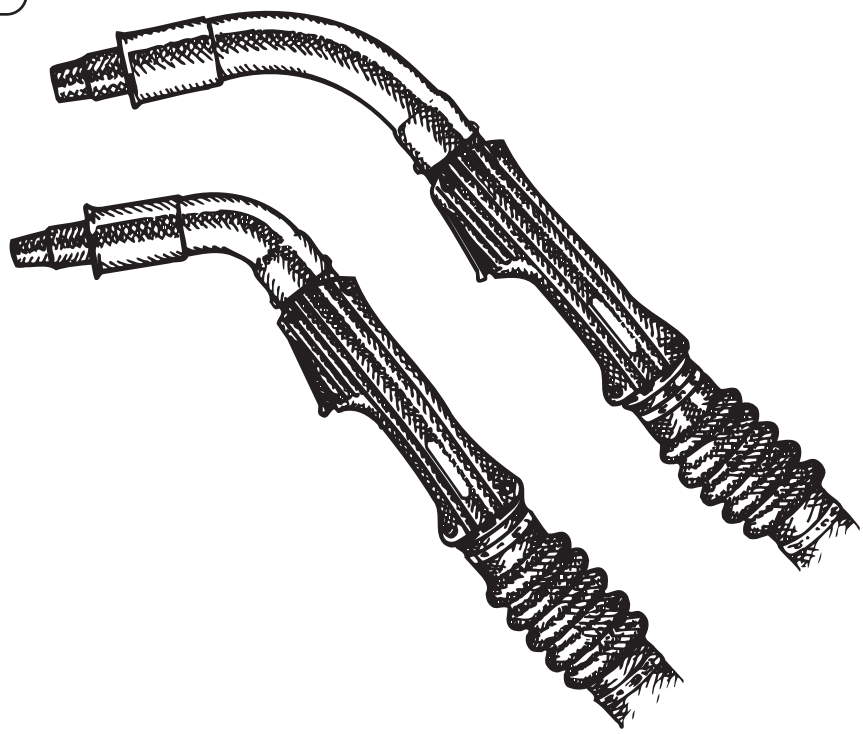
Magnum ™X-Tractor

IM446-B

November, 2008

250XA and 400XA Air Cooled Fume Extraction GMA Gun and Cable Assemblies

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



Safety Depends on You

Lincoln arc welding equipment is designed and built with safety in mind. However, your overall safety can be increased by proper installation ... and thoughtful operation on your part. **DO NOT INSTALL, OPERATE OR REPAIR THIS EQUIPMENT WITHOUT READING THIS MANUAL AND THE SAFETY PRECAUTIONS CONTAINED THROUGHOUT.** And, most importantly, think before you act and be careful.

OPERATOR'S MANUAL

ISO 9002

Accredited by the Dutch Council for Certification

REGISTRAR ACCREDITATION BOARD

Manufactured Under a Quality Program Certified by ABS Quality Evaluations, Inc. to ISO 9002 Requirements.

CERTIFICATE NUMBER: 30273

LINCOLN® ELECTRIC

• World's Leader in Welding and Cutting Products •
• Sales and Service through Subsidiaries and Distributors Worldwide •
Cleveland, Ohio 44117-1199 U.S.A. TEL: 216.481.8100 FAX: 216.486.1751 WEB SITE: www.lincolnelectric.com

⚠ WARNING

⚠ CALIFORNIA PROPOSITION 65 WARNINGS ⚠

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

The Above For Diesel Engines

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

The Above For Gasoline Engines

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

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

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

FOR ENGINE powered equipment.

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

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

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

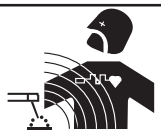
1.d. Keep all equipment safety guards, covers and devices in position and in good repair.Keep hands, hair, clothing and tools away from V-belts, gears, fans and all other moving parts when starting, operating or repairing equipment.

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

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

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

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



ELECTRIC AND MAGNETIC FIELDS may be dangerous

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

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

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

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

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

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

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

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

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

Mar '95

ELECTRIC SHOCK can kill.

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

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

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

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

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

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

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

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

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

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

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

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

ARC RAYS can burn.

4.a. Use a shield with the proper filter and cover plates to protect your eyes from sparks and the rays of the arc when welding or observing open arc welding. Headshield and filter lens should conform to ANSI Z87. I standards.

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

4.c. Protect other nearby personnel with suitable, non-flammable screening and/or warn them not to watch the arc nor expose themselves to the arc rays or to hot spatter or metal.

FUMES AND GASES can be dangerous.

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

5. b. 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.

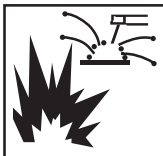
5.c. Do not weld in locations near chlorinated hydrocarbon vapors coming from degreasing, cleaning or spraying operations. The heat and rays of the arc can react with solvent vapors to form phosgene, a highly toxic gas, and other irritating products.

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 and CUTTING SPARKS can cause fire or explosion.

6.a. Remove fire hazards from the welding area. If this is not possible, cover them to prevent the welding sparks from starting a fire. Remember that welding sparks and hot materials from welding can easily go through small cracks and openings to adjacent areas. Avoid welding near hydraulic lines. Have a fire extinguisher readily available.

6.b. Where compressed gases are to be used at the job site, special precautions should be used to prevent hazardous situations. Refer to "Safety in Welding and Cutting" (ANSI Standard Z49.1) and the operating information for the equipment being used.

6.c. When not welding, make certain no part of the electrode circuit is touching the work or ground. Accidental contact can cause overheating and create a fire hazard.

6.d. Do not heat, cut or weld tanks, drums or containers until the proper steps have been taken to insure that such procedures will not cause flammable or toxic vapors from substances inside. They can cause an explosion even though they have been "cleaned". For information, purchase "Recommended Safe Practices for the Preparation for Welding and Cutting of Containers and Piping That Have Held Hazardous Substances", AWS F4.1 from the American Welding Society (see address above).

6.e. Vent hollow castings or containers before heating, cutting or welding. They may explode.

6.f. Sparks and spatter are thrown from the welding arc. Wear oil free protective garments such as leather gloves, heavy shirt, cuffless trousers, high shoes and a cap over your hair. Wear ear plugs when welding out of position or in confined places. Always wear safety glasses with side shields when in a welding area.

6.g. Connect the work cable to the work as close to the welding area as practical. Work cables connected to the building framework or other locations away from the welding area increase the possibility of the welding current passing through lifting chains, crane cables or other alternate circuits. This can create fire hazards or overheat lifting chains or cables until they fail.

6.h. Also see item 1.c.

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

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

CYLINDER may explode if damaged.

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

7.b. Always keep cylinders in an upright position securely chained to an undercarriage or fixed support.

7.c. Cylinders should be located:

- Away from areas where they may be struck or subjected to physical damage.
- A safe distance from arc welding or cutting operations and any other source of heat, sparks, or flame.

7.d. Never allow the electrode, electrode holder or any other electrically "hot" parts to touch a cylinder.

7.e. Keep your head and face away from the cylinder valve outlet when opening the cylinder valve.

7.f. Valve protection caps should always be in place and hand tight except when the cylinder is in use or connected for use.

7.g. Read and follow the instructions on compressed gas cylinders, associated equipment, and CGA publication P-l, "Precautions for Safe Handling of Compressed Gases in Cylinders," available from the Compressed Gas Association 1235 Jefferson Davis Highway, Arlington, VA 22202.

FOR ELECTRICALLY powered equipment.

8.a. Turn off input power using the disconnect switch at the fuse box before working on the equipment.

