RETURN TO MAIN MENU

MIG PULSER

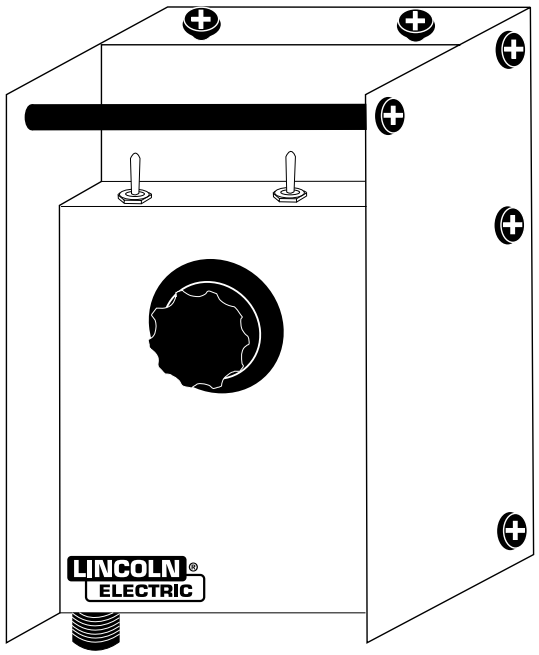
IM555

March, 1999

For use with machines having Code Numbers: **10213**

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.



OPERATOR'S MANUAL

World's Leader in Welding and Cutting Products

LINCOLN ELECTRIC

Premier Manufacturer of Industrial Motors

• 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

⚠ WARNING

⚠ CALIFORNIA PROPOSITION 65 WARNINGS ⚠

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

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

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.

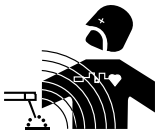
1.d. Keep all equipment safety guards, coversand devices in position and in good repair.Keep hands, hair, clothing and tools away from V-belts, gears, fans and all other moving parts when starting, operating or repairing equipment.

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.

Mar '95

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.**

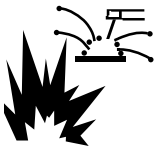
5.b. Do not weld in locations near chlorinated hydrocarbon vapors coming from degreasing, cleaning or spraying operations. The heat and rays of the arc can react with solvent vapors to form phosgene, a highly toxic gas, and other irritating products.

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.

Mar ‘95



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.

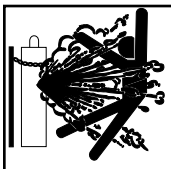
6.d. Do not heat, cut or weld tanks, drums or containers until the proper steps have been taken to insure that such procedures will not cause flammable or toxic vapors from substances inside. They can cause an explosion even though they have been “cleaned”. For information, purchase “Recommended Safe 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.

Mar ‘95

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.

Mar. '93

Thank You —— for selecting a **QUALITY** product by Lincoln Electric. We want you to take pride in operating this Lincoln Electric Company product ••• as much pride as we have in bringing this product to you!

Please Examine Carton and Equipment For Damage Immediately

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

Please record your equipment identification information below for future reference. This information can be found on your machine nameplate.

Model Name & Number _____

Code & Serial Number _____

Date of Purchase _____

Whenever you request replacement parts for or information on this equipment always supply the information you have recorded above.

Read this Operators Manual completely before attempting to use this equipment. Save this manual and keep it handy for quick reference. Pay particular attention to the safety instructions we have provided for your protection. The level of seriousness to be applied to each is explained below:

⚠ WARNING

This statement appears where the information **must** be followed **exactly** to avoid **serious personal injury** or **loss of life**.

⚠ CAUTION

This statement appears where the information **must** be followed to avoid **minor personal injury** or **damage to this equipment**.

vi

TABLE OF CONTENTS

TECHNICAL SPECIFICATIONS - MIG PULSER

INPUT				
Model	**Description**	**Volts**	**Amps**	**Frequency**
K954-1	MIG Pulser	42 VAC	1 A	50/60Hz

OUTPUT			
Output Frequency Range	**Peak Current Settings**	**Background Current Settings**	**Pulse Width**
20 to 300 Hz	250, 325 or 400 A	40 or 80 A	2 mS

PHYSICAL DIMENSIONS			
HEIGHT	**WIDTH**	**DEPTH**	**WEIGHT**
2.5 in. 64(mm)	5.0 in. 127(mm)	7.0 in. 178(mm)	3 lbs (1.4 kg) (without cables)

