PRO-CUT® 125

PLASMA CUTTING POWER SOURCE

IM491-B

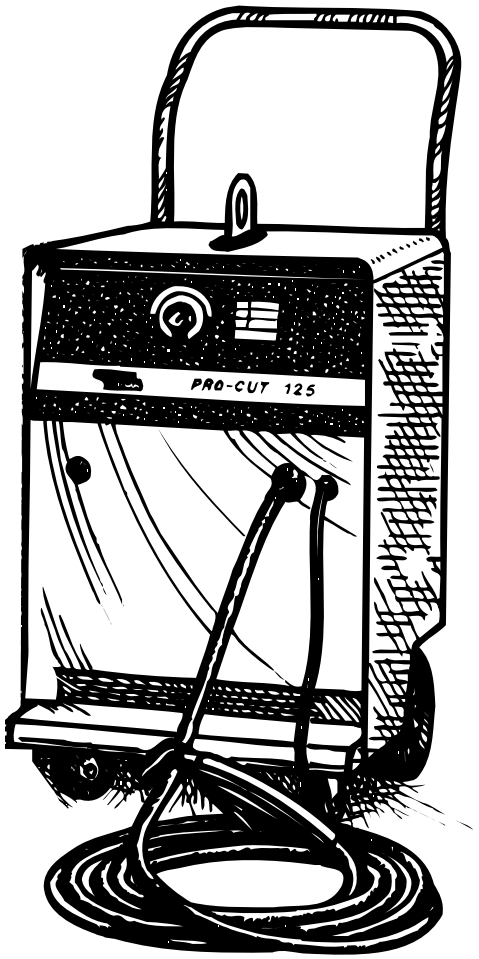
October,1999

For use with machines having Code Numbers 9626; 9627; 9666; 9828; 9829; 9830; 10093; 10094; 10108; 10109; 10119; 10294; 10295; 10384; 10385; 10386; 10388

This manual covers equipment which is no longer in production by The Lincoln Electric Co. Specifications and availability of optional features may have changed.

Safety Depends on You

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



OPERATOR'S MANUAL

LINCOLN® ELECTRIC

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⚠ WARNING

PLASMA CUTTING or GOUGING 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.

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

ELECTRIC SHOCK can kill.

1.a. The electrode and work (or ground) circuits are electrically "hot" when the power source is on. Do not touch these "hot" parts with your bare skin or wet clothing. Wear dry, hole-free gloves to insulate hands.

1.b. When the power source is operating voltages in excess of 250 volts are produced. This creates the potential for serious electrical shock - potentially even fatal.

1.c. Insulate yourself from work and ground using dry insulation. When cutting or gouging in damp locations, on metal framework such as floors, gratings or scaffolds and when in positions such as sitting or lying, make certain the insulation is large enough to cover your full area of physical contact with work and ground.

1.d. Always be sure the work cable makes a good electrical connection with the metal being cut or gouged. The connection should be as close as possible to the area being cut or gouged.

1.e. Ground the work or metal to be cut or gouged to a good electrical (earth) ground.

1.f. Maintain the plasma torch, cable and work clamp in good, safe operating condition. Replace damaged insulation.

1.g. Never dip the torch in water for cooling or plasma cut or gouge in or under water.

1.h. When working above floor level, protect yourself from a fall should you get a shock.

1.i. Operate the pilot arc with caution. The pilot arc is capable of burning the operator, others or even piercing safety clothing.

1.j. Also see Items 4c and 6.

ARC RAYS can burn.

2.a. Use safety glasses and a shield with the proper filter and cover plates to protect your eyes from sparks and the rays of the arc when performing or observing plasma arc cutting or gouging. Glasses,headshield and filter lens should conform to ANSI Z87. I standards.

2.b. Use suitable clothing including gloves made from durable flame-resistant material to protect your skin and that of your helpers from the arc rays.

2.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.

3.a. Plasma cutting or gouging may produce fumes and gases hazardous to health. Avoid breathing these fumes and gases.When cutting or gouging, keep your head out of the fumes. Use enough ventilation and/or exhaust at the arc to keep fumes and gases away from the breathing zone. **When cutting or gouging 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 cutting or gouging on galvanized steel.**

3.b. Do not use plasma arc cutting or gouging 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.

3.c. Gases used for plasma cutting and gouging can displace air and cause injury or death. Always use enough ventilation, especially in confined areas, to insure breathing air is safe.

3.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.

CUTTING SPARKS can cause fire or explosion.

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

4.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.

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

4.d. Do not cut or gouge 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).

4.e. Vent hollow castings or containers before heating, cutting or gouging. They may explode.

4.f. Do nor fuel engine driven equipment near area where plasma cutting or gouging.

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

4.h. Connect the work cable to the work as close to the cutting or gouging area as practical. Work cables connected to the building framework or other locations away from the cutting or gouging area increase the possibility of the 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.

CYLINDER may explode if damaged.

5.a. Use only compressed gas cylinders containing the correct 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.

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

5.c. Cylinders should be located:
- Away from areas where they may be struck or subjected to physical damage.
- A safe distance from plasma cutting or gouging, arc welding operations and any other source of heat, sparks, or flame.

5.d. Never allow any part of the electrode, torch or any other electrically "hot" parts to touch a cylinder.

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

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

5.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.

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

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

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

PLASMA ARC can injure.

7.a. Keep your body away from nozzle and plasma arc.

7.b. Operate the pilot arc with caution. The pilot arc is capable of burning the operator, others or even piercing safety clothing.

ELECTRIC AND MAGNETIC FIELDS may be dangerous

8.a. Electric current flowing through any conductor causes localized Electric and Magnetic Fields (EMF). Cutting or gouging current creates EMF fields around torch cables and cutting machines.

8.b. EMF fields may interfere with some pacemakers, so operators having a pacemaker should consult their physician before cutting or gouging.

8.c. Exposure to EMF fields during cutting or gouging may have other health effects which are now not known.

8d. All operators should use the following procedures in order to minimize exposure to EMF fields from the cutting or gouging circuit:

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

8.d.2. Never coil the torch cable around your body.

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

8.d.4. Connect the work cable to the workpiece as close as possible to the area being cut or gouged.

8.d.5. Do not work next to cutting power source.

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.

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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 & Number _____

Code & Serial Number _____

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**.

