IM294-C

LN-9 SEMIAUTOMATIC WIRE FEEDER

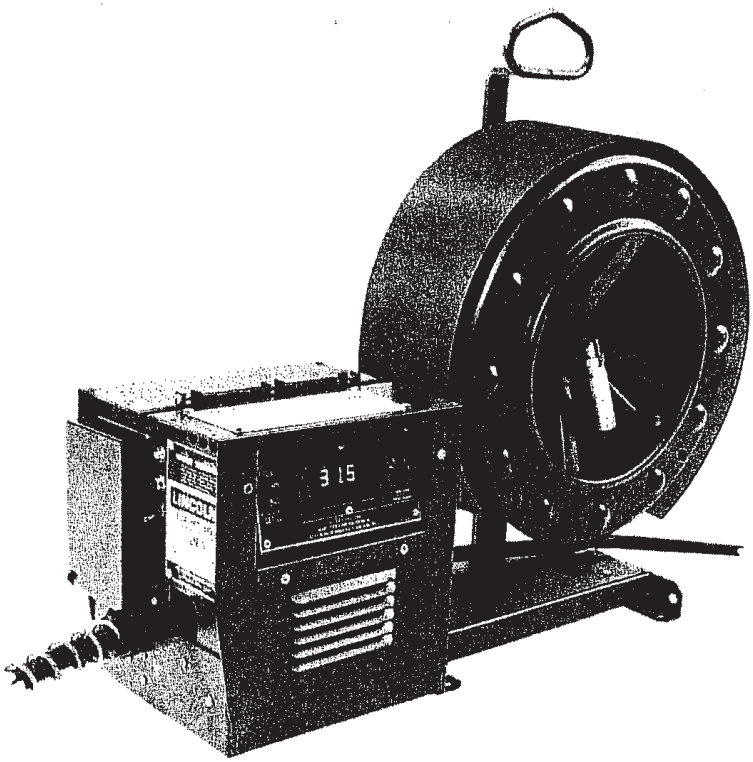
June, 2010

For Submerged Arc, Innershield® and Other Open Arc Semiautomatic Arc Welding Processes

For Operation with Appropriate Lincoln Power Sources

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

ISO 9001

Designed and Manufactured Under a Quality Program Certified by ABS Quality Evaluations, Inc. to ISO 9001 Requirements.
CERTIFICATE NUMBER: 30273

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

⚠ 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.

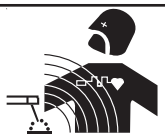
1.d. Keep all equipment safety guards, covers and devices in position and in good repair.Keep hands, hair, clothing and tools away from V-belts, gears, fans and all other moving parts when starting, operating or repairing equipment.

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.

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 within applicable OSHA PEL and ACGIH TLV limits 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.**

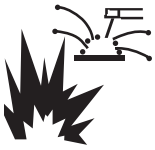
5. b. The operation of welding fume control equipment is affected by various factors including proper use and positioning of the equipment, maintenance of the equipment and the specific welding procedure and application involved. Worker exposure level should be checked upon installation and periodically thereafter to be certain it is within applicable OSHA PEL and ACGIH TLV limits.

5.c. 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.d. 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.e. 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.f. Also see item 1.b.



WELDING and CUTTING 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.

6.I. Read and follow NFPA 51B “ Standard for Fire Prevention During Welding, Cutting and Other Hot Work”, available from NFPA, 1 Batterymarch Park, PO box 9101, Quincy, Ma 022690-9101.

6.j. Do not use a welding power source for pipe thawing.

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.

Refer to **http://www.lincolnelectric.com/safety** for additional safety information.

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.

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!

CUSTOMER ASSISTANCE POLICY

The business of The Lincoln Electric Company is manufacturing and selling high quality welding equipment, consumables, and cutting equipment. Our challenge is to meet the needs of our customers and to exceed their expectations. On occasion, purchasers may ask Lincoln Electric for advice or information about their use of our products. We respond to our customers based on the best information in our possession at that time. Lincoln Electric is not in a position to warrant or guarantee such advice, and assumes no liability, with respect to such information or advice. We expressly disclaim any warranty of any kind, including any warranty of fitness for any customer's particular purpose, with respect to such information or advice. As a matter of practical consideration, we also cannot assume any responsibility for updating or correcting any such information or advice once it has been given, nor does the provision of information or advice create, expand or alter any warranty with respect to the sale of our products.

Lincoln Electric is a responsive manufacturer, but the selection and use of specific products sold by Lincoln Electric is solely within the control of, and remains the sole responsibility of the customer. Many variables beyond the control of Lincoln Electric affect the results obtained in applying these types of fabrication methods and service requirements.

Subject to Change – This information is accurate to the best of our knowledge at the time of printing. Please refer to www.lincolnelectric.com for any updated information.

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.

Product _____

Model Number _____

Code Number or Date Code_____

Serial Number_____

Date Purchased_____

Where Purchased_____

Whenever you request replacement parts or information on this equipment, always supply the information you have recorded above. The code number is especially important when identifying the correct replacement parts.

On-Line Product Registration

- Register your machine with Lincoln Electric either via fax or over the Internet.
  - For faxing: Complete the form on the back of the warranty statement included in the literature packet accompanying this machine and fax the form per the instructions printed on it.
  - For On-Line Registration: Go to our **WEB SITE at www.lincolnelectric.com.** Choose "Quick Links" and then "Product Registration". Please complete the form and submit your registration.

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**.

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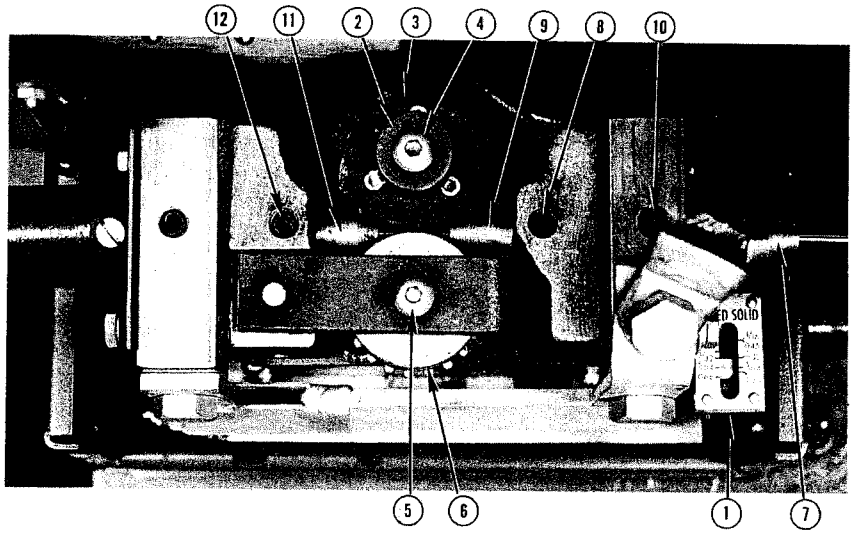
August 1996

PRODUCT DESCRIPTION

A new concept in semiautomatic welding — a wire feeder which when used with an appropriate Lincoln power source, takes the guesswork from procedure setting and procedure control. This unit is designed to achieve higher quality control and weld quality levels more easily. The arc voltage and wire feed speed can be set on a digital meter before the arc is struck and the procedure remains precisely set day in and day out on production jobs.

SEC. N2 — INSTALLATION

Sec. N2.2
MECHANICAL INSTALLATION



LN-9N Wire Feed Mechanism set for 3/32" (2.4 mm) electrode diameter.

Sec. N2.2.0
WIRE DRIVE

The LN-9 semiautomatic wire feeder is available in either two or four roll wire drive models. The two roll model utilizes two driven rolls to feed steel electrode, and only a single driven roll for feeding aluminum electrode.

The four roll wire drive is similar to the two roll and uses some of the same components. The most noticeable difference between the two is that four driven rolls are used instead of two for feeding all steel electrodes and two driven rolls with two undriven rolls are used for feeding aluminum electrodes instead of one. Drive roll and guide tube kits for both wire drives are available as follows:

		2 Roll Wire Drive	4 Roll Wire Drive
Steel Electrodes	7/64"-.120" Cored (2.8-3.0 mm)	KP502-120	KP545-120
	.068"-3/32" Cored or Solid (1.7-2.4 mm)	-3/32	-3/32
	1/16" (.062") Cored (1.6 mm)	-1/16C	-1/16C
	1/16" Solid (1.6 mm)	-1/16	-1/16
	.045"-.052" Cored (1.0-1.4 mm)	-052C	-052C
	.045"-.052" Solid (1.0-1.4 mm)	-.052	-.052
	.030"-.035" Solid (0.8-0.9 mm)	-035	-035
Aluminum Electrodes	1/16" (1.6 mm)	KP503-1/16A	KP546-1/16A
	3/64" (1.2 mm)	-3/64A	-3/64A
	.035" (0.9 mm)	-035A	-035A

Sec.N2.2.0 (continued)

The drive rolls for .045"-.062" (1.0-1.6 mm) cored wire sizes and all wire sizes of .068" (1.8 mm) and above use knurled "V-groove" rolls. The smaller solid wire sizes are driven with smooth "V-groove" rolls. The amount of driving force on the electrode should be just under the buckling point of the electrode. The spring loaded drive roll assembly of the two roll wire drive has a nameplate with graduations on it so that the spring can be properly set for the wire size being used. The spring loaded quick release drive roll mechanisms for the four roll wire drive do not have graduations because of the wide variety of dereeler and cable configurations that are possible. See following Sections on setting the drive roll spring pressure for two or four drive roll systems.

Sec. N2.2.1

WIRE FEED ROLLS AND GUIDE TUBES TWO ROLL WIRE DRIVE SYSTEM

The drive rolls and guide tubes for the wire size specified on the machine order are shipped loose with the wire feed unit. Install these parts per the following instructions:

1. Loosen idle roll spring pressure screw (1).
2. Remove clamping collar (2) from the drive shaft.
3. Install drive roll (3) with the key and replace clamping collar (2). Tighten screw (4).
4. Remove the idle roll shaft screw (5) — install idle roll (6). Replace screw and tighten.
5. Remove the large ingoing guide (7) from rear brass block by loosening screw (10).
6. Loosen the ingoing guide tube clamping screw (8). Install the guide tube (9) which is stenciled "in" through the rear brass block. Tighten the locking screw.
7. Replace the large ingoing guide (7) tube into the rear brass block. Tighten the locking screw (10).
8. Install the outgoing guide tube (11) with its plastic insert through the front brass block. Tighten the locking screw (12), so the dog point goes into the groove in the O.D. of the guide tube.

NOTE: The Aluminum Wire Drive Roll Kits have one-piece drive rolls and idle rolls with a large chamfer on one side, instead of gear teeth. This large chamfer side must face the gearbox when installed. The side with the smaller chamfer and wire size stencil must be installed facing out.

March 1979

Sec. N2.2.2

SETTING THE DRIVE ROLL SPRING PRESSURE –TWO ROLL WIRE DRIVE SYSTEM

NOTE: The drive rolls and guide tubes are stamped with the wire size for which they are designed. If a wire size other than that stamped on the components is to be used, the drive rolls and guide tubes will have to be changed.

For Steel Wire, the idle roll pressure should be adjusted as follows:

a. For wire sizes from .030 thru .052" (.8 thru 1.3 mm) — with wire in the system, the idle roll pressure indicator should be set to the proper wire size shown on the "solid" side of the nameplate.[1] This setting is a starting point and may have to be changed depending upon 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 set too high. When set, during a stoppage the drive rolls will slip and 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.

[1] For .030 (.8 mm) wire size, if the .030 mark is not present, set the pressure indicator slightly less than the .035 marking.

b. For 1/16 solid or .062" (1.6 mm) cored, using the 1/16 drive roll, the idle roll pressure should be set with wire in the system:

   — For 1/16" (1.6 mm) solid, the indicator should be lined up with the "solid" 1/16 mark.

   — For .062" (1.6 mm) cored, the indicator should be lined up with the "cored" .062-3/32 common mark or set to the "cored" 3/32 mark if .062 is not labeled.

These settings should be accurate enough so that there is no need to re-adjust unless the electrode is unusually soft.

c. For wire sizes from .068 thru .120" (1.7-3.0 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.

   The indicator settings for these larger wire sizes are accurate enough so that there is no need to re-adjust unless the electrode is unusually soft. When using 7/64" (2.8 mm) diameter "Innershield" wire, adjust the idle roll pressure so that the indicator is between the .120 and 3/32" setting.

For Aluminum Wire, the idle roll pressure should be adjusted as follows:

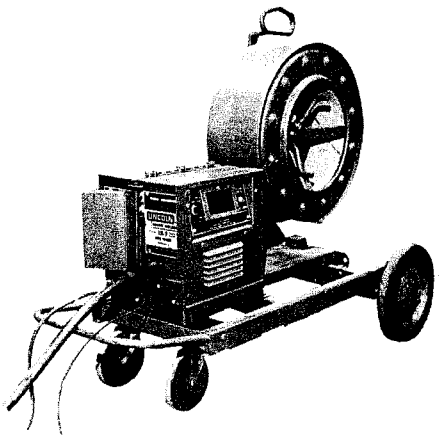
a. With low idle roll pressure, load the feeder so it's ready for welding.

b. Run the feeder at a slow speed (about 100 IPM) and reduce the idle roll pressure until the idle roll stops rotating.

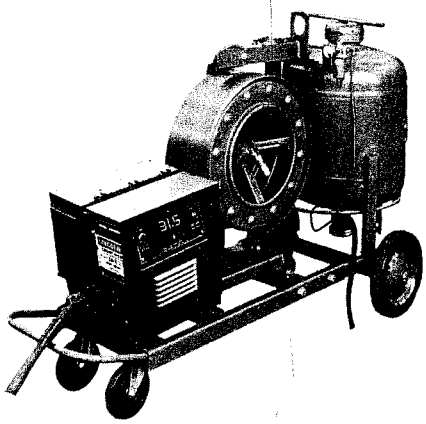
c. Slowly increase idle roll pressure until the idle roll **just** starts to rotate consistently with the drive roll without slippage, then add an extra 1/4 to 1/3 turn more idle roll pressure.

This pressure setting should be optimum for feeding and to avoid "bird-nesting" by allowing the drive roll to slip on the wire if a gun cable jam or stoppage occurs. If using harder or larger diameter aluminum wires more idle roll pressure, if necessary, can be tolerated. However, if the pressure required to properly feed the aluminum wire also permits "bird-nesting", or excessive slippage results in aluminum pickup in the drive roll groove, the loading on the wire by the gun-cable or wire reel should be inspected and alleviated.

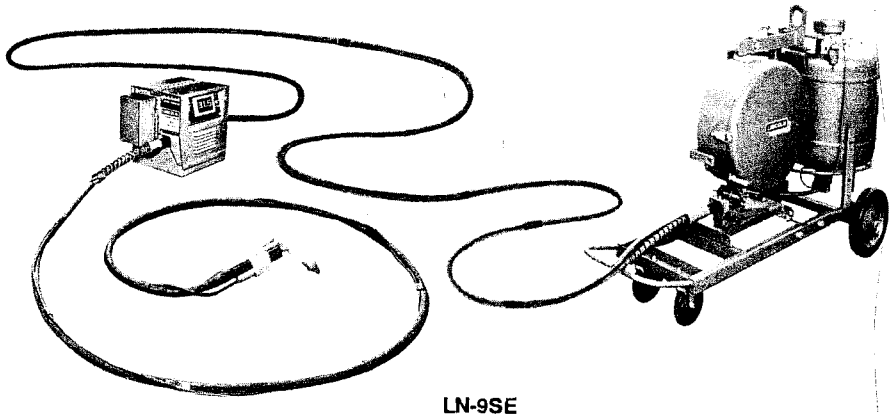
April 1987



LN-9N 0r -9HN (Obsolete) and Optional K163 Undercarriage.



LN-9S



LN-9SE

Sec. N2.2.3

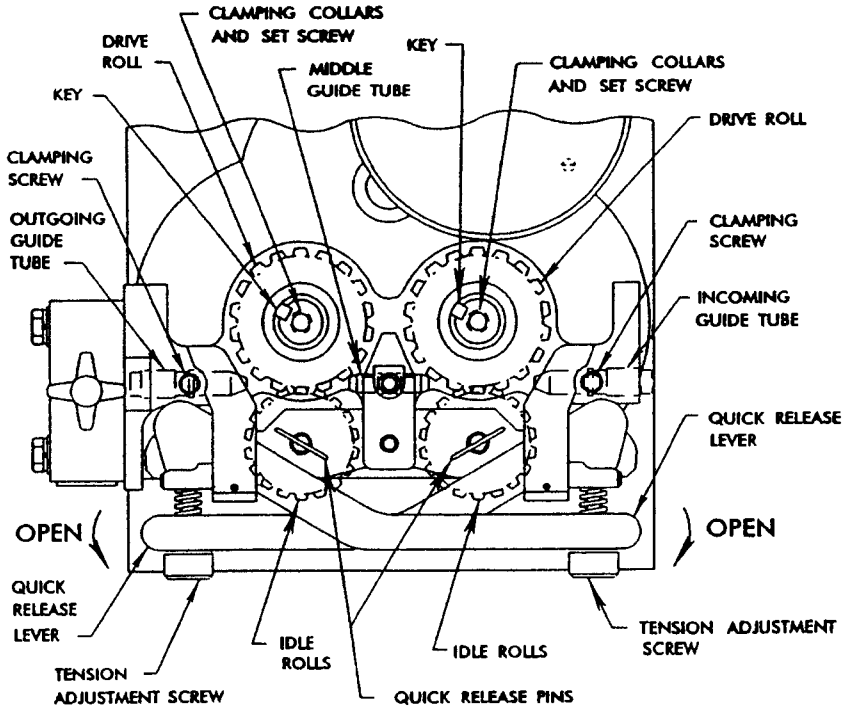
WIRE FEED ROLLS AND GUIDE TUBES — FOUR ROLL WIRE DRIVE SYSTEM

1. Release both quick release levers.
2. Remove clamping collars from both drive shafts.
3. Install one drive roll with the key and replace clamping collar. Tighten screw.
4. Slide the middle guide tube into place. Do not tighten set screw.
5. Install second drive roll with the key and replace clamping collar. Tighten screw. (Note: The middle guide tube may need to be pushed up tight against the first drive roll to allow room for installing the second roll.)
6. Center the middle guide tube and lock in place with its set screw.
7. Remove idle roll quick release pins — install idle rolls. Replace pins.

NOTE: The Aluminum wire drive roll kits have one-piece drive rolls and idle rolls with a larger chamfer on one side, instead of gear teeth. This larger chamfer side must face the gearbox when installed. The side with the smaller chamfer and wire size stencil must be installed facing out.

8. Loosen the ingoing guide tube clamping screw. Install the guide tube which is stenciled "in". The guide tube should be slid in until it almost touches the drive rolls. Tighten the locking screw.
9. Install the outgoing guide tube with its plastic insert through the front brass block. Tighten the locking screw so its dog point goes into the groove in the O.D. of the guide tube.

August 1996



Sec. N2.2.4

SETTING THE DRIVE ROLL SPRING PRESSURE-FOUR ROLL WIRE DRIVE SYSTEM

NOTE: The drive rolls are stenciled with the wire size for which they are designed. If a wire size other than that stamped on the drive rolls is to be used, the drive roll and guide tubes will have to be changed. Drive rolls stamped with a "C" suffix to the wire size range are recommended specifically for use with cored wires.

Because every feeding situation is different, the four roll wire drive does not have graduated markings with wire sizes indicated on it. A recommended starting pressure is indicated below for each applicable wire size and type. Depending on the particular application, these starting pressures may need to be adjusted up or down. Some of the variables that affect tension settings are type and brand of electrode, surface condition, lubrication, hardness, type and length of cables and conduits, routings of cables and conduits, and drive roll wear.

In most applications, the front and rear drive roll pressures should be adjusted the same. To adjust, start by releasing both "quick release" arms. Tighten the tension adjusting screws to full pressure and then back off per the particular instructions for your electrode size and type as outlined below.

For Steel Wire

a. .030-.052 (0.8-1.4 mm) solid.....4 turns from maximum
.045-.052 (1.0-1.4 mm) cored.....12 turns from maximum

The optimum pressure setting can be determined when there are wire stoppages. If the wire "birdnests" between the rolls and guide tubes, the pressure is too great. When properly set, during a stoppage the drive rolls will slip and 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 too low.

b. 1/16 (1.6 mm) solid .....2 to 4 turns from maximum
.062 (1.6 mm) cored .....7 to 8 turns from maximum

Sec. N2.2.4 (continued)

These settings should be accurate unless the electrode is unusually soft or the feeding path is excessively long and curved.

c. .068-3/32 solid (1.7-2.4 mm)..8 to 10 turns from maximum
.068-.120 cored (1.7-3.0 mm) 6 or 7 turns from maximum

Larger wire settings are accurate for most all applications. Some unusual circumstances will require "fine tuning".

For Aluminum Wire
Each set of rolls should have their pressure set independent of the other. To do this, release and open the other quick release arm while making each adjustment. Follow the procedure below for each adjustment.

a. With low idle roll pressure, load the feeder so it's ready for welding.
b. Run the feeder at a slow speed (about 100 IPM) and reduce the idle roll pressure until the idle roll stops rotating.
c. Slowly increase idle roll pressure until the idle roll **just** starts to rotate consistently with the drive roll with stoppage, then add an extra 1/4 to 1/3 turn more idle roll pressure.

This pressure setting should be optimum for feeding and to avoid "bird-nesting" by allowing the drive roll to slip on the wire if a gun cable jam or stoppage occurs. If using harder or larger diameter aluminum wires more idle roll pressure, if necessary, can be tolerated. However, if the pressure required to properly feed the aluminum wire also permits "bird-nesting", or excessive slippage results in aluminum pickup in the drive roll groove, the loading on the wire by the gun-cable or wire reel should be inspected and alleviated.

October 1991

Sec. N2.2.5

WIRE FEED UNIT AND WIRE REEL MOUNT (Models LN-9N, LN-9HN (Obsolete) and LN-9S)

1. The wire feed unit and wire reel mount are shipped separately. To connect:
   a. Remove the three 3/8" screws from the back of the wire drive unit.
   b. Place the wire drive unit in position against the wire reel mounting bracket.
   c. Replace and tighten the screws. The long screw with plain washer goes into the top hole.

April 1987

Sec. N2.2.6
INPUT CABLE CONNECTIONS TO LN-9

1. Models LN-9N, LN-9HN (Obsolete) and LN-9S

   The input cable consists of an electrode cable and multi-conductor control cable. The control cable has a polarized plug on the wire feeder end. To install:

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

   b. Remove the screws holding the cable clamp located near the rear of the wire reel base. Put the control cable and the 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.)

   c. Pass the single electrode cable through the holes provided in the back corner of the control section and fasten it to the copper strap on the wire drive unit.

2. Models LN-9NE and LN-9SE

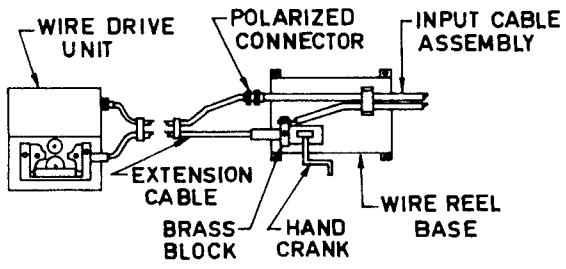
   The hand crank assembly mounted on the wire reel base is set up to feed all wire sizes.

   a. Position the Extension Assembly cable so the Amphenol plug with the threads on its O.D. can be attached to the Amphenol end of the power input cable and the opposite end to the wire drive unit.

   b. Connect the Amphenol connector of the control cable on the extension assembly (the one with threads on its O.D.) to the connector on the input cable assembly.

   c. Remove the screws holding the cable clamp located near the rear of the wire reel base. Put the control cable and the 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.) Connect the electrode cable of the input cable assembly to the brass block on the hand crank.

   d. Insert the connector on the conductor sheath of the extension assembly into the brass block of the hand crank assembly, and tighten the locking screw with a 3/16" (4.8 mm) hex Allen wrench.



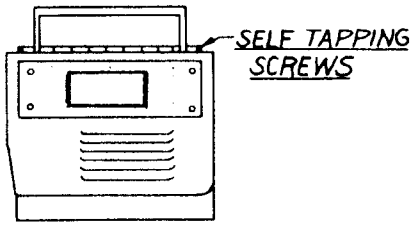
   e. At the wire drive unit connect the Amphenol of the Extension control cable to the receptacle on the back of the LN-9.

   f. Remove the ingoing guide tube from the rear brass block and then plug the connector of the conductor sheath into the brass block. Tighten the locking screw with a 3/16" (4.8 mm) hex Allen wrench. The guide tube removed is not used when the extension assembly is installed.

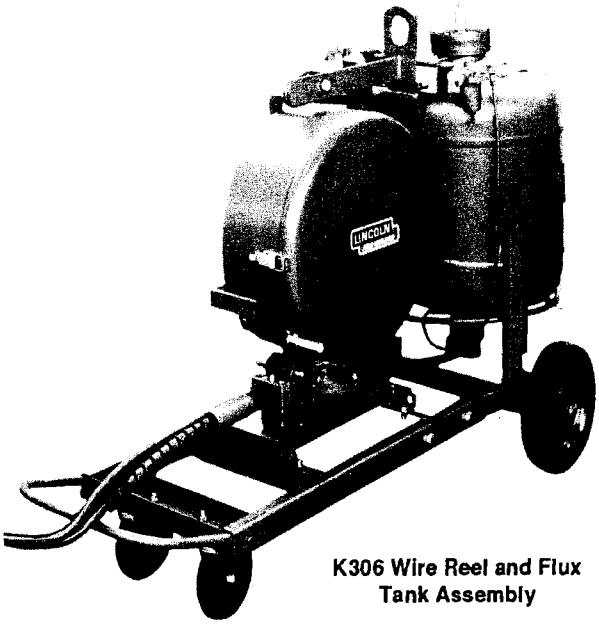
   g. If using welding currents over 450 amperes connect a length of 1/0 cable between the brass block on the hand crank and the input strap located in the wire drive unit. Tape this cable to the extension assembly. Proper cable lengths are as follows:

22-1/2 ft. extension	26' (7.8 m) M5906-106
45 ft. extension	46' (13.8 m) M5906-104

   h. A handle for the wire feeder is provided with wire reel mounts equipped with the hand crank and is mounted to the wire drive unit in the following manner:



Remove the two self tapping screws that hold the hinge pin in captivity, push the hinge pin out, leaving the covers intact. Place the handle into the slots provided, 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 and tighten securely.



K306 Wire Reel and Flux Tank Assembly

i. 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 (19.5 mm) feet long and is the correct length for use with the 45 (13.7 mm) foot extension. If a 22-1/2 (6.9 mm) foot extension is to be used, cut off 22-1/2 (6.9 mm) feet of the flux hose to give the correct length of 41-1/2 feet (12.6 mm). (The conductor cable of the extension assembly is 22-1/2 (6.9 mm) feet long, tip to tip, and can be used to measure the length cut off.) If the flux hose is taped on the extension cables or the gun cable, it should be done in such a manner as not to deform or collapse the flux hose.

November 1979

Sec. N2.2.7

FLUX TANK INSTALLATION (Models LN-9S and LN-9SE)

(See S14121 for installation of the K320 Flux Tank to wire feeder with K163 undercarriage.)

The air required for the automatic flux feeding system can be obtained directly from the plant compressed air system as long as the air pressure is no greater than 120 psi (827kPa) or less than 60 psi (414 kPa). The flux tank is equipped with a water separator and pressure regulator to reduce the air pressure.

As shipped the unit is set for 30 pounds per square inch (207 kPa) which is the proper value for an 18 foot flux hose. When an Extension Assembly is used and the flux hose is long, set the air pressure at 45 psi (310 kPa) when using 1/2 inch (12.7 mm) I.D. hose and 55 psi (379 kPa) when using 3/8 inch (9.5 mm) I.D. hose. The amount of air required for flux feeding will normally be less than 1.5 cubic feet per minute.

Connection of the incoming air hose is made at the street elbow, which is made to receive 1/4 inch pipe thread. A quick disconnect connector should be inserted between the elbow and the air hose proper.

Flux Hose Connection to Gun — Using the hose clamp provided connect the flux hose to the flux tube at the rear of the gun. If the flux hose is taped to the gun cables make certain it is done in such a manner as to not deform or collapse the flux hose.

October 1991

Sec. N2.2.8

INSTALLATION OF THE LN-9F AND LN-9FH (obsolete)

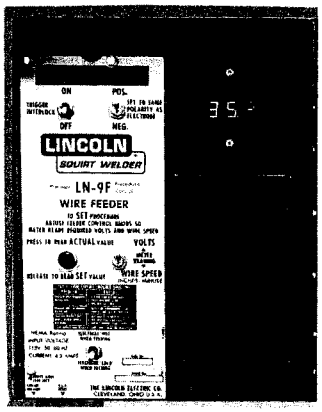
1. **Wire Feed Mechanism**

   Mount the wire feed mechanism by means of the mounting plate attached to the bottom of the gear box. See L6022(2 Roll) or L8505 (4 Roll) for size and location of the mounting holes. The gear box assembly is electrically "hot" when the gun trigger is pressed. Therefore, make certain the gear box does not come in contact with the structure on which the mechanism is mounted.

   The mechanism should be mounted so that the drive rolls are in a vertical plane so dirt will not collect in the drive roll area. Position the mechanism so it will point down at about a 45° angle so the wire feed cable will not be bent sharply as it comes from the unit.

   Install the drive rolls per Section N2.2.2, "Wire Feed Rolls and Guide Tubes".

2. **Control Box**
   a. The control has two keyhole slots and one slot for mounting. See M13660 for size and location of these holes. Mount the box at some convenient location near enough to the wire feed mechanism so that the 16 foot control cables supplied with the LN-9F will reach between the two units.
   b. Drill the required holes in the mounting surface. Partially install the 1/4-20 screws.
   c. Open the control box door.
   d. Mount the box.
   e. Tighten the screws.
   f. Close the control box door and replace the door screws.



LN-9F Control Box

3. **Electrical Connections — Wire Feed Mechanism to Control Box**
   a. Making certain the cables are protected from any sharp corners which may damage their jackets, mount the 16 foot control and electrode cable assembly along the boom so the end with the two right angle amphenol connectors terminating the control cables is at the wire feed mechanism.
   b. Connect the two right angle cable connectors to the receptacles on the wire feed mechanism.
   c. At the same end, connect the electrode lead to the front brass block on the wire feed mechanism.
   d. At the control box end connect the two amphenol connectors of the cable assembly to the control box. If more convenient for the installation, the right angle connector housing can be rotated by removing the connector cable clamp and the two housing screws,

Sec. N2.2.8 (continued)

repositioning the housing as desired and replacing the screws and clamp.

4. **Input Cable Connections to Control Box**

Connect the K196 input cable assembly to the LN-9F control box as follows:

a. Connect the amphenol connector on the control cable to the receptacle on the bottom of the control box.

b. Bolt the electrode lead from the power source to the electrode lead of the wire feed mechanism using the nut and bolt supplied. Insulate connection with electrical tape.

5. **Electrode Routing**

The electrode supply may be either from 50-60 lb.(22.5-27.2 Kg) reels, 25-30 lb. spools, Speed-Feed drums or Speed-Feed reels.

a. The electrode must be routed to the wire feed mechanism so that the bends in the wire are at a minimum, and also that the force required to pull the wire from the reel into the wire feed mechanism is kept at a minimum.

b. The electrode, of course, is "hot" when the gun trigger is pressed and must be insulated from the bottom.

c. If more than one feeder head shares the same boom, their wire reels must be insulated from each other and insulated from their mounting structure.

October 1991

Sec. N2.2.9

GUN AND GUN CABLE

1. **General**

The LN-9 is used with various guns. Use the gun recommended for the wire type ("solid" or "Innershield") and size to be used.

2. Gun Cable: LN-9 to Gun

Lay the cable out straight. Insert the male end of the welding conductor cable into the brass block on the front of the LN-9. Make sure it is in all the way and tighten the locking screw with a 3/16" (4.8 mm) Allen wrench or thumbscrew (if provided). Keep this connection clean and bright. Insert the control cable polarized plug into the receptacle next to the coupling.

October 1991

SEC. N2.3 — ELECTRICAL INSTALLATION

⚠ WARNING

- Do not operate with covers removed.
- Turn off power source before installing or servicing.
- Do not touch electrically hot parts.
- Turn the input power to the welding power source off at the fuse box before working in the terminal strip.

ELECTRIC SHOCK can kill.

- Keep away from moving parts.

MOVING PARTS can injure.

- Only qualified personnel should install, use or service this equipment.

Sec. N2.3.1

INPUT CABLE CONNECTIONS TO THE POWER SOURCE

Input Power (115VAC, 4.5A) is supplied by the power souce. Connect to appropriate Lincoln power source as follows:

1. If using a multiprocess power source (SAM, SA-800, SAF-600, DC-400, DC-600), be sure it is properly set for the welding process being used, per Sections N2.3.3-A, -C and -D.
2. Connect the LN-9 input cable to the power source exactly as specified on the appropriate connection diagram (See Sec. N2.3.3). Include all jumpers on the terminal strips as shown on the diagrams. Do *not* add any additional jumpers.
3. Depending on the power source and process to be used the jumpers on the LN-9 Voltage Board and Start Board (on models where used) may have to be changed. As shipped, the LN-9 is connected for use with Lincoln DC type power sources. For other power sources refer to the appropriate connection diagram.
4. Connect a work lead of sufficient size and length (per the table) between the Work stud on the power source and the work. Be sure the connection to the work makes tight metal-to-metal contact.

Current (Amps) 60% Duty Cycle	Work Cable Length		
	25'	50'	100'
300	1/0	1/0	3/0
400	2/0	2/0	4/0
500	2/0	3/0	4/0
600	3/0	3/0	Two 3/0

August 1996

Sec. N2.3.2

EQUIPMENT COMPONENTS

NOTE: There are references in this manual, in the text and the connection diagrams, to P.C. boards (and their jumpers) and other equipment components. The following descriptions and photographs should assist in locating them in order to make the proper connections or settings.

1. **Control Board**:

   Pin "F" — Fast Acceleration.
   Pin "S" — Slow Acceleration.

   Time required for wire feed speed to go from 0 to preset wire feed speed.

2. **Voltage Board:**

   Pin "F" — Fast dynamic response at the arc.
   Pin "S" — Slow dynamic response at the arc.

3. **Start Board (below Code 9087)**:

   Pin "A" — Permits voltage control to start and weld with the response selected on the voltage board.
   Pin "B" — Permits voltage control to start with the response selected on the voltage board, then shortly after establishing the arc an additional slow dynamic response is added.

NOTE: For LN-9, Codes 9088 and higher, the voltage board and start board are combined into one.

4a. **Trigger Interlock (below Code 7981):**

"On" position keeps the trigger circuit energized once the arc is established, without holding the trigger, until the arc is broken.

4b. **Trigger Interlock and "Hot"/"Cold" Wire Feed Switch (above Code 7980):**

This three-position switch performs a dual function. In the center position the wire may be fed electrically cold. In the down position the wire is electrically hot when feeding and the trigger circuit is controlled only by the trigger. In the up position the wire is electrically hot when feeding and the trigger circuit remains energized once the arc is established (without holding the trigger) until the arc is broken.

5. **Electrode Hot When Feeding — Electrode Cold When Feeding (below Code 7981):**

   This switch is found only on the LN-9F and is used to allow electrically cold wire feeding when required.

6. **Wire Feed Direction Switch (above Code 7980):**

   Provides wire feed in both directions for easier service.

7. **Polarity Switch:**

   This switch is for circuit control monitoring and is to be set the same as the electrode polarity. It *does not* change the output polarity.

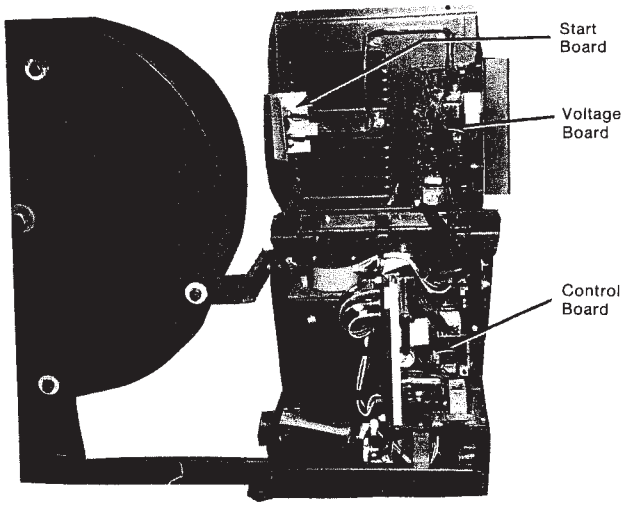
8. **Volts — Wire Speed Switch:**

   This switch is used to allow either voltage or wire feed speed to be read from the same meter.

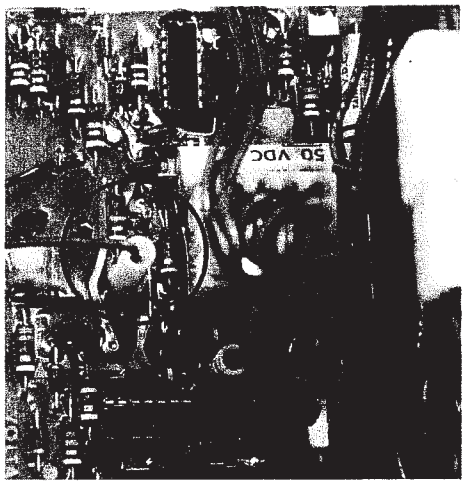
9. Actual Value Push Button:
This button us used to allow the meter to be changed from a preset readout to a reading of actual arc voltage or wire feed speed.

10. Direct Work Lead Jack (below code 8200):
This jack permits connection of the direct work clip lead to the LN-9 to more accurately monitor arc voltage. See Sec. N4.4.4 for direct work lead connection of later LN-9 models.

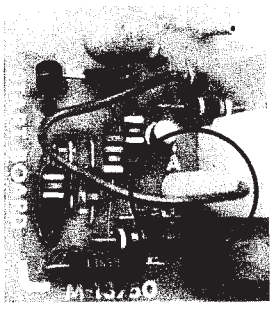
11. Duty Cycle:
The amount of welding performed in a 10 minute period, expressed as a percentage.



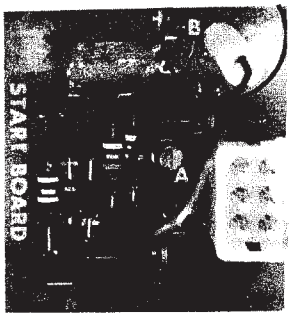
Location of P.C. Boards on the LN-9N and -9HN (Obsolete).



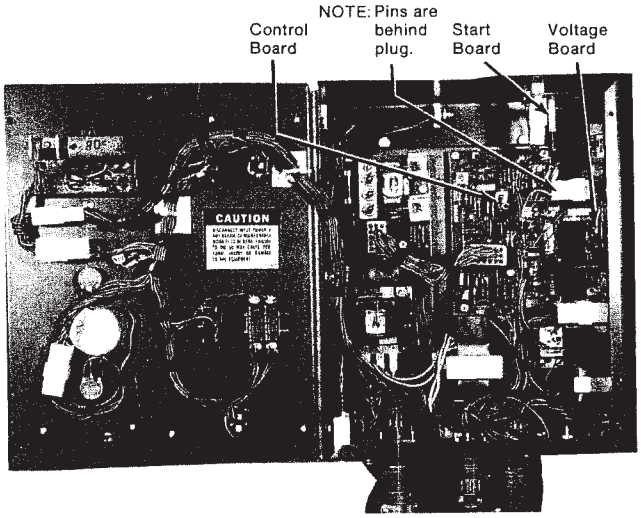
Voltage Board with Pin "F" connected.



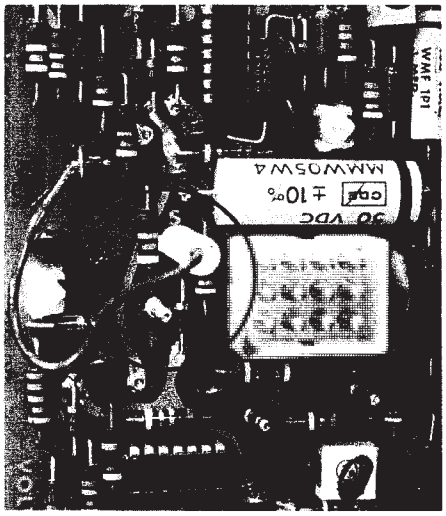
Start Board[1] with Pin "A" connected.



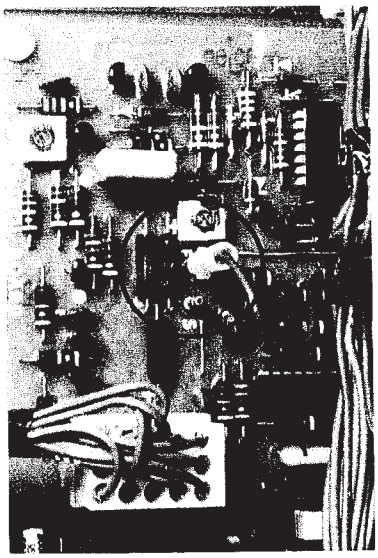
Start Board[1] with Pin "B" connected.



Location of P.C. Boards on the LN-9F and -9FH (Obsolete).



Voltage Board with Pin "S" connected.

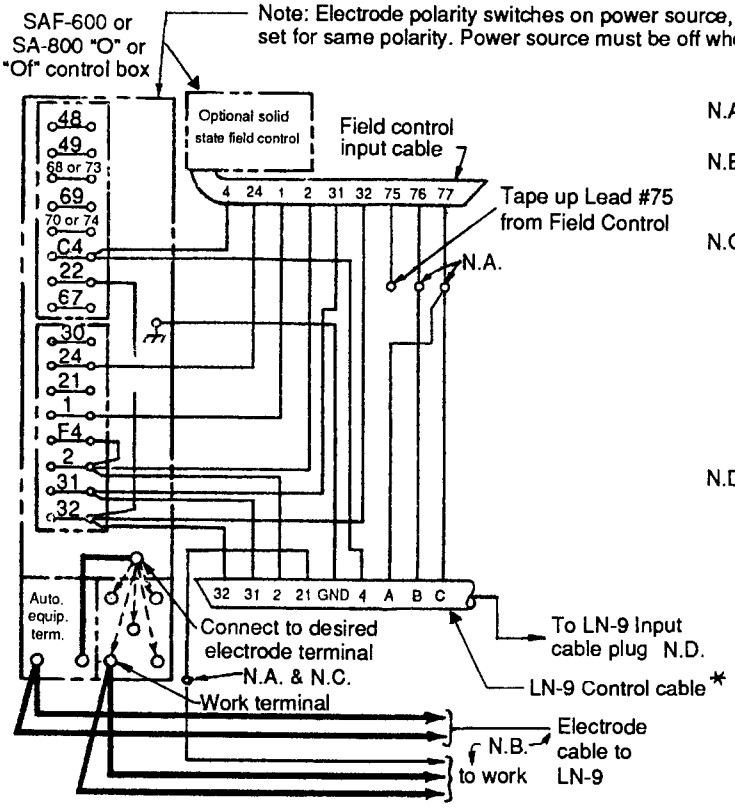


Control Board with Pin "F" connected. This is recommended for most applications. Pin "S" can be used when slower wire feed motor acceleration is needed (normally long stickout applications).

[1]LN-9 models above code 8991 do not use a start board. Pins "A" & "B" on these later models are located on the Voltage Board (P.N. L6084-2 or higher).

Sec.N2.3.3-A

CONNECTION OF LN-9 TO A SAF-600 OR SA-800 ("– O" OR "– OF") USING A K224 SOLID-STATE FIELD CONTROL (Obsolete)



N.A. Bolt and tape connection.

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 #21 lead 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-9's meter kits which have a direct work lead jack.)

N.D. The LN-9 Voltage Control jumper must be connected as follows (Refer to LN-9 Operating Manual):
White jumper on voltage board:
To Pin "F" for open arc processes, or to Pin "S" for submerged arc processes.
Blue jumper on voltage board (later units only), or on start board (earlier units), to Pin "A".

Connect the 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.

*If using an older LN-8 control cable: connect lead #76 to #76 field control lead #75 and #77 to #77 field control lead.

S16284
6-28-85N

POWER SOURCE SETTINGS

Turn Power Source OFF

SAF-600 or SA-800 (Type -O or -OF) with K224: (Obsolete)

Set power source "Electrode Polarity" switch to desired position. Set "Voltage" control to maximum for higher voltage applications (above 25 volts), and mid-range for low voltage applications.

For Submerged Arc Applications:

Set "Voltage Range" switch to "High". Connect lead from contactor box to the appropriate "Submerged Arc" tap for the current being used.

For Open Arc Processes:

Set "Voltage Range" switch to "Low". Connect lead from contactor box to the "Innershield" tap.

K224 Solid State Remote Field Control:

Set the toggle switch on the K224 to the same polarity as the power source.

April 1987

NOTE: Refer to Sec. N2.3.2 for Control Board pin placement.

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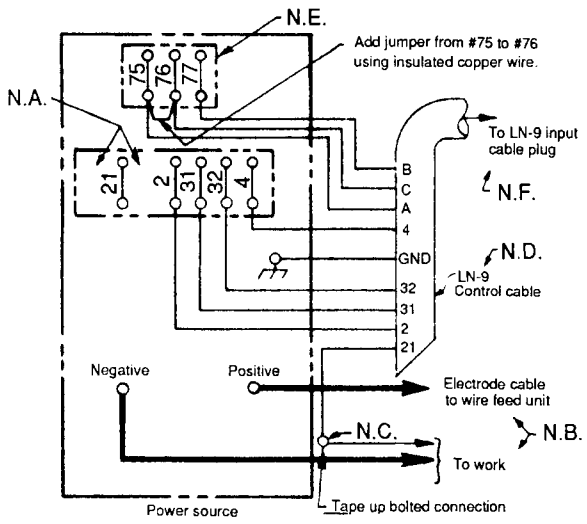
Sec. N2.3.3-B

CONNECTION OF LN-9 TO AN IDEALARC R3S-400, 600 OR 800 WITHOUT LINE VOLTAGE COMPENSATOR (Obsolete)

NOTE: In the event the R3S is equipped with a line voltage compensator it should be disconnected before connecting the LN-9.



Above diagram shows electrode connected positive. To change polarity, turn power off, reverse the electrode and work leads at the power source and reverse the "control switch" at the power source, and the "polarity switch" on the LN-9.

Connect the 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 grounded properly.

S16285
6-28-85N

N.A. On earlier R3S-400, -600 & -800 machines, #67 & #1 terminals 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 S-16586-[ ] 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 #21 lead 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-9's which have a direct work lead jack.)

N.D. If using an older LN-8 control cable: connect lead #75 to #75 on terminal strip, connect lead #76 to #77 on terminal strip, connect lead #77 to #76 on terminal strip. Then jumper terminal strip #75 to #76 per diagram.

N.E. Upper terminal strip (#75, #76 & #77) may not appear on older R3S machines, and therefore is not compatible for use since there will be no adjustment of voltage by the LN-9.

N.F. The LN-9 voltage control jumpers must be connected as follows (refer to LN-9 Operating Manual):
White jumper on voltage board:
To Pin "F" for open arc process or to Pin "S" for submerged arc process.
Blue jumper on voltage board (later units only), or on start board (earlier units), to Pin "A".

POWER SOURCE SETTINGS

Turn Power Source OFF

R3S-400, R3S-600 and R3S-800 (Obsolete)

a. Connect electrode lead to terminal of desired polarity.

b. Set toggle switch to same polarity as the electrode cable connection.

c. Set toggle switch to "Remote".

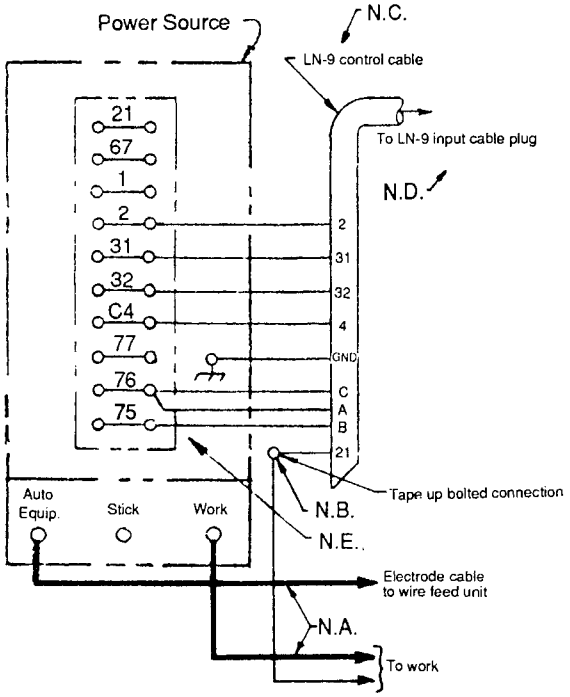
d. Install voltage triangle to a position as close as possible to desired arc voltage.

NOTE: Refer to Sec. N2.3.2 for Control Board pin placement.

April 1987

Sec. N2.3.3-C

CONNECTION OF LN-9 TO A SAM MOTOR GENERATOR OR ENGINE WELDER



Connect the 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 grounded properly.

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 #21 lead 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-9's which have a direct work lead jack.)

N.C. If using an older LN-8 control cable: connect lead #76 to #75 on terminal strip, connect leads #75 and #77 to #76 on terminal strip.

N.D. The LN-9 voltage control jumpers must be connected as follows (refer to LN-9 Operating Manual).
White jumper on voltage board:
To Pin "F" for open arc processes, or to Pin "S" for sub-merged arc process.
Blue jumper on voltage board (later units only), or on start board (earlier units), to Pin "A".

N.E. Remove SAM portable field control and connect LN-9 control cable.

S16286
6-28-85N

POWER SOURCE SETTINGS

Turn Power Source OFF

SAM Motor Generator or Engine Welder for Sub-merged Arc Applications:

a. Set "Electrode Polarity" switch to "Variable Voltage" position of the desired polarity for the process being used.

b. Set the toggle switch to "Constant Voltage".

c. Set the "Constant Voltage Control" rheostat to Number 7 and the "Current Control" to 500 for CV sub arc processes.

For Innershield and other Open Arc Processes:

a. Set "Electrode Polarity" switch to "Constant Voltage" position of the desired polarity for the process being used.

b. Set the toggle switch to "Constant Voltage".

c. Set the "Constant Voltage Control" rheostat to Number 5 for Innershield and other open arc processes.

NOTE: Refer to Sec. N2.3.2 for Control Board pin placement.

April 1987

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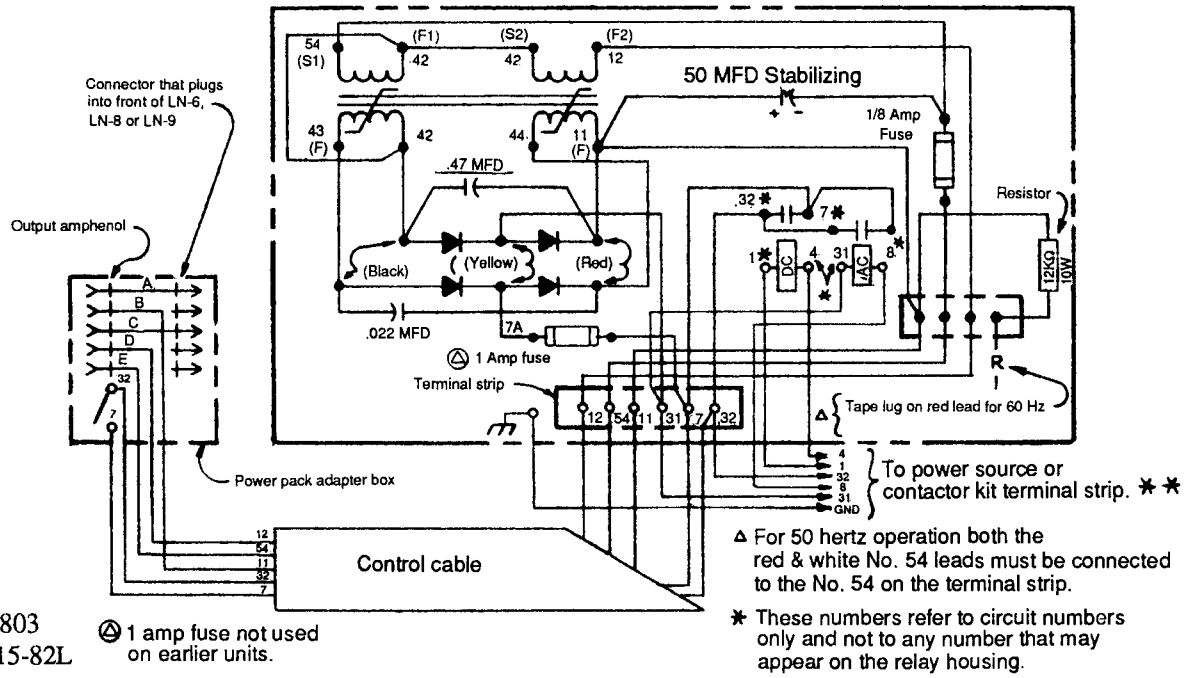
K161 POWER PACK WIRING DIAGRAM

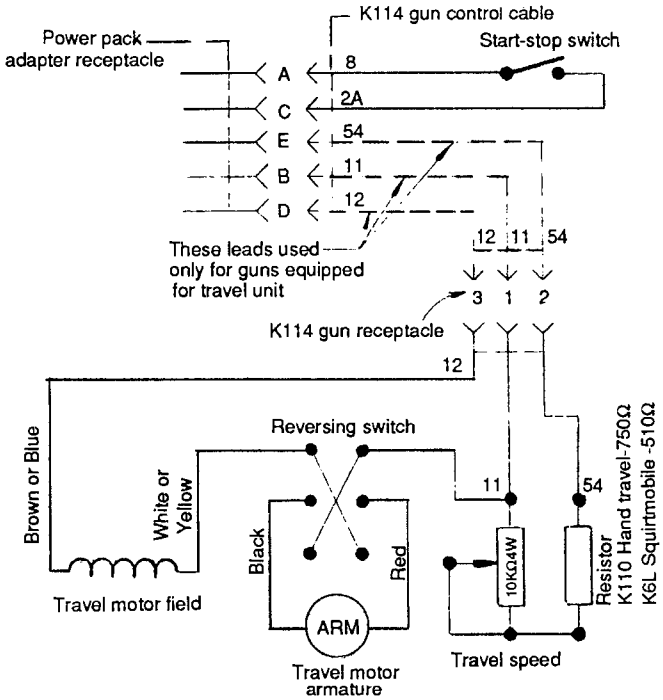


S15803
10-15-82L

1 amp fuse not used on earlier units.

