INSTRUCTIONS AND PARTS MANUAL

CWP-11 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-CWP11-IPM-0218

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



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.



- 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.
- 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.
- Never open the equipment without first unplugging the power cord or serious injury may result.
- 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.

- 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.
- 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.

- 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.



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.



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Patents Pending

INTRODUCTION

The CWP-11 (CWP-1100) Programmable Circle Welder is designed for welding of nozzles into vessels utilizing SUB-ARC, MIG or FLUX CORED PROCESS, with gas shielding. The CWP-11 mounts on a 3-Jaw Chuck for welding diameter 6" to 50" O.D.

FEATURES

- Amperage & wire speed control.
- Wire feeder with one set of drive rolls.
- Wire sizes from 0.035 7/64 in (0.9 2.8 mm) for subarc welding.
- 1/12 HP P.M. motor and rotational speed control.
- 600 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 60 lb. (27 kg) spools.
- Adjustable vertical and horizontal torch positioning system
- Microprocessor controlled rise and fall, up to 5" (125 mm).
- Brushes and collector rings for welding current, rated at 600 AMPS 100% duty cycle.
- Brushes and collector rings for all controls, eliminates cable and hose wrap.

TECHNICAL DATA

Input Voltage: 115 VAC Amperage: 0-600 amps. Voltage: 0-50 Wire Sizes: 0.035 - 7/64 (0.8-2.8 mm.) Rotation Speed: 0.06-0.72 rpm Vertical Range: 0"-5" (0-125 mm.) Welding Radius: 0"-25" (0-0.625 m.) Shielding Gas: Solenoid Control Height: 43" (1092 mm.) Net Weight: 360 lbs. (163.6 kg.) Shipping Weight: 490 lbs. (222.3 kg.)

DIMENSIONS



Max Welding Radius

SETUP AND OPERATION

POWER SOURCE

Use only constant voltage (CV) type power sources with this circle welder machine. If using a multiple process power source, be sure that it is set for constant voltage (CV) 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.

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 through the incoming tube of the wire feeder at least once a day.

ADDITIONAL CABLES

Each circle welder is supplied with the following cables:

- 1. CWO-3971 50' (15 m) power cable that connects the power source to the cable connector on the top gear of the machine.
- 2. CWO-3040 50' (15 m) weld cable that connects the lead coming out of the top of the machine to your power supply, using the quick connect connector .
- 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*.)

WHEEL ADJUSTMENT

The CWP-11 Motorized Racking System (CBP-1640) and the Large Horizontal Racker (CWO-1690) are equipped with adjustable wheels. Always check these components for proper wheel adjustment before using the machine. Adjust the wheels 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 (shown in Figure 1) are adjustable. To adjust the wheels, loosen the hex bolt (A) until the eccentric bushing (B) can be rotated. Correct the wheel alignment by rotating the eccentric bushing (B). Once adjusted, hold the eccentric bushing (B) while tightening the hex bolt (A). Recheck alignment.

WIRE SPEED AND VOLTAGE ADJUSTMENT

The wire speed control on the front of the CWO-3535 Wire Feed Control box has a dial that is calibrated directly in inches per minute. Set the voltage using the control on the power source.

INSTALLATION

Use a 3-Jaw Chuck to mount and center the CWP-11 on nozzles with or without flanges, as seen in Figure 2. See page 43 for a list of available 3-Jaw Chucks.

MACHINE CONTROLS

Operational parameters can be set using the two control boxes. Please refer to the sections in this manual entitled "Rotation Controls" and "Pendant Control" for descriptions of the various speed and directional capabilities. For the LN-9 Wire Feed Control Box; refer to the supplied LN-9 Semiautomatic Wire Feeder Manual from Lincoln Electric.



Figure 1: Adjustable Wheel



Figure 2: Installation with 3-Jaw Chuck

SETUP AND OPERATION, CONT'D.

WELD STARTING POSITION

Proper positioning of the electrode is crucial to a successful weld. The CWP-11 rotates in a clockwise direction. The weld should start on the centerline of the nozzle parallel to the centerline of the vessel and begin welding downhill. For on-center nozzles, there are two valid start positions, shown as A1 and A2 in Figure 3. There is only one valid start position for a hillside nozzle, shown as B in Figure 4.



Figure 3: Weld Starting Position for On-center nozzles.





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

MAKING A WELD

- 1. Connect the ground cable to the workpiece. The ground cable must make good electrical contact with the work.
- 2. Set Auto/Manual switch on Wire Feeder Control Box to MANUAL.
- 3. Depress red STOP button on Rotation Control Box.
- 4. Position the welding gun at the start position using the Rotation Controls and the Racking System. Position the electrode in the joint. The end of the electrode may be lightly touching the work.
- 5. Depress black RESET button on Rotation Control Box to set new Home position.
- 6. Using the Pendant Control, call up the desired program number or input a new program. When finished press "D" to display the program data.
- 7. Set the Auto/Manual switch on the Wire Feeder Control Box to AUTO.
- 8. Depress the green START button on the Rotation Control Box to begin the weld program.
- 9. The machine will automatically stop at the end of the weld program.

CWO-3535 LN-9 WIRE FEEDER CONTROLS



- A. Wire Burn Back Control
- B. Wire Polarity Control
- C. Wire Direction Control
- D. Volt / Wire Speed Meter
- E. Meter Selector Switch
- F. Voltage Control
- G. Wire Speed (Current) Control
- H. Actual / Set Value Jog Button
- I. Cold Wire Inch
- J. Wire Hot / Cold Selector
- K. Weld On / Off

CWO-3535 LN-9 WIRE FEEDER CONTROLS

For further information refer to Lincoln Electric LN-9 Wire Feeder Operators Manual

A. WIRE BURN BACK CONTROL

This control 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 burn back depending on wire size, process, procedure, Etc.

B. WIRE POLARITY CONTROL

Set the switch to the same polarity as the electrode lead connection to the power source. If the switch is not set for the correct polarity the wire feeder will stop welding shortly after the arc is struck.

C. WIRE DIRECTION CONTROL

Controls the direction the wire is being fed through the feeder. **UP** to return wire to the spool. **DOWN** to feed wire to the gun.

D. VOLT / WIRE SPEED METER

A three-digit meter is provided to set and monitor the welding procedure. The arc voltage is displayed in volts, and the wire feed speed is displayed in either inches/minute or meters/minute.

E. METER SELECTION SWITCH

When the **METER SELECTION SWITCH** is set to "VOLTS" position, the meter reads the arc voltage setting as adjusted by the **VOLTAGE CONTROL**. The three "WIRE SPEED" positions include an "ENGLISH" position, for the meter readings in inches/minute; and "LO" and "HIGH" range "METRIC" positions, for meter readings in meters/minute.

F. VOLTAGE CONTROL

Increases and decreases the voltage in conjunction with the **METER SELECTION SWITCH**. Adjustments can be made before and during the welding operation.

