

# INSTRUCTIONS AND PARTS MANUAL

## CWP-5 PROGRAMMABLE CIRCLE WELDER

Please record your equipment identification information below for future reference. This information can be found on your machine nameplate.

Model Number \_\_\_\_\_

Serial Number \_\_\_\_\_

Date of Purchase \_\_\_\_\_

Whenever you request replacement parts or information on this equipment, always supply the information you have recorded above.

LIT-CWP-5-IPM-0218

Bug-O Systems is guided by honesty, integrity and  
ethics in service to our customers and in all we do.



**B U G - O   S Y S T E M S**

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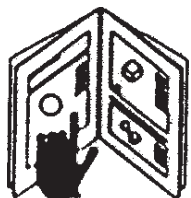
## SAFETY

**PROTECT YOURSELF AND OTHERS FROM SERIOUS INJURY OR DEATH. KEEP CHILDREN AWAY. BE SURE THAT ALL INSTALLATION, OPERATION, MAINTENANCE AND REPAIR PROCEDURES ARE PERFORMED ONLY BY QUALIFIED INDIVIDUALS.**



### **ELECTRIC SHOCK can kill.**

- 1) The equipment is not waterproof. Using the unit in a wet environment may result in serious injury. Do not touch equipment when wet or standing in a wet location.
- 2) The unused connectors have power on them. Always keep the unused connectors covered with the supplied protective panels. Operation of the machine without the protective panels may result in injury.
- 3) Never open the equipment without first unplugging the power cord or serious injury may result.
- 4) Verify the customer-supplied power connections are made in accordance with all applicable local and national electrical safety codes. If none exist, use International Electric Code (IEC) 950.
- 5) Never remove or bypass the equipment power cord ground. Verify the equipment is grounded in accordance with all applicable local and national electrical safety codes. If none exist, use International Electric Code (IEC) 950.



### **READ INSTRUCTIONS.**

Read the instruction manual before installing and using the equipment.



### **EQUIPMENT DAMAGE POSSIBLE.**

- 1) Do not plug in the power cord with out first verifying the equipment is OFF and the cord input voltage is the same as required by the machine or serious damage may result.
- 2) Always verify both the pinion and wheels are fully engaged before applying power or equipment damage may occur.
- 3) Do not leave the equipment unattended.
- 4) Remove from the work site and store in a safe location when not in use.



### **FALLING EQUIPMENT can cause serious personal injury and equipment damage.**

Faulty or careless user installation is possible. As a result, never stand or walk underneath equipment.



### **MOVING PARTS can cause serious injury.**

- 1) Never try to stop the pinion from moving except by removing power or by using the STOP control.
- 2) Do not remove any protective panels, covers or guards and operate equipment.

## HIGH FREQUENCY WARNINGS

**SPECIAL PRECAUTIONS ARE REQUIRED WHEN USING PLASMA, TIG OR ANY WELDING PROCESS THAT USES HIGH FREQUENCY TO STRIKE AN ARC.**



**WARNING:** HIGH FREQUENCY CAN EFFECT MACHINE OPERATION AND THEREFORE, WELD QUALITY.

**Read the precautions below before installing and using the equipment.**

### **PRECAUTIONS:**

- 1) Some plasma or welding cables are strong sources of high frequency interference. NEVER lay a plasma or welding cable across the controls of the machine.
- 2) Always physically separate the plasma or welding cable leads from the machine cables. For example, the plasma or welding cable leads should NEVER be bundled with a pendant cable or the machine power cord. Maximize the separation between any machine cables and the plasma or welding cables.
- 3) Strictly follow the grounding procedures specified for the plasma or welding unit.  
NOTE: Some plasma and welding units produce exceptionally large amounts of high frequency noise. They may require a grounding rod be driven into the earth within six feet (2 meters) of the plasma or welding unit to become compatible with an automatic cutting or welding process.
- 4) If the high frequency is produced using a spark gap, adjust the points so the gap is as small as possible. The larger the gap, the higher the voltage and the higher the interference.
- 5) Some plasma or welding units will inject high frequency interference into the AC power line. Use separate power line branches whenever possible to power the plasma or welding source and the machine. Do not plug them into the same outlet box.
- 6) High frequency noise may enter the machine through the plasma or welding supply remote contactor leads. Some plasma and welding sources can produce noise spikes of up to several thousand volts. These sources are not compatible with automated cutting and welding equipment. It is recommended that the remote contactor leads on these plasma or welding sources not be connected to the machine. An alternate solution is to purchase a separate remote contactor isolation box.

# CWP-5 PROGRAMMABLE CIRCLE WELDER

## INSTRUCTIONS AND PARTS MANUAL

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## INTRODUCTION

The CWP-5 Circle Welder is designed for circular single or multi-pass welding of couplings on sprinkler pipe utilizing MIG or FLUX CORED process, with gas shielding. For 1-12 in. (25.4-304.8 mm) diameter welds. The CWP-5 can accommodate couplings in both on-center and hillside positions.

## FEATURES

- Amperage & wire speed control
- Wire feeder with one set of drive rolls
- 1/12 HP P.M. motor and rotational speed control
- 300 AMP Gun & cable assembly
- Gas shielding kit with 120 VAC solenoid valve
- 5/8" (16 mm) gas cup
- Burn back control
- 50 ft. (15 m) power cable
- 50 ft. (15 m) gas shielding hose
- 50 ft. (15 m) weld cable
- Quick disconnects for all cables
- Weld contact switch
- Cold wire inch switch
- Wire direction switch
- Pre and post flow controls
- Wire reel adaptor for 30 lb. (14 kg) spools
- Adjustable vertical and horizontal torch positioning system
- Microprocessor controlled rise and fall with 5" (125 mm) of travel
- Brushes and collector rings for welding current, rated at 300 AMPS 100% duty cycle
- Brushes and collector rings for all controls, eliminate cable and hose wrap



## SETUP AND OPERATION

### POWER SOURCE

Use only constant voltage type power sources with this circle welder machine. If using a multiple process power source, be sure that it is set for constant voltage output as per the instructions in the manual for the power source. Set the power source polarity switch or properly connect the electrodes and work leads for the correct electrode polarity.

### FIXTURING

All circle welders have to be fixtured in some manner from the top of the shaft. This may be achieved in one of the following: column & boom, manipulator or carriage & monorail.

### GUNS AND CABLES

All circle welders come equipped with a gun and cable assembly. It is our recommendation that at least once a week the liner be taken out of the cable and soaked overnight in a solvent solution. To keep the wire moving it is also recommended that a felt clip be saturated with a product like Ferro Slick and fed thru the incoming tube of the wire feeder at least once a day.

### ADDITIONAL CABLES

The circle welders are supplied with the following cables:

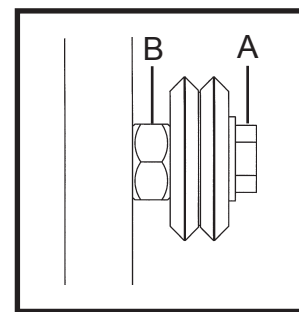
1. CWO-3139 50' (15 m) power cable that connects the power source to the cable connector on the top gear of the machine.
2. CWO-3019 50' (15 m) weld cable that connects the lead coming out of the top of the machine using the quick connect connector to your power supply.
3. CWO-9406 50' (15 m) gas shielding hose that connects the gas fitting on the top of the shaft to your shielding gas supply. MIG models, only.

### WIRE SPEED AND VOLTAGE ADJUSTMENT

The wire speed control, on the Control Panel, is calibrated directly in inches per minute. Set the voltage using the control on the power source.

### WHEEL ADJUSTMENT

The CWP-5 Racking System CBP-1670 and the Small Horizontal Racker CWO-1685 are equipped with adjustable wheels. Always check these components for proper wheel adjustment before using the machine. The wheels need adjustment if you can cock or wiggle the components out of alignment. The wheels should be snug but not prohibit movement along the path of travel. The wheels with the hex stand offs are adjustable, as shown in Figure 1. To adjust the wheels, loosen the hex bolt (A) until the adjustable bushing (B) can be rotated. Correct the wheel alignment by rotating the adjustable bushing (B). Once adjusted, hold the adjustable bushing (B) while tightening the hex bolt (A). Recheck alignment.



*Figure 1: Wheel Adjustment*

## SETUP AND OPERATION, CONT'D.

### MACHINE CONTROLS

Please refer to pages 8-9 in this manual entitled CWP-1570 Control Panel for descriptions of the various control parameters that are available.

### WELD STARTING POSITION

Proper positioning of the electrode is crucial to a successful weld. The CWP-5 rotates in a clockwise direction. Depending on the job, whether on-center or hillside, or the process, the optimum starting point of the weld may vary. The desired starting position should be entered at setup as an angle to the pipe axis direction, as shown in Figure 3.

The default start position (start angle =  $0.00^\circ$ ) is shown as A and B in Figure 3. For an on-center joint, this would be the topmost point. For a hillside joint,  $-90.00^\circ$  is the topmost point (C in Figure 3) and  $90.00^\circ$  is the lowest point.

During setup, enter the Start Angle in hundredths of degrees: 4500 is  $45.00^\circ$ . The machine makes one revolution from the start point for each pass. Overlap is only added to the last pass.

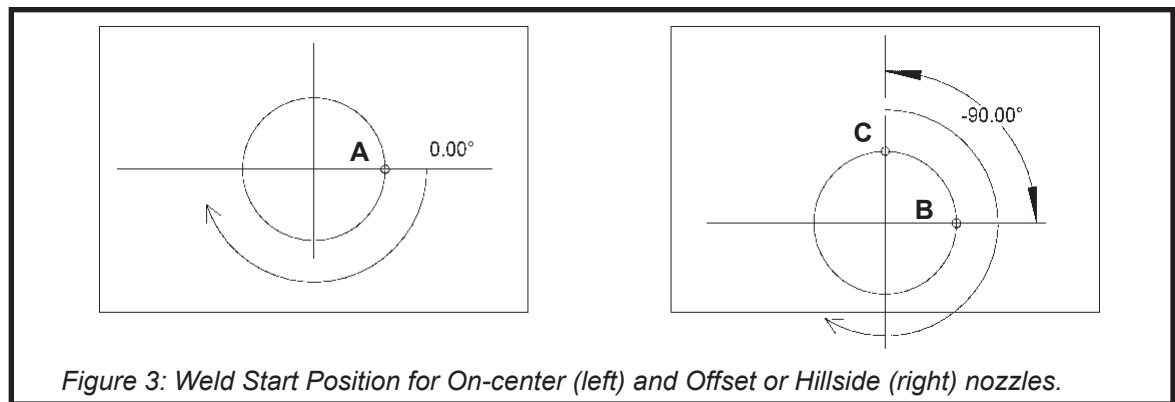


Figure 3: Weld Start Position for On-center (left) and Offset or Hillside (right) nozzles.

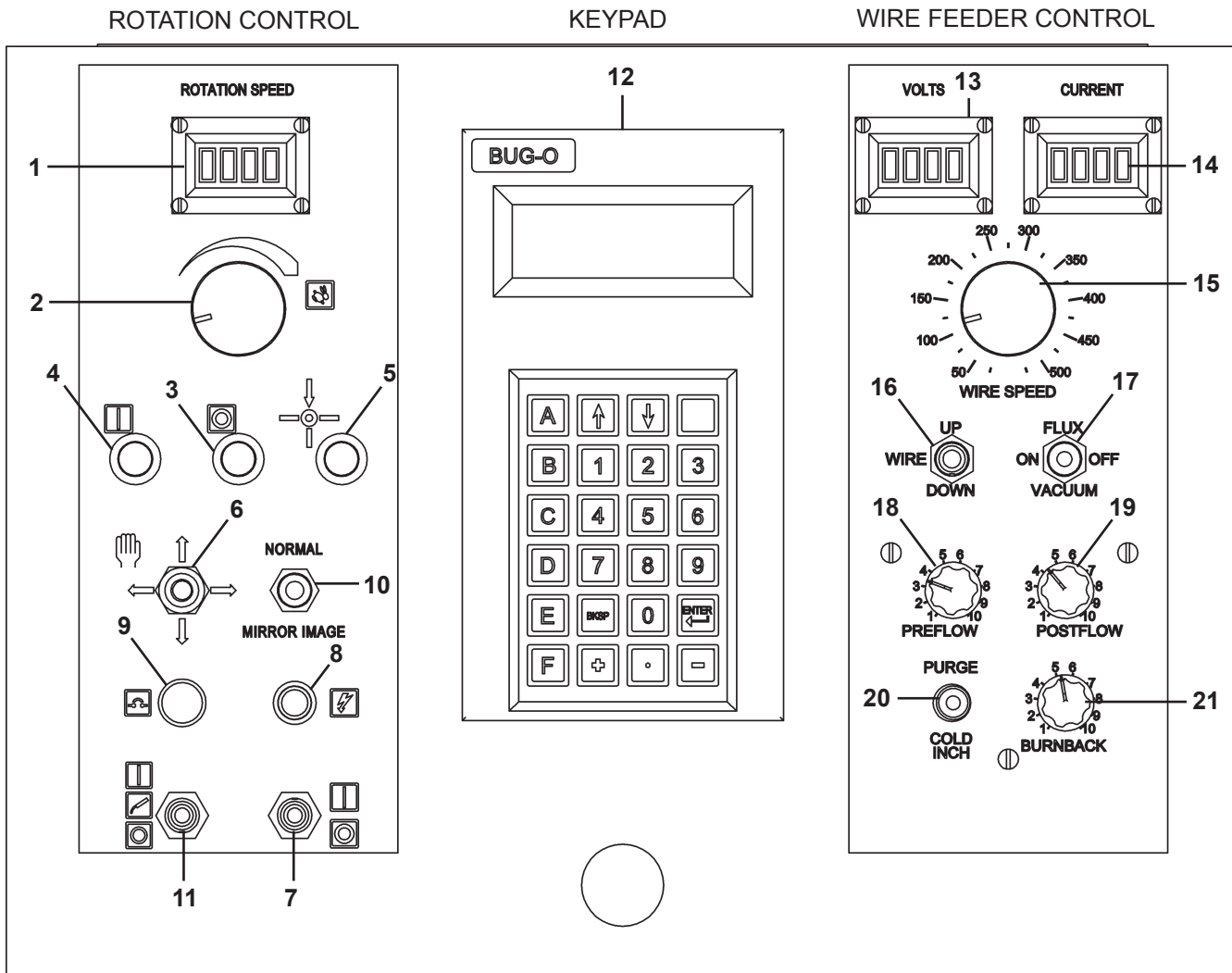
### MAKING A WELD

1. Connect the ground cable to the workpiece. The ground cable must make good electrical contact with the work.
2. Set Weld ON/OFF Switch to the OFF position.
3. Depress red STOP button.
4. Position the welding gun at the start position using the Racking System CBP-1670 and the rotation controls. Position the electrode in the joint. The end of the electrode may be lightly touching the work.
5. Depress the black RESET button to set a new Home position.
6. Using the keypad, call up the desired program number or input a new program. When finished, press "D" to review the program data.
7. Set the Weld ON/OFF Switch to the ON position.
8. Depress the green START button to begin the weld program.
9. Turn on the FLUX RECOVERY VACUUM Switch to the ON position.
10. The CWP-5 will automatically stop at the end of the weld program.

**WARNING: When using an open arc process, it is necessary to use correct eye, head and body protection.**

## CWP-1570 CONTROL PANEL

The CWP-1570 control panel, (shown below), controls all aspects of the CWP-5 machine and the weld and provides real time displays for Rotation Speed, Volts, and Current. The panel is divided into three major sections - Rotation Controls, Keypad and Wire Feeder Controls.



- 1 ROTATION SPEED (REF. # ONLY)
- 2 SPEED CONTROL
- 3 STOP / PAUSE
- 4 START / RESUME
- 5 RESET
- 6 MANUAL JOG
- 7 CONTROL POWER
- 8 POWER INDICATOR
- 9 CIRCUIT BREAKER
- 10 MIRROR IMAGE
- 11 WELD ON/OFF

- 12 KEYPAD
- 13 VOLTS METER
- 14 CURRENT METER
- 15 WIRE FEED SPEED
- 16 WIRE DIRECTION
- 17 FLUX VACUUM
- 18 PREFLOW
- 19 POSTFLOW
- 20 PURGE / COLD INCH
- 21 BURNBACK



# CWP-1570 CONTROL PANEL, CONT'D.

## ROTATION CONTROLS

The rotation controls are located on the left portion of the control panel (Items 1-11 on page 8). Use these controls to maneuver the electrode to the starting position, to start or interrupt the weld and to control the rotation speed. A brief description of each item is provided below.

