

# K386

## NARROW GAP, DEEP GROOVE, NOZZLE

### 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.

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## ELECTRIC SHOCK can kill.

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

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

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

- Semiautomatic DC Constant Voltage (Wire) Welder.
- DC Manual (Stick) Welder.
- AC Welder with Reduced Voltage Control.

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

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

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

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

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

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

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

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



## ARC RAYS can burn.

4.a. Use a shield with the proper filter and cover plates to protect your eyes from sparks and the rays of the arc when welding or observing open arc welding. Headshield and filter lens should conform to ANSI Z87.1 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. Do not weld in locations near chlorinated hydrocarbon vapors coming from degreasing, cleaning or spraying operations. The heat and rays of the arc can react with solvent vapors to form phosgene, a highly toxic gas, and other irritating products.

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

5.d. Read and understand the manufacturer's instructions for this equipment and the consumables to be used, including the material safety data sheet (MSDS) and follow your employer's safety practices. MSDS forms are available from your welding distributor or from the manufacturer.

5.e. Also see item 1.b.

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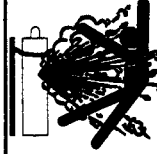


### WELDING SPARKS can cause fire or explosion.

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

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

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



### CYLINDER may explode if damaged.

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

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

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## 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 pistilage. 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.

Mar. '93

# Thank You

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

## **Please Examine Carton and Equipment For Damage Immediately**

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

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

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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## Description

The 750 amp water-cooled automatic nozzle is designed for narrow gap, deep groove, submerged arc welding procedures using a single 3/32 diameter LC-72 or solid electrode fed by a standard NA Automatic head.

## Features

1. A rigid water-cooled nozzle body, fully insulated with a replaceable insulation jacket, capable of welding in a 5/8 inch minimum joint gap of up to 10 inches deep.
2. A built-in 7° tip drag angle provides consistent positive electrode contact at the replaceable contact tip. Two contact tips are included with each nozzle.
3. A pivoting wire guide tube with hand-wheel clamp permits welding angle to joint adjustment of up to 30° to the left and 30° to the right sides of the joint, even while welding.
4. The entire nozzle body can be rotated 180° , and is clamped by a second hand-wheel, to permit rapid direction of travel reversals when the nozzle body is out of the joint.
5. A flux feed tube is mounted on the nozzle with a wing-nut clamp which permits easy flux height control and adjustment, even while welding.
6. Included with the nozzle are extension mounting brackets and pins for the K219 Automatic Flux Hopper (included with the K208-B or K346-B Automatic head) and a flexible flux hose for proper dispensing of welding flux to the nozzle.

## Recommended Equipment For Use With The K386 Nozzle

### Required Equipment

#### AC Welding (refer to procedure)

- |  |            |
|--|------------|
| 1. K388 NA-4 Control •                                       | 1 req'd. Δ |
| 2. K208-B Automatic Head<br>(includes Automatic Flux Hopper) | 1 req'd. Δ |
| 3. K1276-C AC-1200 Power Source                              | 1 req'd.   |

#### DC Welding (refer to procedure)

- |  |          |
|--|----------|
| 1. K210 NA-3S or K356 NA-5 Control   | 1 req'd. |
| 2. K208-B NA-3 or K346-B NA-5 Automatic Head<br>(includes Automatic Flux Hopper) | 1 req'd. |
| 3. K1288 DC-600 or K1298 DC-1000 Power Source                                    | 1 req'd. |

#### AC or DC Welding

- |  |           |
|--|-----------|
| 4. K386 Narrow Gap, Deep Groove Nozzle   | 1 req'd.  |
| 5. K215 Input Cable Assembly   | 1 req'd.  |
| 6. Work cable(s)   | As req'd. |
| 7. 3/32" Electrode and Flux Consumables<br>(refer to procedure)  | As req'd. |
| 8. Extra T14879-3/32 Contact Tips<br>(refer to Maintenance Section V.)<br>(1 extra tip included with nozzle) | As req'd  |
| 9. K223 Water Solenoid Assembly  | 1 req'd.  |
| 10. Cooling water tubing and fittings<br>(Refer to Installation Section III.)                                | As req'd. |

