



OWNERS MANUAL

Product Description	Cobra III
M.K. Manual Part Number	091-0264
M.K. Form Number	CTIII
NWSA Form Number	550
Effective with Serial Number	35000
Voltage Rating	24 VDC
Printing/Revision Date	9/95
This manual applies to the following Torch Model Numbers	160-xxx 161-xxx 162-xxx 163-xxx

Cobramatic® Gooseneck Welding Torch



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SAFETY CONSIDERATIONS

ELECTRIC ARC WELDING EQUIPMENT

CAUTION : READ BEFORE ATTEMPTING INSTALLATION, OPERATION OR MAINTENANCE OF THIS EQUIPMENT

1-1 INTRODUCTION

This equipment is intended for ultimate application by commercial/industrial users and for operation by persons trained and experienced in the use and maintenance of welding equipment. Operation should not be undertaken without adequate training in the use of such equipment. Training is available from many public and private schools or similar facilities.

Safe practices in the installation, operation and maintenance of this equipment requires proper training in the art, a careful study of the information provided with the equipment, and the use of common sense. Rules for safe use are generally provided by suppliers of welding power sources, compressed gas suppliers, and electrode suppliers. Careful compliance with these rules will promote safe use of this equipment.

The following Safety Rules cover some of the more generally found situations. READ THEM CAREFULLY. In case of any doubt, obtain qualified help before proceeding.

1-2 GENERAL PRECAUTIONS

A. Burn Prevention

ELECTRIC ARC WELDING PRODUCES HIGH INTENSITY HEAT AND ULTRAVIOLET RADIANT ENERGY WHICH MAY CAUSE SERIOUS AND PERMANENT EYE DAMAGE AND WHICH MAY DAMAGE ANY EXPOSED SKIN AREAS.

Wear helmet with safety goggles or glasses with side shields underneath, appropriate filter lenses or plates (protected by clear cover glass). This is a must for welding or cutting (and chipping) to protect the eyes from radiant energy and flying metal. Replace cover glass when broken, pitted, or spattered.

Medical first aid and eye treatment. First aid facilities and a qualified first aid person should be available for each shift unless medical facilities are close by for immediate treatment of flash burns of the eyes and skin burns.

Wear protective clothing - leather (or asbestos) gauntlet gloves, hat, and high safety-toe shoes. Button shirt collar and pocket flaps, and wear cuffless trousers to avoid entry of sparks and slag.

Avoid oily or greasy clothing. A spark may ignite them.

Flammable hair preparations should not be used by persons intending to weld or cut.

Hot metal such as electrode stubs and work pieces should never be handled without gloves.

Ear plugs should be worn when working on overhead or in a confined space. A hard hat should be worn when others work overhead.

B. Toxic Fume Prevention

Adequate ventilation. Severe discomfort, illness or death can result from fumes, vapors, heat, or oxygen enrichment or depletion that welding (or cutting) may produce. Prevent them with adequate ventilation. NEVER ventilate with oxygen.

Lead-, cadmium-, zinc-, mercury-, beryllium-bearing and

similar materials, when welded or cut, may produce harmful concentrations of toxic fumes. Adequate local exhaust ventilation must be used, or each person in the area, as well as the operator, must wear an air-supplied respirator. For beryllium, both must be used.

Metals coated with or containing materials that emit toxic fumes should not be heated unless coating is removed from the work surface, the area is well ventilated, or the operator wears an air-supplied respirator.

Work in a confined space only while it is being ventilated and, if necessary, while wearing an air-supplied respirator.

Gas leaks in a confined space should be avoided. Leaked gas in large quantities can change oxygen concentration dangerously. Do not bring gas cylinders into a confined space.

Leaving confined space, shut OFF gas supply at source to prevent possible accumulation of gases in the space if downstream valves have been accidentally opened or left open. Check to be sure that the space is safe before reentering it.

Vapors from chlorinated solvents can be decomposed by the heat of the arc (or flame) to form PHOSGENE, a highly toxic gas, and other lung and eye irritating products. The ultraviolet (radiant) energy of the arc can also decompose trichloroethylene and perchloroethylene vapors to form phosgene. DO NOT WELD or cut where solvent vapors can be drawn into the welding or cutting atmosphere or where the radiant energy can penetrate to atmospheres containing even minute amounts of trichloroethylene or perchloroethylene.

C. Fire and Explosion Prevention

Causes of fire and explosion are: combustibles reached by the arc, flame, flying sparks, hot slag, or heated material, misuse of compressed gases and cylinders, and short circuits.

BE AWARE THAT flying sparks or falling slag can pass through cracks, along pipes, through windows or doors, and through wall or floor openings, out of sight of the goggled operator. Sparks can fly many feet.

To prevent fires and explosion: Keep equipment clean and operable, free of oil, grease, and (in electrical parts) of metallic particles that can cause short circuits.

If combustibles are in area, do NOT weld or cut. Move the work if practicable, to an area free of combustibles. Avoid paint spray rooms, dip tanks, storage areas, ventilators. If the work cannot be moved, move combustibles at least 35 feet away, out of reach of sparks and heat; or protect against ignition with suitable and snug-fitting, fire-resistant covers or shields.

Walls touching combustibles on opposite sides should not be welded on (or cut). Walls, ceilings, and floor near work should be protected by heat-resistant covers or shields.

Fire watcher must be standing by with suitable fire extinguishing equipment during and for some time after welding or cutting if:

1. Appreciable combustibles (including building construction) are within 35 feet.
2. Appreciable combustibles are further than 35 feet, but can be ignited by sparks.
3. Openings (concealed or visible) in floors or walls within 35 feet may expose combustibles to sparks.

4. Combustibles adjacent to walls, ceilings, roofs, or metal partitions can be ignited by radiant or conducted heat.

Hot work permit should be obtained before operation to ensure supervisor's approval that adequate precautions have been taken.

After work is done, check that area is free of sparks, glowing embers, and flames.

An empty container that held combustibles, or that can produce flammable or toxic vapors when heated, must never be welded on or cut, unless container has first been cleaned in accordance with industry standards.

This includes: a thorough steam or caustic cleaning (or a solvent of water washing, depending on the combustible's solubility), followed by purging and inerting with nitrogen or carbon dioxide, and using protective equipment.

Water-filling just below working level may substitute for inerting.

A container with unknown contents should be cleaned (see paragraph above). Do NOT depend on sense of smell or sight to determine if it is safe to weld or cut.

Hollow castings or containers must be vented before welding or cutting. They can explode.

Explosive atmospheres. NEVER weld or cut where the air may contain flammable dust, gas, or liquid vapors (such as gasoline).

