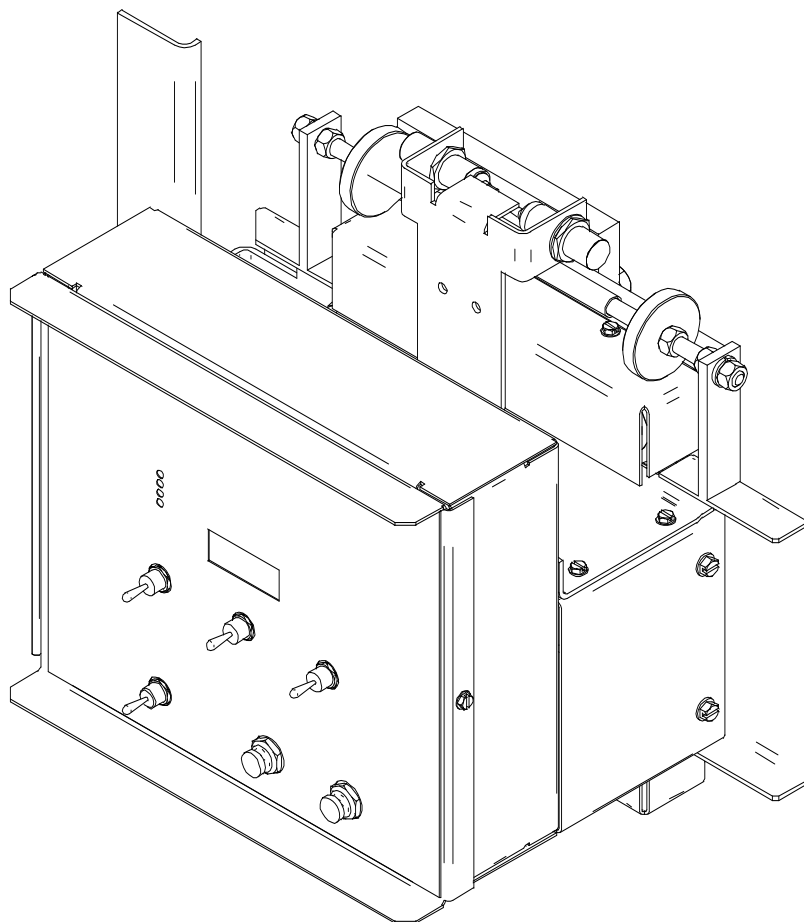


# SPREADARC

For use with machines having Code Numbers: **11006**

## 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



**LINCOLN**<sup>®</sup>  
**ELECTRIC**

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## ⚠ WARNING

### ⚠ CALIFORNIA PROPOSITION 65 WARNINGS ⚠

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

The Above For Diesel Engines

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

The Above For Gasoline Engines

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

Read and understand the following safety highlights. For additional safety information, it is strongly recommended that you purchase a copy of "Safety in Welding & Cutting - ANSI Standard Z49.1" from the American Welding Society, P.O. Box 351040, Miami, Florida 33135 or CSA Standard W117.2-1974. A Free copy of "Arc Welding Safety" booklet E205 is available from the Lincoln Electric Company, 22801 St. Clair Avenue, Cleveland, Ohio 44117-1199.

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



### FOR ENGINE powered equipment.

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



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



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

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

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



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

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



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



### ELECTRIC AND MAGNETIC FIELDS may be dangerous

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

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

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

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

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

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

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

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

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

Mar '95



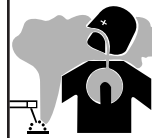
## ELECTRIC SHOCK can kill.

- 3.a. The electrode and work (or ground) circuits are electrically "hot" when the welder is on. Do not touch these "hot" parts with your bare skin or wet clothing. Wear dry, hole-free gloves to insulate hands.
- 3.b. Insulate yourself from work and ground using dry insulation. Make certain the insulation is large enough to cover your full area of physical contact with work and ground.
- In addition to the normal safety precautions, if welding must be performed under electrically hazardous conditions (in damp locations or while wearing wet clothing; on metal structures such as floors, gratings or scaffolds; when in cramped positions such as sitting, kneeling or lying, if there is a high risk of unavoidable or accidental contact with the workpiece or ground) use the following equipment:**
- Semiautomatic DC Constant Voltage (Wire) Welder.
  - DC Manual (Stick) Welder.
  - AC Welder with Reduced Voltage Control.
- 3.c. In semiautomatic or automatic wire welding, the electrode, electrode reel, welding head, nozzle or semiautomatic welding gun are also electrically "hot".
- 3.d. Always be sure the work cable makes a good electrical connection with the metal being welded. The connection should be as close as possible to the area being welded.
- 3.e. Ground the work or metal to be welded to a good electrical (earth) ground.
- 3.f. Maintain the electrode holder, work clamp, welding cable and welding machine in good, safe operating condition. Replace damaged insulation.
- 3.g. Never dip the electrode in water for cooling.
- 3.h. Never simultaneously touch electrically "hot" parts of electrode holders connected to two welders because voltage between the two can be the total of the open circuit voltage of both welders.
- 3.i. When working above floor level, use a safety belt to protect yourself from a fall should you get a shock.
- 3.j. Also see Items 6.c. and 8.



## ARC RAYS can burn.

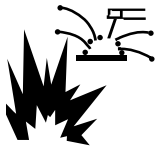
- 4.a. Use a shield with the proper filter and cover plates to protect your eyes from sparks and the rays of the arc when welding or observing open arc welding. Headshield and filter lens should conform to ANSI Z87.1 standards.
- 4.b. Use suitable clothing made from durable flame-resistant material to protect your skin and that of your helpers from the arc rays.
- 4.c. Protect other nearby personnel with suitable, non-flammable screening and/or warn them not to watch the arc nor expose themselves to the arc rays or to hot spatter or metal.



## FUMES AND GASES can be dangerous.

- 5.a. Welding may produce fumes and gases hazardous to health. Avoid breathing these fumes and gases. When welding, keep your head out of the fume. Use enough ventilation and/or exhaust at the arc to keep fumes and gases away from the breathing zone. **When welding with electrodes which require special ventilation such as stainless or hard facing (see instructions on container or MSDS) or on lead or cadmium plated steel and other metals or coatings which produce highly toxic fumes, keep exposure as low as possible and below Threshold Limit Values (TLV) using local exhaust or mechanical ventilation. In confined spaces or in some circumstances, outdoors, a respirator may be required. Additional precautions are also required when welding on galvanized steel.**
5. b. 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.

AUG 06

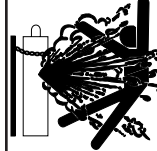


### WELDING SPARKS can cause fire or explosion.

6.a. Remove fire hazards from the welding area. If this is not possible, cover them to prevent the welding sparks from starting a fire.

Remember that welding sparks and hot materials from welding can easily go through small cracks and openings to adjacent areas. Avoid welding near hydraulic lines. Have a fire extinguisher readily available.