8.b. Install equipment in accordance with the U.S. National Electrical Code, all local codes and the manufacturer's recommendations.

8.c. Ground the equipment in accordance with the U.S. National Electrical Code and the manufacturer's recommendations.

Jan, 07

PRÉCAUTIONS DE SÛRETÉ

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

Sûreté Pour Soudage A L'Arc

1. Protegez-vous contre la secousse électrique:

   a. Les circuits à l'électrode et à la piéce sont sous tension quand la machine à souder est en marche. Eviter toujours tout contact entre les parties sous tension et la peau nue ou les vétements mouillés. Porter des gants secs et sans trous pour isoler les mains.
   b. Faire trés attention de bien s'isoler de la masse quand on soude dans des endroits humides, ou sur un plancher metallique ou des grilles metalliques, principalement dans les positions assis ou couché pour lesquelles une grande partie du corps peut être en contact avec la masse.
   c. Maintenir le porte-électrode, la pince de masse, le câble de soudage et la machine à souder en bon et sûr état defonctionnement.
   d. Ne jamais plonger le porte-électrode dans l'eau pour le refroidir.
   e. Ne jamais toucher simultanément les parties sous tension des porte-électrodes connectés à deux machines à souder parce que la tension entre les deux pinces peut être le total de la tension à vide des deux machines.
   f. Si on utilise la machine à souder comme une source de courant pour soudage semi-automatique, ces precautions pour le porte-électrode s'applicuent aussi au pistolet de soudage.

2. Dans le cas de travail au dessus du niveau du sol, se protéger contre les chutes dans le cas ou on recoit un choc. Ne jamais enrouler le câble-électrode autour de n'importe quelle partie du corps.

3. Un coup d'arc peut être plus sévère qu'un coup de soliel, donc:

   a. Utiliser un bon masque avec un verre filtrant approprié ainsi qu'un verre blanc afin de se protéger les yeux du rayonnement de l'arc et des projections quand on soude ou quand on regarde l'arc.
   b. Porter des vêtements convenables afin de protéger la peau de soudeur et des aides contre le rayonnement de l'arc.
   c. Protéger l'autre personnel travaillant à proximité au soudage à l'aide d'écrans appropriés et non-inflammables.

4. Des gouttes de laitier en fusion sont émises de l'arc de soudage. Se protéger avec des vêtements de protection libres de l'huile, tels que les gants en cuir, chemise épaisse, pantalons sans revers, et chaussures montantes.

5. Toujours porter des lunettes de sécurité dans la zone de soudage. Utiliser des lunettes avec écrans lateraux dans les zones où l'on pique le laitier.

6. Eloigner les matériaux inflammables ou les recouvrir afin de prévenir tout risque d'incendie dû aux étincelles.

7. Quand on ne soude pas, poser la pince à une endroit isolé de la masse. Un court-circuit accidental peut provoquer un échauffement et un risque d'incendie.

8. S'assurer que la masse est connectée le plus prés possible de la zone de travail qu'il est pratique de le faire. Si on place la masse sur la charpente de la construction ou d'autres endroits éloignés de la zone de travail, on augmente le risque de voir passer le courant de soudage par les chaines de levage, câbles de grue, ou autres circuits. Cela peut provoquer des risques d'incendie ou d'echauffement des chaines et des câbles jusqu'à ce qu'ils se rompent.

9. Assurer une ventilation suffisante dans la zone de soudage. Ceci est particuliérement important pour le soudage de tôles galvanisées plombées, ou cadmiées ou tout autre métal qui produit des fumeés toxiques.

10. Ne pas souder en présence de vapeurs de chlore provenant d'opérations de dégraissage, nettoyage ou pistolage. La chaleur ou les rayons de l'arc peuvent réagir avec les vapeurs du solvant pour produire du phosgéne (gas fortement toxique) ou autres produits irritants.

11. Pour obtenir de plus amples renseignements sur la sûreté, voir le code "Code for safety in welding and cutting" CSA Standard W 117.2-1974.

PRÉCAUTIONS DE SÛRETÉ POUR LES MACHINES À SOUDER À TRANSFORMATEUR ET À REDRESSEUR

1. Relier à la terre le chassis du poste conformement au code de l'électricité et aux recommendations du fabricant. Le dispositif de montage ou la piece à souder doit être branché à une bonne mise à la terre.

2. Autant que possible, l'installation et l'entretien du poste seront effectués par un électricien qualifié.

3. Avant de faires des travaux à l'interieur de poste, la debrancher à l'interrupteur à la boite de fusibles.

4. Garder tous les couvercles et dispositifs de sûreté à leur place.

Mar. '93

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

CUSTOMER ASSISTANCE POLICY

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

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

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

Please Examine Carton and Equipment For Damage Immediately

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

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

Product _____

Model Number _____

Code Number or Date Code_____

Serial Number_____

Date Purchased_____

Where Purchased_____

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

On-Line Product Registration

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

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

⚠ WARNING

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

⚠ CAUTION

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

TABLE OF CONTENTS

PRODUCT DESCRIPTION

The Magnum™™ 250XA and 400XA fume extraction guns are part of an expanding line of Magnum™ X-Tractor fume extraction products designed to help users worldwide comply with tougher welding fume regulations as well as providing cleaner working environments. The guns differ from fume extraction gun and cables in the past in that they are more flexible, lighter in weight, and they are more comfortable in the user's hand.

All Magnum™ X-Tractor gun and cable assemblies are designed to work with any existing Lincoln K173, K179 and K184 Linconditioner or X-Tractor vacuum source, and any centralized vacuum source[1] capable of providing an adequate supply of vacuum air at the fume nozzle.

The K556 Magnum™ 400XA and the K566 Magnum™ 250XA are only available with the Fast-Mate™ connection system. These guns can be fitted to any Lincoln feeder by using the appropriate K489-1 or -2 feeder adapter kit. A K489-3 adapter is available to fit popular Miller® feeders. They can also be connected to any other competitive feeder by using a commercially available euro adapter for that particular feeder, assuming that it is not already euro compatible.

The Magnum™ X-Tractor guns are designed to meet NEMA EW3 specifications for welding with steel electrode using the GMAW and the gas-shielded FCAW processes. For best results when welding mild and alloy steels, it is recommended that L-50™ and L-56™ Lincoln solid wire electrodes be used for the GMAW process and OS-70 or OS-71 Outershield® cored electrodes be used for the gas-shielded FCAW process.

[1] Requires a 1-3/4" exhaust hose to fit the supplied hose adapter. Lincoln Electric has 1-3/4" hoses for both regular duty (PVC flexhose S19947-) and heavy duty (reinforced rubber S14927-8) applications.

⚠ WARNING

ELECTRIC SHOCK can kill.

• Have a qualified individual install and service this equipment.

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

• Do not touch electrically hot parts.

