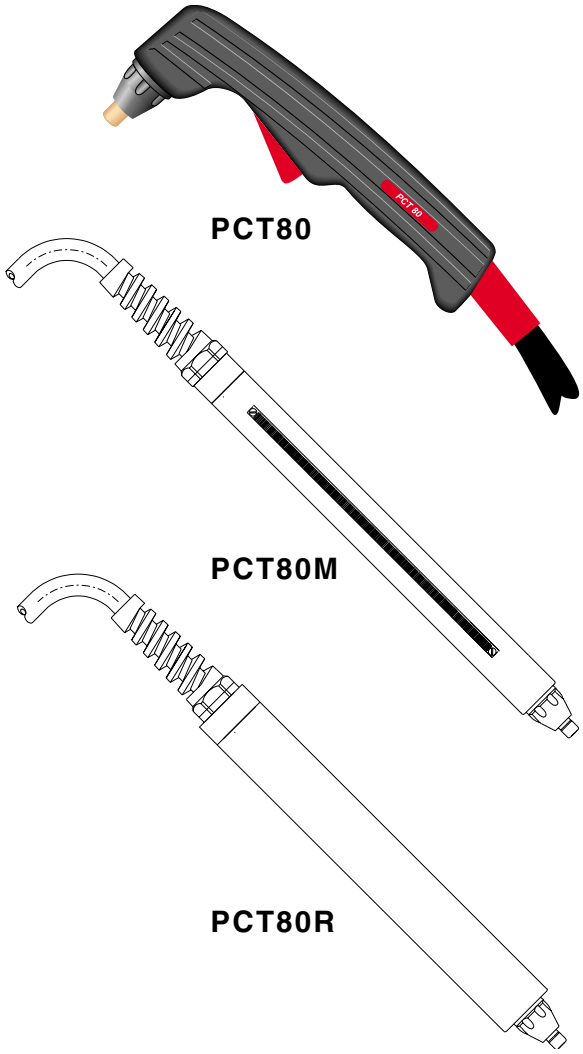
IM588-A
March, 2001

PCT80, PCT80M & PCT80R Plasma Torches

Safety Depends on You

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



Date of Purchase:_____
Serial Number:_____
Code Number:_____
Model:_____
Where Purchased:_____

OPERATOR'S MANUAL

LINCOLN® ELECTRIC

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

⚠ WARNING

⚠ CALIFORNIA PROPOSITION 65 WARNINGS ⚠

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

The Above For Diesel Engines

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

The Above For Gasoline Engines

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

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

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

FOR ENGINE powered equipment.

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

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

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

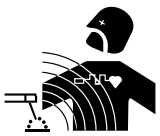
1.d. Keep all equipment safety guards, covers and devices in position and in good repair.Keep hands, hair, clothing and tools away from V-belts, gears, fans and all other moving parts when starting, operating or repairing equipment.

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

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

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

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



ELECTRIC AND MAGNETIC FIELDS may be dangerous

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

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

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

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

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

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

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

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

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

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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.

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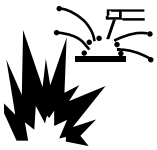


WELDING SPARKS can cause fire or explosion.

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.

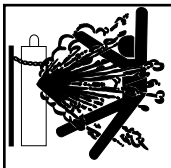
6.d. Do not heat, cut or weld tanks, drums or containers until the proper steps have been taken to insure that such procedures will not cause flammable or toxic vapors from substances inside. They can cause an explosion even though they have been “cleaned”. For information, purchase “Recommended Safe 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-I, “Precautions for Safe Handling of Compressed Gases in Cylinders,” available from the Compressed Gas Association 1235 Jefferson Davis Highway, Arlington, VA 22202.

FOR ELECTRICALLY powered equipment.

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

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

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

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PRÉCAUTIONS DE SÛRETÉ

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

Sûreté Pour Soudage A L'Arc

1. Protegez-vous contre la secousse électrique:

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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 Spec Number (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. 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**.