OPTIONS/ACCESSORIES	
(K955-25)	25 ft. (7.5m) Control Cable Extension

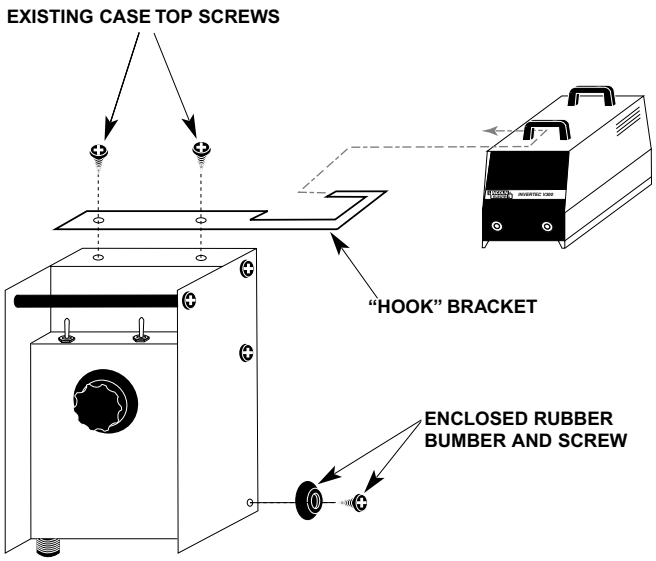


Figure A.1a - "Hook" Bracket Installation for mounting to a V300 Power Source.

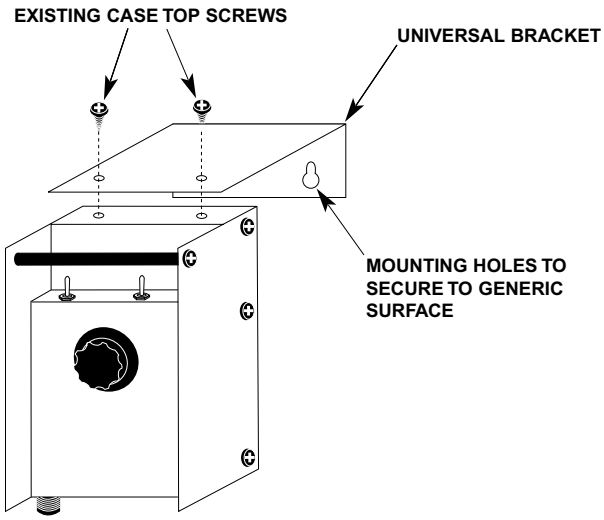


Figure A.1b - Universal Mounting Bracket Installation for mounting to a generic surface.

Read this entire installation section before you start installation.

SAFETY PRECAUTIONS

⚠ WARNING

ELECTRIC SHOCK can kill.

•Only qualified personnel should perform this installation.

•Turn the input power OFF at the disconnect switch or fuse box before working on this equipment.

•Do not touch electrically hot parts.

•Always connect the V300 grounding terminal (located on the bottom of the input connection box) to a good electrical earth ground.

Only qualified personnel should install, use or service this equipment

LOCATION

The MIG Pulser can be used in the same locations and environments as the V300. It is rated for use in damp, dirty environments.

MOUNTING BRACKETS

Locate the two mounting brackets and rubber bumper with screw that are supplied with the MIG Pulser in the loose parts bag. To prevent accidentally dropping the unit, always secure the MIG Pulser to a stable surface with one of the brackets.

The first bracket is designed to “hook” onto the front handle of the V300, allowing the MIG Pulser to be located next to the V300 Control Panel. Attach this bracket as shown in figure A.1a by using the two screws from the top of the MIG Pulser. To prevent the MIG Pulser from scratching the paint off the V300, affix the rubber bumper to the bottom corner of the MIG Pulser case with the longer provided screw.

The second bracket is a universal bracket that is designed to allow the MIG Pulser to be fastened to any secure surface. Attach the bracket to the desired surface. Then attach the MIG Pulser to the universal bracket using the two screws from the top of the MIG Pulser as shown in figure A.1b.

HIGH FREQUENCY INTERFERENCE PROTECTION

A V300 with a MIG Pulser may not be suitable for use near a high frequency arc starter (such as is found in a TIG welding power source or a plasma cutter). The V300 should be located at least 15 feet (5 meters) from the high frequency source. There should be at least 25 feet (7.5 meters) or greater separation between the ground connections and welding or cutting arcs of the V300 and the high frequency source.

ELECTRICAL INPUT CONNECTIONS

MACHINE GROUNDING

The MIG Pulser is grounded to the V300 by the ground lead carried inside the Control Cable. Ground the V300 according to all local and national electrical codes. Also refer to the V300 operator’s manual for any other grounding considerations.

SUPPLY CONNECTIONS

The MIG Pulser receives its input power from the V300 through the Control Cable.

CONNECTION TO A V300

⚠ WARNING

Turn the Power switch on the V300 “OFF” before connecting or disconnecting input power lines, output cables or control cables.

CONTROL CABLE CONNECTION

The MIG Pulser is supplied with a “wye” adapter for making connections to the V300. The 14-pin plug should be inserted into the V300 Wire Feeder receptacle, the 14-pin socket is for the wire feeder Control Cable, and the 6-pin socket connects directly to the MIG Pulser (Refer to figure A.2). If a DC TIG Starter is attached and connected to the V300, the 14 pin Pulser plug can be connected to the lower 14 pin socket on the DC TIG STARTER, which is labeled “connect to WIRE FEEDER”. Switch to “control at wire feeder” to transfer control to the MIG PULSER.

