



# Cobramatic® (42 Volt) Wire Feed Cabinet Owner's Manual

Product:	Cobramatic
Manual:	091-0498
Serial:	01010001
Voltage Rating:	42 VAC
Revision:	Dec. 2001 A
Model Number:	150-205





# SAFETY CONSIDERATIONS

## ELECTRIC ARC WELDING EQUIPMENT

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

#### 1-1 INTRODUCTION

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

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

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

#### 1-2 GENERAL PRECAUTIONS

##### A. BURN PREVENTION

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

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

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

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

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

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

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

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

##### B. TOXIC FUME PREVENTION

WARNING: The use of this product may result in exposure to chemicals known to the State of California to cause cancer and birth defects or other reproductive harm.

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

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

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

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

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

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

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

##### C. FIRE AND EXPLOSION PREVENTION

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

BE AWARE THAT flying sparks or falling slag can pass through cracks, along pipes, through windows

or doors, and through wall or floor openings, out of sight of the goggled operator. Sparks can fly many feet.

To prevent fires and explosion:

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

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

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

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

1. Appreciable combustibles (including building construction) are within 35 feet.
2. Appreciable combustibles are further than 35 feet, but can be ignited by sparks.
3. Openings (concealed or visible) in floors or walls within 35 feet may expose combustibles to sparks.
4. Combustibles adjacent to walls, ceilings, roofs, or metal partitions can be ignited by radiant or conducted heat.

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

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

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

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

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

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

if it is safe to weld or cut.

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

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

#### D. COMPRESSED GAS EQUIPMENT

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

##### 1. Pressure Regulators

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

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

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

Leaks - if gas leaks externally.

Excessive Creep - if delivery pressure continues to rise with downstream valve closed.

Faulty Gauge - if gauge pointer does not move off stop pin when pressurized, nor returns to stop pin after pressure release.

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

##### 2. Cylinders

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

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

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

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

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

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

Locate or secure cylinders so they cannot be knocked over.

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

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

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

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

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

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

NEVER refill any cylinder.

Cylinder fittings should never be modified or exchanged.

##### 3. Hose

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

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

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

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

Coil excess hose to prevent kinks and tangles.

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

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

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

##### 4. Proper Connections

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

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

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

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

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

##### 5. Pressurizing Steps:

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

Stand to side of regulator while opening cylinder valve.

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

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

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

#### E. USER RESPONSIBILITIES

Follow all Safety Rules.

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

#### F. LEAVING EQUIPMENT UNATTENDED

Close gas supply at source and drain gas.

#### G. ROPE STAGING-SUPPORT

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

### 1-3 ARC WELDING

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

#### A. BURN PROTECTION

Comply with precautions in 1-2.

The welding arc is intense and visibly bright. Its radiation can damage eyes, penetrate lightweight clothing, reflect from light-colored surfaces, and burn the skin and eyes. Skin burns resemble acute sunburn; those from gas-shielded arcs are more severe and painful.

**DON'T GET BURNED; COMPLY WITH PRECAUTIONS.**

**1. Protective Clothing**

Wear long-sleeve clothing in addition to gloves, hat, and shoes. As necessary, use additional protective clothing such as leather jacket or sleeves, flameproof apron, and fire-resistant leggings. Avoid outer garments of untreated cotton.

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

**2. Eye and Head Protection**

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

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

Protect filter plate with a clear cover plate.

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

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

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

**3. Protection of Nearby Personnel**

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

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

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

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

**B. TOXIC FUME PREVENTION**

Comply with precautions in 1-2B.

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

**C. Fire and Explosion Prevention**

Comply with precautions in 1-2C.

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

Loose cable connections may overheat or flash

and cause afire.

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

**D. COMPRESSED GAS EQUIPMENT**

Comply with precautions in 1-2D.

**E. SHOCK PREVENTION**

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

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

To protect against shock:

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

**1. Grounding the Equipment**

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

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

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

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

**2. Connectors**

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

**3. Cables**

Frequently inspect cables for wear, cracks, and damage. IMMEDIATELY REPLACE those with excessively worn or damaged insulation to avoid possibly lethal shock from bared cable. Cables

with damaged areas may be taped to give resistance equivalent to original cable.

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

**4. Terminals and Other Exposed Parts**

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

**5. Electrode Wire**

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

**6. Safety Devices**

Safety devices such as interlocks and circuit breakers should not be disconnected or shunted out.

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

Do not open power circuit or change polarity while welding. If, in an emergency, it must be disconnected, guard against shock burns or flash from switch arcing.

Leaving equipment unattended. Always shut OFF, and disconnect all power to equipment.

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

# Thank You

For selecting a quality product. We want you to take pride in operating this product...as much pride as we have in bringing the 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 replacements parts for, or information on this equipment always supply the information you have recorded above.

Read this Owner's 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.

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## Section A

## Installation

### Technical Specifications

**Wire Diameter Capacity**..... .030 inch - 1/16 inch ALL Types

**Wire Spool Capacity** ..... 12 inch Standard  
..... (Insulated or Non-Insulated)

**Power Input** ..... 42 VAC 50/60 Hz,  
..... 150 Watts Peak (3 amps)

**Weight** ..... 41 pounds

**Shipping Weight** ..... 46 pounds

**For Use with torch prefix number** ..... 14X, 16X, and 21X

### Support Equipment Required

C.V. or C.C. power source of sufficient capacity for your needs.

Regulated gas supply and hoses.

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

### Coolant Recommendations

Coolant recirculator and hose capable of providing a minimum of **1 quart per minute at 45 p.s.i.** when using water cooled torches.

Use a name-brand additive which does not contain reactive sulphur or chlorine and does not react with copper, brass, or aluminum.

Check coolant periodically to remain within limits of the following:

- A. Coolant Flow rate - 1 quart per minute at 45 p.s.i.**
- B. Resistivity - 10K ohms/centimeter**
- C. Ph Range - 5.5-8.5**
- D. Particle Size - .005 inch**

MK Recommended Coolant Solution:

- 1 part ethylene glycol
- 3 parts distilled water
- 1 teaspoon liquid glycerin

### Machine Grounding

The Cobramatic® and GMAW wire feeders are ground to the power source through the input cable. The power source grounding terminal must be properly connected to electrical ground per the power source operating manual.

### Mounting Location

The cabinet should be placed in a location where it can be protected from damage. Lead lengths and accessibility must also be considered when installing the cabinet.

### Input Connections

(See Cabinet and Torch Hook-Up in the Appendix)

#### **42 VAC**

Your Wire Feeder comes factory ready to connect into any standard 42VAC power supply.

The **42VAC** is connected to the PC Board on terminal strip **J5 #1** (neutral) and **#2** (hot) and Ground to the Cabinet chassis. See diagram in the appendix.

## Section A (Continued)

### Shielding Gas

In accordance with the required support equipment, the customer must provide a cylinder of shielding gas, a pressure regulator, a flow control valve, and a hose from the flow control valve to the left bottom-most fitting on the power block.

The end of the hose must have a male connector to fit the female 5/8-18 brass fitting. Use a 11/16" wrench to tighten.

### Coolant Supply and Return (if used)

Using a recirculator with properly mixed coolant, as previously described, connect the coolant RETURN hose to the left middle fitting on the power block. Connect the coolant SUPPLY hose to the left top-most fitting on the power block.

The coolant hoses must have a male 5/8-18 left-hand thread to connect to the power block fittings. Use an 11/16" wrench to tighten.

### Welding Power

The electrode cable coming from the welding power supply should be affixed with a 1/2" copper ring lug. Using a 9/16" wrench, remove the 3/8" bolt and washer from the bottom of the power block. Use a 9/16" wrench to tighten.

It is recommended to make this connection last, after connecting the gas and coolant hoses. Reference Input Connections figure in the Appendix.

## Wire Threading Procedure

### Wire Spool Installation

Release latches, and open right side door of cabinet.

Remove spool retainer from spindle hub.

Raise wire retainer bar to latched position.

Install wire spool onto spindle hub so that wire feeds from bottom of spool towards slave motor. Make sure that the hole in the spool aligns with pin on spindle hub. The white dot on the end of the spindle hub will aid in this alignment.

Replace the spool retainer nut.

Lower the wire retainer bar onto the spool.

### Wire Spool Drag Setting

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*NOTE:*

*Standard factory setting of the Spindle Tension Knob is set for All Other Wires.*

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There are two visible position settings for this Knob, IN - All Other Wires (Fig. 1) and, OUT - .030/.035 Al Only (Fig. 2). The Spindle Tension Knob must be set to match the Wire Size Selector Switch on the Cobramatic® front panel.



IN - All other wires  
Figure 1



OUT - .030/.035 Aluminum ONLY  
Figure 2

## Section A (Continued)

To change this setting, it is easier done without the spool of wire on the spindle. Remove the wire spool retainer and re-install it reversed back onto the Spindle Tension Knob (Fig. 3). In the "Tool Mode", the square shaped end of the retainer fits onto the Knob. Grab the retainer and turn in the COUNTER-CLOCKWISE direction until it stops. The Knob is now set to the OUT position (.030/.035 AL Only).



Wire Spool Retainer In "Tool Mode";  
used to change spindle drag.  
Figure 3

To reset the Knob back to the factory setting of All Other Wires, use the retainer as described above, and turn in the CLOCKWISE direction until it stops. The Knob is now set to the IN position. Turning the retainer and Knob in this direction may require more effort, since turning CLOCKWISE is working against a spring.

Load wire spool onto spindle according to the previous instructions.

Replace the spool retainer nut.

Lower the wire retainer bar onto the spool.

### **Threading Procedure**

Place wire size selector switch on front panel to the correct position for the wire being used.

Loosen end of wire from spool and cut off any kinked or bent portions.

Unreel and straighten out first 6" to 8" of wire.

Raise wire type lever to center position.

Route wire into inlet guide, along drive roll groove, and into wire conduit.

Flip wire type lever to show type of wire being used.

Tighten the torch pressure adjusting knob so the wire will be picked up and fed through the contact tip. Proper tension is achieved when wire does not slip if a small amount of pressure is added to the wire as it exits the tip.

### **Wire Retainer Bar**

The design of the patented Cobramatic® Wire Retainer Bar performs two very important and very basic functions of the wire feeder: a) spool drag tension, and b) wire maintenance on the spool.

The spool drag tension is set by lowering the wire retainer bar onto the wire inside of the spool. The spring tension of the wire retainer bar applies enough pressure on the spool so that when the torch trigger is released, engaging the brake pall, the spool does not overrun kicking wire off the spool.

Wire maintenance on the spool is performed by the applied pressure of the wire retainer bar spread across the coiled wire on the spool. The replaceable pad (P/N 437-0255) of the wire retainer bar is designed to hold the wire on the spool, maintaining the smooth layering of the wire and keeping it from jumping off, and possibly, electrically shorting to the cabinet chassis.

## Section B (Continued)

### Welding Torch Connections

#### Work Cable

Connect a work lead of sufficient size and length (see table below) between the proper output stud on the power source and the work. Be sure the connection to the work makes tight metal to metal electrical contact. Poor work lead connections can result in poor arc initiation, poor weld results and activation of the ground lead protector.

Current 60% Duty Cycle	Work Lead Lengths	
	Up to 50ft. (15.2m)	10-100ft. (15.2-30.4m)
300A	0 (53mm)	0 (67mm)
400A	00 (67mm)	00 (85mm)
500A	00 (67mm)	00 (85mm)
600A	000 (85mm)	000 (107mm)

#### Control Cable

The 7-Pin "W" Clocked connector screws onto the mating receptacle on the front panel of the wire feeder. This provides all electrical signals (motor voltage, potentiometer control & trigger) to and from the feeder to the torch.

#### Wire Conduit Inlet

Front panel access to attach conduit to front of slave motor assembly.

#### Power Cable Inlet

Front panel access to attach power cable (air or water) to top of power block.

