ARCAIR®

AN ESAB® BRAND

K4000®
K3000™

AIR CARBON-ARC MANUAL GOUGING TORCHES



Operating Manual

English

Revision: AC	**Issue Date:** June 15, 2016	**Manual No.:** 89250012

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Congratulations on receiving your new Arcair® product. We are proud to have you as our customer and will strive to provide you with the best service and support in the industry. This product is backed by our extensive warranty and world-wide service network.

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1-800-462-2782 (USA) and 1-905-827-4515 (Canada),
or visit us on the web at **www.esab.com/arcair**

WARNINGS

Read and understand this entire Manual and your employer's safety practices before installing, operating, or servicing the equipment.

While the information contained in this Manual represents the Manufacturer's best judgement, the Manufacturer assumes no liability for its use.

Arcair® K3000™ & K4000® Air Carbon-Arc Manual Gouging Torches
Operating Manual
Operating Manual Guide Number: 89250012

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SECTION 1: INTRODUCTION

1.01 Air Carbon-Arc Cutting/Gouging

The air carbon-arc process (CAC-A) removes metal physically, not chemically as in oxy-fuel cutting (OFC). Gouging or cutting occurs when the intense heat of the arc between the carbon electrode and the workpiece melts part of the workpiece. Simultaneously, air passes through the arc quickly enough to blow the molten material away.

The air carbon-arc process does not require oxidation to maintain the cut, so it can gouge or cut metals that the OFC process cannot. Most common metals (e.g., carbon steel, stainless steel, many copper alloys and cast irons) can be cut using the air carbon-arc process. The metal removal rate depends on the melting rate and how efficiently the air jet removes molten metal. In the process, the air must lift the molten metal clear of the arc before the metal solidifies.

1.02 History

Air carbon-arc gouging began in the 1940's, evolving from the existing carbon-arc cutting process. Myron Stepath, a welding engineer, developed air carbon-arc gouging to remove several hundred feet of flat, cracked, stainless steel weld.

Previously, carbon-arc cutting removed overhead and vertical defective welds and rivet heads. The carbon-arc melted the metal, then gravity moved the molten metal away.

Stepath reasoned that an air jet could provide the force to remove metal lying flat. So he tried a direct-current, electrode-negative carbon-arc with a second operator directing an air blast via air nozzle at the molten pool. However, this attempt was unsuccessful because the arc was less stable than a carbon-welding arc. So, Stepath tried a direct-current, electrode-positive arc, and the result was air carbon-arc gouging.

In 1948, Myron Stepath introduced the first air carbon-arc torch to the welding industry. In 1949, Stepath and two associates founded the Arcair Company.

Two operators were no longer needed. The compressed air now passed through the torch and exited beneath the electrode. This new tool saved time on weld backgouging, crack removal, and weld defect repair on carbon, alloy, and stainless steel. Previously, these tasks were performed by grinding or chipping.

Today, the basic principle remains the same, but with improved equipment and an expanded number of applications.

1.03 Applications

The industry has enthusiastically adopted air carbon-arc gouging and found many uses for the process in metal fabrication and casting finishing, chemical and petroleum technology, construction, mining, general repair, and maintenance.

Arcair Torches and Electrodes are used throughout the world, anywhere metal is gouged, grooved, severed, or removed from a surface.

The air carbon-arc process is flexible, efficient, and cost effective on practically any metal: carbon steel, stainless steel and other ferrous alloys; gray, malleable and ductile iron; aluminum; nickel; copper alloys and other nonferrous metals.

1.04 The "BEST" Just Got Better…

Arcair is changing the game when it comes to the power and air connection design on their K-Series torch cable assemblies.

Since the invention of the air carbon-arc process in 1949, the torch and cable have always used a molded rubber "boot" to provide electrical protection for the power connection by preventing arcing against a grounded work surface. This boot design incorporates a large open rectangular end that allows the power cable and air hose space to connect to the torch cable. However, the boot can expose the power connection to the grounded work surface if it is not properly installed and kept in place over the connection.

Now, the improved boot design encapsulates the power/air connection, eliminating the chance of accidental arcing. It can accept one 4/0 welding cable from the power supply and one ¾" diameter air hose assembly that provides current and compressed air.

This new boot design is molded from a hard nylon reinforced fiber material that can withstand the abuse of everyday use in a fabrication shop.

