GMAW Push-Pull Gun

IM599
MK 091-0416
November 2001
Rev. M

OPERATOR'S MANUAL

Prince® XL/Spool Gun

Model #350 (factory model)
For use with Cabinet K1583-1

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 thoughful 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.

CE

OPERATOR'S MANUAL

LINCOLN ELECTRIC

World's Leader in Welding and Cutting Products

Premier Manufacturer of Industrial Motors

Sales and Service through Subsidiaries and Distibutors Worldwide

Cleveland, Ohio 44117-1199 U.S.A. TEL: 216.481.8100 FAX: 216.486.1751 WEB SITE: www.lincolnelectric.com

SAFETY

⚠ 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.

For more detailed information it is strongly recommended that you purchase a copy of "Safety in Welding and Cutting - ANSI Standard Z49.1" and WTIA Technical Note 7. All WTIA publications and ANSI/AWS Standards are available from the Welding Technology Institute of Australia, PO Box 6165 Silverwater NSW 2128. For copies of various Australian Standards contact your local S.A.A. office.

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.

Oct '00

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 follow safe practices that minimize their exposure to electric and magnetic fields (EMF).

2.e. For welders wearing implanted pacemakers, safe welding practices are particularly important and additional procedures should be followed by those who have decided to continue to weld. (Hopefully in keeping with a doctor's advice).

2.f. The following procedures will not eliminate exposure to EMF or the possibility of arc welding having an effect on a pacemaker, however if followed, they will significantly reduce exposure to electric and magnetic fields. Electric and magnetic fields are created any time electric current flows through a conductor, however it is not clear whether such exposure affects ones health.

2.g. Some researchers have reported that exposure to EMF may cause leukemia or other illnesses. These claims originally arose in relation to high voltage electric power lines and are very much in dispute in the medical and scientific arena, however the best advice is to minimize your exposure to EMF to protect your health should doctors eventually decide there is a risk.

2.h. There are four fundamental facts about EMF:

2.h.1 With direct current (DC), the field strength is relatively constant and does not change.

2.h.2 With alternating current (AC), the field strength constantly changes.

2.h.3 The greater the current flow, i.e. the higher the amps, the stronger the field created by the current

2.h.4 The closer the conductor or electrical device is to the body the greater the exposure to the field.

MINIMIZE EXPOSURE TO EMF

2.i. All welders should use the following procedures to minimize EMF exposure:

2.i.1 Route electrode or gun and work cables together. Secure them with tape if possible.

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

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

2.i.4 Connect the work cable to the work piece as close as possible to the area being welded. (This is also a good practice to eliminate a common problem on welding - a poor work connection.

2.i.5 Do not work next to the welding power source.

ADDITIONAL PRECAUTIONS FOR WELDERS WITH PACEMAKERS

2.j. There is no question that the fields in arc welding can interfere with a pacemakers function. Generally the interference does not permanently damage the pacemaker. Once the wearer leaves the arc welding environment or stops welding, the pacemaker returns to normal functioning. The welding arc has little or no effect on the operation of some pacemakers, especially designs that are bi-polar or designed to filter out such interference.

2.k. For a welder or anyone working around electrical equipment the selection of a pacemaker is very important. Get a doctor's advice about which pacemaker is the least sensitive to interference from welding while still being medically suitable.

2.l. In addition to the normal safety precautions, the following additional procedures should be adopted by welders with pacemakers.

2.l.1 Use gas welding when the application is suitable.

2.l.2 Use the lowest current setting appropriate for the application. Do not exceed 400 amps. Low current (75-200 amps) direct current (DC) welding should be used if arc welding is necessary. Do not TIG weld with high frequency.

2.l.3 Do not use repeated, short welds. Wait about ten seconds between stopping one weld and starting the next. When having difficulty starting an electrode, do not restrike the rod repeatedly.

2.l.4 If you feel light headed, dizzy or faint, immediately stop welding. Lay the electrode holder down so that it does not contact the work and move away from any welding being performed. Arrange your work in advance so that, if you become dizzy and drop the electrode holder it will not fall on your body or strike the work.

2.l.5 Do not work on a ladder or other elevated position or in a cramped, confined place.

2.l.6 Do not work alone. Work only in the presence of an individual who understands these precautions and the possible effect welding may have on your pacemaker.

2.l.7 Do not work near spot welding equipment.

2.l.8 If you have a pacemaker and wish to continue arc welding, discuss this and any other questions you may have with your physician and follow his or her advice. The doctor may wish to contact the pacemaker manufacturer for a recommendation. As mentioned before, the design of the pacemaker significantly affects the degree to which it is subject to interference from a welding circuit. Do not rely on the fact that you know another welder with a pacemaker who has welded for years without experiencing a problem.That welder and his or her pacemaker may be quite different from you and your pacemaker.

Oct '00

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

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

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

5.e. Also see item 1.b.

Mar '95

WELDING SPARKS can cause fire or explosion.

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

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

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

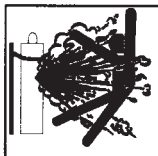
6.d. Do not heat, cut or weld tanks, drums or containers until the proper steps have been taken to insure that such procedures will not cause flammable or toxic vapors from substances inside. They can cause an explosion even though they have been "cleaned". For information, purchase "Recommended Safe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

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

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

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

6.h. Also see item 1.c.



CYLINDER may explode if damaged.

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

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

7.c. Cylinders should be located:

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

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

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

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

7.g. Read and follow the instructions on compressed gas cylinders, associated equipment, and CGA publication P-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 National Electrical Code, all local codes and the manufacturer's recommendations.

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

Mar '95

INSTRUCTIONS FOR ELECTRO-MAGNETIC COMPATIBILITY

Conformance

Products displaying the C-Tick mark are in conformity with Australian/New Zealand requirements for Electromagnetic Compatibility (EMC) according to standard (emission) AS/NZS 3652 "Electromagnetic Compatibility – Arc Welding Equipment".

Products displaying the CE mark are in conformity with European Community Council Directive 89/336/EEC requirements for EMC by implementing EN50199 "Electromagnetic Compatibility (EMC) – Product standard for arc welding equipment".

Products are:
- **For use with other Lincoln Electric/LiquidArc equipment.**
- **Designed for industrial and professional use.**

Introduction

All electrical equipment generates small amounts of electromagnetic emission. Electrical emission may be transmitted through power lines or radiated through space, similar to a radio transmitter. When emissions are received by other equipment, electrical interference may result. Electrical emissions may effect many kinds of electrical equipment: other nearby welding equipment, radio and TV transmitters and receivers, numerical controlled machines, telephone systems, computers, etc. Be aware that interference may result and extra precautions may be required when a welding power source is used in a domestic establishment.

Installation and Use

The purchaser/user is responsible for installing and using the welding equipment according to the manufacturer's instructions. If electromagnetic disturbances are detected then it shall be the responsibility of the purchaser/user of the welding equipment to resolve the situation with the technical assistance of the manufacturer. In some cases this remedial action may be as simple as earthing (grounding) the welding circuit (see note below). In other cases it could involve constructing an electromagnetic screen enclosing the power source and the work complete with associated input filters. In all cases electromagnetic disturbances must be reduced to the point where they are no longer troublesome.

Note: The welding circuit may or may not be earthed for safety reasons according to national codes. Changing the earthing arrangements should only be authorized by a person who is competent to assess whether the changes increase the risk of injury, eg. by allowing parallel welding current return paths which may damage the earth circuits of other equipment.

Assessment of Area

Before installing welding equipment the purchaser/user shall make an assessment of potential problems in the surrounding area.

The following shall be taken into account:

- Other supply cables, control cables, signalling and telephone cables above, below and adjacent to the welding equipment;
- Radio and television transmitters and receivers;
- Computer and other control equipment;
- Safety critical safety equipment, eg. guarding of industrial equipment;
- The health of people around, eg. the use of pacemakers and hearing aids;
- Equipment used for calibration or measurement;
- The immunity of other equipment in the environment. The purchaser/user shall ensure that other equipment being used in the environment is compatible. This may require additional protection measures;
- The time of the day that welding or other activities are to be carried out.

The size of the surrounding area to be considered will depend on the structure of the building and other activities that are taking place. The surrounding area may extend beyond the boundaries of the premises.

Methods of Reducing Emissions

Mains Supply

Welding equipment should be connected to the mains supply according to the manufacturer's recommendations.If interference occurs, it may be necessary to take additional precautions such as filtering the mains supply. Consideration should be given to shielding the supply cable of permanently installed welding equipment in metallic conduit or equivalent. Shielding should be electrically continuous throughout its length. The shielding should be connected to the welding power source so that good electrical contact is maintained between the conduit and the welding power source enclosure.

Maintenance of the Welding Equipment

The welding equipment should be routinely maintained according to the manufacturer's recommendations. All access and service doors and covers should be closed and properly fastened when the welding equipment is in operation. The welding equipment should not be modified in any way except for those changes and adjustment covered in the manufacturer's instructions. In particular, the spark gaps of arc initiation and stabilizing devices should be adjusted and maintained according to the manufacturer's recommendations.

Welding Cables

The welding cables should be kept as short as possible and should be positioned close together, running at or close to the floor level.

Equipotential Bonding

Bonding of all metallic components in the welding installation and adjacent to it should be considered. However, metallic components bonded to the work piece will increase the risk that the operator could receive a shock by touching these metallic components and the electrode at the same time. The operator should be insulated from all such bonded metallic components.

Earthing of the workpiece

Where the workpiece is not bonded to earth for electrical safety, nor connected to earth because of its size and position, eg. ship's hull or building steelwork, a connection bonding the workpiece to earth may reduce emissions in some, but not all instances. Care should be taken to prevent the earthing of work pieces increasing the risk of injury to users, or damage to other electrical equipment. Where necessary, the connection of the workpiece to earth should be made by direct connection to the workpiece, but in some countries where direct connection is not permitted, the bonding should be achieved by suitable capacitance, selected according to national regulations.

Screening and Shielding

Selective screening and shielding of other cables and equipment in the surrounding area may alleviate problems of interference. Screening of the entire welding installation may be considered for special applications.

Portions of the preceding text are extracted from:
- Australian/New Zealand standard AS/NZS 3652. Permission to reproduce has been granted by Standards Australia and Standards New Zealand. For further explanation, readers should be referred to the standard itself.
- British Standards Institution standard BS EN 50199:1995. Reproduced with permission of BSI under license number 2000SK0631. Complete standards can be obtained from BSI Customer Services, 389 Chiswick High Road, London W4 4AL. United Kingdom. (Tel +44 (0) 20 8996 9001).

JAN '01

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

Please Examine Carton and Equipment For Damage Immediately

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

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

Model Name and Sales SpecNumber (K-xxx) _____

Date of Purchase _____

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

Read this Operators Manual completely before attempting to use this equipment. There are some important topics covered in the manual about how this system works and how it is different than wire feeders you may be use to. 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.**

The Wire Feeder - Gun section of the welding package is a push-pull system, which means that there is a motor in the wire feeder as well as the welding gun. These must both be set-up properly to achieve maximum benefit from the welding package.

The Wire Feeder – Gun section of the welding package is fully warranted by MK Products and Lincoln Electric and can be serviced at the MK Products Service locations listed inside the back cover of this manual.

Spare parts may be purchased from either company if so indicated by a part number in the respective company part number column in the parts listings.

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SECTION A

INSTALLATION

TECHNICAL SPECIFICATIONS

PRINCE™ XL TORCH

Wire Capacity

- .023" -.045" (0.6 - 1.2mm) solid and hard wire
- .030" - 1/16" (0.8 - 1.6mm) aluminum and cored wire

Wire Speed

- 750 ipm (19.0 mpm) max.

Duty Cycle - 100%

- **150 Amps** *Air cooled standard*
- **200 Amps** *Air cooled using optional Kool Cup Adapter & Gas Cup*
- **225 Amps** *Air Cooled using optional Heavy Duty Finned Copper Gas Cup, Adapter, & Tip*
- **300 Amps** *Water cooled standard using W/C Cup Adapter & A/C Gas Cup*
- **400 Amps** *Water cooled using optional 100% W/C Gas Cup*

All ratings are at 25V using Argon Gas

Torch weight (less leads & standard barrels)

- Air cooled - 36.4 oz. (1.02 kilogram)
- Water cooled - 38.4 oz (1.08 kilogram)

PRINCE™ XL SPOOL GUN

Wire Capacity

- .023" - .045" (0.6 - 1.2mm) solid and hard wire
- .030" - 1/16" (0.8 - 1.6mm) aluminum and cored wire

Wire Speed *

- 750 ipm (19.0 mpm) max.

Spool Size

- 4 inches (101.6mm)

Duty Cycle - 100%

- **150 Amps** *Air cooled standard*
- **200 Amps** *Air cooled using optional Kool Cup Adapter & Gas Cup*
- **225 Amps** *Air Cooled using optional Heavy Duty Finned Copper Gas Cup, Adapter, & Tip*

All ratings are at 25V using Argon Gas

Torch weight (less wire & leads)

- Air cooled - 46.5 oz (1.3 kilogram)

** Maximum ipm varies depending on input voltage, wire size and the control box used.*

Prince® XL Part Numbers		
	Air Cooled	Water Cooled
15'	K1591-1	K1592-1
25'	K1591-2	K1592-2
50'	K1591-3	K1592-3
Prince® XL Spool Gun Part Numbers		
25'	K1692-1	--
50'	L10984-2	--

Support Equipment Required

- CV or CC power source of sufficient capacity for your needs.
- Regulated gas supply and hoses.
- Properlly sized power leads from power source to wire feeder and ground.
- Water source and hose capable of providing a minimum of 1 quart (.95 liter)/minute at 45 p.s.i. when using water cooled torches.

Coolant Recommendations

Proper coolant is a very important part of keeping the water cooled Prince®XL in good working condition. Any coolant which does not contain reactive sulfur or chlorine, and which specifically does not react with copper, brass or aluminum, may be used. One such mixture has proven extremely successfull when used in conjunction with a water re-circulator. It consists of the following 3:1 mixture:

Use 3 gallons distilled water (not deionized)
Use 1 gallon ethleyne glycol
Use 1 teaspoon liquid glycerin per gallon of mixture
The coolant flow rate should be 1 quart/minute at 35 p.s.i.

Torch Lead Connections

Power Cable - Air Cooled

A #2 AWG power cable is used on the Prince®XL air cooled torch. The torch end is threaded into the torch body. The power cable fitting connects to the Power Block.

(MK P/N 003-1674) when using a Cobramatic® wire feed cabinet. When the Prince®XL is purchased as a Spool Gun, the power cable comes standard with a lug connector and should be connected to positive lug of power supply.

Power Cable - Water Cooled

Prince™XL water cooled torch utilizes a power/water cable with a #4AWG cable inside a 5/8" (16MM) diameter hose. The torch end is threaded into the torch body. The power cable fitting connects to the Power Block.

Conduit

The Prince™XL Torch comes standard with a poly lined conduit, for running aluminum wire. The longer fitting with a shallow groove is used on the torch end. A set screw located on top of the torch handle secures the conduit in place. A small spool liner (MK P/N 003-0198) is used on the spool gun and held in place by the same set screw.

Gas Hose

The gas hose is secured over the barbed gas fitting with a tie wrap. The cabinet end of the gas hose uses our standard gas fitting (1/8" - 27 nps), whereas the spool gun uses a 5/8" - 18 IAA RH male gas fitting.

Water Hose

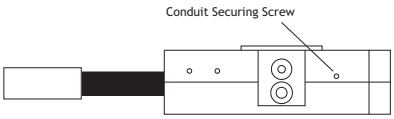
The water hose (if so equiped) is secured over the barbed water fitting with a tie wrap, in the torch body. The loose end connects to the return line of the recirculator.

Electric Cable

A seven conductor control cable is used on the Prince®XL Torch. The torch end of the control cable is secured to the torch with a boot clamp and plugged into the pot assembly and micro switch connectors. Slack is left in the electric cable as it exits the back of the torch to prevent cable breakage. The cabinet end has a seven pin "W" clocked amphenol connector. See page 22 for torch electrical connections.