G. WIRE SPEED (CURRENT) CONTROL

Increases and decreases the wire speed in conjunction with the **METER SELECTION SWITCH**. Adjustments can be made before and during the welding operation.

H. ACTUAL / SET VALUE JOG BUTTON

After the weld has been started the "ACTUAL" voltage or wire speed can be read by pressing the "SET- ACTUAL" push button. The **METER SELECTION SWITCH** must be set in the desired position. When the push button is not being operated the meter continues to read the "SET" value.

I. COLD INCH SWITCH

The **COLD INCH SWITCH** when pressed energizes the wire feeder but not the gas solenoid or the welding power source.

J. WIRE HOT / COLD SELECTOR

The two position switch performs a dual function. In the "down" position the wire may be fed electrically cold. In the "up" position the wire is electrically hot when feeding and the contact circuit is controlled only by the **WELD ON-OFF SWITCH**.

K. WELD ON / OFF

The "OFF" position allows the operator to rotate the machine without welding to check the wire placement. The "ON" position will start the entire weld operation based on the operators settings, including machine rotation.

CBP-1550 ROTATION CONTROLS



DIGITAL READ OUT: Displays speed reference value.

SPEED CONTROL: Controls the speed at which the machine travels.

START/RESUME: Starts rotation.

STOP/PAUSE: Stops rotation.

RESET: Sets machine position as "home" position.

MANUAL JOG: Allows user to manually position the welding tip while the machine is stopped or paused.

ON/OFF SWITCH: Enables/disables power to the rotation control box.

PILOT LIGHT: Indicates when the machine is powered on.

PENDANT CONTROL (BUG-6050)

This is the pendant control with keypad and display. The pendant control is used for programming the sizes of the work pieces and their fit, as described on the next page. It plugs into the Pendant Control Connection on the CBP-1500 rotation control box.



ALPHA KEYS: Press Keys A, B, C, D, or E for the function desired, as described in the programming section of this manual.

DIGIT KEYS: Use the digit keys to enter pipe diameters or dimensions.

ENTER: Push the enter button to store the numeric value keyed.

- **BACKSPACE:** The backspace key removes the last digit keyed in before pushing the enter button, if a correction is required.
- **SHIFT:** The blank key in the top right corner of the key pad is the SHIFT key. Use this key to access additional programming options.

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 centérlines.

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. The time delay setting is not saved as part of a program.

EXAMPLE

The following is a step-by-step example for setting up and running the CWP-11.

BASIS:

Weld an 8" nozzle onto a 36" Diameter vessel, with an offset of 6". Weld two passes, and allow 0.3 seconds for puddle build-up at the start of the weld. Assign program number 01 to this weld.

Step 1. Select a suitable 3-Jaw Chuck.

Choose either a CWO-3660 or a CWO-3661 for the 8-in nozzle, from the list on page 41.

Step 2. Install the CWP-11.

Insert chuck into nozzle and secure CWP-11 to chuck. Connect ground cable to work piece; ensure good contact. On the wire feeder controls, set the Weld switch to OFF. Power ON the rotation control box. Set travel speed using the rotation control box.

Step 3. Position the welding gun.

Press the red [STOP] button on the rotation control box.

Using rotation controls and CWO-1640 racking system, place the electrode at the weld start. The weld should start at the beginning of the larger downhill as shown in Figure 4 on page 9. Press the black [RESET] button on the rotation control box.

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.
- [8], [0], [0], then [ENTER] At the "Enter Large Diameter" prompt, enter the vessel diameter. [3], [6], [0], [0], then [ENTER]
- At the "Offset" prompt, enter the offset distance.
 - [6], [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.

[2], then [ENTER]

Step 5. Start the weld.

On the wire feeder controls, set the Weld switch to AUTO. Depress green [START] button on rotation control box.

Step 6. End the weld.

The CWP-11 will automatically stop after completing the number of passes entered. Depress the red [STOP] button on rotation control box after the weld has stopped and before repositioning the machine.

CWP-1100 PROGRAMMABLE CIRCLE WELDER / EXPLODED VIEW



CWP-1100 PROGRAMMABLE CIRCLE WELDER / PARTS LIST

| ITEM | <u>QTY</u> | PART NO. | DESCRIPTION |
|------|------------|--------------|-------------------------------------|
| 1 | 2 | BUG-3278 | Spacer |
| 2 | 1 | CWO-3530 | LN-9F Wire Feeder * |
| 3 | 1 | CWO-1121 | CWP-11 Wire Feeder Mount Plate |
| 4 | 1 | CWO-1122 | LN-9F Control Mount Plate |
| 5 | 1 | CWO-1123 | Control Mt. Spacer Block |
| 6 | 1 | CWO-1124 | Control Mount Plate |
| 7 | 1 | CBP-1640 | Motorized Racking System |
| 8 | 1 | CWO-1690 | Large Horizontal Rack |
| 9 | 1 | CWO-3133 | Collector w/ Power Racker |
| 10 | 1 | CWO-3165 | Housing Assembly |
| 11 | 1 | CWO-3218 | Cable Support Bar |
| 12 | 1 | CWO-3312 | Lifting Lug Weldment |
| 13 | 1 | CWO-3315 | Brush Holder & Support |
| 14 | 1 | CBP-1595 | Encoder Assembly |
| 15 | 1 | CWO-3432 | Shaft Assembly |
| 16 | 1 | CWO-3490 | Flux Hopper Assembly** |
| 17 | 1 | CWO-3498-11 | Wire Reel Assembly |
| 18 | 1 | CWO-3506 | 4066 Motor Assembly |
| 19 | 2 | CWO-3528 | 2" Flange Bearing w/ Fasteners |
| 20 | 1 | CWO-3531 | Motor & Transmission Plate Assembly |
| 21 | 1 | CWO-3535 | LN-9 Wire Feeder Control |
| 22 | 1 | CWO-3534 | Slide Bar Mounting Assembly |
| 23 | 1 | CWO-3537 | Guard Assembly |
| 24 | 1 | CWO-3931 | Brush Retainer |
| 25 | 1 | CWO-3968 | Base Plate |
| 26 | 1 | CWO-3969 | Terminal Block Assembly |
| 27 | 1 | CWO-5074 | 1-1/2" I.D. Trantorque |
| 28 | 1 | CWO-5793 | Gear |
| 29 | 1 | CBP-1500 | Rotation Control |
| 30 | 1 | CWO-4390 | Flux Hopper Support Bar** |
| 31 | 1 | CWO-2005 | Wire Feeder Guard |
| 32 | 1 | BUG-6050 | Pendant Keypad (Not Shown) |
| 33 | 1 | BUG-9448 | 1/2" Wrench (Not Shown) |
| 34 | 1 | BUG-9449 | Hex Key Kit (Not Shown) |
| 35 | 1 | MUG-1621-1.5 | Cable, 18" (Not Shown) |
| 36 | 2 | MUG-1634-4 | Shielded Cable 4'-6' (Not Shown) |

* See available drive roll options located on page 40. ** Subarc (SA) models only.

