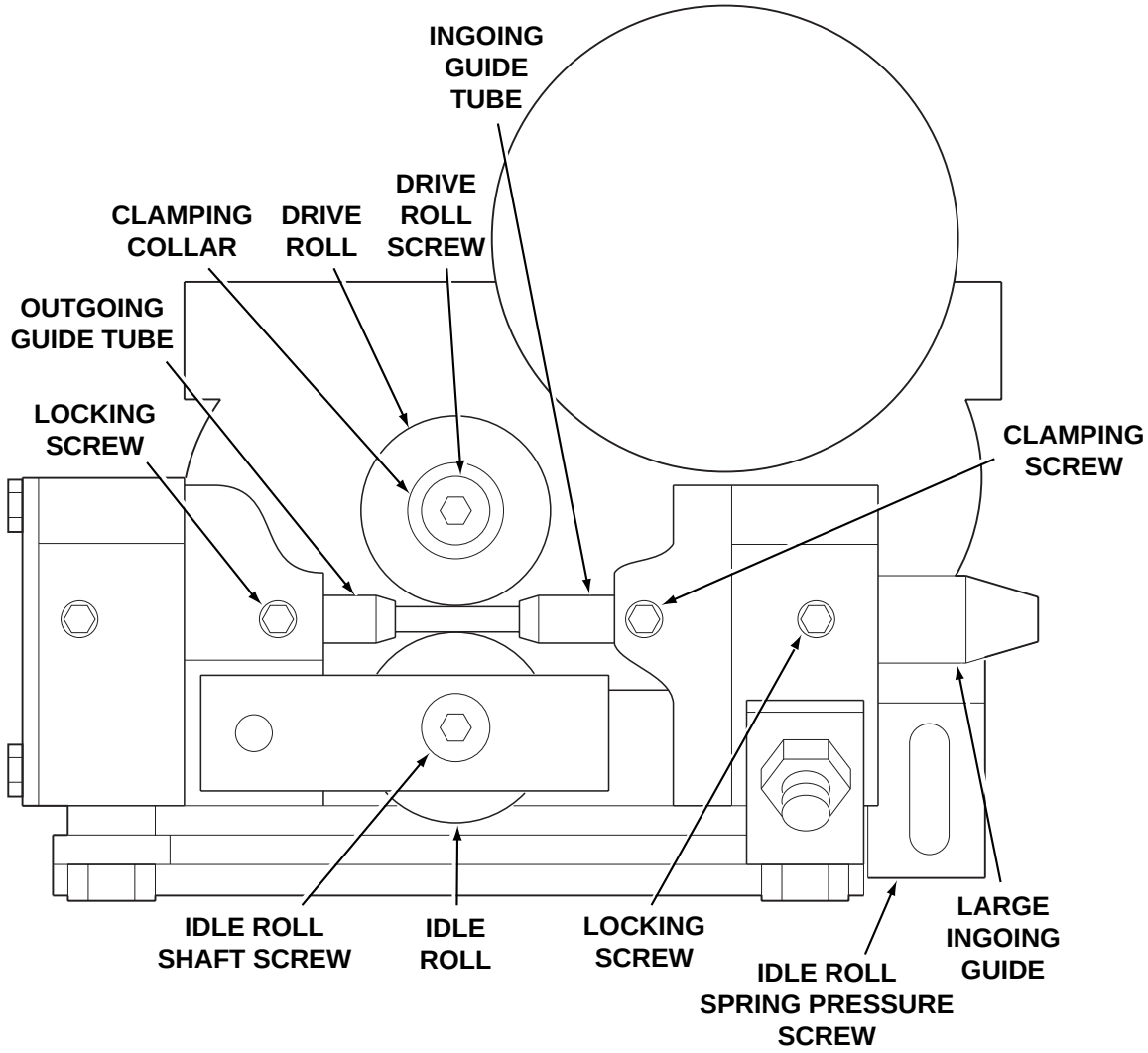
WIRE FEED ROLLS AND GUIDE TUBES

The drive rolls and guide tube kits are ordered separately. Refer to Figure B.3 and install these parts per the following instructions:

1. Loosen the idle roll spring pressure screw.
2. Remove the drive roll screw and clamping collar from the drive shaft.
3. Install the drive roll and replace the clamping collar. Tighten the drive roll screw.
4. Remove idle roll shaft screw. Install the idle roll and idle roll shaft screw.
5. Remove the large ingoing guide from the rear brass block by loosening the locking screw.
6. Loosen the ingoing guide tube clamping screw. Install the ingoing guide tube (which is stenciled “in”) through the rear brass block. Tighten the clamping screw.

FIGURE B.3 – WIRE FEED ROLLS AND GUIDE TUBE INSTALLATION



7. Install the large ingoing guide into the rear brass block and tighten the locking screw.

8. Install the outgoing guide tube with its plastic insert through the front brass block. Tighten the locking screw so the dog point goes into the groove on the O.D. of the guide tube.

9. Set the drive roll spring pressure:

   a. For wire sizes from 0.030 thru 0.052 in. (0.8 thru 1.3 mm) – With wire in the system, the idle roll pressure indicator should be set to the wire size shown on the “solid” side of the nameplate. (For 0.030 in. (0.8 mm) solid wire, set the pressure indicator to slightly less than the 0.035 in. (0.9 mm) marking.) This setting is a starting point and may have to be changed depending upon the type of wire, surface condition, lubrication, and hardness. The optimum idle roll setting can be determined when there are wire stoppages. If the wire “bird nests” between the drive roll and the guide tube, the idle roll spring pressure is too high. When properly set, the drive rolls will slip during a stoppage. If the electrode is removed from the cable, there will be a slight waviness in the electrode for about a foot beyond the slip marks on the electrode. If there is no waviness, the pressure is set too low.

   b. For 1/16 in. (1.6 mm) solid or 0.062 in. (1.6 mm) cored wire (using the 1/16 in. drive roll) The idle roll pressure should be set with wire in the system. For 1/16 in. (1.6 mm) solid wire, the indicator should be lined up with the “solid” 1/16 in. mark. For 0.062 in. (1.6 mm) cored wire, adjust the idle roll pressure so that the indicator is lined up with the “cored” 3/32 in. mark.

NOTE: These indicator settings are accurate enough so that there is no need to readjust unless the electrode is unusually soft.

   c. For wire sizes from 0.068 thru 0.120 in. (1.7 thru 3.0 mm) Idle roll pressure should be set with wire in the system. For solid wire, the indicator should be lined up with the “solid” wire settings. For cored wire, the indicator should be lined up with the “cored” wire settings. When using 7/64 in. (2.8 mm) diameter ‘Innershield’ wire, adjust the idle roll pressure so that the indicator is between the 0.120 and 3/32 in. “cored” wire setting.

NOTE: The indicator settings for these larger wire sizes are accurate enough so that there is no need to readjust, unless the electrode is unusually soft.

The drive rolls are stamped with the wire size for which they are designed. If a wire size is used that is not stamped on the drive roll, the drive rolls and guide tubes will have to be changed.

SETTING FOR CV OR CC POWER SOURCES

The LN-8N and LN-8NE weld only with a constant voltage (CV) power source. These machines can be converted for constant current (CC) welding by installing the proper parts.

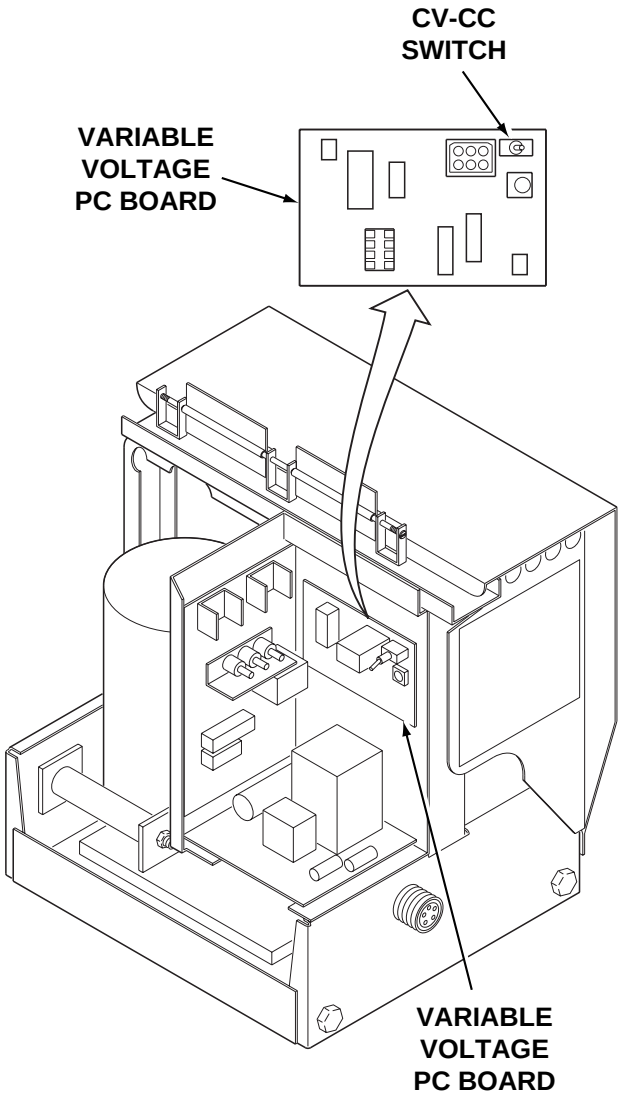
The LN-8S and LN-8SE weld with either a CV or CC power source. Set the equipment for either “CV” or “CC” as appropriate per the following:

1. If using a multi-process power source, set it up per the instructions in the operating manual shipped with the power source.

2. Turn the input power off and open the left panel. Set the “CV-CC” switch located on the variable voltage PC board inside the control box as shown in ***Figure B.4***.

3. There are two nameplates on top of each other on the front of the wire feeder control box. Make sure the correct nameplate for the power source being used is on top.

FIGURE B.4 – CV-CC SWITCH



WELDING WITH A CONSTANT VOLTAGE POWER SOURCE

1. Current and voltage adjustments

   Amps Control — All Power Sources
   Set the welding current (or wire feed speed) with the LN-8 Amps control.

   Volts Control — DC-600 Power Source
   a. Set the mode switch on the power source to CV Innersheild or CV Subarc, as required.

   b. Place power source output control toggle switch in the 'Output Control Remote' position. Total voltage control is now at the LN–8.

   Volts Control — Idealarc R3S Power Sources
   Set the power source to the approximate voltage required, per the R3S instruction manual. Make final adjustments with the LN–8 'Volts' control (or the 'Fine Voltage Control' on the optional Line Voltage Compensator).

   Volts Control — SAM Power Sources
   Set the power source for the approximate voltage required, per the SAM instruction manual. Make final adjustments with the LN-8 'Volts' control.

   If using the variable inductance control (see SAM instruction manual), set the SAM 'Current Control' as desired in the 8 o'clock range.

2. Set the 'Direction of Wire Feed' switch so the wire feeds out of the gun.

3. Adjust the electrical stickout and the actual welding current and voltage as needed.

WELDING WITH A CONSTANT CURRENT POWER SOURCE

1. Current and voltage adjustments

   Volts Control — All Power Sources
   Set the welding voltage with the LN-8 'Volts' control.

   Amps Control — CC Power Sources
   a. Place mode switch in the CC submerged arc position.

   b. Place power source output control toggle switch in the 'Output Control Remote' position. Total current control is now at the LN–8.

   Amps Control — SAM Power Sources
   Set the Current Control on the power source for the approximate current required. Make final adjustments with the LN-8 'Amps' control.

2. Set the 'Direction of Wire Feed' switch so the wire feeds out of the gun.

3. Adjust the welding current and voltage while welding as needed.

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WIRE REEL LOADING – 50 AND 60 lb COILS (K303 WIRE REEL STAND)

MOUNTING A 50 OR 60 lb COIL

1. To remove the wire reel from its shaft, grasp the spring loaded knob and pull out. This straightens the knob so it seats into the shaft when released. Remove the reel.

2. Lay the reel flat on the floor. Loosen the spinner nut and remove the cover plate. See Figure B.5.

3. Place the coil of electrode on the reel so it unwinds as the reel rotates clockwise. DO NOT cut the tie wires at this time.

4. Be sure the coil is placed so the spring loaded arms will not interfere with the later removal of the coil tie wires.

5. When loading the electrode, be certain the coil is placed on the reel so the spring loaded arms are at the center of the slots in the cardboard coil liner. This provides the positive compression of the coil sides needed for trouble-free wire feeding.

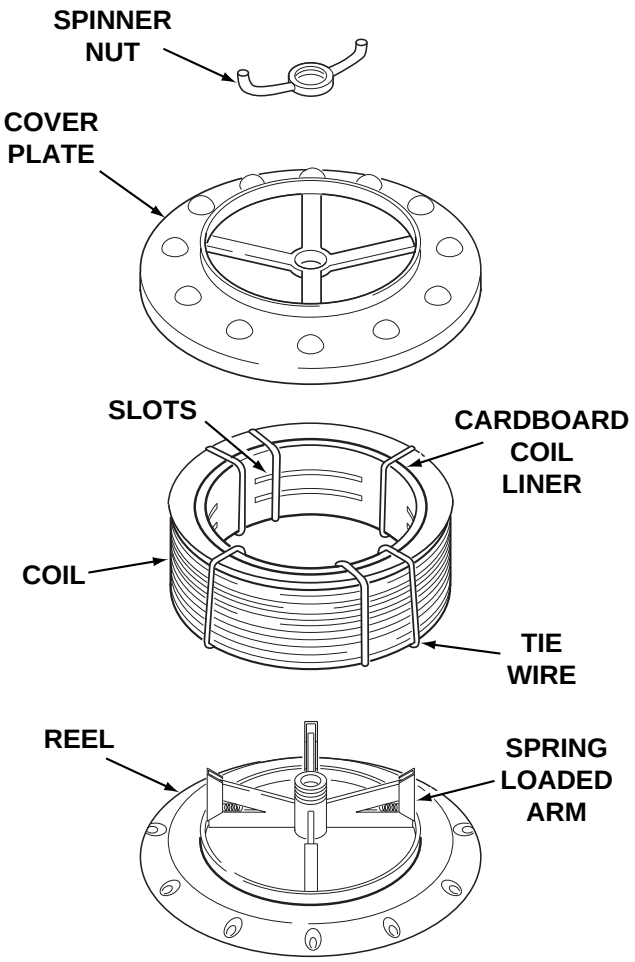
6. Put the cover plate on the reel so the four arms of the cover plate straddle and are in line with the spring loaded arms of the reel.

7. Tighten the cover as much as possible by hand. DO NOT hammer on the spinner nut arms.

⚠ CAUTION

Always be sure the free end of the coil is securely held while the tie wires are being cut and until the wire is feeding through the drive rolls. Failure to do this will result in “back lashing” of the coil, which may tangle the wire. A tangled coil will not feed. It must be untangled or discarded.

FIGURE B.5 – LOADING A 50 OR 60 lb COIL



8. Cut and remove **only** the tie wire holding the free end of the coil. Insert the free end into one of the holes in the cover and secure it by bending it back. Cut and remove the remaining tie wires.

9. Replace the reel on the wire reel stand. Grasp the shaft knob, pull it out and swing it across the reel hub, locking the reel in place.

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WIRE REEL LOADING (K1524-1 UNIVERSAL WIRE REEL STAND)

TO MOUNT A 30 lb (14 kg) READI-REEL PACKAGE (USING THE MOLDED PLASTIC K363-P READI-REEL ADAPTER):

The spindle should be located in the LOWER mounting hole.

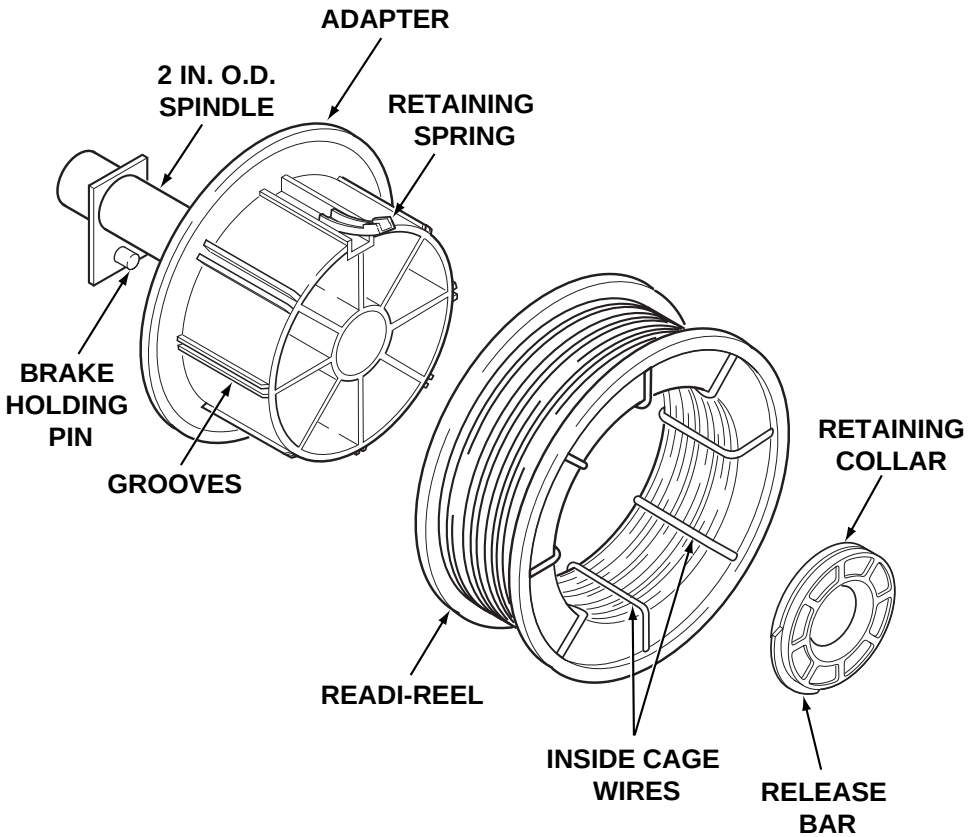
1. Depress the Release Bar on the Retaining Collar and remove it from the spindle. See Figure B.6.
2. Place the Adapter on the spindle.
3. Re-install the Retaining Collar. Make sure that the Release Bar “pops up” and that the collar retainers fully engage the retaining groove on the spindle.
4. Rotate the spindle and adapter so the retaining spring is at the 12 o’clock position.
5. Position the Readi-Reel so that when it rotates the wire is de-reeled from the bottom of the coil.
6. Set one of the Readi-Reel inside cage wires on the slot in the retaining spring tab.
7. Lower the Readi-Reel to depress the retaining spring and align the other inside cage wires with the grooves in the molded adapter.
8. Slide the cage all the way onto the adapter until the retaining spring “pops up” fully.

⚠ CAUTION

Check to be sure the Retaining Spring has fully returned to the locking position and has SECURELY locked the Readi-Reel cage in place. The Retaining Spring must rest on the cage, not the welding electrode.

9. To remove the Readi-Reel from the Adapter, depress the retaining spring tab with a thumb while pulling the Readi-Reel cage from the molded adapter with both hands. Do not remove the Adapter from the spindle.

FIGURE B.6 – READI-REEL MOUNTING



TO MOUNT 10 TO 44 lb (4.5 to 20 kg) SPOOLS (12 in./300 mm DIAMETER) OR 14 lb (6 kg) INNERSHIELD COILS:

The spindle should be located in the lower mounting hole.

[For 8 in. (200 mm) spools, a K468 spindle adapter must first be slipped onto the spindle.]

[For 13 to 14 lb (6 kg) Innershield coils, a K435 Coil Adapter must be used.]

1. Depress the Release Bar on the Retaining Collar and remove it from the spindle.

2. Place the spool on the spindle, making certain the spindle brake pin enters one of the holes in the backside of the spool. Be certain the wire comes off the reel in a direction so as to de-reel from the bottom of the coil.

3. Re-install the Retaining Collar. Make sure that the Release Bar “pops up” and that the collar retainers fully engage the retaining groove on the spindle.

TO MOUNT A 50 to 60 lb (22.7 to 27.2 kg) COIL: (USING K1504-1 COIL REEL) (FOR 50 to 60 lb READI-REELS A K438 READI-REEL ADAPTER MUST BE USED.)

The spindle should be located in the UPPER mounting hole.

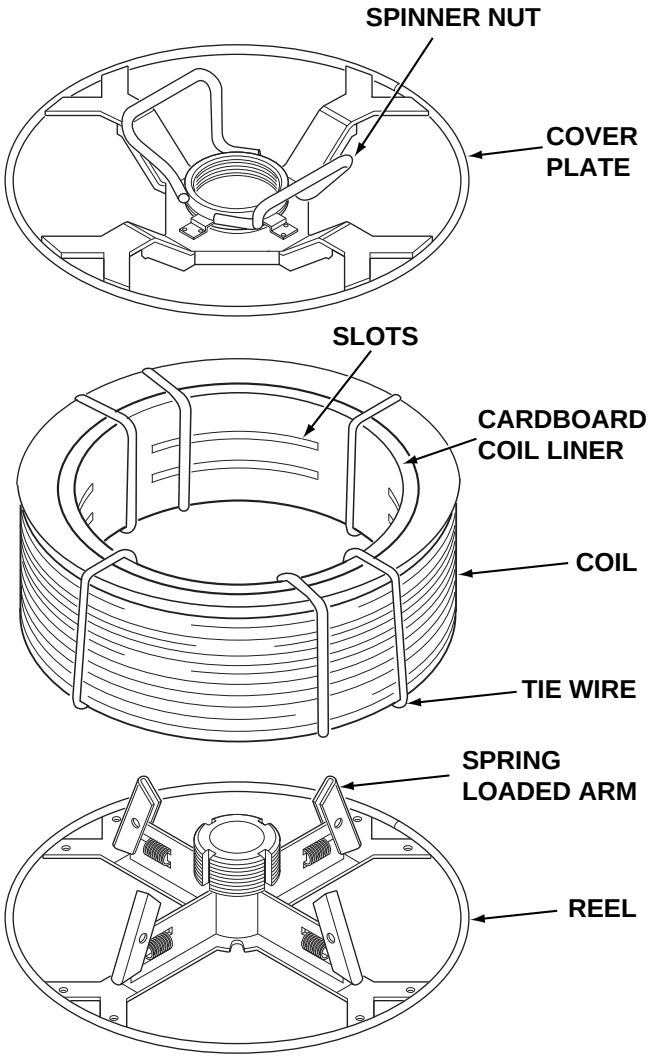
1. With the K-1504-1 Coil Reel mounted on the 2 in. (51 mm) spindle (or with reel laying flat on the floor) loosen the spinner nut and remove the reel cover. See Figure B.7.

