RETURN TO MAIN MENU

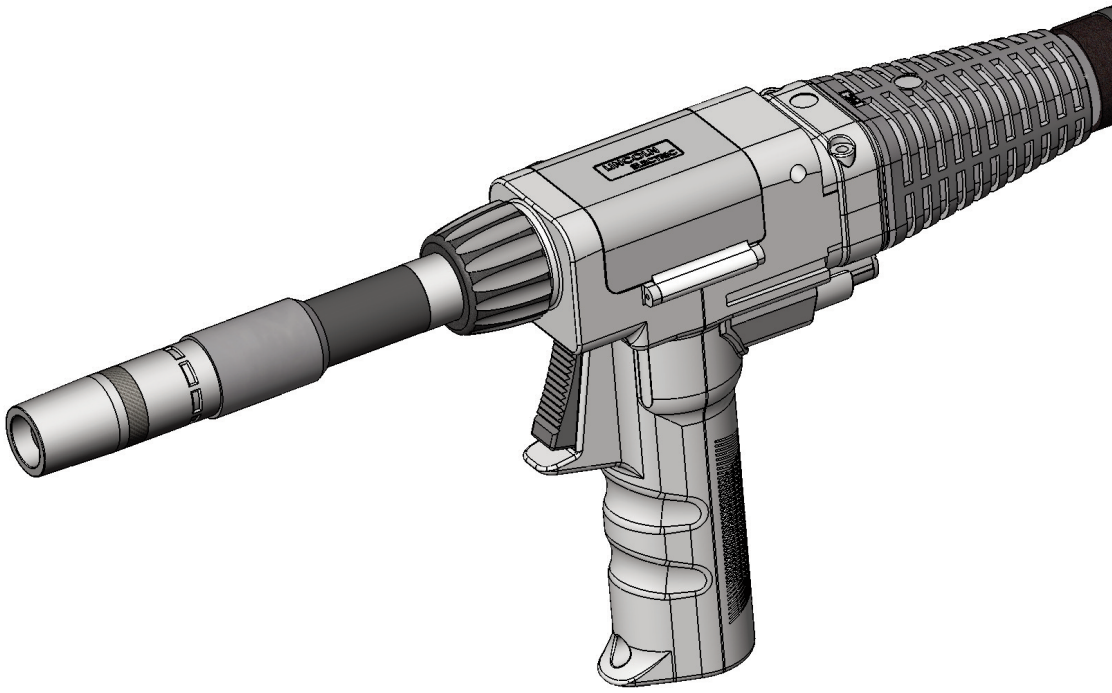
IM10032
August 2009

COUGAR™

Push Pull GUN

Models: K2704-2, K2704-3

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® 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.

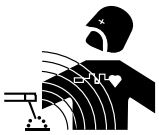
1.d. Keep all equipment safety guards, covers and devices in position and in good repair.Keep hands, hair, clothing and tools away from V-belts, gears, fans and all other moving parts when starting, operating or repairing equipment.

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 within applicable OSHA PEL and ACGIH TLV limits using local exhaust or mechanical ventilation. In confined spaces or in some circumstances, outdoors, a respirator may be required. Additional precautions are also required when welding on galvanized steel.**

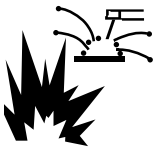
5. b. The operation of welding fume control equipment is affected by various factors including proper use and positioning of the equipment, maintenance of the equipment and the specific welding procedure and application involved. Worker exposure level should be checked upon installation and periodically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

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

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

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

5.f. Also see item 1.b.



WELDING and CUTTING SPARKS can cause fire or explosion.

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

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

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

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

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

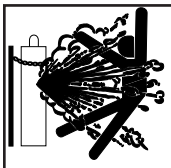
6.f. Sparks and spatter are thrown from the welding arc. Wear oil free protective garments such as leather gloves, heavy shirt, cuffless trousers, high shoes and a cap over your hair. Wear ear plugs when welding out of position or in confined places. Always wear safety glasses with side shields when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

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

6.h. Also see item 1.c.

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

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



CYLINDER may explode if damaged.

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

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

7.c. Cylinders should be located:

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

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

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

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

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

FOR ELECTRICALLY powered equipment.

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

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

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

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

Jan '09

PRÉCAUTIONS DE SÛRETÉ

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

Sûreté Pour Soudage A L'Arc

1. Protegez-vous contre la secousse électrique:

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

Thank You——

for selecting one of our **QUALITY** products. We want you to take pride in operating this product ••• as much pride as we have in bringing this product to you!

CUSTOMER ASSISTANCE POLICY

The business of our company is manufacturing and selling high quality welding equipment. Our challenge is to meet the needs of our customers and to exceed their expectations. On occasion, purchasers may ask us 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. We are not in a position to warrant or guarantee such advice, and assume 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.

We are a responsive manufacturer, but the selection and use of specific products sold by us is solely within the control of, and remains the sole responsibility of the customer. Many variables beyond our control 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 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 (if available)_____

Serial Number (if available)_____

Date Purchased_____

Where Purchased_____

Whenever you request replacement parts or information on this equipment, always supply the information you have recorded above.

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 Cougar™ push-pull gun is a lightweight, handheld combined semiautomatic wire feeder and welding gun, designed primarily for aluminum welding using argon shielding gas. The cable included with the push-pull gun allows welding up to 25 (7.62m) or 50 feet (15.2m) from the power source.

The gun is intended for use with Power Wave C300, Power Feed 10M, Power Feed 25M and Power Mig 350MP Power Sources. For other applications, contact your local Lincoln Electric sales office or distributor.

The push-pull gun is ideal for aluminum fabrication in industrial shops, automobile body shops, marinas and for the advanced hobbyist.