<b>ROTATION SPEED</b>	Displays reference # only
<b>SPEED CONTROL</b>	Controls speed of rotation. Turn right to increase; left to decrease
<b>STOP / PAUSE</b>	Immediately stops welding and rotation. Does not burnback or purge
<b>START / RESUME</b>	Starts or resumes program
<b>RESET</b>	Resets home or weld start position
<b>MANUAL JOG</b>	Manually position welding electrode for vertical and horizontal axes
<b>CONTROL POWER</b>	Enables / Disables power to control panel
<b>POWER INDICATOR</b>	When lit, indicates power ON to control panel
<b>CIRCUIT BREAKER</b>	Protects control box electronics
<b>MIRROR IMAGE</b>	Reverses rotation direction
<b>WELD ON/OFF</b>	ON enables weld. OFF disables weld for dry run

## KEYPAD

The keypad (Item 12 on page 8) is the second section of the control panel. This is used for programming and inputting dimensions. Refer to the section titled "Programming" (below) for more detailed information. An overview of the key functions is provided below.

<b>ALPHA KEYS</b>	Press keys A, B, C, D, or E for the function desired, as described in the "Programming" section of this manual.
<b>DIGIT KEYS</b>	Use the digit keys to enter pipe diameters or dimensions.
<b>ENTER</b>	Push the ENTER button to store the numeric value entered.
<b>BACKSPACE</b>	Use BACKSPACE to remove the last digit keyed in before pushing the ENTER button, if a correction is required.
<b>SHIFT</b>	The blank key in the top right corner of the keypad is the SHIFT key. Use this key to access additional programming options.
<b>ARROW KEYS</b>	Used to jog vertical axis during auto-run program to set new torch position.

## PROGRAMMING

### FUNCTION KEYS

All programming is done using the **PENDANT CONTROL**. Use the following Alpha Keys for programming:

- A: To enter dimensions.
- B: To enter the time delay for puddle build-up.
- C: To change Program Number in memory (numbers 0 – 99).
- D: To display the dimensions of the weld.
- E: To enter the number of passes (1 – 99).

Three other useful key functions are:

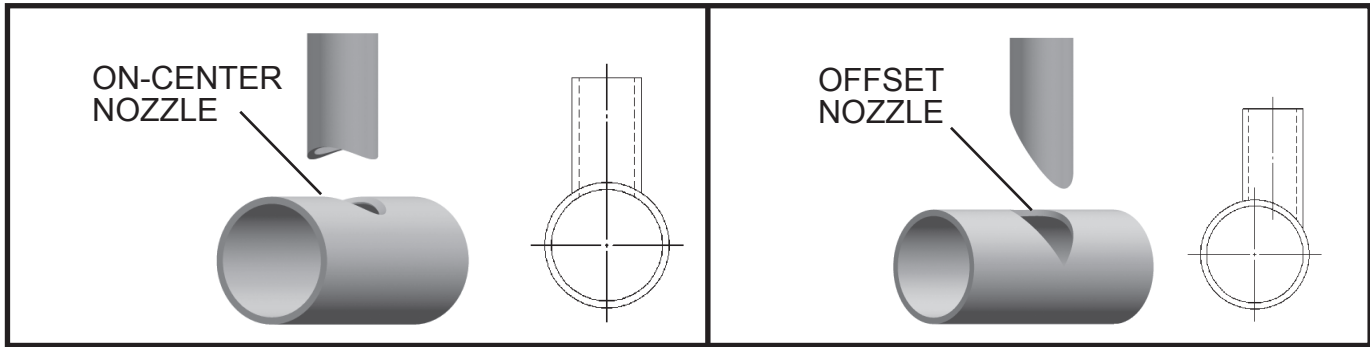
- Shift 9: Set units, English (inch) or metric (meters)
- Shift 8: Test drives & encoders
- Shift E: Version number (have this information ready when calling for service)

### DATA REQUIRED

1. Small diameter (nozzle size)
2. Large diameter (pipe it fits on)
3. Offset distance between centerlines

When entering data, use the diameter of the cylinder along whose intersection the cut has been made. Usually this will be the inside diameter of the nozzle or the outside diameter of the pipe it fits on. This will also allow for any bevel, if necessary. If no offset, enter “0” or just press “Enter”.

NOTE: If the STOP / RESUME button is pressed, the machine will be in pause mode, and cannot be programmed. Press the RESET button to get back to the ready mode for programming.



## DATA ENTRY

When entering data with the pendant keypad, multiply inches, degrees, or seconds by 100 and enter the number without a decimal point. For metric dimensions, multiply mm X 10 or cm X 100.

Example: 350 for 3.5 inches,  
800 for 80 mm, on metric machines

Press “ENTER” on the keypad after the number is entered.

## SAVING PROGRAMS

The machine has 100 storage areas or welds, numbered 0 to 99 in memory. Push the “C” button on the pendant keypad to change (or set) the program number and enter the desired number. Program data is retained until reprogrammed. At any time, one of these numbers is selected, it will stay selected even when power is shut off and turned back on, it will not change until the program number is changed by the operator. Settings for time delay and number of passes are not saved as part of a program.

## WIRE FEEDER CONTROLS

The third section of the control panel is the wire feeder controls (Items 12-21 on page 8). An overview of each wire feeder control is provided below. For more detailed information, refer to the Lincoln Operating manual.

<b>VOLTS</b>	Displays actual voltage during welding
<b>CURRENT</b>	Displays actual current (amps) during welding
<b>WIRE FEED SPEED</b>	Controls the feed speed of the wire. Turn left for slower speeds; right for higher speeds.
<b>WIRE DIRECTION</b>	Controls the direction the wire is being fed through the feeder. UP to return wire to the spool. DOWN to feed the wire to the gun in order to weld.
<b>FLUX VACUUM</b>	Turns the Flux Recovery Vacuum ON and OFF.
<b>PREFLOW</b>	Controls flow of shielding gas to the work before the arc is established. The gas solenoid valve is energized immediately when the gun trigger is closed, but the time delay before the wire feeder is energized is adjustable from 0 to 1.5 seconds. Turn the knob LEFT for shorter delays, RIGHT for longer delays.
<b>POSTFLOW</b>	Controls flow of shielding gas to the work after the welding has stopped. Adjustable from 0.5 to 4.5 seconds. Turn the knob LEFT for shorter delays, RIGHT for longer delays.
<b>PURGE / COLD INCH</b>	Control some wire feeder functions without energizing the welding power source. The momentary UP position energizes the gas solenoid, but not the wire feeder or welding power source. The momentary DOWN position energizes the wire feeder but not the gas solenoid or the welding power source.
<b>BURNBACK</b>	Provides a precise time delay that allows the wire to be burned off at the end of the weld. This is useful for those applications where higher speed, fine wire feeding is used and there is a tendency for the electrode to overrun at the end of the weld and cause “sticking” in the crater. The delay is adjustable for optimum burnback depending on wire size, process, procedure, etc.

## EXAMPLE

The following is a step-by-step example for setting up and running the CWP-5.

### BASIS:

Weld a 2" nozzle onto a 10" header, with an offset of 2" and a weld overlap of 5°. Weld a single pass, and allow 0.3 seconds for puddle build-up at the start of the weld. Assign program number 01 to this weld.

#### Step 1. Setup fixturing for the CWP-5.

- Setup machine on carriage with monorail and pipe stands, as described on page 32.

#### Step 2. Install the CWP-5

- Connect ground cable to work piece; ensure good contact
- Set the Weld switch to OFF
- Power ON the Control Panel
- Set travel speed using the rotation control box

#### Step 3. Position the welding gun.

- Press the red [STOP] button
- Using rotation controls and CBP-1670 racking system, place the electrode at the weld start (as shown in Figure 2 on page 7)
- Press the black [RESET] button

#### Step 4. Program the weld.

- Press [SHIFT], [9] to select units
- Press [C] to set the program number  
[0], [1], then [ENTER] or [1], then [ENTER]
- Press [A] to set dimensions
  - At the "Enter Small Diameter" prompt, enter the nozzle diameter.  
[2], [0], [0], then [ENTER]
  - At the "Enter Large Diameter" prompt, enter the vessel diameter.  
[1], [0], [0], [0], then [ENTER]
  - At the "Offset" prompt, enter the offset distance.  
[2], [0], [0], then [ENTER]
  - At the "Overlap" prompt, enter the amount of the overlap in degrees.  
[5], [0], [0], then [ENTER]
- Press [B] to enter time delay for puddle build-up  
Note: This value is universal and not associated with program number.  
[3], [0], then [ENTER]
- Press [D] to display or review the program dimensions
- Press [E] to set number of passes  
[1], then [ENTER]

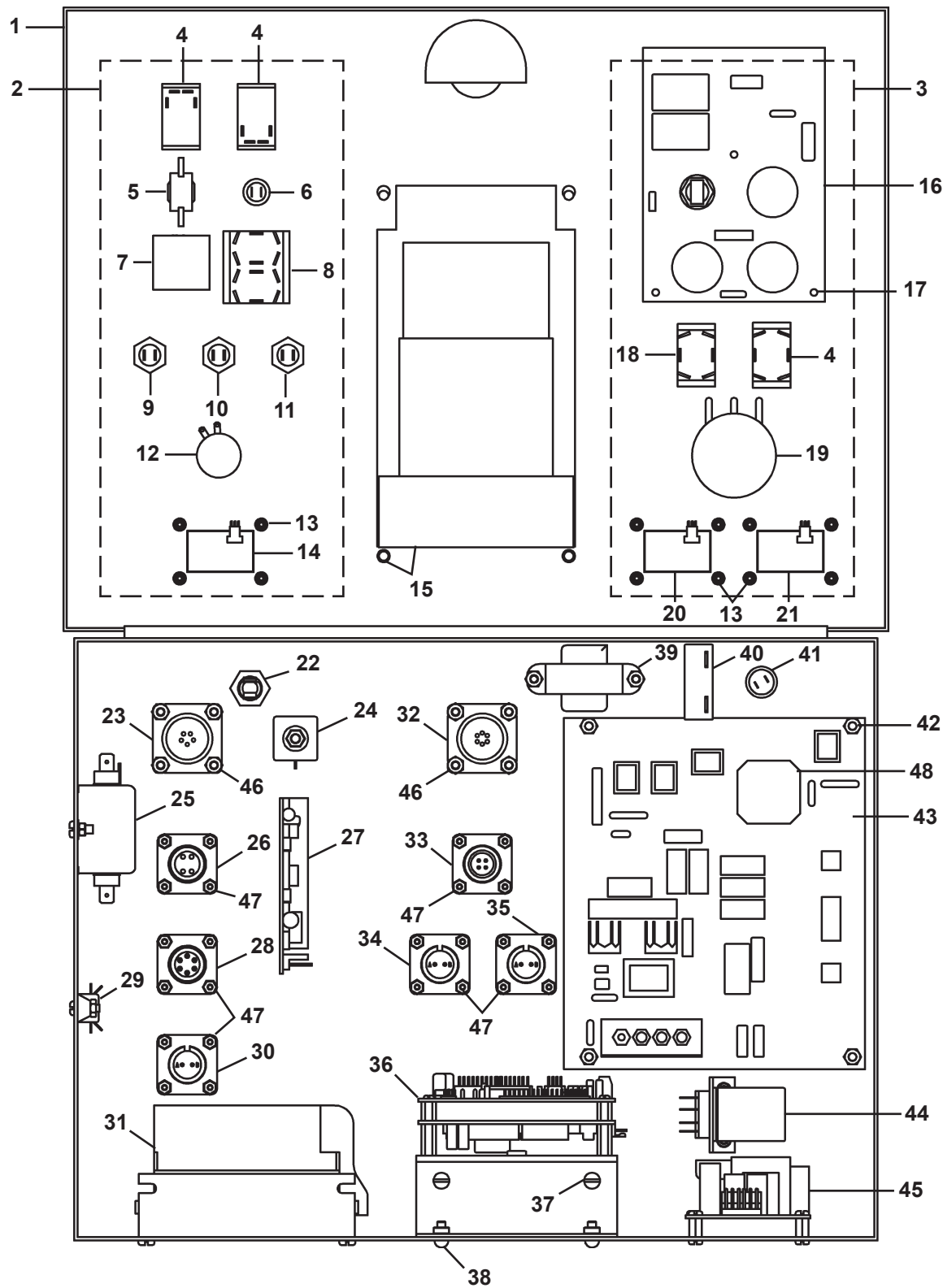
#### Step 5. Start the weld.

- Set the Weld switch to ON
- Depress the green [START] button

#### Step 6. End the weld.

- The CWP-5 will automatically stop after completing the number of passes entered
- Depress the red [STOP] button after the weld has stopped and before repositioning the machine