CBP-1640 MOTORIZED RACKING SYSTEM / EXPLODED VIEW / PARTS LIST



CBP-1675 MOTORIZED RACKER / EXPLODED VIEW / PARTS LIST



CBP-1590 DRIVE BOX / EXPLODED VIEW / PARTS LIST

| ITEM | <u>QTY</u> | <u>PART NO.</u> | 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 | 1 | CBP-1585 | Drive Box |
| 5 | 1 | CBP-1586 | Drive Plate |
| 6 | 1 | CBP-1587 | Motor Spacer |
| 7 | 4 | FAS-0204 | Rnd Hd Slt Scr 4-40 x 3/8 |
| 8 | 4 | FAS-0517 | Soc Hd Cap Scr 6-32 x 3/4 |
| 9 | 4 | FAS-0527 | Soc Hd Cap Scr 8-32 x 3/4 |
| 10 | 4 | FAS-1305 | Hex Nut 4-40 |
| 11 | 1 | GOF-3014 | Drive Pinion |



| ITEM 1 | <u>QTY</u> | <u>PART NO.</u> BUG-2032 | DESCRIPTION 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-1687 | Mount Plate (Large Racker) | |
| 8 | 2 | CWO-4326 | Fixed Leg & Wheel Assembly | |
| 9 | 2 | CWO-4327 | Adj. Leg & Wheel Assembly | |
| 10 | 2 | FAS-0559 | Soc Hd Cap Scr 1/4-20 x 1" | 1. |
| 11 | 1 | FAS-1307 | Hex Jam Nut 3/4-16 | 40 |
| 12 | 1 | MUG-1141 | Bearing Collet | 16 |
| 13 | 1 | MUG-1142 | Knob, Locking | |
| 14 | 1 | MUG-1144 | Shaft | 13· |
| 15 | 2 | MUG-1453 | Stand-Off | |
| 16 | 1 | MUG-1579 | Retaining Ring | 14· |
| 17 | 2 | WAS-0240 | 1/4" SAE Washer | |

F= FIXED WHEEL PLACEMENT A= ADJUSTABLE WHEEL PLACEMENT



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CWO-3165 HOUSING ASSEMBLY / EXPLODED VIEW / PARTS LIST



| ITEM | <u>QTY</u> | <u> PART NO.</u> | DESCRIPTION |
|-------------|------------|------------------|--------------------------------------|
| 1 | 1 | CWO-4133 | 1/4-18 Npsm Hex Plug, Brass |
| 2 | 1 | CWO-5842 | Center Tube Housing |
| 3 | 1 | CWO-5845 | Top Housing Plate |
| 4 | 1 | CWO-5853 | Lower Housing Plate |
| 5 | 2 | CWO-5980 | Plastic Bushing |
| 6 | 3 | CWO-9339 | Angle for Guard |
| 7 | 3 | FAS-0535 | Soc Hd Cap Scr 10-24 x 1/2" |
| 8 | 8 | FAS-0548 | Soc Hd Cap Scr 10-32 x 3/4" Low Head |

CWO-3315 BRUSH HOLDER & SUPPORT ASSEMBLY / EXPLODED VIEW / PARTS LIST

| 9 | ITEM | <u>QTY</u> | PART NO. | DESCRIPTION |
|-----|-------------|------------|----------|--------------------------------|
| | 1 | 1 | CWO-4470 | Brush Holder Support |
| | 2 | 1 | CWO-4473 | Attachment Bar |
| ()F | 3 | 3 | CWO-3263 | Large Brush Holder |
| | 4 | 6 | CWO-3264 | Spring Clip |
| | 5 | 6 | CWO-4337 | Large Brush 1-1/2" x 3/4" x 2" |
| | 6 | 2 | CWO-5548 | Micarta Spacer |
| | 7 | 1 | CWO-5549 | Micarta Bushing |
| | 8 | 1 | CWO-4470 | Support Brush Holder Extension |
| | 9 | 1 | FAS-3308 | Hex Hd Cap Scr 1/2-13 x 3" |
| | 10 | 1 | FAS-0309 | Hex Hd Cap Scr 1/2-13 x 1" |
| | 11 | 1 | FAS-0357 | Hex Hd Cap Scr 1/4-20 x 3/4 |
| | 12 | 3 | FAS-0359 | Hex Hd Cap Scr 1/4-20 x 1" |
| | 13 | 1 | FAS-3304 | Hex Hd Cap Scr 1/2-13 x 4" |
| | 14 | 4 | WAS-0243 | 1/4" Split Lock Washer |
| | 15 | 3 | WAS-0280 | 1/2" SAE Flat Washer |
| | 16 | 3 | WAS-0281 | 1/2" Split Lock Washer |

CWO-3432 SHAFT ASSEMBLY / EXPLODED VIEW / PARTS LIST



CWO-3490 FLUX HOPPER ASSEMBLY / EXPLODED VIEW / PARTS LIST

| ITEM | <u>QTY</u> | PART NO. | DESCRIPTION |
|------|------------|-------------|--|
| 1 | 1 | CWO-3757 | Hopper Support Rod |
| 2 | 1 | CWO-3760 | Clamp Block 1/2" |
| 3 | 1 | CWO-3478 | 1-3/4" Hose Barb |
| 4 | 1 | CWO-3769 | Flux Hopper Steel 12" |
| 5 | 1 | GOF-3019 | Handle w/ Bolts |
| 6 | 1 | CWO-3491-48 | Flux Hose 3/4" ID x 1" OD x 48" Lg (Not Shown) |

NOTE: Sub-Arc models only.





CWO-3498-11 WIRE REEL ASSEMBLY / EXPLODED VIEW / PARTS LIST

<u>QTY</u>

1

1

2

2

2



PART NO. BUG-3293 CWO-3217-11 FAS-1301 FAS-2305 WAS-0281

DESCRIPTION

Reel, 60 lbs. Wire Reel Support Assembly Hex Nut 1/2-13 Hex Hd Cap Scr 1/2-13 x 1-3/4" 1/2" Lock Washer