SPECIFICATIONS

Model	**Cougar™ Push-Pull Gun with Remote Wire Speed Control**
Wire Capacity	.035"-1/16" (0.8mm-1.6mm) Aluminum and cored wire
Wire Speed	800 IPM MAX.
Duty Cycle	300 amps @ 60% Argon Gas
Shipping Weight	25 Ft. (7.6m) - 17 Lbs. (7.7Kg.) 50 Ft. (15.2m) - 31 Lbs. (14Kg)

Supplied with:

KP2744-364A, 3/64" Contact Tip (Installed)
KP2744-035A, .035 Contact Tip
KP2746-1, Gas Diffuser (Installed)
KP2742-1-62R, Gas Nozzle (Installed)
KP2773-2, Insulator (Installed)
KP2876-1, Drive Roll (.035-3/64)
Service Wrench
Instruction Manual

RECOMMENDED PROCESSES AND EQUIPMENT

The push-pull gun can be used to weld aluminum and aluminum alloys using Gas Metal Arc Welding or GMAW (also known as MIG) process, which requires a supply of shielding gas. Argon is normally used due to its smooth, stable arc, good metal transfer, and low cost. Positive polarity gives good penetration and affords a base metal cathode cleaning effect.

Unpacking the Push-Pull Gun

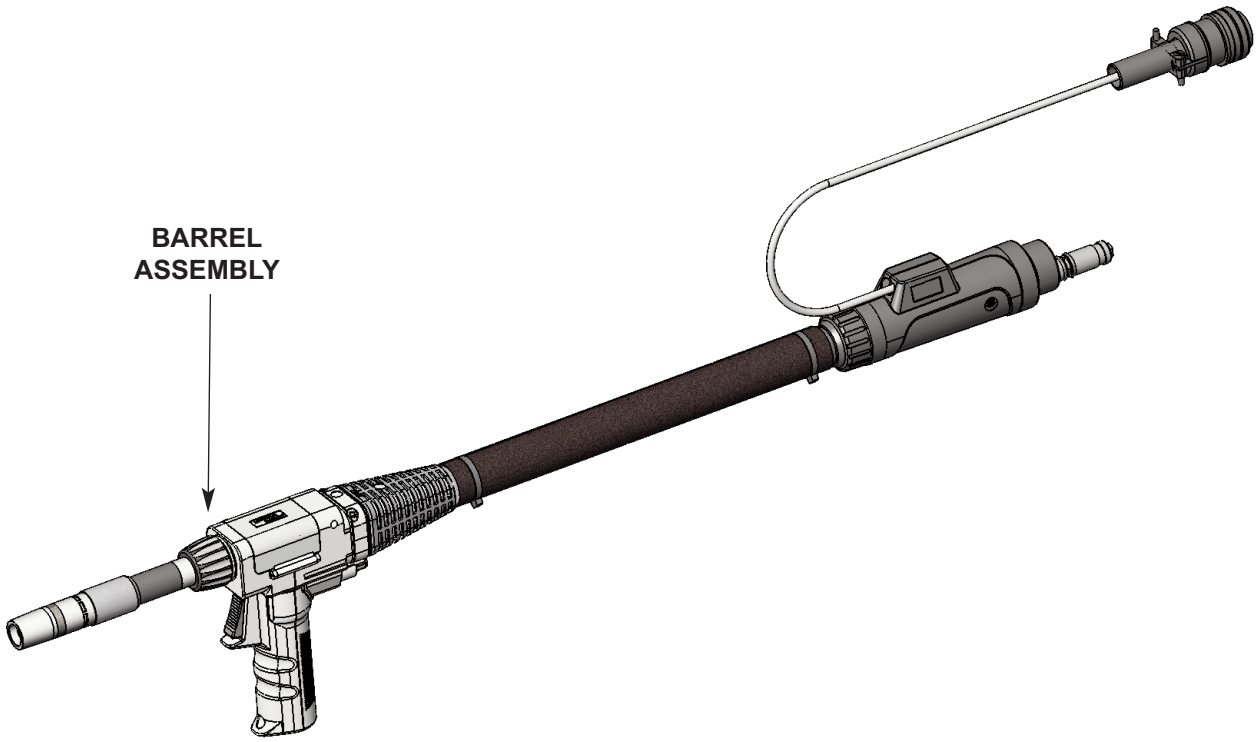
Safety Precautions

– Read "Safety Precautions" in the Operating Manual before proceeding. Only personnel that have read and understood the Operating Manual should install and operate this equipment.

– Power source must be turned "OFF" and power leads disconnected when installing this unit.

Unpacking the Push-Pull Gun

Carefully unpack your Cougar™ Push-Pull Gun and attach the Barrel Assembly, and make sure you have all of the parts shown below.



OPERATOR'S MANUAL

COUGAR™ - PUSH-PULL GUN

KP2744-035A	Contact Tip .035 (0.9mm)	Included
KP2744-364A	Contact Tip . 3/64" (1.2mm)	Installed on Barrel Assembly
KP2746-1	Gas Diffuser	Installed on Barrel Assembly
KP742-1-62R	Gas Nozzle	Installed on Barrel Assembly
KP2773-2	Insulator	Installed on Barrel Assembly
KP2876-1	Drive Roll (.035 / 3/64th)	Installed
	Service Wrench	Included

Push-pull Gun Familiarization

Become familiar with your push-pull gun before connecting to welder. For features described below, refer to Figure on the next page.

1. Handle, gun can be used in either right or left hand.

2. Trigger operates welding power, gas flow, and wire feed.

3. Remote wire speed control, located behind the handle, controls the speed of the drive motor.

4. Open body cover by flipping lid and observe the following:

   a. Wire drive release lever up position moves pressure roller away from drive roll to stop wire feed. Down position movespressure roller to wire. Operate wire drive release lever and see pressure roller move.