CWP-1570 CONTROL PANEL - OPEN BOX / EXPLODED VIEW



# CWP-1570 CONTROL PANEL - OPEN BOX / PARTS LIST

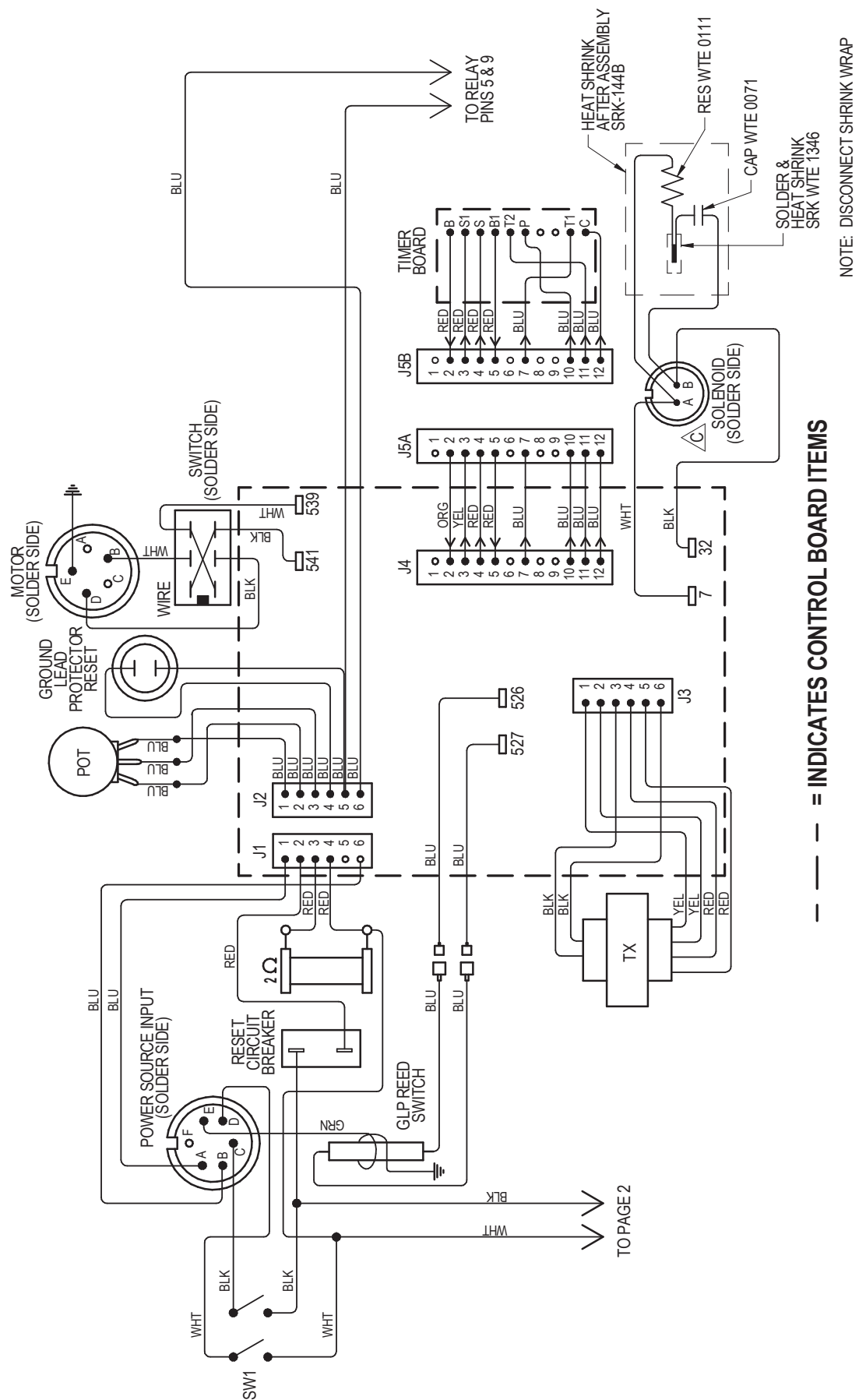
<u>ITEM</u>	<u>QTY</u>	<u>PART NO.</u>	<u>DESCRIPTION</u>	<u>ITEM</u>	<u>QTY</u>	<u>PART NO.</u>	<u>DESCRIPTION</u>
1	1	CWP-1571	Enclosure, hinged	29	1	BUG-6028	Terminal Block, Kulka
2	1	CWP-1573	Legend Plate, Rotation	29	2	FAS-0115	Screw, Pan Hd, 6-32x1/2
3	1	CWP-1572	Legend Plate, Wire Feed	29	2	FAS-1310	Hex Nut 6-32
4	3	ARM-2279	Toggle Switch	30	1	BUG-9486	Panel Connector, 2T-M
5	1	BUG-2923	Circuit Breaker, 0.7 amp	31	1	CWO-6520	4-Quadrant Speed Control
5	1	BUG-2924	Reset Seal, Transparent	31	4	FAS-0124	Screw, Pan Hd, 8-32x3/8
6	1	BUG-1415	Pilot Light	31	4	FAS-1320	Hex Nut, 8-32
7	1	PRS-1065	Joystick	32	1	MS-2A18-11S	Panel Connector, 5T-F
8	1	SWT-0S42	Toggle Switch, DPDT	33	1	BUG-1034	Panel Connector, 4T-M
9	1	SWT-1113	Push Button, N.O., Green	34	1	CON-1202S	Panel Connector, 2T-F
10	1	SWT-1112	Push Button, N.O., Red	34	1	SRK-144B	Shrink Tube
11	1	SWT-1111	Push Button, N.O., Black	34	1	RES WTE 0111	470ohm 1/4w 5% carbon film-TR
12	1	BUG-1562	Potentiometer, 10k, 3 Turn	34	1	CAP WTE 0071	.1UF 250V 10% .4" Radial
12	1	BUG-5757	Knob, Black, Large	34	1	SRK WTE 1346	1/8" Black Shrink Tube
13	12	FAS-0104	Screw, Pan Hd, Blk, 4-40x3/8	35	1	BUG-9856	Panel Connector, 2T-F
13	12	SCF-1001	Self-clinching Nut, 4-40	36	1	CBP-6030	Control Module
13	12	WAS-0201	Lockwasher, #4 Internal Star	36	4	FAS-0204	Screw, Rnd Hd Slit, 4-40x3/8
14	1	MDS-1011	Bezel Display	36	1	BUG-6029	Bracket
14	1	BUG-1764	Meter Display Board	36	1	CBP-1511	Transformer Bracket
15	1	BUG-6051	Terminal, Panel Mount w/fast.	37	2	FAS-0124	Screw, Pan Hd, 8-32x3/8
16	1	PCB-1350	Lincoln Timer Board	38	2	FAS-0224	Screw, Rnd Hd, 8-32x3/8
17	3	SCW WTE 0481	Screw, Pan Hd, 6-32x1/4	39	1	LDC-1107	Transformer
18	1	SWT-0809	Toggle Switch, DPDT	40	1	LN7 WTE 1352	Circuit Breaker, 250V 2.5A
19	1	LDC-1103	Potentiometer	41	1	LDC-1108	Ground Lead Protector Reset
19	1	BUG-5757	Knob, Black, Large	42	4	STOF-2009	Stand-Off, 6-32, 1/4x1/4
20	1	MDS-1011	Bezel Display	42	4	SCW WTE 0264	Screw, Pan Hd, #6 x 1/4
20	1	MTR-1008	DPM LED 8-50 VDC	43	1	PCB-1351	Motor Control Board
21	1	MDS-1011	Bezel Display	44	1	BUG-1383	Relay, 4PDT, 3A 120V, Plug-in
21	1	MTR-1007	Ammeter LED 8-36 VDC	44	1	BUG-1384	Relay Socket & Spring
22	1	FHO-0188	Fuse Holder	44	1	BUG-1404	Relay Bracket
22	1	CWO-6076	Fuse, 5 Amp, Fast Acting	44	2	FAS-0114	Screw, Pan Hd, 6-32x3/8
23	1	CWO-6759	Panel Connector, 6T-M	45	1	BMV-1530	Power Supply
24	1	LDC-1109	Power Resistor	45	4	BMV-1570	PC Board Stand-off
25	1	BUG-6031	Filter	45	4	FAS-0114	Screw, Pan Hd, 6-32x3/8
25	2	FAS-0124	Screw, Pan Hd, 8-32x3/8	46	8	FAS-0215	Screw, Rnd Hd, 6-32x1/2
25	2	FAS-1320	Hex Nut, 8-32	46	8	FAS-1310	Hex Nut. 6-32
25	2	WAS-0221	Lockwasher, #8, Internal Star	46	8	WAS-0211	Lockwasher, #6 Internal Star
26	1	MUG-1156	Panel Connector, 4T-F	47	24	FAS-0204	Screw, Rnd Hd, 4-40x3/8
27	1	BUG-1770	Motor Control Board	47	24	FAS-1305	Hex Nut, 4-40
27	2	FAS-0124	Screw, Pan Hd, 8-32x3/8	47	24	WAS-0201	Lockwasher, #4 Internal Star
28	1	BUG-9909	Panel Connector, 6T-M	48	1	PCB-1355	Relay, 3PDT, 24 VDC for LN7

\*ITEMS NOT SHOWN.

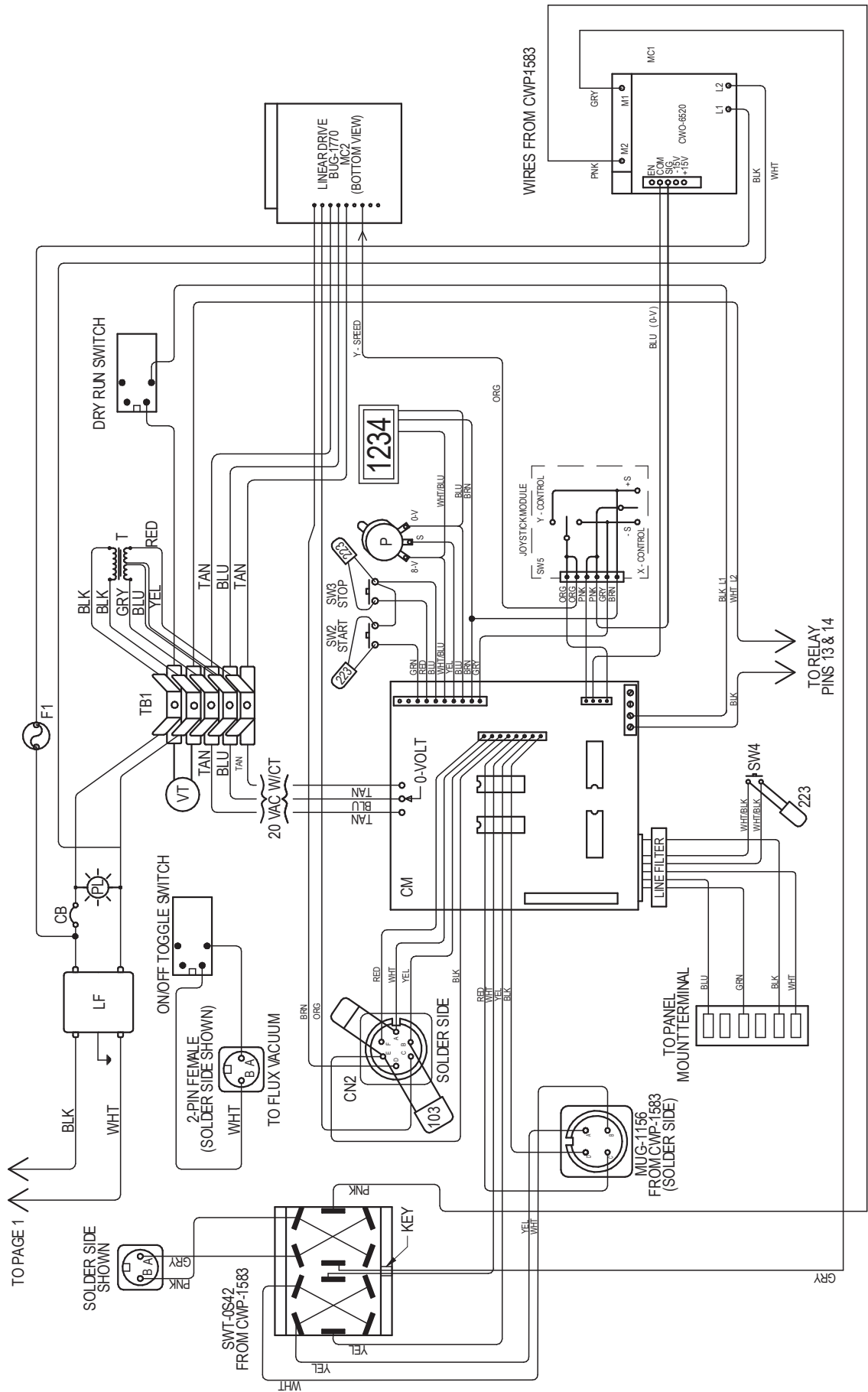
\*The following items are used to secure Control Box to Mounting Arms, but are not shown:

<u>QTY</u>	<u>PART NO.</u>	<u>DESCRIPTION</u>
4	FAS-2358	Screw, Hex Hd, 1/4-20 x 3
4	BUG-1069-2	Spacer
4	WAS-0240	Washer, 1/4 SAE Flat
4	FAS-1351	Hex Nut, 1/4-20

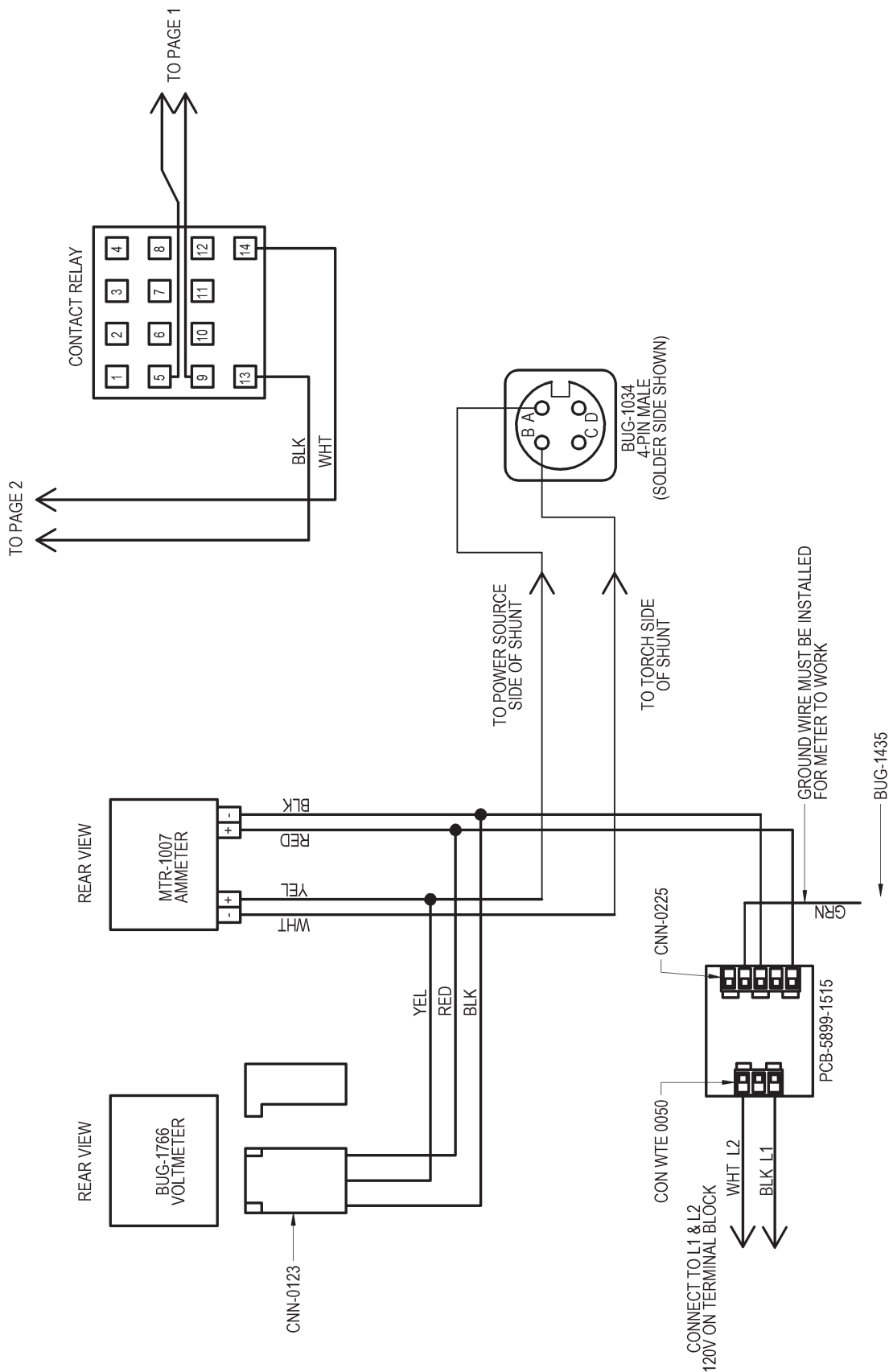
CWP-1570-WD CONTROL PANEL / WIRING DIAGRAM (1 OF 3)



# CWP-1570-WD CONTROL PANEL / WIRING DIAGRAM (2 OF 3)



CWP-1570-WD CONTROL PANEL / WIRING DIAGRAM (3 OF 3)

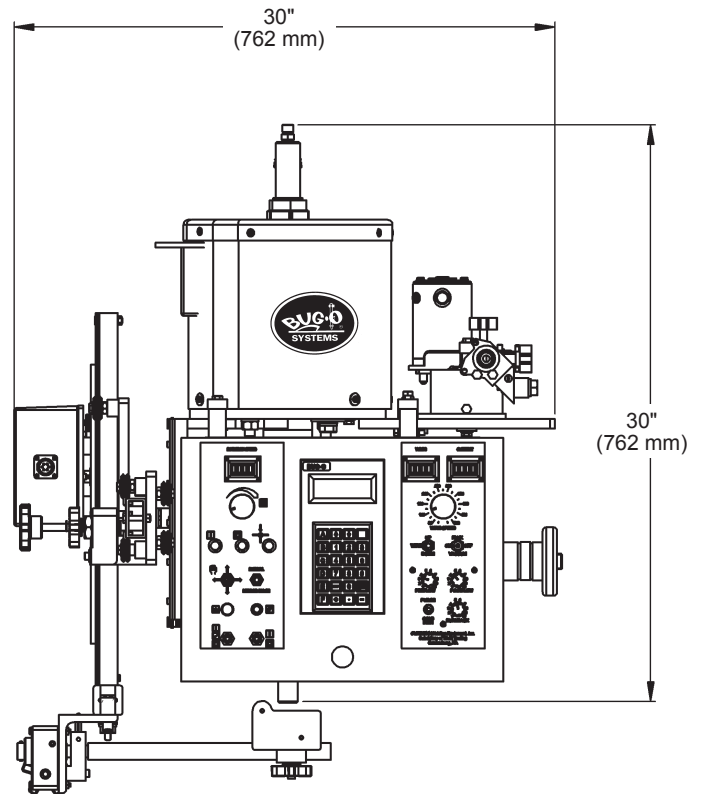
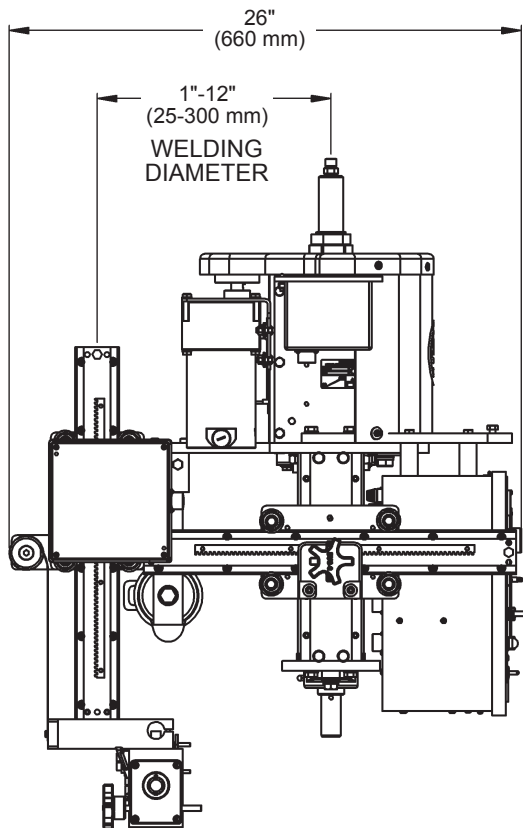