D. Compressed Gas Equipment

The safe handling of compressed gas equipment is detailed in numerous industry publications. The following general rules cover many of the most common situations.

1. Pressure Regulators

Regulator relief valve is designed to protect only the regulator from overpressure; it is not intended to protect any downstream equipment. Provide such protection with one or more relief devices.

Never connect a regulator to a cylinder containing gas other than that for which the regulator was designed.

Remove faulty regulator from service immediately for repair (first close cylinder valve). The following symptoms indicate a faulty regulator:

- Leaks - if gas leaks externally.
- Excessive Creep - if delivery pressure continues to rise with downstream valve closed.
- Faulty Gauge - if gauge pointer does not move off stop pin when pressurized, nor returns to stop pin after pressure release.

Repair. Do NOT attempt repair. Send faulty regulators for repair to manufacturer's designated repair center, where special techniques and tools are used by trained personnel.

2. Cylinders

Cylinders must be handled carefully to prevent leaks and damage to their walls, valves, or safety devices:

Avoid electrical circuit contact with cylinders including third

rails, electrical wires, or welding circuits. They can produce short circuit arcs that may lead to a serious accident. (See 1-3C)

ICC or DOT marking must be on each cylinder. It is an assurance of safety when the cylinder is properly handled.

Identifying gas content. Use only cylinders with name of gas marked on them; do not rely on color to identify gas content. Notify supplier if unmarked. NEVER DEFACE or alter name, number, or other markings on a cylinder. It is illegal and hazardous.

Empties: Keep valves closed, replace caps securely; mark MT; keep them separate from FULLS, and return promptly.

Prohibited use. Never use a cylinder or its contents for other than its intended use, NEVER as a support or roller.

Locate or secure cylinders so they cannot be knocked over.

Passageways and work areas. Keep cylinders clear of areas where they may be stuck.

Transporting cylinders. With a crane, use a secure support such as a platform or cradle. Do NOT lift cylinders off the ground by their valves or caps, or by chains, slings, or magnets.

Do NOT expose cylinders to excessive heat, sparks, slag, and flame, etc. that may cause rupture. Do not allow contents to exceed 55 degrees C (130 degrees F.) Cool with water spray where such exposure exists.

Protect cylinders, particularly valves from bumps, falls, falling objects, and weather. Replace caps securely when moving cylinders.

Stuck valve. Do NOT use a hammer or wrench to open a cylinder valve that cannot be opened by hand. Notify your supplier.

Mixing gases. NEVER try to mix any gases in a cylinder.

NEVER refill any cylinder.

Cylinder fittings should never be modified or exchanged.

3. Hose

Prohibited use. Never use hose other than that designed for the specified gas. A general hose identification rule is: red for fuel gas, green for oxygen, and black for inert gases.

Use ferrules or clamps designed for the hose (not ordinary wire or other substitute) as a binding to connect hoses to fittings.

No copper tubing splices. Use only standard brass fittings to splice hose.

Avoid long runs to prevent kinks and abuse. Suspend hose off ground to keep it from being run over, stepped on, or otherwise damaged.

Coil excess hose to prevent kinks and tangles.

Protect hose from damage by sharp edges, and by sparks, slag, and open flame.

Examine hose regularly for leaks, wear, and loose connections. Immerse pressured hose in water; bubbles indicate leaks

Repair leaky or worn hose by cutting area out and splicing. Do NOT use tape.

4. Proper Connections

Clean cylinder valve outlet of impurities that may clog orifices and damage seats before connecting regulator. Except for hydrogen, crack valve momentarily, pointing outlet away from people and sources of ignition. Wipe with a clean, lintless cloth.

Match regulator to cylinder. Before connecting, check

that the regulator label and cylinder marking agree, and that the regulator inlet and cylinder outlet match. NEVER Connect a regulator designed for a particular gas or gases to a cylinder containing any other gas.

Tighten connections. When assembling threaded connections, clean and smooth seats where necessary. Tighten. If connection leaks, disassemble, clean, and retighten, using properly fitting wrench.

Adapters. Use a CGA adapter (available from your supplier) between cylinder and regulator, if one is required. Use two wrenches to tighten adapter marked RIGHT and LEFT HAND threads.

Regulator outlet (or hose) connections may be identified by right hand threads for oxygen and left hand threads (with grooved hex on nut or shank) for fuel gas.

5. Pressurizing Steps:

Drain regulator of residual gas through suitable vent before opening cylinder (or manifold valve) by turning adjusting screw in (clockwise). Draining prevents excessive compression heat at high pressure seat by allowing seat to open on pressurization. Leave adjusting screw engaged slightly on single-stage regulators.

Stand to side of regulator while opening cylinder valve.

Open cylinder valve slowly so that regulator pressure increases slowly. When gauge is pressurized (gauge reaches regulator maximum) leave cylinder valve in following position: for oxygen and inert gases, open fully to seal stem against possible leak; for fuel gas, open to less than one turn to permit quick emergency shut-off.

Use pressure charts (available from your supplier) for safe and efficient recommended pressure settings on regulators.

Check for leaks on first pressurization and regularly thereafter. Brush with soap solution. Bubbles indicate leaks. Clean off soapy water after test; dried soap is combustible.

E. User Responsibilities

Follow all Safety Rules.
Remove leaky or defective equipment from service immediately for repair. Read and follow user manual instructions.

F. Leaving Equipment Unattended

Close gas supply at source and drain gas.

G. Rope Staging-Support

Rope staging-support should not be used for welding or cutting operation; rope may burn.

1-3 ARC WELDING

Comply with precautions in 1-1, 1-2, and this section. Arc Welding, properly done, is a safe process, but a careless operator invites trouble. The equipment carries high currents at significant voltages. The arc is very bright and hot. Sparks fly, fumes rise, ultraviolet and infrared energy radiates, weldments are hot, and compressed gases may be used. The wise operator avoids unnecessary risks and protects himself and others from accidents.

A. Burn Protection

Comply with precautions in 1-2.

The welding arc is intense and visibly bright. Its radiation can damage eyes, penetrate lightweight clothing, reflect from light-colored surfaces, and burn the skin and eyes. Skin burns resemble acute sunburn; those from gas-shielded arcs are more severe and painful. DON'T GET BURNED; COMPLY WITH PRECAUTIONS.

1. Protective Clothing

Wear long-sleeve clothing in addition to gloves, hat, and

shoes. As necessary, use additional protective clothing such as leather jacket or sleeves, flameproof apron, and fire-resistant leggings. Avoid outer garments of untreated cotton.

Bare skin protection. Wear dark, substantial clothing. Button collar to protect chest and neck, and button pockets to prevent entry of sparks.