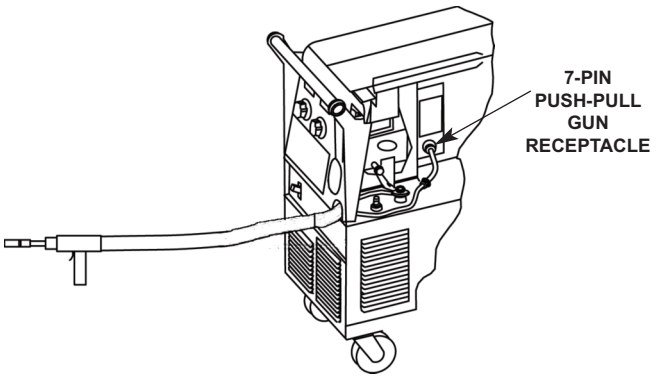
   b. Drive roll with two wire grooves. Narrow groove feeds .035 (0.9 mm) diameter wire. Wide groove feeds 3/64 inch (1.2 mm) diameter wire. Gun is shipped with wide groove or 3/64 in operating position (toward handle). Reverse roller for .035 inch (0.9 mm) diameter wire.

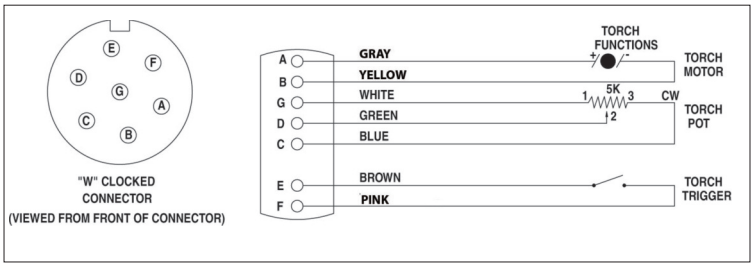
5. Gas nozzle directs gas flow around arc. Unthread gas nozzle to see contact tip and gas diffuser. Push-pull gun is shipped with 3/64th inch (1.2 mm) contact tip installed.

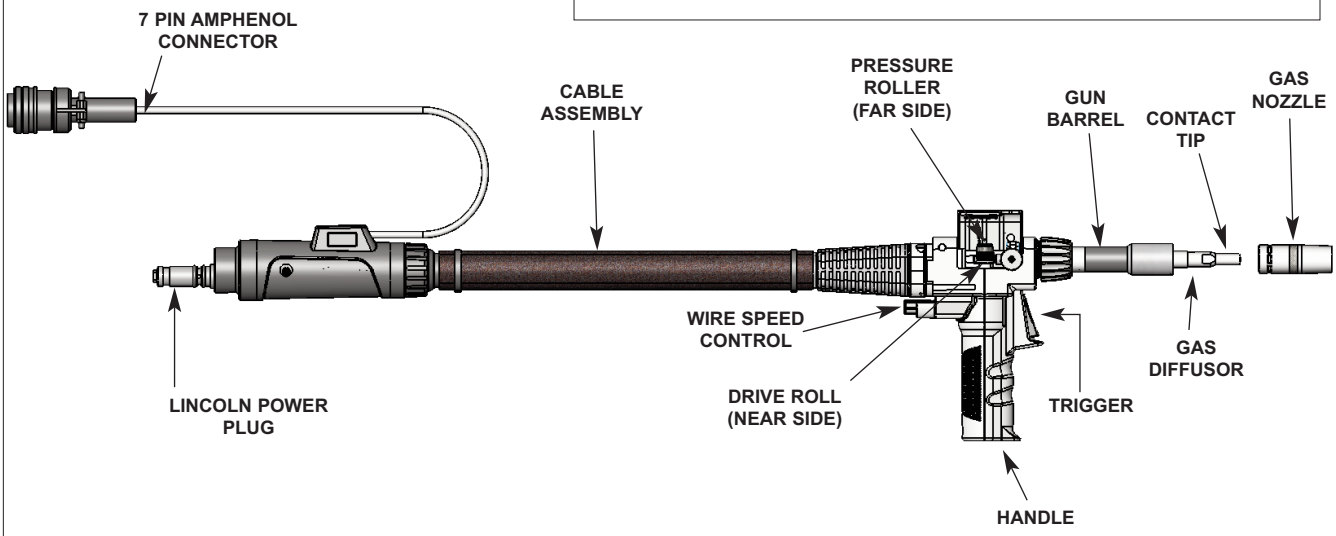
6. Cable assembly for power, control, and gas. Hold gun and become familiar with gun's weight and balance.

CONNECTING TO POWER SOURCE:

1. **Power source must be "off" and power cord disconnected.**
2. **Connect Push-Pull Gun to wire feeder by inserting power plug to the machine**
3. **Connect 7-Pin control cable plug to power source receptacle.**
4. **Reconnect power and turn on machine.**

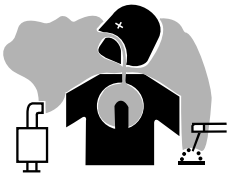




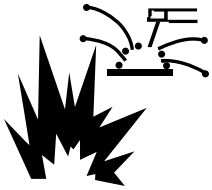


Safety Precautions

- **Do not touch electrically live parts or electrode with skin or wet clothing**
- **Insulate yourself from work and ground.**
- **Always wear dry insulating gloves.**



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



- **Keep flammable material away.**
- **Do not weld on containers that have held combustibles.**

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

WARNING: Electric shock can kill. Fumes and gases can be dangerous to your health. Arc rays can injure eyes and burn skin. See additional warning information under "Arc Welding Safely Precautions" on inside of front cover of operating manual. When inching, (the electrode and drive mechanism are always electrically energized and remain energized several seconds after the gun trigger is released.