2. Before cutting the tie wires, place the coil of electrode on the reel so it unwinds from the bottom as the reel rotates.

3. Tighten the spinner nut against the reel cover as much as possible by hand, using the reel cover spokes for leverage. DO NOT hammer on the spinner nut arms.

4. Cut and remove only the tie wire holding the free end of the coil. Hook the free end around the rim of the reel cover and wrap it around to secure. Cut and remove the retaining tie wires.

FIGURE B.7 – K1504-1 COIL REEL



⚠ CAUTION

Always be sure the free end of the coil is securely held while the tie wires are being cut and until the wire is feeding through the drive rolls. Failure to do this will result in “backlash” of the coil, which may tangle the wire. A tangled coil will not feed, so it must either be untangled or discarded.

5. Be sure the coil is engaged with the spindle brake pin and the Release Bar and Retaining Collar “pops up” and that the collar retainers fully engage the retaining groove on the spindle.

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FEEDING ELECTRODE TO THE LN-8N OR LN-8S

1. Turn the reel until the free end of the electrode is accessible.
2. While tightly holding the electrode, cut off the bent end and straighten the first six inches. Cut off the first inch. (If the electrode is not properly straightened, it may not feed or may not go into the outgoing guide tube causing a “birdnest”.)
3. Insert the free end through the incoming guide tube.
4. Press the gun trigger and push the electrode into the drive roll.

⚠ WARNING

ELECTRIC SHOCK can kill.

- Do not touch electrically live parts such as output terminals or internal wiring.
- When inching with the gun trigger, electrode and drive mechanism are “hot” to work and ground.

5. Inch the electrode through the gun.

FEEDING ELECTRODE TO THE LN-8NE OR LN-8SE (WITH EXTENSION)

1. Slide the ingoing guide tube of the hand crank to the forward position.
2. Remove start end of coil from the hole in the wire reel cover, straighten the first six inches of the wire and then insert this end into the ingoing guide tube. Push at least one foot of wire through.
3. Pull the ingoing guide tube back to the rear position and rotate 90˚ so that it will remain in this position during the cranking operation.
4. Pull the plastic hand crank handle to the out position in the arm.
5. Pull the shaft and drive roll assembly to the out position.
6. Apply downward pressure to the idler roll pressure arm. Maintain this pressure and start cranking the wire thru the system. Keep the conductor cable as straight as possible during the loading operation. This will facilitate cranking the wire through.
7. Crank until the wire touches the drive roll and then pull the gun trigger. This will start the drive rolls and feed the wire the rest of the way through the cable and gun assembly.

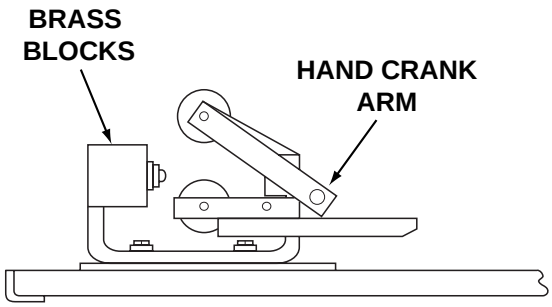
⚠ WARNING

ELECTRIC SHOCK can kill.

- Do not touch electrically live parts such as output terminals or internal wiring.
- When inching with the gun trigger, electrode and drive mechanism are “hot” to work and ground.

8. Push the plastic of the hand crank to the in position, as shown in Figure B-8.
9. Shift the ingoing guide tube to the forward position.

FIGURE B.8 – HAND CRANK POSITION



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SLOW ACCELERATION STARTING (CODE 7926 AND ABOVE)

The LN-8 has the capability of optimum starting for different processes. This is accomplished by designing the LN-8 to start with two different speeds of controlled acceleration. As shipped, the unit is connected for fast acceleration, which is best for most open arc procedures. The slower acceleration may be more desirable for long stickout applications and most submerged arc procedures. If the electrode being used does not give satisfactory starting because of "stubbing" or "blast off", the slower acceleration can be obtained by modifying the LN-8 as follows:

1. Turn off the control power to the LN-8 at the power source.
2. Remove the screws holding the control section cover in place and swing open.
3. Switch circuit #1 of S1 on the Control PC board from position "F" to position "S".
4. Reassemble.

FLUX TANK LOADING

Either turn off the incoming air line or remove the quick disconnect if one has been installed. Slightly loosen the tank cap and let the air in the tank escape in the holes in the side of the cap. After pressure has been released, remove the cap from the tank. Using the funnel provided, put 100 pounds of flux in the tank. It is very important that only new or properly reclaimed flux be put in the tank. Coarse particles and/or magnetic particles will stop the flux feeding process. New Lincoln flux is properly screened at the factory. All reclaimed flux must be separately screened through a vibrating screen with 0.065 to 0.075 in. openings and be put through a magnetic separator. The K310 vibrated screen and K58 magnetic separator are available for this purpose. The screen in the funnel supplied with the tank has much larger openings and its only purpose is to keep paper and slag out of the tank. Screw the tank cap back on and tighten hand tight. Reconnect the incoming air supply.

There will always be a small amount of air and possibly drops of water coming out of the end of the tube coiled under the tank. This is an automatic disposal system in case the plant air has water and dirt in it.

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GENERAL

The following is a list of the accessories that can be used with the LN-8 wire feeder unit. A detailed description of each item is given later in the section.

TABLE C.1 – LN-8 WIRE FEEDER ACCESSORIES

Product Number	Name
K163	UNDERCARRIAGE
K178	MOUNTING PLATFORM
K261	METER KIT
K202	BURNBACK KIT
K58	MAGNETIC SEPARATOR
K119	GRAVITY FEED FLUX CONE
K310	FLUX SCREEN
K320	FLUX TANK
K161	MECHANIZED TRAVEL POWER PACK
K240	CONTACTOR KIT
K317	DUAL PROCESS KIT (NO POLARITY CHANGE)
K318	DUAL PROCESS CONTACTOR KIT (WITH POLARITY CHANGES)
K303	50 THRU 60 lb (22.7 THRU 27.2 kg) WIRE REEL STAND
K1524-1	UNIVERSAL REEL STAND AND BASE ASSEMBLY
K162	SPINDLE FOR MOUNTING READI-REELS AND 10 THRU 30 lb (4.5 THRU 13.5 kg) SPOOLS
K377	SMALL MOUNTING STAND FOR READI-REEL COILS OR 10 THRU 30 lb (4.5 THRU 13.5 kg) SPOOLS WITH 2 in. (50 mm) I.D.
K378	SMALL MOUNTING STAND FOR 13-14 lb. (6.0-6.4 kg) INNERSHIELD COILS
M11514	WIRE REEL DUST SHIELD DOOR FOR K303
K112	SUBMERGED ARC WELDING GUN - 500 AMPS
K113	SUBMERGED ARC WELDING GUN - 600 AMPS
K114	SUBMERGED ARC WELDING GUN - 600 AMPS
K115	INNERSHIELD WELDING GUN - 450 AMPS
K116	INNERSHIELD WELDING GUN - 400 AMPS
K126	INNERSHIELD WELDING GUN - 350 AMPS
K497	MAGNUM GMA WELDING GUN - 200 AMPS
K471	MAGNUM GMA WELDING GUN - 300 AMPS
K527	MAGNUM GMA WELDING GUN - 400 AMPS
K70	FILLET GUIDE
K110	HAND TRAVEL UNIT
K62	SQUIRTMOBILE
	CONSTANT CURRENT CONVERSION PARTS

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K163 UNDERCARRIAGE (REQUIRES K303, K377, OR K378)

The undercarriage includes casters, wheels, a handle, and related hardware. Casters are mounted at the front and wheels are mounted at the rear of the platform. The handle is bolted to the front of the platform so the wire feeder can be tilted back and wheeled like a two-wheel truck. Installation sheet M13424 is provided with the undercarriage.

K178 MOUNTING PLATFORM

This is a turntable type platform for mounting the LN-8 to the top of Idealarc power sources. Bolt the platform to the lift bail per the instructions supplied with the platform.

K261 METER KIT

All LN-8 wire feed units with code no. 7580 to 7925 come equipped with a factory calibrated Speedmeter Trimmer PC board and meter kit receptacle prepared to accept the optional K261 speed-ammeter voltmeter (analog) kit. LN-8 wire feed units no. 7926 and above come with the speedmeter trimmers incorporated into the Control PC board.

K202 BURNBACK KIT

This kit is useful to help prevent the electrode from sticking in the crater at the end of the weld in two types of welding applications:

1. Welding with small diameter wire [0.035 thru 1/16 in. (0.9 thru 1.6 mm)] at fast wire feed speed when there is a tendency to overrun the wire.

2. When the semiautomatic gun is mounted in a fixture or on the K62 Squirtmobile in such a manner that it cannot be lifted from the work at the end of the weld.

The kit delays the dropout of the contactor allowing the electrode to burnback from the crater at the end of the weld. The delay time is adjustable for optimum burnback for different sizes, processes, and procedures. Installation instructions are shipped with the kit.

K58 MAGNETIC SEPARATOR

Useful with any submerged arc equipment. The unit removes foreign magnetic particles from reused submerged arc welding flux. Operating instructions are included with the kit.

K119 GRAVITY FEED FLUX CONE

The flux cone is manual feed attachment for the K112 and K113 sub-arc guns that is used instead of the continuous feed flux system. The flux cone attaches to the gun using the screws provided. The cone also includes a new clamp to be used to hold the trigger pod to the gun. Use it in place of the clamp shipped with the gun.

K310 FLUX SCREEN

The unit was designed to fit the top of either the standard fill funnel or the K58 magnetic separator. The unit has a steel screen with 0.065 to 0.075 in. openings and an air vibrator attached to the frame. The vibrator can be used with air line pressures ranging from 20 through 100 psi.

For ease of handling, the user should connect the incoming air line to the 1/8 in. pipe elbow with the aid of a quick disconnect type air coupling.

It is very important that reclaimed flux to be used in the continuous flux feeding system be passed through the K310 screen or its equivalent.

K320 FLUX TANK

The flux tank is available to permit the LN-8 to be used for submerged arc welding. Installation instructions are shipped with the kit.

K161 MECHANIZED TRAVEL POWER PACK

The power pack supplies the power needed by the K110 hand travel unit or the K62 Squirtmobile when used with the K114 sub-arc welding gun. Complete installation instructions are shipped with the kit.

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K240 CONTACTOR KIT

Output contactor with pilot relay to make the electrode 'cold' when not welding. Must be ordered when using the LN-8 with SA-750, SAE, TM, R3M and R3R Idealarcs. Contactor kits are rated at 600 amps maximum, and cannot be paralleled with each other.

K317 DUAL PROCESS KIT (NO POLARITY CHANGE)

The Dual Process Kit is a transfer device that connects two wire feeders to a single power source and enables each wire feeder to weld a different procedure without changing any of the dials. When used with the DC-600, the wire feeders can be set for different modes; CV Innershield or CV Submerged Arc. Both wire feeders will operate at the same polarity.

K318 DUAL PROCESS CONTACTOR KIT (WITH POLARITY CHANGES)

The Dual Process Contactor Kit permits the connection of two wire feeders to a single power source and enables each wire feeder to weld at a different procedure and polarity without changing any dials or switches. When used with the DC-600, the wire feeders can be set for different modes; CV Innershield or CV Submerged Arc. The kit can also be connected to operate with the same polarity on each wire feeder.

REEL MOUNTING ACCESSORIES

K303 50 TO 60 lb (22.7 TO 27.2 kg) WIRE REEL STAND

This assembly includes a framework to which is attached a 50 to 60 lb (22.7 to 27.2 kg) wire reel, a mounting spindle, a lift bail, and a cable clamp for fastening the input cable assembly.

K1524-1 UNIVERSAL REEL STAND AND BASE ASSEMBLY

The wire reel stand comes with a 2 in. spindle. With the addition of the proper spindle and Readi-Reel adapters, it can accomodate various sizes of coils, spools, and Readi-Reels.

K363P	30 lb Readi-Reel Adapter
K435	Spindle Adapter for 14 lb coils
K468	Spindle Kit
K1504-1	60 lb Wire Reel
K438	60 lb Readi-Reel Adapter

K162 SPINDLE FOR MOUNTING READI-REELS AND 10 THRU 30 lb (4.5 THRU 13.5 kg) SPOOLS

For use with the K303 wire reel stand. To mount this spindle kit, remove the shaft from the standard 50 to 60 lb (22.5 to 27.2 kg) wire coils from the mounting framework. Install the spindle per the instructions shipped with the kit.

K377 SMALL MOUNTING STAND FOR READI-REEL COILS OR 10 THRU 30 lb (4.5 THRU 13.5 kg) SPOOLS WITH 2 in. (50 mm) I.D.

This assembly includes a wire reel spindle (similar to the K162 spindle) attached to a small frame. The unit is supplied with the K363 Readi-Reel Adapter for using the Lincoln "Readi-Reel Electrode Coils". Without the adapter, the unit is capable of handling spools with a 2 in. I.D., a 12 in. maximum O.D., and a 4 in. width. The spindle has an adjustable breaking system.

K378 SMALL MOUNTING STAND FOR 13 TO 14 lb (6.0 TO 6.4 kg) INNERSHIELD COILS

This assembly includes the smaller frame as used in the K377 and the fully enclosed canister system for derailing of the 14 lb coil. This system has a fixed brake for the 14 lb coil.

M11514 WIRE REEL DUST SHIELD DOOR FOR K303

In extremely dusty and dirty locations, this door kit can be added to those units having a dust shield kit (S14543). This door kit includes a hinged door and sliding bottom seal. When these parts are attached to the reel support per the instructions included, the unit becomes a completely enclosed housing. Order part no. M11514.

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WELDING GUNS

INNERSHIELD GUNS

The K126 gun and cable assembly is recommended for most Innershield electrodes at up to 350 amps.

The K115 gun and cable assembly is recommended for up to 450 amps.

The K116 gun and cable assembly is recommended for up to 600 amps.

NOTE: Linconditioner™ guns are recommended for locations where smoke accumulation is a problem and conventional exhaust systems are ineffective. The available smoke removal type Innershield guns and vacuum units can be used in these locations. Instructions are shipped with the equipment.

SUBMERGED ARC GUNS

The K112 gun and cable assembly is recommended for welding up to 500 amps.

The K113 gun and cable is recommended for use up to 600 amps.

The K114 gun and cable assembly is a 600 amp gun that includes a flux valve and receptacle for the K110 or K62.

GMAW GUNS

An expanding line of Magnum GMA gun and cable assemblies are available to allow welding with solid and cored electrodes using the GMAW process. See the appropriate Magnum literature for descriptions of the 100-500 ampere air cooled gun and cables that are available. Gun cable lengths range from 10 to 25 ft. (3.0 to 7.5 m) and feed electrode sizes 0.023 to 3/32 in. (0.6 to 2.4 mm).

NOTE: Magnum GMA welding guns require a K466-1 connector for use with an LN-8 wire feeder.

WELDING GUN ACCESSORIES

K70 FILLET GUIDE

The fillet guide is designed to help guide the K114 sub-arc gun so the operator can make more uniform horizontal fillet welds with less effort. It consists of a vertical plate roller guide and rear wheel assembly. Once the roller guide and rear wheel are adjusted, the weld is easily made by gently pushing the gun into the fillet. The operator does not have to constantly control the drag of the flux cone against the vertical plate or carefully watch the angle of the gun.

K110 HAND TRAVEL UNIT

The mechanized travel unit can be attached to the K114 sub-arc gun and is used to obtain controlled travel speeds ranging from 7 to 60 inches. Since the hand travel unit derives its control power from a mag-amp source, a K161 power pack is required for this mode of operation.

K62 SQUIRTMOBILE

The Squirtmobile is a self-propelled trackless carriage that carries the K114 sub-arc gun on long welds for automatic welder economy without high fixture costs. To use the LN-8S or LN-8SE with the Squirtmobile, install the K161 mechanized travel power pack.

CONSTANT CURRENT CONVERSION PARTS

To convert the LN-8N or LN-8NE for welding with a constant current power source, purchase a variable voltage PC board L5039, and constant current dial plate (M12230 for LN-8N and LN-8S models, M13148 for LN-8F models above code 7580).

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ROUTINE MAINTENANCE

DRIVE ROLLS AND GUIDE TUBES

After feeding every coil of wire, inspect the drive roll section. Clean the assembly as necessary. Do not use solvent to clean the drive roll assembly as it may wash the lubricant out of the bearings. The drive rolls and guide tubes are stamped with the wire sizes they will feed. If a wire size other than that stamped on the rolls is to be used, the rolls and guide tubes must be changed.

The drive rolls for 0.068 and 0.120 in. (1.7 thru 3.0 mm) wire have a double set of teeth so they can be reversed for additional life. Between the two knurled rolls is a shim washer which limits the damage to the electrode if wire feeding problems occur. Drive rolls for 1/16 in. (1.6 mm) and smaller wire have no teeth and are not reversible.

Refer to the instructions included with the drive roll kit for installation and replacement of the drive rolls on the wire feeder.

WIRE REEL MOUNTING

To prolong the life of the reel shaft on the 50 to 60 lb coils, periodically coat it with a thin layer of grease. No maintenance to the two position brake is required. If the brake shoe wears through to metal, replace the brake assembly.

PERIODIC MAINTENANCE

CONTROL BOX

Every six months, open and inspect the control section. The accumulated dirt should be gently blown off all the electrical components. Be sure the air that is used is dry. Check all relay contacts.

WIRE DRIVE MOTOR AND GEARBOX

Every year, inspect the gearbox and coat the gear teeth with a moly-disulfide filled grease. Do not use graphite grease.

Every six months, check the motor brushes. Replace them if they are less than 1/4 in. (6.4 mm) long.

GUN AND CABLE MAINTENANCE

For instructions on periodic maintenance for the welding gun and cables, refer to the manual for your specific model of welding gun.

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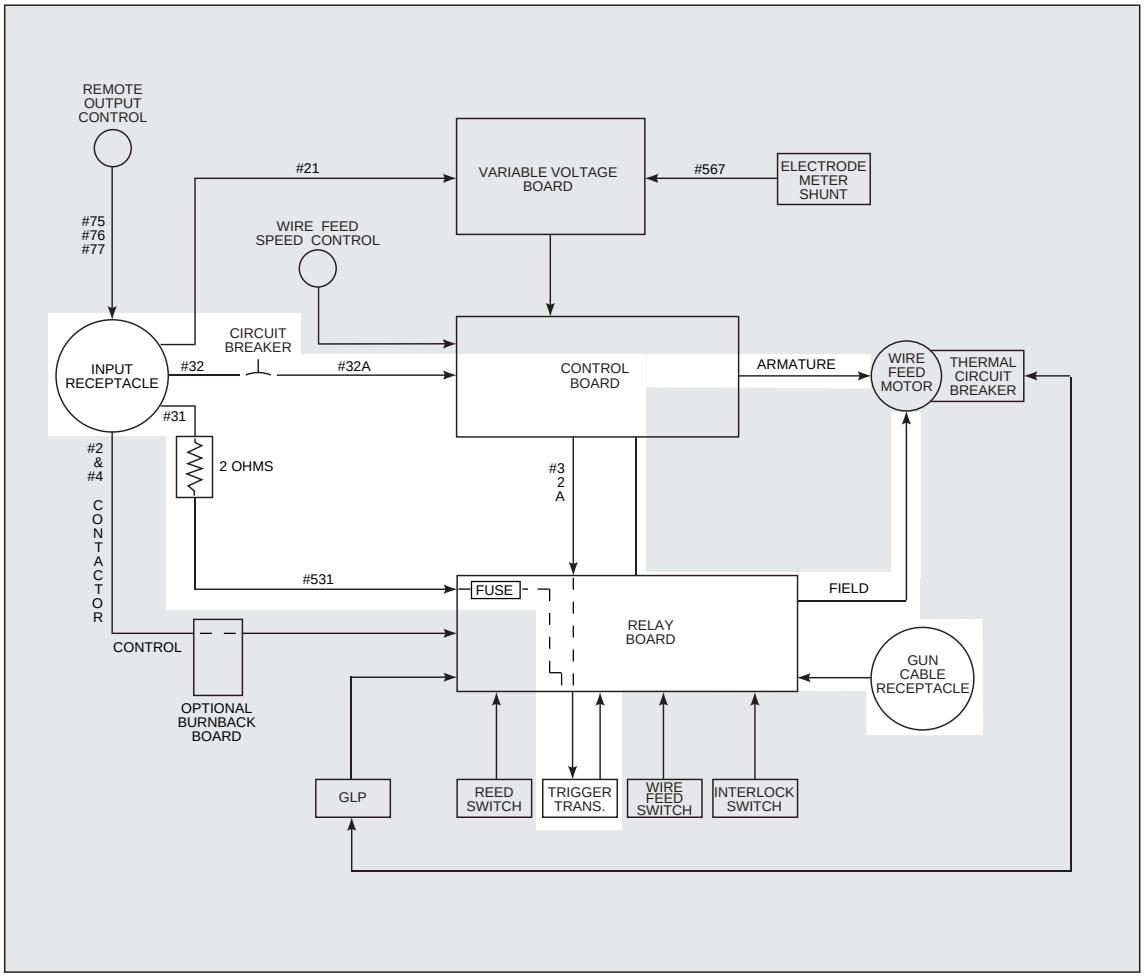
FIGURE E.1 – POWER INPUT CIRCUITS



GENERAL DESCRIPTION

The LN-8 is a semiautomatic wire feeder designed for Innershield (FCAW) and gas metal arc processes with the appropriate accessories. It is also suitable for constant voltage (CV) submerged arc welding processes. With the optional variable voltage board installed the LN-8 can be used with constant current (CC) procedures. The wire feed speed and welding power source output can be controlled from the LN-8.