SPECIFICATIONS

Type	K1394-* and K1395-* K880-1[25Ft.(7.6m)Cable] & K880-2 [50Ft.(15.2m)Cable] Magnum PCT125 Air Cooled Torch		
Input Frequency	50 or 60 Hz, 3ø		
Output Rating	125 Amps, 148 volts, 60% Duty Cycle 110 Amps, 140 volts, 80% Duty Cycle 100 Amps, 135 volts, 100% Duty Cycle		
Pilot Current	26 amps		
Pilot Duty Cycle	25% (20 seconds out of 80 seconds)		
Current Range	50-125 Amps		
Maximum OCV@10% High Input	357		
Normal OCV	325		
Input Power			
Standard Voltages	230/460/3/50/60	220/380/440/3/50/60	575/3/60
Current	101/49 @ 60% 95/44 @ 80% 88/40 @ 100%	102/59/51 @ 60% 87/54/45 @ 80% 81/49/42 @ 100%	40 @ 60% 33 @ 80% 32 @ 100%
Idle Current	4.5 amps @ 220V		
Idle Power	0.7 kW Maximum		
Power Factor @ Rated Load	0.60		
Net Weight			
w/25 ft. (7.6 m) Cable	480 lbs/218.2 kg		
w/50 ft. (15.2 m) Cable	489 lbs/222.3 kg		
Dimensions, H x W x D (includes lift bail and undercarriage)	35.6” x 19” x 22” (905mm x 483mm x 559mm)		

* Several standard input voltages and options packages are available specified by type number.

PRODUCT DESCRIPTION

The PRO-CUT™ 125 is a constant current, single range, continuous control plasma cutting system. The system is one of the most sophisticated on the market. It provides excellent starting characteristics, cutting visibility and arc stability. The torch has a patented safety mechanism which insures that the consumables are in place before cutting or gouging. This is extremely important due to the high voltages involved.

The PRO-CUT 125 comes with an air regulator, coarse air filter, oil coalescing filter, and pressure gauge. The machine comes with a 25 ft. torch cable or a 50 ft. torch cable and a spare parts kit. The undercarriage is built-in and the unit is shipped assembled except for the handle. The machine is capable of cutting with compressed air or nitrogen. Nitrogen is used to cut aluminum and other nonferrous metals.

The PRO-CUT is controlled by a microprocessor-based system. The machine performs rudimentary self troubleshooting when started, which aids in field servicing.

To enhance safety and protection, the 60 second postflow period is monitored. During the first 12 seconds of postflow, the pilot arc may be initialized with a single trigger pull. After 12 seconds, the trigger must be pulled twice to start the pilot arc. The second trigger pull must follow the first within 1 second to initiate the arc. This prevents accidental starting if the plasma torch is resting in such a manner that the trigger is depressed. The postflow time is reset only if the pilot arc is initialized.

Special control circuitry detects when the nozzle is touched to the workpiece. If the nozzle is touched to the workpiece, the machine output is instantaneously reduced which protects the consumables. When the nozzle is removed form the workpiece, the output will return to the set level. This feature protects the consumables from accidental damage when cutting at high currents.

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 alloy steels and heat treated aluminum. Job conditions, prevailing codes, alloy level, and other considerations may also require preheat temperature control. The recommended minimum preheat temperature is 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 1/4 inch is 70 (°F).

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. Variations 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.

INSTALLATION

SAFETY PRECAUTIONS

- Read the safety precautions at the beginning of this Operator's Manual before proceeding.
- Only personnel that have read and understood this Operating Manual should install and operate this equipment.
- Machine must be connected to system ground per any national, local or other applicable electrical codes.
- The power switch is to be in the “OFF” position when connecting power cord to input power.

⚠ WARNING

TURN THE INPUT POWER OFF USING THE DISCONNECT SWITCH AT THE FUSE BOX BEFORE ATTEMPTING TO CONNECT THE INPUT POWER LINES.

• Only qualified personnel should perform this installation.

• Turn the power switch on the PRO-CUT “off” before connecting or disconnecting output cables.

• Connect the PRO-CUT grounding terminal located on the side of the case back to a good electrical earth ground.

LOCATION

Place the PRO-CUT where clean cooling air can freely circulate in through the front intake and out through the rear louvers. Dirt, dust or any foreign material that can be drawn into the machine should be kept at a minimum. Failure to observe these precautions can result in excessive operating temperatures and nuisance shutdown of the machine. Before planning the installation, read the section entitled “High Frequency Interference Protection”.

A source of clean, dry compressed air or nitrogen must be supplied to the PRO-CUT. Oil in the air is a severe problem and must be avoided. The supply pressure must be between 80 and 150 psi (551 and 1032 kPa). The flow rate is approximately 8.0 cfm (225 l/min.). Failure to observe these precautions could result in excessive operating temperatures or damage to the torch.

HIGH FREQUENCY INTERFERENCE PROTECTION

The PRO-CUT employs a solid state high frequency torch starting circuit which drastically reduces high frequency emissions from the machine as compared with spark gap type high frequency generators.

Radiated interference can develop, however, in the following four ways:

(1) Direct interference radiated from the machine.

(2) Direct interference radiated from the cutting leads.

(3) Direct interference radiated from feedback into the power lines.

(4) Interference from reradiation of “pickup” by ungrounded metallic objects.

Keeping these contributing factors in mind, installing equipment per the following instructions should minimize problems.

(1) Keep the machine power supply lines as short as possible.

(2) Keep the work and torch leads as short as possible and as close together as possible. Lengths should not exceed 50’ (15.2 m). Tape the leads together when practical.

(3) Be sure the torch and work cable rubber coverings are free of cuts and cracks that allow high frequency leakage.

(4) Keep the torch in good repair and all connections tight to reduce high frequency leakage.

(5) Keep all access panels and covers securely in place

NOTE: The machine frame MUST also be grounded - see paragraph under “Input Connection”. The work terminal ground does not ground the machine frame.

(6) When the machine is enclosed in a metal building, several good earth driven electrical grounds around the periphery of the building are recommended.

Failure to observe these recommended installation procedures may cause radio or TV interference problems and result in unsatisfactory cutting or gouging performance resulting from lost high frequency power.

ELECTRICAL INPUT CONNECTION

⚠ WARNING

ELECTRIC SHOCK can kill.

• Disconnect input power before proceeding.

• Have a qualified electrician make the input connections.

• Be sure the voltage, phase and frequency of the input power is as specified on the machine nameplate.

Before starting the installation, check with the local power company if there is any question about whether your power supply is adequate for the voltage, amperes, phase and frequency specified on the rear machine nameplate. Also be sure the planned installation will meet the U.S. National Electrical Code and local code requirements.