2. Eye and Head Protection

Protect eyes from exposure to arc. Eyes may be damaged by radiant energy when exposed to the electric arc, even when not looking in the direction of the arc. Never look at an electric arc without protection.

Welding helmet or shield containing a filter plate shade no. 12 or denser must be used when welding. Place over face before striking arc.

Protect filter plate with a clear cover plate.

Cracked or broken helmet or shield should NOT be worn; radiation can be passed through to cause burns.

Cracked, broken, or loose filter plates must be replaced IMMEDIATELY. Replace clear cover plate when broken, pitted, or spattered.

Flash goggles with side shields MUST be worn under the helmet to give some protection to the eyes should the helmet not be lowered over the face before an arc is struck. Looking at an arc momentarily with unprotected eyes (particularly a high intensity gas-shielded arc) can cause a retinal burn that may leave a permanent dark area in the field of vision.

3. Protection of Nearby Personnel

Enclose the welding area. For production welding, a separate room or enclosed bay is best. In open areas, surround the operation with low-reflective, noncombustible screens or panels. Allow for free air circulation, particularly at floor level.

Viewing the weld. Provide face shields for all persons who will be looking directly at the weld.

Others working in area. See that all persons are wearing flash goggles.

Before starting to weld, make sure that screen flaps or bay doors are closed.

B. Toxic Fume Prevention

Comply with precautions in 1-2B.

Generator engine exhaust must be vented to the outside air. Carbon monoxide can kill.

C. Fire and Explosion Prevention

Comply with precautions in 1-2C.

Equipment's rated capacity. Do not overload arc welding equipment. It may overheat cables and cause a fire.

Loose cable connections may overheat or flash and cause a fire.

Never strike an arc on a cylinder or other pressure vessel. It creates a brittle area that can cause a violent rupture or lead to such a rupture later under rough handling.

D. Compressed Gas Equipment

Comply with precautions in 1-2D.

E. Shock Prevention

Exposed electrically hot conductors or other bare metal in the welding circuit, or in ungrounded, electrically-HOT

equipment can fatally shock a person whose body becomes a conductor. DO NOT STAND, SIT, LIE, LEAN ON, OR TOUCH a wet surface when welding without suitable protection.

To protect against shock:

Keep body and clothing dry. Never work in damp area without adequate insulation against electrical shock. Stay on a dry duckboard, or rubber mat when dampness or sweat cannot be avoided. Sweat, sea water, or moisture between body and an electrically HOT part - or grounded metal - reduces the body surface electrical resistance, enabling dangerous and possibly lethal currents to flow through the body.

1. Grounding the Equipment

When installing, connect the frames of each unit such as welding power source, control, work table, and water circulator to the building ground. Conductors must be adequate to carry ground currents safely. Equipment made electrically HOT by stray currents may shock, possibly fatally. Do NOT GROUND to electrical conduit, or to a pipe carrying ANY gas or a flammable liquid such as oil or fuel.

Three-phase connection. Check phase requirement of equipment before installing. If only three-phase power is available, connect single-phase equipment to only two wires of the three-phase line. Do NOT connect the equipment ground lead to the third (live) wire, or the equipment will become electrically HOT - a dangerous condition that can shock, possibly fatally.

Before welding, check ground for continuity. Be sure conductors are touching bare metal of equipment frames at connections.

If a line cord with a ground lead is provided with the equipment for connection to a switch box, connect the ground lead to the grounded switch box. If a three-prong plug is added for connection to a grounded mating receptacle, the ground lead must be connected to the ground prong only. If the line cord comes with a three-prong plug, connect to a grounded mating receptacle. Never remove the ground prong from a plug, or use a plug with a broken ground prong.

2. Connectors

Fully insulated lock-type connectors should be used to join welding cable lengths.

3. Cables

Frequently inspect cables for wear, cracks, and damage. IMMEDIATELY REPLACE those with excessively worn or damaged insulation to avoid possibly lethal shock from bared cable. Cables with damaged areas may be taped to give resistance equivalent to original cable.

Keep cable dry, free of oil and grease, and protected from hot metal and sparks.

4. Terminals and Other Exposed Parts

Terminals and other exposed parts of electrical units should have insulating covers secured before operation.

5. Electrode Wire

Electrode wire becomes electrically HOT when the power switch of gas metal-arc welding equipment is ON and welding gun trigger is pressed. Keep hands and body clear of wire and other HOT parts.

6. Safety Devices

Safety devices such as interlocks and circuit breakers should not be disconnected or shunted out. Before installation, inspection, or service of equipment,

shut OFF all power, and remove line fuses (or lock or red-tag switches) to prevent accidental turning ON of power. Disconnect all cables from welding power source, and pull all 115 volts line-cord plugs.

Do not open power circuit or change polarity while welding. If, in an emergency, it must be disconnected, guard against shock burns or flash from switch arcing. Leaving equipment unattended. Always shut OFF, and disconnect all power to equipment.

Power disconnect switch must be available near the welding power source.

INTRODUCTION

Congratulations! You have just purchased the latest generation of the popular Cobra System III Gooseneck Torch.

With the quest to be a Leader in Welding Technology this generation of Cobra System III Gooseneck Torch is the best MK Products has ever developed. Stronger gas and water tubes, motor and gearbox with enough torque and speed to feed aluminum and flux core wires from .030 to 1/16, solid and hard wires from .030 to .045. Matched up with any of MK's Cobramatic wire feed system is a combination that can not be beat.

This manual details the installation and operation of your Cobra System III Gooseneck Torch. Properly installed, adjusted for your welding conditions, it will be a reliable welding system producing consistently uniform welds.

Conduits for all MK torches (System III Gooseneck, Prince, and King) are interchangeable. Some parts are interchangeable with existing Gooseneck and Prince torches (contact tips, gas cups, drive and idler rolls). Consult your owner's manual for more information on your Cobra System III Gooseneck torch.

SPECIFICATIONS

WIRE CAPACITY

.030-.045 solid and hard wire
.030-1/16 aluminum and cored wire

WIRE SPEED

800 IPM Max. at 120VAC Feeder Input

DUTY CYCLE

Air Cooled Torches (161 and 163 series) - 200 amps @ 50%

Water Cooled Torches (160 and 162 series) - 250 amps @ 50%

Water Cooled Torches w/ Optional Heavy Duty Finned Gas Cup - 300 amps @ 50%

All are at 25 volts max. using Argon Gas

SHIPPING WEIGHT

Air Cooled

15' 13 lbs.
25' 18 lbs.
50' 30 lbs.

Water Cooled

15' 15 lbs.
25' 19 lbs.
50' 32 lbs.

SUPPORT EQUIPMENT REQUIRED

C.V. or C.C. Power Source of sufficient capacity for your needs.