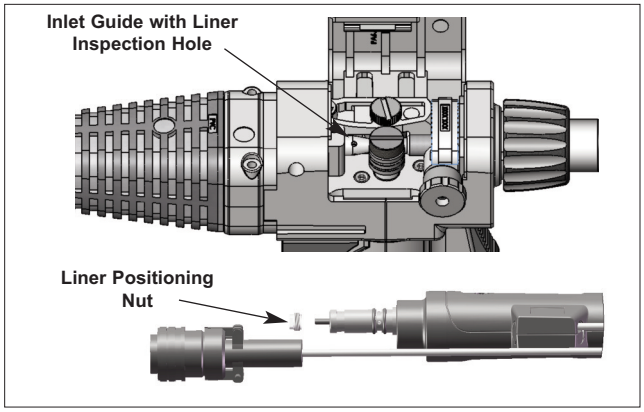
Setup Procedure

Selecting Electrode Wire

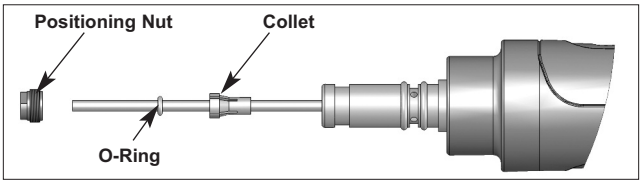
Several alloy types of filler metals are available, and the best choice depends on the type of base metals and the desired characteristics of the weldment, such as ductility and strength, corrosion resistance, sustained service temperature, and anodic treatment color matching. In addition, several wire sizes are available, and the choice here will depend upon several factors, including base metal thickness and the arc transfer process used. Consult your local dealer or appropriate AWS publication for help in selecting an appropriate alloy type and wire size. Also refer to, "Procedure Settings" later in this chapter, for wire sizes used with typical base metal thicknesses and procedure settings.

Installing Conduit Liner:

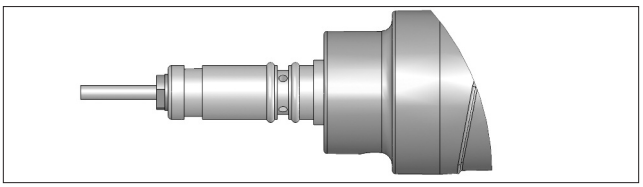
1. Laying torch out straight remove positioning nut, then insert your liner, tapered end first, all the way into torch until it stops. NOTE: You should see the liner through the holes in the inlet guide this will help make sure liner is fully installed.



2. While torch is still laying out straight adjust your O-Ring and collet so that they will fit up inside of the power-pin when positioning nut is installed.

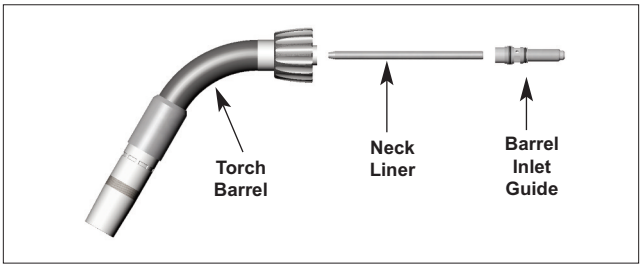


3. Reinstall the positioning nut securely, then trim rest of liner flush with positioning nut, accordingly to fit up to drive rolls.



Installing Barrel Liner

1. Unscrew barrel inlet guide
2. Unscrew barrel liner from inlet guide
3. Reverse procedure with new liner. Be sure to install liner with tapered end toward contact tip, and liner is fully threaded into inlet guide.



Drive Roll Groove Selection

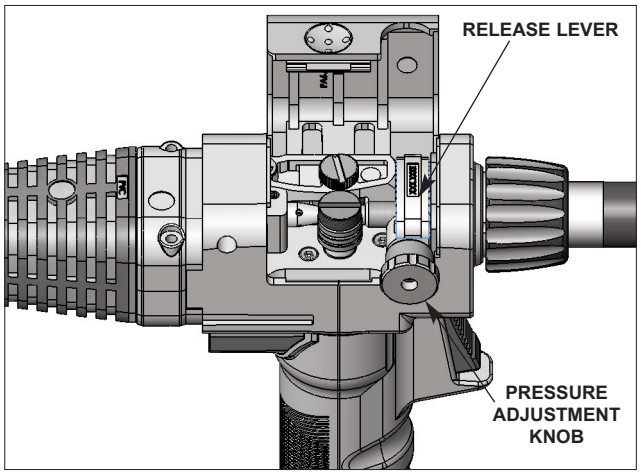
The drive roll has two grooves. A wider groove for feeding 3/64” (.047) wire and a narrow groove for feeding .035” (0.9mm) wire to accommodate changes in the wire size used. Changing between the grooves simply requires reversing the drive roll.

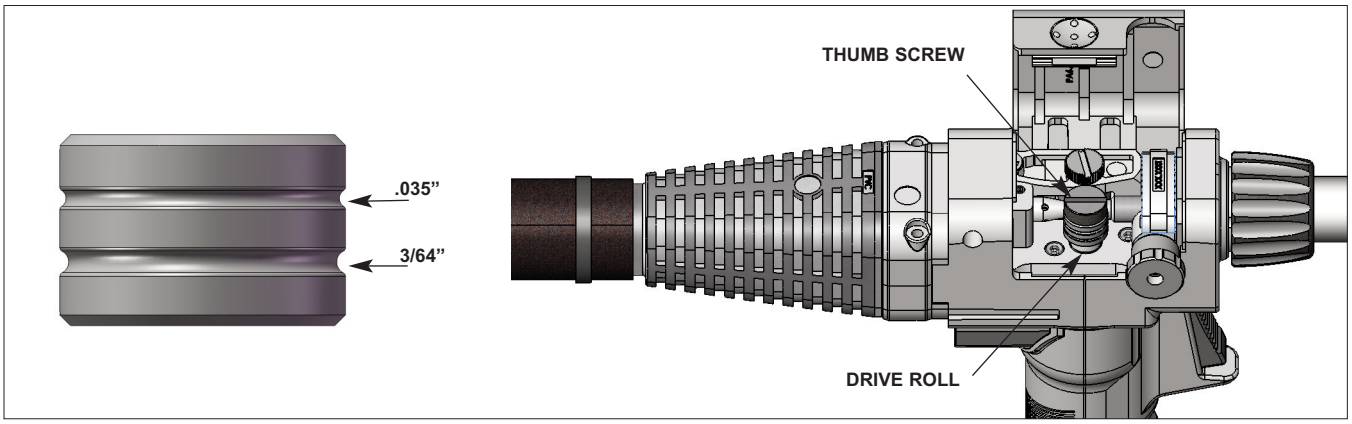
A. Drive Roll Orientation

1. Drive roll is scribed with wire groove size. For appropriate groove orientation, ensure desired size callout is facing up and visible.