### Optional Equipment

- |  |          |
|--|----------|
| K29 Vertical Head lift Adjuster                                  | 1 req'd. |
| K96 Horizontal Head Adjuster                                     | 1 req'd. |
| K325-S TC-3 Automatic Travel Carriage                            | 1 req'd. |
| K299 50-60 lb. Wire Reel and Mountings                           | 1 req'd. |
| M10214 Wire Straightener (for LC-72 electrode)                   | 1 req'd. |
| K283 Portable Digital Wire Feed Speed Meter<br>(except for NA-5) | 1 req'd. |

Δ If using an earlier K248 NA-4 Control and head with a 142:1 gear ratio:

1. Order and install a T13724-B Drive Roll and Guide Tube Kit.
2. In order to obtain wire feed speeds above 150 IPM; order S15013-2 motor pinion gear and S12503 helical gear to convert the 142:1 gear ratio to 95:1 per the instructions given in Section L6.2.1 of the NA-4 IM278 Manual.

• See "NA-4 Control Modification" section for user modification of NA-4 Control to extend wire speed range.

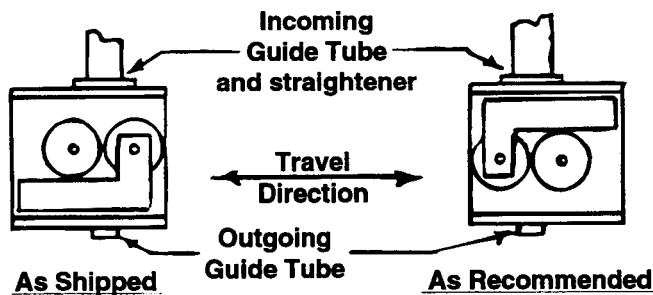


## Installation

The following instructions pertain to the installation and operation of the K386 Narrow Gap Nozzle. The installation and operation of the required and optional equipment (see previous Section) used with the K386 nozzle is covered in the IM278 NA-3/4 manual, the IM305 NA-5 manual, or in the literature included with the equipment used.

### Automatic Flux Hopper Mounting

1. Mount the wire feed head so the drive roll axis of rotation is perpendicular to the direction of travel.
2. To obtain smooth symmetrical flux hose routing from the flux hopper to the nozzle flux tube for either direction of travel, it is recommended that the faceplate of the head be rotated 180° about the drive roll axis:



This rotation requires the following additional changes be made during initial set up:

- a. Exchange the outgoing guide tube and nozzle mountings with the incoming guide tube, straightener and its mounts.

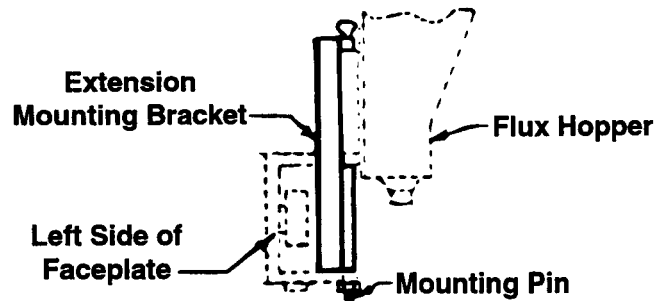
### **⚠ WARNING**

Be sure all power to the NA control box is shut off at the power source.

- b. Interchange the motor field lead connections at the terminal strip inside the NA control box to re-establish proper wire feed direction:

#626 lead to terminal #627  
#627 lead to terminal #626

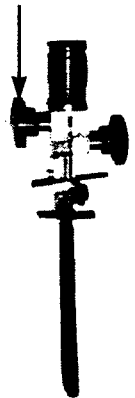
3. Using the flux hopper Extension Mounting Brackets and Pins, included with the nozzle, mount the flux hopper above the faceplate as shown:



**NOTE:** Both Extension Brackets must be against the side of the faceplate so as not to electrically contact the bin of the flux hopper.