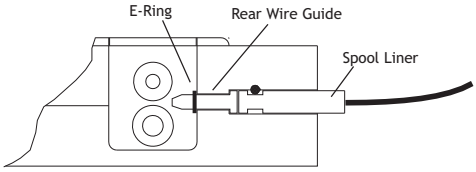
Installing Spool Assembly (P/N 003-2090)

Loosen the screw that secures the conduit through access hole located on



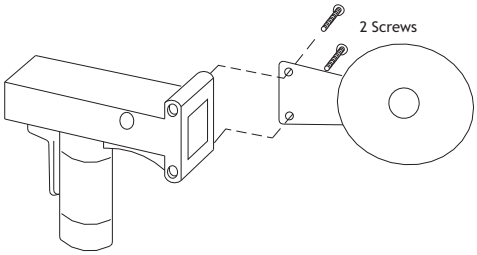
top right rear handle with a 1/16" Allen wrench.

Remove conduit by pulling it out of the back of the gun.



Install spool liner, and secure with screw.

Remove both rear handle screws, and secure spool canister with longer



screws provided.

Spool Gun Setup

Loading Electrode Wire

Unscrew, and remove spool cover.

Apply tension to drive rolls, so the wire will be picked up and fed through the contact tip.

Straighten out first six inches of wire and push through liner.

Jog trigger until wire is picked up by drive rolls and fed through contact tip.

Hold brake assembly back towards top of gun, load spool onto shaft with wire coming off the bottom of the spool. Release brake assembly to rest on wire surface.

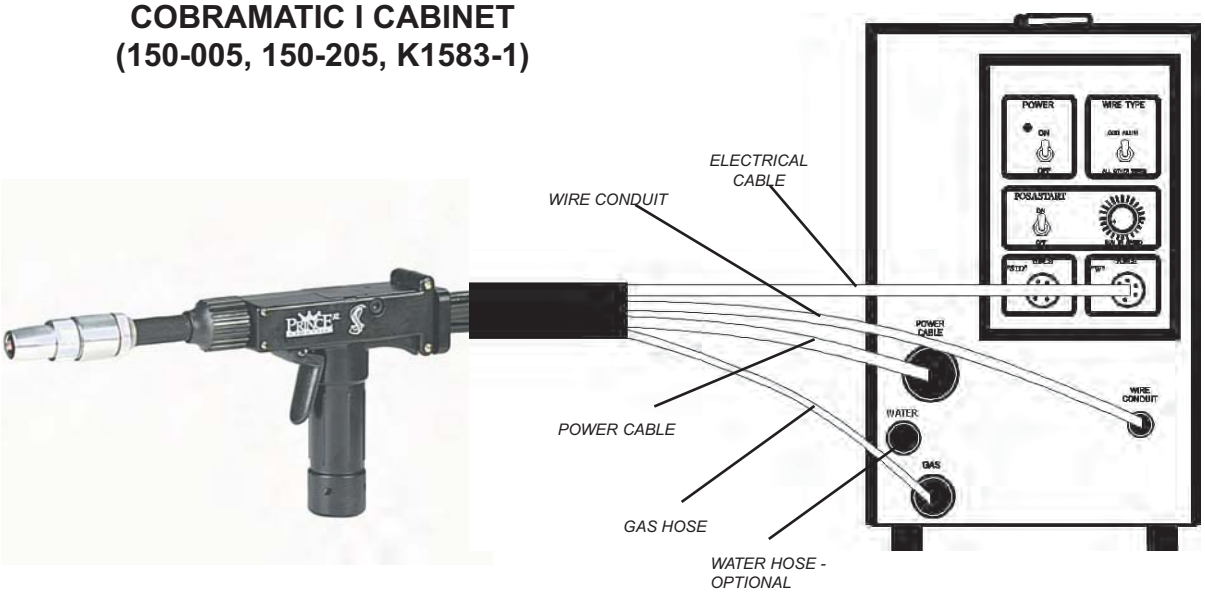
Replace spool cover, making sure opening is over liner.

Note:

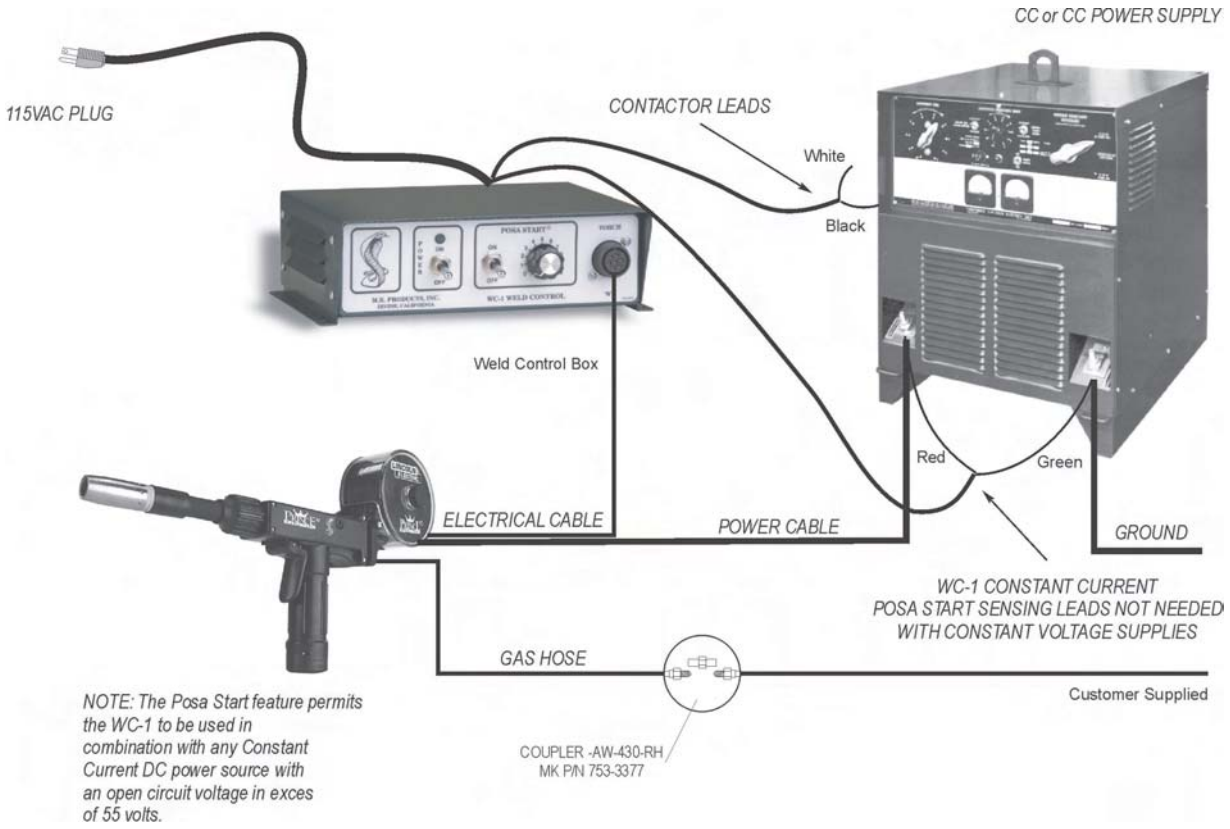
The brake paddle assembly is designed to automatically control spool drag and keep the wire from jumping off the spool.

INTERCONNECTIONS

PRINCE™XL TORCH TO COBRAMATIC I CABINET (150-005, 150-205, K1583-1)



PRINCE™XL SPOOL GUN TO WC-1 WELD CONTROL BOX



Section B

Operation

General

The Prince™XL torch maintains a constant, steady, uniform wire feed speed, regardless of curved or looped wire conduit. The constant push exerted by the slave motor in the cabinet, combined with the pull of the torch motor, causes the wire to literally float friction-free through the wire conduit. The 24VDC torch motor is controlled by a 3-3/4 turn potentiometer in the torch handle.

Barrels

Air Cooled

The Prince™XL air cooled systems (K1591 series) come standard with a straight barrel. An optional curved air cooled barrel assembly is also available as a spare part. The end of the air cooled barrels have an adapter that is easily replaced if the cup threads become damaged. The adapter is threaded onto the barrel. The barrel assembly locks to the Prince™XL body using the patented EZ Lock™ system.

Water Cooled

The Prince™XL water cooled systems (K1592 series) come standard with a straight water cooled barrel assembly. An optional curved water cooled barrel assembly is also available as a spare part.

Barrel Removal and installation

To remove a barrel assembly, loosen the patented EZ Lock™ Taper lock nut assy MK P/N 003-2572 (see page 22, item 1) 3/4 to 1 turn. This will push barrel away from the body far enough so that it may be pulled out of the body.

To replace a barrel assembly, take care not to damage the “O” rings when inserting into the body. Open the drive and idler roll door and seat the barrel assembly until the inlet guide is almost touching the drive and idler roll and the rear face of the barrel is flush with the aluminum body block (see diagram). Tighten taper lock nut assembly firmly so that barrel cannot rotate.

Barrel Rotation

To rotate a barrel assembly, loosen the patented EZ Lock™ Taper lock nut assembly no more than 1 turn. Rotate barrel to the position of your choice and retighten taper lock nut assembly firmly so that the barrel cannot rotate.

WARNING:

Do not attempt to weld without the barrel being tightly secured in the torch body, or damage to the barrel or body may result.

Controls And Settings

Potentiometer

The pot is located in the bottom of the pistol grip and provides 3-3/4 turns of rotation and up to 750 ipm.

The pot is mounted to one side of a PC board and is held in place by a support plate; both of which have slots that locate and secure the pot in the handles. The other side of the PC board houses the motor connectors and ribbon cable. Locking disks behind the pot knob provides a stop at the minimum and maximum pot settings.

Trigger, Gas Valve and Micro Switch

The torch trigger is designed so that when it is partially depressed, gas flow starts via the valve located in the torch body, prior to ignition of the arc. When the trigger is partially released after welding (extinguishing the arc), gas flow continues until the trigger is fully released; built-in pre and post gas flow.

The micro switch is wired “Normally Open” and secured to the torch block with two (2) screws. An insulator between the torch block and micro switch prevents accidental shorting of the switch leads. The trigger pin reaches through the handle and activates the micro switch just before the trigger bottoms out on the handle.

Drive And Idler Rolls

General

The Prince™XL torch comes standard with knurled drive rolls which will handle wire diameters from .023 - 1/16 inch. Optional grooved drive rolls are also available for feeding aluminum wire if desired (see Optional kits).

Drive roll tension is accomplished by means of a pressure adjusting allen screw located on the left hand side of the torch. Proper tension is achieved when wire does not slip if a small amount of pressure is added to the wire as it exits the tip.

---------- IMPORTANT ----------

NOTE: Over-tightening of the drive rolls will cause excessive knurling and/or deformation of the wire. When the complete system is setup properly, feeding wire out of the end of the torch and letting fall on the ground should form a large uniform circle. If it forms a spiral or spring then there is too much tension in the system, please refer to the Cabinet Owners Manual for adjustment to the tension setting.

INCORRECT DRIVE ROLL TENSION IS THE NUMBER ONE CAUSE OF POOR WIRE FEED PERFORMANCE

Drive Roll Installation And Removal

Note:

Neither of the handles needs to be removed to access the Drive or Idler Rolls.

1. Using a 5/32” hex wrench, loosen the Idler Roll tension screw. This will relieve the pressure against the drive roll.

2. Align the Drive Roll Removal Tool (P/N 931-0100) over the flats of the drive roll. Hold the torch with one hand or on a table top, with the other hand give the Removal Tool a quick snap-turn in the CLOCKWISE DIRECTION.

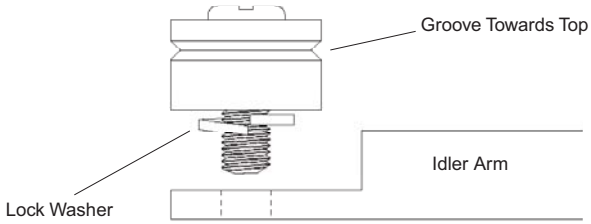
3. Once the drive roll is loose, continue to spin drive roll in the clockwise direction to remove the drive roll from the torch.

4. Install a new drive roll on the left-hand threaded shaft. The drive roll will self-tighten when it is feeding wire.

Idler Roll Installation And Removal

1. Using a slot type screwdriver, loosen idler screw, taking care not to lose lock washer under idler roll.

2. Insert new idler roll and lock washer onto screw, insuring that idler groove is toward top and lock washer is beneath.



3. Tighten.

4. Using a 5/32” hex wrench, turn the Idler Roll tension screw into the gearbox housing and reference the Gearbox Assembly drawing to adjust the pressure against the drive roll.

NOTE:
Lock washer must be under idler roll or it will not turn freely.

Section C

Accessories

Contact Tips - Air Cooled Barrel Assy.

Contact Tips for Prince XL Air Cooled Torch					
Wire Size	Tip I.D.*	Arc Type	Length	LE P/N	MK P/N
.023" (0.6mm)	.030" (0.8mm)	Spray Arc	1-1/2" (38mm)	___	621-0057
		Short Arc	1-3/4" (44mm)	___	621-0328
.030" (0.8mm)	.036" (0.9mm)	Spray Arc	1-1/2" (38mm)	___	621-0325
		Short Arc	1-3/4" (44mm)	___	621-0326
.030" (0.8mm) or .035" (0.9mm)	.040" (1.0mm)	Spray Arc	1-1/2" (38mm)	S23978-29	621-0076
		Short Arc	1-3/4" (44mm)	___	621-0077
.035" (0.9mm)	.044" (1.1mm)	Spray Arc	1-1/2" (38mm)	S23978-1	621-0001
		Short Arc	1-3/4" (44mm)	___	621-0002
.045" (1.2mm)	.053" (1.3mm)	Spray Arc	1-1/2" (38mm)	___	621-0327
.045" (1.2mm) or .052" (1.3mm)	.060" (1.5mm)	Spray Arc	1-1/2" (38mm)	S23978-2*	621-0003
		Short Arc	1-3/4" (44mm)	___	621-0286
1/16" (1.6mm)	.075" (1.9mm)	Spray Arc	1-1/2" (38mm)	S23978-3	621-0075
1/16" (1.6mm)	.085" (2.1mm)	Spray Arc	1-1/2" (38mm)	___	621-0153
		Short Arc	1-3/4" (44mm)	___	621-0154

* Standard - Furnished with torch.
All tips stamped with tip I.D.

NOTE: As a rule of thumb, use the smaller I.D. tip for steel, stainless steel and the 5000 series aluminium.
Softer alloys such as the 100 and 400 series aluminum require more clearance and , therefore, use a larger I.D. tip.

Gas Cups - Air Cooled Barrel Assy.

Gas Cups for Prince XL Air Cooled Torch			
SIZE	I.D.	LE P/N	MK P/N
5	1/4" (6.4mm)	___	621-0079
6	3/8" (9.5mm)	___	001-0137
8	1/2" (12.7mm)	S23978-4*	001-0138
10	5/8" (15.8mm)	___	001-0139

*Standard - Furnished with torch

Contact Tips - Water Cooled Barrel Assy.

Contact Tips for PrinceXL Water Cooled Torch					
Wire size	Tip I.D.	Arc	Tip Length	LE P/N	MK P/N
.030" / .8mm	.040" / 1.0mm	Spray Short	1-5/8" / 41.3mm 1-7/8" / 47.6mm	S23978-30 ___	621-0158 621-0165
.035" / .9mm	.044" / 1.0mm	Spray Short	1-5/8" / 41.3mm 1-7/8" / 47.6mm	S23978-9 ___	621-0157 621-0166
.045" / 1.2mm	.053" / 1.35mm	Spray Short	1-5/8" / 41.3mm 1-7/8" / 47.6mm	___ ___	621-0161 621-0167
.052" / 1.4mm	.060" / 1.5mm	Spray Short	1-5/8" / 41.3mm 1-7/8" / 47.6mm	S23978-10* ____	621-0162* 621-0168
.063" / 1.6mm	.075" / 1.9mm	Spray Short	1-5/8" / 41.3mm 1-7/8" / 47.6mm	S23978-11 ___	621-0163 621-0169
.063" / 1.6mm	.085" / 2.16mm	Spray	1-5/8" / 41.3mm	___	621-0164
.093" / 2.3 mm	.113" / 2.8 mm	Spray	1-5/8" / 41.3mm	___	621-0215

To remove contact tip when using fulll water cooled gas cup (P/N 621-0065) the contact tip removal tool (P/N 931-0002) must be used.