MAGNUM™ 400 XA (400 amperes) at 60% Duty Cycle with CO_2 Gas*								
Description / Product Number	Gun Cable Length (m)	Wire Size in. (mm)	Contact Tips Standard Duty	Gas Diffuser Assembly	Gas Nozzle	Fume Nozzle	Cable Liner	Fume Tube
K556-1	10 Ft. (3.0)	.035 (0.9) .045 (1.2)	KP2020-1B1 -2B1	KP2024-1	KP1930-3 KP1931-3	S20654	KP1933-1	S20636-4 (45°)
K556-2	15 Ft. (4.5)	.035 (0.9) .045 (1.2)	KP2020-1B1 -2B1	KP2024-1	KP1930-3 KP1931-3	S20654	KP1933-1	S20636-4 (45°)
K556-3	12 Ft. (3.6)	.035 (0.9) .045 (1.2)	KP2020-1B1 -2B1	KP2024-1	KP1930-3 KP1931-3	S20654	KP1933-1	S20636-4 (45°)
K556-4	10 Ft. (3.0)	.052 (1.3) 1/16 (1.6)	KP2020-3B1 -4B1	KP2024-1	KP1930-3 KP1931-3	S20654	KP1933-2	S20636-4 (45°)
K556-5	15 Ft. (4.5)	.052 (1.3) 1/16 (1.6)	KP2020-3B1 -4B1	KP2024-1	KP1930-3 KP1931-3	S20654	KP1933-2	S20636-4 (45°)
K556-6	12 Ft. (3.6)	.052 (1.3) 1/16 (1.6)	KP2020-3B1 -4B1	KP2024-1	KP1930-3 KP1931-3	S20654	KP1933-2	S20636-4 (45°)
K556-10	10 Ft. (3.0)	.035 (0.9) .045 (1.2)	KP2020-1B1 -2B1	KP2024-1	KP1930-3 KP1931-3	S20654	KP1933-1	S20636-5 (60°)
K556-11	15 Ft. (4.5)	.035 (0.9) .045 (1.2)	KP2020-1B1 -2B1	KP2024-1	KP1930-3 KP1931-3	S20654	KP1933-1	S20636-5 (60°)
K556-12	12 Ft. (3.6)	.035 (0.9) .045 (1.2)	KP2020-1B1 -2B2	KP2024-1	KP1930-3 KP1931-3	S20654	KP1933-1	S20636-5 (60°)
K556-13	10 Ft. (3.0)	.052 (1.3) 1/16 (1.6)	KP2020-3B1 -4B1	KP2024-1	KP1930-3 KP1931-3	S20654	KP1933-2	S20636-5 (60°)
K556-14	15 Ft. (4.5)	.052 (1.3) 1/16 (1.6)	KP2020-3B1 -4B1	KP2024-1	KP1930-3 KP1931-3	S20654	KP1933-2	S20636-5 (60°)
K556-15	12 Ft. (3.6)	.052 (1.3) 1/16 (1.6)	KP2020-3B1 -4B1	KP2024-1	KP1930-3 KP1931-3	S20654	KP1933-2	S20636-5 (60°)

* May also be used with other gases at a reduced rating (up to 50%)

MAGNUM™ 250XA (250 amperes) at 60% Duty Cycle with CO_2 Gas*								
Description / Product Number	Gun Cable Length (m)	Wire Size in. (mm)	Contact Tips Standard Duty	Gas Diffuser Assembly	Gas Nozzle	Insulator	Cable Liner	Fume Tube
K566-1	10 Ft. (3.0)	.035 (0.9) .045 (1.2)	KP2020-1B1 -2B1	S19418-3	M16080-2 M16081-2	S20654	M16087-1	S20636-1 (45°)
K566-2	15 Ft. (4.5)	.035 (0.9) .045 (1.2)	KP2020-1B1 -2B1	S19418-3	M16080-2 M16081-2	S20654	M16087-1	S20636-1 (45°)
K566-3	10 Ft. (3.0)	.025 (0.6) .030 (0.8)	KP2020-6B1 -7B1	KP2026-3	KP1930-2 KP1931-2	S20654	KP1934-2	S20636-1 (45°)
K566-4	15 Ft. (4.5)	.025 (0.6) .030 (0.8)	KP2020-6B1 -7B1	KP2026-3	KP1930-2 KP1931-2	S20654	KP1934-2	S20636-1 (45°)
K566-5	12 Ft. (3.6)	.035 (0.9) .045 (1.2)	KP2020-1B1 -2B1	KP2026-3	KP1930-2 KP1931-2	S20654	KP1934-1	S20636-1 (45°)
K566-6	12 Ft. (3.6)	.025 (0.6) .030 (0.8)	KP2020-6B1 -7B1	KP2026-3	KP1930-2 KP1931-2	S20654	KP1934-2	S20636-1 (45°)
K566-7	10 Ft. (3.0)	.035 (0.9) .045 (1.2)	KP2020-1B1 -2B1	KP2026-3	KP1930-2 KP1931-2	S20654	KP1934-1	S20636-2 (60°)
K566-8	15 Ft. (4.5)	.035 (0.9) .045 (1.2)	KP2020-1B1 -2B1	KP2026-3	KP1930-2 KP1931-2	S20654	KP1934-1	S20636-2 (60°)
K566-9	10 Ft. (3.0)	.025 (0.6) .030 (0.8)	KP2020-6B1 -7B1	KP2026-3	KP1930-2 KP1931-2	S20654	KP1934-2	S20636-2 (60°)
K566-10	15 Ft. (4.5)	.025 (0.6) .030 (0.8)	KP2020-6B1 -7B1	KP2026-3	KP1930-2 KP1931-2	S20654	KP1934-2	S20636-2 (60°)
K566-11	12 Ft. (3.6)	.035 (0.9) .045 (1.2)	KP2020-1B1 -2B1	KP2026-3	KP1930-2 KP1931-2	S20654	KP1934-1	S20636-2 (60°)
K566-12	12 Ft. (3.6)	.025 (0.6) .030 (0.8)	KP2020-6B1 -7B1	KP2026-3	KP1930-2 KP1931-2	S20654	KP1934-2	S20636-2 (60°)

* May also be used with other gases at a reduced rating (up to 50%)

Read this entire installation section before you start installation.

SAFETY PRECAUTIONS

⚠ WARNING

ELECTRIC SHOCK can kill.

- **Do not touch electrically live parts such as output terminals or internal wiring.**
- **Insulate yourself from the work and ground.**
- **Always wear dry insulating gloves.**

Only qualified personnel should install, use or service this equipment

Connection of Gun and Cable to Wire Feeders

Magnum™ X-Tractor fume removal guns are only available with dedicated Fast-Mate (euro style) feeder connectors. This "all-in-one" type of connection makes installation and removal of X-Tractor guns extremely simple.

Connection of Lincoln and Competitive Feeders

a) If your Lincoln feeder is not set up with a Fast-Mate gun connection, it can easily be adapted by installing the appropriate K489 kit per the instructions included with the kit. See the ACCESSORY section for the appropriate adapter. The SP-250 is factory equipped with a suitable Fast-Mate connector and will need no modifications.

b) If your competitive feeder is not already Fast-Mate (euro) compatible, obtain a K489-3 adapter kit (for Miller Feeders) or a commercially available euro adapter kit for the particular feeder make and model and install per the instructions provided with the kit.

c) Magnum™ X-Tractor gun and cable assemblies are shipped ready to weld with the liner and contact tip installed. Check to be sure the contact tip size matches the electrode. If not, there is another second contact tip shipped with the gun. Verify that it is the proper size and exchange it with the tip in the gun.

d) Check that the feeder wire guide tubes, as well as the drive rolls, are appropriate for the electrode size to be used. When using an adapter kit, be certain that the adapter guide tube is also properly sized.

e) Align and fully engage the brass Fast-Mate connector end of the gun into the mating connector on the wire feeder. Secure the connection by hand, tightening the Fast-Mate connector collar nut.

f) If the orientation of the "Y" tube does not allow for easy connection of the vacuum hose to the gun, remove the screw that anchors the "Y" tube to the connector, rotate the tube 180°, and reinstall the screw.