POWER INPUT CIRCUITS

The 115VAC is applied (usually from the welding power source) via the input receptacle, through the circuit breaker and 2 ohm resistor to the control board, the relay board, and the trigger transformer.

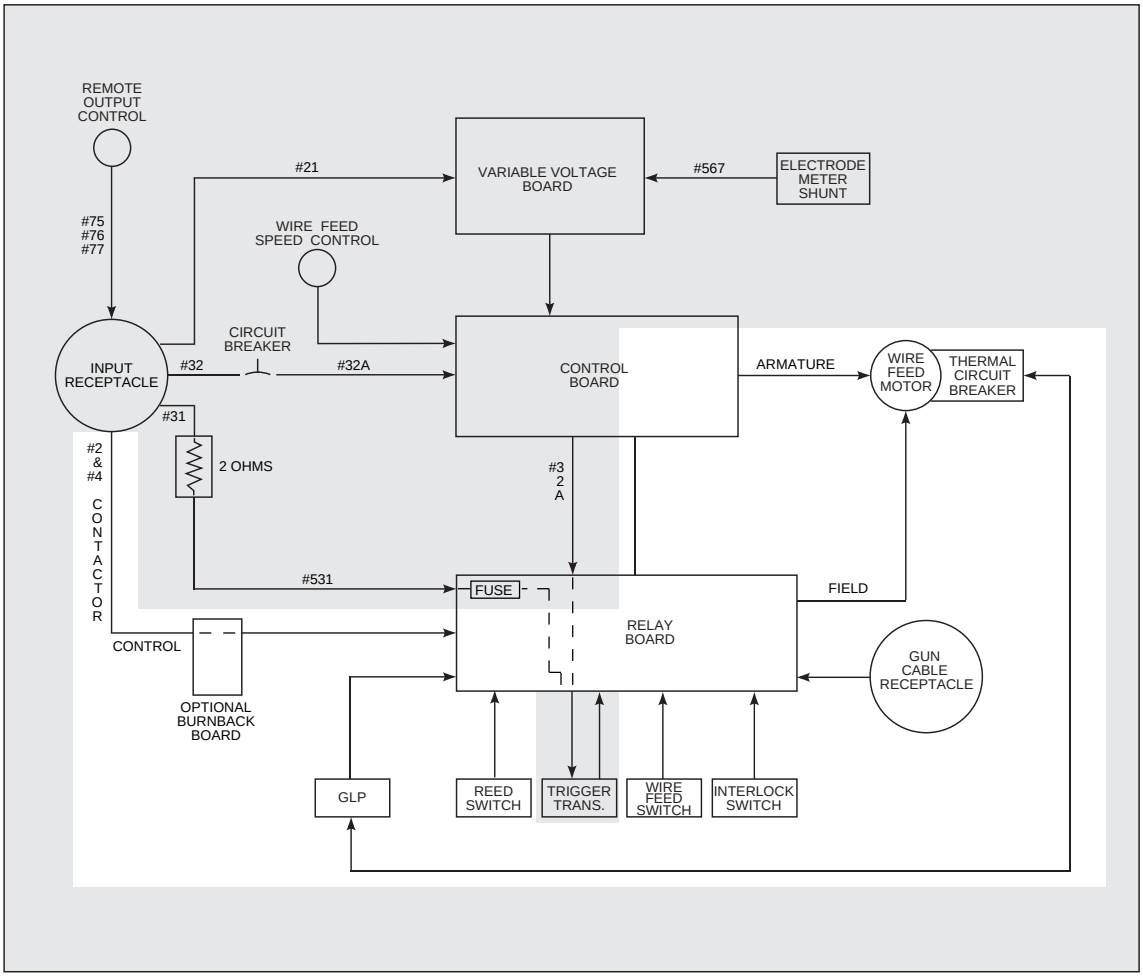
The 24VAC developed at the trigger transformer is rectified on the relay board and applied to the gun trigger circuit which controls the 1CR relay.

The 115VAC that is applied to the control board is rectified and controlled by SCRs (See ***SCR Operation***) and applied to the armature of the wire feed motor.

The relay board rectifies the 115VAC and applies it to the field winding of the wire feed motor.

NOTE: Unshaded areas of block logic diagrams are the subject of discussion.

FIGURE E.2 – GUN TRIGGER AND 1CR CONTACT CONTROL CIRCUITS



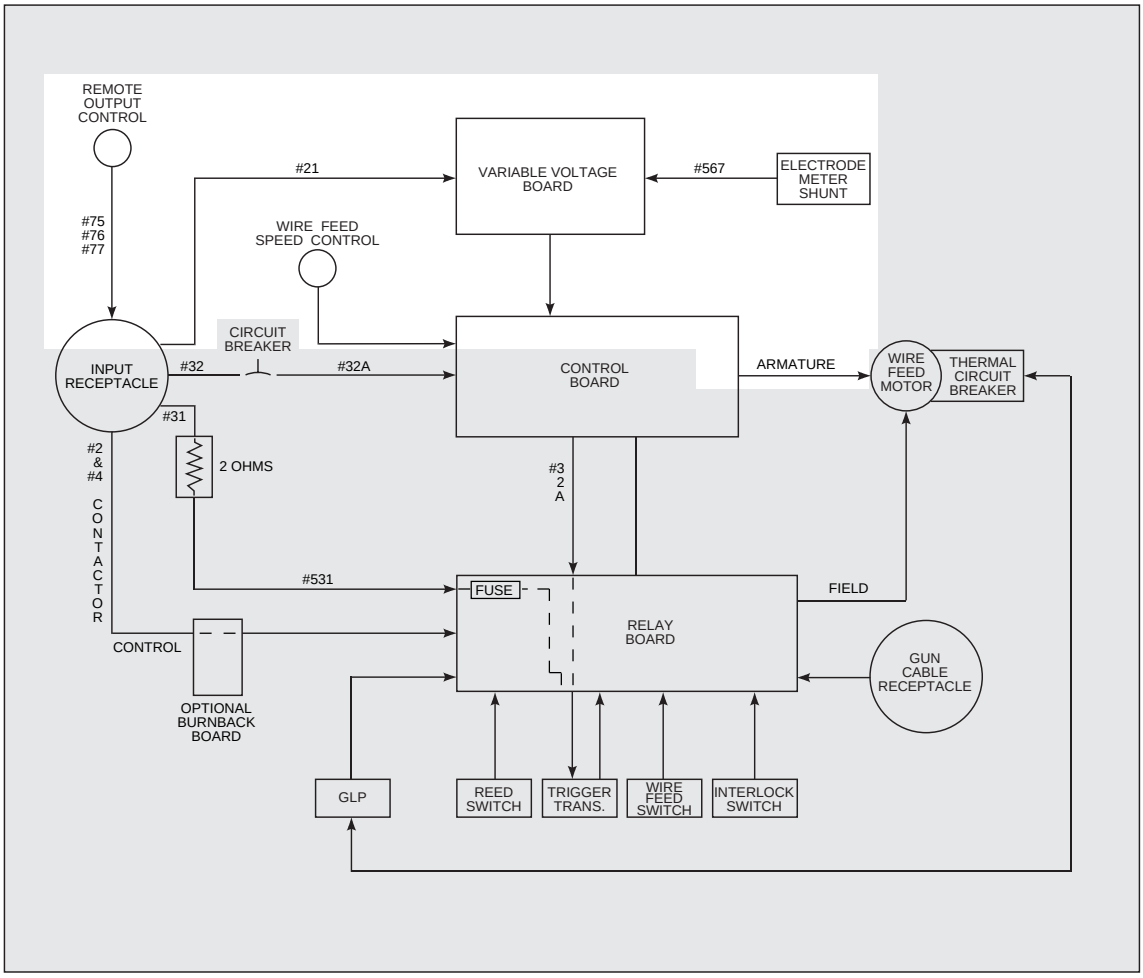
GUN TRIGGER AND 1CR RELAY CONTACT CONTROL CIRCUITS

When the gun trigger switch is activated (closed) the 1CR relay is energized. Three sets of isolated contacts incorporated within the 1CR relay perform several functions. One set of contacts completes the circuit to energize the wire feed motor armature and also the auxiliary circuit #7 and #32A. Another set of contacts control the motor field circuit polarity which, along with the wire feed switch, dictate the wire feed direction. The third set of contacts control the #2 and #4 contactor circuit which enables the power source welding output. The #2 and #4 contactor circuit is passed through the optional burnback board which delays the "opening" of the circuit and prevents the electrode from "sticking" in the weld puddle.

The interlock switch, reed switch, ground lead protector (GLP), and thermal circuit breaker are all incorporated in the gun trigger circuit. In case of a fault condition, the GLP or thermal circuit breaker will disable the trigger circuit. The interlock switch and reed switch enhance the gun trigger circuitry by allowing the operator to release the trigger button and continue welding.

NOTE: Unshaded areas of block logic diagrams are the subject of discussion.

FIGURE E.3 – VARIABLE VOLTAGE BOARD, METER SHUNT, WIRE SPEED, AND REMOTE OUTPUT CONTROLS



VARIABLE VOLTAGE BOARD, METER SHUNT, WIRE SPEED AND REMOTE OUTPUT CONTROLS

The optional variable voltage board enables the LN-8 to be used with a constant current power source. The variable voltage board monitors the arc voltage via leads #21 and #567 and modifies the wire feed speed according to arc voltage variations and requirements.

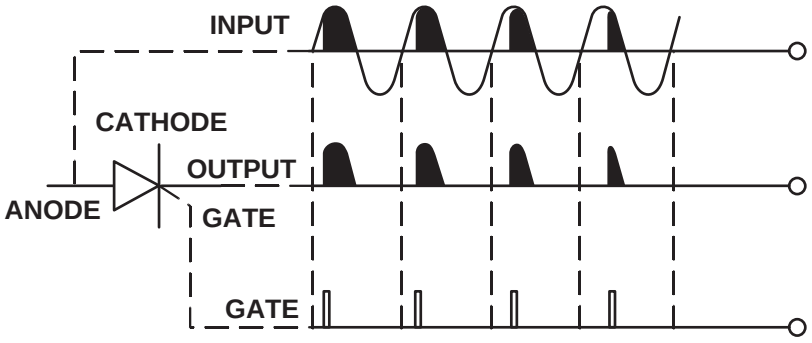
The wire speed control dictates to the control board the directives of the operator. The control board adjusts the armature voltage applied to the wire feed motor to change the motor speed.

The remote output control permits power source control from the LN-8 unit. The remote control is coupled to the welding power source via leads #75, #76, and #77 through the input receptacle.

The electrode meter shunt, which is connected to and also in series with the gun connector block, senses the welding current and arc voltage. This information is used by the variable voltage board and also the optional meter kit.

NOTE: Unshaded areas of block logic diagrams are the subject of discussion.

FIGURE E.4 – SILICON-CONTROLLED RECTIFIER OPERATION



NOTE: AS THE GATE PULSE IS APPLIED LATER IN THE CYCLE, THE SCR OUTPUT IS DECREASED.

SCR OPERATION

A silicon controlled rectifier (SCR) is a three terminal semi-conductor device used to control currents to a load. Refer to Figure E.4. An SCR acts very much like a switch. When a gate signal is applied to the SCR it is turned ON and there is current flow from anode to cathode. In the ON state the SCR acts like a closed switch. When the SCR is turned OFF there is no current flow, thus the device acts like an open switch. As the name suggests, the SCR is a rectifier, so it passes current only during positive half cycles of the AC supply, The positive half cycle is the portion of the sine wave in which the anode of the SCR is more positive than the cathode.

When an AC supply voltage is applied to the SCR, the device spends a certain portion of the AC cycle time in the ON state and the remainder of the time in the OFF state. The amount of time spent in the ON state is controlled by the gate.

An SCR is fired by a short burst of current into the gate. This gate pulse must be more positive than the cathode voltage. Since there is a standard PN junction between the gate and cathode, the voltage between these terminals must be slightly greater than 0.6 VDC. Once the SCR has fired, it is not necessary to continue the flow of gate current. As long as current continues to flow from anode to cathode the SCR will remain on. When the anode to cathode current drops below a minimum value, called holding current, the SCR will shut off. This normally occurs as the AC supply voltage passes through zero into the negative portion of the sine wave. If the SCR is turned on early in the positive half cycle, the conduction time is longer, resulting in greater SCR output. If the gate firing time is later in the cycle the conduction time is less, resulting in lower SCR output.

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HOW TO USE TROUBLESHOOTING GUIDE

⚠ WARNING

Service and Repair should only be performed by Lincoln Electric Factory Trained Personnel. Unauthorized repairs performed on this equipment may result in danger to the technician and machine operator and will invalidate your factory warranty. For your safety and to avoid Electrical Shock, please observe all safety notes and precautions detailed throughout this manual.

This Troubleshooting Guide is provided to help you locate and repair possible machine malfunctions. Simply follow the three-step procedure listed below.

Step 1. LOCATE PROBLEM (SYMPTOM).
Look under the column labeled "PROBLEM (SYMPTOMS)". This column describes possible symptoms that the machine may exhibit. Find the listing that best describes the symptom that the machine is exhibiting. Symptoms are grouped into the following categories: function problems, feeding problems, and welding problems.

Step 2. PERFORM EXTERNAL TESTS.
The second column labeled "POSSIBLE AREAS OF MISADJUSTMENT(S)" lists the obvious external possibilities that may contribute to the machine symptom. Perform these tests/checks in the order listed. In general, these tests can be conducted without removing the case wrap-around cover.

Step 3. RECOMMENDED COURSE OF ACTION

The last column labeled "Recommended Course of Action" lists the most likely components that may have failed in your machine. It also specifies the appropriate test procedure to verify that the subject component is either good or bad. If there are a number of possible components, check the components in the order listed to eliminate one possibility at a time until you locate the cause of your problem.

All of the referenced test procedures referred to in the Troubleshooting Guide are described in detail at the end of this chapter. Refer to the Troubleshooting and Repair Table of Contents to locate each specific Test Procedure. All of the specified test points, components, terminal strips, etc. can be found on the referenced electrical wiring diagrams and schematics. Refer to the Electrical Diagrams Section Table of Contents to locate the appropriate diagram.

⚠ CAUTION

If for any reason you do not understand the test procedures or are unable to perform the tests/repairs safely, contact the Lincoln Electric Service Department for technical troubleshooting assistance before you proceed call 1-800-833-9353.

TROUBLESHOOTING & REPAIR

PC BOARD TROUBLESHOOTING PROCEDURES

⚠ WARNING

ELECTRIC SHOCK can kill.

- Have an electrician install and service this equipment. Turn the input power OFF at the fuse box before working on equipment. Do not touch electrically hot parts.

⚠ CAUTION

Sometimes machine failures appear to be due to PC board failures. These problems can sometimes be traced to poor electrical connections. To avoid problems when troubleshooting and replacing PC boards, please use the following procedure:

1. Determine to the best of your technical ability that the PC board is the most likely component causing the failure symptom.
2. Check for loose connections at the PC board to assure that the PC board is properly connected.
3. If the problem persists, replace the suspect PC board using standard practices to avoid static electrical damage and electrical shock. Read the warning inside the static resistant bag and perform the following procedures:

PC board can be damaged by static electricity.

ATTENTION Static-Sensitive Devices Handle only at Static-Safe Workstations

- Remove your body's static charge before opening the static-shielding bag. Wear an anti-static wrist strap. For safety, use a 1 Meg ohm resistive cord connected to a grounded part of the equipment frame.

- If you don't have a wrist strap, touch an un-painted, grounded, part of the equipment frame. Keep touching the frame to prevent static build-up. Be sure not to touch any electrically live parts at the same time.

- Tools which come in contact with the PC board must be either conductive, anti-static or static-dissipative.

- Remove the PC board from the static-shielding bag and place it directly into the equipment. Don't set the PC board on or near paper, plastic or cloth which could have a static charge. If the PC board can't be installed immediately, put it back in the static-shielding bag.

- If the PC board uses protective shorting jumpers, don't remove them until installation is complete.

- If you return a PC board to The Lincoln Electric Company for credit, it must be in the static-shielding bag. This will prevent further damage and allow proper failure analysis.

4. Test the machine to determine if the failure symptom has been corrected by the replacement PC board.

NOTE: It is desirable to have a spare (known good) PC board available for PC board troubleshooting.

NOTE: Allow the machine to heat up so that all electrical components can reach their operating temperature.

5. Remove the replacement PC board and substitute it with the original PC board to recreate the original problem.
   a. If the original problem does not reappear by substituting the original board, then the PC board was not the problem. Continue to look for bad connections in the control wiring harness, junction blocks, and terminal strips.
   b. If the original problem is recreated by the substitution of the original board, then the PC board was the problem. Reinstall the replacement PC board and test the machine.
6. Always indicate that this procedure was followed when warranty reports are to be submitted.

NOTE: Following this procedure and writing on the warranty report, "INSTALLED AND SWITCHED PC BOARDS TO VERIFY PROBLEM," will help avoid denial of legitimate PC board warranty claims.

TROUBLESHOOTING GUIDE

Observe all Safety Guidelines detailed throughout this manual

PROBLEMS (SYMPTOMS)	POSSIBLE AREAS OF MISADJUSTMENT(S)	RECOMMENDED COURSE OF ACTION
FUNCTION PROBLEMS		
No wire feed or arc voltage when the gun trigger is activated. The drive rolls do not turn. The LN-8 appears “dead”.	1. Check the Ground Lead Protector (GLP). Reset if necessary. 2. Check the circuit breaker. Reset if necessary. 3. Make sure 115VAC is being applied to the LN-8 at the input receptacle. Pin “C” lead #31 and pin “D” lead #32. 4. Check the 1/2 amp fuse located on the relay board. Replace if necessary. 5. If the LN-8 has a variable voltage board and the power source is a constant current supply, check to make sure the switch on the variable voltage board is in the “VV” position. 6. If the switch on the variable board is in the “VV” position, make sure the power source is set for an open circuit voltage of 30VDC or more.	1. Check for loose or faulty connections between the input receptacle, the circuit breaker, and the 2 ohm resistor. See wiring diagram. 2. Check the 2 ohm resistor. Replace if faulty. 3. Perform the ***Trigger Transformer Test.*** 4. Perform the ***Internal Voltage Test.*** 5. Perform the ***1CR Relay Test.*** 6. Check the relay board. Replace if faulty. 7. Check the variable voltage board (if used). Replace if faulty.

⚠ CAUTION

If for any reason you do not understand the test procedures or are unable to perform the tests/repairs safely, contact the Lincoln Electric Service Department for technical troubleshooting assistance before you proceed. Call 1-800-833-9353.

Observe all Safety Guidelines detailed throughout this manual

PROBLEMS (SYMPTOMS)	POSSIBLE AREAS OF MISADJUSTMENT(S)	RECOMMENDED COURSE OF ACTION
FUNCTION PROBLEMS (Continued)		
The wire feeds when the gun trigger is activated but there is no arc voltage.	1. Check the welding cables for loose or faulty connections. 2. Put a jumper wire from #2 to #4 on the power source terminal strip. (machines with 14 pin amphenols pin C to pin D). If the arc voltage is not present at the output terminals, the power source is faulty. If the arc voltage IS present, the problem is in the wire feeder or control cable. 3. Check the continuity of leads #2 and #4 through the control cable. Replace if “open”. 4. The welding gun may be faulty. Check or replace.	1. The 1CR relay, located on the power board, may be faulty. Check or replace. Note: The relay may operate but the individual contacts may not be functioning properly. 2. If a burnback kit is installed, remove and install the jumper plug. If the problem is solved, the burnback kit is faulty. 3. Check the #2 and #4 leads in the LN-8 wiring harness for loose or faulty connections. See wiring diagram.
The wire continues to feed with the gun trigger open, and the wire is electrically “hot”. The interlock switch is in the “off” position.	1. Disconnect the gun trigger cable. If the problem is solved, the gun trigger or cable is faulty. Repair or replace.	1. The 1CR relay may be stuck closed. Perform the ***1CR Relay Test.*** 2. Check the relay board. Replace if faulty.
With the interlock switch (S2) in the “ON” postion, the wire feed stops when the gun trigger is released.	1. Check leads #529 and #528 for loose or faulty connections between the 2CR reed switch and the control board and motor thermal circuit breaker. See wiring diagram.	1. The 2CR reed switch may be faulty. Check to see if it closes when welding. 2. Check the interlock switch (S2) for proper operation. 3. Check the continuity (zero ohms) of leads #523 and #536 between the interlock switch (S2) and the relay board. See wiring diagram. 4. The relay board may be faulty.