* Standard - furnished with torch

Spring LoadedContact Tips - Water Cooled Barrel Assy

Spring Loaded Contact Tips for Prince XL Water Cooled Torch		
MK P/N	Tip I.D.	Tip Length
621-0202	0.044" / 1.1 mm	1-5/8" / 41.3 mm lg
621-0203	0.053" / 1.4 mm	1-5/8" / 41.3 mm lg
621-0204	0.060" / 1.5 mm	1-5/8" / 41.3 mm lg
621-0205	0.075" / 1.9 mm	1-5/8" / 41.3 mm lg

Note: To remove contact tip when using full water cooled gas cup (P/N 621-0065) the contact tip removal tool (P/N 931-0002) must be used.

Gas Cups - Water Cooled Barrel Assy.

Water Cooled Cup for Prince XL Water Cooled Torch				
Cup Size	Cup I.D.	Cup Length	LE P/N	MK P/N
No. 10	5/8" (15.9mm)	3" (76.2mm)	S23978-19	621-0065
Air Cooled Cups for Prince XL Water Cooled Torch				
Cup Size	Cup I.D.	Cup Length	LE P/N	MK P/N
No. 6	3/8" (9.5mm)	1.43" (36.5mm)	___	621-0170
No. 8	1/2" (12.7mm)	1.43" (36.5mm)	S23978-12*	621-0159*
No. 10	5/8" (15.9mm)	1.43" (36.5mm)	___	621-0160

To use air cooled gas cups, you must order a cup retaining nut (MK P/N 449-0193*) and a water cooled gas adapter (MK P/N 621-0101*).
*Standard - supplied with torch

Torch Barrel Liners

Prince^{AE} XL Torch Barrel Liners					
Barrel P/N	**Description**	**Wire Type**	**Wire Size**	**LE P/N**	**MK P/N**
003-1980	Straight Air Cooled	All Wires	.030" - .063" (.8-1.6mm)	S23978-15*	615-0537
003-1980	Straight Air Cooled	Optional All Wires	.030 - .035" (.8-.9mm)	—	615-0544
003-1973	Straight Water Cooled	All Wires	.030" - .063" (.8-1.6mm)	S23978-16*	615-0323
003-1973	Straight Water Cooled	Optional All Wires	.030 - .035" (.8-.9mm)	—	615-0545
003-1986	Curved Air Cooled	All Wires	.030" - .063" (.8-1.6mm)	S23978-26*	615-0539
003-1986	Curved Air Cooled	Optional All Wires	.030 - .035" (.8-.9mm)	—	615-0546
003-1986	Curved Air Cooled	Steel Wire Only	.030" - .063" (.8-1.6mm)	—	615-0547
003-1987	Curved Water Cooled	All Wires	.030" - .063" (.8-1.6mm)	—	615-0539*
003-1987	Curved Water Cooled	Optional All Wires	.030 - .035" (.8-.9mm)	—	615-0546
003-1987	Curved Water Cooled	Steel Wire Only	.030" - .035" (.8-1.2mm)	—	615-0547

Bulk teflon liner material for .030 - .063" (.8-1.6mm) is P/N 615-0178
Bulk teflon liner material for .030 - .035" (.8-.9mm) is P/N 615-0177

*Standard - furnished with torch

NOTE: P/N 615-0547 is a spiral steel liner. All other liners are white teflon.

Barrel Assemblies

ALL BARRELS RATED AT 100% DUTY CYCLE

Standard 003-1980
150 Amp, Air Cooled

Standard 003-1973
300 Amp, Water Cooled

Standard, curved 003-1986
150 Amp, Air Cooled

Standard, curved 003-1987
300 Amp, Water Cooled

OPTIONAL
Standard Curved,
200 Amp
Air-Cooled barrel with
Kool Cup adapter & cup

OPTIONAL
Standard Curved,
400 Amp
Water-Cooled barrel with
water cooled cup

OPTIONAL
Standard Curved,
200 Amp
Air-Cooled barrel with
Finned Copper Cup

Optional 12" and 18" Water Cooled Straight and Curved Barrel Assemblies

12" Straight Water Cooled Barrel Assembly 003-2085
12" Curved Water Cooled Barrel Assembly 003-2086
18" Straight Water Cooled Barrel Assembly 003-2087
18" Curved Water Cooled Barrel Assembly 003-2088

Optional Kits

Insulated drive roll kits are used to prevent preheating of the wire which may soften it and clog the liner. This picking up of current at the drive rolls rather than at the contact tip is usually not a problem usless using too large of a contact tip or excessively oxidized aluminum wire.

Insulated Groove Drive Roll Kit.....(MK P/N) 005-0640
For .030" (0.8mm) dia. aluminum wire.
Includes and insulated drive roll P/N 511-0150 and idler roll assy. P/N 003-2097.

Insulated Groove Drive Roll Kit..... (LE P/N) KP1594-035
..... (MK P/N) 005-0641)
For .035" (0.9mm) dia. aluminum wire.
Includes insulated drive roll
P/N 511-0151 and idler roll assy. P/N 003-2097.

Insulated Groove Drive Roll Kit.....(MK P/N) 005-0642
For .040" (1.0mm)dia. aluminum wire.
Includes insulated drive roll
P/N 511-0152 and idler roll assy. P/N 003-2097.

Insulated Groove Drive Roll Kit.....(LE P/N) KP1594-3/64
.....(MK P/N) 005-0643
For .045" (1.2mm) dia. aluminum wire.
Includes insulated drive roll
P/N 511-0153 and idler roll assy. P/N 003-2097.

Insulated Groove Drive Roll Kit.....(LE P/N) KP1594-1/16
.....(MK P/N) 005-0644
For .062" (1.6mm) dia. aluminum wire.
Includes insulated drive roll
P/N 511-0154 and idler roll assy. P/N 003-2097.

Optional Accessories

Conduits

Flat Spiral Steel Conduit for steel & cored wire.		Standard Conduit with additional protective cover.	
615-0208	15 ft./4.5m	001-0774	15 ft./4.5m
615-0216	25 ft./7.6m	001-0775	25 ft./7.6m
615-0218	50 ft./15.2m	001-1278	35 ft./10.5m
		001-0777	50 ft./15.2m

NOTE: *The protective cover is used to help protect the conduit from burns.*

25' 7 Pin Amphenol Extension Cable . . . . . (MK) 005-0260
Used to extend the spool gun. Two cables may be joined together for 50' extension. Power & gas cables not included.

Snake Skin zipper cover
Leather Snake Skin protective covers are now standard on all torches. You may order replacement covers to protect the lead assembly of the torch when the original factory cover becomes damaged or worn. The Velcro® closure makes it easy to replace in the field.

13' cover fits 15' lead	(MK) 931-0110
23' cover fits 25' lead	(MK) 931-0122
48' cover fits 50' lead	(MK) 931-0123

Prince™XL Handle Kit.....(MK P/N) 005-0633
Includes left and right handle with door, trigger and pin,and all handle screws.

Spool Adaptor Kit.....(MK P/N) 005-0632
Includes left and right handle with door, trigger and pin,and all handle screws. Used to change a standard 212-xxx or 213-xxx series Prince™XL torch into a Spool Gun.

One Heavy Duty Contact Tip, one Heavy Duty Gas Cup Adapter, one Finned Copper gas cup and one 615-0331 Torch Liner must be ordered and used together as an assembly.

Heavy Duty Contact Tips - Air Cooled Barrel Assy.

Heavy Duty Contact Tips for Prince XL Air Cooled Torch*				
Wire Size	**Tip I.D.***	**Arc Type**	**Length**	**MK P/N**
.030" (0.8mm)	.040" (1.0mm)	Spray Arc	1-5/8" (41.3mm)	621-0390
		Short Arc	1-7/8" (47.6mm)	621-0396
.035" (0.9mm)	.044" (1.1mm)	Spray Arc	1-5/8" (41.3mm)	621-0391
		Short Arc	1-7/8" (47.6mm)	621-0397
045" (1.2mm)	.053" (1.3mm)	Spray Arc	1-5/8" (41.3mm)	621-0392
		Short Arc	1-7/8" (47.6mm)	621-0398
.052" (1.3mm)	.060" (1.5mm)	Spray Arc	1-5/8" (41.3mm)	621-0393
		Short Arc	1-7/8" (47.6mm)	621-0399
1/16" (1.6mm)	.075" (1.9mm)	Spray Arc	1-5/8" (41.3mm)	621-0394
		Short Arc	1-7/8" (47.6mm)	621-0400
1/16" (1.6mm)	.085" (2.1mm)	Spray Arc	1-5/8" (41.3mm)	621-0395

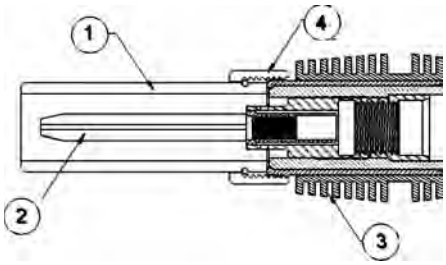
* using Heavy Duty Cup Adapter P/N 431-1631
All tips stamped with tip I.D.

Finned Copper Gas Cups - Air Cooled Barrel Assy.

Finned Copper Gas Cups for Prince XL Air Cooled Torch		
Size	**I.D.**	**Part No.**
n/a	H.D. Gas Cup Adapter	431-1631
8	1/2" (12.7mm)	621-0249
10	5/8" (15.8mm)	621-0250
10 H.D.	5/8" (15.8mm)	621-0251
12 H.D.	3/4" (19.0mm)	621-0252

Kool Cup Adapter And Cups

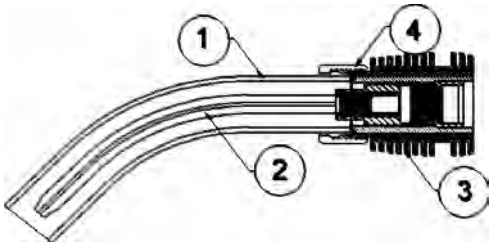
Note :
These parts are used on the air cooled straight or curved barrel assemblies to increase the capacity from 150 amps to 200 amps @ 100%



Kool Cup Adapter Heavy Duty			
Item No.	LE P/N	MK P/N	Description
1	S23978-17	621-0388	#8 Gas Cup for Kool Cup Adapter
1	--	621-0386	#10 Gas Cup for Kool Cup Adapter
2	--	see page 8	Use standard Prince tips
3	S23978-18	003-1487	Kool Cup Adapter
4	S23978-14	449-0193	Nut Cup retainer

Gas Cup And And Contact Tips- 48°

Note :
Must be used with Kool Cup Adapter and Cup Retaining Nut with straight air cooled barrel assemblies.



48 Degree PrinceXL Air Cooled Torch Cup and Tips Must be used with Kool Cup Adapter and Cup Retaining Nut				
LE P/N	MK P/N	Item #	Description	Wire Size
S23978-18	003-1487	3	Kool Cup Adapter	N/A
S23978-14	449-0193	4	Cup Retaining Nut	N/A
--	621-0375	1	48 Degree Curved Gas Cup	N/A
--	621-0387	2	48 Degree Tip .040 ID	.023"
--	621-0381	2	48 Degree Tip .045 ID	.030"
--	621-0382	2	48 Degree Tip .052 ID	.035"
--	621-0383	2	48 Degree Tip .060 ID	.045"
--	621-0384	2	48 Degree Tip .075 ID	3/64" - 1/16"
--	621-0385	2	48 Degree Tip .085 ID	1/16"

Prince Spool Gun Controls

WC-1
P/N 001-3062


WC-1

The WC-1 is desinged to hookup to any CV or CC power supply having its own contactor. CC Posa Start “run-in speed” is included as a standard feature. The control operates on 115VAC, 50-60hz power. For macines such as gas drives that do not have contactors, the MK200 Contactor Box (P/N 001-3066) must be used.

MK200 Contactor Box
P/N 001-3066

MK200 Contactor Box

PA-L1 Spool Gun Control - Lincoln
P/N 005-0676

Spool Gun Control - Lincoln

Connects directly to Lincoln Electric power supplies (42V system) with 14-Pin (X-clocked) amphenol connectors, such as:

CV 250	CV 300	CV 400
CV 655	DC 400	DC 600
DC 655	V350-Pro (factory model)	Ranger 250
Range 275	Ranger 305G	

PA-M1 Spool Gun Control - Miller
P/N 005-0261

Spool Gun Control - Miller

Connects directly to Miller power supplies (24V system) that are classified with 14-Pin amphenols as type 6 or 9 and to Thermal Arc units, such as:

MILLER SUPPLIES		***THERMAL ARC***
Millermatic 200	Deltaweld's	Thermal Arc 300GMS CC/CV
Shopmaster	CP Series	Fabricator 210, 250, 300 LF
XMT's & Maxtron	Trailblazer 250, 251	
Regency's		

Any Gas-drive that has a CV tap and contactor installed with a 14 pin amphenol.

PA-G1 Spool Gun Control - Generic
P/N 005-0264

Spool Gun Control - Generic

This Generic Torpedo is designed to hook-up to CV power supplies that supply an auxiliary 26 VAC @ 1.7 amps and uses a closing contact signal. The unit is supplied with bare wires that must be connected to the power supply. Some examples of power supplies that can be hooked-up are:

Lincoln SP-250, 255 & Wirematic 250 & 255
Beta-Mig 200 & Beta-Mig LF

Airco Dip-Pak 200, 225 & 250

ESAB (L-TEC) / MigMaster 250
P/N 005-0206


ESAB (L-Tec-Linde) MigMaster 250

An amphenol adaptor cable and gas/power lug are all that is needed to connect to the Migmaster. Adaptor kit includes everything needed.

MillerMatic 250 & Vintage / Hobarts BetaMig 2510
P/N 005-0205

This easy to install, plug in module fits the Millermatic 250, Miller Vintage machine, or Hobart Betamig 2510. It and a Prince Spool Gun are all that is needed to get your customer up and running.

MillerMatic 250, Vintage and BetaMig 2510

Panasonic Gunslinger 260
P/N 005-0617

Easy to install adapter cable using Gunslinger speed control.


Panasonic Gunslinger 260

ESAB MigMaster 251
P/N 005-0624

A panel kit plugs directly into the front of the MigMaster 251 and includes everything that is needed to interface the spool gun.

ESAB MigMaster 251

MillerMatic 250X
P/N 005-0629

Easy to install adapter cable using MillerMatic 250X speed control.


MillerMatic 250X

Section D

Maintenance

Periodic Maintenance

Maintenance of the torch will normally consist of a general cleaning of the wire guide system, including tubes, drive rolls, and conduits at regular intervals.

Remove spatter build-up from inside of nozzles with a hardwood stick.

The only parts on the Prince® XL that are subject to normal wear are the conduit, contact tips, gas cups, barrel liners, drive and idler rolls. A supply of these parts should be maintained on hand.

If repairs do become necessary, qualified shop maintenance personnel can easily replace any part.

Your Cobramatic System is designed to provide years of reliable service. Normal wear and component failure may require occasional service.

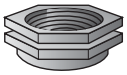
The number of units in operation and the importance of minimal “down time” will determine to what extent spare parts should be stocked on hand. See the “Recommended spare parts list” for the most commonly replaced parts.

Maintenance Tools		
Tool	LE P/N	MK P/N
Gas Valve Removal Tool	----	931-0584
Contact Tip Removal Tool	S23978-21	931-0002
Drive Roll Removal Tool	----	931-0100

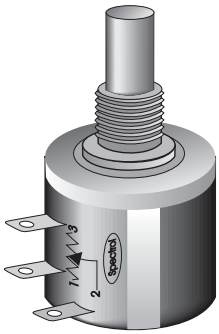
Recommended Spare Parts List			
Part Number	Description	Part Number	Description
615-0007	Conduit 15'	325-0206	Idler Roll Screw
615-0008	Conduit 25'	333-0082	Idler Roll Washer
005-0661	Potentiometer Kit	003-0585	Trigger Assy.
003-0568	Micro Switch	431-3117	Door
005-0633	Handle Kit	003-0198	Wire Guide-Spool Gun
511-0101	Drive Roll	003-2072	Brake Assy.-Spool Gun
511-0001	Idler Roll	003-2071	Cover Assy.-Spool Gun

Knob
401-0521

"O" Ring
303-0540



Nut
449-0542



Pot
117-0520

Potentiometer Assembly

Idler Roll
511-0001

Drive Roll
511-0101

Micro Switch
161-0002

SECTION E

TROUBLESHOOTING

Regardless of which torch or feeder used, all MK Products push-pull guns operate on the same principle. The 115 VAC or 42VAC slave motor in the feeder runs at a fast, constant speed, but has very low torque. It is always trying to feed more wire than the torch motor wants, and when the motor gets all it wants, it slows the slave motor, preventing a bird's nest. Because of the low torque produced by the slave motor, a brake system is used to prevent wire overrun rather than tension.