If the power source or contactor kit has terminals 31, 32, and 4, but **no terminal 1, connect leads 31 and 32 from the power pack to their respective terminals on the terminal strip. Connect **lead 8** from the power pack to **terminal 4** on the terminal strip. Tape separately the lugs on leads 1 and 4. Connect the green lead from the power pack to the frame of the power source or contactor kit by means of the frame stud near the terminal strip or other secure electrical connection.

If the power source or contactor kit has terminals 31, 32, 4 and 1, connect leads 31, 32, 4 and 1 from the power pack to their respective terminals on the terminal strip. Tape up the lug on lead 8. Connect the green lead from the power pack to the power source or contactor kit by means of the frame stud near the terminal strip or other secure electrical connection.



T12309
10-15-82L

NOTE: Limit of ± 1/2 on all angles unless otherwise specified.
Limit of ± 1/64 on all fractional dimensions unless otherwise specified.
Limit of ± .002 on all decimal dimensions unless otherwise specified.

Sec. N2.3.3-D

INTRODUCTION TO DC-600 COMPONENTS

NOTE: The DC-600 instruction manual (IM-306) and the connection diagrams in this manual make reference to DC-600 components. The following descriptions and photographs should assist in locating, and properly using these components. (For Codes below 8200 see IM-291.)

1. **Control P.C. Board Jumper Lead Connections:**

For access to the Control P.C. board:

a. Turn off all power to the DC-600.

b. Remove the screws securing the nameplate and control cover.

c. Open the cover and locate the control board which is the P.C. board on the right side of the control compartment (facing the machine).

Codes Between 8000 and 8045:

As shipped these codes had the control P.C. board jumper leads connected for optimum welding on all processes except solid wire and gas. If solid wire and gas is to be used change the jumpers per the following:

For All Open Arc Processes Except NR-302 and NR-203 Electrodes:

1. Set mode switch to CV Innershield.
2. White lead on control P.C. board is connected to Pin "M" and blue lead to "W".

(Can also be used with other processes except that with some Innershield electrodes such as NR-203 and NR-302 erratic arc action may be experienced.)

If a Dual Process Kit (K317) or Dual Process Contactor Kit (K318) is used with these codes, position the jumpers for the processes to be used according to the information above. The only combination *not* recommended with the dual process equipment is solid wire and gas, and either NR-203 or NR-302 Innershield electrodes.

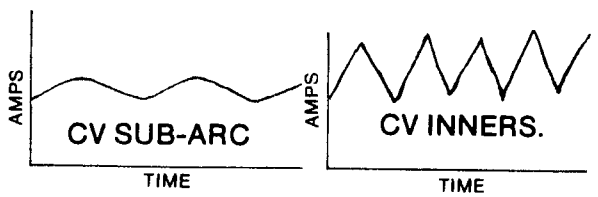
Codes Between 8045 and 8200:

As shipped these codes had the control P.C. board jumper connected for optimum welding on all processes[1] *except* NR-203. When using NR-203, it is necessary to change the jumper on the control board (for optimum arc stability) per the following instructions:

All Processes Except NR-203	White jumper on "M"
NR-203	White jumper on "I"

Codes Above 8200:

No control P.C. board jumper lead connections are necessary.



2. **Mode Switch**

CV Innershield — Fast current response to a change in voltage.
CV Submerged Arc — Very slow current response to a change in voltage.
CC Stick Option, Sub Arc — Constant Current characteristics. For stick and for some sub arc applications when using wire feeders other than the LN-9.

3. **Machine — Remote Switch:**
This switch is set in remote position for voltage control at wire feeder.

4. **Circuit Polarity Switch:**
This switch must be set to the same polarity as the electrode cable connection.

5. **Terminal Strip Connections:**
2 and 4 — Output circuit.
31 and 32 — 115 AC power.
75, 76, 77 — Control lead connections for remote control of power source output.
80 and 81 — Leads used to allow the selection of CV Innershield or CV submerged arc at a remote position (K317 or K318).
Grounding Terminal — Connects power source frame to wire feeder frame.

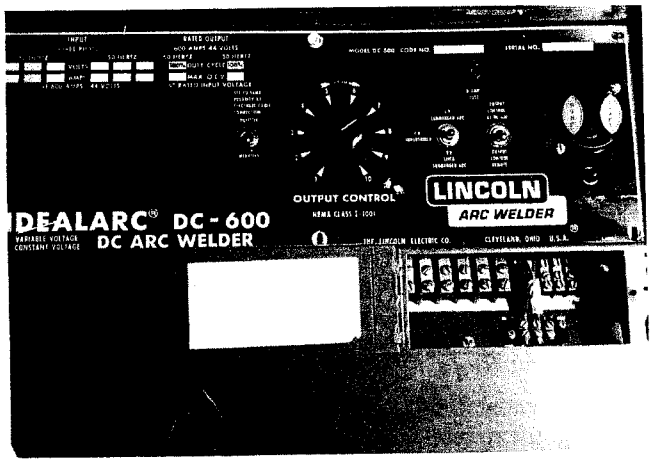
6. **N-P-S Terminal Strip (Codes Below 8200 only):**
This is used for proper starting.

N and P Jumpered — Provides proper DC-600 starting when connected to LN-9.

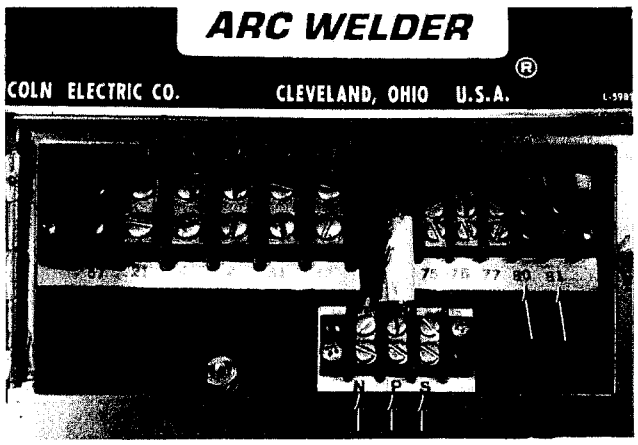
N and S Jumpered — Provides proper DC-600 starting when connected to other type wire feeders (Not Preset).

[1]Not recommended for short circuiting transfer.

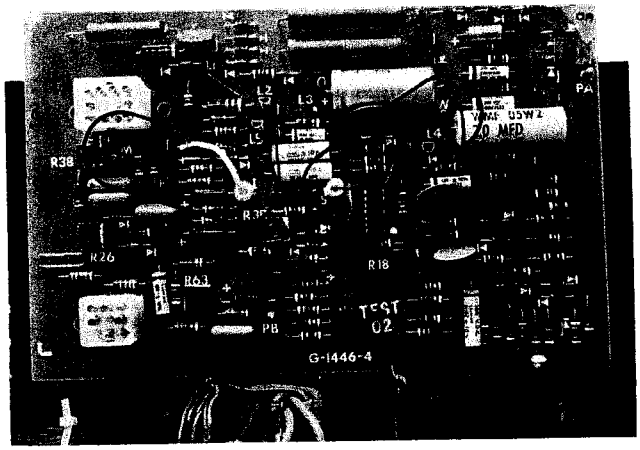
January 1989



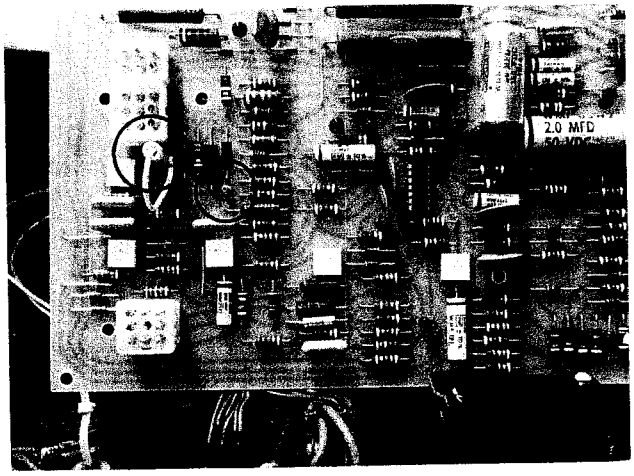
Front Panel of DC-600.



Terminal Strip of DC-600 (Codes Below 8200 only).

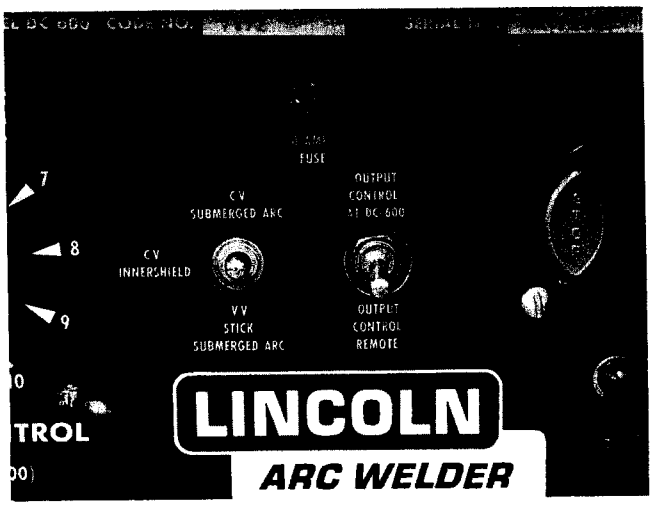


DC-600 Control Board for Codes 8000 to 8045. NOTE: 4 pins on P.C. Board



DC-600 Control Board for Codes Between 8045 and 8200. NOTE: Only 2 pins on P.C. Board.

NOTE: This photo is for all processes except NR-203 electrodes. Pin "I" is used for NR-203 electrodes.



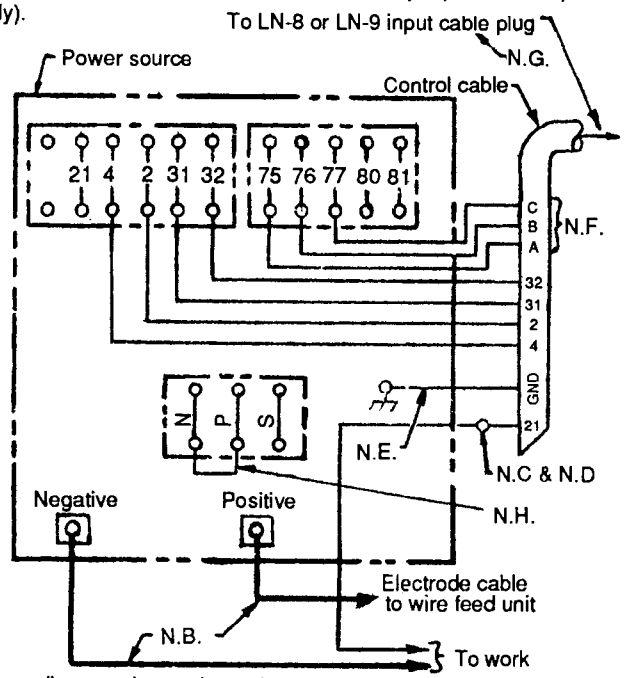
Mode and Circuit Polarity Switch on DC-600

November 1979

Sec. N2.3.3-E

CONNECTION OF LN-8 OR LN-9 TO A DC-600

NOTE: Pay particular attention to note N.E. A jumper must be placed between N and P on the DC-600 N-P-S terminal strip (Codes below 8200 only).



Above diagram shows electrode connected positive. To change polarity, turn power off, reverse the electrode and work leads at the power source and position the switch on power source to proper polarity.

For optimum performance with the LN-9, DC-600's with codes 8202 and above are preferred.

S16367
6-28-85N

POWER SOURCE SETTINGS

DC-600 (All Codes)

Turn Power Source OFF

Adjust the Power Source: DC-600:

a. Connect electrode lead to terminal of desired polarity.

b. Set toggle switch to same polarity as the electrode cable connection.

c. Set toggle switch to "Remote".

d. Set mode switch to the desired position for the process to be used.

Codes 8000 – 8045:

For Sub Arc:

1. Set mode switch to CV sub arc.
2. White lead on Control P.C. Board is connected to Pin "M" and blue lead is connected to "W".

For all Open Arc Processes Except NR-302 and NR-203 Electrodes:

1. Set mode switch to CV Innershield
2. White lead on Control P.C. Board is connected to Pin "M" and blue lead is connected to "W".

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 #21 lead 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-9's which have a direct work lead jack.)

N.D. Tape up bolted connection.

N.E. Connect the LN-8 or LN-9 control cable ground lead to the frame terminal marked ⏚ near the power source terminal strip. The power source must be properly grounded.

N.F. If using an older LN-8 control cable: connect lead #75 to #75 on terminal strip, connect lead #76 to #76 on terminal strip, connect lead #77 to #77 on terminal strip.

N.G. The LN-9 voltage control jumpers must be connected as follows (refer to LN-9 Operating Manual):
White jumper on voltage board to pin 'S'
Blue jumper on voltage board (later units only) or on start board (earlier units) to pin 'B'.

N.H. For DC-600 codes below 8200:
Connect a jumper from 'N' to 'P' on LN-9 only.
Connect a jumper from 'N' to 'S' on LN-8 only.
There is no NPS terminal strip on codes above 8200.

For NR-203 and NR-302 Electrodes:

1. Set mode switch to CV Innershield.
2. White lead on Control P.C. Board is connected to Pin "I" and blue lead is connected to "S".

Codes 8046 – 8200:

For Sub Arc:

1. Set mode switch to CV sub arc.
2. White lead on Control P.C. Board is connected to Pin "M".

For all Open Arc Processes Except NR-203 Electrodes:

1. Set mode switch to CV Innershield.
2. White lead on Control P.C. Board is connected to Pin "M".

For NR-203 Electrodes:

1. Set mode switch to CV Innershield.
2. White lead on Control P.C. Board is connected to Pin "I".

Above Code 8200:

For Sub Arc:

1. Set mode switch to CV sub arc.

For all Open Arc Processes:

1. Set mode switch to CV Innershield.

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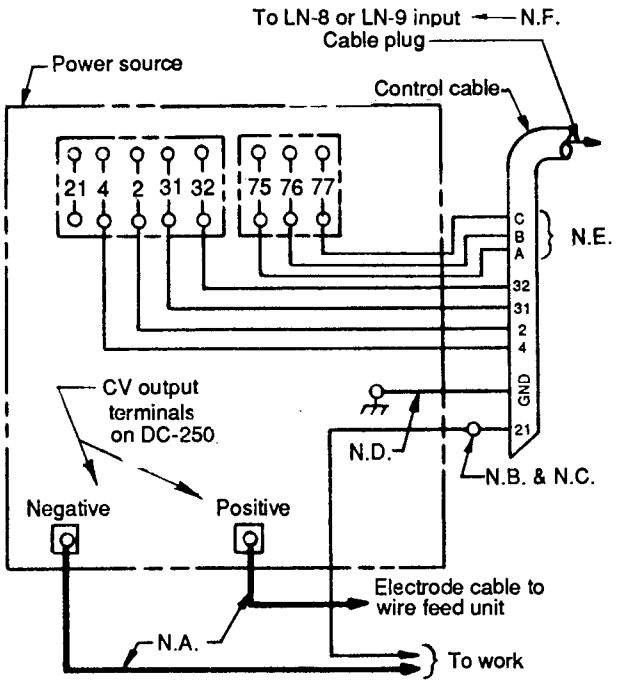
Sec. N2.3.3-F

CONNECTION OF LN-8 OR LN-9 TO A DC-250, DC-400 AND CV/CVI POWER SOURCES



S17373
8-26-88A

Above diagram shows electrode connected positive. To change polarity, turn power off, reverse the electrode and work leads at the power source and position the switch on power source and wire feeder (if equipped) to proper polarity. Also refer to note N.G.

* 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 AWG 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 #21 lead should be taped to the welding work lead. (If the length of 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 control cable ground lead to the frame terminal marked ⏚ near the power source terminal strip. The power source grounding terminal (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: Connect lead #75 to #75 on terminal strip, connect lead #76 to #76 on terminal strip, connect lead #77 to #77 on the terminal strip.

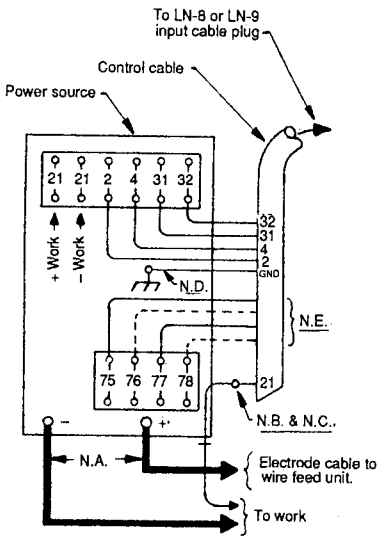
N.F. The LN-9 voltage control jumpers must be connected as follows (refer to LN-9 Operating Manual):

White jumper on voltage board to pin 'S'.

Blue jumper on voltage board (later units only), or on start board (earlier units), to pin 'B'.

N.G.* If lead #21 is to be connected to the terminal strip, connect to the #21 terminal that matches work polarity. This connection must be changed whenever the electrode polarity is changed.

CONNECTION OF LN-8 OR LN-9 TO PULSE POWER 500



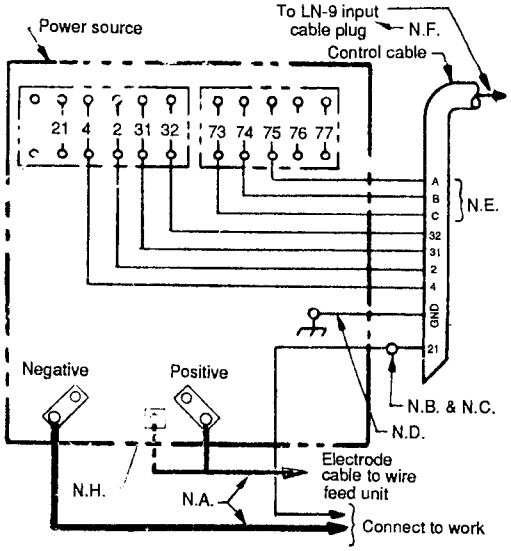
Above diagram shows electrode connected positive. To change polarity, turn power off, reverse the electrode and work leads at the power source and properly set the feeder polarity switch.

NOTE: For proper pulse welding operation with LN-9:

1. The LN-9 must have an L6084-3 (or higher superseding part number) voltage board installed. (Standard above code 9100.)
2. The Pulse Power Filter board must be installed and connected in the LN-9 per instructions provided with the kit.
3. The pulse current sensor assembly (with looped copper energizer) must be installed. (Standard above code9100.) Feeder conversion kits are available for all LN-9 model codes (below 9100, and above 9100). See instruction manual.

M15205
11-13-87K

CONNECTION OF LN-9 TO DC-1000



Above diagram shows electrode connected positive. To change polarity, turn power off, reverse the electrode and work leads at the power source, position the positive – negative switch on the power source to correspond to the polarity of the electrode cable connection. Refer to LN-9 Operating Manual for required polarity connections.

S17185
8-2-90F
91Oc

⚠ WARNING

ELECTRIC SHOCK can kill.

- Do not operate with covers removed.
- Disconnect welding power source before servicing.
- Do not touch electrically live parts.
- Only qualified persons should install, use or service this machine.

N.A. Welding cables must be of proper capacity for the current and duty cycle of immediate and future applications. See LN-8 or LN-9 Operating Manual for proper sizes.

N.B. Extend lead #21 using 14 AWG or larger insulated wire physically suitable for the installation. An S16586-LENGTH 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 #21 lead should be taped to the welding work lead.

N.C. Tape up bolted connection.

N.D. Connect the control cable ground lead to the frame terminal marked ⏚ near the power source terminal strip. The power source grounding terminal (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. Connect control leads to terminal strip as follows:

LN-8:	A to 75	LN-9:	A to 75
	B to 76		B to 77
	C to 77		C to 78

N.F. The LN-9 voltage control jumpers must be connected as follows. (Refer to LN-9 Operating Manual):

White jumper on voltage board to pin "S". Blue jumper on voltage board is not connected to any pin. (Secure loose jumper clear of any possible interference.)

NOTE: The trigger interlock feature of the LN-8 models may not reliably function when using pulse welding modes.

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 separate from the welding work cable connection to work piece. For convenience, this extended #21 lead should be taped along the welding work cable. (This extended #21 lead connection replaces the need to employ the remote work lead accessory on LN-9's which have a direct work lead jack).

N.C. Tape up bolted connection.

N.D. Connect the LN-9 control cable ground lead to the frame terminal marked ⏚ near the power source terminal strip. The power source must be properly grounded.

N.E. If using an older automatic control cable with leads 75, 76, 77; Connect lead 75 to #75 on terminal strip, connect lead #76 to #74 on terminal strip, connect lead #77 to #73 on terminal strip.

N.F. The LN-9 voltage control jumpers must be connected as follows(refer to LN-9 Operating Manual):

White jumper on voltage board to Pin "S".

Blue jumper on voltage board (later units only) or on start board (earlier units). to Pin "B".

N.G. Set the DC-1000 controls as follows:

Set the control switch to "Output Control Remote". For Submerged Arc Processes, set the mode switch to "C.V. Submerged Arc". For Open Arc Processes, set the mode switch to "C.V. Innershield".

N.H. Alternative 500 Amp positive terminal connection provided on DC-1000 models above code 9500 only.

The Lincoln Electric Company
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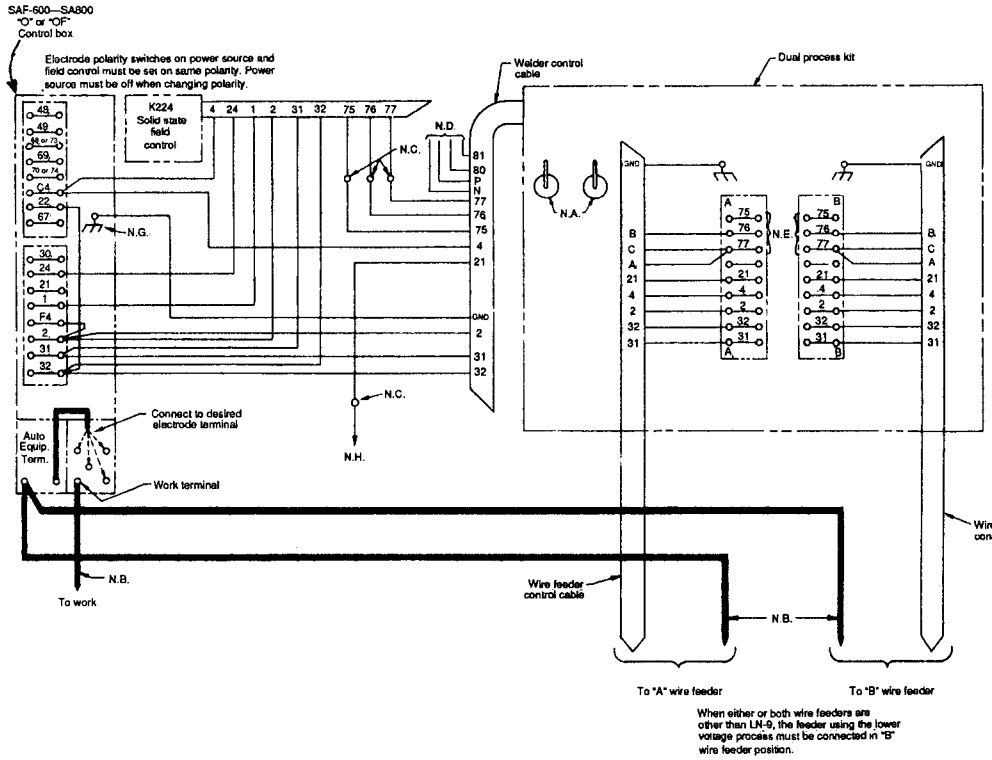
Sec. N2.3.3-L

K317 DUAL PROCESS KIT
SAF-600 AND SA-800 CONNECTION TO LN-8 OR LN-9 (Obsolete)

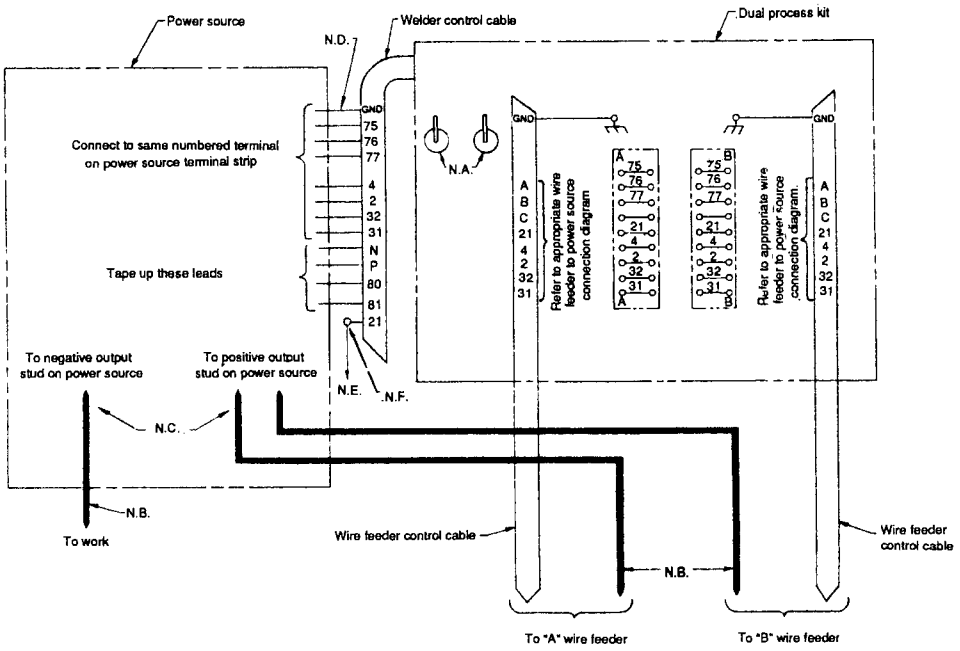


N.A. Mode switch has no effect when using SA-800 or SAF-600 welders.
N.B. Welding cables must be of proper capacity for the current and duty cycle of immediate and future applications.
N.C. Bolt and tape connections.
N.D. Tape up leads.
N.E. Connections shown for LN-9 wire feeders. For LN-8 wire feeders connect "A" to 75, "B" to 76 and "C" to 77.
N.F. Electrode polarity on wire feeders set by polarity switch on power source.
N.G. Connect the 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.H. Use #14 or larger wire physically suitable for the installation and connect it directly to the work piece keeping it separate from the welding work lead circuit and connection.

M13701
4-24-81

Sec. N2.3.3-M

K317 DUAL PROCESS KIT
R3S AND SAM CONNECTION TO LN-8 OR LN-9

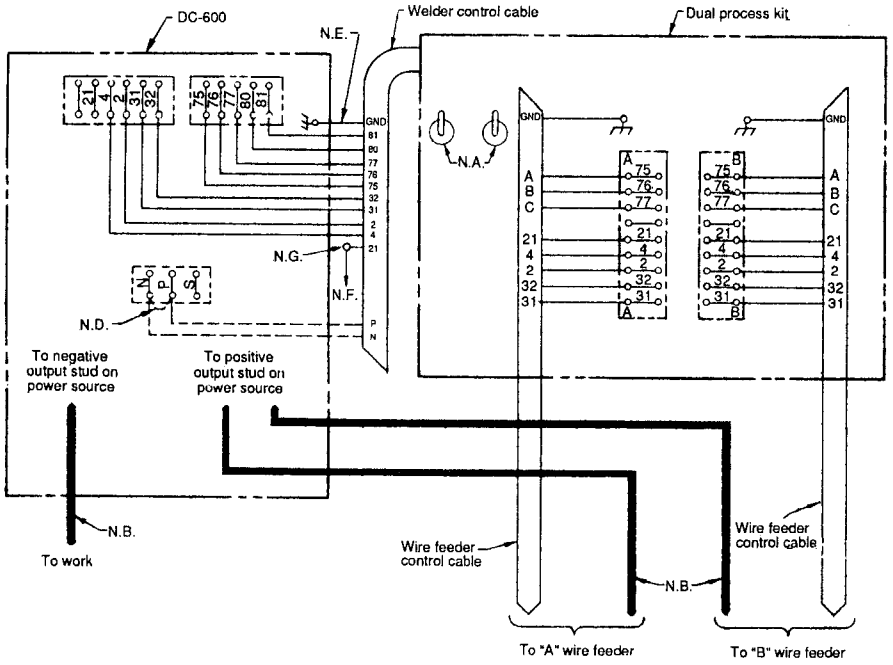


N.A. Mode switch has no effect when using R3S or SAM welders.
N.B. Welding cables must be of proper capacity for the current and duty cycle of immediate and future applications.
N.C. Connection shown for positive polarity. For negative polarity reverse electrode and work cables connected to power source output studs on R3S welders. On SAM welders, electrode polarity is set by polarity switch on power source.
N.D. Connect the 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. Use #14 or larger wire physically suitable for the installation and connect it directly to the work piece keeping it separate from the welding work lead circuit and connection.
N.F. Bolt and tape connection.

M13702
9-22-78

Sec. N2.3.3-N

K317 DUAL PROCESS KIT
DC-600 CONNECTION TO LN-8 OR LN-9



N.A. Place mode switch on power source to CV Innershield and place each mode switch on dual process control in the position required by process used with wire feeder.

N.B. Welding cables must be of proper capacity for the current and duty cycle of immediate and future applications.

N.C. Connection shown for positive polarity, for negative polarity reverse electrode and work cables connected to power source output studs.

N.D. For DC-600 codes below 8200:
(1)When using two LN-9 wire feeders, connect jumper on the power source terminal strip as shown between terminal "N" and "P". (2) When using two LN-8 wire feeders, tape up control cable leads "N" and "P". Connect jumper to power source terminals "N" and "S". There is no N.P.S. terminal strip on codes above 8200 . Tape up leads "P" and "N".

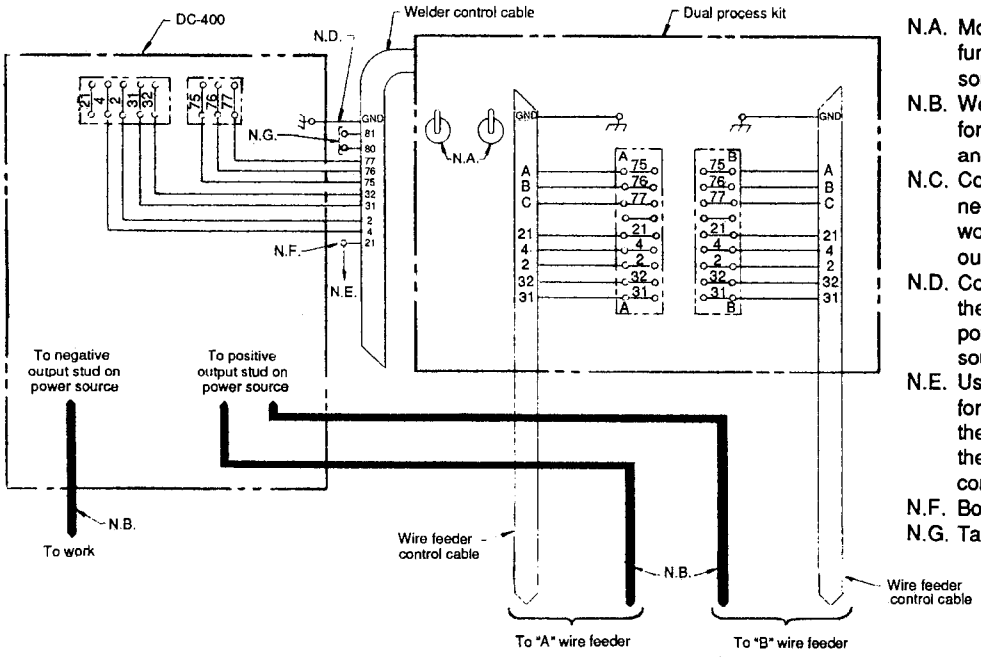
N.E. Connect the control cable ground lead to the frame terminal marked ⏚ near the power source terminal strip. The power source must be properly grounded.

N.F. Use #14 or larger wire physically suitable for the installation and connect it directly to the work piece keeping it separate from the welding work lead circuit and connection.

N.G. Bolt and tape connection.

M13751
9-7-79

K317 DUAL PROCESS KIT
DC-400 CONNECTION TO LN-8 OR LN-9



N.A. Mode switches on dual process kit are not functional when connected to power source.

N.B. Welding cables must be of proper capacity for the current and duty cycle of immediate and future applications.

N.C. Connection shown for positive polarity. For negative polarity reverse electrode and work cables connected to power source output studs.

N.D. Connect the control cable ground lead to the frame terminal marked ⏚ near the power source terminal strip. The power source must be properly grounded.

N.E. Use #14 or larger wire physically suitable for the installation and connect it directly to the work piece keeping it separate from the welding work lead circuit and connection.

N.F. Bolt and tape connection.

N.G. Tape up separately.

M14549
1-20-89B

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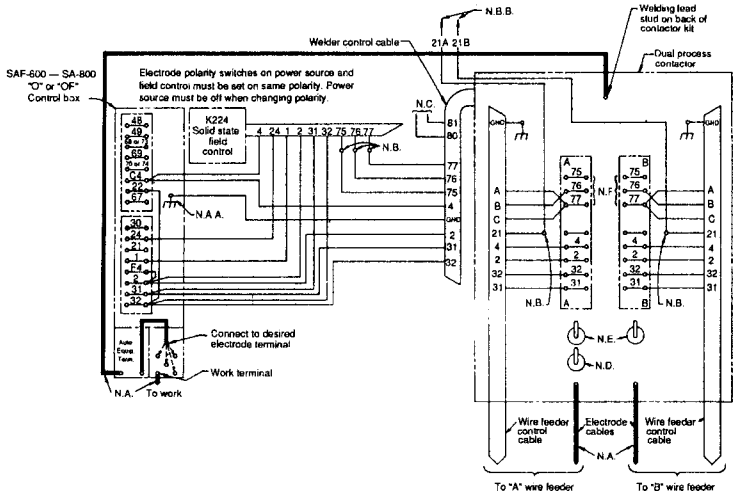
Sec. N2.3.3-P

K318 DUAL PROCESS CONTACTOR KIT (ABOVE CODE 8020) SAF-600 AND SA-800 CONNECTION TO TWO LN-8's OR TWO LN-9's FOR SAME POLARITY OPERATION (Obsolete)



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 leads.
N.D. Put transfer switch in "same polarity on feeders" position.
N.E. Mode switch has no effect when using SA-800 or SAF-600 welders.
N.F. Connections shown for LN-9 wire feeders. For LN-8 wire feeders connect "A" to 75, "B" to 76 and "C" to 77.
N.G. Electrode polarity on wire feeders set by polarity switch on power source.

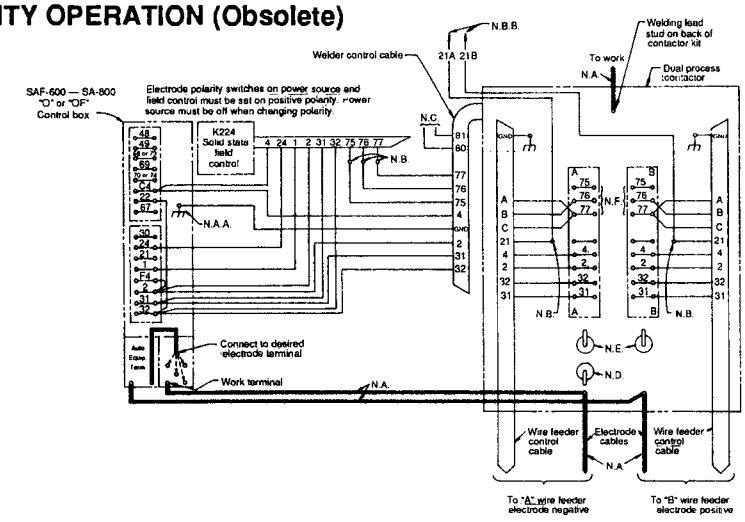
M13913
4-24-81

N.A.A. Connect the 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 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.

For 50 Hz Operation
Disconnect both brown leads from terminal 31B and tape up each lead. Untape both red leads and connect to 31B.

Sec. N2.3.3-Q

K318 DUAL PROCESS CONTACTOR KIT (ABOVE CODE 8020) SAF-600 AND SA-800 CONNECTION TO TWO LN-8'S OR TWO LN-9's FOR OPPOSITE POLARITY OPERATION (Obsolete)



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 leads.
N.D. Put transfer switch in "same polarity on feeders" position.
N.E. Mode switch has no effect when using SA-800 or SAF-600 welders.
N.F. Connections shown for LN-9 wire feeders. For LN-8 wire feeders connect "A" to 75, "B" to 76 and "C" to 77.

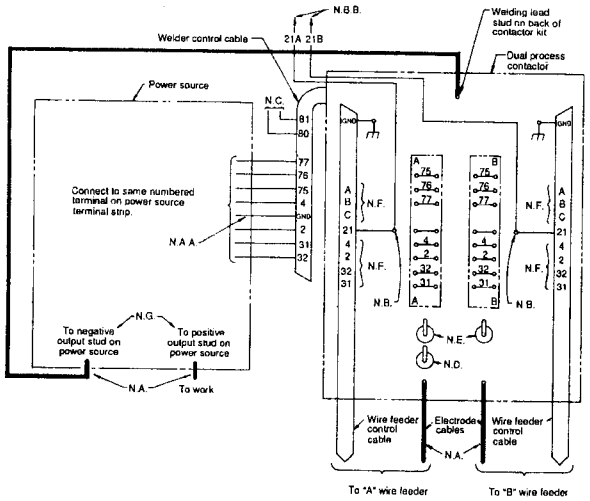
M13914
4-24-81

N.A.A. Connect the 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 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.

For 50 Hz Operation
Disconnect both brown leads from terminal 31B and tape up each lead. Untape both red leads and connect to 31B.

Sec. N2.3.3-R

K318 DUAL PROCESS CONTACTOR KIT
R3S AND SAM CONNECTION TO TWO LN-8's OR TWO LN-9's FOR SAME POLARITY OPERATION



N.A.A. Connect the 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 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 leads.

N.D. Put transfer switch in "same polarity on feeders" position.

N.E. Mode switch has no effect when using R3S or SAM welders.

N.F. Refer to appropriate wire feeder to power source connection diagram.

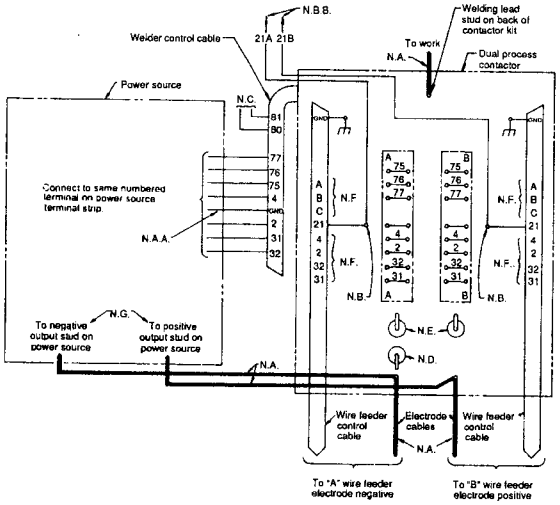
N.G. Connections shown for negative polarity. For positive polarity reverse electrode and work cables connected to power source output studs on R3S welders. On SAM welders electrode polarity is set by polarity switch on power source.

For 50 Hz Operation
Disconnect both brown leads from terminal 31B and tape up each lead. Untape both red leads and connect to 31B.

M13915
11-2-79

Sec. N2.3.3-S

K318 DUAL PROCESS CONTACTOR KIT
R3S AND SAM CONNECTION TO TWO LN-8's OR TWO LN-9's FOR OPPOSITE POLARITY OPERATION



N.A.A. Connect the 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 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 leads.

N.D. Put transfer switch in "opposite polarity on feeders" position.

N.E. Mode switch has no effect when using R3S or SAM welders.

N.F. Refer to appropriate wire feeder to power source connection diagram.

N.G. To make "A" feeder positive polarity and "S" feeder negative polarity, reverse electrode cables connected to power source output studs.

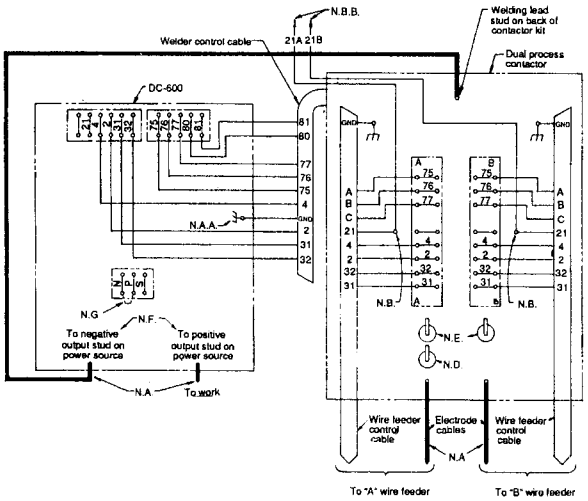
For 50 Hz Operation
Disconnect both brown leads from terminal 31B and tape up each lead. Untape both red leads and connect to 31B.

M13916
11-2-79

The Lincoln Electric Company
Cleveland, Ohio 44117-1199

Sec. N2.3.3-T

K318 DUAL PROCESS CONTACTOR KIT
DC-600 CONNECTION TO TWO LN-8's OR TWO LN-9's FOR SAME POLARITY OPERATION



N.A.A. Connect the 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 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.

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. 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.D. Put transfer switch in "same polarity on feeders" position.

N.E. Place mode switch on power source to CV Innershield and place each mode switch on dual process control in the position required by process used with wire feeder.

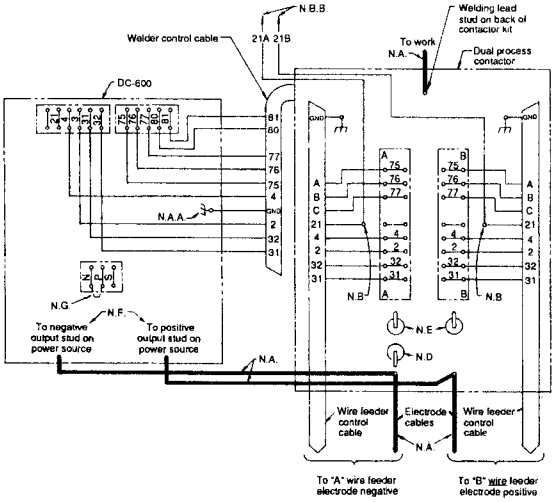
N.F. Connection shown for negative polarity. For positive polarity reverse electrode and work cables connected to power source output studs.

N.G. For DC-600 codes below 8200 only: (1) When using two LN-9 wire feeders, connect jumper on the power source terminal strip as shown between terminals "N" & "P".
(2) When using two LN-8 wire feeders, connect jumper to power source terminals "N" & "S".
(3) Wire feeder "A" & "B" MUST BE OF SAME MODEL.

M13917
11-2-79

Sec. N2.3.3-U

K318 DUAL PROCESS CONTACTOR KIT
DC-600 CONNECTION TO TWO LN-8's OR TWO LN-9's FOR OPPOSITE POLARITY OPERATION



N.A.A. Connect the 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 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 lead should be taped to the welding work lead. Each lead must be connected directly to the work and leads must not be connected together.

M13918
11-2-79

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. 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.D. Put transfer switch in "opposite polarity on feeders" position.

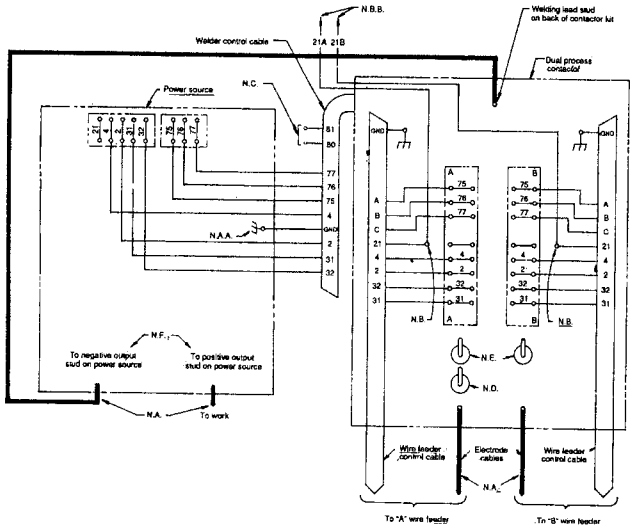
N.E. Place mode switch on power source to CV Innershield and place each mode switch on dual process control in the position required by process used with wire feeder.

N.F. To make "A" feeder positive polarity and "B" feeder negative polarity, reverse electrode cables connected to power source output studs.

N.G. For DC-600 codes below 8200 only: (1) When using two LN-9 wire feeders, connect jumper on the power source terminal strip as shown between terminals "N" & "P".
(2) When using two LN-8 wire feeders connect jumper to power source terminals "N" & "S".
(3) Wire feeder "A" & "B" MUST BE OF SAME MODEL.

Sec. N2.3.3-V

K318 DUAL PROCESS CONTACTOR KIT
DC-400 CONNECTION TO TWO LN-8's OR TWO LN-9's FOR THE SAME POLARITY OPERATION



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 DC-400.
N.F. Connection shown for negative polarity. For positive polarity reverse electrode and work cables connected to power source output studs.

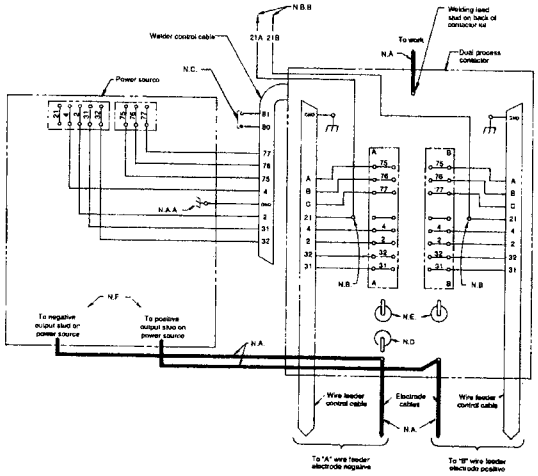
N.A.A. Connect the control cable ground lead to the frame terminal marked ⏚ near the power source terminal strip or to an unpainted frame screw. The power source must be properly grounded.
N.B.B. Extend lead 21A and 21B using #14 or larger insulated wire physically suitable for the installation. An S16586 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.

M14550
1-20-89B

For 50 Hz Operation
Disconnect both brown leads from terminal 31B and tape up each lead. Untape both red leads and connect to 31B.

Sec. N2.3.3-W

K318 DUAL PROCESS CONTACTOR KIT
DC-400 CONNECTION TO TWO LN-8's OR TWO LN-9's FOR OPPOSITE POLARITY OPERATION



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 DC-400.
N.F. To make "A" feeder positive polarity and "B" feeder negative polarity, reverse electrode cables connected to power source output studs.

N.A.A. Connect the 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 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.

M14551
1-20-89B

For 50 Hz Operation
Disconnect both brown leads from terminal 31B and tape up each lead. Untape both red leads and connect to 31B.

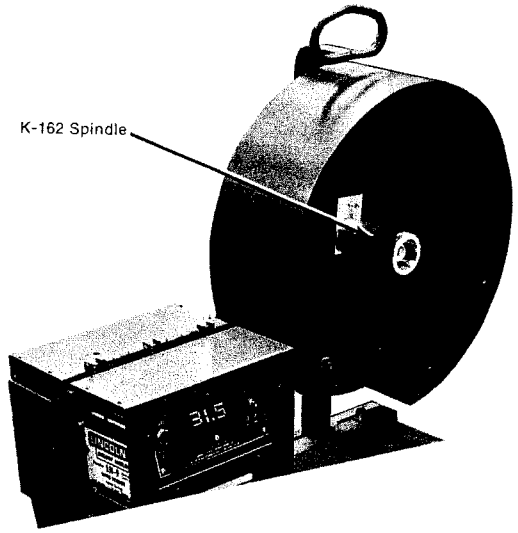
SEC. N3 — OPTIONAL FEATURES

Sec. N3.3.1

K178-1 MOUNTING PLATFORM – LN-9N OR -9HN (Obsolete) ON IDEALARC R3S, DC-TYPE AND CV POWER SOURCES.

This is a turntable type platform for mounting the wire feeder and reel assembly on the top of Idealarc power sources including new CV-power sources. Bolt the platform on the lift bail per instructions supplied with the platform.

October 1991



LN-9N or -9HN (Obsolete) with K162-H Spool Spindle.

Sec. N3.3.2

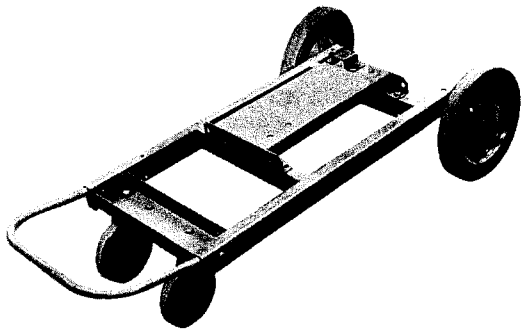
K162-H – 10 to 60 POUND READI-REEL SPOOL SPINDLE

To mount the spindle kit remove the shaft for the standard 50-60 pound wire reel from the mounting framework. Install the spindle per the instructions shipped with the kit.

When used with Readi-Reels, an appropriate Readi-Reel Adapter is required.

A K468 Adapter is required when using 8" (200 mm) diameter spools, and a K435 Adapter for 14 lb. Innershield Coils. Adjust the brake tension screw on the spindle as needed.

October 1991



Sec. N3.3.3

K163 UNDERCARRIAGE (For all LN-9/ Wire Reel Stand Combinations)

Wheels, handle and hardware are shipped with the undercarriage. Mount the casters at the front and wheels to the rear of the platform. Be sure the round rear axle is to the rear of the mounting bolts that hold the U-shaped axle member to the frame. Bolt the handle to the front of the platform so it can be tilted back and wheeled like a two-wheeled truck. Holes for installing the wire reel support are provided in the platform.

October 1991

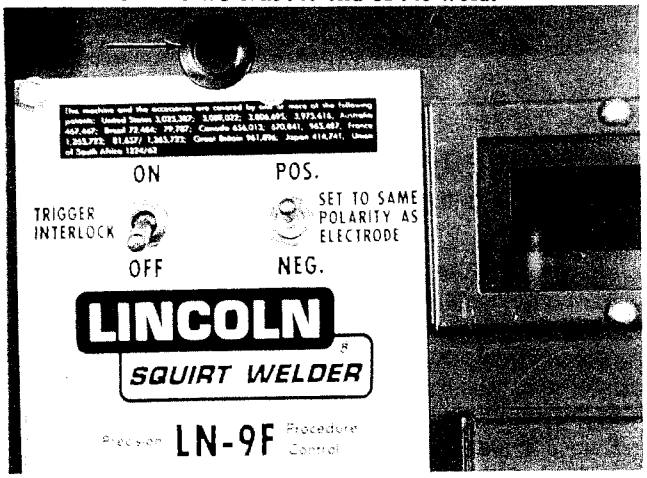
The Lincoln Electric Company
Cleveland, Ohio 44117-1199

Sec.N3.3.4
(File as Sec. K2.5.7 in IM-274)

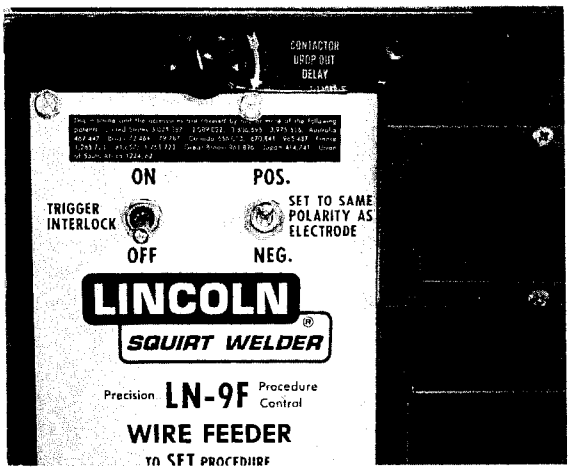
K202 Burnback Kit (For all models of LN-9)

This kit is useful to help prevent the electrode from sticking in the crater or ending with too much stickout at the end of the weld in two types of welding applications:

1. Welding with small diameter [.030 thru 1/16" (0.9 thru 1.6 mm)] wires at fast wire feed speed when there is a tendency for wire overrun.
2. When the semiautomatic gun is mounted in a fixture or on the Squirtmobile® in such a manner that it cannot be lifted from the work at the end of the weld.