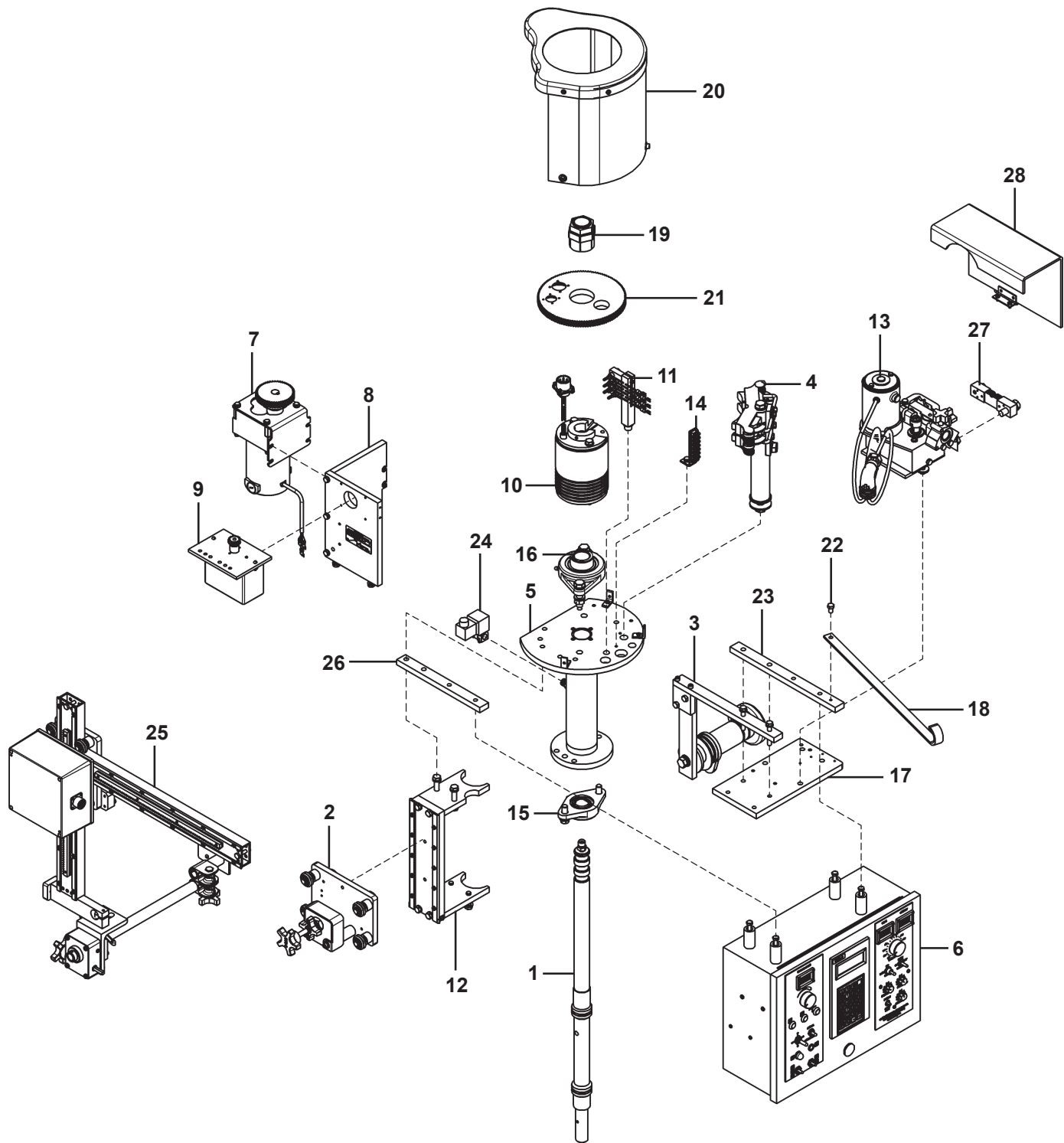
## TECHNICAL DATA

<b>Amperage:</b>	0-300 amps
<b>Input Voltage:</b>	115 VAC
<b>Voltage:</b>	0-50 VAC
<b>Wire Sizes:</b>	.035 - .062" (.8 - 1.6 mm)
<b>Rotation Speed:</b>	.5-6.0 rpm
<b>Cam Range:</b>	5" (125 mm)
<b>Welding Diameter:</b>	1 - 12" (25 - 300 mm)
<b>Shielding Gas:</b>	Solenoid Control
<b>Height:</b>	30" (762 mm)
<b>Net Weight:</b>	155 lbs. (71 kg)
<b>Shipping Weight:</b>	200 lbs. (91 kg)

## DIMENSIONS



## CWP-5 CIRCLE WELDER / EXPLODED VIEW

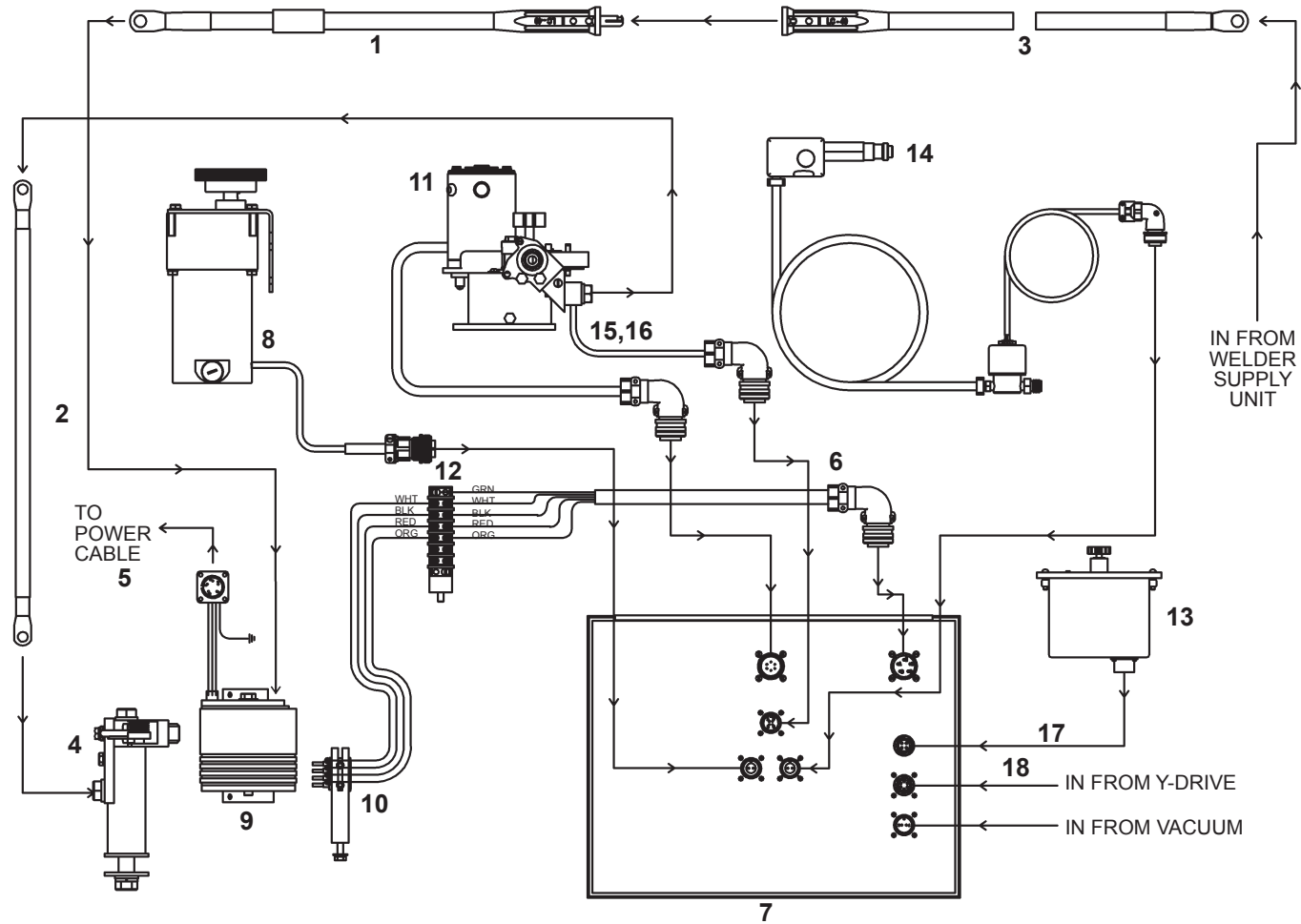


## CWP-5 CIRCLE WELDER / PARTS LIST

<u>ITEM</u>	<u>QTY</u>	<u>PART NO.</u>	<u>DESCRIPTION</u>
1	1	CWO-3001	CWP-5 Shaft Assembly
2	1	CWO-1685	Small Horizontal Racker
3	1	CWP-1580	Wire Reel Assembly
4	1	CWO-3059	Brush Holder & Support Assembly
5	1	CWO-3199	CWP-5 Housing Assembly
6	1	CWP-1570	Dual Control Box
7	1	CWO-3384-PCW	P.M. Motor Assembly
8	1	CWO-3417	Motor & Transmission Plate Assembly
9	1	CBP-1595-5	Encoder Assembly
10	1	CWO-3456	CWP-5 Collector
11	1	CWO-3462	Small Brush Retainer Assembly
12	1	CWP-1575	Slide Bar Mounting Assembly
13	1	CWO-3468	LN-7 Wire Feeder Assembly
14	1	CWO-3935	Terminal Block Assembly CWP-5
15	1	CWO-4050	1" Bearing With Fasteners
16	1	CWO-4060	1-1/4" Bearing With Fasteners
17	1	CWO-4088	Wire Feeder Mount Plate
18	1	CWO-4092	Cable Support
19	1	CWO-5075	1-1/4" Trantorque
20	1	CWO-5220	Guard Assembly
21	1	CWO-5734	Gear, Alum (0716112) 2" Bore
22	1	FAS-0376	Hex Hd Cap Scr 5/16-18 x 5/8"
23	1	CWP-1574	Control Box Mounting Arm 1
24	1	CWO-8056	Solenoid Adaptor Kit
25	1	CBP-1670	CBP Racking System
26	1	CWP-1576	Control Box Mounting Arm
27	1	CWO-6008	CWP-5 Shunt Bar
28	1	CWO-2005	Wire Feeder Guard

**NOTE:** See **CWP-5 Circle Welder Wiring Diagram** (page 20) for wiring and cable information.

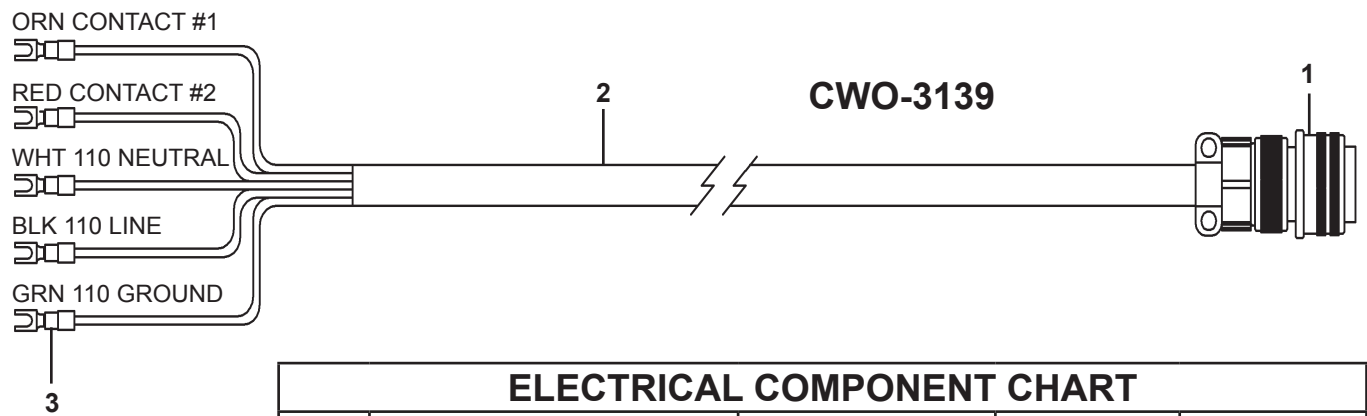
CWP-5 CIRCLE WELDER / WIRING DIAGRAM



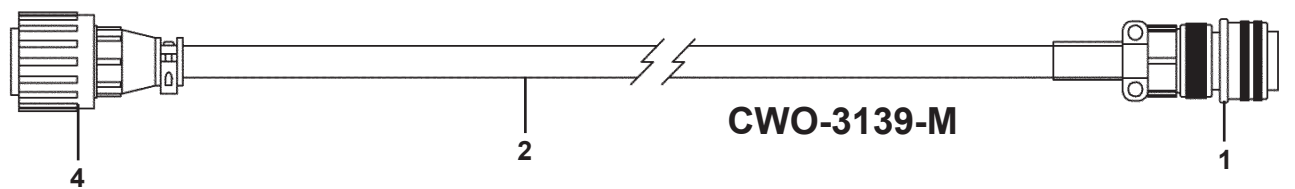
ELECTRICAL COMPONENT CHART		
ITEM	DESCRIPTION	PART NO.
1	Weld Cable Inlet 2/0	CWO-3020-2/0
2	Weld Cable	CWO-3013
3	Weld Cable 50'	CWO-3019
4	Large Brush Holder & Support	CWO-3059
5	Power Cable	CWO-3139*
6	GMA Pigtail	CWO-3331
7	Dual Control Box	CWP-1570
8	P.M. Motor Assembly	CWO-3384
9	CWP-5 Collector	CWO-3456
10	Small Brush Retainer Assembly	CWO-3462
11	LN-7 Wire Feeder Assembly	CWO-3468
12	Terminal Block	CWO-3935
13	Rotation Encoder Assembly	CBP-1595-5
14	Solenoid Adapter Kit	CWO-8056
15	Shunt Bar	CWO-6008
16	CWP-5 Shunt Cable	CWP-1585
17	Cable 18"	MUG-1621-1.5
18	Shielded Cable	MUG-1634-3

\*CWO-3139 Universal      CWO-3139-M for Miller Welders

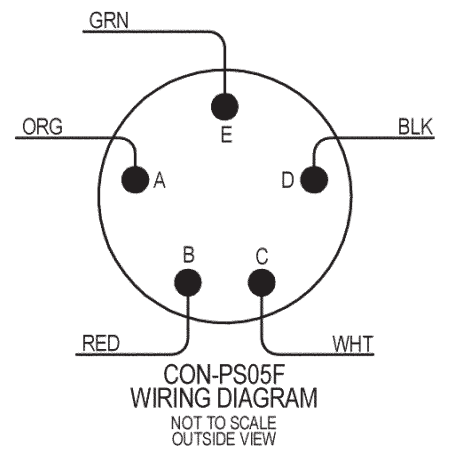
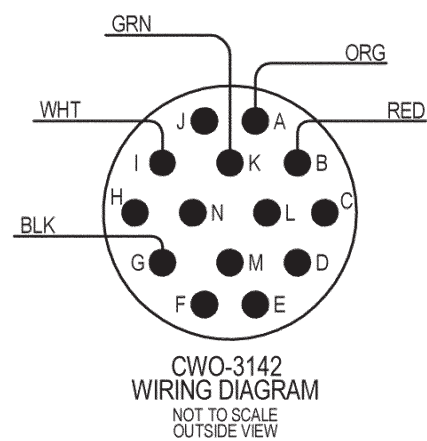
CWO-3139 (CWO-3139-M) UNIVERSAL POWER CABLE / WIRING DIAGRAM