Vacuum Connections

Magnum™ X-Tractor fume exhaust guns will connect to all Linconditioner smoke exhaust units and all Magnum™ X-Tractor vacuum sources. In addition, carefully selected competitive vacuums and centralized vacuum systems may also be used as long as they are capable of providing an adequate supply of vacuum at the fume nozzle of the gun. (Approximately 33-55 CFM [60-95M^3/hr] at 2.2-4.0 in Hg [750-1450 mm WG]).

NOTE: It is strongly recommended that a thorough examination of critical gas shielded welds be performed to assure weld integrity, especially when using competitive or centralized vacuums, or if any component of the fume extraction equipment is modified for any reason.

Connection to Lincoln K173, K179 and K184 Series Vacuums

All Lincoln X-Tractor vacuum sources and XA-Guns are supplied with hose adapters to fit 1-3/4" (45 mm) hose. This hose may be either light duty: S19947-5 (16.4 ft), S19947-9 (10 ft), or S19947-10 (25 ft.) or heavy duty: S14927-8 (15 ft.)

a) The S19947 series of hoses can be screwed into the adapter connected to the 'y' on the wire feeder end of the gun and cable assembly and the hose adapter supplied with the vacuum source.

The heavy duty S14927-8 hose will slip into the adapter connected to the 'y' on the wire feeder end of the gun and cable assembly and the inlet tube on the vacuum source. The S14927-8 hose should be secured at each end with a clamp (S10788-21).

b) If the installation is somewhat permanent and the hose provided is longer than required, you may wish to trim the hose to a shorter length to give a neat looking installation. Also, a shorter hose may result in more vacuum at the end of the gun.

Connection to Competitive Vacuums and Centralized Systems

When using Magnum™ X-Tractor guns with centralized or non-Lincoln vacuums, the unit must be capable of providing an adequate supply of vacuum at the fume nozzle of the gun. Too little vacuum will only reduce the effectiveness of the gun, but too much vacuum could actually remove shielding gases and critically affect the soundness of the weld. Approximately 33-55 CFM of vacuum is required at the front end of the gun for adequate smoke pickup.

A 1-3/4" exhaust hose is recommended for connection to X-Tractor guns, Lincoln Electric has 1-3/4" hoses for both regular duty (PVC flexhose: S19947-5, S19947-9, and S19947-10) and heavy duty (reinforced rubber S14927-8) applications. The 1-3/4" hose will connect directly to the X-Tractor gun, as well as to the adapters provided with all X-Tractor Vacuum sources. If any other exhaust hose is used for connection, it will need to slip over the 1.98" (50.3 mm) O.D., inside the 1.73" (44 mm) I.D. of the "Y" tube on the X-Tractor gun, or inside the S20591-8 adapter supplied with the gun. After connection, check for any excessive air leaks and eliminate them with duct tape or other suitable material.

Liner Installation

NOTE: XA Models, using the Fast-Mate connector, are shipped with a factory installed liner. To change liner in these models, see Maintenance Section.

Contact Tip and Gas Nozzle Installation

Magnum™ XA guns are shipped with a contact tip and gas nozzle installed. If the tip or nozzle needs to be replaced follow these instructions:

1) Choose the correct size contact tip for the electrode being used (wire size is stenciled on the side of the contact tip) and screw it snugly into the gas diffuser.

2) Screw the appropriate gas nozzle tightly onto the 400XA gun tube or the 200XA diffuser. Either a .38" (9.5 mm), .50 (12.7 mm), .62" (15.9 mm) or .75" (19.1 mm) I.D. fixed gas nozzle may be used and should be selected based on the welding application. Different length fixed nozzles are available to allow either spray or short-circuiting transfer welding. Heavy duty coarse thread (2 piece) nozzles are larger in diameter than the one-piece nozzles and can cause poor smoke pickup or electrical arcing. For these reasons they are not recommended.

   Choose the gas nozzle as appropriate for the GMAW process to be used. Typically, the contact tip end should be flush to .12" (3.0 mm) extended for the short-circuiting transfer process and .12" (3.0 mm) recessed for spray transfer and for the Outershield® (FCAW) process.

NOTE: Never use slip-on gas nozzles and nozzle insulators on X-Tractor guns. The shielding gas can be pulled back past these types of nozzles before it ever reaches the weld.

ELECTRODES AND EQUIPMENT

The Magnum™ X-Tractor fume extraction guns and cables have been designed for use with Lincoln L 50 and L-56, solid steel wire electrodes for the GMAW process and Lincoln Outershield® cored electrodes for the gas-shielded FCAW process. Refer to the appropriate Lincoln Process and Procedure Guidelines for the electrode used for information on recommended electrical and visible stickouts.

MAKING A WELD

⚠ WARNING

Do not attempt to use this equipment until you have thoroughly read all operating and maintenance manuals supplied with your machine. They include important safety precautions, detailed engine starting, operating and maintenance instructions and parts lists.

ELECTRIC SHOCK can kill.

- **Do not touch electrically live parts such as output terminals or internal wiring.**
- **Insulate yourself from the work and ground.**
- **Always wear dry insulating gloves.**

FUMES AND GASES can be dangerous.

- **Keep your head out of fumes.**
- **Use ventilation or exhaust to remove fumes from breathing zone.**

WELDING SPARKS can cause fire or explosion.

- **Keep flammable material away.**

ARC RAYS can burn.

- **Wear eye, ear and body protection.**

Only qualified personnel should operate this equipment.

1) Check that the welding power source is on and that the shielding gas supply is set for the proper flow rate. When using fume extraction, at least 40 cubic feet per hour (1.9 liters/min) of shielding gas should be used.

2) Be certain that the vacuum source is in the "ON" or "AUTO" mode.

3) Position electrode over joint. End of the electrode should be slightly off the work.

4) Lower welding helmet, close gun trigger, and begin welding. Hold the gun so the contact tip to work distance gives the correct electrical stickout as required for the procedure being used.

5) Operator technique can have a definite effect on the amount of fume picked up by the X Tractor system. If possible, try different techniques such as "pushing", "dragging", changing the angle of the electrode to work, travel speed, etc. to optimize fume pickup.

6) To stop welding, release the gun trigger and then pull the gun away from the work after the arc goes out. Follow wire feeder instruction manual if using a trigger interlock circuit.

AVOIDING WIRE FEEDING PROBLEMS

Wire feeding problems can be avoided by observing the following gun handling procedures:

1) Do not kink or pull cable around sharp corners.

2) Keep the electrode cable as straight as possible when welding or loading electrode through cable.

3) Keep the cable as straight as possible at the front of the feeder. Sharp bends in this area can promote high feeding resistance, resulting in wires breaking and being forced through the side of the cable.

4) Avoid wrapping excess cable around handle or front of wire feeder.

5) Do not allow dolly wheels or trucks to run over cables.

6) Keep cable clean by following maintenance instructions.

7) Use only clean, rust-free electrode. The Lincoln electrodes have proper surface lubrication.

8) Replace contact tip when the arc starts to become unstable or the contact tip end is fused or deformed.

MAINTENANCE

⚠ WARNING

ELECTRIC SHOCK can kill.

• Have a qualified individual install and service this equipment.

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

• Do not touch electrically hot parts.

Removal, Installation, and Trimming Instructions for Magnum™ Liners

NOTE: The variation in cable lengths prevents the interchangeability of liners. Once a liner has been cut for a particular gun, it should not be installed in another gun, unless it can meet the liner cut off length requirement.

1) Remove the fume nozzle and gas nozzle. Loosen the set screw located in the side of the diffuser with a 5/64" (2.0mm) Allen wrench.