- 6.b. Where compressed gases are to be used at the job site, special precautions should be used to prevent hazardous situations. Refer to "Safety in Welding and Cutting" (ANSI Standard Z49.1) and the operating information for the equipment being used.
- 6.c. When not welding, make certain no part of the electrode circuit is touching the work or ground. Accidental contact can cause overheating and create a fire hazard.
- 6.d. Do not heat, cut or weld tanks, drums or containers until the proper steps have been taken to insure that such procedures will not cause flammable or toxic vapors from substances inside. They can cause an explosion even though they have been "cleaned". For information, purchase "Recommended Safe Practices for the Preparation for Welding and Cutting of Containers and Piping That Have Held Hazardous Substances", AWS F4.1 from the American Welding Society (see address above).
- 6.e. Vent hollow castings or containers before heating, cutting or welding. They may explode.
- 6.f. Sparks and spatter are thrown from the welding arc. Wear oil free protective garments such as leather gloves, heavy shirt, cuffless trousers, high shoes and a cap over your hair. Wear ear plugs when welding out of position or in confined places. Always wear safety glasses with side shields when in a welding area.
- 6.g. Connect the work cable to the work as close to the welding area as practical. Work cables connected to the building framework or other locations away from the welding area increase the possibility of the welding current passing through lifting chains, crane cables or other alternate circuits. This can create fire hazards or overheat lifting chains or cables until they fail.
- 6.h. Also see item 1.c.



### CYLINDER may explode if damaged.

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

- 7.b. Always keep cylinders in an upright position securely chained to an undercarriage or fixed support.
- 7.c. Cylinders should be located:
  - Away from areas where they may be struck or subjected to physical damage.
  - A safe distance from arc welding or cutting operations and any other source of heat, sparks, or flame.
- 7.d. Never allow the electrode, electrode holder or any other electrically "hot" parts to touch a cylinder.
- 7.e. Keep your head and face away from the cylinder valve outlet when opening the cylinder valve.
- 7.f. Valve protection caps should always be in place and hand tight except when the cylinder is in use or connected for use.
- 7.g. Read and follow the instructions on compressed gas cylinders, associated equipment, and CGA publication P-1, "Precautions for Safe Handling of Compressed Gases in Cylinders," available from the Compressed Gas Association 1235 Jefferson Davis Highway, Arlington, VA 22202.



### FOR ELECTRICALLY powered equipment.

- 8.a. Turn off input power using the disconnect switch at the fuse box before working on the equipment.
- 8.b. Install equipment in accordance with the U.S. National Electrical Code, all local codes and the manufacturer's recommendations.
- 8.c. Ground the equipment in accordance with the U.S. National Electrical Code and the manufacturer's recommendations.

Mar '95

## PRÉCAUTIONS DE SÛRETÉ

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

### Sûreté Pour Soudage A L'Arc

1. Protégez-vous contre la secousse électrique:
  - a. Les circuits à l'électrode et à la pièce 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 vêtements mouillés. Porter des gants secs et sans trous pour isoler les mains.
  - b. Faire très attention de bien s'isoler de la masse quand on soude dans des endroits humides, ou sur un plancher métallique ou des grilles métalliques, principalement dans les positions assis ou couché pour lesquelles une grande partie du corps peut être en contact avec la masse.
  - c. Maintenir le porte-électrode, la pince de masse, le câble de soudage et la machine à souder en bon et sûr état de fonctionnement.
  - d. Ne jamais plonger le porte-électrode dans l'eau pour le refroidir.
  - e. Ne jamais toucher simultanément les parties sous tension des porte-électrodes connectés à deux machines à souder parce que la tension entre les deux pinces peut être le total de la tension à vide des deux machines.
  - f. Si on utilise la machine à souder comme une source de courant pour soudage semi-automatique, ces précautions pour le porte-électrode s'appliquent 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 où 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 soleil, 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 latéraux 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 un endroit isolé de la masse. Un court-circuit accidentel peut provoquer un échauffement et un risque d'incendie.
8. S'assurer que la masse est connectée le plus près 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 chaînes de levage, câbles de grue, ou autres circuits. Cela peut provoquer des risques d'incendie ou d'échauffement des chaînes et des câbles jusqu'à ce qu'ils se rompent.
9. Assurer une ventilation suffisante dans la zone de soudage. Ceci est particulièrement important pour le soudage de tôles galvanisées plombées, ou cadmiées ou tout autre métal qui produit des fumées 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 phosgène (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 châssis du poste conformément au code de l'électricité et aux recommandations du fabricant. Le dispositif de montage ou la pièce 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 faire des travaux à l'intérieur de poste, la débrancher à l'interrupteur à la boîte 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!

## **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](http://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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## PRODUCT DESCRIPTION

### General Physical Description

The K278-1 Spreadarc has been designed to oscillate an Automatic welding head across the line of travel when welding long seams. The welding head and nozzle are mounted to the Spreadarc carriage. The Spreadarc is then mounted to either a stationary head mount or travel carriage. The Spreadarc is compatible with all Lincoln Electric welding heads including the NA-3, NA-4, NA-5, and Power Feed-10S. The Spreadarc is often used in conjunction with the TC-3 Travel Carriage and Vertical Lift Adjuster.

### General Functional Description

The Spreadarc produces a linear oscillation of the head and nozzle. A 24 VDC right-angle gear motor drives the carriage onto which wire drive is mounted, accommodating a 70-pound maximum load. The moving carriage is supported on a top and bottom "V" track by four double row bearings, two on the top and two on the bottom. The carriage motion is produced by a pinion driving a rack that is mounted on the moving carriage support.

Proximity switches control the length of travel. The proximity switches remain stationary and stops mounted to the moving carriage can be easily adjusted to control travel distance. Both left and right extremes are adjustable.

The operator can set the oscillation travel speed and dwell times at either end of the stroke to provide smoother bead edges. Additionally, the Jog Mode allows the operator to position the welding nozzle in the correct starting location for a particular weld seam. These values are set through a digital control panel on the front of the machine.

The oscillator uses bright digital displays and LED's, toggle switches, and heavy-duty push button designed for every-day industrial use.

### Advantages of the Spreadarc are:

Arc length remains constant during oscillation to provide more uniform penetration.

Dwell timers provide periods at the end-points of the stroke for smoother bead edges.

The travel speed of the arc is uniform across the bead.

## RECOMMENDED PROCESSES AND EQUIPMENT

### RECOMMENDED PROCESSES

- The Spreadarc is compatible with all Lincoln Electric welding heads including the NA-3, NA-4, NA-5, and PF-10S.
- The Spreadarc can be used with submerged arc (SAW), flux-cored (FCAW) and solid wire MIG (GMAW) applications.

### EQUIPMENT LIMITATIONS

- The Spreadarc cannot be used with a K96 horizontal head adjuster.
- The Spreadarc requires 42Vac input.

### DESIGN FEATURES

- Compatible with NA-3, NA-4, NA-5, and PF-10S Automatic Heads.
- Load capacity – 70 pounds.
- Oscillation Speed – 10-150 inches per minute.
- Dwell Time (Left/Right) – 0.0-4.0 seconds.
- Jog feature for positioning nozzle before welding procedure begins.
- Rugged 24VDC Right-Angle gear motor.
- Bright, Digital Displays and LED's.
- Heavy-duty push button.
- Proximity Sensors for adjustable sweep distance.

SPREADARC





<b>BASIC PACKAGE</b>	
K1288-17	DC 600 Power Source
K325S	TC-3 Travel Carriage
K210-2	NA-3 Control
K212A	NA-3N Head
K231-1/8	Subarc Contact Nozzle
K278-1	Spreadarc
K1842-10	Weld Cable
K29	Vertical Lift Adjuster
K219	Automatic Flux Hopper

<b>ADVANCED PACKAGE</b>	
K1797-xx	Control Cable (10' included with K278-1)

SPREADARC



## SPREADARC (K279-1)

<b>INPUT VOLTAGE AND CURRENT</b>			
	<b>Voltage</b>	<b>Input Amperes</b>	
	42/1/50/60	3.0	
<b>PHYSICAL DIMENSIONS</b>			
<b>HEIGHT</b>	<b>WIDTH</b>	<b>DEPTH</b>	<b>WEIGHT</b>
13.7 in. (348 mm)	17.8 in. (452.12 mm)	12.6 in. (320.04 mm)	65 lbs (29.5 kg)
<b>ENVIRONMENTAL RANGES</b>			
Operating Temperature	-4°F to 104°F (-20°C to 40°C)		
Storage Temperature	-40°F to 185°F (-40°C to 85°C)		

SPREADARC



## NON-STANDARD SAFETY INFORMATION

**⚠ WARNING**

**ELECTRIC SHOCK can kill.**

- Turn off power at the power source disconnect switch before working inside the equipment.