⚠ CAUTION

If for any reason you do not understand the test procedures or are unable to perform the tests/repairs safely, contact the Lincoln Electric Service Department for technical troubleshooting assistance before you proceed. Call 1-800-833-9353.

Observe all Safety Guidelines detailed throughout this manual

PROBLEMS (SYMPTOMS)	POSSIBLE AREAS OF MISADJUSTMENT(S)	RECOMMENDED COURSE OF ACTION
FUNCTION PROBLEMS (Continued)		
The circuit breaker (5 amp) repeatedly trips when the gun trigger is activated.	1. Check or replace the gun trigger and leads. Make sure the trigger leads are not shorted to the electrode or work cables. 2. Disconnect any accessory that may be connected to terminals #7 and #32A. See wiring diagram. If the problem is resolved, the accessory may be faulty.	1. Perform the ***Trigger Transformer Test.*** 2. Perform the ***Drive Motor Test.*** 3. Remove the molex plug from the relay board. If the circuit breaker continues to trip, the control board may be faulty. If the circuit breaker does not trip, the relay board may be faulty.
The circuit breaker (5 amp) trips when power is applied to the LN-8. Gun trigger is NOT activated.	1. Disconnect any kits or accessories that may be incorporated in the LN-8. Be sure to install any necessary jumper plugs. If problem is resolved the fault may be in the disconnected kit.	1. Check the wiring harness leads #32, #32A, #31, and #531 for shorts or grounds. See wiring diagram. 2. Perform the ***Trigger Transformer Test.*** 3. Remove the molex plug from the relay board. If the circuit breaker continues to trip, the control board may be faulty. If the circuit breaker does not trip, the relay board may be faulty. 4. Perform the ***Drive Motor Test.***
The 1/2 amp fuse on the relay board repeatedly fails.	1. Check to make sure the correct input voltage (115VAC) is being applied to the LN-8. 2. Very rapid and repetitive gun triggering can possibly cause the field fuse to fail.	1. Perform the ***Drive Motor Test.*** 2. Perform the ***Trigger Transformer Test.*** 2. The relay board may be faulty.
The drive motor thermostat “opens” while welding.	1. Check for mechanical restrictions in the wire feeding path. This condition could cause the motor to overheat. 2. The electrode may be rusty or dirty. Clean or replace.	1. Perform the ***Drive Motor Test.***

⚠ CAUTION

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Observe all Safety Guidelines detailed throughout this manual

PROBLEMS (SYMPTOMS)	POSSIBLE AREAS OF MISADJUSTMENT(S)	RECOMMENDED COURSE OF ACTION
FUNCTION PROBLEMS (Continued)		
The wire feed speed cannot be controlled. The motor runs and feeds wire but the speed cannot be changed regardless of control setting.	1. If the LN-8 is being used for submerged arc welding with the variable voltage board switch in the VV position, change it to the CV position. If proper motor speed control returns, the variable voltage board may be faulty.	1. Check for loose connections between the speed control, the control board, and the variable voltage board. See wiring diagram. 2. Check the speed control rheostat for proper operation. Normal resistance is 5000 ohms. 3. Perform the ***Drive Motor Test.*** 4. The control board may be faulty.
The wire feed "coasts" when the gun trigger is released.	1. Make sure the gun trigger is not "sticking".	1. Perform the ***1CR Relay Test.***
The wire feeds normally and welds but the solenoid is not operating.	1. Check or replace the solenoid.	1. With the gun trigger activated, check for the presence of 115VAC at terminals 32A and 7. If the proper voltage is present, the solenoid may be faulty. If the correct voltage (115VAC) is NOT present, the relay board may be faulty.
When the gun trigger is activated the wire "backs up" instead of feeding forward.	1. Check wire feed direction switch for proper direction and operation.	1. The 1CR relay may be faulty. Check or replace.

⚠ CAUTION

If for any reason you do not understand the test procedures or are unable to perform the tests/repairs safely, contact the Lincoln Electric Service Department for technical troubleshooting assistance before you proceed. Call 1-800-833-9353.

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Observe all Safety Guidelines detailed throughout this manual

PROBLEMS (SYMPTOMS)	POSSIBLE AREAS OF MISADJUSTMENT(S)	RECOMMENDED COURSE OF ACTION
FEEDING PROBLEMS		
When the gun trigger is activated, the drive rolls turn but the wire will not feed or wire feeding is rough.	1. Check or replace the gun cable. It may be kinked, clogged or twisted. 2. Make certain the drive rolls and guide tubes are correct for the wire being used. 3. Check or replace the gun contact tip. 4. The electrode wire may be rusty or dirty. Replace if necessary.	1. If conditions are extremely dirty, install a wiper on the wire before it enters the guide tube. Use a piece of cloth saturated with “Pyroil B”.

⚠ CAUTION

If for any reason you do not understand the test procedures or are unable to perform the tests/repairs safely, contact the Lincoln Electric Service Department for technical troubleshooting assistance before you proceed. Call 1-800-833-9353.

Observe all Safety Guidelines detailed throughout this manual

PROBLEMS (SYMPTOMS)	POSSIBLE AREAS OF MISADJUSTMENT(S)	RECOMMENDED COURSE OF ACTION
WELDING PROBLEMS		
The welding arc is variable or "hunting".	1. Make sure the welding parameters are correct for the welding procedure being used. 2. Check the welding cables for loose or faulty connections. 3. The gun cable may be faulty. Check or replace. 4. The gun contact tip may be worn. Check or replace. 5. The welding power supply may be faulty. Check or replace.	1. Put the power source in "Machine Control" and check if the welding performance improves. If the problem is resolved, check or replace the control cable and/or check the output control in the LN-8. 2. Perform the ***Drive Motor Test.***
Poor arc striking with sticking or "blast offs". The weld bead may also be ropey and display weld porosity.	1. Make sure the welding parameters and techniques are correct for the welding procedure being used. 2. Check the welding cables for loose or faulty connections. 3. The gun cable may be faulty. Check or replace. 4. The gun contact tip may be worn. Check or replace. 5. The welding power source may be faulty. Check or replace.	1. Put the power source in "Machine Control" and check if welding performance improves. If the problem is resolved, check or replace the control cable and/or check the output control in the LN-8.

⚠ CAUTION

If for any reason you do not understand the test procedures or are unable to perform the tests/repairs safely, contact the Lincoln Electric Service Department for technical troubleshooting assistance before you proceed. Call 1-800-833-9353.

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LN-8 ELECTRICAL SEQUENCE OF OPERATION

FIGURE F.1 – LN-8 ELECTRICAL SEQUENCE OF OPERATION

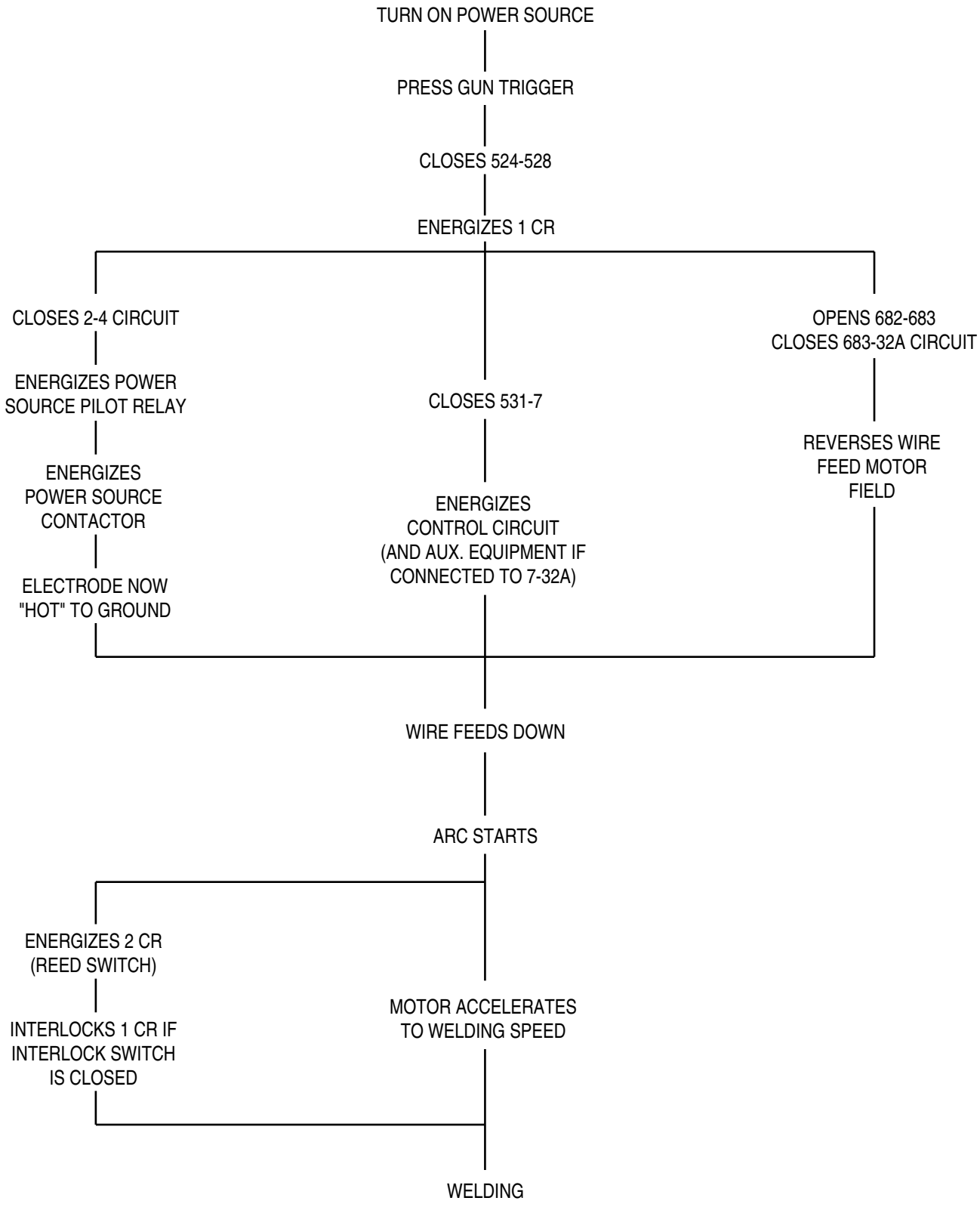
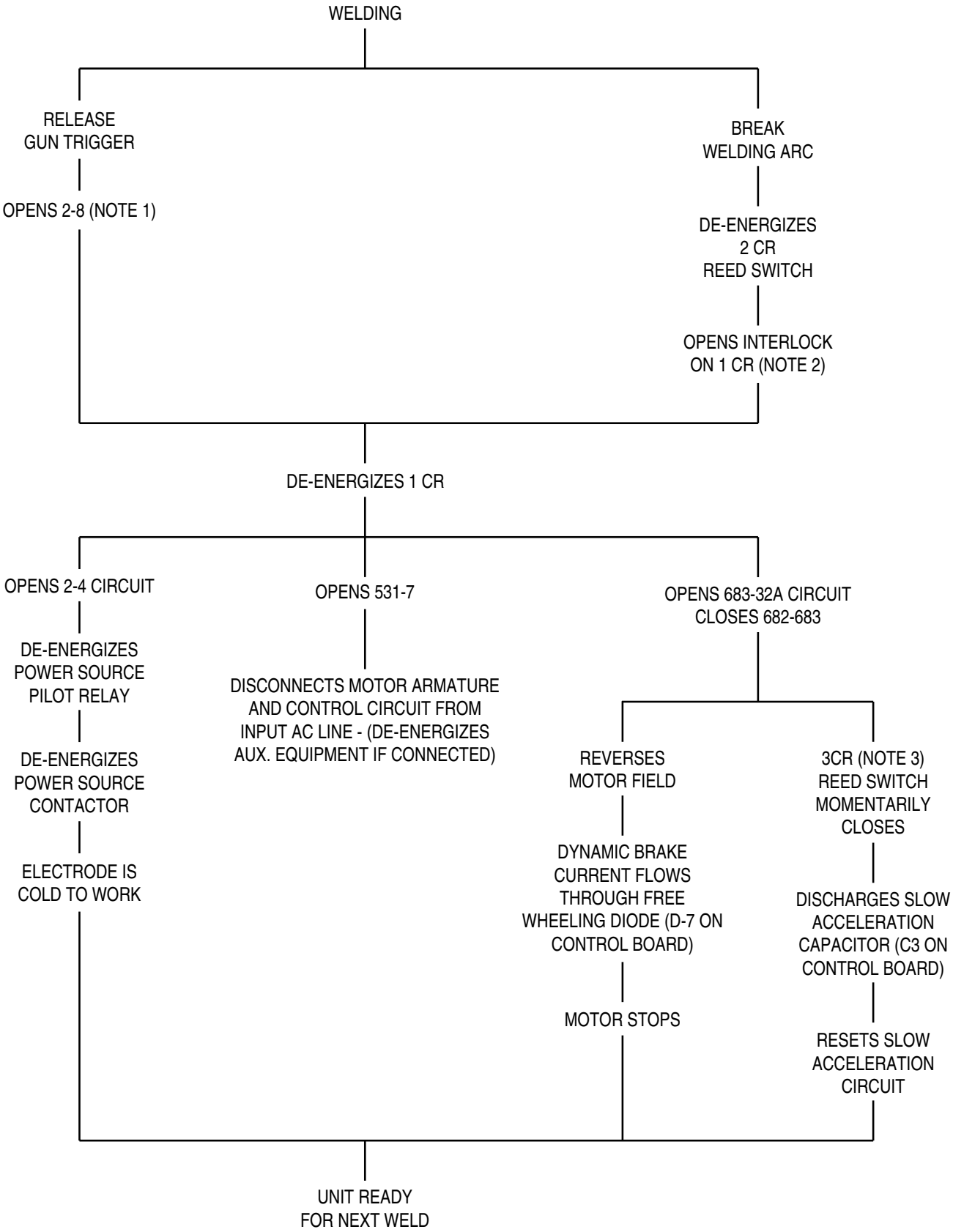


FIGURE F.1 – LN-8 ELECTRICAL SEQUENCE OF OPERATION *(continued)*



NOTE 1: When interlock is open.
NOTE 2: When interlock is closed.
NOTE 3: 3 CR is not used on units with code no. 7926 and up.

TRIGGER TRANSFORMER TEST

⚠ WARNING

Service and repair should be performed only by Lincoln Electric factory trained personnel. Unauthorized repairs performed on this equipment could result in danger to the technician or the machine operator and will invalidate your factory warranty. For your safety and to avoid electrical shock, please observe all safety notes and precautions detailed throughout this manual.

If for any reason you do not understand the test procedures or are unable to perform the tests/repairs safely, contact the Lincoln Electric service department for technical troubleshooting assistance before you proceed.
Call (800) 833-9353 (WELD).

TEST DESCRIPTION

This test will aid the technician in determining if the Trigger Transformer is functioning properly.

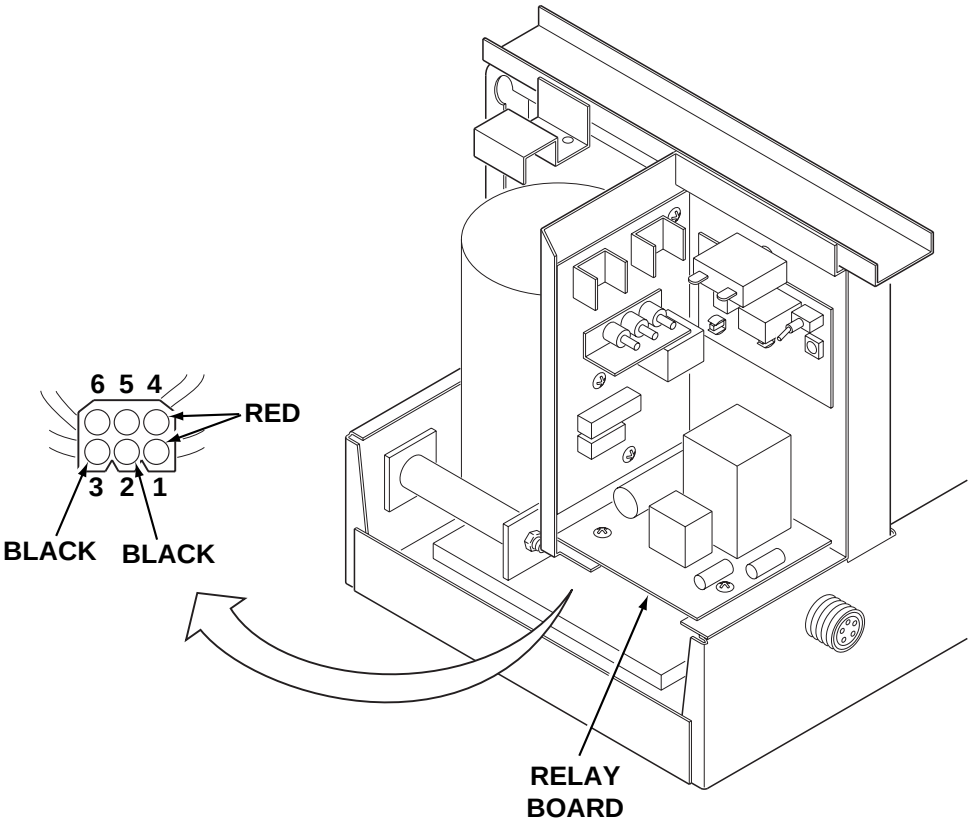
This procedure takes approximately 8 minutes to perform.

MATERIALS NEEDED

115 VAC power supply
5/16 in. nutdriver
Volt-Ohmmeter (Multimeter)

TRIGGER TRANSFORMER TEST *(continued)*

FIGURE F.2 – TRIGGER TRANSFORMER TEST POINTS



TEST PROCEDURE

1. Remove input power to the LN-8.
2. Using the 5/16 in. nutdriver, remove the screws holding the left side cover assembly.
3. Disconnect the Molex plug from the under-side of the relay board. See Figure F.2.
4. Apply power (115VAC) to the black primary transformer leads, pins 2 and 3.
5. Using the voltmeter, check for approximately 24VAC at the red secondary leads, pins 1 and 4.
6. If 115VAC is applied to the black primary leads (2 and 3) and the secondary voltage (red leads 1 and 4) is missing or low, the trigger transformer may be faulty. Replace.
7. Reconnect the Molex plug to the underside of the relay board.
8. Install the screws that secure the left side cover assembly.

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INTERNAL VOLTAGE TEST

⚠ WARNING

Service and repair should be performed only by Lincoln Electric factory trained personnel. Unauthorized repairs performed on this equipment could result in danger to the technician or the machine operator and will invalidate your factory warranty. For your safety and to avoid electrical shock, please observe all safety notes and precautions detailed throughout this manual.

If for any reason you do not understand the test procedures or are unable to perform the tests/repairs safely, contact the Lincoln Electric service department for technical troubleshooting assistance before you proceed.
Call (800) 833-9353 (WELD).

TEST DESCRIPTION

This test will aid the technician in determining if the correct voltages are present in the LN-8.

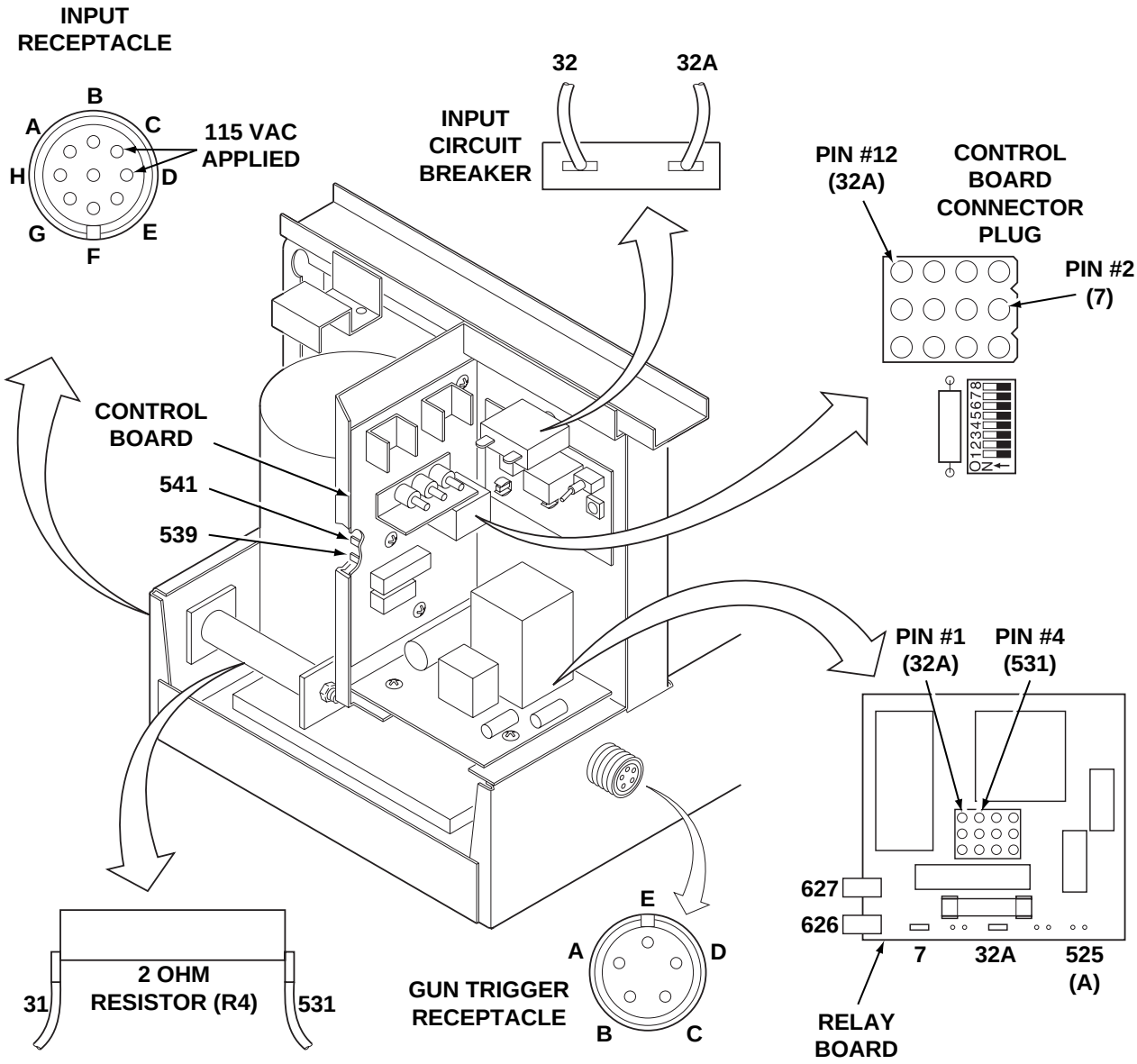
This procedure takes approximately 20 minutes to perform.