The 24 VDC torch motor is controlled by a solid state speed control and a pot located in the torch. The torch motor, potentiometer, and micro switch are connected to the cabinet/control box via a control cable and amphenol. If this cable becomes damaged, a variety of symptoms can occur, depending on which wire(s) break. To test, check each wire for continuity and shorts.

With the increased torque rating in the current Prince XL motor, P/N 211-0071, it now draws about twice as much current on start-up as the original Prince motors P/N's 211-0054 & 211-0056. Even though the duration of start-up is very short, about 15msec, it is too much for the standard 2A fuse to handle. For this reason, all 2A fuses in the motor circuitry (F1) should be changed to a 3AG 4A fast blow 250V fuse, P/N 151-0043. This new 4A fuse is sufficient for use on all model welding guns on the wire feeders, while still providing protection for the circuitry from any shorts in the motor or motor leads.

This fuse change includes all Cobramatic, Cobramatic II and CobraMig 250/260, WC-1, Torpedo's, and any other motor circuits powering Prince XL or Spool Guns using motor P/N 211-0071.

Remember the micro switch in the torch activates both the 115 VAC or 42 VAC and 24 VDC circuits in the cabinet. Therefore, if the slave motor and brake solonoid operate, but the torch does not, look more toward the 24 VDC circuits, speed control, control cable, or the torch motor. If nothing operates, look more toward the 115 VAC or 42 VAC input, micro switch leads, or micro switch.

The complete pot assembly is connected to the motor and set into the handles. If the pot is disassembled, the pot knob can be put on the shaft in any position and secured with the set screw. Turn the knob fully CCW, then fully CW, then fully CCW again. This will self-align the pot, i.e., fully CCW will be minimum wire feed speed, and fully CW will be maximum wire speed.

TROUBLESHOOTING GUIDE		
TROUBLE	**CAUSE**	**REMEDY**
No wire feed at torch, feeder not operating, i.e. no slave motor or brake solenoid.	115/42VAC control fuse in feeder.	Replace fuse.
	Micro-switch defective/not being activated.	Replace switch. Check switch for operation.
	Broken electrical cable.	Check micro-switch wires for continuity.
No wire feed at torch, feeder operating properly.	4 amp fuse (F1) in feeder/Control box blown.	Check motor leads for shorts;then replace fuse.
	Bad potentiometer.	Check potentiometer with meter.
	Broken electrical cable.	Check motor and potentiometer wires for continuity.
	Bad speed control/PCB.	See specific cabinet/control box owners manual for speed control operation.
Wire feeds, but welding wire is not energized.	Loose or no cable connections.	Check all power connections
	Contactor control cable loose or in wrong position	Check power supply owners manual for location and type of contactor signal required, i.e., closing or 115 VAC.
	Welding power source.	Check power source manual.
Wire feeds erratically.	Dirty or worn conduit	Blow out or replace conduit
	Incorrect pressure on drive rolls	Adjust pressure at both feeder and torch
	Idler roll stuck.	Check for lock washer under idler roll, or replace if damaged.
	Wrong size contact tip.	See contact tip table.
Wire feeds one speed only.	Bad potentiometer.	Check with meter.
	Broken electrical cable.	Check potentiometer wires for continuity or short
	Bad speed control.	See specific cabinet/control owners manual for speed control operation.
Wire walks out of drive rolls.	Idler roll upside-down.	Place groove in idler roll toward top.
	Rear wire guide missing.	Replace wire guide
Poor gas/water flow	Incorrect placement of barrel insulator	Slide barrel insulator down and thread until it bottoms out, covering coolant ports and exposing gas ports.

Testing The Torch

Motor Check

Remove the torch connector from the cabinet.

Using the torch Amphenol, 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.

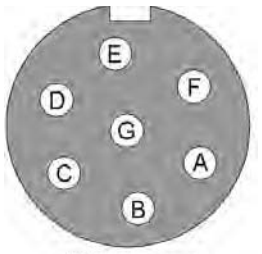
Testing the Potentiometer

Using the torch Amphenol, check the resistance across pin “D” (wiper) and pin “C”. The resistance should vary from 0 - 5K ohms.

Check the resistance across pin “D” (wiper) and pin “G”. The resistance should vary from 5K - 0 ohms.

Testing the Micro Switch

Using the torch Amphenol, check for continuity across pins “E” and “F” when the trigger is pressed.



"W" Clocked
Amphenol Connector
Viewed from front of connector

Section F

Appendices

Diagrams/Parts Lists

003-1792 (MK) Head Body.....23

003-1259 (MK) Torch Head.....24

K1692-1 (LE) / 001-1375 (MK) Spool Gun (25ft).....25

L10984-2 (LE) / 001-1376 (MK) Spool Gun (50ft).....25

S23978-23 (LE) / 003-1980 (MK) 7” Air Cooled Straight Barrel Assembly 26

S23978-25 (LE) / 003-1986 (MK) 7”Air Cooled 45° Barrel Assembly 27

S23978-22 (LE) / 003-1973 (MK) Water Cooled Straight Barrel Assembly, 7” 28

S23978-24 (LE) / 003-1987 (MK) Water Cooled 45° Barrel Assembly, 7” 29

003-2090 Spool Assembly 30

Air Cooled Lead Assembly 31

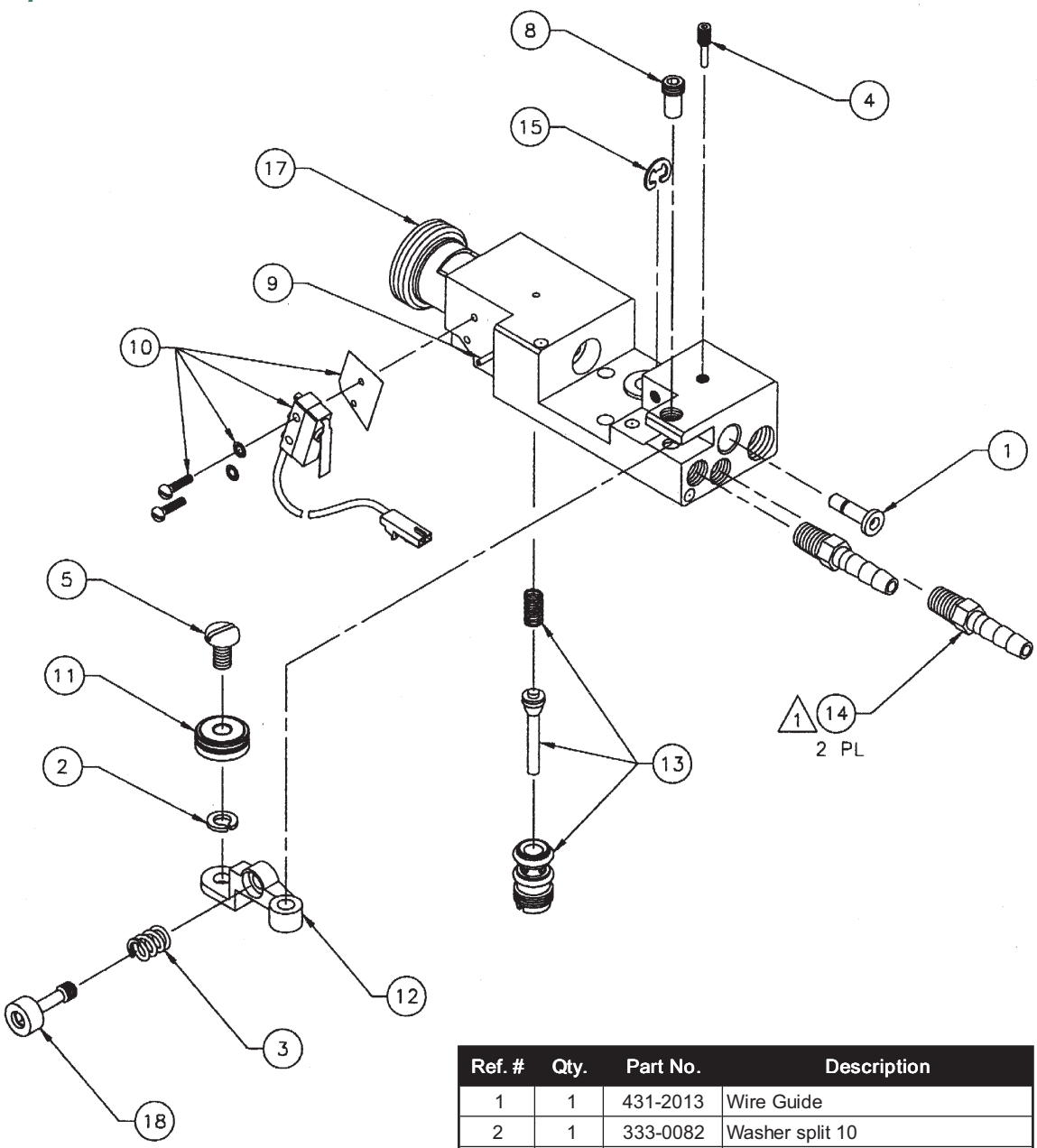
Water Cooled Lead Assembly 32

Spool Gun Lead Assemlby 33

Control Cable 34

Schematic.....35

Head Body, Exploded View
MK P/N 003-1972c



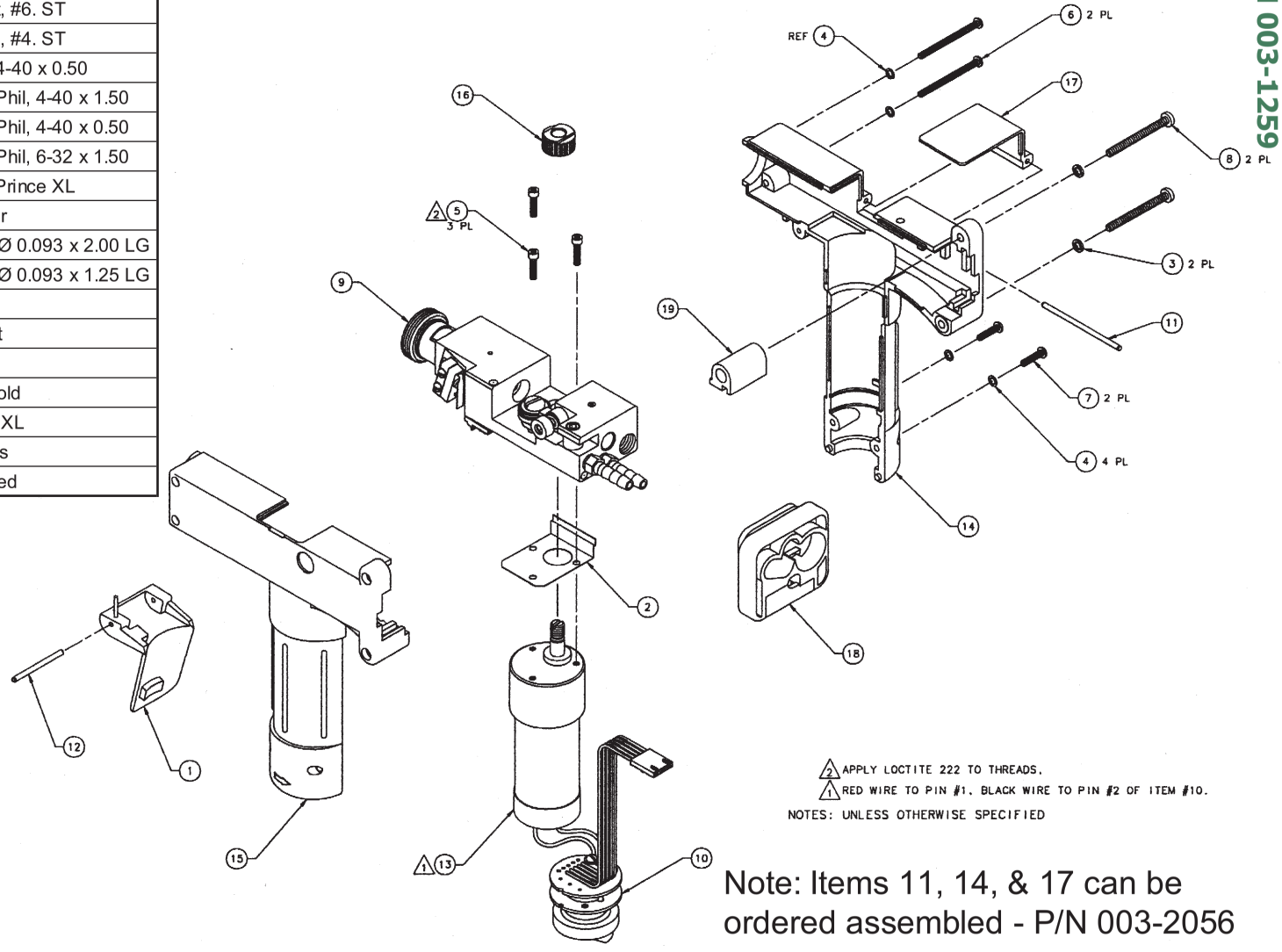
Ref. #	Qty.	Part No.	Description
1	1	431-2013	Wire Guide
2	1	333-0082	Washer split 10
3	1	419-0020	Spring compress 0.29 od x 0.047
4	1	321-1074	Set scr mod 6-32unc x 5/8
5	1	325-0206	Screw pan head 10-24-3/8
8	1	431-1427	Pivot pin
9	1	421-0129	Pin spring 0.063 x 0.437
10	1	003-0568	Micro switch assy
11	1	511-0001	Idler wire feed assy
12	1	431-1424	Idler arm
13	1	001-0562	Gas valve cobra
14	1	431-3034	Fitting 3/16 hose to 1/16-27npt
15	1	313-0008	E-ring shaft 0.188
17	1	002-0573	Main body assy
18	1	002-0583	Adjust screw idler arm
19	A/R	823-0044	Sealand, Pipe thread

Items numbers 6,7, and 16 are not used.

Note: If Cobramatic Wire Feeder is equipped with a gas solenoid kit, a modified gas value stem (p/n 431-1080) must be installed in torch to allow gas flow from cabinet value.

