



Product Description	Cobramatic®
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MK Form Number	CB/OM-5
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Effective with Serial Number	12001
Voltage Rating	115 VAC
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This manual applies to the following model numbers	150-005

Cobramatic® Wire Feed Cabinet



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 a fire.

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 Capacity030 - 1/16" ALL Types

Wire Spool Capacity 12" Standard

(Insulated or Non-Insulated)

Power Input 115 VAC 50/60 Hz,

..... 150 Watts Peak (1.3 amps)

Weight 41 pounds

Shipping Weight 46 pounds

For Use with torch prefix number 14X, 16X, 21X & 22X

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 qt/min.**
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/minute at 45 p.s.i.**
- B. Resistivity - 10K ohms/centimeter**
- C. Ph Range - 5.5-8.5**
- D. Particle Size - .005"**

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)

115 VAC

Your Wire Feeder comes factory ready with a standard 3-prong plug ready to connect into any standard 120VAC, 15 A receptacle. Several optional, pre-wired harnesses are available for different power supplies. See part numbers and description of each in the OPTIONAL KITS section of this manual.

The **115 VAC** 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.

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

NOTE:

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

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

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.

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

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

NOTE:

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

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.

Main Board Configuration

Factory supplied, this switch will be shipped in the CV (Constant Voltage) position. This designates the type of welding power supply the Cobramatic is connected to. If the the power supply is a Constant Current type (CC), the switch should be moved to the CC position.

This switch is designed to configure the main board so that the OCV (Open Circuit Voltage) and welding current (measured at J1 current sensor) properly engages the PosaStart® circuit to transfer from the run-in wire speed to welding wire speed.

If the position of the switch does not match that of the power supply, the PosaStart® circuit will not engage and wire speed transfer will not occur.



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:
Reverse polarity MUST be used.

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 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.

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
005-0316	8ft Interface Cable for Miller 14-Pin, 115VAC
005-0658	25ft Interface Cable for Miller 14-Pin, 115VAC
005-0608	8ft Interface Cable for Lincoln 14-Pin, 115VAC
005-0659	25ft Interface Cable for Lincoln 14-Pin, 115VAC
005-0674	Gas Purge/Trigger Latch Kit
005-0630	8ft Interface Cable for Thermal Arc 19-Pin, 115VAC
005-0614	8ft Interface Cable for ESAB 19-Pin, 115VAC

005-0316 8ft Interface Cable for Miller 14-Pin, 115VAC

005-0658 25ft Interface Cable for Miller 14-Pin, 115VAC

When properly connected, these interface cables will supply all the necessary signals and power needed, from most Miller welding power supplies: a Closing Contact signal and 115VAC input power.

005-0608 8ft Interface Cable for Lincoln 14-Pin, 115VAC

005-0659 25ft Interface Cable for Lincoln 14-Pin, 115VAC

When properly connected, these interface cables will supply all the necessary signals and power needed, from most Lincoln Electric welding power supplies: a Closing Contact signal, Posa-Start Voltage Sensing and 115VAC input power.

005-0630 8ft Interface Cable for Thermal Arc 19-Pin, 115VAC

When properly connected, these interface cables will supply all the necessary signals and power needed, from most Miller welding power supplies: a Closing Contact signal and 115VAC input power.

005-0614 8ft Interface Cable for ESAB 19-Pin, 115VAC

When properly connected, these interface cables will supply all the necessary signals and power needed, from most Lincoln Electric welding power supplies: a Closing Contact signal, Posa-Start Voltage Sensing and 115VAC input power.

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).

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

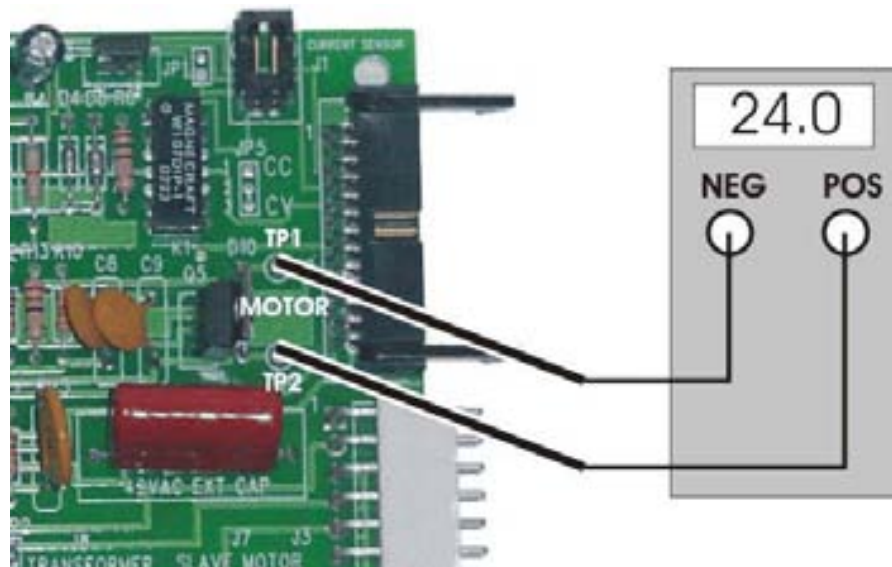
The AC circuits are protected by fuse F3. If F3 continually blows, disconnect J4 (Brake Solenoid), J7 (Slave Motor) and J5-3 & 4 - if connected (AC Contactor Out.) from the PC board. Replace fuse and re-trigger system. If fuse does not blow, isolate problem by reconnecting J4, J7 and J5-3 & 4 one at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

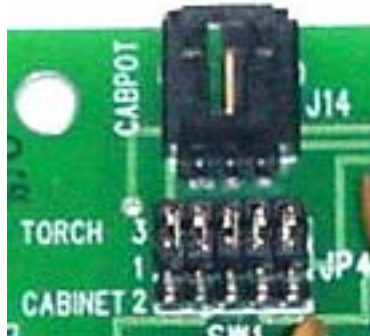
Check the resistance across pin “D” (wiper) and pin “G”. The resistance should vary from **5K - 0 ohms**.

Testing the Micro Switch

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

Remote Potentiometer

When connecting a remote (cabinet or otherwise) wire speed potentiometer, the jumpers at JP4 must be moved from the upper position (1-3) to the lower position (1-2). This will disable the potentiometer in the welding torch. The remote potentiometer leads must then be connected at J14. The cabinet potentiometer feature applies to installation of this board into Cobramatic® Model 150-003 only, while the remote potentiometer feature applies to Cobramatic® Models 150-003 & 150-005.



Section E Troubleshooting

Troubleshooting		
Symptom	Cause	Remedy
No wire feed at torch, feeder not operating, i.e., no slave motor or brake solenoid.	F3 (2amp) fuse in feeder blown.	Check AC circuit. Replace fuse.
	F1 (4amp) fuse in feeder.	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 circuit.	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 assembly.	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