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SECTION 2: SAFETY AND HEALTH

Safe practices in welding and cutting processes, such as air carbon-arc, are covered in ANSI Z49.1, “Safety in Welding and Cutting”, and ANSI 249.2, “Fire Prevention in Use of Welding and Cutting Processes.” Air carbon-arc operators and their supervisors should adhere to the safe practices discussed in these documents.

Other hazards in arc welding and cutting are briefly discussed in this section.

2.01 Proper Installation, Use, and Maintenance

Serious injury or death may result if gouging and cutting equipment is not properly installed, used, and maintained. Misuse of this equipment and other unsafe practices can be hazardous. The operator, supervisor, and helper must read and understand the following safety warnings and instructions before installing or using any air carbon-arc torch or equipment.

The gouging/cutting process is used in many potentially dangerous environments, such as elevated heights, areas with limited ventilation, close quarters, areas around water, hostile environments, etc. The operator must be aware of the dangers associated with working in these types of conditions. The operator must be trained in safe practices for his work environment and be under competent supervision.

It is essential that the operator, supervisor, and others in the work area be aware of the dangers of the air carbon-arc process. Training and proper supervision are important for a safe work place. Keep these instructions for future use. Additional recommended safety and operating information is referenced in each section.

2.02 Electrodes



WARNING

ELECTRIC SHOCK CAN CAUSE INJURY OR DEATH

Install and maintain equipment in accordance with the National Electrical Code (NFPA 70) and local codes. Do not service or repair equipment with power on. Do not operate equipment with protective insulators or covers removed. Service or repair to equipment must be done by qualified and/or trained personnel only

Keep carbon electrodes dry. If electrodes become damp, bake them for 10 hours at 300˚ F (176˚ C). Wet electrodes may shatter.

Do not touch electrically live parts. Do not touch an electrode with bare skin and electrical ground at the same time. Always wear dry welding gloves that are in good condition. Aluminized protective clothing can become part of the electrical path. Keep oxygen cylinders, chains, wire ropes, cranes, hoists, and elevators away from any part of the electrical circuit. Check all ground connections periodically to determine if they are mechanically strong and electrically adequate for the required current.

If you are engaged in alternating current gouging/cutting under wet conditions or warm surroundings where perspiration is a factor, use reliable automatic controls for reducing no load voltage to reduce shock hazard. When the gouging/cutting process requires values of open circuit voltages in alternating current machines higher than 80 volts, and direct current machines higher than 100 volts, take precautions, such as using adequate insulation, to prevent the operator from making accidental contact with the high voltage.

If you are going to suspend gouging for any substantial period of time, such as during lunch or overnight, remove all electrodes from the torch and the put the torch in a safe location so that accidental contact cannot occur. Disconnect the torch from the power source when it is not in use. Never immerse air carbon-arc torches or electrodes in water.

2.03 Ventilation Hazards



WARNING

SMOKE, FUMES, AND GASES CAN BE DANGEROUS TO YOUR HEALTH

Keep smoke, fumes and gases from the breathing area. Fumes from the gouging process are of various types and strengths, depending on the kind of base metal being worked on. To ensure your safety, do not breathe these fumes. Ventilation must be adequate to remove smoke, fumes and gases during the operation to protect gouging operators and others in the area.

Vapors of chlorinated solvents can form the toxic gas phosgene when they are exposed to ultraviolet radiation from an electric arc. Remove all solvents, degreasers, and potential sources of these vapors from the operating area.

Fumes that are produced by cutting in particularly confined places can cause discomfort and physical harm if inhaled over an extended period of time. Provide adequate ventilation in the gouging/cutting area. Use air-supplied respirators if there is not enough ventilation to remove all fumes and gases. Never ventilate with oxygen, because oxygen supports and vigorously accelerates fire.

2.04 Personal Protective Equipment and Clothing



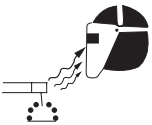
WARNING

NOISE CAN DAMAGE HEARING

Noise from the air carbon-arc process can damage your hearing. Operators and surrounding personnel must wear adequate protective hearing devices to ensure personal protection against noise when noise levels exceed OSHA standards.

Duration Per Day (hours)	Sound Level (dBA*) Slow Response
8	90
6	92
4	95
3	97
2	100
1-1/2	102
1	105
1/4 or less	115

* dBA = decibels



WARNING

ARC RAYS, HOT SLAG, AND SPARKS CAN INJURE EYES AND BURN SKIN

The gouging/cutting process produces extreme localized heat and strong ultraviolet rays. Never attempt to gouge/cut without a welding helmet with the proper lens that complies with federal guidelines.

