

# INSTRUCTIONS AND PARTS MANUAL

## CARRIAGES AND 3-JAW EXPANDABLE CHUCKS

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-CARRIAGES-IPM-1019

Bug-O Systems is committed to empowering our customers by providing operator controlled mechanized solutions for their welding, cutting and custom applications.



**B U G - O   S Y S T E M S**

A DIVISION OF WELD TOOLING CORPORATION

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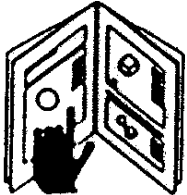
## SAFETY

**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 without 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.

# **CARRIAGES AND 3-JAW EXPANDABLE CHUCKS**

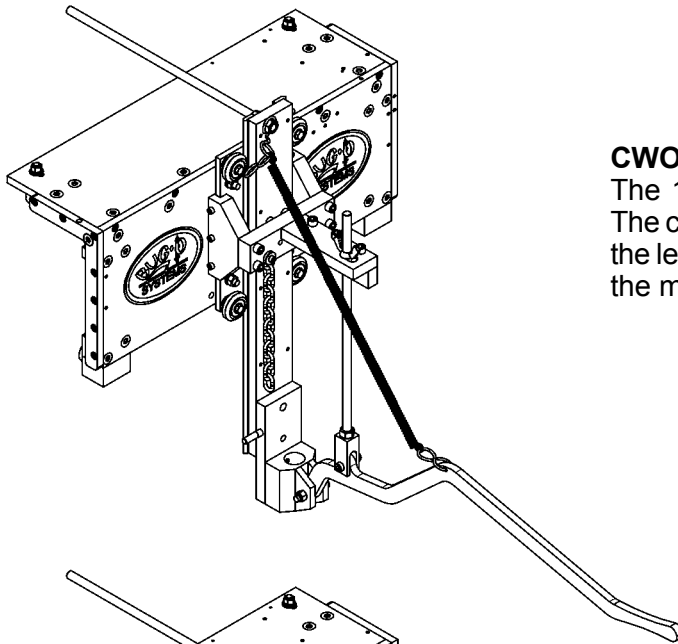
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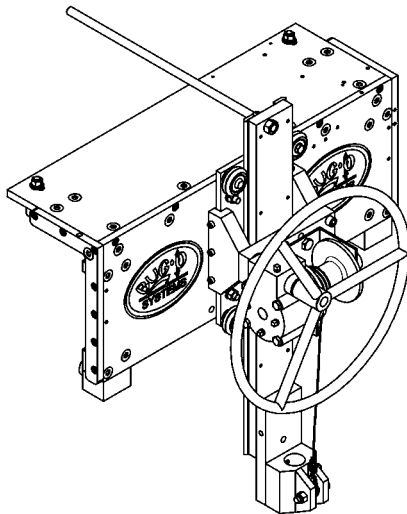
## CARRIAGES

(For use on CW-5 / CW-5AX Circle Welders and on CB-1P Circle Burner)



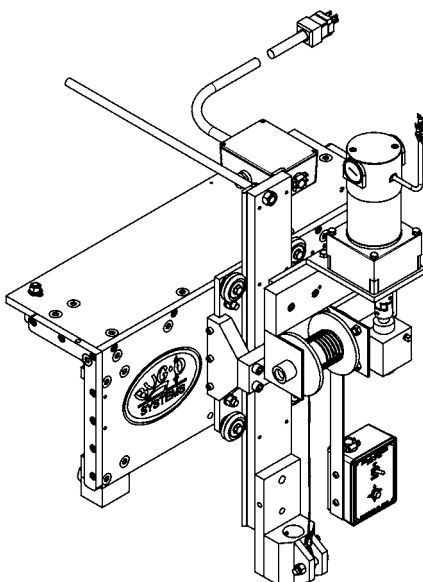
### **CWO-4530 151 Carriage**

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.



### **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.

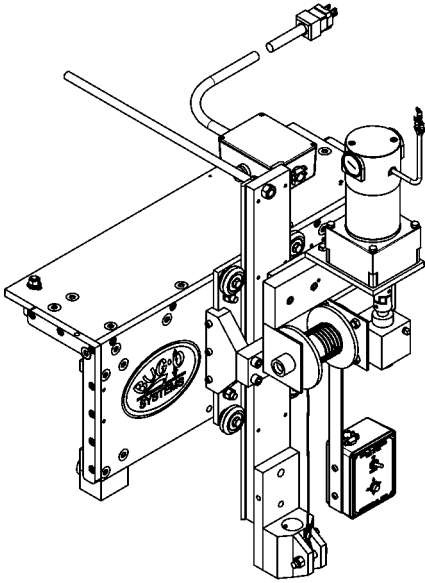


### **CWO-4550 151M Carriage**

The 151M Carriage mounts on a standard monorail. The carriage allows the operator to move the machine the length of the pipe, while utilizing an electric motorized winch to position the machine vertically. To be used with CWO series machine only.

## CARRIAGES, CONT'D

(For use on CW-5 / CW-5AX Circle Welders and on CB-1P Circle Burner)

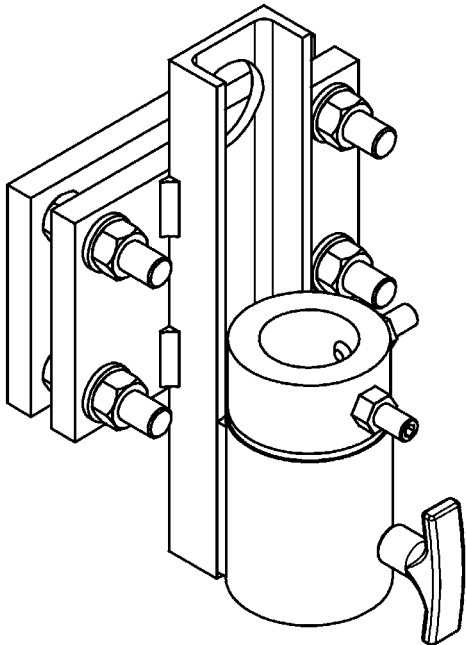


### **CWE-4550 151M Motorized Carriage**

The 151M Carriage mounts on a standard monorail. The carriage allows the operator to move the machine the length of the pipe, while utilizing an electric motorized winch to position the machine vertically. To be used with CWE series machine only.

## MANIPULATOR BRACKET

(For use on CB-3 Circle Burner)



### **CWO-3744 MANIPULATOR BRACKET**

The Manipulator Bracket is a non-adjustable fixturing device designed for use on an existing column and boom set-up.

# SETUP INSTRUCTIONS FOR CARRIAGES USED IN SPRINKLER FABRICATION

## INSTALLING CARRIAGES AND MACHINES ON THE MONORAIL:

Assemble carriages and put them on the monorail.

The CW-5/CW-5AX 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.

Proper installation will require the use of an 8" (203.2 mm) diameter pipe.

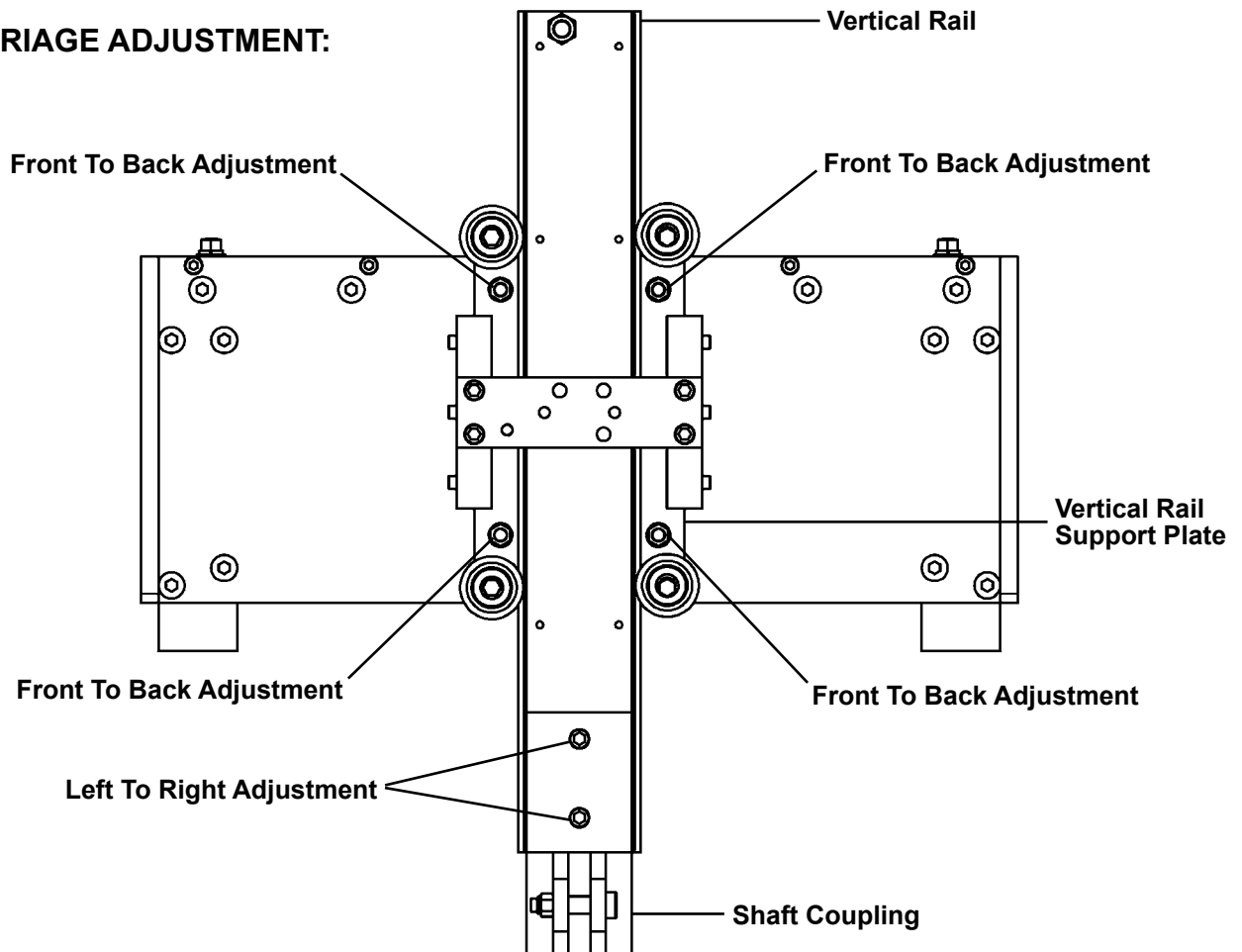
Put the CB-1P cutter machine on the 8" (203.2 mm) pipe in the stands and bring the carriage to the machine. Lower the shaft coupling over the main shaft on the cutter. Ensure that shaft is fully inserted into the shaft coupling. Rotate the machine so that the plasma leads are in front and parallel to the carriage and tighten the set screws in the shaft coupling to secure the main shaft to the vertical slide assembly.

