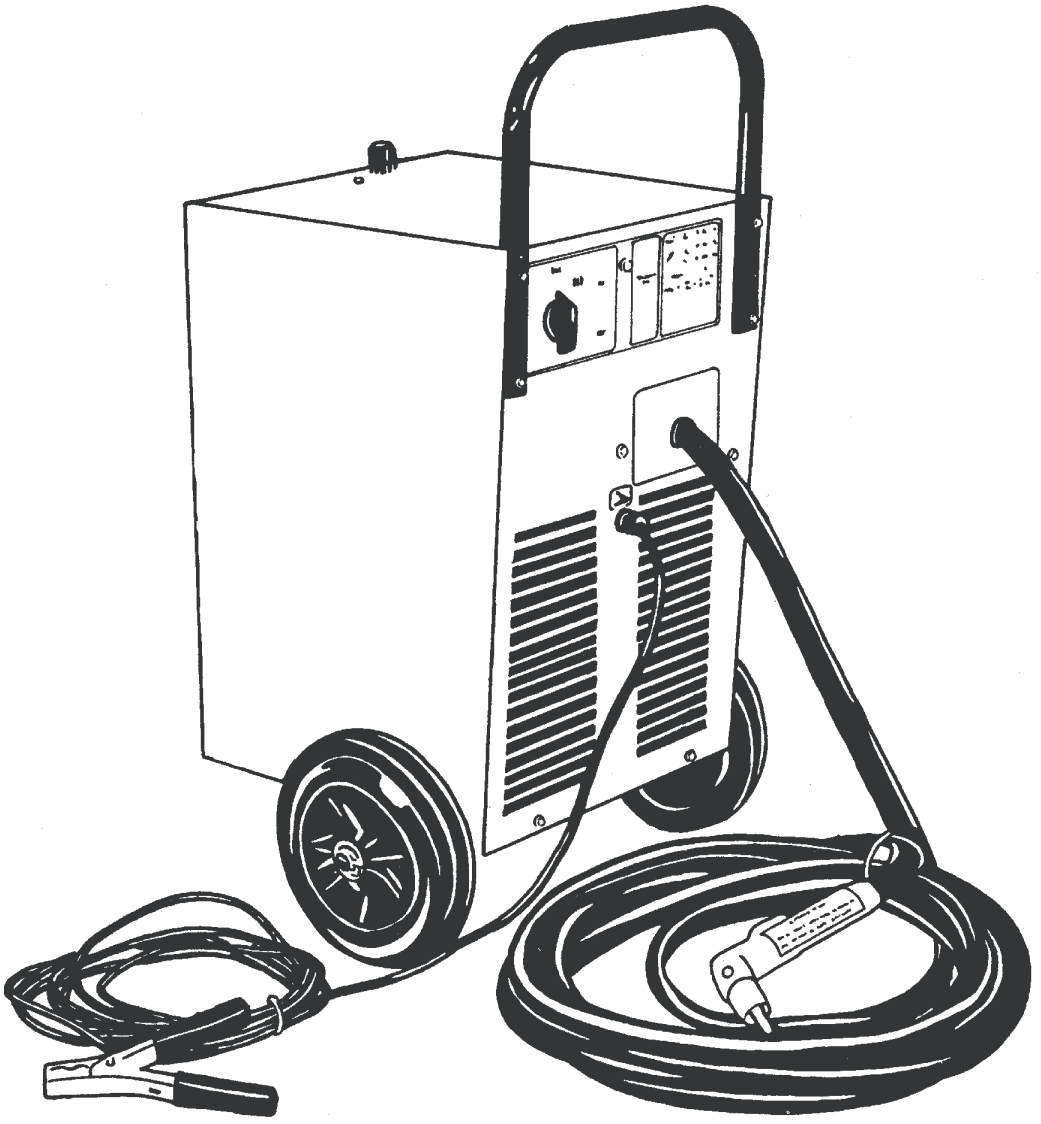
OPERATING INSTRUCTIONS
MANUEL D'INSTRUCTIONS
MANUAL DE INSTRUCCIONES

FOR MODEL:
SERIES B

M12156



IMPORTANT OPERATING INSTRUCTIONS
SAVE THESE INSTRUCTIONS

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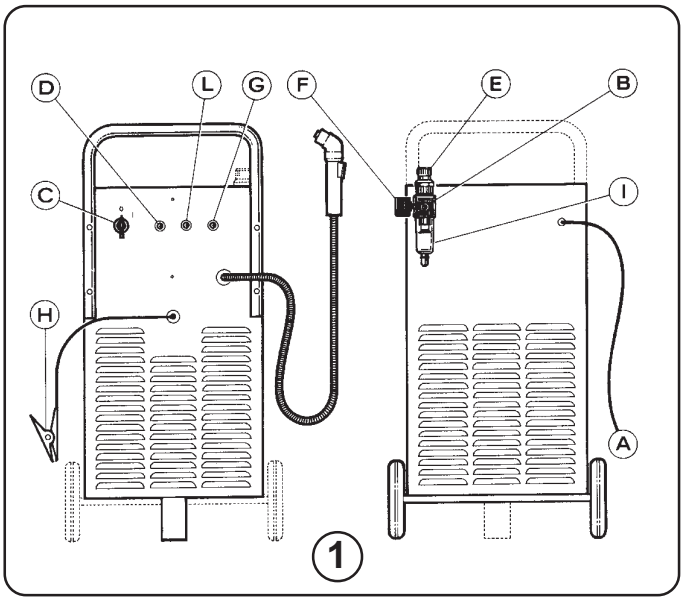
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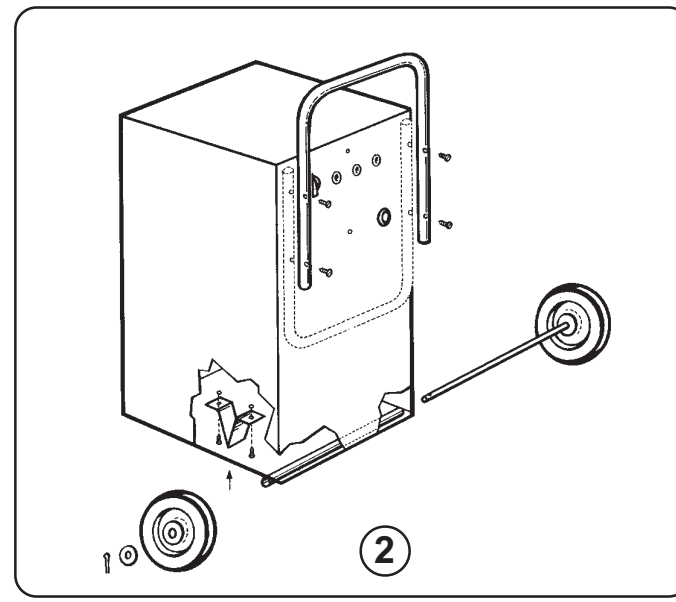
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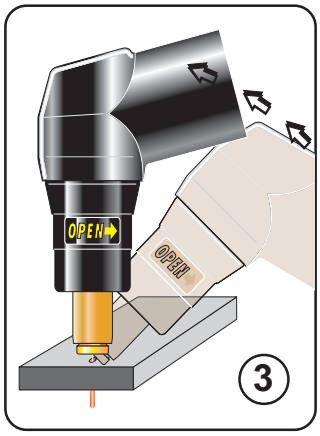
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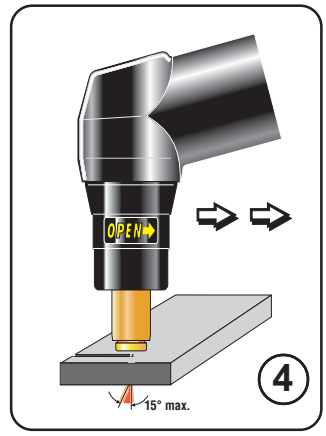
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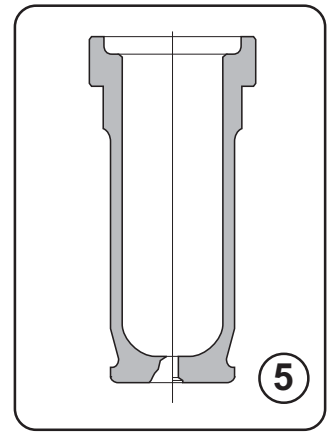