MATERIALS NEEDED

5/16 in. nutdriver
Volt-Ohmmeter
Wiring diagram

INTERNAL VOLTAGE TEST *(continued)*

FIGURE F.3 – VOLTAGE TEST POINTS



TEST DESCRIPTION

1. Remove input power to the LN-8.
2. Using the 5/16 in. nutdriver, remove the screws from the left side cover assembly.
3. Lift the left side cover.
4. Apply 115VAC to the input receptacle at pins C and D.
5. Using the voltmeter, carefully test the voltages per ***Table F.1*** at the test points shown in Figure F.3.
6. When testing is complete, install the screws that secure the left side cover assembly.

INTERNAL VOLTAGE TEST *(continued)*

TABLE F.1 – VOLTAGE TEST POINTS

CHECKPOINT LOCATIONS	TEST DESCRIPTION	LEAD NO.	ACCEPTABLE VOLTAGE READING
Input Circuit Breaker and Resistor R4	Input voltage before the circuit breaker and 2 ohm resistor (R4).	#31 and #32	103 to 126VAC
Input Circuit Breaker and Resistor R4	Input voltage after the circuit breaker.	#31 and #32A	103 to 126VAC
Input Circuit Breaker and Resistor R4	Input voltage after the circuit breaker and 2 ohm resistor (R4).	#531 and #32A	103 to 126VAC
Gun trigger receptacle pins A and C	Check voltage across gun trigger - - trigger open.	#524 (pin A) and #528 (pin C)	34 to 42VDC
Terminals #7 and #32A located on relay board	Auxiliary terminals (gas solenoid) Note: Gun trigger must be activated.	#7 and #32A	103 to 126VAC
Terminals #626 and #627 located on relay board	Drive motor field voltage.	#626 and #627	102 to 125VDC
Terminals #539 and #541 located on control board	Drive motor armature voltage. Note: Gun trigger must be activated and armature voltage will be dependent upon wire speed setting.	#539 and #541	4VDC (min) - 90VDC (max).
Control board connector plug	Check that 115VAC is being applied to control board when gun trigger is activated.	#32A (pin 12) and #7 (pin 2)	103 to 126VAC
Relay board connector plug	Check that 115VAC is being applied to the control board.	#32A (pin 1) and #531 (pin 4)	103 to 126VAC

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1CR RELAY TEST

⚠ WARNING

Service and repair should be performed only by Lincoln Electric factory trained personnel. Unauthorized repairs performed on this equipment could result in danger to the technician or the machine operator and will invalidate your factory warranty. For your safety and to avoid electrical shock, please observe all safety notes and precautions detailed throughout this manual.

If for any reason you do not understand the test procedures or are unable to perform the tests/repairs safely, contact the Lincoln Electric service department for technical troubleshooting assistance before you proceed.
Call (800) 833-9353 (WELD).

TEST DESCRIPTION

This test will determine if the control relay is functioning properly by measuring the resistance across the contacts when the relay is energized and de-energized.

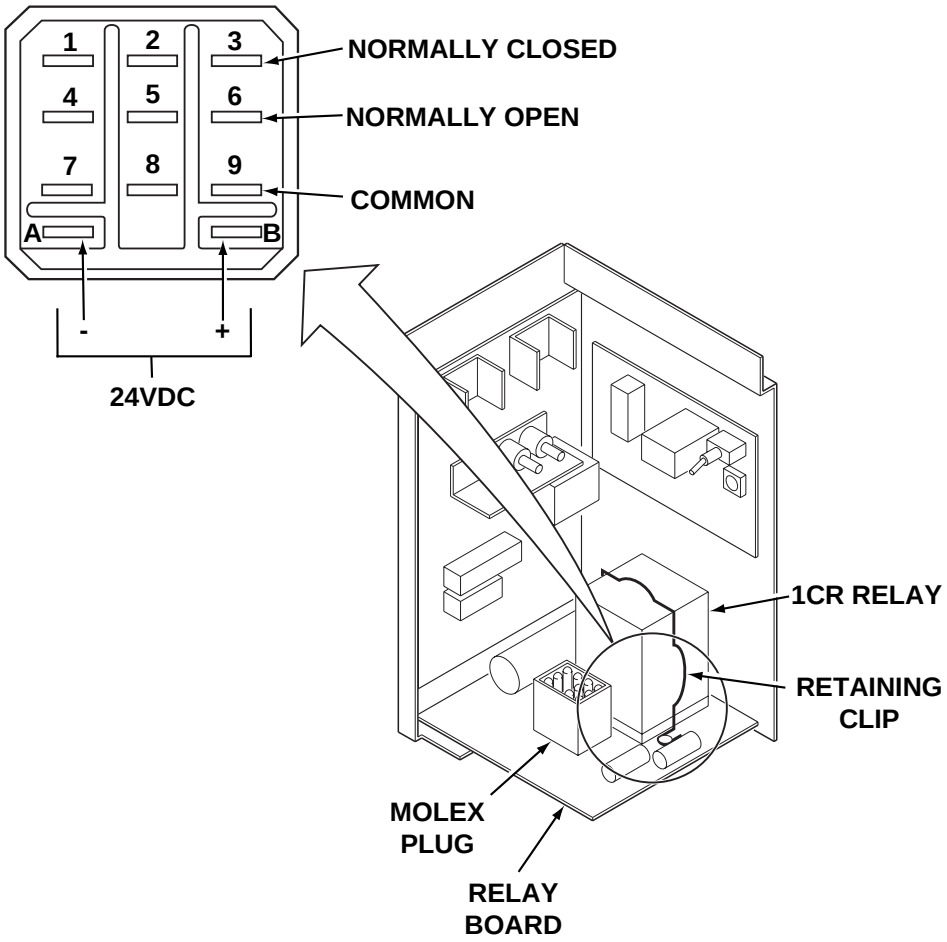
This procedure takes approximately 15 minutes to perform.

MATERIALS NEEDED

Volt-Ohmmeter
24VDC power supply
5/16 in. nutdriver

1CR RELAY TEST *(continued)*

FIGURE F.4 – 1CR RELAY TEST POINTS



TEST PROCEDURE

1. Remove input power to the LN-8.
2. Using the 5/16 in. nutdriver, remove the screws from the left side cover assembly.
3. Lift the left side cover.
4. Locate the 1CR relay. Slide the retaining clip off the relay and carefully remove the relay from the relay board. See Figure F.4.

Note: The Molex plug located on the relay board may have to be removed to gain access to the 1CR relay.

5. Connect the 24VDC supply to terminals A- and B+ on the 1CR relay. Do not energize the power supply at this time.
6. Connect the ohmmeter across the first set of terminals shown in ***Table F.2.***

1CR RELAY TEST *(continued)*

TABLE F.2 – RELAY TEST TERMINAL CONNECTIONS

Terminals	Terminals A&B Energized	Terminals A&B De-energized
7-1	Open	Closed
7-4	Closed	Open
8-2	Open	Closed
8-5	Closed	Open
9-3	Open	Closed
9-6	Closed	Open

7. Measure the resistance across the contacts. A resistance of less than one ohm indicates that the contacts are closed. An infinite resistance indicates that the contacts are open. Energize the 24VDC power supply and measure the resistance again. Compare to the conditions given in Table F.2. If the readings do not match the table, the relay is faulty and should be replaced.
8. Repeat the above procedure for all of the contacts.
9. Re-install relay into the relay board.
10. Install the screws that secure the left side cover assembly.

DRIVE MOTOR TEST

⚠ WARNING

Service and repair should be performed only by Lincoln Electric factory trained personnel. Unauthorized repairs performed on this equipment could result in danger to the technician or the machine operator and will invalidate your factory warranty. For your safety and to avoid electrical shock, please observe all safety notes and precautions detailed throughout this manual.

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Call (800) 833-9353 (WELD).

TEST DESCRIPTION

This test will help determine if the drive motor is functioning correctly.

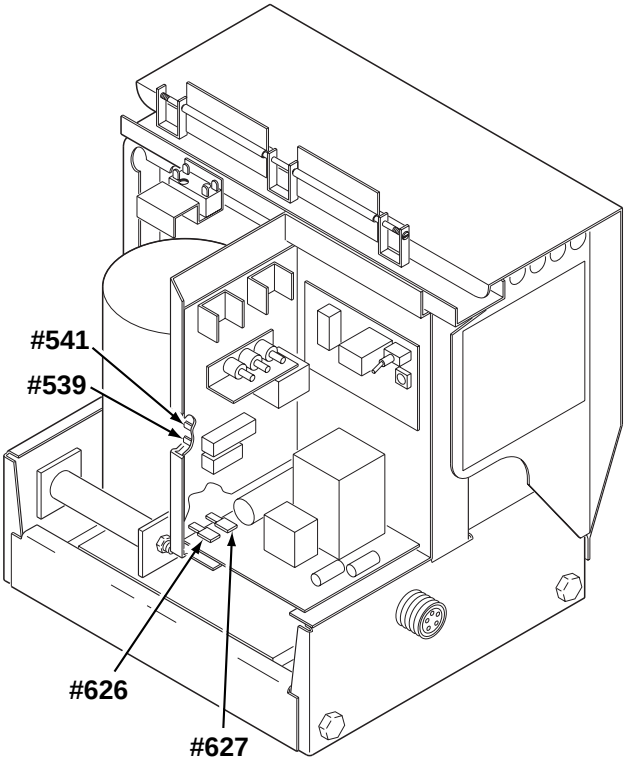
This procedure takes approximately 20 minutes to perform.

MATERIALS NEEDED

5/16 in. nutdriver
Volt-Ohmmeter
Variable DC voltage supply 0 to 90VDC
Isolated DC voltage supply 120VDC

DRIVE MOTOR TEST *(continued)*

FIGURE F.5 – DRIVE MOTOR TEST POINTS

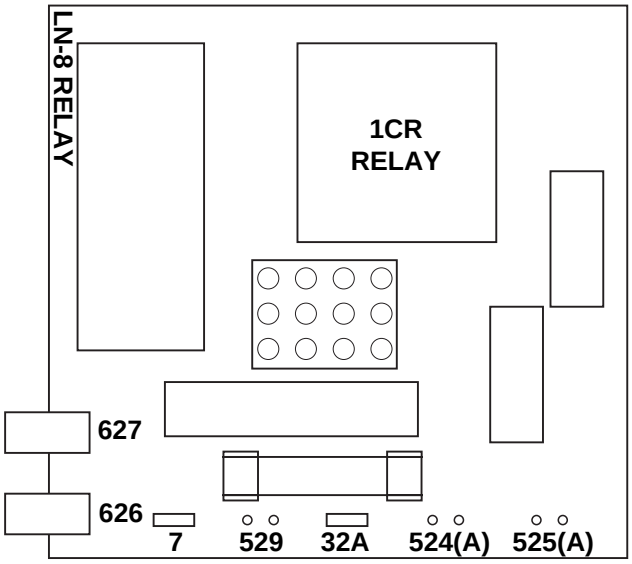


TEST PROCEDURE

1. Remove input power to LN-8.
2. Remove the electrode wire or disengage drive rolls.
3. Using the 5/16 in. nutdriver, remove the screws from the left side cover assembly.
4. Lift the left side cover.
5. Locate leads #539 and #541 at the control board. See Figure F.5.

DRIVE MOTOR TEST *(continued)*

FIGURE F.6 – GUN TERMINAL JUMPER LOCATIONS



6. Locate leads #626 and #627 at the relay board.

7. If a variable voltage board is installed in the LN-8, make certain the mode switch is in the CV position.

8. Apply 115VAC to the input receptacle at pins C and D.

9. With the gun trigger activated or the gun trigger terminals jumpered together, (see wiring diagram), check the motor armature volts at leads #541 (+) and #539 (-). Normal is 5 to 95VDC dependent upon the setting of the wire feed speed control.

10. With the LN-8 at idle (gun trigger NOT activated) check the motor field voltage at lead #626 and #627. Normal is 115VDC. When the gun trigger is activated or the gun terminals jumpered together, Figure F.6, the field voltage polarity should reverse from the idle state. Normal is 115VDC and is independent of motor speed.

Note: The wire feed direction switch (S3) must be in the forward, or "welding" position.

11. If the above voltages are present and motor does not operate, the motor, motor brushes, or the gear box may be faulty. If the armature voltage is not correct (leads #539 and #541), the control board may be faulty. If the field voltage is not correct (leads #626 and #627), the 1CR relay or relay board may be faulty.

DRIVE MOTOR TEST *(continued)*

To further check the drive motor:

12. Remove input power (115VAC) from the LN-8.
13. Locate and remove leads #539 and #541 from the control board, see ***Figure F.5***.
14. Locate and remove leads #626 and #627 from the relay board.
15. Using the ohmmeter, measure the resistances per Table F.3.
16. If the motor resistance test is good, proceed to the Motor Applied Voltage Test.

MOTOR APPLIED VOLTAGE TEST

1. Carefully connect the isolated 120VDC supply (supply turned off) to motor leads #626 and #627, see ***Figure F.5***.
2. Carefully connect the variable 0 to 120VDC supply (supply turned off) to motor leads #539 and #541.
3. Apply field voltage first (leads #626 and #627) to the motor. Then slowly apply the armature voltage at leads #539 and #541.
4. The motor should run and the speed should vary with changes to the armature voltage.
5. If the motor does NOT run and change speed correctly, the motor or gear box may be faulty.
6. To stop the motor, remove the armature voltage first, leads #539 and #541.

AFTER TESTING

1. Replace motor leads.
2. Install the screws that secure the left side cover assembly.
3. If disengaged, engage the drive rolls.
4. If removed, feed the electrode back into the wire drive unit.

TABLE F.3 – DRIVE MOTOR TEST POINTS

TEST POINTS	RESISTANCE	DC VOLTAGE
Lead #539 to #541 Armature	3 to 5 ohms	0 to 90VDC
Lead #626 to #627 Field Winding	750 to 950 ohms	90 to 120VDC
All leads to motor shell	500,000 ohms min.	N/A

POTENTIOMETER REPLACEMENT

⚠ WARNING

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If for any reason you do not understand the test procedures or are unable to perform the tests/repairs safely, contact the Lincoln Electric service department for technical troubleshooting assistance before you proceed.
Call (800) 833-9353 (WELD).

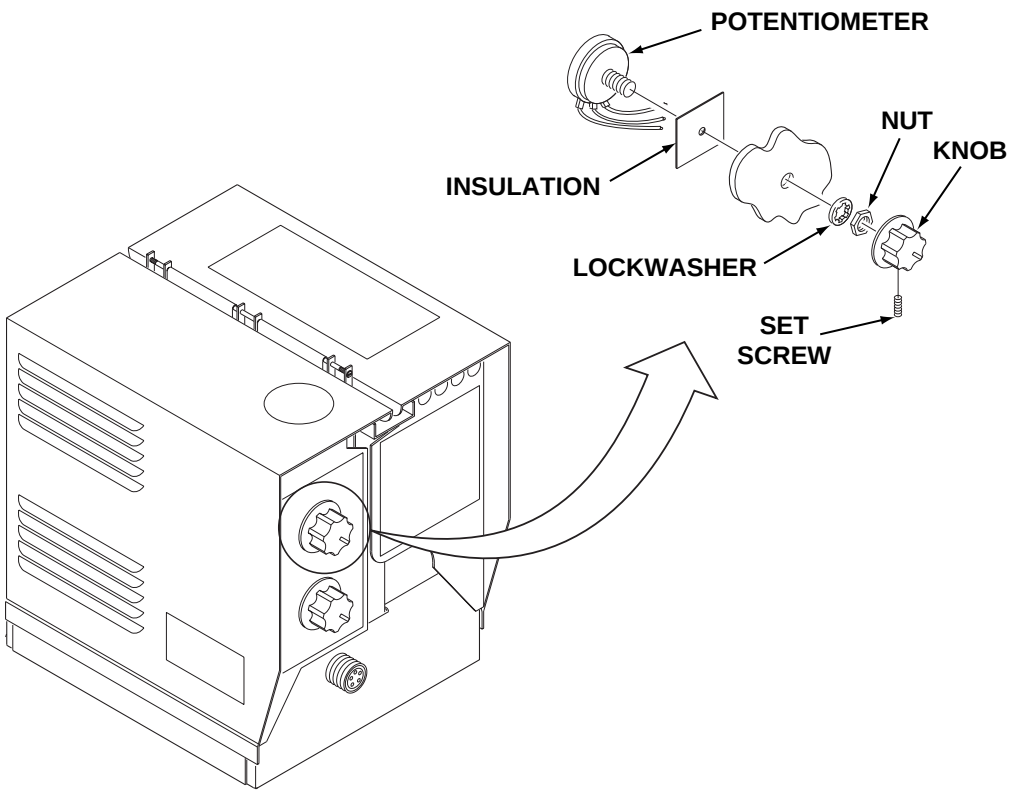
MATERIALS NEEDED

5/16 in. nutdriver
1/2 in. wrench
5/64 in. Allen wrench
Small slothead screwdriver
Soldering iron and solder

This procedure takes approximately 10 minutes to perform.

POTENTIOMETER REPLACEMENT *(continued)*

FIGURE F.7 – POTENTIOMETER REMOVAL



REPAIR PROCEDURE

1. Remove input power to the LN-8
2. Using the 5/16 in. nutdriver, remove the screws from the left side cover assembly.
3. Using a 5/64 in. Allen wrench or slothead screwdriver, loosen the setscrew on the potentiometer knob and remove the knob from the potentiometer. Refer to Figure F.7.
4. Remove the nut and lockwasher holding the potentiometer to the left side cover assembly.
5. Remove the potentiometer and insulation sheet from the inside of the left side cover assembly.
6. Tag the three wires on the potentiometer so that they can be reattached in the same location from where they were removed. Unsolder the three wires from the potentiometer.
7. Solder the three wires to the new potentiometer on the corresponding terminals from where they were removed.
8. Place the new potentiometer and insulation sheet through the cover assembly from the inside. Ensure that the index pin in the potentiometer fits in the locating hole on the cover assembly. Install the lockwasher and nut on the potentiometer. Tighten the nut until it is snug.
9. Install the knob onto the potentiometer so the set screw aligns with the flat on the potentiometer. Tighten the set screw.
10. Install the screws that secure the left side cover assembly.

CIRCUIT BREAKER REPLACEMENT

⚠ WARNING

Service and repair should be performed only by Lincoln Electric factory trained personnel. Unauthorized repairs performed on this equipment could result in danger to the technician or the machine operator and will invalidate your factory warranty. For your safety and to avoid electrical shock, please observe all safety notes and precautions detailed throughout this manual.

If for any reason you do not understand the test procedures or are unable to perform the tests/repairs safely, contact the Lincoln Electric service department for technical troubleshooting assistance before you proceed.
Call (800) 833-9353 (WELD).