#### Gas Inlet

Front panel access to attach gas hose to bottom fitting of power block.

#### Water Inlet (For Water Cooled Torches)

Front panel access to connect the water hose to the middle fitting on the power block.

## Section B

### Operation

#### General

The AC slave motor in the feeder runs at a fast, constant speed, but has very low torque. It is always trying to feed more wire than the torch motor wants, and when the motor gets all it wants, it slows the slave motor preventing a bird's nest. Because of the low torque produced by the slave motor, a brake system is used to prevent wire overrun rather than tension. The spool drag tension is produced by the patented Wire Retainer Bar mechanism to keep the wire slightly taut. The 24 VDC torch pull motor is controlled by a solid state speed control and a potentiometer located in the torch.

#### Recommended Processes and Equipment

The Cobramatic® is recommended for use in the GMAW and FCAW welding applications. It is recommended for use with constant voltage power sources. The Cobramatic® is capable of feeding wires (diameter capacity) ranging from .023" through .045" solid/cored and .030" through 1/16" aluminum.

#### Controls and Settings

##### On/Off Switch

Placing the switch in the "ON" position energizes the feeder circuitry and the power indicator light.

##### Wire Size Selector Switch

The wire size selector switch changes the torque of the slave motor for the wire you are using. When in the .030-.035 aluminum only position, the slave

## Section B (Continued)

motor produces approximately **1 1/2 lbs.** inches and approximately **4 1/2 lbs.** inches when in the all other wires position.

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### NOTE:

*Operating the cabinet with the switch in the wrong position will cause wire feed difficulties.*

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### Posa Start Controls

The Posa Start Run-in Speed Control, located on the front panel, provides adjustment for slow wire run-in. Once the arc has been established, the wire feed speed is automatically changed from the slow run-in speed to the welding speed set on the torch potentiometer.

### Posa Start Operating Procedure

#### General

The Posa Start Run-in Speed Control, located on the front panel, provides adjustment for slow wire run-in. Once the arc has been established, the wire feed speed is automatically changed from the slow run-in speed to the welding speed set on the torch potentiometer.

The Posa Start feature allows the Cobramatic® to be used in combination with constant current DC welding power sources of open circuit voltage in excess of 55 volts - also, any constant voltage welding power source capable of a minimum of 50 amps.

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#### Note:

*Reverse polarity MUST be used.*

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### Posa Start Connections

Attach the #14 single black lead which extends from the back of the cabinet to the negative terminal of the power supply or work ground. The Posa Start lead is internally connected to the P.C. board on terminal strip J6, terminal 2.

### CV Posa Start Operations

Attach Cobramatic® to CV power source according to the installation instructions.

Turn the Cobramatic® to the “**ON**” position and the Posa Start to the “**OFF**” position.

Adjust power source to desired voltage for your weld condition.

Depress gun trigger and adjust wire feed speed at gun to match voltage setting. If approximate wire feed is not known, it is better to start with excess wire feed rather than too little, in order to prevent a “burn-back”.

Turn the Posa Start switch to the “**ON**” position. Press torch trigger and, using Run-in Speed Control, adjust wire feed rate to approximately 10% of welding wire speed set at torch.

Strike an arc, and adjust wire feed rate at gun until correct condition is achieved.

### CC Posa Start Operation

Attach the Cobramatic® to a CC power source according to the installation instructions.

Insure power supply high frequency switch is in the “**OFF**” position, and power supply is set to DC reverse polarity.

The power supply contactor should be set to “**Remote**” or “**Tig**” and the

## Section C (Continued)

amperage control set to “Panel” or “Standard” depending on power supply.

Turn the Cobramatic® power switch to the “ON” position and the Posa Start switch to the “OFF” position.

Adjust power source to desired amperage for your weld condition.

Press gun trigger and adjust wire feed speed at gun to match current setting. If approximate wire feed speed is not known, it is better to start with excess wire feed rather than too little, in order to prevent possible damage to the contact tip.

Turn Posa Start switch to the “ON” position. Press torch trigger and, using Run-in Speed Control, adjust wire feed speed to approximately 10% of welding wire speed set at torch.

Strike an arc; if the wire stubs out, reduce wire feed rate at gun, or increase amperage setting on power source.

### CAUTION:

Do Not operate this wire feeder on a power source having a high-frequency starting circuit before making sure that the high frequency portion of the power source is turned off.

Failure to take this precaution will cause permanent damage to the Posa Start circuitry.

### NOTE:

*Because the Posa Start Run-in Speed always remains a percentage of the actual welding wire feed rate, the Posa Start run-in speed will always slow down or speed up proportional to any adjustment you now make at the gun. Therefore, if you slow down the welding wire feed speed, you will have to increase the Run-in Speed setting.*

## Section C

### OPTIONAL KITS

The following is a list of Optional Kits available for the Cobramatic® Wire Feeder.

A detailed description of each kit is given later in this section.

P/N	Description
005-0674	Gas Purge/Trigger Latch Kit
005-0675	Water Pressure Kit

#### **005-0674 Gas Purge/Trigger Latch Kit**

The Gas Purge/Trigger Latch Kit is a dual function kit. The kit includes an easy to install interface control PC board, a 24VAC solenoid for pre and post purge control, a modified valve stem for the welding torch and, a front panel switch for activating the Trigger Latch mechanism.

The gas control times have been preset to 0.5 seconds pre-purge and 1.0 seconds post-purge. This offers an optimum amount of inert gas shielding prior to striking the arc and after the arc has been extinguished.

The Trigger Latch mechanism gives the operator the flexibility of normal trigger operation (pull trigger to weld - release trigger to stop). This also offers the comfort of latched trigger operation (pull trigger once to latch and weld - pull trigger again to unlatch and stop).

#### **005-0675 Water Pressure Kit**

By monitoring the pressure from the water recirculator, the switch uses the pressure as the key safety element in protecting the torch from overheating

## **Section D (Continued)**

while welding. If there is a loss of water pressure, the switch will keep the arc from igniting so no welding takes place without water cooling the torch. The benefit of the water pressure switch far exceeds the minimal cost of its purchase and installation.

This kit, when installed into the wire feeder, is physically adaptable to all makes and models of water recirculators using standard fittings (left-hand threaded).

## **Section D**

### **Maintenance**

#### **Routine Maintenance**

Maintenance of the torch will normally consist of a general cleaning of the wire guide system, including tubes, drive rolls, and conduits at regular intervals.

Remove spatter build-up from inside of nozzles with a hardwood stick.

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

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

Your Cobramatic® is designed to provide years of reliable service. Normal wear and component failure may require occasional service.

The number of units in operation and the importance of minimal "down time" will determine to what extent spare parts should be stocked on hand.

#### **Testing the Feeder**

##### **Relay K2 Operation**

When the torch trigger is pressed, 24VAC is sent to the coil of relay K2. When K2 is energized, AC is sent to the slave motor, spool brake, and the AC contactor. Relay K2 is also responsible for sending 24VAC to the speed control circuit and shorting the torch motor leads together when the trigger is released for the dynamic braking system. K2 also provides the closing contactor signal.

##### **Testing the Input Power Circuits**

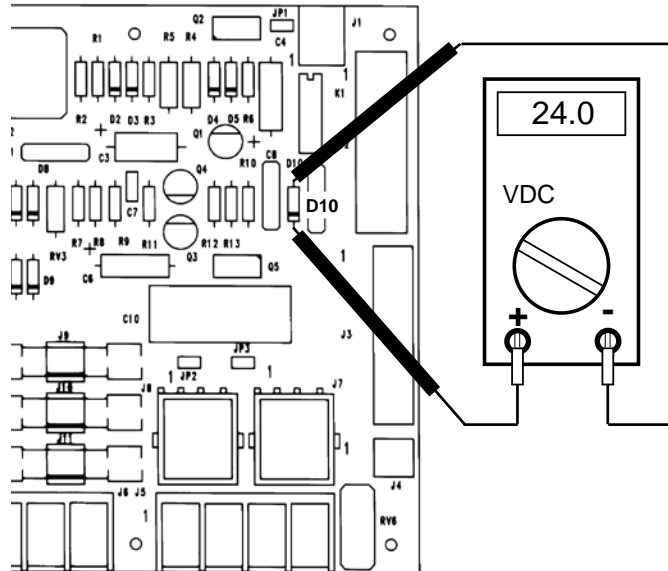
The AC circuits are protected by fuse F3. If F3 continually blows, disconnect J4 (Brake Solenoid), J7 (Slave Motor) and J5-3 & 4 - if connected (AC Contactor Out.) from the PC board. Replace fuse and re-trigger system. If fuse does not blow, isolate problem by reconnecting J4, J7 and J5-3 & 4 one at a time until the fuse blows.

## Testing the Speed Control

### **NOTE:**

*The torch should be tested first and the amphenol must be connected to the Cobramatic® to perform this test.*

Place a voltmeter across diode **D10** and press torch trigger. A reading of **0 - 24VDC** should be observed, as the torch potentiometer varied.



## Testing the Torch

### **Motor Check**

Remove the amphenol connector from the cabinet.

Using the torch amphenol, check the resistance across pins "A" and "B" (motor leads). The resistance across the motor should be between **5-10 ohms**.

If an open circuit or short exist, check the motor leads and motor independently.

### **Testing the Potentiometer - "W" Clocked**

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

Check the resistance across pin "D" (wiper) and pin "G". The resistance should vary from **5K - 0 ohms**.

### **Testing the Micro Switch**

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



## Section E Troubleshooting

TROUBLESHOOTING		
SYMPTOM	CAUSE	REMEDY
No wire feed at torch, feeder not operating, i.e., no slave motor or brake solenoid.	F2 & F3 (MDA7 7A Slow Blow) fuse in feeder blown.	Check AC circuit. Replace fuse.
	F1 (4 amp) fuse in feeder blown.	Check motor leads for shorts, then replace fuse.
	Micro-switch defective/not being activated. Broken electrical cable.	Replace switch. Check switch for operation. Check micro switch wires for continuity.
	Relay K2 inoperative.	Check/Replace relay K2.
	Loose J2, J3, P.C. board connector	Check J2, J3 connectors.
Brake solenoid inoperative.	Solenoid defective.	Replace solenoid.
	Relay K2 inoperative.	Check for 42VAC across J4-1 and J4-2
No wire feed at torch, feeder operating properly.	Bad potentiometer.	Check potentiometer with meter.
	Bad torch motor.	Check/Replace motor.
	Broken electrical cable.	Check motor and potentiometer wires for continuity.
	Bad speed control/PCB.	Check/Replace P.C. Board.
Wire feeds, but welding wire is not energized.	Loose or no cable connections.	Check all power connections.
	Relay K2 not sending contactor signal.	Check/Replace relay K2.
	Contactor control cable loose or in wrong position.	Check power supply owners manual for location and type of contactor signal required, i.e. closing contacts or AC.
	Welding power source not working right.	Check power supply for proper operation.
Wire feeds erratically.	Dirty or worn conduit.	Blow out or replace conduit.
	Incorrect pressure on drive rolls.	Adjust pressure at torch.
	Idler roll stuck in torch.	Check for lock washer under idler roll, or replace if damaged or worn.
	Wrong size contact tip.	See contact tip table.
Wire feeds one speed only	Bad potentiometer.	Check with meter.
	Broken electrical cable in lead assy.	Check potentiometer wires for continuity or shorts.
	Bad speed control.	Check/Replace P.C. Board.
Wire walks out of drive rolls	Idler roll upside-down.	Place groove in idler roll towards top.
	Rear wire guide missing.	Replace wire guide.