The MIG PULSER cannot be used for TIG welding.

If the optional 25 foot Control Cable Extension is used, it should be plugged into the 6-pin receptacle of the wye adapter and then into the MIG Pulser. Only one Control Cable Extension should be used; do not series multiple extensions together. Using 50 foot or longer control cables will cause the signals traveling between the V300 and the MIG Pulser to degrade, leading to poor welding performance.

NOTE: The voltage meter on the wire feeder will not display voltage due to the lack of a 21 lead in the feeder connection.

OUTPUT CABLES FOR PULSE WELDING

Pulse welding generates high peak currents, which in turn cause large voltage drops in welding cables. It is essential that large cables (2/0 minimum) are used and that all connections are clean and tight.

Because of voltage drops, the total length of the welding leads (work lead length plus electrode lead length) should not exceed 50 feet. If longer cables are used, the maximum achievable output voltage will be reduced.

NOTE: Do not coil the output cables around any metal object.

USE WITH THE LN-9 GMA

Using the MIG PULSER with a LN9-GMA requires installation of the voltage board bypass jumper. Other adapters as called for in the V300 manual are not needed for this usage, but can be left in if already present.

Problems with the trigger interlock may be experienced when using the MIG PULSER with an LN-9 GMA which has a L7265-2 Power PC Board. If needed, replace with the latest Power PC Board available.

CONNECTING A SPOOL GUN

Refer to Figure A.3 for information about connecting a spool gun in conjunction with the MIG PULSER.

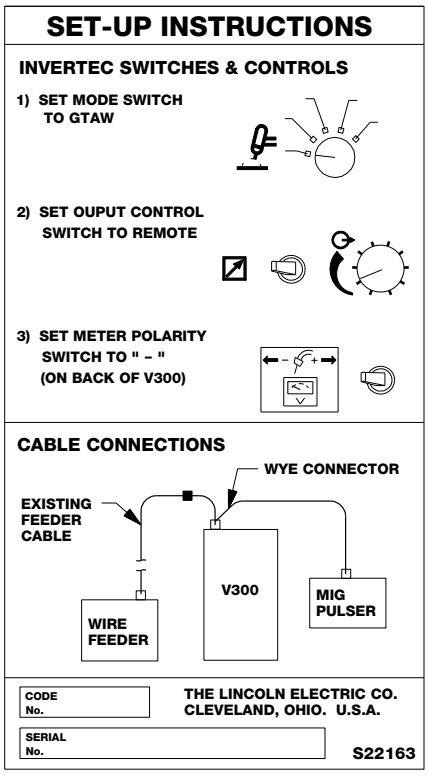


Figure A.2 Control Cable Connection.

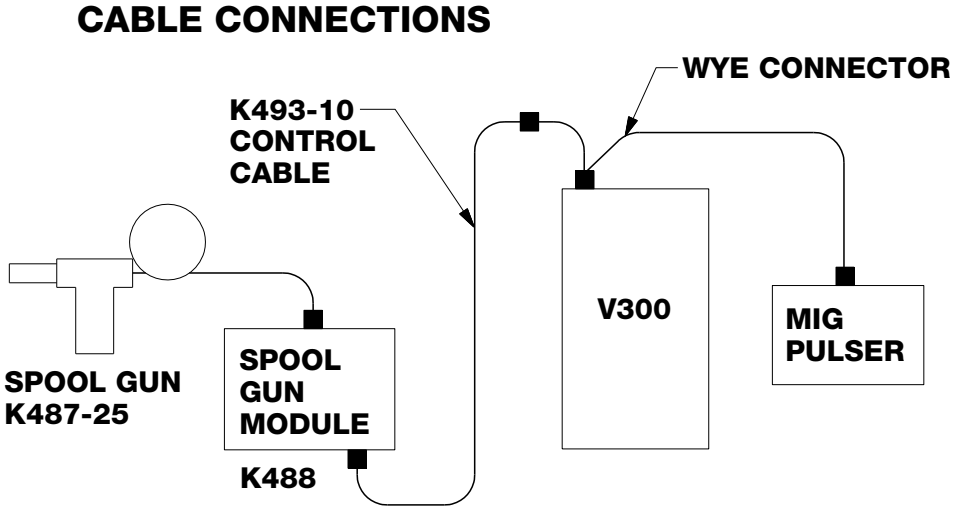


Figure A.3 Spool Gun Connection Diagram.

SAFETY PRECAUTIONS

Read entire section before operating this unit. Additionally, read the V300 operator's manual before operating this unit.

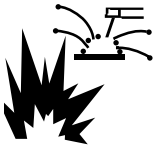
⚠ WARNING

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 SPARKS can cause fire or explosion.