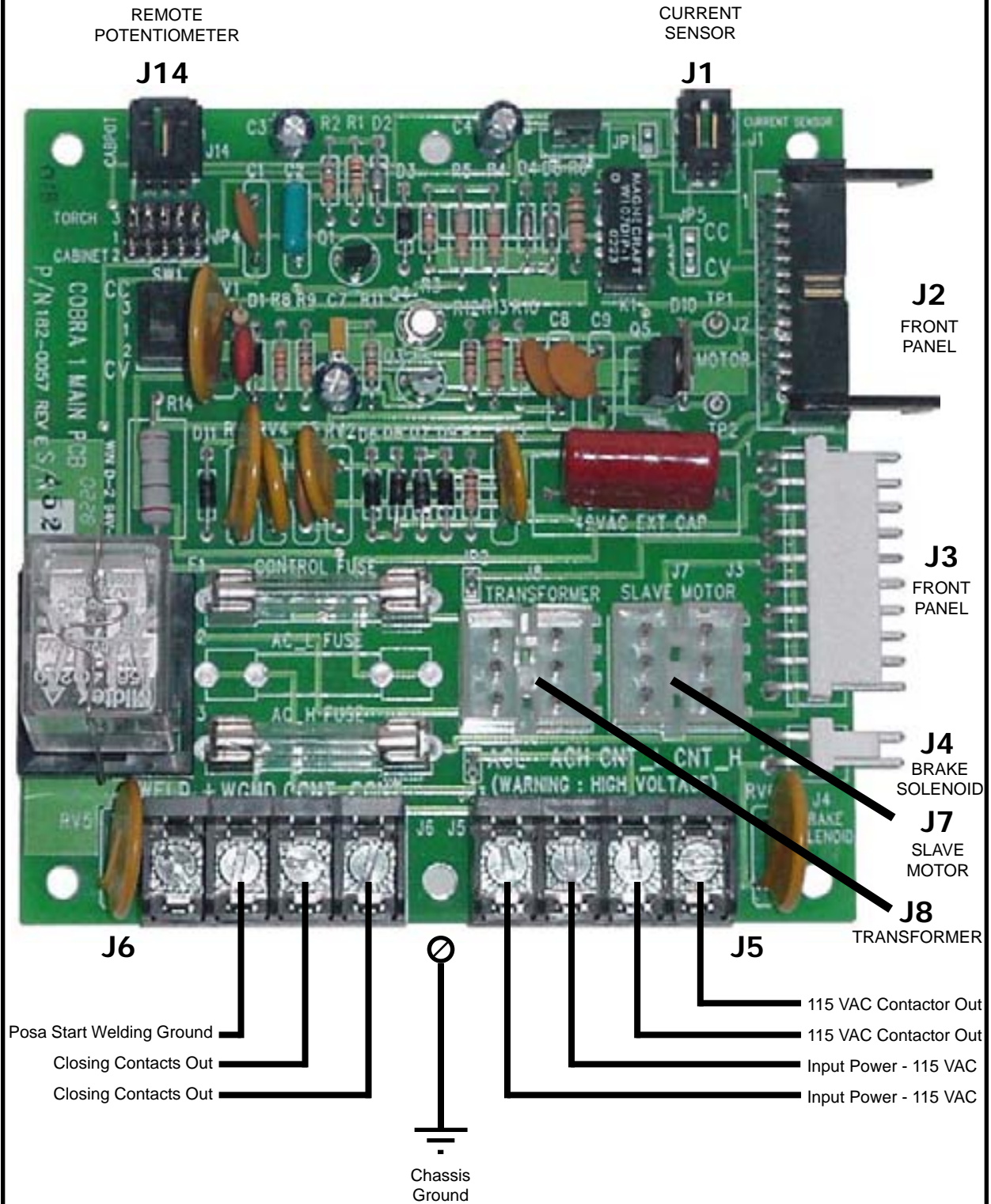
Appendices

Diagrams/Parts List

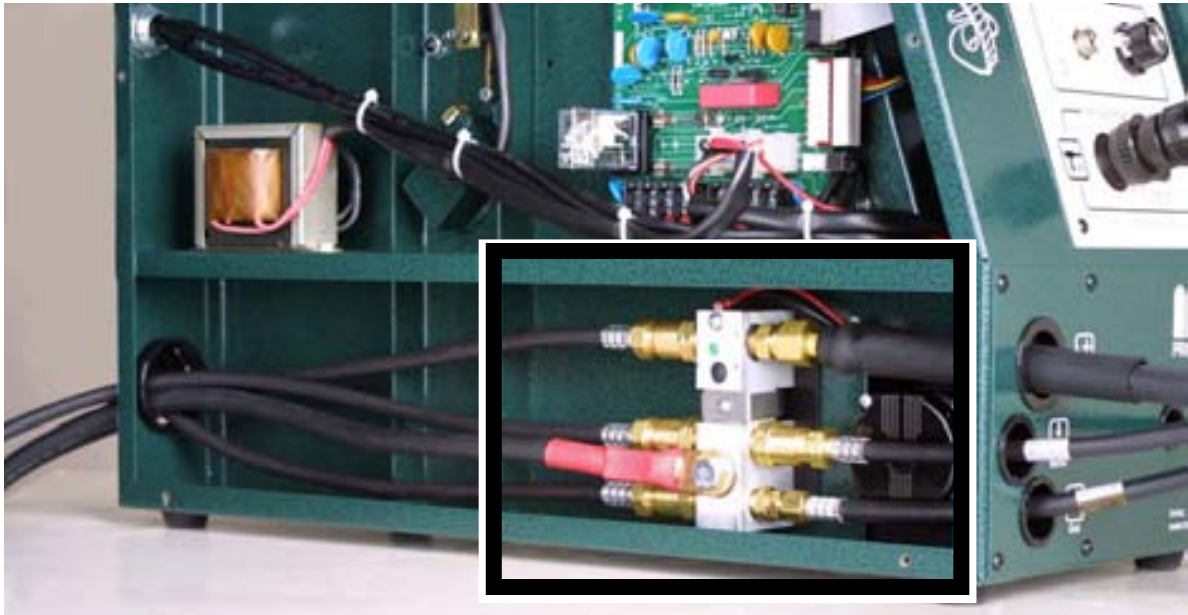
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Main P.C. Board Connections