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PARTS LISTS ..... P210-K, P210-M and P210-N

SPECIFICATIONS SUMMARY

TYPE

K1571-1 PCT80 Hand-held Plasma Torch with 25 ft. (7.6m) cable
K1571-2 PCT80 Hand-held Plasma Torch with 50 ft. (15.2m) cable
K1571-3 PCT80M Plasma Machine Torch with 25 ft (7.6m) cable and 24 and 32 pitch gear racks
K1571-4 PCT80M Plasma Machine Torch with 50ft (15.2m) cable and 24 and 32 pitch gear racks
K1571-5 PCT80R Robotic Plasma Torch with 25ft (7.6m) cable
K1571-6 PCT80R Robotic Plasma Torch with 50 ft (15.2m) cable

OUTPUT RATING

80 Amps, 100% Duty Cycle

NET WEIGHT

K1571-1 PCT80 Hand-held Plasma Torch with 25 ft. (7.6m) cable, 8.7 lbs (3.95 kg)
K1571-2 PCT80 Hand-held Plasma Torch with 50 ft. (15.2m) cable, 14.2 lbs (6.44 kg)
K1571-3 PCT80M Plasma Machine Torch with 25 ft (7.6m) cable, 15.1lbs (6.85 kg)
K1571-4 PCT80M Plasma Machine Torch with 50ft (15.2m) cable, 15.1 lbs (6.85 kg)
K1571-5 PCT80R Robotic Plasma Torch with 25ft (7.6m) cable, 15.1 lbs (6.85 kg)
K1571-6 PCT80R Robotic Plasma Torch with 50 ft (15.2m) cable, 15.1 lbs (6.85 kg)

TORCH COMPONENTS

Torch	Electrode	Swirl Ring Assembly	O-Rings	VORTECH™ Nozzle	Shield Cup	Drag Cup
K1571-1 K1571-2 K1571-3 K1571-4 K1571-5 K1571-6	S22149	S22148	Outer: T13483-36 Swirl: T13483-23	<u>For 55A machine:</u> S22147- 043 (1.09mm) orifice S22147- 068 (1.73mm) orifice for gouging <u>For 80A machine:</u> S22147-055 (1.35mm) orifice S22147-082 (2.08mm) orifice for gouging	S22150	S22151

GENERAL DESCRIPTION

The PCT80, PCT80M and PCT80R plasma torches have been designed for use with the Pro-Cut 55 and Pro-Cut 80. All of the torches are single gas, air-cooled, and use a patented HF-less torch start mechanism. All torches come with a quick connect adapter for easy installation.

The hand-held torches and mechanized torches are available with either a 25ft (7.6m) or 50ft (15.2m) cable.

Two styles of mechanized torches are available. The robotic torch features a 8" (203mm) long, 1.625" (41.2mm) diameter barrel. The machine torch has a 11" (279mm) long, 1.375" (34.9mm) diameter barrel with a 32 pitch gear rack. The 32 pitch gear rack can be easily substituted with a 24 pitch gear rack which is included with the machine torch.

All of the K1571 plasma torches must have an electrode, swirl ring, nozzle and shield cup in order to operate. These parts are used with all amperage machines except for the nozzles. See the table in SPECIFICATIONS SUMMARY for proper nozzle orifice to machine combination.

INSTALLATION

⚠ WARNING

ELECTRIC SHOCK can kill.
- Only qualified personnel should perform this installation.
- Turn the input power OFF at the disconnect switch or fuse box before working on this equipment.
- Do not touch electrically hot parts.
- Do not operate with covers removed.

TOOLS REQUIRED:

None

A. Turn off power to the Pro-Cut at the disconnect switch or fuse box. Do not proceed until the power is definitely turned off.