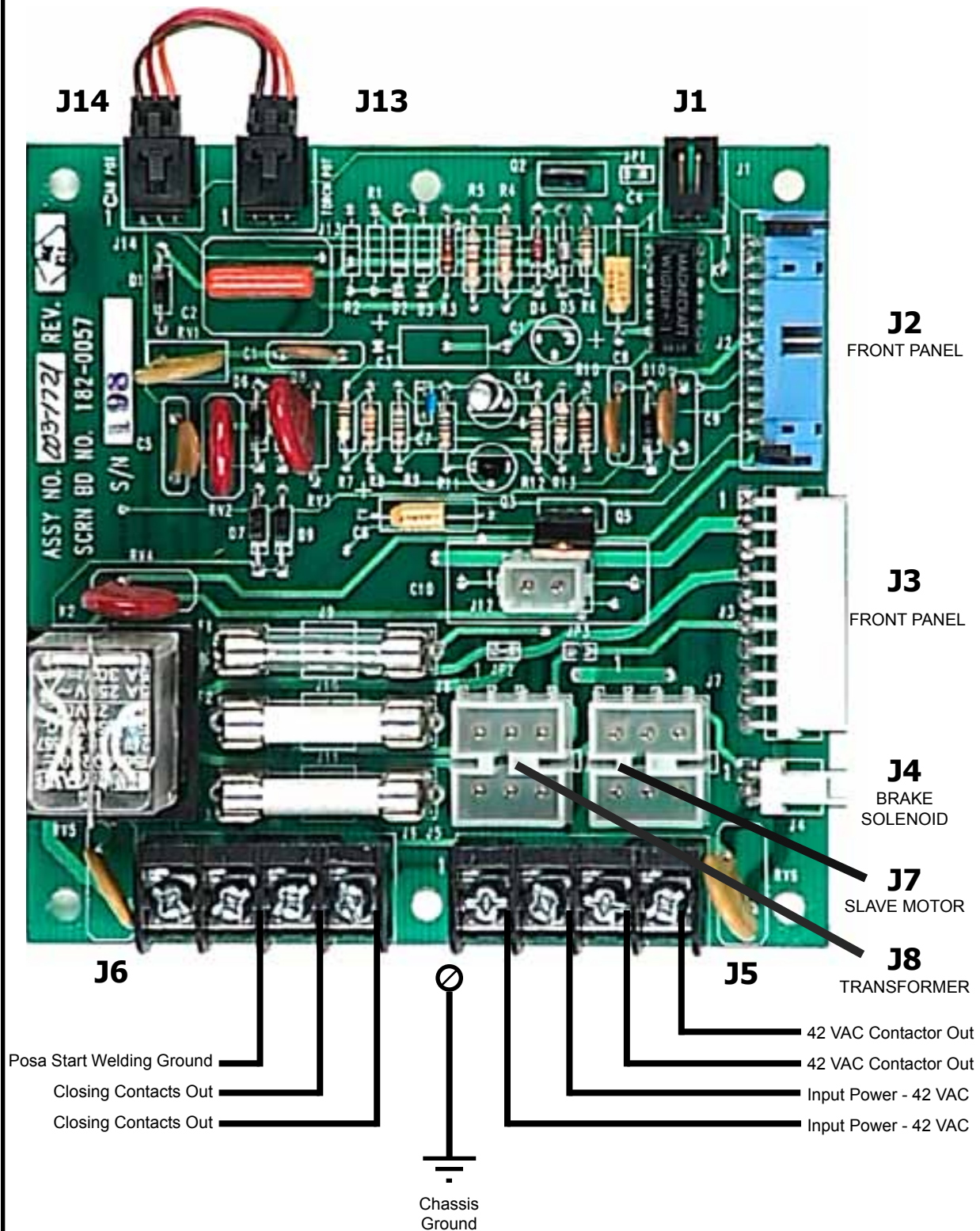
## Section F

## Appendices

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# Main P.C. Board Connections