Front panel of the LN-9F without K202. Plug button is removed when installing K202 kit.



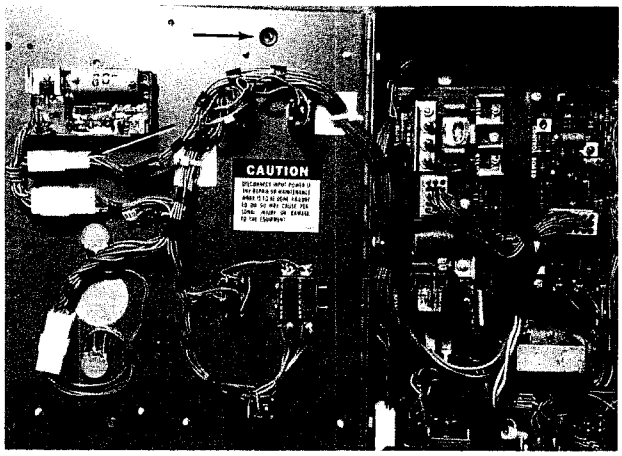
Front panel of the LN-9F with K202 installed. Attach decal as shown in photograph.

This kit delays shutting off the power source output allowing the electrode to be melted while the wire feed motor is stopping at the end of the weld. The delay time is adjustable for optimum burnback for different wire sizes, processes, procedures, etc. The operator must release the trigger slightly before he wants the weld to stop, and hold the gun in position until the arc goes out.

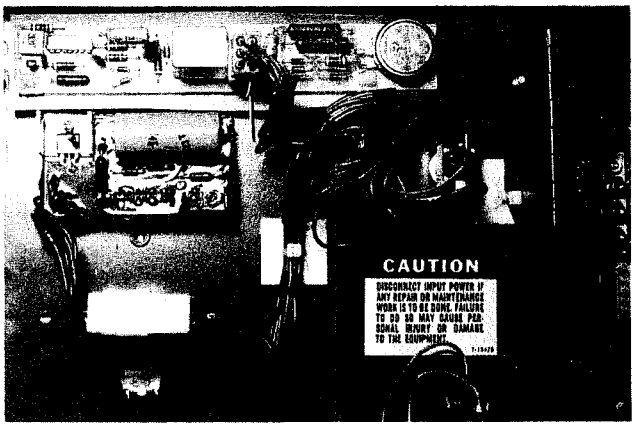
Installation instructions are shipped in the kit.

NOTE: The K202 does not delay the opening of the auxiliary equipment contacts (see Sec. N3.3.6). If it is desired to continue power to auxiliary equipment during the K202 burnback time, this can be accomplished *only* if using an R3S, DC-400 or DC-600 power source by connecting the 115 volt AC auxiliary equipment leads to #4 and #31 on the power source terminal strip. The auxiliary equipment power requirements should not exceed 15 watts.

This alternate connection cannot be used with the DC-250, CV-, or CVI-type power source.



Back panel of the LN-9F without K202. Note space at top of panel and location of connection plug to be used. Jumper plug is removed when connecting the K202 kit.



Back panel of the LN-9F with K202.

October 1991

Sec. N3.3.5
M11514 WIRE REEL ENCLOSURE DOOR (For -N or -S Models)

The door kit includes a hinged door and a sliding bottom seal. When installed, the wire reel mounting becomes a completely enclosed housing. Instructions are included in the kit. Put the bottom seal panel in the forward position when using .030 thru 1/16" (0.8 thru 1.6 mm) electrode and in the rear position when using 5/64 thru .120" (2.0 thru 3.0 mm) electrode.

October 1991

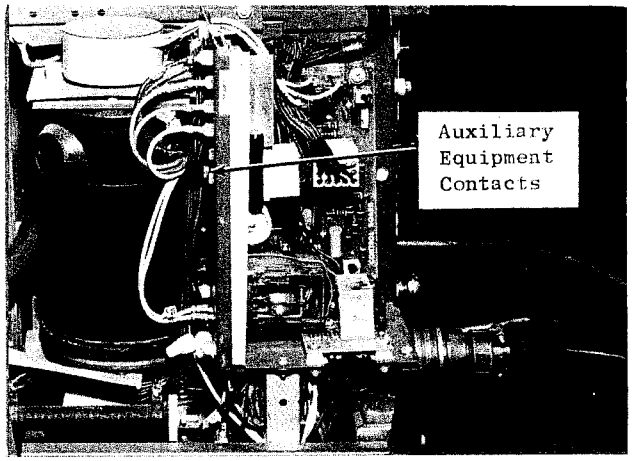
Sec.N3.3.6
AUXILIARY EQUIPMENT CONTACTS

The power for 115 volt AC auxiliary equipment can be obtained from the terminals inside the LN-9 control box. The contacts are "hot" whenever the trigger is pressed or the unit is welding. The current draw of this circuit must not exceed 1/4 ampere.

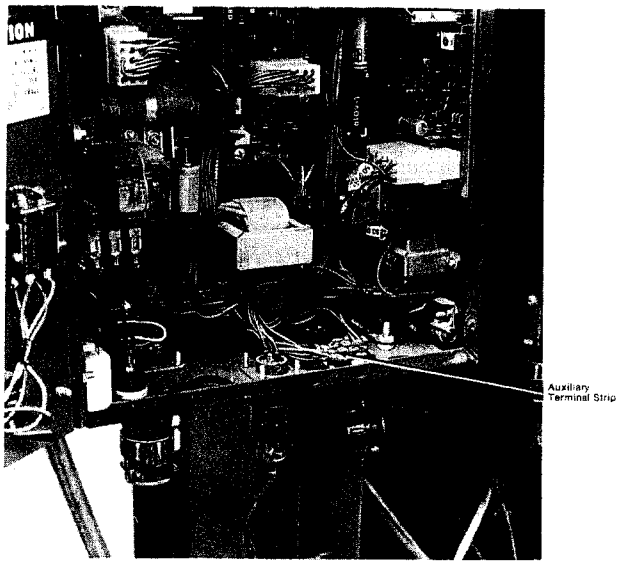
To use, turn the Power Source Off.

LN-9 or LN-9H Models:
Install 1/4" (6.0 mm) quick connect terminals to the leads from the auxiliary equipment. Route the leads to the terminals marked #32A and #7 which come through the rectangular hole in the control section sheet metal near the wire feed motor.

LN-9F or LN-9FH Models:
Install terminals for #6 screws to the leads from the auxiliary equipment. Route the leads to the terminals #32A and #7 on the terminal strip on the inside bottom of the control box.



LN-9 and LN-9H (Obsolete)

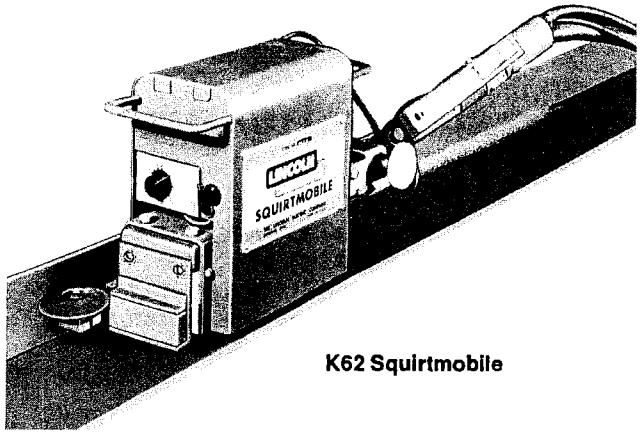


LN-9F and LN-9FH (Obsolete)

Sec. N3.3.7
K62 SQUIRTMOBILE®

The Squirtmobile is a self-propelled trackless carriage that carries the K114 submerged arc gun on long welds for automatic welder economy without high fixture costs. To use the LN-9S or LN-9SE with the Squirtmobile install a K161 Power Pack Kit per Sec. N3.3.8.

January 1989



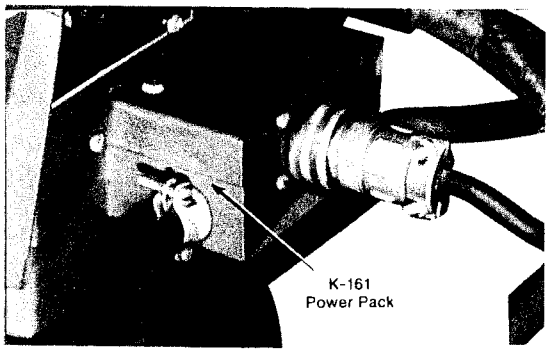
K62 Squirtmobile

The Lincoln Electric Company
Cleveland, Ohio 44117-1199

Sec.N3.3.8
K161 MECHANIZED TRAVEL POWER PACK

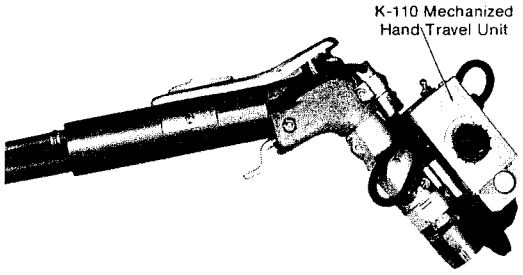
[Not designed for use with the LN-9F or -9FH (Obsolete) units.]

The K161 power pack supplies the power needed by the K110 mechanized hand travel unit or Squirtmobile when used with the K114 submerged arc welding gun.



Connect the leads of the power kit box (the one with the handle) to the power source. Extend the control cable to the wire feed unit. Mount the small box at the end of the cable to the front of the wire feed unit. Connect the K114 gun control cable to the polarized plug built into this small box.

Complete installation instructions are shipped with the kit.



March 1979

Sec. N3.3.9
K70 FILLET GUIDE

Simplifies horizontal fillet welding when using the Mechanized Hand Travel Unit (K110).

March 1979

Sec. N3.3.10
K320 CONTINUOUS FLUX FEEDING TANK ASSEMBLY

For LN-9 models -N, -NE and -F. Standard on -S and -SE models. Complete system including air filter, pressure regulator, gauge, tank and 18 foot flux hose. Also includes funnel for filling tank plus lift bail assembly required to mount tank and wire feeder to K163 undercarriage. The tank can also be used as a free standing assembly.

October 1991

Sec. N3.3.11
K58 MAGNETIC SEPARATOR

Removes magnetic particles from recirculated submerged arc fluxes to reduce porosity and eliminate clogging at the flux cone when making long welds. (See Sec. N4.4.13.)

March 1979

Sec. N3.3.12
K310 SCREEN

Vibrated screen available for screening recirculated flux. (See Sec. N4.4.13.)

February 1980

Sec. N3.3.14
K299 WIRE REEL ASSEMBLY

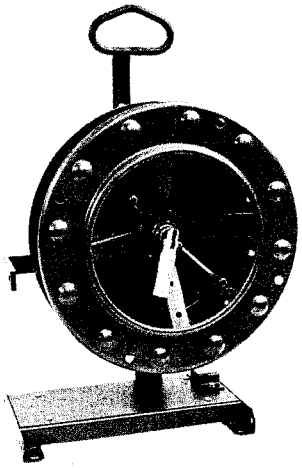
For special mounting such as on a robot. It includes a reel, reel mounting spindle and brake. It is designed for 50 and 60 pound coils.

April 1987

Sec. N3.3.15
K376 WIRE REEL ASSEMBLY

A mounting stand for 50 and 60 pound coils. It is open and does not include a shroud and can be attached to LN-7, LN-8, and LN-9 type wire feeders.

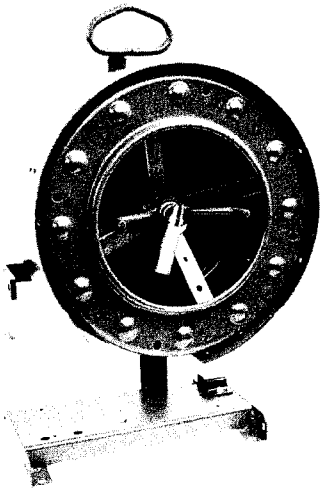
April 1987



Sec. N3.3.16
K303 WIRE REEL ASSEMBLY

Includes the same frame as used in the K376. It also has a shroud that covers the wire reel.

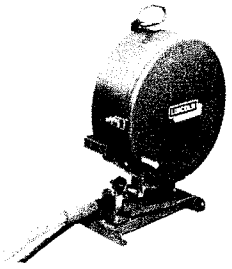
April 1987



Sec. N3.3.17
K304 WIRE REEL ASSEMBLY

A reel and brake assembly in a closed housing with a hand crank for extension loading. 50 and 60 lb. coils can be used and it is easily attached to the LN-7, LN-8 and LN-9 type feeders.

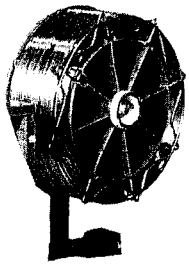
April 1987



Sec. N3.3.18
K377 WIRE REEL ASSEMBLY

A small mounting stand for Readi-Reel® coils or 10-30 pound spools with 2" I.D. This assembly includes a small frame which is attached to a wire spindle similar to the K162-H spindle. A K363-P Readi-Reel is supplied for Lincoln "Readi-Reel Electrode Coils". Without the adapter the unit can handle spools with a 2" I.D., a 12" max. O.D., and 4.06" max. width. The spindle has an adjustable braking system. Holes for attaching unit to LN-7, LN-8 and LN-9's are provided.

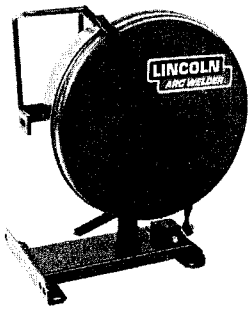
April 1987



Sec. N3.3.19
K378 WIRE REEL ASSEMBLY

A small mounting stand for 13-14 pound Innershield® coils. This assembly includes the same smaller frame as used in the K377 and a fully enclosed canister system. This system has a fixed brake for the 14 pound coil.

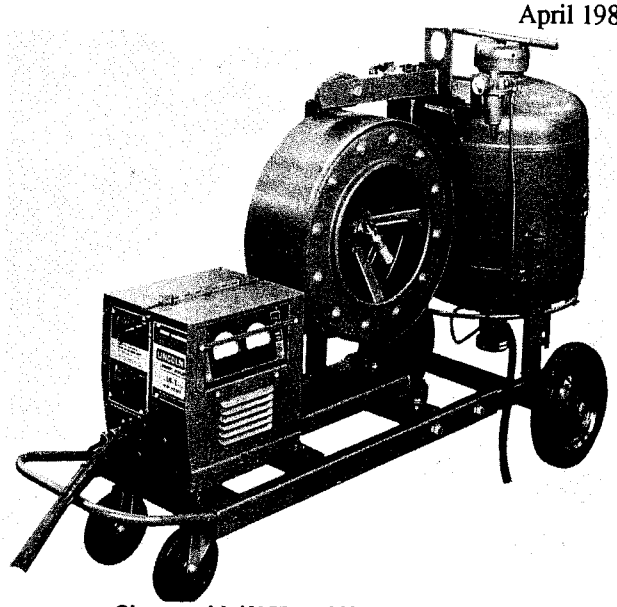
April 1987



Sec. N3.3.20
K305 (LN-9S) WIRE REEL AND FLUX TANK ASSEMBLY

Includes a reel and brake assembly in an open shroud, with K320 flux tank mounted on a K163 undercarriage. A LN-7, LN-8, or LN-9 type wire feeder can be added.

April 1987

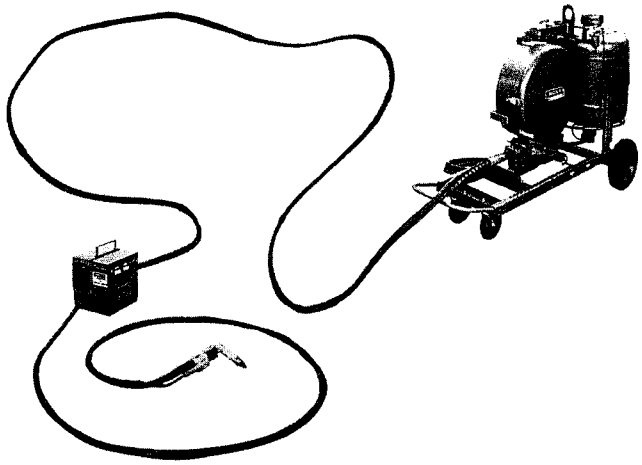


Shown with K357 and K319 attached.

Sec. N3.3.21
K306 (LN-9SE) WIRE REEL AND FLUX TANK ASSEMBLY

Includes the same frame as used in the K305. In addition there is a closed housing for the reel and hand crank for extension loading. Also includes a handle for wire feeders and 64' of flux hose.

April 1987



Sec. N3.3.22
K445 WIRE REEL ASSEMBLY

An open mounting stand similar to the K376, but equipped with a K162-H 2" O.D. Spindle and K438 Readi-Reel® Adapter for 50-60 pound Readi-Reel coils

January 1989

OPTIONAL FEATURES

Sec. N3.5.1
(File as Sec. K2.5.18 in IM-274-A)

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 at a different procedure without changing any dials. Simply actuating the circuit of the desired wire feeder turns the unit on and its controls set the complete procedure including the power source output level. When used with a 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.

The unit is a small control box that mounts on the side of the power source and is connected to the welder terminal strip. Each wire feeder control cable is connected to the Kit.

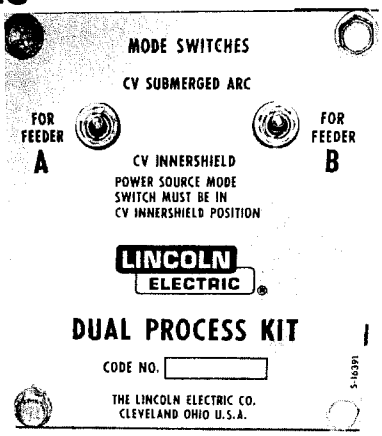
The electrode of the wire feeder not being used will be "hot" although, of course, there will be no wire feed. This usually is no problem since the unused gun or nozzle can be placed safely out of the way. If, however, it is desired to have the unused electrode "cold", use a K318 Dual Process Contactor Kit connected for same polarity operation.

Maximum versatility is obtained when the Kit is used with a DC-600 power source. The following chart shows the advantages that a DC-600 has over other welders. The K317 should not be used with power sources other than those shown below.

Power Source	Voltage Range	Mode Change	Mounting Adapter
DC-400	Full	No	No
DC-600	Full	Yes	Yes
SAF-600 (Obsolete) or SA-800 (Obsolete) with K224 Solid State Remote Control	Full	No	No
SAM	Partial[1]	No	No
R3S (Obsolete)	Limited[1]	No	No
Pulse Power 500	Full	Yes	No
DC-1000	Full	No	No
DC-1500	Full	No	No
CV-400	Full	No	No

[1]The output range is limited by the voltage change obtainable by the remote control. The voltage range between the two procedures required may be outside the range covered by the remote control and it would be impossible to set the procedures without adjustment at the power source.

Although designed primarily for use with the LN-8 or LN-9 wire feeders, the kit will also work with two LN-7's when they are used with two remote control units or with two NA-3's, NA-4's or NA-5's.

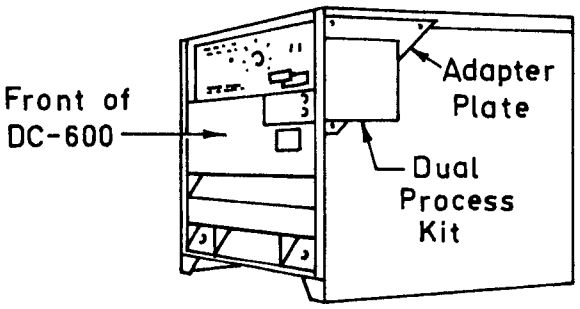


Closeup of controls for the K317 dual process kit. Note, when used with a DC-600, each mode switch should be set in the proper position for the process being used. K317 mode switches have no function with any other power source.

INSTALLATION

Refer to the following connection diagrams to connect the Dual Process Kit to the power source and LN-8 or LN-9 wire feeders.

DC-400	M14549
DC-600	M13751
R3S and SAM	M13702
SAF-600 or SA-800 with Solid State Remote Field Controls	M13701
PP500	M15081
CV400	M14549



Turn the power source off. On the DC-600, fasten the adapter plate of the Dual Process Kit to the control terminal strip side of the power source using two roof screws and one front panel screw.

On all other power sources, remove the adapter plate from the Kit and fasten Kit to the side of the power source or some convenient location so its control cable can be connected to the power source terminal strip. Use control box as a template to locate the four 5/32" (4.0 mm) diameter holes that must be drilled in the case side. Mount unit with the four #10 self-tapping screws provided.

Remove cover from Kit and connect wire feeder control cables to the terminal strips in the Kit. Connect the Kit control cable to the power source terminal strip per the appropriate connection diagram. Replace cover on Kit and unit is ready to operate.

The Lincoln Electric Company
Cleveland, Ohio 44117-1199

Sec. N3.5.1 (continued)

OPERATION

For DC-600, set the mode switch on the front of the power source to "CV Innershield". Set the mode switches on the kit to the position required by the process used on the wire feeder. On all other power sources the mode switches have no effect.

To set procedures, weld with "A" wire feeder and set procedure with its control dials. Then weld with "B" wire feeder and set the procedure with its control dials. With the LN-9, it is not necessary to weld. Each unit will now weld at its required procedure when its gun trigger is actuated. Do not try to weld with both units simultaneously because the procedures will not be correct and the power source may be overloaded.

WARNING: Place unused gun so electrode does not touch work, wire feeder case or other metal because both electrodes become electrically hot when either gun trigger is pulled.

TROUBLESHOOTING

1. No control of power source output.	a. DC-600 or R3S power source toggle switch not set to remote. Set power source per its instruction manual. b. Defective K317 relay — replace relay. c. Defective wire feeder control rheostat. Refer to operating manual.
2. Poor bead shape or arc response when using DC-600 power source.	a. Mode switch in wrong position on Dual Process Contactor Kit or on welder. Place in correct position. b. Defective K317 relay — replace relay.
3. Poor starting when using DC-600 (below Code 8200).	a. Improper connection on power source terminals N, P, and S. Refer to connection diagram to connect properly.

November 1990

Sec. N3.5.2
(File as Sec. K.2.5.19 IM-274-A)

K318 DUAL PROCESS CONTACTOR KIT (With Polarity Change)

The dual process contactor kit is a control box (transfer device) that permits 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. Simply actuating the gun trigger of the desired wire feeder turns the unit on, selects the polarity and sets the complete procedure, including power source output level. When used with a DC-600, the wire feeders can also 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. The kit is rated 600 amperes at 100% duty cycle.

Maximum versatility is obtained when the kit is used with a DC-600 power source. The following chart shows the advantage that a DC-600 has over other welders.

Power Source	Voltage Range	Mode Change
DC-400	Full	No
DC-600	Full	Yes
SAF-600 or SA-800 with K224 Solid-State Remote Control	Full	No
SAM	Partial*	No
R3S	Limited*	No
Pulse Power 500	Full	No
CV-400	Full	No

* The output range is limited by the voltage change obtainable by the remote control. The voltage range between the two procedures required may be outside the range covered by the remote control and it would be impossible to set the procedure without adjustment at the power source.

Although designed primarily for use with the LN-8 or LN-9 wire feeders, the kit will also work with two LN-7's when they are used with two remote control units.

Installation

If it is desired to mount the K318 on top of a DC-600, an S16552 mounting bracket is available.

Refer to the following connection diagrams to connect the dual process contactor kit to the power source and LN-8 or LN-9 wire feeders.

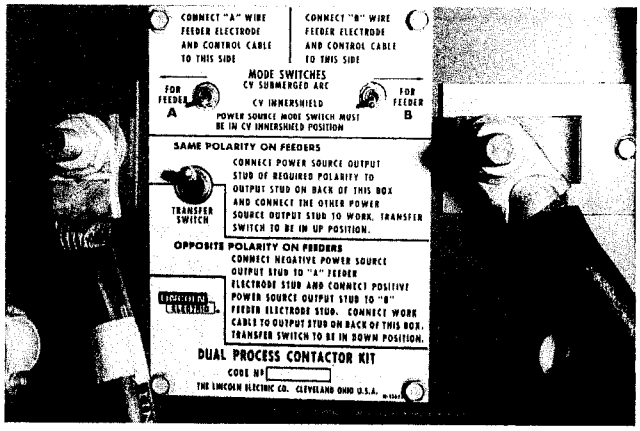
To connect the two wire feeder control cables, remove the cover from the contactor kit for access to the terminal strips. Run the cables through the two box connectors, then under the "L" shaped brackets mounted on the bottom to keep the cables away from the contactors. Connect the leads to the two terminal strips per the appropriate connection diagram.

If 50 hertz is used, reconnect contactor coil leads per the wiring diagram.

K318 Kit	Below Code 8020	Above Code 8020
Opposite polarity operation:		
DC-400	—	M14551
DC-600	M13720	M13918
R3S and SAM	M13706	M13916
SAF-600 and SA-800 with solid-state remote field control	M13704	M13914
CV-400	—	M14551
Same polarity operation:		
DC-400	—	M14550
DC-600	M13736	M13917
R3S and SAM	M13705	M13915
SAF-600 and SA-800 with solid-state remote field control	M13703	M13913
PP500	—	M15082
CV-400	—	M14550

Connect the dual process contactor kit control cable to the power source per the connection diagram. Two 3/0 leads are provided to connect the power source output studs to the kit for opposite polarity operation. Only one lead is used for same polarity operation. Connect work lead and wire feeder electrode leads as shown on the diagram. Put cover back on control box and unit is ready to operate.

CAUTION: When fixture mounted wire feeders are used, the wire reels must be insulated from each other and insulated from their mounting structure.



Closeup of controls for the K318 dual process contactor kit. NOTE: when used with a DC-600, each mode switch should be set in the proper position for the process being used. K318 mode switches have no function with any other power source.

OPERATION

For DC-600, set the mode switch on the front of the power source to "CV Innershield". Set the mode switches on the

Sec. N3.5.2 (continued)

kit to the position required by the process used on the wire feeder. On all other power sources the mode switches have no effect. Check that transfer switch on the dual process contactor kit is in the proper position. When wire feeders are connected for opposite polarity operation, wire feeder "A" will be negative polarity and "B" will be positive polarity.

Codes Above 8020:

Before welding, actuate gun trigger once to interlock contactor and set procedure. Subsequent welding with the same gun can be done in a normal manner. If the trigger is not operated once when changing feeders, the first weld start may be poor if the voltage setting of the two feeders is far apart.

To set procedures, weld with "A" wire feeder and set procedure with its control dials. Then weld with "B" wire feeder and set the procedure with its control dials. With the LN-9, it is not necessary to weld. Each unit will now weld at its required polarity and procedure when the gun trigger is actuated. **Do not try to weld with both units simultaneously** or pull the trigger of one wire feeder when the other is welding because the welder output will be shut off.

TROUBLESHOOTING

Trouble	Cause and Remedy
1. Electrode feeds, but is electrically cold.	1. Transfer switch is in wrong position. Place in correct position.
2. Poor bead shape or arc response when using DC-600 power source.	2. Mode switch in wrong position on dual process contactor kit or on welder. Place in correct position.
3. No control of power source output.	3. a. Power source voltage control switch not set to "remote". Set power source per its instruction manual. b. Defective relay in kit. Check operation of 1CR and replace if defective. c. Defective wire feeder control rheostat. Refer to operating manual.
4. Poor starting when using DC-600 (below Code 8200).	4. Improper connection on power source terminals N, P and S. Refer to connection diagram to connect properly.
5. Poor starting or burn back on the first weld when changing wire feeders.	5. Relays not transferred properly. Actuate gun trigger once before starting when changing from one wire feeder to another.

April 1987

OPTIONAL FEATURES —CONT'D

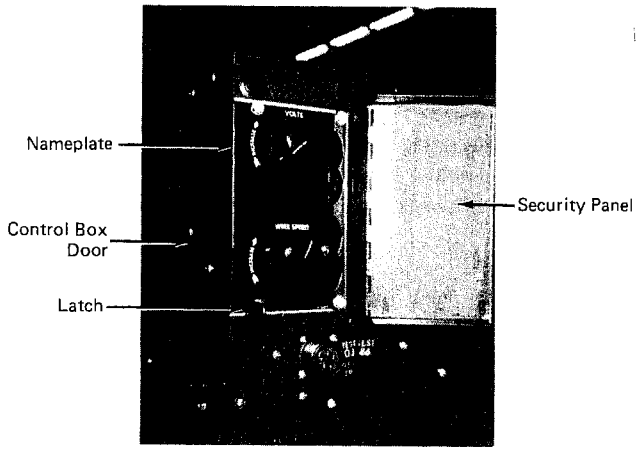
Sec. N3.5.3
K319 DUAL PROCEDURE KIT

The dual procedure kit is a transfer device that enables an operator to choose one of two procedures with a selector switch that is attached to a semiautomatic gun handle. Simply changing the selector switch position will set the wire feed speed and voltage to the values chosen for each procedure. The unit can be used with an LN-9, LN-9H (Obsolete), LN-9F or LN-9FH (Obsolete) wire feeder.

A small control box is attached to the wire feeder control box and is connected to the gun-mounted selector switch with a control cable. The switch can be attached to the side of the gun handle of a K112, K113, K115, K126, K206 or K289 gun and cable assembly. When used with an "F" unit, a K302 (17 feet standard length) extension cable is required to extend the control cable to the control box. The length required is the same length as the control box to wire feeder cable.

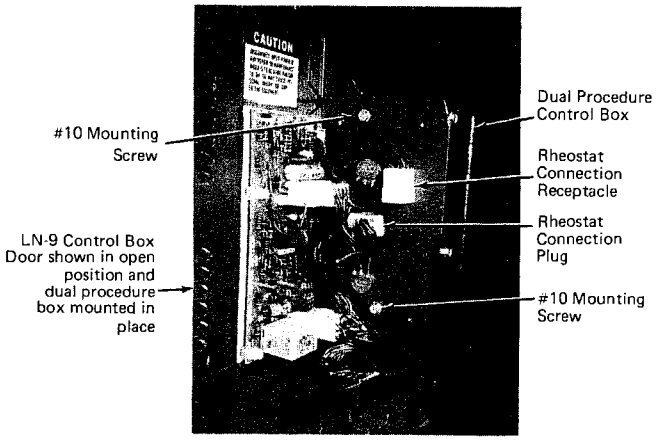
Maximum versatility is obtained when the wire feeder is connected to a DC-250, -400, or -600. When used with a SAM or R3S power source the voltage range between the two procedures required may be outside the range covered by the remote control and it would therefore be impossible to set the procedure without adjustment at the power source.

INSTALLATION

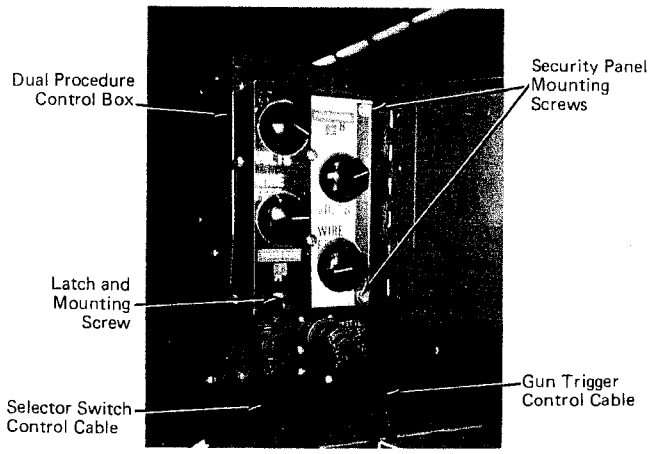


Installing dual procedure control box. Pictures show LN-9 control box.

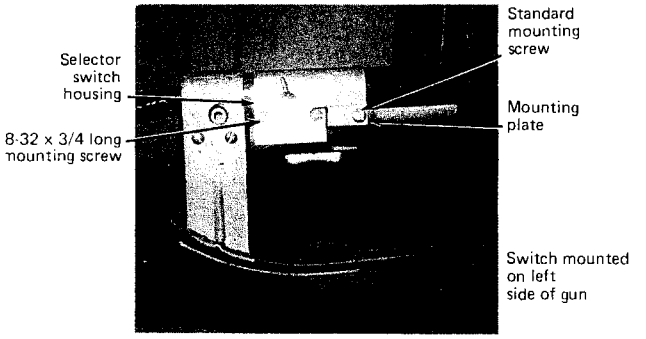
1. Turn off all input power, and remove security panel, nameplate and latch from LN-9.
2. Remove screws that hold the LN-9 control box door in place and open to expose back of rheostat panel shown below.
3. Fasten dual procedure control box to the rheostat panel with two #10 mounting screws supplied.

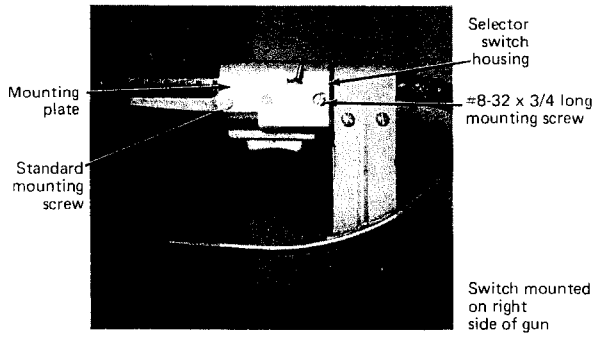


4. Remove rheostat connection plug from its receptacle and plug into dual procedure receptacle which is accessible through a hole in the LN-9 rheostat panel.
5. Close door and replace screws.
6. Fasten security panel and latch that was removed from LN-9 to dual procedure control box as shown below.
7. The selector switch can be mounted on either side of the gun handle. The unit is shipped for mounting on the left side of the gun and is best suited for operating gun with the right hand. If required to mount switch on the right side of the gun, first remove the mounting plate from the switch housing and reassemble the mounting plate to the back side of the switch housing. To mount the unit on the gun, remove the two trigger mounting screws from side of gun trigger and fasten the selector switch to gun as shown below. Use one of the standard screws and the #8-32 x 3/4 long screw provided as shown on the next page.



Sec. N3.5.3 (continued)



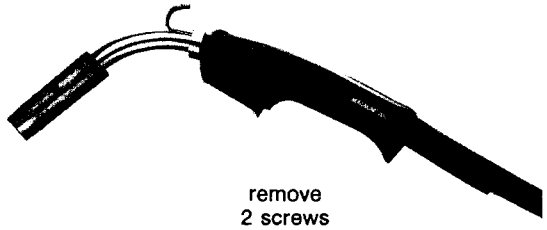


8. Tape selector switch control cable to gun cable as required. Check that the control cable is plugged into the dual procedure control box.

Magnum K470, K471 and K497 GMA Guns

Remove the two handle screws shown below. Fasten the switch mounting plate, that is sent loose, to the gun handle using the #10-24 x 1.25 and #6-32 x 1.00 screws sent with the kit. The mounting plate can be mounted on either side of the gun handle.

Remove the switch mounting plate that is attached to the switch. Fasten the switch to the mounting plate that was added to gun handle using the 8-32 x .25 screw removed from the switch and an #8-32 x .25 screw sent with the kit.



OPERATION

Set selector switch to position "1" and use "Procedure 1" dials on dual procedure kit to preset wire speed and voltage per standard LN-9 operation. Then set selector switch to position "2" and use "Procedure 2" dials on dual procedure kit to preset wire speed and voltage. Unit will now weld at settings for "Procedure 1" when switch is in position "1" or settings for "Procedure 2" when switch is in position "2".

TROUBLESHOOTING

Trouble	Cause and Remedy
1. Unit welds at one procedure only.	1. Defective selector switch or relay. Replace defective parts.

October 1991

Sec. N3.5.4

K422-1 PULSE POWER FEEDER CONVERSION KIT

(K422-2 for LN-9 model codes below 9100.)

Required for proper pulse welding operation with the Pulse Power 500 power source.

January 1989

Sec. N3.5.5

K392 POWER EXTENDED WIRE DRIVE

(For LN-9 model codes 8180 and higher.)

Permits extending gun and cable up to 80 feet from wire feeder.

January 1989

Sec. N3.5.6

K425 GAS SOLENOID KIT

(For LN-9 models above code 9131 except for LN-9F models.)

Mounts outside the wire drive section and connects to the 115V AC auxiliary power connections per the instructions (M15199) included with the kit.

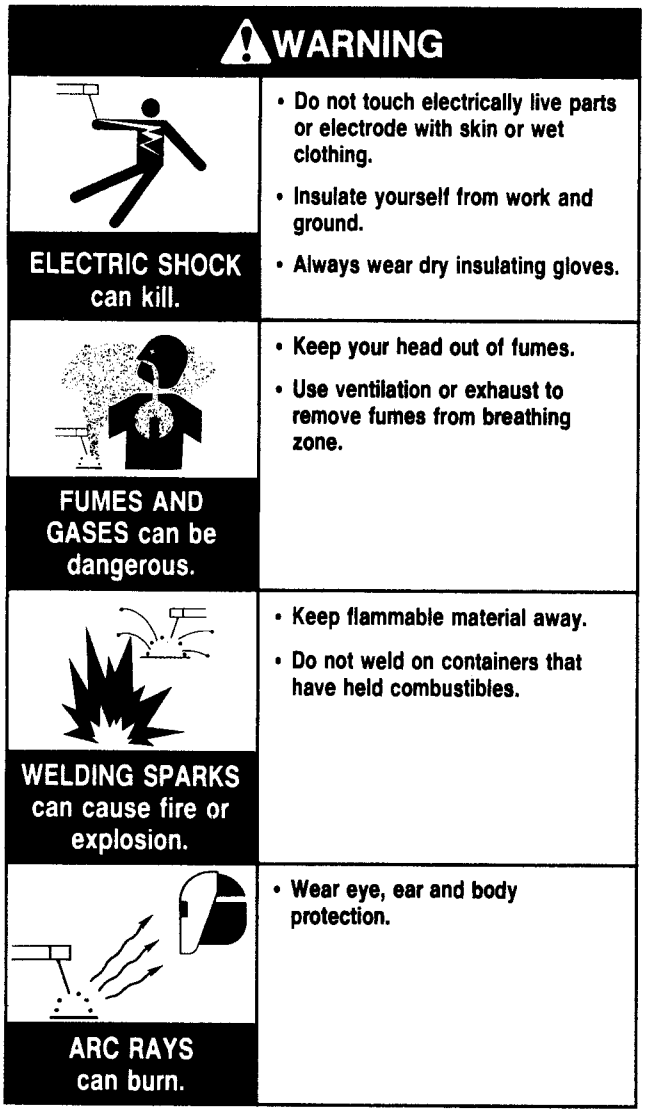
K437 GAS SOLENOID KIT.

(For all LN-9F models and LN-9 model codes below 9132.)

Mounts to the outside front of the feeder case and connects to 115V AC auxiliary power connections inside the feeder per the instructions (M15253) included in the kit.

January 1989

SEC. N4 — OPERATING INSTRUCTIONS



IMPORTANT SAFETY NOTE: This wire feeder provides "COLD" electrode when gun trigger is released. This feature and DC Constant Voltage output provide an added margin of safety when welding must be performed under electrically hazardous conditions such as:

- damp locations
- while wearing wet clothing
- on metal structures, or,
- in cramped positions (sitting, kneeling or lying) if there is a high risk of unavoidable or accidental contact with the workpiece or ground.

Sec. N4.4.1

WIRE REEL BRAKE (50-60 Pound Reel Mounting)

The mount for standard 50 and 60 pound electrode coils includes a two position brake assembly. Generally the brake should be at the inner position (nearest to the wire reel shaft) for wire feed speeds below 400 in./min (10 m/min). It should be at the outer position for faster wire speeds. To adjust the brake position, remove the wire reel. Pull the cotter pin that holds the brake shoe to the arm, move the shoe and replace the cotter pin. Do not bend the cotter pin — it is held in place by a friction fit.

October 1991

Sec. N4.4.2

DRIVE ROLL PRESSURE

See Sec. N2.2.2/N2.2.4, "Setting the Drive Roll Spring Pressure", for the correct procedure to set the idle roll spring pressure screw.

October 1991

Sec. N4.4.3

"CIRCUIT POLARITY" SWITCH

Set the switch to the same polarity as the electrode lead connection to the power source. If the switch is not set for the correct polarity the wire feeder will stop welding shortly after the arc is struck. (See Item F in Troubleshooting Section, N6.)

February 1980

Sec. N4.4.4

READING ARC VOLTAGE

Lincoln specified procedures give voltage readings taken between the work and the gun cable brass connection block of the LN-9. To match these voltage readings, the latest connection diagrams show the #21 lead of the LN-9 control cable being extended and connected directly to the work instead of #21 on the power source terminal strip, (or Dual Process Kit terminal strip). This extended lead *must* be connected *directly* to the work and when using a Dual Process Kit extended *individually* for each LN-9.

This extended #21 lead connection replaces the need for the "Direct Work Lead Jack" and the 15-foot direct work lead, both supplied with LN-9 models with Codes under 8200. Older unit installations which are not connected per the latest connection diagrams can be either reconnected or the 15-foot direct work lead plug can be inserted into the jack and its alligator clip connected directly to the work.

In early 1983, LN-9 models were provided with a quick-connect terminal splice connection in the #21 lead between the input amphenol connector of the LN-9 and its polarity switch (refer to the LN-9 wiring diagram). This in-line connection consists of a red insulated male and female .250 x .032 terminal pair located in the lead harness running up along the right side of the wire feed motor inside the control section of the LN-9 and LN-9H (obsolete) models, and in the lead harness at the inside lower left corner of the control box (near the input amphenol) of the LN-9F and LN-9FH (obsolete) models. If desired, by opening this #21 lead

Sec. N4.4.4 (continued)

connection, a user-provided direct work lead equipped with a .250 x .032 female quick-connect terminal can be connected to the male side of the #21 lead splice. This direct work lead connection must be tape insulated, strain-relieved, and routed outside the LN-9 control box and connected directly to the work.

With the use of either direct work lead connection method, the LN-9 regulates the output of the power source to hold the arc voltage constant even with voltage drop changes of the electrode lead, work lead, or work lead connection. Should the direct work lead be disconnected from the work, the LN-9 wire feeder will stop welding shortly after the arc is struck. (See Item F in Troubleshooting Section, N6.)

April 1987

Sec. N4.4.5a

"TRIGGER INTERLOCK" SWITCH (Below Code 7981)

With the "Trigger Interlock" switch "off", 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, release the trigger and lift the gun from the work.

With the "Trigger Interlock" switch "on", the operator holds the trigger until the arc is established, then the trigger can be released.

When the weld is completed, the operator raises the gun from the work to break the arc. This stops the wire feed and deenergizes the welding circuit.

February 1980

Sec. N4.4.5b

TRIGGER INTERLOCK AND "HOT"/"COLD" WIRE FEED SWITCH (Above Code 7980)

This three-position switch performs a dual function. In the center position the wire may be fed electrically cold. In the down position the wire is electrically hot when feeding and the trigger circuit is controlled only by the trigger. In the up position the wire is electrically hot when feeding and the trigger circuit remains energized once the arc is established (without holding the trigger) until the arc is broken.

February 1980

Sec. N4.4.5c

DIRECTION OF WIRE FEED SWITCH (Above Code 7980)

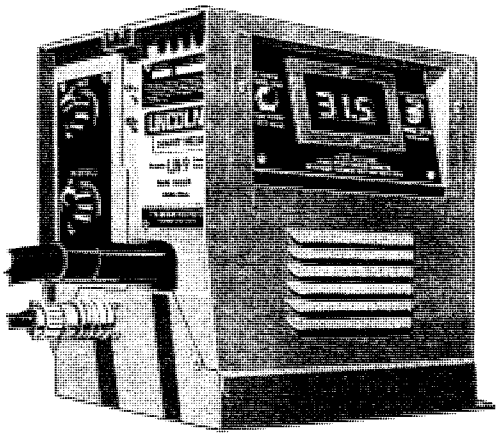
This switch enables the operator to feed the wire in either direction by pressing the gun trigger. If backing wire out, it is recommended that "cold" wire feed be used. (See Sec. N4.4.5b.)

February 1980

Sec. N4.4.6

DIGITAL METER

A three digit meter is provided to set and monitor the welding procedure. The arc voltage is displayed in volts, and the wire feed speed is displayed on Metric LN-9 models in either inches/minute or meters/minute.



December 1982

Sec. N4.4.7

"METER READING", SWITCH, "VOLTS" AND "WIRE SPEED" CONTROLS

The switch is located to the right of the digital meter on LN-9 and LN-9H (obsolete) models and to the left of the procedure control knobs on LN-9F and LN-9FH (obsolete) models.

LN-9 models below Code 8600 use a two-position toggle switch. When set to "Volts", the meter reads the arc voltage setting as adjusted by the "Volts" control on the LN-9. When set to "Wire Speed", the meter reads the wire feed speed in in/min as adjusted by the "Wire Speed" control on the LN-9.

Metric LN-9 models above Code 8600, use a four-position rotary selector switch. When set to the "Volts" position, the meter reads the arc voltage setting as adjusted by the "Volts" control. The three "Wire Speed" positions include an "English" position, for meter readings in inches/minute; and "LO" and "HI" range "Metric" positions, for meter readings in meters/minute. The wire feed speed setting is adjusted by the "Wire Speed" control on the LN-9. When using "Metric" meter readings, set the switch to "LO" for more precise meter readings up to 9.99 m/min (393 in/min.) For higher wire feed speeds, the "LO" position will result in an over-range meter readings of E.EE which indicates the "HI" range, with single decimal place resolution, should be used.

The procedure adjustments can be made before or during the weld. This feature permits the operator to set welding voltage and wire speed before welding and without assistance.

Sec. N4.4.7 (continued)

Once set, the control circuits of the LN-9 will continuously monitor the volts and wire speed and correct any deviation from the set value so there will be negligible change.

Should the range of the power source output voltage be such that the LN-9 circuit cannot keep the arc voltage as set, the LN-9 will stop welding shortly after the arc is struck. (See Item F in the Troubleshooting Section, N6.)

April 1987

Sec. N4.4.8

SET-ACTUAL PUSH BUTTON

After the weld has been started the ACTUAL voltage or wire speed can be read by pressing the Set-Actual push button. The "Meter Reading" switch must be set in the desired position. When the push button is not being operated the meter continues to read the SET value.

March 1979

Sec. N4.4.9

ELECTRODE "HOT"/"COLD" SWITCH (LN-9F, Code 7980 only). See N4.4.5b for Codes Above 7980.

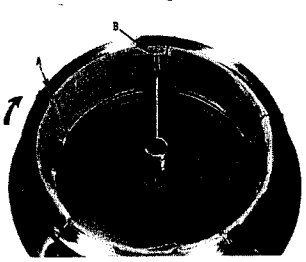
The switch permits feeding the wire electrically hot or electrically cold. When the switch is in the upper position and the trigger is pressed, the electrode will feed hot and when it contacts the work the welding will be initiated. When the switch is in the down position and the trigger is pressed, the electrode will be electrically cold and no arc can be established. The use of this switch permits the loading of the LN-9F with an electrically cold electrode.

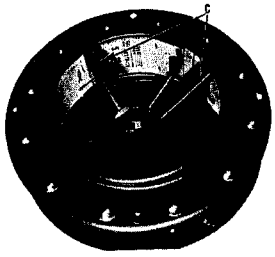
February 1982

Sec. N4.4.10

WIRE REEL LOADING (50 and 60 Pound Coils)

1. To remove the wire reel from its shaft, grasp the spring loaded knob and pull it 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.
3. Before cutting the tie wires place the coil of electrode on the reel so it unwinds as the reel rotates clockwise.
   a. Be sure the coil is placed so the spring loaded arms will not interfere with the later removal of the coil tie wires. (See photo.)





   b. When loading .030, .035, .045 and .052" solid wire or 1/16, 5/64, 3/32, 1/8, .045, .052" Outershield® wire, 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 needed for trouble free wire feeding. (See photo.)
   c. Put the cover plate on the reel so the four arms of the cover straddle and are in line with the spring loaded arms of the reel proper.
4. Tighten the cover as much as possible by hand. Do NOT hammer on the spinner nut arms.
5. 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.

   NOTE: 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 "backlashing" of the coil, which may tangle the wire. A tangled coil will not feed so it must either be untangled or discarded.
6. Replace the reel on the wire feeder. Grasp the shaft knob, pull it out and swing it across the reel hub.
7. Turn the reel until the free end of the electrode is accessible. While tightly holding the electrode, cut off the bent end.

   Straighten the first 6 inches and cut off the first inch. Insert the free end thru the incoming guide tube. Press the gun trigger and push the electrode into the drive roll. Inch the electrode thru the gun. (If the electrode is not properly straightened, it may not feed or may not enter the outgoing guide tube causing a "bird nest".)

WARNING: The electrode is "hot" to ground while inching with the gun trigger. NOTE: On Codes above 7980 the "Trigger Interlock and Hot/Cold Wire Feed Switch" should be in the center position. In this position the wire may be fed electrically cold.

January 1989

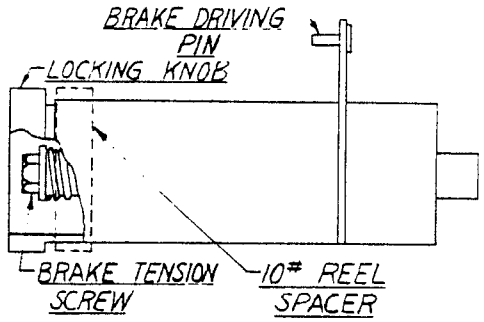
Sec. N4.4.11

WIRE REEL LOADING — Readi-Reels and 10 to 30 Pound Spools

To mount a 30 lb. Readi-Reel package, remove the locking collar and remove the outside Readi-Reel adapter arm. Engage the inside Readi-Reel adapter arm in the brake driving pin and rotate the spindle until the inside adapter arm is in the vertical position. Set the Readi-Reel on the adapter arm. The Readi-Reel must be installed so that it will rotate in a *clock-wise* direction when feeding (wire is dereeled from the bottom of the coil). The outside adapter arm is then placed on the spindle at an angle of 90° from

Sec. N4.4.11 (continued)

the inside adapter and the locking collar installed. Tighten the locking collar securely.



To mount 15 to 30 lb. spools, remove the locking collar and the Readi-Reel adapters from the 2 inch dia. spindle. Place the spool in the spindle making certain the brake driving pin enters one of the holes in the back side of the spool. Be certain the wire comes off the reel in *clock-wise* direction. Replace and tighten the locking collar. When 8" O.D. spools are used, place the K468 spindle adapter on the spindle between the brake driving pin and the spool.

To feed the electrode, turn the Readi-Reel or spool until the free end of the electrode is accessible. While tightly holding the electrode, cut off the bent end. Straighten the first six inches and cut off the first inch. Insert the free end through the incoming guide tube. Press the gun trigger and push the electrode through the gun. (If the electrode is not properly straightened, it may not feed or may not go into the outgoing guide tube causing a "bird nest".) Adjust the brake tension with the hex head screw or thumb screw on the spindle hub until the reel turns freely but with little or no overrun when wire feeding is stopped.

WARNING: The electrode is "hot" to ground while inching with the gun trigger. NOTE: On Codes above 7980 the "Trigger Interlock and Hot/Cold Wire Feed Switch" should be in the center position. In this position the wire may be fed electrically cold.

In order to use the new 30 pound Readi-Reel electrode package, a K363-P adapter is used in conjunction with the K162-H Spindle Kit. The K363-P consists of a one piece, lightweight, reusable molded plastic adapter. It is held by securely tightening the K162-H retaining collar.

The Readi-Reel plus the K363-P adapter can also be used on other 2 inch diameter shafts capable of using 30 pound spooled wire.

An S17712 Installation Instruction is shipped with the kit.

WARNING: The electrode is "hot" to ground while inching with the gun trigger. NOTE: On Codes above 7980 the "Trigger Interlock and Hot/Cold Wire Feed Switch" should be in the center position. In this position the wire may be fed electrically cold.

Sec. N4.4.12

THREADING ELECTRODE INTO MACHINE

1. **When using Models -N and -S**

   Turn the reel until the free end of the electrode is accessible. While tightly holding the electrode, cut off the bent end. Straighten the first six inches and insert the free end through the incoming guide tube. Press the gun trigger and push the electrode into the drive roll. Inch the electrode through the gun. (If the electrode is not properly straightened, it may not feed or may not go into the outgoing guide tube causing a "bird nest".)

   After the wire picks up, inch the electrode out through the gun cable and gun assembly.

WARNING: The electrode and drive mechanism are "hot" to ground while inching with the gun trigger. NOTE: On Codes above 7980 the "Trigger Interlock and Hot/Cold Wire Feed Switch" should be in the center position. In this position the wire may be fed electrically cold.

2. **When using the extension assembly (Models -NE and -SE)**

   Slide the ingoing guide tube of the hand crank to the forward position.

   Remove start end of coil from hole in wire reel cover; straighten the first six inches or so of the wire and then insert this end in the ingoing guide tube. Push a foot or so of wire through.

   Now pull the ingoing guide tube back to the rear position and rotate it 90° so that it will remain in this position during the cranking operation.

   Pull the plastic hand crank handle to the "out" position in the arm.

   Pull the shaft and drive roll assembly to the "out" position with the left hand.

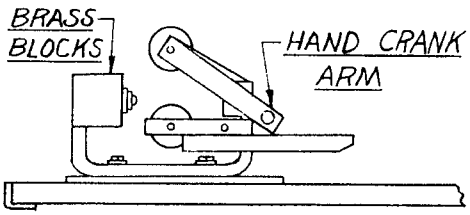
   Apply a downward pressure to the idler roll pressure arm with the right hand. Maintain this pressure and start cranking the wire through the system. Keep the conductor cable as straight as possible during the loading operation. This will make it much easier to crank the wire through. Crank until the wire touches the drive rolls, operate the gun trigger and feed the wire through the cable and gun assembly.