Next put the CW-5/CW-5AX welder on the 8" (203.2 mm) pipe and bring its carriage to it. Lower the shaft coupling down on 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:



## SETUP INSTRUCTIONS, CONT'D.

### LUBRICATING THE CWO-9425 MANUAL WINCH ASSEMBLY

*Do not over lubricate the brake bushings. Over lubricating may cause oil to leak onto the friction discs, which may damage the friction discs or result in poor operation of the disc brake.*

*Make sure the breather plug is clean and open to vent heat and pressure. Poor ventilation may cause overheating and result in equipment damage. Breather plugs are required for the PB series. Refer to parts list for your model.*

*Fill the gearbox to the proper level without overfilling. Too much or too little lubricant will cause overheating and result in equipment damage.*

The winch is shipped without lubricant in the gearbox. Lubricate the winch properly to help protect it from wear and rust. Read the following instructions carefully:

- Change gearbox oil after the first 40 hours of operation.
- Check oil level and fill, if needed, before every operation, and every 10 hours during operation. Fill the gearbox through the breather plug hole until the lubricant reaches the level check plug. Use 90 weight gear oil. See page 9.
- Check oil level by removing the check level plug. Fill the gearbox through the breather plug hole until the oil reaches the level check plug.
- Re-install and check level plug when gearbox is filled.
- Change gearbox oil every 6 to 12 months, or when it is dirty or otherwise contaminated. Remove the drain plug to drain oil from the gearbox. See page 9.
- Grease can be used as an alternate gearbox lubricant. It is not necessary to replace the grease after being placed in service.
- Check grease level every 6 months of operation and fill, if needed. Fill the gearbox through the lowest plug location or drain plug hole until the lubricant reaches the level check plug. Use grease rated for worm gearing operation such as a Alco Metalube or Mobil products.
- Check grease level by removing the check level plug, clean plug opening and pump grease into fitting to verify grease is filled to the gear case check level plug.
- Re-install and check level plug when gearbox is filled.
- Lubricate the disc brake at least every 6 months. Place 1 to 2 drops of SAE 30 non-detergent oil into the hole in the brake housing marked "oil", and turn the brake several times to allow the oil to penetrate. See page 9.
- Lubricate the wire rope and other equipment by following the manufacturer's recommendations.

#### **IMPORTANT:**

Do not leave plug holes in the gearbox open. Open plug holes will allow dirt and moisture to contaminate the lubrication.

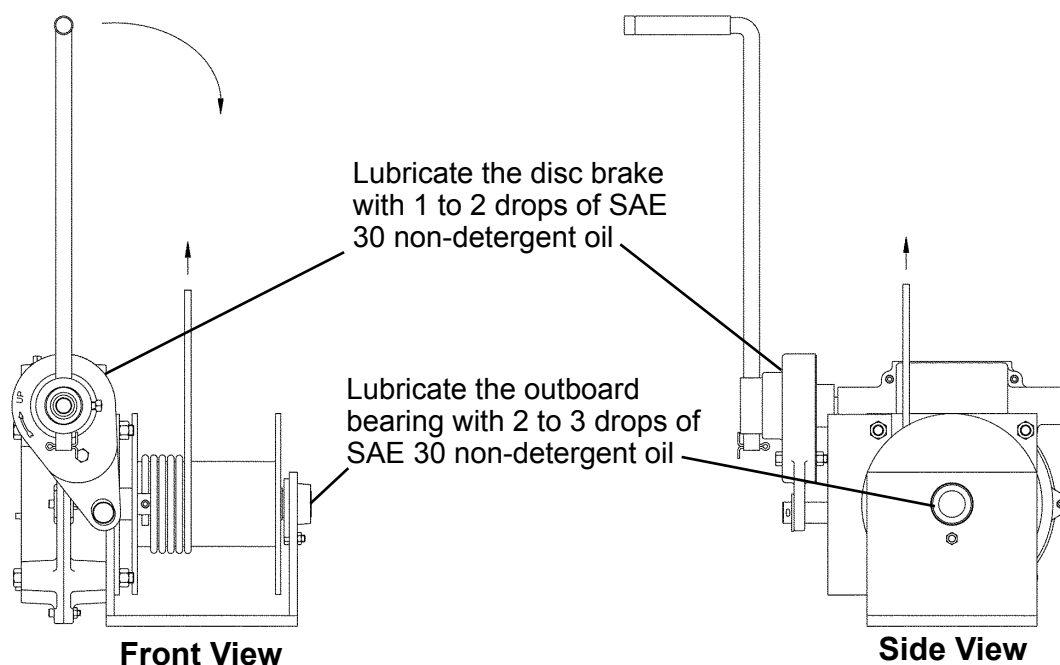
Make sure lubricant has a temperature rating appropriate for the ambient temperatures of the operation.

Use grease rated for worm gearing operation. Grease will separate and liquefy with heat or non-use over periods of time.

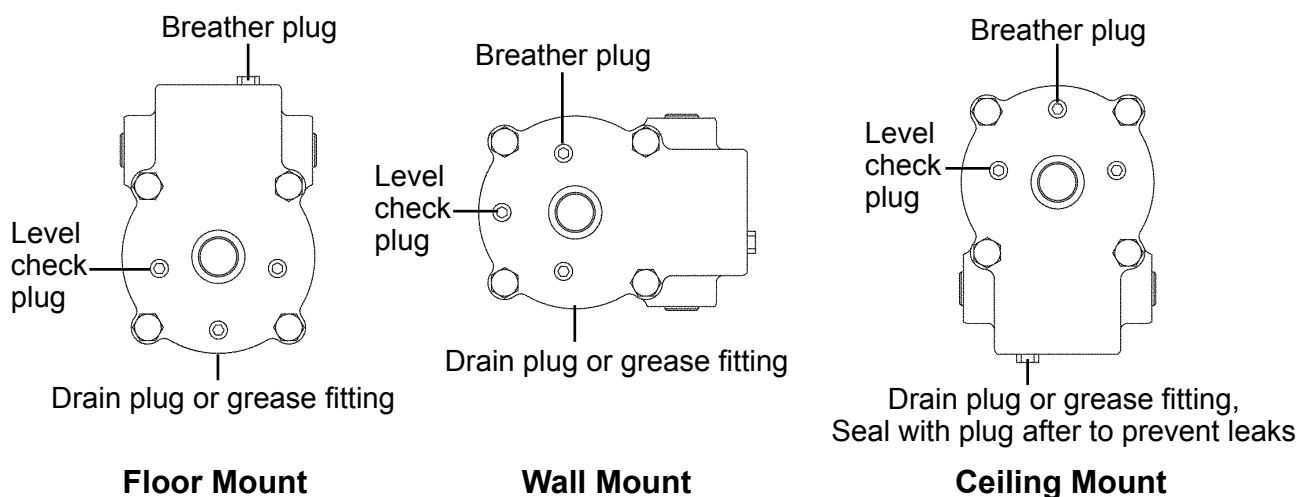


## SETUP INSTRUCTIONS, CONT'D.

### LUBRICATING THE OUTBOARD BEARING AND BRAKE



### INSTALLING THE BREATHER PLUG



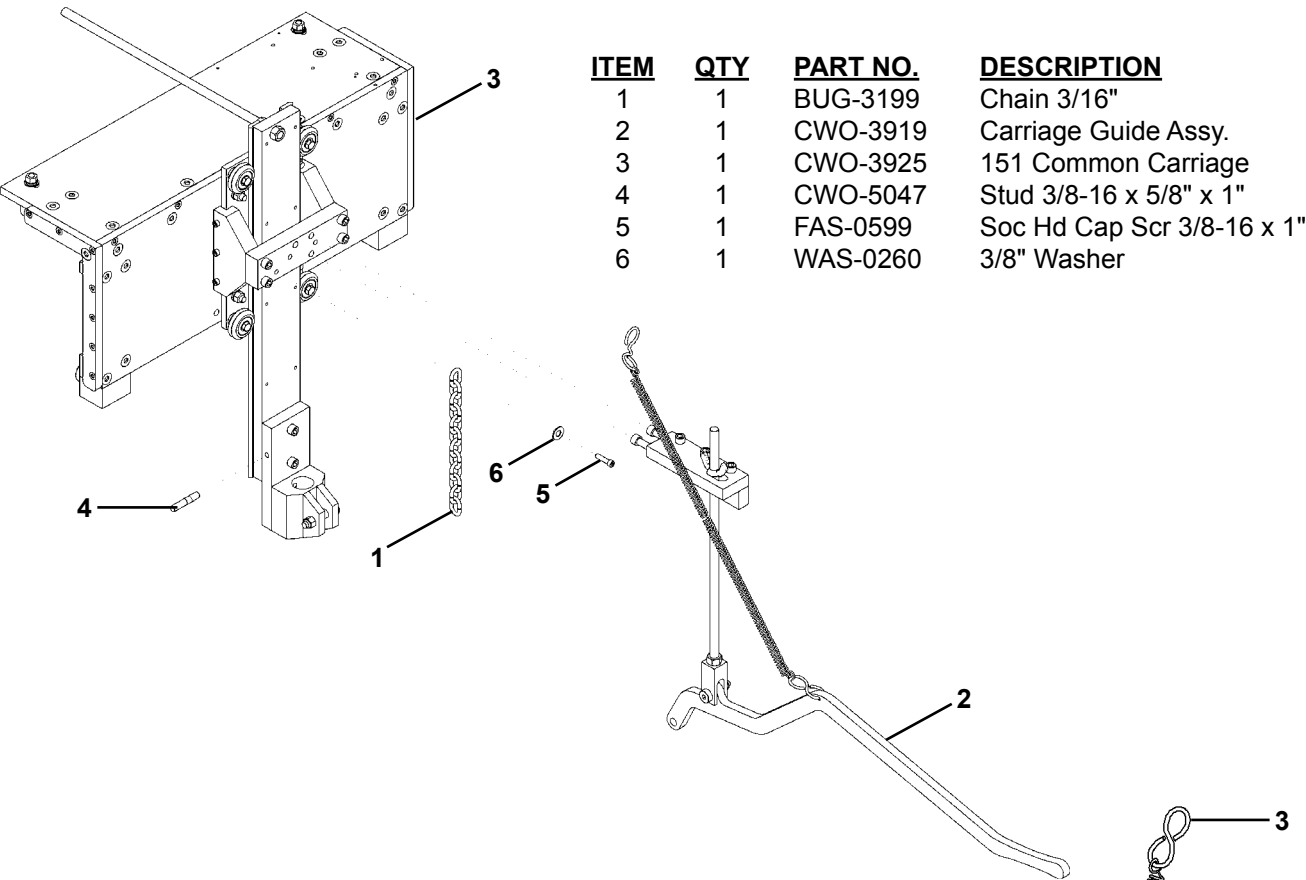
### CLEANING THE WINCH

Clean the winch to remove dirt and help prevent rust and corrosion.

- Clean the winch every six months or whenever it is dirty.
- Wipe all equipment to remove dirt and grease.
- Leave a light film of oil on all surfaces to protect them against rust and corrosion.
- Leave a light film of oil on all surfaces to protect them against rust and corrosion.
- Remove all unnecessary objects from the area surrounding the winch.