2) Remove the gas diffuser from gun.

3) Lay gun and cable out straight on a flat surface. Remove the liner nut from the connector end of the cable and pull liner out of cable. (Refer to Fig. D.1)

4) Insert a new untrimmed liner into the connector end of the cable. Be certain that the liner bushing is stencilled appropriately for the wire size being used.

5) Fully seat the liner bushing into the connector. Finger tighten the liner nut onto the cable connector.

6) With the cable straight, trim liner to appropriate trim length per Table D.1 (found under Fig.D.1). Remove any burrs from the end of the liner.

7) Screw the gas diffuser onto the end of the gun tube and securely tighten.

8) Tighten the set screw in the side of the gas diffuser against the cable liner using a 5/64 (2.0mm) Allen wrench.

⚠ CAUTION

This screw should be gently tightened. Overtightening will split or collapse the liner and cause poor wire feeding.

9) Reinstall the appropriate contact tip, gas nozzle and fume nozzle.

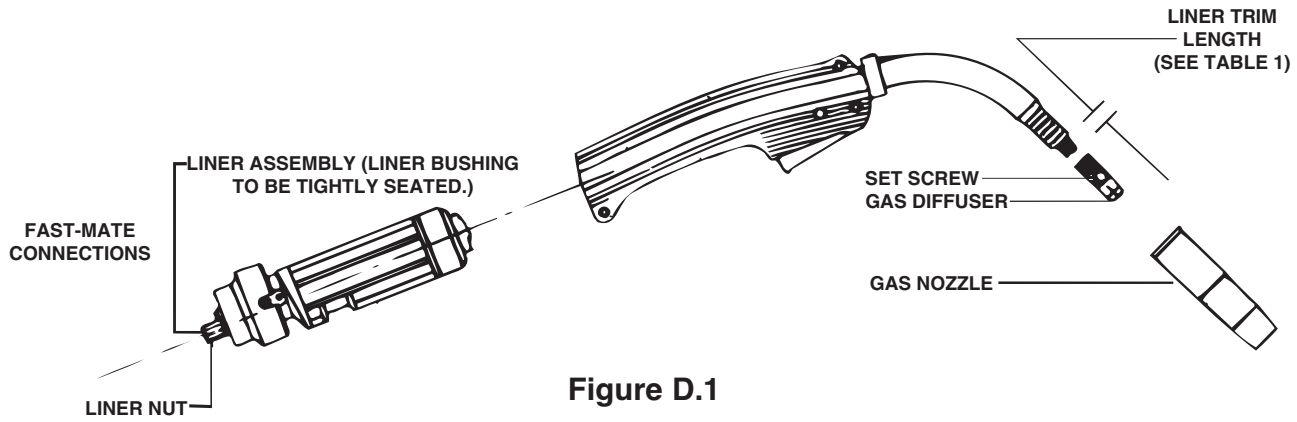


Figure D.1

GUN DESCRIPTION	CONNECTION TYPE	LINER TRIM LENGTH
K556-All (400 XA)	Fast-Mate	9/16" (14.3mm)
K566-All (250 XA)	Fast-Mate	1-1/2" (38.1mm)

Table D.1

Contact Tips and Nozzles

1) Replace worn contact tips as required.

2) Remove spatter from inside of gas nozzle and from tip after each 10 minutes of arc time or as required.

3) Periodically check fume nozzles and fume tube for spatter and dirt buildup. Clean as necessary.

Gun Handle

The gun handle should be opened once a month and cleaned of any spatter that has collected in the gun handle. Use of an anti spatter compound on the gas nozzle will accelerate the build up of material in the gun handle and cause plugging of the air passages.

Gun Cables

Cable Cleaning

Clean cable liner after using approximately 300 lbs. (136 kg) of electrode. Remove the cable from the wire feeder and lay it out straight on the floor. Remove the contact tip from the gun. Using an air hose and only partial pressure, gently blow out the cable liner from the gas diffuser end.

⚠ CAUTION

Excessive pressure at the start may cause the dirt to form a plug.

Flex the cable over its entire length and again blow out the cable. Repeat this procedure until no further dirt comes out.

Cable Repair

The Magnum™ X-Tractor fume extractor guns feature the use of repairable cable connectors at the feeder end of the cable only. If the cable ever gets severely damaged, it may be cut shorter and repaired by the user. Repair cables as follows:

Wire Feeder End Repair

a) Remove the cable liner per instructions previously listed.

b) Remove and save the nut and bolt that hold the corrugated hose to the "Y" tube.

c) Rotate the collar nut until the screw anchoring the cable handle ("Y" tube) is visible. Remove the screw and save it.

d) Slide the "Y" tube and collar nut toward the middle of the cable, exposing the brass connector. Remove and save the cable clamp.

NOTE: If sliding the cable handle ("Y" tube) becomes difficult, try rotating it 180˚.

e) Remove incoming connector from cable by unscrewing connector nut from the incoming connector. If the cable liner tube is difficult to remove from the connector assembly, carefully slit it lengthwise with a knife up to the brass connector.

f) Cut the cable control wires where they meet the cable jacket or else unsolder the connection where they connect to the terminal lead assembly. If you cut the wires, strip the cut end 3/8" (9.5mm) from the end.

g) Open up the gun handles at the opposite end of the gun, allowing the hose swivel and boot to move freely on the cable. Remove the hose/boot/swivel assembly from the cable and save.

h) Cut off the damaged section of cable and strip off the outer jacket as shown in Figure D.3. Be careful not to cut the insulation on the control wires while stripping jacket. Strip red and white control leads 3/8" (9.5mm) from the end.

NOTE: The cable contains three control leads. Any two control leads can be used, provided the two colors used are the same at both ends. The extra lead is a spare that can be used if needed.

i) Reinstall the corrugated vacuum hose on the cable, properly positioning it in the handle. Cut the corrugated hose about 5" shorter than the cut cable. Again, separate the hose, cable, and gun tube from the handles.

j) Check that the "Y" tube and collar nut are on the cable. Using the "Y" tube, push the hose as far as possible up the cable. Slip the connector nut over the copper strands with the threaded end out. Orient the connector assembly so the red and white control leads will have the straightest possible routings to the sockets on the back side of the connector.

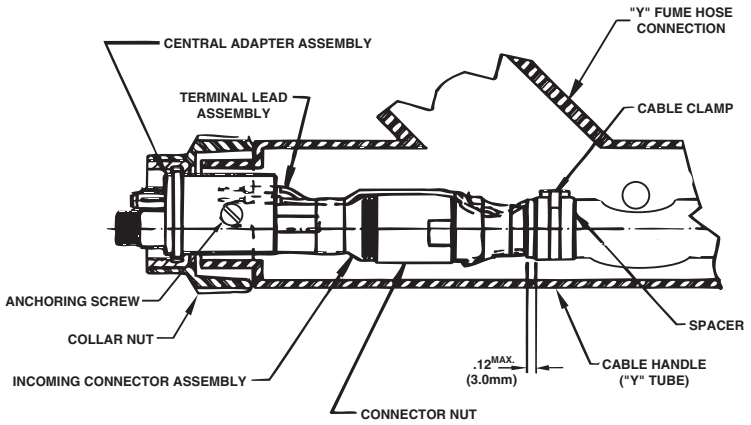


Figure D.2

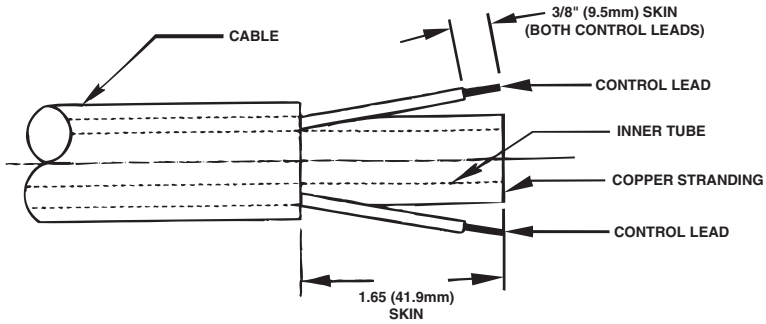


Figure D.3

Assemble the incoming connector to the cable by forcing the steel tube of the connector into the inside diameter of the cable inner tube until the copper strands are butted against the incoming connector shoulder. Keeping the copper strands against the shoulder, pull the connector nut over the copper strands, engage the incoming connector threads, and tighten in place. Refer to Figure D.2.