A number 12 to 14 shade filter lens provides the best protection against arc radiation. When in a confined area, prevent the reflected arc rays from entering around the helmet. Make sure others are protected from arc rays and sparks. Use approved shielding curtains and appropriate goggles to provide protection to others in the surrounding area and operators of nearby equipment.

Skin should also be protected from arc rays, heat and molten metal. Always wear protective gloves and clothing that will not allow skin to become exposed. Close all pockets and sew shut all cuffs. Wear leather aprons, sleeves, leggings, etc. for out-of-position gouging/cutting, or for heavy metal-removal operations using large electrodes. High top work shoes provide adequate protection from foot burns. Use leather spats for added protection. Do not use flammable hair preparations when gouging/cutting. Wear ear plugs to protect ears from sparks.

2.05 Shielding Booths

Where the work permits, the arc welder should be enclosed in an individual booth painted with a finish of low reflectivity—an important factor for absorbing ultraviolet radiations—such as zinc oxide and lamp black. The welder may also be enclosed in similarly painted noncombustible screens.

2.06 Fire and Burn Hazards



WARNING

WELDING SPARKS CAN CAUSE FIRES AND EXPLOSIONS.

Causes of fire and explosion include combustibles reached by the arc, flame, flying sparks, hot slag or heated materials. Remove combustibles from the work area and/or provide a fire watch. Avoid oily or greasy clothing as a spark may ignite them. Keep a fire extinguisher nearby, and know how to use it.

Be alert to the danger of conduction or radiation. For example, if you will be gouging/cutting on a metal wall, partition, ceiling or roof, take precautions to prevent combustibles from igniting on the other side. Do not gouge/cut containers that have held combustibles. Vent all hollow spaces, cavities and containers before gouging/cutting to permit air or gases to escape. Purging with inert gas is recommended.

Table 2-1 - Recommended Minimum Air Requirements

Type of Torch	Air Pressure[1] psi (kPA)	Air Consumption cfm (L/min.)	Recommended Compressor Rating		
			Intermittent Use hp (kW)	Continuous Use hp (kW)	ASME Receiver Size gal (lit)
Light Duty[2]	40 (280)	8 (227)	0.5 (0.4)	1.5 (1.1)	60 (227)
General Duty[2]	80 (550)	25 (708)	5 (3.7)	7.5 (5.6)	80 (303)
Multipurpose[3]		33 (934)	7.5 (5.6)	10 (7.5)	
Automatic[4]	60 (414)	46 (1303)	N/A	15 (11.2)	

[1] Pressure while torch is in operation.
[2] Accommodates flat electrodes.
[3] Generally considered a foundry torch.
[4] Requires some kind of mechanical manipulation.

Use only compressed air. Using combustible compressed gases can cause explosions that may result in personal injury or death.

2.07 Safety and Operating References

1. Code of Federal Regulations. (OSHA) Section 29 Part 1910.95, 132, 133, 134, 139, 251, 252, 253, 254 AND, 1000. U.S. Government Printing Office, Washington, DC 20402

2. ANSI Z49.1 “Safety In Welding and Cutting”

3. ANSI Z87.1 “Practice for Occupational and Educational Eye and Face Protection.”

4. ANSI Z88.2 “Standard Practice for Respiratory Protection.” American National Standards Institute, 1430 Broadway, New York, NY 10018.

5. AWS C5.3 “Recommended Practices for Air Carbon-Arc Gouging and Cutting.”

6. AWS F4.1 “Recommended Safe Practices for Welding and Cutting Containers.” The American Welding Society, 550 NW Lejeune RD., P.O. Box 351040, Miami FL. 33135

7. NFPA 51B “Fire Prevention in Cutting and Welding Processes” National Fire Protection Association, Battery Park. Quincy MA 02269

8. CSA Standard W117.2, “Safety in Welding. Cutting and Allied Processes” Canadian Standards Association, 178 Rexdale Blvd., Rexdale, Ontario, Canada M9W 1R3

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SECTION 3: HOW TO USE THIS MANUAL

To ensure safe operation, read the entire manual, including the chapters on safety instructions and warnings.

Throughout this manual, the words WARNING, CAUTION, and NOTE may appear. Pay particular attention to the information provided under these headings. These special annotations are easily recognized as follows:



WARNING

A WARNING GIVES INFORMATION REGARDING POSSIBLE PERSONAL INJURY.