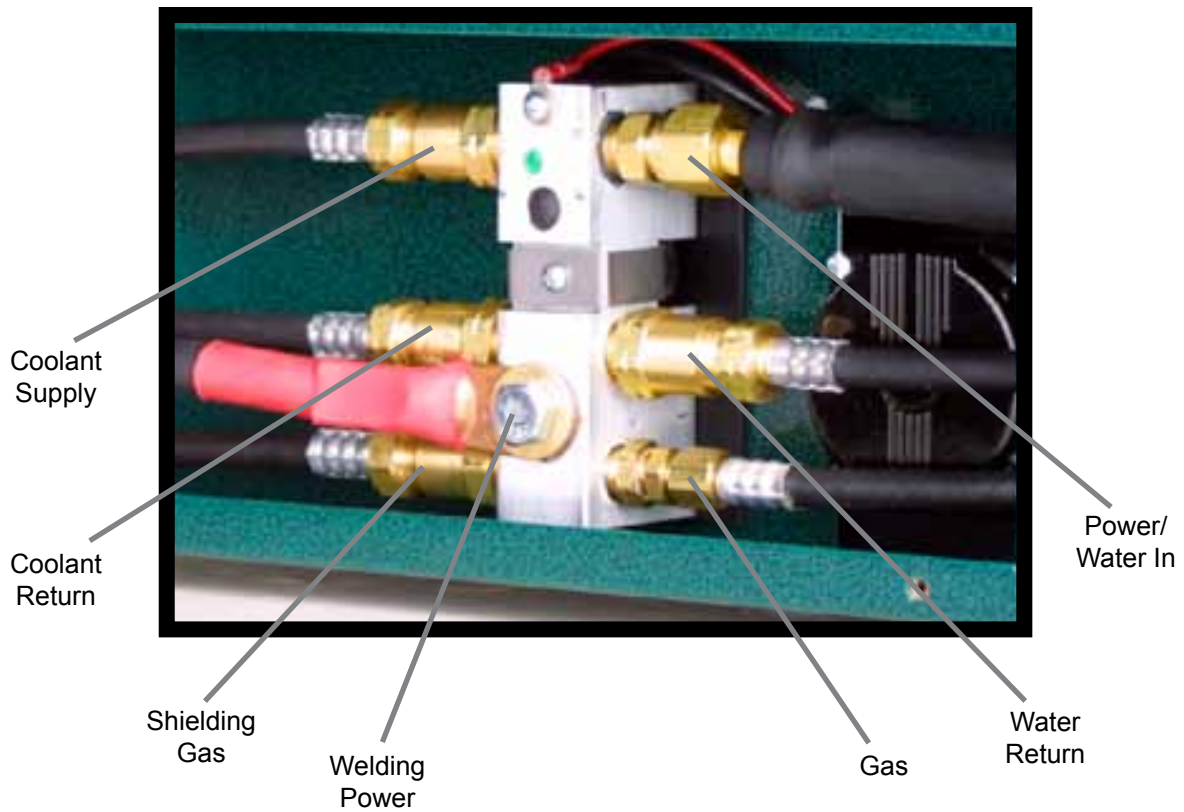


## Cabinet and Torch Hook-up



## Input Connections

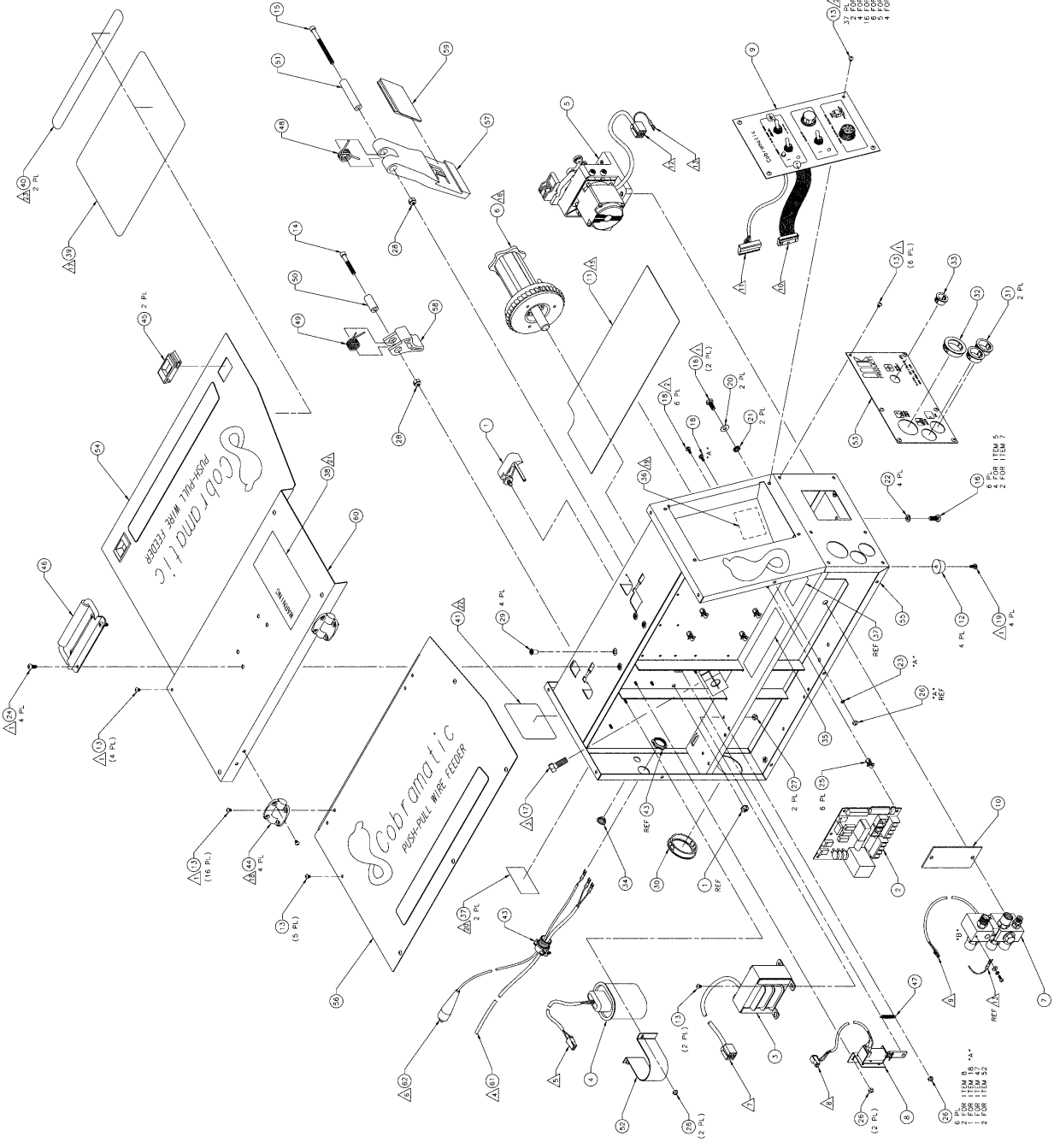
## Torch Connections



# 001-4010 Cobramatic Assembly

## Cobramatic 42V Assembly 001-4010a

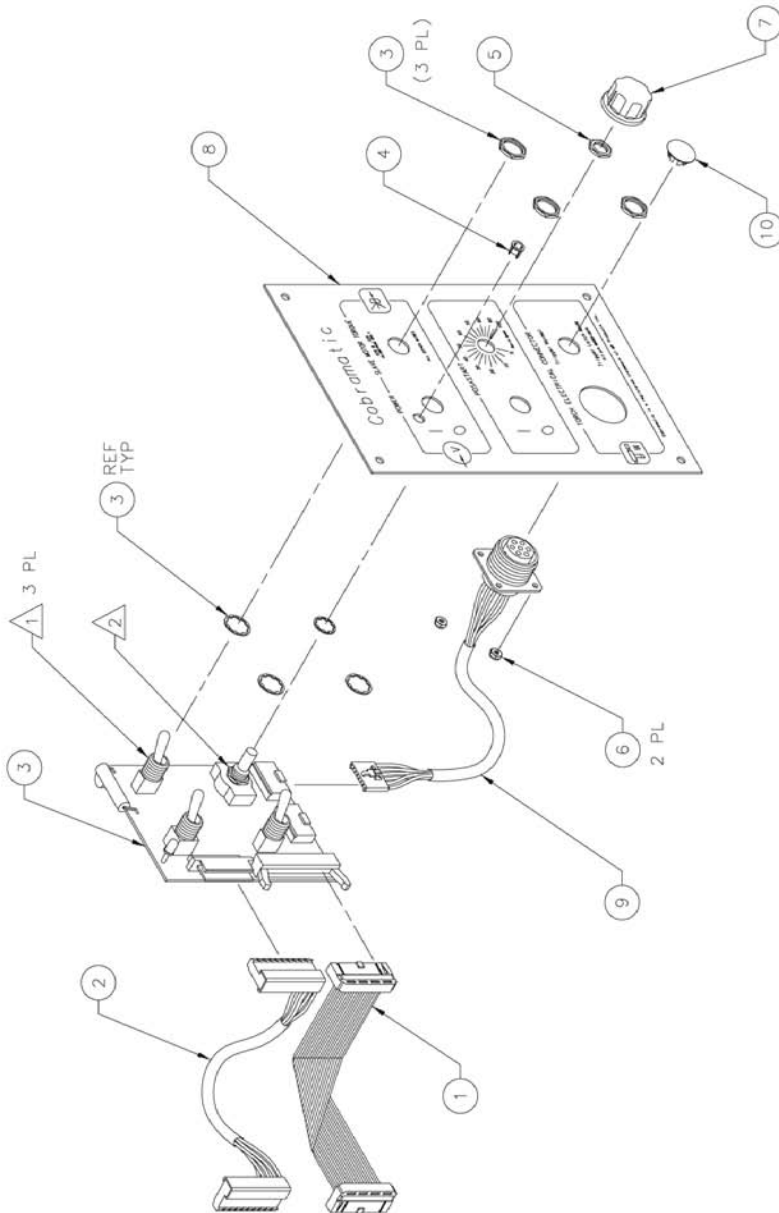
No.	Qty.	Part No.	Description
1	1	003-0784	Assy Pawl CB
2	1	003-1721	Assy PCB Main 42V
3	1	003-1722	Assy Xtrm 42V
4	1	003-1798	Assy Can Ext 42V
5	1	003-3980	Assy Shine Motor 42V
6	1	003-2146	Assy Spindle CB
7	1	003-2063	Assy Power Block
8	1	003-2095	Assy Sol Bk 42V Top
9	1	003-2109	Assy Pfl FC 42V
10	1	281-4105	Insulator Power Block
11	1	281-4834	Insulator Spool
12	4	301-4107	Foot Rev W/Wsh R8 ID
13	35	336-0230	Srr Psh Ph 8-32 x 1/4 Bk
14	1	328-0063	Srr Sol 1/4-20 x 1.3/4 Bk
15	1	328-0258	Srr Sol 1/4-20 x 3.1/2 St
16	6	329-0002	Screw Hex 1/4-20 x 5/8
17	1	329-0008	Srr Hdr 3/8 x 1.0
18	8	329-1037	Srr Hex Wsh St 6-32 x 3/8 St
19	4	329-1019	Srr Hex Wsh St 6-32 x 3/8 St
20	2	331-0448	Wsh Flt 2610 x 62500 St
21	2	332-0008	Wsh Shld 2650 x 38500 x 500
22	4	333-0008	Wsh Spr Lk 1/4
23	2	333-0023	Wsh Lk Ext Star #6
24	4	336-0228	Srr Psh Ph 10-32 x 1/2 Sfl Bk
25	6	342-0410	Spacer Shaking 6-32 x 0.53
26	5	345-0008	Nut Hex Lock 6-32
27	2	345-0015	Nut Hex Lock 1/4-20 St
28	4	351-0008	Insert Thread 10-32
29	1	351-0103	Blsh Srrp 1 5/8ID 822 Hole
30	2	351-0245	Blsh Srrp 1 5/8ID 817 1/8 Mtg
31	1	351-0752	Blsh Srrp 1 1/8ID 817 1/2 Hole
32	1	351-0752	Blsh Srrp 9/16ID 834H Hole
33	1	351-1635	Srrp Bln 6/12 Hole Bk
34	1	405-0736	Decal Electric Com 42V
35	1	405-0886	Decal Warning T1327
36	1	405-0887	Decal Warning T13470
37	2	405-0888	Decal Warning T16196
38	1	405-0943	Decal Instructions Door Spool
39	1	405-0944	Decal Door Caution
40	2	405-0945	Serial Number ID Plate 42V
41	1	411-0003	The Yimp
42	6	411-0003	Clamp Cn Sfr Ref
43	1	415-0075	Finge CB
44	2	415-0075	Later Slide
45	1	415-0243	Handle Cam Black
46	1	419-0089	Spring Ext 2190D x 3/4LG
47	1	419-0089	Tension Spring Restraint Wire CB
48	1	419-0090	Tension Spring Catch
49	1	431-1666	Mandrel Catch CB
50	1	431-1669	Mandrel Restraint Wire CB
51	1	435-1121	Holder Cam CB
52	1	435-1148	SS Pawl CB
53	1	435-1150	SS Door Sol CB
54	1	435-1151	SS Wimp CB
55	1	437-0242	Restraint Wire Mold CB
56	1	437-0243	Catch Mold Restraint CB
57	1	437-0245	Paint top CB
58	1	438-0062	Paint top CB
59	1	843-0064	Cable Connector Rlt
60	1	843-0064	Cable Connector Rlt
61	1	843-0064	Cable Connector Rlt
62	1	843-0064	Cable Connector Rlt
63	1	843-0064	Cable Connector Rlt
64	1	843-0064	Cable Connector Rlt
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66	1	843-0064	Cable Connector Rlt
67	1	843-0064	Cable Connector Rlt
68	1	843-0064	Cable Connector Rlt
69	1	843-0064	Cable Connector Rlt
70	1	843-0064	Cable Connector Rlt



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# 003-2109

# Cobramatic Front Panel Assembly



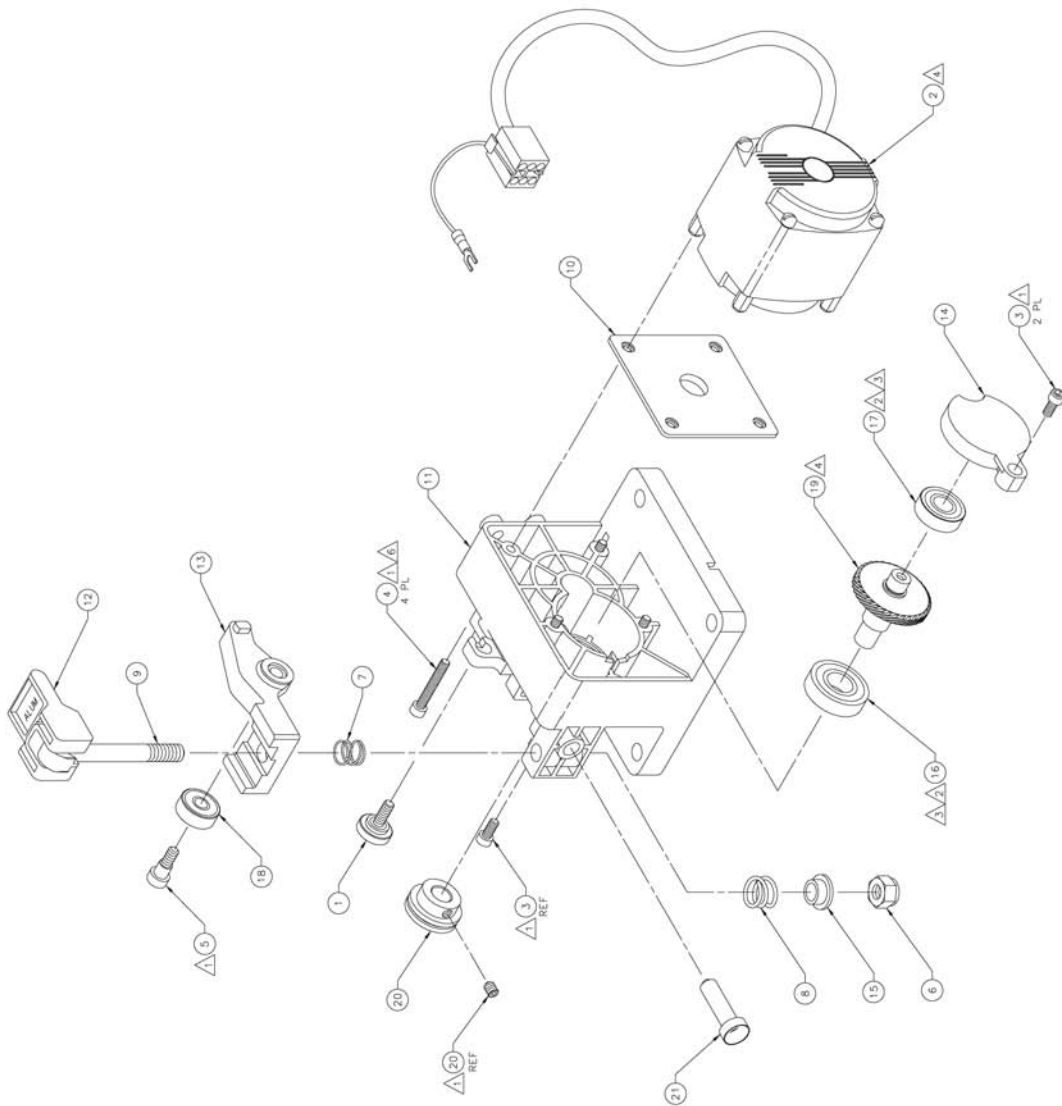
No.	Qty.	Part No.	Description
10	1	351-0835	SNAP BTN 1/2 ID NYL BLK
9	1	003-1642	ASSY CON 7P "W" CB
8	1	436-0144	SS PNL FR CB
7	1	401-0012	KNOB FLUTE 1 IN DIA BLK
6	2	345-0004	NUT HX LK #4-40UNC
5	1	341-0050	NUT HX 3/8-32
4	1	301-0023	GROM PNL MTG LED BLK
3	1	003-2001	PCB ASSY PNL FR 42V CB I
2	1	003-1631	ASSY CBL PWR BD TO BD CBI
1	1	003-1332	RBN 8.50 CB II
No.	Qty.	Part No.	Description