**⚠ WARNING**

## INPUT CONNECTIONS

- Only a qualified electrician should connect the Spreadarc. Installation should be made in accordance with the appropriate National Electrical Code, all local codes and the information in this manual.

## LOCATION

The Spreadarc will operate in harsh environments. Even so, it is important that simple preventative measures are followed in order to assure long life and reliable operation.

- The Spreadarc must be located where there is free circulation of clean air such that air movement in the back, sides and bottom will not be restricted.

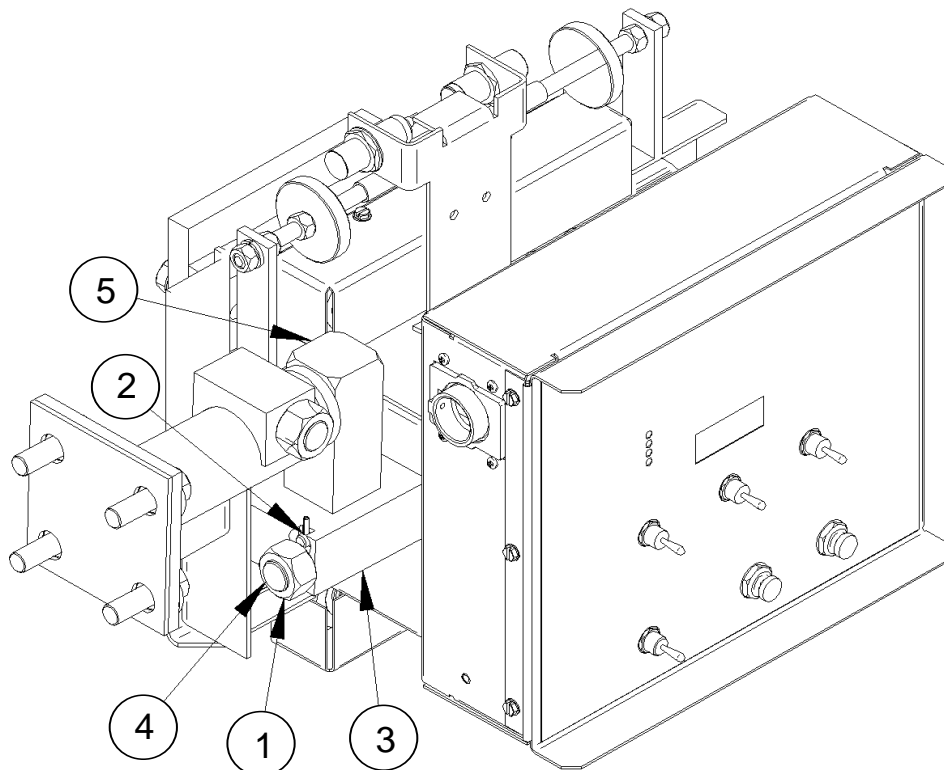
- Dirt and dust that can be drawn into the Spreadarc should be kept to a minimum. Failure to observe these precautions can result in excessive operating temperatures and nuisance shutdown.

## MOUNTING

(See Figure A-1)

1. The Spreadarc can be mounted on a K325 travel carriage or on a stationary head mount in which case the work piece must be moved. When more than one wire reel is used, the K325HC heavy duty travel carriage is recommended. In many applications it may be desirable to use the K29 vertical lift adjuster.
2. Remove the hex nut **Item 1** and the support pin **Item 2** from the Spreadarc mounting block **Item 3**. With the draw bolt **Item 4** properly in place, mount the Spreadarc to the head support or vertical lift **Item 5**. Maintain support until the support pin **Item 2** is inserted into the mounting block **Item 3**, and install hex nut **Item 1** and draw bolt **Item 4**. Rotate the Spreadarc until it is perpendicular to the travel carriage beam and tighten hex nut **Item 1**. Make certain that the travel carriage beam or stationary mount is properly squared up. The Spreadarc must be level in the horizontal plane within  $\pm 2^\circ$ .

FIGURE A-1



SPREADARC

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**ELECTRIC**

- Remove the head mounting block from the NA-3, NA-4, NA-5, or POWER FEED-10S head (if included) by removing the four allen head cap screws. This part is not used during the installation of the Spreadarc. Mount the head to the Spreadarc using the **two 1/2-13 X 1.00 hex head screws**, washers and lock washers supplied with the Spreadarc through the two large holes in the head mounting pad. (See Figure A-2)

**Note:** Before mounting an NA-5 or PF-10S head to the Spreadarc, in order to assure clearance between the motor connection box and the Spreadarc head mounting surface, the motor mounting to the gearbox should be rotated per the instructions below:

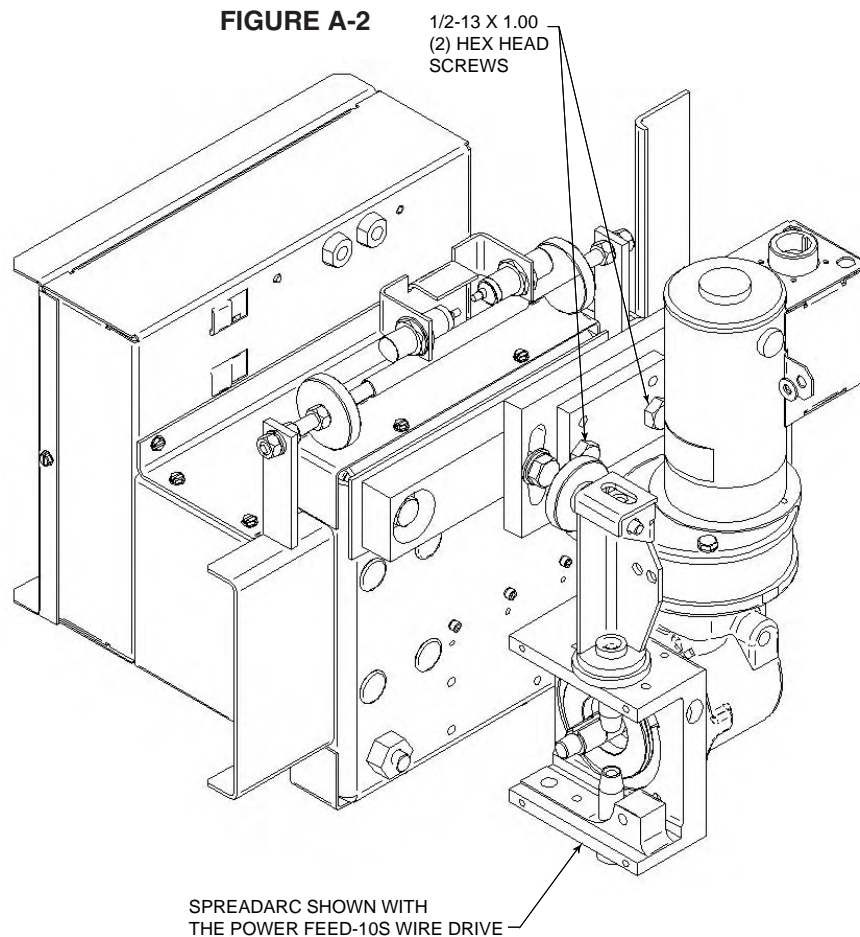
- Remove the four screws mounting the gearbox assembly to the motor adapter plate, and remove gearbox.
- Remove the three screws mounting the adapter plate to the motor, rotate the adapter plate 90° clockwise and replace the three mounting screws.
- Remount the gearbox assembly with the four mounting screws.