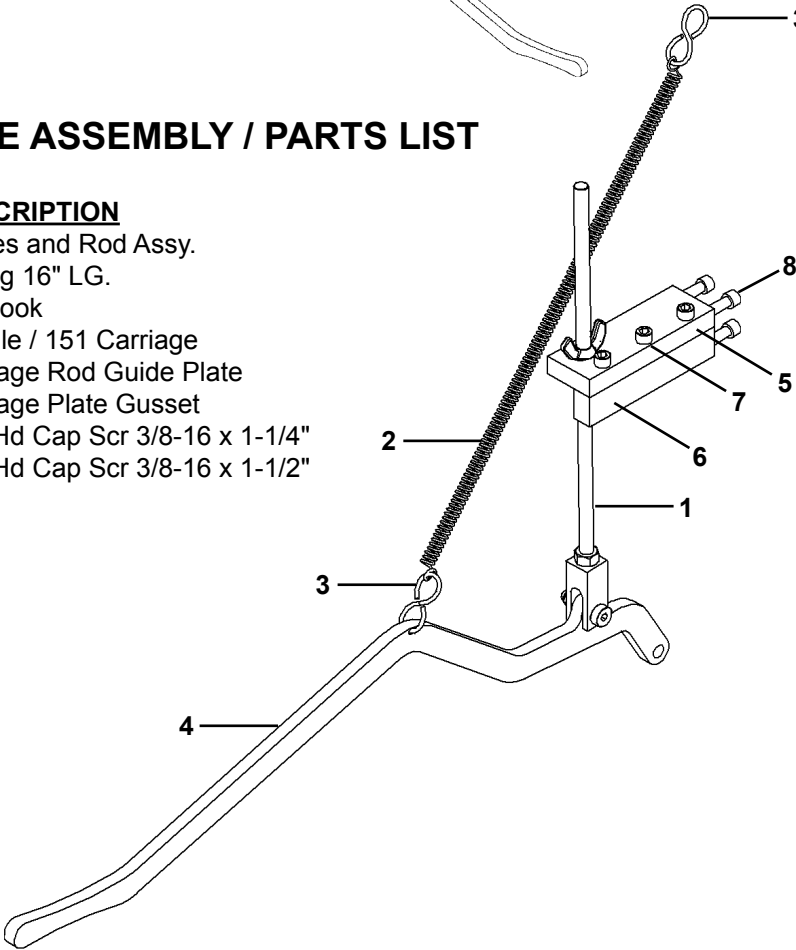
*Note: Increase the frequency of maintenance procedures if the winch is operated for long periods, used to pull heavy loads, or operated in wet, dirty, hot, or cold surroundings.*

CWO-4530 151 CARRIAGE ASSEMBLY / EXPLODED VIEW / PARTS LIST

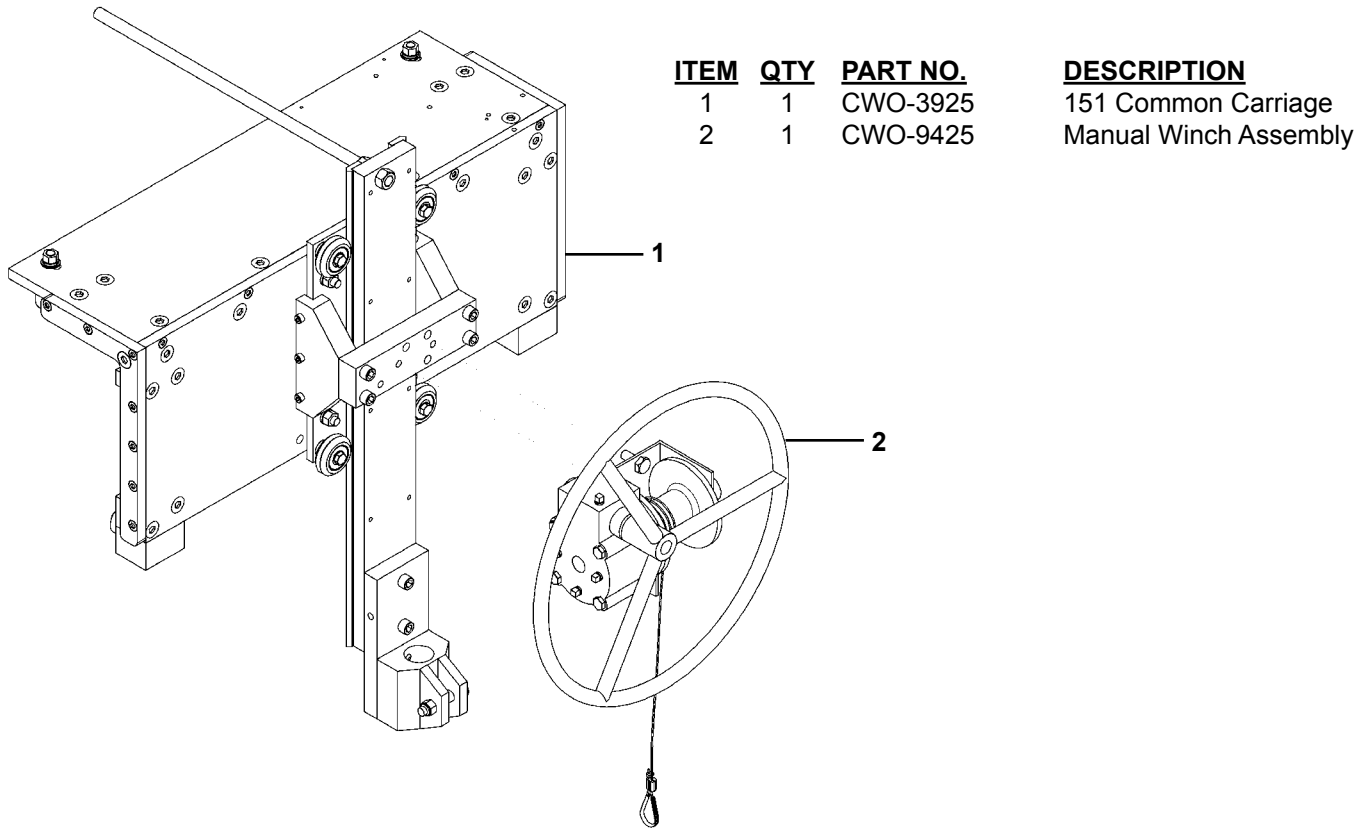


CWO-3919 CARRIAGE GUIDE ASSEMBLY / PARTS LIST

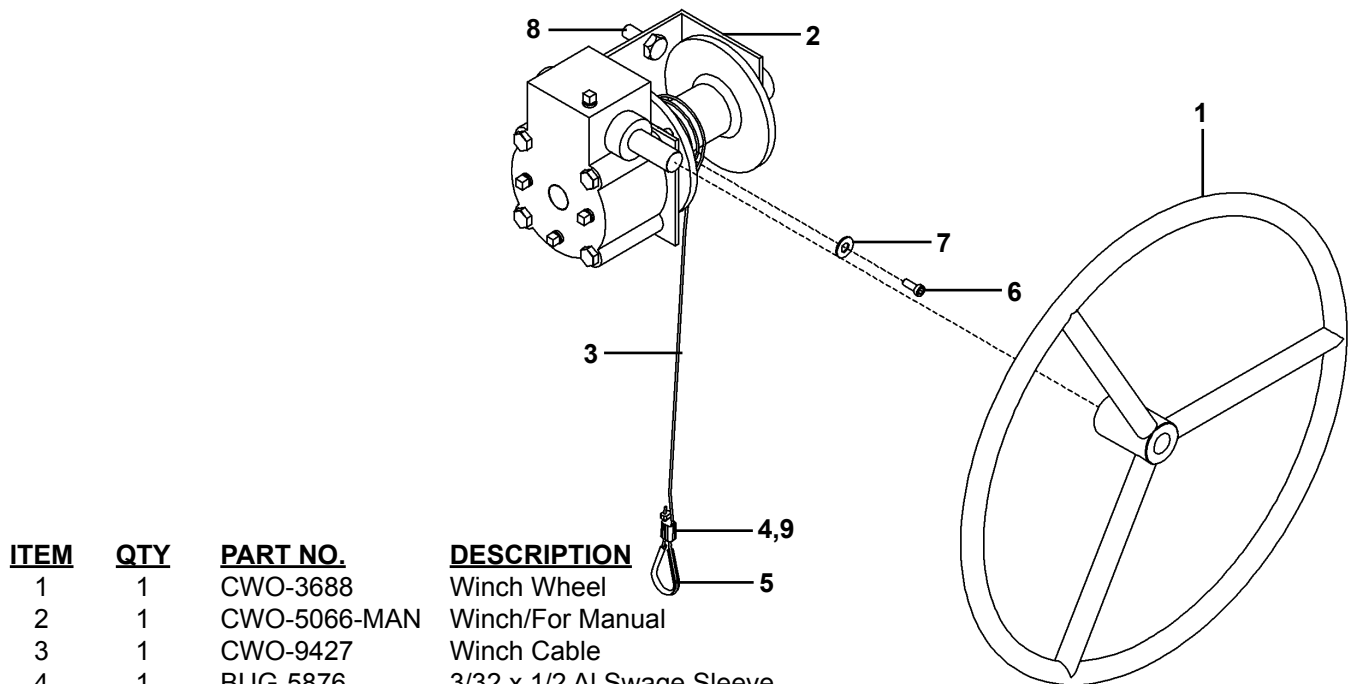
ITEM	QTY	PART NO.	DESCRIPTION
1	1	CWO-3924	Cleves and Rod Assy.
2	1	CWO-5036	Spring 16" LG.
3	2	CWO-5037	"S" Hook
4	1	CWO-5039	Handle / 151 Carriage
5	1	CWO-9013	Carriage Rod Guide Plate
6	1	CWO-9014	Carriage Plate Gusset
7	3	FAS-2591	Soc Hd Cap Scr 3/8-16 x 1-1/4"
8	3	FAS-2593	Soc Hd Cap Scr 3/8-16 x 1-1/2"



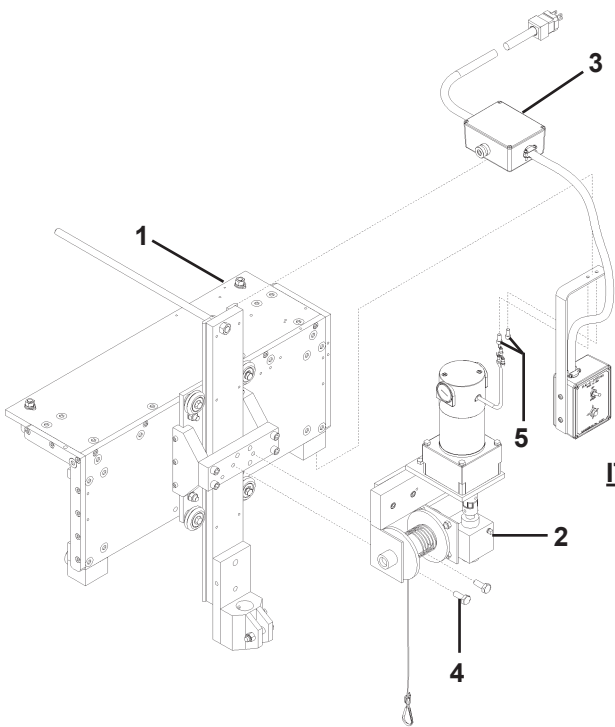
## CWO-4540 151P CARRIAGE ASSEMBLY / EXPLODED VIEW / PARTS LIST