### Nozzle Mounting

1. Make sure the nozzle's incoming guide insert is in place, then snugly mount the nozzle over the head's outgoing guide tube using the nozzle mounting clips provided with the head.
2. Loosen the nozzle's body pivot clamp (top hand-wheel) and rotate the nozzle body clockwise (looking down the nozzle) to its stop pin limit, then re-tighten the body pivot clamp.
3. Re-loosen the nozzle mounting clips and position the entire nozzle so the nozzle's side is parallel to the direction of travel with its flux tube on the left side of the nozzle. Then securely tighten the nozzle mounting clips.
4. Loosen the nozzle's flux tube clamp wing-nut then adjust and re-clip the flux tube height so the bottom end of the tube is 1/8" to 1/4" below the bottom edge of the nozzle's insulation jacket.
5. Attach the 10.50 inch Flux Hose, included with the nozzle, between the flux hopper and the nozzle's flux tube. Adjust for a smooth routing with no kinks even when the nozzle body is pivoted between the 180° stop pins.
6. Connect the electrode leads from the NA-4 to the nozzle connection tab using the bolt and nut provided. Be sure that the cables have enough slack to permit any required pivot adjustments of the nozzle.
7. Connect a flexible tube, from a water supply capable of supplying at least 1/4 gal./min., to the nozzle's inlet tube (furthest from flux tube) and a second flexible tube to the nozzle's outlet tube (nearest the flux tube).



### ⚠ WARNING

The water tubing must be electrically non-conductive since the nozzle inlet and outlet tubes will be at the same potential as the electrode while welding. Also, allow enough slack in the tubes to permit any required pivot adjustments of the nozzle, but keep the tubes away from any hot surfaces capable of melting the tube.

### Water Solenoid Connection

The K223 water solenoid should be used with the NA Control to automatically turn on the water flow while welding. However, since the control box receptacle, normally used to electrically connect the K223, is also used for the Automatic Flux Hopper, the K223 must be wired directly to the terminal strip inside the control box.

### ⚠ WARNING

Be sure all power to the NA control is shut off at the power source.

- Remove the K223 cable bolted to the two solenoid leads.
- Extend the two solenoid leads to #87 and #531 at the NA control box terminal strip.
- Connect a wire from the K223 grounding screw to the NA control box grounding screw.

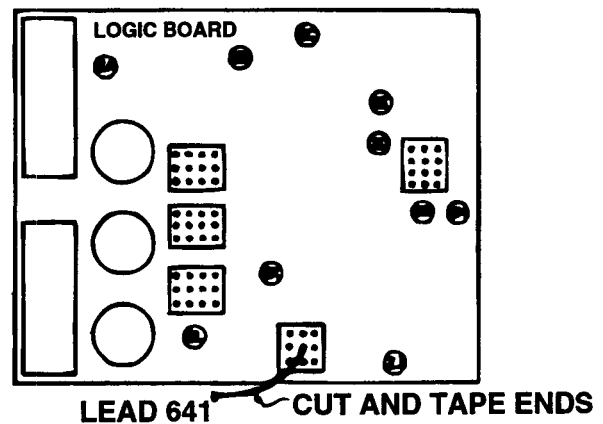
### NA-4 Control Modification

The wire feed speed procedures for narrow gap welding approach, or exceed, the range of speed control provided by the NA-4 Control as shipped from the factory. This range can be extended to adequately provide the procedure speed requirements in the following manner:

### ⚠ WARNING

Be sure all power to the NA-4 is shut off at the power source.

- Open the NA-4 Control box door and subpanel, then locate the Logic P.C. board on the rear of the NA-4 subpanel.
- Locate the 9-cavity plug on the bottom center of the Logic board.
- Locate lead #641 routed to the center cavity of the plug.
- Cut Lead #641 and insulate both cut ends with tape.



- Close the NA-4 subpanel and door.

## Nozzle Operation

### Loading the Nozzle

1. Check that the nozzle contact tip is screwed in tight against the tip block with a pair of pliers.
2. The end of the electrode should be cut off clean, with minimal burrs or flattening, and straightened for about the first 8 inches.
3. Push the electrode down through the straightener to the drive rolls, then inch down and out of the nozzle's contact tip.
4. While feeding, adjust the straightener as required to obtain a consistent location of the wire for at least 2 inches beyond the end of the contact tip.

## Nozzle Adjustments

### Nozzle Body Pivot

By loosening the upper hand-wheel clamp, the entire nozzle assembly can be rotated 180° between two stop pins and clamped in the desired position.

This adjustment is designed to permit 180° travel direction reversal and can only be adjusted when the nozzle body is out of the deep groove joint. The nozzle's flux tube must always lead the nozzle in the welding direction of travel.

### Welding Angle Pivot

By loosening the lower hand-wheel clamp, the nozzle's wire guide tube and contact tip can be pivoted up to 30° either side of center using the insulated pivot handles. The hand-wheel can then be tightened to clamp the nozzle in the desired position.