Regulated gas supply and hoses.

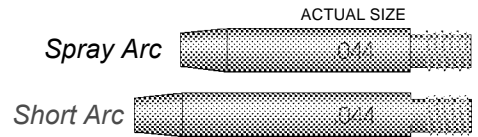
Properly sized power leads from power source to wire feeder and ground.

Water source and hose capable of providing a minimum of **1 qt/min. at 45 p.s.i.** when using water cooled torches.

COOLANT RECOMMENDATIONS

1. Use a name-brand additive which does not contain reactive sulphur or chlorine and does not react with copper, brass, or aluminum.
2. Check coolant periodically to remain within limits of the following:
 - A. Coolant Flow rate - 1 quart/minute at 45 p.s.i.
 - B. Resistivity - 10K ohms/centimeter
 - C. Ph Range - 5.5-8.5
 - D. Particle Size - .005"

CONTACT TIPS



CONTACT TIP GUIDE

WIRE SIZE	TIP I.D. **	ARC TYPE	LENGTH	PART NO.
.023" (0.6mm)	.030" (0.8mm)	Spray Arc	1-1/2" (38mm)	621-0057
	.030" (0.8mm)	Short Arc	1-3/4" (44mm)	621-0328
.030" (0.8mm)	.036" (0.9mm)	Spray Arc	1-1/2" (38mm)	621-0325
	.036" (0.9mm)	Short Arc	1-3/4" (44mm)	621-0326
.030" (0.8mm) or .035" (0.9mm)	.040" (1.0mm)	Spray Arc	1-1/2" (38mm)	621-0076
	.040" (1.0mm)	Short Arc	1-3/4" (44mm)	621-0077
.035" (0.9mm)	.044" (1.1mm)	Spray Arc	1-1/2" (38mm)	621-0001
	.044" (1.1mm)	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)	621-0003
	.060" (1.5mm)	Short Arc	1-3/4" (44mm)	621-0286
1/16" (1.6mm)	.075" (1.9mm)	Spray Arc	1-1/2" (38mm)	621-0075
1/16" (1.6mm)	.085" (2.1mm)	Spray Arc	1-1/2" (38mm)	621-0153
	.085" (2.1mm)	Short Arc	1-3/4" (44mm)	621-0154

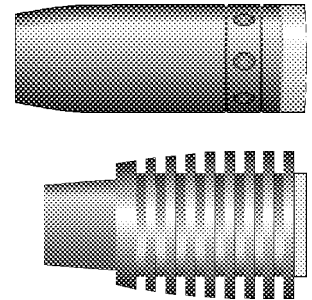
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* Standard - Furnished with torch. ** All tips stamped with tip I.D.

NOTE: As a rule of thumb, use the smaller I.D. tip for steel, stainless steel and the 5000 series aluminum. Softer alloys such as the 1000 and 4000 series aluminum require more clearance and, therefore, use a larger I.D. tip.

GAS CUPS

Standard Cup



STANDARD GAS CUPS			HEAVY-DUTY GAS CUPS		
SIZE	I.D.	PART NO.	SIZE	I.D.	PART NO.
5	1/4" (6.4mm)	621-0079			
6	3/8" (9.5mm)	001-0137			
*8	1/2" (12.7mm)	001-0138	8	1/2" (12.7mm)	621-0366
10	5/8" (15.8mm)	001-0139	10	5/8" (15.8mm)	621-0367

*Standard - Furnished with torch

TORCH LINERS

BARREL	LINER MATERIAL	WIRE TYPE USED	PART NO.
Straight*	Green Teflon	All	615-0316
Curved & Long Straight	Green Teflon	Aluminum	615-0317
Curved & Long Straight	Spiral Steel	Steel / Cored	615-0318
Spool Kit liner	Black Teflon	All	615-0319
Straight	HD White Teflon	All (.045max.)	615-0325
Curved & Long Straight	HD White Teflon	Aluminum (3/64max.)	615-0326

*Standard - Furnished with torch

Bulk green teflon liner material P/N 615-0054 - Bulk HD white teflon liner material (.023-.045) P/N 615-0209 - Order bulk material by the foot.

OPTIONAL KITS

Insulated Knurled Drive Roll Kit 005-0118
 For .030" through 1/16" dia. wire. Includes insulated drive roll P/N 511-0068 and idler roll assy. P/N 511-0074.

Insulated Groove Drive Roll Kit 005-0244
 For .030" (0.8mm) dia. aluminum wire.
 Includes and insulated drive roll P/N 511-0089 and idler roll assy. P/N 003-1870.

Insulated Groove Drive Roll Kit 005-0245
 For .035" (0.9mm) dia. aluminum wire.
 Includes insulated drive roll P/N 511-0090 and idler roll assy. P/N 003-1870.

Insulated Groove Drive Roll Kit 005-0246
 For .040" (1.0mm) dia. aluminum wire.
 Includes insulated drive roll P/N 511-0091 and idler roll assy. P/N 003-1870.

Insulated Groove Drive Roll Kit 005-0247
 For .045" (1.2mm) dia. aluminum wire.
 Includes insulated drive roll P/N 511-0092 and idler roll assy. P/N 003-1870.

Insulated Groove Drive Roll Kit 005-0248
 For .062" (1.6mm) dia. aluminum wire.
 Includes insulated drive roll P/N 511-0093 and idler roll assy. P/N 003-1870.

Handle Kit - System III torch only 005-0255
 Includes right and left handles, trigger, pot nut, and knob and related hardware.

NOTE: 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 unless using too large of a contact tip or excessively oxidized aluminum wire.

OPTIONAL ACCESSORIES

Flat Spiral Steel Conduit
for steel & cored wire.

615-0208 15 ft./4.5m
615-0216 25 ft./7.6m
615-0218 50 ft./15.0m

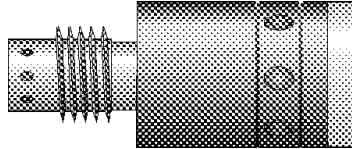
Standard Conduit
with additional protective cover.

001-0774 15 ft./4.5m
001-0775 25 ft./7.6m
001-0777 50 ft./15.0m

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

Tip Extender 621-0017

Tip extender is used if torch cup or tip threads have been damaged or to prevent damage. Longer liners are required when using tip extender.



OPERATION

1. GENERAL

The patented Cobra Gooseneck Torch maintains a constant, steady, uniform 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 24 volt DC torch motor is controlled by a three (3) turn potentiometer in the torch handle.

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.

2. POTENTIOMETER

The pot is located on the left hand side of the torch and provides three (3) turns of rotation. A spacer is placed on the pot shaft before the pot is inserted into the handle. A special pot nut and O-Ring provides drag on the knob and also secures the pot to the handles.