Torch Head, Exploded View
MK P/N 003-1259

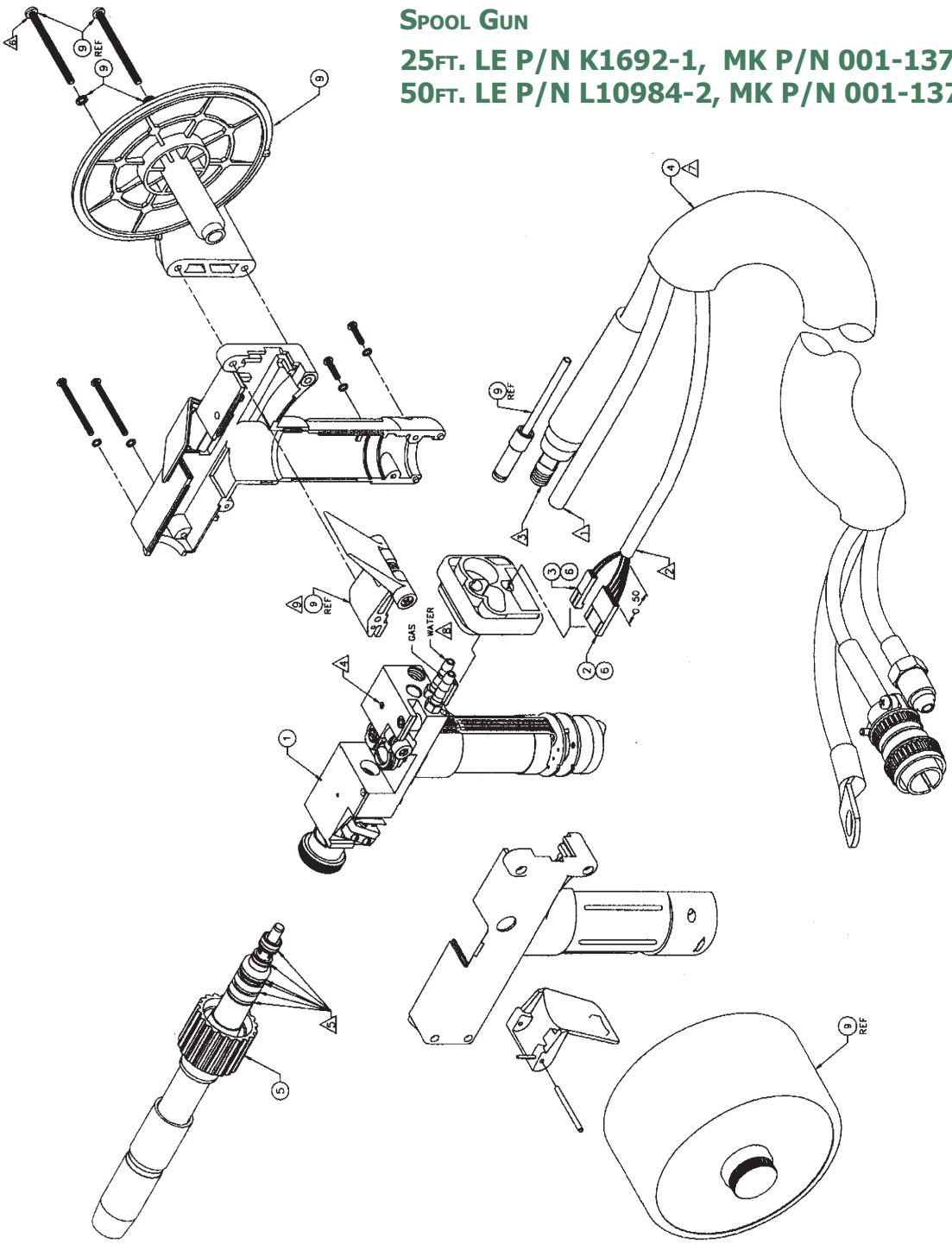
No.	Qty.	Part No.	Description
1	1	003-0585	Trigger Assy. Prince XL
2	1	435-3124	Spring, Door, Prince XL
3	2	333-0005	Washer, Split, #6. ST
4	4	333-0003	Washer, Split, #4. ST
5	3	328-0003	Screw, Shc, 4-40 x 0.50
6	2	336-0056	Screw, Pnh, Phil, 4-40 x 1.50
7	2	336-0003	Screw, Pnh, Phil, 4-40 x 0.50
8	2	336-0070	Screw, Pnh, Phil, 6-32 x 1.50
9	1	003-1972	Head Body, Prince XL
10	1	003-0567	Potentiometer
11	1	421-0408	Pin, Dowel, Ø 0.093 x 2.00 LG
12	1	421-0409	Pin, Dowel, Ø 0.093 x 1.25 LG
13	1	211-0071	Motor
14	1	436-0136	Handle, Right
15	1	436-0137	Handle, Left
16	1	511-0101	Drive Roll, Gold
17	1	431-3117	Door, Prince XL
18	1	003-1974	Clamp, Leads
19	1	437-0237	Spacer Molded



Note: Items 11, 14, & 17 can be ordered assembled - P/N 003-2056

Spool Gun

25ft. LE P/N K1692-1, MK P/N 001-1375(A)
50ft. LE P/N L10984-2, MK P/N 001-1376



No.	Qty.	Part No.	Description
1	1	003-1259	Assy Head
2	1	153-0857	Conn Molex 5 Pos
3	1	153-0856	Conn Molex 2 Pos
4	1	001-1317	Lead 25 ft. Spool
4	1	001-1318	Lead 50 ft. Spool
5	1	003-1980	Barrel Straight 7.00
6	1	153-0852	Pin
7	1	411-0045	Tie Wrap
8	.13 ft	739-0006	Tube H/S Ø 1/4
9	1	003-2090	Assy Spool Lincoln

△ REPLACE SPACER (437-0237) WITH ASSY BRAKE (003-2072)
△ SHIELD WATER RETURN FITTING WITH ITEM #8.
△ AFTER INSTALLING LEAD ASSEMBLY, PLACE SPIRAL WRAP. THEN SECURE SNAKESKIN COVER WITH TIE WRAPS.
△ INSTALL MOUNTING SCREW THROUGH MIDDLE HOLE.
△ APPLY PARKER SILICONE BASE "SUPER LUBE" TO O-RINGS.
△ ITEM USED TO LOCK CONDUIT IN PLACE.
△ APPLY NAOLOX COMPOUND MK#823-0029 TO THREADS.
△ STRIP CABLE JACKET 0.63 AND WIRES 0.12 THEN INSTALL WIRES TO ITEM #6.

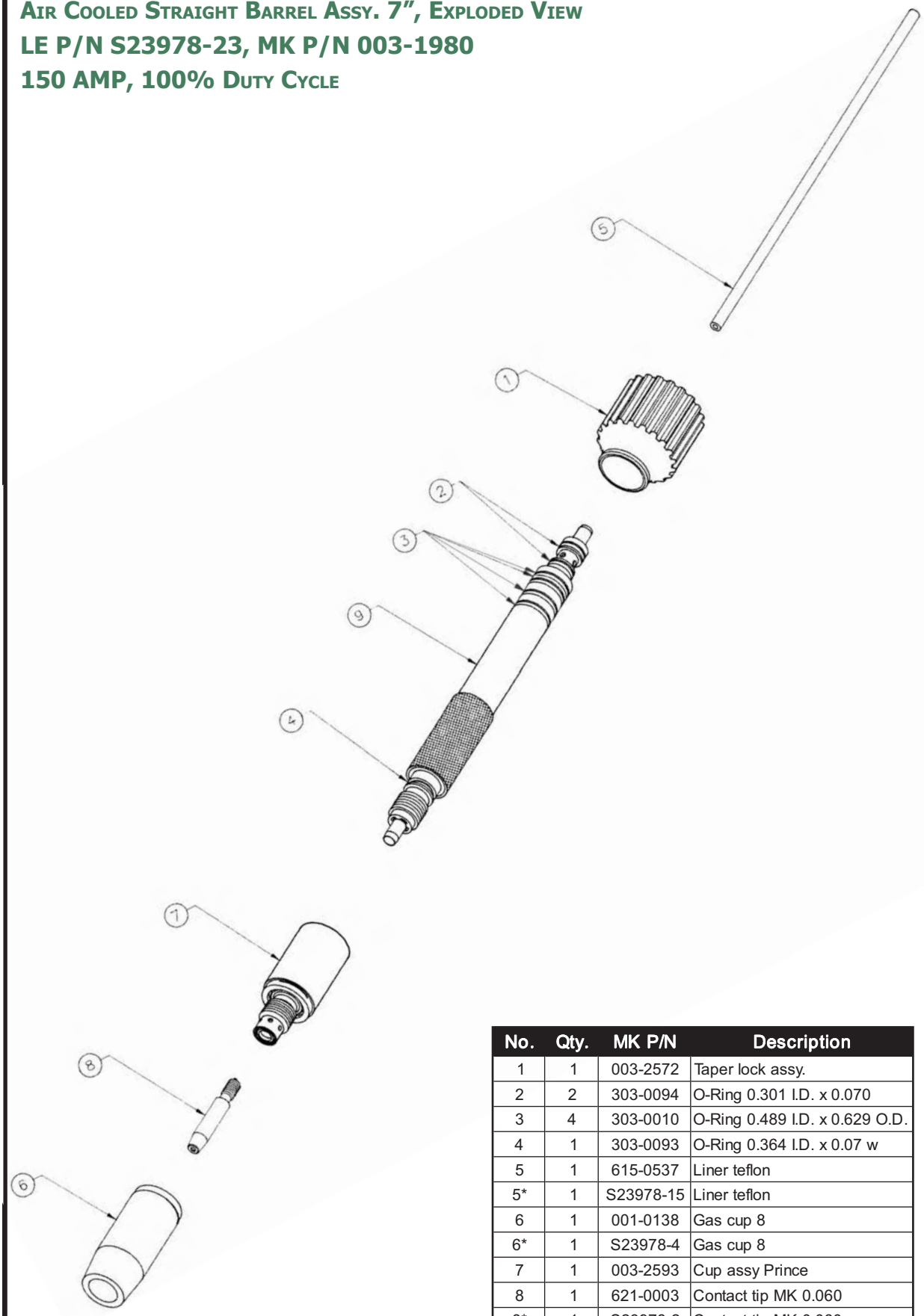
RED WIRE TO PIN #1
BLACK WIRE TO PIN #2
WHITE WIRE TO PIN #3
GREEN WIRE TO PIN #4
BLUE WIRE TO PIN #5
] TO ITEM #2

BROWN WIRE TO PIN #1
YELLOW WIRE TO PIN #2
] TO ITEM #3

△ PLACE GAS LEAD, THEN SECURE WITH ITEM #7.

NOTES: UNLESS OTHERWISE SPECIFIED

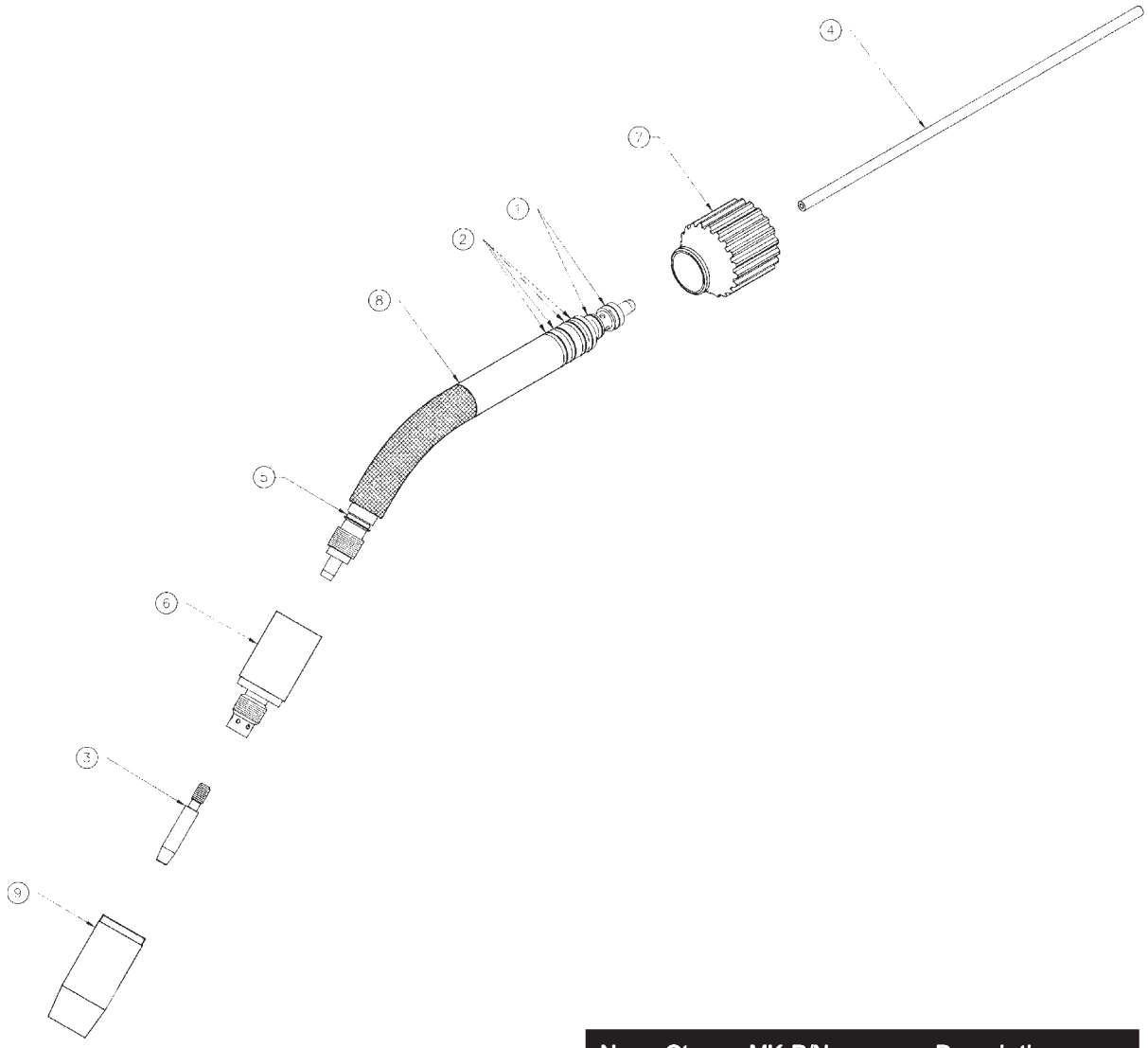
Air Cooled Straight Barrel Assy. 7", Exploded View
LE P/N S23978-23, MK P/N 003-1980
150 AMP, 100% Duty Cycle



No.	Qty.	MK P/N	Description
1	1	003-2572	Taper lock assy.
2	2	303-0094	O-Ring 0.301 I.D. x 0.070
3	4	303-0010	O-Ring 0.489 I.D. x 0.629 O.D.
4	1	303-0093	O-Ring 0.364 I.D. x 0.07 w
5	1	615-0537	Liner teflon
5*	1	S23978-15	Liner teflon
6	1	001-0138	Gas cup 8
6*	1	S23978-4	Gas cup 8
7	1	003-2593	Cup assy Prince
8	1	621-0003	Contact tip MK 0.060
8*	1	S23978-2	Contact tip MK 0.060
9	1	002-0575	Brazed barrel air cooled

* Lincoln Electric part number

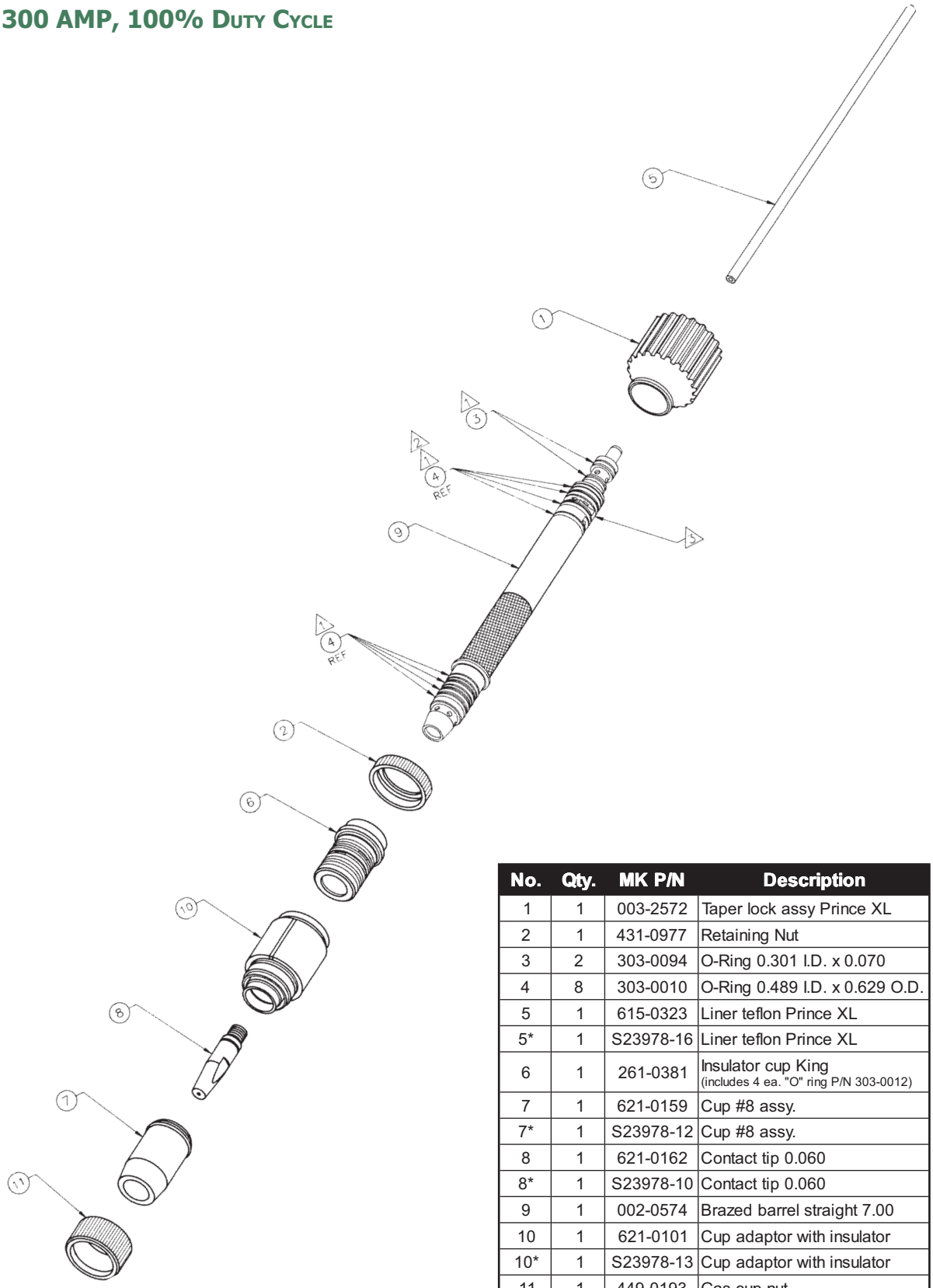
Air Cooled 45° Barrel Assy. 7", Exploded View
LE P/N S23978-25, MK P/N 003-1986
150 AMP, 100% Duty Cycle