- Keep flammable material away.
- Do not weld on containers that have held combustibles.

ARC RAYS can burn.

- Wear eye, ear and body protection.

Observe additional Safety Guidelines detailed in the beginning of this manual.

GENERAL DESCRIPTION

The MIG Pulser is a hand-held "pendant" type GMAW Pulsing option for the V300 Pro and V300-I power sources. It is a simple, easy-to-use unit, with a minimum of controls. It supports the GMAW-P (pulse MIG) process on mild steel, stainless steel, and aluminum. The MIG Pulser is supplied with a cable and brackets for connection and mounting to a V300. An optional control cable extension is also available which allows the MIG Pulser to be placed up to 25 feet from the V300.

RECOMMENDED PROCESSES AND EQUIPMENT

The MIG Pulser/V300 combination can run the following processes:

GMAW-P

- .035 steel, 100 - 700 IPM (90/10 Ar/CO_2)
- .045 steel, 75 - 400 IPM (90/10 Ar/CO_2)
- .035 stainless steel, 100 - 700 IPM (98/2 Ar/O_2)
- .045 stainless steel, 75 - 350 IPM (98/2 Ar/O_2)
- 3/64 5356 Aluminum, 150 - 600 IPM (Ar)

The MIG Pulser/V300 combination can be used with all wire feeders recommended for the V300 (LN-25, LN-7 family). It will also work with the Magnum Spoolgun with limitations. No other options or accessories are required or supported. Note: Using the MIG PULSER with a LN9-GMA requires installation of the voltage board bypass jumper on the LN9.

OPERATIONAL FEATURES AND CONTROLS

The MIG Pulser has the following controls as standard: Arc Length (continuously variable), Peak Current (choice of Low, Medium and High), and Background Current (choice of Normal and High).

DESIGN FEATURES AND ADVANTAGES

•Simple controls make this unit easy to set up and adjust.

•The control algorithm is adaptive — it responds to changes in stick-out and gun angle while maintaining a stable arc.

•Designed to the IEC-974-1 standard.

•Attractive, rugged case includes carrying handle and rubber feet.

•Unit is supplied with one bracket for mounting to the V300, and one “universal” bracket for mounting to vertical or horizontal surfaces.

WELDING CAPABILITY

The V300 must be derated when used for GMAW-P with the MIG Pulser. High peak currents required by the pulse process increase the power source heating, thus reducing the rated output. The V300 Pro and V300-I (with three phase input) are presently rated 300 amps at 60% duty cycle. When pulsing, the ratings of both models must be reduced to 250 amps at 60%. The single phase rating of the V300 PRO must be reduced from 250 amps/60% to 200 amps/60% when pulsing. The single phase rating of the V300-I must be reduced from 200 amps/60% to 150 amps/60% when pulsing. Refer to Table B.1.

LIMITATIONS

The V300/MIG Pulser combination cannot be used with long work and electrode leads. The total length of the welding leads (work lead length plus electrode lead length) should not exceed 50 feet. [If longer cables are used, refer to the ***Output Cables for Pulse Welding*** section in the Installation chapter for limitations.]

The Magnum Spoolgun/MIG Pulser combination will not run low wire feed speed, fine wire aluminum procedures well. These wires are best run in a spray mode; GMAW-P offers few advantages in those areas.

The voltage meter on the wire feeder will not display voltage due to the lack of a 21 lead in the feeder connection.

The V300 with a MIG Pulser may not be suitable for use near a high frequency arc starter (such as is found in a TIG welding power source or a plasma cutter). Refer to ***High Frequency Interference Protection*** section in the Installation section of this manual.

Problems with the trigger interlock may be experienced when using the MIG PULSER with an LN9-GMA that has a L7265-2 power board.

TABLE B.1 V300 OUTPUT DERATING

V300 PRO Input Power	Standard V300 PRO Rating (without MIG Pulser)	V300 PRO Rating when Using MIG Pulser
3 Phase, 60 Hz	300 Amps / 60 % Duty Cycle	250 Amps / 60 % Duty Cycle
1 Phase, 60 Hz	250 Amps / 60% Duty Cycle	200 Amps / 60% Duty Cycle

V300-I Input Power	Standard V300-I Rating (without MIG Pulser)	V300-I Rating when Using MIG Pulser
3 Phase, 50 Hz	300 Amps / 60 % Duty Cycle	250 Amps / 60 % Duty Cycle
1 Phase, 50 Hz	200 Amps / 60% Duty Cycle	150 Amps / 60% Duty Cycle

V300 SETTINGS

Read and understand the V300 Instruction Manual before attempting to use the V300/MIG Pulser system. Also refer to figure A.2 in the Installation chapter.

The V300 must be set to the TIG Mode when using the MIG Pulser. This is because pulse welding is a current controlled process, not a constant voltage process like straight GMAW. By using the GTAW position, the V300 is placed in a current control mode, and the Arc Force/Inductance control is made inactive.