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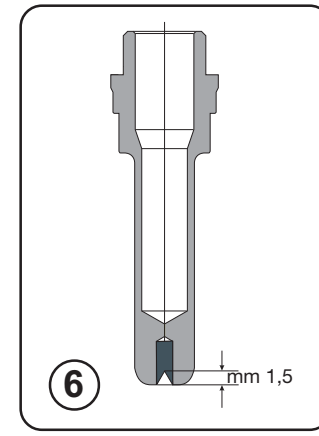
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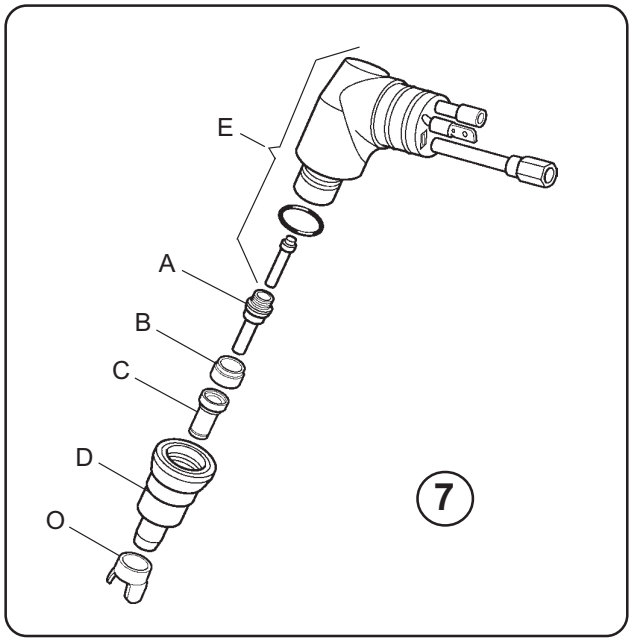
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PLASMA CUTTER INSTRUCTION MANUAL

Read this entire manual carefully before using this unit. Failure to respect the rules described herein shall exempt the manufacturer from any liability. The unit has been designed, built and protected only for the functions described below. Any other use not explicitly included in this manual is considered prohibited.