The drive motor is to be in the vertical position and the drive rolls are to face the front. Loosen the head face plate clamp screw and rotate the face plate so that the idle roll arm is down. Install the nozzle, wire straightener and flux hopper (if used) per the NA-3, NA-4, NA-5, or PF-10S operating manual.

When using the K225 Twinarc nozzle, a K219 flux hopper and a standard head mounting on a travel carriage, and when welding from left to right, a special 12" flux tube is required. The tube, which is included with the Spreadarc, may be trimmed to length to fit the installation. In addition, it is necessary to re-position the steel plate on the nozzle to which the flux hose retainer ring is attached. Remove the two screws holding this plate and rotate the plate 180° so the ring is closer to the bottom of the nozzle. Replace the screws.

## HIGH FREQUENCY PROTECTION

Locate the Spreadarc away from radio controlled machinery. The normal operation of the Spreadarc may adversely affect the operation of RF controlled equipment, which may result in bodily injury or damage to the equipment.



**SPREADARC**  
**LINCOLN**  
**ELECTRIC**

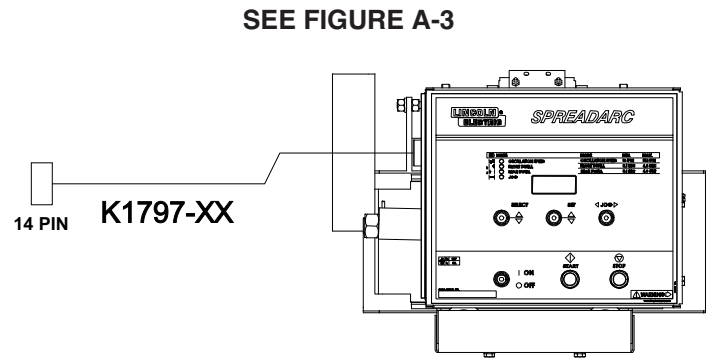
## CONNECTION DIAGRAM

### Connection to 42Vac Power Source

(See Figure A-3)

Required:

- 42Vac Power Source.
- K1797-xx Control Cable (10ft. included with K278-1).
- K278-1 Spreadarc.
- NOTE: K1798 Terminal Strip Adapter may be necessary if power source 14-pin connector is unavailable.

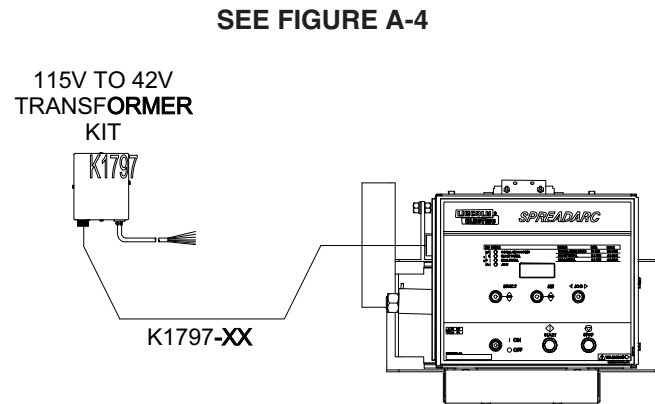


### Connection to 115Vac Power Source

Required:

(See Figure A-4)

- 115Vac Power Source.
- K1797-xx Control Cable (10ft.[3.05m] included with K278-1).
- K1520-1 42 Volt Transformer Kit.
- K278-1 Spreadarc.

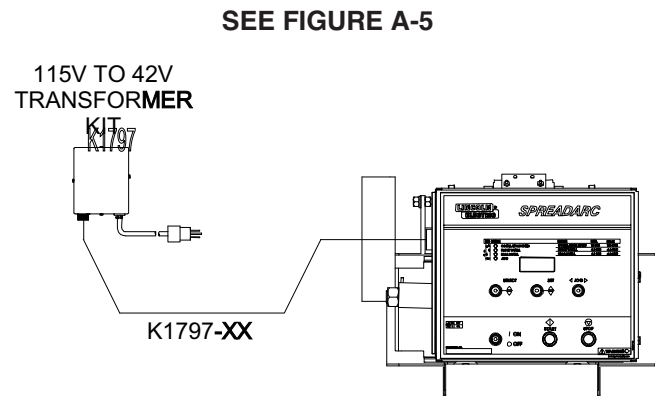


### Connection to 115Vac (direct)

Required:

(See Figure A-5)

- K1797-xx Control Cable (10ft.[3.05m] included with K278-1).
- K1520-1 42 Volt Transformer Kit (with customer supplied input plug attached).
- K278-1 Spreadarc.
- Outlet plug not included.

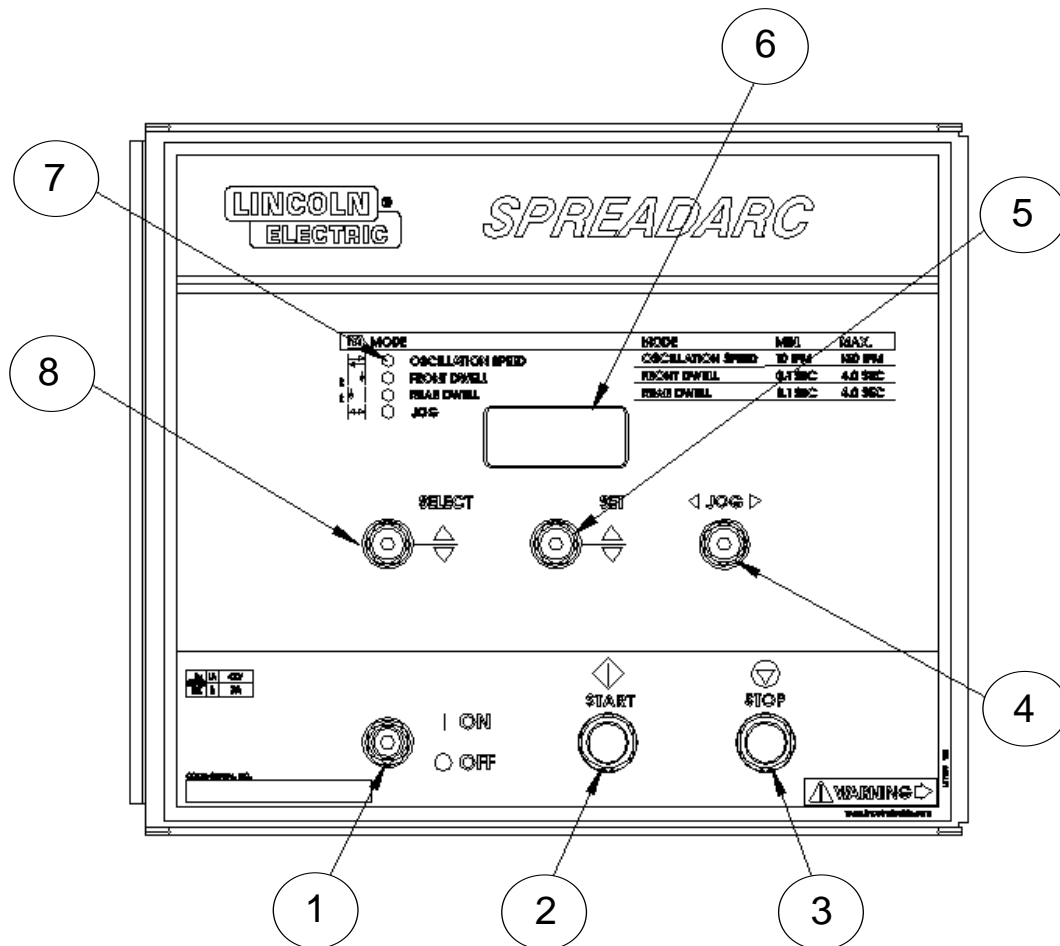


**CASE FRONT CONTROL DESCRIPTION**

(See Figure B-1)