The Wire Feeder Voltmeter Switch on the back of the V300 must be set to the "-" position (normally called the "electrode negative" position) although the MIG Pulser is used for electrode positive welding. The setting allows the MIG Pulser to sense arc voltage.

The V300 Local/Remote Switch must be set to Remote Control. This allows the MIG Pulser to control the V300 output. The Output Control on the V300 is not functional in the Remote Control mode.

Other V300 settings should be made according to the installation conditions and the wire feeders used.

MIG PULSER CONTROLS AND SETTINGS

The MIG Pulser has three adjustments, consisting of two switches (Peak Current and Background Current) and one knob (Arc Length). See figure B.1.

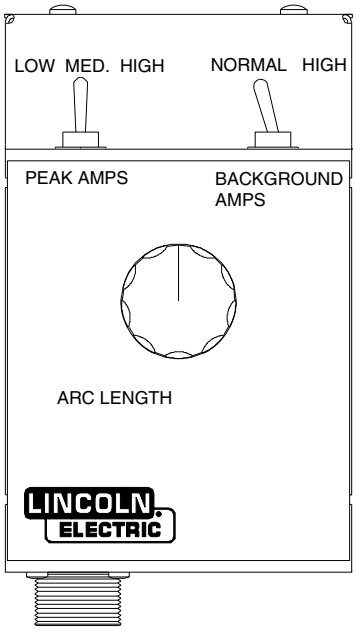


Figure B.1 MIG PULSER Controls

OPERATION GUIDELINES

The suggested steps for initially establishing a welding procedure are as follows:

1. Set the Peak Current to Low, Background Current to Normal, and Arc Length to minimum.

2. Set the desired wire feed speed on the feeder

3. Pull the gun trigger to establish an arc. Increase the Arc Length setting until a stable arc is present. (If the arc will not start with the Arc Length set to minimum, raise the Arc Length until a good start occurs.)

4. Once a stable arc is established, the Peak Current level can be increased, resulting in a broader, softer arc. This might be useful for out of position work, or for low travel speeds. Conversely, for faster travel speeds, lower Peak Current settings are recommended.

5. The Background Current affects the overall heat input to the weld. It also can affect arc stability. Too low of a Background Current can lead to a "popping" arc.

Adjusting the Peak Current, Background Current or Arc Length will lead to changes that can be both seen and heard in the arc. It is best to experiment with various settings to familiarize yourself with their effects.

If the wire feed speed is changed at the wire feeder, it is typical to need to raise the Arc length setting also. If the wire feed speed is increased a great deal, it may be necessary to increase the Peak Current setting as well.

Changes in wire size require similar procedural changes. Larger wire sizes require higher Arc Length settings, and possibly higher Peak Currents.

Note that a sound weld with good operator appeal can be achieved with more than one combination of settings. For instance, raising the Peak Current one position typically raises the arc length, causing a definite change in the sound of the weld.

The MIG Pulser is based on "adaptive" principles. In an adaptive pulser, many variables can affect the arc length: Stick-out, gun position, weld position, gas mixture, electrode composition, electrode surface condition, the switch settings and the Arc Length control. All of these conditions feed back into the circuitry allowing the MIG Pulser to adapt the arc length to the welding conditions.

PULSE WELDING PROCEDURE GUIDELINES

Tables B.2 and B.3 list initial settings guidelines for pulse welding with the MIG PULSER for Stainless Steel and Mild Steel. These settings are intended as suggestions only. The serviceability of a product or structure utilizing this type of information is and must be the sole responsibility of the builder/user. Many variables beyond the control of The Lincoln Electric Company affect the results obtained in applying this type of information. These variables include, but are not limited to, welding procedure, plate chemistry and temperature, weldment design, fabrication methods and service requirements.

These settings were developed for joints in the flat or horizontal position. Out-of-position work will require adjustments to these procedures.

To tighten or stiffen the arc, try decreasing the Peak setting. To widen or soften the arc, try increasing the Peak setting.

Table B.2 Procedure Guidelines for Stainless Steel

	.035 E308LSi 98/2 Ar/O_2			.045 E308LSi 98/2 Ar/O_2		
Wire Feed Speed	Peak	Bkgnd	Arc Length	Peak	Bkgnd	Arc Length
135 IPM	Low	Norm	2	--	--	--
150	Low	Norm	3.5	Med	Norm	4.5
200	Low	Norm	5	Hi	Norm	5.5
250	Med	Norm	5.5	Hi	Norm	6.5
300	Med	Norm	6	Hi	Norm	7
350	Med	Norm	6.5	Hi	Norm	7.5
400	Med	Norm	7	Hi	Norm	7.7
450	Med-Hi	Norm	7.5	Hi	Norm	8
500	Med-Hi	Norm	8	Hi	Norm	8.1
550	Med-Hi	Norm	8.5	--	--	--
600	Med-Hi	Norm	9	--	--	--
650	Med-Hi	Norm	9.5	--	--	--