Use a three phase power supply fused with the recommended super lag fuses. Choose an input and grounding wire size according to local codes or use the table below. “Delay type” circuit breakers (also called “inverse time” or “thermal/magnetic”; which have a delay in tripping action that decreases as the magnitude of the current increases) may be used in place of fuses. Using fuses or circuit breakers smaller than recommended may result in “nuisance” tripping from machine inrush currents even if not cutting or gouging at high currents.

Models that have multiple input voltages specified on the rear nameplate (e.g. 230/460) are shipped connected for the higher voltage. If the machine is to be operated on the lower voltage, it must be reconnected according to the instructions on the inside of the removable panel in the center of the rear panel. Electrical supply lines enter the machine next to the removable panel.

⚠ WARNING

ELECTRIC SHOCK can kill.

• Make certain that the input power is electrically disconnected before removing the screws that hold the removable rear panel in place.

Have a qualified electrician connect the input leads to “U”, “V” and “W” of the reconnect panel in accordance with the U.S. National Electrical Code, all local codes and the connection diagram located on the inside of the cover.

The frame of the machine must be grounded. A ground terminal marked with the symbol ⏚ located at the left side of the input box is provided for this purpose. See the U.S. National Electrical Code for details on proper grounding methods. Follow other grounding instructions per the paragraph under “High Frequency Interference Protection”.

On triple voltage input machines, be sure the reconnect panel is connected per Figure 1 in the back of this manual, for the voltage being supplied to the machine.

⚠ CAUTION

• Failure to follow these instructions can cause immediate failure of machine components.

The PRO-CUT is shipped connected for the highest nameplate input voltage. Reconnect the power straps to their respective terminals corresponding to the input voltage used.

RECOMMENDED WIRE SIZE FOR PRO-CUT INPUT CONNECTIONS
Based on 1993 U.S. National Electric Code

Input Voltage / Hz.	Wire Size (Copper, 75°C)		Fuse Size
	3 Input Wires	1 Grounding Wire	
230/60	#3 (25mm²)	#8 (10mm²)	125Amp
460/60	#8 (10mm²)	#8 (10mm²)	60Amp
220/50/60	#3 (25mm²)	#8 (10mm²)	125Amp
380/50/60	#6 (16mm²)	#8 (10mm²)	70Amp
440/50/60	#8 (10mm²)	#8 (10mm²)	60Amp

AIR INPUT CONNECTIONS

⚠ WARNING

CYLINDER may explode if damaged

- Keep cylinder upright and chained to a fixed support.
- Keep cylinder away from areas where it may be damaged.
- Never lift equipment with cylinder attached.
- Never allow the cutting torch to touch cylinder.
- Keep cylinder away from live electrical circuits.
- Maximum inlet pressure 150 psig.

A source of clean compressed air or nitrogen must be supplied to the PRO-CUT. The supply pressure must be between 80 and 150 psi (551 and 1034 kPa). The flow rate is approximately 8.0 cfm. Oil in the air is a very severe problem and must be avoided.

Remove the plastic thread protector from the regulator input port (located on the back of the machine). Use a suitable gas connection fitting to make the connection to the available air supply. The input port is a 1/4" (6.3 mm) NPT thread. Tighten the air fitting to prevent leakage but do not overtighten. The use of Teflon tape to seal the connection is recommended.

Nitrogen from cylinders may be used with this machine. The cylinder of nitrogen gas must be equipped with a pressure regulator. No more than 150 psi (1034 kPa) may be supplied to the regulator on the machine. Install a hose between the regulator on the gas cylinder and the gas inlet on the cutter.

OUTPUT CONNECTIONS

⚠ WARNING

HIGH FREQUENCY SHOCK CAN CAUSE INJURY OR FALL.

- Keep the cutting torch and cables in good condition.
- Secure yourself in position to avoid a fall.

Torch Connection

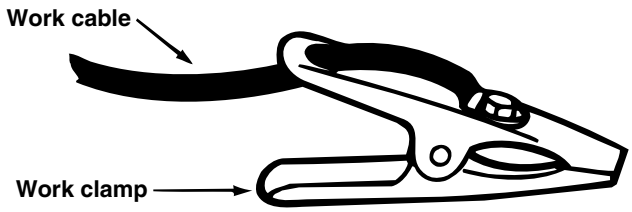
The PRO-CUT comes factory equipped with a cutting torch. Cutting torches come with a 25 ft. (7.6 m) or a 50 ft. (15.2 m) cable.

Pictures of the torch and the required replacement parts are shown in the parts lists in the back of this manual. The ends of the cable to be connected to the power source are unique. Follow the applicable instructions given in Figure 2 in the back of this manual.

Work Cable and Clamp Installation

Attach the work clamp to the work cable per the following:

1. Unplug the machine or turn the power switch to the "Off" position.
2. Insert the work cable terminal lug with the larger hole through the strain relief hole in the work clamp as shown below.
3. Fasten securely with the bolt and nut provided.



OPERATING INSTRUCTIONS

Sequence of events:

A. Turn on the line power.

B. Connect the air supply to the machine.

C. Turn the power switch on.

-The green "Power On" LED should begin to glow.

-The fan should start.

-If the "Safety" LED is glowing, push the "Safety Reset" button. If there is no problem, the LED will go off. If there is a problem, refer to Step F and the Troubleshooting Guide.

D. Set the Purge/Run switch to Purge.

-The air should start.

-The "Air Pressure" LED should be lit.

-Adjust the air regulator so that the pressure gauge reads 60 psi (414 kPa).

E. Set the Purge/Run switch to Run.

-The air will continue to run for 60 seconds of postflow. If the trigger is activated within the first twelve seconds, the pilot arc will immediately start. After twelve seconds, a double trigger pull is required to start the arc. The second trigger pull must follow the first within one second to start the pilot arc.

F. When ready to cut, place the work lead on the piece to be cut, place the torch near the work, make certain all safety precautions have been taken and pull the trigger.

-The air will flow for a preflow time of 2 seconds and the pilot arc will start. (This is true unless the machine is in postflow, then the preflow time is skipped.)

-The “Output ON” LED will light.

-The pilot arc will run for 1.8 seconds and shut off unless the plasma is brought in contact with the work and the arc is transferred.

-When the arc is transferred, cutting begins. When finished cutting, release the trigger.

G. When the trigger is released, the arc will stop.

-The air will continue to run for 60 seconds of postflow. If the trigger is activated within the first 12 seconds, the pilot arc will immediately restart. After twelve seconds, a double trigger pull is required to start the arc. The second trigger pull must follow the first within one second to start the pilot arc.