NOTE: For best results, insert a rod through the connector and into core of cable approximately 5.00" (127mm) when pushing the connector tube into the cable core tube. A .219"/.240" (5.6-6.1mm) diameter rod is required for 400 amp cables and a .175/.197 (4.5-5.0mm) diameter rod for 250 amp cables. To tighten, hold the connector in place while turning the nut. Then remove the rod from the core. This procedure assures the inner core does not kink while assembling or tightening.

k) Solder the terminal lead assemblies from Step (f) to the control leads stripped in Step (g). Insulate both soldered connections using either heat shrink tubing or electrical tape.

l) Fully insert the two control lead pins into the sockets on the incoming connector. Tape the leads in place in the necked down area of the connector. Keeping the leads as close to the connector and nut as possible, tape the insulated, soldered connections and the spare lead to the cable in the area between the cable jacket and connector nut. This must be done neatly and kept as low as possible or the "Y" tube will not slide over this area.

m) Install the cable clamp on the cable jacket within 1/8" (3.2mm) from the end of the jacket and tighten.

n) Slide the collar nut and "Y" tube over the connection and into place. Anchor the cable handle ("Y" tube) with the screw removed in Step (c).

NOTE: If the cable handle ("Y" tube) becomes difficult to slide over connection, try rotating it.

o) With the cable laid out straight, insert the corrugated hose into the "Y" tube approximately 1.50" (38mm). Using the existing holes in the "Y" tube as a guide and the hose extended 1.50" (38mm) into the tube, carefully drill a .250" (6.4mm) diameter hole through the hose.

BE CAREFUL NOT TO DRILL THROUGH THE CABLE INSIDE THE HOSE.

p) Reinstall the nut and bolt through the “Y” tube and hose, keeping the cable opposite of the “Y” fume hose connection (See Figure D.2).

q) Reassemble the cable, gun tube and hose in the handles. Properly reassemble handle with the screws that were removed earlier.

r) Install and trim liner per Maintenance section.

Gun Tubes

The Magnum™ X-Tractor fume extractor guns have standard gun tube angles of 45° and 60°. An 82° fume neck kit is available for both sized guns. Replace gun tubes as follows: (See Figure D.4).

Tools Required:

A #1 Phillips Head Screwdriver
B. 1 - 9/16” & 1 - 5/8” Open-ended Wrench
C. 5/64” (2mm) Allen Key (Provided with the Fume X-Tractor Gun Kit)
D. Pair Locking Pliers (Optional)

Directions:

1. Disconnect Gun Cable from the Wire Feeder.
2. Unscrew and remove the Gas Nozzle Assembly.
3. Remove the Fume Nozzle.
4. Using the Allen key provided with the Fume X-Tractor Gun, loosen the set screw in the Gas Diffuser Assembly then unscrew and remove the Gas Diffuser Assembly and the Contact Tip Together. (Replace if necessary).
5. Using a screwdriver, remove the two self-tapping screws from the Fume Tube Assembly, then remove the Fume Tube Assembly.
6. Remove the four pan head screws in the Gun Handle using a screwdriver. Remove the Right Gun Handle half. Remove the Gun Tube Assembly from the Left Gun Handle half by wedging a screwdriver between the Gun Tube Assembly and the Handle half to break free the manufacturer’s retaining epoxy.
7. Holding the Connector with a wrench, loosen the Locking Nut with the other wrench, then unscrew and remove the Gun tube assembly from the Connector. Save the Locking Nut and Lock Washer for use with the new Gun Tube Assembly.

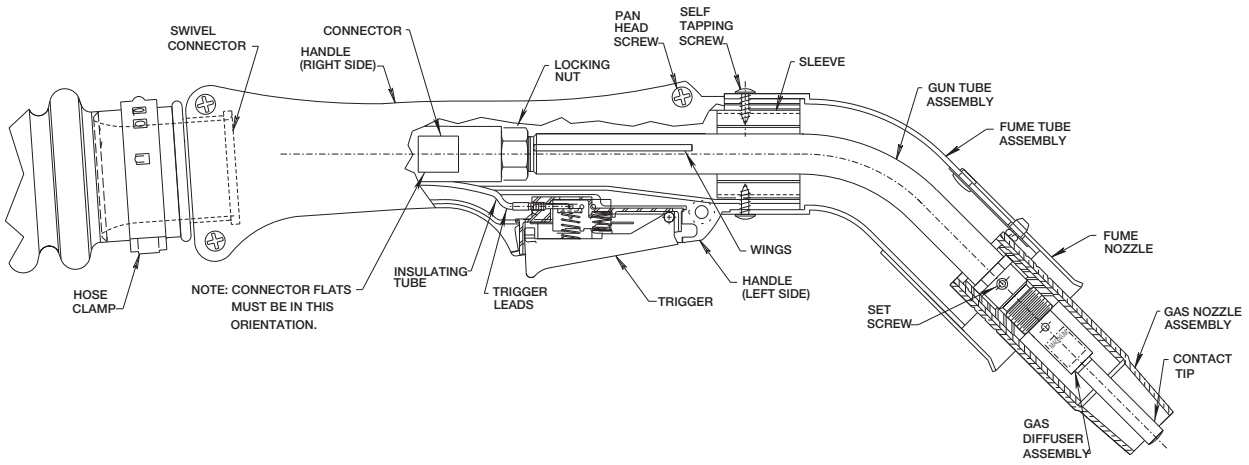


Figure D.4

NOTE: Older guns made before July 1996 used a 7/16 threaded connection. This connection was changed to a 1/2-20 thread. Check that the threads on the gun tube match the threads on the locking nut and cable connecter.

8. Screw the old Locking Nut on to the new Gun Tube Assembly until it is against the back of the Wings, and then place the Lock Washer on the assembly. (Replace the liner if changing to a 60° or an 82° gun tube). Slide the Gun Tube Assembly over the liner and then screw the Gun Tube Assembly all of the way into the Connector.

9. Loosen the Gun Tube Assembly from the Connector until the wings on the assembly are perpendicular to the flats on the connector and the Trigger Leads are on the bottom side of the Gun Tube Assembly. THIS WILL NEVER BE MORE THAN ONE FULL TURN!

10. Holding the Connector with one wrench, tighten the Locking Nut onto the Connector with the other wrench to approximately 15 ft.lbs(6.8 K). DO NOT OVER TIGHTEN THE LOCKING NUT!