CAUTION

A CAUTION refers to possible equipment damage.

NOTE

A NOTE offers helpful information concerning certain operating procedures.

3.01 Receipt of Equipment

When you receive the equipment, check it against the invoice to make sure it is complete and inspect the equipment for possible damage due to shipping. If there is any damage, notify the carrier immediately to file a claim. Furnish complete information concerning damage claims or shipping errors to the location in your area listed in the inside back cover of this manual. Include a full description of the parts in error.

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SECTION 4: INSTALLATION

4.01 Installing the DC Welding Power Cable and Air Hose to the Power and Air Connector

Models Part No. 61-065-006, 61-065-007, 61-082-008 and 61-082-009

Follow these instructions to connect the DC Welding Power Cable and Compressed Air Line directly to the Power and Air Connector on the Torch Swivel Cable Assembly.

1. Remove the Torch and Cable Assembly from the carton and lay the assembly in a straight and untwisted position on a workbench or floor.
2. Position the molded boot so that you have access to the four (4) screws as shown in Figure 4-1.



Figure 4-1

3. Use a straight blade screwdriver to remove the four (4) screws. Lift the top half of the molded boot away from the assembly.



Figure 4-2



Figure 4-3

4. Using a ½”-13 x 1” hex head bolt, position the bolt down so that its threads run through the crimped lug of the DC Welding Power Cable and through the Power and Air Connector on the Swivel Cable Assembly. The head of the bolt should be against the flat side of the crimped lug as shown in Figure 4-4.

5. Place a ½” lock washer over the bolt threads and begin to thread a ½”-13 nut down against the assembly.



Figure 4-4

6. Position the brass Power and Air Connector back into the bottom half of the boot.

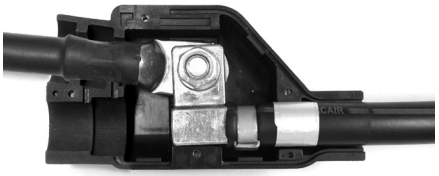


Figure 4-5

7. Using your index finger to apply an upward force on the bolt, tighten the assembly down.



Figure 4-6

8. Lift the assembly away from the bottom half of the boot to securely fasten. Do not allow the crimped lug to move while doing this final tightening step.



Figure 4-7

9. Thread the incoming Compressed Air Line with a 3/8" pipe threaded fitting into the Power and Air Connector. This connection should be wrench tight.



Figure 4-8

10. Reposition the Cable Assembly with the DC Welding Power Cable and Air Hose back in place in the lower half of the boot.



Figure 4-9

10. Reposition the top half of the boot in place and secure with the four (4) screws that were removed in step 3.



Figure 4-10

11. The assembly is now ready to be used in your metal removal application.

4.02 Installing the DC Welding Power Cable with Twist Lock Power Connection and Air Hose to the Torch Swivel Cable Assembly

Models Part No. 61-065-002, 61-065-003, 61-082-006 and 61-082-007

1. Remove the Torch and Cable Assembly from the carton and lay the assembly in a straight and untwisted position on a workbench or floor.
2. Remove the Twist Lock Connector attached to the Torch Swivel Cable Assembly. Follow these steps to connect the brass female connector to the DC Power Cable:
    a. Remove the cover screw holding the outer cover in place from the assembly.
    b. Trim the rear of the connector cover to fit the cable being used. NOTE: Do not over trim. The cover should fit snugly.
    c. Slip the cover over the cable.
    d. Trim the cable insulation back 1-7/8", exposing the copper stranding.
    e. Loosen the ball-point screws and insert the copper cable into the cable hole of the brass connector half.
    f. Tighten the ball-point screws securely (150 – 250 in./lbs.) The heads of the screws should be flush with, or below, the connector body.
    g. Slip the connector cover over the brass body and install/tighten the cover screw. The screw fits into the second cover hole.
3. Thread the 3/8" pipe threaded fitting that is connected to the Air Hose coming out of the Torch Swivel Cable, into your shop air line. This connection should be wrench tight.

4.03 Connecting to DC or AC Welding Power Supplies

Gouging applications normally use three-phase welding power supplies with an open circuit voltage higher than 60 volts, to allow for any voltage drop in the circuit.

1. Connect the Welding Power Cable that is connected to the Torch Swivel Cable to the positive terminal on the power supply (DCEP or AC). Refer to Figure 4-11.
2. Connect the Welding Power Cable that is connected to the negative terminal on the power supply to the workpiece.