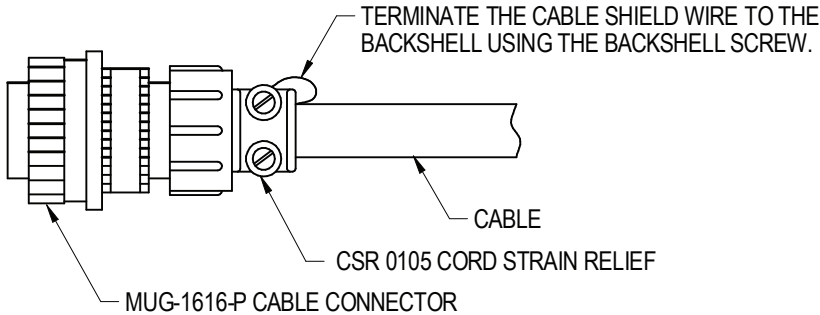
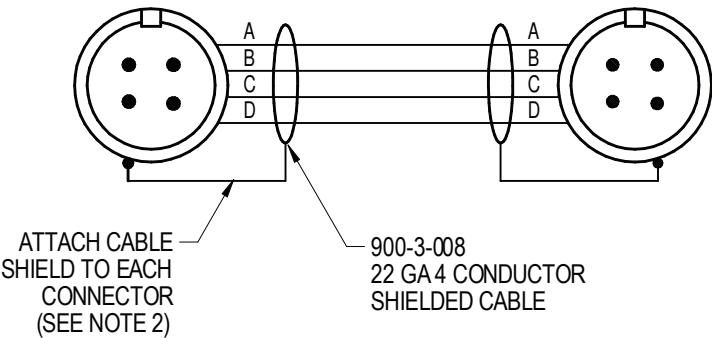
ELECTRICAL COMPONENT CHART				
ITEM	DESCRIPTION	PART NO.	CWO-3139 QTY	CWO-3139-M QTY
1	Plug, Straight, 5 Pin, Female	CON-PS05F	1	
2	Panel Connector 2T-F	WER WTE 0667	600"	
3	Power Receptacle	TERM WTE 0602	5	
4	14 Pin Miller Connector Assy	CWO-3142		1



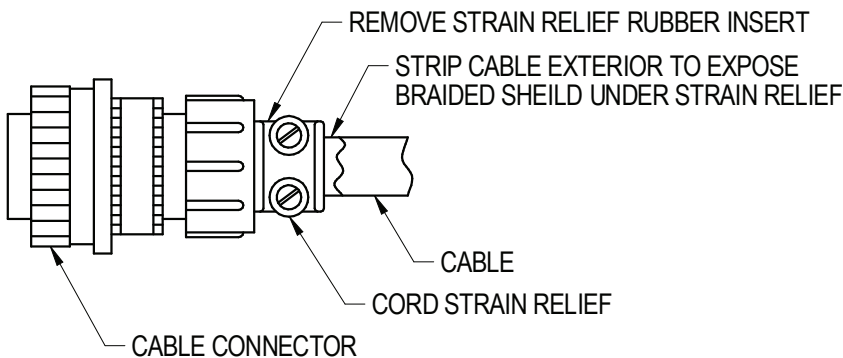
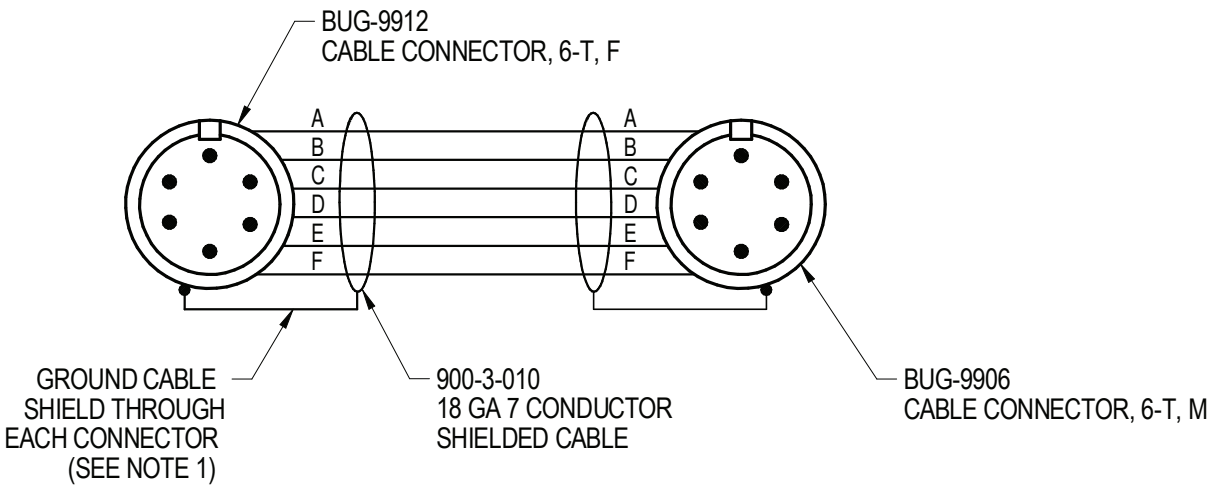
OUTSIDE VIEW OF PLUGS / WIRING DIAGRAMS



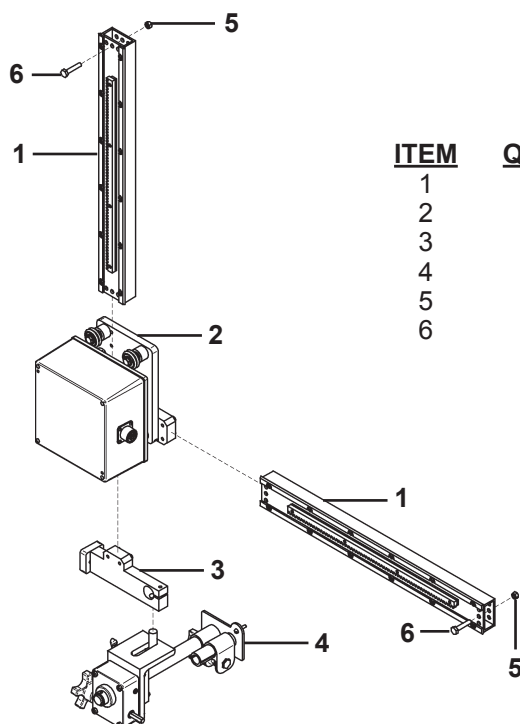
MUG-1621-1.5 CABLE 18" / MUG-1634-3 SHIELDED CABLE / WIRING DIAGRAMS



MUG-1634-3 SHIELDED CABLE / WIRING DIAGRAMS

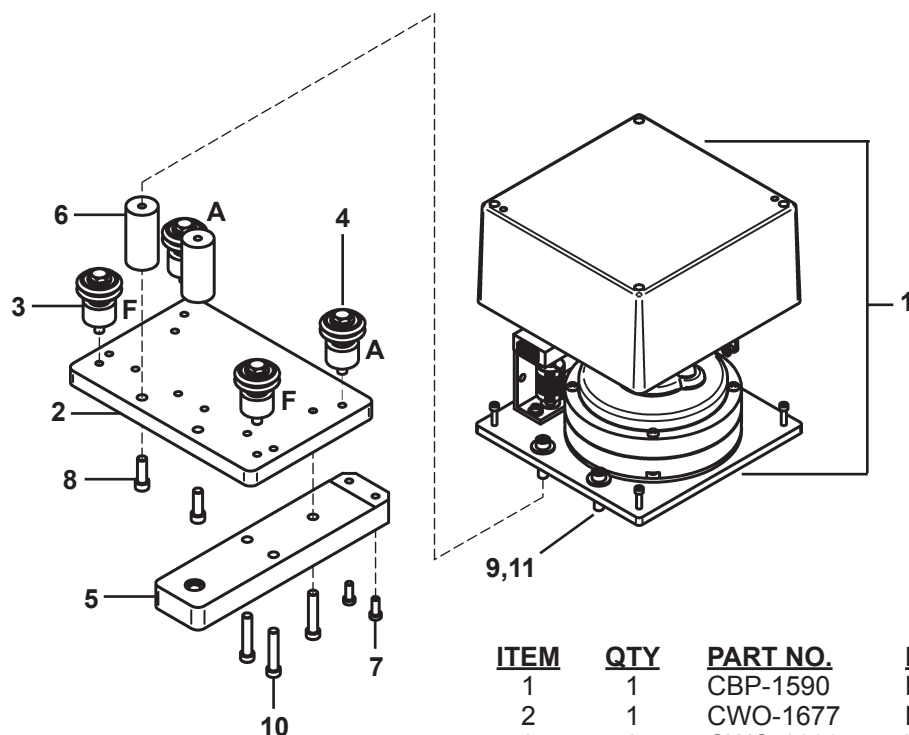


## CBP-1670 CWP-5 MOTORIZED RACKING SYSTEM / EXPLODED VIEW / PARTS LIST



ITEM	QTY	PART NO.	DESCRIPTION
1	2	ABR-1070	V-Guide Ways 19"
2	1	CBP-1675	Motorized Vertical Racker
3	1	CWO-1695	Attachment Block
4	1	CWO-3023-1	Torch Angle Adjuster 16"
5	2	FAS-1351	Hex Nut 1/4-20
6	2	FAS-2351	Screw, Hex Hd Cap 1/4-20 x 1-1/4"

## CBP-1675 VERTICAL RACKER / EXPLODED VIEW / PARTS LIST



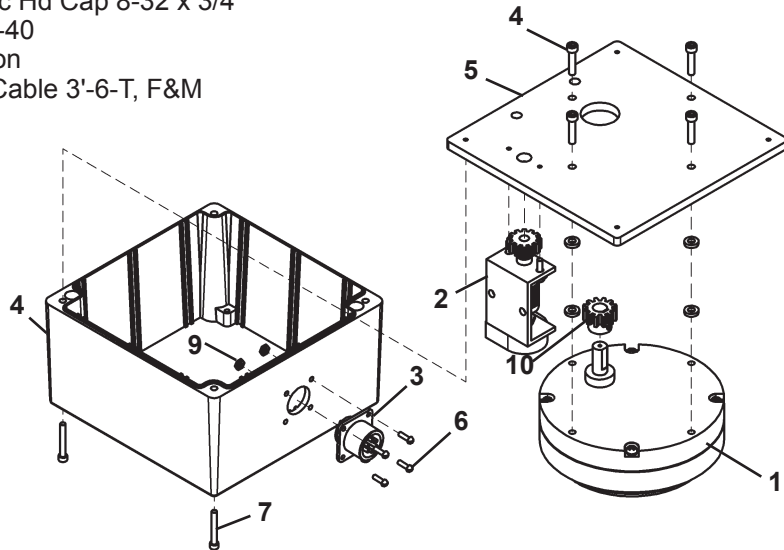
A = Adjustable Wheel Placement  
F = Fixed Wheel Placement

ITEM	QTY	PART NO.	DESCRIPTION
1	1	CBP-1590	Drive Box
2	1	CWO-1677	Mount Plate
3	2	CWO-1680	W2 Fixed Leg & Wheel Assembly
4	2	CWO-1681	W2 Adj Leg & Wheel Assembly
5	1	CWO-1682	Racker Mount Bar
6	2	CWO-1694	Stand-Off
7	2	FAS-0555	Screw, Soc Hd Cap 1/4-20 x 1/2
8	2	FAS-0557	Screw, Soc Hd Cap 1/4-20 x 3/4
9	2	FAS-0559	Screw, Soc Hd Cap 1/4-20 x 1
10	3	FAS-2551	Screw, Soc Hd Cap 1/4-20 x 1 1/4
11	2	WAS-0240	Washer, SAE 1/4

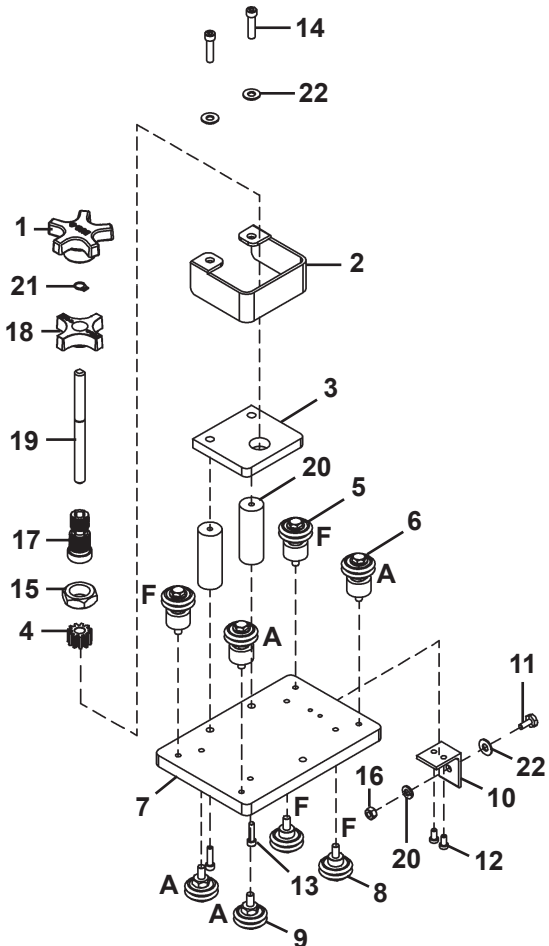
## CBP-1590 DRIVE BOX / EXPLODED VIEW / PARTS LIST

ITEM	QTY	PART NO.	DESCRIPTION
1	1	BUG-1550	Gear Motor (150:1)
2	1	BUG-6040	Gear / Encoder Assembly
3	1	BUG-9909	Panel Connector, 6-T, M
4	8	CBP-1585	Drive Box
5	1	CBP-1586	Drive Plate
6	4	FAS-0204	Screw, Rnd Hd Slit 4-40 x 3/8
7	4	FAS-0517	Screw, Soc Hd Cap 6-32 x 3/4
8	4	FAS-0527	Screw, Soc Hd Cap 8-32 x 3/4
9	4	FAS-1305	Hex Nut 4-40
10	1	GOF-3014	Drive Pinion
*11	1	MUG-1634-3	Shielded Cable 3'-6-T, F&M

\* = Not Shown



## CWO-1685 HORIZONTAL RACKER / EXPLODED VIEW / PARTS LIST



ITEM	QTY	PART NO.	DESCRIPTION
1	1	BUG-2032	Knob, Black
2	1	CWO-1671	Racker Shield
3	1	CWO-1678	Racker Plate
4	1	CWO-1679	Pinion 11T
5	2	CWO-1680	W2 Fixed Leg & Wheel Assembly
6	2	CWO-1681	W2 Adj. Leg & Wheel Assembly
7	1	CWO-1686	Mount Plate (Small Racker)
8	2	CWO-4020	Fixed Leg & Wheel Assembly
9	2	CWO-4021	Adj. Leg & Wheel Assembly
10	1	CWO-4112	Bracket
11	1	FAS-0355	Hex Hd Cap Scr 1/4-20 x 1/2"
12	2	FAS-0534	Soc Hd Cap Scr 10-24 x 3/8"
13	2	FAS-0557	Soc Hd Cap Scr 1/4-20 x 3/4"
14	2	FAS-0559	Soc Hd Cap Scr 1/4-20 x 1"
15	1	FAS-1307	Hex Jam Nut 3/4-16
16	1	FAS-1351	Hex Nut 1/4-20
17	1	MUG-1141	Bearing Collet
18	1	MUG-1142	Knob, Locking
19	1	MUG-1144	Shaft
20	2	MUG-1453	Stand-Off
21	1	MUG-1579	Retaining Ring
22	3	WAS-0240	1/4" SAE Washer
23	1	WAS-0243	1/4" Split Lock Washer