11. Fit the wing from the Gun Tube Assembly into the slot in the Left Gun Handle half and the Trigger Assembly into the Gun Handle half. Make sure that the Connector flat is aligned with the retaining post on the Gun Handle. If the flat is not aligned, go back to step 7. To keep the Swivel Connector from interfering with this step, hold the Swivel Connector away from the Gun Handle using locking pliers. Then fit the Swivel Connector into the Left Gun Handle half.

12. Assemble the Right Gun Handle half making sure the second wing fits into the other slot, the Connector flat is aligned with the other retaining post, and the Swivel Connector fits completely inside the Gun Handle. DO NOT TIGHTEN THE SCREWS IF THE GUN HANDLE HALVES DO NOT PROPERLY MATE TOGETHER! BE VERY CAREFUL THAT TRIGGER LEADS DO NOT GET PINCHED BETWEEN THE HANDLE HALVES!

13. Screw together the two halves using the four Pan Head Screws. Then orient the Sleeve and the Fume Tube Assembly before screwing in the Self Tapping Screws. (If replacing the liner, cut to length specified by instructions on the liner package).

14. Follow steps 1 thru 3 in reverse order to finish Assembly.

NOTES:

N.A. If the Gun Handles are being replaced, the fit-up between the Gun Tube Assembly and the new Gun Handles may allow the Gun Tube Assembly a slight amount of movement, To reduce this movement, add a retaining compound (such as epoxy) in the slot in the Left Gun Handle half before fitting in the Gun Tube Assembly wing.

N.B. If the Trigger Assembly is being replaced, make sure to keep the Insulating Tubing over the Trigger Leads. This insulation protects the leads from hot gases and sparks.

HOW TO USE TROUBLESHOOTING GUIDE

⚠ WARNING

Service and Repair should only be performed by Lincoln Electric Factory Trained Personnel. Unauthorized repairs performed on this equipment may result in danger to the technician and machine operator and will invalidate your factory warranty. For your safety and to avoid Electrical Shock, please observe all safety notes and precautions detailed throughout this manual.

This Troubleshooting Guide is provided to help you locate and repair possible machine malfunctions. Simply follow the three-step procedure listed below.

Step 1. LOCATE PROBLEM (SYMPTOM).
Look under the column labeled "PROBLEM (SYMPTOMS)". This column describes possible symptoms that the machine may exhibit. Find the listing that best describes the symptom that the machine is exhibiting.

Step 2. POSSIBLE CAUSE.
The second column labeled "POSSIBLE CAUSE" lists the obvious external possibilities that may contribute to the machine symptom.

Step 3. RECOMMENDED COURSE OF ACTION
This column provides a course of action for the Possible Cause, generally it states to contact your local Lincoln Authorized Field Service Facility.

If you do not understand or are unable to perform the Recommended Course of Action safely, contact your local Lincoln Authorized Field Service Facility.

⚠ CAUTION

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

TROUBLESHOOTING

E-2

Observe all Safety Guidelines detailed throughout this manual

PROBLEMS (SYMPTOMS)	POSSIBLE CAUSE	REMEDY
PROBLEMS		
1. Drive rolls turn, but wire will not feed or wire feeding is rough.	a. Gun cable kinked and/or twisted.	a. Keep as straight as possible. Inspect cable and replace if necessary.
	b. Wire jammed in gun and cable.	b. Remove wire from gun and cable.Feed in new wire. Note any obstruction. Replace liner if necessary.
	c. Incorrect drive rolls and guide tubes.	c. Be sure the wire diameter being used is stamped on drive rolls and guide tubes. Replace if necessary.
	d. Gun cable liner dirty.	d. Clean liner or replace.
	e. Worn drive rolls.	e. Replace or reverse split drive roll type.
	f. Electrode rusty and/or dirty.	f. Replace the electrode if it is rusty.
	g. Worn or improper size cable liner.	g. Replace cable liner.
	h. Partially flashed, melted or improper size contact tip.	h. Replace the contact tip.
	i. Cable is on wrong side of “Y” connector bolt.	i. Make sure that cable is opposite the “Y” fume hose connection (See Figure 2).
2. Variable or “hunting” arc.	a. Contact tip worn or incorrect size.	a. Replace contact tip.
	b. Worn or undersize ground cables or poor ground connection	b. Inspect-repair or replace as necessary.
	c. Loose electrode connections	c. Be sure the following connections are tight: electrode cable to wire feeder and power source; work cable to power source and work; gun cable to wire feeder contact block; gun nozzle to body; and contact tip to nozzle.
3. Tip Seizes in diffuser.	a. Tip overheating due to prolonged or excessive high current and/or duty cycle welding.	a. Do not exceed current and duty cycle rating of gun. A light application of high temperature antiseize lubricant may be applied to tip threads.

⚠ CAUTION

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

Observe all Safety Guidelines detailed throughout this manual

PROBLEMS (SYMPTOMS)	POSSIBLE CAUSE	REMEDY
PROBLEMS		
4. Poor arc striking with sticking or "blast-offs", weld porosity, narrow and ropy looking bead, or electrode stubbing into plate while welding.	a. Improper procedures or techniques.	a. See "Gas Metal Arc Welding guide" (GS-100).
	b. Improper gas shielding.	b1. Clean gas nozzle. Make certain that gas cylinder is not empty or turned off. Make certain gas solenoid valve is operating and gas flow rate is proper. b2. Remove gun liner and check rubber seal for any sign of deterioration or damage. Be sure set screw in brass connector is in place and tightened against the liner bushing. b3. Make sure that there isn't too much vacuum or that the fume nozzle has not been modified to increase the fume extraction. b4. Check to see that a fixed rather than a slip-on nozzle is being used. The nozzle must be fully threaded into place.
5. Inadequate fume extraction.	a. Vacuum passages are blocked.	a. Make sure that the fume nozzle and fume tube are not plugged with dirt or spatter.
	b. There is a vacuum leak.	a1. Minimize use of an anti-spatter compound on the gas nozzle. b. Check for vacuum leaks or holes in the fume hoses and connections. Repair or seal as necessary.
	c. Vacuum source is not performing properly.	c. Check the vacuum source for a plugged filter or other performance problem per the instruction manual provided with it.
	d. Oversized gas nozzle is restricting flow of vacuum.	d. Be sure that one-piece, not two-piece, gas nozzle is being used.
	e. Fume nozzle adjustment wrong.	e. Move fume nozzle farther forward on the fume tube and/or change to a longer fume nozzle.
Handle over heating.	a. Air passages are blocked.	a. Clean air passages including handle.