3. MICRO SWITCH

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. The micro switch lever may be adjusted to accomplish this.

4. MOTOR GEAR BOX

A 19.5:1 24VDC motor gear box is used on this version of the Gooseneck Torch. The motor gear box attaches to the angle head with three (3) Allen screws. The torch serial number is stamped on the angle head. There are no spare parts for the motor gear box; it must be replaced as a whole.

5. LEAD ASSEMBLIES

Power Cable

Water-cooled torches use a bare #4 AWG power cable housed inside a flexible hose. The torch fitting is screwed into the back of the torch block using a conductive sealant. Because of the small cable used, these torches must be water-cooled. Ultraflex torches, on the other hand, use a #2 AWG power cable which is secured to the torch in the same manner. The power cable fitting on the end connects to the power block inside the Cobramatic feeder.

Conduit

The Cobra Gooseneck comes standard with a teflon lined conduit. The torch end is secured with a set screw accessible through a hole in the handles. Spiral steel liners are available when using hard and cored wires.

Gas Hose

The gas hose is crimped to the inlet tube with a ferrule. The gas inlet tube is located in the lower left of the torch when viewed from the rear.

Water-In Hose

The Water-In Hose is crimped to the inlet tube with a ferrule. The Water-In tube is located in the upper right of the torch when viewed from the rear. Air cooled torches

do not have a Water-In Hose.

Electric Cable

A seven conductor control cable is used on the Gooseneck Torch. The torch end of the control cable is secured to the back of the torch with a cable clamp and the wires are soldered to the motor, pot, and micro switch. The cabinet end has a seven pin "S" or "W" clocked Amphenol connector. See schematic for wiring information.

6. DRIVE AND IDLER ROLLS

A. General

The Gooseneck torch comes standard with knurled drive rolls which will handle wire diameters from .030-1/16 inch. Optional V-groove 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 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.

NOTE: Over-tightening of the drive rolls will cause excessive knurling and/or deformation of the wire.

B. Drive Roll Installation/Removal

1. Remove right handle.
2. Rotate drive roll by jogging drive motor with trigger switch or with finger tips until slots line up.
3. Hold the drive roll with 3/8" open-end wrench.

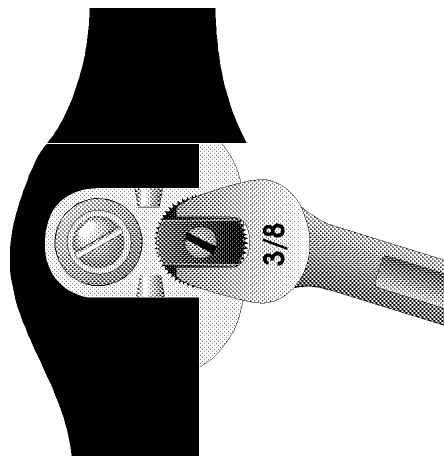


Figure 1

4. Insert a slot type screwdriver into the slot on motor shaft, and turn screwdriver CCW (left hand thread).
5. Install new drive roll on motor shaft using left hand thread. Drive roll will self-

tighten when feeding wire.

C. 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.

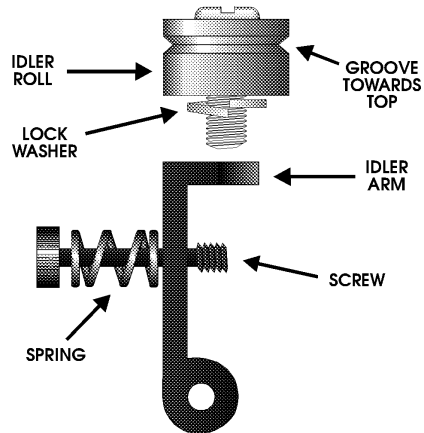
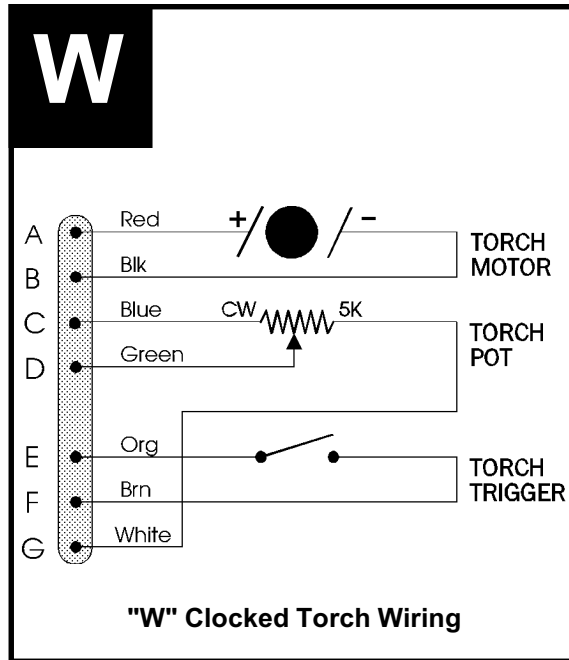


Figure 2

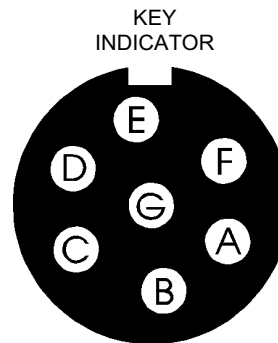
3. Tighten.