CWO-3506 4066 MOTOR ASSEMBLY / EXPLODED VIEW / PARTS LIST



CWP-3506 MOTOR CABLE / WIRING DIAGRAM



CBP-1535-11 ENCODER ASSEMBLY / EXPLODED VIEW / PARTS LIST



| | <u>Q1Y</u> | <u>PART NO.</u> | DESCRIPTION |
|----|------------|-----------------|------------------------------------|
| 1 | 1 | CBP-1594 | Encoder Mounting Bar |
| 2 | 2 | FAS-2941 | Flt Hd Soc Scr 10-32 x 1/4" |
| 3 | 1 | CBP-1549 | Encoder, 512 CPR |
| 4 | 1 | FAS-0124 | Pan Hd Scr 8-32 x 3/8", Di-Chrome |
| 5 | 1 | MUG-1592 | Bracket |
| 6 | 1 | BUG-6044 | Flexible Coupling |
| 7 | 2 | FAS-0115 | Pan Hd Scr 6-32 x 1/2", Zinc |
| 8 | 2 | SFX-1218 | Bearing, Flanged |
| 9 | 1 | MUG-1593 | Pod |
| 10 | 1 | MUG-1594 | Plate |
| 11 | 2 | FAS-0227 | Rnd Hd Scr 8-32 x 3/4" |
| 12 | 1 | CBP-1593 | Gear Shaft Assembly |
| 13 | 2 | FAS-0559 | Soc Hd Cap Scr 1/4-20 x 1" |
| 14 | 4 | FAS-1305 | Hex Nut, 4-40 |
| 15 | 1 | MUG-1596 | Enclosure |
| 16 | 1 | CON-1305P | Panel Connector 5-T, M |
| 17 | 4 | FAS-0204 | Rnd Hd Slt Scr 4-40 x 3/8", Zinc |
| 18 | 1 | WAS-0232 | #10 Split Lock Washer |
| 19 | 2 | FAS-1340 | Hex Nut 10-32 |
| 20 | 1 | CAP-1105M | Capacitor, 1UF 50V 10% (Not Shown) |
| 21 | 1 | CBP-1598 | Connector Cable (Not Shown) |
| | | | |

CWO-3528 2" FLANGE BEARING w/FASTENERS / EXPLODED VIEW / PARTS LIST

| ITEM | <u>QTY</u> | PART NO. |
|------|------------|----------|
| 1 | 1 | CWO-1511 |
| 2 | 1 | CWO-4482 |
| 3 | 2 | FAS-1398 |
| 4 | 2 | FAS-3305 |
| 5 | 2 | WAS-0290 |
| 6 | 2 | WAS-0291 |

DESCRIPTION

1/8" Pipe Plug Black Iron Flange Bearing 2" Bore 9/16-12 Hex Nut Hex Hd Cap Scr 9/16-12 x 2" 9/16" SAE Washer 9/16" Split Lock Washer



CWO-3531 MOTOR & TRANSMISSION PLATE ASSEMBLY / EXPLODED VIEW / PARTS LIST 6



| <u>ITEM</u> | <u>QTY</u> | <u>PART NO.</u> | DESCRIPTION |
|-------------|------------|-----------------|---------------------------------|
| 1 | 1 | BUG-1338 | I.D. Plate |
| 2 | 1 | CWO-5788 | Cover Plate |
| 3 | 1 | CWO-5887 | Motor & Transmission Plate |
| 4 | 1 | CWO-5888 | End Plate |
| 5 | 5 | FAS-0359 | Hex Hd Cap Scr 1/4-20 x 1" |
| 6 | 8 | FAS-1390 | Hex Nut 3/8-16 |
| 7 | 3 | FAS-2372 | Hex Hd Cap Scr 5/16-18 x 1-1/4" |
| 8 | 2 | FAS-2374 | Hex Hd Cap Scr 5/16-18 x 1-3/4" |
| 9 | 4 | FAS-2398 | Hex Hd Cap Scr 3/8-16 x 3" |
| 10 | 5 | WAS-0243 | 1/4" Split Lock Washer |
| 11 | 5 | WAS-0251 | 5/16" Split Lock Washer |
| 12 | 4 | WAS-0260 | 3/8" Washer |
| 13 | 8 | WAS-0262 | 3/8" Split Lock Washer |
| | | | |

CWO-3534 SLIDE BAR ASSEMBLY / EXPLODED VIEW / PARTS LIST



DESCRIPTION

PART NO.