F = FIXED WHEEL PLACEMENT

A = ADJUSTABLE WHEEL PLACEMENT

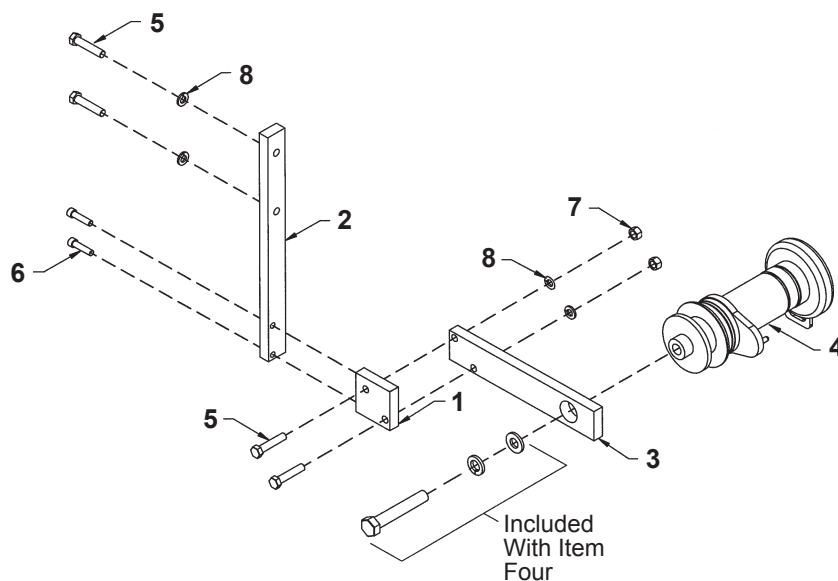


## CWO-3001 SHAFT ASSEMBLY / EXPLODED VIEW / PARTS LIST



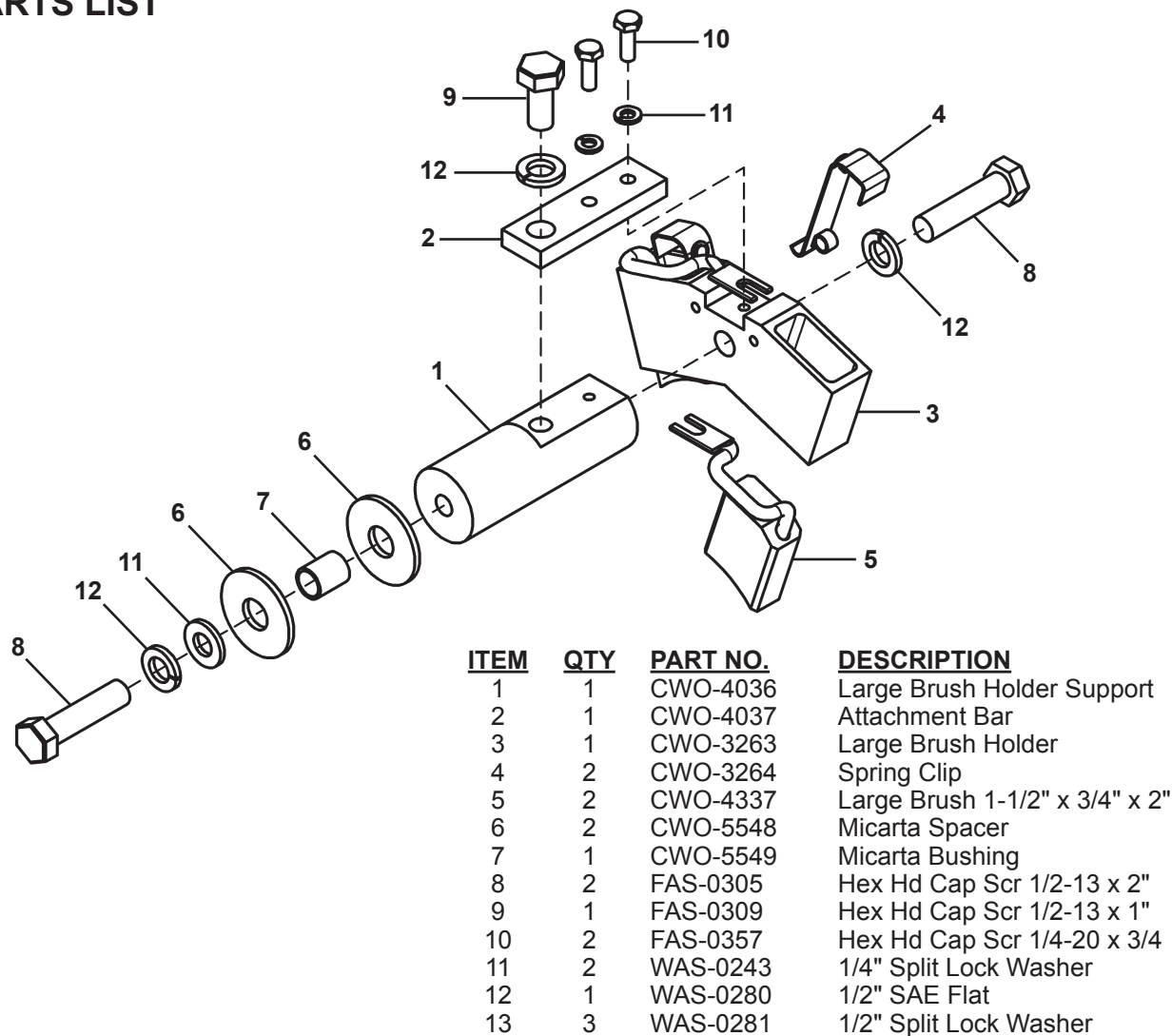
<u>ITEM</u>	<u>QTY</u>	<u>PART NO.</u>	<u>DESCRIPTION</u>
1	2	CWO-4003	O-Ring
2	1	CWO-5781	CWP-5 Shaft
3	1	BUG-9096	Outlet Bushing, Oxygen

## CWP-1580 WIRE REEL MOUNT ASSEMBLY / EXPLODED VIEW

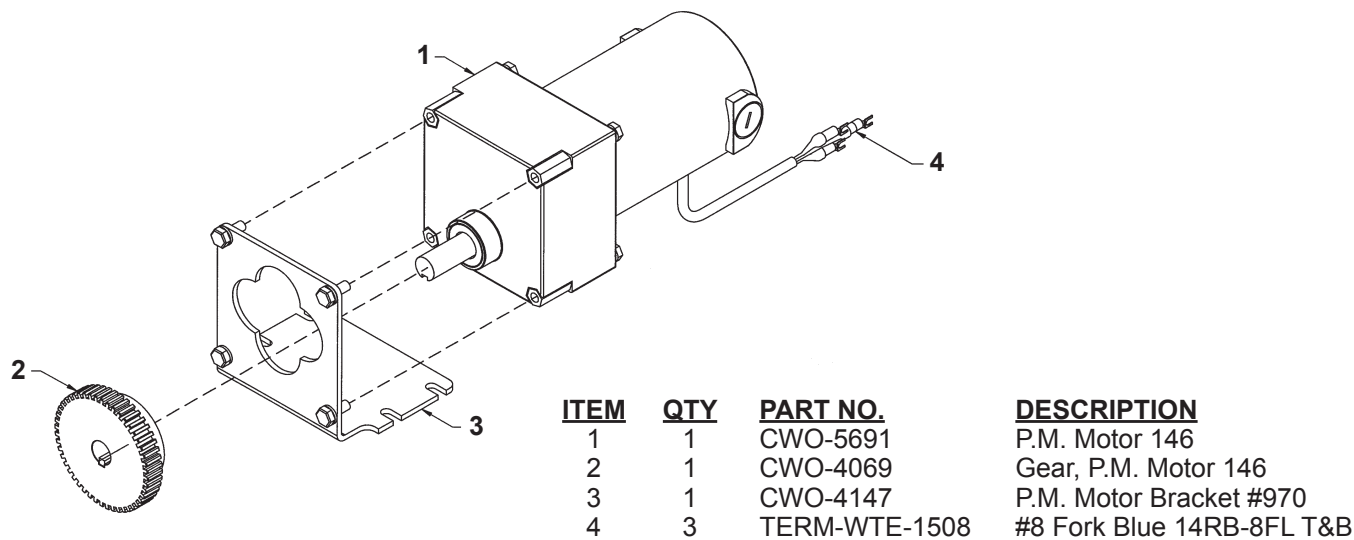


<u>ITEM</u>	<u>QTY</u>	<u>PART NO.</u>	<u>DESCRIPTION</u>
1	1	CWO-5977	Vertical Mount Plate
2	1	CWO-3743	Horizontal Mount Plate
3	1	CWO-4081	Wire Reel Mount Bar
4	1	WFU-1041	2" O.D. Spindle Kit
5	4	FAS-2375	Hex Hd Cap Scr 5/16-18 x 2"
6	2	FAS-0559	Soc Hd Cap Scr 1/4-20 x 1"
7	2	FAS-1370	Hex Nut 5/16-18
8	4	WAS-0251	5/16 Lock Washer

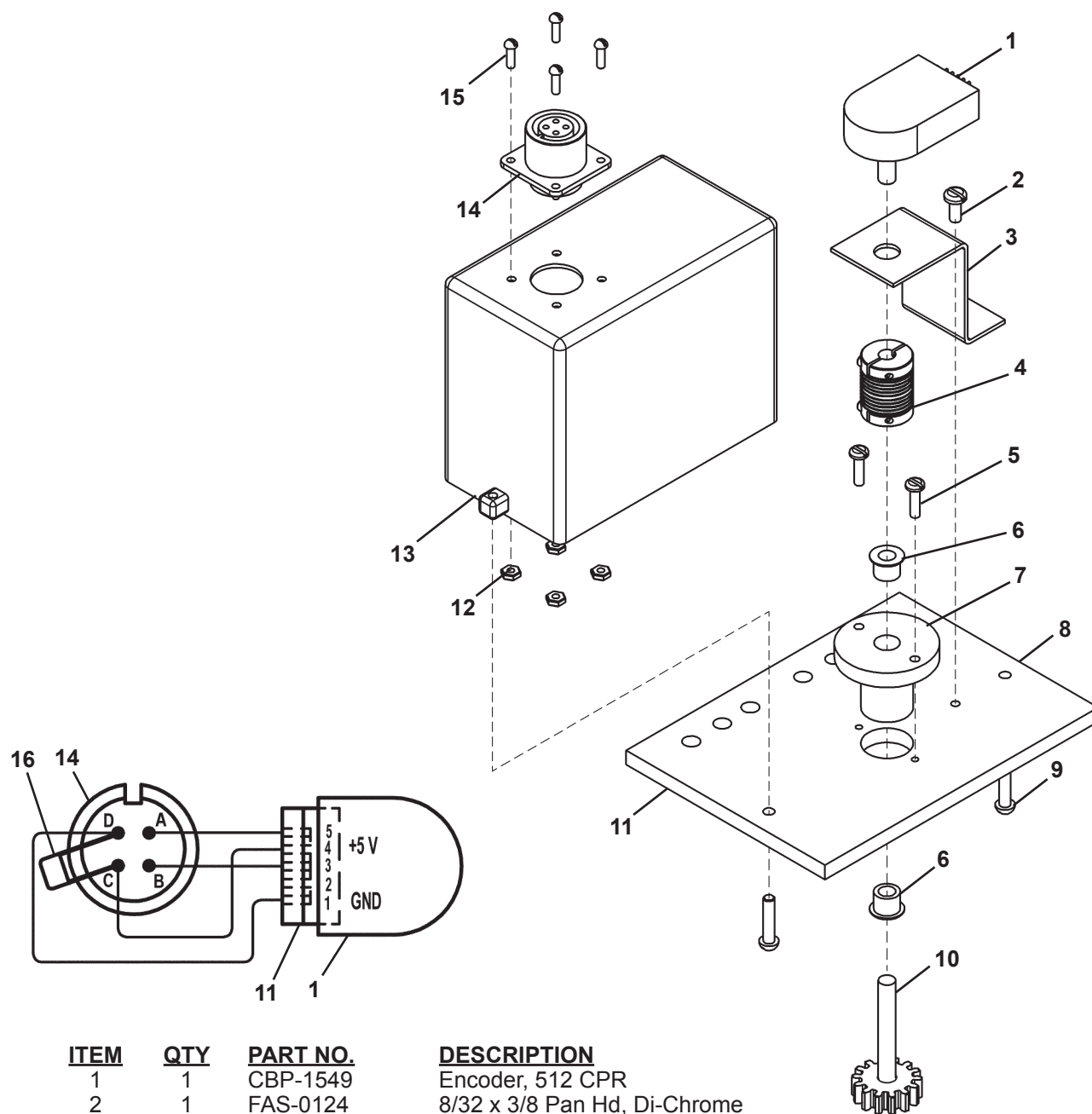
CWO-3059 LARGE BRUSH HOLDER AND SUPPORT / EXPLODED VIEW / PARTS LIST



CWO-3384 P.M. MOTOR ASSEMBLY / EXPLODED VIEW / PARTS LIST



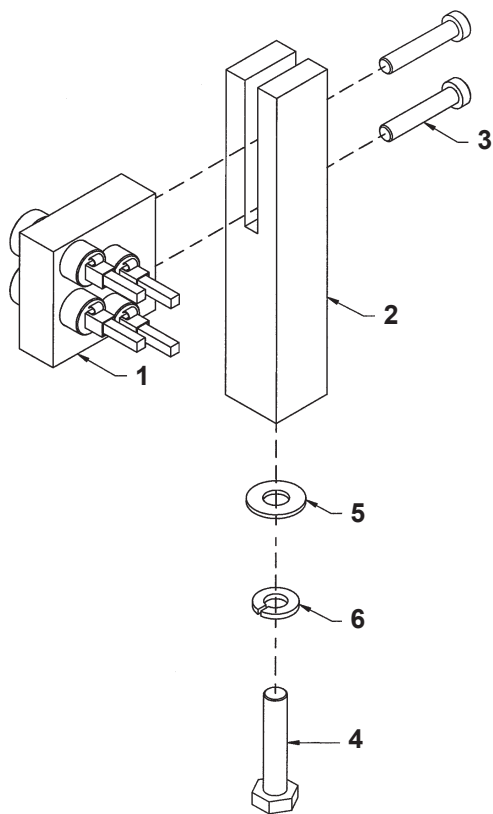
# CBP-1595-5 ENCODER ASSEMBLY / EXPLODED VIEW / PARTS LIST / WIRING DIAGRAM



ITEM	QTY	PART NO.	DESCRIPTION
1	1	CBP-1549	Encoder, 512 CPR
2	1	FAS-0124	8/32 x 3/8 Pan Hd, Di-Chrome
3	1	MUG-1592	Bracket
4	1	BUG-6044	Flexible Coupling
5	2	FAS-0115	6-32 x 1/2 Pan Head, Zinc
6	2	SFX-1218	Bearing-Flg 1/4 ID x 3/8 OD x 5/16 Lg
7	1	MUG-1593	Pod
8	1	MUG-1594	Plate
9	2	FAS-0227	Rnd Hd Scr 8-32 x 3/4
10	1	CBP-1589	Gear Shaft Assembly
11	1	CBP-1598	Connector Cable
12	4	FAS-1305	Hex Nut 4-40
13	1	MUG-1596	Enclosure
14	1	MUG-1156	Panel Connector, 4-T, F
15	4	FAS-0204	Rnd Hd Slit Scr 4-40 x 3/8 Zinc
16	1	CAP-1105M	1Uf 50V 10% Radial
*17	1	MUG-1621-1.5	Cable 18"

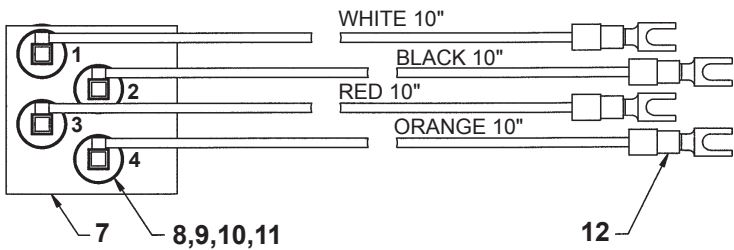
\* = Not Shown

CWO-3462 SMALL BRUSH HOLDER ASSEMBLY / EXPLODED VIEW / PARTS LIST



ITEM	QTY	PART NO.	DESCRIPTION
1	1	CWO-3461	Small Retainer Block Assembly
2	1	CWO-9076	Retainer Support
3	2	FAS-0539	Soc Hd Cap Scr 10-24 x 1"
4	1	FAS-2351	Hex Hd Cap Scr 1/4-20 x 1 1/4"
5	1	WAS-0240	1/4" Washer
6	1	WAS-0243	1/4" Split Lock Washer
7	1	CWO-5626	Small Brush Retainer BLK
8	4	CWO-5831	Brush 1/8" x 1/8" x 7/8"
9	4	CWO-5874	Brush Holder
10	4	CWO-5875	Cap
11	4	CWO-5876	Clip
12	4	TERM-WTE-0602	#6 Fork Blue