1. **ON/OFF SWITCH** – Turns power on/off to the unit.
2. **START BUTTON** – Starts the oscillation based on the values set in each of the modes.
3. **STOP BUTTON** – Stops oscillation.
4. **JOG SWITCH** – The Jog Switch will move the oscillation carriage left or right at the speed set on the Display. The speed can be pre-set before pressing the Jog Switch left or right, or it can be changed (real time) while jogging.
5. **ADJUST SWITCH** – The Adjust Switch is used to change values stored in each mode. The Adjust Switch can be used to set a value prior to starting oscillation, or it can be used to change a mode value (real time) while oscillating.
6. **DIGITAL DISPLAY** – Displays numerical settings for each of the modes, such as Oscillation Speed in inches per minute, Dwell Times in seconds, or Jog Speed in inches per minute, under normal operation. Error codes are also displayed during fault conditions.
7. **LED MODE INDICATORS** – Illuminate to show the active mode. When a mode is selected, the Display will show the current value. This value can be changed using the Adjust Switch in a stopped condition or during active oscillation. Modes can be selected while actively oscillating (real time).
8. **SELECT SWITCH** – Used to select between the available modes. When pressed up, the LED Mode Indicators will scroll up the list. When pressed down, the LED Mode Indicators will scroll down the list. The Select Switch can be used in a stopped state, or during active oscillation.

FIGURE B-1





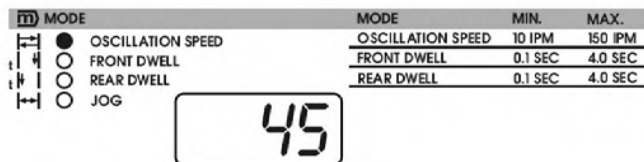
**USER INTERFACE CONTROLS**

**SETTING OSCILLATION SPEED**

(See Figure B-2)

Oscillation Speed is the speed in inches per minute that the Spreadarc carriage will travel back and forth. To adjust the Oscillation Speed, press the Select Toggle Switch up or down until the LED for Oscillation Speed illuminates. The Display will show the current value in inches per minute. To change the Oscillation Speed value, press the Adjust Toggle Switch up or down to raise or lower the Oscillation Speed value. When the Start Button is pressed, the Spreadarc will travel at this speed. The Oscillation speed can be changed before active oscillation or while actively oscillating.

**FIGURE B-2**

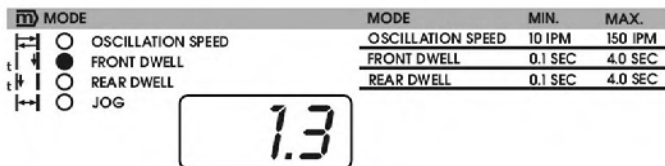


**SETTING FRONT DWELL TIME**

(See Figure B-3)

Front Dwell is the amount of time in seconds that oscillation will stop at the RIGHT proximity switch (when facing the Spreadarc Control Box) while welding continues. This feature is used for good wash-in of the weld metal with the wall of the work. To adjust the Front Dwell time, press the Select Toggle Switch up or down until the LED for Front Dwell illuminates. The Display will show the current value in seconds. To change the Front Dwell time value, press the Adjust Toggle Switch up or down to raise or lower the Front Dwell time value. When the Start Button is pressed, the Spreadarc will "dwell" for this amount of time when the proximity sensor is activated. The Front Dwell can be changed before active oscillation or while actively oscillating.

**FIGURE B-3**

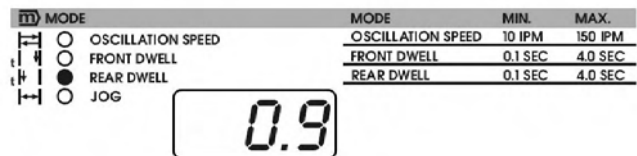


**SETTING REAR DWELL TIME**

(See Figure B-4)

Rear Dwell is the amount of time in seconds that oscillation will stop at the LEFT proximity switch (when facing the Spreadarc Control Box) while welding continues. To adjust the Rear Dwell time, press the Select Toggle Switch up or down until the LED for Rear Dwell illuminates. The Display will show the current value in seconds. To change the Rear Dwell time value, press the Adjust Toggle Switch up or down to raise or lower the Rear Dwell time value. When the Start Button is pressed, the Spreadarc will "dwell" for this amount of time when the proximity sensor is activated. The Rear Dwell can be changed before active oscillation or while actively oscillating.

**FIGURE B-4**

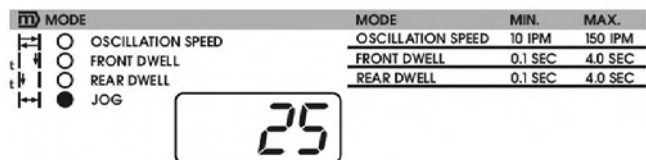


**JOG MODE**

(See Figure B-5)

Jog is used while not actively oscillating in order to move the carriage into a starting position. This feature is good for verifying what the Spreadarc will do once oscillation is activated. To activate Jog, press the Select Toggle Switch up or down until the LED for Jog illuminates. The Display will show the current value in inches per minute. To change the Jog speed value, press the Adjust Toggle Switch up or down to raise or lower the Jog speed value. The Jog feature cannot be accessed during active oscillation.

**FIGURE B-5**



**POWER -DOWN, POWER-UP SEQUENCE**

At power-down, the Spreadarc will save all parameters.

At power-up, the Spreadarc will return all parameters and settings that were stored at last power-down.

## COMMON WELDING PROCEDURES

Set the oscillation speed and the rear and front dwell times as called for in the welding procedure. The front dwell time controls the dwell when the nozzle is at the proximity sensor farthest from the Spreadarc mounting bracket (right-side when facing the Spreadarc User Interface). The rear dwell time controls the dwell when the nozzle is at the proximity sensor closest to the Spreadarc mounting bracket (left-side when facing the Spreadarc User Interface). The oscillation distance, or sweep length, is controlled by rotating either or both of the proximity sensor stops as required giving proper front and rear electrode position. After the desired oscillation track is obtained, lock the stops in place by tightening the hex nuts against the stops.

In order to protect the Spreadarc from high temperatures, best welding practices would be to set the travel direction such that the unit moves away from the heat of the arc, instead of over it.

## SAFETY PRECAUTIONS

### ⚠ WARNING



**ELECTRIC SHOCK can kill.**

- Turn off power at the power source disconnect switch before working inside the equipment.