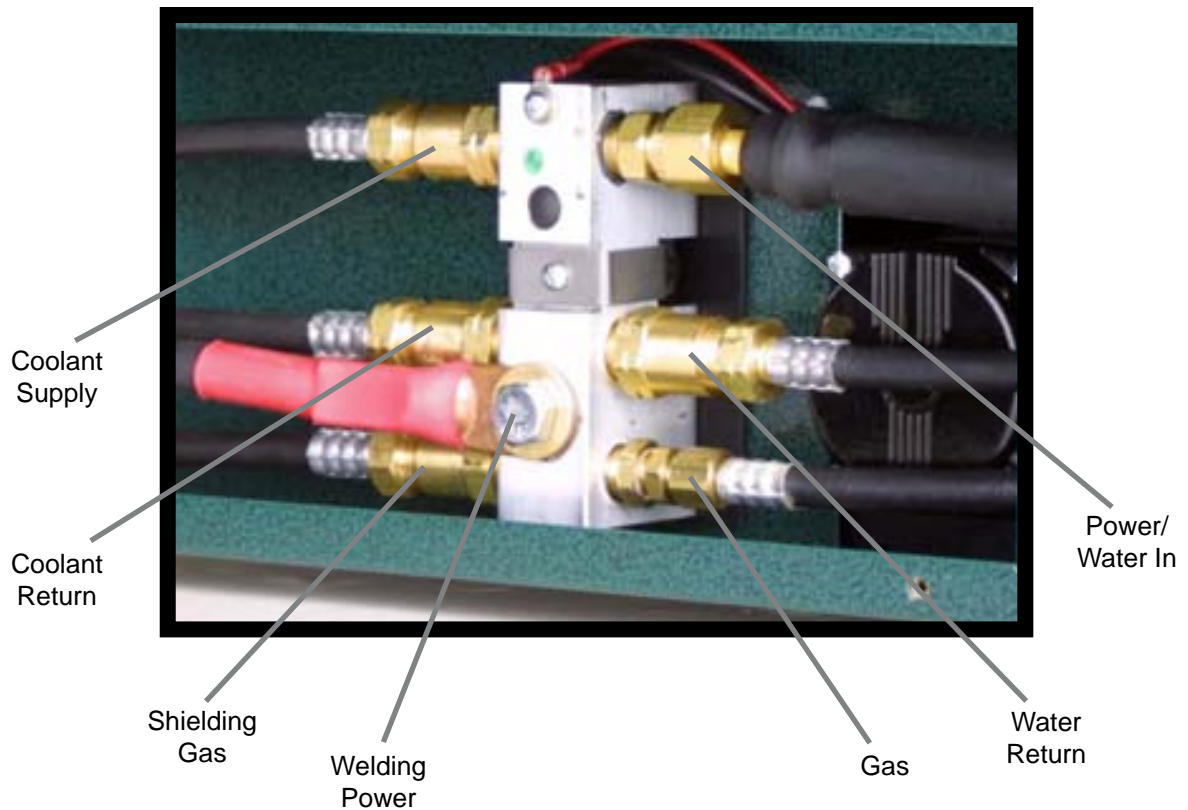


Cabinet and Torch Hook-up



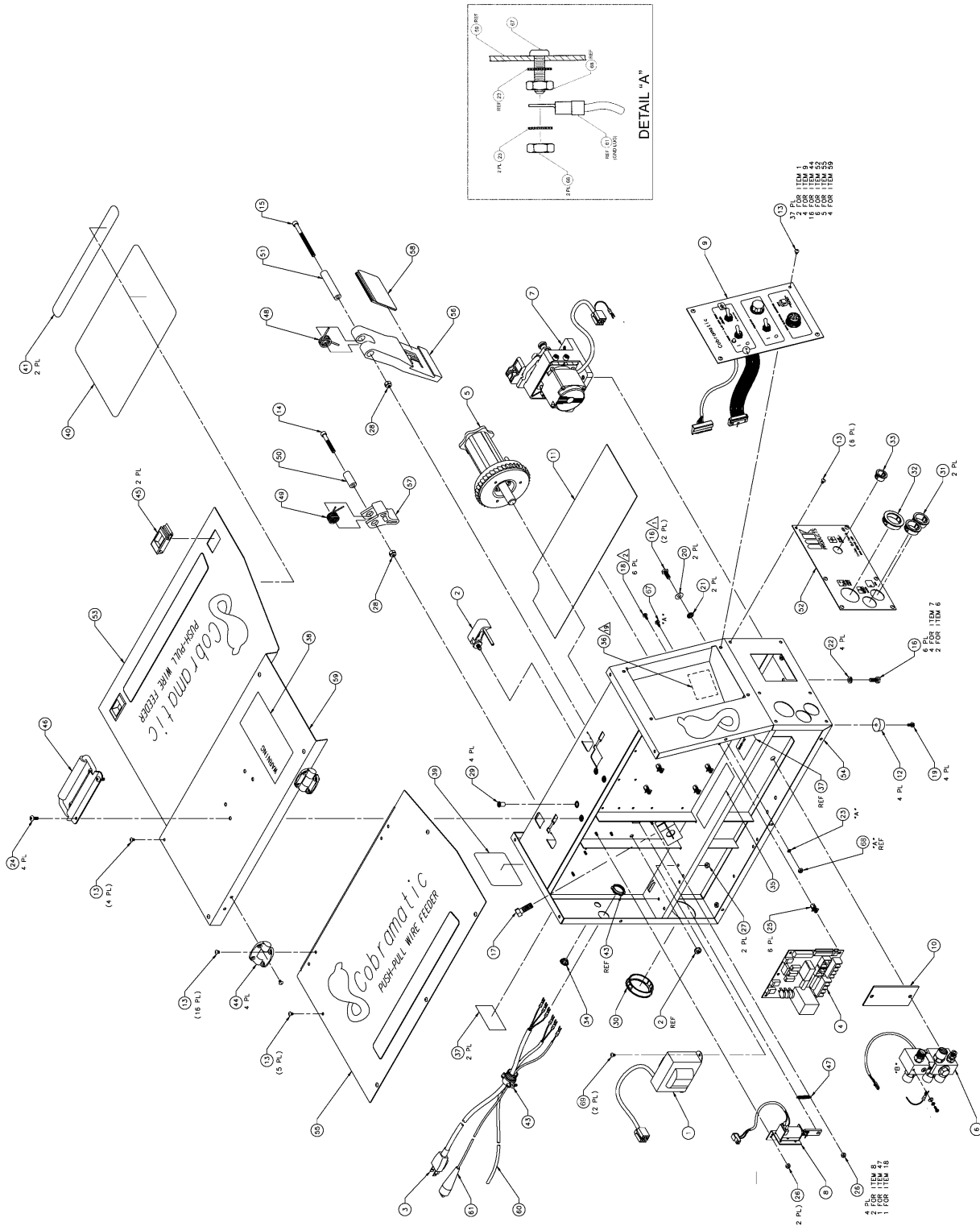
Input Connections

Torch Connections

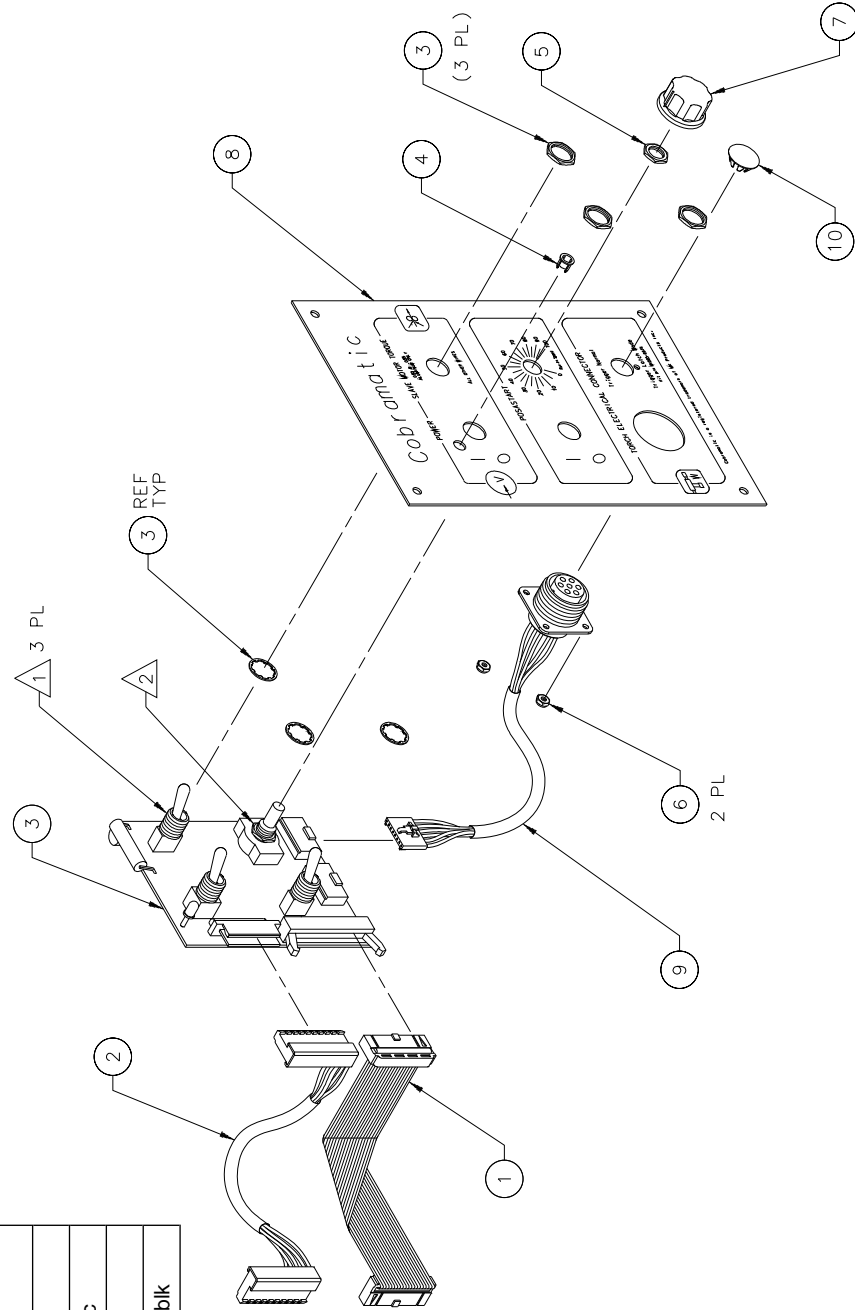


001-4011 Cobramatic Assembly

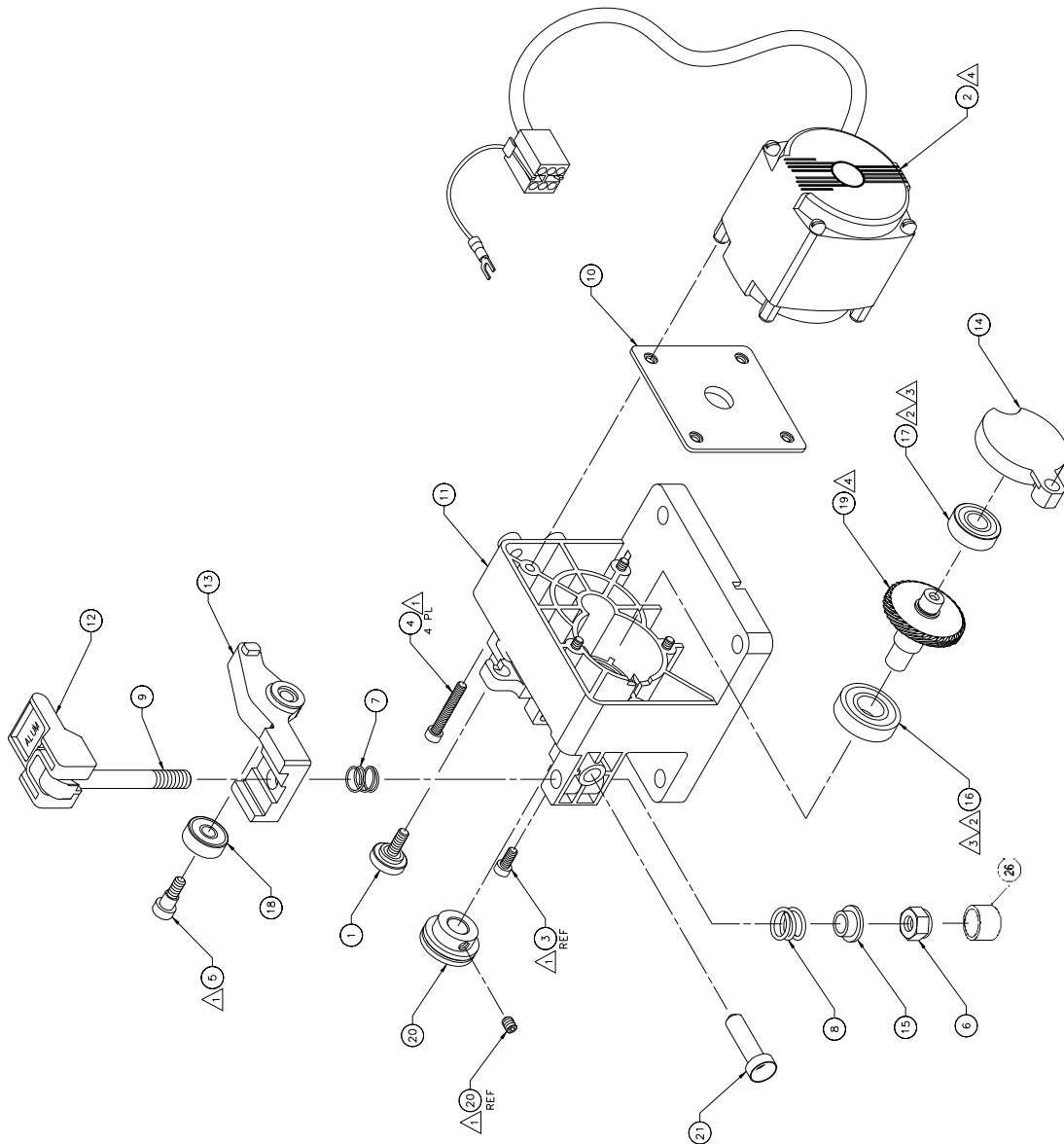
No.	Qty.	Part No.	Description
1	1	003-0773	Assy Xmmr 115V
2	1	003-0784	Assy Pawk CB
3	1	003-0796	Cable Power
4	1	003-1628	Assy Fw Main CB 110V
5	1	003-2146	Assy Switch CB
6	1	003-2683	Assy Power Block
7	1	003-2078	Assy Slave Motor 115V
8	1	003-2086	Assy Sol Brk 115V Top
9	1	003-2110	Assy Pnl F CB
10	1	261-0635	Insulator Power Block
11	1	261-0634	Insulator Strool
12	4	301-0107	Scr Pnl Rbr W/Wahr #8 ID
13	35	338-0230	Scr Pnl Ph 8.32 x 1/4 Blk
14	1	328-0063	Scr Soln 1/4-20 x 1.34 Blk
15	1	328-0256	Scr Soln 1/4-20 x 1/2 SH
16	6	338-0002	Screw Hex 1/4-20 x 5/8
17	1	338-0209	Scr Hex 3/8 x 1.0
18	6	328-1007	Scr Hex W/Wr S16.52 x 3/8 SI
19	4	328-1019	Scr Hex W/Wr S16.52 x 3/8 SI
20	4	331-0048	W/r Pt .261Dx.365Dx.50D
21	2	431-1690	W/r Shdr .261Dx.365Dx.50D
22	4	333-0009	W/r Spr LK 1/4
23	2	333-0023	W/r LK Ext Star #6
24	4	338-0228	Scr Pnl Ph 10.32 x 1/2 Blk
25	6	342-0410	Spacer Shaking 6.32 x 0.53
26	3	345-0008	Nut Hex Lock 8.32
27	2	345-0009	Nut Hex Lock 8.32 SI
28	2	345-0115	Nut Hex Lock 1/4-20 SI
29	4	351-0089	Hexnut Thread 10.32
30	1	351-0100	Bush Slap 1.500D.62 Hole
31	2	351-0145	Bush Slap 1.518D.01.112 Mlg
32	1	351-0752	Bush Slap 1.188D.01.172 Hole
33	1	351-0758	Bush Slap 9/16D.034 Hole
34	1	351-0835	Snap Bin 0.172 Hole Blk
35	1	405-0724	Decal Electronic Connection
36	1	405-0886	Decal Warning T13270
37	2	405-0887	Decal Warning T13270
38	1	405-0888	Decal Warning T16196
39	1	405-0889	Decal Number ID Plate
40	1	405-0943	Decal Instructions Door Spoil
41	2	405-0944	Decal Door Caution
42	6	411-0020	Tie Wrip
43	1	411-0157	Clamp Chn SF Ref
44	4	415-0075	Hinge CB
45	2	415-0079	Latch Slide
46	1	415-0243	Handle Carry Black
47	1	419-0080	Sprg Ext 2190D x .M/G
48	1	419-0089	Torsion Spring Restraint CB
49	1	419-0090	Torsion Spring Catch
50	1	431-1609	Metal Catch CB
51	1	431-1609	Metal Restraint Wire CB
52	1	438-0146	SS Pwr Pnl CB
53	1	438-0150	SS Door Spn CB
54	1	438-0151	SS Wrip CB
55	1	438-0152	SS Door Pwr CB
56	1	437-0243	Restraint Wire Mold CB
57	1	437-0243	Catch Mold Restraint CB
58	1	437-0255	Pad Restraint Wire
59	1	438-0062	Paint Top CB
60	1	843-0064	Cable Connector RT
61	1	843-0227	Cable Passpart
62	AIR	823-0043	Thread Locking Compd Med Str
63	0	0	0
64	0	0	0
65	AIR	823-0050	Thread Locking Compd Low Str
66	REF	031-0067	Tie Procedure
67	1	338-0006	Scr Pnl Ph 8.32 x 1/2
68	2	341-0005	Nut Hex 6.32
69	2	338-0003	Scr Pnl Ph 8.32 x 1/2 ST