WARNING: The electrode is "hot" to ground while inching with the gun trigger. NOTE: On Codes above 7980 the "Trigger Interlock and Hot/Cold Wire Feed Switch" should be in the center position. In this position the wire may be fed electrically cold.

Push the plastic of the hand crank to the "in" position and shift the ingoing guide tube to the forward position.

Sec. N4.4.12 (continued)

The proper position for the hand crank arm, when it is not being used, is shown in the sketch below.



April 1987

Sec. N4.4.13

FLUX TANK LOADING

1. **Flux Tank (Optional)**

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 through the holes in the side of the cap. After pressure has been released, remove cap from the tank. Using the funnel provided, put 100 pounds of flux into 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 vibrated screen having .065 – .075 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 line to the tank.

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.

2. **K310 Flux Screen (Optional)**

The unit was designed to fit the top of either the standard fill funnel of a continuous flux feed system or a K58 magnetic separator. The unit has a steel screen with .065 to .075 openings and an air vibrator attached to the frame. The vibrator can be used with air line pressure ranging from 20 thru 100 psi, (138 thru 689 kPa).

For ease of handling, the user should connect the incoming air line to the 1/8" (3.2 mm) pipe elbow with the aid of a fast disconnect type air coupling.

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

3. **Magnetic Separator (Optional)**

The K58 is a permanent magnet type of separator designed to fit the top of the standard fill funnel of the continuous flux feed system.

The purpose of the separator is to remove magnetic materials such as mill scale and any other extraneous magnetic materials which may have been recovered along with the flux to be processed.

It is important to remove these magnetic particles from the flux which is to be reused in the continuous flux feeding system. If the magnetic material is not removed it will gather around the nozzle of the gun and impede or shut off the flux flow when making relatively long welds or welding continuously. The magnetic particles can also cause porosity in the weld.

Fit the magnetic separator into the funnel or hopper. Pour the flux to be reclaimed into the top pan of the separator.

The separator is designed so the flux flows around three permanent magnets. The magnets remove all magnetic particles. When the magnets become covered with their full load, they automatically stop the flux flow. When the flux flow stops, remove the separator from the funnel or hopper. Turn it over and open the panel that covers the magnets.

Remove the magnetic particles with brushing or an air blast. Be careful to protect yourself and others in the area from flying particles.

The magnetic separator is used with all Lincoln mild steel fluxes – 760, 761, 780, 781, 801, 860, 882, 880, 880M and 990. Do not use the magnetic separator with any stainless steel, alloy, or hardfacing flux except H-535. The magnetic separator removes some of the alloying elements from these fluxes thus changing their characteristics.

April 1987

Sec. N4.4.14

MAKING TEST WELDS

(See appropriate connection diagram for wire feeder and power source adjustments.)

Adjusting the LN-9 controls:

a. Set the LN-9 electrode polarity switch to same polarity as the electrode lead.

b. Connect the "Direct Work Lead" if it is going to be used.

c. Set the "Trigger Interlock" switch as desired.

d. Set the "Meter Reading" switch to "Wire Speed" and adjust the "Wire Speed" rheostat so the meter reads the desired wire feed speed.

e. Set the "Meter Reading" switch to "Volts" and adjust the "Volts" rheostat so the meter reads the desired arc voltage.

IMPORTANT: Make certain this setting is within the voltage output range of the power source setting.

f. Load the LN-9 with electrode per Sec. N4.4.10 through N4.4.12.

Sec. N4.4.14 (continued)

g. Set up a piece of scrap steel with properly connected "work" lead. Inch the electrode so it extends 1/2 – 3/4" (12.7–19.0 mm) beyond the end of the gun for starting.

h. Hold the gun with the electrode **lightly** touching the work. Do not push the wire into the work. Press the trigger to start welding.

i. At the end of the weld release the trigger and lift gun from the work after the arc goes out.

October 1991

Sec. N4.4.15
(File as Sec. K3.2.3 in IM-274)

MAKING SUBMERGED ARC WELDS

Gun Operating Positions: K114 Squirtgun

The K114 Squirtgun is used either with or without the mechanized hand travel unit (K110). With the LN-6, LN-8 and LN-9 a K161 "Mechanized Travel Power Pack" must be installed when using the K110. Since the travel unit assures uniform travel at the maximum usable speed and reduces the tendency to waver off the seam, it is recommended for most applications. The following photographs show suggested gun positions to produce the best welds in the least time. For proper flux feeding these same positions should be maintained when the gun is hand held and the mechanized travel is not used.

Figure 1 and Figure 2

Travel Unit Adjusting

Loosen the motor mounting wing nut to adjust the travel unit (Figure 1). Move the travel unit up and down or around the gun nozzle to suit different welding applications (Figure 2). Pull the motor controlled plug out to remove the travel unit from the gun.

Flux Depth

The depth of the flux pile is controlled by the gun height. Gun height is measured from the lower tip of the nozzle flux cone to the plate. Proper gun height is the height at which a minimum of flux is used without excessive arcing. As a general rule the required gun height increases as the travel speed decreases and the voltage and current increase.

On some fillet welds a drag technique without the travel unit is used. In this instance the amount of flux is controlled by the internal diameter of the nozzle flux cone. For sufficient flux on some applications, use the nozzle flux cones with larger I.D.

Travel Speed

Set the speed of travel with the rheostat on the mechanized travel unit. Speed range is 7 to 60 inches per minute (0.2 to 1.5 m/min), but will vary with AC input variations. Operate the toggle switch on the unit to change direction of travel.

The K161 Power Pack has a pod which is mounted to the front of the LN-8 and LN-9. To set an exact travel speed turn the switch on the pod (or the 'Weld Travel Only' switch on LN-4 or ML-3 machines) to "on" (or to 'Travel Only'). This turns the travel motor on without energizing the welding circuit. Adjust the speed dial until you have the exact speed set. Return this switch to the "off" position and you are ready to weld. **NOTICE**: Be sure this switch is set on "off" when plugging in the travel motor or conductor cables.

Figure 3

Butt Weld — Arrow shows direction of travel.

Position the gun over the seam so the electrode feeds directly into the seam and the gun nozzle is perpendicular to the plate. Swing the gun handle horizontally to a comfortable position for welding. Be sure the travel drive wheel is parallel to the seam.

Operate the gun trigger to open the flux valve, start the travel and start the arc.

Guide the gun with two hands. Place one hand on the gun to steady it. Place the other hand on the cables just back of the gun handle. When making the weld, lean the gun slightly forward into the direction of travel. Let the weight rest on the drive roll. Let the travel unit do the work.

Figure 4 and Figure 5

Horizontal Fillet Weld — Arrow shows direction of travel.

Position the gun so the electrode feeds directly into the corner of the seam. Do this with the electrode sticking out and the flux valve closed. This position is usually obtained when the gun handle is approximately perpendicular to the vertical plate. Once the correct angle is established, guiding is accomplished by keeping the flux cone lightly in contact with the vertical plate. Be sure the travel guide wheel is parallel to the seam.

Operate the gun trigger to open the flux valve, start the travel and start the arc.

Guide the gun with two hands. Place one hand on the gun to steady it. Press down lightly with this hand to increase the weight on the drive roll. Place the other hand on the cables just back of the gun handle. When making the weld, lean the gun slightly forward into the direction of travel. Let the weight rest on the drive roll. Let the travel unit do the work.

Figure 6

Horizontal Lap Weld — Arrow shows direction of travel

The above horizontal fillet weld instructions also apply in making horizontal lap welds. However, since there is no vertical plate to lightly hold the cone against, keeping the proper electrode angle must be done by eye.

Sec. N.4.4.15 (continued)

Figure 7

Positioned Fillet Weld

Attach the positioned fillet adapter. Rotate the travel unit and adapter so the drive wheel rides in the seam ahead of the weld. Position the gun with the gun nozzle perpendicular to the seam. Guide the gun with two hands. Tilt it slightly forward in the direction of travel when making the weld.

November 1990

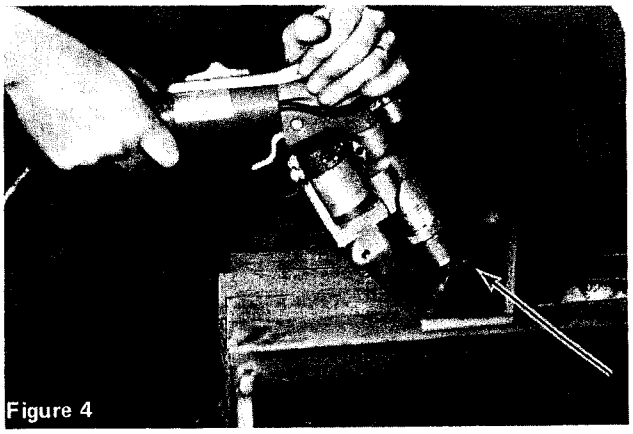


Figure 4


Figure 5

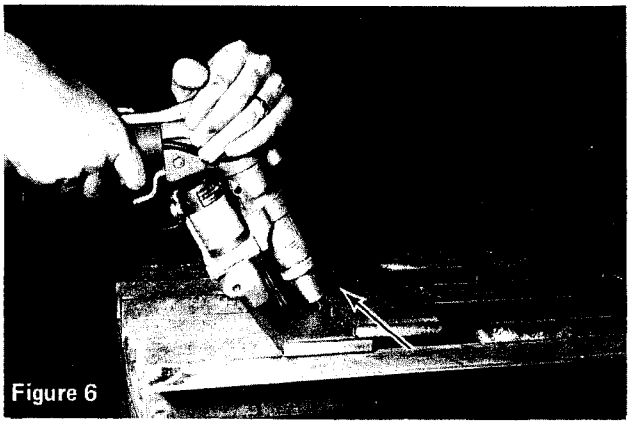
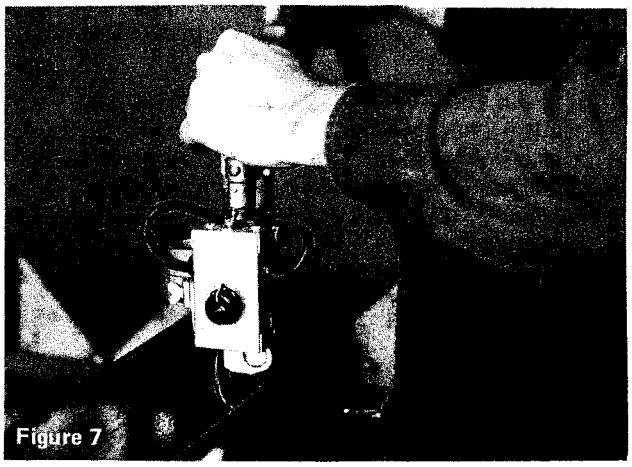


Figure 6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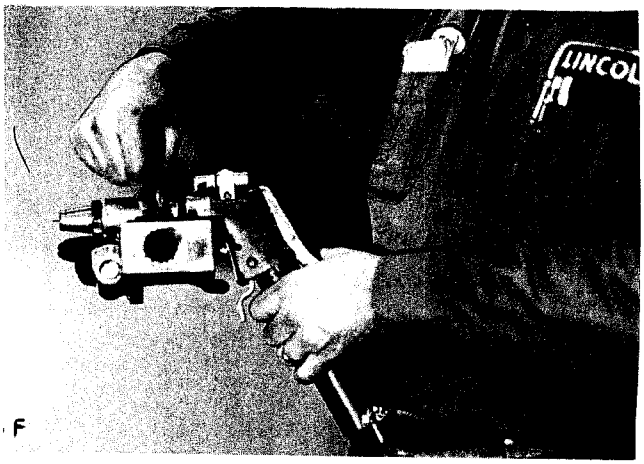
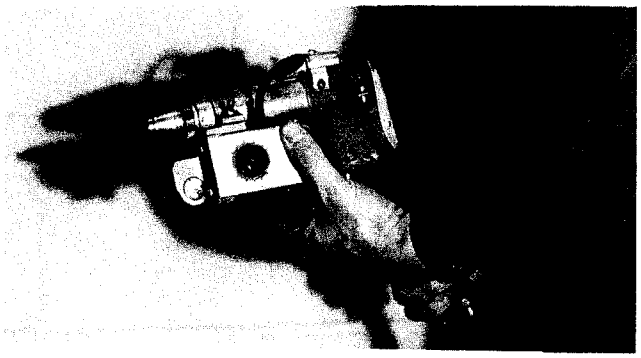


F



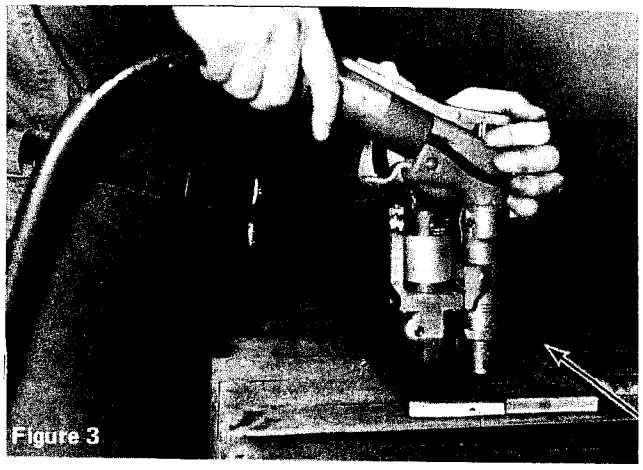


Figure 3

The Lincoln Electric Company
Cleveland, Ohio 44117-1199

(File as Sec. K3.2.4 in IM-274)

FILLET GUIDE (OPTIONAL): K70

The Fillet Guide is designed to help guide Squirtgun K114 so the operator can make more uniform horizontal fillet welds with less effort. It consists of a vertical plate roller guide and a 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 nor carefully watch the angle of the gun.

1. **Installation: Squirtgun K114**

Fit the vertical plate roller guide directly on the gun nozzle.

Clamp the rear wheel to the gun as shown in the sketches. Use of the rear wheel requires a riding surface under the handle 7 to 11 inches (180 to 280 mm) from the vertical plate. Exact location of the rear wheel is not critical. However, the greater distance provides better stability and ease of operation. Even if the horizontal surface is not available, using the roller guide without the rear wheel still aids in making fillet welds.

If the nozzle extension used with long stickout procedures is installed, replace item 15 with the long guide roll arm, item 16. This is shipped loose with the fillet guide kit.

2. **Operation**

After the Fillet Guide is installed with the rear wheel placed as required for the application (see "Installation"), proceed as follows:

a. Position the travel unit so the nozzle flux cone is at the right height to deposit enough flux to cover the arc.

b. Inch the electrode out so the point will just miss touching the plate when the gun is held in the proper position for welding. The electrode end should slightly favor the horizontal plate. The nozzle flux cone should miss the vertical plate by about 1/32" (0.8 mm). The gun handle must be 90° to the vertical plate when looking down from above. Be certain the electrode has not been bent when making these adjustments.

c. Hold the gun in proper position for welding. Lower the rear wheel until it touches the horizontal plate. Lock it into position. The adjustment range of the rear wheel can be increased by moving the wheel from position "A" to "B". If using the nozzle extensions for long stickout procedures, replace item 15 with the long guide roll arm, item 16.

d. Slip the roller guide down until the two small rollers touch the vertical plate. Lock it in position. The nozzle flux cone should never drag on the vertical plate when welding. The roller guides and rear wheel should be parallel to the travel unit drive wheel.

If the fillet angle varies from one weld to another, readjustment of the roller guide may be necessary. For example, assume the Fillet Guide was adjusted for an angle of 90°. If the fillet angle of the next weld is 95°, the cone may drag on the vertical plate. Readjust the roller guide.

e. Recheck the electrode alignment after tightening the guides and before making the welds. When welding, apply slight pressure down and forward on the gun. This insures contact of guide wheels and the drive wheel with the plates.

Sec. N4.4.15 (continued)

P-165 — K-110 Mechanized Hand Travel Unit

FIGURE 1 600 A. Gun Without Extended Stickout

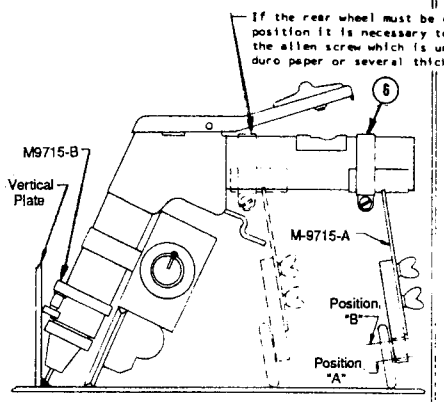
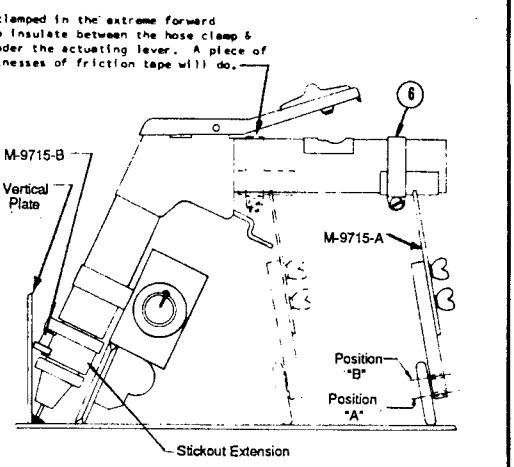


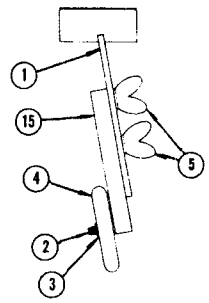
FIGURE 2 600 A. Gun With Extended Stickout



Parts List P-165

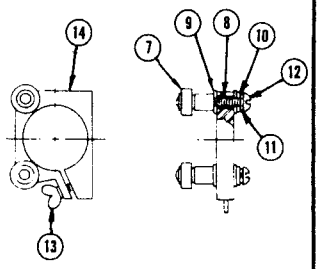
Item	Part No.	Description	Req.
1	T-11690	Wheel Holder Asbly.	1
2	T-9447-22	Socket Hd. Screw	1
3	T-8892	Guide Roller	1
4	T-11692	Rubber Tire	1
5	T-9078-1	Wing Screw	2
6	S-10888-16	Clamp	1
7	T-11695	Guide Roll Asbly.	2
8	T-6675-2	Insulating Tube	2
9	S-10773-35	Insulating Washer	4
10	S-9262-22	Flat Washer	2
11	E-106-A-1	Lockwasher	2
12	#10-24 x 7/8	Round Head Screw	2
13	T-9078-3	Wing Screw	1
14	S-11867	Guide Roll Holder	1
15	T-11688	Short Guide Roll Arm	1
16	T-11688-1	Long Guide Roll Arm	1
17	S-11865	Adapter Ring	1

M-9715-A Rear Wheel Assembly



* Replace item 15 with item 16 when using any stickout extension.

M-9715-B Guide Wheel Assembly



March 1979

Sec. N4.4.16

PROCEDURE AT END OF COIL

When the wire on the reel is used up, the following procedure is to be followed for removing the old wire from the conductor cable and loading a new reel:

1. *Cut* the end of the electrode off at the gun end. Do not break it off by hand since this puts a slight bend in the wire and makes it difficult or impossible to pull it back through the nozzle.
2. Uncouple the gun conductor cable from the LN-9.
3. Lay the cable out straight.
4. Using pliers to grip the wire, pull it out of the cable from the connector end. Do not pull it from the gun end.
5. Put the conductor cable back on the wire drive unit after the electrode has been removed.
6. Load a new reel of wire and feed it through the cable as described in the section on "Loading Machine with Electrode".

March 1979

Sec. N4.4.17

STARTING CHARACTERISTICS

ACCELERATION SETTING:

The LN-9 has the capability of optimum starting for different processes. This is accomplished by designing the LN-9 to start with two different speeds of controlled acceleration. As shipped, the unit is connected for fast acceleration which is the best for most situations except when using long electrical stickouts.

If the electrode being used does not give satisfactory starting because of stubbing or "blasting off", a slower acceleration can be obtained by modifying the LN-9 as follows:

1. Turn off the control power to the LN-9 at the power source.
2. Remove the screws holding the LN-9 control section cover in place and swing open.
3. Move the jumper plug on the control P.C. board from pin "F" to pin "S".
4. Reassemble.

Sec. N4.4.17 (continued)

START VOLTAGE TRIM:

The start voltage is the voltage provided by the welding power source before establishing the welding arc. This start voltage setting is a function of the open circuit voltage characteristic of the power source, the SET value of the weld voltage, and the start voltage trimmer (R41) setting on the LN-9 Voltage PC Board. As set at the factory, the start voltage trim level is typically about 20% higher than the LN-9 SET level. This generally gives good starting for steel cored and MIG processes using CO2 or Argon/CO2 blended shielding gas. If you are using "hotter" gases (such as Argon/Oxygen blends) and other processes (such as stainless steel MIG), arc flaring may occur at start, which required lowering the start voltage trim as follows:

a) Turn off the control power to the LN-9 at the power source.

b) Remove the screws holding the control section cover in place and swing it open.

c. On the voltage board, locate trimmer R41 (below R40 next to the 1/8 amp fuse) and labeled START.

d) The slot on the START trimmer is marked with a red seal for factory setting. To decrease the factory setting, turn the slot CCW (opposite to the labeled arrow direction).

NOTE: If the start trim is set too low, stubbing may occur at start, requiring increasing the START trimmer by turning the slot CW (in the direction of the labeled arrow).

e) Re-assemble.

August 1996

Sec. N4.4.18

VOLTAGE CONTROL RESPONSE

The LN-9 is provided with a pre-selected voltage control response. Proper setting depends on the power source and process being used. Refer to the appropriate power source connection diagram for the proper connection of the jumpers located on the LN-9 Voltage Board and Start Board (used on earlier models).

To change the voltage control response:

1. Turn off the control power to the LN-9 at the power source.
2. Remove the screws holding the left hand control section cover in place and swing open.
3. Position the jumper plugs on the Voltage Board[1] and the Start Board (used on earlier models) per the appropriate power source connection diagram.
4. Reassemble.

[1] In an LN-9F and -9FH (obsolete) the Voltage Board is mounted on the right hand wall of the control box. This places pins "S" and "F" **behind** the upper molex plug and out of sight of the viewer. When moving this jumper be sure to remember that "S" is the top pin and "F" is the bottom pin.

January 1989

Sec. N4.4.19

SECURITY OF WELD PROCEDURE SETTINGS

There are two means provided to prevent or limit unauthorized readjustment of the LN-9 voltage and wire feed speed controls once set to the desired procedure.

Once the procedure is set, the security panel of the LN-9 can be locked to prevent access to the control knobs.
The control range of the procedure control knobs can be limited to either about 3% or about 15% of the full range control by installing a knob rotation stop screw to either or both of the control knobs. This stop screw is installed in the following manner.

1. Turn off the input power to the LN-9.
2. Loosen the knob set screw and remove the control knob and the felt seal located behind the knob.
3. Remove the control potentiometer locknut and fiber spacer, then open the control panel and remove the potentiometer from the panel.
4. Install a 1/2" long, pan or round head #4 metal screw into the .10" dia. hole located .40" from the center of the potentiometer hole so the head is on the backside of the panel (inside the control box).
5. Remount the control potentiometer with the fiber spacer under the locknut, then close and secure the control panel.
6. Replace the felt seal around the fiber spacer so the #4 screw protrudes between the fiber spacer and the felt seal.
7. Turn on the LN-9 input power and set the desired procedure by rotating the potentiometer shaft.
8. Carefully replace the control knob so the #4 screw inserts into the center of the shorter length channel on the back of the knob for about 3% of the total range of control or the center of the longer length channel for about 15% of the total range of control.
9. With finger pressure on the knob against the felt seal carefully retighten the knob set screw.

NOTE: Steps 7 thru 9 will have to be repeated if it is desired to change the set procedure to a value outside the selected 3% or 15% control range limit.

February 1982

SEC. N5 — GENERAL MAINTENANCE

⚠ WARNING

- Do not operate with covers removed.
- Turn off power source before installing or servicing.
- Do not touch electrically hot parts.
- Turn the input power to the welding power source off at the fuse box before working in the terminal strip.

ELECTRIC SHOCK can kill.

- Keep away from moving parts.

MOVING PARTS can injure.

- Only qualified personnel should install, use or service this equipment.

Sec. N5.5.1

DRIVE ROLLS AND GUIDE TUBES

After every coil of wire, inspect the drive rolls and guide tubes and clean as necessary. The drive rolls can be brushed with a wire brush. Do not use a solvent on the outside drive roll as it may wash the lubricant out of the drive roll bearing.

The drive rolls and guide tubes are stamped with the wire size range for which they are designed. If a wire size other than that stamped on the drive roll is to be used, the drive rolls and guide tubes have to be changed.

- The inner drive rolls using the knurled "V-Groove" design wire have a double set of teeth so they can be reversed for additional life. Between the two knurled rolls, for .068 thru .120", is a shim washer which limits the damage to the wire to a minimum should wire feeding problems occur. When drive rolls are interchanged, leave the three socket head screws of the roll assembly loose until it is re-assembled on the drive shaft. Then tighten all three. **Be sure the roll faces and spacer faces are thoroughly cleaned before re-assembly.**

- Drive rolls for 1/16" and smaller solid wire using the smooth "V-Groove" design, have no teeth. They are not reversible.

October 1991

Sec. N5.5.2

WIRE DRIVE MOTOR AND GEAR BOX

Every year examine the gear box. Paint the gear teeth with moly-disulfide filled grease (Lincoln Spec. E2322), such as Non Fluid Oil Corp. A29 Special/MS. *Do not* use graphite grease.

Check the motor brushes. Replace if they are worn down to 1/4" or less. When ordering feed motor brushes, give all information from the motor nameplate.

November 1979

Sec. N5.5.3

WIRE REEL ASSEMBLY (For 50 and 60 Pound Coils)

To prolong its life, periodically coat the reel shaft with a thin layer of grease. No maintenance on the brake assembly is required. If the brake shoe wears through to metal, replace the brake assembly.

March 1979

Sec. N5.5.4

CONTROL BOX

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

A spatter-resistant shield protects the digital meter. This shield must always be installed. Should it get broken, replace it by removing the two screws securing its frame and install a new clear spatter resistant standard headshield cover plate.

April 1987

Sec. N5.5.5

AUTOMATIC FLUX FEEDING SYSTEM

The only maintenance required on the flux feeding system is cleaning the water and sludge trap sump. Do every six months or whenever air no longer escapes from the coiled tube under the flux tank.

To clean: Turn off the incoming air and release the tank pressure; remove the coiled aluminum tubing from the bottom of the filter unit. Remove the pinched copper end piece from the end of the aluminum tube. Wash all the material out of the aluminum tube. Clean out the short pinched section; this should have a gap of between .005-.050 to allow a small amount of air to escape when the equipment is being used. If this end piece is badly corroded, replace it with a new end piece.

Loosen the collar on the 2-1/8 inch steel filter tube and take the filter tube off the machine. Wash out completely. Fit steel tube back into its bracket and attach the aluminum tube to its bottom. Fill steel tube to within two inches of the top with any clean Lincoln submerged arc welding flux.

Raise the steel tube into place and tighten the collar. When the air pressure is turned on again, part of the flux in the steel tube will be forced into the coiled tube. Be certain a small amount of air is escaping from the pinched end of the copper tube.

March 1979

Sec. N5.5.6e

HAND TRAVEL UNIT (K110)

Check the lubrication in the gear box every three months. If the motor worm and its worm gear appear dry, wipe a thin coating of a good non-fluid grease (equivalent to Clark Oil Co. Sea Gull Speed Reducer Lubricant) on each. Do not add too much or the motor will be overloaded. Lubrication for this first reduction must be by spatter and drip, not by running in a pool of grease.

Once each year flush out the gear box and relubricate. To do this remove both the output shaft assembly and the motor assembly. Flush the box with a good solvent. Force fresh grease in through the output shaft opening. Do not put grease through the motor mounting side. Use about 0.6 of a cubic inch of grease. This is a pad 1/2 inch (12.7 mm) in diameter by 3 inches (76.2 mm) long. Replace the output shaft assembly. With a wire or screwdriver work the grease around the input worm gear to apply a thin coat of grease to this gear. Replace the motor assembly.

Check the travel motor brushes every three months.

March 1979

Sec. N5.5.7

CIRCUIT PROTECTION AND AUTOMATIC SHUTDOWN

1. **Circuit Breaker**

   The circuit breaker located on the front of the LN-9 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. When the circuit breaker is tripped, the digital meter is off and the trigger circuit will not operate.

2. **Motor Thermal Protection**

   The temperature sensing thermal protector mounted in the motor opens the control circuit if 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 removing supply power to the LN-9 and also by cooling the motor with an air hose or fan. When the protector is tripped the digital meter is lit but there will be zero reading. The trigger circuit will not operate.

3. **Field Circuit Fuse**

   The fuse on the P.C. board inside the control box protects the motor field circuit.

   When the fuse is blown the digital meter is off and the trigger circuit will not operate.

4. **Grounding Lead Protector**

   The frame of the LN-9 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.

   If such a grounding lead fault occurs the meter will still be on and will be reading. However, the trigger circuit will not operate. To reset the circuit press the "G.L.P. Reset" button.

5. **Voltage P.C. Board Fuse** (Not included on boards built prior to 1983)

   The 1/8 amp fast-blow fuse protects the LN-9 circuitry from damage which may result from a ground, or case, faulted control lead. If this fuse blows, the LN-9 arc voltage sensing lead circuit will be opened (see Section 6.e. below), and the LN-9 Troubleshooting Guide should be consulted to detect and clear the fault.

6. **Automatic Shutdown**

   If the LN-9 voltage control is unable to supply the "SET" value of arc voltage while welding, the automatic shutdown circuit will activate. This protection circuit immediately returns the LN-9 control to idle state within a few seconds after the arc voltage discrepancy occurs.

   Typical causes for the activation of this protective shutdown circuit are as follows:

   a. "SET" value of arc voltage is outside the power source range (see "Out-of-Range Shutdown" in Sec. N6.6.2).

   b. Power source voltage control not set for "Remote".

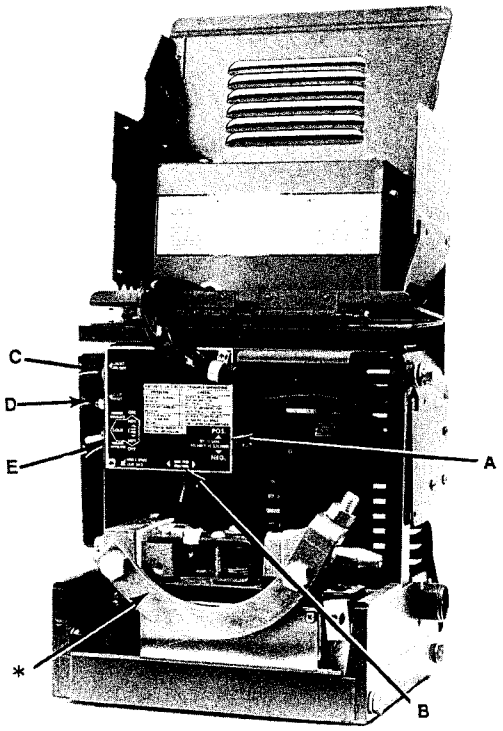
   c. Misconnection of LN-9 control cable leads to power source.

   d. Incorrect weld polarity connections, or settings, at LN-9 or power source.

   e. Lost connection of LN-9 voltage sensing leads (#67 and #21) between arc and voltage control or a blown 1/8A fuse on Voltage P.C. boards built since early 1983.

   In the case of full range control power sources, such as the DC-600, this protective shutdown circuit could prevent welding under the conditions of (c), (d), and (e) above by holding the power source output at minimum, possibly providing too low of a power source output to even establish an arc.

Sec. N5.5.7 (continued)



A. Circuit Polarity Switch.
B. Direction of Wire Feed Switch.
C. Circuit Breaker.
D. G.L.P. Reset.
E. Trigger Interlock and Hot/Cold Wire Feed Switch.

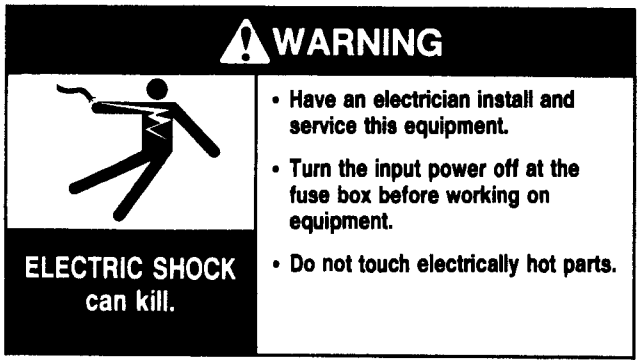
*Strap design has changed in later models.

Avoiding Shutdown by the Grounding Lead Protector Being Activated

1. Do not allow the electrode to contact the case of the wire feeder or uninsulated part of its wire reel stand when the gun trigger is activated.
2. Be sure that all work lead connections to the work make tight metal-to-metal electrical contact.
3. Do not allow excess electrode cable or work cable that is coiled up to be placed closer than three feet to the wire feeder. The magnetic field that is generated by welding current going through the coiled cable can falsely activate the G.L.P.

April 1987

SEC. N6 — MAINTENANCE OF GUN AND CABLE ASSEMBLIES



A. SUBMERGED ARC GUNS

Sec. N6.2.1

DISASSEMBLY OF SUBMERGED ARC SQUIRTGUNS K113 AND K112

To remove the nozzle from the gun, loosen the socket head screw in the gun handle and pull the nozzle straight out. To reinstall, insert the nozzle into the gun handle. Push it in as far as possible and tighten the socket head screw.

To disassemble the switch housing from these guns, remove the four screws holding the saddle around the gun handle. Then hold the switch housing with the cable toward the floor and look into the switch cavity. The tight side of the larger roll pins is to the right. Drive these pins to the left. They can be easily removed when they clear the right side of the casting. Do not remove the smaller roll pins unless the trigger is being replaced. The height of the Z spring controls the operating point of the switch with respect to the trigger movement. Set the spring so the switch operates at about the midpoint of the trigger travel.

To remove the handle from the cable, slip the spatter shield out of the front of the handle. Remove the snap ring from the cable connector and the handle can then be slipped off the cable.

Sec. N6.2.2

DISASSEMBLY OF SUBMERGED ARC SQUIRTGUN K114

Remove the cable from the wire feeder. To disassemble the gun from the conductor cable proceed as follows (refer to Sec. N7.2, page E):

1. Be sure the air is off and the pressure is released from the tank.
2. If the gun still has filler wire in it, clip the end of wire and back the wire out of the gun.
3. Loosen the screw holding the travel receptacle clamp (item 8). (Do not remove the nut from the screw.) This will allow the clamp and the travel plug to swing free.
4. Loosen the electrical connection clamping screw (item 33).
5. With the trigger bar (item 10) in the off position, grasp the gun tube (item 5) in one hand and the cable handle (item 28) in the other. Pull the two units apart using a slight back and forth motion.

To disassemble the gun proceed as follows:

1. Using a pair of needle nose pliers, lift the end of the spring (item 9) out of the hole in the trigger bar (item 10).
2. Loosen the gun tube clamping screw (item 3), and remove the gun tube. A slight back and forth twisting action will help.
3. Remove both the screws (item 21) which hold the two plastic halves together. After these screws have been removed, the left and right gun mounts (items 6 and 11) can be separated and the remaining parts, the nozzle (item 4), gun hanger (item 18), and the flux tube assembly (item 7) can be removed.

To disassemble the gun handle from the cable proceed as follows:

1. Remove the flux hose from the gun.
2. To remove the flux tube (item 29) take out the two flat head screws (item 32). The flux tube (item 29) can then be removed by pulling it straight back. Be careful not to damage the ends of the tube.
3. To remove the cable (item 31) from the handle, take the snap ring (item 34) off the end of the brass connector. With the clamping screw (item 33) loose, the cable (item 31) can then be pulled back out of the handle.
4. To remove the switch, remove the three round head screws (item 37). This will allow the switch mounting plate (item 36) to be removed from the fiber handle. Remove the two small screws (item 40) which hold the switch to the plate. The leads that go to the switch can then be unsoldered.
5. To remove the clamping ring (item 26) from the handle, remove the screw (item 35) and tighten the clamp screw (item 33). The clamping ring may then be removed from the handle.

To reassemble the unit, follow this procedure in reverse.

When finished with the reassembly, make certain that the electrical connection locking screw (item 33) is loosened before assembling the gun and then retightened before attempting to weld.

Sec. N6.2.3
GUN CABLE CLEANING

A dirty gun cable can cause rough and erratic wire feeding. Therefore, the cable liner must be cleaned periodically. Procedures differ depending upon whether the cable has a permanent core or removable liner.

1. Permanent Core Cables (K112-500, K113, K114, and Obsolete K133)

   Remove the cable from the wire feeder. Lay it out straight on the floor. Remove the contact nozzle tip from the gun. Using an air hose and only partial pressure, gently blow out the cable from the gun end. Too much pressure at the start will cause the dirt to form a plug. Flex the cable over its entire length and again blow out the cable. Repeat this procedure until no further dirt comes out.

2. Cable with Removable Liner (Obsolete K112)

   To clean the liner, first disconnect the cable from the wire feeder and remove the gun nozzle from the gun handle.

   To remove the liner from the cable insert a 3/16" diameter rod about 18" long into the gun end. Push the liner out of the cable far enough that it can be pulled from the opposite end. If the liner does not pull out easily, do not force it. Continue to push the liner until it pulls freely.

   To clean the liner, soak it in degreasing solvent for one hour. Flex short lengths of the liner around a 3" diameter mandrel to spread the coil turns and blow compressed air across and between the turns at 90° to the liner axis. This is needed to remove particles from between the turns. Do not blow compressed air through the master cable.

   Be sure the outside diameter of the liner is clean when inserting it into the cable. Insert by short sections about 3" in length. Do not let the liner bend sharply because this may cause a permanent bend in the liner.

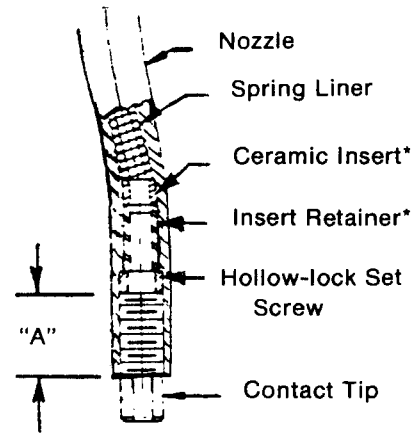
Sec. N6.2.4
GUN NOZZLES

1. Replace worn contact tips as required.
2. Replace worn spring liners in nozzles. The life of the liner can be doubled by rotating liner 180°. The liner can be pulled out the back end of the nozzle by wedging the blade of a small screwdriver in the I.D. and pulling.
3. Internal parts of nozzles can be removed and replaced by removing the internal hollow-lock set screw from the contact tip end of the nozzle with a 5/32 or 3/16" Allen wrench.

The ceramic insert and retainer will normally fall out the end of the nozzle but, if they do not, gently drive the spring liner towards the outgoing end of the nozzle.

See appropriate parts list page for construction details and replaceable parts. For those guns where similar nozzles are used for different wire sizes, note the identifying wire size that is stenciled or molded in an area close to the incoming end. When reassembling nozzle, make certain the ceramic nozzle insert (if used) is placed next to the spring liner. The hollow-lock set screw is to be tightened to give the dimension specified below as measured from the end of the nozzle to the hollow-lock set screw.

Gun	"A"
K-112 (500)	.38
K-113	.38
K-114	.38



*Not used on K112 and K114.

B. INNERSHIELD GUNS

Sec. N6.2.5
DISASSEMBLY OF K126, K115 SQUIRTGUNS

1. **Nozzle** — To remove nozzle from gun, loosen socket head screw in gun handle with 3/16" hex key and pull nozzle straight out. To reinstall, insert the nozzle, push in as far as possible, and tighten screw.
2. **Switch Housing** — Remove the four screws that hold the switch housing to the saddle around the gun handle. To remove the snap action switch from the housing, hold the switch housing with the cable towards the floor and look into the switch cavity. The tight side of the two larger roll pins that hold the snap action switch is to the right. Drive these pins to the left. They can be easily removed when they clear the right side of the casting. If trigger is to be replaced, remove the two smaller roll pins in the same way.
3. **Cable** — To remove cable from handle, remove nozzle and slip the spatter shield out of the front of the handle. Remove the snap ring from the cable connector and slip handle off the cable.

Sec. N6.2.6

DISASSEMBLY OF K116 SQUIRTGUN

1. **Cable and Nozzle** — Disassembly is same as K115 or K126.
2. **Switch Housing** — Remove pistol grip assembly from the gun by removing the four screws which clamp the assembly to the handle and remove the one screw which holds the housing in the pistol grip handle. Slip the aluminum housing out of the handle. To remove the snap action switch from the housing, look into the cavity with the threaded hole towards the floor. The tight side of the two larger roll pins that hold the snap action switch is to the right. Drive these pins to the left. They can be easily removed when they clear the right side of the casting. If trigger is to be replaced, remove the two smaller roll pins in the same way.

Sec. N6.2.7

GUN CABLES

1. Clean cables after using approximately 300 pounds of electrode. Remove the cable from the wire feeder and lay it straight on the floor. Remove the nozzle contact tip from the gun. Using an air hose and only partial pressure, gently blow out the cable from the gun end. Too much pressure at the start will cause the dirt to form a plug. Flex the cable over its entire length and again blow out the cable. Repeat this procedure until no further dirt comes out.

Sec. N6.2.8

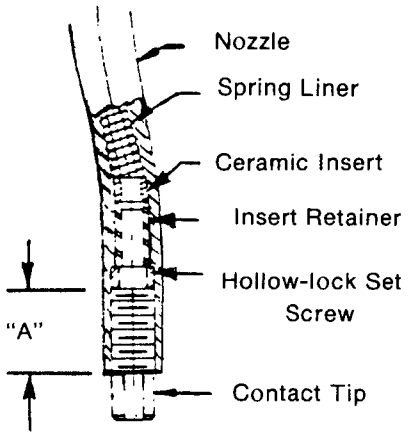
GUN NOZZLES

1. Replace worn contact tips as required.
2. Remove spatter from tip or extension guide after each ten minutes of arc time or as required.
3. Replace worn spring liners in nozzles. The life of the liner can be doubled by rotating liner 180°. The liner can be pulled out the back end of the nozzle by wedging the blade of a small screwdriver in the I.D. and pulling.
4. Internal parts of nozzles can be removed and replaced by removing the internal hollow-lock set screw from the contact tip end of the nozzle with a 5/32 or 3/16" Allen wrench.

   The ceramic insert and retainer will normally fall out the end of the nozzle but, if they do not, gently drive the spring liner towards the outgoing end of the nozzle.

   See appropriate parts list page for construction details and replaceable parts. For those guns where similar nozzles are used for different wire sizes, note the identifying wire size that is stenciled or modeled in an area close to the incoming end. When reassembling nozzle, make certain the ceramic nozzle insert (if used) is placed next to the spring liner. The hollow-lock set screw is to be tightened to give the dimension specified below as measured from the end of the nozzle to the hollow-lock set screw.

Gun	"A"
K115	.75
K116	.75
K126	.38
K206	.38
K289-5/64	.44
K289-3/32 and .120	.75
K309	.38



C.LINCONDITIONER GUNS

Sec. N6.2.9

1. For K206 request IM-548
2. For K289 request IM-549
3. For K309 request IM-550

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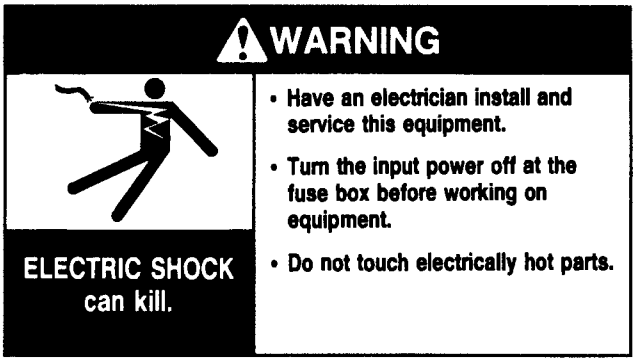
D.GMAW/FCAW GUN AND CABLES

Sec. N6.2.10

1. For K427 (.045-3/32) request IM-356
2. For K470 and K471 (.035-5/64) request IM-381
3. For K497 (.025-.045) request IM-434

SEC. N6.5 — GENERAL TROUBLESHOOTING[1]



Sec. N6.6

LN-9 TROUBLESHOOTING

To use this guide, find the problem in the index below and then see the specific section indicated and follow the instructions.

Problem	See Section
A. Drive rolls turn but wire will not feed or wire feeding is rough or uneven.	A
B. Variable or "hunting" arc.	B
C. Gun trigger will not feed wire. Digital meter is not lit.	D
D. Gun trigger will not feed wire. Meter is "on" but only reads zeros in either the "VOLTS" or "WIRE SPEED" setting of the meter switch.	E
E. Gun trigger will not feed wire. Meter is "on" and reads SET value of "VOLTS" or "WIRE SPEED".	F
F. Gun trigger works and arc can be struck. Unit then shuts down while welding, or voltage too low to establish arc (LN-9 ACTUAL VOLTS meter reading is low, or zero, when trigger is closed).	G
G. Poor arc striking with sticking or "blast-offs", weld porosity, narrow and ropy-looking bead, or electrode stubbing into plate while welding.	C

TROUBLE	CAUSE	WHAT TO DO
A. Drive rolls turn but wire will not feed or wire feeding is rough or uneven.	1. Gun cable kinked and/or twisted.	1. Keep as straight as possible. Inspect cable and replace if necessary.
	2. Wire jammed in gun and cable.	2. Remove wire from gun and cable — feed in new wire. Note any obstruction. Replace gun and cable if necessary.
	3. Incorrect drive rolls and guide tubes, incorrect drive roll assembly or pressure setting.	3. Be sure the wire diameter being used is stamped on drive rolls and guide tubes. Replace if necessary. Check proper assembly and pressure setting.
	4. Gun cable dirty.	4. Clean per Sec. N6.2.3 instructions.
	5. Worn drive rolls.	5. Replace on reverse split drive roll type.
	6. Electrode rusty and/or dirty.	6. Replace the electrode if it is rusty. If conditions are extremely dirty or electrode is old (solid wire only) put a wiper on the wire before it enters the guide tube. Use a piece of cloth or felt saturated with "Pyroil B" held around the wire with a light clamp.
	7. Worn nozzle liner.	7. Replace nozzle liner.
	8. Partially flashed or melted contact tip.	8. Replace the contact tip.

Sec. N6.6 (continued)

TROUBLE	CAUSE	WHAT TO DO
B. Variable or "hunting" arc.	1. Contact tip worn or incorrect size. 2. Worn or undersized work cables or poor work connections. 3. Loose electrode connections. 4. Voltage Control Response not properly set for power source and process.	1. Replace contact tip. 2. Inspect — repair or replace as necessary. 3. Be sure the following connections are tight: electrode cable to wire feeder and power source, work cable to power source and work, gun cable to wire feeder contact block, gun nozzle to body, and contact tip to nozzle. 4. See appropriate power source connection diagram.
C. Gun trigger will not feed wire. Digital meter is not lit.	1. Circuit breaker is tripped. 2. Field circuit fuse blown. 3. No 115V AC supply from power source.	1. Reset circuit breaker. See "Circuit Breaker" in Sec. N5.5.7. 2. Replace fuse. See "Field Circuit Fuse" in Sec. N5.5.7. 3. Check that power source is on. If so, check power source AC fuse.
D. Gun trigger will not feed wire. Meter is "on" but only reads zeros in both the "Volts" and "Wire Speed" settings of the meter switch.	1. Internal motor thermal protector has tripped.	1. Let unit cool until protector resets. See "Motor Thermal Protection" in Sec. N5.5.7.
E. Gun trigger will not feed wire. Meter is "on" and reads SET value of "Volts" or "Wire Speed".	1. Grounding lead protector circuit has tripped.	1. Clear fault between electrode circuit and wire feeder frame and then press "GLP Reset" button. See "Grounding Lead Protector" in Sec. N5.5.7.
F. Gun trigger works and arc can be struck. Unit then shuts down while welding or voltage output too low to establish arc (LN-9 ACTUAL VOLTS meter reading is low, or zero, when trigger is closed.)	1. Wire feeder or power source "Electrode Polarity" switches are not set properly. 2. Direct Work Lead Plug not fully engaged into wire feeder with jack, or clip not connected to work. 3. Power source voltage control not set for REMOTE. 4. LN-9 control cable leads or weld cables misconnected to power source. 5. 1/8 A fuse on Voltage P.C. board[2] is blown. 6. Welding power source is unable to supply SET voltage.	1. Set Polarity Switches in proper position. See "Electrode Polarity Switch", Sec. N4.4.3. 2. Fully engage Work Lead Plug into jack. Connect Direct Work Lead Clip to work. See "Reading Arc Voltage", Sec. N4.4.4. 3. R3S or DC power source voltage control switch must be set to REMOTE. See Sec. N2.3.3-B. 4. Refer to connection diagram for Lincoln power source being used. 5. Refer to Section II.H.4. of the Comprehensive Troubleshooting Guide[1] to determine cause of fuse blowing. 6. Reset output range controls of power source so it can supply SET voltage. See "Out-of-Range Shutdown", Sec. N6.6.2.
G. Poor arc striking with sticking or "blast-offs", weld porosity, narrow and ropy-looking bead or electrode stubbing into plate while welding.	1. Improper procedures or techniques. 2. Improper wire feed acceleration setting for process. 3. Voltage Control Response not properly set for power source and process.	1. See "How To Make Submerged Arc Welds" (S604) or "Innershield Production Welding Guide" (N675). 2. See "Starting Characteristics", Sec. N4.4.17, for proper acceleration setting. 3. See "Voltage Control Response", Sec. N4.4.18, and the appropriate power source connection diagram.

[1]The LN-9 *Comprehensive Troubleshooting Guide* (IM-294-TS) is distributed to Lincoln Service Stations.
[2]Voltage P.C. boards built prior to 1983 do not have fuse protection.

Sec. N6.6.2

OUT OF RANGE SHUTDOWN

Although out of range shutdown can occur with all power sources when working with very low or very high arc voltages, it is most likely to occur when using the R3S models with the somewhat limited voltage range of the various taps. For instance, if the R3S-400 triangle tap setting is for 31 volts, the range of control from the remote circuit is approximately 7 volts, i.e., 27-1/2 to 34-1/2 volts at nominal input voltage. If the LN-9 controls are set for 29 volts and the input voltage to the R3S goes up, it may not be possible for the LN-9 control circuit to hold the 29 volts so the welding will shut down. By changing to the 27 volt triangle setting, the range will be approximately 23-1/2 to 30-1/2 volts and at a high input voltage there will be sufficient control to hold the SET arc voltage. On these machines if the LN-9 stops welding, follow this procedure.

a. Move the LN-9 voltage set point 2 volts lower than the desired procedure and make a test weld.
   1. If the LN-9 still shuts down, go to Step b. below.
   2. If the LN-9 keeps welding, change the R3S triangle setting to the next *higher* voltage and reset the LN-9 set point to the desired procedure. R3S is now set properly unless there is a significant change in input voltage. Skip Step b.

b. Move the LN-9 voltage set point 2 volts higher than the desired procedure and make a test weld.
   1. If the LN-9 now keeps welding, change the R3S triangle setting to the next *lower* voltage and reset the LN-9 set point to the desired procedure. The R3S is now set properly unless there is a significant change in input voltage.
   2. If the LN-9 still shuts down, refer to the paragraph below and the other possible causes previously listed.

In some cases, it is also possible to hold the "ACTUAL" button pressed while starting the arc. Before the LN-9 shuts down, the actual arc voltage can be read on the digital meter. Comparing this reading to the "SET" reading will tell what change in the range controls of the power source are required so it can supply the desired voltage. Should the meter read zero, check LN-9 sensing leads (#21 and #67) connections. Should the meter read a minus (–) voltage, the polarity connections or settings at the LN-9 or power source are wrong.

This same general procedure can be used on other power sources. For example, if the LN-9 keeps shutting down and the other possible causes have been checked, adjust the SET voltage higher and/or lower than the desired voltage. If the LN-9 continues to weld at one of these voltages, it can then be determined what change in the range controls of the power source are required so it can supply the desired voltage.

July 1981

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PARTS LIST FOR

LN-9 AND LN-9 GMA

This parts list is provided as an informative guide only.

This information was accurate at the time of printing. However, since these pages are regularly updated in Lincoln Electric's official Parts Book (BK-34), always check with your Lincoln parts supplier for the latest parts information.