## PERIODIC MAINTENANCE

(See Figure D-1)

### "V" Tracks and Bearings

Clean, inspect, and re-lubricate twice per year (more often under severe duty applications) as follows:

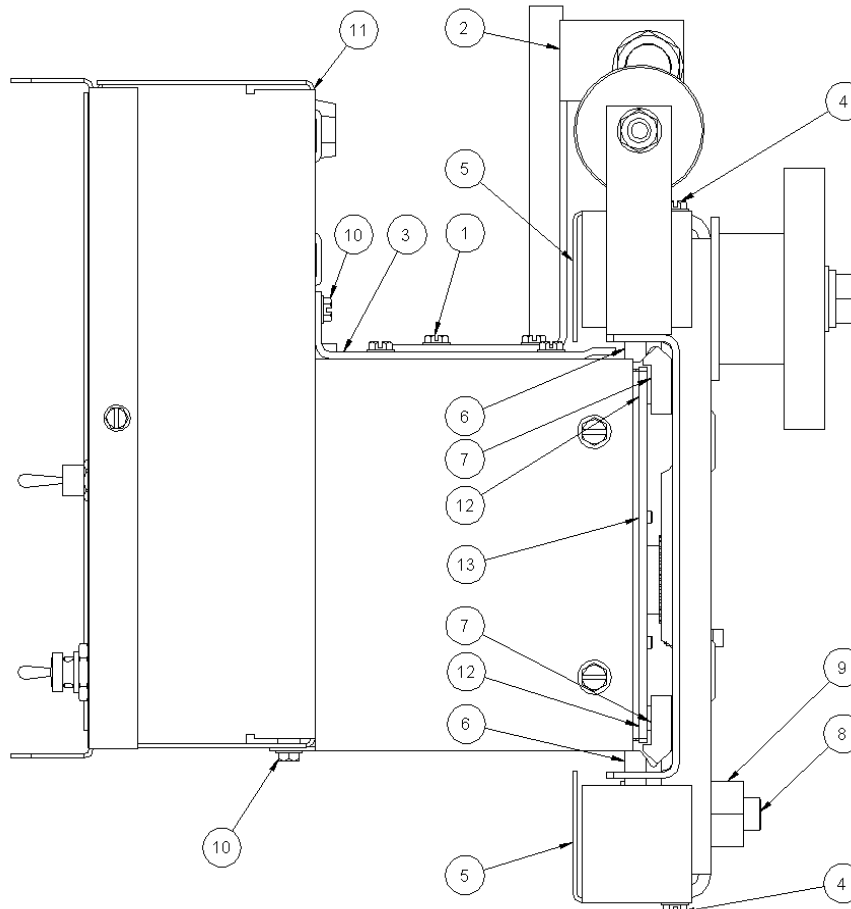
1. Remove the four screws **Item 1** holding the proximity sensor bracket **Item 2** to the top cover **Item 3**.
2. Remove the four screws **Item 4** holding the top and bottom track covers **Item 5** in place and remove the track covers.
3. Clean the four "V" groove bearings **Item 6** and the top and bottom "V" tracks **Item 7** and inspect for wear.
4. Provided the tracks are not severely worn, re-lubricate the contact surface of the bearings and tracks with a graphite or moly filled grease such as automotive chassis grease and re-assemble.  
**NOTE: Do not lubricate the gear motor pinion and gear rack.**

If the wear on the inside edge of the top rack has reached 0.040", either interchange the top and bottom tracks if the bottom track is not severely worn, or replace both tracks.

### To remove the tracks:

1. Loosen the 1/2-13 hex head screws **Item 8** which hold the bottom "V" bearings **Item 6** in place by rotating the screws while keeping the eccentric nuts **Item 9** from turning.
2. Rotate the eccentric nuts to give maximum clearance of the bearings in relationship to the tracks.
3. Lift the carriage to disengage the pinion gear from the rack and remove. Set aside.
4. Remove the four screws **Item 10** holding the control box **Item 11** in place. Maintain support for the control box in order not to strain any leads.

FIGURE D-1



SPREADARC

**LINCOLN**  
ELECTRIC

5. With the control box and carriage out of the way, access to the track fasteners **Item 12** can be gained.
6. Inspect the four "V" bearings on the carriage to verify that they rotate freely and are not excessively worn.
7. **Note: Do not loosen the hex nuts holding the gear motor in place – the gear motor has been factory set to give proper clearance between the rack and pinion**
8. Remove the eight hex head screws **Item 12** holding the top and bottom tracks in place and remove the tracks.
9. Install new tracks, or switch the tracks, on the track support **Item 13** ensuring that the tracks are seated firmly on the edges of the track support.
10. Reassemble all parts except for the top and bottom track shields and proximity sensor bracket.
11. To adjust the eccentric nuts on the bottom "V" bearings, tighten the 1/2-13 screws until snug.
12. Rotate the eccentric nuts to bring the bottom bearings snug against the track.
13. While holding the eccentric nuts securely, tighten the 1/2-13 screws.
14. **Verify proper pressure by turning outer race of bottom bearings by hand. They must slip on track, but there must be no vertical play in the carriage assembly.** Readjust eccentric nuts, if necessary.
15. Lubricate tracks and bearings and install top and bottom track shields and proximity sensor bracket.