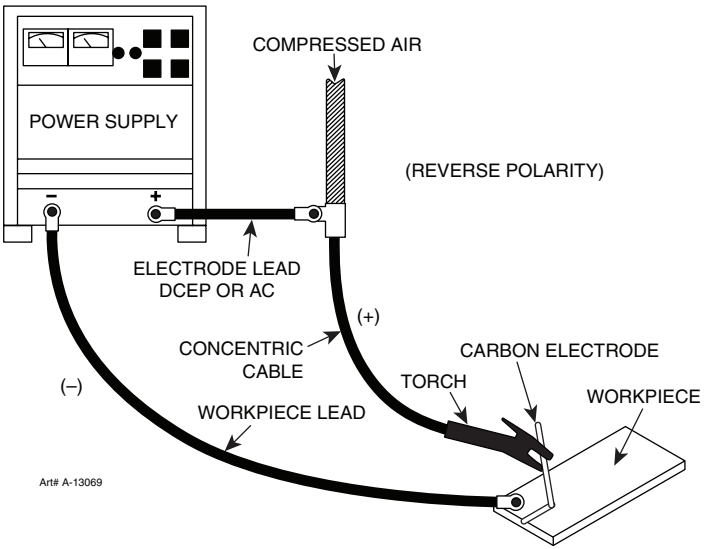


Figure 4-11

3. Turn on the power supply and air supply to the gouging torch and cable assembly.
4. While the torch valve is open, adjust the air pressure at the torch to the normal pressures range between 80 psi (551.6 kPa) and 100 psi (690 kPa); higher pressures may be used, but they do not remove metal more efficiently.
5. Press down on the lever of the torch to insert the air carbon-arc electrode "carbon" into the torch. When using copper coated carbons, the bare carbon end should be down and away from the torch. This is where the arc will be struck between the carbon and workpiece. Refer to Figure 4-12.

WARNING

Carbon is electrically HOT at this point.

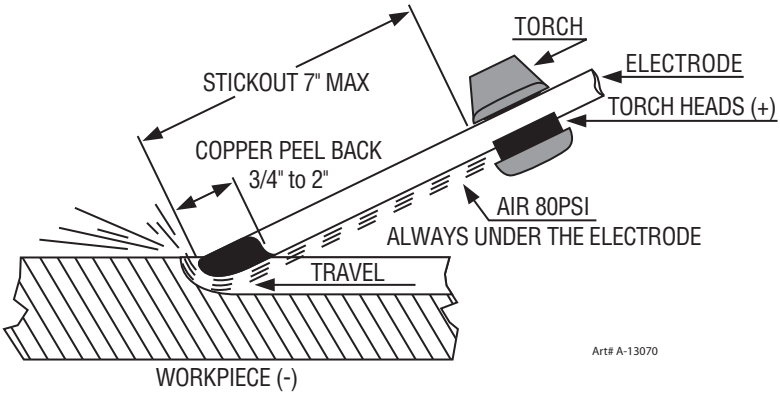


Figure 4-12

6. Hold the electrode as shown in Figure 4-12, so that a maximum of 7" (178 mm) extends from the torch. This extension should be 3" (76.5 mm) for aluminum.

7. Adjust the welding current (Constant Current) or voltage (Constant Voltage), depending on the type of power supply being used, to the suggested current range shown for the carbon diameter being used. Refer to Table 4-1.

Table 4-1 - Suggested Current Ranges (AMP) for Commonly Used Electrode Types and Sizes

Electrode Diameter	DC Electrode DCEP	AC Electrode AC	AC Electrode DCEN
in (mm)	min - max	min - max	min - max
1/8 (3.2)	60 - 90	N/A	
5/32 (4.0)	90 - 150		
3/16 (4.8)	200 - 250	200 - 250	150 - 180
1/4 (6.4)	300 - 400	300 - 400	200 - 250
5/16 (7.9)	350 - 450	N/A	
3/8 (9.5)	450 - 600	350 - 450	300 - 400
1/2 (12.7)	800 - 1000	N/A	
5/8 (15.9)	1000 - 1250		
3/4 (19.1)	1250 - 1600		
1 (25.4)	1600 - 2200		
3/8 (9.5) FLAT	250 - 450		
5/8 (9.5) FLAT	300 - 500		

8. Turn on the air jet before striking the arc. Hold the torch between a 45˚ - 60˚ work angle, so that the electrode slopes back from the direction of travel. The air jet sweeps between the electrode and workpiece, providing the force to remove all molten metal from the groove.