The unit must be used in a sufficiently ventilated room that is free of dust and excess moisture, and where there is no risk of fire, explosion or flooding.

The unit must only be used and serviced by qualified personnel, and all current safety regulations must be followed.

The manufacturer shall not be held responsible for any damage caused by incorrect use of the unit.

1 INTRODUCTION

This unit must be used exclusively for cutting on any electrically conductive material (metals and alloys).

In this machine, arc ignition is obtained by the contact and the subsequent separation of the electrode from the nozzle. Plasma cutting is possible due to the extremely high temperature generated by a concentrated electric arc, thus creating the potential for a highly dangerous situation. It is therefore essential to pay the utmost attention to the section entitled SAFETY PRECAUTIONS, or serious personal injury may occur.

The symbols located next to certain paragraphs indicate information requiring extra attention, practical advice or basic critical information.

This manual must be kept in good condition in a place that is familiar to everyone involved with using the unit. It should be consulted whenever doubts arise and kept for the entire life span of the unit, because it also contains valuable information regarding ordering replacement parts.

2 SAFETY DEVICES

This unit employs the following safety devices:

Thermal: Located on the power transformer windings to prevent overloads, and is indicated by indicator light **G** (see picture 1).

Pneumatic: Located on the torch feed line to prevent insufficient air pressure, and is indicated by indicator light **L** (see picture 1).

Electrical: Located on the torch body to protect from dangerous voltages while replacing the nozzle, diffuser, electrode or nozzle holder.

The unit is also equipped with an error detection system. Each malfunction is indicated by a different flashing pattern on indicator light **G**.

A) One flash followed by a one second pause indicates a short circuit is present in the torch (for example between the electrode and the nozzle).

B) Two flashes follow by a one second pause indicates that the start button was pressed while the unit was turned on. Release the button.

- Do not remove or short-circuit the unit's safety devices.
- Only use genuine spare parts.
- Always replace any damaged part of the unit or torch with genuine spare parts.
- Do not use any torch other than the one originally shipped with the unit.
- Do not use the unit with the cover removed. This is dangerous both for the user and for any bystanders in the work area, and prevents the unit from cooling efficiently.

3 DESCRIPTION OF TECHNICAL SPECIFICATIONS

MODEL **Nº**		SERIAL **Nº**
TORCH TYPE		SERIES **B**
		CLASS OF INSULATION ISOLIERSTOFFKLASSE CLASSE DES ISOLANTS CLASE DE AISLAMIENTO CLASSE DI ISOLAMENTO **F**
U0 V MAX. O.C.V. 280	**X**	25%
	I2	35 A
	U2	95 V
		THERMAL PROTECTION THERMISCH GESCHÜTZ PROTECTION THERMIQUE PROTECCION TERMICA PROTEZIONE TERMICA
1~ **60**Hz	**I**1	21 A
	U1	230 V
		FORCED VENTILATION KUHLART F VENTILE VENTILACION FORZADA VENTILAZIONE FORZATA
IP 21	**Made in Italy**	

Nº. Machine serial number, which must appear on requests or inquiries concerning the unit.

TORCH TYPE Type of torch that may be used with this unit.

U0. Secondary no-load voltage.

X. Duty cycle percentage. The duty cycle is the number of minutes (expressed as a percentage), that the machine can operate (arc on) within a ten minute period without overheating. The duty cycle varies according to the output current.

I2. Output cutting current.

U2. Secondary voltage with cutting current I2

U1. Rated supply voltage

1~60Hz Single-phase input supply at 60 Hz.

I1. Input current (Amps) corresponding to different output levels.

IP21. Machine case protection class. The 1 after the 2 indicates that this unit is not fit to work outdoors in the rain.

4 DESCRIPTION OF UNIT DEVICES (see picture 1)

A) Input power cord
B) Compressed air fitting (1/4" female pipe thread)
C) Main power switch
D) Main pilot light
E) Air pressure regulator
F) Gauge
G) Light indicating thermostat is open 
H) Work clamp
I) Water trap
L) Light indicating insufficient air pressure 

5 ASSEMBLY

Unpack the unit and assemble the wheels, stand and handle according to the instructions in picture 2. Place the unit in a properly ventilated room that is relatively free of dust. Make sure that the unit's air inlet and outlet slots are not obstructed.