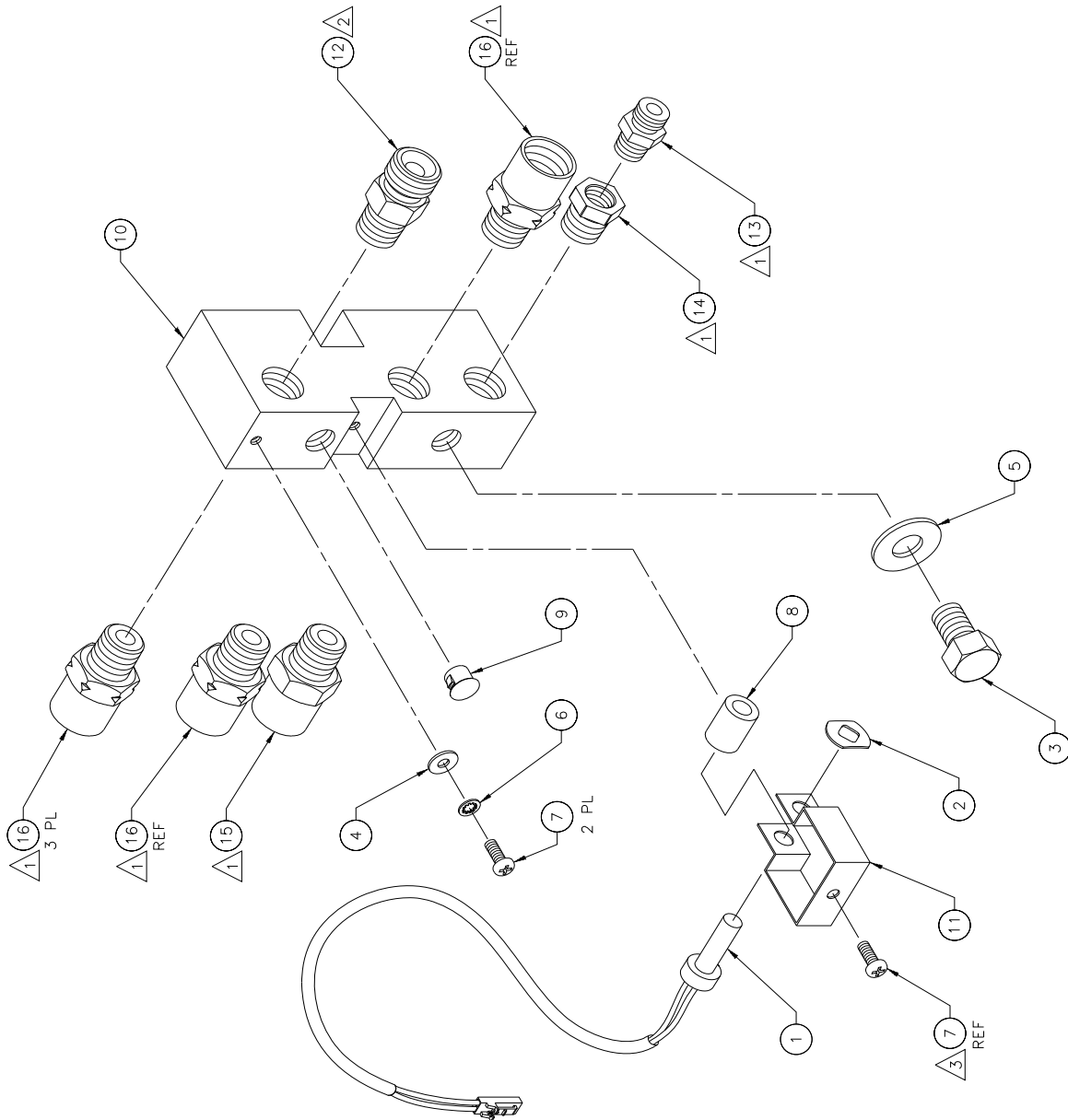
Front Panel Assy. 003-2110b		
No.	Qty.	Part No. Description
1	1	003-1332 Assy cbl rbn 26c
2	1	003-1631 Cable power assy
3	1	003-2024 Assy pcb fr pnl cb 1 110V
4	1	301-0023 Grommet panel mount
5	1	341-0050 Nut 3/8 - 32 st
6	2	345-0004 Nut hex lock 4-40
7	1	401-0012 Knob Ø1.0 blk
8	1	436-0144 SS pnl fr Cobramatic
9	1	003-1642 Assy con 7p "w" cb
10	1	351-0835 Snap btn Ø1/2 hold blk