This adjustment is designed to set the required welding angle to joint procedure requirement and can be adjusted even while welding.

### Flux Tube Height

By loosening the wing-nut of the insulated clamp, the height of the flux tube can be adjusted, then clamped.

This adjustment is designed to obtain the proper welding flux depth and can be adjusted while welding. Proper flux depth is usually obtained when the end of the flux tube is 1/8 to 1/4 inch below the nozzle's insulation jacket.

## Maintenance

See the parts list section following for replacement parts and assembly.

### Contact Tip Replacement

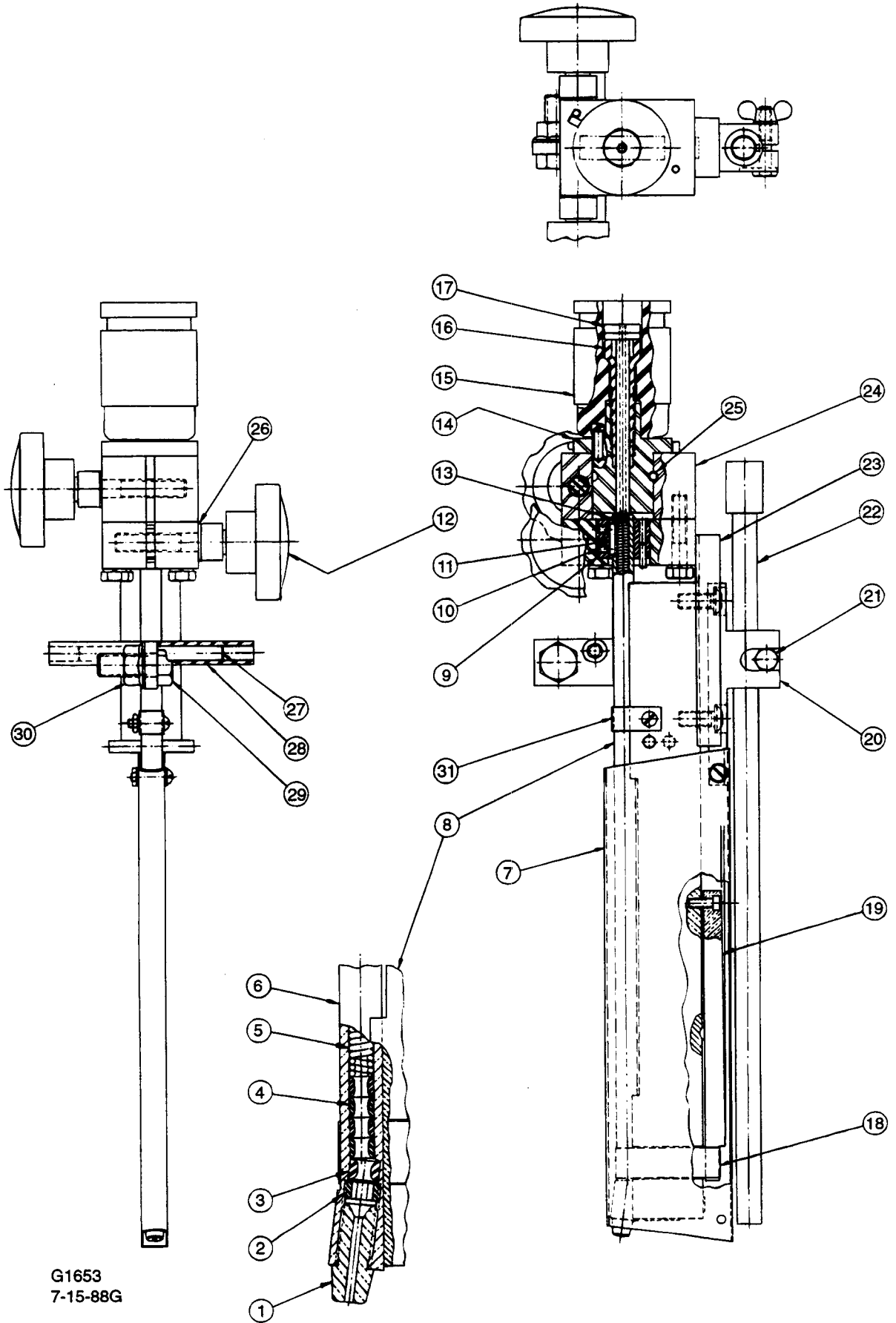
The T14879-3/32 contact tip should be replaced by the time the maximum inside dimension of the electrode exit hole wears to .130 inch. When using non-coppered electrode, such as LC-72, the tip wear should be monitored when feed deposition exceeds about 200 pounds. Unscrew the contact tip with a pair of pliers.