6 INSTALLATION

The unit must be installed by qualified personnel. All fittings must be in conformity with existing rules, and in full compliance with safety regulations.

Connect the air feed to fitting **B** making sure that pressure is at least 88 psi (6bar or .6MPa), with a minimal capacity of 5 CFM (140 liters/min.).

The air fitting connected to the pressure reducer must have a threaded portion that is no more than 1/4" to 5/16" (6-8 mm) long, since a longer thread may cause problems inside the reducer.

If the air feed comes from a pressure reducing unit of a compressor or a centralized plant, the reducing unit should be adjusted at the highest output pressure, not exceeding 120 psi (8bar or 0.8MPa). If the air feed comes from a compressed air tank, a pressure regulator must be used. **Never connect compressed air tanks directly to the regulator! Pressure may exceed the regulator's capacity and cause an explosion.**

Be sure that the main power supply matches the rating indicated on the rating plate of the machine.

When connecting power cord **A**, the yellow-green wire of the cord must first be connected to a reliable system ground. The remaining wires should then be connected to the feed line, passing through the switch. Place the switch as close as possible to the cutting area for easy access, in case the unit needs to be turned off quickly.

The rating of the electrical breaker in series with the switch should be equal to the input current ($\mathbf{I}_1$) of the unit. Input current ($\mathbf{I}_1$) can be found by reading the technical specifications on the unit, i.e. feed voltage ($\mathbf{U}_1$) available.

Any extensions should have adequate wire size for the input current ($\mathbf{I}_1$).

7 OPERATION

Turn on the main power by pressing switch **C** (see picture 1). Light **D** will illuminate. By pressing and immediately releasing the torch trigger, the compressed air flow is opened. Make sure that the pressure shown on gauge **F** is about 65/70 psi (4.5 to 4.7 bar or .45 to .47 MPa). If not, adjust it by using knob **E** of the regulator, then once the desired reading is attained, lock the knob by pressing it down.

Connect the work clamp **H** to the work piece. Make sure the work piece is clean to ensure good electrical contact.

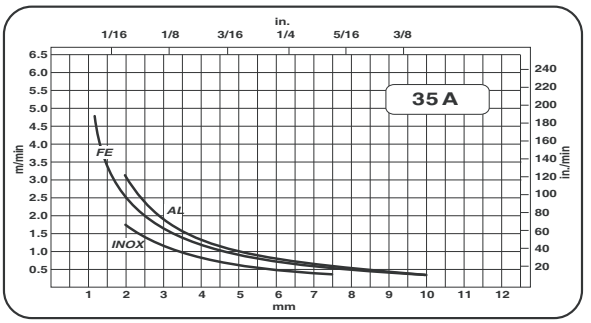
When cutting, the torch should be pulled if possible, which is easier than pushing. Keep the torch in a vertical position.

Once cutting is finished and the trigger is released, air continues to flow out of the torch for about 60 seconds, enabling it to cool down. Do not turn off the unit until this process is complete.

Do not attempt to drill holes or start cutting from the center of a piece unless your material is thicker than 1/16" (2mm). When cutting this way, the torch should be tilted and then slowly straightened to prevent molten metal from being spread onto the nozzle (see picture 3). If you are performing a circular cut, it is recommended to use a caliper, which is available separately.

During down periods, Avoid keeping the pilot arc on needlessly, in order to prevent unnecessary electrode, diffuser and nozzle consumption. **When you have finished working, turn off the machine and hang the torch on the provided hook.**

8 CUTTING SPEED GRAPH



9 TROUBLESHOOTING

1) Insufficient penetration.

Possible causes:

- Cutting too fast. Always make sure that the arc passes thoroughly through the work piece and that it is not tilted in excess of a 10–15º angle. This will reduce wear on the nozzle.
- Excessive thickness of the work piece (see graph above of cutting speed and thickness).
- Work clamp **H** does not have good electrical contact with the work piece.
- Worn nozzle and/or electrode.
- The cutting current is too low.

2) Cutting arc switches off inadvertently.

Possible causes:

- A worn nozzle, electrode or diffuser.
- The air pressure is too high.

3) Tilted cutting.

Possible causes:

- The air pressure is lower than the recommended setting.
- Excessive burns on the end of the nozzle holder.
- Excessive wear of consumable parts.

4) Excessive wear of consumable parts.

Possible causes:

- The air pressure is lower than the recommended setting.
- Excessive burns on the end of the nozzle holder.

10 PRACTICAL RECOMMENDATIONS

- If the system air contains excessive humidity or oil, you will need to use a drying filter to avoid oxidation and wear of consumable parts, torch damage, and/or reduced speed and quality of cutting.
- Impurities in the system air can cause oxidation of the electrode and/or nozzle, and can make it difficult to light the pilot arc. If this occurs, clean the electrode tip and inside the nozzle with fine sandpaper.
- Make sure that any new electrode and nozzle are clean and degreased.
- Keep the nozzle free from slag.
- When cleaning the nozzle, avoid using sharp tools that could damage or change the shape of the nozzle hole.
- Even if the unit is provided with an automatic discharge for water that works whenever the air feed is closed, it is recommended to check from time to time that no water remains in the trap **I** of the reducer (see picture 1).
- **To avoid damage of the torch and to prevent dangerous situations, always use genuine spare parts.**

11 TORCH MAINTENANCE

Always disconnect the unit from the power supply before any repair of the torch.

