



OPERATING MANUAL

IM-346
TEMPORARY
Feb. 1985
Ram

K-406 LINCONDITIONERTM GUN AND CABLE ASSEMBLY 350 AMPS, 60% DUTY CYCLE FOR .068, .072 AND 5/64" INNERSHIELD[®] ELECTRODES

IM346
February 1985
K-406 Linconditioner Gun/Cable

This manual covers equipment which is obsolete and no longer in production by The Lincoln Electric Co. Specifications and availability of optional features may have changed.

SHIPPING DAMAGE CLAIMS

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.

SAFETY DEPENDS ON YOU

Lincoln welders are 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 OPERATING MANUAL AND THE ARC WELDING SAFETY PRECAUTIONS ON THE INSIDE FRONT COVER. And, most importantly, think before you act and be careful.



THE LINCOLN ELECTRIC COMPANY

World's Largest Manufacturer of Arc Welding Products • Manufacturer of Industrial Motors
Cleveland, Ohio 44117 U.S.A.

ARC WELDING SAFETY PRECAUTIONS

PROTECT YOURSELF AND OTHERS FROM POSSIBLE SERIOUS INJURY OR DEATH. READ AND UNDERSTAND BOTH THE SPECIFIC INFORMATION GIVEN IN THE OPERATING MANUAL FOR THE WELDER AND/OR OTHER EQUIPMENT TO BE USED AS WELL AS THE FOLLOWING GENERAL INFORMATION.

1. HAVE ALL INSTALLATION, OPERATION, MAINTENANCE AND REPAIR WORK performed only by qualified people

2. ELECTRIC SHOCK can kill.

Protect yourself from possible dangerous electrical shock:

- a. The electrode and work (or ground) circuits are electrically "hot" when the welder is on. Never permit contact between "hot" parts of the circuits and bare skin or wet clothing. Wear dry, hole-free gloves to insulate hands.
- b. Always insulate yourself from the work and ground by using dry insulation. When welding in damp locations, on metal floors, gratings or scaffolds, and when in positions (such as sitting or lying), make certain the insulation is large enough to cover your full area of physical contact with work and ground.
- c. Maintain the electrode holder, work clamp, welding cable and welding machine in good, safe operating condition.
- d. Never dip the electrode holder in water for cooling.
- e. 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.
- f. If using the welder as a power source for mechanized welding, the above precautions also apply for the automatic electrode, electrode reel, welding head, nozzle or semiautomatic welding gun.
- g. When working above floor level, protect yourself from a fall should you get a shock.
- h. Ground the work or metal to be welded to a good electrical ground.
- i. Also see Item 7.

3. FUMES AND GASES can be dangerous to your health.

- 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 on galvanized, lead or cadmium plated steel and other metals which produce toxic fumes, even greater care must be taken.
- 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.
- c. Also see Item 8b.

4. ARC RAYS can injure eyes and burn skin.

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

5. FIRE OR EXPLOSION can cause death or property damage.

- a. Remove fire hazards well away from the 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. Have fire extinguisher readily available.
- 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.

- 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.
- 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 F4.1-80 from the American Welding Society (see address below).
- e. Vent hollow castings or containers before heating, cutting or welding. They may explode.
- f. Also see Items 6c and 8c.

Additional Safety Precautions

6. For Welding in General.

- a. Droplets of molten slag and metal are thrown or fall from the welding arc. Protect yourself with 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 when in a welding area. Use glasses with side shields when near slag chipping operations.
- b. 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.
- c. Be sure the work cable is connected to the work as close to the welding area as practical. Work cables connected to the building framework or other locations some distance 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.

7. For Electrically Powered Equipment.

- a. Turn off the input power using the disconnect switch at the fuse box before working on the equipment.
- b. Make the electrical installation in accordance with the National Electrical Code, all local codes and the manufacturer's recommendations.
- c. Properly ground the equipment in accordance with the National Electrical Code and the manufacturer's recommendations.

8. For Engine Powered Equipment.

- a. Turn the engine off before troubleshooting and maintenance work unless the maintenance work requires it to be running.
- b. Operate internal combustion engines in open, well-ventilated areas or vent the engine exhaust fumes outdoors.
- c. Do not add the fuel near an open flame, welding arc or when the engine is running. Stop the engine and, if possible, allow it to cool to prevent spilled fuel from igniting on contact with hot engine parts or electrical sparks. Do not spill fuel when filling tank. If fuel is spilled, wipe it up and do not start engine until fumes have been eliminated.
- d. 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.
- e. To avoid scalding, do not remove the radiator pressure cap when the engine is hot.