9. Lightly touch the electrode to the workpiece to establish the arc. Do not draw back the electrode once the arc is ignited. When the correct arc voltage is being maintained, the sound of the arc and the compressed air is loud. When the sound is muffled, the arc voltage is below the recommended operating conditions. Normal arc voltage with a handheld gouging torch is measured between 35 to 50 volts.

10. The groove's depth is controlled by travel speed. Grooves up to 1" (25 mm) deep may be made. However, the deeper the groove, the more experienced the operator needs to be. Slow travel speeds produce deep grooves, and fast travel speeds produce shallow grooves. The width of the groove is determined by the size of the electrode used and is typically about 1/8" (3.2 mm) wider than the electrode's diameter. A wider groove may be made with a small electrode by oscillating in a circular or weave motion.

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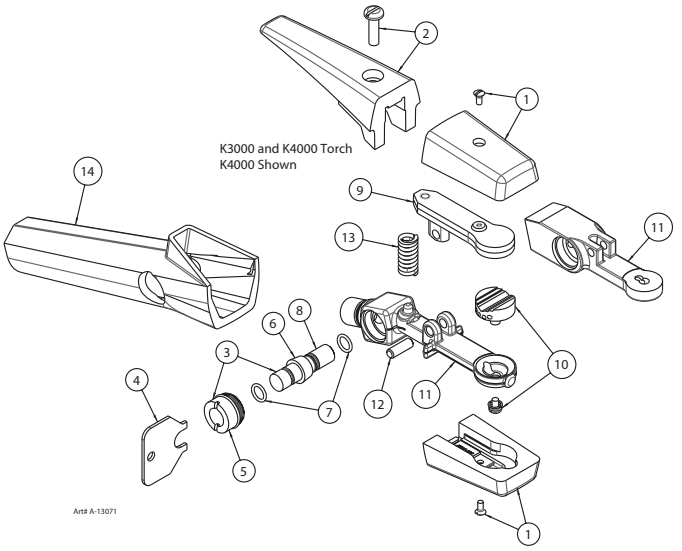
SECTION 5: TROUBLESHOOTING

Problem	Cause	Solution
Large free-carbon deposit at the beginning of the groove.	1. The operator either neglected to turn on the air jet before striking the arc or the torch was located improperly.	1. Turn on air before striking the arc and air should flow between the electrode and the workpiece.
	2. Carbon rod not positioned properly in head assembly.	2. Ensure carbon rod is seated in groove in torch head.
An unsteady arc, causing the operator to use a slow travel speed even on shallow grooves.	1. Not enough amperage for the electrode diameter used (see Table 2). While the lowest recommended amperage may be enough, it requires greater operator skill. A mid-range amperage is better.	1. If the desired amperage cannot be obtained from the available power source, use the next smaller diameter electrode or parallel two or more welding power supplies.
Erratic groove with the arc wandering from side-to-side and with the electrode heating up rapidly.	1. The process used with DCEN (electrode negative).	1. Gouging process should be done with DCEP (Electrode positive) whenever possible. Direct current electrodes should be used with DCEP (electrode positive) on all metals, except for a few copper alloys such as Superston and Nialite.
Intermittent arc action resulting in an irregular groove surface.	1. The travel speed was too slow in manual gouging. The operator possibly set their hand on other work for balance, a tendency in shielded metal-arc welding. Since the speed of air carbon-arc gouging is much faster than shielded metal-arc welding, friction between the gloved hand and the workpiece may cause a jerky forward motion thus causing the gap between the electrode and workpiece to become too large to maintain the arc.	1. The operator should stand comfortably so their arms move freely and their gloves do not drag on the workpiece. If using mechanized equipment, check Table 4 (Page 4-24) for proper operating conditions.
	2. Poor ground connection.	2. Inspect ground clamps and lead(s) to ensure connection proper.