B. To assemble a torch to the Pro-Cut:

1. Facing the front of the Pro-Cut, insert the connector with the plastic retaining key in the up position. Grasp the connector with one hand while twisting the large lock nut clockwise onto the threaded bulkhead with the other hand. Tighten hand tight.

2. For mechanized torches only:

A trigger kit is included with either the machine or robotic torch. This kit allows for triggering the power source.

An optional Interface kit can be ordered which adds Arc Transfer and Voltage Feedback.

C. To remove a torch from the Pro-Cut:

1. Facing the front of the Pro-Cut, grasp the connector with one hand while twisting the large lock nut at the bulkhead counter clockwise with the other hand. Once the nut is loose, pull the connector straight back away from the bulkhead. Install per part "B" above.

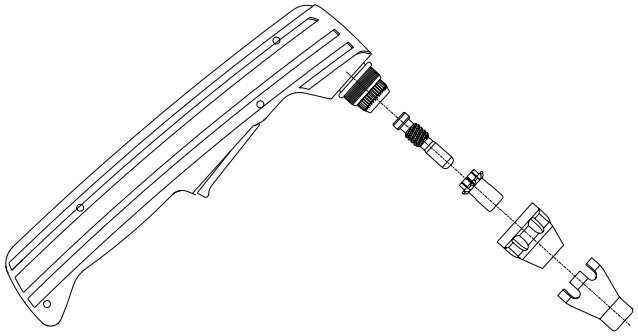


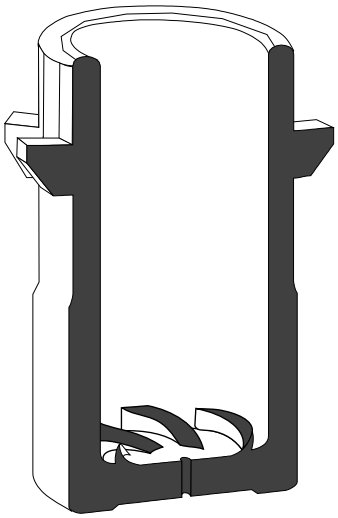
FIGURE A.1

D. Assemble an electrode, nozzle, shield cup and drag cup on the torch as shown in the Figure A.1. First insert the electrode with the hafnium insert facing out. Then, place the nozzle over the electrode and allow it to seat against the swirl ring. Place the shield cup over the nozzle and tighten firmly by hand. Slide the drag cup onto the shield cup for drag cutting.

E. Restore power to the Pro-Cut.

ALWAYS USE GENUINE LINCOLN ELECTRIC ELECTRODES AND VORTECH™ NOZZLES

- Only Genuine Lincoln Electric consumables yield the best cutting performance for the PRO-CUT 55 and PRO-CUT 80.
- The patented VORTECH™ nozzle provides an extra "kick" of swirl as the arc exits the nozzle which improves cutting performance. No other nozzle has this capability or can match its performance.



⚠ WARNING

When plasma cutting, it is necessary to wear proper eye, head and body protection.

PREHEAT TEMPERATURE FOR PLASMA CUTTING

Preheat temperature control is recommended for optimum mechanical properties, crack resistance and hardness control. This is particularly important on high carbon alloy steels and heat treated aluminum. Job conditions, prevailing codes, alloy level, and other considerations may also require preheat temperature control. The following minimum preheat temperature is recommended as a starting point. Higher temperatures may be used as required by the job conditions and/or prevailing codes. If cracking or excessive hardness occurs on the cut face, higher preheat temperature may be required. The recommended minimum preheat temperature for plate thickness up to 1/2" (12.7mm) is 70F (21.1C).

USER RESPONSIBILITY

Because design, fabrication, erection and cutting variables affect the results obtained in applying this type of information, the serviceability of a product or structure is the responsibility of the user. Variation such as plate chemistry, plate surface condition (oil, scale), plate thickness, preheat, quench, gas type, gas flow rate and equipment may produce results different than those expected. Some adjustments to procedures may be necessary to compensate for unique individual conditions. Test all procedures duplicating actual field conditions.