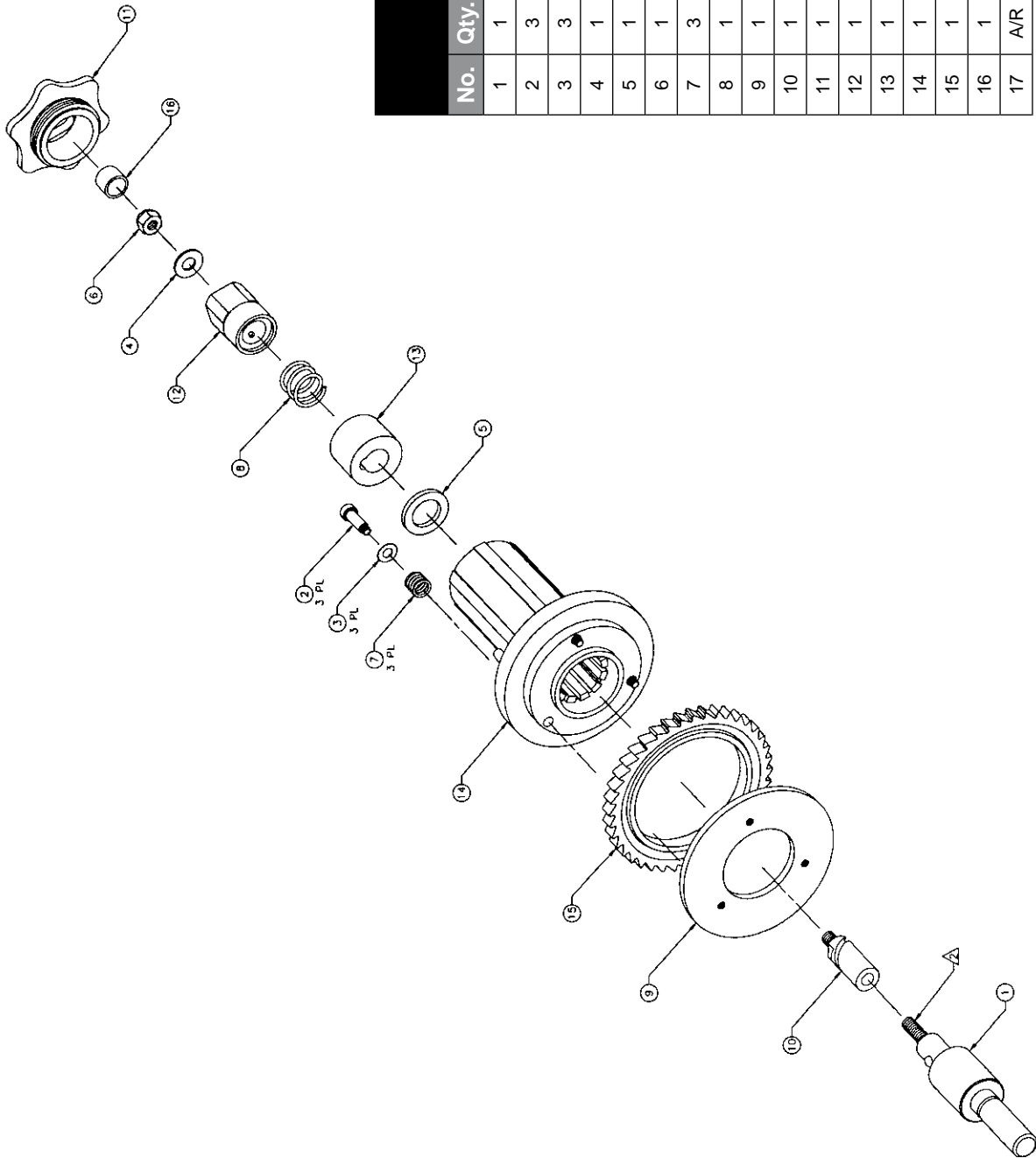


Slave Motor Assy. 003-2078			
No.	Qty.	Part No.	Description
1	1	003-0176	Assy knob conduit
2	1	003-2069	Assy torque motor 115V
3	2	328-0024	Scr shc 8-32 X 3/8 stl
4	4	328-0259	Scr shc 8-32 X 1-1/8 stl
5	1	330-0258	Scr Shldr 1/4 X 1/4 X 10/24
6	1	345-0018	Nut Lock 5/16-18
7	1	419-0085	Spring comp 1/32 X OD .40
8	1	419-0211	Spring comp OD 5/8 X 1/16
9	1	431-1576	Bolt swing mod
10	1	435-01582	Plate locate slave motor
11	1	437-0230	Housing slave motor mold
12	1	437-0231	Handle mold slave motor
13	1	437-0232	Arm idler mold slave motor
14	1	437-0245	Cap bearing mold
15	1	437-0254	Sleeve spring
16	1	501-0118	Bearing 1.125 X .50 X .31
17	1	501-0156	Bearing .875 X .38 X .28
18	1	501-0207	Bearing idler roll
19	1	507-0130	Shaft gear
20	1	511-0206	Drive roll
21	1	753-0210	Guide wire inlet
22	A/P	823-0043	Locite threadlocking
23	A/P	835-0001	Grease mobilux 2
24	A/P	823-0051	Locite retaining compound
25	Ref	031-0167	Test procedure
26	1	751-0018	Cap .5 X .5 lg vinyl black



Power Block Assy. 003-2063		
No.	Qty.	Part No. Description
1	1	003-1243 Assy sensor Posa-Start
2	1	313-0021 Stud receiver push-on
3	1	329-0054 Scr hex 3/8-16 X 5/8
4	1	331-0002 Washer flat #6 st.
5	1	331-0777 Washer flat 0.391 ID X 0.875OD
6	1	333-0252 Wshr lk star-in #6 st.
7	2	336-0005 Scr pn ph 6-32 x .375 stl
8	1	342-0395 Spacer current sensor
9	1	351-0066 Plug hole Ø5/16
10	1	431-1612 Block power cb2k
11	1	435-3038 Bracket current sensor
12	1	753-0112 Ftg 1/4npt male to 5/8-18 male
13	1	753-0114 Aprt 1/8nt X 1/8nps
14	1	753-0115 Bush 1/4npt male to 1/8mpt fem
15	1	753-0466 Aprt 1/4npt male to 5/8-18 fem
16	3	753-0475 Aprt 1/4npt m to 5/8-18 fem lh
17	A/R	823-0029 Noalox pipe thread sealant
18	A/R	823-0043 Loctite 242 threadlock
19	A/R	823-0044 Loctite pipe thread sealant

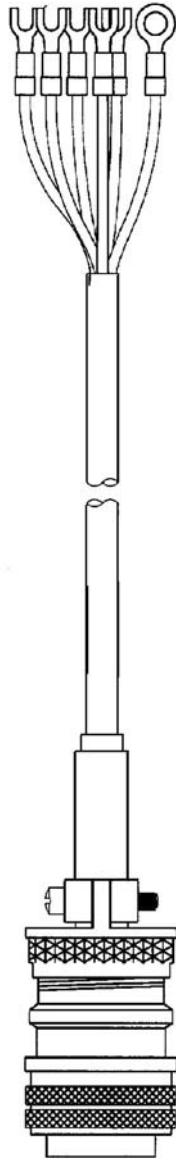




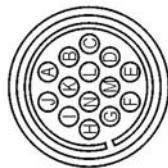
Spindle Brake Assy. 003-2146		
No.	Qty.	Part No. Description
1	1	003-2139 Assy bearing spindle
2	3	330-3063 Scr shldr mod .25 X .63 10-14
3	3	331-0063 Wshr fit .355 X .505
4	1	331-0095 Wshr fit 11/32 X 3/4 sst
5	1	331-0313 Wshr leather .75 ID X .125 thk
6	1	345-0018 Nut hex lock 5/16-18 st
7	3	419-0059 spg comp .468 X .437 X .056
8	1	419-0095 Spg comp .85 X .69 X .75
9	1	431-1266 Plate back-up ring
10	1	431-3726 Adapter spiral spindle
11	1	437-0258 Retainer spool spindle
12	1	437-0259 Knob tension spindle
13	1	437-0645 Spacer spindle
14	1	437-0645 Spindle
15	1	723-0059 Disk ratchet brake
16	1	751-0018 Cap .5 X .5 lg vinyl black
17	A/R	823-0049 Thread locking permanent

005-0608
005-0659

8ft., 115 VAC Lincoln Interface Control Cable
25ft., 115 VAC Lincoln Interface Control Cable



FRONT VIEW
PLUG CONNECTIONS
STRIP OUTER JACKET BACK
3/4" THIS END

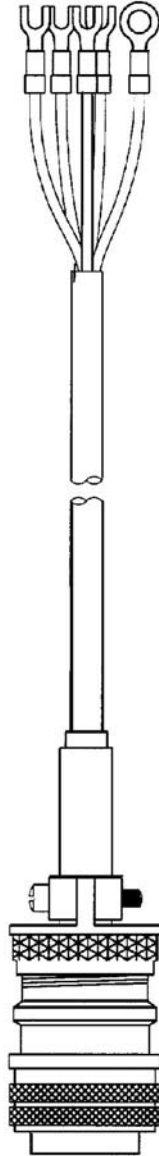
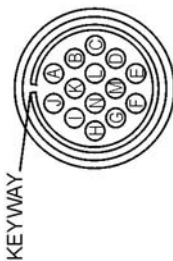


Wire List			
Pin	Wire Color	Terminal	Function
H	Blue	J6-2	PosaStart
C	Red	J6-3	Closing Contact
D	Orange	J6-4	Closing Contact
J	White	J5-1	115V Neutral
A	Black	J5-2	115V Hot
B	Green	Chassis	Ground

005-0316
005-0658

8ft., 115 VAC Miller Interface Control Cable
25ft., 115 VAC Miller Interface Control Cable

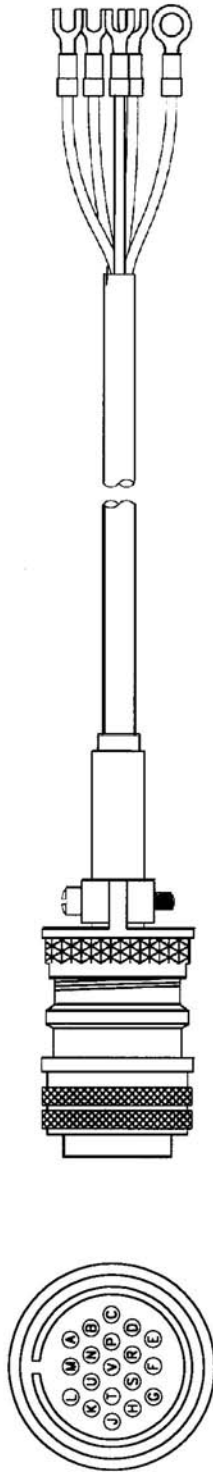
FRONT VIEW
PLUG CONNECTIONS
STRIP OUTER JACKET BACK
3/4" THIS END



Wire List			
Pin	Wire Color	Terminal	Function
A	Red	J6-3	Closing Contact
B	Orange	J6-4	Closing Contact
G	White	J5-1	115V Neutral
I	Black	J5-2	115V Hot
K	Green	Chassis	Ground

NOTE: Posa Start lead from Cobramatic® must be attached to working (welding) ground.