B. Changing Drive Roll Orientation

1. Flip lid open, then move release lever to the up position.
2. Unscrew thumb screw and remove drive roll





Making A Weld

1 Check that the push-pull gun power, control, and gas connections are correct for the power source being used. Check that the gas supply is turned on. Check wire push-pull for an adequate supply of wire.

2. See "Procedure Settings", below for wire feed speed and voltage settings. Set these controls depending on the welding wire and base metal thickness being used.

3. Connect work clamp to metal being welded. Work clamp must make good electrical contact to the workpiece. The workpiece must also be grounded as stated in "Arc Welding Safety Precautions".

4. Connect power to welder and turn "ON".

5. Prepare to purge gas line by first releasing wire drive. Push wire drive release lever to the UP position, to avoid feeding wire.

WARNING: Gun body and contact tip become electrically energized when gun trigger is pressed and remain so for several seconds after trigger is released.

6. Press and hold gun trigger for about 5 seconds to purge gas line. If adjustable regulator or metering valve is installed, adjust gas flow per, "Setting Gas Flow Rate".

7. Re-engage wire drive by pushing release lever to down position to feed wire.

8. Momentarily squeeze trigger and verify that wire feeds properly. Trim wire to approximately 1/4" (6 mm) from end of contact tip.

WARNING: When using an open arc process, it is necesary to use correct eye, ear, head, and body protection.

9. Position gun over joint at 10° pushing angle. End of wire may be lightly touching the work.

10. Lower welding helmet, close gun trigger, and begin welding. Hold the gun so that the contact tip to work distance is about 1/2 inch (13 mm).

11. To stop welding, release the gun trigger and then pull the gun away from the work after the arc goes out.

12. When no more welding is to be done, close valve on gas cylinder, momentarily operate trigger to release gas pressure in line and turn off power source.

13. Note that clogged tips can often be salvaged by peeling away melted wire.

Procedure Settings

The following procedure settings for 4043 aluminum wire and argon gas can be used as starting points for developing specific welding procedures:

Wire Size in. (mm)	Metal Thickness ga.	Metal Thickness in. (mm)	Arc Volts	Wire Speed ipm (mpm)	Amps DC (+)
.030 (0.8)	22	.030 (0.8)	13-14[1]	200 (5.1)	40
	20	.036 (1.0)	13-14[1]	240 (6.1)	40
	18	.048 (1.2)	14-15[1]	290 (7.4)	50
	16	.060 (1.6)	15-16[1]	340 (8.6)	60
	14	.075 (2.0)	16-17[1]	370 (9.4)	70
	12	.105 (2.5)	16-18[1]	430 (10.9)	90
	10	.135 (3.5)	24-26	460 (11.7)	110
	3/16	(5.0)	24-26	500 (12.7)	150
	1/4	(6.0)	28-29	560 (14.2)	180
	3/8	(10.0)	28-30	600 (15.2)	200
.035 (0.9)	22	.030 (0.8)	13-14[1]	150 (3.8)	40
	20	.036 (1.0)	13-14[1]	175 (4.4)	40
	18	.048 (1.2)	13-14[1]	215 (5.5)	50
	16	.060 (1.6)	14-16[1]	250 (6.4)	60
	14	.075 (2.0)	14-16[1]	270 (6.9)	70
	12	.105 (2.5)	16-18[1]	320 (8.1)	90
	10	.135 (3.5)	24-26	410 (10.4)	110
	3/16	(5.0)	24-26	450 (11.4)	150
	1/4	(6.0)	26-28	530 (13.5)	180
	3/8	(10.0)	26-29	560 (14.2)	200
	1/2	(12.0)	26-30	600 (15.2)	220
3/64(1.2)	10	.135 (3.5)	20-21[1]	180 (4.6)	110
	3/16	(5.0)	20-21[1]	220 (5.6)	150
	1/4	(6.0)	27-28	250 (6.4)	180
	3/8	(10.0)	25-30	260 (6.6)	200
	1/2	(12.0)	25-31	270 (6.9)	220
	3/4	(20.0)	25-31	290 (7.4)	250

[1]Short arc transfer.

Setting Gas Flow Rate

Gas handling systems having adjustable flow valves should be set for the following argon flow rates, depending on base metal thickness and welding position.

ARGON SHIELDING GAS FLOW RATES

Material Thickness In Inches and (mm)	Welding Position	Flow Rates In cf/hr (l/mln)
1/16 (1.6 mm)	Flat	30 (11.8)
3/32 to 3/16 (2.4 to 4.8 mm)	Flat, Vertical, Horizontal, Overhead	35 (14)
1/4 to 3/8 (6.3 to 9.5 mm)	Flat, Vertical, Flat Vertical, Horizontal, Overhead	35 (14) 35 (16.5) 40 (18.9)
3/4 (19 mm)	Flat, Vertical Horizontal, Overhead	35 (16.5) 40 (18.9)

ACCESSORIES (consult Lincoln Sales Bulletin E12.16)

The following accessories are available for the Cougar™ push-pull gun.