### Insulation Jacket Replacement

The S17545 insulation jacket should be reversed, top to bottom, or replaced if the jacket erodes so as to expose the brass cooling bar or the wire guide tube to possible arcing to work.

# PARTS

## K386 NARROW GAP, DEEP GROOVE, NOZZLE GENERAL ASSEMBLY



G1653  
7-15-88G

# PARTS

## K386 NARROW GAP, DEEP GROOVE, NOZZLE GENERAL ASSEMBLY

Item	Description	Part No.	No. Req'd.
1	Nozzle Tip	T14879-3/32	2
2	Hollow Set Screw	T12932-2	1
3	Ceramic Insert	T12576-1	1
4	Ceramic Insert	T12576-2	4
5	Spring Liner	T12931-35	1
6	Nozzle Tube Asbly.	S17543	1
7	Insulation Jacket	S17545	1
	Round Head Screw	#8-32x.75	1
	Plain Washer	S9262-3	2
	Hex Nut	#8-32	1
8	Cooling Bar Asbly.	S17546	1
9	Nozzle Pivot Hub Asbly.	T14891	1
10	Set Screw	S11604-42	2
11	Key	M8776-89	1
12	Rotating Lock Screw Asbly.	T14885	2
13	Snap Ring	S9776-46	1
14	Pivot Asbly.	T14883	1
15	Nozzle Insulator Asbly.	S10493-1	1
16	Socket Head Screw	T10570	1
17	Nozzle Insert Asbly.	S15106-1	1
18	Pressure Belt	T14889	1
19	Pressure Arm Asbly.	T14890	1
	Socket Head Screw	T9447-56	1
20	Flux Tube Clamp	S17542	1
	Button Head Socket Screw	T11551-6	2
21	Hex Head Screw	1/4-20x1.25	1
	Plain Washer	S9262-23	1
	Wing Nut	T9968-1	1
22	Flux Tube	T14887	1
23	Pivot Housing Arm	M14717	1
	Lockwasher	E106A-14	3
	Hex Head Screw	5/16-18x1.50	3
24	Mounting Clamp Asbly.	S17550	1
25	Roll Pin	T9967-43	1
26	Plain Washer	S9262-104	2
27	Roll Pin	T9967-29	1
28	Pivot Handle	T14939-1	2
29	Hex Head Screw	1/2-13x1.25	1
30	Flange Nut	T3960	1
31	Nozzle Tube Strap	T14974	1
	Round Head Screw	#8-32x.75	1
	Lockwasher	T9695-3	1
	Hex Nut	#8-32	1

5-17-96

# NOTES

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<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>● Aislese 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 헝겊 또는 피부로 절대 접촉치 마십시오.</li> <li>● 모재와 접지를 접촉치 마십시오.</li> </ul>	<ul style="list-style-type: none"> <li>● 인화성 물질을 접근 시키지 마시오.</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 الألتروتود بجند 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 عنى 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>● ヒュームから頭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ください。</li> </ul>	<ul style="list-style-type: none"> <li>● 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。</li> </ul>	Japanese <b>注意事項</b>
<ul style="list-style-type: none"> <li>● 頭部遠離煙霧。</li> <li>● 在呼吸區使用通風或排風器除煙。</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>● 儀表板打開或沒有安全罩時不準作業。</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 작동치 마십시오.</li> </ul>	Korean <b>위험</b>
<ul style="list-style-type: none"> <li>● ابعء رأسك بعيداً عن الدخان.</li> <li>● استعمل التهوية أو جهاز ضغط الدخان للخارج لكي تبعد الدخان عن المنطقة التي تتنفس فيها.</li> </ul>	<ul style="list-style-type: none"> <li>● افصع التيار الكهربائي قبل القيام بأية صيانة.</li> </ul>	<ul style="list-style-type: none"> <li>● لا تشغل هذا الجهاز اذا كانت الاغطية الحديدية الواقية 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。

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

이 제품에 동봉된 작업지침서를 숙지하시고 귀사의 작업자 안전수칙을 준수하시기 바랍니다.

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