Problem	Cause	Solution
In gouging, free carbon deposits at varying groove intervals; in pad -washing, free carbon deposits at various spots on the washed surface.	1. A shorted electrode on the workpiece. In manual gouging, this is a result of excessive travel speed for the amperage used and for the depth of the groove being made. In mechanized operations, this is a result of excessive travel speed or using a flat-curve, constant-voltage power source for a small diameter electrode 5/16" (7,9 mm). In padwashing, this is caused by holding the electrode at too small a push angle.	1. Use an electrode-to-work angle of 15° to 70°. A smaller angle increases the arcing area,reducing the current density; this reduction in arc-current density requires a great decrease in arc length, to the point of short circuit. Keep a proper arc gap.
Irregular groove: too deep, then too shallow.	1. The operator was unsteady.	1. The operator should assume a comfortable position while gouging.
Slag adhering to the edges of the groove.	1. Slag ejection was inadequate. To resolve, keep a proper air pressure and flow rate (cfm). Air pressure between 80 and 100 psi (550-690 kPa) may not effectively eject all of the slag if the volume is insufficient.	1. To deliver adequate volume, the air hose feeding the concentric cable assembly needs a minimum hose ID of 3/8" (9.5 mm) for manual torches. For automatic torches, the minimum hose ID should be 1/2" (12.7 mm). Direct the air jet parallel to the gouge area. Do not favor one side unless operator wants to minimize slag from adhering to one side of the cut.

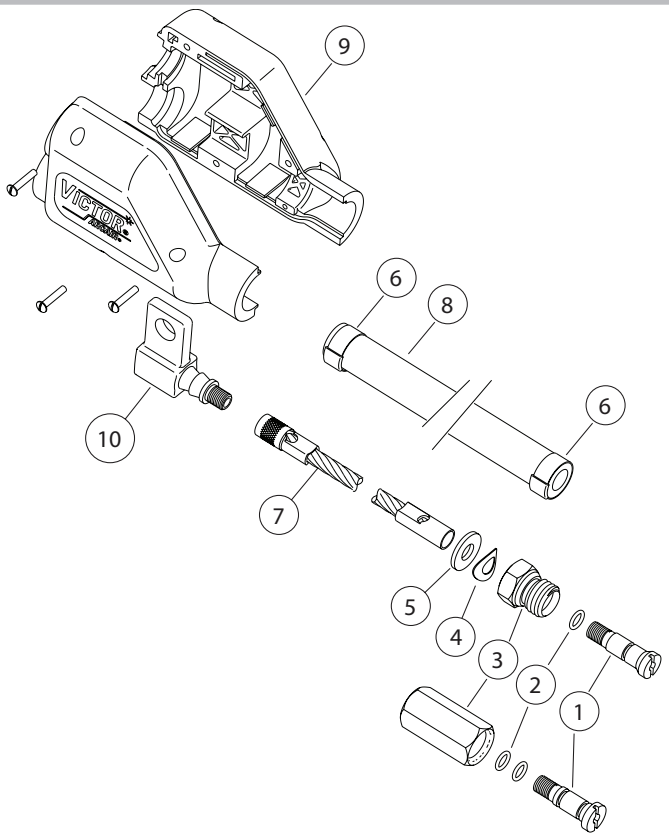
SECTION 6: REPLACEMENT PARTS

K3000™ & K4000® TORCH REPLACEMENT PARTS



TORCH REPLACEMENT PARTS LIST			
Item	Description	K3000™	K4000®
1	Insulators & Screws	94-433-193	94-433-183
2	Lever & Screw	94-476-080	94-476-066
3	Valve Bonnet	94-104-016	94-104-016
4	Bonnet Wrench	94-960-001	94-960-001
5	Bonnet Only	94-104-012	94-104-012
6	Spool & O-Rings	94-801-011	94-801-011
7	O-Ring	94-710-036	94-710-036
8	Spool Only	94-801-010	94-801-010
9	Upper Arm	94-048-120	94-048-088
10	Head & Screw	94-378-366	94-378-368
11	Torch Body	94-103-232	94-103-206
12	Hinge Pin	94-632-101	94-632-094
13	Spring	94-800-191	94-800-077
14	Handle	94-370-179	94-370-163