No.	Qty.	MK P/N	Description
1	2	303-0094	O-Ring 0.301 I.D. x 0.070
2	2	303-0010	O-Ring 0.489 I.D. x 0.629 O.D.
3	1	621-0003	Contact tip MK 0.060
3*	1	S23978-2	Contact tip MK 0.060
4	1	615-0539	Liner teflon 0.175od
4*	1	S23978-26	Liner teflon 0.175od
5	1	303-0093	O-Ring 0.364 I.D. x 0.07 w
6	1	003-2593	Cup air barrel Prince XL
7	1	003-2572	Taper lock assy Prince XL
8	1	002-0591	Barrel curved 45° a/c
9	1	001-0138	Gas cup 8
9*	1	S23978-1	Gas cup 8

* Lincoln Electric part number

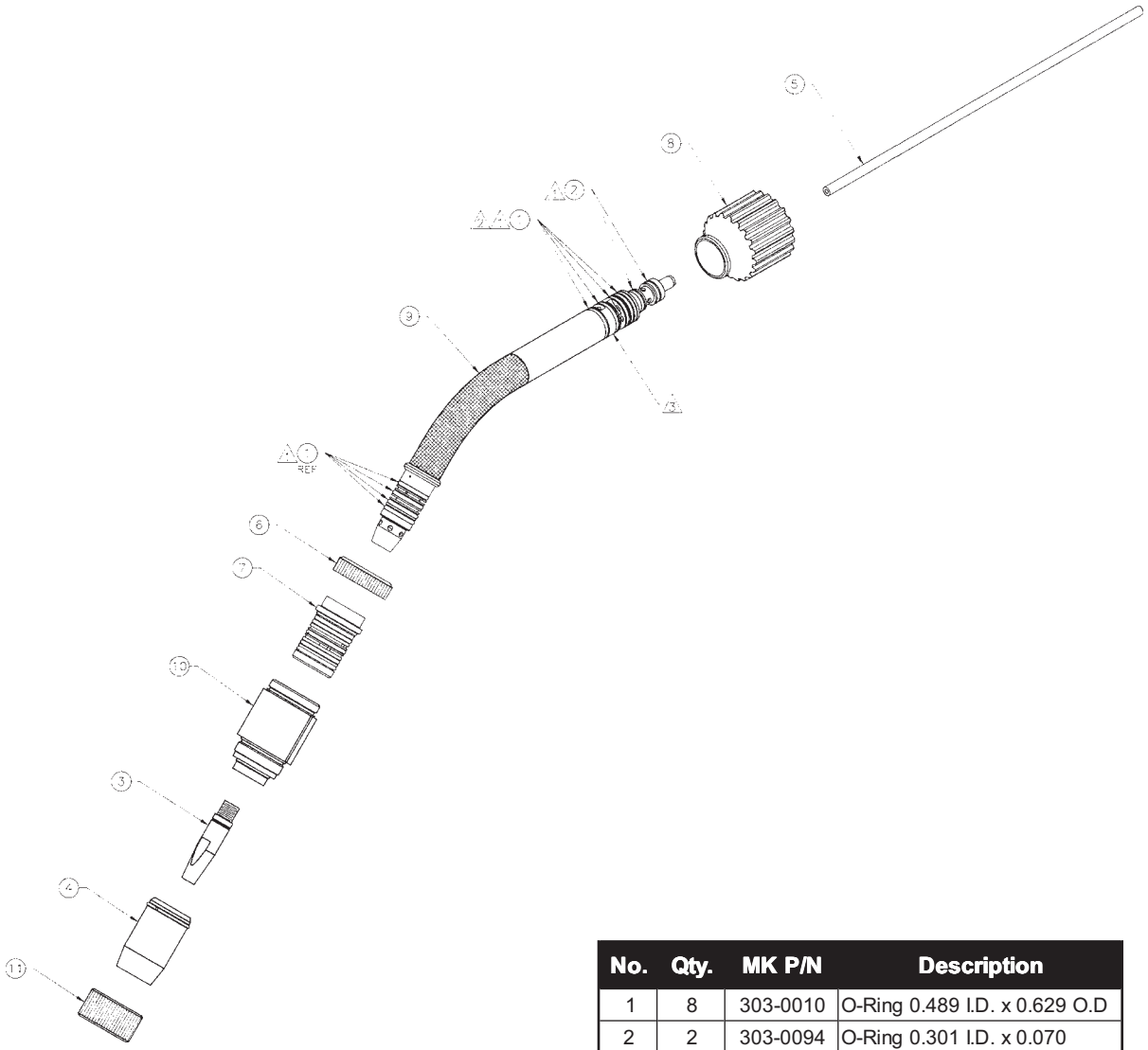
Water Cooled Straight Barrel Assy. 7", Exploded View
LE P/N S23978-22, MK P/N 003-1973B
300 AMP, 100% Duty Cycle



No.	Qty.	MK P/N	Description
1	1	003-2572	Taper lock assy Prince XL
2	1	431-0977	Retaining Nut
3	2	303-0094	O-Ring 0.301 I.D. x 0.070
4	8	303-0010	O-Ring 0.489 I.D. x 0.629 O.D.
5	1	615-0323	Liner teflon Prince XL
5*	1	S23978-16	Liner teflon Prince XL
6	1	261-0381	Insulator cup King (includes 4 ea. "O" ring P/N 303-0012)
7	1	621-0159	Cup #8 assy.
7*	1	S23978-12	Cup #8 assy.
8	1	621-0162	Contact tip 0.060
8*	1	S23978-10	Contact tip 0.060
9	1	002-0574	Brazed barrel straight 7.00
10	1	621-0101	Cup adaptor with insulator
10*	1	S23978-13	Cup adaptor with insulator
11	1	449-0193	Gas cup nut
11*	1	S23978-14	Gas cup nut
12	1	751-0011	Round vinyl cap

*Lincoln Electric part number

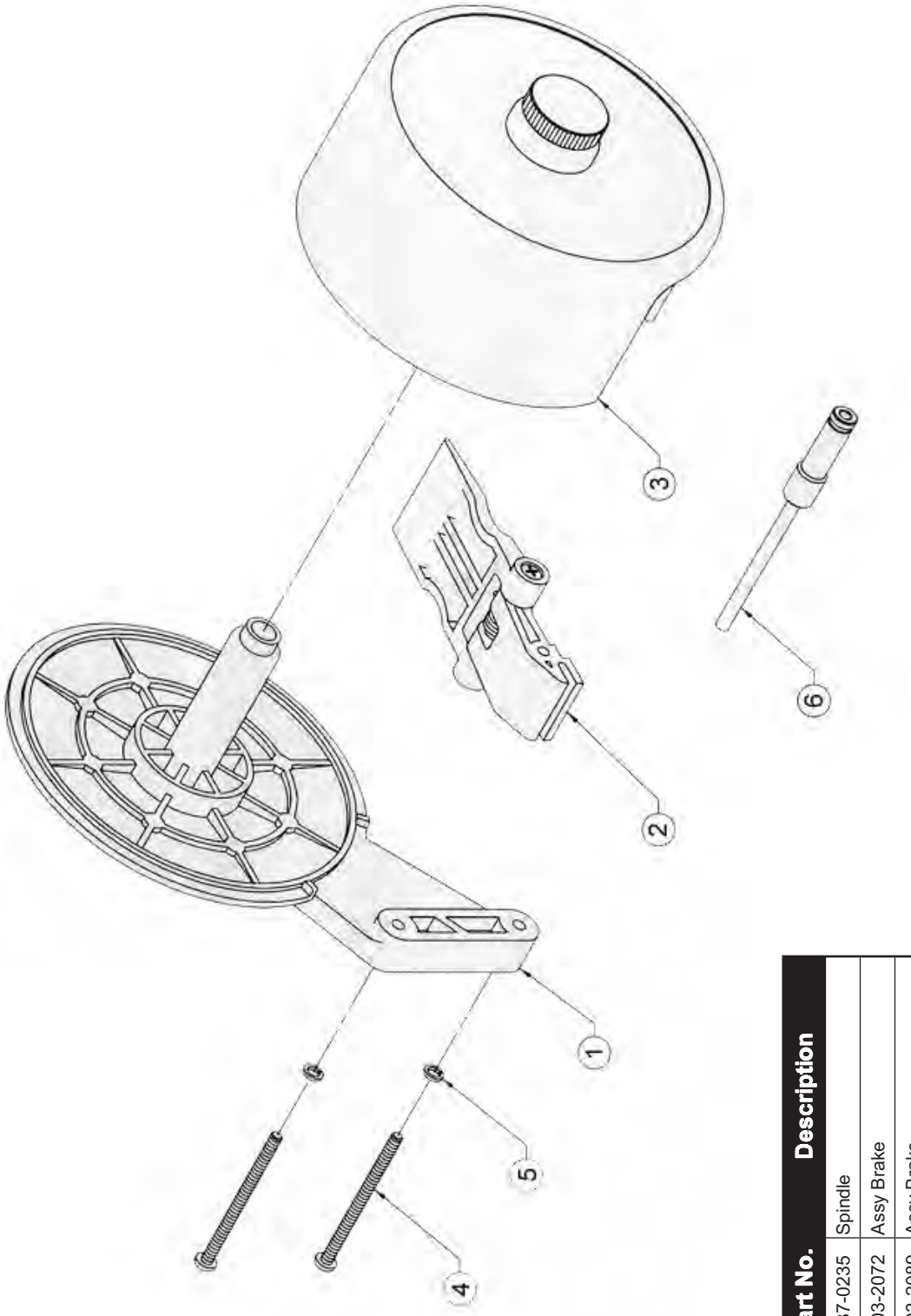
Water Cooled 45° Barrel Assy. 7", Exploded View
LE P/N S23978-24, MK P/N 003-1987A
300 AMP, 100% Duty Cycle



No.	Qty.	MK P/N	Description
1	8	303-0010	O-Ring 0.489 I.D. x 0.629 O.D
2	2	303-0094	O-Ring 0.301 I.D. x 0.070
3	1	621-0162	Contact tip 0.060
3*	1	S23978-10	Contact tip 0.060
4	1	621-0159	Cup #8 assy
4*	1	S23978-12	Cup #10 assy
5	1	615-0539	Liner teflon 0.175od x 8.06
5*	1	S23978-26	Liner teflon 0.175od x 8.06
6	1	431-0977	Retaining nut
7	1	261-0381	Insulator cup (includes 4 ea. "O" ring P/N 303-0012)"
8	1	003-2572	Taper lock assy.
9	1	002-0592	Barrel curve 45° w/c
10	1	621-0101	Cup adapter with insulator
11	1	449-0193	Gas cup nut
12	1	751-0011	Round vinyl cap

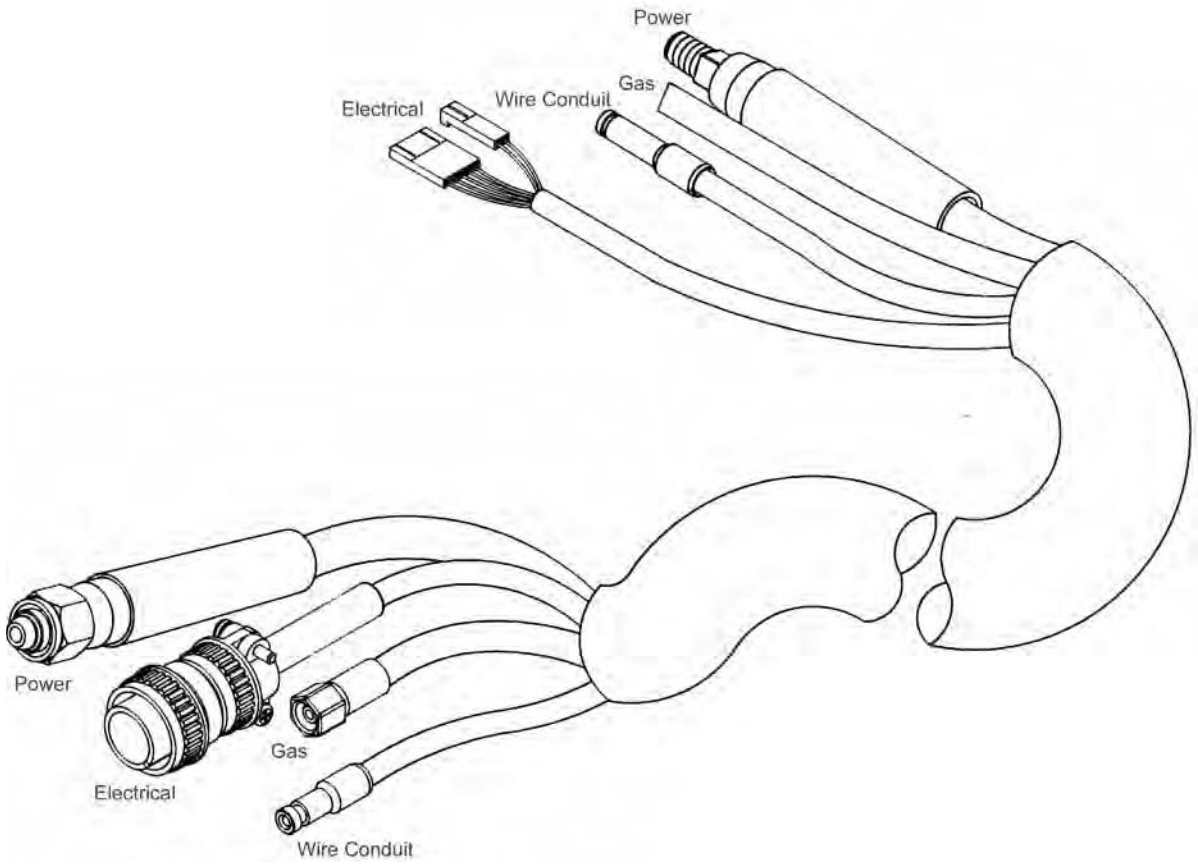
* Lincoln Electric part number

Spool Assembly, Exploded View
MK P/N 003-2090A



No.	Qty.	Part No.	Description
1	1	437-0235	Spindle
2	1	003-2072	Assy Brake
3	1	003-2089	Assy Brake
4	2	336-0073	Scr Pan HD Phil 6-32 x 2.00 ST
5	2	333-0005	Washer Split #6
6	1	003-0198	Wire Guide