H. If the “Safety” LED lights at any time, check the following:

⚠ WARNING

ELECTRIC SHOCK CAN KILL.

• Turn off machine at the disconnect switch at the back of the machine before tightening, cleaning or replacing consumables.

• Check the assembly of the torch consumables. If they are not properly in place then machine will not start.

• Check the conditions of the inside of the nozzle. If debris has collected, scrape it out with a piece of sturdy wire or a suitable drill bit. Refer to“Suggestions for Extra Utility from the PRO-CUT system”.

• After the problem is found, reset the machine by pressing the “Safety Reset” button. (It is possible for electrical noise to trip the safety circuit on rare occasions. This should not be a regular occurrence.)

• If the machine does not reset or continues to trip, consult the Troubleshooting Section of this manual.

Pilot Arc Discussion:

The PRO-CUT has a smooth, continuous pilot arc. The pilot arc is only a means of transferring the arc to the workpiece for cutting. Repeated pilot arc starts, in rapid succession, are not recommended, as this will reduce consumable life. Occasionally, the pilot arc may sputter or start intermittently. This is aggravated when the consumables are worn or the air pressure is too high. Keep in mind that the pilot arc is designed to transfer the arc to the workpiece and not for numerous starts without cutting.

Procedure Recommendations

When properly used, plasma arc cutting or gouging is a very economical process. Improper use will result in a very high operating cost.

If the nozzle is touched to the work while cutting, the output current will be reduced to minimum until the nozzle is removed from the work.

General

• Follow safety precautions as printed inside the operating manual and on the machine.

• Either the S19972 standoff guide or S19973 and S19974 contact attachments are recommended for all cutting applications to protect the torch from dross and improper arcing conditions.

• Use proper cutting or gouging procedures referred to in procedures guideline.

Material thickness below .75 (19mm):

Output set below mid-range.

• Do not allow the torch cable or body to contact hot surfaces.

• The best cut quality is obtained by reducing the current to a level that is adequate for the maximum travel speed.

• Aluminum, copper and other nonferrous metals typically require more current than the same thickness of steel.

• For thickness below .75” (19mm) use an S19961-2 nozzle (1.4mm dia. orifice). The S19972 standoff guide should be set in the lowest position for maximum standoff.

Expanded Metal:

Output set near mid-range.

- Cut it as you would light gauge sheet metal.
- Expanded metal is pilot arc intensive. After about 30 seconds of cutting, the pilot arc will change from a bright continuous arc to a discontinuous one which will sputter slightly. It will stay in this mode as long as metal has been cut in the previous 5 seconds. If metal is not cut in the previous 5 seconds, the arc will shut off and the machine will go into postflow.
- If the trigger is continuously pressed and released to obtain the bright pilot arc for long periods of time, the machine will go into pilot arc duty cycle limit. This is a 20 seconds out of 80 seconds pilot duty cycle. The pilot arc is disabled in the limit period. Pilot arc duty cycle limit is indicated by alternately flashing "OUTPUT ON" and "MALFUNCTION" LED's.
- Placing a thin piece of scrap sheet metal above the area to be cut and cutting through both can make the job easier.
- Do not allow cable or body to contact hot surface.

Material Thickness above .75" (19mm):

Output set above mid-range.

- The best quality and consumable life will be obtained by holding the torch nozzle off the surface about 1/4" (6.4mm). Do not touch the nozzle to the work or carry a long arc.
- Use either S19972 standoff guide or S19973 and S19974 contact attachments to protect the torch. The only reason not to use these are in special tight corners. Always hold at least a 1/4" (6.4mm) standoff in those situations.
- Set the current to the minimum necessary to make the cut.
- Pierce the plate by slowly lowering the torch onto it at an angle of about 30° to blow the dross away from the torch tip and slowly rotate the torch to a vertical position as the arc becomes deeper.
- Where possible, start the cut from the edge of the workpiece.
- **Keep moving!** A steady speed is necessary. Do not pause.
- Do not allow the torch cable or body to contact hot surfaces.
- For thickness between .75" (19mm) and 1.00" (25.4mm), use an S19961-4 nozzle (1.9mm dia. orifice). The S19972 standoff guide should be in the lowest position for maximum standoff.
- For thickness above 1.00" (25.4mm), use an S19961-4 nozzle (1.9mm dia. orifice). The S19972 standoff guide should be in the lowest position for maximum standoff.

Gouging:

Output set to maximum.

- Use a gouging nozzle S19961-5. The pilot arc may sputter while gouging, but this is normal.
- Use the S19975 gouging attachment in the lowest position for maximum standoff.
- Bring the torch slowly towards the work at about a 30° angle as if piercing the plate. Blow the molten metal away from the torch.
- Do not touch the nozzle to the work.
- To obtain deeper penetration when gouging, lower the flowing air pressure to 50 psi. To obtain shallower penetration, raise the flowing air pressure to 70 psi.
- This process will blow a lot of molten metal and dross. **BE CAREFUL!** Blow the dross away from the torch, away from the operator and away from flammable objects.
- Do not allow the torch cable or body to contact hot surfaces.
- Performance is similar to air carbon arc gouging with a 1/8" (3.2mm) carbon electrode.

In All Cases:

- Do not pause when cutting or gouging the metal. This is not necessary and causes operational difficulty. Pausing at the edge of the workpiece causes poor consumable life and erratic operation.

- Always position the torch in the best way to keep dross and hot air from burning back into it.

- Do not carry a long arc. This may trip the safety or fault circuits and wears consumables rapidly.

- Always hold a 1/4" standoff while cutting.

- Use the proper machine setting. Setting the machine to maximum output will not produce the best cutting performance in most situations.

- Use proper cutting or gouging procedures referred to in Procedures Guideline.

- Use the nozzle with the largest orifice size that gives an acceptable cut. This will improve parts life. Never use the 1.1 mm dia. or 1.4 mm dia. nozzles at outputs above the yellow range.

- The electrode should be finger tight for a snug fit. It should not be torqued any more than 38 inch pounds. **DO NOT USE PLIERS TO OVER-TIGHTEN THE ELECTRODE.**

- Always allow the 62 second postflow time to elapse before attempting to change the electrode. Failure to do so may cause severe damage to the torch head.