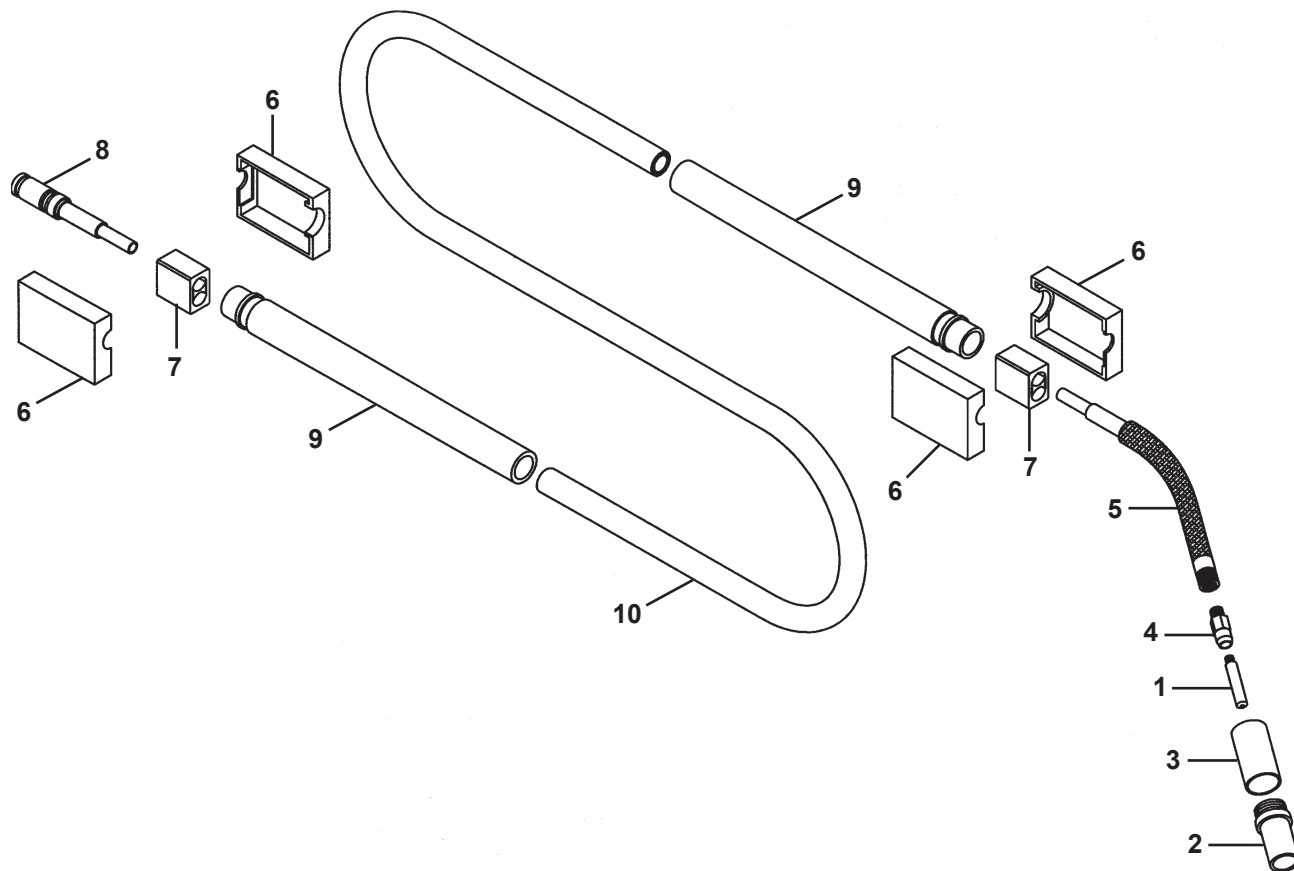
CWO-3461 SMALL RETAINER BLOCK ASSEMBLY / DETAIL VIEW



## CWP-5 GUN ASSEMBLIES

CWO-1500-A	#4 1/16 GUN ASSEMBLY MIG/FLUX	1/16 WIRE SIZE	
	CWO-8002	14H-116 CONTACTOR TIP	10
	CWO-8006	24A-62-SS NOZZLE	1
	CWO-8007	34A NOZZLE INSULATOR	1
	CWO-8008	54A GAS DIFFUSER	1
	CWO-8011	44-116-15 CABLE LINER	1
	CWO-8523	40902 400 AMP CABLE	1
CWO-1500-B	#4 .035 GUN ASSEMBLY MIG/FLUX	.035 WIRE SIZE	
	CWO-8003	14H-35 CONTACTOR TIP	10
	CWO-8006	24A-62-SS NOZZLE	1
	CWO-8007	34A NOZZLE INSULATOR	1
	CWO-8008	54A GAS DIFFUSER	1
	CWO-8009	44-3545-15 CABLE LINER	1
	CWO-8523	40902 400 AMP CABLE	1
CWO-1500-C	#4 .045 GUN ASSEMBLY MIG/FLUX	.045 WIRE SIZE	
	CWO-8004	14H-45 CONTACTOR TIP	10
	CWO-8006	24A-62-SS NOZZLE	1
	CWO-8007	34A NOZZLE INSULATOR	1
	CWO-8008	54A GAS DIFFUSER	1
	CWO-8009	44-3545-15 CABLE LINER	1
	CWO-8523	40902 400 AMP CABLE	1
CWO-1500-D	#4 5/64 GUN ASSEMBLY MIG/FLUX	5/64 WIRE SIZE	
	CWO-8005	14H-564 CONTACTOR TIP	10
	CWO-8006	24A-62-SS NOZZLE	1
	CWO-8007	34A NOZZLE INSULATOR	1
	CWO-8008	54A GAS DIFFUSER	1
	CWO-8012	44-564-15 CABLE LINER	1
	CWO-8523	40902 400 AMP CABLE	1
CWO-1500-E	#4 .052 GUN ASSEMBLY MIG/FLUX	.052 WIRE SIZE	
	CWO-8001	14H-52 CONTACT TIP	10
	CWO-8006	24A-62-SS NOZZLE	1
	CWO-8007	34A NOZZLE INSULATOR	1
	CWO-8008	54A GAS DIFFUSER	1
	CWO-8011	44-116-15 CABLE LINER	1
	CWO-8523	40902 400 AMP CABLE	1

## #4 GUN AND CABLE ASSEMBLY / EXPLODED VIEW / PARTS LIST



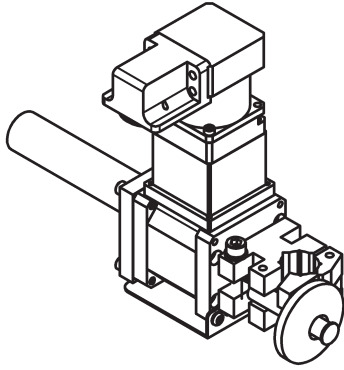
PARTS LIST				WIRE SIZE				
ITEM	QTY	PART NO.	DESCRIPTION	.035	.045	.052	1/16	5/64
1	1	CWO-8001	14H-52 Contact Tip			X		
1	1	CWO-8002	14H-116 Contact Tip				X	
1	1	CWO-8003	14H-35 Contact Tip	X				
1	1	CWO-8004	14H-45 Contact Tip		X			
1	1	CWO-8005	14H-564 Contact Tip					X
2	1	CWO-8006	24A-62-55 Nozzle	X	X	X	X	X
3	1	CWO-8007	34A Nozzle Insulator	X	X	X	X	X
4	1	CWO-8008	54A Gas Diffuser	X	X	X	X	X
5	1	CWO-8014	64A-60 Conductor Tube	X	X	X	X	X
6	2	CWO-8017	185 Case w/Binder Screws	X	X	X	X	X
7	2	CWO-8018	104 Cable Connector Block	X	X	X	X	X
8	1	CWO-8025	174 Connector Plug w/ O-Rings	X	X	X	X	X
9	1	CWO-8019	234-12 Cable Hose Support	X	X	X	X	X
10	1	CWO-8523	40902 400 AMP cable	X	X	X	X	X
*	1	CWO-8009	44-3545-15 Cable Liner	X	X			
*	1	CWO-8011	44-116-15 Cable Liner			X	X	
*	1	CWO-8012	44-564-15 Cable Liner					X

\* ITEM NOT SHOWN

## CWP-5 DRIVE ROLL KITS

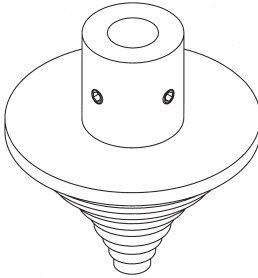
PART NO.	DESCRIPTION
CWO-7026-.035	DRIVE ROLL KIT .035 (0.9mm) SOLID WIRE
CWO-7026-.035C	DRIVE ROLL KIT .035 (0.9mm) CORED WIRE
CWO-7026-.052	DRIVE ROLL KIT .045-.052 (1.0-1.3mm) SOLID WIRE
CWO-7026-.052C	DRIVE ROLL KIT .045-.052 (1.0-1.3mm) CORED WIRE
CWO-7026-1/16	DRIVE ROLL KIT 1/16 (1.6mm) SOLID/CORED WIRE
CWO-7026-3/32	DRIVE ROLL KIT .068-3/32 (1.7-2.4mm) SOLID/CORED WIRE

## ACCESSORIES



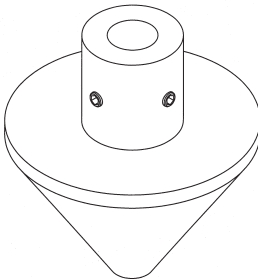
### **KBUG-5050 Stand Alone Weaver**

The compact oscillator provides a pendulum weaving motion to the gun. Speed, width and dwells are independently adjustable.



### **CWO-3670 Step Adaptor for Thread-O-Lets CWO-3675 Step Adaptor for Groove-O-Lets**

The Step Adaptor is a stepped centering device used to center the machine on threaded I.D. couplings. The range of the Step Adaptor is 1/2" to 4" (13-102 mm) diameter.

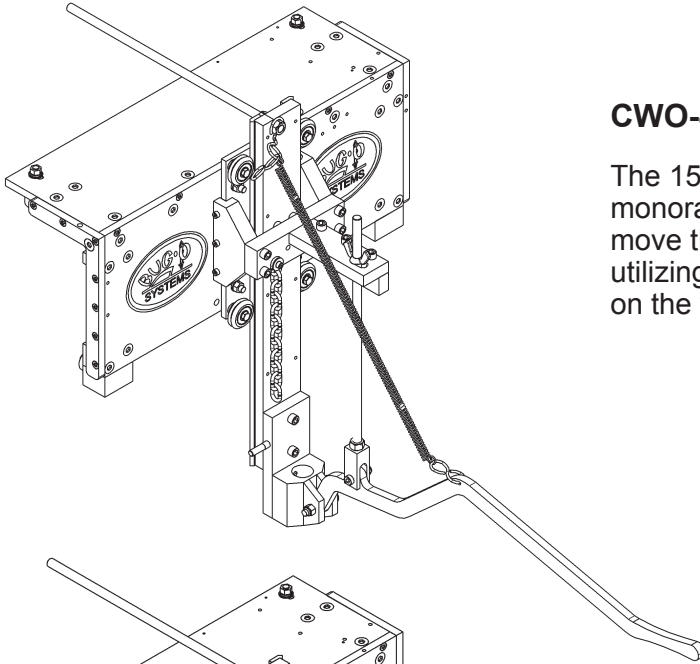


### **CWO-5790 Cone Adaptor**

The Cone Adaptor is a tapered centering device used to center the machine on pipe stubbies. The range of the Cone Adaptor is 1-1/4" to 4" (32-102 mm) diameter.

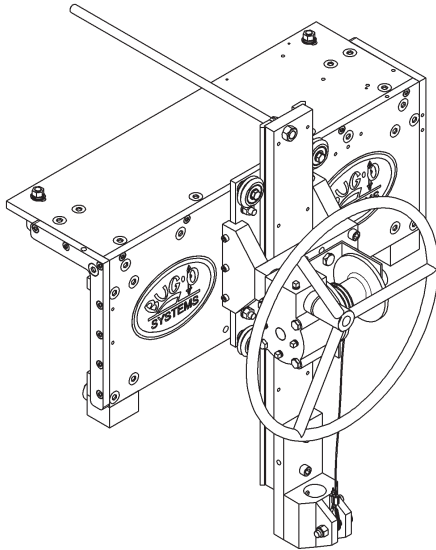


## CARRIAGES



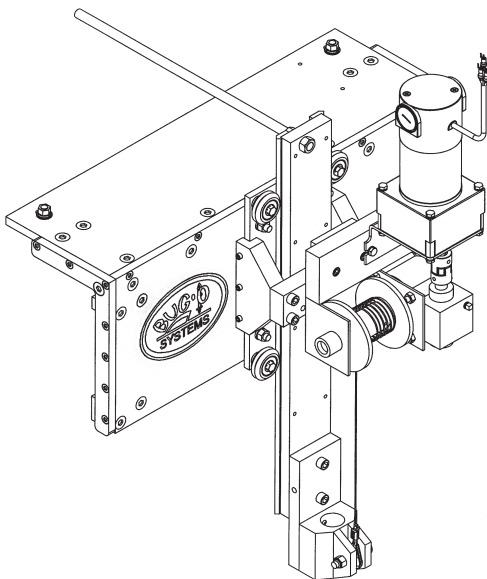
### **CWO-4530 151 Carriage**

The 151 Carriage mounts on a standard monorail. The carriage allows the operator to move the machine the length of the pipe, while utilizing a lever to position the machine vertically on the work piece.



### **CWO-4540 151P Carriage**

The 151P Carriage mounts on a standard monorail. The carriage allows the operator to move the machine the length of the pipe, while utilizing a winch to position the machine vertically on the work piece.



### **CWO-4550 151M Carriage**

The 151M Carriage mounts on a standard monorail, or "bridge crane" type setups. The carriage allows the operator to move the machine the length of the pipe, while utilizing an electric motor to mechanically position the machine vertically on the work piece.

# SET-UP INSTRUCTIONS FOR CWP-5 / CB-1P USED IN SPRINKLER FABRICATION

## SUPPORTING FIXTURE AND PIPE STANDS

The first priority should be given to where the fixture is to be placed. The burning of the holes and welding of the couplings should be the last part of the operation performed on the pipe. It is important that a flow pattern or line be looked at, so that when the pipe is taken out of the fixture, it is finished and ready for shipment.

The mono rail consists of a 4" x 8" x 1/4" wall rectangular tubing with a 3/8" x 3" flat bar welded to the tubing (See pg. 32). The flat bar has to project 1" above the top of the tubing. "C" clamps are to be used to hold the flat bar against the tubing with no gaps. The "C" clamp may be walked down the tubing as it is being tack welded. If the beam has a bow in it, take the following steps:

1. Determine exactly where the center of the bow is. This may be accomplished by putting a string along the front side of the monorail. Place 1/2" nuts between the string and the monorail and measure the gap between the string and the monorail. Always measure on the same side of the string.
2. After you have determined where center of the bow is, take a hand torch and heat the outside of the bow. The outside of the bow should be the side the flat bar is welded to. Take a piece of chalk and draw a triangle with a 2" base under the bottom of the flat bar with the top or point of the triangle pointing down. Do the same on the top of the monorail against the flat bar with the top or point pointing towards the face of the monorail. Heat these two areas so that they become cherry red in color. After the heat has been applied, take a large rag and a bucket of water and cool the heated area. After the area has been cooled, check the beam again. Repeat as necessary.

## PIPE STANDS

The pipe stands consist of 3" pipe in floor flanges with a 2-1/2" or 3" angle welded to the top of the pipe, and they should be spaced and aligned as shown (See pg. 32). The two stands should have some sort of clamping device to hold the pipe in place. The clamping device can be anything from a pipe vise to a chain and boom. The clamping device must be staggered.

After the pipe stands and supporting columns are in place, the monorail is to be placed on the supporting columns. The pipe stands and the supporting columns must be level and plumb. These items may have to be shimmed. With these items level, the monorail may be put in place on the supporting columns and held in place by two "C" clamps. Put a level on the face of the beam in the vertical position and on the bottom in the horizontal position. The beam should be level both ways, and if not, the beam will have to be shimmed. If the monorail has a twist, which may occur, level one end so that the other end needs to be pulled back.

Next, put a piece of 8" pipe in the pipe stands and clamp down. Take a center head and find the center of the pipe on each end and in the middle. You can now use two methods to check to see if the monorail is aligned with the pipe below. They are as follows:

1. Use a plumb bob off the face of the monorail and measure from the center of the pipe to the plumb bob. The distance should be 5-11/16" in all three locations.
2. The second method is to put one carriage on the monorail and attach the CB-1P to it. With the center pin in the burning machine, check all three locations. The burning machine must be plumb on the carriage if this method is used.

# SET-UP INSTRUCTIONS FOR CWP-5 / CB-1P USED IN SPRINKLER FABRICATION

## INSTALLING CARRIAGES AND MACHINES ON THE MONORAIL

Assemble carriages and put them on the rail.

The CWP-5 welder is put on the carriage that is nearest to the welding power source and the CB-1P cutter nearest to the plasma power source.