Replacing consumable parts (see picture 7):

The parts subjected to wear are electrode **A**, diffuser **B** and nozzle **C**. Any of these parts may only be replaced after loosening nozzle holder **D**. Electrode **A** should be replaced when a 1/16" (1.5 mm) deep crater is created in the middle (see picture 6). The use of a worn electrode quickly wears out the nozzle.

ATTENTION! Do not make sudden jerks when unscrewing the electrode, but gradually turn it to unlock the thread. The new electrode will need to be screwed into its housing and locked without tightening.

Nozzle **C** should be replaced when its central hole is damaged or enlarged in comparison to the new part.

Make sure that nozzle holder **D** is tightly secured after replacing the nozzle.

ATTENTION! Nozzle holder D should only be screwed on the head when electrode A, diffuser B, and nozzle C are assembled. The absence of any of these parts jeopardizes the operator's safety and the proper functioning of the machine.

12 GENERAL MAINTENANCE

Any operation inside the unit must only be carried out by qualified personnel.

Maintenance conducted inside the unit must only be performed after disconnecting the power cord.

It is necessary to periodically clean the inside of the unit with compressed air to clear out metal dust particles.

13 PRECAUTIONS TO TAKE AFTER A REPAIR

After making repairs, remember to reposition the cables so you can be assured that there will be insulation between the primary and secondary sides of the machine. Make sure that no wires can come in contact with any moving parts, or parts that will become hot during operation. Replace all clamps to their original positions on the unit in order to prevent contact between the primary and secondary circuits in the event that a conductor accidentally breaks or disconnects.

14 BASIC SAFETY PRECAUTIONS

WARNING: DISCONNECT POWER SOURCE BEFORE DISASSEMBLY OF THE TORCH.

ELECTRIC SHOCK
Electric shock can kill! All electric shocks are potentially fatal.

This plasma cutter requires high voltages for striking the arc (approx. 250-350 V). Therefore, the following safety rules must be observed when using this unit.

- Do not touch live parts.
- Insulate yourself from the work piece and from the work clamp by wearing insulating gloves and clothing.
- Keep your clothing (gloves, shoes, hats, shirts) and body dry.
- Do not work in humid or wet areas.
- Avoid touching the work piece with bare hands.
- Always arrange for proper insulation against electric shock.
- Use all possible precautions if you are working close to or in a dangerous area.
- If you feel even the slightest sensation of an electric shock, stop cutting immediately. Do not use the unit again until the source of the problem has been identified and corrected.
- Always fit a power disconnect switch with an adequate rating, and place it as close to the unit as possible in case it needs to be shut off quickly in an emergency.
- Check the power cord, torch cable, torch, and ground cable for damage frequently. Never use the unit if any of these parts are damaged, replace them immediately.
- Disconnect the power cord from the power source before replacing cables or before removing the cover from the unit.
- Always switch off the unit or disconnect power before replacing the nozzle, swirl ring, electrode or nozzle holder.
- Do not use the unit with the cover removed.
- Always replace any damaged parts of the unit, torch and cables with genuine spare parts.
- Never remove the torch or unit safety devices.
- Make sure that the power cord is equipped with a grounded plug, and used in a properly grounded outlet only.
- Any maintenance should be carried out only by qualified personnel who are aware of the risks involved due to the dangerous high voltages employed by this unit.

ATTENTION: Never screw the nozzle holder D (see picture 7) to torch body E without fitting the electrode A, diffuser B, and nozzle C. The absence of any of these parts jeopardizes the operator's safety and the proper functioning of the machine.

ULTRAVIOLET RADIATION
Ultraviolet radiation created by the arc may damage your eyes and burn your skin.

- Be sure to wear proper clothing and a helmet.
- Do not wear contact lenses!!! The intense heat coming from the arc may cause them to melt and stick to your corneas.
- Use a mask with at least grade DIN 7 or 8 safety lenses.
- Protect people surrounding the cutting area.

FUMES
Cutting operations give off harmful fumes and metal dust that may damage your health.