Suggestions for Extra Utility from the PRO-CUT System:

- If it becomes absolutely necessary to cut through a very thick section, the air flow at the regulator on the back of the machine may be **lowered** to get a better result. If it is taken too low, the power source will trip off until the pressure is raised back to about 45 psi (311 kPa). It is not wise to operate in this manner for long periods of time because the consumable life is severely shortened.

- In some cases where moderate or thin sections are being cut, higher air pressure may give better consumable life. At pressures about 70 psi (482 kPa), the pilot arc may sputter. This may be an annoyance but it will not damage the torch or power source. 60 psi (414kPa) is the minimum recommended pressure to provide proper cooling in all situations. Feel free to experiment with higher pressures not to exceed 150 psi (1034 kPa).

- The PRO-CUT is capable of operation with a 50 ft. (15.2 m) plasma torch. Pilot arc operation may be slightly degraded with this torch installed. Sputtering may occur after the pilot arc is established and occasionally the pilot arc may not light after the trigger is depressed. Neither cutting performance nor machine reliability will be lessened by this condition. Keep in mind that the condition of the consumables and air pressure level have a large impact on pilot arc ignition.

⚠ WARNING

ELECTRIC SHOCK CAN KILL.

Turn off machine at the disconnect switch on the front of the machine before tightening, cleaning or replacing consumables.

- The PRO-CUT will cut with consumables that are worn considerably. Many competitive systems require replacement consumables long before a PRO-CUT system does. This is because of the solid state current regulation that the PRO-CUT has. Also, the safety reset circuit provides a means of extending nozzle life. Sometimes a small piece of material "spits" from the electrode and bridges the gap between the nozzle and the electrode. In a competitive unit, this would often result in the destruction of the electrode and nozzle due to overheating. This will result in the tripping of the PRO-CUT safety circuit. When this happens, turn the power off, remove the nozzle and scrape any debris from its inside cavity with a piece of sturdy wire or a suitable drill bit. Replace the nozzle, turn on the power and continue cutting.

- Gouging nozzles may be made from worn cutting nozzles by drilling the orifice out to .125" (3.2mm). Use a 1/8 or #31 drill bit. Take care to center the hole and be careful because the copper nozzle may seize to the drill bit.

- Use of the nozzle with the largest orifice size that produces acceptable cutting results will maximize consumable life. Smaller orifice sizes constrict the arc more, raising the energy density and the temperature. Larger orifice sizes have the opposite effect. Small orifice nozzles run hotter and wear faster than large orifice nozzles but produce a finer cut with less kerf width. There is a certain current where each orifice size becomes unstable because it runs too hot. Never use the smallest .043 (1.1 mm) orifice size at outputs above the yellow range because it will be quickly destroyed.

MAINTENANCE PROCEDURES

⚠ WARNING

ELECTRIC SHOCK CAN KILL.
BEFORE PERFORMING ANY MAINTENANCE THAT REQUIRES OPENING THE CASE OF THE POWER SOURCE:

- Disconnect input power to this machine at the Disconnect switch.
- Do not touch electrically live parts or internal wiring.
- Only qualified personnel should service this machine.

ROUTINE MAINTENANCE

1. Keep the cutting or gouging area and the area around the machine clean and free of combustible materials. No debris should be allowed to collect which could obstruct air flow to the machine.

2. Every few months, blow the dust off the air intakes and louvers with compressed air.

3. Check the air regulator filters to be sure they do not become clogged. The first stage of the air filter on the machine is self draining and will stop most of the water in the air line. The second stage of the filter is also self draining and will stop almost all of the oil in the line as well as particulate matter. Both stages will drain automatically when the flow rate changes rapidly.

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

5. 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 periodically and relieve any so as not to restrict the flow of air to the torch.

⚠ WARNING

ELECTRICAL SHOCK CAN KILL.
Turn off machine at the disconnect switch at the back of the machine before tightening, cleaning or replacing consumables.

Change consumables as required.

TROUBLESHOOTING PROCEDURES

⚠ WARNING

ELECTRIC SHOCK CAN KILL.
BEFORE PERFORMING ANY MAINTENANCE THAT REQUIRES OPENING THE CASE OF THE POWER SOURCE:

- Disconnect input power to this machine at the Disconnect switch.
- Do not touch electrically live parts or internal wiring.
- Only qualified personnel should service this machine.

HOW TO USE THIS GUIDE: Carefully read through each applicable section listed on the following pages. Remember that most problems are caused by improper setup, such as switch settings, control settings, etc.

If you believe the set up is correct and the trouble still exists, first check for the obvious: input power, blown fuses, loose PC board connectors, broken wires and the like. The sections listed on the following pages are intended to help you find the less obvious sources of trouble.

TROUBLESHOOTING GUIDE

Visual Inspection

Clean interior of machine with a low pressure airstream. Make a thorough inspection of all components. Look for signs of overheating, broken leads or other obvious problems. Many problems can be uncovered with a good visual inspection.

After the visual inspection proceed to the proper symptom section of this guide for necessary checks to perform.

SYMPTOM	CHECK
No LED's light when the power switch is turned on.	1. Check the input power to be sure it is on. 2. Check the power line fuses and machine connection. 3. Replace line switch.
The "MACHINE ON" LED is lit, but there is no response when the trigger is pulled.	1. Check the "SAFETY" LED. If it is lit, check the torch consumables and press the "SAFETY RESET" button. 2. Check the air supply to the machine. If the air does not flow, the machine will not start. 3. Check the operation of the air solenoid by switching the machine to "PURGE". If the pressure is sufficient, the air should begin to flow and the "AIR PRESSURE" LED should turn on. Return to "RUN" mode. If air does not flow, check the solenoid by applying 115 VAC to its input leads. If it is not bad, replace PC board. 4. Low air pressure also results in a "no start" condition. "AIR PRESSURE" LED must be lit when air is flowing. 5. 12 seconds, or more, of postflow time has elapsed and a double trigger pull is required to start the pilot arc. The second trigger pull must follow the first within 1 second to start the pilot arc.