## CWO-9425 MANUAL WINCH ASSEMBLY / EXPLODED VIEW / PARTS LIST

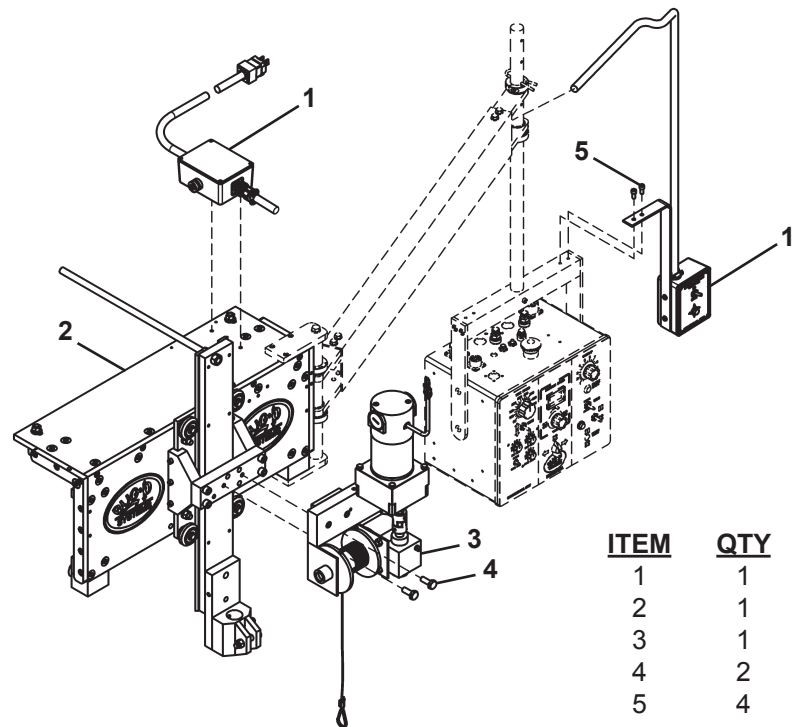


CWO-4550 151M MOTORIZED CARRIAGE ASSEMBLY / EXPLODED VIEW / PARTS LIST



ITEM	QTY	PART NO.	DESCRIPTION
1	1	CWO-3925	151 Common Carriage
2	1	CWO-9430	151M Motor Assy.
3	1	CWO-3190	Motorized Carriage Control
4	2	FAS-0399	Hex Hd Cap Scr 3/8-16 x 1"
5	1	FAS-0555	Hex Hd Cap Scr 1/4-20 x 1/2"

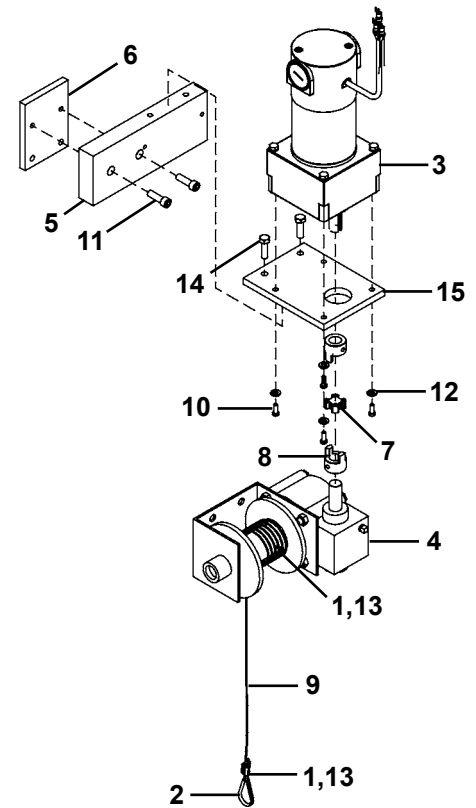
CWE-4550 151M MOTORIZED CARRIAGE ASSEMBLY / EXPLODED VIEW / PARTS LIST



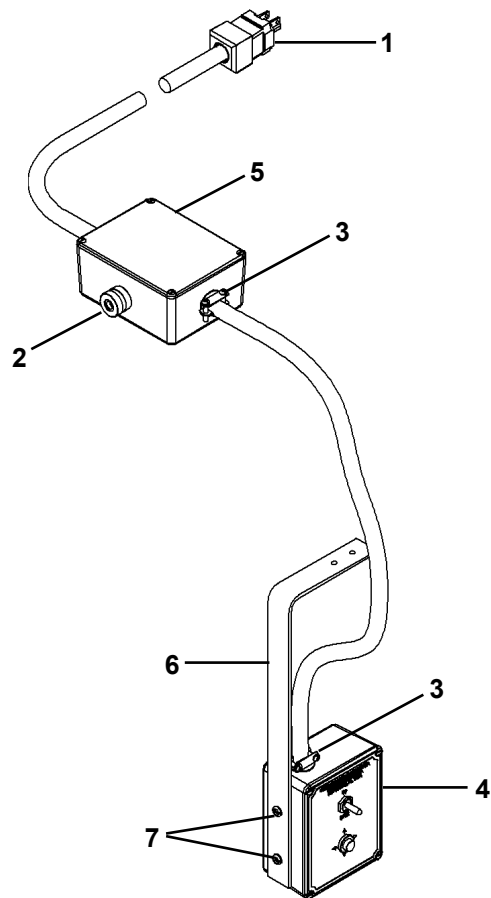
ITEM	QTY	PART NO.	DESCRIPTION
1	1	CWE-3190	Motorized Carriage Control
2	1	CWO-3925	151 Common Carriage
3	1	CWO-9430	151M Motor Assembly
4	2	FAS-0399	Hex Hd Cap Scr 3/8-16 x 1"
5	4	FAS-0555	Soc Hd Cap Scr 1/4-20 x 1/2"

## CWO-9430 151M MOTOR ASSEMBLY / EXPLODED VIEW / PARTS LIST

<u>ITEM</u>	<u>QTY</u>	<u>PART NO.</u>	<u>DESCRIPTION</u>
1	2	BUG-5876	3/32 x 1/2 AL Swage Sleeve
2	1	BUG-1082	Thimble
3	1	CWO-3380	P.M. Motor Assembly
4	1	CWO-5066	Winch/For Motorized
5	1	CWO-5692	Slide Mount Motor Plate
6	1	CWO-5693	Carriage Slide Attachment Plate
7	1	CWO-5929	Spider/Lovejoy Coupling
8	2	CWO-5931	Lovejoy Coupling
9	1	CWO-9427	Winch Cable
10	4	FAS-0562	Soc Hd Cap Scr 1/4-28 x 1/2"
11	2	FAS-0579	Soc Hd Cap Scr 5/16-18 x 1"
12	2	WAS-0243	1/4" Split Lockwasher
13	2	BUG-5877	3/32 x 9/32 AL Button Sleeve
14	2	FAS-0389	Hex Hd Cap Scr 5/16-24 x 1"
15	1	CWO-5696	Motor Mount Plate

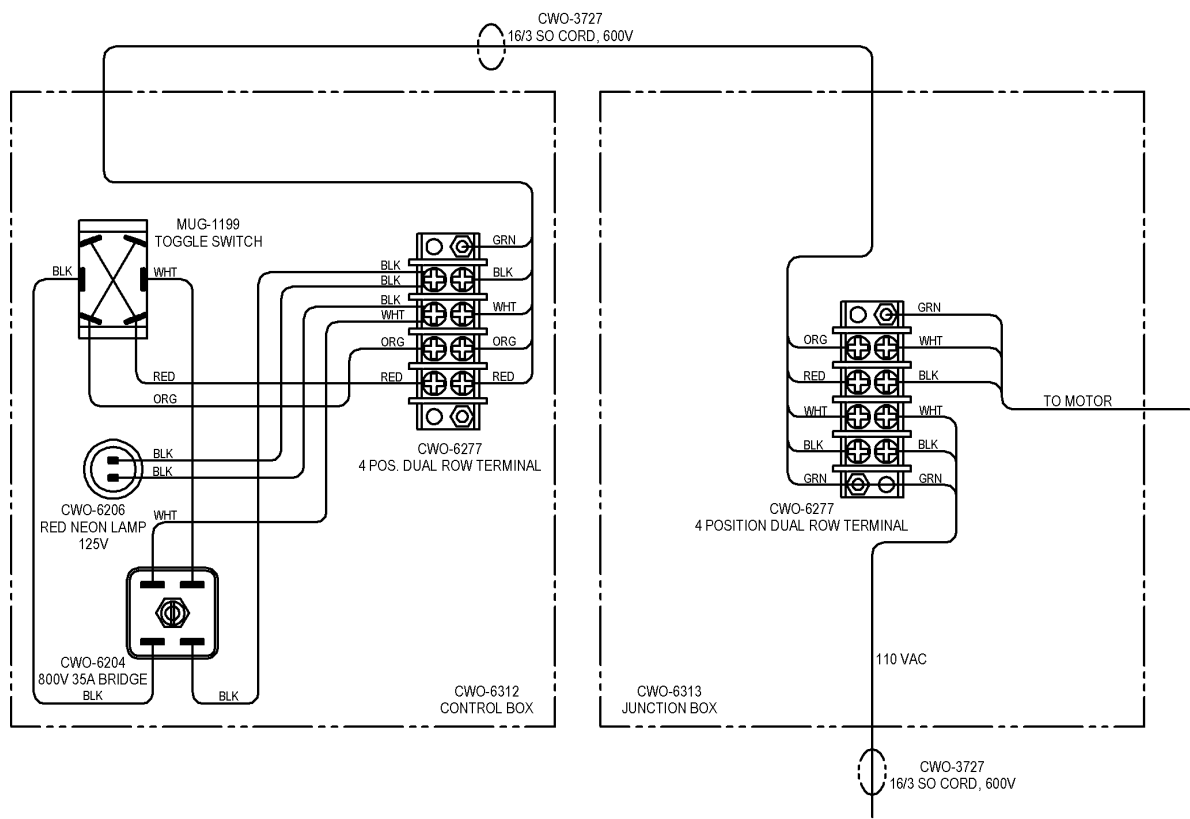


CWO-3190 MOTORIZED CARRIAGE CONTROL / EXPLODED VIEW / PARTS LIST

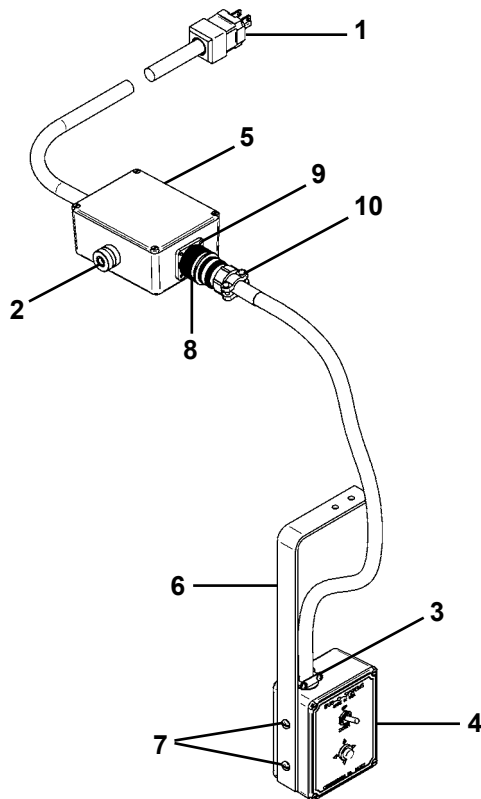


ITEM	QTY	PART NO.	DESCRIPTION
1	1	BUG-2271	120V Valise Plug
2	1	BUG-9216	Cord Grip
3	3	CWO-6278	Cord Grip 3/8" Romex
4	1	CWO-6312	Control Box Enclosure
5	1	CWO-6313	Junction Box Enclosure
6	1	CWO-9483	"L" Mounting Bracket
7	2	FAS-0146	Pan Hd Scr 10-32 x 5/8"