Table B.3 Procedure Guidelines for Mild Steel

	.035 L-56 90/10 Ar/CO_2			.045 L-56 90/10 Ar/CO_2		
Wire Feed Speed	Peak	Bkgnd	Arc Length	Peak	Bkgnd	Arc Length
100 IPM	--	--	--	Low	Norm	5.1
125	--	--	--	--	--	--
150	Low	Norm	4.5	Med	Norm	6.2
200	Low	Norm	5.5	Med	Norm	7
250	Low	Norm	6	Med	Norm	7.5
300	Low	Norm	6.4	Med	Norm	8
350	Low	Norm	7	Med	Norm	8.5
400	Low	Norm	7.5	Med	Norm	9
450	Low	Norm	8.1	Med	Norm	9.5
500	Med	Norm	8.2	--	--	--
550	Med	Norm	8.4	--	--	--
600	Med	Norm	8.5	--	--	--
650	Med	Norm	9	--	--	--
700	Med	Norm	9.5	--	--	--

GENERAL MAINTENANCE

No regular or periodic maintenance is required for the MIG Pulser. As with any welding equipment, occasionally clean the exterior of the unit with a low pressure airstream or a damp cloth. This keeps the front and rear nameplates in a readable condition. Replace any nameplates that become illegible.

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: engine problems, function problems and output 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

If you have exhausted all of the items in step 2. Contact your Local Lincoln Authorized Field Service Facility.

⚠ CAUTION

If for any reason you do not understand the test procedures or are unable to perform the tests/repairs safely, contact your **Local Lincoln Authorized Field Service Facility** for technical troubleshooting assistance before you proceed.

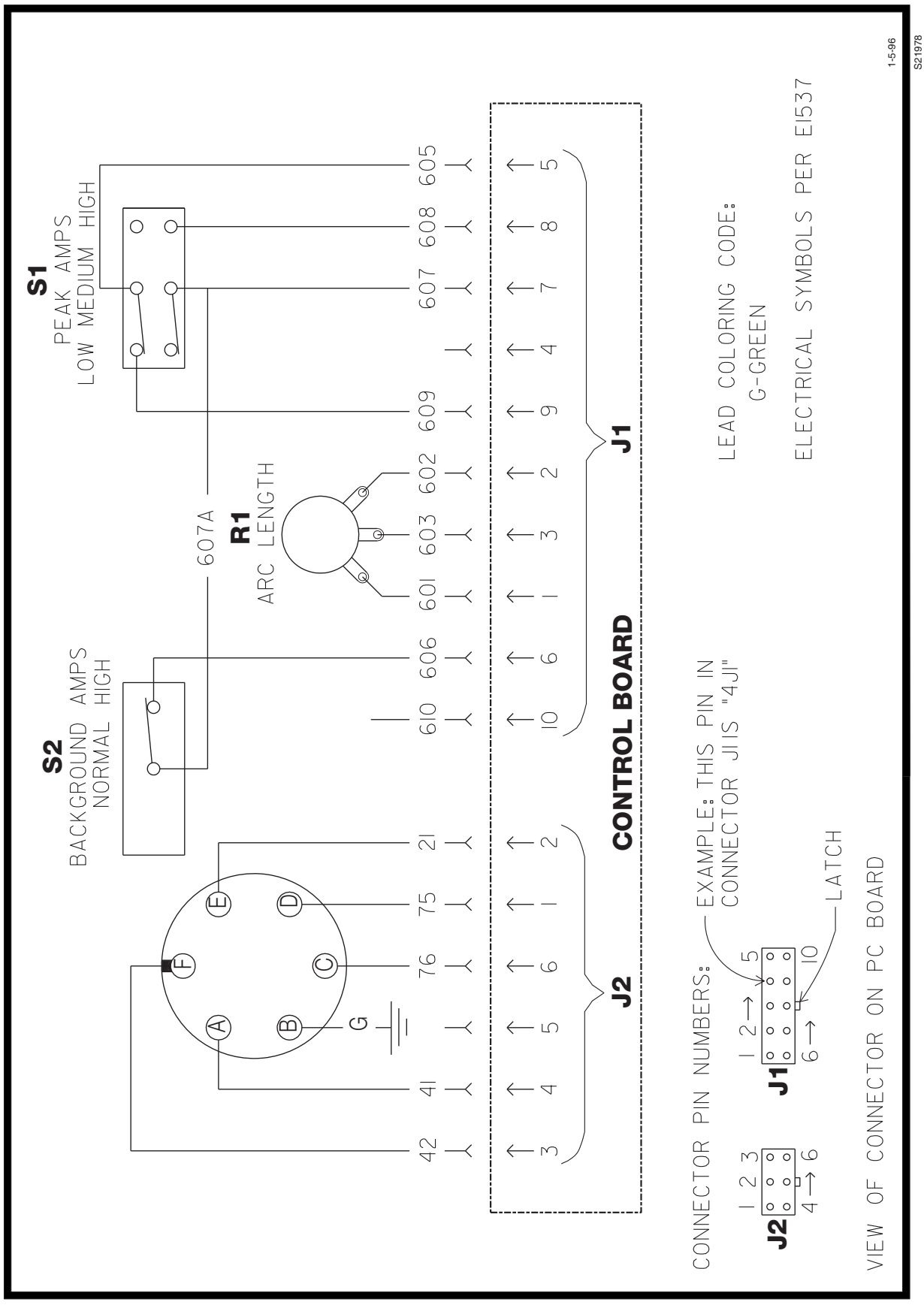
Observe all Safety Guidelines detailed througout this manual