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

**"W" CLOCKED
TORCH WIRING
DIAGRAM**



This wiring applies to all 162 & 163 Series Torches

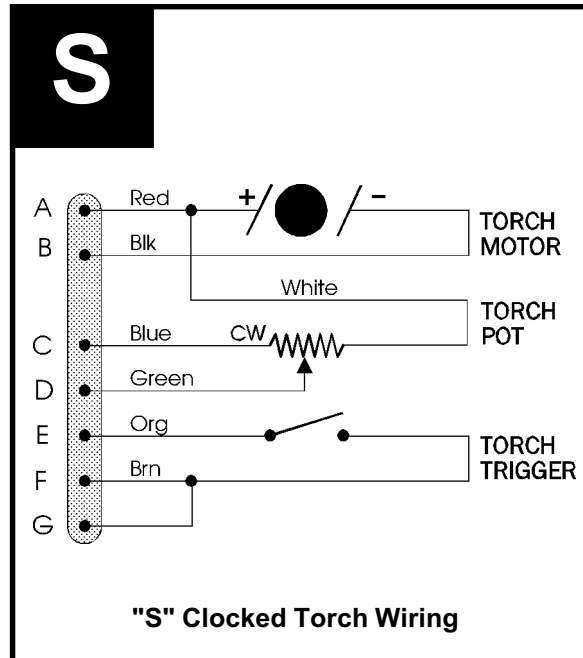


**New "W" Clocked
Amphenol Connector**

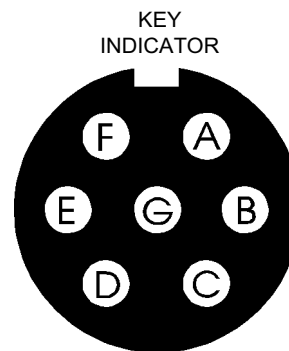
Viewed from the front of connector

Figure 3

**"S" Clocked
Torch Hook-up
Diagram**



This wiring applies to all 160 & 161 Series Torches



**Standard "S" Clocked
Amphenol Connector**

Viewed from the front of connector

Figure 6

**"W" CLOCKED
CABLE
ASSEMBLIES**

"W" SERIES TORCHES ONLY

162 SERIES WATER COOLED CABLE ASSEMBLIES

Length	Complete Cable Assy	Conduit	#4 Water/ Power Cable	Electrical Cable 7 pin "W" Clocked	Gas Hose	Water In Hose	Boot
15'	001-1196	615-0007	001-2521	001-3787	001-0537	001-0529	551-0272
25'	001-1197	615-0008	001-2524	001-3788	001-0538	001-0530	551-0273
50'	001-1199	615-0068	843-0338	001-3790	001-0665	001-0667	551-0293

163 SERIES ULTRA FLEX CABLE ASSEMBLIES

Length	Complete Cable Assy	Conduit	#2 Power Cable	Electrical Cable 7 pin "W" Clocked	Gas Hose		Boot
15'	001-1143	615-0007	001-2527	001-3787	001-0537		551-0274
25'	001-1144	615-0008	001-2528	001-3788	001-0538		551-0275
50'	001-1145	615-0068	001-1042	001-3790	001-0665		551-0277

CABLE FITTINGS & FERRULES

Power Cable Fittings for #4 Water-Cooled Torches (162 series)

Component	Torch End	Cabinet End	Ferrule #650
Part No.	003-0590	003-1327	469-0002

Power Cable Fittings for Ultra-Flex Torches (163 series)

Component	Torch End	Cabinet End	
Part No.	431-1128	003-1328	

Gas Hose & Water In Hose Ferrules (all Torches)

Component	Ferrule #400	Cabinet End Nut & Nipple	
Part No.	469-0161	753-0464	

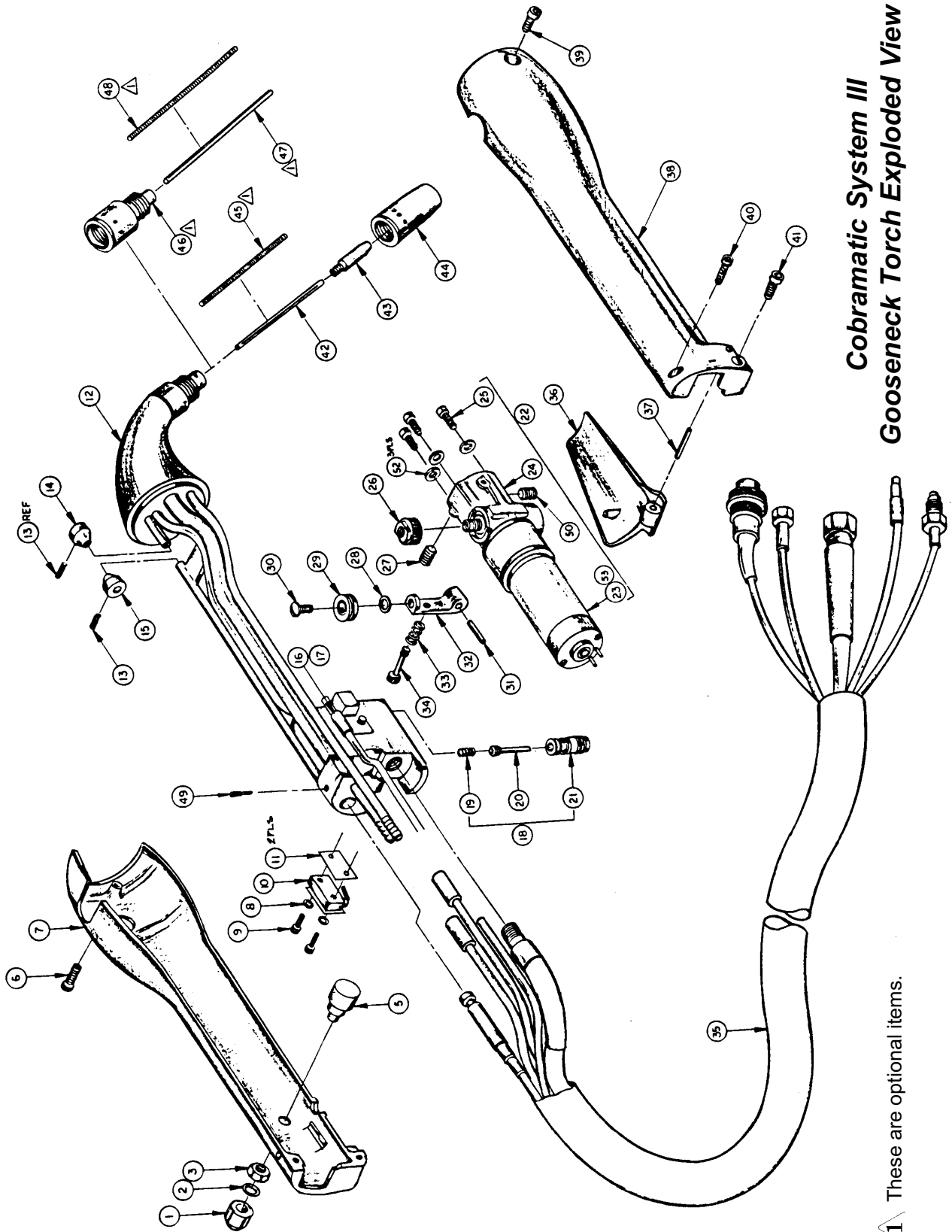
See page xx for listings on "S" clocked Torches

**MODEL NUMBER
REFERENCE
CHART**

MODEL SERIES	DESCRIPTION	CONNECTOR CLOCKING	WIRE IPM	CABLE TYPE
160-xxx	Cobra Gooseneck	S	800	Water-Cooled
161-xxx	Cobra Gooseneck	S	800	Air-Cooled
162-xxx	Cobra Gooseneck	W	800	Water-Cooled
163-xxx	Cobra Gooseneck	W	800	Air-Cooled