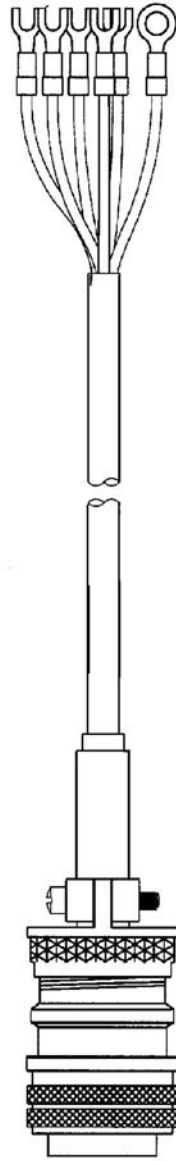
005-0614 8ft Interface Cable for Thermal Arc 19-Pin, 115VAC



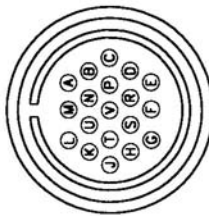
FRONT VIEW
 PLUG CONNECTIONS
 STRIP OUTER JACKET BACK
 3/4" THIS END

Wire List			
Pin	Wire Color	Terminal	Function
A	Red	J6-3	Closing Contact
B	Orange	J6-4	Closing Contact
G	Green	Chassis	Ground
E	Black	J5-2	115V Hot
F	White	J5-1	115V Neutral

005-0614 8ft Interface Cable for ESAB 19-Pin, 115VAC

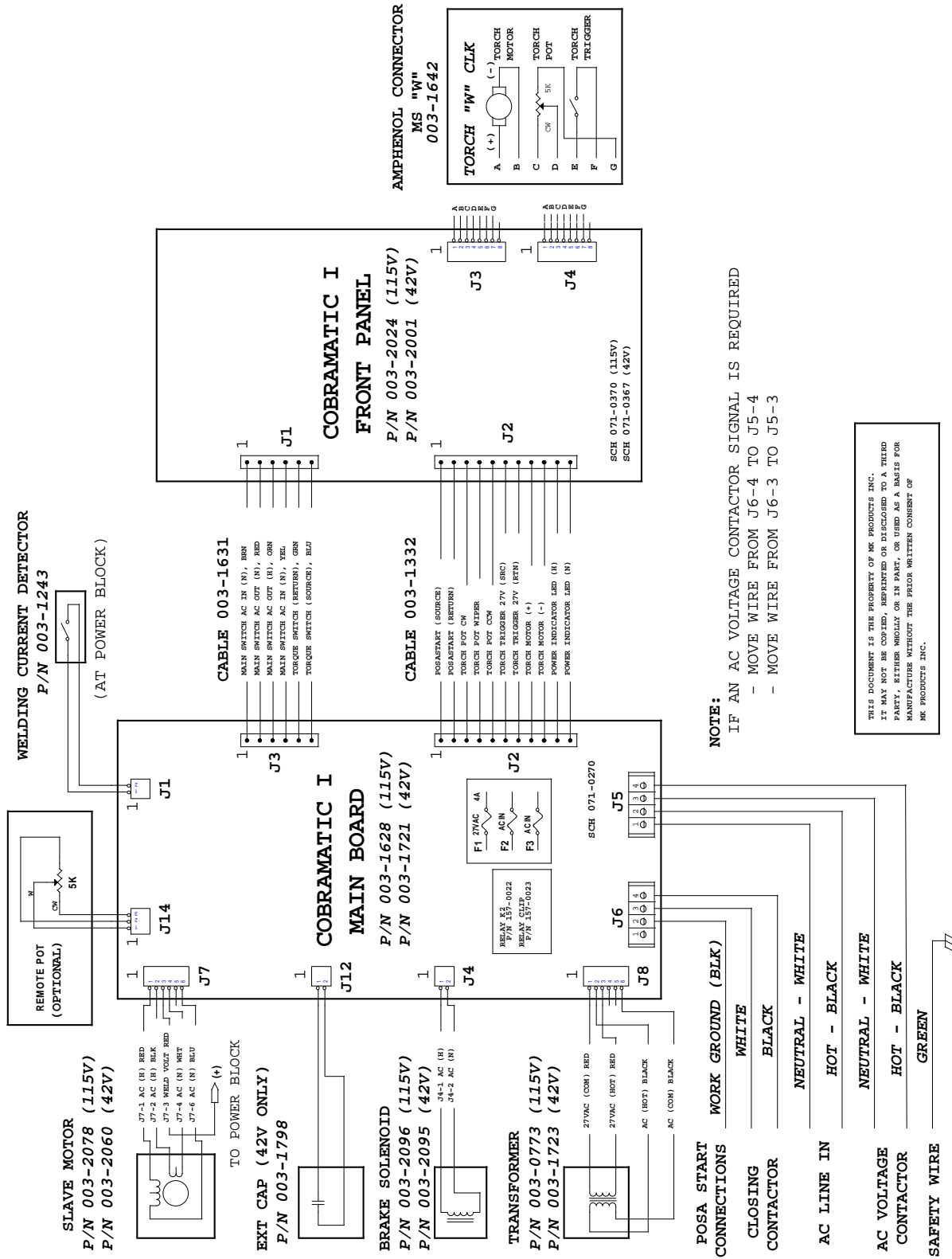


FRONT VIEW
 PLUG CONNECTIONS
 STRIP OUTER JACKET BACK
 3/4" THIS END



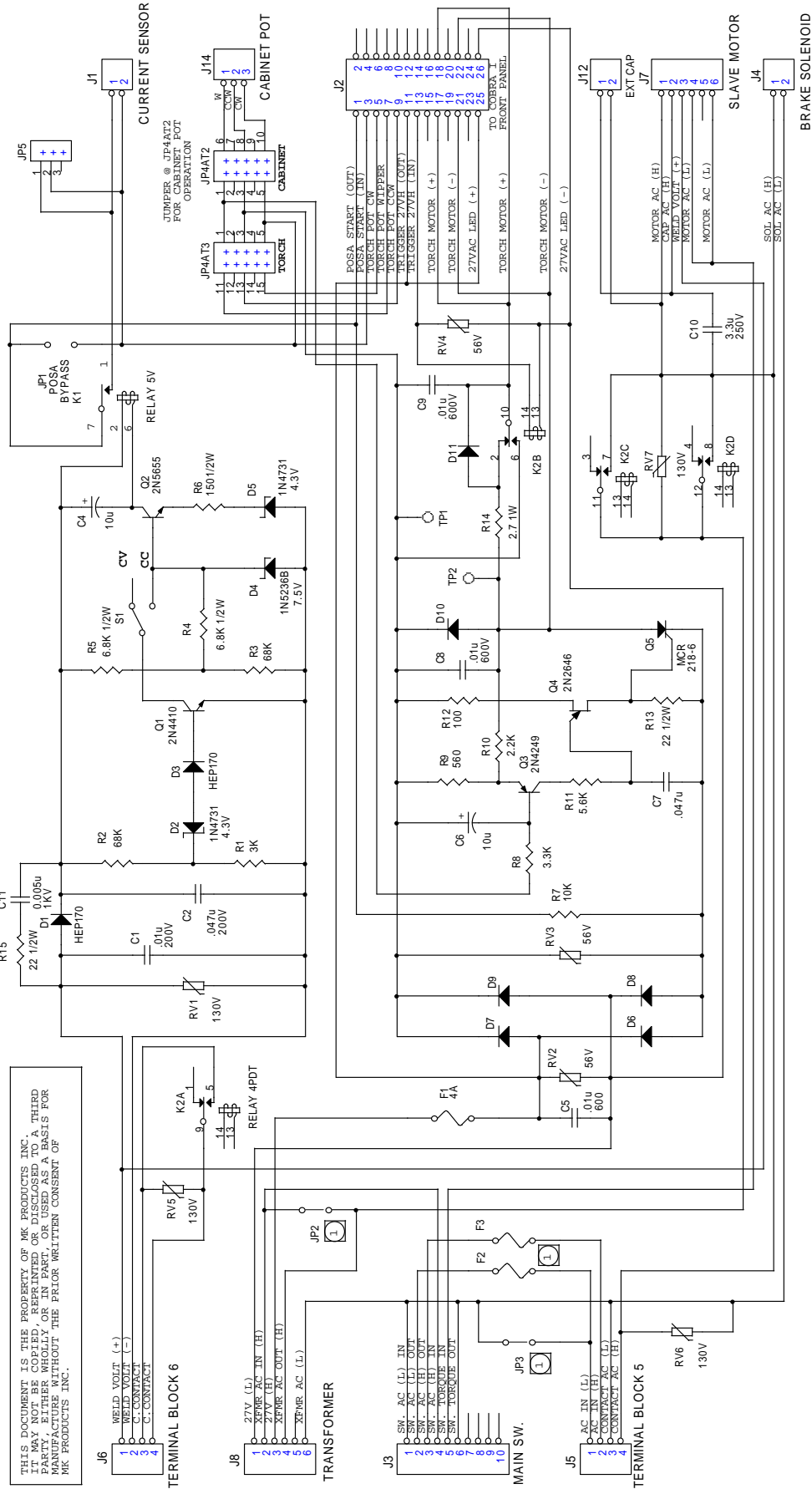
Wire List			
Pin	Wire Color	Terminal	Function
A	Black	J5-2	115V Hot
B	White	J5-1	115V Neutral
D	Green	Chassis	Ground
M	Blue	J6-2	PosaStart
U	Orange	J6-4	Closing Contact
V	White w/ Black or Red	J6-3	Closing Contact