P-127-A

LN-9 AND LN-9 GMA SQUIRT WELDERS

Squirtgun and Cable Assembly ..... **P-103 Series**

LN-9 Wire Feeders and Options (LN-9, -9H)
Control Box (2 Roll & 4 Roll Drive) P-127-C
Hinged Door Assembly (2 Roll & 4 Roll) P-127-D
Base Platform (2 Roll & 4 Roll) P-127-E
Control Panel Instrument Assembly P-127-F
Meter Panel P-127-G
Wire Drive, Motor & Gear Box Assembly (2Roll Drive) P-127-H
Wire Drive, Motor & Gear Box Assembly (4Roll Drive) P-127-L
Options P-127-B.1
Conversion Kit Chart ..... P-127-T & V

LN-9 Wire Feeders (LN9F, -FH)
Meter Panel P-127-G
Wire Drive, Motor & Gear Box Assembly (2 Roll Drive) P-127-H
Wire Drive, Motor & Gear Box Assembly (4 Roll Drive) P-127-L
Control Box P-127-M
Door Assembly P-127-N
Instrument Panel P-127-S
Options P-127-B.1
Conversion Kit Chart ..... P-127-T & V

LN-9GMA
Control Box (2 Roll & 4 Roll Drive) P127-C
Hinged Door Assembly (2 Roll & 4 Roll) P127-D
Base Platform (2 Roll & 4 Roll) P-127-E
Control Panel Instrument Assembly (Roll & 4 Roll Drive) P-127-F
Meter Panel Assembly P-127-G
Wire Drive, Motor & Gear Box Assembly (4 Roll Drive) P-127-J
Wire Drive, Motor & Gear Box Assembly (2 Roll Drive) P-127-K
Options P-127-B.1
Conversion Kit Chart ..... P-127-T & V

LN-9F GMA
Wire Drive, Motor & Gear Box Assembly (4 Roll Drive) P-127-J
Wire Drive, Motor & Gear Box Assembly (2 Roll Drive) P-127-K
Control Box P-127-M
Door Assembly P-127-N
Instrument Panel P-127-S
Meter Panel Assembly P-127-G
Options P-127-B.1
Conversion Kit Chart P-127-T-V

P-127-B.1

OPTIONAL EQUIPMENT LISTING

(Miscellaneous Options Available for your machine are listed below)

LN-9 Squirt Welder Options

Standard Options

Input Cable (K196) and Extension (LN9NE) Cable Assemblies	P-107-M	
50 and 60# Wire Support	P-107-O	
Wire Reel Shaft (1.00")	P-107-P	
Hand Crank Assembly	P-107-R	
Flux Tank (LN9S and LN9SE)	P-107-S	
Undercarriage: K163 (Standard on LN-9S and LN-9SE)	P-107-T	
Stand Assembly for Readi-Reel (K377)	P-125-N	
Stand Assembly for 14 Pound Reel (K378)	P-125-O	

Miscellaneous Options

Mechanized Travel Power Pack: K161	P-107-V	
600 Amp Contactor Kit	P-107-W.2	
Mechanized Hand Travel Unit: K110	P-107-X	
Gear Box for K110	P-107-Y	
Solid State Remote Field Control: K224	P-114-H (See IM278)	
Burnback Kit (Except GMA Models)	Order K202	
Burnback Kit (GMA Models)	Order K419	
10 thru 60 pound Spindle Kit (2.00" Dia.)	Order K162H	
Swivel Type Mounting Platform	Order K178	
Squirtmobile K62	IM235 (P-57-C,D,E)	
Dual Process Kit: K317	P-127-P	
Dual Process Contactor Kit: K318	P-127-U	
Dual Procedure Kit; K319	P-127-R	
Gas Solenoid Valve Kit (Below Code 9100 Only) (Not Req'd on GMA Models)	Order K437	
Gas Solenoid Valve Kit (Above Code 9100 Only) (Not Req'd on GMA Models)	Order K425	
Pulse Power Feeder Conversion Kit (Below Code 9100 Only)	Order K442-2	
Pulse Power Feeder Conversion Kit (Above Code 9100 Only)	Order K442-2	

Gun & Cables

K112 and K113 Squirt Guns & Cables	P-103C	#
K112 and K113 Gun Assembly	P-103-D	#
K114 Squirt Gun and Cable	P-103-E	#
K115 Squirt Gun and Cable	P-103-F	#
K116 Squirt Gun and Cable	P-103-G & P-103-H	#
K126 Squirt Gun and Cable	P-103-J & P-103-K	#

# Indicates a Change This Printing

P-127-B.2

MISCELLANEOUS ITEMS

(These Items Are Not Illustrated)

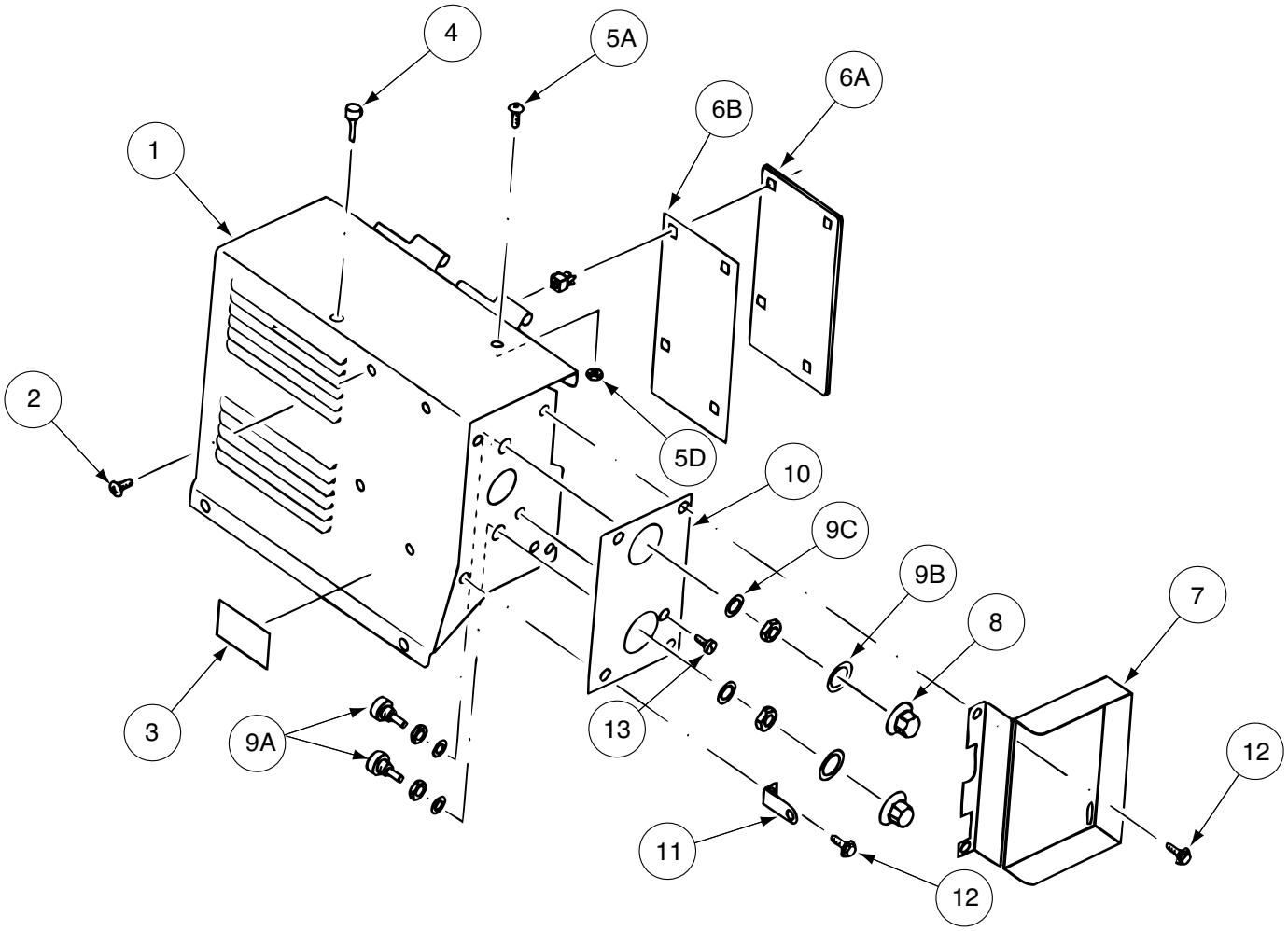
# Indicates a Change This Printing

ITEM	DESCRIPTION	PART NO.	QTY.	1	2	3	4	5	6	7	8	9
	Work Jack	T14280	1									
	Input Amphenol	S12021-12	1									
	Output Amphenol	S12021-3	1									
	Heat Sink (LN9 & LN9H) (Part of Motor)	M13579	1									
	Insulator (LN9 & LN9H) (Part of Motor)	S16267	1									
	Drive Motor Cover (LN9F & LN9FH) (Part of Motor)	S16718	1									
	Grommet (LN9F & LN9FH) (Part of Motor)	S10255-12	1									
	Hose Nipple	T15008	1									
	Inert Arc Nut	T15007-1	1									
	Handle (Optional)	S13863	1									
	Burn Back Jumper Plug	T13498-3	1									
	Collar Assembly	T12341	1									
	Button Head Socket Screw	T11551-6	1									
	Key	M8776-31	1									
	Sems Screw	T10082-26	1									
	Key	M8776-82	1									
	Sems Screw	T10082-4	1									
	Plug Button	T10397-4	1									
	Wiring Harness (Code 8421, 8423, 8670, 8671, 8990, 8991)	L6323-7	1									
	Wiring Harness (Code 9089, 9090, 9131, 9756, 9959)	L6323-8	1									
	Wiring Harness (Code 9159, 9844, 9961, 10248, 10249,10322,10350, 10351)	L6323-9	1									
	Wiring Harness (Code 10355, 10356)	L6323-10	1									
	Wiring Harness (Code 9134, 9842, 9958, 10316, 10327)	L7202-1	1									
	Wiring Harness (Code 9135, 9160, 9843, 9960, 10326)	L7271	1									
	Wiring Harness (Code 10353, 10354)	L7271-1	1									

NOTES

P-127-C

CONTROL BOX
LN9 & LN9 GMA
(2-Roll & 4-Roll)



P-127-C.1

# Indicates a Change This Printing

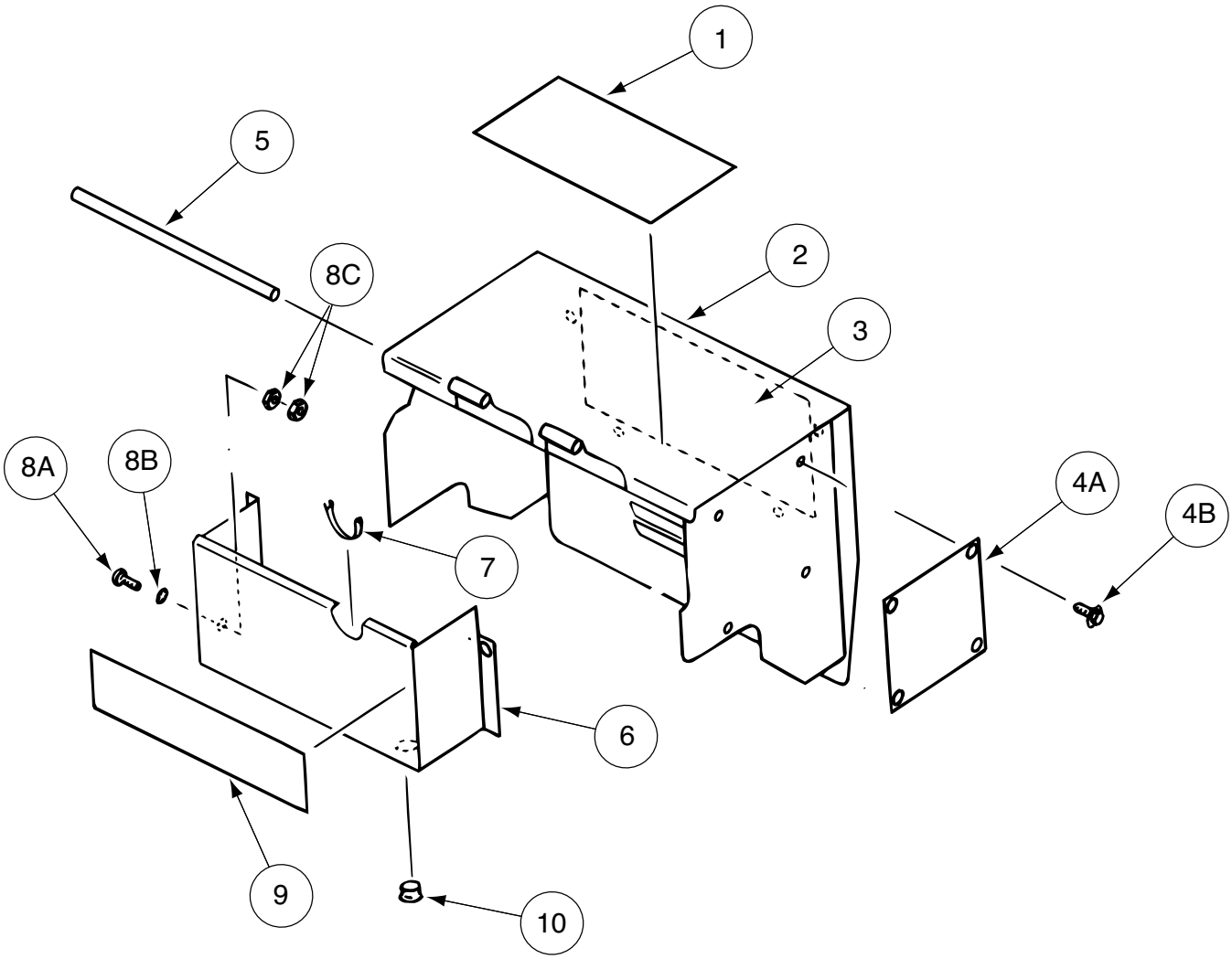
Use Column 1 for LN9, LN9H, LN9 GMA (2 Roll Drive)
Use Column 2 for LN9, and LN9 GMA (4 Roll Drive)
Use only the parts marked "X" in the column under the heading number called for in the model index page.

ITEM	DESCRIPTION	PART NO.	QTY.	1	2	3	4	5	6	7	8	9	
1	Cover Assembly (Below Code 8200)	M12216-1	1	X	•								
1	Cover Assembly (Code 8200 to Code 9000)	M12216-2	1	X	•								
1	Cover Assembly (Code 9000 & Above)	M14851-3	1	X	•								
1	Cover Assembly	M14851-5	1	•	X								
2	Self Tapping Screw	S8025-14	4	X	X								
3	Warning Decal	T13470	1	X	X								
4	Door Bumper	T14882	1	X	X								
5A	#8-32x.50 Round Head Screw	CF000033	1	X	X								
5B	Plain Washer (Not Shown)	S9262-3	1	X	X								
5C	Lock Washer (Not Shown)	T4291-A	1	X	X								
5D	#8-32 Hex Nut	CF000042	1	X	X								
5E	Lead Clamp (Not Shown)	T12563-7	1	X	X								
6A	Voltage P.C. Board (Code 7949 Only)	L6041	1	X	•								
6A	Voltage P.C. Board (Code 7949-A to 9000)	L6084	1	X	•								
6A	Voltage P.C. Board (Code 9000 to 9100)	L6084-2	1	X	•								
6A	Voltage P.C. Board (Above Code 9100)	L6084-[ ]	1	X	X								
6B	P.C. Board Insulation	S16364	1	X	X								
7	Security Panel	S16275	1	X	X								
8	Knob	T10491	2	X	X								
9	Potentiometer & Plug Assembly, includes: (Not Shown)	S14165-173	1	X	X								
9A	Potentiometer	S16296-1	2	X	X								
9B	Felt Washer	T14034	2	X	X								
9C	Plain Washer	S9262-76	2	X	X								
9D	Insulating Tube	T7028-241	2	X	X								#
10	Dial Plate	S16277	1	X	X								
11	Lock Tab	T10045-40	1	X	X								
12	Self Tapping Screw	S8025-70	4	X	X								
13	Self Tapping Screw	S8025-60	1	X	X								

Note: When ordering new printed circuit boards indicate the dash number [ ] of the "Old" board that is to be replaced. This will aid Lincoln in supplying the correct and latest board along with any necessary jumpers or adapters. The dash number brackets [ ] have purposely been left blank so as to eliminate errors, confusion and updates.

P-127-D

HINGED DOOR ASSEMBLY
LN9 & LN9 GMA
(2-Roll & 4-Roll)



Use Column 1 for LN9, LN9H, LN9 GMA (2 Roll Drive)
Use Column 2 for LN9, and LN9 GMA (4 Roll Drive)

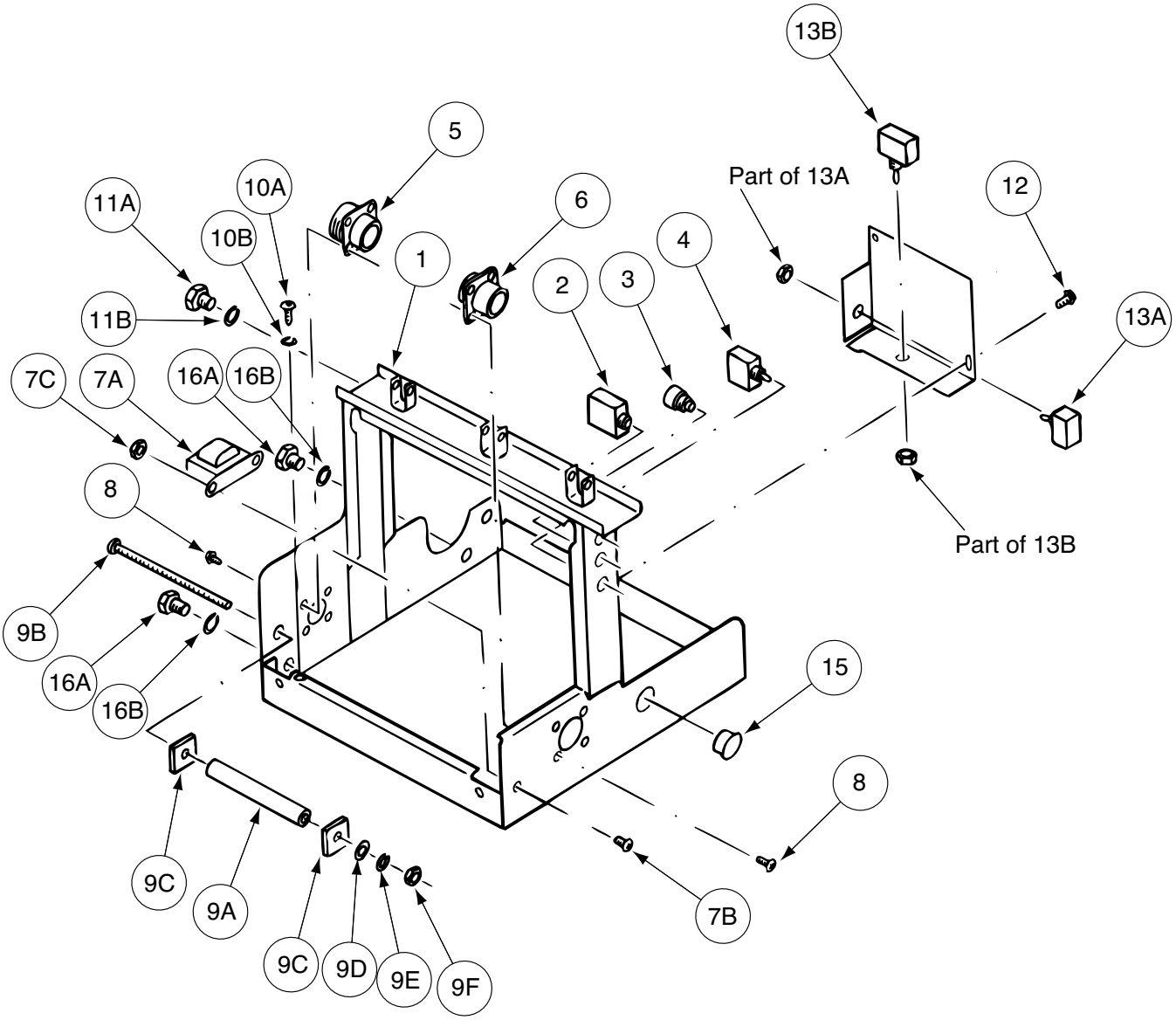
# Indicates a Change This Printing

ITEM	DESCRIPTION	PART NO.	QTY.	1	2	3	4	5	6	7	8	9
1	Warning Decal	M16196	1	X	X							
2	Door Assembly (Below Code 9000)	M11490-1	1	X	•							
2	Door Assembly (Above Code 9000)	M14850-2 ø	1	X	•							
2	Door Assembly (Red)	M16806	1	•	X							
3	Meter Panel Assembly	See P127-G	1	X	X							
4A	Nameplate (LN9 Only)	S16279	1	X	•							
4A	Nameplate (LN9H Only)	S16623	1	X	•							
4A	Nameplate (LN9 GMA)	S18003	1	X	•							
4A	Nameplate (LN9, 4 Roll Drive)	S20424-1	1	•	X							
4A	Nameplate (LN9 GMA, 4-Roll Drive)	S20424-2	1	•	X							
4B	Self Tapping Screw	S8025-70	4	X	X							
5	Hinge Pin	M8809-53	1	X	X							
6	Meter Panel Enclosure (Except LN9, GMA 2 & 4 Roll Drive & LN9, 4 Roll Drive)	S16502	1	X	•							
6	Meter Panel Enclosure (LN9 GMA 2 & 4 Roll Drive)	S18005	1	X	•							
6	Meter Panel Enclosure (LN9, 4 Roll Drive)	S16502-1	1	•	X							
6	Meter Panel Enclosure LN9 GMA, 4 Roll Drive)	S18005-1	1	X	X							
7	Grommet Strip	T12823-14	1	X	X							
8A	Thread Cutting Screw	S9225-36	1	X	X							
8B	Lock Washer	T9695-1	1	X	X							
8C	Hex Nut	#10-24	2	X	X							
9	Drive Roll Decal	S17973	1	X	•							
9	Drive Roll Decal (Below Code 10351)	S20101	1	•	X							
9	Drive Roll Decal (Above Code 10351)	S22739-2	1	•	X							
10	Plug Button	T13597-2	4	X	X							

Ø This part is obsolete and no longer available.

P-127-E

BASE PLATFORM
LN9 & LN9 GMA
(2-Roll & 4-Roll)



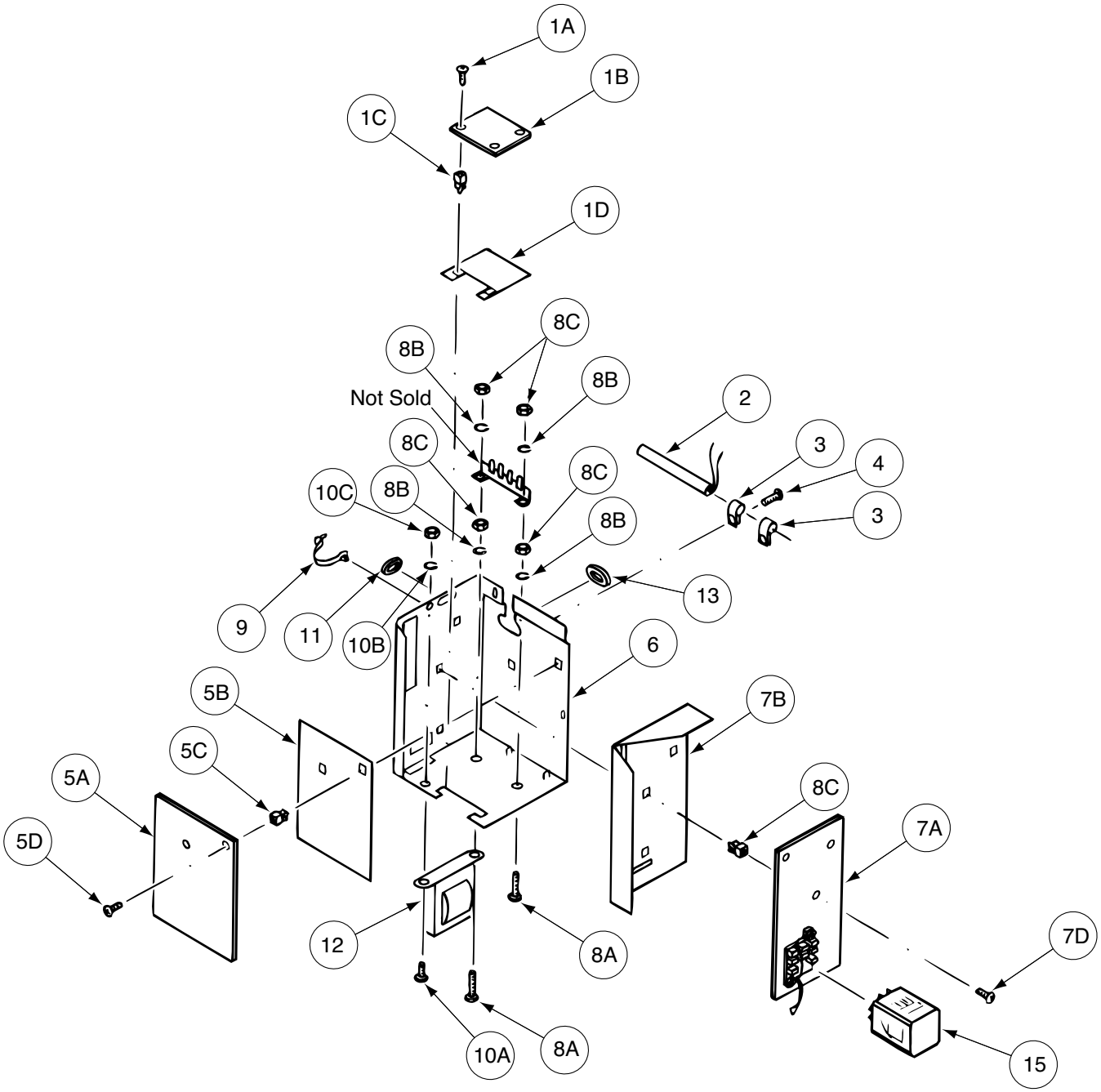
# Indicates a Change This Printing

Use Column one for (2 Roll).
Use Column two for (4 Roll)

ITEM	DESCRIPTION	PART NO.	QTY.	1	2	3	4	5	6	7	8	9
1	Base Assembly (Below Code 8000)	L5778-4	1	X	•							
1	Base Assembly (Code 8178 thru 8180)	L5778-5	1	X	•							
1	Base Assembly (Code 8420 and up) and (LN-9 & LN-9H Only)	L5778-7	1	X	•							
1	Base Assembly (LN9 GMA Only)	L7269	1	X	•							
1	Base Assembly (LN9, 4 Roll Only)	L8815	1	•	X							
2	Circuit Breaker (LN9) (2 & 4 Roll Drive)	T12287-10	1	X	X							
2	Circuit Breaker (LN9H, LN9 GMA) (2 & 4 Roll Drive) (Above Code 8000)	T12287-8	1	X	X							
3	Push Button Switch GLP	T14200	1	X	X							
4	Hot-Cold Interlock Switch (Above Code 8000)	T10800-12	1	X	X							
5	Input Connector	S12021-12	1	X	X							
6	Output Connector Assembly	S12021-3	1	X	X							
7A	Transformer Assembly	S14651-5	1	X	X							
7B	Sems Screw	T10082-27	2	X	X							
7C	#8-32 Hex Nut	CF000042	2	X	X							
8	Self Tapping Screw	S8025-73	8	X	X							
9A	Resistor	S10404-75	1	X	X							
9B	#10-24x5.00 Round Head Screw	CF000045	1	X	X							
9C	Insulating Washer	T4479-A	2	X	X							
9D	Plain Washer	S9262-27	1	X	X							
9E	Lock Washer	E106A-1	1	X	X							
9F	#10-24 Hex Nut	CF000010	1	X	X							
10A	Thread Forming Screw	S9225	4	X	X							
10B	Lock Washer	T9695-1	1	X	X							
11A	3/8-16x.875 Hex Head Cap Screw	CF000070	1	X	X							
11B	Lock Washer	E106A-16	1	X	X							
11C	Plain Washer	S9262-120	2	X	X							
12	Self Tapping Screw	S8025-4	2	X	X							
13	Switch Box Assembly, includes: (Below Code 8000)	S16270 ø	1	X	•							
13	Switch Box Assembly, includes: (Above Code 8000) (Except LN9 GMA 2 & 4 Roll)	S16270-1	1	X	X							
13	Switch Box Assembly, includes: (LN9 GMA 2 & 4 Roll Drive)	S16270-2	1	X	X							
13A	Polarity Switch	T13111	1	X	X							
13B	Direction Switch (Above Code 8000) (Except LN9 GMA)	T14535	1	X	X							
13B	Direction Switch (LN9 GMA)	T10800-7	1	X	X							
13C	Trigger Interlock Switch (Below Code 8000) (Not Shown)	T10800-4	1	X	X							
14	Switch Box (Not Shown)	M13576	1	X	X							
15	Plug Button (LN9, 4 Roll Only)	T10397-4	2	•	X							
16A	3/8-16x.625 Hex Head Cap Screw	CF000018	2	X	X							
16B	Lock Washer	E106A-16	2	X	X							
	* Resistance Coil (Below Code 9100)	T14104	1	X	•							

Ø This part is obsolete and no longer available.

CONTROL PANEL INSTRUMENT ASSEMBLY
LN9 & LN9 GMA
(2-Roll & 4-Roll)



P-127-F.1

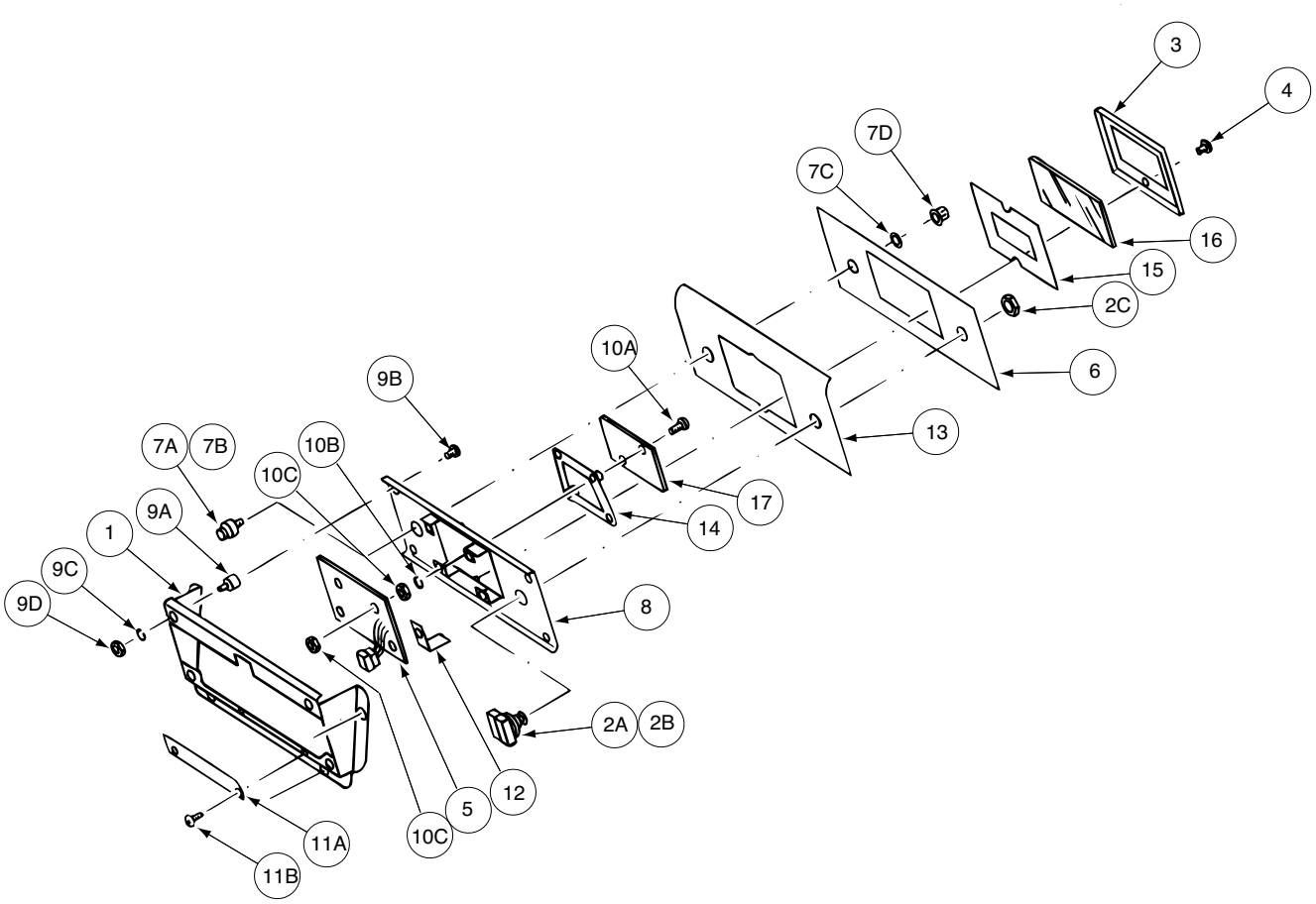
# Indicates a Change This Printing

ITEM	DESCRIPTION	PART NO.	QTY.	1	2	3	4	5	6	7	8	9	
1A	Self Tapping Screw	S8025-14	3	X									
1B	Trigger P.C. Board	M13861-3	1	X									
1B	Trigger P.C. Board (Above Code 8000)(GMA)	L9928-[ ]	1	X									
1C	Plastic Expansion Nut	S14020-1	3	X									
1D	P.C. Board Insulation (Below Code 8000)	T14274	1	X									
1D	P.C. Board Insulation (Above Code 8000)	S16609	1	X									
2	Reed Switch Assembly	S12334-29	1	X									
3	Lead Clamp	T12563-7	2	X									
4	#8-32x.50 Br RHS	CF000102	2	X									
5A	Control P.C. Board (LN9 & 9H Only)	L6019	1	X									
5A	Control P.C. Board (LN9 GMA Only (Below Code 10352)	L7253-[ ]	1	X									
5A	Control P.C. Board (LN9 GMA Only) (Above Code 10352)	L10068-[ ]	1	X									
5B	P.C. Board Insulation (LN9 & 9H Only)	S16365	1	X									
5B	P.C. Board Insulation (LN9 GMA Only)	S16365-1	1	X									
5C	Plastic Expansion Nut	S14020-1	2	X									
5D	Self Tapping Screw	S8025-14	1	X									
6	Instrument Mounting Panel (Below Code 8000)	M13580 ø	1	X									
6	Instrument Mounting Panel (Above Code 8000)	M13580-1	1	X									
7A	Power P.C. Board (LN9 & 9H Only)	L6043-[ ]	1	X									
7A	Power P.C. Board (P.M.) (GMA)	L7265-[ ]	1	X									
7B	P.C. Board Insulation (LN9 & 9H Only)	S16363	1	X									
7B	P.C. Board Insulation (LN9 GMA Codes 9135, 9160, 9960, 9843, 10320, 10326, 10353)	S18006	1	X									
7B	P.C. Board Insulation (LN9 GMA)	S18006-1	1	X									
7C	Plastic Expansion Nut	S14020-1	5	X									
7D	Self Tapping Screw	S8025-14	5	X									
8A	#6-32x.625 RHS	CF000043	2	X									
8B	Lock Washer	E106A-13	4	X									
8C	#6-32 HN	CF000005	4	X									
9	Lead Clamp	T13496-2	1	X									
10A	#6-32x.375 RHS	CF000003	1	X									
10B	Lock Washer	E106A-13	1	X									
10C	#6-32 HN	CF000005	1	X									
11	Grommet	S10255-12	1	X									
12	Transformer Asbly (Part of M15098-3 Harness)	S16282	1	X									#
13	Grommet	S10255-14	1	X									
14	Power Board Connection Diagram (LN9 & 9H Only)	T14258	1	X									
14	Power Board Connection Diagram (LN9 & GMA Only)	T15050	1	X									
15	Relay (Mounts on Power P.C. Board)	S13929-6	1	X									

Note: When ordering new printed circuit boards indicate the dash number [ ] of the “Old” board that is to be replaced. This will aid Lincoln in supplying the correct and latest board along with any necessary jumpers or adapters. The dash number brackets [ ] have purposely been left blank so as to eliminate errors, confusion and updates.

Ø This Part is Obsolete and No Longer Available.

METER PANEL ASSEMBLY



# Indicates a Change This Printing

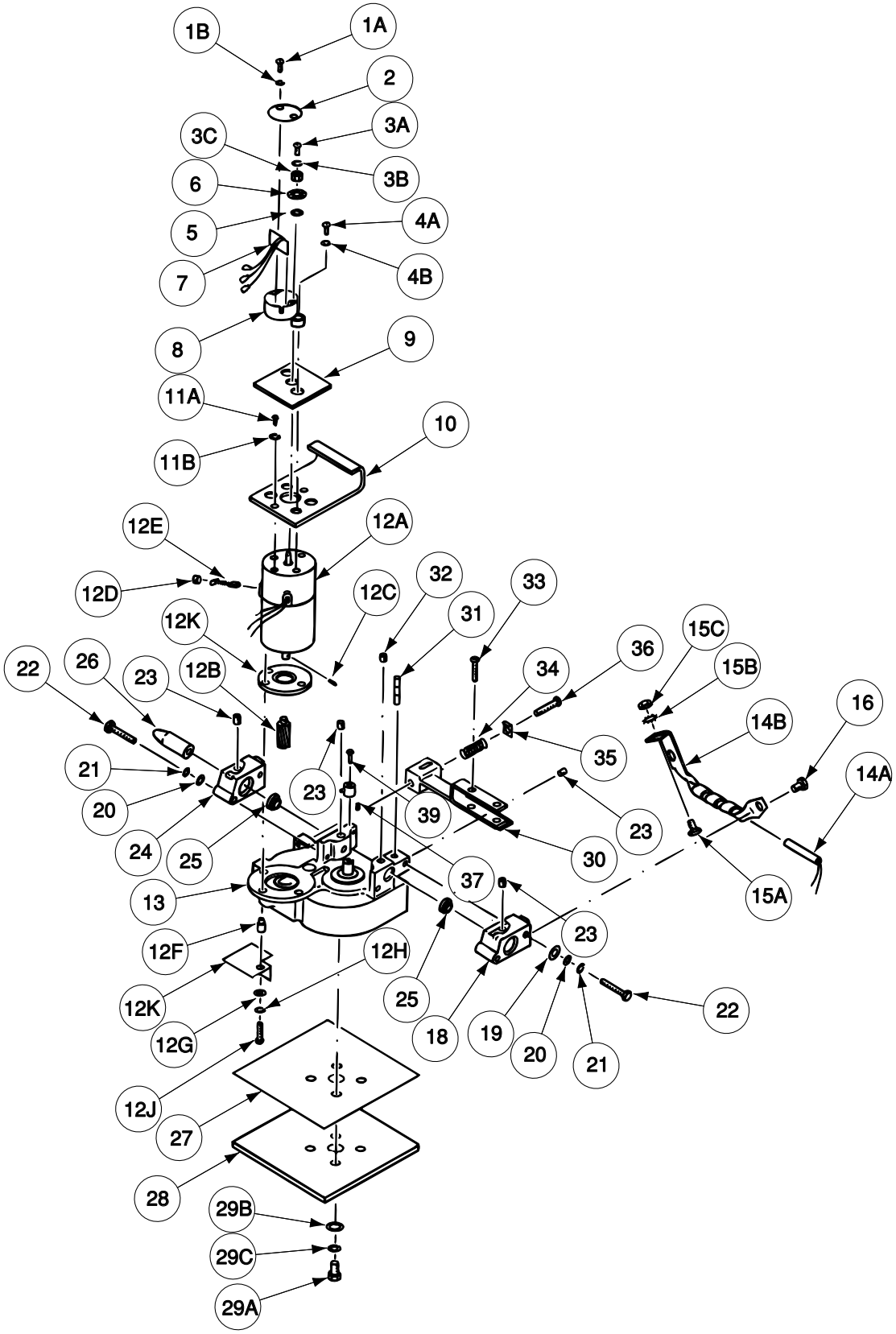
For Codes Below 8000, use parts marked “X” in Column 1.
For Codes 8000 to 8700, use parts marked “X” in Column 2.
For Codes Above 8700, use parts marked “X” in Column 3.

ITEM	DESCRIPTION	PART NO.	QTY.	1	2	3	4	5	6	7	8	9
1	Meter Housing (Below Code 9900)	L4753 ø	1	X	X	X						
1	Meter Housing (Above Code 9900)	L4753-1	1	•	•	X						
2A	Actuator & Switch Assembly	T14751-1	1	X	X	X						
2B	Lock Washer	T9695-16	1	X	X	X						
2C	Hex Nut	T10940-11	1	X	X	X						
3	Meter Shield Frame	M13572	1	X	X	X						
4	Sems Screw	T10082-27	2	X	X	X						
5	Meter Printed Circuit Board (LN9 Only)	L6685-[ ]	1	•	X	•						
5	Meter Printed Circuit Board (LN9H Only)	L6686	1	•	X	•						
5	Meter Printed Circuit Board (LN9 Metric Only)	L6687-[ ]	1	•	X	X						
5	Meter Printed Circuit Board (LN9H Metric & LN9 GMA Only)	L6688-[ ]	1	•	X	X						
6	Nameplate	M13582	1	X	X	•						
6	Nameplate (LN9, LN-9H Metric & LN9 GMA Only)	M13582-1	1	•	X	X						
7A	Switch (LN9 Only)	T13111	1	X	X	•						
7A	Switch (LN9H Only)	T13381-2	1	•	X	•						
7A	Switch (LN9, LN9H Metric & LN9 GMA Only)	S16670-5	1	•	X	X						
7B	Non-Turn Washer	T14457-1	1	X	X	X						
7C	Plain Washer	S9262-76	1	X	X	X						
7D	Knob	T13639	1	X	X	X						
8	Meter Panel Assembly	T14248	1	X	•	•						
8	Meter Panel Assembly	T14248-1	1	•	X	X						
9A	Shock Mounting	T13003	4	X	X	X						
9B	Sems Screw	T10082-27	4	X	X	X						
9C	Lock Washer	T9695-3	4	X	X	X						
9D	Hex Nut	#8-32	4	X	X	X						
10A	Round Head Screw	#6-32x.50	2	X	X	X						
10B	Lock Washer	T9695-2	2	X	X	X						
10C	Hex Nut	#6-32	4	X	X	X						
11A	Insulation	S16635	1	•	X	X						
11B	Self Tapping Screw	S8025-60	2	•	X	X						
12	Insulation	T14468	1	•	X	X						
13	Spatter Shield	S17016	1	•	•	X						
14	P.C. Board Spacer	M14537	1	•	•	X						
15	Bezel Assembly	S17414	1	•	•	X						
16	Meter Shield (Standard Clear Welding Lens)	T14771	1	X	X	•						
16	Filter Lens	T14807-1	1	•	•	X						
17	Meter and Printed Circuit Board Assembly (Not Shown)	M13650 ø	1	X	•	•						
17	Meter and Pin Assembly (Not Shown)	Order S17747	1	•	X	•						
17	Digital Voltmeter P.C. Board	M14490-[ ]	1	•	•	X						
18A	Round Head Screw (Not Shown)	#6-32x1.00	2	X	X	X						
18B	Lock Washer (Not Shown)	T9695-2	2	X	X	X						
18C	Hex Nut (Not Shown)	#6-32	4	X	X	X						
19A	Lead Clamp (Not Shown) (LN9H, LN9 GMA) (Not Shown)	T12563-6	1	X	X	X						
19B	Self Tapping Screw (Not Shown)	S8025-73	1	X	X	X						
19C	Plain Washer (Not Shown)	S9262-3	1	X	X	X						

ø This part is obsolete and no longer available.

P-127-H

WIRE DRIVE
LN9, LN9H, LN9F, LN9FH



P-127-H.1

# Indicates a Change This Printing

For LN9, use parts marked “X” in Column 1.
For LN9F, use parts marked “X” in Column 2.
For LN9H, use parts marked “X” in Column 3.
For LN9FH, use parts marked “X” in Column 4.

ITEM	DESCRIPTION	PART NO.	QTY.	1	2	3	4	5	6	7	8	9
	Wire Drive Motor & Gear Box Assembly, Includes:	L5743-10		X	•	•	•					
	Wire Drive Motor & Gear Box Assembly, Includes:	L5743-3 ø	1	X	•	•	•					
	Wire Drive Motor & Gear Box Assembly, Includes:	L5743-4	1	•	X	•	•					
	Wire Drive Motor & Gear Box Assembly, Includes:	L5743-6	1	•	•	X	•					
	Wire Drive Motor & Gear Box Assembly, Includes: (Items 2, 4C, 4B, 6, 7, 8, 10, 12A, 12B, 12C, 12F, 12J, 12K, 13)	L5743-7 ø	1	•	•	•	X					
1A	#6-32x.375 Round Head Screw	CF000003	2	X	X	X	X					
1B	Lock Washer	E106A-13	2	X	X	X	X					
2	Cover Assembly	T14326	1	X	X	X	X					
3A	#6-32x.375 Phillips Round Head Screw	CF000108	1	X	X	X	X					
3B	Lock Washer	E106A-13	1	X	X	X	X					
3C	Cap	T14246	1	X	X	X	X					
4A	#8-32x.375 Round Head Screw	CF000006	2	X	X	X	X					
4B	Lock Washer	T4291-A	2	X	X	X	X					
4C	Plain Washer (Not Shown)	S9262-3	2	X	X	X	X					
5	Plain Washer (Shim)	S16268-1	4	X	X	X	X					
6	Slotted Disc	S16180	1	X	X	X	X					
7	Tachometer Pick UP P.C. Board	M14700-[ ]	1	X	X	X	X					
8	Pick-Up Housing Assembly	M13578	1	X	X	X	X					
9	Insulator	S16267	1	X	X	X	X					
10	Heat Sink	M13579	1	X	X	X	X					
11A	#8-32x.375 Round Head Screw	CF000006	2	X	X	X	X					
11B	Lock Washer	T4291-A	2	X	X	X	X					
12	Drive Motor Assembly,(LN9) includes: (12A & 12B)	L5974-1	1	X	•	•	•					
12A	Drive Motor, Pinion & Shaft, includes: (Codes 8420, 8180, 9087, 9134, 9958)	S16470-1	1	X	•	•	•					
12	Drive Motor Assembly,(LN9F) includes: (12A & 12B)	L5974-2	1	•	X	•	•					
12A	Drive Motor, Pinion & Shaft, includes: (Codes 8921, 8670, 9089, 8421, 8670)	S16470-2	1	•	X	•	•					
12	Drive Motor Assembly,(LN9H) includes: (12A & 12B)	L5974-3	1	•	•	X	•					
12A	Drive Motor, Pinion & Shaft, includes: (Codes 8178, 8422, 8669, 9088)	M13862-1 ø	1	•	•	X	•					
12	Drive Motor Assembly,(LN9FH) includes: (12A & 12B)	L5974-4	1	•	•	•	X					
12A	Drive Motor, Pinon & Shaft, includes: Codes 8423, 8671, 9090)	M13862-2	1	•	•	•	X					
12B	Pinon Gear	S15013-4	1	X	X	•	•					
12B	Pinon Gear	S16612	1	•	•	X	X					
12C	Roll Pin (Gear to Shaft)	T9967-33	1	X	X	X	X					
12D	Brush Cap (Stature)	M13312-13	1	X	X	•	•					
12D	Brush Cap (Universal) (Early Design 7/8-27 THD)	M9655-7A ø	1	•	X	•	•					
12D	Brush Cap (Universal) (Present Design 3/4-27 THD)	M9655-7B ø	1	•	X	•	•					
12D	Brush Cap	M13274-7	1	•	•	X	X					
12E	Brush & Spring Assembly (Stature)	M13312-12	2	X	•	•	•					
12E	Brush & Spring Assembly (Universal)	M12254-1F	2	•	X	•	•					
12E	Brush & Spring Assembly (Stature)	M13312-12	2	•	X	•	•					
12E	Brush & Spring Assembly	M13274-6	2	•	•	X	X					
12F	Insulating Bushing	T14058	3	X	X	X	X					
12G	Plain Washer	S9262-147	3	X	X	X	X					
12H	Lock Washer	T4291-A	3	X	X	X	X					
12J	8-32x1.125 Round Head Screw	CF000007	3	X	X	X	X					
12K	Motor Insulator	M13479-1	1	X	X	X	X					
12L	Insulation (Not Shown)	T13911	1	X	•	X	X					
12M	Speed Clip (Not Shown)	T10982-5	1	X	X	X	X					

Ø This part is obsolete and no longer available.

P-127-H.2

# Indicates a Change This Printing

For LN9, use parts marked “X” in Column 1.
For LN9F, use parts marked “X” in Column 2.
For LN9H, use parts marked “X” in Column 3.
For LN9FH, use parts marked “X” in Column 4.