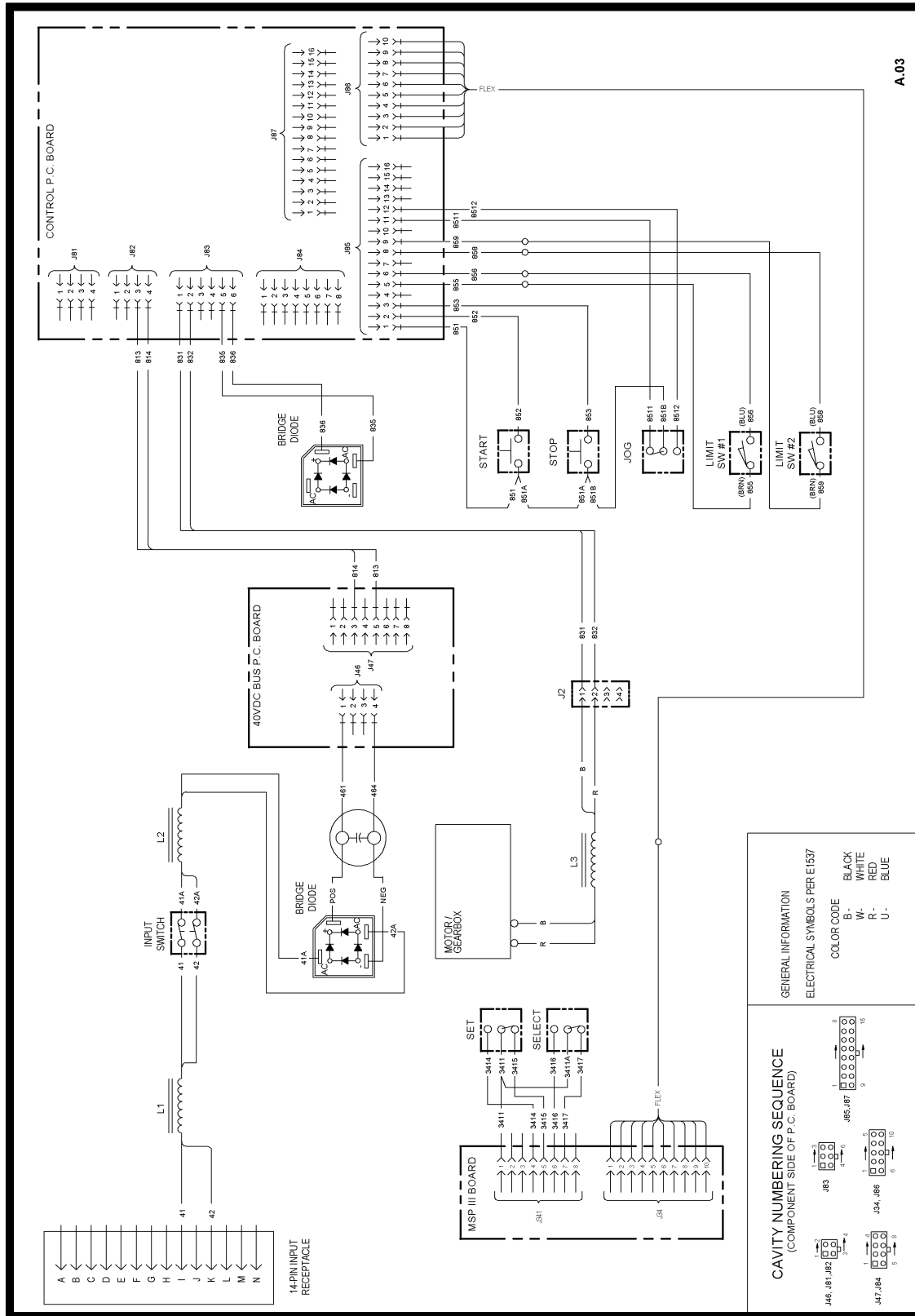
## CONTROL BOX

Every six months inspect the control box. If needed, blow dirt out using low pressure air. Replace screw holding door closed.

## CALIBRATION SPECIFICATION

All calibration is factory set on the Spreadarc.

SPREADARC



A.03

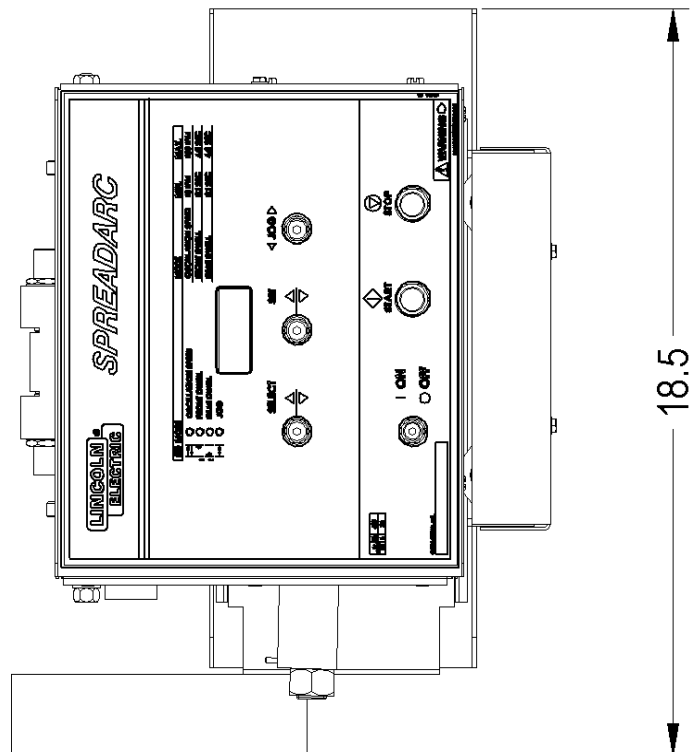
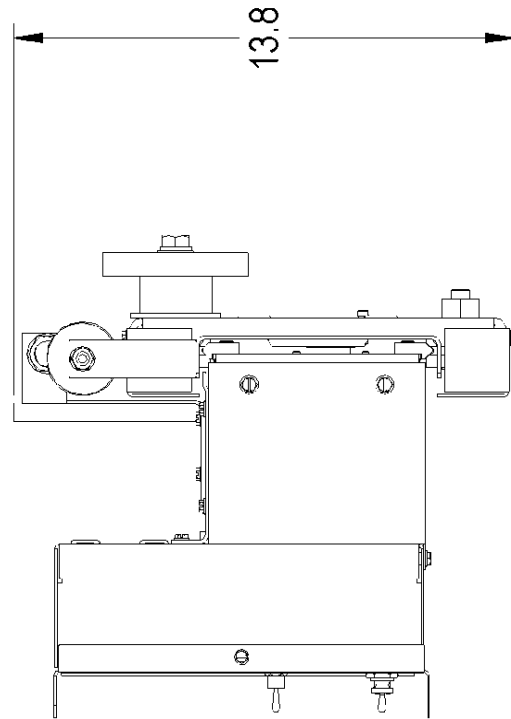
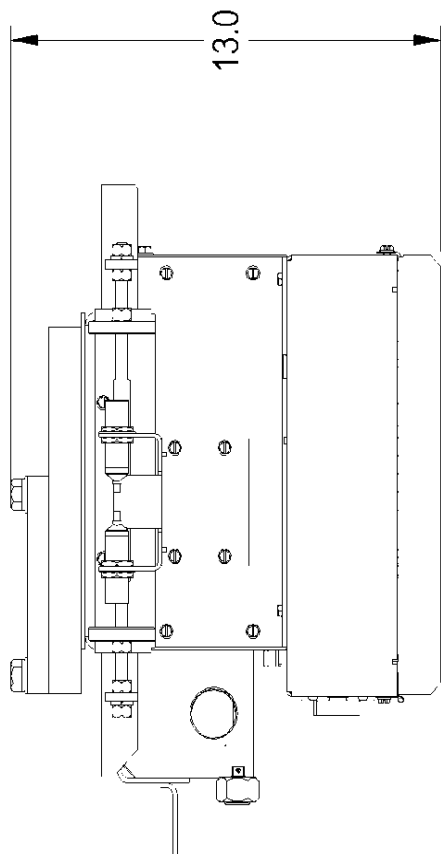
M20161

**CAVITY NUMBERING SEQUENCE**  
(COMPONENT SIDE OF P.C. BOARD)

**GENERAL INFORMATION**  
ELECTRICAL SYMBOLS PER E1537

**COLOR CODE**  
 B. BLACK  
 W. WHITE  
 R. RED  
 U. BLUE

NOTE: This diagram is for reference only. It may not be 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 equipment code number..