OPERATION

A. Connect the ground lead to the material to be cut.

B. Turn the Pro-Cut "ON" with the power switch on the front of the machine.

C. Press the Purge switch and hold. Adjust the regulator until the pressure gage reads 70 psi (4.8 Bar.). Release the Purge switch and the air flow will stop. The pressure may increase by 5 to 10 PSI after air flow stops but this is normal.

D. Adjust the output to the desired level. Refer to the appropriate Lincoln Process and Procedure Guidelines for recommended output, standoff, nozzle and cutting technique for your application.

E. Activate the trigger.

- If the air was not already flowing, the Pro-Cut will allow the air to flow for two seconds before the pilot arc is started. This is called PREFLOW.
- If the trigger was activated during postflow then a pilot arc will start *instantly.*

F. Bring the pilot arc close to the material to be cut. Once the torch is about 1/4" to 1/2" away from the work piece the arc will automatically transfer to the work and the Pro-Cut will regulate output to the setting on the dial. It is best to minimize the pilot arc time in order to prolong consumable life. Starting at the edge of the work piece instead of piercing the material will also increase consumable life.

G. Release the trigger when the cut is complete. Air will continue to flow for 10 seconds to cool the torch. This is called POSTFLOW.

MAINTENANCE

⚠ WARNING

ELECTRIC SHOCK CAN KILL
- **Only qualified personnel should perform this installation.**
- **Turn the input power OFF at the disconnect switch or fuse box before working on this equipment.**
- **Do not touch electrically hot parts.**
- **Do not operate with covers removed.**

Keep the work area clean and free of combustible materials. Prevent debris and objects from obstructing air flow around the Pro-Cut.

Check the filter elements every several months to see if they are clogged (weekly in very dirty environments). Replace if necessary.

Inspect the cable periodically for any slits or puncture marks in the cable jacket. Replace if necessary. Check to make sure that nothing is crushing the cable and blocking the flow of air through the air tube inside. Also, check for kinks in the cable and relieve any so as not to restrict the flow of air to the torch.

Replace the electrode when the pit in the center of the electrode is deeper than .060" (1.5 mm) or when the copper portion is severely distorted.

Replace the nozzle when the orifice is no longer round or when the inside surface is covered with scale.

Green colored arcs indicate the electrode and/or nozzle are worn and need to be replaced.

REPLACEMENT INSTRUCTIONS FOR PCT80M or PCT80R CABLE AND TORCH HEAD ASSEMBLY

⚠ WARNING

ELECTRIC SHOCK can kill.

- **Turn the input power off to the Pro-Cut using the disconnect switch at the fuse box before attempting to replace either the torch head or the cable assembly.**
- **Only qualified personnel should install, service or use this equipment.**
- **Read instructions thoroughly before beginning.**

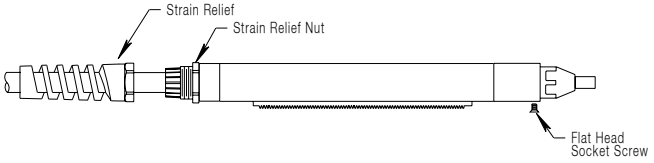
Tools Required:

Tools Required:
(1) 1/2" open end wrench (1) 5/64" allen wrench
(2) 7/16" open end wrenches

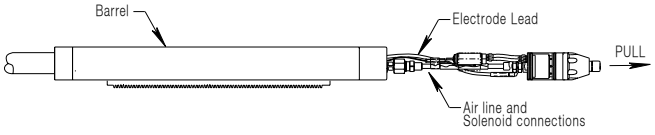
NOTE: The pictures illustrate the machine torch. The procedure for replacing components on the robotic torch is similar.

1. Be sure power is OFF to the machine by using the disconnect switch at the fuse box. Do not proceed until power to the machine is disconnected.