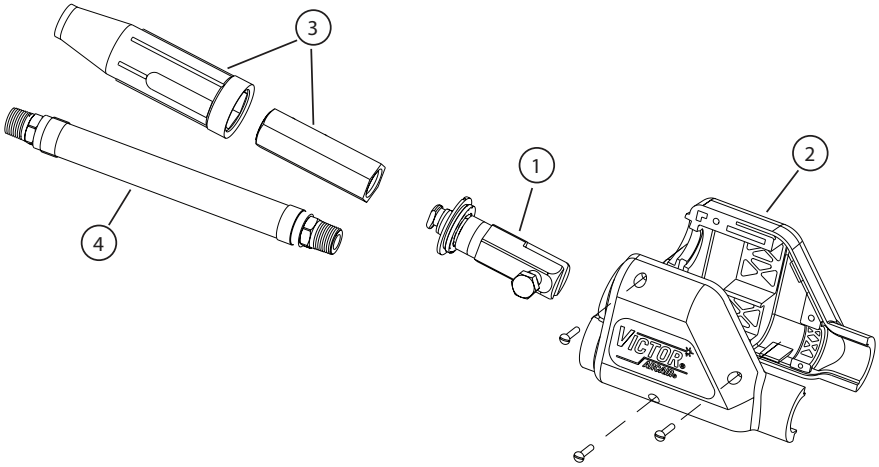
K3000™ & K4000® SWIVEL CABLE REPLACEMENT PARTS



CABLE REPLACEMENT PARTS LIST			
Item	Description	K3000™	K4000®
	7ft. (2.1M) Swivel Cable	70-088-107	70-084-207
	10ft. (3M) Swivel Cable	70-088-110	70-084-210
1	Retainer Screw	94-695-054	94-170-182 *
2	O-Ring	94-710-027	
3	Connector	94-170-178	
4	Spring Washer	94-940-104	94-940-104
5	Flat Washer	94-940-103	94-940-103
6	Clamp (2 Required)	98-167-010	98-167-010
7	7ft. (2.1M) Conductor	96-130-314	96-130-263
	10ft. (3M) Conductor	96-130-315	96-130-261
8	7ft. (2.1M) Cover	94-171-273	94-171-273
	10ft. (3M) Cover	94-171-274	94-171-274
9	Molded Hard Boot with Screws	94-105-032	94-105-032
10	Female Connector	94-170-150	94-170-150

* Includes Retainer Screw, O-Ring, and Connector

POWER & AIR HOOK-UP KIT



HOOK-UP KIT & PARTS LIST		
Item	Description	Cat No.
	Complete Hook-Up Kit	94-463-046
1	Male Connector	94-170-184
2	Molded Hard Boot with Screws	94-105-031
3	4-WPC-R Connector	4WPC-R
4	Pigtail Air Supply Hose	94-396-205

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STATEMENT OF WARRANTY

LIMITED WARRANTY: ESAB warrants that its products will be free of defects in workmanship or material. Should any failure to conform to this warranty appear within the time period applicable to the ESAB products as stated below, ESAB shall, upon written notification thereof and substantiation that the product has been stored, installed, operated, and maintained in accordance with ESAB's specifications, instructions, recommendations and recognized standard industry practice, and not been subject to misuse, repair, neglect, alteration, or accident, correct such defects by suitable repair or replacement, at ESAB's sole option, of any components or parts of the product determined by ESAB to be defective.

THIS WARRANTY IS EXCLUSIVE AND IS IN LIEU OF ALL OTHER WARRANTIES, EXPRESS OR IMPLIED, INCLUDING ANY WARRANTY OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE.

LIMITATION OF LIABILITY: ESAB shall not under any circumstances be liable for special, indirect or consequential damages, such as, but not limited to, damage or loss of purchased or replacement goods, business interruption or loss of profit, or claims of customers of distributor (hereinafter the "Purchaser") for service interruption. The remedies of the Purchaser set forth herein are exclusive and the liability of ESAB with respect to any contract, or anything done in connection therewith such as the performance or breach thereof, or from the manufacture, sale, delivery, resale, or use of any goods covered by or furnished by ESAB whether arising out of contract, negligence, strict tort, or under any warranty, or otherwise, shall not, except as expressly provided herein, exceed the price of the goods upon which such liability is based.

THIS WARRANTY BECOMES INVALID IF REPLACEMENT PARTS OR ACCESSORIES ARE USED WHICH MAY IMPAIR THE SAFETY OR PERFORMANCE OF ANY ESAB PRODUCT.

THIS WARRANTY IS INVALID IF THE PRODUCT IS SOLD BY NON-AUTHORIZED PERSONS.

This warranty is effective for the time stated in the Warranty Schedule beginning on the date that the authorized distributor delivers the products to the Purchaser.

Warranty repairs or replacement claims under this limited warranty must be submitted by an authorized ESAB repair facility within thirty (30) days of the repair. No transportation costs of any kind will be paid under this warranty. Transportation charges to send products to an authorized warranty repair facility shall be the responsibility of the Purchaser. All returned goods shall be at the Purchaser's risk and expense. This warranty supersedes all previous ESAB warranties.

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