For more detailed 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.

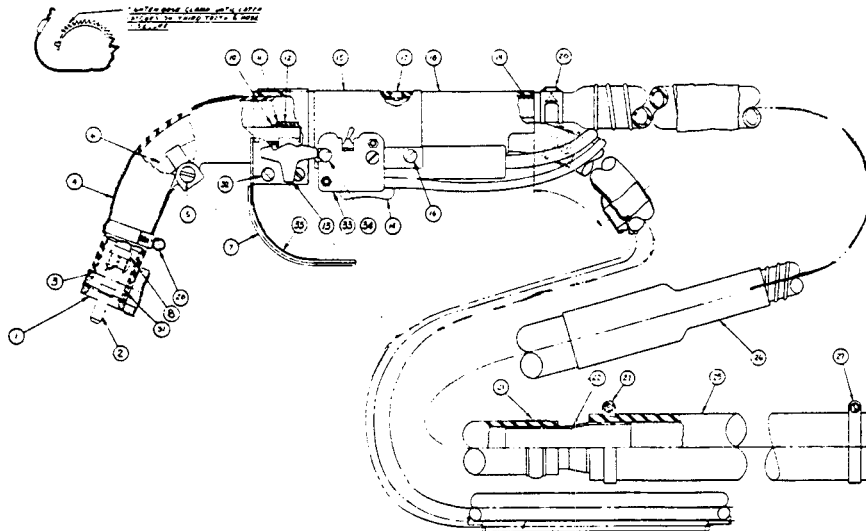
The K-406 Linconditioner gun has been designed for use with the LN-23P wire feeder and a Linconditioner vacuum unit. The gun includes a switch for utilizing the reduce wire speed capability of the LN-23P.* The gun cable is 10 feet long with a 15 foot exhaust hose for connection to the K-179 or K-184 vacuum units. Each gun comes with one .068/.072 contact tip and one 5/64 contact tip.

Welding fumes are collected with this system very close to the welding arc. This makes a much more efficient and cost effective system than a general exhaust system. The Linconditioner system is especially suited to applications when welding in confined areas and where adequate ventilation is difficult to achieve.

The I.D. of the extension guide, the I.D. of the steel adapter and the nozzle spacer must be kept free of excessive spatter to maintain air flow through the gun. On high current welding, these parts usually require cleaning after 5 minutes of arc time. Spatter will also collect around nozzle support in the intake housing. Clean after every coil of electrode is used, unless more frequent cleaning is indicated.

* Can also be used with the LN-22, but the reduced speed switch is not applicable.

K-406 LINCONDITIONER™ GUN AND CABLE



P-103-S

L-7081-1
9-28-84

ITEM	PART NAME AND DESCRIPTION	NO. REQ'D.
	Gun & Cable Assembly, Includes All Below:	1
1	Extension Guide (1/4 to 1" Electrical Stickout)	1
2	Nozzle Tip - See Note 1	*
3	Nozzle Spacer	1
4	Intake Housing	1
5	Slotted Flat Hd. Screw	2
6	Nozzle Assembly	1
7	Shield	1
8	Insulator	1
10	Conductor Cable	1
11	Snap Ring	1
12	Nozzle Clamp	1
13	Hand Screw Assembly	1
14	Trigger & Control Cable Assembly	1
15	Switch Housing Clamp	1
16	Pan Head Screw	3
17	Rivet Button	1
18	Handle	1
19	Exhaust Tube	1
20	Hose Clamp	1
21	Hose Clamp	1
22	Connector Assembly	1
25	Exhaust Hose	1
26	Exhaust Hose Assembly	1
27	Hose Clamp	2
28	Locking Clamp	1
31	Thread Insert	1
32	Round Head Screw	2
	Lockwasher	2
	Hex Nut	2
33	Switch & Cable Assembly	1
34	Round Head Screw	1
35	Gun Warning Decal	1
	Note 1: When tip life is limited by tip being fused over, the use of T-14726-5/64 tips may result in a lower overall cost.	
*	As Required	

OPERATION

The gun is shipped ready to feed 3/32" electrode at 2-3/4" electrical stickout. Change the extension guide if a different electrical stickout is required. The extension guides are simply screwed on the end of the intake housing. Each stickout guide can be used for any electrode size. The correct contact tip must be used for the appropriate wire size.