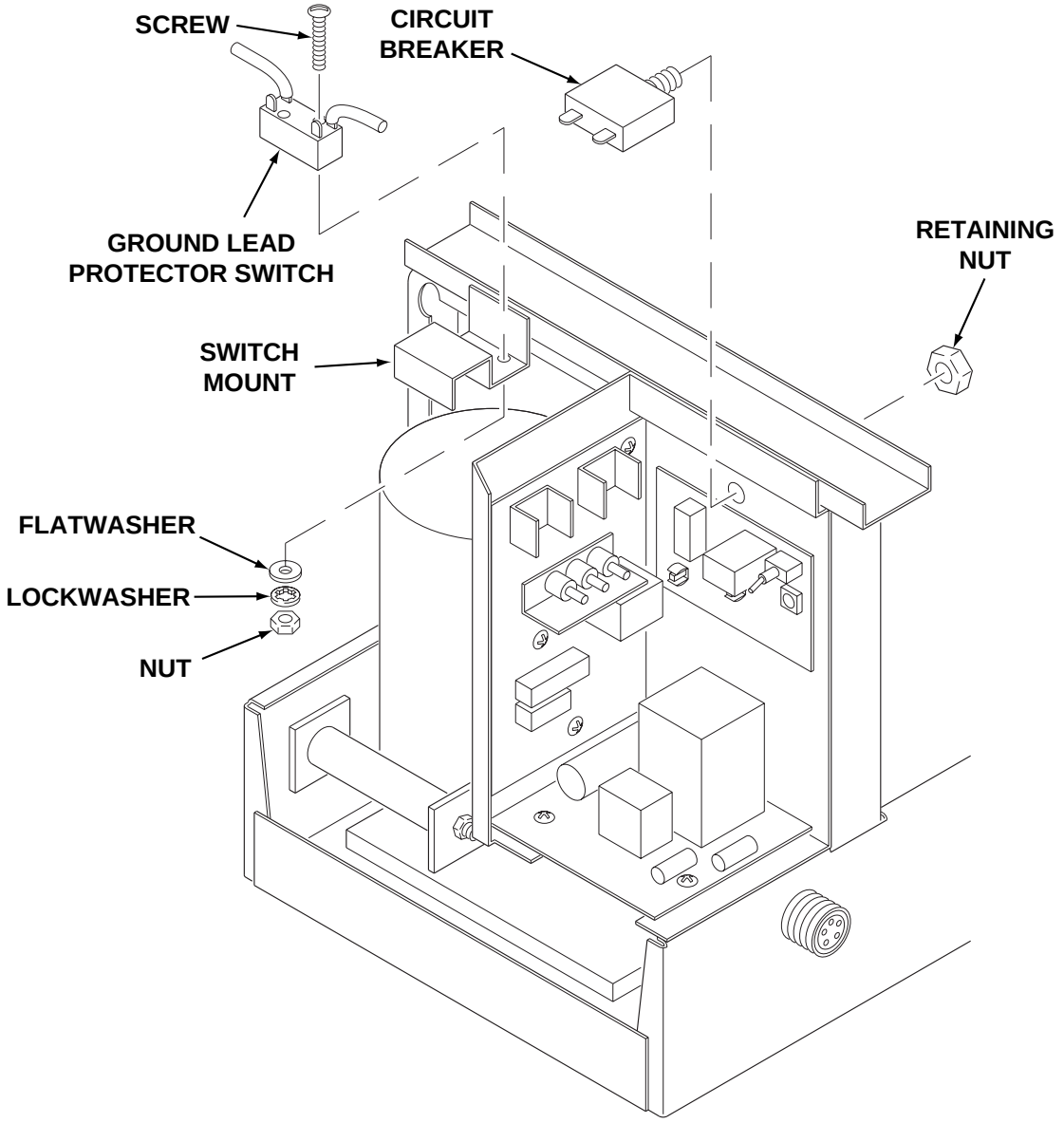
MATERIALS NEEDED

5/16 in. nutdriver
9/16 in. wrench

This procedure takes approximately 6 minutes to perform.

CIRCUIT BREAKER REPLACEMENT *(continued)*

FIGURE F.8 – CIRCUIT BREAKER AND GROUND LEAD PROTECTOR REPLACEMENT



REPAIR PROCEDURE

1. Using the 5/16 in. nutdriver, remove the screws from the left side cover assembly.
2. Tag and remove the two connectors from the back of the circuit breaker. Refer to Figure F.8.
3. Using the 9/16 in. wrench, remove the retaining nut that secures the circuit breaker to the center panel on the wire feeder. Remove the circuit breaker from the wire feeder.
4. Install the new circuit breaker through the panel of the control box. Secure the circuit breaker with the retaining nut.
5. Install the connectors onto the back of the circuit breaker at the positions they were removed from.
6. Install the screws that secure the left side cover assembly.

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GROUND LEAD PROTECTOR PUSH BUTTON SWITCH REPLACEMENT

⚠ WARNING

Service and repair should be performed only by Lincoln Electric factory trained personnel. Unauthorized repairs performed on this equipment could result in danger to the technician or the machine operator and will invalidate your factory warranty. For your safety and to avoid electrical shock, please observe all safety notes and precautions detailed throughout this manual.

If for any reason you do not understand the test procedures or are unable to perform the tests/repairs safely, contact the Lincoln Electric service department for technical troubleshooting assistance before you proceed.
Call (800) 833-9353 (WELD).

MATERIALS NEEDED

5/16 in. nutdriver
3/32 in. wrench
Jewelers' flat blade screwdriver
Soldering iron and solder

This procedure takes approximately 10 minutes to perform.

GROUND LEAD PROTECTOR PUSH BUTTON SWITCH REPLACEMENT *(continued)*

REPAIR PROCEDURE

1. Using the 5/16 in. nutdriver, remove the screws from the left side cover assembly.
2. Using the 3/32 in. wrench and jewelers' flat blade screwdriver, remove the ground lead protector switch from the switch mount. Refer to ***Figure F.8***.
3. Remove insulation and unsolder the two leads from the ground lead protector switch.
4. Solder the two leads onto the new switch and reinsulate the connections.
5. Place the switch onto the switch mount and install the screws, flat washers, lockwashers and nuts that secure the switch into place.
6. Install the screws that secure the left side cover assembly.

TRIGGER TRANSFORMER REPLACEMENT

⚠ WARNING

Service and repair should be performed only by Lincoln Electric factory trained personnel. Unauthorized repairs performed on this equipment could result in danger to the technician or the machine operator and will invalidate your factory warranty. For your safety and to avoid electrical shock, please observe all safety notes and precautions detailed throughout this manual.

If for any reason you do not understand the test procedures or are unable to perform the tests/repairs safely, contact the Lincoln Electric service department for technical troubleshooting assistance before you proceed.
Call (800) 833-9353 (WELD).

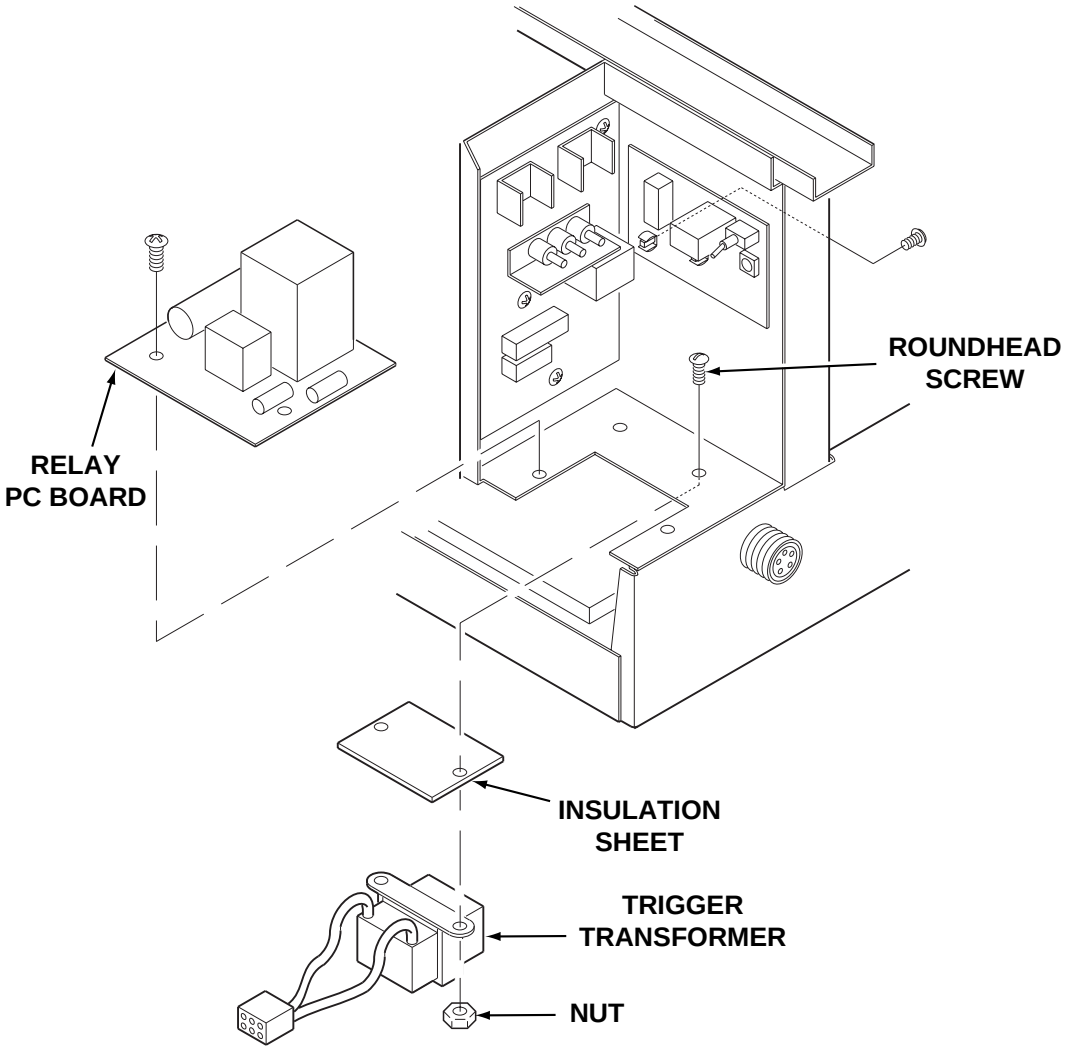
MATERIALS NEEDED

5/16 in. nutdriver
Flat blade screwdriver
Needlenose pliers

This procedure takes approximately 12 minutes to perform.

TRIGGER TRANSFORMER REPLACEMENT *(continued)*

FIGURE F.9 – TRIGGER TRANSFORMER REMOVAL



REPAIR PROCEDURE

1. Using the 5/16 in. nutdriver remove the screws from the left side cover assembly.
2. Remove the Relay PC board as described in the ***PC Board Replacement procedure.***
3. Disconnect the Molex plug for the trigger transformer from the bottom of the relay board. Refer to Figure F.9.
4. Using a flat blade screwdriver and needlenose pliers, remove the trigger transformer and insulation sheet from the case.
5. Place the insulation sheet and new trigger transformer into the case and install the screws and nuts that secure the transformer in place.
6. Install the Relay PC board as described in the ***PC Board Replacement procedure***.
7. Attach the trigger transformer Molex plug to the bottom of the relay board.
8. Install the screws that secure the left side cover assembly.

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PC BOARD REPLACEMENT

⚠ WARNING

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If for any reason you do not understand the test procedures or are unable to perform the tests/repairs safely, contact the Lincoln Electric service department for technical troubleshooting assistance before you proceed.
Call (800) 833-9353 (WELD).

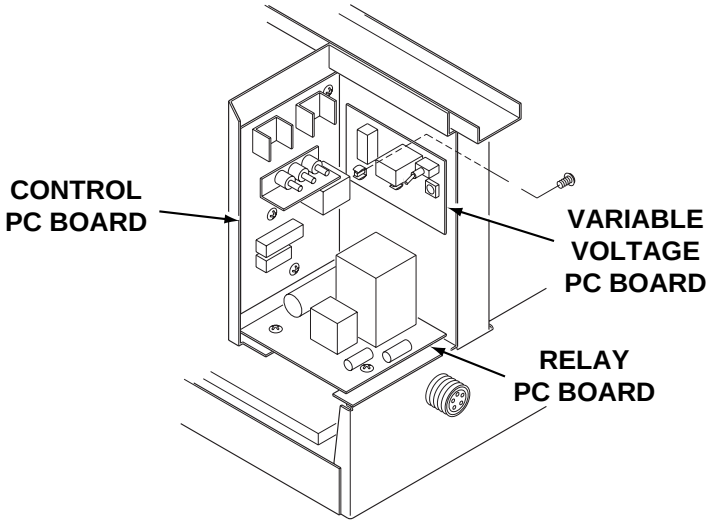
MATERIALS NEEDED

5/16 in. nutdriver
Phillips screwdriver

The Variable Voltage board takes approximately 5 minutes to replace.
The Relay board takes approximately 5 minutes to replace.
The Control board takes approximately 5 minutes to replace.

PC BOARD REPLACEMENT *(continued)*

FIGURE F.10 – PC BOARD LOCATIONS



REPAIR PROCEDURE

1. Observe the static precautions detailed in the ***PC Board Troubleshooting Procedures*** at the beginning of this section.

2. Using the 5/16 in. nutdriver, remove the screws from the left side cover assembly.

CAUTION: Label all wires and connectors prior to removal. All wires and connectors must be reconnected to the same terminals from where they were removed. Improper connection may lead to component damage or machine malfunction.

VARIABLE VOLTAGE BOARD REMOVAL AND REPLACEMENT

1. Disconnect all plugs and connectors that can be reached without removing the variable voltage PC board. Refer to Figure F.10.

2. Using a Phillips screwdriver, remove the screws that secure the variable voltage PC board to the case.

NOTE: The screws that secure the Variable Voltage PC board are on the wire drive assembly side of the unit.

3. Carefully move the PC board away from the case, checking to ensure that all plugs and connectors have been removed. Disconnect any connectors that have been missed or that could not be reached while the PC board was installed.

4. Place the new PC board into the case and install the mounting screws.

5. Connect all plugs and connectors to the PC board in the same location they were removed from.

6. Install the screws that secure the left side cover assembly.

RELAY BOARD REMOVAL AND REPLACEMENT

1. If the Relay PC board is being replaced, remove the 1CR Relay from the PC board.
2. Disconnect all plugs and connectors.
3. Remove mounting screws.
4. Place the new PC board into the case and install the mounting screws.
5. Install the 1CR Relay into the PC board.

CAUTION: Do not use excessive force when installing the 1CR Relay. Excessive force can damage the Relay PC board. If the relay does not fit properly, remove it and try again.

6. Connect all plugs and connectors to the PC board in the same location they were removed from.
7. Install the screws that secure the left side cover assembly.

CONTROL PC BOARD REMOVAL AND REPLACEMENT

1. Disconnect all plugs and connectors from the Control PC board.
2. Using a Phillips screwdriver, remove the screws that secure the Control PC board to the case.
3. Carefully move the Control Board away from the case. Check to ensure that all plugs and connectors have been disconnected.
4. Place the new PC board into the case and install the mounting screws.
5. Connect all plugs and connectors to the PC board in the same location they were removed from.
6. Install the screws that secure the left side cover assembly.

WIRE DRIVE ASSEMBLY AND COMPONENT REPLACEMENT

⚠ WARNING

Service and repair should be performed only by Lincoln Electric factory trained personnel. Unauthorized repairs performed on this equipment could result in danger to the technician or the machine operator and will invalidate your factory warranty. For your safety and to avoid electrical shock, please observe all safety notes and precautions detailed throughout this manual.

If for any reason you do not understand the test procedures or are unable to perform the tests/repairs safely, contact the Lincoln Electric service department for technical troubleshooting assistance before you proceed.
Call (800) 833-9353 (WELD).

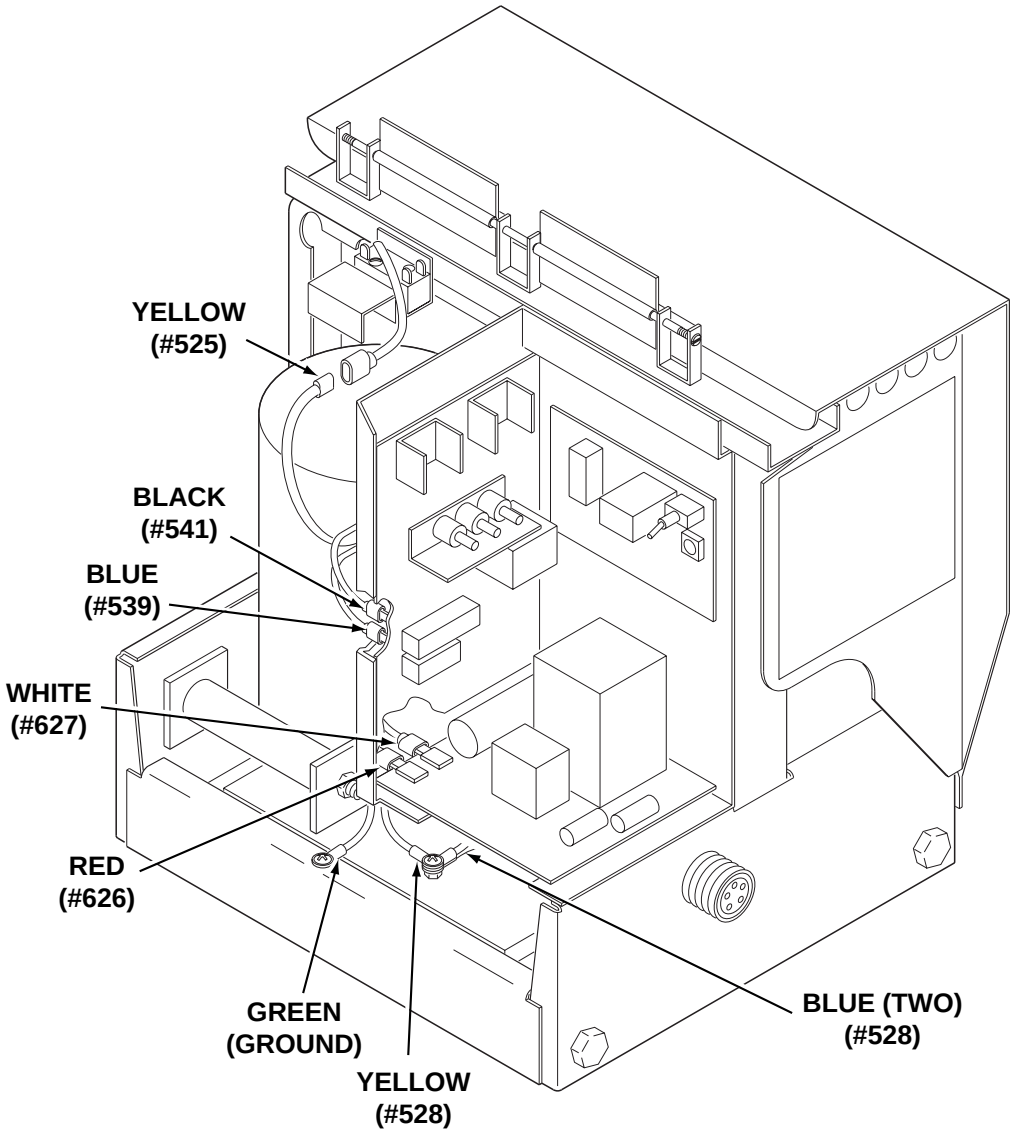
MATERIALS NEEDED

Offset flat blade screwdriver
Flat blade screwdriver
Phillips screwdriver
7/16 in. wrench
1/2 in. wrench
11/32 in. wrench
Insulating tape

This procedure takes approximately 40 minutes to perform.

WIRE DRIVE ASSEMBLY AND COMPONENT REPLACEMENT *(continued)*

FIGURE F.11 – DRIVE MOTOR ELECTRICAL CONNECTIONS



REPAIR PROCEDURE

1. Using the 5/16 in. nutdriver, remove the screws from the left side cover assembly.

2. Disconnect drive motor leads #539 (blue) and #541 (black) from the back of the Control PC board. Refer to Figure F.11.

3. Disconnect drive motor leads #626 (red) and #627 (white) from the side of the Relay PC board.

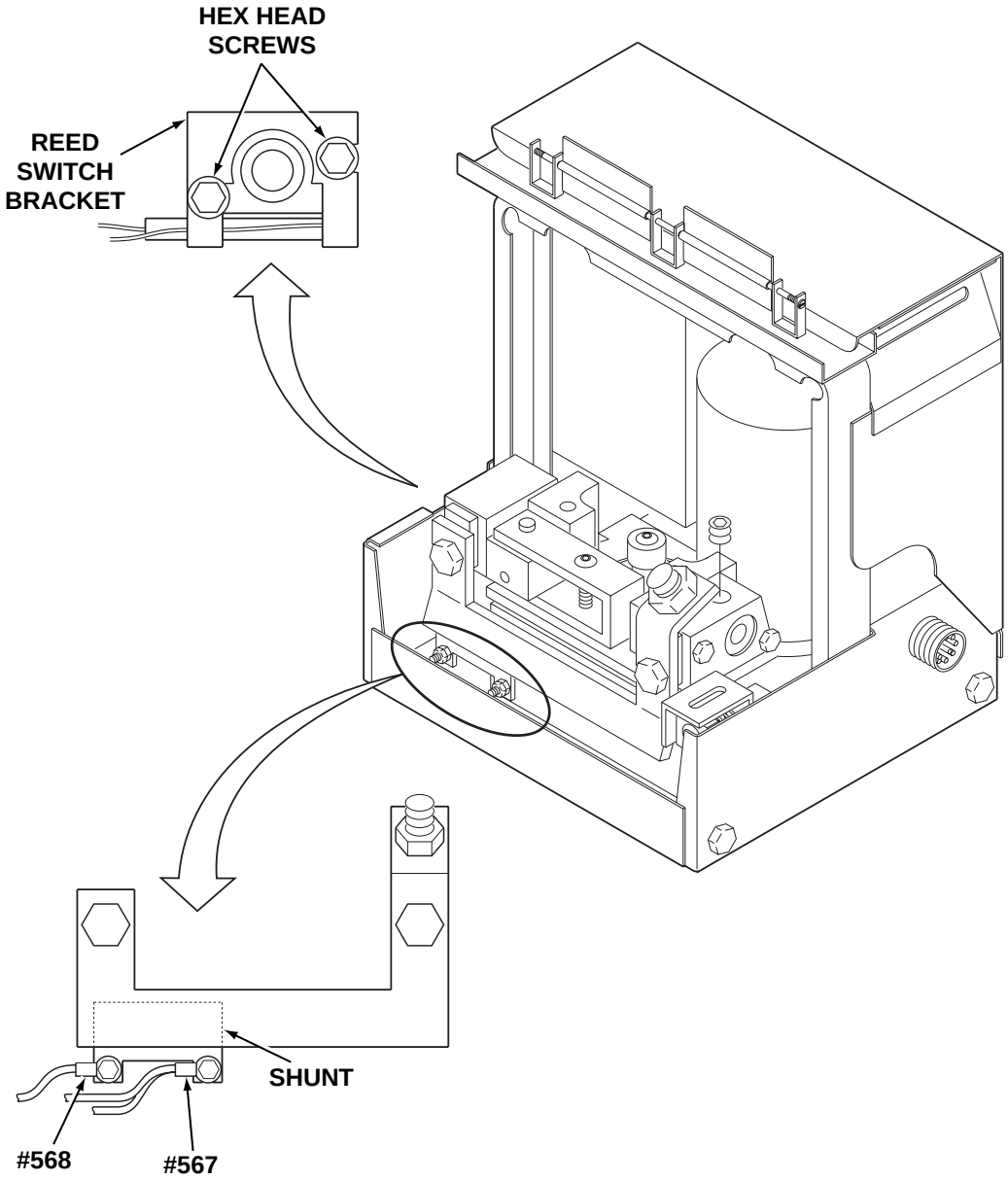
4. Using a Phillips screwdriver, disconnect the drive motor ground lead (green) from the case.