PROBLEMS (SYMPTOMS)	POSSIBLE AREAS OF MISADJUSTMENTS(S)	RECOMMENDED COURSE OF ACTION
PROBLEMS		
The MIG PULSER does not give a satisfactory Weld.	1. Incorrect settings at the V300. Make sure the V300 switches are set in the proper positions. See ***V300 SETTINGS*** in the Operation section of this manual. 2. Output Cables are either too long or of improper size. See ***OUTPUT CABLES FOR PULSE WELDING*** in the Installation section of this manual. 3. The control cable may be extended too long. Do not use more than one optional 25 foot control cable extension. 4. There may be high frequency interference. Refer to the ***HIGH FREQUENCY INTERFERENCE PROTECTION*** section in the Installation section of this manual for proper installation guidelines.	Contact your **Local Lincoln Authorized Field Service Facility** for technical troubleshooting assistance.
The voltmeter on the wire feeder (if equipped) will not display.	1. This is normal. The wire feeder voltmeter will not display since there is no 21 lead in the feeder connection.	

⚠ CAUTION

If for any reason you do not understand the test procedures or are unable to perform the tests/repairs safely, contact your **Local Lincoln Authorized Field Service Facility** for technical troubleshooting assistance before you proceed.

WIRING DIAGRAM - MIG PULSER



Note: This diagram may not be totally applicable to every code covered by this manual. The diagram specific to your machine is pasted inside one of the enclosure panels.

LINCOLN ELECTRIC

LINCOLN ELECTRIC SERVICE MANUALS

Now Available ...The following Service Manuals

These are comprehensive single sources of information relative to Installation, Operation, Maintenance, Accessories, Theory of Operation, Replacement Parts, Electrical Diagrams and Extensive Troubleshooting.

ORDER FROM: **Technical Service Group-Customer Service Dept.**
Lincoln Electric Company
22801 St. Clair Ave.
Cleveland, Ohio 44117-1199

All orders must be pre-paid (US Funds Only)**:** Please allow up to 4 weeks for delivery.

Make checks or Money Orders payable to the Lincoln Electric Company

Qty.	Titles	Machine Codes	Manual #	Unit Price	Total Price
	Square Wave Tig 255	(Codes 10022-10134)	SVM100-A	$45.00	
	V300I	(Codes 9826-10133)	SVM101-A	$45.00	
	SP100	(Codes 9284-10050)	SVM102-A	$45.00	
	Power Arc 4000	(Codes 10083)	SVM103-A	$45.00	
	Power Arc 4000	(Codes 10200-10244)	SVM103-B	$45.00	
	ProCut 60 Single Phase	(Codes 9819-10118)	SVM104-A	$45.00	
	V300 PRO	(Codes 9934-10131)	SVM105-A	$45.00	
	LN 7 GMA	(Codes 9168-9931)	SVM106-A	$45.00	
	RANGER 8	(Codes 9972-10110)	SVM107-A	$45.00	
	DC600	(Codes 9773-9910)	SVM108-A	$45.00	
	POWER WAVE 350/500	(Codes 10104-10155)	SVM109-A	$65.00	
	RANGER 9	(Codes 9975-9976)	SVM110-A	$45.00	
	SP250	(Codes 9402-10002)	SVM111-A	$45.00	
	POWER WAVE 450	(Codes 10105-10195)	SVM112-A	$65.00	
	WELDAN POWER 125	(Codes 10158-10160)	SVM113-A	$45.00	
	LN25	(Codes 9218-10150)	SVM114-A	$45.00	
	SP255	(Codes 10164-10165)	SVM115-A	$45.00	
	Idealarc CV-300	(Codes 9456-10181)	SVM116-A	$45.00	
	Wire-matic 250	(Codes 9799-10004)	SVM117-A	$45.00	
	Square Wave TIG 355	(Codes 9951-9955)	SVM118-A	$45.00	
	Wire-matic 255	(Codes 10166,10167)	SVM119-A	$45.00	
	Ranger 10-LX	(Codes 9975, 9976)	SVM120-A	$45.00	
				TOTAL	

SHIP MANUALS TO:

Name: _____

Address: _____

_____

_____

Phone: _____

Now Available...12th Edition
The Procedure Handbook of Arc Welding

With over 500,000 copies of previous editions published since 1933, the Procedure Handbook is considered by many to be the "Bible" of the arc welding industry.