Parts List

# 003-2060

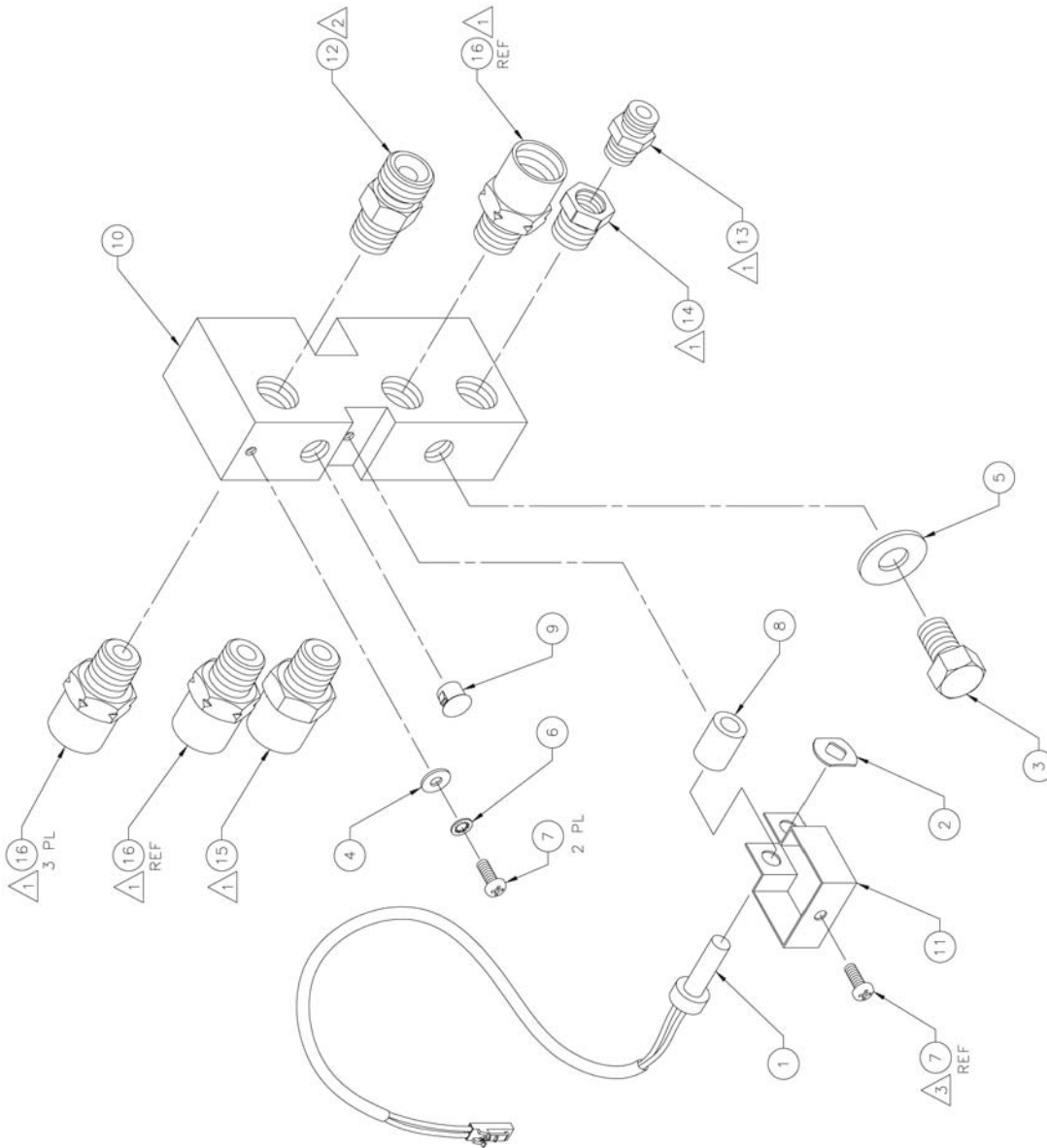
# Cobramatic Slave Motor Assembly

No.	REF	Qty.	Part No.	Description
25	REF		031-0167	Test Procedure
25	A/R		823-0051	Loctite Retaining Compound
24	A/R		835-0001	Grease Mobilux 2
23	A/R		823-0043	Loctite Threadlocking
22	1		753-0062	Guide Wire Inlet Nylon
21	1		511-0206	Drive Roll
20	1		507-0130	Shaft Gear
19	1		501-0207	Bearing Idler Roll
18	1		501-0156	Bearing .875 x .38 x .28
17	1		501-0118	Bearing 1.125 x .50 x .31
16	1		437-0254	Sleeve Spring
15	1		437-0245	Cap Bearing Mold
14	1		437-0232	Arm Idler Mold Slave Motor
13	1		437-0231	Handle Mold Slave Motor
12	1		437-0230	Housing Slave Motor Mold
11	1		435-1582	Plate Locate Slave Motor
10	1		431-1576	Bolt Swing Mod
9	1		419-0211	Spring Comp OD 5/8 x 1/16
8	1		419-0085	Spring Comp 1/32 x DD .40
7	1		345-0018	Nut Lock 5-16-18
6	1		333-0006	Washer Spring Lock #8
5	1		330-0258	Scr Shldr 1/4 x 1/4 x 10-24
4	4		328-0259	Scr Shc B-32 x 1-1/B Sfl
3	2		328-0024	Scr Shc B-32 x 3/B Sfl
2	1		003-2113	Assy Torque Motor 42V
1	1		003-0176	Assy Knob Conduit
No.	Qty.	Part No.	Description	





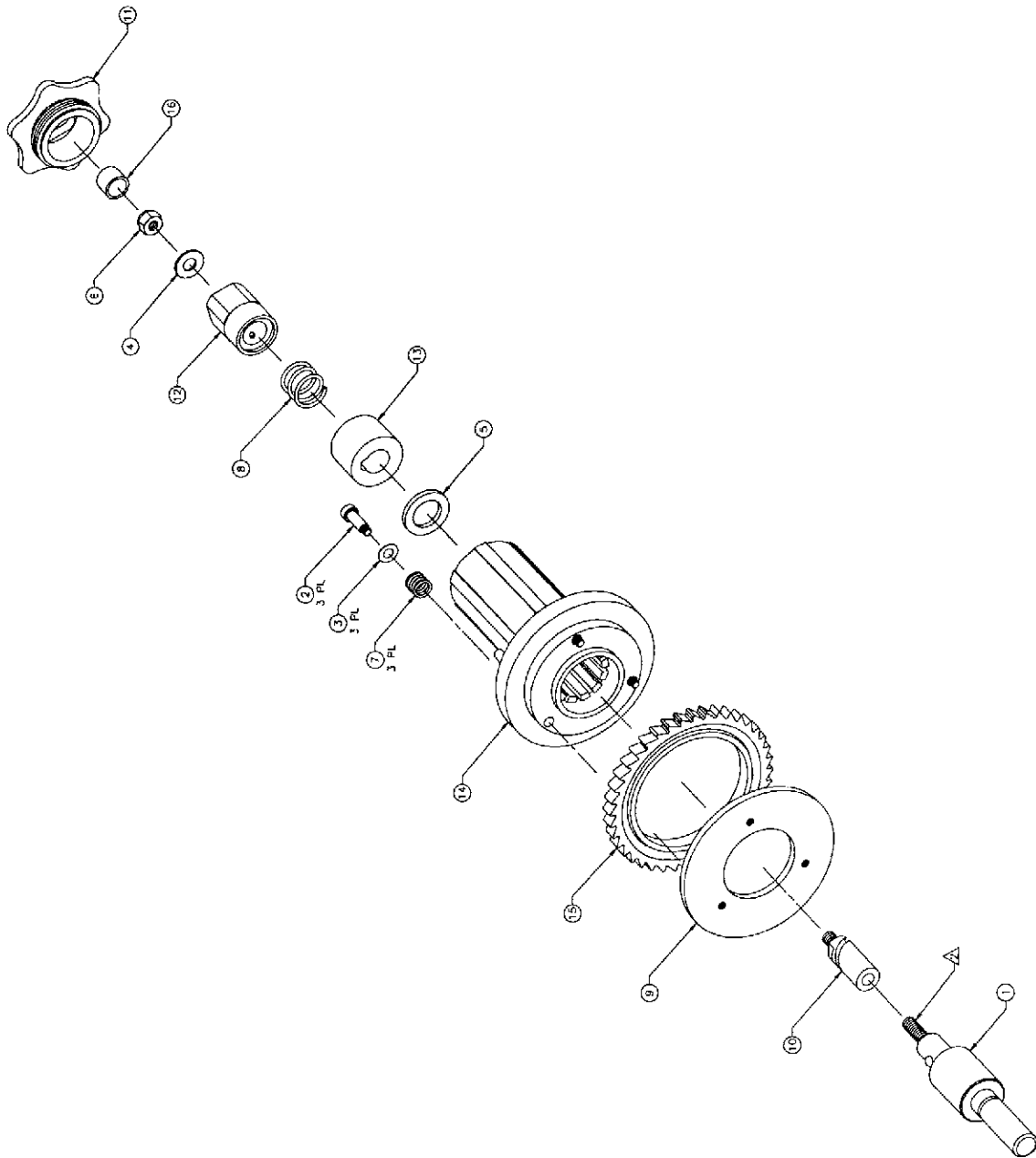
No.	A/R	Part No.	Description
19	A/R	823-0044	Loctite Pipe Thread Sealant
18	A/R	823-0043	Loctite 242 Threadlock
17	A/R	823-0029	Noalox Pipe Thread Sealant
16	3	753-0475	Aprt 1/4npt M to 5/8-18 Fem LH
15	1	753-0466	Aprt 1/4npt Male to 5/8-18 Fem
14	1	753-0115	Bush 1/4npt Male to 1/8mpt Fem
13	1	753-0114	Aprt 1/8npt x 1/8nps
12	1	753-0112	Flg 1/4npt Male to 5/8-18 Male
11	1	435-3038	Bracket Current Sensor
10	1	431-1612	Block Power CB2K
9	1	351-0066	Plug Hole Ø5/16
8	1	342-0395	Spacer Current Sensor
7	2	336-0005	Scr Pn Ph 6-32 x .375 Sll
6	1	333-0252	Wshr Lk Starin #6 St.
5	1	331-0777	Washer Flat 0.391 ID x 0.875OD
4	1	331-0002	Washer Flat #6 Sll
3	1	329-0054	Scr Hex 3/8-16 x 5/8
2	1	313-0021	Stud Receiver Push-on
1	1	003-1243	Assy Sensor Posa-Start
No.	Qty.	Part No.	Description