5. Separate ground lead protection wire #525 (yellow) at the in-line connector.

6. Remove the insulating tape from wire #528 (yellow) and disconnect it from the reed switch wire and gun receptacle wire (#528, and both blue leads) using a 11/32 in. wrench and a Phillips screwdriver. See the wiring diagram.

WIRE DRIVE ASSEMBLY AND COMPONENT REPLACEMENT *(continued)*

FIGURE F.12 – REED SWITCH REMOVAL AND SHUNT ELECTRICAL CONNECTIONS



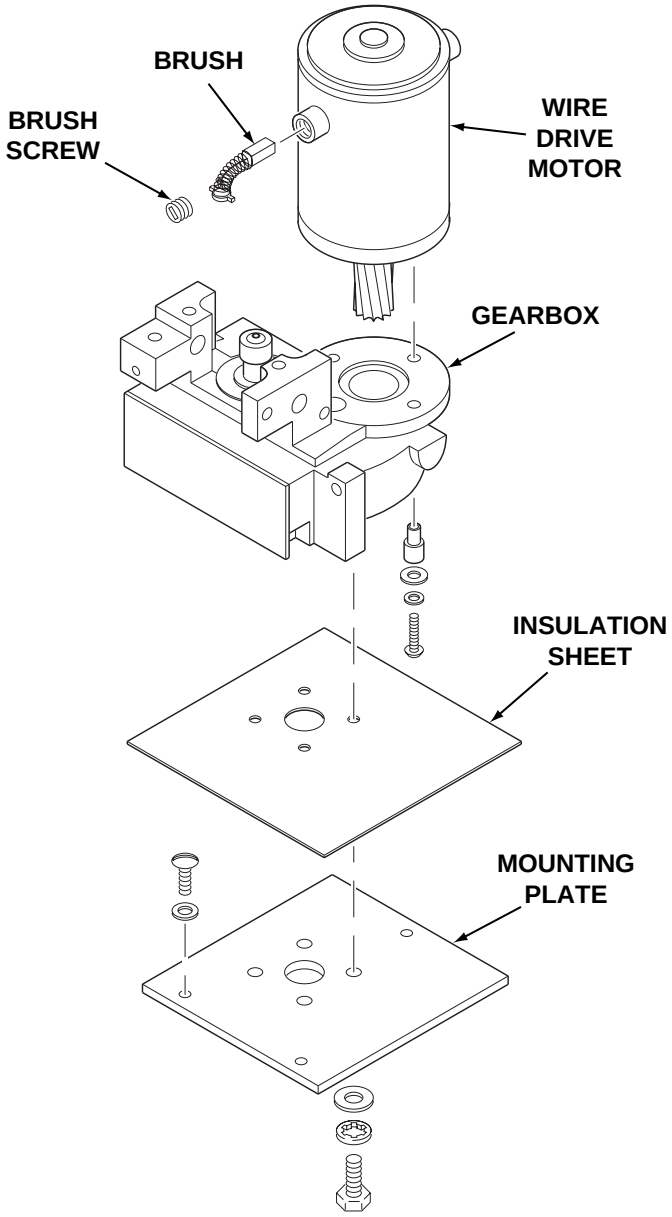
7. Disconnect two leads #567 (blue), and lead #568 (blue) from the shunt using the 11/32 in. wrench. See Figure F.12. Note the lead placement on the shunt for reassembly.

8. Using a 7/16 in. wrench, loosen the two hex head screws that secure the reed switch bracket to the front of the wire drive assembly. Slide the bracket off the front of the wire drive assembly.

9. Using an offset flat blade screwdriver, remove the two mounting screws below the shunt and the one mounting screw below the wire drive motor. Remove the wire drive assembly through the wire drive side of the case.

WIRE DRIVE ASSEMBLY AND COMPONENT REPLACEMENT *(continued)*

FIGURE F.13 – WIRE DRIVE ASSEMBLY REMOVAL



10. Using a 1/2 in. wrench, remove the four hex head screws, lockwashers and flat washers that hold the mounting plate to the gear box assembly, and remove the mounting plate and insulation sheet. Refer to Figure F.13.

11. Using a flat blade screwdriver, remove the three screws, lockwashers, flat washers and spacers that secure the drive motor to the gearbox assembly, and remove the drive motor.

12. For further disassembly of the wire drive assembly, refer to Figure F.13.

13. Secure the drive motor to the gearbox assembly using three screws, lockwashers, flat washers, and spacers.

WIRE DRIVE ASSEMBLY AND COMPONENT REPLACEMENT *(continued)*

14. Install the gearbox assembly onto the insulation sheet and mounting plate using four hex head screws, lockwashers and flat washers. Ensure that the edge of the mounting plate that has the single mounting hole is under the drive motor.

15. Place the wire drive assembly into the case. Secure the wire drive assembly using three round head screws and lockwashers.

16. Position the reed switch bracket onto the front of the wire drive assembly and tighten the two hex head screws that secure it in place. Refer to ***Figure F.12***.

17. Connect the two #567 (blue) leads and the #568 (blue) lead to the shunt. Note lead placement. Refer to ***Figure F.13***.

18. Connect the #528 wire (yellow) from the drive motor to the reed switch wire and gun receptacle wire (both #528 blue) using the round head screw and nut. Wrap the connection in insulating tape. Refer to ***Figure F.11***.

19. Connect the drive motor wire #525 (yellow) to the ground lead protection wire at the in-line connector.

20. Connect the drive motor ground lead (green) to the case.

21. Connect the drive motor leads #539 (blue) and #541 (black) to the back of the Control PC board.

22. Connect drive motor leads #626 (red) and #627 (white) to the side of the Relay PC board.

23. Install the screws that secure the left side cover assembly.

RETEST AFTER REPAIR

If a failed test indicates that any mechanical part that could affect the machine's electrical characteristics must be replaced or if any electrical components are repaired or replaced, the machine must be retested and meet the following standards.

Wire Feed Speed Range	50 to 600 IPM
Gas Solenoid (If Used)	Must function when gun trigger is activated.
1CR Relay	Must function when gun trigger is activated.
2CR Reed Switch	Must close when welding current is present.

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-ELECTRICAL DIAGRAMS SECTION-

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Wiring Diagram. G-2
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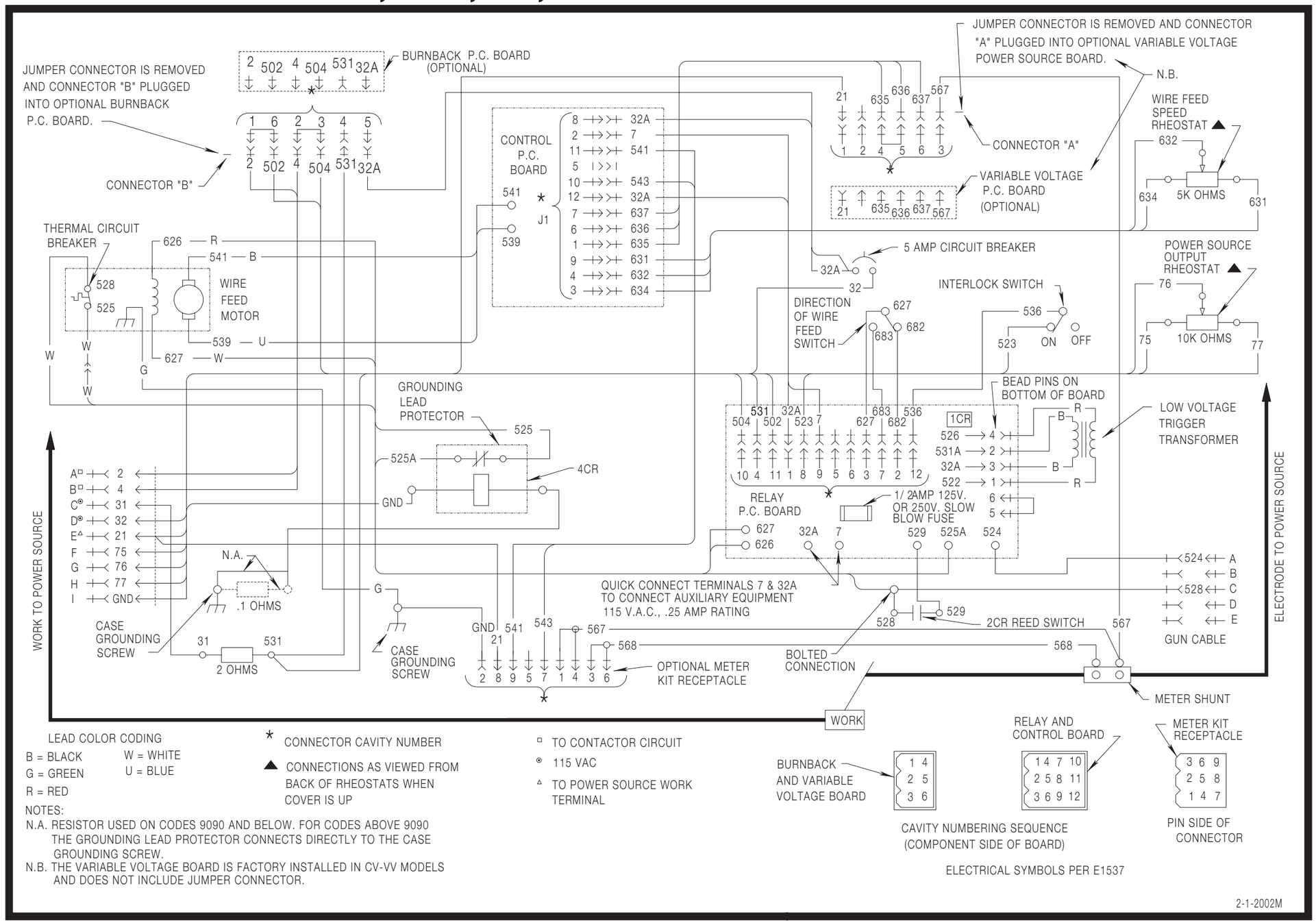
Control Board (L5767) Schematic G-5
Variable Voltage Board (L5039) Schematic G-6
Control Board (L5767) Layout G-7
Variable Voltage Board (L5039) Layout G-8

Return to Master TOC
Return to Master TOC
Return to Master TOC
Return to Master TOC

Wiring Diagram

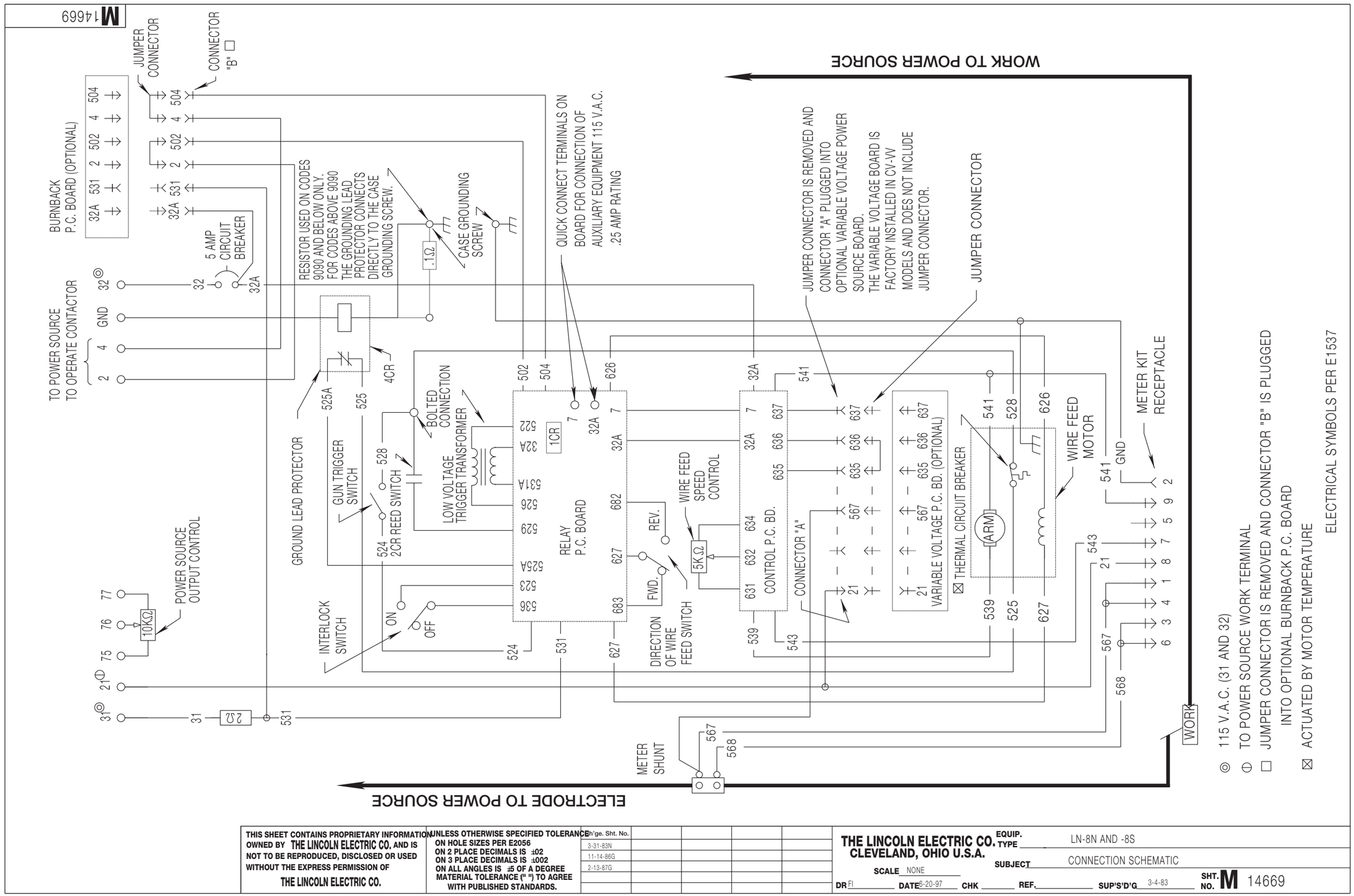
LN-8N, -8NE, -8S, AND -8SE WIRING DIAGRAM



M14679

NOTE: This diagram is for reference only. It may not be accurate for all machines covered by this manual.

CONNECTION SCHEMATIC



UNLESS OTHERWISE SPECIFIED TOLERANCE
ON HOLE SIZES PER E2056
ON 2 PLACE DECIMALS IS ±02
ON 3 PLACE DECIMALS IS ±002
ON ALL ANGLES IS ±5 OF A DEGREE
MATERIAL TOLERANCE (" ") TO AGREE WITH PUBLISHED STANDARDS.

Ch'ge. Sht. No.				
3-31-83N				
11-14-86G				
2-13-87G				

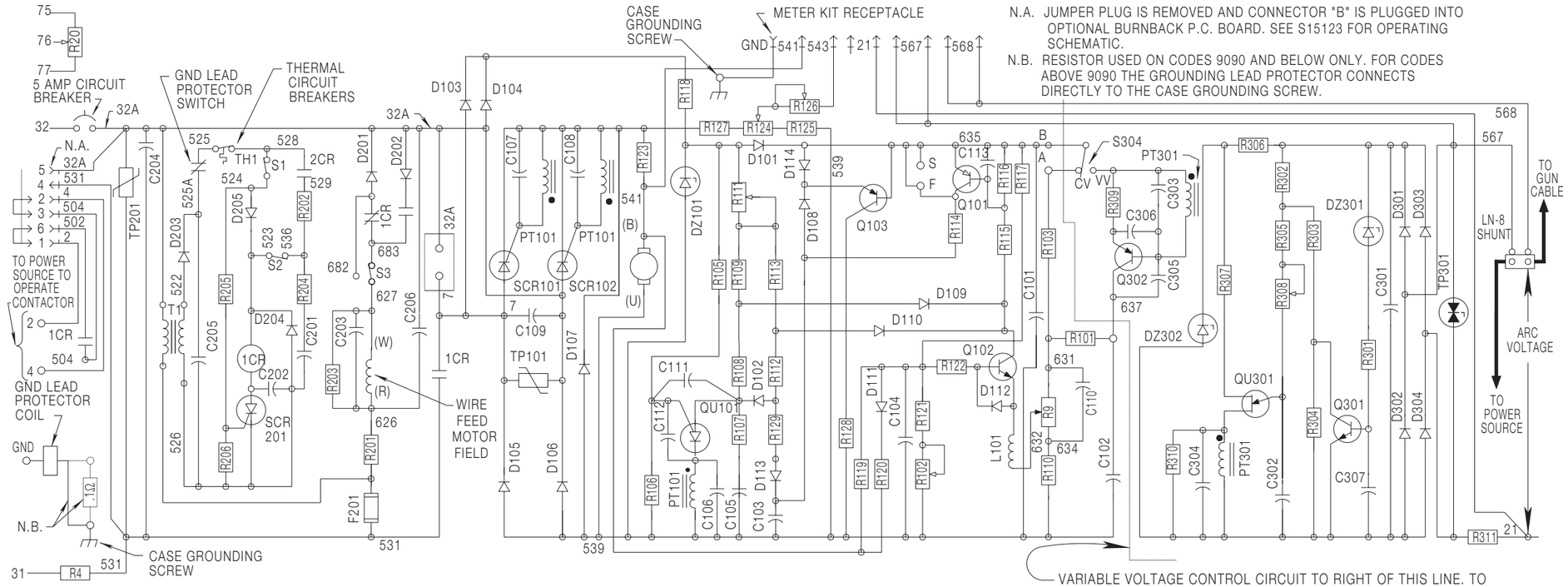
THE LINCOLN ELECTRIC CO.
CLEVELAND, OHIO U.S.A.

EQUIP. TYPE LN-8N AND -8S
SUBJECT CONNECTION SCHEMATIC
SCALE NONE
DR FI DATE 6-20-97 CHK ____ REF. ____ SUP'S'D'G 3-4-83
SHT. NO. M 14669

NOTE: Lincoln Electric assumes no responsibility for liablilities resulting from board level troubleshooting. PC Board repairs will invalidate your factory warranty. **Individual Printed Circuit Board Components are not available from Lincoln Electric.** This information is provided for reference only. Lincoln Electric discourages board level troubleshooting and repair since it may compromise the quality of the design and may result in danger to the Machine Operator or Technician. Improper PC board repairs could result in damage to the machine.

Return to Section TOC Return to Master TOC

OPERATING SCHEMATIC



* CONTROL CIRCUIT (BOARD #1)

C101	1MFD		L101	5.6MH	
C102	2MFD		Q101	2N4125	
C103	39MFD ~10%		Q102	2N4123	
C104	4.7MFD		Q103	2N5815	
C105	.10MFD		QU101	2N6027	
C106, C110,C111	.02 MFD		TP101	TRANSIENT PROTECTION	
C112, C113	.02 MFD		SCR101	12A 400V	
C107, C108	.047MFD		SCR102	12A 400V	
C109	.005MFD		PT101	1:1:1 PULSE TRANSFORMER	
D101	1A.	R101	6.8KΩ	R116	10KΩ
D102	1A.	R102	2KΩTRIMMER	R117	22KΩ
D103	1A.	R103	10KΩ	R118	4.7KΩ4W
D104	1A.	R105	4.7KΩ	R119	27KΩ
D105	16A.	R106	4.7KΩ	R120	15KΩ
D106	16A.	R107	15Ω	R121	1.5KΩ
D107	16A.	R108	33KΩ	R122	10KΩ
D108	1A.	R109	33KΩ	R123	.25Ω7W
D109	1A.	R110	750Ω	R124	1KΩTRIMMER
D110	1A.	R111	50KΩTRIMMER	R125	4.7KΩ4W
D111	1A.	R112	27KΩ	R126	1KΩTRIMMER
D112	1A.	R113	39KΩ	R127	150Ω
D113	1A.	R114	10KΩ	R128	1KΩ
D114	1A.	R115	68KΩ	R129	15KΩ
DZ101	20V.				