SYMPTOM	CHECK
The air begins to flow, the “OUTPUT ON” LED lights for a brief period, but no arc is established.	1. Check the torch consumables to be sure they are in tight, not dirty or greasy, and in good shape. Replace the consumables if necessary. 2. Check that CR2 engages. 3. Blow off the components in the upper compartment with compressed air. 4. Check pilot to 391 for 1.5 ohm resistance. 5. Check both 3 ohm 300 watt resistors. 6. Replace Control PC board.
The arc starts but sputters badly.	1. Check the torch consumables to be sure they are tight, not dirty or greasy and in good shape. Replace if necessary. 2. Check air supply for oil or a great deal of water. If there is oil or a great deal of water, the air must be filtered or the machine switched to nitrogen or bottled air. 3. Check air pressure. It should be set to 60 psi (414 kPa) while air is flowing.
The “THERMAL” LED is lit. The “MALFUNCTION” LED is blinking.	1. The machine is overheated. Allow it to cool and reset. The air intakes of the machine must not be blocked, or this will become a nuisance. Machine will cool much faster if left on with output off.
The “MALFUNCTION” LED is blinking two short flashes in close succession followed by a one second off period.	1. The torch connected to the machine is not connected properly or has been damaged. Check all connections and look for sign of damage to the assembly. 2. The connected torch is not designed for use with this machine, see Specifications Summary for listing of valid torches for this machine.

SYMPTOM	CHECK
The “MALFUNCTION” LED is lit.	1. The FAULT circuit monitors the torch to see if it is shorted as well as internal machine failures. 2. Check the torch consumables to see if they are melted together or are simply touching each other. Tighten, clean or replace. See “Suggestions for Extra Utility from the PRO-CUT System”. 3. Check the torch cable to see if it is cut or punctured. Replace. 4. Turn off the machine and turn it back on. If the “FAULT” LED will not stay off when you try to cut again and there is no problem with the torch, then something has failed in the machine and the machine should not be left on. 4a. Check electrode to pilot for short. 4b. Check the SCR board. Replace if bad. 4c. Check operation of contactors. Replace if bad. 5. Replace Control PC board.
Alternating “AIR/MALFUNCTION” LED lights	1. Replace Control PC board.
Air pressure cannot be set to 60 psi (414 kPa) or the machine cuts poorly through thick sections.	1. Watch the pressure gauge during pilot mode. The air pressure should start as 60 psi (414 kPa) and be reduced significantly when the trigger is pulled. If not, then there is a problem with the solenoid assembly.

SYMPTOM	CHECK
The “SAFETY” LED is lit.	1. The machine will not operate. The machine senses that the shield cup is not in place, or the operators could be exposed to dangerous voltages if the machine were allowed to operate. 2. Check the shield cup to be sure it is tightly in place. 3. Check the torch consumables to see if they are melted together or are simply touching each other. Tighten, clean or replace. See “Suggestions for Extra Utility from the Pro-Cut System”. 4. Check the torch cable to see if it is cut or punctured. Replace. 5. Check to see that the torch is hooked to the machine properly. 6. Push the ‘SAFETY RESET” button, the LED should go out. 7. This circuit rarely trips on power up or because of noise. If the circuit can be reset, it is OK to continue operation. 8. Replace Control PC board, as this is a safety problem.
The “OUTPUT ON” and “MALFUNCTION” LED’s blink in alternating order.	1. The pilot arc duty cycle has been exceeded. The machine will cool down and the lights will quit blinking in about 10 seconds. The pilot arc is limited to 20 out of 80 seconds except in special circumstances such as cutting expanded metal. (See the section on expanded metal in the Operating Section.)
Airflow will not shut off.	1. Check harness 1J7 (332) and 3J7 (333) 24VAC auxiliary supply. 2. Replace Control PC board.
No OCV when 2 and 4 are closed.	1. Check CR1. 2. 230 VAC across CR1. 3. 250V SCR PC board positive/negative 4. Check across 31/32 for 110 VAC. 5. Replace Control PC board.

PRO-CUT 125 STATUS LIGHTS OPERATING MODES

STATUS LIGHTS	CONDITION	SUGGESTIONS
MACHINE ON	Should always be on when machine is on.	Normal
OUTPUT ON	On when there is voltage potential at the torch (cutting or pilot). OUTPUT ON is blinking alternately with AIR PRESSURE when power is first applied to machine. If OUTPUT ON is blinking alternately with MALFUNCTION, the pilot arc duty cycle is exceeded.	Normal There is a problem with the microprocessor, replace the Control PC board. Wait for machine lights to stop blinking.
AIR PRESSURE	On whenever the air pressure is above 45 psi (311 kPa), there is an error condition mentioned above where air will turn on. The air will turn on for a brief time when power is first applied to machine.	Normal conditions are purge, preflow, postflow and cutting.
THERMAL	Should normally be off.	If on, wait for machine to cool down. Machine will cool faster if left on with output off.
MALFUNCTION	Light on. At end of preflow, machine checks to see if the torch is shorted and if it can fire the SCR's. Light blinking. If cutting tried with air pressure less than 45 psi (311 kPa) then the machine will wait for air pressure to become greater than 45 psi (311 kPa). Light blinking alternately with OUTPUT ON. Light started blinking during cutting or gouging. There is an overcurrent condition caused by a surge of current the machine was not designed to handle. Release the trigger and resume cutting or gouging. Light blinking with THERMAL light on. Light is blinking two short flashes in close succession followed by one second off period.	Check consumables, replace as needed. Check torch cable to see if it is punctured or cut. No air connected to machine, air pressure set too low, or air leak in system. Pilot arc duty cycle has been exceeded. Wait for machine lights to stop blinking. If cutting or gouging with standoff more than 1/4" (6.4mm) at high range of machine and nozzle is accidentally touched to work, shorten stickout, or use drag cup. Check consumables to see if electrode melted to nozzle. Wait for machine to cool. Torch assembly is: 1. Not connected properly. 2. Damaged 3. Not designed for use with this machine. Check connections; repair or replace as needed.

STATUS LIGHTS	CONDITION	SUGGESTIONS
SAFETY	It is possible that this light could turn on when power is first applied to machine.	If machine can be reset, it is OK to continue operation.
	The torch assembly is misconnected or damaged.	Check torch connection to machine.
	The shield cup assembly is not in place.	Securely fasten shield cup assembly in place.
	While cutting or gouging if the voltage between the nozzle and the work is too high, it will put the machine into safety.	By pressing reset, the machine will be functional. This occurs most often when the consumables are wearing out. By removing the hafnium that builds up on the inside of the nozzle, it is possible to extend the life of the consumables.
	If the cable is punctured or cut, it can trip the SAFETY	By pressing reset, it will clear the SAFETY. When cutting is tried again, the machine will either go into MALFUNCTION or SAFETY; until that time, the machine will not indicate a malfunction condition.