.035-3/64" Aluminum Drive Roll Kit
Features two grooves for feeding aluminum wire. The smaller groove feeds .035 wire. The larger groove feeds 3/64th wire.
Order KP2876-1

1/16" Aluminum Drive Roll Kit
Features two grooves, each capable of feeding 1/16" Aluminum wire
Order KP2876-2

Barrel Liner (45°, 60° Barrels)
Liner for feeding up to1/16" wire.
Order KP2879-1

Barrel Liner (180° Straight Barrel)
Liner for feeding up to1/16" wire.
Order KP2879-2

Gun Barrel

60 degree air-cooled gun barrel	**Order KP2877-60**
45 degree air-cooled gun barrel	**Order KP2877-45**
180 degree air-cooled gun barrel	**Order KP2877-180**

Wire Conduits

25 foot .035"-1/16" Wire Diameter	**Order KP2881-25**
50 foot .035"-1/16" Wire Diameter	**Order KP2881-50**

Gas Diffuser
Diffuser designed to accept thread on gas nozzles
Order KP2746-1

Gun Tube Insulator
For insulation of gas nozzle
Order KP2773-2

Gas Nozzle

.50 Thread on Nozzle (Tip Recessed)	**Order KP2742-1-50R**
.62 Thread on Nozzle (Tip Recessed)	**Order KP2742-1-62R**

Contact Tips

.035	**Order KP2744-035A**
3/64"	**Order KP2744-364A**
3/64" (5356)[1.]	**Order KP2744-364A5356**
1/16"	**Order KP2744-116A**

[1.] For use on lower amperage applications with 5356 wire. Features a smaller tip inner diameter to reduce arc flaring.

MAINTENANCE

Safety Precautions

⚠ WARNING

- **Do not operate with covers removed.**
- **Disconnect input power from welder before installing gun.**
- **Do not touch electrically hot part.**
- **Only qualified persons should install, use or service this machine.**

ELECTRIC SHOCK can kill.

When finished welding, be sure to turn power source off and close valve on gas cylinder.

⚠ WARNING

- **Working with flying or falling objects can cause serious eye injuries.**
- **Protective eyeware such as safety specticals with side shields or goggles must be worn at all times.**

FLYING FRAGMENTS can cause eye injury.

Routine Maintenance

Periodically blow out or vacum any metal wire shavings from Drive Roll area.

Inspect and replace any worn wire on inlet guide or barrel liner.

NOTE: Oil and spray cleaners can contaminate electrode wire and cause bad welds. They could also make wire drive rollers slip. Be careful when using any of these liquids on push-pull gun.

Carefully clean gun with a cleaner that is safe for plastic. Apply cleaner to rag and wipe gun. Do **NOT** spray cleaner on gun. Keep cable clean. Oil, grease gasoline, paint, and solvents degrade cable insulation.

Routine maintenance for consumable spare parts will depend on Duty Cycle and particular application.

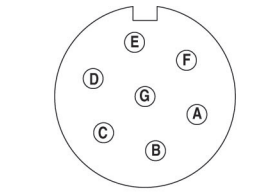
Troubleshooting Guide

PROBLEM	SYMPTOMS	REMEDY
No arc, wire feed, or gas flow.	1. Cable connections loose. 2. Trigger switch loose or defective. 3. Welder not turned on. 4. Welder not plugged in. 5. Cable or adapter cable damaged.	1. Check all power connections. 2. Fix switch or replace. 3. Turn on welder power. 4. Plug in. 5. Inspect and replace
No arc, weak arc.	1. Poor ground connection to work. 2. Power cable connection loose. 3. Voltage set too low. 4. Tip too large for wire size. 5. Wire feed speed too slow.	1. Check ground connection. 2. Check connections; if defective, replace cable or connectors. 3. Adjust to proper voltage 4. Change tip size. 5. Increase wire feed speed.
No wire feed.	1. Feeding small diameter wire with large groove on drive roller. 2. Wire drive release open. 3. Wire welded to tip. 4. Wire push-pull empty in machine. 5. Tip too small for wire. 6. Kink or bend in wire. 7. Control cable loose. 8. Drive roller worn. 9. Pressure roller stuck. 10. Roller spring loose or broken.	1. Change position of wire drive roller. 2. Close wire drive release. 3. Peel wire off tip or use new tip. 4. Insert new push-pull. 5. Insert correct tip. 6. Pull wire through tip or start new wire end. 7. Check all connections. 8. Replace. 9. Replace or lubricate. 10. Replace.
Wire feed too fast or too slow.	1. Wrong wire speed set for work.	1. Adjust wire feed speed.
Low or no gas flow. Oxidation of work.	1. Gas flow not set right. 2. Cylinder out of gas. 3. Cylinder valve closed. 4. Leak in gas line. 5. Leak in gun. 6.Gas diffuser clogged	1. Set proper flow rate. 2. Get new cylinder of gas. 3. Open cylinder valve. 4. Inspect and replace. 5. Check for missing gun tubes and/or missing gun body cover. 6. Blow out gas diffuser openings.
Oxidized work, arc unstable.	1. Wrong welding polarity.	1. Check polarity.