CWO-3190 MOTORIZED CARRIAGE CONTROL / WIRING DIAGRAM

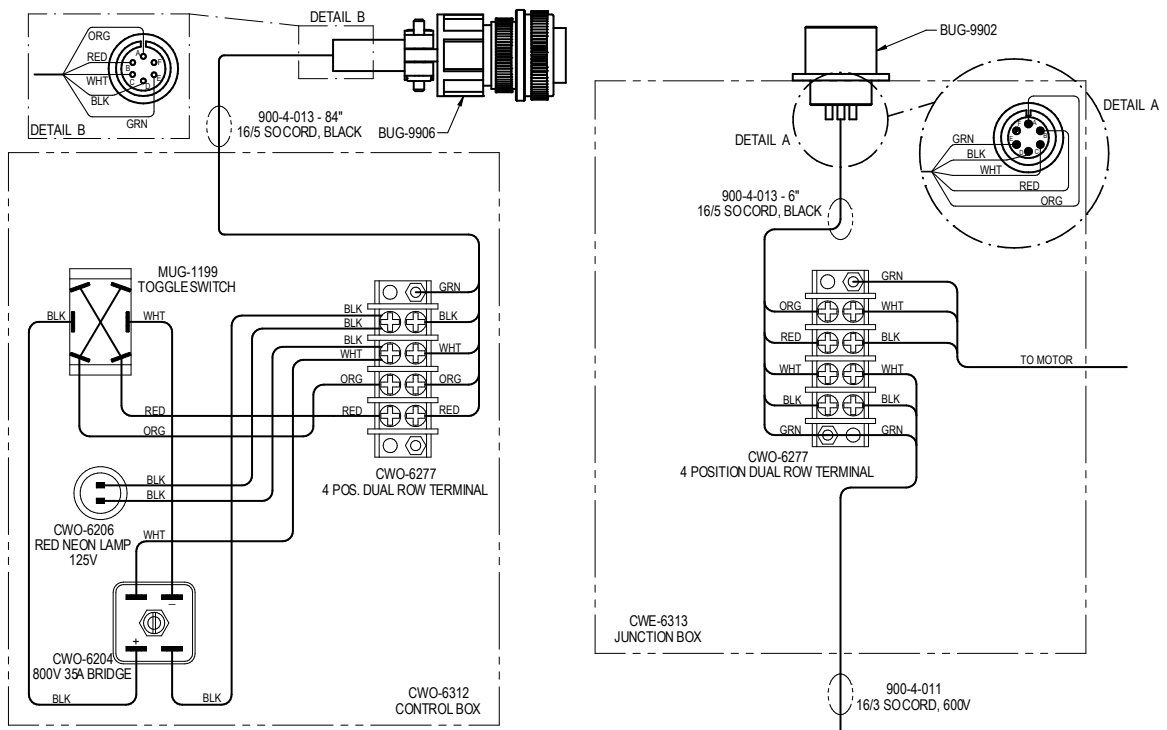


# CWE-3190 MOTORIZED CARRIAGE CONTROL / EXPLODED VIEW / PARTS LIST

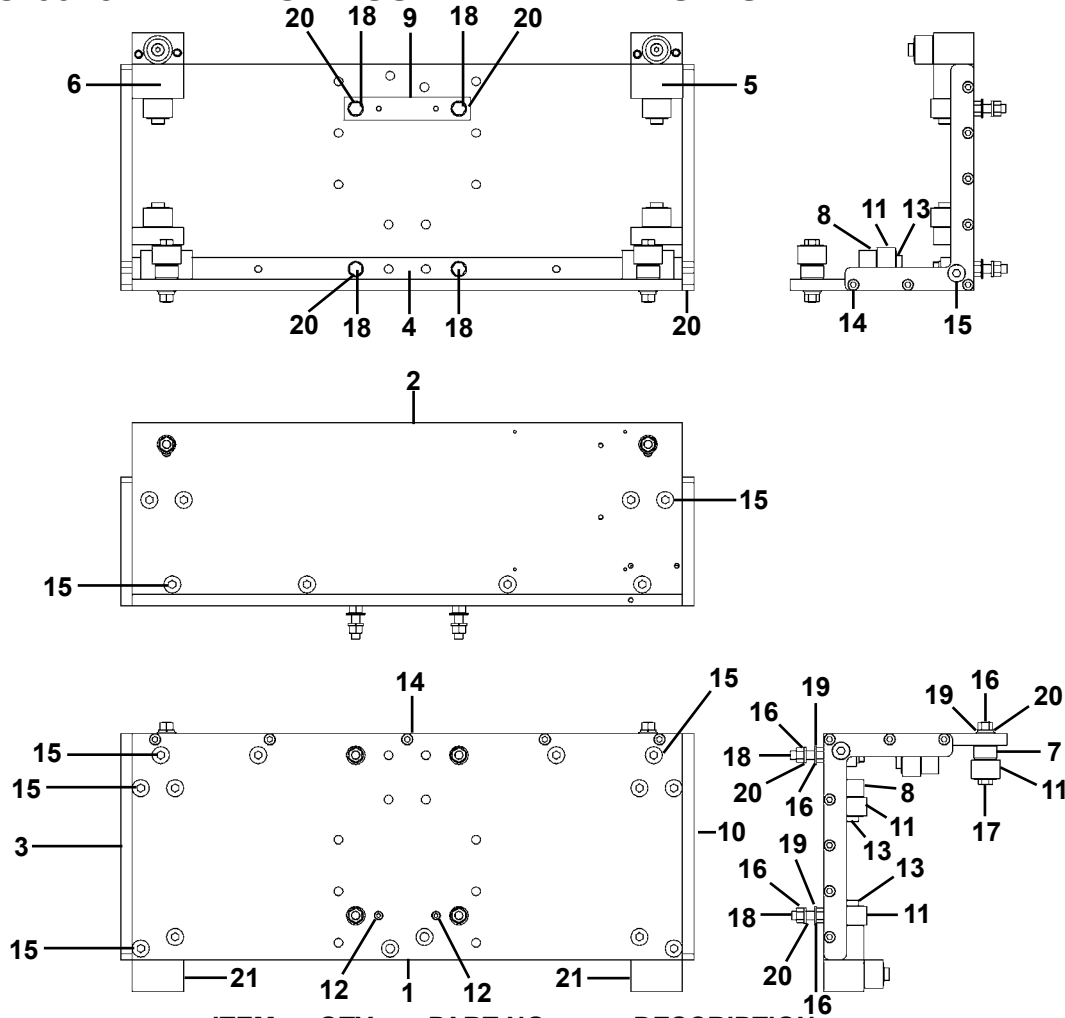


ITEM	QTY	PART NO.	DESCRIPTION
1	1	BUG-2271	120V Valise Plug
2	1	BUG-9216	Cord Grip
3	3	CWO-6278	Cord Grip 3/8" Romex
4	1	CWO-6312	Control Box Enclosure
5	1	CWO-6313	Junction Box Enclosure
6	1	CWO-9483	"L" Mounting Bracket
7	2	FAS-0146	Pan Hd Scr 10-32 x 5/8"
8	1	CON-2506S	Cable Connector, 6T, Female
9	1	CWO-6759	Panel Connector, 6T, Male
10	1	CSR-3057-10A	Cord Strain Relief, Size 18

# CWE-3190 MOTORIZED CARRIAGE CONTROL / WIRING DIAGRAM



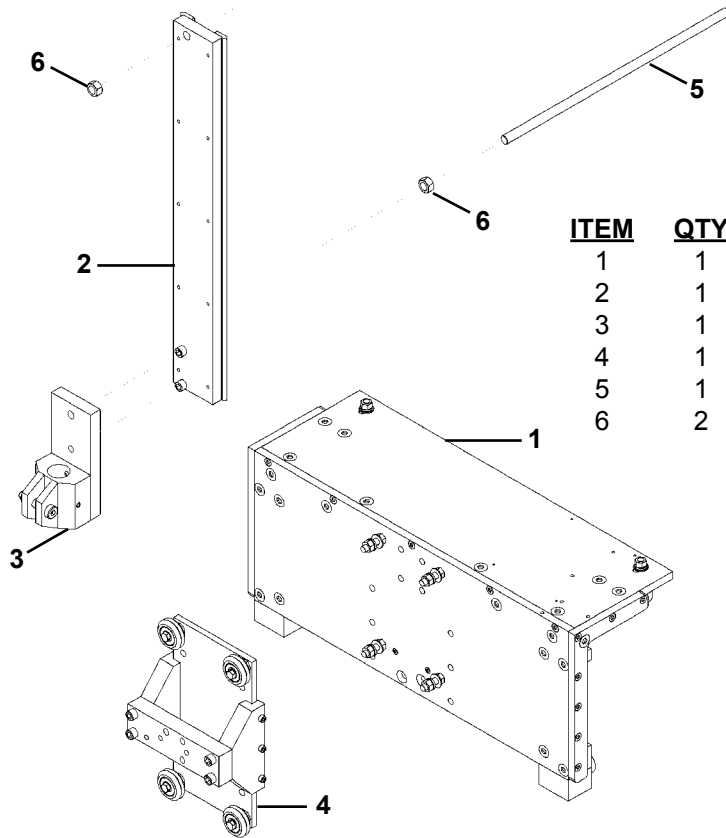
CWO-3918 CARRIAGE ASSEMBLY / PARTS LIST



ITEM	QTY	PART NO.	DESCRIPTION
1	1	CWO-9001	Carriage Front Plate
*2	1	CWO-9002	Carriage Top Plate
3	1	CWO-9003	Carriage End Plate (LH)
4	1	CWO-9004	Carriage Reinforcement Bar
5	1	CWO-9005	Wheel & Clamp Mounting Block, Right
6	1	CWO-9006	Wheel & Clamp Mounting Block, Left
7	2	CWO-9007	Cam Roller Spacer
8	4	CWO-9008	Wheel Mount Block
9	1	CWO-9011	Carriage Back-Up Bar
10	1	CWO-9194	Carriage End Plate (RH)
11	8	CWO-4884	Cam Roller
12	2	FAS-0557	Soc Hd Cap Scr 1/4-20 x 3/4"
13	6	FAS-0679	Soc Hd Cap Scr 3/8 x 1 x 5/16-18
14	19	FAS-0959	Flt Hd Soc Scr 1/4-20 x 1"
15	22	FAS-0999	Flt Hd Soc Scr 3/8-16 x 1"
16	10	FAS-1390	Hex Nut 3/8-16
17	2	FAS-2397	Hex Hd Cap Scr 3/8-16 x 2-1/2"
18	4	FAS-2399-FT	Hex Hd Cap Sce 3/8-16 x 3-1/2" F.T.
19	6	WAS-0260	3/8" Washer
20	10	WAS-0262	3/8 Split Lockwasher
21	2	CWO-9490	Lower Cam Roller Assembly