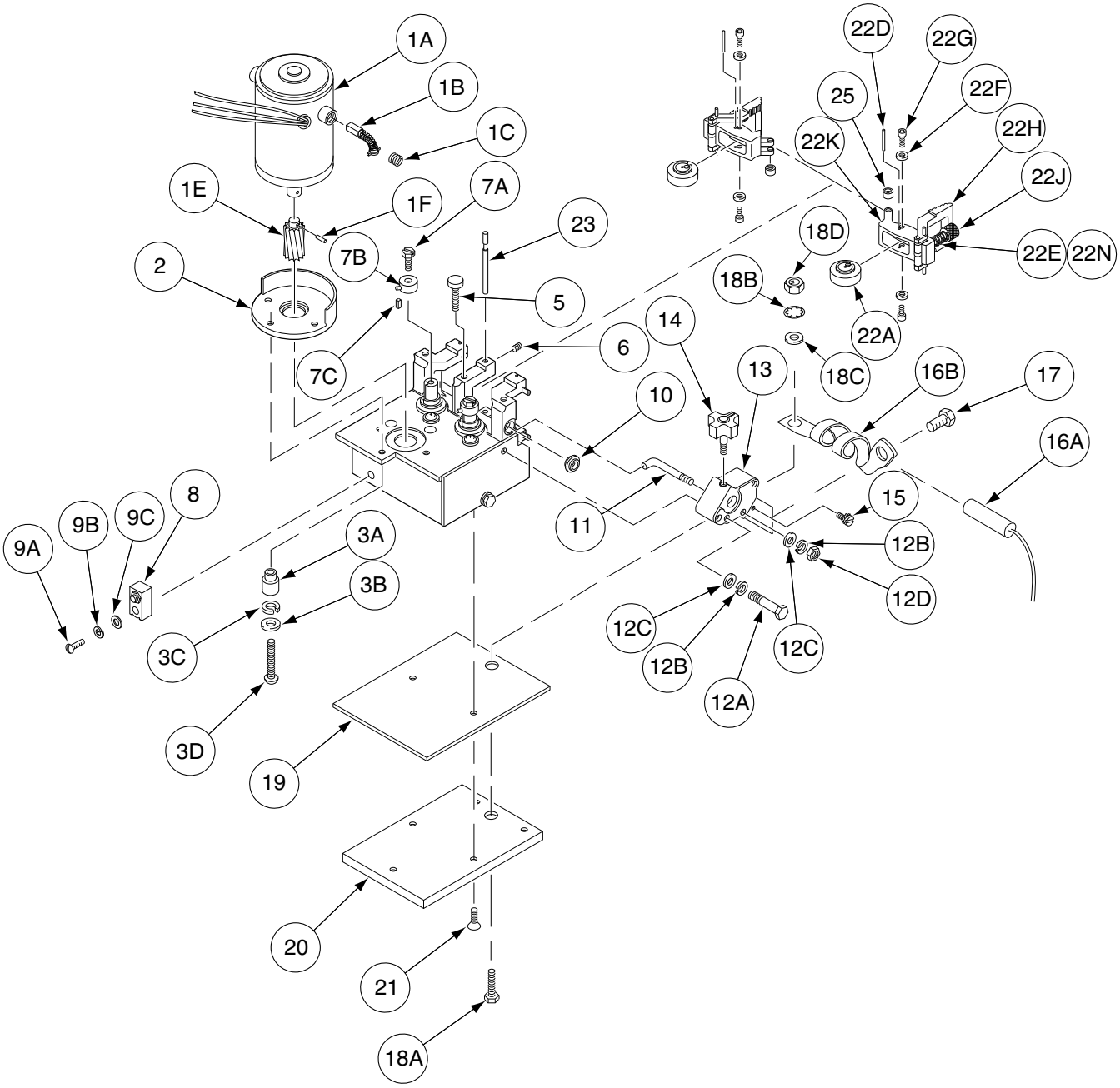
ITEM	DESCRIPTION	PART NO.	QTY.	1	2	3	4	5	6	7	8	9
13	Gearbox	M14310-1	1	X	X	•	•					
13	Gearbox	M14310-2	1	•	•	X	X					
14A	Reed Switch & Energizer Assembly (Below Code 9100)	S14623-2	1	X	•	X	•					
14A	Reed Switch (Above Code 9100)	S12334-43	1	X	•	•	•					
14A	Reed Switch (Above Code 9100)	S12334-45	1	•	X	•	•					
14A	Reed Switch & Energizer Assembly (Below Code 9100)	S14623-2	1	X	•	X	•					
14A	Reed Switch & Energizer Assembly (Below Code 9100)	S14623-3	1	•	X	•	X					
14B	Energizer (Above Code 9100)	L7392	1	X	X	•	•					
14C	Self Tapping Screw (Not Shown)	S8025-13	1	X	X	X	X					
15A	Hex Head Cap Screw (Above Code 9100)	1/2-13x1.000	1	X	X	•	•					
15A	Hex Head Cap Screw (Below Code 9100)	1/4-20x2.00	4	X	X	X	X					
15B	Lock Washer (Above Code 9100)	T9860-2	1	X	X	•	•					
15C	Hex Jam Nut (Above Code 9100)	1/2-13	1	X	X	•	•					
16	Hex Head Cap Screw	1/2-13x.750	2	X	X	•	•					
18	Outgoing Conductor Block	L6872-2	1	X	X	X	X					
19	Plain Washer (Above Code 9100)	S9262-120	2	X	X	•	•					
20	Plain Washer	S9262-23	4	X	X	X	X					
21	Lock Washer	E106A-2	4	X	X	X	X					
22	Hex Head Cap Screw	1/4-20x2.00	4	X	X	X	X					
23	Hollow Set Screw	S11604-28	4	X	X	X	X					
24	Incoming Conductor Block	L6872-1	1	X	X	X	X					
25	Locator Bushing	T12189	2	X	X	X	X					
26	Incoming Wire Guide	T12272	1	X	X	X	X					
27	Insulation	M12137	1	X	X	X	X					
28	Gear Box Mounting Plate	M11460	1	X	X	X	X					
29A	Hex Head Screw	5/16-18x.75	4	X	X	X	X					
29B	Plain Washer	S9262-121	4	X	X	X	X					
29C	Lock Washer	E106A-14	4	X	X	X	X					
30	Yoke Assembly	S13454	1	X	X	•	•					
30	Yoke Assembly	S16731	1	•	•	X	X					
31	Pivot Pin	T12206-3	1	X	X	X	X					
32	Hollow Set Screw	S11604-8	1	X	X	X	X					
33	Button Head Set Screw	T11551-5	1	X	X	X	X					
34	Compression Spring	T10247-10	1	X	X	X	X					
35	Yoke Setting Indicator	T12689	1	X	X	X	X					
36	Button Head Screw	T11551-1	1	X	X	X	X					
37	Key (Below Code 10300)	M8776-31	1	X	X	X	X					
38	Collar Assembly (Below Code 10300)	T12341	1	X	X	X	X					
38	Collar Assembly (Above Code 10300)	S21193	1	X	X	X	X					
39	Button Head Socket Screw	T11551-6	1	X	X	X	X					
40	Feed Unit Mounting Screw (Not Shown)	M12616	1	•	X	•	X					
41	Round Head Screw (Not Shown)	1/4-20x.625	3	•	X	•	X					
42	Lock Washer (Not Shown)	E106A-2	3	•	X	•	X					
43	Hex Nut (Not Shown)	1/4-20	3	•	X	•	X					
	* Cover - Black (End of Motor)	S16718	1	X	X	X	X					

NOTES

P-127-J

WIRE DRIVE, MOTOR & GEAR BOX ASSEMBLY
LN9 GMA & LN9F GMA

(4-Roll)



P-127-J.1

ITEM	DESCRIPTION	PART NO.	QTY.	1	2	3	4	5	6	7	8	9	
	Gear Box Asbly (LN9F GMA 4 Roll), Includes:	G2262-3	1	X									
	Gear Box Asbly (LN9 GMA 4 Roll), Includes:	G2262-2	1	X									
1	Drive Motor Asbly (LN9 GMA), Includes:	M15078-1	1	X									
1	Drive Motor Asbly (LN9F GMA), Includes:	M15078-3	1	X									
1A	Drive Motor, Includes:	**NSS**	1	X									
1B	Brush & Spring Asbly (Universal Electric)	M13274-6	2	X									
1B	Brush & Spring Asbly (Specialty Motors)	M16718-F ø	2	X									
1B	Brush & Spring Asbly (Stature Electric)	M15114-1K	2	X									
1C	Brush Cap (Universal Electric)	M13274-7	2	X									
1C	Brush Cap (Specialty Motors)	M14907-1G	2	X									
1C	Brush Cap (Stature Electric)	M15114-1L	2	X									
1D	Plain Washer (Not Shown)	S9262-70	1	X									
1E	Pinion Gear	S17980-1	1	X									
1F	Roll Pin	T9967-33	1	X									
1G	Ring Magnet (Not Shown)	S18011	1	X									
2	Motor Insulator / Spacer	M16803	1	X									
3A	Bushing	T14058-1	3	X									
3B	Plain Washer	S9262-147	3	X									
3C	Lock Washer	T4291-A	3	X									
3D	#8-32 x 1.50 RHS	CF000119	3	X									
5	Thumb Screw	S19924	3	X									
6	Set Screw	S11604-6	1	X									
7A	Sems Screw	T10082-26	2	X									
7B	Collar Assembly (Below Code 10300)	T12341	2	X									
7B	Collar Assembly (Above Code 10300)	S21193	2	X									
7C	Key (Below Code 10300)	M8776-82	2	X									
8	Hall Effect Switch (LN9 GMA)	S18160-1	1	X									
8	Hall Effect Switch (LN9F GMA)	S18160-1	1	X									#
9A	#10-24 x 1.00 RHS	CF000038	1	X									
9B	Lock Washer	E106A-1	1	X									
9C	Plain Washer	S9262-27	1	X									
10	Locator Bushing	T14031	1	X									
11	Bent Bolt	S20629-1	1	X									
12A	Hex Head Screw	1/4-20x1.750	2	X									
12B	Lock Washer	E106A-2	2	X									
12C	Plain Washer	S9262-23	2	X									
12D	1/4-20 Hex Nut	CF000017	1	X									
13	Conductor Block	M13972-2	1	X									
14	Molded Hand Screw	T13858	1	X									
15	Sems Screw	T10082-4	1	X									
16A	Reed Switch Assembly (LN9F GMA 4 Roll)	S12334-47	1	X									
16A	Reed Switch Assembly (LN9 GMA 4 Roll)	S12334-43	1	X									
16B	Reed Switch Energizer	M15173	1	X									
17	1/2-13 x .750 HHCS	CF000029	1	X									
18A	1/2-13 x 1.75 HHCS	CF000277	1	X									
18B	Lock Washer	T9695-8	1	X									
18C	Plain Washer (LN9 GMA)	S9262-1	1	X									
18C	Plain Washer (LN9F GMA)	S9262-125	1	X									
18D	1/2-13 HJN	CF000054	2	X									
19	Gear Box Insulation (Lower) (Not used on LN9 GMA 4 Roll)	T11472-26	1	X									

Ø This part is obsolete and no longer available.

NSS - Not Sold Separately

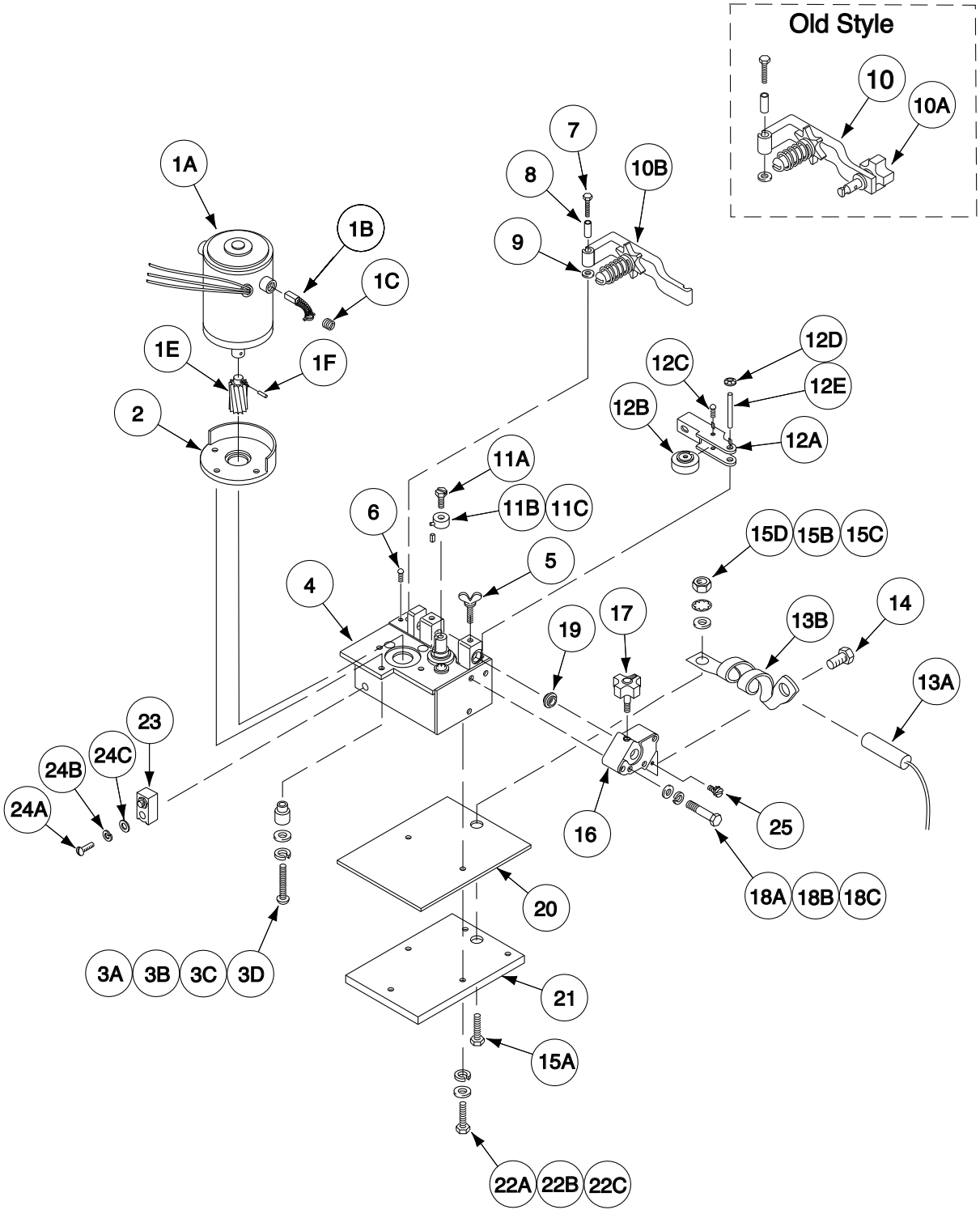
P-127-J.2

ITEM	DESCRIPTION	PART NO.	QTY.	1	2	3	4	5	6	7	8	9
20	Gear Box Mounting Plate	S20331	1	X								
21	1/4-20x.625 Flat Head Screw	CF000345	2	X								
22	Swing Arm Assembly, Includes:	M16445	2	X								
22A	Bearings & Shaft Assembly	T13244-1	1	X								
22B	Roll Pin (Not Shown)	T9967-25	1	X								
22C	Plain Washer (Not Shown)	S9262-60	1	X								
22D	Pin	M8809-122	1	X								
22E	Spring	T10247-11	1	X								
22F	Plain Washer	S9262-3	2	X								
22G	Socket Head Screw	T9447-21	2	X								
22H	Release Assembly	S19965	1	X								
22J	Knob	S19922	1	X								
22K	Swing Arm	M16446	1	X								
22L	Pivot Block Shaft (Not Shown)	S19921	1	X								
22M	Spacer (Not Shown)	S20244	2	X								
22N	Tension Rod	S19920	1	X								
23	Pin	S19828	1	X								
24	Connection Box Assembly LN9F GMA (4 Roll) (Not Shown)	M15238-1	1	X								
	Female Connector	T11591-3	1	X								
	Solenoid Valve Assembly	M15234	1	X								
	Number Plate	T10726-153	1	X								
	Hose Clamp	S10888-35	1	X								
	Connector	T14557-3	1	X								
	Connector and Lead Assembly	S13100-73	1	X								
	Terminal Strip	S14530-10	1	X								
	Terminal Strip	S14872-1	1	X								
	Warning Label	T9274-4	1	X								
25	Swing Arm Spacer	S19923	1	X								

NOTES

WIRE DRIVE, MOTOR & GEAR BOX ASSEMBLY
LN9 GMA & LN9F GMA

(2-Roll)



P-127-K.1

# Indicates a Change This Printing

ITEM	DESCRIPTION	PART NO.	QTY.	1	2	3	4	5	6	7	8	9
1	Drive Motor Asbly (LN9 GMA), Includes:	M15078-1	1	X								
1	Drive Motor Asbly (LN9F GMA), Includes:	M15078-3	1	X								
1A	Drive Motor	**NSS**	1	X								
1B	Brush & Spring Asbly (Universal Electric)	M13274-6	2	X								
1B	Brush & Spring Asbly (Specialty Motors)	M14996-F	2	X								
1B	Brush & Spring Asbly (Stature Electric)	M15114-1K	2	X								
1C	Brush Cap (Universal Electric)	M13274-7	2	X								
1C	Brush Cap (Specialty Motors)	M14907-G	2	X								
1C	Brush Cap (Stature Electric)	M15114-1L	2	X								
1D	Plain Washer (Not Shown)	S9262-70	1	X								
1E	Pinion Gear	S17980-1	1	X								
1F	Roll Pin	T9967-33	1	X								
1G	Ring Magnet (Not Shown)	S18011	1	X								
2	Motor Insulator	M13479-4	1	X								
3A	Bushing	T14058	3	X								
3B	Plain Washer	S9262-3	3	X								
3C	Lock Washer	T4291-A	3	X								
3D	#8-32x1.125 RHS	CF000007	3	X								
4	Gear Box	L7255-1	1	X								
5	Thumb Screw	T15046	2	X								
6	Drive Screw	S8025-19	1	X								
7	1/4-20x1.25 HHCS	CF000069	1	X								
8	Pivot Spacer	S10918-7	1	X								
9	Plain Washer	S9262-103	1	X								
10	Quick Release Asbly (Old Style), Includes:	M15023	1	X								
10A	Latch Knob	T13858-1	1	X								
10B	Quick Release Assembly (Current Style)	M19266-1	1	X								
11A	Sems Screw	T10082-26	1	X								
11B	Collar Assembly (Below Code 10300)	T12341	1	X								
11B	Collar Assembly (Above Code 10300)	S21193	1	X								
11C	Key (Below Code 10300)	M8776-82	1	X								
12A	Idle Roll Assembly	S16666-1	1	X								
12B	Bearing	T13244	1	X								
12C	Self Taping Screw	S8025-19	1	X								
12D	Speed Clip	T10982-7	1	X								
12E	Groove Pin	T10580-9	1	X								
13A	Reed Switch Assembly	S12334-43	1	X								
13B	Reed Switch Energizer	M15173	1	X								
14	1/2-13x.75 HHCS	CF000020	1	X								
15A	1/2-13x1.75 HHCS	CF000277	1	X								
15B	Lock Washer	T9695-8	1	X								
15C	Plain Washer (LN-9 GMA)	S9262-1	1	X								
15C	Plain Washer (LN-9F GMA)	S9262-125	1	X								
15D	1/2-13 HJN	CF000054	2	X								
16	Conductor Block	S17798	1	X								
17	Knob	T13858	1	X								
18A	1/4-20x1.75 HHCS	CF000016	2	X								
18B	Lock Washer	E106A-2	2	X								
18C	Plain Washer	S9262-23	2	X								
19	Locator Bushing	T14031	1	X								

NSS - Not Sold Separately

P-127-K.2

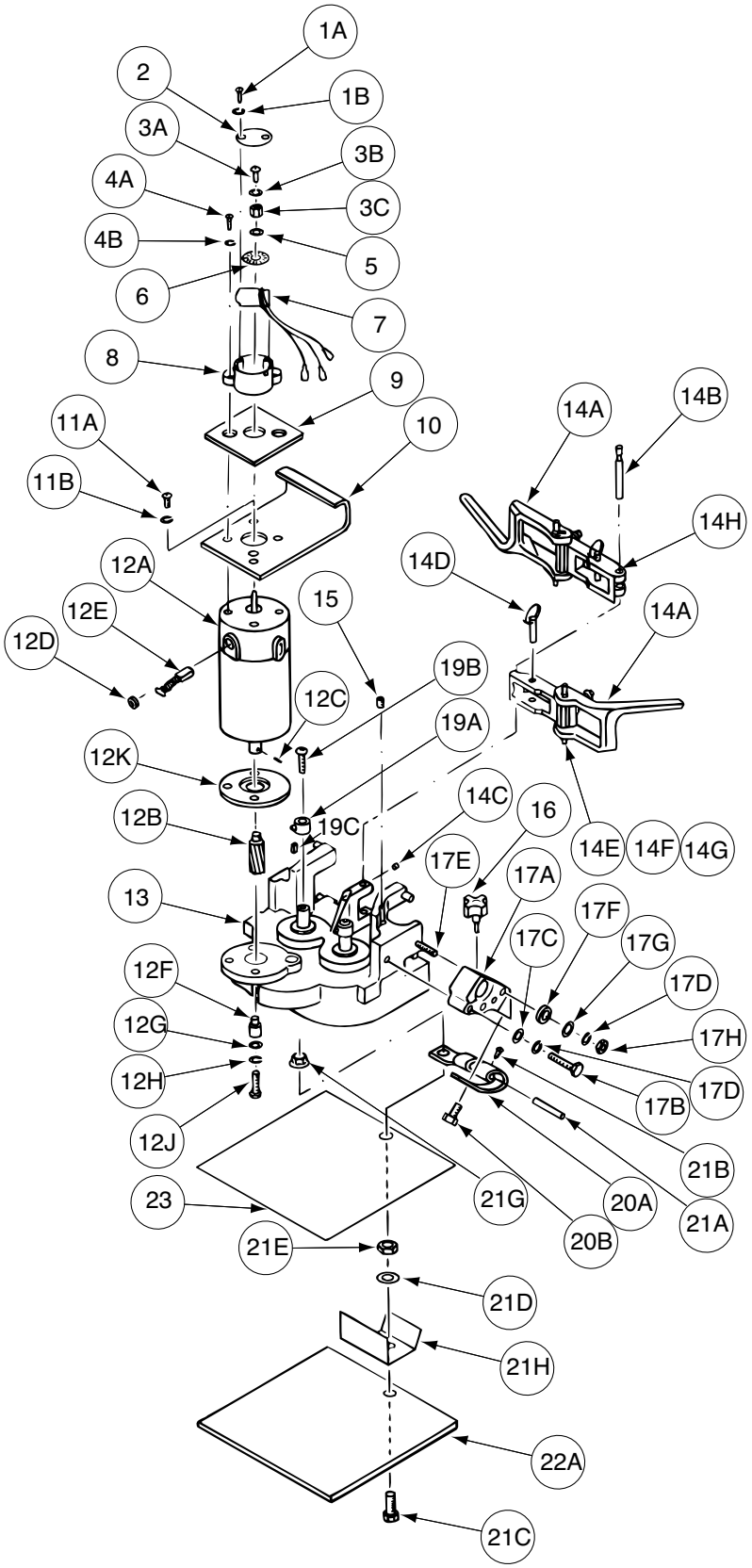
# Indicates a Change This Printing

ITEM	DESCRIPTION	PART NO.	QTY.	1	2	3	4	5	6	7	8	9
20	Gear Box Insulation	T15049	1	X								
21	Gear Box Mounting Plate	S17979	1	X								
22A	1/4-20x.75 HHCS	CF000014	2	X								
22B	Lock Washer	E106A-2	2	X								
22C	Plain Washer	S9262-98	2	X								
23	Switch Mounting Housing Assembly	S21227	1	X								
24A	#10-24x1.00 RHS	CF000038	1	X								
24B	Lock Washer	E106A-1	1	X								
24C	Plain Washer	S9262-27	1	X								
25	Sems Screw	T10082-4	1	X								
26	Connection Bolt Insulation (Not Shown)	S18169	1	X								
27	Hall Effect Switch, (Not Shown)	S18160-1	1	X								
28	Gas Solenoid & Support (Not Shown)	M15095-1	1	X								

NOTES

P-127-L

WIRE DRIVE, MOTOR & GEAR BOX ASSEMBLY
LN9 & LN9F
(4-Roll Drive)



LN9 AND LN9 GMA

1-17-97

P-127-L.1

# Indicates a Change This Printing

ITEM	DESCRIPTION	PART NO.	QTY.	1	2	3	4	5	6	7	8	9
	Wire Drive and Gear Box Assembly (LN9F, 4-Roll), includes:	G2223-1										
	Wire Drive and Gear Box Assembly (LN9, 4-Roll), includes:	G2223-4										
1A	#6-32x.375 Round Head Screw	CF000003	2	X								
1B	Lock Washer	E106A-13	2	X								
2	Cover Assembly	T14326	1	X								
3A	#6-32x.375 Phillips Round Head Screw	CF000108	1	X								
3B	Lock Washer	E106A-13	1	X								
3C	Cap	T14246	1	X								
4A	#8-32x.375 Round Head Screw	CF000006	2	X								
4B	Lock Washer	T4291-A	2	X								
4C	Plain Washer (Not Shown)	S9262-3	2	X								
5	Plain Washer (Shim)	S16268-1	4	X								
6	Slotted Disc	S16180	1	X								
7	Tachometer Pick Up P.C. Board	M14700-[ ]	1	X								
8	Pick-Up Housing Assembly	M13578	1	X								
9	Insulator	S20425	1	X								
10	Heat Sink	M13579	1	X								
11A	#8-32x.375 Round Head Screw	CF000006	2	X								
11B	Lock Washer	T4291-A	2	X								
12A	Drive Motor Assembly (LN9, 4-Roll), includes:	L5974-8	1	X								
	Drive Motor, Pinion & Shaft, includes: (LN9, 4-Roll)	S16470-1	1	X								
12A	Drive Motor Assembly (LN9F, 4-Roll), includes:	L5974-2	1	X								
	Drive Motor, Pinion & Shaft, includes: (LN9F, 4-Roll)	S16470-2	1	X								
12B	Pinion	S15013-4	1	X								
12C	Roll Pin (Gear to Shaft)	T9967-33	1	X								
12D	Brush Cap (Stature Electric)	M13312-13	2	X								
12D	Brush Cap (Universal Electric)	M9655-7B ø	2	X								
12E	Brush & Spring Assembly (Stature Electric)	M13312-12	2	X								
12E	Brush & Spring Assembly (Universal Electric)	M12254-1F	2	X								
12F	Insulating Bushing	T14058-1	3	X								
12G	Plain Washer	S9262-147	3	X								
12H	Lock Washer	T4291-A	3	X								
12J	8-32x1.125 Round Head Screw	CF000007	3	X								
12K	Motor Insulator	M13479-1	1	X								
12L	Insulation (Not Shown)	T13911	1	X								
12M	Speed Clip (Not Shown)	T10982-5	1	X								
13	Gearbox	G2232	1	X								
14A	Swing Arm	M16373	2	X								
14B	Swing Arm Pin	S19828	1	X								
14C	Set Screw	S11604-6	1	X								
14D	Quick Release Pin	S19829	2	X								
14E	Pivot Block Shaft	S19827	2	X								
14F	Pivot Block	S19826	2	X								
14G	Roll Pin	T9967-27	2	X								
14H	Swing Arm	L8364	1	X								
15A	Cam (Not Shown)	S19824	4	X								
15B	Roll Pin (Not Shown)	T9967-5	4	X								
16	Screw & Handle Assembly	T13858	1	X								

Ø This part is obsolete and no longer available.

P-127-L.2

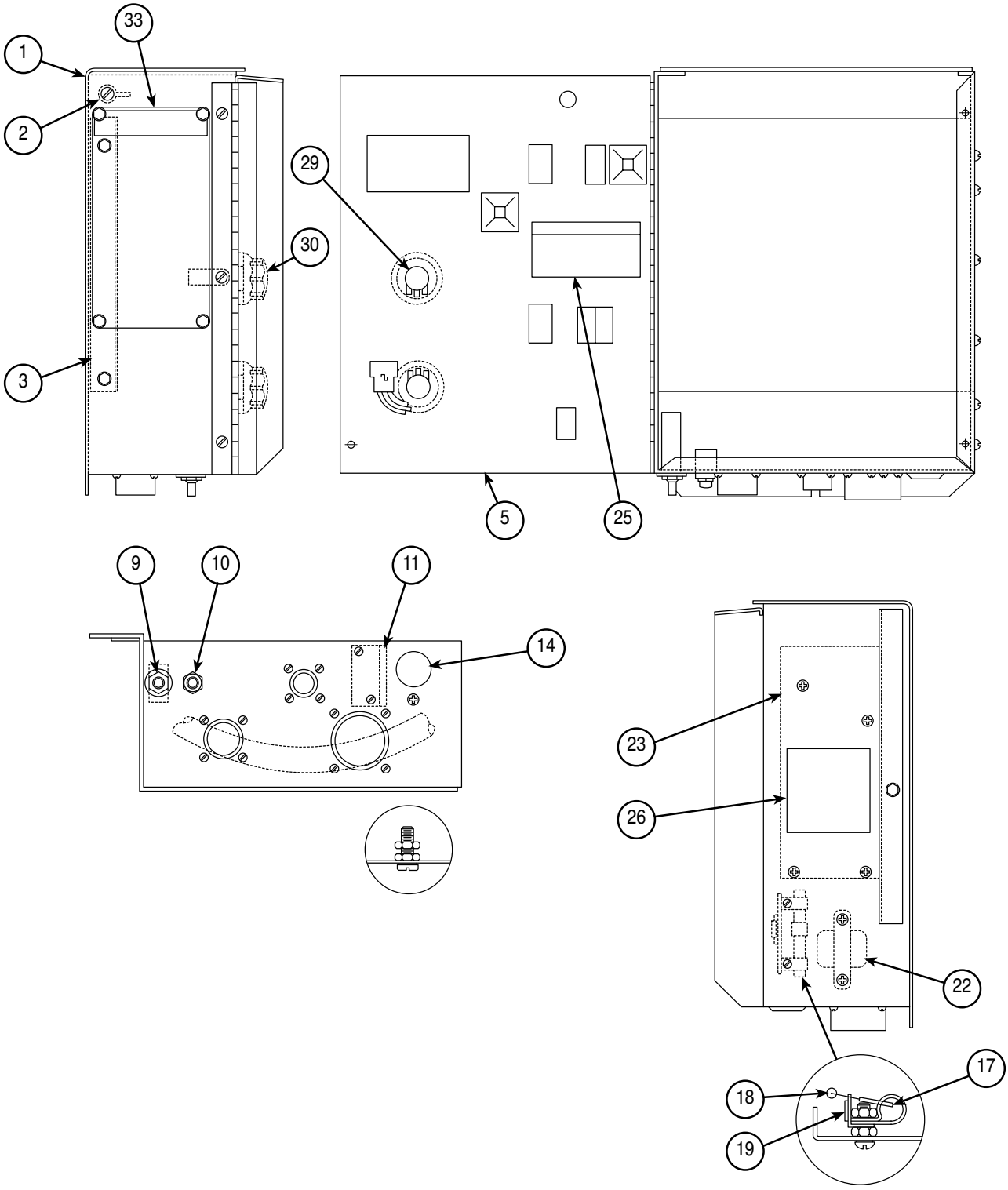
# Indicates a Change This Printing

ITEM	DESCRIPTION	PART NO.	QTY.	1	2	3	4	5	6	7	8	9
17A	Conductor Block	S19830	1	X								
17B	1/4-20x1.50 Hex Head Cap Screw	CF000141	1	X								
17C	Plain Washer	S9262-23	2	X								
17D	Lock Washer	E106A-2	2	X								
17E	Stud	T9781-129	1	X								
17F	Insulating Tube	T7028-13	1	X								
17G	Insulating Washer	S10773-53	1	X								
17H	1/4-20 Hex Nut	CF000017	1	X								
18	Locator Bushing (Not Shown)	S19825	1	X								
19A	Collar Assembly (Below Code 10300)	T12341	2	X								
19A	Collar Assembly (Above Code 10300)	S21193	1	X								
19B	Button Head Socket Screw	T11551-6	2	X								
19C	Key (Below Code 10300)	M8776-31	2	X								
20A	Reed Switch Energizer	M16370	1	X								
20B	1/2-13x.75 Hex Head Cap Screw	CF000020	1	X								
21A	Reed Switch Assembly	S12334-43	1	X								
21B	Self Tapping Screw	S8025-13	1	X								
21C	1/2-13x1.75 Hex Head Cap Screw	CF000026	1	X								
21D	Plain Washer	S9262-1	1	X								
21E	Flange Nut	T3960	1	X								
21F	Lock Washer (Not Shown)	T9695-8	1	X								
21G	1/2-13 Hex Jam Nut	CF000054	1	X								
21H	Insulation	S18169	1	X								
22A	Gearbox Mounting Plate	S19831	1	X								
22B	5/16-18x.75 Hex Head Cap Screw (Not Shown)	CF000040	4	X								
22C	Plain Washer (Not Shown)	S9262-121	4	X								
22D	Lock Washer (Not Shown)	E106A-14	4	X								
23	Insulation	M16372	1	X								

NOTES

P-127-M

CONTROL BOX
LN9F, LN9FH & LN9F GMA



L7201
6-28-85M

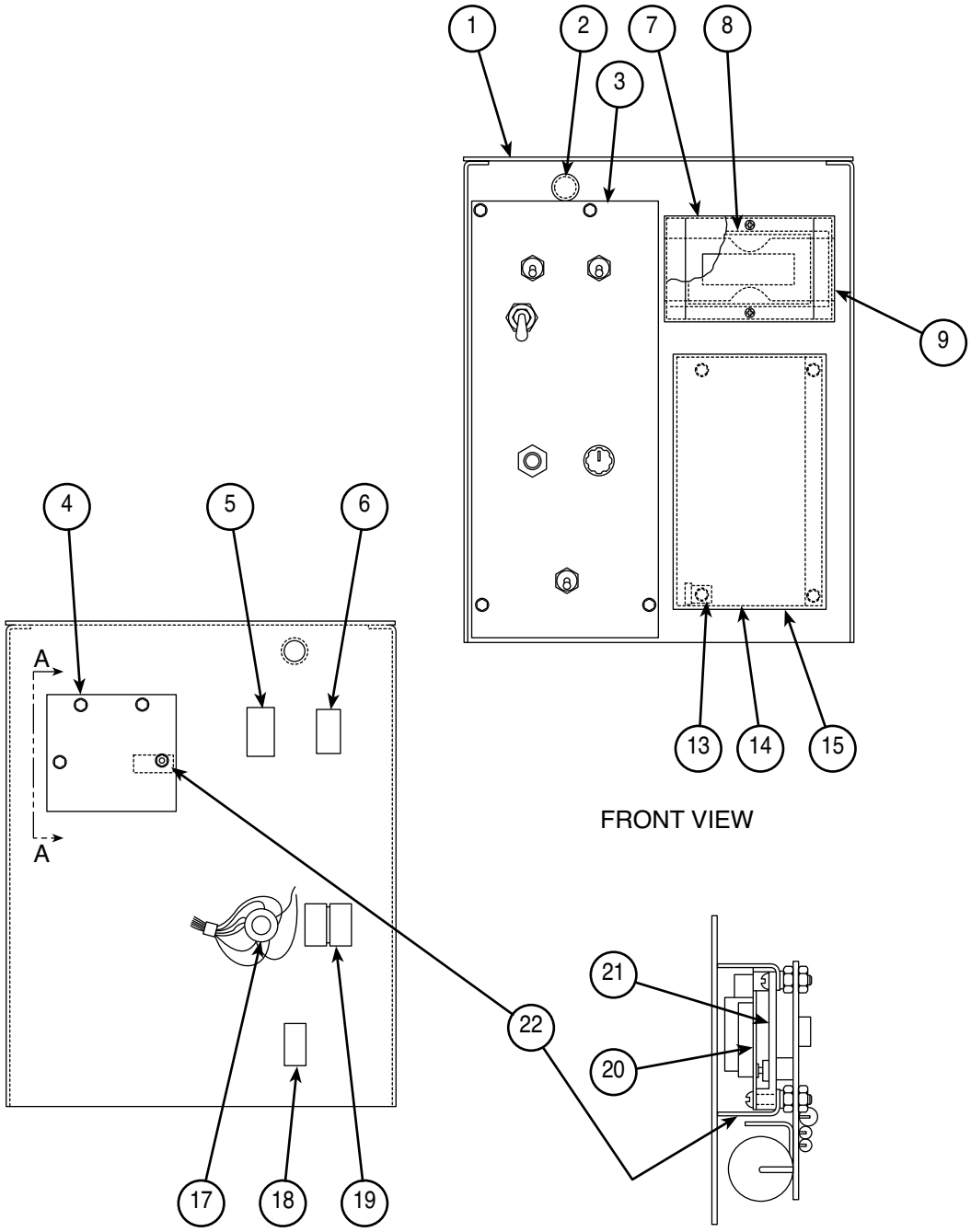
# Indicates a Change This Printing

ITEM	DESCRIPTION	PART NO.	QTY.	1	2	3	4	5	6	7	8	9	
1	Control Box Welded Assembly (LN-9F Above Code 9100)	M13655-1	1	X									
1	Control Box Welded Assembly (LN9F & 9FH Below Code 9100)	M13655	1	X									
1	Control Box Welded Assembly (LN-9F GMA)	M13655-3	1	X									
2	Resistor	S10404-75	1	X									
	#10-24 x 5.00 RHS	CF000045	1	X									
	Insulating Washer	T4479-A	2	X									
3	Sub Panel Assembly	See P-127-S	1	X									
4	Work Jack (Below Code 8400)(Not Shown)	T14280	1	X									
5	Door Assembly	See P-127-N	1	X									
9	Circuit Breaker (LN9F)	T12287-10	1	X									
9	Circuit Breaker (LN9FH & LN9F GMA)	T12287-8	1	X									
10	Push Button Switch	T14200	1	X									
11	Terminal Strip	S13323-5	1	X									
	Number Plate	T10726-130	1	X									
14	Plug Button	T13597-1	1	X									
17	Reed Switch Assembly	S12334-26	1	X									
18	Resistor	T12731-34F	1	X									
19	Terminal Strip	T10707	1	X									
22	Transformer Assembly	S14651-6 ø	1	X									
23	Voltage Printed Circuit Board Assembly (Below Code 9000)	L6084	1	X									
23	Voltage Printed Circuit Board Assembly (Above 9000)	L6084-[ ]	1	X									
	Voltage Printed Circuit Board Insulation	S16364	1	X									
25	Warning Decal	T13470	1	X									
26	Patent Decal	S13232	1	X									
27	Start Printed Circuit Board Assembly (Below Code 9000 Only) (Not Shown)	M13750	1	X									
29	Potentiometer	S16296-1	2	X									
30	Felt Washer	T14034	2	X									
	Insulating Tube	T7028-241	2	X									#
	Knob	T14091	2	X									
33	Warning Label	S16722-3A	1	X									
	Parts (Not Shown)												
	Tachometer Connector (Not Used On LN9F GMA)	S12021-18	1	X									
	Input Connector	S12021-12	1	X									
	Output Connector (LN9F & 9FH)	S12021-10	1	X									
	Output Connector (LN9F GMA)	S12021-37	1	X									

Note: When ordering new printed circuit boards indicate the dash number [ ] of the “Old” board that is to be replaced. This will aid Lincoln in supplying the correct and latest board along with any necessary jumpers or adapters. The dash number brackets [ ] have purposely been left blank so as to eliminate errors, confusion and updates.

ø This part is obsolete and no longer available.

DOOR ASSEMBLY
LN9F, LN9FH, & LN9F GMA



L7091
2-1-85B

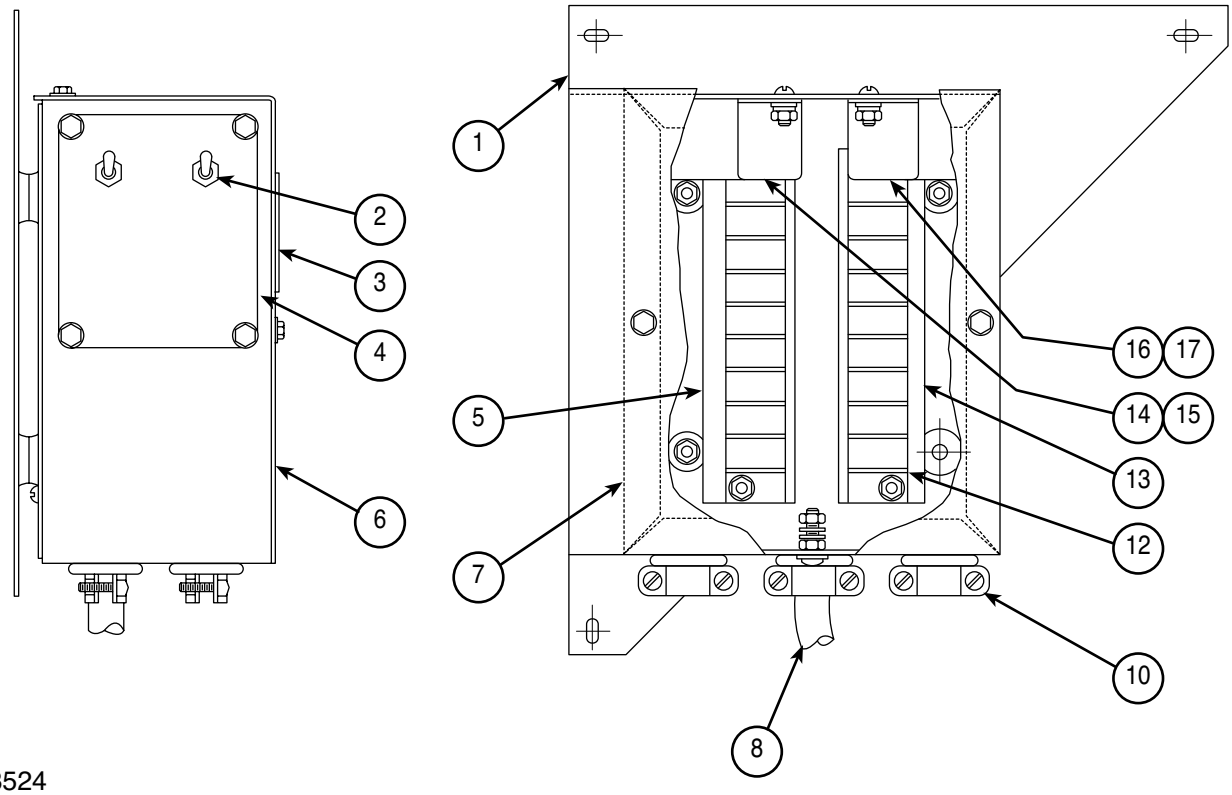
# Indicates a Change This Printing

For Codes Below 8000, use parts marked “X” in Column 1.
For Codes 8000 to 8700, use parts marked “X” in Column 2.
For Codes Above 8700, use parts marked “X” in Column 3.
For LN9F GMA, use parts marked “X” in Column 4.

ITEM	DESCRIPTION	PART NO.	QTY.	1	2	3	4	5	6	7	8	9	
	Door Assembly, Includes:	L6023	1	X	•	•	•						
	Door Assembly (LN9F Only), Includes:	L6185-1	1	•	X	•	•						
	Door Assembly (LN9FH Only), Includes:	L6185-2	1	•	X	•	•						
	Door Assembly (LN9F Metric), Includes:	L6667-1	1	•	X	•	•						
	Door Assembly (LN9FH Metric), Includes:	L6667-2	1	•	X	•	•						
	Door Assembly (LN9F Metric), Includes:	L7091-1	1	•	•	X	•						
	Door Assembly (LN9FH Metric), Includes:	L7091-2	1	•	•	X	•						
	Door Assembly (LN9F GMA), Includes:	L7367	1	•	•	•	X						
1	Door	S16336 ø	1	X	•	•	X						
1	Door	S16336-2	1	•	•	•	X						
1	Door	S16336-1	1	•	X	X	•						
2	Button Plug	T13597-2	1	X	X	X	•						
2	Button Plug	T13597-2	4	•	•	•	X						
3	Nameplate	L6005	1	X	•	•	•						
3	Nameplate (LN9F Only)	L6183 ø	1	•	X	•	•						
3	Nameplate (LN9FH Only)	L6184 ø	1	•	X	•	•						
3	Nameplate (LN9F Metric)	L6183-1	1	•	X	X	•						
3	Nameplate (LN9F GMA)	L7348	1	•	•	X	•						
3	Nameplate (LN9FH Metric)	L6184-1	1	•	X	X	•						
4	Meter & P.C. Board Assembly	M13650	1	X	•	•	•						
4	Meter & P.C. Board (LN9F Only)	L6181-[ ]	1	•	X	•	•						
4	Meter & P.C. Board (LN9FH Only)	L6181-[ ]	1	•	X	•	•						
4	Meter & P.C. (LN9F Metric)	L6687-[ ]	1	•	X	X	•						
4	Meter & P.C. Board (LN9FH Metric & LN9F GMA)	L6688-[ ]	1	•	X	X	X						
5	Switch (Polarity)	T13111	1	X	X	X	X						
6	Switch & Transient Protector Assembly	T14535	1	X	X	X	•						
6	Switch (Direction)	T10800-7	1	•	•	•	X						
7	Bezel Assembly	S17414	1	•	•	X	X						
8	Meter Shield (Std. Clear Lens)	T14771	1	X	X	•	•						
8	Filter Lens	T14807-1	1	•	•	X	X						
9	Meter Shield Frame	M13572	1	X	X	X	X						
13	Lock Tab	T10045-40	1	X	X	X	X						
14	Dial Plate	S16277	1	X	X	X	X						
15	Security Panel	S16275	1	X	X	X	X						
17	Switch (LN9F Only)	T13111	1	X	X	•	•						
17	Switch (LN9FH Only)	T13381-2	1	•	X	•	•						
17	Switch (LN9FH Metric, LN9F GMA), Includes:	S16670-5	1	•	X	X	X						
	Knob	T13639	1	•	X	X	X						
18	Switch	T10800-4	1	X	•	•	•						
18	Switch (Hot-Cold Interlock)	T10800-12	1	•	X	X	X						
19	Switch & Actuator Assembly	T14751-1	1	X	X	X	X						
20	Meter & Pin Assembly	S16636	1	•	X	•	•						
20	Digital Meter P.C. Board	M14490-[ ]	1	•	•	X	X						
21	P.C. Board Spacer	M14537	1	•	•	X	X						
22	Printed Circuit Board Insulation	T14468	1	X	•	X	X						
	Items Not Shown:												
	Fiber Washer	S10773-15	2	X	X	X	X						#
	Felt Washer	T14034	2	X	X	X	X						
	Insulating Tube	T7028-241	2	X	X	X	X						
	Potentiometer	S16296-1	2	X	X	X	X						
	Knob	T14091	2	X	X	X	X						

Ø This part is obsolete and no longer available.

K317 DUAL PROCESS KIT



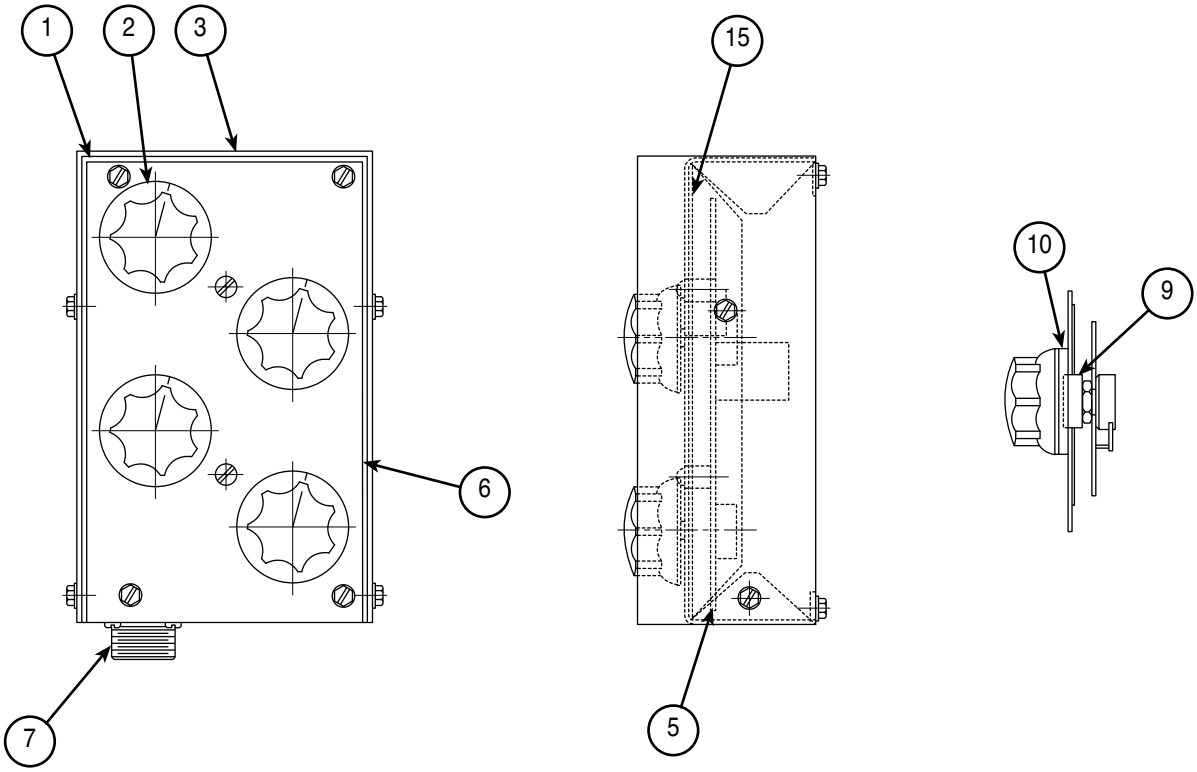
M13524
10-8-82G

P-127-P.1

# Indicates a Change This Printing

ITEM	DESCRIPTION	PART NO.	QTY.	1	2	3	4	5	6	7	8	9
1	Mounting Bracket	M13696	1	X								
2	Toggle Switch	T13381	2	X								
3	Caution Decal	T13470	1	X								
4	Nameplate	S16391	1	X								
5	Number Plate	T10726-125	1	X								
6	Cover	M13692	1	X								
7	Case Welded Assembly	S16191	1	X								
8	Control Cable	S16190	1	X								
10	Box Connector	T9639-1	2	X								
12	Terminal Strip	S8542-1	2	X								
13	Number Plate	T10726-126	1	X								
14	Relay (1CR)	T13845-3	1	X								
15	I.D. Sticker	T12286-1	1	X								
16	Relay (2CR)	S14293-7	1	X								
17	I.D. Sticker	T12286-2	1	X								

K319 DUAL PROCEDURE KIT



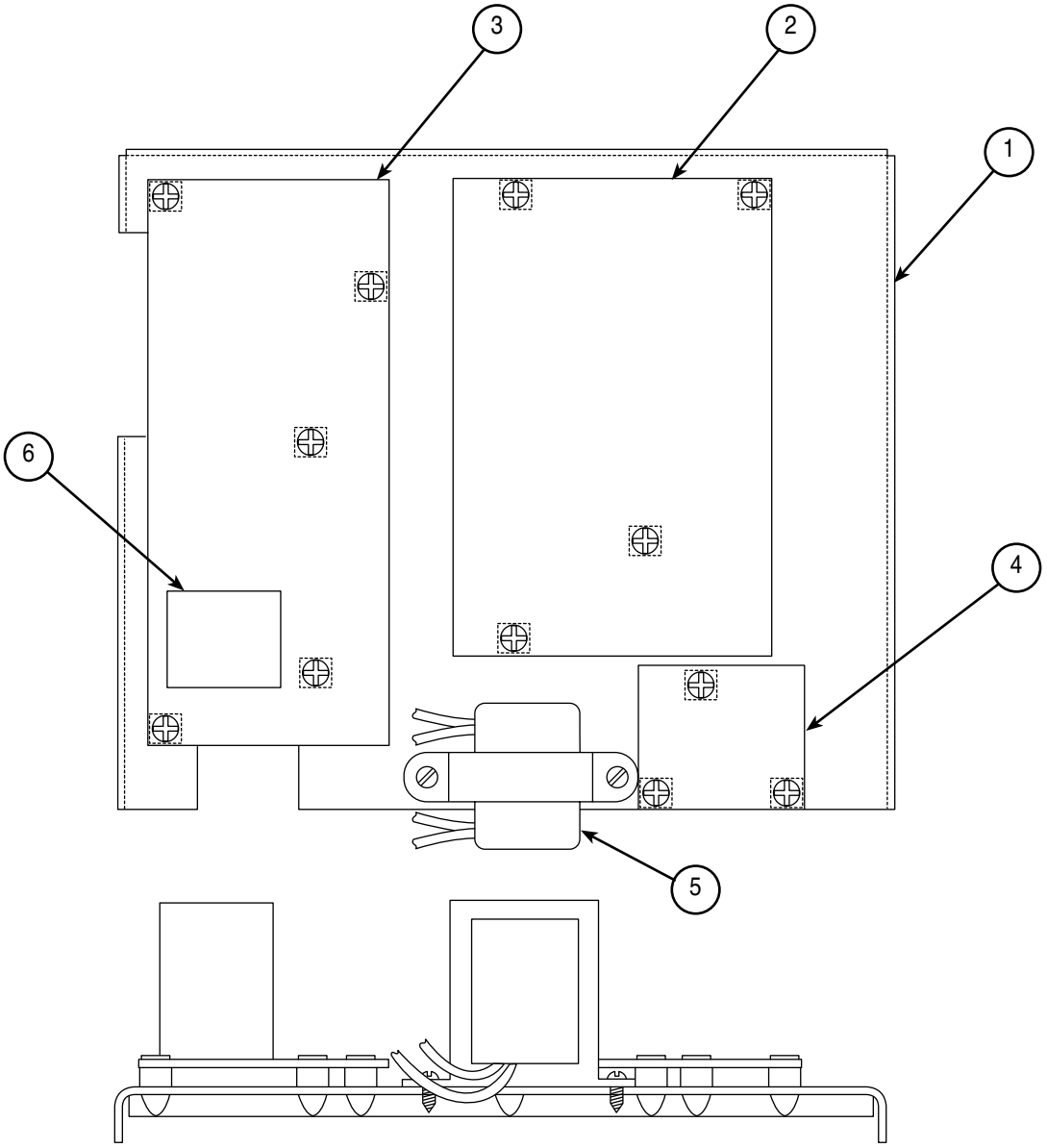
L6055
11-5-82M

P-127-R.1

# Indicates a Change This Printing

ITEM	DESCRIPTION	PART NO.	QTY.	1	2	3	4	5	6	7	8	9	
1	Control Box	L6054	1	X									
2	Rheostat Knob	T10491	4	X									
3	Cover	M13652	1	X									
4	Insulation	S16384	1	X									
5	P.C. Board Assembly	M13679-[ ]	1	X									
6	Nameplate	S16382	1	X									
7	Receptacle Assembly	S13100-63	1	X									
9	Insulating Tube	T14767	4	X									
10	Shaft Seal	T14034	4	X									
	Insulating Tube	T7028-241	2	X									#
	Items Not Shown:												
	Gun Mounted Selector Switch & Cable Assembly, Includes:	S16383	1	X									
	3 pin Amphenol Connector	S12020-16	1	X									
	Cable Clamp	S12024-4	1	X									
	Extension Cable Assembly, Includes:	M13681	1	X									
	3 socket Amphenol Connector	S12023-8	1	X									
	3 pin Amphenol Connector	S12020-16	1	X									
	Cable Clamp	S12024-4	2	X									

INSTRUMENT PANEL
LN9F, LN9FH & LN9F GMA



M13647
2-10-95D

P-127-S.1

# Indicates a Change This Printing

ITEM	DESCRIPTION	PART NO.	QTY.	1	2	3	4	5	6	7	8	9
	Sub Panel Assembly, Includes: (Below Code 8000)	M13647	1	X								
	Sub Panel Assembly, Includes: (Above Code 8000 LN9F & FH)	M13647-1	1	X								
	Sub Panel Assembly, Includes: (LN9F GMA)	M13647-1	1	X								
1	Sub Panel (Below Code 8000)	M13626	1	X								
	Sub Panel (Above Code 8000)	M13872-1	1	X								
2	Control Printed Circuit Board (LN9F & FH)	L6019	1	X								
2	Control Printed Circuit Board (LN9F GMA) (Below Code 10352)	L7253-[ ]	1	X								
2	Control Printed Circuit Board (LN9F GMA) (Above Code 10352)	L10068-[ ]	1	X								
	Plastic Expansion Nut	S14020-3	4	X								
	Self Tapping Screw	S8025-71	4	X								
3	Power Printed Circuit Board (LN9F & FH)	L6043-[ ]	1	X								
3	Control Printed Circuit Board (LN9F GMA)	L7265-2	1	X								
	Plastic Expansion Nut	S14020-3	5	X								
	Self Tapping Screw	S8025-71	5	X								
4	Trigger Printed Circuit Board (Below Code 8000)	M13630	1	X								
4	Trigger Printed Circuit Board (Above Code 8000)	M13861-[ ]	1	X								
	Plastic Expansion Nut	S14020-3	3	X								
	Self Tapping Screw	S8025-71	3	X								
5	Transformer Assembly	S16282	1	X								
5	Transformer Assembly (Used with Trigger Board)	S16282-1	1	X								
6	Power Board Relay	S13929-6	1	X								

P-127-T

Conversion Kit Chart

LN9 GMA (2 Roll Drive)

WIRE	CONVERSION KIT	INCOMING GUIDE	DRIVE ROLL	OUTGOING GUIDE TUBE	OUTGOING GUIDE INSERT	DRIVE ROLL SPACER	
.068"-5/64 Cored	KP653-3/32	KP2139-8	S14541-3/32 (2 Req"d)	KP2125-5	KP2125-8	S13342-3/32	#
(.062) 1/16 Cored or Solid*	KP653-1/16	KP2139-5	S14541-1/16 (2 Req"d)	KP2125-3	KP2124-5	None	#
.045 & .052"	KP653-052C	KP2139-3	S14542-052	KP1999-1	KP2124-3	None	#
.045" -.052" Cored	KP653-052C	KP2139-3	M17301 (2 Req"d)	KP1999-1	KP2124-3	None	#
.023" -.035" Solid	KP653-035S	KP2139-3	M17301-035	KP2125-1	KP2124-1	T14984	#
.030 Solid	KP653-030S	KP2139-1	M17301-030	KP2125-1	KP2124-1	T14984	#
.035 Cored	KP653-030C	KP2139-3	M17301-030	KP2125-1	KP2124-1	T14984	#
.035 Solid	KP653-035S	KP2139-3	M17301-035	KP2125-1	KP2124-1	T14984	#
7/64 Cored	KP653-7/64H	KP2139-8	M17302-120	KP2125-4	KP2124-7	None	#
.120 Cored	KP653-120C	KP2139-7	M17302-120	KP2125-4	KP2124-7	None	#
1/16A	KP654-1/16A	KP2139-5	S17092-1/16A	KP2125-3	KP2124-5	Wing Screw T9078-3	#
3/64A	KP654-3/64A	KP2139-3	S17092-035A	KP1999-1	KP2124-1	Wing Screw T9078-3	#
.035A	KP654-035A	KP2139-1	S17092-035A	KP2125-1	KP2124-1	Wing Screw T9078-3	#

* Can be used for .052

LN9 GMA (4 Roll Drive)

WIRE SIZE GUIDE	CONVERSION KIT	INCOMING GUIDE TUBE ASSEMBLY	DRIVE ROLL	SPACER (2 REQ'D)	OUTGOING GUIDE TUBE	OUTGOING GUIDE INSERT	MIDDLE INSERT L(LOOSE)	
.023 - .025S	KP655-025S	KP2139-2	M17301-025	T14984	KP2125-1	KP2124-1	KP2114-1	#
.030 Solid	KP655-030S	KP2139-2	M17301-030	T14984	KP2125-1	KP2124-1	KP2114-1	#
.035 Cored	KP655-035C	KP2139-4	M17302-035	None	KP2125-1	KP2124-1	KP2114-1	#
.035 Solid	KP655-035S	KP2139-4	M14932 (2 Req"d)	T14984	KP2125-1	KP2124-1	KP2114-1	#
.045 & .052" Solid	KP655-052S	KP2139-4	S14542-052 (2 Req'd)	None	KP1999-1	KP2124-3	KP2114-2	#
.045 - .052" Cored	KP655-052C	KP2139-4	S14541-052 (4 Req'd)	None	KP1999-1	KP2124-3	KP2114-2	#
1/16 Solid	KP655-1/16	KP2139-6	S14541-1/16 (4 Req'd)	None	KP2125-3	KP2124-5	KP2114-3	#
.068 - 3/32 Cored	KP655-3/32	KP2139-9	S14541-3/32 (4 Req'd)	S13342-3/32	KP2125-5	KP2124-8	KP2114-5	#
.120 Cored	KP655-120C	T13467-120F	M17302-120	None	KP2125-4	KP2124-7	KP2114-4	#
1/16A	KP656-1/16A	KP2132-1	S17092-1/16A (2 Req'd)	None	KP2137-2	S14349-1/16L	KP2115	#
3/64A	KP656-3/64A	KP2132-2	S17092-3/64A (2 Req'd)	None	KP2137-3	S14349-045 L	KP2115-2	#
.035A	KP656-035A	S21273-3/64F	S17092-035F(2 Req'd)	None	KP2137-1	S14349-045L	KP2115-2	#

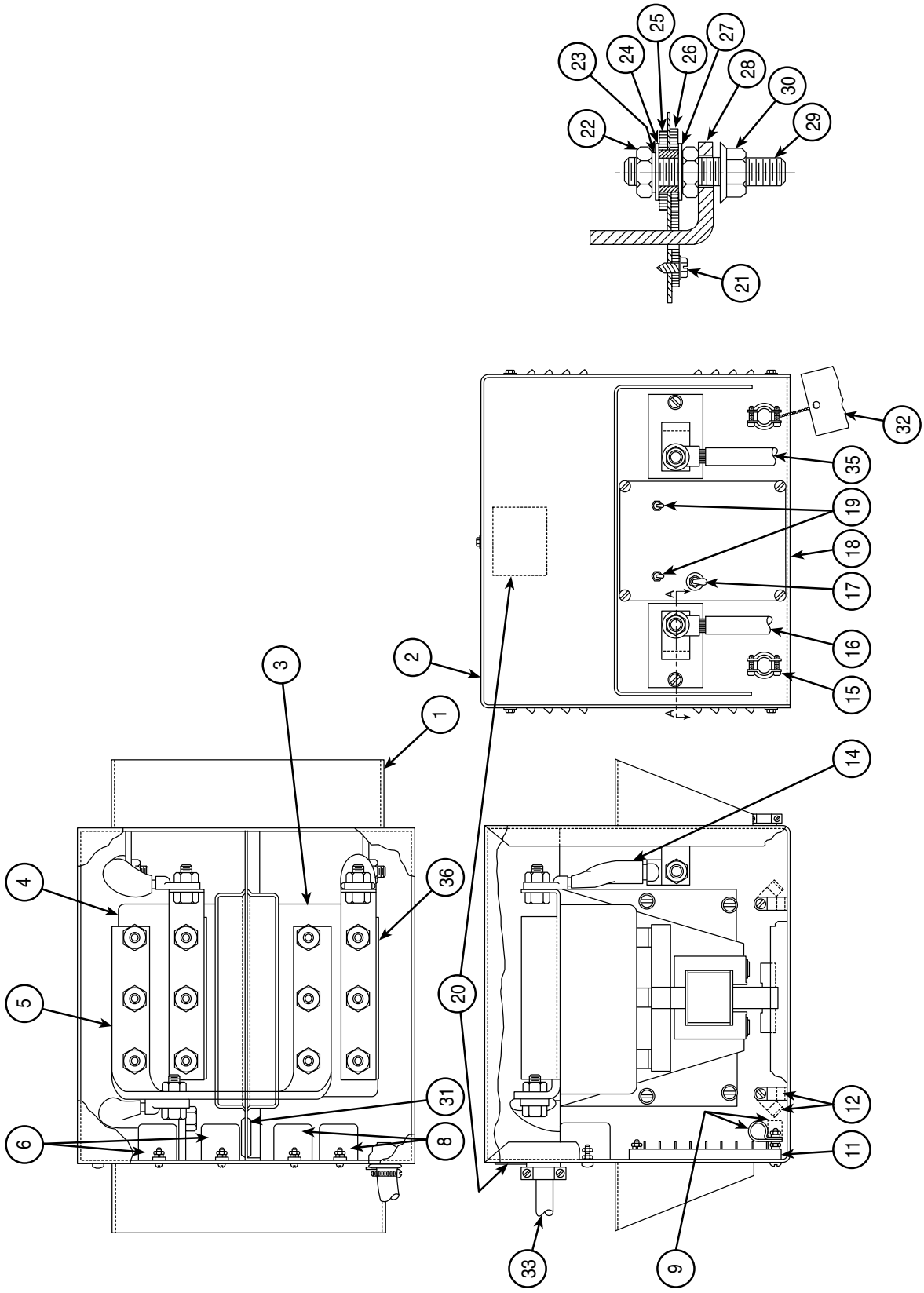
#Indicates a Change This Printing

Some Drive Rolls Available Only in a Kit.