071-0387 Cobramatic Block Diagram

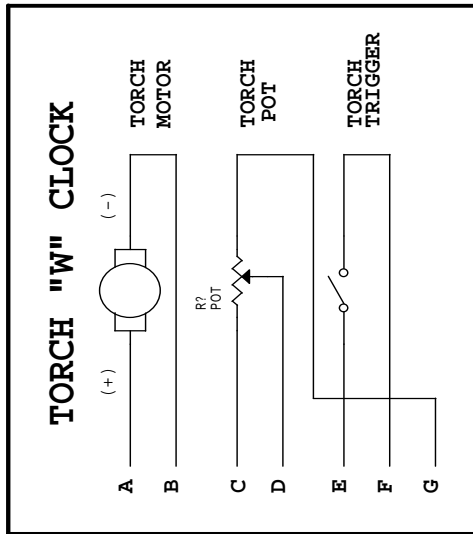
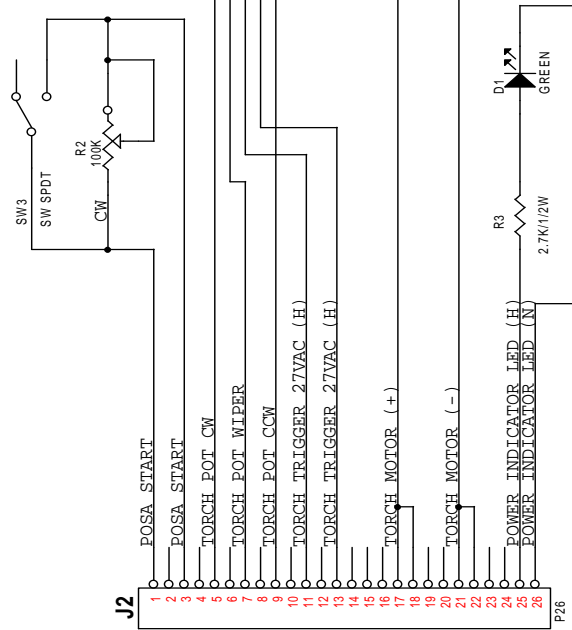
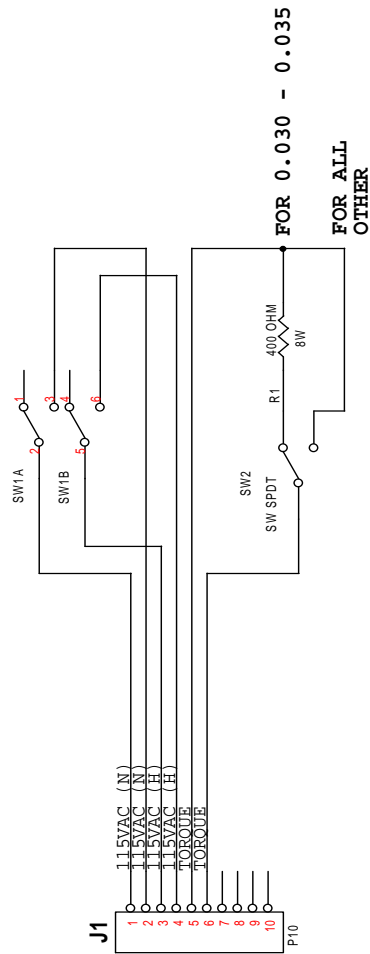


NOTE:
IF AN AC VOLTAGE CONTACTOR SIGNAL IS REQUIRED
- MOVE WIRE FROM J6-4 TO J5-4
- MOVE WIRE FROM J6-3 TO J5-3

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MK WARRANTY REPAIR STATIONS

for MK Products as of 8/29/02
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ALABAMA

AIRGAS - SOUTH, INC. Birmingham, AL 205/251-6835	DIXIE WELDING SUPPLY Attalla, AL 256/538-6157	INDUSTRIAL WELDING SERVICES Quinton, AL 205/674-3258
KIBRO, INC. Theodore, AL 251/653-4672	WELDING ENGINEERING SUPPLY CO. Prichard, AL 334/457-8681	WELDING MACHINE HOSPITAL Montgomery, AL 334/832-9353

ALASKA

RNR, INC. dba Rubey Engine & Electric Anchorage, AK 907/336-5152		
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ARIZONA

PRAXAIR DISTRIBUTION, INC. Phoenix, AZ 602/269-2151	ALLSTATE ELECTRIC MOTOR CO. Phoenix, AZ 602/233-0500	
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ARKANSAS

APPLIED SERVICES, INC. Benton, AR 501/860-6464	ARKANSAS WELDING IND'L SUPPLY Hot Springs, AR 501/321-9922	EL DORADO WELDING & INDUSTRIAL SUPPLY El Dorado, AR 870/863-4088
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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	ARCO WELDER REPAIR Santa Fe Springs, CA 562/921-5240	ARK WELDER REPAIR Fresno, CA 559/292-4714
CAL-WELD SUPPLY Fresno, CA 209/445-0131	DELTA-TECH Sun Valley, CA 818/767-4234	EMCO-EAST WELD'R REPAIR Concord, CA 925/798-4411
FRESNO OXYGEN Fresno, CA 559/233-6684	INDUSTRIAL WELDER REPAIR LaPuente, CA 626/961-7643	NESCO WELDING SUPPLY Fontana, CA 909/427-9670
PRAXAIR DISTRIBUTION (ARC RENTS) Signal Hill, CA 562/989-3212	PRAXAIR DISTRIBUTION, INC. Bakersfield, CA 661/321-9922	R. J. KATES San Diego, CA 619/565-6960
RED-D-ARC, INC. Carson, CA 310/233-3327	SIMS-ORANGE WELDING SUPPLY Santa Ana, CA 714/549-9393	SOUTHWEST WELDER REPAIR Fontana, CA 909/357-1661
SWEINHART ELECTRIC CO., INC. Long Beach, CA 714/521-9100		

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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
CONNECTICUT		
ABCO WELDING & INDUSTRIAL SUPPLY CO. Waterford, CT 800/962-0285	TECH AIR Milford, CT 203/783-1834	
DELAWARE		
KEEN COMPRESSED GAS New Castle, DE 302/594-4555		
FLORIDA		
A & I SPECIALTIES Lehigh Acres, FL 941/368-7435	AAA GENERATOR & PUMP Ft. Myers, FL 941/332-1136	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. Winter Park, FL 407/681-6064
HOLOX Ocala, FL 352/351-4417	J.K. CIRCUIT TECHNOLOGY Boynton Beach, FL 561/733-7859	ROPER ELECTRIC MOTOR SERVICE Panama City, FL 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
TRI-TECH Sarasota, FL 941/758-3825	V.A. ELECTRICAL MOTORS CENTER, INC. Hialeah, FL 305/825-3327	
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	ROSSITER ELECTRIC Idaho Falls, ID 208/529-3665	

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ILLINOIS		
CMS ELECTROMECHANICAL SERVICES, INC. Galesburg, IL 309/342-4125 – 888/964-3526	FRED ARMS ELECTRIC MOTOR REPAIR Stone Park, IL 708/343-6262	INDUSTRIAL WELDER REBUILDERS Alsip, IL 708/371-5688
RELIABLE EQUIPMENT REPAIR Hamel, IL 618/633-5000	ROCKFORD INDUSTRIAL WELDING SUPPLY Rockford, IL 815/226-1900	
INDIANA		
AGA GAS, INC. Hammond, IN 219/989-9030	AIRGAS - MID AMERICA, INC. Evansville, IN 800/424-8905	B & H ELECTRIC Seymour, IN 812/522-5607
COX EQUIPMENT COMPANY Indianapolis, IN 317/241-8881	EVANSVILLE ARMATURE, INC. Evansville, IN 812/428-9034	HARRISON ELECTRIC, INC. Michigan City, IN 219/879-0444
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 ENGRG. & EQUIPMENT Des Moines, IA 515/266-8890
SUPERIOR WELDING SUPPLY Waterloo, IA 319/236-9660	WRIGHT WELDING SUPPLY Ft. Dodge, IA 515/576-0640	
KANSAS		
AEROFORM CORPORATION Coffeyville, KS 620/251-1430	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	WELDERS EQUIPMENT CO. Broussard, LA 337/837-5701	
MARYLAND		
CCM MECH/ELEC REPAIR SERVICE Owings, MD 301/855-7508		

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MASSACHUSETTS		
DYNAMIC WELDING SUPPLY Syracuse, NY 308/832-2088	DYNAMIC WELD'G & REPAIR Bayshore, NY 631/643-1308	HAUN WELDING SUPPLY Syracuse, NY 315/463-5241
MICHIGAN		
ANN ARBOR WLDG 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. Saginaw, MI 517/793-9696
SIMPKINS ELECTRICAL SVC. Michigan Center, MI 517/764-7766	SOUTHPARK WELDING Marysville, MI 810/364-6521	WELDING METALS, INC. Madison Heights, MI 248/585-0480
WESAR COMPANY Three Rivers, MI 616/483-9125		
MINNESOTA		
AIRGAS – NORTH CENTRAL Albert Lea, MN 507/373-2411	CAPITOL CITY WELDING SUPPLY St. Paul, MN 651/224-4843	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	ROD'S SERVICE, INC. St. Louis, MO 314/721-6000
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 HAMPSHIRE		
WELDING SYSTEMS SVC. Raymond, NH 603/895-4700		
NEW JERSEY		
INDUSTRIAL ELECTRIC SER- VICE CO. Hawthorne, NJ 973/423-1212		