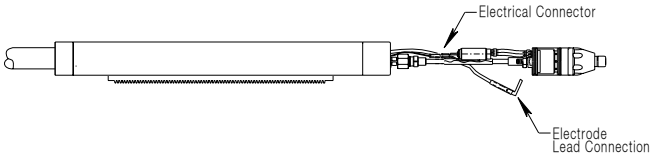
2. Unscrew the strain relief and strain relief nut. Slide strain relief and nut about one foot along the cable.



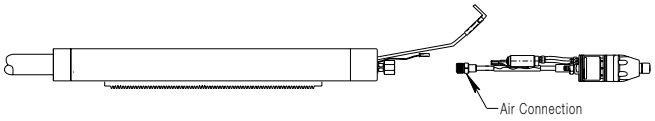
3. Remove the flat head socket screw using the 5/64" allen wrench. Grasp shield cup with one hand and barrel with other. Pull shield cup gently straight forward, until air line and solenoid connections are exposed.



4. Using the 7/16" wrench, loosen the nut at the back of the torch head to remove the electrode lead and then unplug the electrical connector.



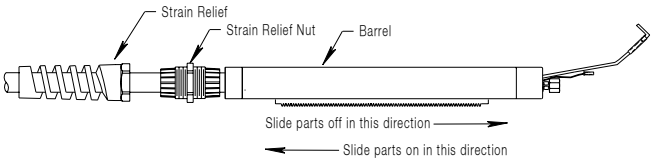
5. Using the 7/16" and 1/2" open end wrenches, disconnect the air connection and remove the entire torch head assembly.



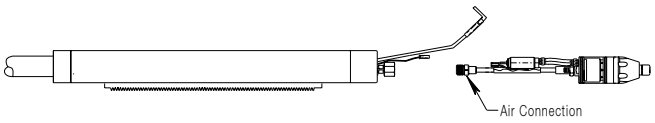
6. Replace Torch Head or Cable Assembly as follows:

   a. For replacing the torch head, obtain a new torch head and discard the old one if damaged.

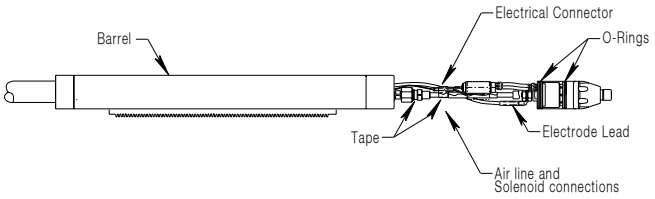
   b. For replacing the cable assembly, slide the barrel, strain relief nut and strain relief off of the old cable. Obtain a new cable and discard the old cable. Slide on the following parts in this order: Strain relief, strain relief nut, and then barrel.



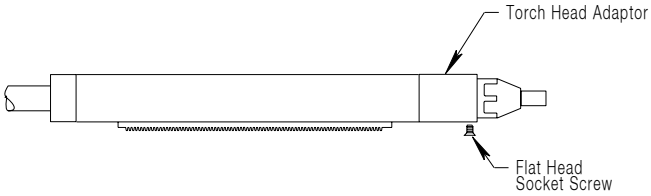
7. Assemble the air connections using the 7/16" and 1/2" open wrenches. Then connect the electrical connectors together.



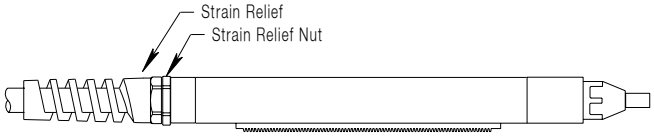
8. Connect the electrode lead to the screw on the back of the torch head using the 7/16" nut. Tighten with the wrench. Tape the electrical connector to the air line. Tape electrode lead to the air line at the air line connection.