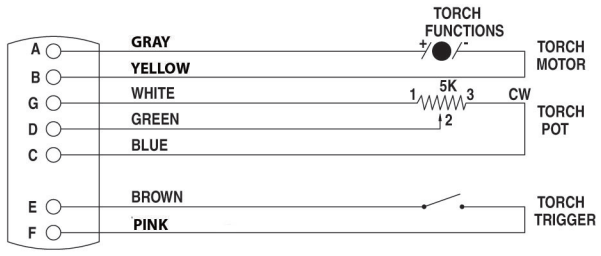
Troubleshooting Guide

TESTING THE TORCH

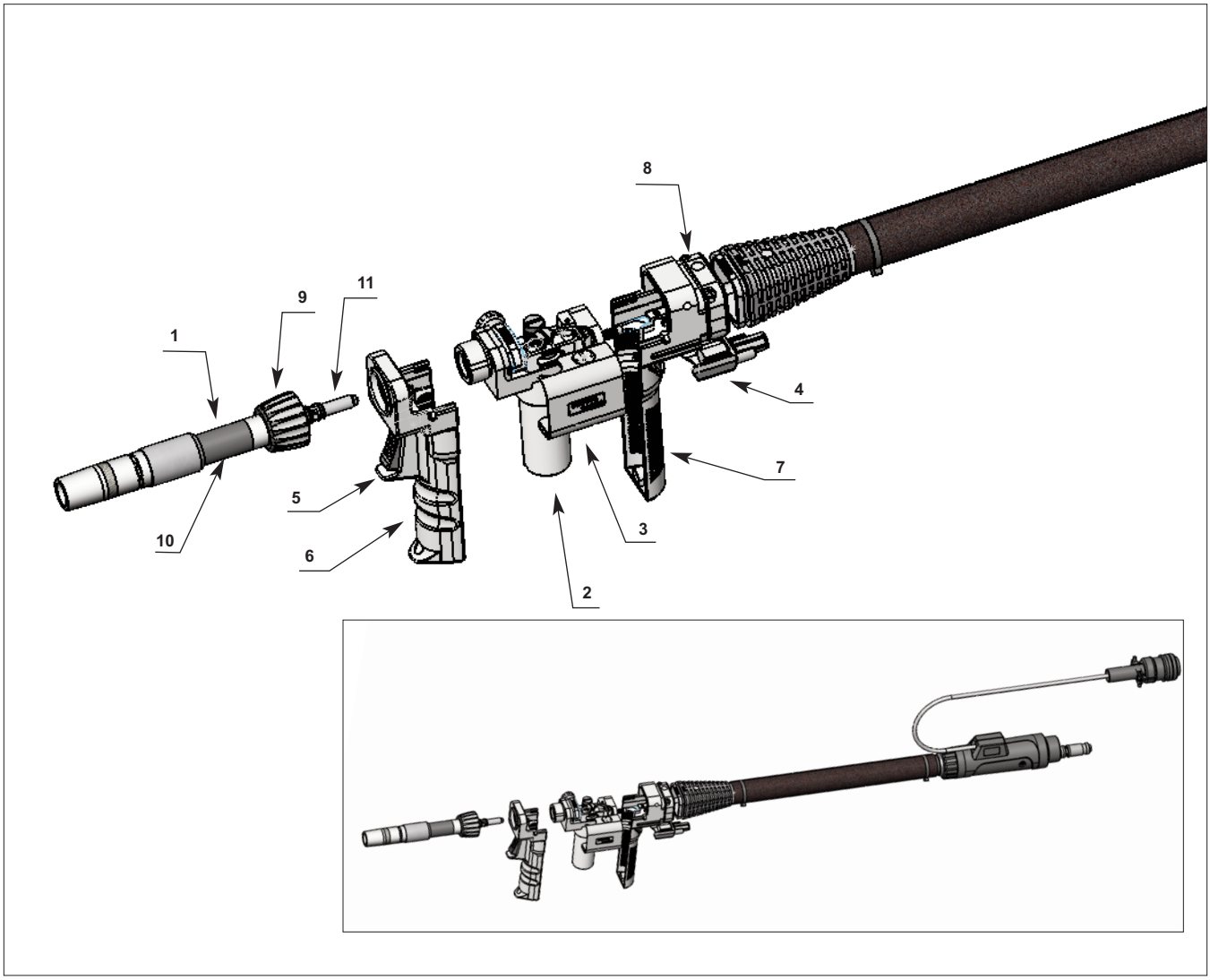
Motor Check.	Remove the torch connector from the cabinet. Using the torch Control Cable Connector, check the resistance across pins “A” and “B” (motor leads). The resistance across the motor should be between 5-10 ohms. If an open circuit or short exist, check the motor leads and motor independently.
Testing the Potentiometer.	Using the torch Control Cable Connector, check the resistance across pin “D” (wiper) and pin “C”. The resistance should vary from 5K - 0 ohms. Check the resistance across pin “D” (wiper) and pin “G”. The resistance should vary from 5K - 0 ohms.
Testing the Trigger Switch.	Using the torch Control Cable Connector, check for continuity across pins “E” and “F” when the trigger is pressed.



"W" CLOCKED
CONNECTOR
(VIEWED FROM FRONT OF CONNECTOR)