CWO-3912

CWO-9033

FAS-0399 FAS-2372

WAS-0251

WAS-0262

| Э |
|----|
| |
| 1" |
| |
| |
| |

CWO-3537 GUARD ASSEMBLY / EXPLODED VIEW / PARTS LIST



CBP-1550 ROTATION CONTROL / EXPLODED VIEW



CBP-1550 ROTATION CONTROL / EXPLODED VIEW / PARTS LIST

| 11CBP-1556Rear Legend Plate21BUG-9446Cord Grip31BUG-9856Panel Connector, 2-T, F41CON-03RS03F *A*Panel Connector, 3-T, F51MUG-1156Panel Connector, 4-T, F61CON-06RP06F *B*Panel Connector, 6-T, F71BUG-9902 *C*Panel Connector, 6-T, F81BUG-9486Panel Connector, 2-T, M91FHO-0188Fuse Holder, Panel Mount101BUG-2924Reset Seal, Transparent | |
|--|-----|
| 2 1 BUG-9446 Cord Grip 3 1 BUG-9856 Panel Connector, 2-T, F 4 1 CON-03RS03F *A* Panel Connector, 3-T, F 5 1 MUG-1156 Panel Connector, 4-T, F 6 1 CON-06RP06F *B* Panel Connector, 6-T, F 7 1 BUG-9902 *C* Panel Connector, 2-T, M 9 1 FHO-0188 Fuse Holder, Panel Mount 10 1 BUG-2924 Reset Seal, Transparent | |
| 31BUG-9856Panel Connector, 2-1, F41CON-03RS03F *A*Panel Connector, 3-T, F51MUG-1156Panel Connector, 4-T, F61CON-06RP06F *B*Panel Connector, 6-T, F71BUG-9902 *C*Panel Connector, 6-T, F81BUG-9486Panel Connector, 2-T, M91FHO-0188Fuse Holder, Panel Mount101BUG-2924Reset Seal, Transparent | |
| 41CON-USRS0SFAPanel Connector, 5-1, F51MUG-1156Panel Connector, 4-T, F61CON-06RP06F *B*Panel Connector, 6-T, F71BUG-9902 *C*Panel Connector, 6-T, F81BUG-9486Panel Connector, 2-T, M91FHO-0188Fuse Holder, Panel Mount101BUG-2924Reset Seal, Transparent | |
| 61CON-06RP06F *B*Panel Connector, 6-T, F71BUG-9902 *C*Panel Connector, 6-T, F81BUG-9486Panel Connector, 2-T, M91FHO-0188Fuse Holder, Panel Mount101BUG-2924Reset Seal, Transparent | |
| 71BUG-9902 *C*Panel Connector, 6-T, F81BUG-9486Panel Connector, 2-T, M91FHO-0188Fuse Holder, Panel Mount101BUG-2924Reset Seal, Transparent | |
| 81BUG-9486Panel Connector, 2-T, M91FHO-0188Fuse Holder, Panel Mount101BUG-2924Reset Seal, Transparent | |
| 91FHO-0188Fuse Holder, Panel Mount101BUG-2924Reset Seal, Transparent | |
| 10 1 BUG-2924 Reset Seal, Transparent | |
| | |
| 11 1 CBP-6030 Control Module | |
| 12 1 BUG-0029 Bracket | |
| 14 1 BUG-6028 Terminal Block Kulka | |
| 15 1 BUG-1770 Motor Control Board | |
| 16 1 CBP-1557 Control Case | |
| 17 1 BUG-1764 Meter Display Board Assy. | |
| 18 1 MDS-1011 Display Bezel | |
| 19 1 BUG-1562 Multi-Turn Potentiometer 10K, 3 tu | rn |
| 20 1 BUG-5/5/ KNOD, Black 21 1 SW/T 1112 N.O. Duch Button Switch Bod | |
| 22 1 SWT-1112 N. O. Push Builton Switch Red 22 1 SWT-1111 NOR Open Push Builton Black | |
| 23 1 MUG-1199 Togale Switch DPDT. (ON)-OFF-(C | DN) |
| 24 1 BUG-9677 Potentiometer 10K OHMS | , |
| 25 1 MDS-1044 Knob for Pot, Yellow | |
| 26 1 CWO-6206 Red Neon Lamp, 125V | |
| 27 1 CBP-1553 Front Legend Plate | |
| 28 2 ARIVI-2279 TOUGUE SWITCH DPST, ON-NOINE-C | "FF |
| 30 1 PRS-1065 Joystick | |
| 31 1 SWT-1113 N. O. Push Button Switch Green | |
| 32 1 ABP-1069 Toggle Switch SPST, ON-NONE-O | FF |
| 33 1 CWO-6520 4-Quadrant Speed Control | |
| 34 1 CBP-1511 Transformer Bracket | |
| 35 1 CBP-1551 Control Cover | |
| 37 1 MUG-1589 Hole Plug 500" | |
| 38 34 FAS-0204 Rnd Hd Slt Scr 4-40 x 3/8" Zinc | |
| 39 30 FAS-1305 Hex Nut 4-40 | |
| 40 2 FAS-0115 6-32 x 1/2 Pan Head, Zinc | |
| 41 2 FAS-1310 Hex Nut 6-32 | |
| 42 6 FAS-0224 Rnd Hd Scr 8-32 x 3/8" | |
| 45 4 FAS-0104 4-40 X 5/6 Pall field, black AA = A = EAS-02AA Bind Hd Ser 10-32 x 3/8" | |
| 45 4 FAS-1340 Hex Nut 10-32 | |
| 46 2 FAS-0525 Soc Hd Cap 8-32 x 1/2" | |
| 47 10 SCW WTE 0264 #6 x 1/4" Pan Hd, Sheet Metal | |
| 48 2 FAS-0253 Rnd Hd Scr 1/4-20 x 5/16" | |
| 49 2 WAS-0242 1/4" External Star Lock Washer | |
| 50 2 WAS-0243 1/4" Split Lock Washer 51 2 EAS 0256 Hey Hd Cop Ser 1/4 20 y 5/8" | |
| 51 2 FAS-0550 Flexing Cap Sci 1/4-20 X 5/6 | |
| * 1 CON-1305S Panel Connector 5-T. F | |
| * 36" 900-4-011 Power Cord, 18" x .410" Max | |
| * 1 CBP-1512 Wire Harness, AC Power | |
| * 1 CBP-1513 Wire Harness, Encoders; Y-Drive | |
| * 1 CBP-1514 Wire Harness, X-Motor | |
| * 1 CBP-151/ WIRE Harness, Pendant * 1 CBP-1510 Wire Harness, Start Stop Speed | |
| CB 1 BUG-2923 7 AMP Circuit Breaker | |
| T 1 BUG-5218 Transformer 117V 50/60 Hz | |

CWO-3931 BRUSH RETAINER / EXPLODED VIEW / PARTS LIST



| QTY | PART NO. | DESCRIPTION |
|-----|---------------------------|--------------------------------------|
| 1 | CWO-3947 | Small Retainer Assembly, 12 POS |
| 12 | CWO-5831 | 1/8" x 1/8" x 1/8" Brush |
| 12 | CWO-5874 | 1/8" Brush Holder |
| 12 | CWO-5875 | Сар |
| 12 | CWO-5876 | Clip |
| 1 | CWO-9067-12 | Small Brush Retainer Block |
| 1 | CWO-9082 | Retainer Support |
| 2 | FAS-0359 | Soc Hd Cap Scr 10-24 x 1" |
| 1 | FAS-0593 | Soc Hd Cap Scr 3/8-16 x 1-1/2" |
| 12 | TERM-WTE-1508 | #8 Fork, Blue |
| 1 | WAS-0260 | 3/8" SAE Washer |
| 1 | WAS-0262 | 3/8" Split Lockwasher |
| 6 | CWO-3947 12 BRUSH ASSE | POSITION SMALL MBLY / DETAIL VIEW |

CWO-3969 TERMINAL BLOCK ASSEMBLY / EXPLODED VIEW / PARTS LIST



CBP-1550 ROTATION CONTROL / WIRING DIAGRAM / ELECTRICAL COMPONENT CHART



- - - = INDICATES ITEMS THAT ARE SUPPLIED TOGETHER.

| | | CBP-1500 | CBP-1502 | |
|------|--------------------------|----------|----------|--|
| ITEM | DESCRIPTION | 120 VAC | 240 VAC | |
| CB | Circuit Breaker | BUG-2923 | BUG-2923 | |
| PC | Power Cord | BUG-9445 | GOF-3115 | |
| PL | Pilot Light | BUG-1415 | BUG-1428 | |
| Т | Transformer | BUG-5218 | BUG-5231 | |
| VT | Volt Trap | BUG-1393 | BUG-1563 | |
| MC1 | 4-Quadrant Speed Control | CWO-6520 | CWO-6522 | |

ELECTRICAL COMPONENT CHART

CBP-1550 ROTATION CONTROL / WIRING DIAGRAM / ELECTRICAL COMPONENT CHART



--- = INDICATES ITEMS THAT ARE SUPPLIED TOGETHER.

| | | CBP-1500 | CBP-1502 |
|------|--------------------------|----------|----------|
| ITEM | DESCRIPTION | 120 VAC | 240 VAC |
| СВ | Circuit Breaker | BUG-2923 | BUG-2923 |
| PC | Power Cord | BUG-9445 | GOF-3115 |
| PL | Pilot Light | BUG-1415 | BUG-1428 |
| Т | Transformer | BUG-5218 | BUG-5231 |
| VT | Volt Trap | BUG-1393 | BUG-1563 |
| MC1 | 4-Quadrant Speed Control | CWO-6520 | CWO-6522 |

ELECTRICAL COMPONENT CHART

CWO-3530 LN-9 WIRE FEEDER / WIRING DIAGRAM





CWP-3535 LN-9 WIRE FEEDER / WIRING DIAGRAM / ELECTRICAL COMPONENT CHART



| ELECTRICAL | COMPONENT | CHART |
|------------|-----------|-------|
|------------|-----------|-------|

| ITEM | DESCRIPTION | PART NO. |
|------|------------------------------|-----------|
| 1 | Toggle Switch On-Off | BUG-9856 |
| 2 | PB Switch, Black | SWT-1111 |
| 3 | Power Receptacle | BUG-2287 |
| 4 | Burnback Kit | BUG-3292 |
| 5 | Panel Connector, 2-T, Female | CON-1202S |

NOTE: All parts not called out are components of a Lincoln Electric LN-9 wire feeder. Component information can be found in the LN-9 wire feeder operators manual.