- Do not work in areas without proper ventilation.
- Keep away from fumes, and do not breathe them in.
- If working in a closed room, use a suitable exhaust fan placed directly under the cutting area if possible.
- If the ventilation is insufficient, use a breathing apparatus approved for this procedure.
- Clean the work piece so it is free of any solvents or halogen degreasers that may create toxic gases when cutting. Some chlorine solvents may decompose with radiation emitted by the arc and create phosgene gas.
- Do not cut plated metals or metals containing lead, graphite, cadmium, zinc, chrome, mercury or beryllium unless you have a proper breathing apparatus.
- The electric arc creates ozone. After long exposure to high concentrations of ozone, you may experience headache, nose, throat and eye irritation as well as serious congestion and chest pains. IMPORTANT: DO NOT USE OXYGEN FOR VENTILATION

FIRE

- Be mindful of sparks and hot metal fragments, which are a potential fire hazard.
- Make sure that a suitable fire extinguisher is readily available in close proximity to the work area.
- Remove all flammable and combustible material within at least a 33 foot radius from the cutting area.
- Do not use the plasma cutter to cut containers of combustible materials or lubricants, even when empty. All materials should be thoroughly cleaned before cutting.
- Do not cut any porous material with pockets that may include flammable material.
- Do not use this unit where high concentrations of combustible vapors, gases or flammable dust may exist.
- Always check the area approximately 30 minutes after cutting to ensure that nothing has caught fire.

BURNS

- Cover your entire body with fire-proof clothing to protect your skin against burns caused by sparks, hot metal and ultraviolet radiation from the arc.
- Do not wear turned-up pants to prevent hot sparks and metal from depositing in your clothing.
- Before touching the torch, wait for it to cool down and switch off the unit.
- **When the pilot arc is lit and the trigger on the torch is pressed, the plasma spark will start even if a work cable is not connected. Avoid directing the jet towards yourself or other people in the cutting area.**
- **To prevent an accidental spark, always switch the unit off before putting down the torch.**
- Do not carry flammable materials such a cigarette lighter or matches in your pockets while cutting.

EXPLOSIONS

- Do not cut in the vicinity of containers under pressure.
- Do not cut anywhere that explosive dust, gases or vapors may be present.

This plasma cutter functions by using compressed air. If you use compressed air in tanks, use the following precautions:

A) CYLINDERS

- Do not connect compressed air cylinders directly to the unit's regulator without a reducing unit. Pressure may exceed the regulator's capacity and cause an explosion.
- Supply pressure must not exceed 120 psi (8bar/o.8MPa)
- Handle and use pressure cylinders in conformity with existing regulations.
- Do not use leaking or damaged cylinders.
- Do not use cylinders that are not properly secured.
- Do not carry cylinders that have unknown contents.
- Never lubricate cylinder valves with oil or grease.
- Do not put the cylinder in electrical contact with the plasma arc.
- Do not expose the cylinder to excessive heat, sparks, hot metal or flames.
- Do not tamper with cylinder valves.
- Do not try to loosen tight valves with hammers, keys or other foreign objects.
- Do not use compressed oxygen.

B) PRESSURE REGULATORS

- Keep pressure regulators in good condition. Damaged regulators could cause property damage or personal injury. A damaged regulator should only be repaired by qualified personnel.
- Do not use regulators for gases other than those for which they are specifically manufactured.
- Never use a leaking or damaged regulator.
- Never lubricate a regulator with oil or grease.

C) AIR HOSES

- Replace air hoses if damaged.
- Keep air hoses in a manner that will prevent bending or kinking.
- Keep excess hose wound and out of the work area to avoid damage.

NOISE

The cutting process may produce noise levels in excess of 80 dB, which means the operator must take appropriate safety precautions in accordance with national safety regulations. When the unit is turned on, the power source alone does not produce noise levels exceeding 80 dB.

PACEMAKERS

Magnetic fields created by high currents in the cutting circuit can adversely affect pacemaker operation. Anyone wearing a pacemaker should consult their doctor before going near this unit, or any arc welding, gouging, cutting or spot welding equipment in operation.

PUBLICATIONS

The following publications provide additional information on safety precautions.