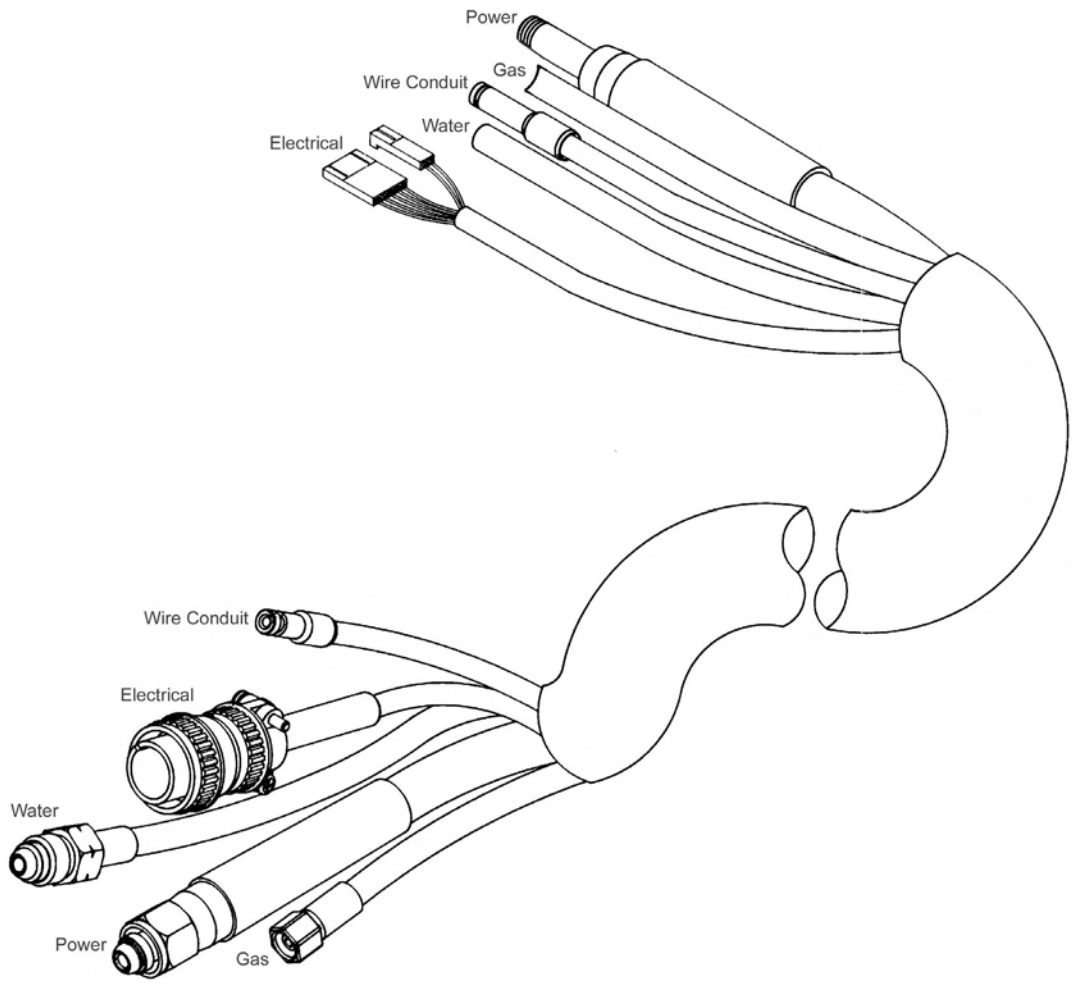
Air Cooled Lead Assembly



Prince XL Air Cooled Cable Assemblies					
Length	**LE P/N Conduit (MK P/N)**	**#2 Pwr Cable***	**Electrical Cable***	**Gas Hose***	**Snake Skin***
15' / 4.5m	S23978-8 (615-0007)	001-2527	005-0305	001-0537	931-0110
25' / 7.6m	S23978-6 (615-0008)	001-2528	005-0306	001-0538	931-0122
50' / 15.2m	S23978-7 (615-0068)	001-1042	005-0308	001-0665	931-0123
* MK Part Numbers					

Cable Fittings for Air Cooled Torches			
Power Cable	**Torch End Fitting**	**Cabinet End Lug Assy**	
MK Part No.	431-1128	003-1328	
Gas Hose		**Nut & Insert**	**Ferrule**
MK Part No.		753-0464	469-0161

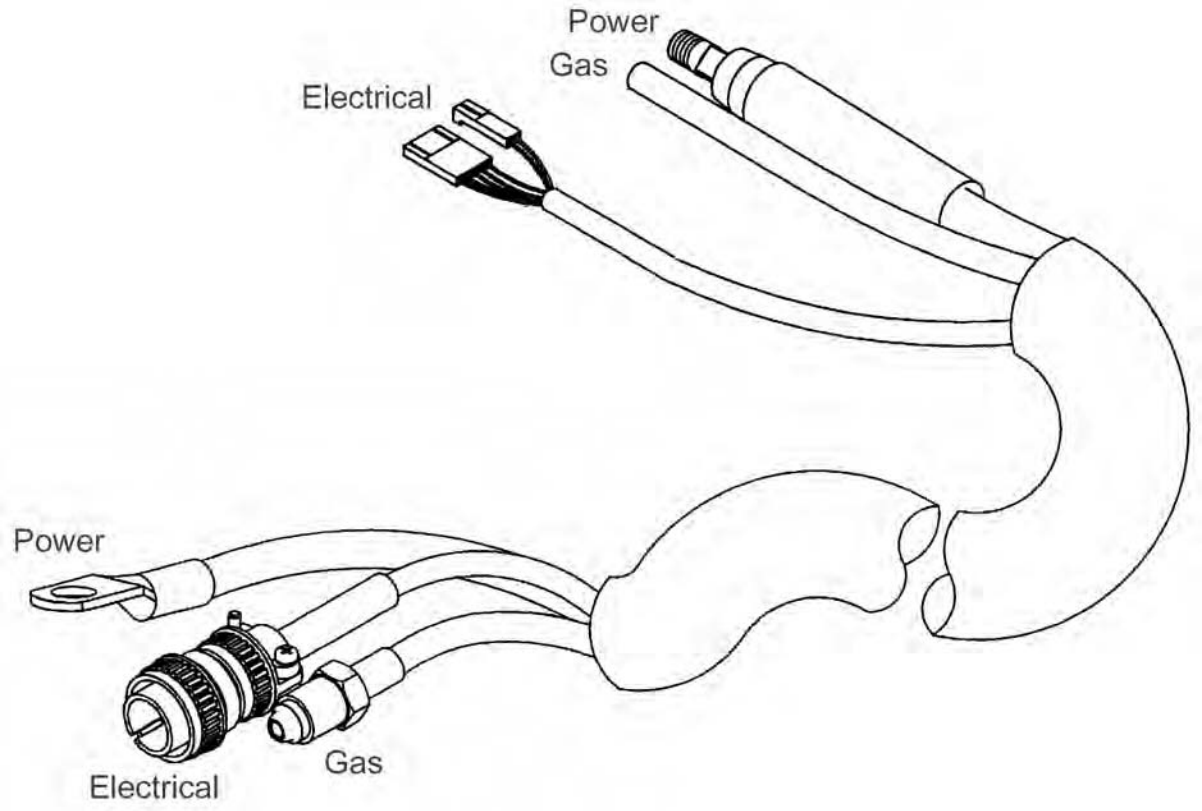
Water Cooled Lead Assembly



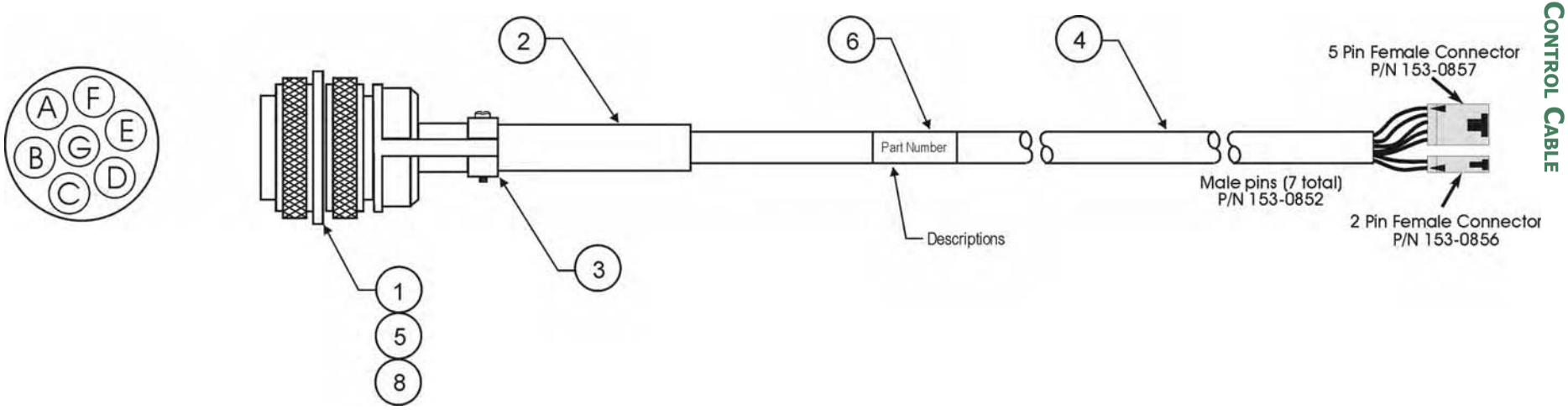
Prince XL Water Cooled Cable Assemblies						
Length	**LE P/N Conduit (MK P/N)**	**#4 Water/ Power Cable***	**Electrical Cable***	**Gas Hose***	**Water Hose***	**Snake Skin***
15' / 4.5m	S23978-8 (615-0007)	001-2521	005-0305	001-0537	001-0529	931-0110
25' / 7.6m	S23978-6 (615-0008)	001-2524	005-0306	001-0538	001-0530	931-0122
50' / 15.2m	S23978-7 (615-0068)	843-0338	005-0308	001-0665	001-0667	931-0123
*MK Part Number						

Cable Fittings for Water-Cooled Torches			
Water / Power Cable	**Torch End Fitting**	**Cabinet End Lug Assy**	**Ferrule #650 1ea**
MK Part No.	003-0590	003-1327	469-0002
Gas Hose		**Nut & Insert**	**Ferrule**
MK Part No.		753-0464	469-0161
Water Hose	**Nipple**	**Nut**	**Ferrule**
MK Part No.	753-0656	753-3379	469-0161

Spool Gun Lead Assembly



Spool Gun Lead Assemblies				
Length	**#2 Pwr Cable**	**Electrical Cable**	**Gas Hose**	**Snake Skin**
25' / 7.6m	843-0484	005-0306	552-0176	931-0122
50' / 15.2m	843-0485	005-0308	552-0178	931-0123
Power Cable and Gas Hose Fittings				
Power Cable	**Torch End Fitting**		**Lug End Fitting**	
Part No.	431-1128		185-0410	
Gas Hose	**Ferrule**		**Nut & Nipple**	**Ferrule**
Part No.	449-0161		753-0159 / 753-0656	449-0161



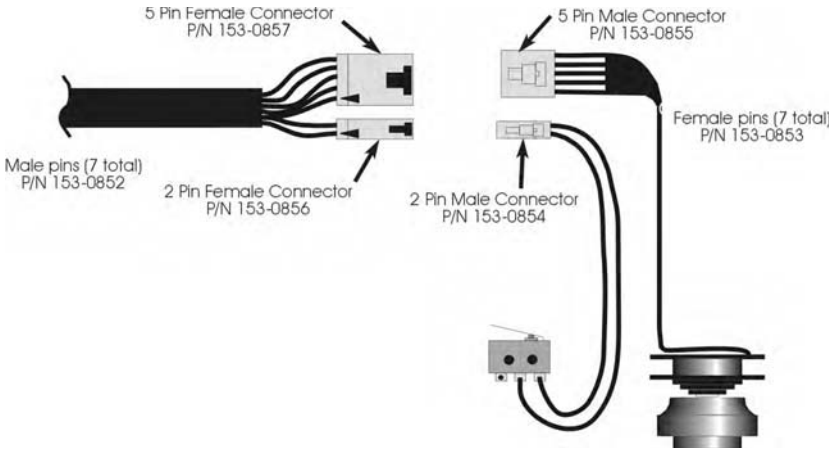
Wire List	
Pin	**Wire Color**
A	Red
B	Black
C	Blue
D	Green
E	Brown
F	Orange
G	White

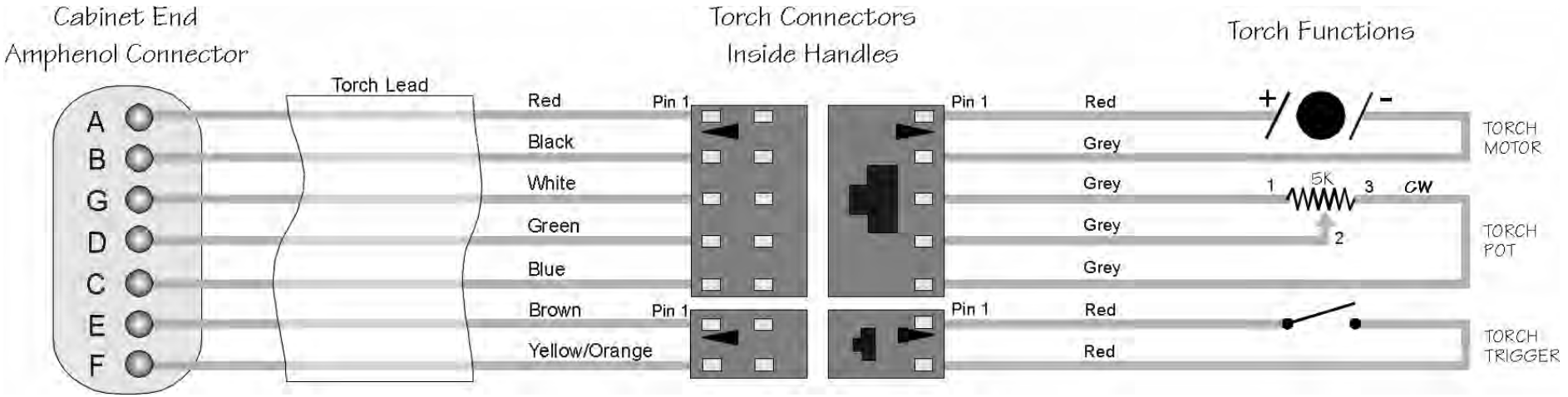
Quantity Required of Item #4		
Part No.	**Description**	**Item #4 Qty.**
001-3784	3' Control Cable	3.50 Ft
001-3785	6' Control Cable	6.50 Ft
001-3786	10' Control Cable	10.50 Ft
001-3787	15' Control Cable	15.50 Ft
001-3788	25' Control Cable	25.50 Ft
001-3789	30' Control Cable	30.50 Ft
001-3790	50' Control Cable	50.50 Ft
001-3800	35' Control Cable	35.50 Ft

Control Cable "W" Torches

001-3784, 001-3785, 001-3786, 001-3787, 001-3788, 001-3789 , 001-3790, 001-3800(H)

No.	Qty.	Part No.	Description
1	1	153-0322	Connector, 7 Pin, "W"
2	1	301-0004	Boot
3	1	411-0025	Clamp
4	table	844-0070	Cable, 7 Cond, 22 Ga.
5	0.30ft	739-0004	Tubing, Shrink, Ø1/8
6	1	405-0762	Label, Self Laminate
7	1	411-0159	Clamp, Retaining
8	1	331-0087	Washer, Flat, Neoprene
9	1	411-0243	Tie Wire #4 Screw 3/4 Dia N


5 Pin Female Connector
P/N 153-0857
5 Pin Male Connector
P/N 153-0855
Female pins (7 total)
P/N 153-0853
Male pins (7 total)
P/N 153-0852
2 Pin Female Connector
P/N 153-0856
2 Pin Male Connector
P/N 153-0854


Cabinet End
Amphenol Connector
Torch Lead
Torch Connectors
Inside Handles
Torch Functions
A
B
G
D
C
E
F
Red
Black
White
Green
Blue
Brown
Yellow/Orange
Pin 1
Pin 1
Pin 1
Pin 1
Red
Grey
Grey
Grey
Grey
Red
Red
+
-
TORCH
MOTOR
1
5K
3
CW
2
TORCH
POT
TORCH
TRIGGER

MK Warranty Repair Stations

for MK Products

Current as of 10/1/01
Please visit our website for up-to-date listing
www.mkproducts.com

ALABAMA

AIRGAS - SOUTH, INC.
Birmingham, AL
205/251-6835

INDUSTRIAL WELDING SERVICES
Quinton, AL
205/674-3258

WELDING ENGINEERING SUPPLY CO.
Prichard, AL
334/457-8681

WELDING MACHINE HOSPITAL
Montgomery, AL
334/832-9353

ARIZONA

PRAXAIR DISTRIBUTION, INC.
Phoenix, AZ
602/269-2151

ALLSTATE ELECTRIC MOTOR CO.
Phoenix, AZ
602/233-0500

ARKANSAS

APPLIED SERVICES, INC.
Benton, AR
501/860-6464

ARKANSAS WELDING IND'L SUPPLY
Hot Springs, AR
501/321-9922

CALIFORNIA

ADVANCED WELDER REPAIR
Commerce, CA
323/263-7383

AIRGAS - WEST, INC.
Gardena, CA
310/523-9355

ALL PHASE WELDER REPAIR & CONSULTING
Sacramento, CA
916/331-0595

ARC PRODUCTS
San Diego, CA
619/628-1022

ARCO WELDER REPAIR
Santa Fe Springs, CA
562/921-5240

ARK WELDER REPAIR
Fresno, CA
559/486-2251

CAL-WELD SUPPLY
Fresno, CA
209/445-0131

DELTA-TECH
Sun Valley, CA
818/767-4234

EMCO EAST
Concord, CA
925/798-4411

FRESNO OXYGEN
Fresno, CA
559/233-6684

INDUSTRIAL WELDER REPAIR
LaPuente, CA
626/961-7643

PRAXAIR DISTRIBUTION, INC.
Long Beach, CA
562/427-0099

PRAXAIR DISTRIBUTION, INC.
Bakersfield, CA
661/321-9922

R. J. KATES
San Diego, CA
619/565-6960

RED-D-ARC, INC.
Carson, CA
310/233-3327

SOUTHWEST WELDER REPAIR
Fontana, CA
909/357-1661

SWEINHART ELECTRIC CO., INC.
Long Beach, CA
714/521-9100

MK Warranty Repair Stations

for MK Products

Current as of 10/1/01
Please visit our website for up-to-date listing
www.mkproducts.com