CWO-3971 CONTROL CABLE / DETAIL VIEW / PARTS LIST



CWO-3973 LN-9 CONTROL CABLE / DETAIL VIEW / PARTS LIST



CWO-6069-P END VIEW

CWO-3974 CONTROL CABLE / DETAIL VIEW / PARTS LIST







| ITEM | <u>QTY</u> | PART NO. |
|------|------------|--------------|
| 1 | 1 | CON-3912S |
| 2 | 1 | CON-3914P |
| 3 | 2 | CSR-3057-16A |
| 4 | 39" | 900-4-017 |
| | | |

DESCRIPTION

| Cable Connector, 12T, F, Elbow |
|--------------------------------|
| Cable Connector, 14T, M, Elbow |
| Strain Relief 28 Shell Size |
| 16/12 SO, 600V |

CWO-3975 TACH CABLE 36" / DETAIL VIEW / PARTS LIST



CWP-11 GUN ASSEMBLIES (MIG/FLUX-CORE)

| CWO-1560-A | #5 .035 GUN ASSEMBLY MIG/FLUX | .035 WIRE SIZE |
|------------|-------------------------------|----------------|
| | CM/O 9007 | |

| CWO-8027 | 15H-35 CONTACT TIP | 10 |
|----------|------------------------|----|
| CWO-8034 | 25CT-75 NOZZLE | 1 |
| CWO-8035 | 35CT NOZZLE INSULATOR | 1 |
| CWO-8036 | 55 SW GAS DIFFUSER | 1 |
| CWO-8039 | 45-3545-15 CABLE LINER | 1 |
| CWO-8524 | 50394 500 AMP CABLE | 1 |

| CWO-1560-B | #5 .045 GUN ASSEMBLY MIG/FLUX | .045 WIRE SIZE |
|------------|-------------------------------|------------------------|
| | CWO-8028 | 15H-45 CONTACT TIP |
| | CWO-8034 | 25CT-75 NOZZLE |
| | CWO-8035 | 35CT NOZZLE INSULATOR |
| | CWO-8036 | 55 SW GAS DIFFUSER |
| | CWO-8039 | 45-3545-15 CABLE LINER |
| | CWO-8524 | 50394 500 AMP CABLE |

CWO-1560-C #5 1/16 GUN ASSEMBLY MIG/FLUX 1/16 WIRE SIZE

CWO-8524

| CWO-8029 | 15H-116 CONTACT TIP | 10 |
|----------|-----------------------|----|
| CWO-8034 | 25CT-75 NOZZLE | 1 |
| CWO-8035 | 35CT NOZZLE INSULATOR | 1 |
| CWO-8037 | 55 GAS DIFFUSER | 1 |
| CWO-8041 | 45-116-15 CABLE LINER | 1 |
| CWO-8524 | 50394 500 AMP CABLE | 1 |
| | | |

50394 500 AMP CABLE

| CWO-1560-D | #5 5/64 GUN ASSEMBLY MIG/FLUX | 5/64 WIRE SIZE | |
|------------|-------------------------------|-----------------------|----|
| | CWO-8031 | 15H-564 CONTACT TIP | 10 |
| | CWO-8034 | 25CT-75 NOZZLE | 1 |
| | CWO-8035 | 35CT NOZZLE INSULATOR | 1 |
| | CWO-8038 | 55 GAS DIFFUSER | 1 |
| | CWO-8085 | 45-564-15 CABLE LINER | 1 |

| CWO-1560-E | #5 3/32 GUN ASSEMBLY MIG/FLUX | 3/32 WIRE SIZE | |
|------------|-------------------------------|------------------------|----|
| | CWO-8032 | 15H-332 CONTACT TIP | 10 |
| | CWO-8034 | 25CT-75-NOZZLE | 1 |
| | CWO-8035 | 35CT NOZZLE INSULATOR | 1 |
| | CWO-8042 | 45H-332-15 CABLE LINER | 1 |
| | CWO-8038 | 55H-GAS DIFFUSER | 1 |
| | CWO-8524 | 50394 500 AMP CABLE | 1 |
| | | | |

CWP-11 GUN ASSEMBLIES (MIG/FLUX-CORE)

CWO-1560-G #5.052 GUN ASSEMBLY MIG/FLUX .052 WIRE SIZE CWO-8024 15H-52 CONTACT TIP 10 CWO-8034 25CT-75 NOZZLE 1 CWO-8035 35CT NOZZLE INSULATOR 1 CWO-8036 **55 SW GAS DIFFUSER** 1 CWO-8041 45-116-15 CABLE LINER 1 CWO-8524 50394 500 AMP CABLE 1

CWO-1560-H #5 7/64 GUN ASSEMBLY MIG-FLX 7/64 WIRE SIZE CWO-8022 15H-764 CONTACT TIP 10 CWO-8034 25CT-75 NOZZLE 1 35CT NOZZLE INSULATOR 1 CWO-8035 CWO-8038 55 H GAS DIFFUSER 1 **CWO-8044** 45H-764-15 CABLE LINER 1 **CWO-8524** 50394 500 AMP CABLE 1

CWP-11 GUN ASSEMBLIES (SUB ARC)

CWO-1700-A #5 .035 GUN ASSEMBLY SUB ARC .035 WIRE SIZE

| CWO-8027 | 15H-35 CONTACT TIP | 10 |
|----------|------------------------|----|
| CWO-8036 | 55 SW GAS DIFFUSER | 1 |
| CWO-8039 | 45-3545-15 CABLE LINER | 1 |
| CWO-8054 | 25-SA NOZZLE FLUX CONE | 1 |
| CWO-8524 | 50394 500 AMP CABLE | 1 |

| CWO-1700-B | #5 .045 GUN ASSEMBLY SUB ARC | .045 WIRE SIZE | |
|------------|------------------------------|------------------------|----|
| | CWO-8028 | 15H-45 CONTACT TIP | 10 |
| | CWO-8036 | 55 SW GAS DIFFUSER | 1 |
| | CWO-8039 | 45-3545-15 CABLE LINER | 1 |
| | CWO-8054 | 25-SA NOZZLE FLUX CONE | 1 |
| | CWO-8524 | 50394 500 AMP CABLE | 1 |
| | | | |

| CWO-1700-G | #5 .052 GUN ASSEMBLY SUB ARC | .052 WIRE SIZE | |
|------------|------------------------------|------------------------|----|
| | CWO-8024 | 15H-52 CONTACT TIP | 10 |
| | CWO-8036 | 55 SW GAS DIFFUSER | 1 |
| | CWO-8041 | 45-116-15 CABLE LINER | 1 |
| | CWO-8054 | 25-SA NOZZLE FLUX CONE | 1 |
| | CWO-8524 | 50394 500 AMP CABLE | 1 |