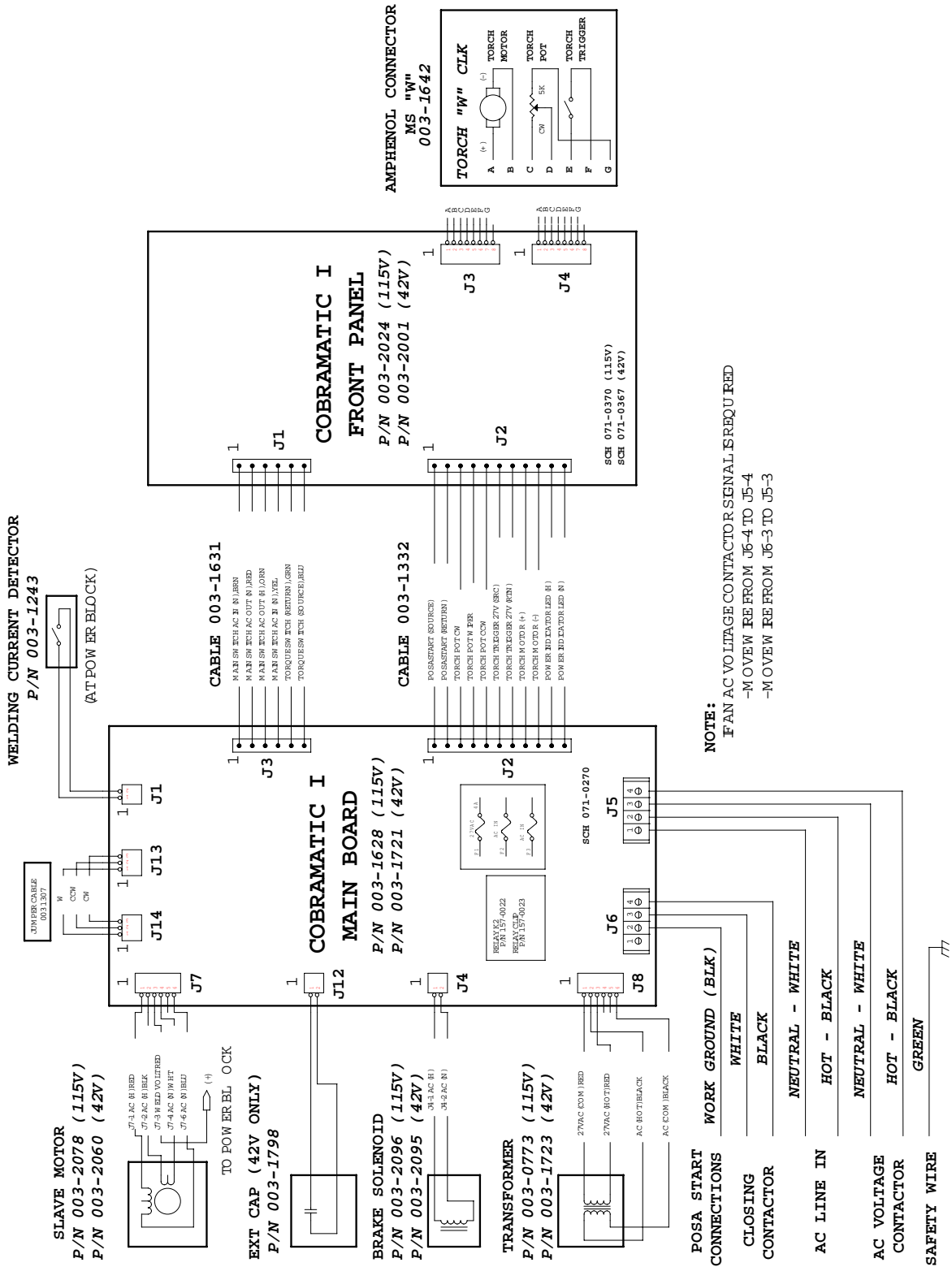
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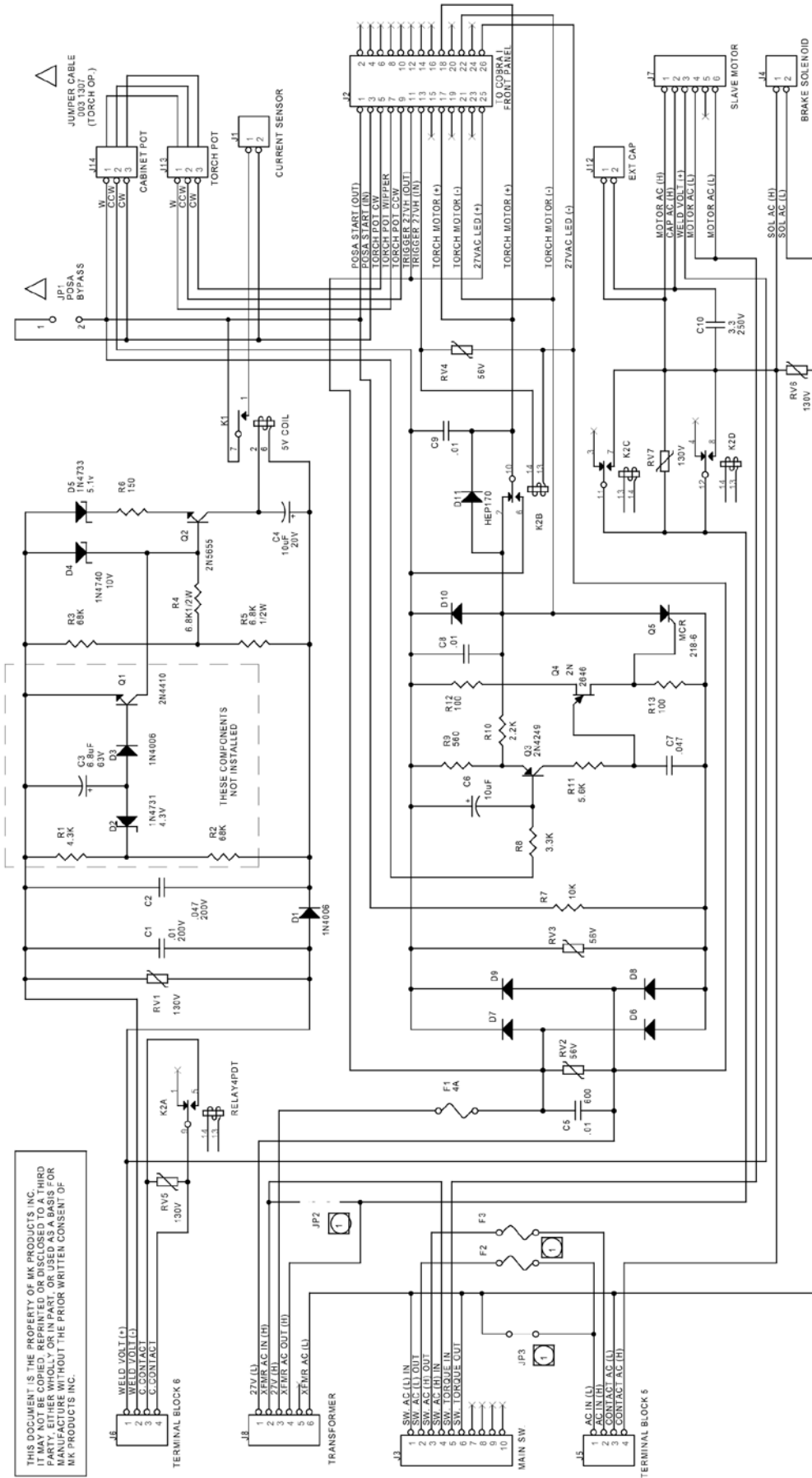
# Cobramatic Spindle Brake Assembly

No.	Qty.	Part No.	Description
17	AIR	823-0049	Thread Locking Permanent
16	1	751-0018	Cap .5 x .5 LG Vinyl Black
15	1	723-0059	Disk Ratchet Brake
14	1	437-0645	Spindle
13	1	437-0645	Spacer Spindle
12	1	437-0259	Knob Tension Spindle
11	1	437-0258	Retainer Spool Spindle
10	1	431-3726	Adapter Spiral Spindle
9	1	431-1266	Plate Back-Up Ring
8	1	419-0095	Spg Comp .85 x .69 x .75
7	3	419-0059	Spg Comp .468 x .437 x .056
6	1	345-0018	Nut Hex Lock 5/16-18 St
5	1	331-0313	Wshr Leather .75 ID x .125 Thk
4	1	331-0095	Wshr Ft 11/32 x 3/4 SST
3	3	331-0063	Wshr Ft .355 x .505
2	3	330-3063	Scr Shldr Mod .25 x .63 10-24
1	1	003-2139	Assy Bearing Spindle
			Parts List



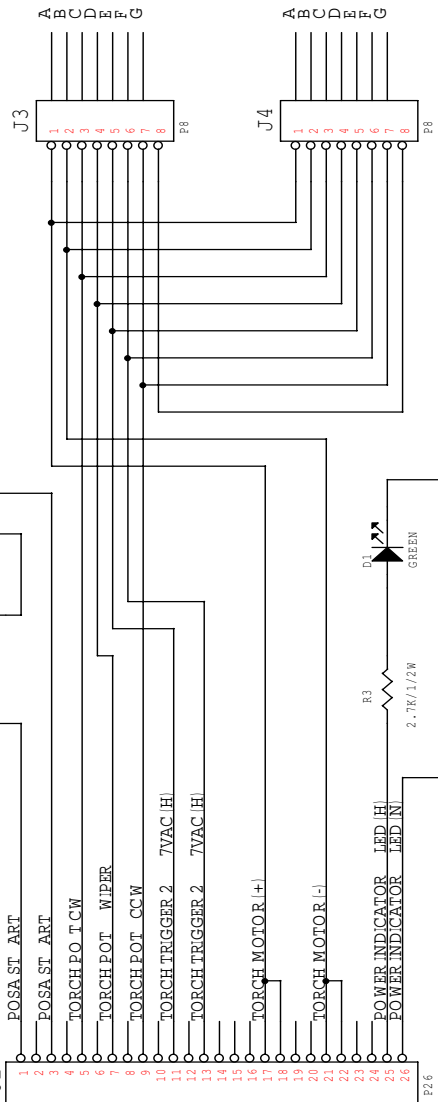
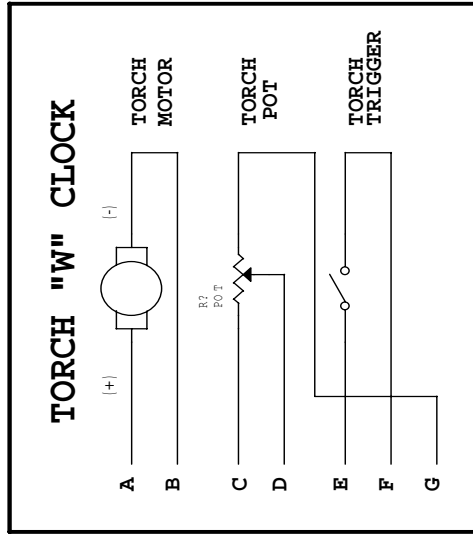
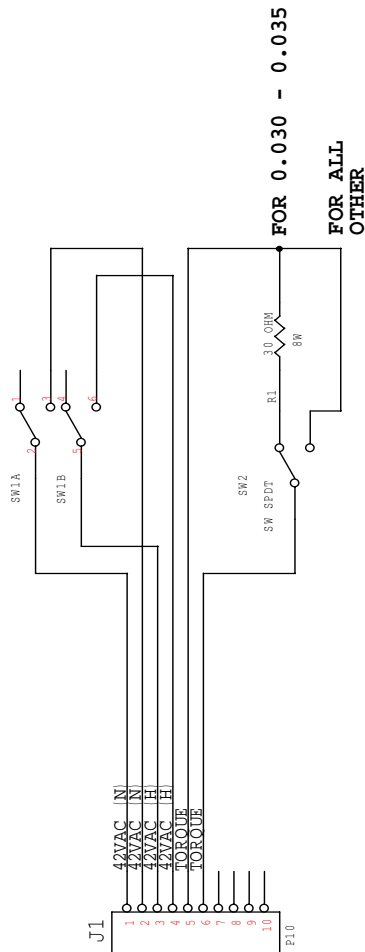
# 071-0387 Cobramatic Block Diagram





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COBRA 1 PCB ASSY	F2	F3	JP2	JP3
003-1626(115V)	NOT INSTALLED	2A	IN	IN
003-1635(120V)	2A	2A	OUT	OUT
003-1721(120V)	7A	7A	IN	OUT