REPLACEMENT PARTS LIST AND DIAGRAM

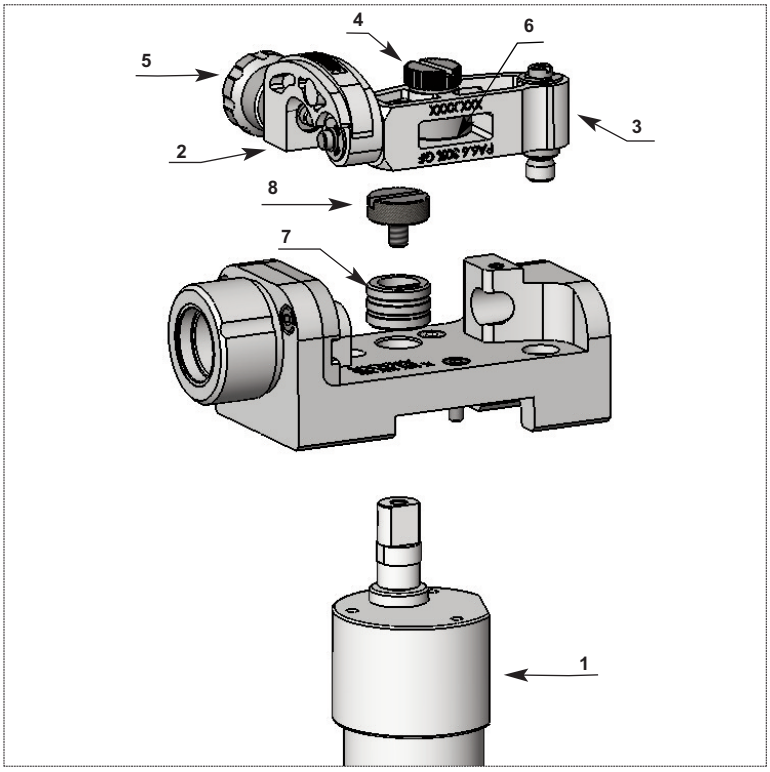


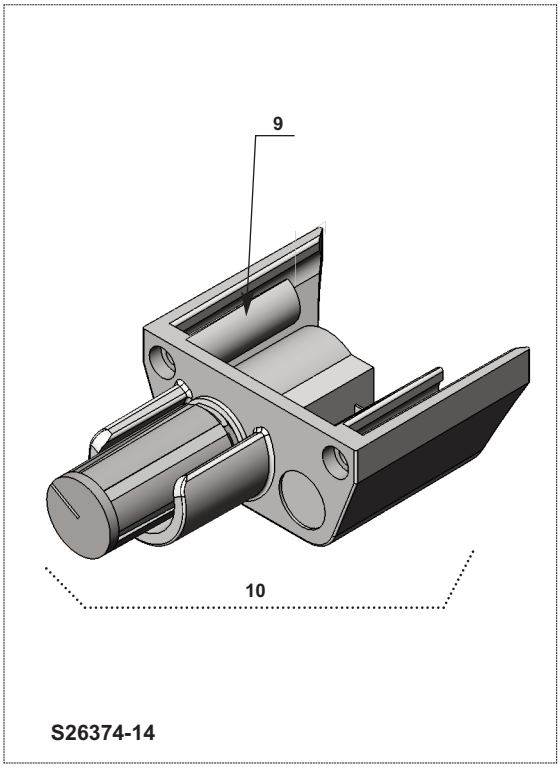
ITEM NO.	PART NO.	DESCRIPTION
1	KP2877-180	180 Degree Air-Cooled Gun Barrel
2	S26374-31	Motor Assembly
3	S26374-6	Wire Drive Cover
4	S26374-14	Potentiometer Assembly
5	S26374-23	Trigger Assembly
6	S26374-24	Handle, Front
7	S26374-25	Handle, Back
8	S26374-33	Strain Relief Clamp Kit
9	S26374-95	Barrel Nut
10	S26374-104	Barrel Insulation Hose
11	S26374-46	Barrel Inlet Guide
N/S	S26374-44	O-Ring Kit A/C Barrel
N/S	S26374-28	25' Cable Assembly - Cougar

ITEM NO.	PART NO.	DESCRIPTION
N/S	S26374-34	50' Cable Assembly - Cougar
N/S	S26374-35	Cable Cover 25
N/S	S26374-36	Cable Cover 50'
N/S	S26374-37	Power Cable Assembly 25'
N/S	S26374-38	Power Cable Assembly 50'
N/S	S26374-39	Wire Conduit Assembly 25'
N/S	S26374-40	Wire Conduit Assembly 50'
N/S	S26374-41	Control Wire Assembly 25'
N/S	S26374-42	Control Wire Assembly 50'
N/S	S26374-60	Gas Hose Assembly 25'
N/S	S26374-61	Gas Hose Assembly 50'
N/S	S26374-32	Rear End Feeder Connection Kit

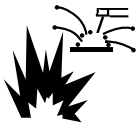
N/S = Not Shown

REPLACEMENT PARTS LIST AND DIAGRAM





ITEM NO.	PART NO.	DESCRIPTION	COMMENTS
1	S26374-31	Motor Assembly	
2	S26374-7	Pressure Lever	
3	S26374-8	Pivot Arm	
4	S26374-9	Set Screw, Pressure Roll	
5	S26374-10	Pressure Adjustment Knob Assembly	
6	S26374-12	Ball Bearing	
7	KP2876-1	Drive Roll Kit AL .035-3/64"	
7	KP2876-2	Drive Roll Kit AL 1/16"	
8	S26374-63	Thumb Screw	
9	S26374-15	Housing, Potentiometer	
10	S26374-14	Potentiometer Assembly	

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

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

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

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

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

			
● Keep your head out of fumes. ● Use ventilation or exhaust to remove fumes from breathing zone.	● Turn power off before servicing.	● Do not operate with panel open or guards off.	**WARNING**
● Los humos fuera de la zona de respiración. ● Mantenga la cabeza fuera de los humos. Utilice ventilación o aspiración para gases.	● Desconectar el cable de alimentación de poder de la máquina antes de iniciar cualquier servicio.	● No operar con panel abierto o guardas quitadas.	Spanish **AVISO DE PRECAUCION**
● Gardez la tête à l'écart des fumées. ● Utilisez un ventilateur ou un aspirateur pour ôter les fumées des zones de travail.	● Débranchez le courant avant l'entretien.	● N'opérez pas avec les panneaux ouverts ou avec les dispositifs de protection enlevés.	French **ATTENTION**
● Vermeiden Sie das Einatmen von 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 **注意事項**
●頭部遠離煙霧。 ●在呼吸區使用通風或排風器除煙。	●維修前切斷電源。	●儀表板打開或沒有安全罩時不準作業。	Chinese **警 告**
● 얼굴로부터 용접가스를 멀리하십시요. ● 호흡지역으로부터 용접가스를 제거하기 위해 가스제거기나 통풍기를 사용하십시요.	● 보수전에 전원을 차단하십시요.	● 판넬이 열린 상태로 작동치 마십시요.	Korean **위 험**
● ابعد رأسك بعيداً عن الدخان. ● استعمل التهوية أو جهاز ضغط الدخان للخارج لكي تبعد الدخان عن المنطقة التي تتنفس فيها.	● اقطع التيار الكهربائي قبل القيام بأية صيانة.	● لا تشغل هذا الجهاز اذا كانت الاغطية الحديدية الواقية ليست عليه.	Arabic **تحذير**

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

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

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

이 제품에 동봉된 작업지침서를 숙지하시고 귀사의 작업자 안전수칙을 준수하시기 바랍니다.

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

NOTES:

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

LNC.0016 7-09