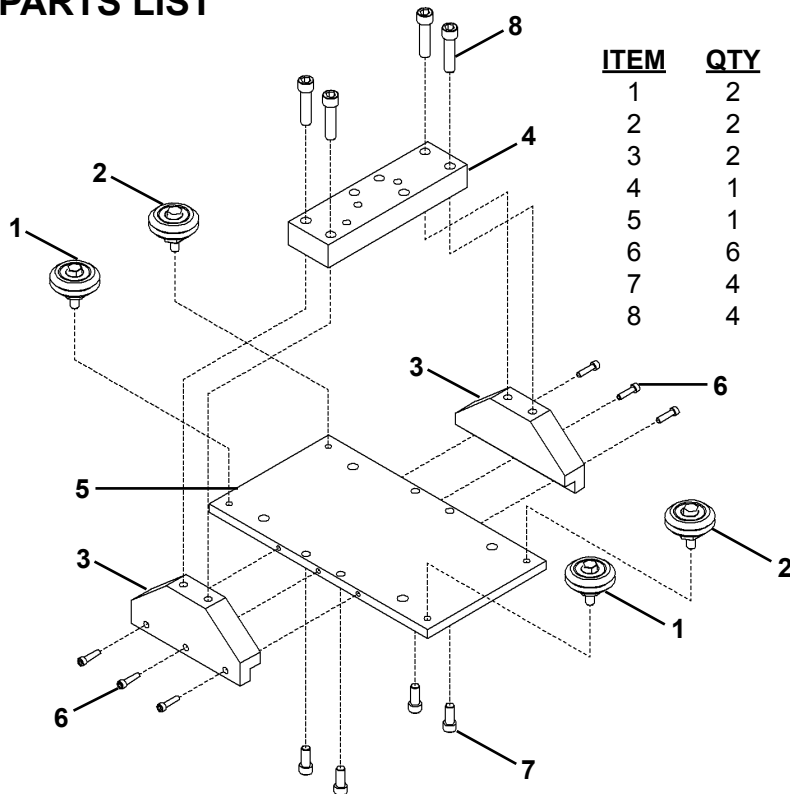


## CWO-3925 COMMON CARRIAGE ASSEMBLY / EXPLODED VIEW / PARTS LIST



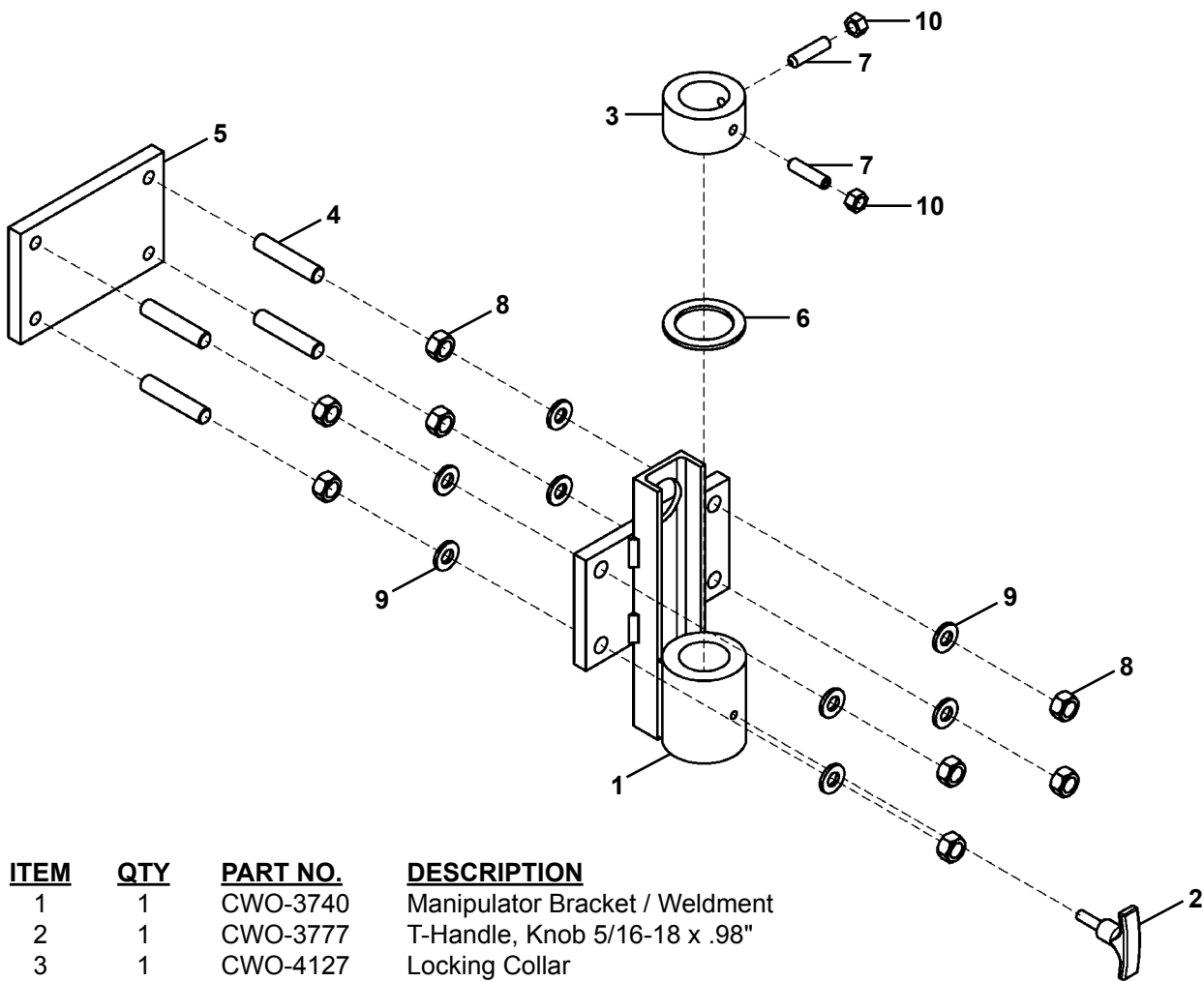
ITEM	QTY	PART NO.	DESCRIPTION
1	1	CWO-3918	Carriage Assy.
2	1	CWO-3928	Vertical Slide Bar Assy.
3	1	CWO-3929	Carriage Machine Support Assy.
4	1	CWO-3946	Carriage Slide Bridge Assy.
5	1	CWO-9023	Cord Support
6	2	FAS-1301	Hex Nut 1/2-13

## CWO-3946 CARRIAGE SLIDE BRIDGE ASSEMBLY / EXPLODED VIEW / PARTS LIST



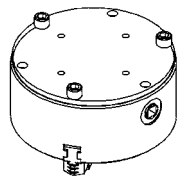
ITEM	QTY	PART NO.	DESCRIPTION
1	2	CWO-4326	Fixed Leg & Wheel Assy.
2	2	CWO-4327	Adjustable Leg & Wheel Assy.
3	2	CWO-9012	Bridge Support
4	1	CWO-9015	Bridge Plate
5	1	CWO-9016	Carriage Wheel Mount Plate
6	6	FAS-0557	Soc Hd Cap Scr 1/4-20 x 3/4"
7	4	FAS-0577	Soc Hd Cap Scr 5/16-18 x 3/4"
8	4	FAS-0593	Soc Hd Cap Scr 3/8-16 x 1-1/2"

CWO-3744 MANIPULATOR BRACKET / EXPLODED VIEW / PARTS LIST

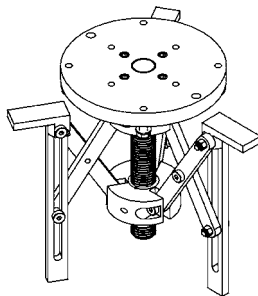


ITEM	QTY	PART NO.	DESCRIPTION
1	1	CWO-3740	Manipulator Bracket / Weldment
2	1	CWO-3777	T-Handle, Knob 5/16-18 x .98"
3	1	CWO-4127	Locking Collar
4	1	CWO-4421	1/2-13 x 2-1/2" All Thread Rod
5	1	CWO-5551	Bracket / Mount Plate
6	1	CWO-5982	Oilite Thrust Bearing
7	2	FAS-2493	Soc Set Scr 3/8-16 x 1-1/2"
8	8	FAS-1301	Hex Nut 1/2-13
9	12	WAS-0280	1/2" Washer
10	2	FAS-1390	Hex Nut 3/8-16"

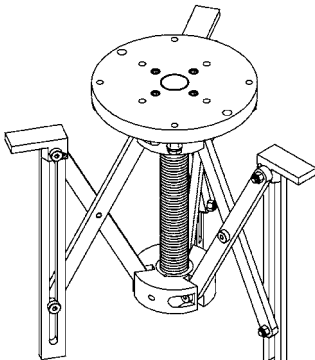
## 3-JAW EXPANDABLE CHUCKS (For use on CW-5AX/CW-7/CW-11 Circle Welders)