Connect the wire feed cable and control to the wire feeder. NOTE: The wire feeder must have correct drive rolls and tension setting for the electrode used. Connect the end of the exhaust hose to a K-179 or K-184 Linconditioner vacuum unit.

These units will provide enough vacuum to remove smoke generated at the welding arc. A vacuum source rated 30 CFM at 55 inches of water can be used in place of the Lincoln vacuum units. A 1¼" diameter inlet is required for the hose connection.

Vacuum must be on when welding with the gun. Without air flow, the gun will become overheated and extension guide and nozzle will deteriorate rapidly.

CAUTION: Some welding sparks and spatter may be picked up. Check that sparks will not damage non-Lincoln vacuum units or create fire hazards.

MAINTENANCE

To insure proper smoke pickup and gun life, the intake ports and end of extension guide must be kept free of spatter. A piece of wire is recommended to keep intake ports and I.D. of extension guide free of spatter and smoke buildup.

The following cleaning schedule is recommended.

Maintenance Recommended	Electrode	3/32" NS-3M	Other Electrodes	NR-202 NR-203
	Current	350 A, Horizontal Welds	350 A, Horizontal Welds	200 A, Vertical Welds

Do not let spatter accumulate on end of extension guide. Clean as necessary. Failure to keep extension guide free of spatter will make extension guide electrically hot and it will arc to work.

Clean intake ports and I.D. of extension guide with wire. Remove spatter from bottom of extension guide.

When intake ports are 50% plugged.

With vacuum off, remove extension guide and clean

Arc time in hours	2.8	2	1
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I.D. of thread insert and clean nozzle spacer.

Lbs. of electrode	50	25	6
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Break loose any particles built up at bend or clamp in intake housing with a piece of wire or electrode.

Lbs. of electrode	500 to 1000	500 to 1000	500 to 1000
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TROUBLESHOOTING

Poor smoke pickup	Vacuum unit not operating correctly.	Clean filters or repair vacuum unit.
	Spatter buildup on intake ports, I.D. of extension guide or I.D. of intake housing.	Remove spatter and clear all passages.
	Hoses blocked or damaged.	Clean or repair hoses.
	Strong drafts.	Eliminate strong drafts or construct barriers so draft will not affect smoke removal.
	Visible stickout is too long.	Shorten visible stickout to recommended length.
Poor arc action or erratic feeding	Worn contact tip or nozzle.	Replace worn parts.
	Dirty cable.	Blow out cable with compressed air.

HOW TO ORDER REPLACEMENT PARTS

Order parts only from Lincoln offices or from the Authorized Field Service Shops listed in the "Service Directory". Give the following information:

- (a) From the nameplate — machine model, code and serial numbers.
- (b) From this manual — complete part name and description, item number, quantity required and the number of the list used to get this information.

Any items indented in the "Parts Name" column are included in the assembly under which they are listed. The indented items may be ordered separately. If the entire assembly is needed, do **not** order the indented parts.

GUARANTEE

The Lincoln Electric Company, the Seller, warrants all new equipment except engines and accessories thereof against defects in workmanship and material for a period of one year from date of shipment, provided the equipment has been properly cared for, and operated under normal conditions. Engines and engine accessories are warranted free from defects for a period of ninety days from the date of shipment.

If the Buyer gives the Seller written notice of any defects in equipment or electrode or flux within any period of warranty and the Seller's inspection confirms the existence of such defects, then the Seller shall correct the defects at its option, either by repair or replacement F.O.B. its own factory or other place as designated by the Seller. The remedy provided Buyer herein for breach of Seller's warranty shall be exclusive.

No expense, liability or responsibility will be assumed by the Seller for repairs made outside of the Seller's factory without

written authority from the Seller.

The Seller shall not be liable for any consequential damages in case of any failure to meet the conditions of any warranty. The liability of the Seller arising out of the supplying of said equipment or electrode or its use by the Buyer, whether on warranties or otherwise, shall not in any case exceed the cost of correcting defects in the equipment or replacing defective electrode in accordance with the above guarantee. Upon the expiration of any period of warranty, all such liability shall terminate.

The foregoing guarantees and remedies are exclusive and except as above set forth. There are no guarantees or warranties with respect to engines, accessories, equipment, electrodes, or flux, either express or arising by operation of law or trade usage or otherwise implied, including without limitation the warranty of merchantability, all such warranties being waived by the Buyer.



THE LINCOLN ELECTRIC COMPANY

World's Largest Manufacturer of Arc Welding Products • Manufacturer of Industrial Motors
Sales and Service Worldwide
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