## MK Warranty Repair Stations

### **ALABAMA**

AIRGAS – SOUTH, INC.  
Birmingham, AL  
205/251-6835

INDUSTRIAL WELDING SERVICES  
Quinton, AL  
205/674-3258

WELDING ENGINEERING SUPPLY CO.  
Prichard, AL  
334/457-8681

WELDING MACHINE HOSPITAL  
Montgomery, AL  
334/832-9353

### **ARIZONA**

ALLSTATE ELECTRIC MOTOR CO.  
Phoenix, AZ  
602/233-0500

PRAXAIR DISTRIBUTION, INC.  
Phoenix, AZ  
602/269-2151

### **ARKANSAS**

APPLIED SERVICES, INC.  
Benton, AR  
501/860-6464

ARKANSAS WELDING IND'L SUPPLY  
Hot Springs, AR  
501/321-9922

### **CALIFORNIA**

ADVANCED WELDER REPAIR  
Commerce, CA  
323/263-7383

AIRGAS – WEST, INC.  
Gardena, CA  
310/523-9355

ALL PHASE WELDER REPAIR & CONSULTING  
Sacramento, CA  
916/331-0595

ARC PRODUCTS  
San Diego, CA  
619/628-1022

CAL-WELD SUPPLY  
Fresno, CA  
209/445-0131

EMCO EAST  
Concord, CA  
925/798-4411

FRESNO OXYGEN  
Fresno, CA  
559/233-6684

INDUSTRIAL WELDER REPAIR  
LaPuente, CA  
626/961-7643

PRAXAIR DISTRIBUTION (ArcRent Div)  
Long Beach, CA  
562/427-0099

PRAXAIR DISTRIBUTION, INC.  
Bakersfield, CA  
661/327-5336

R. J. KATES  
San Diego, CA  
619/565-6960

RED-D-ARC, INC.  
Carson, CA  
310/233-3327

SOUTHWEST WELDER REPAIR  
Fontana, CA  
909/357-1661

SWEINHART ELECTRIC CO., INC.  
Long Beach, CA  
714/521-9100

### **COLORADO**

AIRGAS-INTERMOUNTAIN, INC.  
Colorado Springs, CO  
719/473-1947

WELDERS & EQUIP. SVC. & TESTING  
Littleton, CO  
303/932-8755

WESTERN SLOPE WELDER REPAIR  
Grand Junction, CO  
970/243-9616

### **FLORIDA**

A & I SPECIALTIES  
Lehigh Acres, FL  
941/368-7435

ACTION WELDING SUPPLY  
Jacksonville, FL  
904/786-2254

AMVEL CORPORATION  
Miami, FL  
305/592-5678

ELECTRICAL WELDERS SERVICE  
Orlando, FL  
407/999-5214

HAUN SYSTEMS REPAIR, INC.  
Orlando, FL  
407/681-6064

J.K. CIRCUIT TECHNOLOGY  
Boynton Beach, FL  
561/733-7859

ROPER ELECTRIC MOTOR SERVICE  
Panama City, FL 32405  
850/769-6643

SMITTY'S WELDER SERVICE  
West Palm Beach, FL  
561/845-1224

TRI-GAS  
Miami, FL  
305/592-3180

TRI-STATE SALES & LEASING  
Lake City, FL  
904/397-3340

### **GEORGIA**

B&W INDUSTRIAL SERVICES  
Augusta, GA  
706/738-8722

MC CULLOUGH ELEC. MOTOR SVC.  
Atlanta, GA  
404/688-5251

### **HAWAII**

DC ELECTRIC, INC.  
Aiea, HI  
808/483-8900

### **IDAHO**

NORCO  
Boise, ID  
208/336-1643

### **ILLINOIS**

INDUSTRIAL WELDER REBUILDERS  
Alsip, IL  
708/371-5688

RELIABLE EQUIPMENT REPAIR  
Hamel, IL  
618/633-5000

SCHERER INDUSTRIAL GROUP, INC.  
Galesburg, IL  
309/342-4125 or 888/964-3526

### **INDIANA**

AGA GAS, INC.  
Hammond, IN  
219/989-9030

AIRGAS – MID AMERICA, INC.  
Evansville, IN  
800/371-5688

COX EQUIPMENT CO.  
Indianapolis, IN  
317/241-8881

EVANSVILLE ARMATURE, INC.  
Evansville, IN  
812/428-9034

MODERN SUPPLY CO., INC.  
Evansville, IN  
812/425-9353

PRAXAIR DISTRIBUTION, INC.  
Speedway, IN  
317/481-4550

SUTTON-GARTEN COMPANY  
Indianapolis, IN  
317/264-3236

### **IOWA**

AIRGAS NORTH CENTRAL  
Des Moines, IA  
515/266-1111

CEDAR RAPIDS WELDING SUPPLY  
Cedar Rapids, IA  
319/365-1466

ELECTRICAL ENGINEERING & EQUIPMENT  
Des Moines, IA  
515/266-8890

WRIGHT WELDING SUPPLY  
Ft. Dodge, IA  
515/576-0640

### **KANSAS**

KANOX  
Hutchinson, KS  
316/665-5551

### **KENTUCKY**

GENERAL WELDING PRODUCTS  
Louisville, KY  
502/635-5218

RED-D-ARC  
Lexington, KY  
800/245-3660

WELDING EQUIPMENT  
Louisville, KY  
502/636-0545

### **LOUISIANA**

RED BALL OXYGEN CO.  
Shreveport, LA  
318/425-3211

### **MICHIGAN**

ANN ARBOR WELDING SUPPLY CO.  
Ypsilanti, MI  
734/572-0444

APEX WELDING GASES & SUPPLY  
Muskegon Heights, MI  
616/722-3185

**AUTOMATIC WELD**

Midland, MI  
517/496-9245

**GREAT LAKES EQUIPMENT**

Clare, MI  
517/386-4630

**HAMILTON ELECTRIC CO.**

Saginaw, MI  
517/799-6291

**SAGINAW WELDING SUPPLY CO.  
(FLINT WELDING SUPPLY CO.-Parent Co.)**

Saginaw, MI  
517/793-9696

**SOUTH PARK WELDING**

Marysville, MI  
810/364-6521

**WELDING METALS, INC.**

Madison Heights, MI  
248/585-0480

**WESAR COMPANY**

Three Rivers, MI  
616/483-9125

**MINNESOTA**

**MINNEAPOLIS OXYGEN CO.**

Minneapolis, MN  
612/588-8855

**OXYGEN SERVICE CO.**

St. Paul, MN  
612/644-7273

**MISSOURI**

**CEE-KAY SUPPLY, INC.**

St. Louis, MO  
324/644-3500

**P.G. WALKER**

Springfield, MO  
417/862-1745

**MISSISSIPPI**

**NORDAN SMITH WELDING SUPPLY**

Hattiesburg, MS  
601/545-1800

**3D SUPPLIES, INC.**

Jackson, MS  
601/353-3330

**NEVADA**

**SIERRA WELDING SUPPLY CO.**

Sparks, NV  
775/359-0542

**NEW JERSEY**

**INDUSTRIAL ELECTRIC SERVICE CO.**

Hawthorne, NJ  
973/423-1212

**NEW YORK**

**HAUN WELDING SUPPLY**

Syracuse, NY  
315/463-5241

**NORTH CAROLINA**

**HOLOX**

Colfax, NC  
336/996-1974

**M & L WELDER REPAIR**

Asheville, NC  
828/250-9353

**MACHINE AND WELDING SUPPLY CO.**

Dunn, NC  
910/892-4016

**MACHINE AND WELDING SUPPLY CO.**

Greenville, NC  
252/752-3089

**MACHINE AND WELDING SUPPLY CO.**

Raleigh, NC  
919/772-9500

**MACHINE AND WELDING SUPPLY CO.**

Winston-Salem, NC  
336/723-9651

**NATIONAL WELDERS SUPPLY CO.**

High Point, NC  
910/882-1110

**NATIONAL WELDERS SUPPLY CO.**

Charlotte, NC  
704/392-7317

**OHIO**

**AGA GASSES, INC.**

Lima, OH  
419/228-2828

**ALBRIGHT WELDING SUPPLY**

Wooster, OH  
330/264-2021

**ARC EQUIPMENT COMPANY**

Struthers, OH  
333/750-9353

**ARC SERVICES, INC.**

Toledo, OH  
419/478-6204

**BELAIR PRODUCTS, INC.**

Akron, OH  
330/253-3116

**BIG RIVER ELECTRIC**

Gallipolis, OH  
740/446-4360



CnD MACHINE, INC.  
Canton, OH 44706  
330/478-8811

RICK'S WELDER REPAIR SERVICE  
Eastlake, OH  
440/269-1204

VALLEY NATIONAL GASES  
Hilliard, OH  
614/771-1311

VALLEY NATIONAL GASES  
Lima, OH  
419/228-1008

VALLEY NATIONAL GASES  
Toledo, OH  
419/241-9114

WEILER WELDING CO., INC.  
Dayton, OH  
937/222-8312

WELDINGHOUSE, INC.  
Cleveland, OH  
216/524-1955

VOLLMER ELECTRIC CO.  
Columbus, OH  
614/476-8800

WEILER WELDING CO., INC.  
Dayton, OH  
937/222-8312

WELDINGHOUSE, INC.  
Cleveland, OH  
216/524-1955

**OKLAHOMA**  
AIRGAS MID-SOUTH  
Tulsa, OK  
918/582-0885

BILL'S WELDER REPAIR  
Oklahoma City, OK  
405/232-4799

MUNN SUPPLY  
Enid, OK  
580/234-4120

OKLAHOMA WELDERS SUPPLY  
Madill, OK  
580/795-5561

**OREGON**  
Industrial Source, Inc.  
Eugene, OR  
541/344-1438

**PENNSYLVANIA**

ALLWELD EQUIPMENT REPAIR  
Pittsburgh, PA  
412/821-8460

GEOVIC WELDING SUPPLY  
Milton, PA  
717/742-9377

J.A. CUNNINGHAM EQUIPMENT, INC.  
Philadelphia, PA  
215/426-6650

POWER SOURCE REPAIR CO., INC.  
Collingdale, PA  
610/532-6460

VALLEY NATIONAL GASES  
Pittsburgh, PA  
412/281-1835

**TENNESSEE**

NEXAIR  
Memphis, TN  
901/523-6821

TRAMCO  
Bristol, TN  
423/968-4499

NATIONAL RENTRAL & REPAIR  
Knoxville, TN  
423/584-6390

**TEXAS**

AIRGAS SOUTHWEST  
Houston, TX  
713/462-8027

ARC CONTROL  
Houston, TX  
713/941-4701

DENISON OXYGEN  
Denison, TX  
903/465-3369

FT. WORTH WELDERS SUPPLY, INC.  
Ft. Worth, TX  
817/332-8696

RITE-WELD SUPPLY, INC  
Fort Worth, TX  
817/626-8237

**UTAH**

C.W. SILVER INDUSTRIAL SERVICE  
Salt Lake City, UT  
801/531-8888

**VIRGINIA**

AIR PRODUCTS & CHEMICALS  
Bristol, VA  
540/669-3161

ARC WELDERS, INC.

Ashland, VA  
804/798-1818

NORFOLK WELDERS SUPPLY

Norfolk, VA  
804/622-6571

**WASHINGTON**

AIRGAS – NORPAC, INC.

Tacoma, WA  
253/473-2282

A-L WELDING PRODUCTS

Tukwila, WA  
425/228-2218

AMERICAN EQUIPMENT SERVICES

Kent, WA  
253/395-9947

HARRIS ELECTRIC, INC.

Seattle, WA  
206/782-6668

OXARC, INC

Spokane, WA  
509/535-7794

PACIFIC WELDING SUPPLIES

Tacoma, WA  
253/572-5302

PRECISION WELDER AND ENGINE REPAIR

Seattle, WA  
206/382-6227

**WEST VIRGINIA**

CARDINAL SALES & SERVICE, INC.

Clarksburg, WV  
304/622-7590

**WISCONSIN**

INTERSTATE WELDING SALES CORP.

Appleton, WI  
920/734-7173

PRAXAIR DISTRIBUTION, INC.

Brookfield, WI  
414/938-6365

**CANADA**

A & A WELDER SERVICES LTD.

Saskatoon, Saskatchewan  
306/934-1601

ARC & GENERATOR REPAIR

Garson, Ontario  
705/525-2141

BARRY HAMEL EQUIPMENT LTD.

Coquitlam, B.C.  
604/945-9313

ELECTRO-MÉCANIK, INC.

Sainte-Foy, Quebec  
418/683-1724

GPR INDUSTRIES 1994 LTD.

Grande Prairie, Alberta  
780/532-5900

HYPERDYNAMICS TECHNOLOGIES LTD.

Pickering, Ontario  
905/683-9938

INDUSTRIAL ELECTRONIC SERVICES

Calgary, Alberta  
403/279-3432

LADEL Ltd.

Quebec, Canada  
819/376-6577

M.R.T. REPAIR CENTER, INC.

Montreal, Quebec  
514/648-0800

OZARK ELECTRICAL MARINE LTD.

St. John's Newfoundland  
709/726-4554

PEEL ENGINES

Mississauga, Ontario  
905/670-1535

PROMOTECH ÉLECTRIQUE, Inc.

Fleurimont, Québec  
819/822-2111

WELDERS SUPPLY

Winnipeg, Manitoba  
204/772-9476

WELDING WIDE SERVICES, INC.