COLORADO

AIRGAS - INTERMOUNTAIN, INC.
Colorado Springs, CO
719/473-1947

WELDERS & EQUIP. SVC. & TESTING
Littleton, CO
303/932-8755

WESTERN SLOPE WELDER REPAIR
Grand Junction, CO
970/243-9616

FLORIDA

A & I SPECIALTIES
Lehigh Acres, FL
941/368-7435

ACTION WELDING SUPPLY
Jacksonville, FL
904/786-2254

AMVEL CORPORATION
Miami, FL
305/592-5678

ELECTRICAL WELDERS SERVICE
Orlando, FL
407/999-5214

HAUN SYSTEMS REPAIR, INC.
Orlando, FL
407/681-6064

HOLOX
Ocala, FL
352/351-4417

J.K. CIRCUIT TECHNOLOGY
Boynton Beach, FL
561/733-7859

ROPER ELECTRIC MOTOR SERVICE
Panama City, FL
850/769-6643

SMITTY'S WELDER SERVICE
West Palm Beach, FL
561/845-1224

TRI-GAS
Miami, FL
305/592-3180

TRI-STATE SALES & LEASING
Lake City, FL
904/397-3340

TRI-TECH
Sarasota, FL
941/758-3825

V.A. ELECTRICAL MOTORS CENTER
Hialeah, FL
305/825-3327

GEORGIA

B&W INDUSTRIAL SERVICES
Augusta, GA
706/738-8722

Mc CULLOUGH ELEC. MOTOR SVC.
Atlanta, GA
404/688-5251

HAWAII

DC ELECTRIC, INC.
Aiea, HI
808/483-8900

IDAHO

NORCO
Boise, ID
208/336-1643

ILLINOIS

INDUSTRIAL WELDER REBUILDERS
Alsip, IL
708/371-5688

RELIABLE EQUIPMENT REPAIR
Hamel, IL
618/633-5000

SCHERER INDUSTRIAL GROUP, INC.
Galesburg, IL
309/342-4125 or 888/964-3526

INDIANA

AGA GAS, INC.
Hammond, IN
219/989-9030

MK Warranty Repair Stations

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AIRGAS-MID AMERICA, INC.
Evansville, IN
800/424-8905

B & H ELECTRIC
Seymour, IN
812/522-5607

COX EQUIPMENT COMPANY
Indianapolis, IN
317/241-8881

EVANSVILLE ARMATURE, INC.
Evansville, IN
812/428-9034

MODERN SUPPLY CO., INC.
Evansville, IN
812/425-9353

PRAXAIR DISTRIBUTION, INC.
Speedway, IN
317/481-4550

SUTTON-GARTEN COMPANY
Indianapolis, IN
317/264-3236

IOWA

AIRGAS NORTH CENTRAL
Des Moines, IA
515/266-1111

CEDAR RAPIDS WELDING SUPPLY
Cedar Rapids, IA
319/365-1466

ELECTRICAL ENGRG. & EQUIPMENT
Des Moines, IA
515/266-8890

WRIGHT WELDING SUPPLY
Ft. Dodge, IA
515/576-0640

KANSAS

KANOX
Hutchinson, KS
316/665-5551

KENTUCKY

GENERAL WELDING PRODUCTS
Louisville, KY
502/635-5218

RED-D-ARC
Lexington, KY
800/245-3660

WELDING EQUIPMENT
Louisville, KY
502/636-0545

LOUISIANA

RED BALL OXYGEN CO.
Shreveport, LA
318/425-3211

MICHIGAN

ANN ARBOR WELDING SUPPLY CO.
Ypsilanti, MI
734/572-0444

APEX WELDING GASES & SUPPLY
Muskegon Heights, MI
616/722-3185

AUTOMATIC WELD
Midland, MI
517/496-9245

GREAT LAKES EQUIPMENT
Clare, MI
517/386-4630

HAMILTON ELECTRIC CO.
Saginaw, MI
517/799-6291

SAGINAW WELDING SUPPLY CO.
Saginaw, MI
517/793-9696

SOUTHPARK WELDING
Marysville, MI
810/364-6521

WELDING METALS, INC.
Madison Heights, MI
248/585-0480

MK Warranty Repair Stations

for MK Products

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WESAR COMPANY
Three Rivers, MI
616/483-9125

MINNESOTA

MINNEAPOLIS OXYGEN CO.
Minneapolis, MN
612/588-8855

OXYGEN SERVICE CO.
St. Paul, MN
612/644-7273

MISSOURI

CEE-KAY SUPPLY, INC.
St. Louis, MO
324/644-3500

P.G. WALKER
Springfield, MO
417/862-1745

MISSISSIPPI

NORDAN SMITH WELDING SUPPLY
Hattiesburg, MS
601/545-1800

3D SUPPLIES, INC.
Jackson, MS
601/353-3330

NEVADA

SIERRA WELDING SUPPLY CO.
Sparks, NV
775/359-0542

NEW JERSEY

INDUSTRIAL ELECTRIC SERVICE CO.
Hawthorne, NJ
973/423-1212

NEW YORK

DELO WELDING SUPPLY
Syracuse, NY
315/478-2188

HAUN WELDING SUPPLY
Syracuse, NY
315/463-5241

NORTH CAROLINA

HOLOX LTD.
Colfax, NC
336/996-1974

M & L WELDER REPAIR
Asheville, NC
828/250-9353

MACHINE & WELDING SUPPLY CO.
Dunn, NC
910/892-4016

MACHINE AND WELDING SUPPLY CO.
Greenville, NC
252/752-3089

MACHINE AND WELDING SUPPLY CO.
Raleigh, NC
919/772-9500

MACHINE AND WELDING SUPPLY CO.
Winston-Salem, NC
336/723-9651

NATIONAL WELDERS SUPPLY CO.
High Point, NC
910/882-1110

NATIONAL WELDERS SUPPLY CO.
Charlotte, NC
704/392-7317

OHIO

AGA GASES, INC.
Lima, OH
419/228-2828

ALBRIGHT WELDING SUPPLY
Wooster, OH
330/264-2021

ARC EQUIPMENT COMPANY
Struthers, OH
333/750-9353

MK Warranty Repair Stations

for MK Products

Current as of 10/1/01
Please visit our website for up-to-date listing
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ARC SERVICES, INC.
Toledo, OH
419/478-6204

BELAIR PRODUCTS, INC.
Akron, OH
330/253-3116

BIG RIVER ELECTRIC
Gallipolis, OH
740/446-4360

CnD MACHINE, INC.
Canton, OH
330/478-8811

OHIO AIR PRODUCTS
Canton, OH
330/821-2771

RICK'S WELDER REPAIR SERVICE
Eastlake, OH
440/269-1204

VALLEY NATIONAL GASES
Hilliard, OH
614/771-1311

VALLEY NATIONAL GASES
Lima, OH
419/228-1008

VALLEY NATIONAL GASES
Toledo, OH
419/241-9114

VOLLMER ELECTRIC CO.
Columbus, OH
614/476-8800

WEILER WELDING CO., INC.
Dayton, OH
937/222-8312

WELDINGHOUSE, INC.
Cleveland, OH
216/524-1955

OKLAHOMA

AIRGAS MID-SOUTH
Tulsa, OK
918/582-0885

BILL'S WELDER REPAIR
Oklahoma City, OK
405/232-4799

MUNN SUPPLY
Enid, OK
580/234-4120

OKLAHOMA WELDERS SUPPLY
Madill, OK
580/795-5561

OREGON

E C COMPANY
dba ELECTRICAL CONSTRUCTION CO.
Portland, OR
800/452-1511

INDUSTRIAL SOURCE
Eugene, OR
541/344-1438

PENNSYLVANIA

ALLWELD EQUIPMENT REPAIR
Pittsburgh, PA
412/821-8460

GEOVIC WELDING SUPPLY
Milton, PA
717/742-9377

J.A. CUNNINGHAM EQUIPMENT, INC.
Philadelphia, PA
215/426-6650

POWER SOURCE REPAIR CO., INC.
Collingdale, PA
610/532-6460

VALLEY NATIONAL GASES
Pittsburgh, PA
412/281-1835

SOUTH CAROLINA

CAROLINA WELDER SERVICE
Lake City, SC
843/687-0413

MK Warranty Repair Stations

for MK Products

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Please visit our website for up-to-date listing
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TENNESSEE

NEXAIR
Memphis, TN
901/523-6821

TRAMCO
Bristol, TN
423/968-4499

NATIONAL RENTAL & REPAIR
Knoxville, TN
423/584-6390

TEXAS

AIRGAS - SOUTHWEST, INC.
Austin, TX
512/835-0202

AIRGAS - SOUTHWEST, INC.
Houston, TX
713/462-8027

ARC CONTROL
Houston, TX
713/941-4701

DENISON OXYGEN
Denison, TX
903/465-3369

FT. WORTH WELDERS SUPPLY, INC.
Fort Worth, TX
817/332-8696

GPC SERVICES, INC.
San Angelo, TX
915/655-4545

RITE-WELD SUPPLY, INC
Fort Worth, TX
817/626-8237

UTAH

C.W. SILVER INDUSTRIAL SERVICE
Salt Lake City, UT
801/531-8888

VIRGINIA

AIR PRODUCTS & CHEMICALS, INC.
Bristol, VA
540/669-3161

ARC WELDERS, INC.
Ashland, VA
804/798-1818

NORFOLK WELDERS SUPPLY
Norfolk, VA
804/622-6571

WASHINGTON

AIRGAS - NORPAC, INC.
Tacoma, WA
253/473-2282

A-L WELDING PRODUCTS
Tukwila, WA
425/228-2218

AMERICAN EQUIPMENT SERVICES
Kent, WA
253/395-9947

HARRIS ELECTRIC, INC.
Seattle, WA
206/782-6668

OXARC, INC.
Spokane, WA
509/535-7794

PACIFIC WELDING SUPPLIES
Tacoma, WA
253/572-5302

PRECISION WELDER & ENGINE REPAIR
Seattle, WA
206/382-6227

WEST VIRGINIA

CARDINAL SALES & SERVICE, INC.
Clarksburg, WV
304/622-7590

MK Warranty Repair Stations

for MK Products

Current as of 10/1/01
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www.mkproducts.com

WISCONSIN

INTERSTATE WELDING SALES CORP.
Appleton, WI
920/734-7173

PRAXAIR DISTRIBUTION, INC.
Brookfield, WI
414/938-6365

WELDER REPAIR & SERVICE, INC.
Fredonia, WI
262/692-3068

CANADA

A&A WELDER SERVICES LTD.
Saskatoon, Saskatchewan
306/934-1601

ARC & GENERATOR REPAIR
Garson, Ontario
705/525-2141

B. HARRIS WELDING SVCS. LTD.
Dartmouth, Nova Scotia
902/468-6255

BARRY HAMEL EQUIPMENT LTD.
Coquitlam, B.C.
604/945-9313

ELECTRO-MÉCANIK, INC.
Sainte-Foy, Quebec
418/683-1724

GPR INDUSTRIES 1994 LTD.
Grande Prairie, Alberta
780/532-5900

HYPERDYNAMICS TECHNOLOGIES LTD.
Pickering, Ontario
905/683-9938

INDUSTRIAL ELECTRONIC SERVICES
Calgary, Alberta
403/279-3432

LADEL LTD.
Quebec
819/376-6577

M.R.T. REPAIR CENTER, INC.
Montreal, Quebec
514/648-0800

OZARK ELECTRICAL MARINE LTD.
St. Johns, Newfoundland
709/726-4554

PEEL ENGINES
Mississauga, Ontario
905/670-1535

PROMOTECH ÉLECTRIQUE, INC.
Fleurimont, Quebec
819/822-2111

WELDERS SUPPLY
Winnipeg, Manitoba
204/772-9476

WELDING WIDE SERVICES, INC.
Brampton, Ontario
905/874-9992

WELDTEC
B.C.
604/545-3886

CHINA

PHT Group Company
Beijing, China
86-10-6858 8395

			
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**	● 皮肤或湿衣物切勿接触带電部件及焊條。 ● 使你自己與地面和工件絶緣。	● 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。	●機裝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說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.

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LIMITED WARRANTY

Effective March 1, 2001

This warranty supersedes all previous MK Products warranties and is exclusive, with no other guarantees or warranties expressed or implied.

LIMITED WARRANTY - MK Products,Inc.,Irvine,California warrants that all new and unused equipment furnished by MK Products is free from defect in workmanship and material as of the time and place of delivery by MK Products. No warranty is made by MK Products with respect to trade accessories or other items manufactured by others. Such trade accessories and other items are sold subject to the warranties of their respective manufacturers, if any.

MK Products' warranty does not apply to components having normal useful life of less than one (1) year, such as relay points, wire conduit, tungsten, and welding torch parts that come in contact with the welding wire, including nozzles, nozzle insulators, and contact tips where failure does not result from defect in workmanship or material.

In the case of MK Products' breach of warranty or any other duty with respect to the quality of any goods, the exclusive remedies therefore shall be at MK Products' option: **(1)** repair; **(2)** replacement; **(3)** where authorized in writing by MK Products, the reasonable cost of repair or replacement at our Irvine, California plant; or **(4)** payment of or credit for the purchase price (less reasonable depreciation based upon actual use) upon return of the goods at customer's risk and expense. Upon receipt of notice of apparent defect or failure, MK Products shall instruct the claimant on the warranty claim procedures to be followed.

As a matter of general policy only, MK Products may honor an original user's warranty claims on warranted equipment in the event of failure resulting from a defect within the following periods from the date of delivery of equipment to the original user:

1. **Torches, Weldheads and Water Recirculators.....1 year**
2. **All Other Equipment.....3 years**
3. **Repairs .....90 days**

Classification of any item into the foregoing categories shall be at the sole discretion of MK Products. Notification of any failure must be made in writing within 30 days of such failure.

A copy of the invoice showing the date of sale must accompany products returned for warranty repair or replacement.

All equipment returned to MK Products for service must be properly packaged to guard against damage from shipping. MK Products will not be responsible for any damages resulting from shipping.

Normal surface transportation charges (both ways) for products returned for warranty repair or replacement will be borne by MK Products, except for products sold to foreign markets.

ANY EXPRESS WARRANTY NOT PROVIDED HEREIN AND ANY IMPLIED WARRANTY, GUARANTY, OR REPRESENTATION AS TO PERFORMANCE, AND ANY REMEDY FOR BREACH OF CONTRACT WHICH, BUT FOR THIS PROVISION, MIGHT ARISE BY IMPLICATION, OPERATION OF LAW, CUSTOM OF TRADE, OR COURSE OF DEALING, INCLUDING ANY IMPLIED WARRANTY OF MERCHANTABILITY OR OF FITNESS FOR PARTICULAR PURPOSE, WITH RESPECT TO ANY AND ALL EQUIPMENT FURNISHED BY MK PRODUCTS, IS EXCLUDED AND DISCLAIMED BY MK PRODUCTS.

EXCEPT AS EXPRESSLY PROVIDED BY MK PRODUCTS IN WRITING, MK PRODUCTS ARE INTENDED FOR ULTIMATE PURCHASE BY COMMERCIAL/INDUSTRIAL USERS AND FOR OPERATION BY PERSONS TRAINED AND EXPERIENCED IN THE USE AND MAINTENANCE OF WELDING EQUIPMENT AND NOT FOR CONSUMERS OR CONSUMER USE. MK PRODUCTS WARRANTIES DO NOT EXTEND TO, AND NO RE-SELLER IS AUTHORIZED TO EXTEND MK PRODUCTS' WARRANTIES TO ANY CONSUMER.

MK Products, Inc.
16882 Armstrong Ave.
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