**SPREADARC**  
**LINCOLN**  
**ELECTRIC**



<b>WARNING</b>	<ul style="list-style-type: none"> <li>● Do not touch electrically live parts or electrode with skin or wet clothing.</li> <li>● Insulate yourself from work and ground.</li> </ul>	<ul style="list-style-type: none"> <li>● Keep flammable materials away.</li> </ul>	<ul style="list-style-type: none"> <li>● Wear eye, ear and body protection.</li> </ul>
Spanish <b>AVISO DE PRECAUCION</b>	<ul style="list-style-type: none"> <li>● No toque las partes o los electrodos bajo carga con la piel o ropa mojada.</li> <li>● Aíslese del trabajo y de la tierra.</li> </ul>	<ul style="list-style-type: none"> <li>● Mantenga el material combustible fuera del área de trabajo.</li> </ul>	<ul style="list-style-type: none"> <li>● Protéjase los ojos, los oídos y el cuerpo.</li> </ul>
French <b>ATTENTION</b>	<ul style="list-style-type: none"> <li>● Ne laissez ni la peau ni des vêtements mouillés entrer en contact avec des pièces sous tension.</li> <li>● Isolez-vous du travail et de la terre.</li> </ul>	<ul style="list-style-type: none"> <li>● Gardez à l'écart de tout matériel inflammable.</li> </ul>	<ul style="list-style-type: none"> <li>● Protégez vos yeux, vos oreilles et votre corps.</li> </ul>
German <b>WARNUNG</b>	<ul style="list-style-type: none"> <li>● Berühren Sie keine stromführenden Teile oder Elektroden mit Ihrem Körper oder feuchter Kleidung!</li> <li>● Isolieren Sie sich von den Elektroden und dem Erdboden!</li> </ul>	<ul style="list-style-type: none"> <li>● Entfernen Sie brennbares Material!</li> </ul>	<ul style="list-style-type: none"> <li>● Tragen Sie Augen-, Ohren- und Körperschutz!</li> </ul>
Portuguese <b>ATENÇÃO</b>	<ul style="list-style-type: none"> <li>● Não toque partes elétricas e electrodos com a pele ou roupa molhada.</li> <li>● Isole-se da peça e terra.</li> </ul>	<ul style="list-style-type: none"> <li>● Mantenha inflamáveis bem guardados.</li> </ul>	<ul style="list-style-type: none"> <li>● Use proteção para a vista, ouvido e corpo.</li> </ul>
Japanese <b>注意事項</b>	<ul style="list-style-type: none"> <li>● 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。</li> <li>● 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。</li> </ul>	<ul style="list-style-type: none"> <li>● 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。</li> </ul>	<ul style="list-style-type: none"> <li>● 目、耳及び身体に保護具をして下さい。</li> </ul>
Chinese <b>警告</b>	<ul style="list-style-type: none"> <li>● 皮肤或湿衣物切勿接触带电部件及焊条。</li> <li>● 使你自已与地面和工件绝缘。</li> </ul>	<ul style="list-style-type: none"> <li>● 把一切易燃物品移离工作场所。</li> </ul>	<ul style="list-style-type: none"> <li>● 佩戴眼、耳及身体劳动保护用具。</li> </ul>
Korean <b>위험</b>	<ul style="list-style-type: none"> <li>● 전도체나 용접봉을 젖은 헝겍 또는 피부로 절대 접촉치 마십시오.</li> <li>● 모재와 접지를 접촉치 마십시오.</li> </ul>	<ul style="list-style-type: none"> <li>● 인화성 물질을 접근시키지 마십시오.</li> </ul>	<ul style="list-style-type: none"> <li>● 눈, 귀와 몸에 보호장구를 착용하십시오.</li> </ul>
Arabic <b>تحذير</b>	<ul style="list-style-type: none"> <li>● لا تلمس الاجزاء التي يسري فيها التيار الكهربائي أو الألكترود بجسد الجسم أو بالملابس المبللة بالماء.</li> <li>● ضع عازلا على جسمك خلال العمل.</li> </ul>	<ul style="list-style-type: none"> <li>● ضع المواد القابلة للاشتعال في مكان بعيد.</li> </ul>	<ul style="list-style-type: none"> <li>● ضع أدوات وملابس واقية على عينيك وأذنيك وجسمك.</li> </ul>

**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.**

			
<ul style="list-style-type: none"> <li>● Keep your head out of fumes.</li> <li>● Use ventilation or exhaust to remove fumes from breathing zone.</li> </ul>	<ul style="list-style-type: none"> <li>● Turn power off before servicing.</li> </ul>	<ul style="list-style-type: none"> <li>● Do not operate with panel open or guards off.</li> </ul>	<b>WARNING</b>
<ul style="list-style-type: none"> <li>● Los humos fuera de la zona de respiración.</li> <li>● Mantenga la cabeza fuera de los humos. Utilice ventilación o aspiración para gases.</li> </ul>	<ul style="list-style-type: none"> <li>● Desconectar el cable de alimentación de poder de la máquina antes de iniciar cualquier servicio.</li> </ul>	<ul style="list-style-type: none"> <li>● No operar con panel abierto o guardas quitadas.</li> </ul>	Spanish <b>AVISO DE PRECAUCION</b>
<ul style="list-style-type: none"> <li>● Gardez la tête à l'écart des fumées.</li> <li>● Utilisez un ventilateur ou un aspirateur pour ôter les fumées des zones de travail.</li> </ul>	<ul style="list-style-type: none"> <li>● Débranchez le courant avant l'entretien.</li> </ul>	<ul style="list-style-type: none"> <li>● N'opérez pas avec les panneaux ouverts ou avec les dispositifs de protection enlevés.</li> </ul>	French <b>ATTENTION</b>
<ul style="list-style-type: none"> <li>● Vermeiden Sie das Einatmen von Schweißrauch!</li> <li>● Sorgen Sie für gute Be- und Entlüftung des Arbeitsplatzes!</li> </ul>	<ul style="list-style-type: none"> <li>● Strom vor Wartungsarbeiten abschalten! (Netzstrom völlig öffnen; Maschine anhalten!)</li> </ul>	<ul style="list-style-type: none"> <li>● Anlage nie ohne Schutzgehäuse oder Innenschutzverkleidung in Betrieb setzen!</li> </ul>	German <b>WARNUNG</b>
<ul style="list-style-type: none"> <li>● Mantenha seu rosto da fumaça.</li> <li>● Use ventilação e exaustão para remover fumo da zona respiratória.</li> </ul>	<ul style="list-style-type: none"> <li>● Não opere com as tampas removidas.</li> <li>● Desligue a corrente antes de fazer serviço.</li> <li>● Não toque as partes elétricas nuas.</li> </ul>	<ul style="list-style-type: none"> <li>● Mantenha-se afastado das partes moventes.</li> <li>● Não opere com os painéis abertos ou guardas removidas.</li> </ul>	Portuguese <b>ATENÇÃO</b>
<ul style="list-style-type: none"> <li>● ヒュームから顔を離すようにして下さい。</li> <li>● 換気や排煙に十分留意して下さい。</li> </ul>	<ul style="list-style-type: none"> <li>● 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。</li> </ul>	<ul style="list-style-type: none"> <li>● パネルやカバーを取り外した状態で機械操作をしないで下さい。</li> </ul>	Japanese <b>注意事項</b>
<ul style="list-style-type: none"> <li>● 頭部遠離須知。</li> <li>● 在呼吸區使用通風或排煙設備。</li> </ul>	<ul style="list-style-type: none"> <li>● 維修前切斷電源。</li> </ul>	<ul style="list-style-type: none"> <li>● 蓋板拆卸或沒有安全罩時不準作動。</li> </ul>	Chinese <b>警告</b>
<ul style="list-style-type: none"> <li>● 얼굴로부터 용접가스를 멀리하십시오.</li> <li>● 호흡지역으로부터 용접가스를 제거하기 위해 가스제거기나 통풍기를 사용하십시오.</li> </ul>	<ul style="list-style-type: none"> <li>● 보수전에 전원을 차단하십시오.</li> </ul>	<ul style="list-style-type: none"> <li>● 판넬이 열린 상태로 작동하지 마십시오.</li> </ul>	Korean <b>위험</b>
<ul style="list-style-type: none"> <li>● نود رأسك بعيداً عن الدخان.</li> <li>● استخدم التهوية أو جهاز منطد للدخان للخارج.</li> <li>● لكن أبعد الدخان عن المنطقة التي تنفس فيها.</li> </ul>	<ul style="list-style-type: none"> <li>● قطع التيار الكهربائي قبل القيام بأية صيانة.</li> </ul>	<ul style="list-style-type: none"> <li>● لا تدخن هذا الجهاز إلا كانت الأغطية الحامية الرولية ليست عليه.</li> </ul>	Arabic <b>تحذير</b>

**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。

請詳閱圖說並理解製造廠提供的說明以及廠家使用的鍍焊材料，並請遵守貴方的有關勞動保護規定。

이 제품에 등본된 작업자접서를 숙지하시고 귀사의 작업자 안전수칙을 준수하시기 바랍니다.

الرجاء بتعمن وإتقهم تعليمات المصنع المنتج لهذه المعدات والمواد قبل استعمالها وتبع تعليمات الوقاية لتصاحب العمل.



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