RELAY CIRCUIT (BOARD #2)

C201	50MFD
C202	.02MFD
C203	50MFD
C204	.005MFD
C205	50MFD
C206	.005MFD
1CR	3PDT 24V.D.C.
D201	1A.
D202	1A.
D203	1A.
D204	1A.
D205	1A.
R201	40Ω2W
R202	100Ω
R203	100KΩ
R204	27Ω
R205	4.7KΩ
R206	1KΩ
F201	1/2A 125V CR 250V SLOW BLOW FUSE
SCR201	4A 400V
TP201	TRANSIENT PROTECTION

▲ VARIABLE VOLTAGE CIRCUIT (BOARD #3)

C301	2MFD	R301	6.8KΩ
C302	.10MFD	R302	5.6KΩ(2%)
C303	.01MFD	R303	1KΩ(2%)
C304	.047MFD	R304	3.9KΩ(2%)
C305	.01MFD	R305	3.3KΩ
C306, C307	.02MFD	R306	4.7KΩ2W
D301	1A.	R307	100Ω
D302	2A.	R308	5KΩTRIMMER
D303	3A.	R309	15Ω
D304	4A.	R310	47Ω
DZ301	62V	R311	68Ω
DZ302	10V	S304	POWER SOURCE SELECTOR SWITCH
Q301	2N3393		
Q302	2N4125	QU301	UJT
PT301	1:1:1 PULSE TRANSFORMER		
TP301	TRANSIENT PROTECTION		

ELECTRICAL SYMBOLS PER E1537

LEAD COLOR CODING
B - BLACK R - RED
U - BLUE W - WHITE

COMPONENTS NOT ON P.C. BOARD

R4	2Ω50W
R9	5KΩ2W POT.
R20	10KΩ2W POT.
T1	110-24V TRANSFORMER
2CR	REED SWITCH (ACTUATED BY WELDING CURRENT)
4CR	GROUNDING LEAD PROTECTOR
S1	SPST GUN SWITCH
S2	SPDT INTERLOCK SWITCH
S3	SPDT DIRECTION SWITCH

* FOR CONTROL P.C. BOARDS L5767-1 AND HIGHER, USE M16802 SCHEMATIC FOR COMPONENT VALUES AND CIRCUIT CONNECTIONS

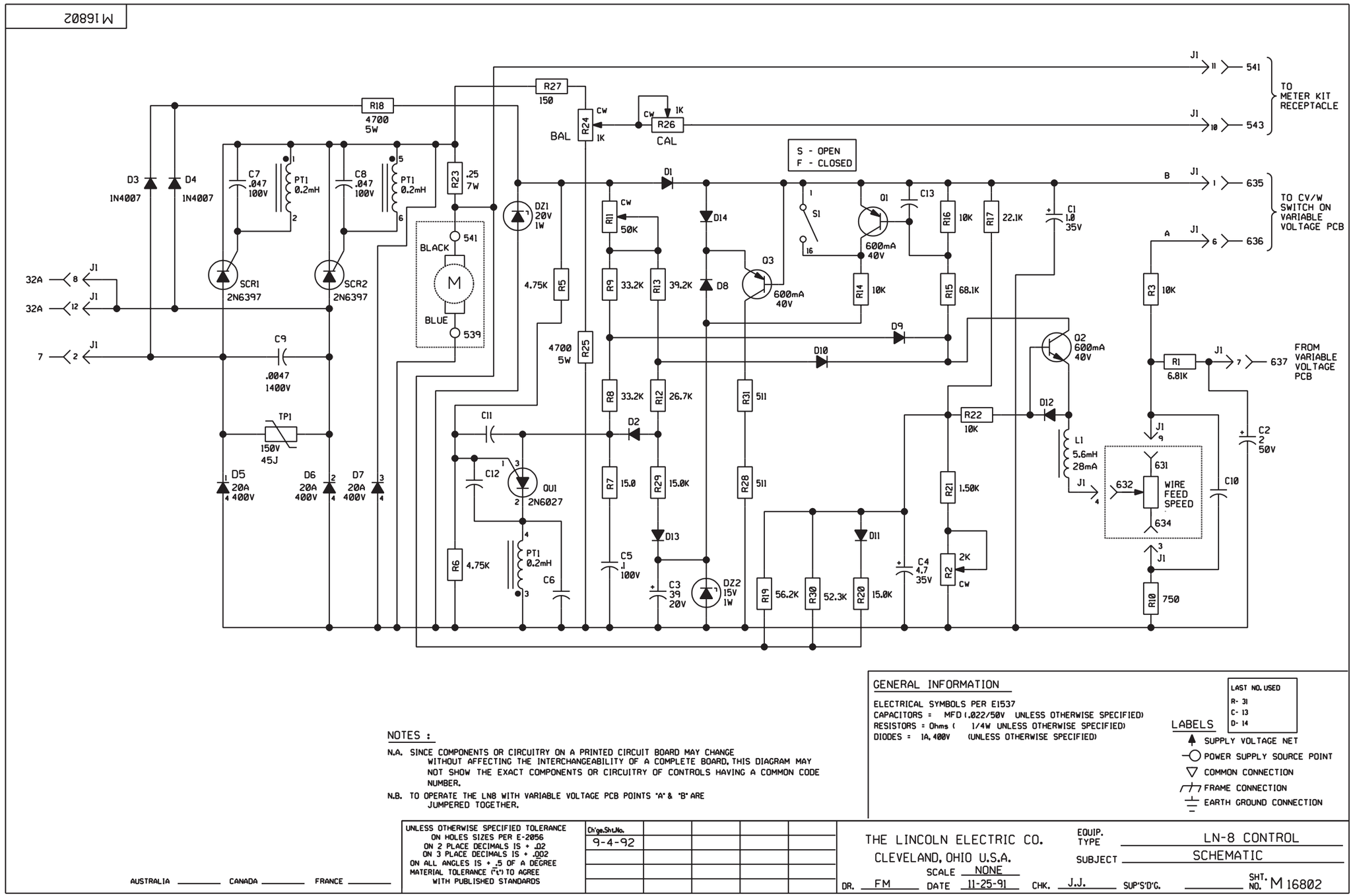
▲ FOR VARIABLE VOLTAGE P.C. BOARD L5039-1 OR HIGHER, USE M16441 SCHEMATIC FOR COMPONENT VALUES AND CIRCUIT CONNECTIONS

SINCE COMPONENTS OR CIRCUITRY ON A PRINTED CIRCUIT BOARD MAY CHANGE WITHOUT AFFECTING THE INTERCHANGEABILITY OF A COMPLETE BOARD, THIS DIAGRAM MAY NOT SHOW THE EXACT COMPONENTS OR CIRCUITRY OF CONTROLS HAVING A COMMON CODE NUMBER.

12-3-92E
M14680

Return to Section TOC
Return to Master TOC

CONTROL BOARD (L5767) SCHEMATIC



NOTES :

N.A. SINCE COMPONENTS OR CIRCUITRY ON A PRINTED CIRCUIT BOARD MAY CHANGE WITHOUT AFFECTING THE INTERCHANGEABILITY OF A COMPLETE BOARD, THIS DIAGRAM MAY NOT SHOW THE EXACT COMPONENTS OR CIRCUITRY OF CONTROLS HAVING A COMMON CODE NUMBER.

N.B. TO OPERATE THE LN8 WITH VARIABLE VOLTAGE PCB POINTS "A" & "B" ARE JUMPERED TOGETHER.

GENERAL INFORMATION

ELECTRICAL SYMBOLS PER E1537
CAPACITORS = MFD (.022/50V UNLESS OTHERWISE SPECIFIED)
RESISTORS = Ohms (1/4W UNLESS OTHERWISE SPECIFIED)
DIODES = 1A, 400V (UNLESS OTHERWISE SPECIFIED)

LAST NO. USED
R- 31
C- 13
D- 14

LABELS
SUPPLY VOLTAGE NET
POWER SUPPLY SOURCE POINT
COMMON CONNECTION
FRAME CONNECTION
EARTH GROUND CONNECTION

UNLESS OTHERWISE SPECIFIED TOLERANCE
ON HOLES SIZES PER E-2056
ON 2 PLACE DECIMALS IS + .02
ON 3 PLACE DECIMALS IS + .002
ON ALL ANGLES IS + .5 OF A DEGREE
MATERIAL TOLERANCE ("t") TO AGREE WITH PUBLISHED STANDARDS

Ch'ge.Sht.No. 9-4-92

AUSTRALIA _____ CANADA _____ FRANCE _____

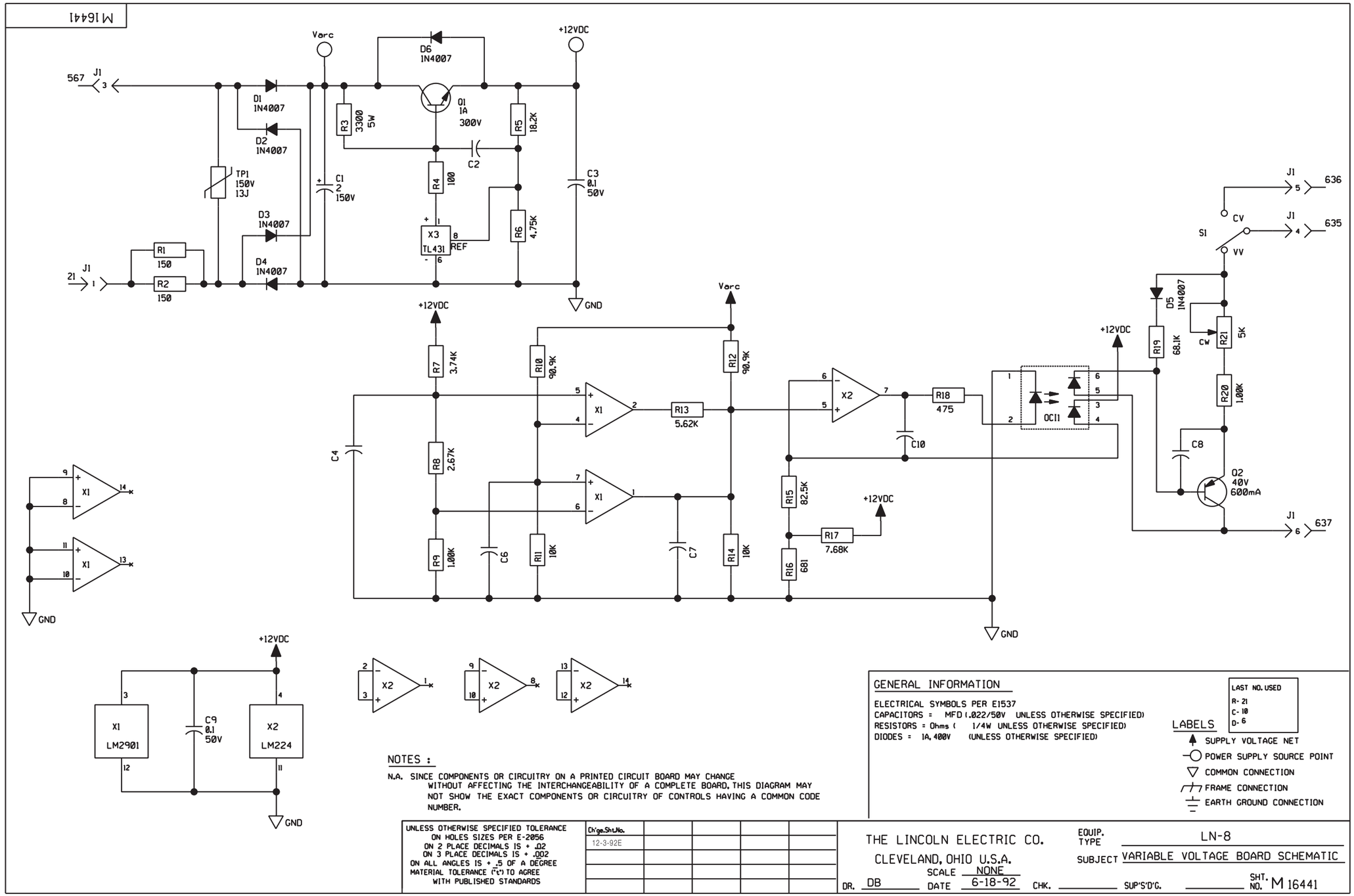
THE LINCOLN ELECTRIC CO.
CLEVELAND, OHIO U.S.A.

EQUIP. TYPE LN-8 CONTROL
SUBJECT SCHEMATIC
SCALE NONE
DR. FM DATE 11-25-91 CHK. J.J. SUP'S'D'G. _____
SHT. NO. M 16802

NOTE: Lincoln Electric assumes no responsibility for liablilities resulting from board level troubleshooting. PC Board repairs will invalidate your factory warranty. **Individual Printed Circuit Board Components are not available from Lincoln Electric.** This information is provided for reference only. Lincoln Electric discourages board level troubleshooting and repair since it may compromise the quality of the design and may result in danger to the Machine Operator or Technician. Improper PC board repairs could result in damage to the machine.

Return to Section TOC
Return to Master TOC

VARIABLE VOLTAGE BOARD (L5039) SCHEMATIC



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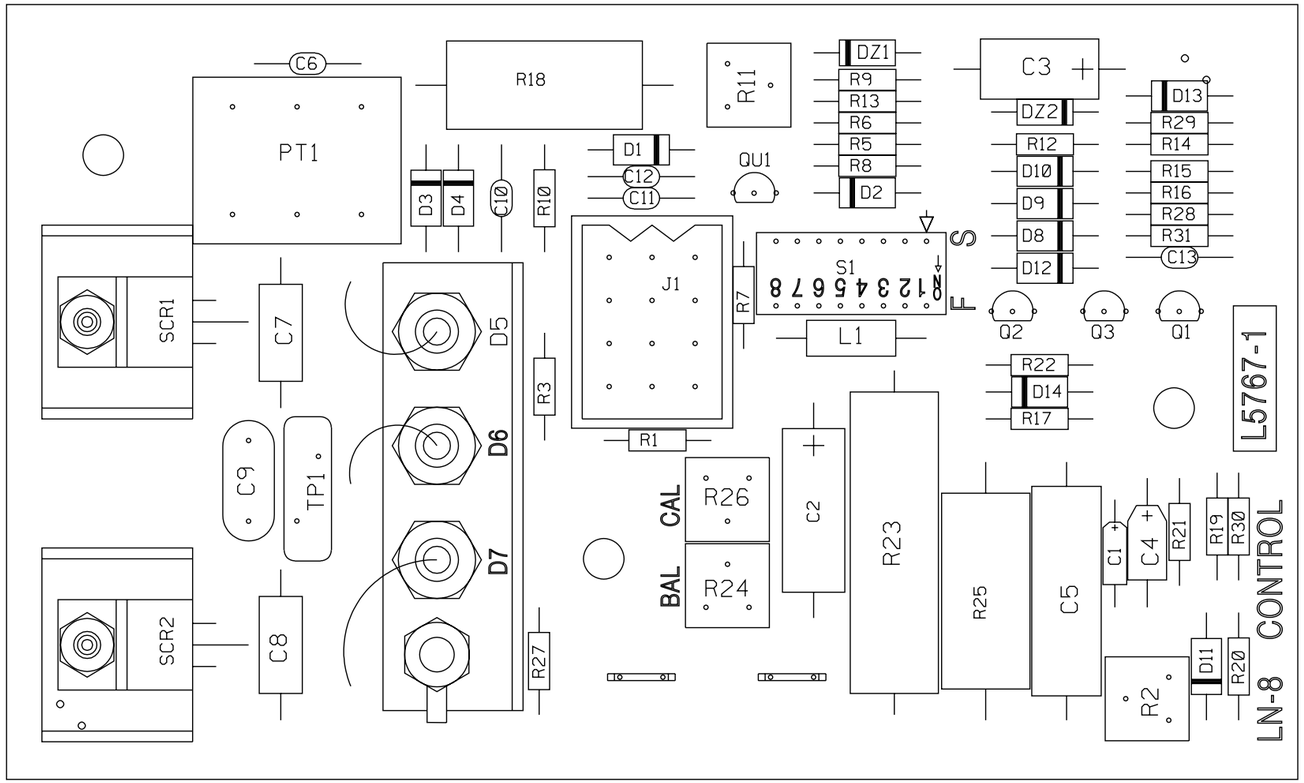
CONTROL BOARD (L5767) LAYOUT



ITEM	REQ'D.	PART No.	IDENTIFICATION
C1	1	S13490-42	1.0/35
C2	1	S13490-67	2/50
C3	1	S13490-104	39uF/20V
C4	1	S13490-25	4.7/35
C5	1	T11577-26	.1/100
C6,C10,C11,C12,C13	5	S16668-5	.022/50
C7,C8	2	S13490-102	.047/100
C9	1	T11577-52	.0047 or .005/1400
D1,D2,D8,D9,D10,D11,D12,D13,D14	9	T12199-1	1N4004
D3,D4	2	T12199-2	1N4007
DZ1	1	T12702-4	IN4747
DZ2	1	T12702-29	1N4744A
L1	1	T12218-2	5.6mH
PT1	1	T12737-2	1:1:1
Q1,Q3	2	T12704-69	2N4403
Q2	1	T12704-68	2N4401
QU1	1	T12707-4	2N6027
R1	1	S19400-6811	
R2	1	T10812-73	2K 1/2W
R3,R14,R16,R22	4	S19400-1002	
R5,R6	2	S19400-4751	
R7	1	S19400-15R0	
R8,R9	2	S19400-3322	
R10	1	S19400-7500	
R11	1	T10812-39	50K 1/2W
R12	1	S19400-2672	
R13	1	S19400-3922	
R15	1	S19400-6812	
R17	1	S19400-2212	
R18,R25	2	T14648-11	4700 .5W
R19	1	S19400-5622	
R20,R29	2	S19400-1502	
R21	1	S19400-1501	
R23	1	T14764-2	.25 7W
R24,R26	2	T10812-68	1K 1/2W
R27	1	S19400-1500	
R28,R31	2	S19400-5110	
R30	1	S19400-5232	
SCR1,SCR2	2	S15161-6	2N6397
TP1	1	T13640-11	45J

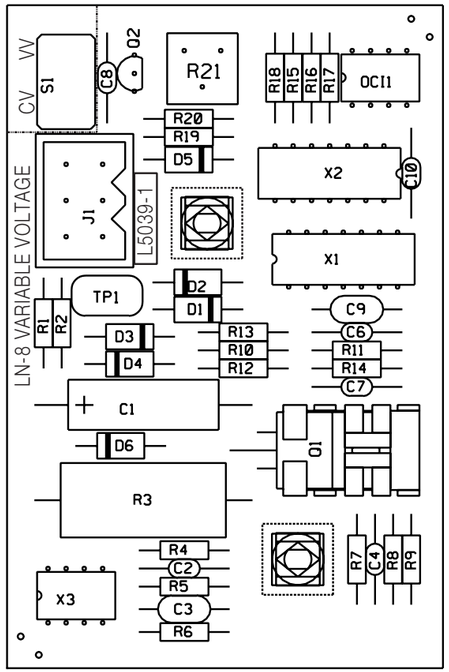
1-24-97B

L5767-1

CAPACITORS = MFD/VOLTS
RESISTORS = OHMS/ 1/4W UNLESS OTHERWISE SPECIFIED
INDUCTANCE = HENRYS

NOTE: Lincoln Electric assumes no responsibility for liablilities resulting from board level troubleshooting. PC Board repairs will invalidate your factory warranty. **Individual Printed Circuit Board Components are not available from Lincoln Electric.** This information is provided for reference only. Lincoln Electric discourages board level troubleshooting and repair since it may compromise the quality of the design and may result in danger to the Machine Operator or Technician. Improper PC board repairs could result in damage to the machine.

VARIABLE VOLTAGE BOARD (L5039) LAYOUT



ITEM	REQ'D	PART NO.	IDENTIFICATION
C1	1	S13490-68	2/150
C2, C4, C6, C7, C8, C10	6	S16668-5	.022/50
C3, C9	2	S16668-11	.1/50
D1, D2, D3, D4, D5, D6	6	T12199-2	1N4007
OCI 1	1	S15000-21	OPTOCOUPLER
Q1	1	T12704-40	TRANSISTOR
Q2	1	T12704-69	2N4403
R1, R2	2	S19400-1500	150 1/4W
R3	1	T14648-5	3.3K 5W
R4	1	S19400-1000	100 1/4W
R5	1	S19400-1822	18.2K 1/4W
R6	1	S19400-4751	4.75K
R7	1	S19400-3741	3.74K 1/4W
R8	1	S19400-2671	2.67K 1/4W
R9, R20	2	S19400-1001	1K 1/4W
R10, R12	2	S19400-9092	90.9K
R11, R14	2	S19400-1002	10K 1/4W
R13	1	S19400-5621	5.62K 1/4W
R15	1	S19400-8252	82.5K 1/4W
R16	1	S19400-6810	681 1/4W
R17	1	S19400-7681	7.68K 1/4W
R18	1	S19400-4750	475 1/4W
R19	1	S19400-6812	68.1K 1/4W
R21	1	T10812-36	5K 1/2W TRIMMER
S1	1	T13381	SPDT SWITCH
TP1	1	T13640-14	MOV
X1	1	S15128-11	14 PIN QUAD COMPARATOR
X2	1	S15128-4	LM224 OP-AMP
X3	1	S15128-10	VOLTAGE REF.

CAPACITORS = MFD VOLTS

INDUCTANCE = HENRY

8-31-2001E

L5039-1

NOTE: Lincoln Electric assumes no responsibility for liablilities resulting from board level troubleshooting. PC Board repairs will invalidate your factory warranty. **Individual Printed Circuit Board Components are not available from Lincoln Electric.** This information is provided for reference only. Lincoln Electric discourages board level troubleshooting and repair since it may compromise the quality of the design and may result in danger to the Machine Operator or Technician. Improper PC board repairs could result in damage to the machine.

Return to Section TOC
Return to Master TOC

SVM ERROR REPORTING FORM

We need to know if there are errors in our manuals. We also value any suggestions as to additional tests or procedures that would make this SVM a better tool for you.

If you discover new or different “Problems or Symptoms” that are not covered in the three column troubleshooting chart, please share this information with us. Please include the machine’s code number and how the problem was resolved.

Thank You,
Technical Services Group
Lincoln Electric Co.
22801 ST. Clair Ave.
Cleveland, Ohio 44117-1199

FAX 216-481-2309

SVM Number _____

Page Number if necessary_____

Your Company_____

Your Name_____

Please give detailed description below:

_____
_____
_____
_____
_____
_____
_____
_____
_____
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SD287 01/99