CWO-3700-1/16 1/16 H.D. GUN ASSEMBLY SUB ARC 1/16 WIRE SIZE

| CWO-1817 | BULK HEAD CONNECTOR | 2 |
|---------------|--------------------------------|----|
| CWO-3491-48 | FLUX HOSE, 48" | 1 |
| CWO-3690-1/16 | 1/16 SUB ARC NOZZLE | 1 |
| CWO-3695-1/2 | ADAPTOR | 1 |
| CWO-3697 | QCC LINER, 72" | 1 |
| CWO-3698 | ADAPTOR LN-7/LN-9 to QCC LINER | 1 |
| CWO-3970-72 | WELD CABLE 4/0 ASS'Y | 1 |
| | CONTACT TIP | 10 |

CWO-3700-5/64 5/64 H.D. GUN ASSEMBLY SUB ARC 5/64 WIRE SIZE

| CWO-1817 | BULK HEAD CONNECTOR | 2 |
|---------------|--------------------------------|----|
| CWO-3491-48 | FLUX HOSE, 48" | 1 |
| CWO-3690-5/64 | 5/64 SUB ARC NOZZLE | 1 |
| CWO-3695-1/2 | ADAPTOR | 1 |
| CWO-3697 | QCC LINER, 72" | 1 |
| CWO-3698 | ADAPTOR LN-7/LN-9 to QCC LINER | 1 |
| CWO-3970-72 | WELD CABLE 4/0 ASS'Y | 1 |
| CWO-8048 | 5/64 CONTACT TIP | 10 |
| | | |

CWP-11 GUN ASSEMBLIES (SUB ARC)

CWO-3700-3/32 3/32 H.D. GUN ASSEMBLY SUB ARC 3/32 WIRE SIZE

| CWO-1817 | BULK HEAD CONNECTOR | 2 |
|---------------|--------------------------------|----|
| CWO-3491-48 | FLUX HOSE, 48" | 1 |
| CWO-3690-3/32 | 3/32 SUB ARC NOZZLE | 1 |
| CWO-3695-1/2 | ADAPTOR | 1 |
| CWO-3697 | QCC LINER, 72" | 1 |
| CWO-3698 | ADAPTOR LN-7/LN-9 to QCC LINER | 1 |
| CWO-3970-72 | WELD CABLE 4/0 ASS'Y | 1 |
| CWO-8049 | 3/32 CONTACT TIP | 10 |
| | | |



CWO-3700- HD Submerged Arc Gun

| | | 0 | |
|-------------|------------|-----------------|-----------------------------|
| <u>ITEM</u> | <u>QTY</u> | <u>PART NO.</u> | DESCRIPTION |
| 1 | 1 | CWO-3698 | Wire Feed Adaptor |
| 2 | 2 | CWO-1817 | Bulk Head Connector QCB |
| 3 | 1 | CWO-3697 | QCC 72" (1829 mm) Liner |
| 4 | 1 | CWO-3695-1/2 | Adaptor K231 1/2" |
| 5 | 1 | CWO-3970-72 | Weld Cable 4/0 Assembly 72" |
| | | | (1829 mm) LG |
| 6 | 1 | CWO-3690-1/16 | Sub-Arc Nozzle 1/16" |
| | 1 | CWO-3690-5/64 | Sub-Arc Nozzle 5/64" |
| | 1 | CWO-3690-3/32 | Sub-Arc Nozzle 3/32" |
| 7 | 1 | CWO-3491-48 | Flux Hose 3/4" ID x 1" OD |
| 8 | 1 | FAS-0452 | Set Scr 1/4-20 x 1/4 |
| 9* | 1 | BUG-2708 | Clamp |
| | | | |

*Item not shown in drawing.



CWO-3690- K231 Sub Arc Nozzle Available for 1/16", 5/64", and 3/32" wire sizes

| <u>ITEM</u> | <u>QTY</u> | PART NO. | DESCRIPTION |
|-------------|------------|----------------|---------------------------------|
| 1 | 1 | PXS-15106-3/32 | Nozzle Insert |
| 2 | 1 | PXT-10570 | Soc Hd Scr |
| 3 | 1 | PXS-10493-1 | Nozzle Insulator |
| 4 | 1 | PXS-121312 | Hex Hd Scr 1 1/2" & Nut 1/2"-13 |
| 5 | 1 | PXT-9967-10 | Nozzle Body Roll Pin |
| 6 | 1 | CWO-8052 | Nozzle Body |
| 7 | 1 | AFW-2291 | Contact Tip, 1/16" (1.6 mm) |
| | | CWO-8048 | Contact Tip, 5/64" (2.0 mm) |
| | | CWO-8049 | Contact Tip, 3/32" (2.4 mm) |
| 8 | 1 | PXS-10138 | Flux Cone Plug (Insulator) |
| 9 | 1 | PXT-9078-1 | Thumb Screw |
| 10 | 1 | PXT-9967-30 | Flux Cone Roll Pin |
| 11 | 1 | PXT-13835 | 3/4" x 7" Flux Hose w/ Fbr Ins |
| 11A | 1 | PXT-3835-IN | Fiber Insulator |
| 12 | 1 | BUG-3161-P | Cone Body Assembly |
| 13 | 1 | BUG-3163 | Locking Ferrule |
| 14 | 1 | BUG-3164 | Flux Cone (KP2085-1) |
| 15 | 1 | BUG-3165 | Retaining Nut |