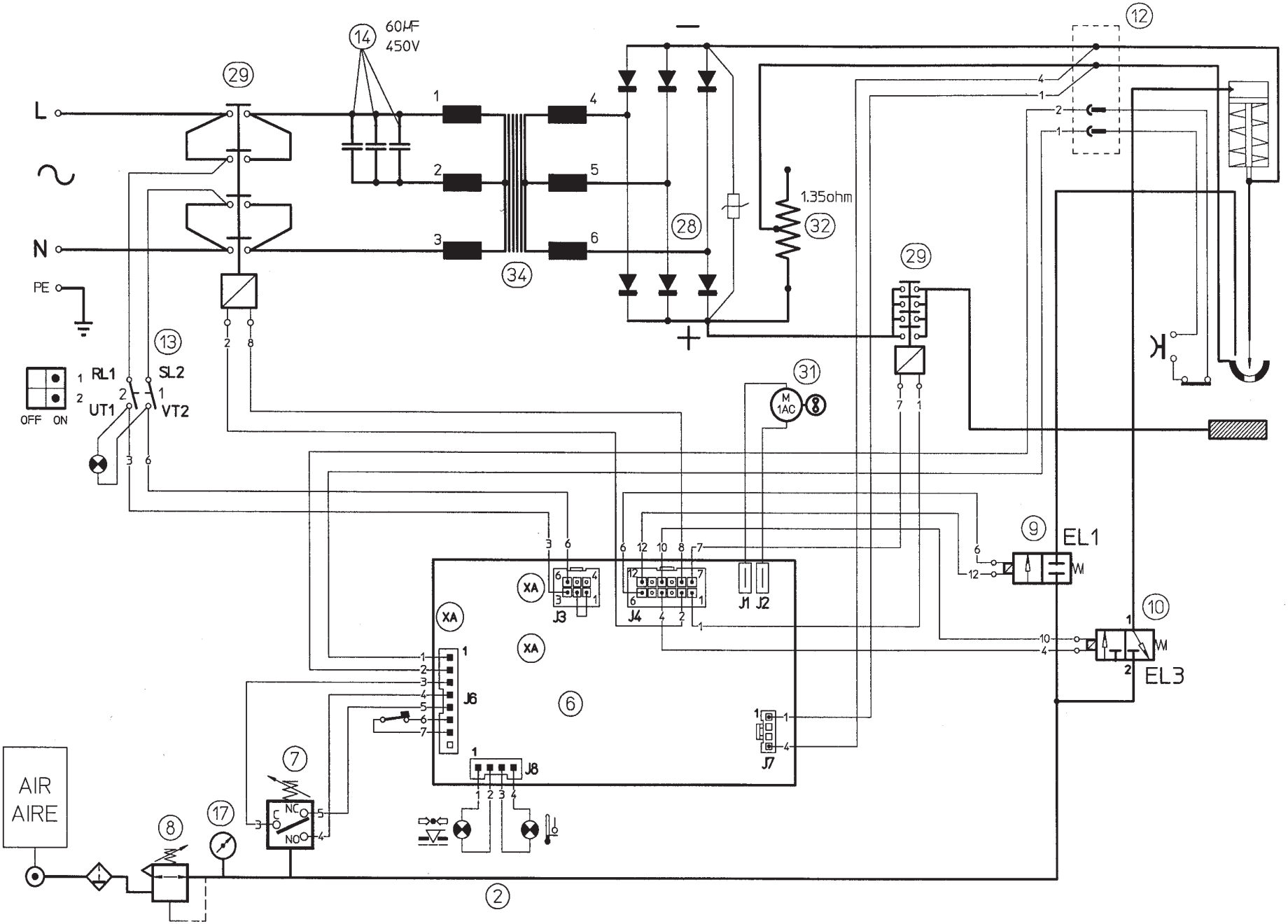
- Bulletin No. C5.2-83 "Recommended Safe Practices for Plasma Arc Cutting"
- American National Standard ANS1Z49.1-83 "Safety in Welding and Cutting"

Both of the above are available from:

American Welding Society, Inc.
2501 Northwest 7th Street
Miami, FL 33125
(303) 443-9353

- OSHA Safety and Health Standards, 29CFR 1910, available from:

U.S. Department of Labor
Washington, DC 20210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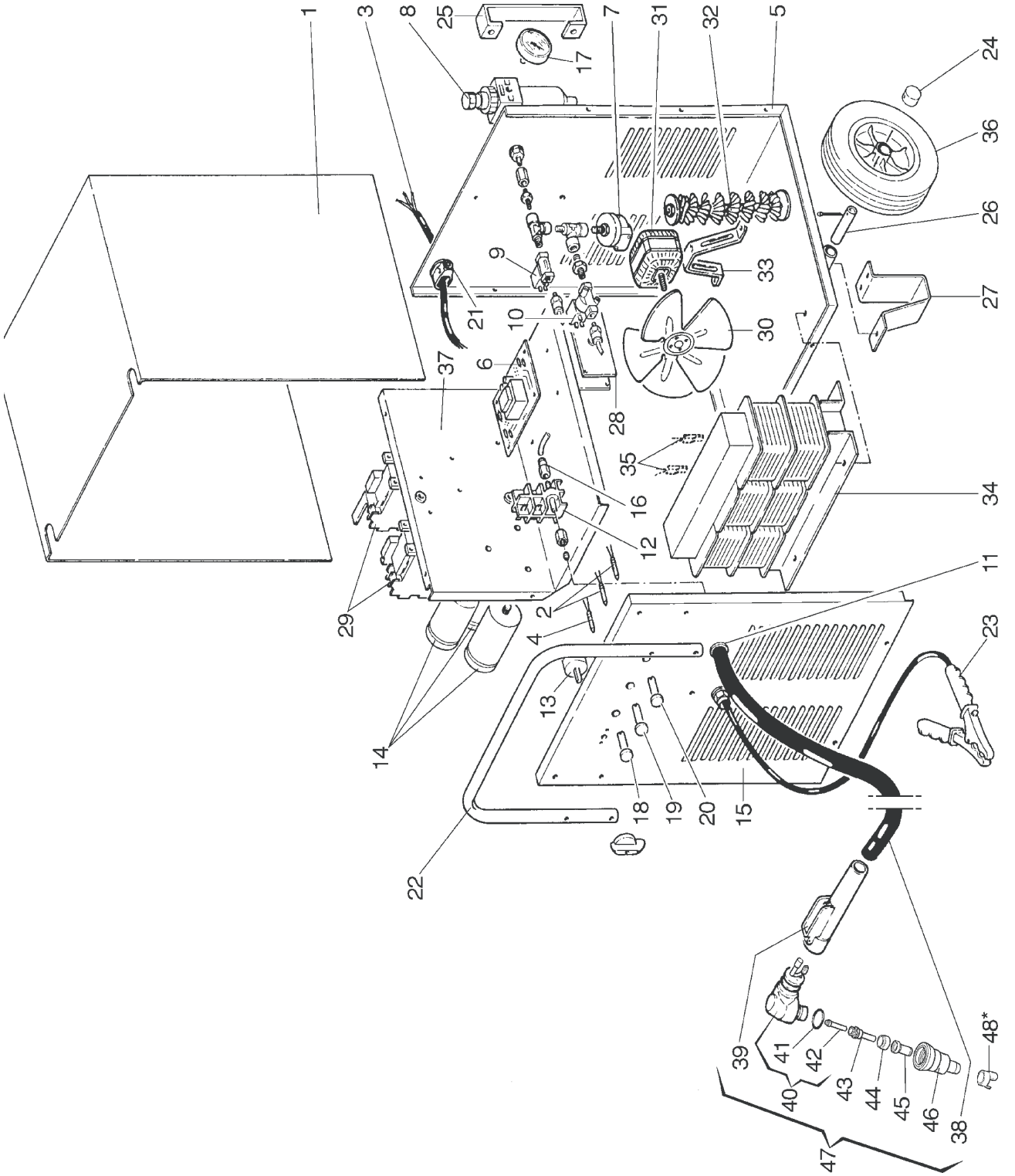