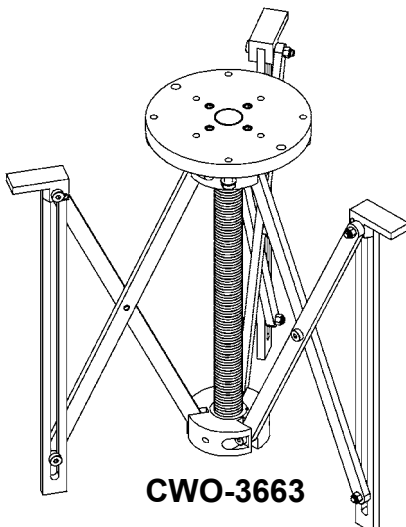
**CWO-3660**



**CWO-3661**



**CWO-3662**

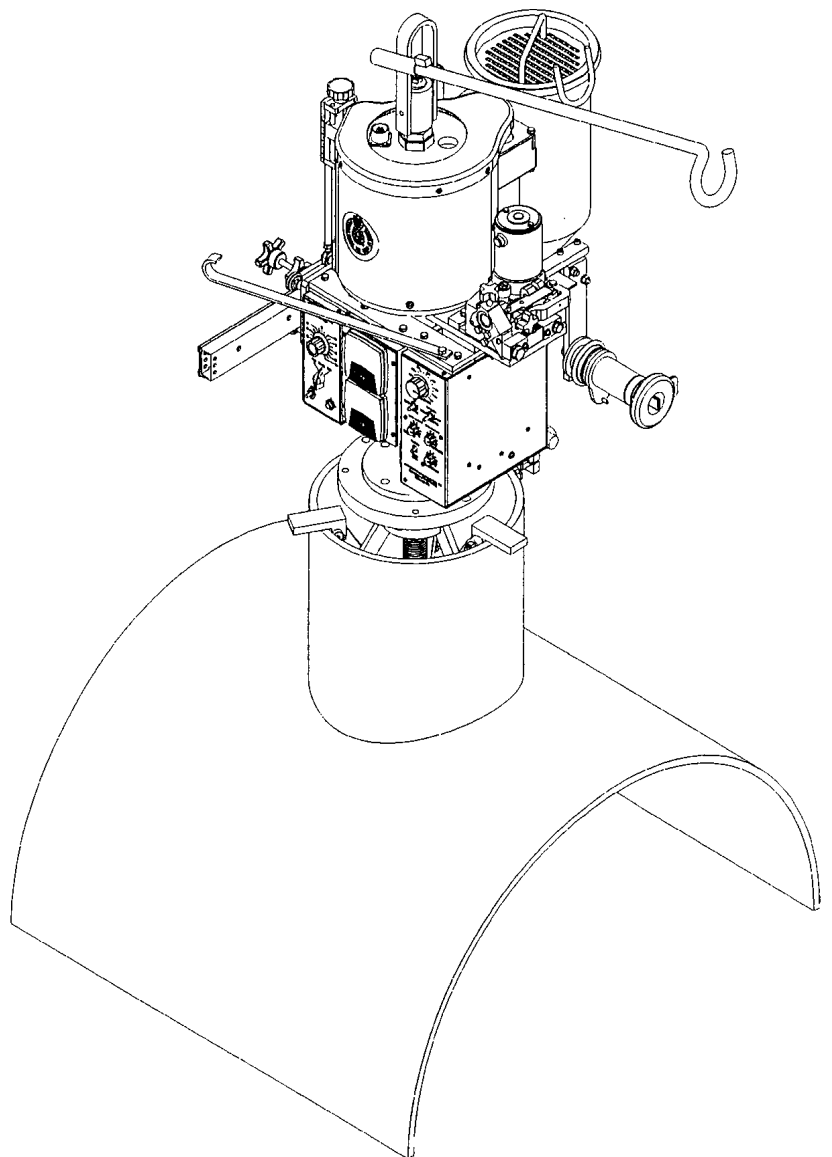


**CWO-3663**

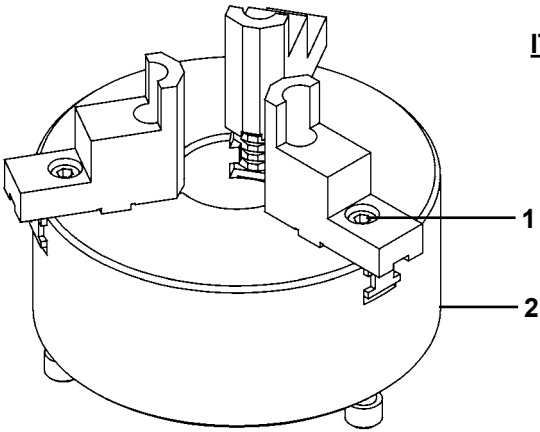
### 3-Jaw Expandable Chucks

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

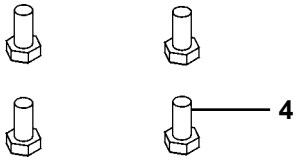
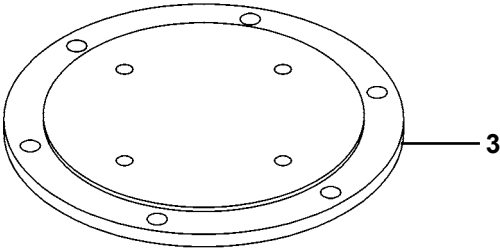
PART NO.	FOR NOZZLE I.D.'S	WEIGHT
CWO-3660	2"-8" (51-204mm)	68 lbs. (31 kg)
CWO-3661	8"-16" (204-405 mm)	36 lbs. (16 kg)
CWO-3662	10"-24" (255-610 mm)	51 lbs. (23 kg)
CWO-3663	15.75"-47.25" (400-1200 mm)	64 lbs. (29 kg)



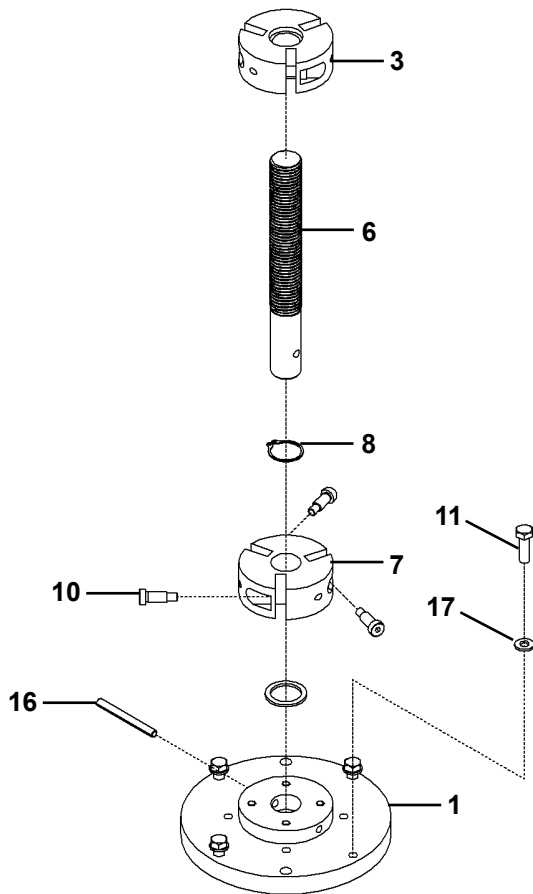
CWO-3660 2/10 3 JAW EXPANDABLE CHUCK / EXPLODED VIEW / PARTS LIST



<u>ITEM</u>	<u>QTY</u>	<u>PART NO.</u>	<u>DESCRIPTION</u>
1	1	CWO-3668	Extension Jaw
2	1	CWO-4978	Chuck 10" 3-Jaw
3	1	CWO-3666	10" Chuck Mount Plate
4	4	FAS-0309	Hex Hd Cap Scr 1/2-13 x 1"

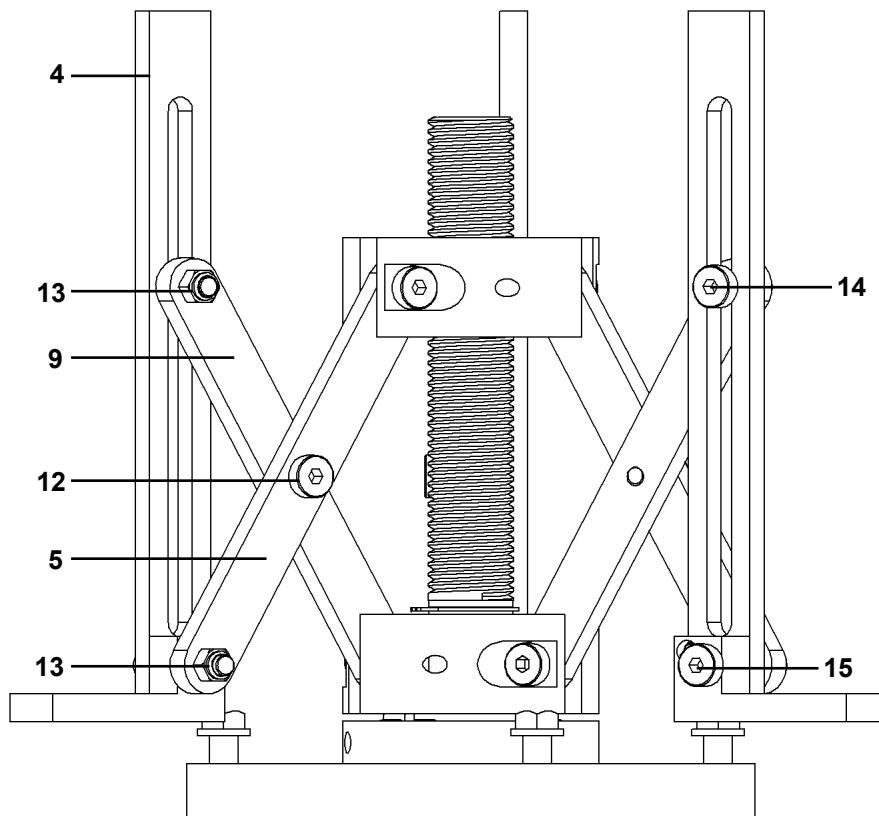


# CWO-3661 8/16 3 JAW EXPANDABLE CHUCK / EXPLODED VIEW / PARTS LIST

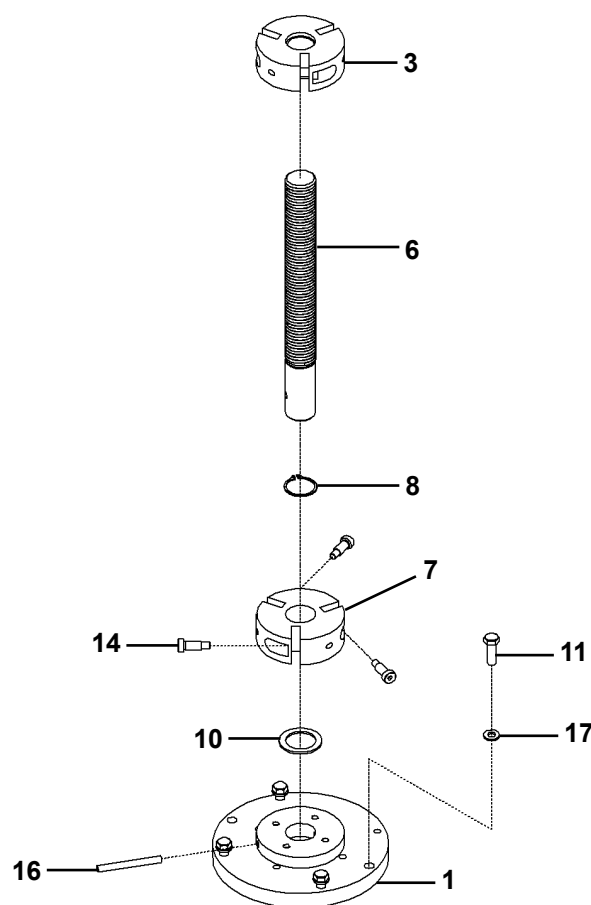


ITEM	QTY	PART NO.	DESCRIPTION
1	1	CWO-3292	8/16 Plate & Hub Assy.
*2	1	CWO-3664	Tightening Bar Assy.
3	1	CWO-3867	8/16 Lower Hub Assy.
4	3	CWO-3868	8/16 Slide Arm Bracket
5	3	CWO-5687	Inside Arm 8/16
6	1	CWO-5895	Chuck Screw 8/16
7	1	CWO-5911	Upper Hub 8/16
8	1	CWO-5954	External Retaining Ring
9	3	CWO-5969	Outside Arm 8/16
10	1	CWO-5981	Oilite Thrust Washer
11	4	FAS-0308	Hex Hd Cap Scr 1/2-13 x 1-1/2"
12	3	FAS-0695	Soc Hd Shd 1/2" x 1/2" x 3/8-16
13	12	FAS-1394	Hex Jam Nut 3/8"-16"
14	6	FAS-2693	Soc Hd Shd 1/2" x 1" x 3/8-16
15	3	FAS-2697	Soc Hd Shd 1/2" x 2" x 3/8-16
16	1	RPS-2139	Roll Pin 3/8" x 3-3/4"
17	4	WAS-0280	1/2" SAE Flat Washer