NOTES

P-127-U

K318 DUAL PROCESS CONTACTOR KIT



L6224
10-8-82G

# Indicates a Change This Printing

For Code 8002, use parts marked “X” in Column 1.
For all other Codes, use parts marked”X” in Column 2.

ITEM	DESCRIPTION	PART NO.	QTY.	1	2	3	4	5	6	7	8	9
1	Case	M13673-1 ø	1	X	•							
1	Case	M13673-2	1	•	X							
2	Wraparound	L3153	1	X	X							
3	Contactor (Less NVR Coil)	L4300-31A	1	X	•							
3	Contactor (Less NVR Coil)	L4300-33A	1	•	X							
	NVR Coil	S17-3	1	X	X							
4	Contactor (Less NVR Coil)	L4300-30A	1	X	•							
4	Contactor (Less NVR Coil)	L6200-32A	1	•	X							
	NVR Coil	S17-3	1	X	X							
5	Contactor Jumper	M8427-1	1	X	X							
6	Relay	S14293-7	1	X	•							
6	Relay	S14293-8	2	•	X							
8	Relay	S14293-7	1	X	•							
8	Relay	S14293-7	2	•	X							
9	Lead Clamp	T12563-11	2	X	X							
11	Terminal Strip	S8542-1	2	X	•							
11	Terminal Strip	S8542-2 ø	2	•	X							
	Number Plate	T10726-125	1	X	•							
	Number Plate	T10726-136 ø	1	•	X							
	Number Plate	T10726-126	1	X	•							
	Number Plate	T10726-137 ø	1	•	X							
12	Lead Clamp	T12363-11	4	X	X							
14	Cable	L2286-139	3	X	X							
15	Box Connector	T9639-1	2	X	X							
16	Cable	L2286-256	1	X	X							
17	Transfer Switch	T10800-14	1	X	X							
18	Nameplate	M13677	1	X	X							
19	Mode Switch	T13381	2	X	X							
20	Caution Decal	T13470	1	X	X							
21	Self Tapping Screw	S8025-65	3	X	X							
22	Hex Jam Nut	1/2-13	6	X	X							
23	Lock Washer	E106A-15	3	X	X							
24	Plain Washer	S9262-1	6	X	X							
25	Insulating Washer	S10773-9	3	X	X							
26	Insulating Panel	T14373	3	X	X							
27	Insulating Tube	T14374	3	X	X							
28	Connection Strap	T8141	3	X	X							
29	Stud	T6931-11	3	X	X							
30	Flanged Nut	T3960	3	X	X							
31	Grommet	T8965	1	X	X							
32	Reconnect Tag	T11590-52	1	X	X							
33	Control Cable	S16378 ø	1	X	•							
33	Control Cable	S16677 ø	1	•	X							
35	Cable	L2286-255	1	X	X							
36	Contactor Jumper	S13472-2	2	X	X							

Ø This part is obsolete and no longer available

Conversion Kit Chart

LN9
(4 Roll Drive)

WIRE	CONVERSION KIT	INCOMING GUIDE	DRIVE ROLL (2 REQ'D)	IDLE ROLL ASSEMBLY	OUTGOING GUIDE TUBE	OUTGOING GUIDE INSERT	MIDDLE GUIDE
7/64"-.120 & 2.8-3.0 mmCored	KP545-120	KP2123-4	T12057-120	S12722-120	KP2119-1	KP2131-1	KP2129-4
.068 & 3/32 1.7-2.4 mm Cored & Solid	KP545-3/32	KP2123-5	T12057-3/32	S12722-3/32	KP2119-2	KP2131-2	KP2129-5
1/16" & 1.6mm Solid	KP545-1/16	KP2123-3	S13343-1/16	S12722-1/16	KP2117-3	KP2130-3	KP2129-3
1/16 & 1.6mm Cored or Solid	KP545-1/16C	KP2123-3	T12057-1/16	S12722-1/16	KP2117-3	KP2130-3	KP2129-3
.045"-.052" & 1.0-1.4 mm Solid	KP545-052	KP2123-2	S13343-052	S12722-052	KP2117-2	KP2130-2	KP2129-2
.045"-.052" & 1.0-1.4mm Cored	KP545-052C	KP2123-2	T12057-052	S12722-052	KP2117-2	KP2130-2	KP2129-2
.030"-.035" & 0.8-0.9mm Solid	KP545-035	KP2123-1	S13343-035	S12722-035	KP2117-1	KP2130-1	KP2129-1
1/16" & 1.6mm	KP546-1/16A	KP2123-3	S17729-1/16	S17731-1/16	KP2117-3	KP2130-3	KP2129-3
3/64" & 1.2mm	KP546-3/64A	KP2123-2	S17729-3/64	S17731-3/64	KP2117-2	KP2130-2	KP2129-2
.035" & 0.9mm	KP546-035A	KP2123-1	S17729-035	S17731-035	KP2117-1	KP2130-1	KP2129-1

LN-9
(2 Roll Drive)

WIRE	CONVERSION KIT	INCOMING GUIDE	DRIVE ROLL	IDLE ROLL ASSEMBLY	OUTGOING GUIDE TUBE	OUTGOING GUIDE INSERT
7/64"-.120 & 2.8-3.0 mm Cored	KP502-120	KP2123-4	T12057-120	S12722-120	KP2119-1	KP2120-1
.068 & 3/32 1.7-2.4 mm Cored & Solid	KP502-3/32	KP2123-5	T12057-3/32	S12722-3/32	KP2119-2	KP2120-2
1/16" & 1.6mm Solid	KP502-1/16	KP2123-3	S13343-1/16	S12722-1/16	KP2117-3	KP2118-3
1/16 & 1.6mm Cored	KP502-1/16C	KP2123-3	T12057-1/16	S12722-1/16	KP2117-3	KP2118-3
.045"-.052" & 1.0-1.4 mm Solid	KP502-052	KP2123-2	S13343-052	S12722-052	KP2117-2	KP2118-2
.045"-.052" & 1.0-1.4mm Cored	KP502-052C	KP2123-2	T12057-052	S12722-052	KP2117-2	KP2118-2
.030"-.035" & 0.8-0.9mm Solid	KP502-035	KP2123-1	S13343-035	S12722-035	KP2117-1	KP2118-1
7/64" &2.8 Hardfacing	KP502-7/64H	KP2123-4	T12057-7/64H	S12722-7/64H	KP2119-1	KP2120-1
1/16" & 1.6mm	KP503-1/16A	KP2123-3	S17729-1/16	S17731-16	KP2117-3	KP2118-3
3/64" & 1.2mm	KP503-3/64A	KP2123-2	S17729-3/64	S17731-3/64	KP2117-2	KP2118-2
.035" & 0.9mm	KP503-035A	KP2123-1	S17729-035	S17731-035	KP2117-1	KP2118-1

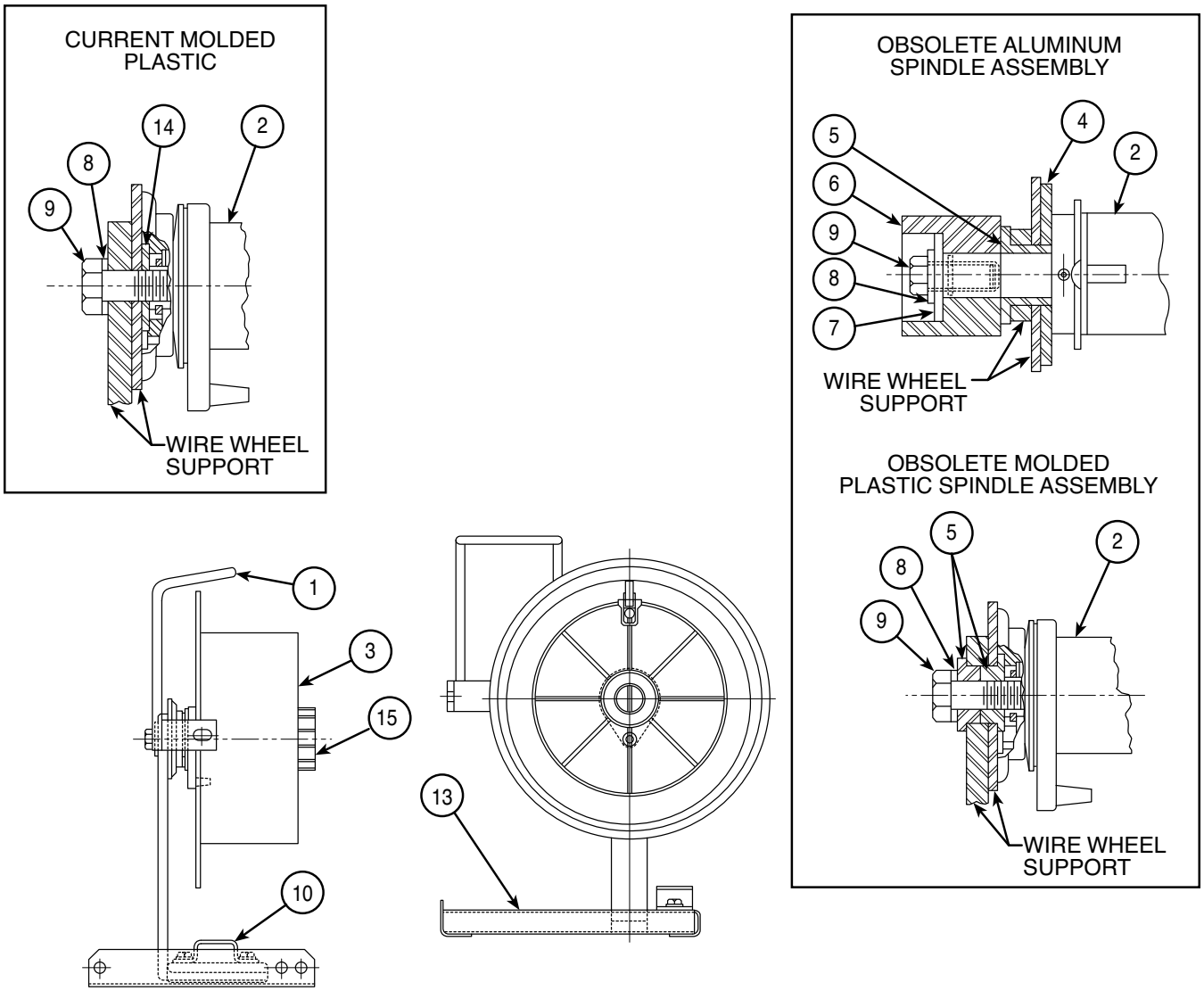
Some Drive Rolls Available Only in a Kit.

NOTES

P-125-N

STAND ASSEMBLY FOR READI-REEL

(K377)



L6940
12-19-85G

11-25-97

P-125-N.1

# Indicates a Change This Printing

For Obsolete Molded Plastic Spindle Assembly Use Column 1.
For Obsolete Aluminum Spindle Assembly Use Column 2.
For Current Molded Plastic Assembly Use Column 3.

ITEM	DESCRIPTION	PART NO.	QTY.	1	2	3	4	5	6	7	8	9	
-													
1	Wire Reel Support Assembly	L6831-3 ø	1	X	X	X							#
2	Wire Reel Shaft Assembly	M14511	1	X	•	•							
2	Spindle Assembly	M14935	1	•	X	X							
3	Readi-Reel Adapter	K363-P	1	X	X	X							
4	Insulating Washer	S10773-52	1	X	•	•							
5	Insulator Bushing	T14816	1	X	•	•							
5	Bushing	T14844	1	•	X	•							
6	Brake Disc Spacer	T12967-1	1	X	•	•							
7	Plainwasher	S9262-14	1	X	•	•							
8	Lockwasher	E106A-15	1	X	X	X							
9	Hex Head Screw	1/2-13 x 1.00	1	X	•	•							
9	Hex Head Screw	1/2-13 x 1.75	1	•	X	X							
10	Cable Clamp	S16819	1	X	X	X							
	Thread Rolling Screw	S9225-8	2	X	X	X							
12	Retaining Collar	S13871	1	X	•	•							
13	Readi-Reel Decal	T13086-44	1	X	X	X							
14	Plainwasher	S9262-14	1	•	•	X							
15	**Retaining Collar**	**M14587-1**	**1**	•	•	**X**							
	Optional - Not Illustrated												
	10# Wire Reel Spacer	S18221	1	X	X	X							

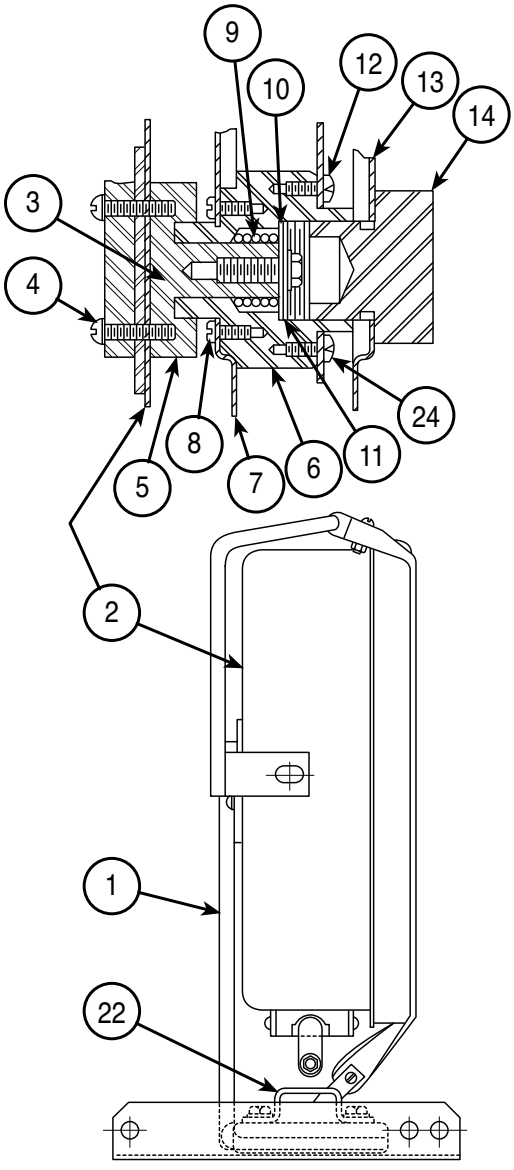
Ø This part is obsolete and no longer available.

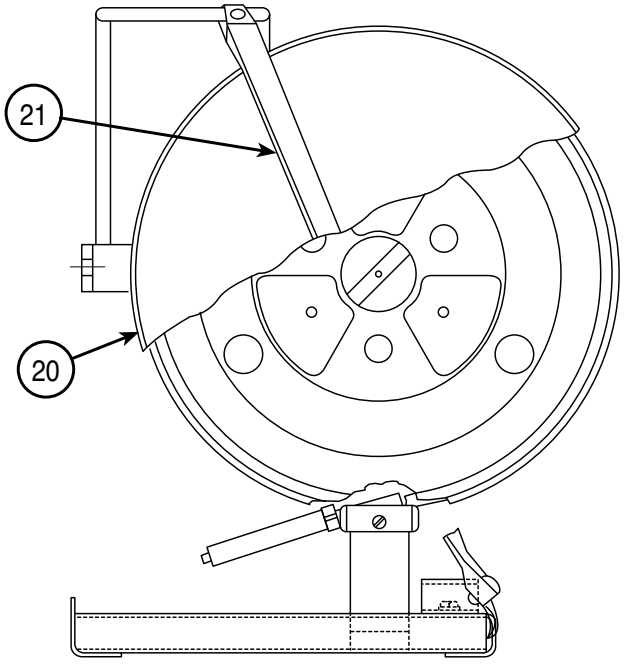
05-09-2002

P-125-O

STAND ASSEMBLY FOR 14 POUND REEL

(K378)





1-28-2002

P-125-O.1

# Indicates a Change This Printing

Use only the parts marked "X" in the column under the heading number called for in the model index page.

ITEM	DESCRIPTION	PART NO.	QTY.	1	2	3	4	5	6	7	8	9	
1	Wire Reel Support Assembly	L6831-3 ø	1	X									#
2	Wire Reel Housing, Includes:	S17069-2	1	X									
	Housing	M11940	1	X									
	Wire Sheath	T14800	1	X									
	Wire Sheath Insulating Block	S17068	1	X									
	Support Washer	S15094	1	X									
3	Axle	S13954	1	X									
4	Round Head Screw	#10-24 x .875	4	X									
	Lockwasher	E106A-1	4	X									
5	Washer	T13984	1	X									
6	Axle Housing	S13953	1	X									
7	Wire Reel Cover (Back)	M11574-2	2	X									
8	Self Tapping Screw	S8025-22	4	X									
9	Spring	T11862-8	1	X									
10	Plainwasher	S9262-45	1	X									
11	Insulating Washer	S10773-49	1	X									
12	Hex Head Screw	5/16-18 x .75	1	X									
	Lockwasher	E106A-3	1	X									
	Plainwasher	S9262-61	1	X									
13	Wire Reel Cover (Front)	M11574-2	1	X									
14	Axle Nut	S13956	1	X									
20	Housing Cover	M11578	1	X									
	Decal	S118932	1	X									
21	Cover Retaining Strap Assembly	S15891	1	X									
22	Cable Clamp	S16819	1	X									
	Thread Cutting Screw	S9225-8	2	X									
23	Coil Support Disc	S17060	1	X									
24	Thread Cutting Screw	S9225-30	2	X									

Ø This part is obsolete and no longer available.

05-09-2002

NOTES

INPUT CABLE AND EXTENSION CABLE ASSEMBLIES

# Indicates a Change This Printing

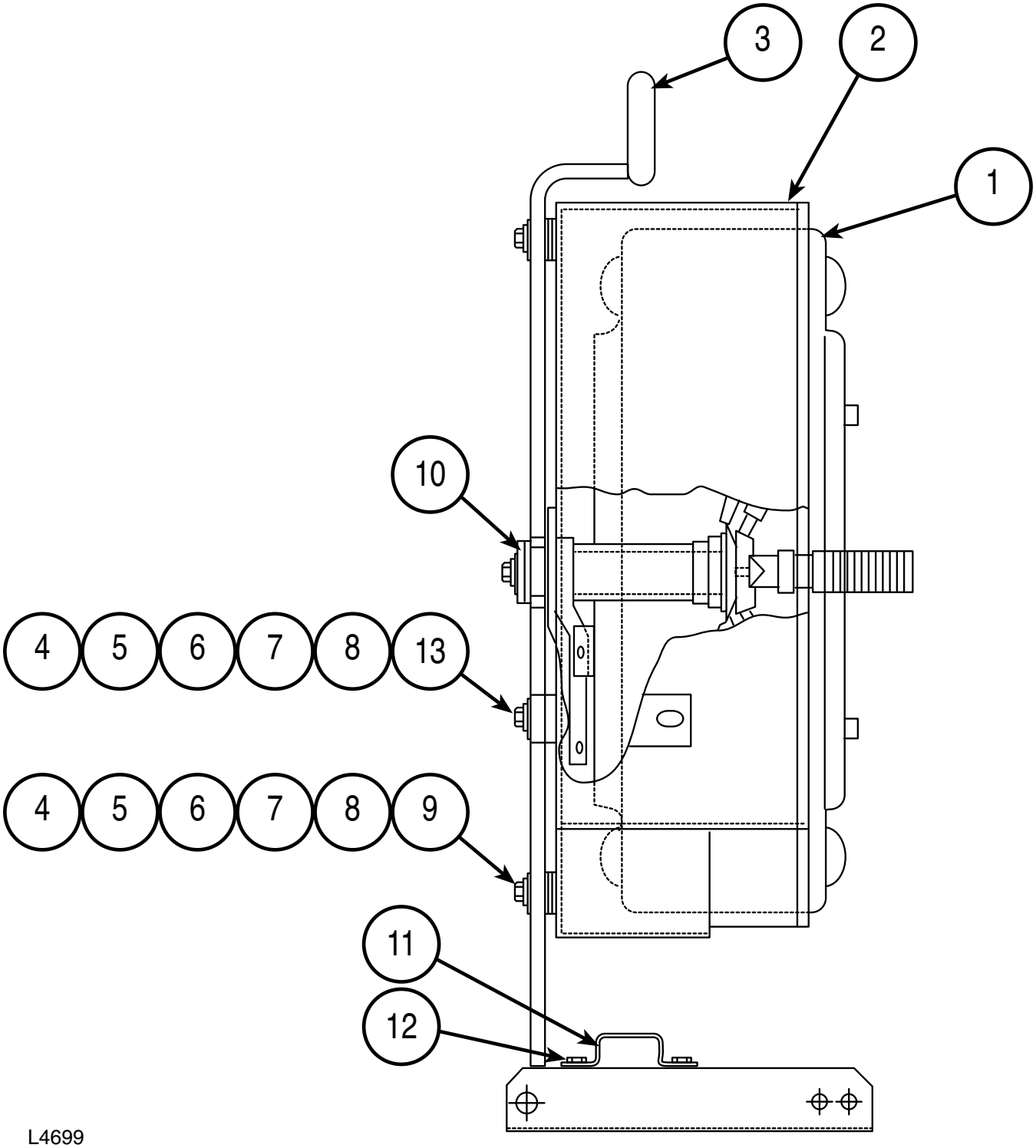
ITEM	DESCRIPTION	PART NO.	QTY.	1	2	3	4	5	6	7	8	9
	LN-6 Power Input Cable Assembly, Includes:	K164*	1									
	Control Cable Assembly, Includes:	L4700-B* ø	1									
	Amphenol Connector (Female)	S12020-11	1									
	Amphenol Connector (Male)	S12020-12	1									
	Amphenol Connector Clamp	S12024-2	2									
	Electrode Cable Assembly	L4700-C*	1									
	LN-8 & LN-9 Power Input Assembly, Includes:	K196*	1									
	Control Cable Assembly, Includes:	L5027-B*	1									
	Amphenol Connector (Female)	S12020-8	1									
	Amphenol Connector (Male)	S12024-2	1									
	Electrode Cable Assembly	L5027-C*	1									
	LN-6NE & LN-6SE Extension Cable Assembly, Includes:	M11518**	1									
	Control Cable Assembly, Includes:	M11517**	1									
	Amphenol Connector (Female)	S12020-11	1									
	Amphenol Connector (Male)	S12023-3	1									
	Amphenol Connector Clamp	S12024-2	2									
	Conductor Cable Assembly	L4702**	1									
	LN-8NE, 8SE, 9NE & 9SE Extension Cable Assembly Includes:	M12220**	1									
	Control Cable Assembly, Includes:	M12219**	1									
	Amphenol Connector (Female)	S12020-8	1									
	Amphenol Connector (Male)	S12023-2	1									
	Amphenol Connector Clamp	S12024-2	2									
	Conductor Cable Assembly	L4702**	1									
	Flux Hose, 22-1/2 Ft. (Req'd. For All Submerged Arc Machines)	T10642-82 ø	1									
	Flux Hose, 45 Ft. (Req'd. For All Submerged Arc Machines)	T10642-83	1									
	Electrode Cable, 22-1/2 Ft. (Req'd. On All Machines Above 450 Amps)	M5906-106	1									
	Electrode Cable, 45 Ft. (Req'd. On All Machines Above 450 Amps)	M5906-104	1									
	* Specify Cable Length and Maximum Current Draw Thru Cable. ** Specify " 22-1/2 Ft." or " 45 Ft." as appropriate.											

Ø This part is obsolete and no longer available.

07-26-2005

P-107-O

50 AND 60# WIRE REEL SUPPORT



07-26-2005

P-107-O.1

# Indicates a Change This Printing

For LN-6N, 6S, 7, 8N, 8S, 9HN and 9S (K303 Wire Reel Open Shroud), use Column 1. For Enclosed LN-6NE, 8NE, 9NE and 9SE, use Column 2. For LN-7 (K376 Wire Reel, No Shroud), use Column 3. For lightweight LN-6NE, 6SE, 8NE, 9NE and 9SE, use Column 4. For LN-22 use Column 5. For K445 use Column 6.

ITEM	DESCRIPTION	PART NO.	QTY.	1	2	3	4	5	6	7	8	9	
	LN-6, LN-7, LN-8 & LN-9 Wire Reel Support Assembly, Includes:	L4699-2	1	X	X	•	•	X	•				
	LN-7 Wire Reel Support Assembly, Includes:	L4959-2	1	•	•	X	•	•	•				
	LN-7 Wire Reel Support Assembly, Includes:	L4959-3	1	•	•	•	•	•	X				
1	Wire Reel	L4604	1	X	X	X	•	X	X				
1	Wire Reel	S18179	1	•	•	•	•	•	X				
2	Wire Reel Housing (For LN-7, K376 Reel, See **Note 1**)	S13858	1	X	X	•	•	X	•				
3	Reel Support	L4680	1	X	X	X	•	X	X				
4	Plain Washer	S9262-23	6	X	X	•	•	X	•				
5	Lock Washer	E106A-2	3	X	X	•	•	X	•				
6	1/4-20 HN	CF000017	3	X	X	•	•	X	•				#
7	1/4-20 x 1.50 HHCS	CF000141	3	X	X	•	•	X	•				#
8	Insulating Washer	S10773-41	12	X	X	•	•	X	•				
9	Insulating Tube	T7028-90	1	X	X	•	•	X	•				
10	Reel Mounting Shaft Assembly	See P-107-P	1	X	X	X	•	X	•				
10	Reel Mounting Shaft Assembly	Order K162-H	1	•	•	•	•	•	X				
11	Cable Clamp	S16819	1	X	X	X	•	X	X				
12	Thread Cutting Screw	S9225-8	2	X	X	X	•	X	X				
13	Insulating Tube	T7028-180	2	X	X	•	•	X	•				
	Optional Door Assembly, Includes:	M11514 **Note** 1	1	X	X	X	•	X	X				
	Door and Hinge Welded Assembly	L4692	1	X	X	X	•	X	X				
	Catch	T12652	1	X	X	X	•	X	X				
	Sealing Panel	S14049	1	X	X	X	•	X	X				
	Sealing Panel Mounting Plate	S14067	2	X	X	X	•	X	X				
	LN-XNE & LN-XSE Fully Wire Reel Support Assembly, Includes all Above plus:	L4745 ø	1	•	X	•	•	•	X				
	LN-22 Fully Enclosed Wire Reel Support Assembly, Includes all above plus:	L4745-2	1	•	•	•	•	X	•				
	Hand Crank Assembly	See P-107-R	1	•	X	•	•	•	X				
	Wire Feed Unit Handle	S13863	1	•	X	•	•	•	X				
	LN-XNE Lightweight Wire Reel Support Assembly, Includes:	L5369-2 ø	1	•	•	•	X	•	•				
	Wire Reel	L4604	1	•	•	•	X	•	•				
	Hand Crank Assembly	See P-107-R	1	•	•	•	X	•	•				
	Cage Type Wire Reel Support	L5368	1	•	•	•	X	•	•				
	Wire Feed Unit Handle	S13863	1	•	•	•	X	•	•				
	Reel Mounting Shaft Assembly (For 2" I.D. Spools)	Order K162	1	•	•	•	X	•	•				
	Reel Mounting Shaft Assembly (Standard)	M12460	1	•	•	•	X	•	•				

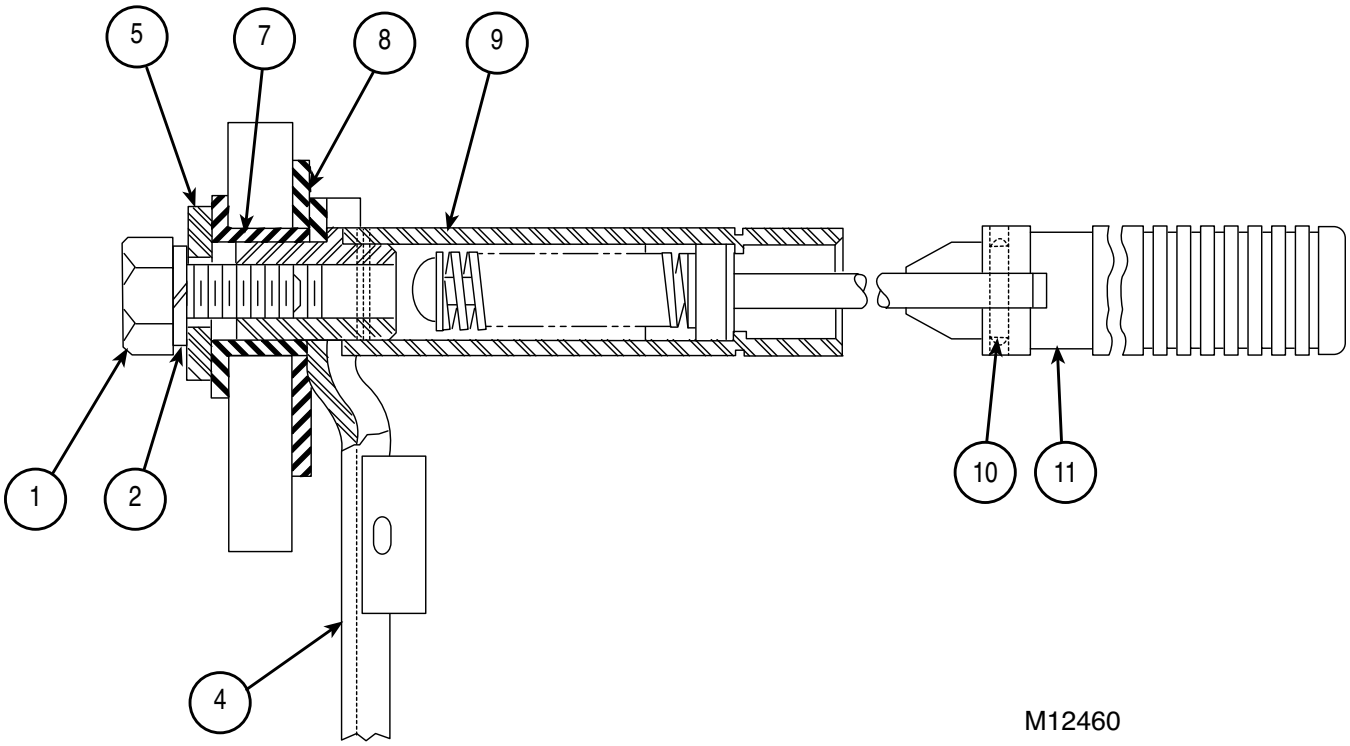
NOTE 1: To equip an LN-7 with a wire reel cover kit order S14543. Includes items 2, 4 through 9 and 13. For LN-7, K376 or K445 Reel, S14543 must also be installed when a K1898-1 door is to be installed.

Ø This part is obsolete and no longer available.

08-25-2009

P-107-P

WIRE REEL SHAFT



M12460

# Indicates a Change This Printing

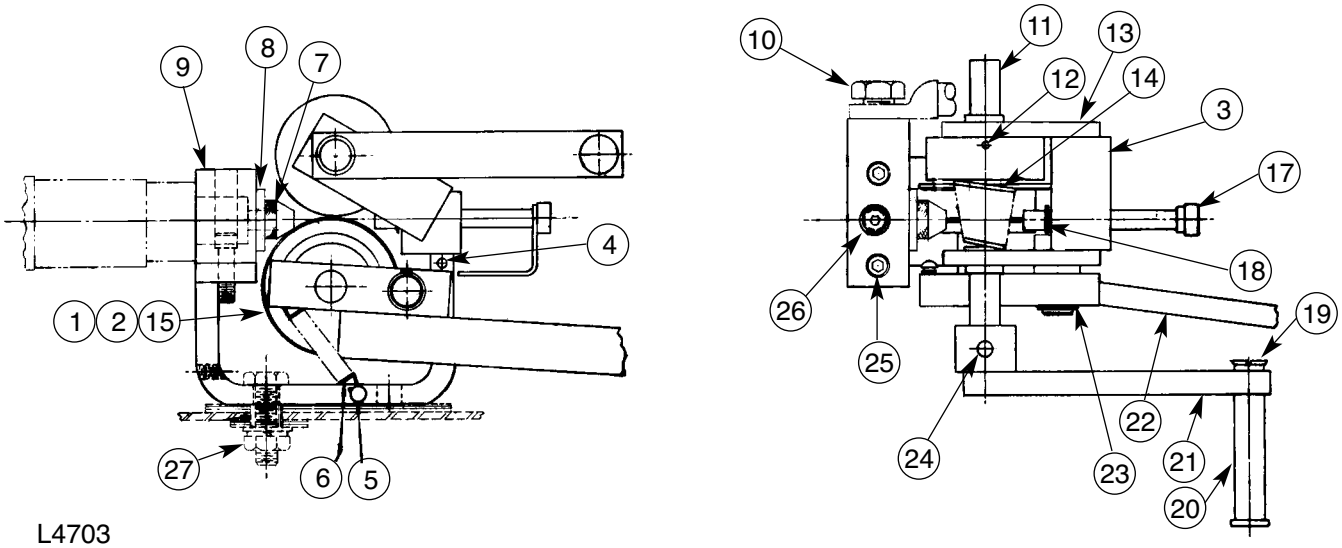
For All LN-6, LN-7, LN-8S, 8N, 8SE, LN-9S, 9N, 9SE, 9NE, 9NH and LN-22, use Column 1. For LN-8F, LN-9F and LN-9FH, use Column 2. For SP-200, use Column 3.

ITEM	DESCRIPTION	PART NO.	QTY.	1	2	3	4	5	6	7	8	9	
	Reel Mounting Shaft Assembly, Includes:	M12460	1	X	•	•							
	Reel Mounting Shaft Assembly, Includes:	M12908	1	•	X	•							
	Reel Mounting Shaft Assembly, Includes:	M12460-1	1	•	•	X							
1	Hex Head Bolt	1/2-13 x 1.00	1	X	X	X							
2	Lock Washer	E106A-15	1	X	X	X							
4	Brake Assembly, Includes:	S14882*	1	X	•	•							
4	Brake Assembly, Includes:	S14882-1	1	•	X	X							
	Brake	T13519	1	X	X	X							
	Cotter Pin	S10750-19	1	X	X	X							
5	Plain Washer (1.38 O.D.)	S9262-14	1	X	X	X							#
5	Plain Washer (1.50 O.D.)	S9262-119	1	•	X	•							
7	Insulator Bushing	T14816	1	X	•	X							
8	Insulating Washer	S10773-52	1	X	•	X							
9	Wire Reel Shaft Assembly	S16253	1	X	•	X							
9	Wire Reel Shaft Assembly	S15492	1	•	X	•							
10	Roll Pin	T9967-9	1	X	X	X							
11	Pull Knob	S11038	1	X	X	X							
*	LN-6 and LN-7 welders built before November 1972 did not have the adjustable brake (Item 4). If a shaft or fixed brake assembly is needed, order the M12460 Assembly.												

4-19-2000

HAND CRANK ASSEMBLY

LN-6, LN-7, LN-8 and LN-9



L4703

For All LN-6, LN-7, LN-8S, 8N, 8SE, LN-9S, 9N, 9SE, 9NE, 9NH and LN-22, use Column 1. For LN-8F, LN-9F and LN-9FH, use Column 2. For SP-200, use Column 3.

# Indicates a Change This Printing

ITEM	DESCRIPTION	PART NO.	QTY.	1	2	3	4	5	6	7	8	9	
	Hand Crank Assembly, Includes:	L4703 ø	1										
1	Plain Washer	S9262-120	1										
2	Hex head Screw	3/8-16 x .50	1										
3	Bracket Assembly	M10965 ø	1										#
4	Lever Arm Stop pin	T9967-4	1										
5	Drive Screw	S8025-7	2										
6	Tension Spring	T11514	1										
7	Guide Tube	S13686	1										
8	Spacer Washer	S9262-56	1										
9	Conductor Block	S13687	1										
10	Hex head Screw	1/2-13 x .75	1										
11	Shaft	T12650-1	1										
12	Roll Pin	T9967-31	1										
13	Drive Roll	S12805	1										
14	Conical Spring	T12648	1										
15	Idle Roll (1/16 thru .120)	T12556-4	1										
17	Incoming Guide Tube	T12654	1										
18	Retaining Ring	S9776-1	1										
19	Flat Head Screw	5/16-18 x 1.25	1										
20	Handle	S13397	1										
21	Crank Arm Assembly	S13392	1										
22	Lever Arm Assembly	S13404	1										
23	Retaining Ring	S9776-3	1										
24	Fiber Pin	T8433	1										
25	Socket Head Cap Screw	T9447-10 ø	2										
26	Set Screw	S11604-11	1										
27	Hex Head Screw	3/8-16 x 1.25	2										
	Insulating Tube	T7305-4	2										
	Insulating Washer	S10773-19	2										
	Plain Washer	S9262-120	2										
	Lock Washer	E106A-4	2										
	Hex Nut	3/8-16	2										
	Insulating Pad	T8477-12	1										

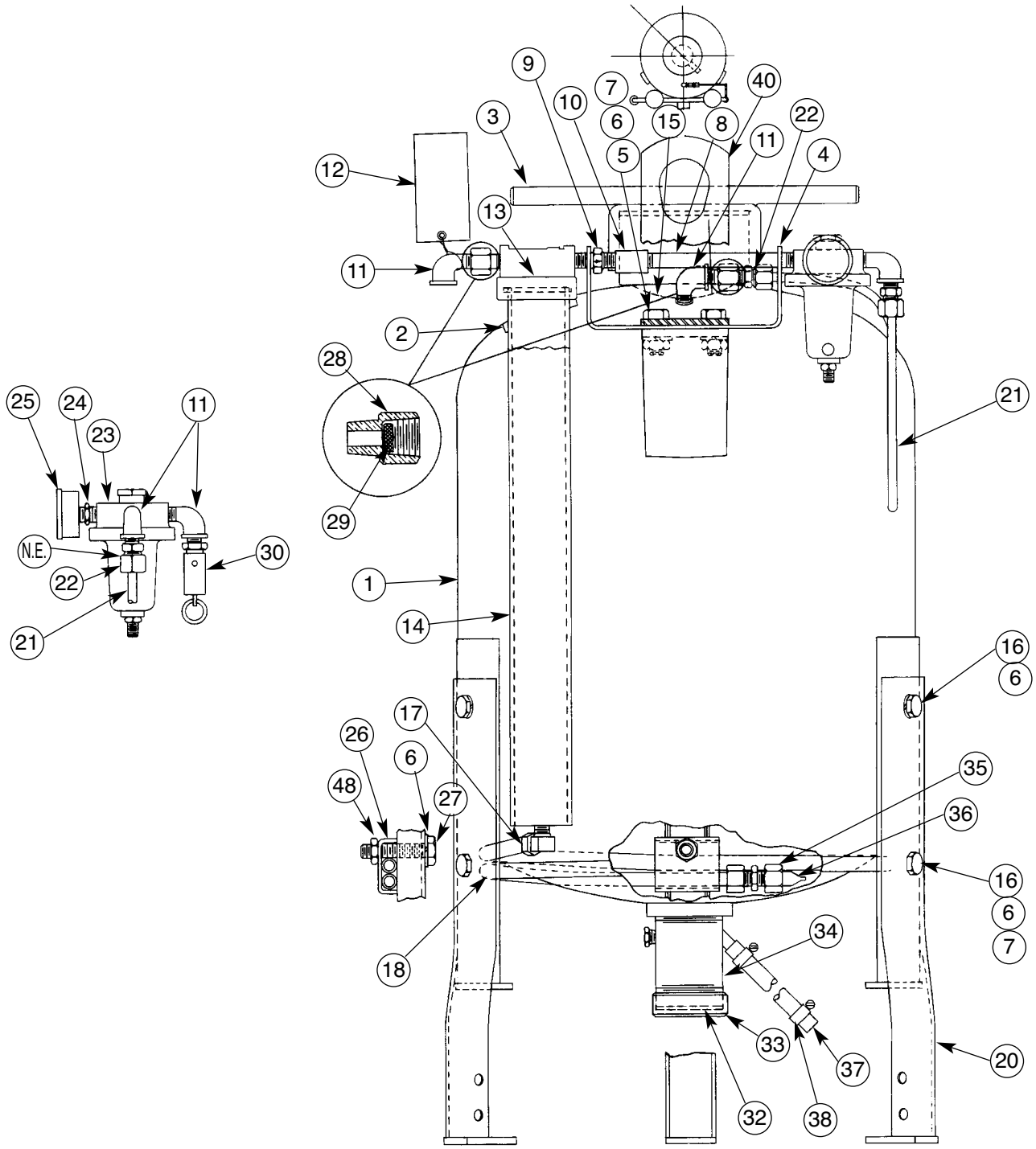
Ø This part is obsolete and no longer available.

01-30-2003

P-107-S

FLUX TANK

(LN-6, LN-7, LN-8 and LN-9)



L4695-4
9-19-80J

3-15-82

# Indicates a Change This Printing

Use Column 1 for Flux Tanks with Safety Valve on Outlet Assembly.
Use Column 2 for Flux Tanks with Safety Valve on Pressure Regulator.
Use Column 3 for Flux Tanks used on Welding Station.

t ITEM	DESCRIPTION	PART NO.	QTY.	1	2	# 3	4	5	6	7	8	9	
	Flux Tank Assembly, Includes:	K320	1	X	•	•							
	Flux Tank Assembly, Includes:	L4695-4	1	•	X	•							
	Flux Tank Assembly, Includes:	L4695-2	1	•	•	X							
1	Flux Tank	G1204	1	X	•	•							
1	Flux Tank	G1204-1	1	•	X	X							
2	Decal	T11182	1	X	X	X							
3	Tank Cover	S11461	1	X	X	X							
4	Instrument Mounting Bracket	S12741	1	X	X	X							
5	Hex Head Screw	1/2-13 x 1.25	2	X	X	X							
6	Lock Washer	E106A-5	8	X	X	X							
7	Hex Nut	1/2-13	4 or 5	X	X	X							
8	Pipe Nipple	T9959-11	1	X	X	X							
9	Check Valve	T11130	1	X	•	•							
9	Check Valve	T14410	1	•	X	X							
10	Pipe Nipple	T9959-7	1	X	•	•							
10	Pipe Coupling	T12390-1	1	•	X	X							
11	Street Elbow	T9958-2	4	X	X	X							
12	Caution Tag	T11416	1	X	X	X							
13	Air Line Filter	S11060	1	X	X	X							
14	Water Separator	M8985-1 ø	1	X	X	X							#
15	Strainer	S16628-1	1	X	X	X							
16	Hex Head Screw	1/2-13 x .75	5	X	X	X							
17	Compression Elbow	S7531	1	X	X	X							
18	Bleeder Line (For LN-4 or LN-5, Also Order Items 35 & 36)	T12995	1	X	X	X							
20	Flux Tank support	S12737	3	X	X	X							
21	Copper Line (For LN-4 or LN-5, Order S4893-65) ø	S4893-61	1	X	•	•							#
21	Copper Line	S4893-66	1	•	X	X							
22	Male Connector	T11167	2	X	X	X							
23	Pressure Regulator	S11028	1	X	X	X							
24	Reducing Bushing	T9948	1	X	X	X							
25	Pressure Gauge	S11395	1	X	X	X							
26	Clamp	S12740	1	X	X	X							
27	Hex Head Screw	1/2-13 x 2.75	1	X	X	X							
28	Adaptor	T11248	2	X	X	X							
29	Screen Cup	T11249	2	X	X	X							
30	Safety Valve	T11394	1	X	X	X							
31	Street Tee	T11393	1	X	•	•							
32	Cap Gasket	T11225-1	1	X	X	X							
33	Outlet Tube Cap	S11155	1	X	X	X							
34	Outlet Assembly	S12739	1	X	X	X							
35	Union	T12754	1	X	X	X							
36	Flared Copper Tube	T12755	1	X	X	X							
37	Flux Hose	T10642-81	1	X	•	•							#
37	Flux Hose (8 Ft. Boom)	T10642-80 ø	1	•	•	X							
37	Flux Hose (11Ft. Boom)	T10642-79	1	•	•	X							
37	Flux Hose (14 Ft. Boom)	T10642-77	1	•	•	X							
38	Hose Clamp (Tank End)	S10888-27	2	X	X	X							
40	Lift Bail Assembly	M11483	1	X	X	•							
	Flux Funnel - Not Illustrated	S11062	1	X	X	X							
	Air Line Connector - Not Illustrated	T14390-2	1	•	•	X							

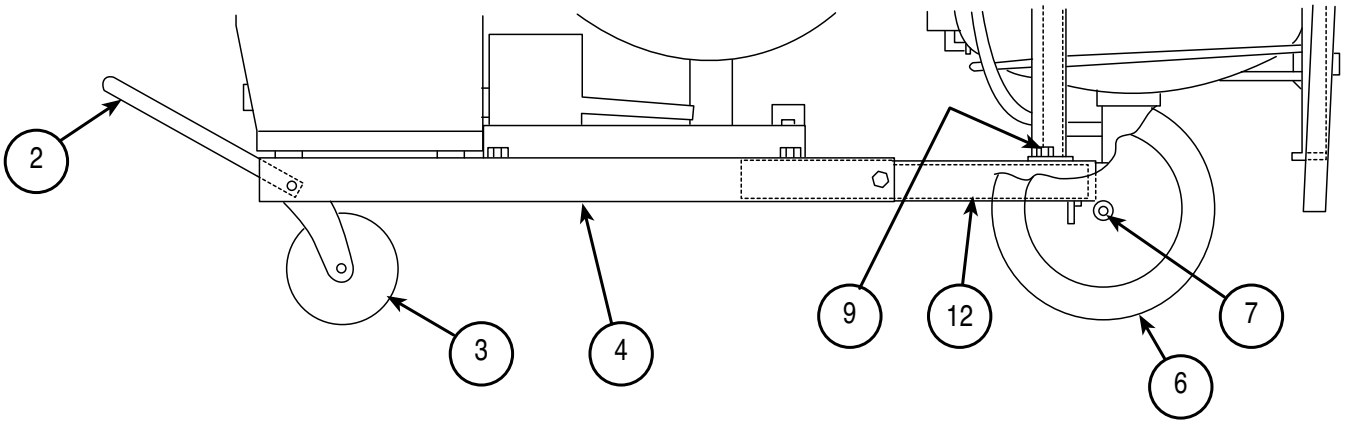
Ø This part is obsolete and no longer available.

12-20-2001

P-107-T

UNDERCARRIAGE: K163

Standard with LN-6S, LN-6SE, LN-8S, LN-8SE, LN-9S and LN-9SE



For optional K163 use parts marked “X” in Column 1.
For LN-6S, 6SE, 8S, 8SE, 9S, and parts marked “X” in Column 2.