When ordering spare parts, always state the following: machine part number, machine serial number, item position number, and the quantity.

El pedido de las piezas de repuesto debe indicar siempre el número de articulo, la posición, la cantidad y la fecha de la adquisición.

La demande de piéces de rechange doit toujours indiquer le numéro de l'article, la position, la quantité et la date d'achat.

118-024, M12156 35 Amp Plasma Cutter

Item	Lincoln Stock #	Customer #	Description
1	238-712-666	B7000380	Housing
2	215-035-666	5585773	Lamp
3	238-713-666	260472	Input Cable
4	215-033-666	5585775	Lamp
5	411-117-016	260565	Bottom
6	860-997-666	5602146	Control Circuit Board
7	246-532-666	B7005380	Pressure Switch
8	254-006-666	B7006380	Air Regulator
9	246-516-666	B7007380	Solenoid Valve
10	246-525-666	3160196	Solenoid Valve
11	334-607-666	B7016380	Cable Bushing
12	239-298-666	B7009380	Terminal Board
13	246-527-666	261543	Power Switch
14	213-043-666	260468	Condenser
15			Front Panel
16	253-340-666	B7013380	Coupling
17	251-030-666	B7014380	Gauge
18	245-168-666	266250, 245-172-666	Lamp Holder
19	245-170-666	B7015380	Lamp Holder
20	245-169-666	246251	Lamp Holder
21	414-020-666	B7018380	Strain Relief
22	312-523-666	B7019380	Handle
23	238-709-666	B7020380	Earth/Ground Cable Assy
24	411-107-026	250224	Cover
25	215-031-666	250901	Protection

Item	Lincoln Stock #	Customer #	Description
26	413-115-666	B7034380	Axle
27	412-756-666	B7035380	Foot
28	244-089-666	261546	Rectifier
29	246-518-666	B7026380	Contactor
30	216-113-666	B7027380	Fan Blade
31	216-108-666	246224	Fan Motor
32	215-030-666	251190	Resistor
33	412-752-666	246188	Support
34	880-583-666	261547	Transformer
35	246-531-666	251156	Thermostat
36	413-118-666	B7033380	Wheel
37	412-751-666	261549	Intermediate Panel
38	238-706-666	5580779	Torch Cable
39	312-518-666	B7037380	Handgrip w/push button
40	334-588-666	1346	Torch Head
41	512-264-666	251194	O-Ring
42	334-587-666	3065225	Diffuser
43	334-580-100	--	Electrode (pk. 2)
44	334-583-100	--	Swirl Ring (pk. 2)
45	334-581-100	--	Nozzle 0.9 mm (pk. 5)
46	334-584-100	--	Nozzle Holder
47	**238-696-666**	**1212.18**	**Complete Torch Assy**
48	334-585-100	--	Two-Point Spacer - Standoff
49	334-604-000	5800818	Electrode Wrench

9/8/2006

Model	Primary Input	Input Plug	Duty Cycle at Rated Output
118-024	230 Vac	None, draws 21 amps	25%

Rated Output	Voltage Settings	Agency Listing	Max Cutting Thickness
35 amps	1	CSA	3/16"