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JACKSON WELDING SUPPLY Rochester, NY 585/235-2920		
NORTH CAROLINA		
ADAMS WELDER REPAIR & ELECTRICAL SERVICE, INC. Nashville, NC 252/459-1960	HOLOX LTD. Colfax, NC 336/996-1974	M & L WELDER REPAIR Asheville, NC 828/250-9353
MACHINE & 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 GASES, INC. Lima, OH 419/228-2828	ALBRIGHT WELDING SUPPLY Wooster, OH 330/264-2021	ALL ABOUT SERVICE Wickliffe, OH 440/516-0303
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 330/478-8811	ELECTRIC WELDER REPAIR Cuyahoga Heights, OH 216/271-5600
MAINTENANCE UNLTD. & TOOL REPAIR Cincinnati, OH 513/554-1313	O.E. MEYER CO. Sandusky, OH 419/621-4201	OHIO AIR PRODUCTS Canton, OH 330/821-2771
RICK'S WELDER REPAIR SER- VICE Eastlake, OH 440/269-1204	S.D. NOLD, INC. Lisbon, OH 330/424-3134	VALLEY NATIONAL GASES Cincinnati, OH 513/241-5840
VALLEY NATIONAL GASES Lima, OH 419/228-1008	VALLEY NATIONAL GASES Hilliard, OH 614/771-1311	VALLEY NATIONAL GASES Toledo, OH 419/241-9114
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		

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ARC SYSTEMS SERVICES Central Point, OR 541/665-2676	E C COMPANY dba ELECTRICAL CONSTRUCTION COMPANY Portland, OR 800/452-1511	INDUSTRIAL SOURCE Eugene, OR 541/344-1438
WELDER SERVICE & REPAIR Redmond, OR 541/548-8711		
PENNSYLVANIA		
ALLWELD EQUIPMENT REPAIR Pittsburgh, PA 412/821-8460	BY DESIGN Columbia, PA 717/681-9494	GEOVIC WELDING SUPPLY Milton, PA 717/742-9377
J.A. CUNNINGHAM EQUIP- MENT, INC. Philadelphia, PA 215/426-6650	JOSEPH PINTO, JR. EQUIPMENT CO. E. Lansdowne, PA 610/259-4100	POWER SOURCE REPAIR CO., INC. Collingdale, PA 610/532-6460
VALLEY NATIONAL GASES Pittsburgh, PA 412/281-1835		
SOUTH CAROLINA		
CAROLINA WELDER SVC. Lake City, SC 843/687-0413		
TENNESSEE		
INDUSTRIAL MACHINE REPAIRS Rogersville, TN 423/272-8199	NEXAIR Memphis, TN 901/523-6821	NATIONAL RENTAL & REPAIR Knoxville, TN 423/584-6390
QUALITY WELD'G EQUIPMENT Nashville, TN 615/726-5282	TRAMCO Bristol, TN 423/968-4499	
TEXAS		
AIRGAS-SOUTHWEST, INC. Austin, TX 512/835-0202	AIRGAS-SOUTHWEST, INC. Houston, TX 713/462-8027	DENISON OXYGEN Denison, TX 903/465-3369
FT. WORTH WELDERS SUPPLY, INC. Ft. Worth, TX 817/332-8696	GPC SERVICES, INC. San Angelo, TX 915/655-4545	LEKTROTECH, INC. Greenville, TX 903/454-7146
RITE-WELD SUPPLY, INC Fort Worth, TX 817/626-8237	TexAir WELDING SUPPLY Longview, TX 903/238-9353	WELDING MACHINE & TORCH REPAIR San Antonio, TX 210/680-8390
UTAH		
ARC SERVICES, LLC West Valley City, UT 801/975-1121	C.W. SILVER INDUSTRIAL SERVICE Salt Lake City, UT 801/531-8888	

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VERMONT		
W.J. WELDING EQUIPMENT REPAIR, INC. N. Clarendon, VT 802/775-7422		
VIRGINIA		
AIR PRODUCTS & CHEMICALS, INC. Bristol, VA 540/669-3161	ARC WELDERS, INC. Ashland, VA 804/798-1818	ARCET EQUIPMENT CO. Hampton, VA 757/728-9353
N.W. MARTIN CO. Springfield, VA 703/644-0120	NORFOLK WELDERS SUPPLY Norfolk, VA 804/622-6571	
WASHINGTON		
AIRGAS - NORPAC, INC. Tacoma, WA 253/473-2282	AIRGAS – NORPAC, INC. Vancouver, WA 360/574-5311	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 & ENGINE REPAIR Seattle, WA 206/382-6227	
WEST VIRGINIA		
CARDINAL SALES & SERVICE, INC. Clarksburg, WV 304/622-7590	WILLARD C. STARCHER Spencer, WV 304/927-2520	
WISCONSIN		
INTERSTATE WELDING SALES CORP. Appleton, WI 920/734-7173	MOSINEE MACHINE & ELECTRIC Mosinee, WI 715/693-0858	PRAXAIR DISTRIBUTION, INC. Brookfield, WI 414/938-6365
VALLEY NATIONAL GASES Milwaukee, WI 414/281-9540	WELDER REPAIR & SERVICE Fredonia, WI 262/692-3068	
CANADA		

MK WARRANTY REPAIR STATIONS

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A&A WELDER SERVICES LTD. Saskatoon, Saskatchewan 306/934-1601	ARC & GENERATOR REPAIR Garson, Ontario 705/525-2141	B. HARRIS WELDING SVCS. Dartmouth, Nova Scotia 902/468-6255
BARRY HAMEL EQUIPMENT LTD. Coquitlam, B.C. 604/945-9313	D-TECH WELD SERVICES Regina, Saskatchewan 306/586-9353	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 819/376-6577	LeBLANC ELECTRO-TECH, INC. Boucherville, Quebec 450/449-5244	M.R.T. REPAIR CENTER, INC. Montreal, Quebec 514/648-0800
OZARK ELECTRICAL MARINE LTD. St. Johns, Newfoundland 709/726-4554	PEEL ENGINES Mississauga, Ontario 905/670-1535	PROMOTECH ÉLECTRIQUE, INC. Fleurimont, Quebec 819/822-2111
WELDERS SUPPLY Winnipeg, Manitoba 204/772-9476	WELDERTECH Calgary, Alberta 403/279-3432	WELDTEC B.C. 604/545-3886
CHINA		
PHT Group Company Beijing, China 86-10-6858 8395		

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WARNING	<ul style="list-style-type: none"> ● Do not touch electrically live parts or electrode with skin or wet clothing. ● Insulate yourself from work and ground. 	<ul style="list-style-type: none"> ● Keep flammable materials away. 	<ul style="list-style-type: none"> ● Wear eye, ear and body protection.
Spanish AVISO DE PRECAUCION	<ul style="list-style-type: none"> ● No toque las partes o los electrodos bajo carga con la piel o ropa mojada. ● Aíslese del trabajo y de la tierra. 	<ul style="list-style-type: none"> ● Mantenga el material combustible fuera del área de trabajo. 	<ul style="list-style-type: none"> ● Protéjase los ojos, los oídos y el cuerpo.
French ATTENTION	<ul style="list-style-type: none"> ● Ne laissez ni la peau ni des vêtements mouillés entrer en contact avec des pièces sous tension. ● isolez-vous du travail et de la terre. 	<ul style="list-style-type: none"> ● Gardez à l'écart de tout matériel inflammable. 	<ul style="list-style-type: none"> ● Protégez vos yeux, vos oreilles et votre corps.
German WARNUNG	<ul style="list-style-type: none"> ● Berühren Sie keine stromführenden Teile oder Elektroden mit Ihrem Körper oder feuchter Kleidung! ● Isolieren Sie sich von den Elektroden und dem Erdboden! 	<ul style="list-style-type: none"> ● Entfernen Sie brennbares Material! 	<ul style="list-style-type: none"> ● Tragen Sie Augen-, Ohren- und Körperschutz!
Portuguese ATENÇÃO	<ul style="list-style-type: none"> ● Não toque partes elétricas e electrodos com a pele ou roupa molhada. ● isole-se da peça e terra. 	<ul style="list-style-type: none"> ● Mantenha inflamáveis bem guardados. 	<ul style="list-style-type: none"> ● Use proteção para a vista, ouvido e corpo.
Japanese 注意事項	<ul style="list-style-type: none"> ● 通電中の電気部品、又は溶材にヒフやぬれた布で触れないこと。 ● 施工物やアースから身体が絶縁されている様にして下さい。 	<ul style="list-style-type: none"> ● 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。 	<ul style="list-style-type: none"> ● 目、耳及び身体に保護具をして下さい。
Chinese 警告	<ul style="list-style-type: none"> ● 皮肤或湿衣物切勿接触带电部件及焊缝。 ● 使你自已离地面和工作件绝缘。 	<ul style="list-style-type: none"> ● 把一切易燃物品移离工作场所。 	<ul style="list-style-type: none"> ● 佩戴眼、耳及身体劳动保护用具。
Korean 위험	<ul style="list-style-type: none"> ● 전도체나 용접봉을 젖은 함집 또는 피부로 절대 접촉치 마십시오. ● 모재와 접지를 접촉치 마십시오. 	<ul style="list-style-type: none"> ● 인화성 물질을 접근 시키지 마십시오. 	<ul style="list-style-type: none"> ● 눈, 귀와 몸에 보호장구를 착용하십시오.
Arabic تحذير	<ul style="list-style-type: none"> ● لا تلمس الأجزاء التي يسري فيها التيار الكهربائي أو الأقطاب بجسدك أو بالملابس المبللة بالماء. ● ضع عازلاً على جسمك خلال العمل. 	<ul style="list-style-type: none"> ● ضع المواد القابلة للاشتعال في مكان بعيد. 	<ul style="list-style-type: none"> ● ضع أدوات وملابس واقية على عينيك وأذنيك وجسمك.

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

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

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

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

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

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

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

請詳細閱讀並理解製造廠提供的說明以及應該使用的銀焊材料，並請遵守貴方的有關勞動保護規定。

이 제품에 등봉된 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 January 1, 2000

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 and Weldheads 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 : January 1, 2000



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