**"S" CLOCKED
CABLE
ASSEMBLIES**

"S" SERIES TORCHES ONLY							
160 SERIES WATER COOLED CABLE ASSEMBLIES							
Length	Complete Cable Assy	Conduit	#4 Water/ Power Cable	Electrical Cable 7 pin "S" Clocked	Gas Hose	Water-In Hose	Boot
15'	001-1009	615-0007	001-2521	001-3794	001-0537	001-0529	551-0272
25'	001-1010	615-0008	001-2524	001-3795	001-0538	001-0530	551-0273
50'	001-1012	615-0068	843-0338	001-3797	001-0665	001-0667	551-0293
161 SERIES ULTRA FLEX CABLE ASSEMBLIES							
Length	Complete Cable Assy	Conduit	#2 Power Cable	Electrical Cable 7 pin "S" Clocked	Gas Hose		Boot
15'	001-1025	615-0007	001-2527	001-3794	001-0537		551-0274
25'	001-1026	615-0008	001-2528	001-3795	001-0538		551-0275
50'	001-1043	615-0068	001-1042	001-3797	001-0665		551-0277
CABLE FITTINGS & FERRULES							
Power Cable Fittings for #4 Water-Cooled Torches (160 series)							
Component	Torch End		Cabinet End		Ferrule #650		
Part No.	003-0590		003-1327		469-0002		
Power Cable Fittings for Ultra-Flex Torches (161 series)							
Component	Torch End		Cabinet End				
Part No.	431-1128		003-1328				
Gas Hose & Water In Hose Ferrules (all Torches)							
Component	Ferrule #400		Cabinet end Nut & Nipple				
Part No.	469-0161		753-0464				



**Cobramatic System III
Gooseneck Torch Exploded View**

Figure 4

**PARTS LIST -
GOOSENECK
TORCH**

ITEM	PART NO.	QTY	DESCRIPTION	ITEM	PART NO.	QTY	DESCRIPTION
1	401-0521	1	Knob	28	333-0082	1	Washer Lock #10 Med.
2	303-0540	1	"O" Ring	29	511-0001	1	Idler Roll
3	449-0542	1	Nut, Pot	30	325-0206	1	Screw P.H. #10-24 x 3/8 LG
5	117-0520	1	Potentiometer	31	421-3106	1	Dowel Pin 1/8 dia. x 3/4 LG
6	328-0015	1	Screw,Soc.HD.Cap #6-32 x 3/4	32	413-0017	1	Idler Arm
7	437-0202	1	Handle, Left Side	33	419-0020	1	Spring Roll Pressure
8	333-0039	2	Lock Washer #2 Int. Star	34	431-0015	1	Torch, Adjusting Screw
9	325-0025	2	Screw, P.H. #2-56 x 3/8 LG	35	See Table	1	Lead Assembly
10	161-0002	1	Micro Switch	36	003-0302	1	Lever-SwitchActuator
11	261-0069	1	Insulator	37	421-0018	1	Dowel Pin 3/32 Dia. x 7/8 LG
12	001-1202	1	Front Body Assy.	38	437-0201	1	Handle, Right Side
13	321-0001	2	Set Screw, #4-40 x 1/8LG	39	328-0013	1	Screw,Cap Soc.HD #6-32 x 1/2
14	431-0743	1	Front Wire Guide	40	328-0002	1	Screw,Cap Soc.HD #4-40 x 3/8
15	431-0115	1	Rear Wire Guide	41	328-0014	1	Screw,Cap Soc.HD #6-32 x 5/8
16	411-0159	1	Cable Clamp	42	615-0055	1	Teflon Liner
17	328-0216	1	Screw Soc.HD Cap#3-48 x 3/16	43	621-0003	1	ContactTip
18	001-0562	1	Gas Valve Assy.	44	001-0138	1	Gas Cup #8
19	419-0742	1	Spring	45	615-0284	1	Spiral Liner
20	001-0740	1	Valve Stem Assy. *	46	621-0017	1	Tip Extension
21	001-0553	1	GasValve Seat Assy.	47	615-0058	1	Long Teflon Liner
22	001-3662	1	Motor & Gear Box Assy. (800ipm)**	48	615-0057	1	Long Spiral Liner
23	211-0058	1	Motor - Pittman (19.5:1) (800ipm)**	49	321-1074	1	Screw, set. modified
24	003-1300	1	Gear Box Assy.	50	321-0083	1	Screw, set. 1/4 - 20 x 3/8
25	328-0003	3	Screw Cap Soc.HD #4-40 x 3/8	51	na		
26	511-0016	1	Drive Roll	52	333-0003	3	Lock Washer
27	321-0080	1	Screw, Set.1/4 - 20 x 3/16				

*NOTE: If feeder is equipped with gas solenoid, modified gas valve stem P/N 431-1080 must be installed in torch.

**NOTE: The following items are for the optional High Speed Torch.

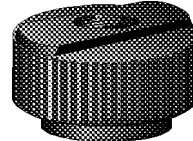
- 22 001-3673 Motor & Gear Box (1000 ipm) Optional High Speed
- 23 211-0064 Motor - Pittman (10:1) (1000 ipm) Optional High Speed
(Motor leads must be reversed on the high speed motor)

RECOMMENDED SPARE PARTS LIST

QTY	PART NUMBER	DESCRIPTION
1	615-0007	Conduit 15'
1	615-0008	Conduit 25'
1	615-0068	Conduit 50'
1	117-0520	Potentiometer
1	161-0002	Micro Switch
3	401-0521	Knob, Pot
2	303-0540	'O' Ring, Pot
2	449-0542	Nut, Pot
1	005-0202	Handle Kit
2	511-0016	Drive Roll
2	511-0001	Idler Roll
2	333-0082	Lock Washer, Idler roll



KNOB
401-0521



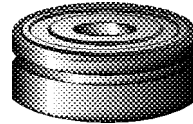
DRIVE ROLL
511-0016



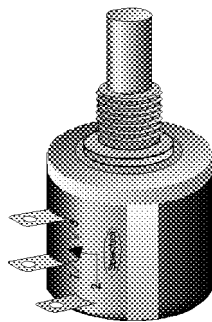
'O' RING
303-0540



NUT
449-0542



IDLER ROLL
511-0001



POT
117-0520



MICRO SWITCH
161-0002

**POTENTIOMETER
ASSEMBLY**

TROUBLESHOOTING GUIDE

TROUBLE	CAUSE	REMEDY
No wire feed at torch, feeder not operating, i.e. no slave motor or brake solenoid.	115 VAC Control fuse in feeder/Control box blown.	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	24 VAC Control fuse 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.
	Contactors 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.
Wire feeds erratically.	Excessive spool drag pressure.	Decrease spool drag pressure.
	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

trouble.tbl

TROUBLE-SHOOTING

Regardless of which torch or feeder used, all M.K. Products' push-pull guns operate on the same principle. The 115 VAC 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 drag adjustment in the spindle is used simply to keep the wire slightly taut, so it will not pull off the spool while feeding wire.