9. Gently slide the barrel up to the torch head. Continue sliding the barrel carefully over the o-rings of the torch head, until the hole of the torch head adapter aligns with the threaded hole of the torch head. Fasten together using the flat head screw with 5/64" allen wrench, until the head of the screw is fully seated in the countersunk hole.



10. Thread strain relief nut into barrel and tighten (Recommended torque - 70-80 in-lbs.). Thread strain relief onto strain relief nut and tighten (Recommended torque - 50-60 in-lbs.).



11. Minimum safety check: using an ohm meter verify that greater than 10 megohms exists between the barrel and all of the pins on the central adapter assembly.

12. Restore power to the machine.

HOW TO USE TROUBLESHOOTING GUIDE

⚠ WARNING

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

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

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

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

Step 3. RECOMMENDED COURSE OF ACTION

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

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

⚠ WARNING

ELECTRIC SHOCK CAN KILL

- **Only qualified personnel should perform this troubleshooting.**
- **Turn the input power OFF at the disconnect switch or fuse box before working on this equipment.**
- **Do not touch electrically hot parts.**
- **Do not operate with covers removed.**

⚠ CAUTION

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

Observe all Safety Guidelines detailed throughout this manual

PROBLEMS (SYMPTOMS)	POSSIBLE CAUSE	RECOMMENDED COURSE OF ACTION
FUNCTION PROBLEMS		
The torch does not start when the trigger is pulled	a. Blown fuse	a. Make sure all fuses are good and the Pro-Cut is reconnected for the proper voltage.
	b. Electrode or nozzle missing	b. Properly assemble an electrode, swirl ring, nozzle and shield cup on the torch.
	c. Torch misconnected	c. Make sure the torch is properly connected to the front of the Pro-Cut.
	d. Consumables are worn excessively	d. Replace electrode and nozzle and replace shield cup hand tight.
	e. Torch connections assembled improperly or shorted	e. Remove the handles (or barrel) of the torch and examine all the connections. Pay attention to location of electrode lead mounting at back of torch head, broken trigger and solenoid leads.
	f. Cable damaged	f. Examine the cable for cuts or punctures. Make sure there is continuity from the nozzle at the torch head to pins 7 & 8 at the quick connect. Make sure there is continuity from the electrode at the torch head to the gas fitting at the quick connect. Make sure there is no blockage of airflow in the cable. Make sure there is continuity between pins 1 & 9 at the quick connect while the trigger is pulled. Replace any damaged cable.
	g. Air is not connected or the pressure setting is low.	g. Check air supply and connections.

⚠ CAUTION

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

Observe all Safety Guidelines detailed throughout this manual

PROBLEMS (SYMPTOMS)	POSSIBLE CAUSE	RECOMMENDED COURSE OF ACTION
FUNCTION PROBLEMS		
	h. Torch head damaged	h. Replace torch head and electrode solenoid assembly.
	i. Pro-Cut inoperative	i. Refer to the troubleshooting guide for the Pro-Cut.
The “Safety” LED is lit	a. Reset button needs to be pressed.	a. After changing consumables the reset button must be pressed.
	b. Consumables are missing	b. Make sure an electrode, swirl ring, nozzle and shield cup are all properly assembled on the torch. Always tighten the shield cup firmly.
	c. Consumable are worn.	c. Replace both electrode and nozzle when they appear to be excessively worn.
	d. Torch misconnected	d. Make sure the torch is properly connected to the front of the Pro-Cut.
	e. Cable damaged	e. Examine the cable for cuts or punctures. Make sure there is continuity from the nozzle at the torch head to pins 7 & 8 at the quick connect. Make sure there is continuity from the electrode at the torch head to the gas fitting at the quick connect. Make sure there is no blockage of airflow in the cable. Make sure there is continuity between pins 1 & 9 at the quick connect while the trigger is pulled. Replace any damaged cable.