PROCEDURE FOR REPLACING PC BOARDS

⚠ WARNING

ELECTRIC SHOCK CAN KILL.
BEFORE PERFORMING ANY MAINTENANCE THAT REQUIRES OPENING THE CASE OF THE POWER SOURCE:

- Disconnect input power to this machine at the Disconnect switch.
- Do not touch electrically live parts or internal wiring.
- Only qualified personnel should service this machine.

Before replacing a PC board which is suspected of being defective, visually inspect the PC board in question for any damage to any of its components and conductors on the back of the board.

If there is **no** visible damage to the PC board, install a new one and see if this remedies the problem. If the problem is remedied, reinstall the **old** PC board to see if the problem still exists. If it **does** no longer exist with the old PC board:

1. Check the PC board harness conductor pins for corrosion, contamination or looseness.
2. Check leads in the plug harness for loose or intermittent connection.

If PC board is visibly damaged electrically (components burned, copper traces opened or damaged), before possibly subjecting the new PC board to the same cause of failure, check for possible shorts, opens or grounds caused by:

1. Frayed or pinched lead insulation.
2. Poor lead termination, such as a poor contact or a short to adjacent connection or surface.
3. Two or more leads shorted together.
4. Foreign matter or interference behind the PC boards.

If PC board is visibly damaged mechanically (such as a part vibrated off or was crushed), inspect for cause, then remedy before installing a replacement PC board.

If there is damage to the PC board and if replacing PC board corrects problem, return it to the local Lincoln Electric Field Service Shop.

NOTES

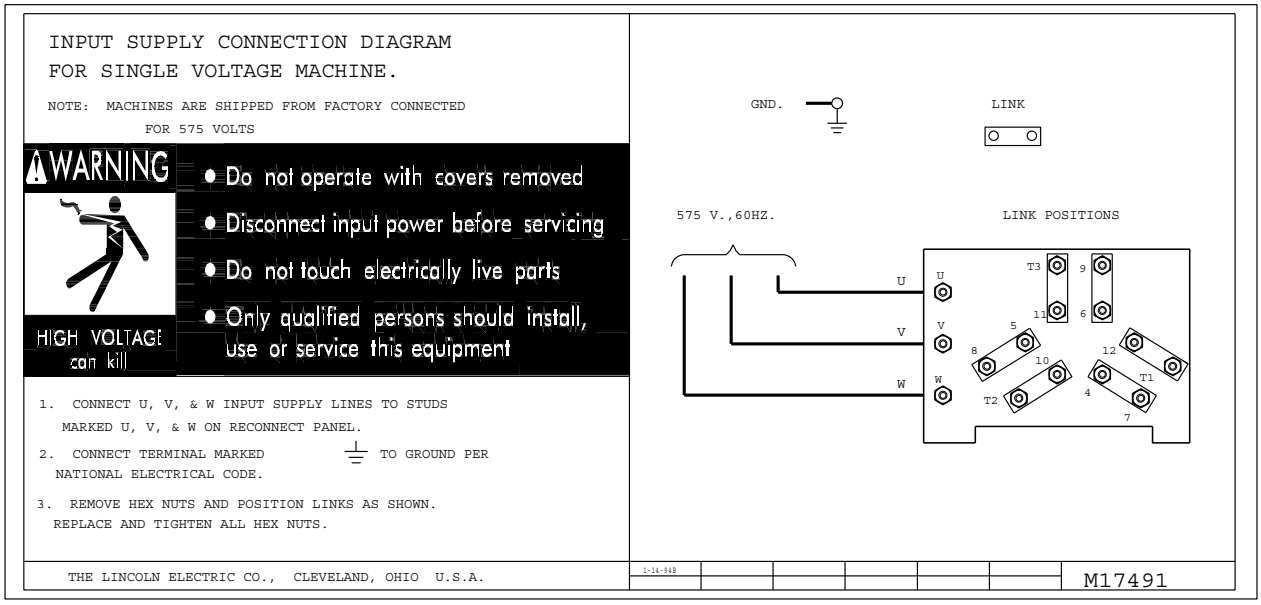


FIGURE 1- SINGLE VOLTAGE

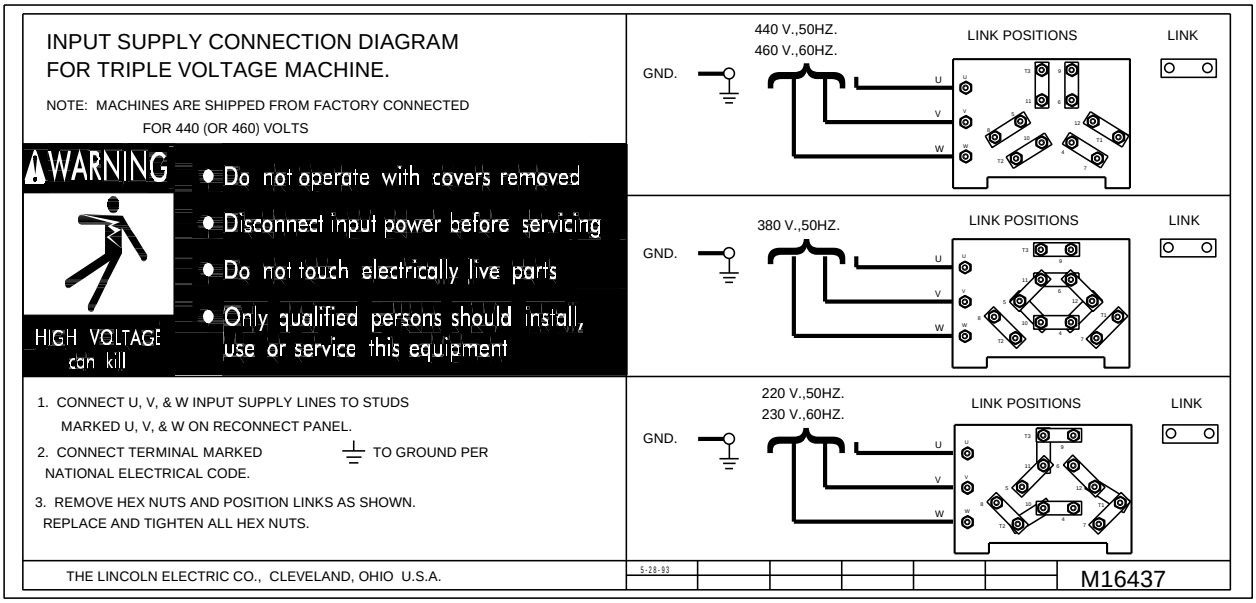
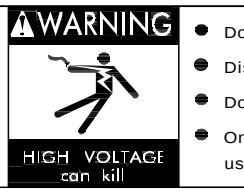