Brampton, Ontario  
905/874-9992

WELDTEC

B.C., Canada  
604/545-3886

**CHINA**

PHT GROUP COMPANY

Beijing, China

			
<b>WARNING</b>	<ul style="list-style-type: none"> <li>● Do not touch electrically live parts or electrode with skin or wet clothing.</li> <li>● Insulate yourself from work and ground.</li> </ul>	<ul style="list-style-type: none"> <li>● Keep flammable materials away.</li> </ul>	<ul style="list-style-type: none"> <li>● Wear eye, ear and body protection.</li> </ul>
Spanish <b>AVISO DE PRECAUCION</b>	<ul style="list-style-type: none"> <li>● No toque las partes o los electrodos bajo carga con la piel o ropa mojada.</li> <li>● Aíslese del trabajo y de la tierra.</li> </ul>	<ul style="list-style-type: none"> <li>● Mantenga el material combustible fuera del área de trabajo.</li> </ul>	<ul style="list-style-type: none"> <li>● Protéjase los ojos, los oídos y el cuerpo.</li> </ul>
French <b>ATTENTION</b>	<ul style="list-style-type: none"> <li>● Ne laissez ni la peau ni des vêtements mouillés entrer en contact avec des pièces sous tension.</li> <li>● Isolez-vous du travail et de la terre.</li> </ul>	<ul style="list-style-type: none"> <li>● Gardez à l'écart de tout matériel inflammable.</li> </ul>	<ul style="list-style-type: none"> <li>● Protégez vos yeux, vos oreilles et votre corps.</li> </ul>
German <b>WARNUNG</b>	<ul style="list-style-type: none"> <li>● Berühren Sie keine stromführenden Teile oder Elektroden mit Ihrem Körper oder feuchter Kleidung!</li> <li>● Isolieren Sie sich von den Elektroden und dem Erdboden!</li> </ul>	<ul style="list-style-type: none"> <li>● Entfernen Sie brennbares Material!</li> </ul>	<ul style="list-style-type: none"> <li>● Tragen Sie Augen-, Ohren- und Körperschutz!</li> </ul>
Portuguese <b>ATENÇÃO</b>	<ul style="list-style-type: none"> <li>● Não toque partes elétricas e electrodos com a pele ou roupa molhada.</li> <li>● Isole-se da peça e terra.</li> </ul>	<ul style="list-style-type: none"> <li>● Mantenha inflamáveis bem guardados.</li> </ul>	<ul style="list-style-type: none"> <li>● Use proteção para a vista, ouvido e corpo.</li> </ul>
Japanese <b>注意事項</b>	<ul style="list-style-type: none"> <li>● 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。</li> <li>● 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。</li> </ul>	<ul style="list-style-type: none"> <li>● 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。</li> </ul>	<ul style="list-style-type: none"> <li>● 目、耳及び身体に保護具をして下さい。</li> </ul>
Chinese <b>警告</b>	<ul style="list-style-type: none"> <li>● 皮肤或湿衣物切勿接触带电部件及铸修。</li> <li>● 使你自已离地面和工作件绝缘。</li> </ul>	<ul style="list-style-type: none"> <li>● 把一切易燃物品移离工作场所。</li> </ul>	<ul style="list-style-type: none"> <li>● 戴眼镜、耳及身体劳动保护用具。</li> </ul>
Korean <b>위험</b>	<ul style="list-style-type: none"> <li>● 전도체나 용접봉을 젖은 옷이나 피부를 절대 접촉하지 마십시오.</li> <li>● 모재와 접지를 접촉하지 마십시오.</li> </ul>	<ul style="list-style-type: none"> <li>● 인화성 물질을 접근시키지 마십시오.</li> </ul>	<ul style="list-style-type: none"> <li>● 눈, 귀와 몸에 보호장구를 착용하십시오.</li> </ul>
Arabic <b>تحذير</b>	<ul style="list-style-type: none"> <li>● لا تلمس الأجزاء التي يسري فيها التيار الكهربائي أو الإلكترود بجلد الجسم أو الملابس المبللة بالماء.</li> <li>● ضع عازلاً على جسمك خلال العمل.</li> </ul>	<ul style="list-style-type: none"> <li>● ضع المواد القابلة للاشتعال في مكان بعيد.</li> </ul>	<ul style="list-style-type: none"> <li>● ضع أدوات وملابس واقية على عينيك وأذنيك وجسمك.</li> </ul>

**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.**

			
<ul style="list-style-type: none"> <li>● Keep your head out of fumes.</li> <li>● Use ventilation or exhaust to remove fumes from breathing zone.</li> </ul>	<ul style="list-style-type: none"> <li>● Turn power off before servicing.</li> </ul>	<ul style="list-style-type: none"> <li>● Do not operate with panel open or guards off.</li> </ul>	<b>WARNING</b>
<ul style="list-style-type: none"> <li>● Los humos fuera de la zona de respiración.</li> <li>● Mantenga la cabeza fuera de los humos. Utilice ventilación o aspiración para gases.</li> </ul>	<ul style="list-style-type: none"> <li>● Desconectar el cable de alimentación de poder de la máquina antes de iniciar cualquier servicio.</li> </ul>	<ul style="list-style-type: none"> <li>● No operar con panel abierto o guardas quitadas.</li> </ul>	Spanish <b>AVISO DE PRECAUCION</b>
<ul style="list-style-type: none"> <li>● Gardez la tête à l'écart des fumées.</li> <li>● Utilisez un ventilateur ou un aspirateur pour ôter les fumées des zones de travail.</li> </ul>	<ul style="list-style-type: none"> <li>● Débranchez le courant avant l'entretien.</li> </ul>	<ul style="list-style-type: none"> <li>● N'opérez pas avec les panneaux ouverts ou avec les dispositifs de protection enlevés.</li> </ul>	French <b>ATTENTION</b>
<ul style="list-style-type: none"> <li>● Vermeiden Sie das Einatmen von Schweißrauch!</li> <li>● Sorgen Sie für gute Be- und Entlüftung des Arbeitsplatzes!</li> </ul>	<ul style="list-style-type: none"> <li>● Strom vor Wartungsarbeiten abschalten! (Netzstrom völlig öffnen; Maschine anhalten!)</li> </ul>	<ul style="list-style-type: none"> <li>● Anlage nie ohne Schutzgehäuse oder Innenschutzverkleidung in Betrieb setzen!</li> </ul>	German <b>WARNUNG</b>
<ul style="list-style-type: none"> <li>● Mantenha seu rosto da fumaça.</li> <li>● Use ventilação e exaustão para remover fumo da zona respiratória.</li> </ul>	<ul style="list-style-type: none"> <li>● Não opere com as tampas removidas.</li> <li>● Desligue a corrente antes de fazer serviço.</li> <li>● Não toque as partes elétricas nuas.</li> </ul>	<ul style="list-style-type: none"> <li>● Mantenha-se afastado das partes moventes.</li> <li>● Não opere com os painéis abertos ou guardas removidas.</li> </ul>	Portuguese <b>ATENÇÃO</b>
<ul style="list-style-type: none"> <li>● ヒュームから顔を離すようにして下さい。</li> <li>● 換気や排煙に十分留意して下さい。</li> </ul>	<ul style="list-style-type: none"> <li>● 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。</li> </ul>	<ul style="list-style-type: none"> <li>● パネルやカバーを取り外したまま機械操作をしないで下さい。</li> </ul>	Japanese <b>注意事項</b>
<ul style="list-style-type: none"> <li>● 頭部遠離須臾。</li> <li>● 在呼吸區使用通風或排風器除煙。</li> </ul>	<ul style="list-style-type: none"> <li>● 維修前切斷電源。</li> </ul>	<ul style="list-style-type: none"> <li>● 置裝板打開或沒有安全罩時不準作業。</li> </ul>	Chinese <b>警告</b>
<ul style="list-style-type: none"> <li>● 얼굴로부터 용접가스를 멀리하십시오.</li> <li>● 호흡지역으로부터 용접가스를 제거하기 위해 가스제거기나 통풍기를 사용하십시오.</li> </ul>	<ul style="list-style-type: none"> <li>● 보수전에 전원을 차단하십시오.</li> </ul>	<ul style="list-style-type: none"> <li>● 판넬이 열린 상태로 작동하지 마십시오.</li> </ul>	Korean <b>위험</b>
<ul style="list-style-type: none"> <li>● لهد رأسك بعيداً عن الدخان.</li> <li>● استعمل التهوية أو جهاز ضبط الدخان للخارج لكي تبعد الدخان عن المنطقة التي تننفس فيها.</li> </ul>	<ul style="list-style-type: none"> <li>● قطع التيار الكهربائي قبل القيام بأية صيانة.</li> </ul>	<ul style="list-style-type: none"> <li>● لا تشغيل هذا الجهاز إذا كانت الاغطية الحديدية الوالفة ليست عليه.</li> </ul>	Arabic <b>تحذير</b>

**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擇材料，並請遵守貴方的有關勞動保護規定。

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.

# LIMITED WARRANTY

**Effective March 1, 2001**

This warranty supersedes all previous MK Products warranties and is exclusive, with no other guarantees or warranties expressed or implied.

**LIMITED WARRANTY** - MK Products, Inc., Irvine, California warrants that all new and unused equipment furnished by MK Products is free from defect in workmanship and material as of the time and place of delivery by MK Products. No warranty is made by MK Products with respect to trade accessories or other items manufactured by others. Such trade accessories and other items are sold subject to the warranties of their respective manufacturers, if any.

MK Products' warranty does not apply to components having normal useful life of less than one (1) year, such as relay points, wire conduit, tungsten, and welding torch parts that come in contact with the welding wire, including gas cups, gas cup insulators, and contact tips where failure does not result from defect in workmanship or material.

In the case of MK Products' breach of warranty or any other duty with respect to the quality of any goods, the exclusive remedies therefore shall be at MK Products' option:

- (1) repair
- (2) replacement
- (3) where authorized in writing by MK Products, the reasonable cost of repair or replacement at our Irvine, California plant; or
- (4) payment of or credit for the purchase price (less reasonable depreciation based upon actual use) upon return of the goods at customer's risk and expense. Upon receipt of notice of apparent defect or failure, MK Products shall instruct the claimant on the warranty claim procedures to be followed.

As a matter of general policy only, MK Products may honor an original user's warranty claims on warranted equipment in the event of failure resulting from a defect within the following periods from the date of delivery of equipment to the original user:

1. Torches, Weldheads, and Water Recirculators ..... 1 year
2. All Other Equipment ..... 3 years
3. Repairs ..... 90 days

Classification of any item into the foregoing categories shall be at the sole discretion of MK Products. Notification of any failure must be made in writing within 30 days of such failure.

A copy of the invoice showing the date of sale must accompany products returned for warranty repair or replacement.

All equipment returned to MK Products for service must be properly packaged to guard against damage from shipping. MK Products will not be responsible for any damages resulting from shipping.

Normal surface transportation charges (both ways) for products returned for warranty repair or replacement will be borne by MK Products, except for products sold to foreign markets.

ANY EXPRESS WARRANTY NOT PROVIDED HEREIN AND ANY IMPLIED WARRANTY, GUARANTY, OR REPRESENTATION AS TO PERFORMANCE, AND ANY REMEDY FOR BREACH OF CONTRACT WHICH, BUT FOR THIS PROVISION, MIGHT ARISE BY IMPLICATION, OPERATION OF LAW, CUSTOM OF TRADE, OR COURSE OF DEALING, INCLUDING ANY IMPLIED WARRANTY OF MERCHANTABILITY OR OF FITNESS FOR PARTICULAR PURPOSE, WITH RESPECT TO ANY AND ALL EQUIPMENT FURNISHED BY MK PRODUCTS, IS EXCLUDED AND DISCLAIMED BY MK PRODUCTS.

EXCEPT AS EXPRESSLY PROVIDED BY MK PRODUCTS IN WRITING, MK PRODUCTS ARE INTENDED FOR ULTIMATE PURCHASE BY COMMERCIAL/INDUSTRIAL USERS AND FOR OPERATION BY PERSONS TRAINED AND EXPERIENCED IN THE USE AND MAINTENANCE OF WELDING EQUIPMENT AND NOT FOR CONSUMERS OR CONSUMER USE. MK PRODUCTS WARRANTIES DO NOT EXTEND TO, AND NO RE-SELLER IS AUTHORIZED TO EXTEND MK PRODUCTS' WARRANTIES TO ANY CONSUMER.



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DATE : March 1, 2001



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