The high torque 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.

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

TESTING THE TORCH

A. Motor Check

1. Remove the torch connector from the cabinet.
2. 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**.
3. If an open circuit or short exist, check the motor leads and motor independently.

B. Testing the Potentiometer - "W" Clocked

1. Using the torch Amphenol, check the resistance across pin "D" (wiper) and pin "C". The resistance should vary from **0 - 5K ohms**.
2. Check the resistance across pin "D" (wiper) and pin "G". The resistance should vary from **5K - 0 ohms**.

C. Testing the Potentiometer - "S" Clocked

1. Using the torch Amphenol, check the resistance across pin "D" (wiper) and pin "C". The resistance should vary from **0 - 5K ohms**.
2. Check the resistance across pin "D" (wiper) and pin "A". The resistance should vary from **5K - 0 ohms**.

D. Testing the Micro Switch

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

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 Cobramatic system that are subject to normal wear are the conduit, contact tips, gas cups, front body liners, wire guides, drive and idler rolls. A supply of these parts should be maintained on hand.

If repairs do become necessary, any part can easily be replaced by a qualified shop maintenance man.

Your Cobramatic 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.

CHANGING THE CONDUIT

Method 1 - Using Conduit Coupler Fitting

1. Lay torch out as straight as possible.
2. Lay out new conduit in front of torch as shown.
3. **B** Remove spiral wrap from both ends of cable assemblies.
4. **A** Using the conduit coupler fitting, (MK P/N 757-0012), couple the old conduit to the new one.
5. Pull the old conduit out while an assistant pushes the new one in.

Method 2 - Field Expedient

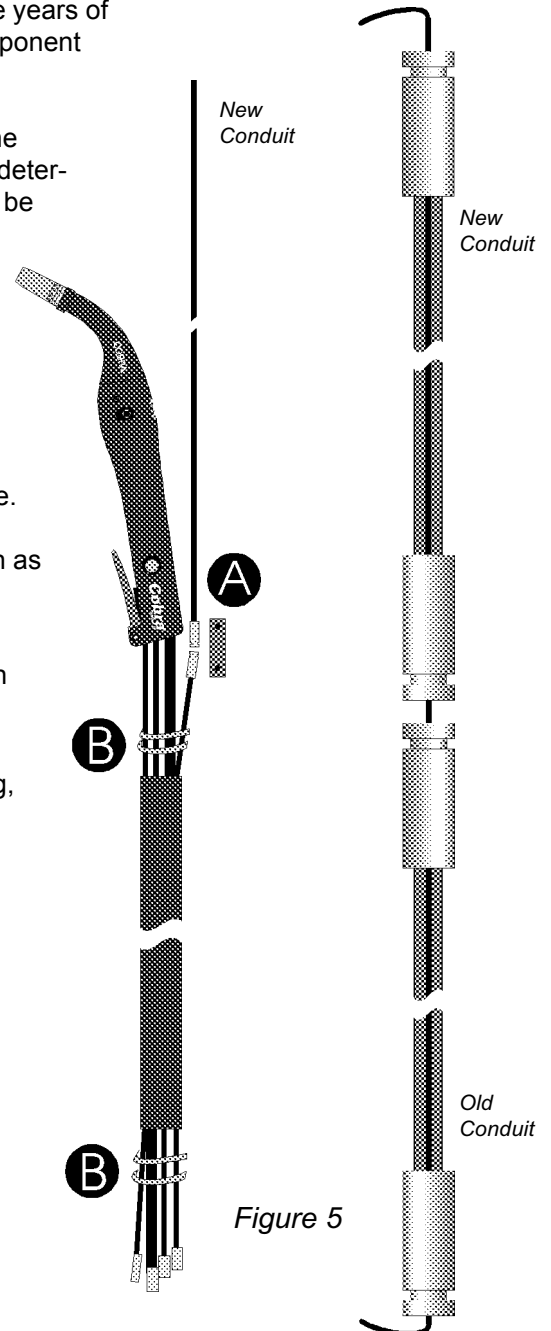
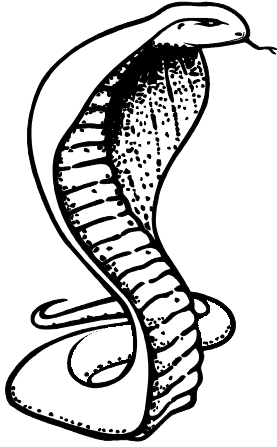


Figure 5

Method 1

Method 2

1. Lay torch out as straight as possible.
2. Lay out new conduit in front of torch as shown.
3. **Remove spiral wrap** from both ends of cable assemblies.
4. Using .045 hard wire, run it through the old and the new conduit and bend wire over at both ends and tape secure.
5. Pull the old conduit out while an assistant pushes the new one in.



SNAKESKIN CABLE COVER

IN ORDER TO PROVIDE BETTER FIELD SERVICEABILITY
WE HAVE REPLACED OUR CABLE COVERS WITH A NEW COVER
CALLED THE "SNAKESKIN".

A "Snakeskin" is a flexible, fire-resistant nylon cable cover with a flap protecting the zipper which is used as a field replacement for COBRA, KING and PRINCE Mig torches. The MK "Snakeskin" is the only cable cover with a protective flap over the zipper, making it an ideal cover for Mig Torches. This cover is reusable reducing future replacement costs. The old rubber boot was difficult to remove and replace in the field.

Features:

- The zipper will not conduct electric current.
- The zipper is covered with fabric to protect it from the welding spatter!
- Sturdy, yet light weight fabric allows for continued easy flexing of the lead assy.

Use the chart below to order your new cover. You can cross reference to the new number using either the old rubber boot part number or simply by cable length.

Rubber Boot P/N	Snakeskin P/N	Cable Length
551-0272 (0274)	931-0110	15.0 ft
551-0273 (0275)	931-0122	25.0 ft
551-0293 (0277)	931-0122 (2 REQ.)	50.0 ft

LIMITED WARRANTY

Effective February 15, 1995

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 and Weldheads** 1 year
2. **All Other Equipment** 2 years
3. **Mechanical & Electro-Mechanical Components** .. 1 year
4. **Electronic Assemblies and Sub-Assemblies** 2 years
5. **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 for foreign markets.

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FORM : LW-6
DATE : February 1995



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