This printing will go fast so don't delay. Place your order now using the coupon below.

The hardbound book contains over 750 pages of welding information, techniques and procedures. Much of this material has never been included in any other book.

A must for all welders, supervisors, engineers and designers. Many welding instructors will want to use the book as a reference for all students by taking advantage of the low quantity discount prices which include shipping by 4th class parcel post.

$15.00 postage paid U.S.A. Mainland

How To Read Shop Drawings

The book contains the latest information and application data on the American Welding Society Standard Welding Symbols. Detailed discussion tells how engineers and draftsmen use the "short-cut" language of symbols to pass on assembly and welding information to shop personnel.

Practical exercises and examples develop the reader's ability to visualize mechanically drawn objects as they will appear in their assembled form.

187 pages with more than 100 illustrations. Size 8-1/2" x 11" Durable, cloth-covered board binding.

$4.50 postage paid U.S.A. Mainland

New Lessons in Arc Welding

Lessons, simply written, cover manipulatory techniques; machine and electrode characteristics; related subjects, such as distortion; and supplemental information on arc welding applications, speeds and costs. Practice materials, exercises, questions and answers are suggested for each lesson.

528 pages, well illustrated, 6" x 9" size, bound in simulated, gold embossed leather.

$5.00 postage paid U.S.A. Mainland

Need Welding Training?

The Lincoln Electric Company operates the oldest and most respected Arc Welding School in the United States at its corporate headquarters in Cleveland, Ohio. Over 100,000 students have graduated. Tuition is low and the training is "hands on"

For details write: Lincoln Welding School
22801 St. Clair Ave.
Cleveland, Ohio 44117-1199.

and ask for bulletin ED-80 or call 216-383-2259 and ask for the Welding School Registrar.

Lincoln Welding School
BASIC COURSE **$700.00**
5 weeks of fundamentals

There is a 10% discount on all orders of $50.00 or more for shipment at one time to one location.
Orders of $50 or less before discount or orders outside of North America must be prepaid with charge, check or money order in U.S. Funds Only.
Prices include shipment by 4 th Class Book Rate for U.S.A. Mainland Only. Please allow up to 4 weeks for delivery.
UPS Shipping for North America Only. All prepaid orders that request UPS shipment please add:

$5.00	For order value up to $49.99
$10.00	For order value between $50.00 & $99.99
$15.00	For order value between $100.00 & $149.00

For North America invoiced orders over $50.00 & credit card orders, if UPS is requested, it will be invoiced or charged to you at cost.
Outside U.S.A. Mainland order must be prepaid in U.S. Funds. Please add $2.00 per book for surface mail or $15.00 per book for air parcel post shipment.

METHOD OF PAYMENT: (Sorry, No C.O.D. Orders)

CHECK ONE:
____ Please Invoice (only if order is over $50.00)
____ Check or Money Order Enclosed, U.S. Funds only
____ Credit Card - VISA MasterCard

Account No. |_|_|_|_|_|_|_|_|_|_|_|_|_|_|_|_|_|_|_|_| Exp Date |_|_| Month |_|_| Year

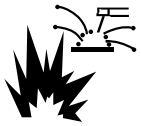
Name: _____
Address: _____
_____
Telephone: _____
Signature as it appears on Charge Card: _____

USE THIS FORM TO ORDER:
BOOKS OR FREE INFORMATIVE CATALOGS

Order from: BOOK DIVISION, The Lincoln Electric Company, 22801 St. Clair Avenue, Cleveland, Ohio 44117-1199
Telephone: 216-383-2211 or, for fastest service, FAX this completed form to: 216-361-5901.

Lincoln Welding School **(ED-80)** _____
Seminar Information **(ED-45)** _____
Educational Video Information **(ED-93)** _____
James F. Lincoln Arc Welding Foundation Book Information **(JFLF-515)** _____

Titles:	Price	Code	Quantity	Cost
New Lessons in Arc Welding	$5.00	L		
Procedure Handbook "Twelfth Edition"	$15.00	PH		
How to Read Shop Drawings	$4.50	H		
Incentive Management	$5.00	IM		
A New Approach to Industrial Economics	$5.00	NA		
The American Century of John C. Lincoln	$5.00	AC		
Welding Preheat Calculator	$3.00	WC-8		
Pipe Welding Charts	$4.50	ED-89		
			SUB TOTAL	
			Additional Shipping Costs if any	
			TOTAL COST	

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

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

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

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

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

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

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

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

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

이 제품에 동봉된 작업지침서를 숙지하시고 귀사의 작업자 안전수칙을 준수하시기 바랍니다.

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