FIGURE 1- DUAL & TRIPLE VOLTAGE

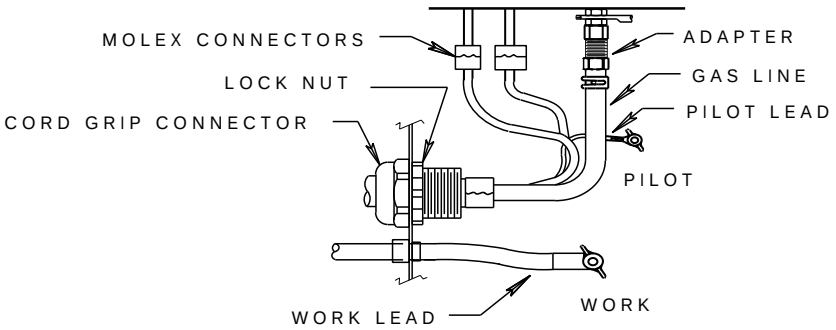
PLASMA TORCH CONNECTION DIAGRAM

FOR LINCOLN

ELECTRIC TORCHES



- Do not operate with covers removed
- Disconnect input power before servicing
- Do not touch electrically live parts
- Only qualified persons should install, use or service this equipment



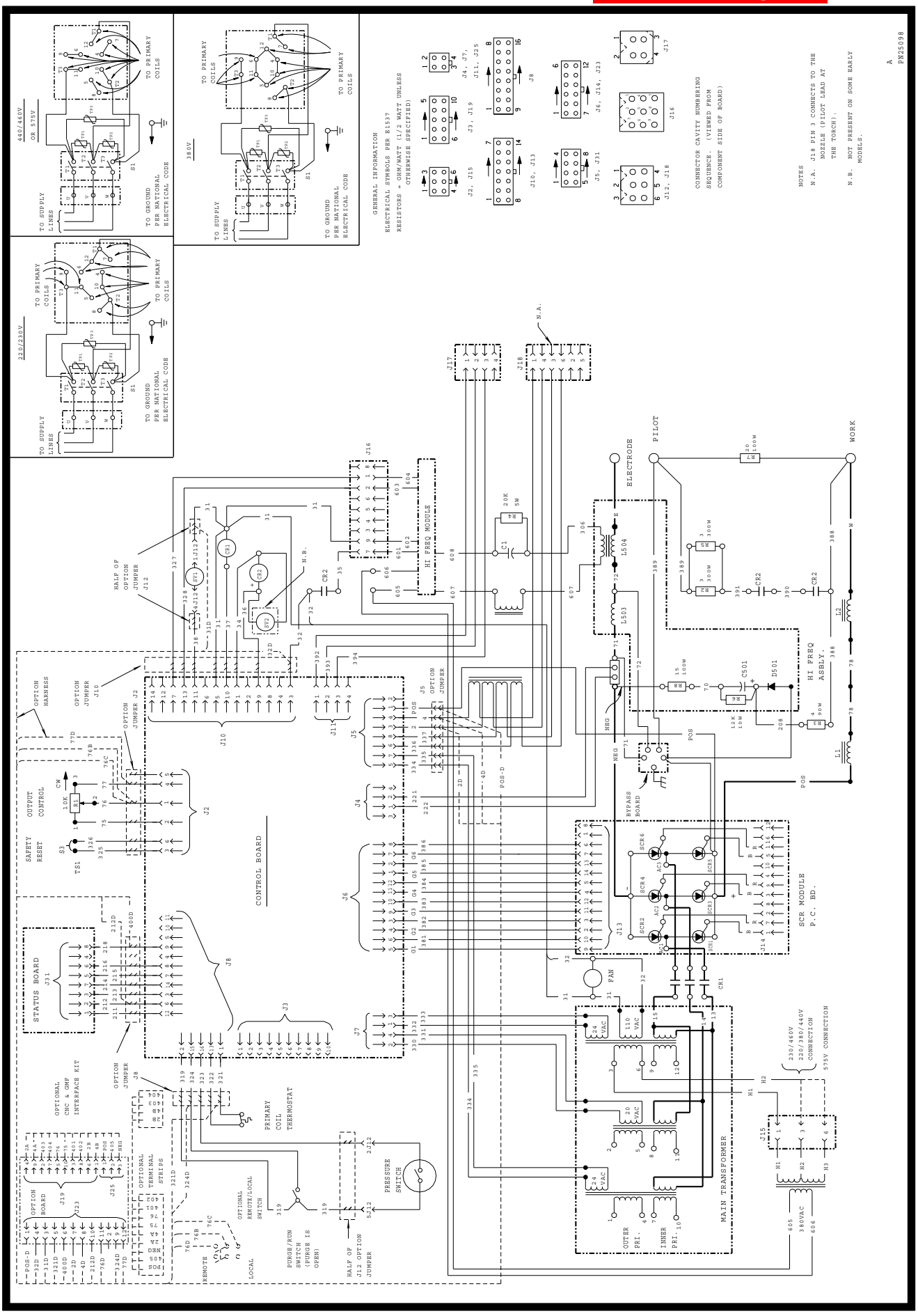
1. DISCONNECT INPUT POWER TO THE PRO-CUT AND TURN MACHINE POWER SWITCH OFF.
2. INSERT TORCH CABLE THROUGH CASE FRONT OPENING. USE LOCK NUT TO MOUNT CORD GRIP CONNECTOR.
3. CONNECT PILOT LEAD.
4. PLACE GAS LINE FITTING ON ADAPTER AND SCREW TIGHT.
5. ATTACH MOLEX CONNECTORS.

THE LINCOLN ELECTRIC CO. CLEVELAND, OHIO U.S.A.	5-28-93					S19934

FIGURE 2

Enhanced Diagram

WIRING DIAGRAM - PRO-CUT 125



NOTE: This diagram is for reference only. It may not be accurate for all machines covered by this manual. The specific diagram for a particular code is pasted inside the machine on one of the enclosure panels. If the diagram is illegible, write to the Service Department for a replacement. Give the equipment code number..

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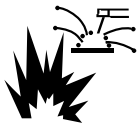
			Additional Shipping Costs if any	
			TOTAL COST	



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捍材料，並請遵守貴方的有関勞動保護規定。

이 제품에 동봉된 작업지침서를 숙지하시고 귀사의 작업자 안전수칙을 준수하시기 바랍니다.

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

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