⚠ CAUTION

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

ACCESSORIES AND EXPENDABLE REPLACEMENT PARTS

FOR MAGNUM™ 400XA GUN & CABLE ASSEMBLIES

TABLE 2

DESCRIPTION	PART NUMBER	ENGLISH SIZE (INCHES)	METRIC SIZE (MM)
Cable Liner For Cables 15' (4.5m) and less	KP1933-1 KP1933-2	.035 - .045 .052 - 1/16	0.9 - 1.2 1.3 - 1.6
Contact Tips Standard Duty	 KP2020-1B1 KP2020-2B1 KP2020-3B1 KP2020-4B1 KP2020-8B1	 .035 .045 .052 1/16 .040	 0.9 1.2 1.3 1.6 1.0
Heavy Duty	KP2021-1B1 KP2021-2B1 KP2021-3B1 KP2021-4B1 KP2021-6B1	.035 .045 .052 1/16 .040	0.9 1.2 1.3 1.6 1.0
Tapered	KP2022-1B1 KP2022-2B1 KP2022-3B1 KP2022-4B1 KP2022-7B1	.035 .045 .052 1/16 .040	0.9 1.2 1.3 1.6 1.0
Gas Diffuser Assembly	S19395-1		
Gas Nozzles Fixed Nozzle Tip Recessed .12" (3mm) (Spray Transfer)	 KP1930-1B1 KP1930-2B1 KP1930-3B1 KP1930-4B1	 3/8 1/2 5/8 3/4	 9.5 12.7 15.9 19.1
Fixed Nozzle Tip Extended .12" (3mm) -Flush (Short Circuited Transfer)	KP1931-1B1 KP1931-2B1 KP1931-3B1 KP1931-4B1	3/8 1/2 5/8 3/4	9.5 12.7 15.9 19.1
Fume Nozzle Bell Shaped 1.3" (33mm) long 2.0" (51mm) long Tapered	 S19953 S20654 S21248		

NOTE: All Above can be used with K556 Magnum™ 400 XA Gun

ACCESSORIES AND EXPENDABLE REPLACEMENT PARTS

FOR MAGNUM™ 250XA GUN & CABLE ASSEMBLIES

TABLE 3

DESCRIPTION	PART NUMBER	ENGLISH SIZE (INCHES)	METRIC SIZE (MM)
Cable Liner For Cables 15' (4.5m) and less	KP1934-1 KP1934-2 KP1934-3	.035 - .045 .025 - .030 .030 - .035	0.9 - 1.2 0.6 - 0.8 0.8 - 0.9
Contact Tips Standard Duty	KP2020-1B1 KP2020-2B1 KP2020-6B1 KP2020-7B1 KP2020-8B1	.035 .045 .025 .030 .040	0.9 1.2 0.6 0.8 1.0
Heavy Duty	KP2021-1B1 KP2021-2B1 KP2021-6B1	.035 .045 .040	0.9 1.2 1.0
Tapered	KP2022-1B1 KP2022-2B1 KP2022-5B1 KP2022-6B1 KP2022-7B1	.035 .045 .025 .030 .040	0.9 1.2 0.6 0.8 1.0
Gas Diffuser Assembly	KP2026-3 KP2051-1(1)		
Gas Nozzles Fixed Nozzle Tip Recessed .12" (3mm) (Spray Transfer)	KP1030-1 KP1030-2 KP1030-3 KP1030-4	3/8 1/2 5/8 3/4	9.5 12.7 15.9 19.1
Fixed Nozzle Tip Extended .12" (3mm) -Flush (Short Circuited Transfer)	KP1031-1 KP1031-2 KP1031-3 KP1031-4	3/8 1/2 5/8 3/4	9.5 12.7 15.9 19.1
Fume Nozzle Bell Shaped 1.3" (33mm) long 2.0" (51mm) long Tapered	S19953 S20654 S21248		

(1) Allows Use of 100L Contact Tips and Gas Nozzles

NOTE: All Above can be used with K566 Magnum™ 250XA Gun

ACCESSORIES FOR MAGNUM™ 250XA AND 400XA GUN & CABLE ASSEMBLIES

K-Number	Description
K611-1	82 Degree gun tube with 7/16-20 thread for 400XA
K611-2	82 Degree gun tube with 7/16-20 thread for 200XA
K611-3	82 Degree gun tube with -20 thread for 400XA
K611-4	82 Degree gun tube with -20 thread for 200XA
K1488-1	Leather cable cover for 15 foot XA guns
K1488-1	Leather cable cover for 10 and 12 foot XA guns
K489-1	Fast-Mate adapter for LN7 series, LN8 & LN9 wire feeders
K489-2	Fast-Mate adapter for LN25 wire feeders
K489-3	Fast-Mate adapter for Miller wire feeders

NOTES

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

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

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

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

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

			
● Keep your head out of fumes. ● Use ventilation or exhaust to remove fumes from breathing zone.	● Turn power off before servicing.	● Do not operate with panel open or guards off.	**WARNING**
● Los humos fuera de la zona de respiración. ● Mantenga la cabeza fuera de los humos. Utilice ventilación o aspiración para gases.	● Desconectar el cable de alimentación de poder de la máquina antes de iniciar cualquier servicio.	● No operar con panel abierto o guardas quitadas.	Spanish **AVISO DE PRECAUCION**
● Gardez la tête à l'écart des fumées. ● Utilisez un ventilateur ou un aspirateur pour ôter les fumées des zones de travail.	● Débranchez le courant avant l'entretien.	● N'opérez pas avec les panneaux ouverts ou avec les dispositifs de protection enlevés.	French **ATTENTION**
● Vermeiden Sie das Einatmen von Schweibrauch! ● Sorgen Sie für gute Be- und Entlüftung des Arbeitsplatzes!	● Strom vor Wartungsarbeiten abschalten! (Netzstrom völlig öffnen; Maschine anhalten!)	● Anlage nie ohne Schutzgehäuse oder Innenschutzverkleidung in Betrieb setzen!	German **WARNUNG**
● Mantenha seu rosto da fumaça. ● Use ventilação e exhaustão para remover fumo da zona respiratória.	● Não opere com as tampas removidas. ● Desligue a corrente antes de fazer serviço. ● Não toque as partes elétricas nuas.	● Mantenha-se afastado das partes moventes. ● Não opere com os paineis abertos ou guardas removidas.	Portuguese **ATENÇÃO**
● ヒュームから頭を離すようにして下さい。 ● 換気や排煙に十分留意して下さい。	● メンテナンス・サービスに取りかかる際には、まず電源スイッチを必ず切って下さい。	● パネルやカバーを取り外したままで機械操作をしないで下さい。	Japanese ● 通電中の電気部品、又は溶材にヒフやぬれた布で触れないこと。 ● 施工物やアースから身体が絶縁されている様にして下さい。
● 頭部遠離煙霧。 ● 在呼吸區使用通風或排風器除煙。	● 維修前切斷電源。	● 儀表板打開或沒有安全罩時不準作業。	Chinese ● 皮肤或濕衣物切勿接觸帶電部件及銲條。 ● 使你自己與地面和工件絶緣。
● 얼굴로부터 용접가스를 멀리하십시요. ● 호흡지역으로부터 용접가스를 제거하기 위해 가스제거기나 통풍기를 사용하십시요.	● 보수전에 전원을 차단하십시요.	● 판넬이 열린 상태로 작동치 마십시요.	Korean ● 전도체나 용접봉을 젖은 헝겁 또는 피부로 절대 접촉치 마십시요. ● 모재와 접지를 접촉치 마십시요.
● ابعد رأسك بعيداً عن الدخان. ● استعمل التهوية أو جهاز ضغط الدخان للخارج لكي تبعد الدخان عن المنطقة التي تتنفس فيها.	● اقطع التيار الكهربائي قبل القيام بأية صيانة.	● لا تشغل هذا الجهاز اذا كانت الاغطية الحديدية الواقية ليست عليه.	Arabic ● لا تلمس الاجزاء التي يسري فيها التيار الكهربائي أو الالكترود بجلد الجسم أو بالملابس المبللة بالماء. ● ضع عازلا على جسمك خلال العمل.

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

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

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

이 제품에 동봉된 작업지침서를 숙지하시고 귀사의 작업자 안전수칙을 준수하시기 바랍니다.

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

LINCOLN® ELECTRIC

• World's Leader in Welding and Cutting Products •
• Sales and Service through Subsidiaries and Distributors Worldwide •
Cleveland, Ohio 44117-1199 U.S.A. TEL: 216.481.8100 FAX: 216.486.1751 WEB SITE: www.lincolnelectric.com