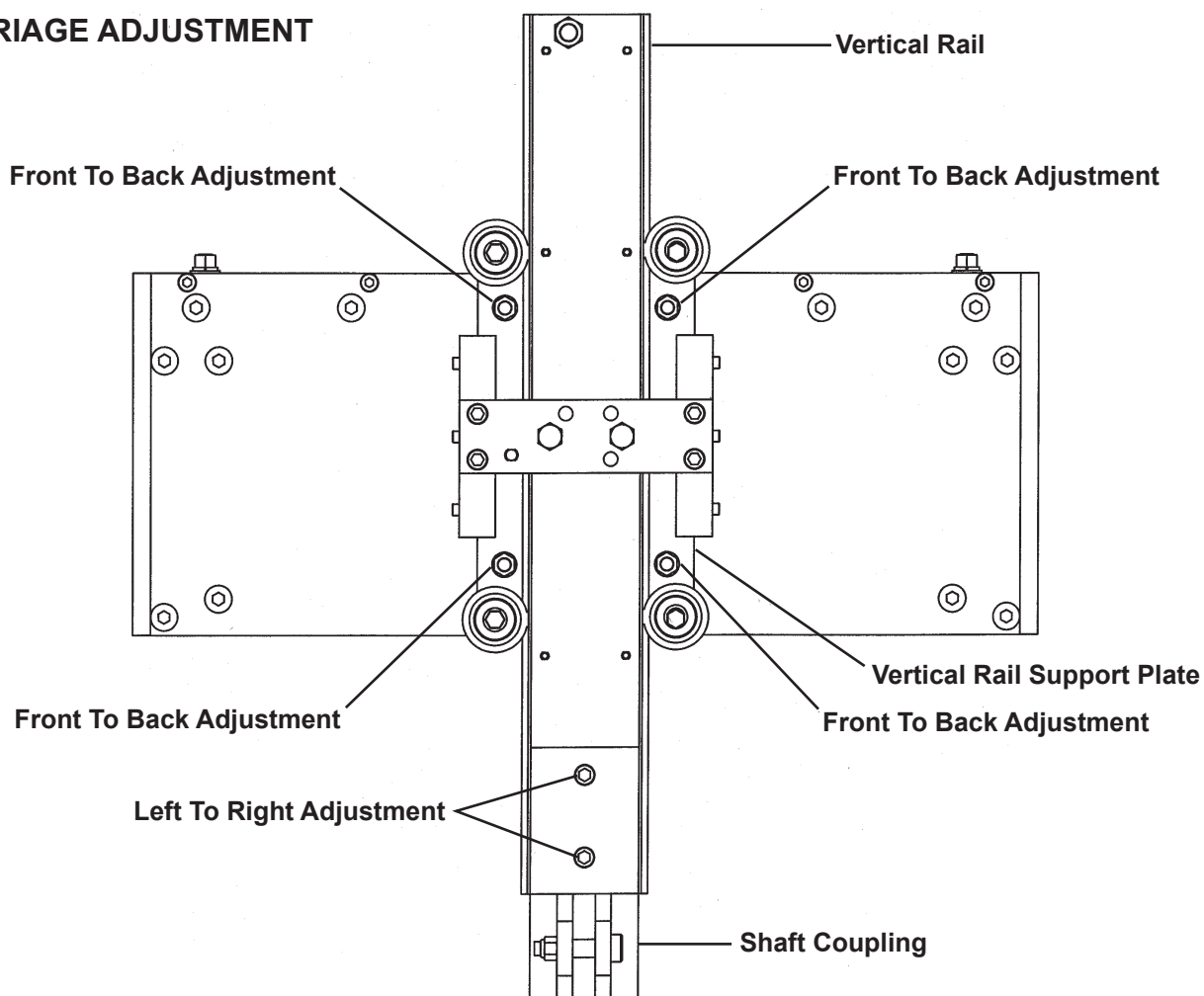
Put the CB-1P cutter machine on the 8" pipe in the stands and bring the carriage to the machine. Lower the shaft coupling over the main shaft on the cutter. Ensure that shaft is fully inserted into the shaft coupling. Rotate the machine so that the plasma leads are in front and parallel to the carriage and tighten the set screws in the shaft coupling to secure the main shaft to the vertical slide assembly.

Next put the CWP-5 welder on the 8" pipe and bring its carriage to it. Lower the shaft coupling down over the main shaft. Rotate the machine so that the welding lead on top of the machine will be on your left. This will put the electrical connector on the right. Tighten the set screws in the shaft coupling to secure the main shaft to the vertical slide assembly.

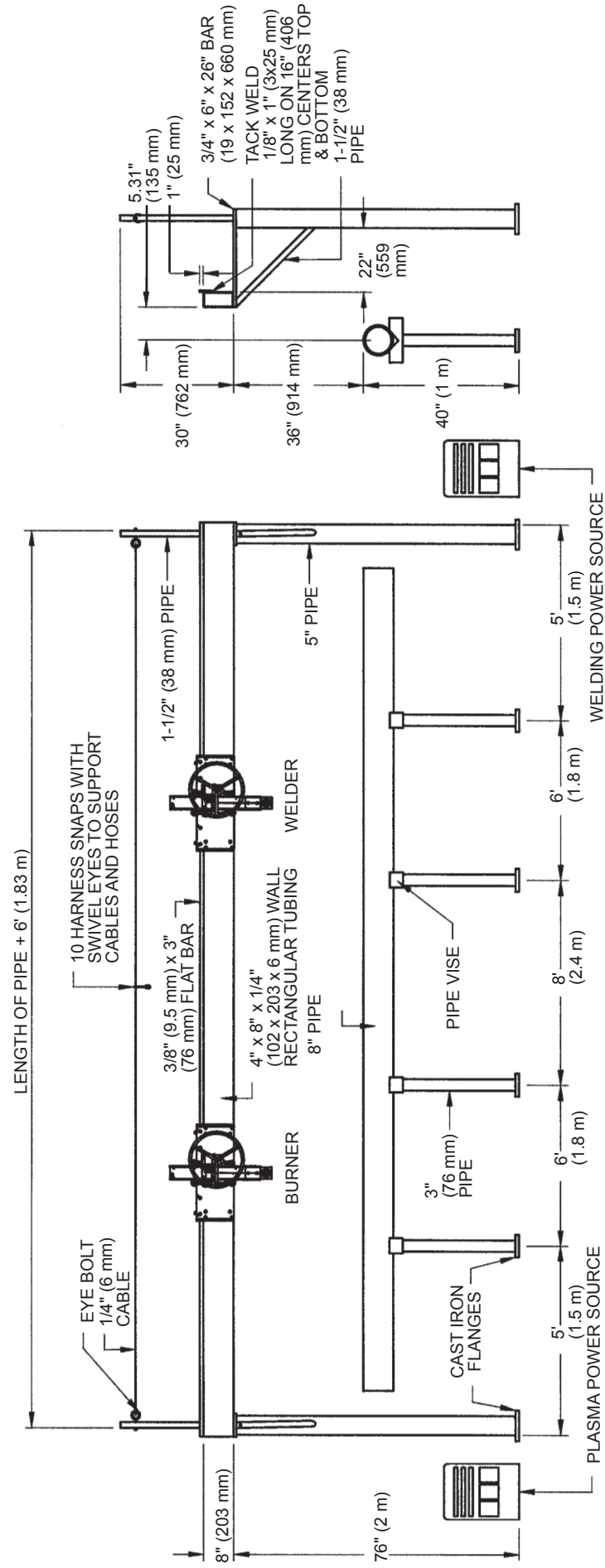
It is important for the machines to hang plumb. Left to right adjustments are made by loosening the two bolts that connect the shaft coupling to the vertical rail. Front to back adjustments are done by adjusting the position of the vertical rail support plate. Move the plate by adjusting the eight nuts on the four studs.

Note: Once machines are plumb verify that the machines are centered over the pipe stand.

## CARRIAGE ADJUSTMENT



# SET-UP DIAGRAM FOR CWP-5 / CB-1P USED IN SPRINKLER FABRICATION



## **PREVENTIVE MAINTENANCE / CWP-5 CIRCLE WELDER**

**IMPORTANT:** Make sure the input power at the power source is turned off and the 50' weld cable is disconnected from the circle welder prior to working inside the circle welder.

### **AFTER DAILY USE:**

#### **Refer to CWP-5 Exploded View and Parts List. (Pg. 18-19)**

##### **Racking System item #25:**

Inspect gear rack, hardened ways and wheels (remove all dirt, grease, weld spatter and rust). Check hardened ways for nicks and replace if necessary. Lubricate with a dry teflon or graphite spray lubricant. Adjust wheels for snug fit and smooth operation. Lubricate racker pinion with a dry teflon or graphite spray lubricant.

##### **Small Horizontal Racker item #2:**

Inspect wheels (remove all dirt, grease, weld spatter and rust). Adjust wheels for snug fit and smooth operation. Lubricate racker pinion and wheels with a dry teflon or graphite spray lubricant.

##### **Slide Bar Mounting Assembly item #12:**

Inspect hardened ways (remove all dirt, grease and weld spatter). Check hardened ways for nicks and replace if necessary. Lubricate with a dry teflon or graphite spray lubricant.

#### **Refer to CWP-5 Electrical Component Chart. (Pg. 20)**

##### **Power Cable item #5:**

Inspect cable connector to make sure threads are not stripped and that the connector is not cracked. Check the cable for cuts, missing insulation and burn spots, replace if necessary.

##### **CWP-5 Collector item #9:**

Inspect cable connector to make sure threads are not stripped and that the connector is not cracked. Ensure that the connector is fastened properly to the large aluminum gear item #21 on the CWP-5 Exploded View Parts List.

### **EVERY SIX MONTHS:**

#### **Refer to CWP-5 Exploded View and Parts List. (Pg. 18-19)**

##### **Aluminum Gear item #21**

Do not grease this gear. Inspect gear teeth (remove all dirt, grease and weld spatter). Lubricate with a dry teflon or graphite spray lubricant. Replace gear if excessively worn.

##### **P.M. Motor Assembly item #7:**

Do not grease this pinion. Inspect the drive pinion (remove all dirt, grease and weld spatter). Lubricate with a dry teflon or graphite spray lubricant. Replace pinion if excessively worn. Check set screw and tighten if necessary. Adjust motor assembly using the four adjustable mounting fasteners so that proper gear mesh is achieved between the aluminum gear item #27 and the motor drive pinion.

##### **Wire Reel Assembly item #3:**

Periodically coat the wire wheel shaft with a thin layer of grease as needed. Inspect the shoe assembly and replace if excessively worn.

## **PREVENTIVE MAINTENANCE / CWP-5 CIRCLE WELDER**

### **Refer to CWP-5 Electrical Component Chart. (Pg. 20)**

#### **Dual Control Box item #7:**

Open control box use an air hose to blow out dust and dirt. Check all wires for breaks and replace if necessary. Check all electrical connectors and plugs. If an electrical component fails refer to CWP-1570 Control Panel Exploded View and Parts List for replacement parts or to return for service.

#### **LN-7 Wire Feeder Assembly item #11:**

Check brushes for wear. Brushes should be replaced when their length is less than 1/4 inch. Replace strain relief on wire if pulled out of motor housing.

#### **Large Brush Holder & Support item #4:**

Inspect brush holder. Make sure constant tension is being applied on the brushes. Brushes should move freely within the brush holder. Check brushes for arc build-up. If brushes are pitted they will need replaced. Remove the brushes and sand them to ensure a smooth contact surface. Make sure all fasteners are tight.

#### **Small Brush Retainer Assembly item #10:**

Inspect black brush holders for cracks and replace if needed. Check and make sure all wires are soldered properly to the holders. Replace the brushes when their length is less than 1/2 inch long. Remove the brushes and sand them to ensure a smooth contact surface. Make sure all fasteners are tight.

#### **Terminal Block item #12:**

Inspect the plastic terminal strip and make sure it is not cracked, replace if necessary. Make sure all terminal connections are tight. Make sure all ground wires are connected to the mounting screws of the terminal strip.

### **EVERY TWELVE MONTHS:**

### **Refer to CWP-5 Exploded View and Parts List. (Pg. 18-19)**

#### **1" Bearing With Fasteners item #15:**

Do not grease the bearing, it is greased for life by the manufacturer. If the grease fitting has not been removed and plugged we suggest that you do so now. Earlier models may not have been plugged at time of assembly.

#### **1-1/4" Bearing With Fasteners item #16:**

Do not grease the bearing, it is greased for life by the manufacturer. If the grease fitting has not been removed and plugged we suggest that you do so now. Earlier models may not have been plugged at time of assembly.

#### **P.M. Motor Assembly item #7:**

Bodine gear motor lubrication. Fill gear motor to oil level indicator with worm gear oil conforming to AGMA#5EP compounded (SAE#90) oil or Bodine lubricant (#L-23). Do not overfill.

#### **LN-7 Wire Feeder Assembly item #13:**

Apply graphite grease to the gear teeth. Inspect the drive roll portion of the assembly, clean as necessary. Do not use solvents on the idle roll because it may wash the lubricant out of the bearings. Do not apply grease to the drive rolls.

#### **Encoder Assembly item #9:**

Inspect for excessive wear and tear. Keep the transmission assembly clean and lubricate with Lubriplate #630-AA.

## PREVENTIVE MAINTENANCE / CWP-5 CIRCLE WELDER

### **Refer to CWP-5 Electrical Component Chart. (Pg. 20)**

#### **CWP-5 Collector item #9:**

The collector ring should be sanded once a year. If the collector ring is pitted too badly it should be replaced. Inspect all wires coming out of the collector ring for cut or missing insulation. All wires should be fastened to the center shaft with a nylon cable tie. Tighten four set screws if needed.

#### **Weld Cable Inlet 2/0 item #1:**

Ensure that the cable is fastened tightly to the collector ring. Inspect the cable for cut or missing insulation. Make sure the micarta insulation tube on the cable is in good condition. Replace the cable if necessary.

#### **Solenoid Adaptor Kit item #14:**

Inspect for damage. Replace if necessary.

#### **GMA Pigtail item #6:**

Inspect the cable for cuts or missing insulation. Ensure that the elbow connector is not damaged. Ensure that all terminal ends are snug. Replace cable if necessary.



# WARRANTY

## Limited 3-Year Warranty\*

Model \_\_\_\_\_  
Serial No. \_\_\_\_\_  
Date Purchased: \_\_\_\_\_  
Where Purchased: \_\_\_\_\_

For a period ending one (1) year from the date of invoice, Manufacturer warrants that any new machine or part is free from defects in materials and workmanship and Manufacturer agrees to repair or replace at its option, any defective part or machine. HOWEVER, if the invoiced customer registers the Product Warranty by returning the Warranty Registration Card supplied with the product within 90 days of the invoice date, or by registering on-line at [www.bugo.com](http://www.bugo.com), Manufacturer will extend the warranty period an additional two (2) years which will provide three (3) total years from the date of original invoice to customer. This warranty does not apply to machines which, after Manufacturer's inspection are determined by Manufacturer to have been damaged due to neglect, abuse, overloading, accident or improper usage. All shipping and handling charges will be paid by the customer.

The foregoing express warranty is exclusive and Manufacturer makes no representation or warranty (either express or implied) other than as set forth expressly in the preceding sentence. Specifically, Manufacturer makes no express or implied warranty of merchantability or fitness for any particular purpose with respect to any goods. Manufacturer shall not be subject to any other obligations or liabilities whatsoever with respect to machines or parts furnished by Manufacturer.

Manufacturer shall not in any event be liable to Distributor or any customer for any loss of profits, incidental or consequential damages or special damages of any kind. Distributor's or customer's sole and exclusive remedy against Manufacturer for any breach of warranty, negligence, strict liability or any other claim relating to goods delivered pursuant hereto shall be for repair or replacement (at Manufacturer's option) of the machines or parts affected by such breach.

### Distributor's Warranty:

In no event shall Manufacturer be liable to Distributor or to any customer thereof for any warranties, representations or promises, express or implied, extended by Distributor without the advance written consent of Manufacturer, including but not limited to any and all warranties of merchantability or fitness for a particular purpose and all warranties, representations or promises which exceed or are different from the express limited warranty set forth above. Distributor agrees to indemnify and hold Manufacturer harmless from any claim by a customer based upon any express or implied warranty by Distributor which exceeds or differs from Manufacturer's express limited warranty set forth above.

### HOW TO OBTAIN SERVICE:

***If you think this machine is not operating properly, re-read the instruction manual carefully, then call your Authorized BUG-O dealer/distributor. If they cannot give you the necessary service, write or phone us to tell us exactly what difficulty you have experienced. BE SURE to mention the MODEL and SERIAL numbers.***

\*Bug-O System's warranty applies to Bug-O components only. Where other brands of power sources, wire feeders or sub components are a part of Bug-O Equipment, please refer to that specific Manufacturer's manual for warranty specifications on their components.