⚠ CAUTION

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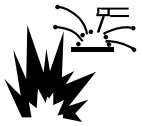
Observe all Safety Guidelines detailed throughout this manual

PROBLEMS (SYMPTOMS)	POSSIBLE CAUSE	RECOMMENDED COURSE OF ACTION
FUNCTION PROBLEMS		
	f. Pro-Cut inoperative.	f. Refer to the troubleshooting guide for the Pro-Cut.
Only a brief spurt of a Pilot Arc appears	a. Make sure the air pressure is set correctly	a. Press the Purge button on the Pro-Cut and adjust the air pressure to 70 psi while the air is flowing.
	b. Air flow may be restricted.	b. Check air connection to the Pro-Cut as well as the torch connection for any blockage of air flow.
	c. There may be oil in the air.	c. Check the air filter for oil. Replace if necessary and eliminate the source of oil.
	d. The Pro-Cut is not working properly.	d. Refer to the troubleshooting guide for the Pro-Cut.

⚠ CAUTION

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

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

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

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

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

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

			
● Keep your head out of fumes. ● Use ventilation or exhaust to remove fumes from breathing zone.	● Turn power off before servicing.	● Do not operate with panel open or guards off.	**WARNING**
● Los humos fuera de la zona de respiración. ● Mantenga la cabeza fuera de los humos. Utilice ventilación o aspiración para gases.	● Desconectar el cable de alimentación de poder de la máquina antes de iniciar cualquier servicio.	● No operar con panel abierto o guardas quitadas.	Spanish **AVISO DE PRECAUCION**
● Gardez la tête à l'écart des fumées. ● Utilisez un ventilateur ou un aspirateur pour ôter les fumées des zones de travail.	● Débranchez le courant avant l'entretien.	● N'opérez pas avec les panneaux ouverts ou avec les dispositifs de protection enlevés.	French **ATTENTION**
● Vermeiden Sie das Einatmen von Schweibrauch! ● Sorgen Sie für gute Be- und Entlüftung des Arbeitsplatzes!	● Strom vor Wartungsarbeiten abschalten! (Netzstrom völlig öffnen; Maschine anhalten!)	● Anlage nie ohne Schutzgehäuse oder Innenschutzverkleidung in Betrieb setzen!	German **WARNUNG**
● Mantenha seu rosto da fumaça. ● Use ventilação e exhaustão para remover fumo da zona respiratória.	● Não opere com as tampas removidas. ● Desligue a corrente antes de fazer serviço. ● Não toque as partes elétricas nuas.	● Mantenha-se afastado das partes moventes. ● Não opere com os paineis abertos ou guardas removidas.	Portuguese **ATENÇÃO**
● ヒュームから頭を離すようにして下さい。 ● 換気や排煙に十分留意して下さい。	● メンテナンス・サービスに取りかかる際には、まず電源スイッチを必ず切って下さい。	● パネルやカバーを取り外したままで機械操作をしないで下さい。	Japanese **注意事項**
●頭部遠離煙霧。 ●在呼吸區使用通風或排風器除煙。	●維修前切斷電源。	●儀表板打開或沒有安全罩時不準作業。	Chinese **警 告**
● 얼굴로부터 용접가스를 멀리하십시요. ● 호흡지역으로부터 용접가스를 제거하기 위해 가스제거기나 통풍기를 사용하십시요.	● 보수전에 전원을 차단하십시요.	● 판넬이 열린 상태로 작동치 마십시요.	Korean **위 험**
● ابعد رأسك بعيداً عن الدخان. ● استعمل التهوية أو جهاز ضغط الدخان للخارج لكي تبعد الدخان عن المنطقة التي تتنفس فيها.	● اقطع التيار الكهربائي قبل القيام بأية صيانة.	● لا تشغل هذا الجهاز اذا كانت الاغطية الحديدية الواقية ليست عليه.	Arabic **تحذير**

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

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

請詳細閱讀並理解製造廠提供的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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