# Indicates a Change This Printing

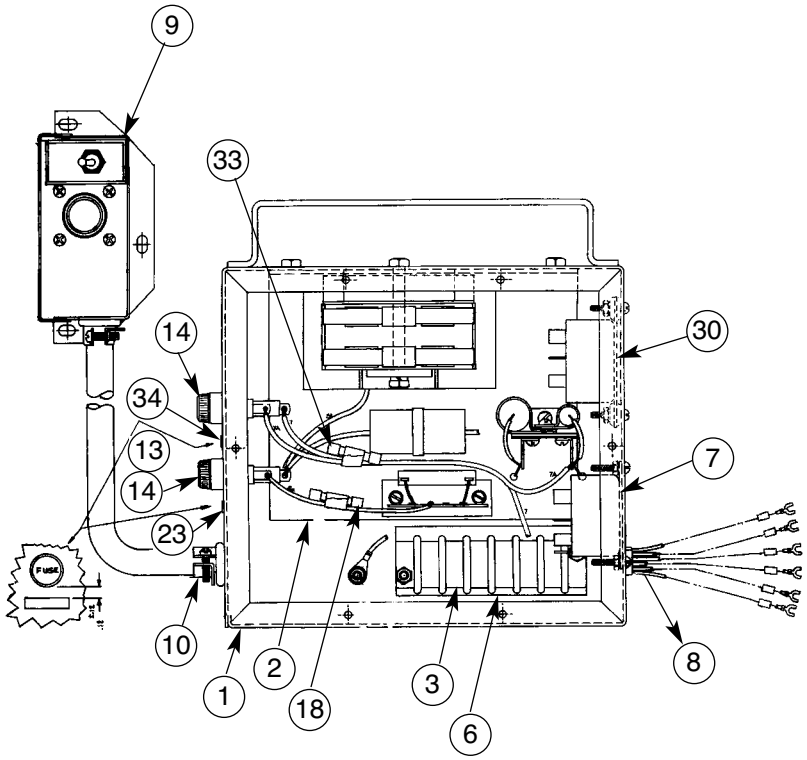
ITEM	DESCRIPTION	PART NO.	QTY.	1	2	3	4	5	6	7	8	9	
	Undercarriage, Includes:	K163	1	X	•								
	Undercarriage, Includes:	(Standard Equip.)	1	•	X								
2	Handle	M10469-1	1	X	X								#
3	Casters	S11124	2	X	X								
4	Base, Platform Type (Discontinued)	L4688	1	X	X								
4	Base, Open Frame Type	L5239	1	X	X								
6	Wheels	S13127	2	X	X								
7	Axle	M10470	1	X	X								
12	Flux Tank Support	S12737	3	•	X								

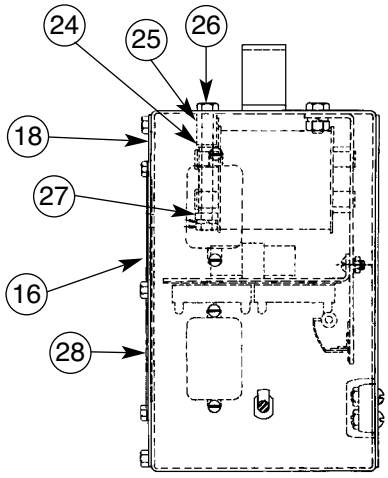
10-22-97

NOTES

P-107-V.a

MECHANIZED TRAVEL POWER PACK: K161





G1429
10-23-81N

05-10-2005

P-107-V.b

# Indicates a Change This Printing
#

Use Parts Marked “X” in Column 1 for Code 6801.
Use Parts Marked “X” in Column 2 for Code 7627.

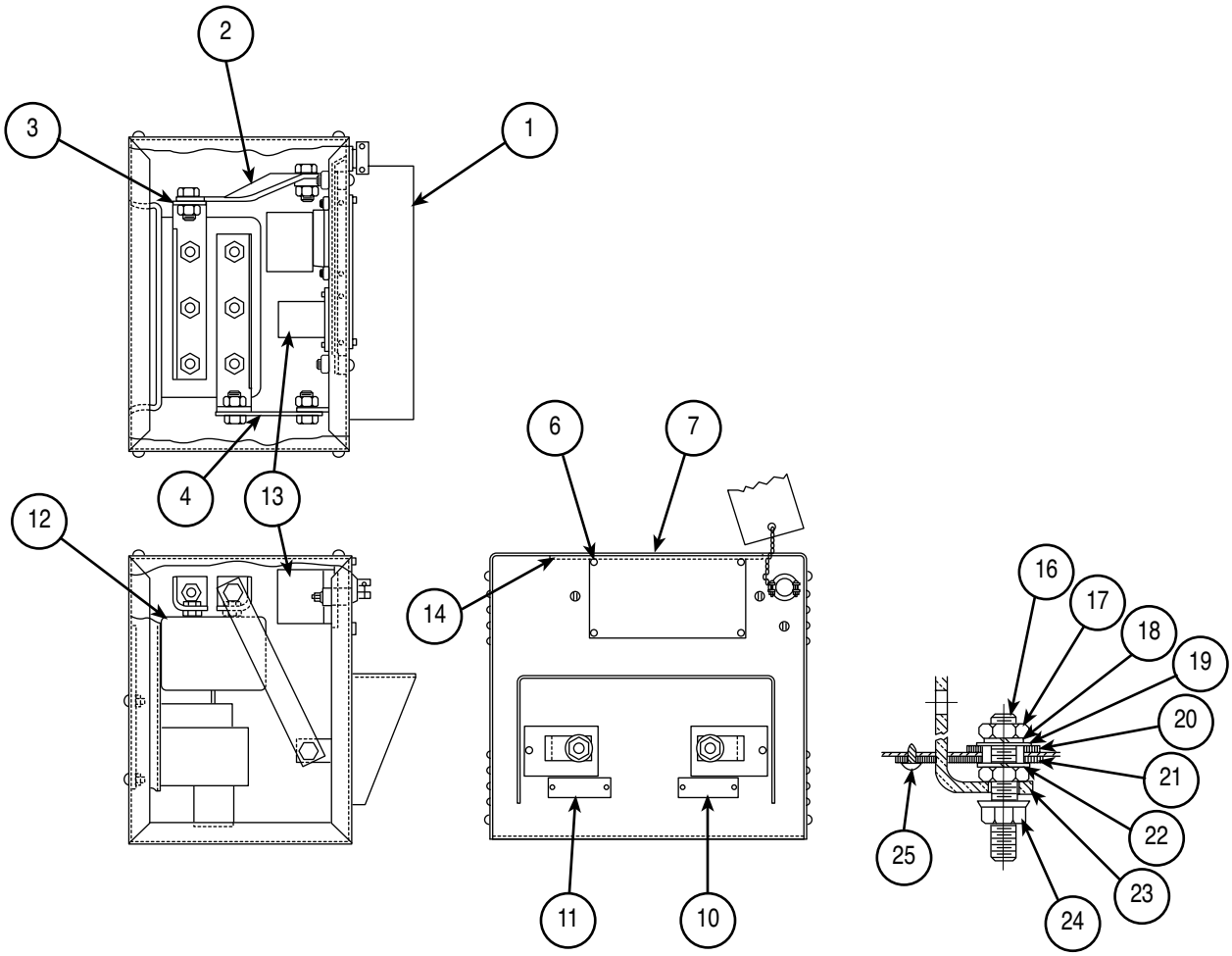
ITEM	DESCRIPTION	PART NO.	QTY.	1	2	3	4	5	6	7	8	9
	Mechanized Travel Power Pack, Includes:	K161*	1	X	X							
1	Case Welded Assembly	M9734	1	X	X							
2	Mag-Amp Assembly, Includes:	L3524-1	1	X	X							
	Core and Coil Assembly	M9017	1	X	X							
	Resistor	S10404-15	1	X	X							
	Insulation	T11134-1	1	X	X							
	Terminal Strip	T10707	1	X	X							
	Condenser	T11577-37	1	X	X							
	Rectifier Assembly	S13707	1	X	X							
5	Terminal Strip	S8542	1	X	X							
6	Number Plate	T10726-60	1	X	X							
7	Relay	S22182	1	X	X							
8	Lead Grommet	T9274-1	1	X	•							
8	Lead Grommet	T9274-2	1	•	X							
9	Adapter Box Assembly, Includes:	M11617*	1	X	X							
	Amphenol Connector (Next to Toggle Switch)	S12021-3	1	X	X							
	Toggle Switch	T13083	1	X	X							
	Amphenol Connector (Opposite Side of Box from Switch)	S12020-6	1	X	X							
10	Connector	T9639-2	1	X	X							
13	Fuse (1/8 Amp)	T10728-9	2	X	X							
14	Fuse Holder	S10433	2	X	X							
16	Nameplate	M9730	1	X	X							
18	Front Panel	S11344	1	X	X							
23	Fuse Identification Sticker	T12607-9	1	X	X							
24	Insulation	T11472-5	1	X	X							
25	Spacer	S10040-33	1	X	X							
26	Hex Head Screw	1/4-20x3.00	1	X	X							
27	Spacer	S10040-34	1	X	X							
28	Wiring Diagram	S13868	1	X	•							
28	Wiring Diagram	M20116	1	•	X							
30	Relay	S15122-10	1	•	X							
33	Fuse	T10728-10	2	X	X							
34	Fuse Identification Sticker	T12607-10	1	X	X							

* Specify Cable Length

05-10-2005

P-107-W.2.a

CONTACTOR KIT: K240



L5360
6-20-86S

6-20-86

P-107-W.2.b

# Indicates a Change This Printing

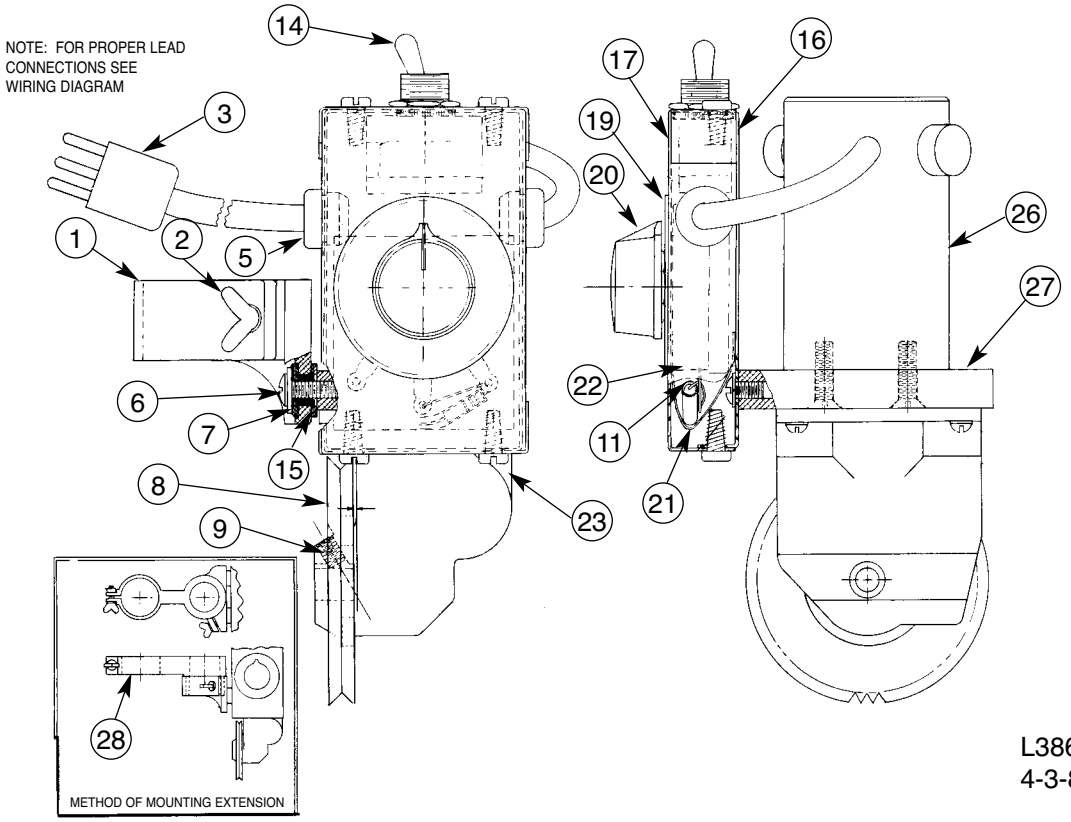
ITEM	DESCRIPTION	PART NO.	QTY.	1	2	3	4	5	6	7	8	9	
1	Case	M12799	1										
2	“Power Source” Lead	S15017-12	1										
3	Contactor Jumper	S13472-3	2										
4	“Auto Equipment” Lead	S15017-11	1										
5	Warning Decal	T13470	1										
6	Wraparound	L4397-1 ø	1										#
7	Nameplate	M12802	1										
10	“Power Source” Marker	T10743	1										
10	Rivet	T8973	2										
11	“Auto Equipment” Marker	T12256	1										
11	Rivet	T8973	2										
12	S67 Contactor (Early Machines)	L4300-35	1										
	L4300-35 Contactor Parts	See P-28-H											
12	S78	L6200-4	1										
	L6200-4 Contactor Parts	See P-28-J											
13	Relay	S10834-1	1										
13	Rubber Chassis Mount	T10325-1	4										
14	Printed Wiring Diagram	S15371	1										
16	Stud	T6931-11	2										
17	Hex Jam Nut	1/2-13	4										
18	Lock Washer	E106A-5	2										
19	Flat Washer	S9262-1	4										
20	Insulating Washer	S10773-9	2										
21	Insulating Panel	T14373	2										
22	Insulating Tube	T14374	2										
23	Connecting Strap	T8141	2										
24	Flange Nut	T3960	2										
25	Self Tapping Screw	S8025-65	2										

Ø This part is obsolete and no longer available.

06-12-2001

P-107-X

MECHANIZED HAND TRAVEL UNIT: K110



L3865
4-3-81E

Use only the parts marked "X" in the column under the heading number called for in the model index page.

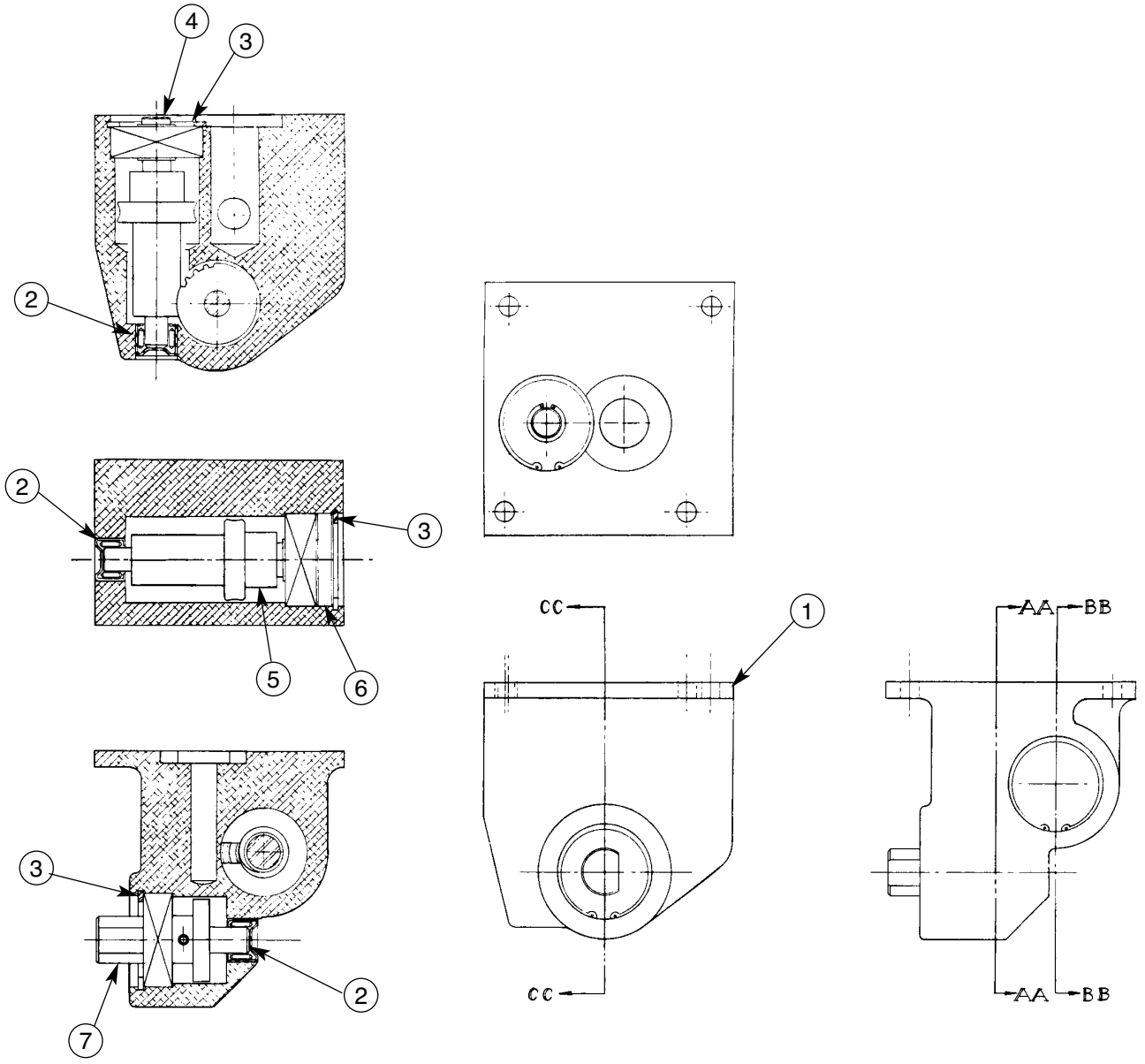
# Indicates a Change This Printing

ITEM	DESCRIPTION	PART NO.	QTY.	1	2	3	4	5	6	7	8	9
t												
	Gun Drive Unit Assembly, Includes:	K110	1									
1	Mounting Clamp	M9108	1									
2	Thumb Screw	T9078-3	1									
3	Control Cable and Plug	S11837	1									
5	Grommet	T9274-1	2									
6	Truss Head Screw	8-32x5/8	2									
7	Insulator Bushing	T11215-2	2									
8	Drive Wheel	M9122	1									
9	Hollow Set Screw, Cup Point	S11604-13	1									
11	Resistor	T12731-3	1									
14	Reversing Switch	T13111	1									
15	Insulating Plate	T11221	1									
16	Control Box Back	M9027-1	1									
17	Control Box Front	M9693	1									
19	Dial Plate	S11163	1									
20	Knob	T11157	1									
21	Insulation	T11228	1									
22	Rheostat	T10812-9	1									
23	Gear Box assembly	See P-107-Y	1									
26	Motor	S11162	1									
27	Adapter Plate	M9109	1									
28	Mounting Clamp Extension	M9142	1									

05-10-2005

P-107-Y

GEAR BOX FOR K110



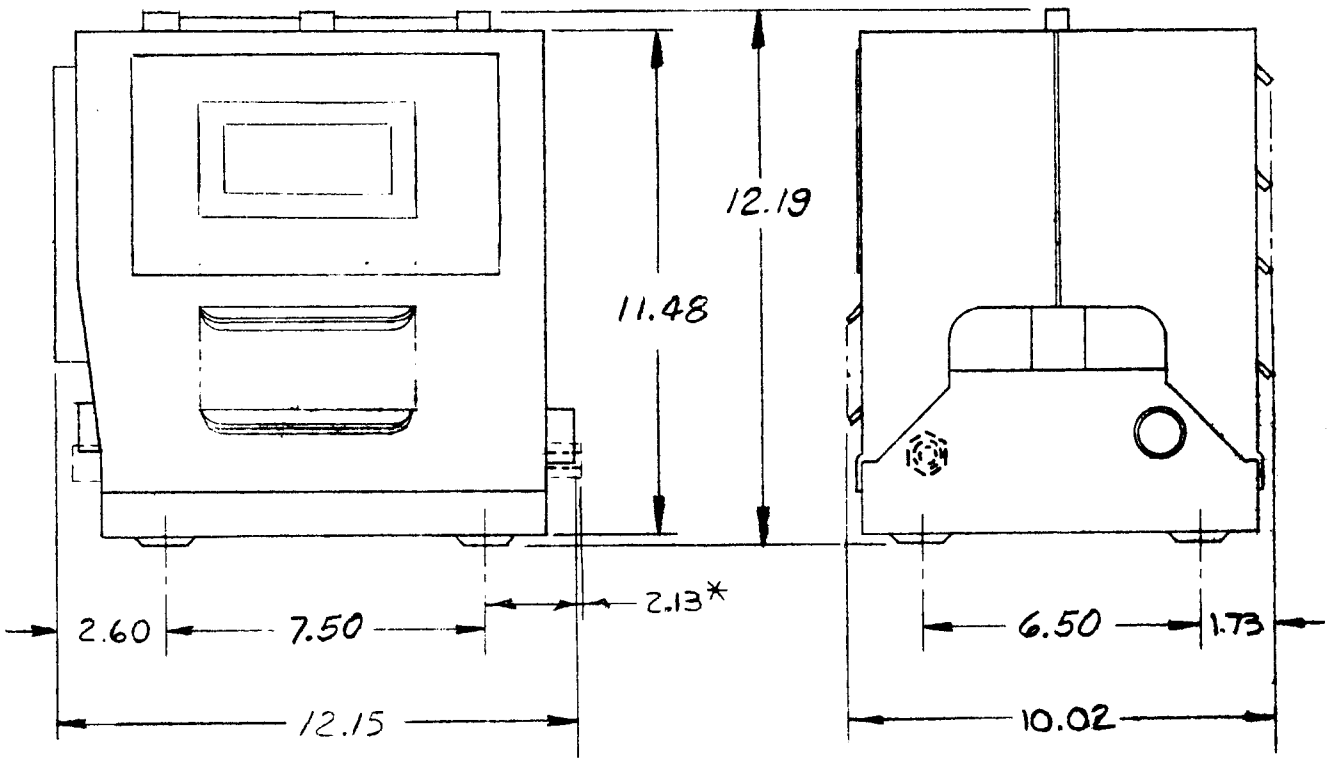
Use only the parts marked “X” in the column under the heading number called for in the model index page.

# Indicates a Change This Printing

ITEM	DESCRIPTION	PART NO.	QTY.	1	2	3	4	5	6	7	8	9
	Gun Drive Gear Case Assembly, Includes:	L3569	1									
1	Gear Box	L3568	1									
2	Needle Bearing	S10116-2	3									
3	Retaining Ring	S9776-9	3									
4	Vertical Shaft Assembly	S11160	1									
5	Cross Shaft Assembly	S11161	1									
6	Shaft Cap	T11226	1									
7	Output Shaft Assembly	S11159	1									

NOTES

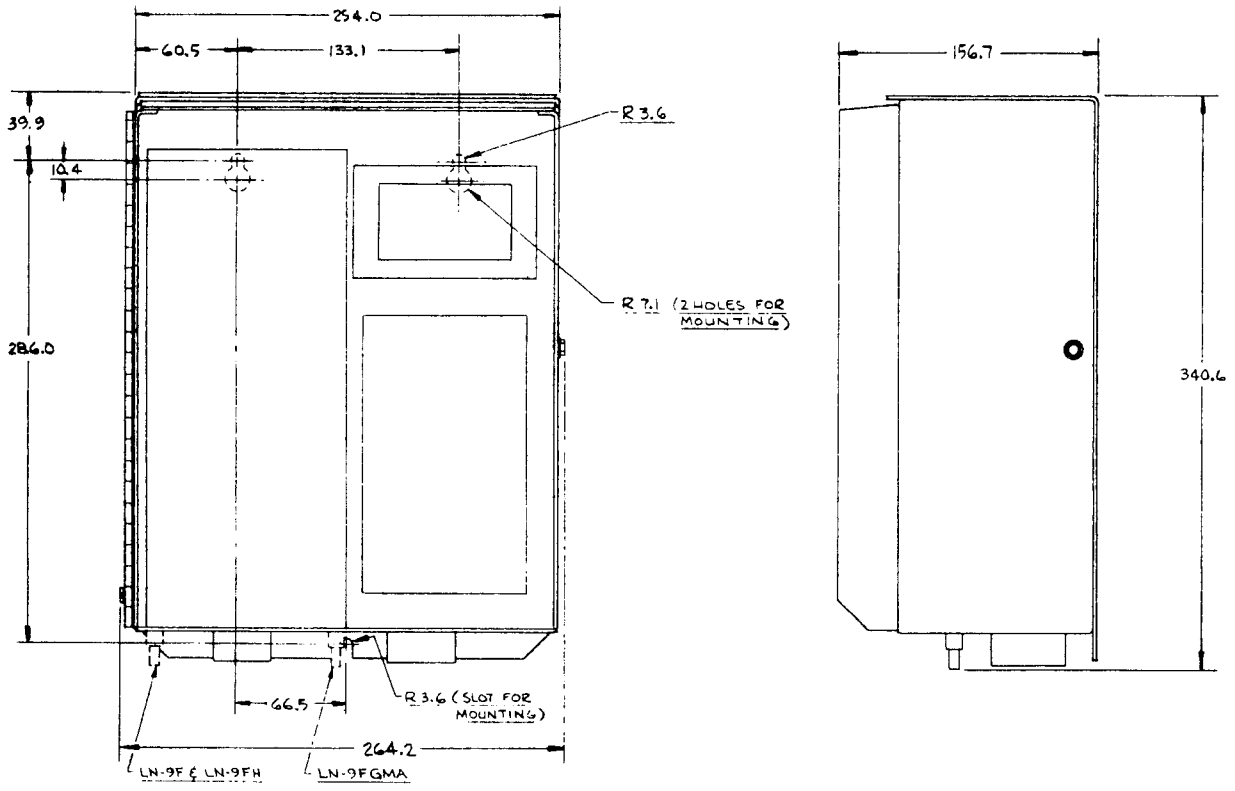
LN-9 AND LN-9H (OBSOLETE) DIMENSION PRINT



S16495
11-14-86B

The Lincoln Electric Company
Cleveland, Ohio 44117-1199

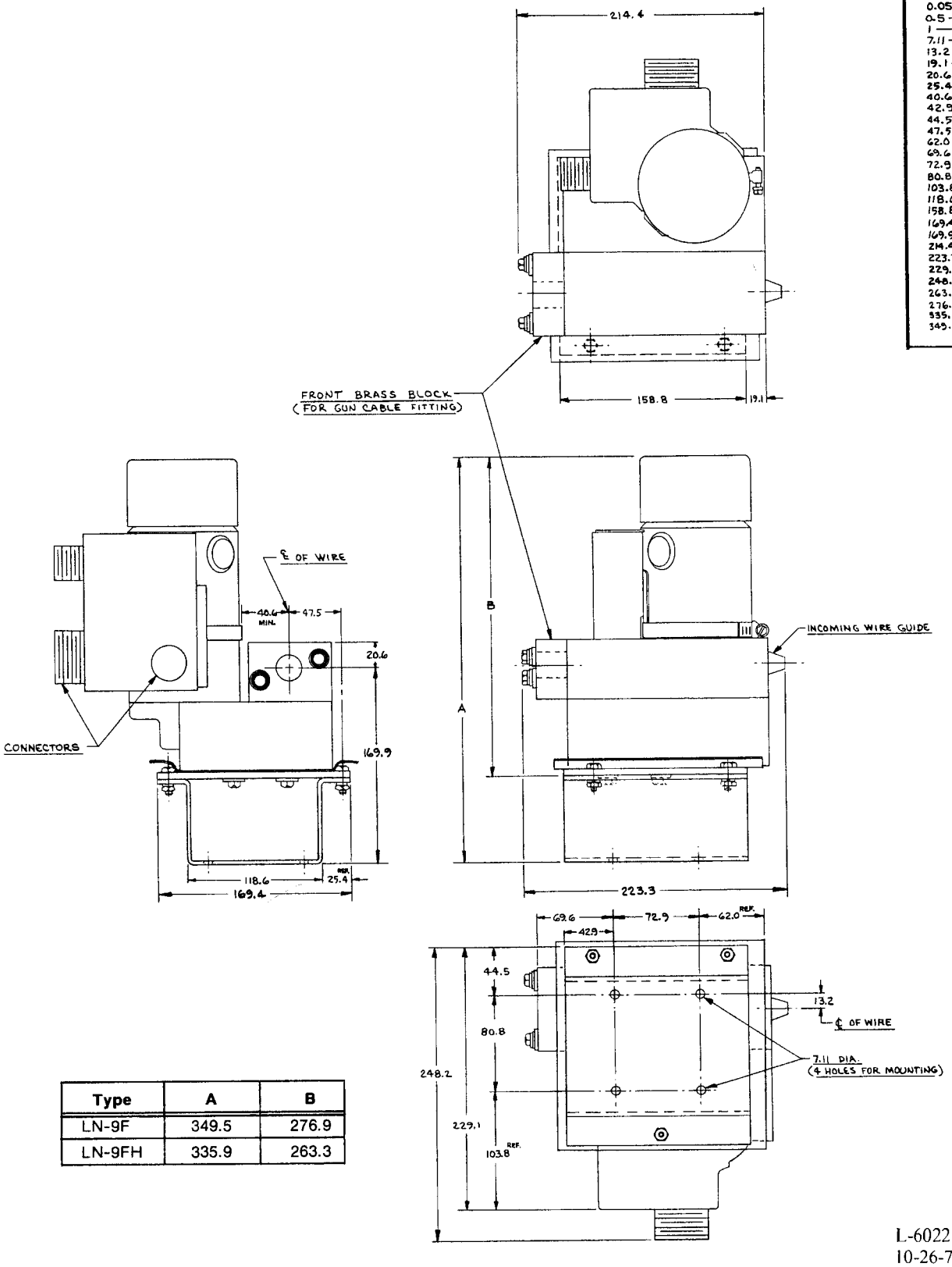
LN-9F CONTROL BOX DIMENSION PRINT



M13660
11-6-87E

LN-9F AND -9FH (OBSOLETE) WIRE DRIVE UNIT DIMENSION PRINT

mm	INCH
0.05	.002
0.5	.02
1	.04
7.11	.280
13.2	.52
19.1	.75
20.6	.81
25.4	1.00
40.6	1.60
42.9	1.69
44.5	1.75
47.5	1.87
62.0	2.44
69.6	2.74
72.9	2.87
80.8	3.18
103.8	4.09
118.6	4.67
158.8	6.25
169.4	6.67
169.9	6.69
214.4	8.44
223.3	8.79
229.1	9.02
248.2	9.77
263.3	10.37
276.9	10.90
335.9	13.22
349.5	13.76

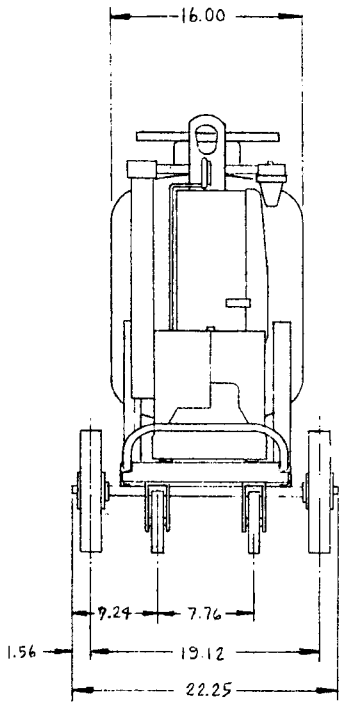


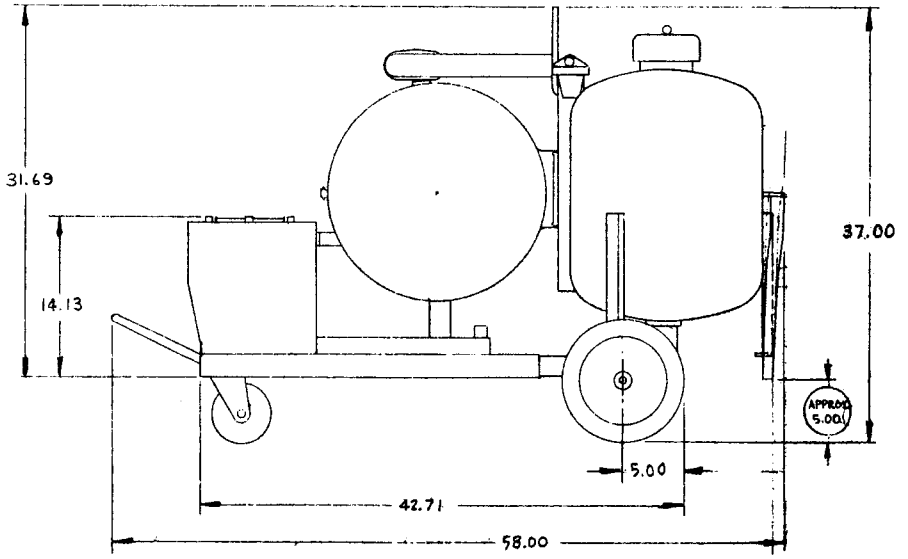
Type	A	B
LN-9F	349.5	276.9
LN-9FH	335.9	263.3

L-6022
10-26-79E

The Lincoln Electric Company
Cleveland, Ohio 44117-1199

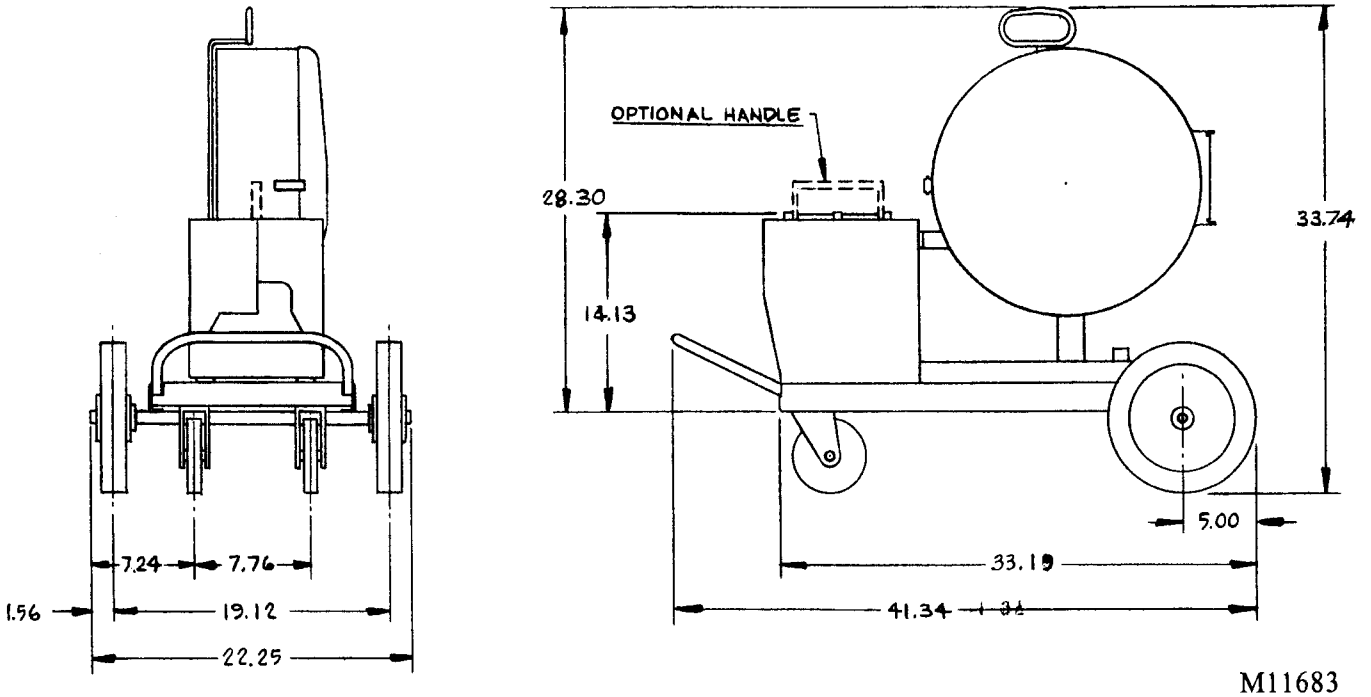
LN-6, LN-8 AND LN-9 DIMENSION PRINT (SUBMERGED ARC)





M11680
10-11-85D

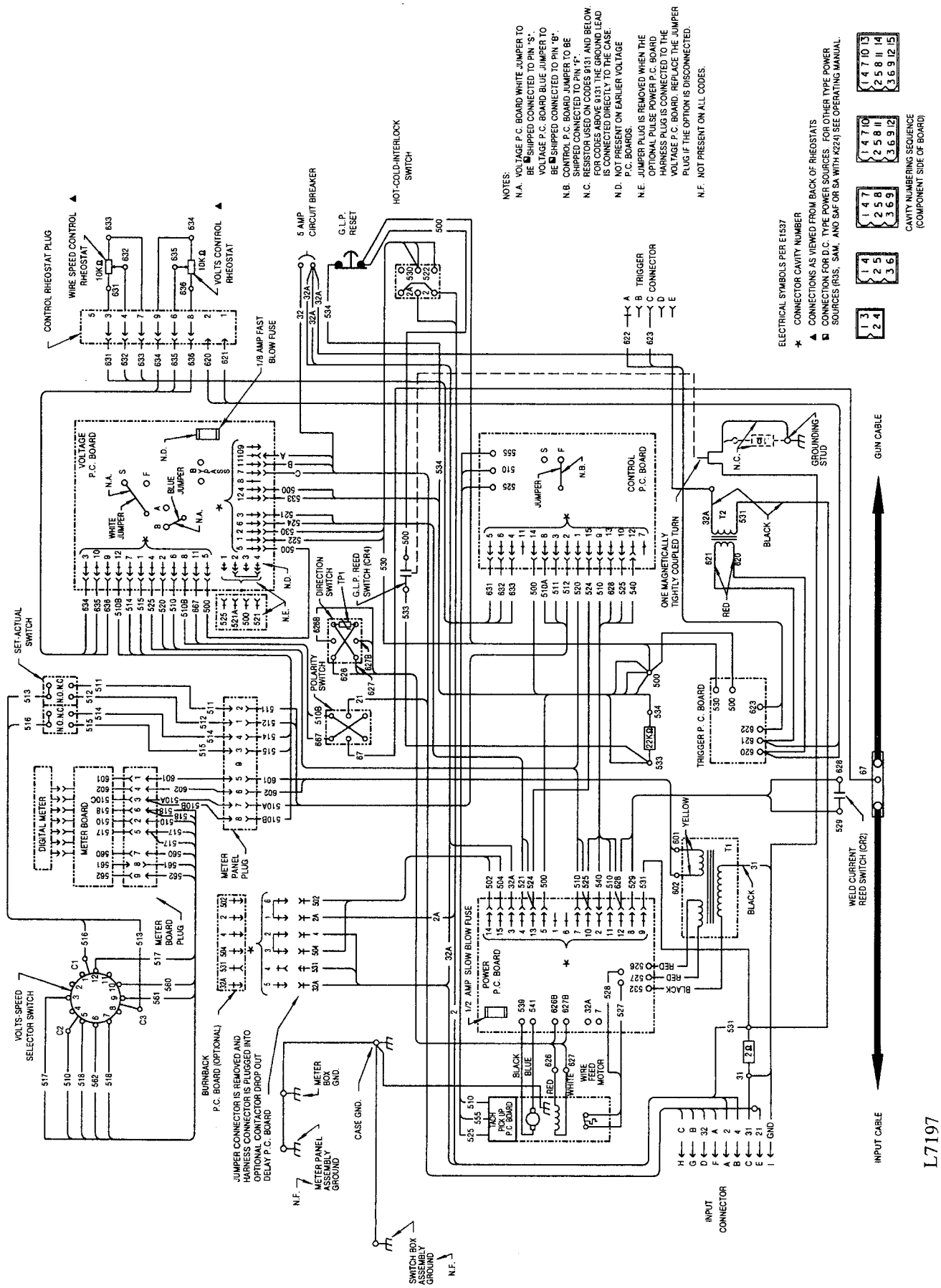
LN-6, LN-8 AND LN-9 DIMENSION PRINT (INNERSHIELD ONLY)



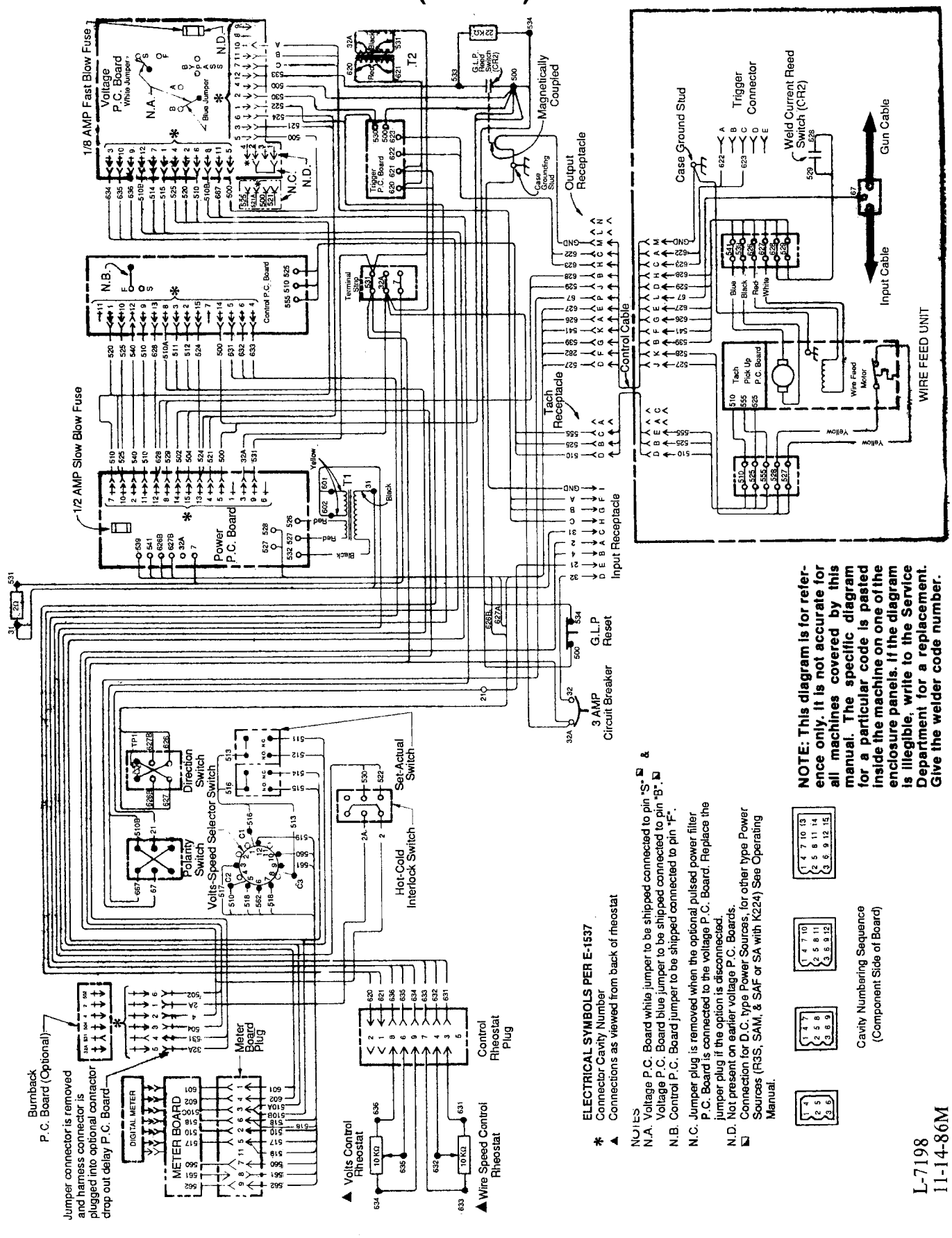
M11683
10-11-85D

The Lincoln Electric Company
Cleveland, Ohio 44117-1199

LN-9 WIRING DIAGRAM (METRIC)



LN-9F WIRING DIAGRAM (METRIC)



ELECTRICAL SYMBOLS PER E-1537

* Connector Cavity Number

▲ Connections as viewed from back of rheostat

NOTES

N.A. Voltage P.C. Board white jumper to be shipped connected to pin "S" & Voltage P.C. Board blue jumper to be shipped connected to pin "B".

N.B. Control P.C. Board jumper to be shipped connected to pin "F".

N.C. Jumper plug is removed when the optional pulsed power filter P.C. Board is connected to the voltage P.C. Board. Replace the jumper plug if the option is disconnected.

N.D. Not present on earlier voltage P.C. Boards.

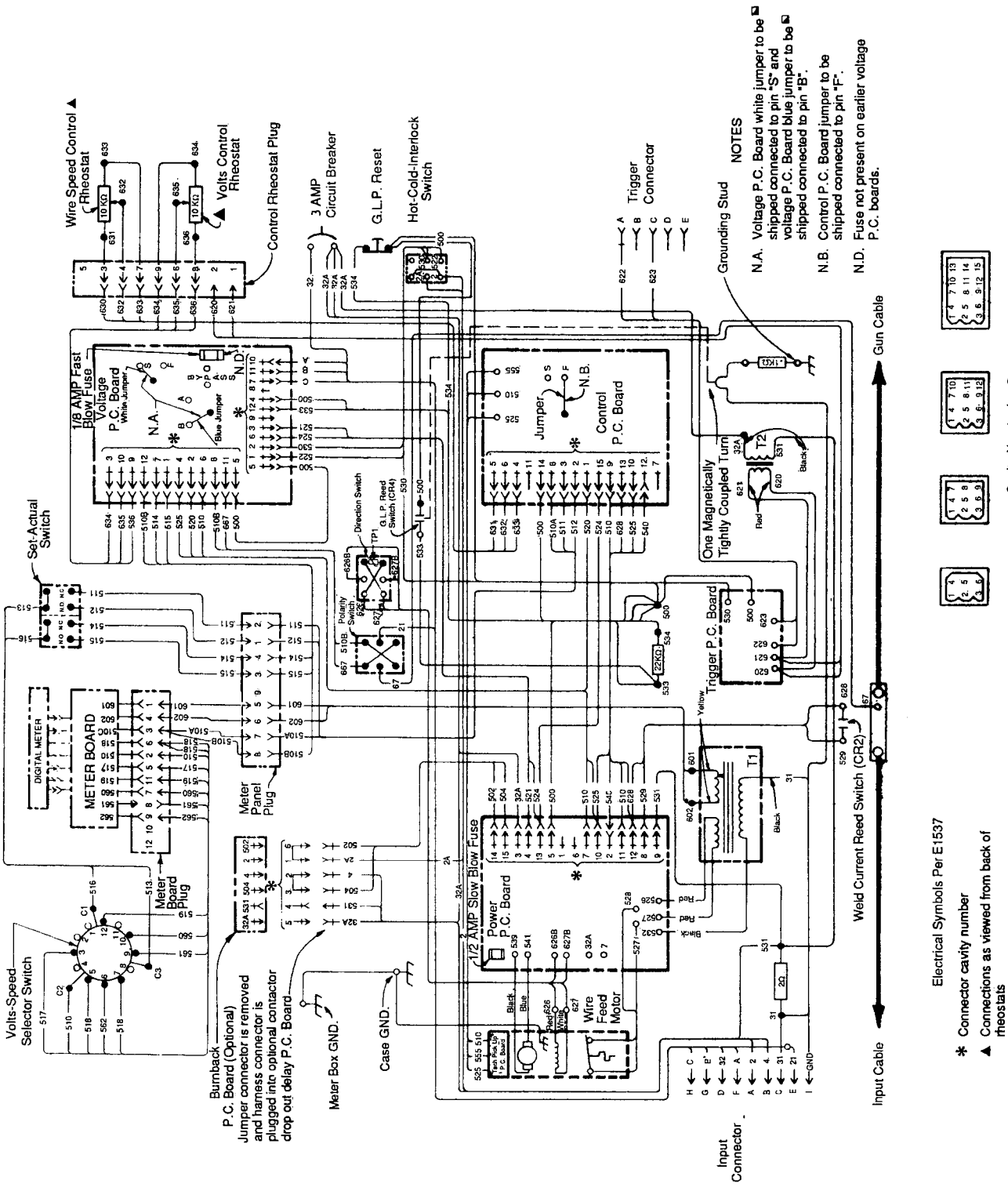
Connection for D.C. type Power Sources, for other type Power Sources (R3S, SAM, & SAF or SA with K224) See Operating Manual.

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

L-7198
11-14-86M

The Lincoln Electric Company
Cleveland, Ohio 44117-1199

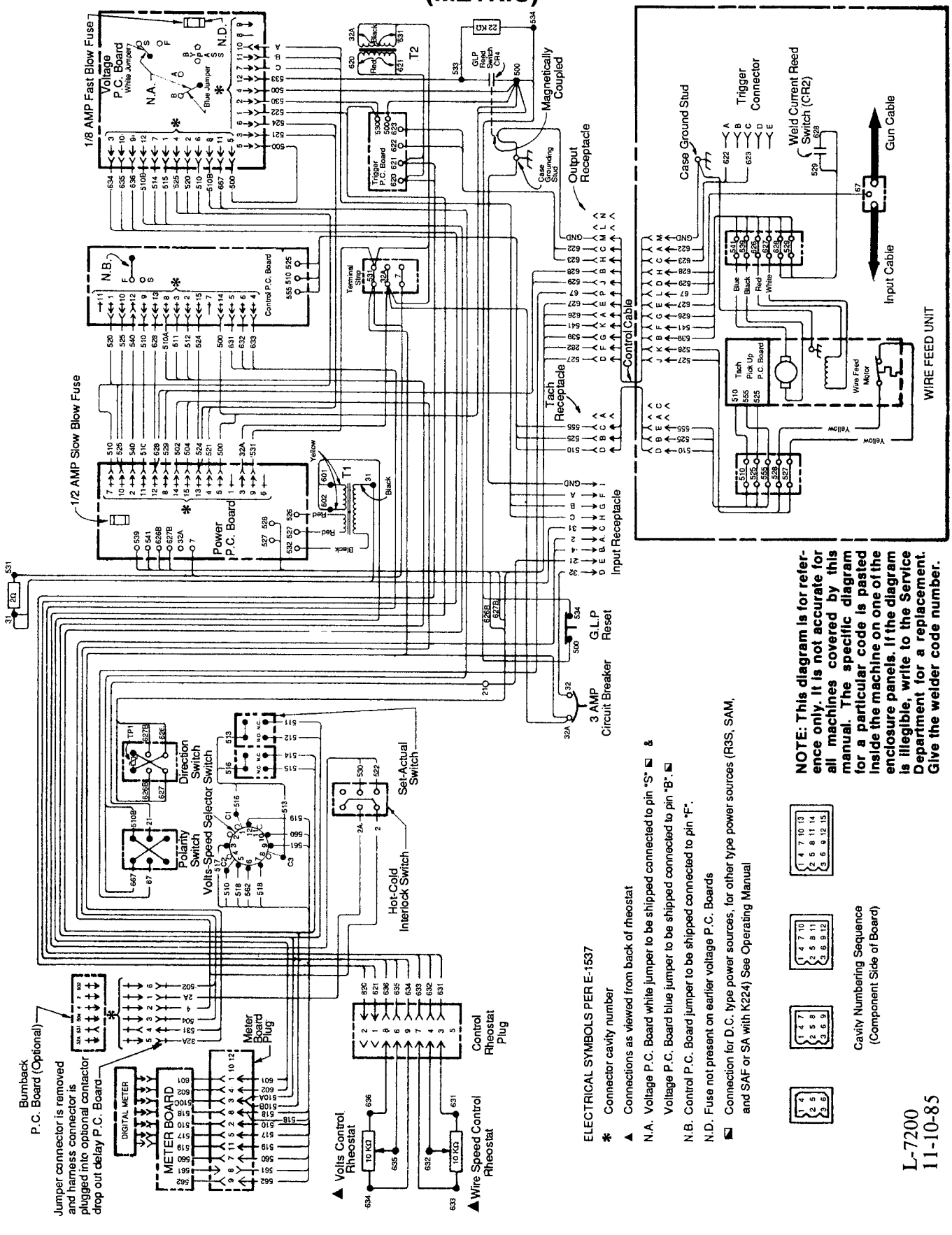
LN-9FH (OBSOLETE) WIRING DIAGRAM (METRIC)



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

L-7199
11-10-85

LN-9H (OBSOLETE) WIRING DIAGRAM (METRIC)



ELECTRICAL SYMBOLS PER E-1537

* Connector cavity number

▲ Connections as viewed from back of rheostat

N.A. Voltage P.C. Board white jumper to be shipped connected to pin "S" ◪ &
Voltage P.C. Board blue jumper to be shipped connected to pin "B". ◪

N.B. Control P.C. Board jumper to be shipped connected to pin "F".

N.D. Fuse not present on earlier voltage P.C. Boards

◪ Connection for D.C. type power sources, for other type power sources (R3S, SAM, and SAF or SA with K224) See Operating Manual

Cavity Numbering Sequence (Component Side of Board)

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

L-7200
11-10-85

			
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**	● 皮肤或湿衣物切勿接触带電部件及焊條。 ● 使你自己與地面和工件絶緣。	● 把一切易燃物品移離工作場所。	● 佩戴眼、耳及身體勞動保護用具。
Korean **위 험**	● 전도체나 용접봉을 젖은 헝겁 또는 피부로 절대 접촉치 마십시요. ● 모재와 접지를 접촉치 마십시요.	● 인화성 물질을 접근 시키지 마시요.	● 눈, 귀와 몸에 보호장구를 착용하십시요.
Arabic **تحذير**	● لا تلمس الاجزاء التي يسري فيها التيار الكهربائي أو الالكترود بجلد الجسم أو بالملابس المبللة بالماء. ● ضع عازلا على جسمك خلال العمل.	● ضع المواد القابلة للاشتعال في مكان بعيد.	● ضع أدوات وملابس واقية على عينيك وأذنيك وجسمك.

READ AND UNDERSTAND THE MANUFACTURER'S 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 Schweißrauch! ● Sorgen Sie für gute Be- und Entlüftung des Arbeitsplatzes!	● Strom vor Wartungsarbeiten abschalten! (Netzstrom völlig öffnen; Maschine anhalten!)	● Anlage nie ohne Schutzgehäuse oder Innenschutzverkleidung in Betrieb setzen!	German WARNUNG
● Mantenha seu rosto da fumaça. ● Use ventilação e exhaustão para remover fumo da zona respiratória.	● Não opere com as tampas removidas. ● Desligue a corrente antes de fazer serviço. ● Não toque as partes elétricas nuas.	● Mantenha-se afastado das partes moventes. ● Não opere com os painéis 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 위험
● 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.

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