#5 GUN & CABLE ASSEMBLY / EXPLODED VIEW / PARTS LIST



| PARTS LIST | | | | WIRE SIZE | | | | | | |
|------------|-----|-------------|-------------------------------|-----------|------|------|------|------|------|-------|
| ITEM | QTY | PART NO. | DESCRIPTION | .035 | .045 | .052 | 1/16 | 5/64 | 3/32 | 7/64* |
| 1 | 1 | CWO-8022 | 15H-764 Contact Tip | | | | | | | Х |
| 1 | 1 | CWO-8024 | 15H-52 Contact tip | | | Х | | | | |
| 1 | 1 | CWO-8027 | 15H-Contact Tip | X | | | | | | |
| 1 | 1 | CWO-8028 | 15H-45 Contact Tip | | Х | | | | | |
| 1 | 1 | CWO-8029 | 15H-116 Contact Tip | | | | Х | | | |
| 1 | 1 | CWO-8031 | 15H-564 Contact Tip | | | | | Х | | |
| 1 | 1 | CWO-8032 | 15H-332 Contact Tip | | | | | | Х | |
| 2 | 1 | CWO-8034 | 25CT-75 Nozzle Insulator | X | Х | Х | Х | Х | Х | Х |
| 3 | 1 | CWO-8035 | 35CT Nozzle Insulator | X | Х | Х | Х | Х | Х | Х |
| 4 | 1 | CWO-8036 | 55SW Gas Diffuser | X | Х | Х | | | | |
| 4 | 1 | CWO-8037 | 55 Gas Diffuser | | | | Х | | | |
| 4 | 1 | CWO-8038 | 55H Gas Diffuser | | | | | Х | Х | Х |
| 5 | 1 | CSM-1053 | 60-3R Conductor Tube | X | Х | Х | Х | Х | Х | Х |
| 5** | 1 | CWO-8045 | 65-60 Conductor Tube | X | Х | Х | Х | Х | Х | Х |
| 5** | 1 | CWO-8046 | 65-45 Conductor Tube | X | Х | Х | Х | Х | Х | Х |
| 5** | 1 | CWO-8046-3R | 65-45-3R Conductor Tube | X | Х | Х | Х | Х | Х | Х |
| 5** | 1 | CWO-8047 | 65-180 Conductor Tube | X | Х | Х | Х | Х | Х | Х |
| 6 | 1 | CWO-8017 | 185 Case w/Binder Screws | X | Х | Х | Х | Х | Х | Х |
| 7 | 2 | CWO-8018 | 104 Cable Connector Block | X | Х | Х | Х | Х | Х | Х |
| 8 | 1 | CSM-1056 | Cable Hose Support | X | Х | Х | Х | Х | Х | Х |
| 9 | 1 | CSM-1054 | Connector Plug Assy. (H.D.) | X | Х | Х | Х | Х | Х | Х |
| 10 | 1 | CWO-8054 | 25-SA Nozzle Flux Cone | X | Х | Х | | | | |
| 11 | 1 | CSM-1058 | 500 AMP Cable Hose Assy. | X | Х | Х | Х | Х | Х | Х |
| 12 | 1 | CSM-1055 | Rear Case / Strain Relief Cap | X | Х | Х | Х | Х | Х | Х |
| 13 | 1 | CSM-1060 | Rear Case Assy. | X | Х | Х | Х | Х | Х | Х |
| * * * | 1 | CWO-8039 | 45-4535-15 Cable Liner | X | Х | | | | | |
| * * * | 1 | CWO-8041 | 45-116-15 Cable Liner | | | Х | Х | | | |
| * * * | 1 | CWO-8042 | 45-332-15 Cable Liner | | | | | | Х | |
| * * * | 1 | CWO-8044 | 45H-764-15 Cable Liner | | | | | | | Х |
| * * * | 1 | CWO-8085 | 45-564-15 Cable Liner | | | | | Х | | |
| * * * | 2 | CSM-1051 | Clamp 136 | X | Х | Х | Х | Х | Х | Х |
| * * * | 2 | CSM-1061 | O-Ring Conduit Stop | X | Х | Х | Х | Х | Х | Х |
| * * * | 2 | CSM-1063 | O-Ring Connector Plug | X | Х | Х | Х | Х | Х | Х |

* FLUX-CORE MIG ONLY

* * OPTIONAL ITEMS

CWP-11 DRIVE ROLL KITS

| PART NO. | DESCRIPTION |
|---------------------------------|--|
| BUG-3150-035 | DRIVE ROLL KIT .035 (0.9mm) SOLID WIRE |
| BUG-3150-035C | DRIVE ROLL KIT .035 (0.9mm) CORED WIRE |
| BUG-3150-052 | DRIVE ROLL KIT .045052 (1.0-1.3mm) SOLID WIRE |
| BUG-3150-052C | DRIVE ROLL KIT .045052 (1.0-1.3mm) CORED WIRE |
| BUG-3150-1/16 BUG-3150-1/16C | DRIVE ROLL KIT 1/16 (1.6mm) SOLID/CORED WIRE |
| BUG-3150-3/32 | DRIVE ROLL KIT .068-3/32 (1.7-2.4mm) SOLID/CORED WIRE |
| BUG-3150-1/8 | DRIVE ROLL KIT 7/64-1/8 (2.8-3.0mm) SOLID/CORED WIRE (REQUIRES MODIFICATIONS FOR 1/8" WIRE) ** FLUX CORE MIG ONLY ** |

3-JAW EXPANDABLE CHUCKS









3-Jaw Expandable Chucks

Mounts and automatically centers the Circle Welder on nozzles with or without flanges. As shown below.

| PART NO. | FOR NOZZLE I.D.'S | WEIGHT |
|-------------------------------|-----------------------------|-----------------|
| CWO-3660 | 2"-8" (51mm-204mm) | 68 lbs. (31 kg) |
| CWO-3661 8"-16" (204-405 mm) | | 36 lbs. (16 kg) |
| CWO-3362 10"-24" (255-610 mm) | | 51 lbs. (23 kg) |
| CWO-3663 | 15.75"-47.25" (400-1200 mm) | 64 lbs. (29 kg) |



PREVENTIVE MAINTENANCE - DAILY

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!

Refer to CWP-11 Exploded View. (Pg. 16)

Racking System Item #7:

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.

Large Horizontal Racker Item #8:

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 #22:

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-11 Electrical Component Chart. (Pg. 31)

LN-9 Control Cables #11, 12, 13:

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-11 Collector Ring Item #3:

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 #29 on the CWP-11 Exploded View, pg. 16).

PREVENTIVE MAINTENANCE - EVERY SIX MONTHS

Refer to CWP-11 Exploded View. (Pg. 16)

Aluminum Gear Item #29:

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 #18:

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 #29) and the motor drive pinion.

Wire Reel Assembly Item #17:

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

Refer to CWP-11 Electrical Component Chart. (Pg. 31)

LN-9 Wire Feed Control Item #6:

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 CWO-3535 Wire Feeder Control electrical component chart (pg. 32) for replacement parts or return for service.

Rotation Control Item #14:

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 CBP-1500 Rotation Control electrical component chart (pg. 30) for replacement parts or return for service.

LN-9 Wire Feeder Assembly Item #1:

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.

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. Replace pitted brushes. Remove the brushes and sand them to ensure a smooth contact surface. Make sure all fasteners are tight.

Small Brush Retainer Assembly Item #7:

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 #8:

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.

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!

PREVENTIVE MAINTENANCE - EVERY TWELVE MONTHS

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!

Refer to CWP-11 Exploded View. (Pg. 16)

1-1/2" Bearing With Fasteners Item #19:

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 #18:

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

LN-9 Wire Feeder Assembly Item #2:

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 #14:

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

Refer to CWP-11 Electrical Component Chart. (Pg. 31)

CWP-11 Collector Item #3:

The collector ring should be sanded once a year. If the collector ring is pitted 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 3/0 Item #10:

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 #15:

Inspect for damage. Replace if necessary.

LN-9 Control Cables #11, 12, 13:

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, 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 Manufacture'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.