\* See CWO-3664 Tightening Bar Exploded View

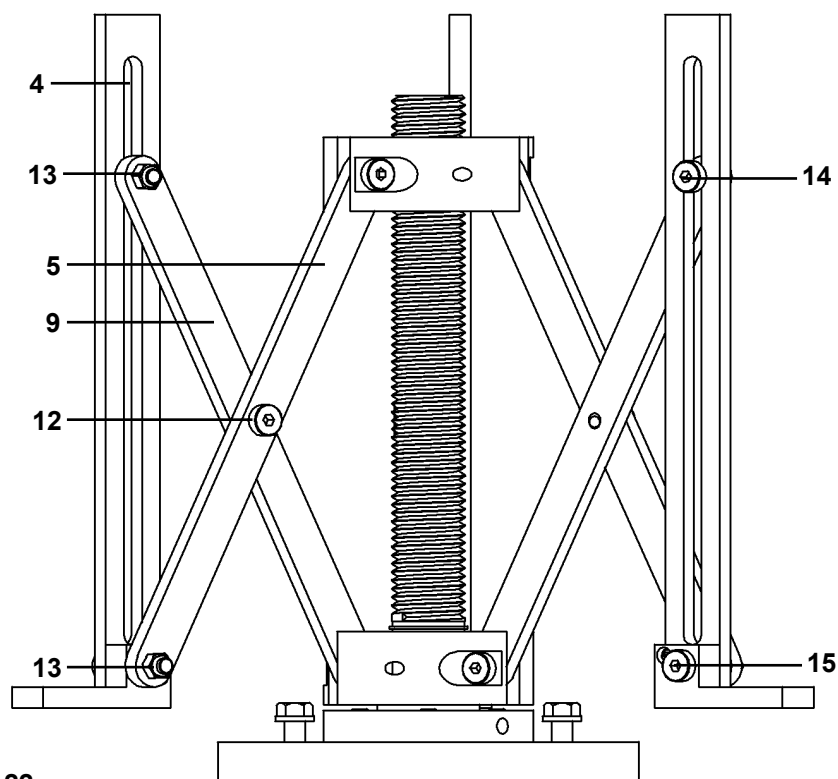


# CWO-3662 10/24 3 JAW EXPANDABLE CHUCK / EXPLODED VIEW / PARTS LIST

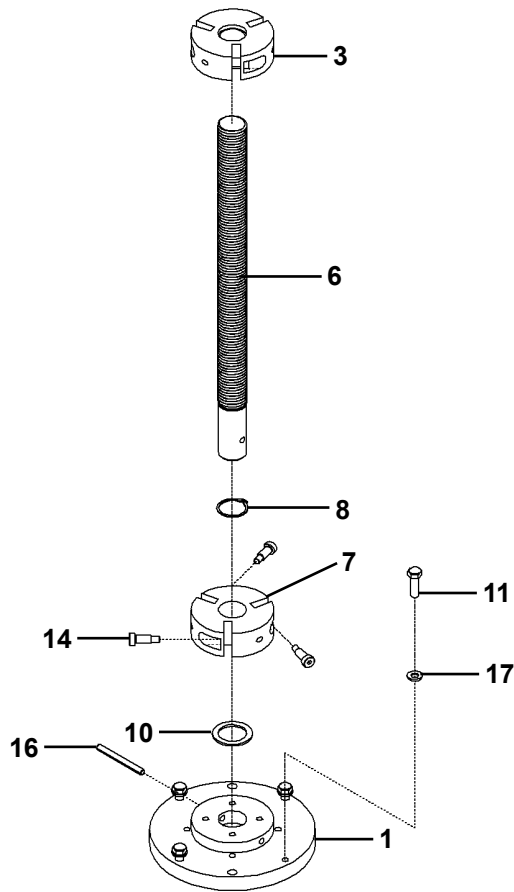


ITEM	QTY	PART NO.	DESCRIPTION
1	1	CWO-3293	10/24, 24/42 Plate & Hub Assy.
*2	1	CWO-3664	Tightening Bar
3	1	CWO-3861	10/24, 24/42 Lower Hub Assy.
4	3	CWO-3869	10/24 Slide Arm Bracket
5	3	CWO-5688	Inside Arm 10/24
6	1	CWO-5896	Chuck Screw 10/24
7	1	CWO-5912	Upper Hub 10/24, 24/42
8	1	CWO-5956	External Retaining Ring
9	3	CWO-5971	Outside Arm 10/24
10	1	CWO-5981	Oilite Thrust Washer
11	4	CWO-0308	Hex Hd Cap Scr 1/2-13 x 1-1/2"
12	3	FAS-0695	Soc Hd Shr 1/2" x 1/2" x 3/8-16
13	12	FAS-1394	Hex Jam Nut 3/8"-16"
14	9	FAS-2693	Soc Hd Shr 1/2" x 1" x 3/8-16
15	3	FAS-2697	Soc Hd Shr 1/2" x 2" x 3/8-16
16	1	RPS-2139	Roll Pin 3/8" x 3-3/4"
17	4	WAS-0280	1/2" Washer

\* See CWO-3664 Tightening Bar Exploded View

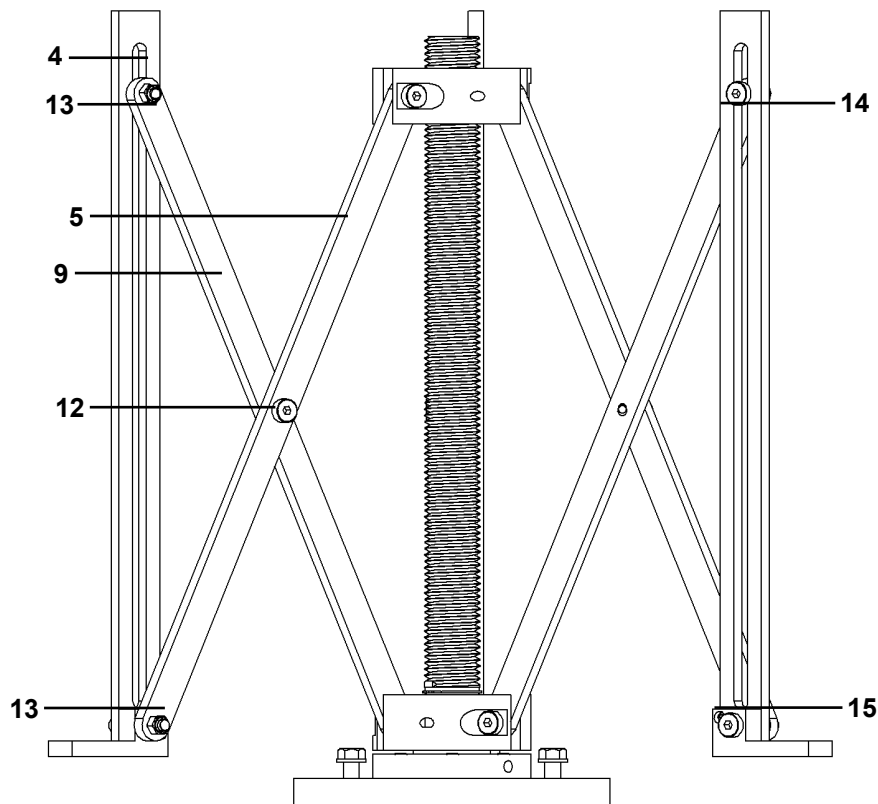


# CWO-3663 24/42 3 JAW EXPANDABLE CHUCK / EXPLODED VIEW / PARTS LIST

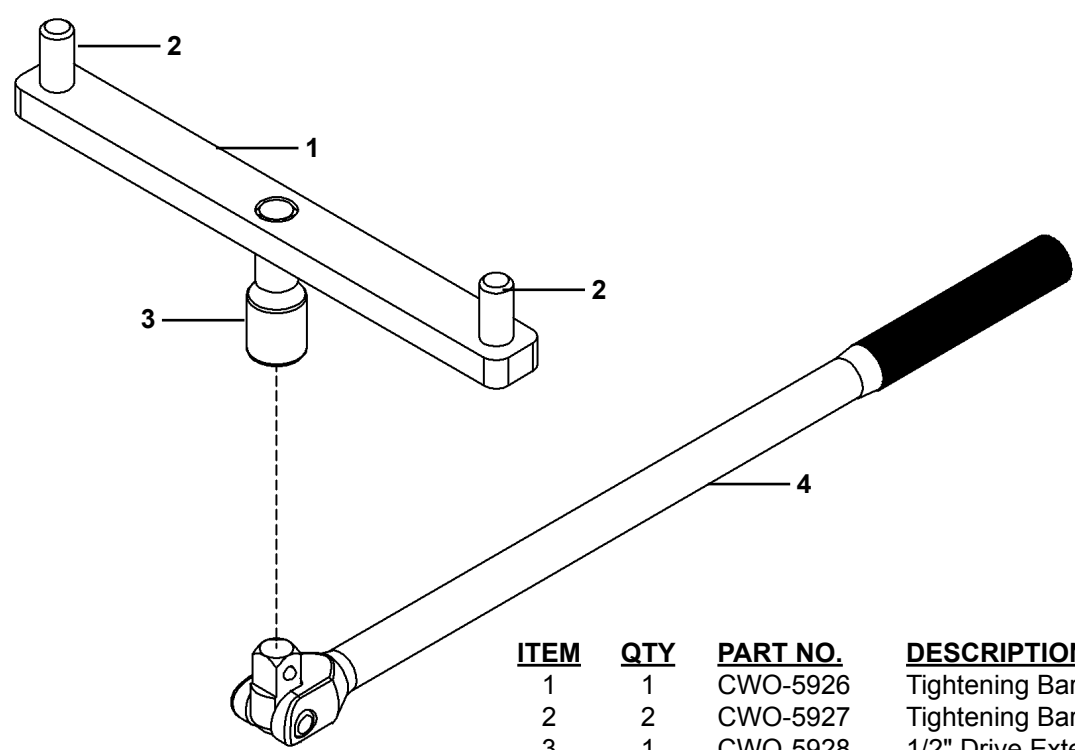


ITEM	QTY	PART NO.	DESCRIPTION
1	1	CWO-3293	10/24, 24/42 Plate & Hub Assy.
*2	1	CWO-3664	Tightening Bar
3	1	CWO-3861	10/24, 24.42 Lower Hub Assy.
4	3	CWO-3871	24/42 Slide Arm Bracket
5	3	CWO-5689	Inside Arm 24/42
6	1	CWO-5897	Chuck Screw 24/42
7	1	CWO-5912	Upper Hub 10/24, 24/42
8	1	CWO-5956	External Retaining Ring
9	3	CWO-5972	Outside Arm 24/42
10	1	CWO-5981	Oilite Thrust Washer
11	4	FAS-0308	Hex Hd Cap Scr 1/2-13 x 1-1/2"
12	3	FAS-0695	Soc Hd Shr 1/2" x 1/2" x 3/8-16
13	12	FAS-1394	Hex Jam Nut 3/8"-16"
14	9	FAS-2693	Soc Hd Shr 1/2" x 1" x 3/8-16
15	3	FAS-2697	Soc Hd Shr 1/2" x 2" x 3/8-16
16	1	RPS-2139	Roll Pin 3/8" x 3-3/4"
17	4	WAS-0280	1/2" Washer

\* See CWO-3664 Tightening Bar Exploded View



CWO-3664 TIGHTENING BAR / EXPLODED VIEW / PARTS LIST



<u>ITEM</u>	<u>QTY</u>	<u>PART NO.</u>	<u>DESCRIPTION</u>
1	1	CWO-5926	Tightening Bar Handle
2	2	CWO-5927	Tightening Bar Dowel Bar
3	1	CWO-5928	1/2" Drive Extension
4	3	CWO-5930	1/2" Drive Hinge Handle



## 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.