

# CRL Two Spindle Glass Edger MODEL VE2PLUS2

(Starting with Serial No. 68966)



## SET-UP and OPERATING INSTRUCTIONS

March 2012



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# CRL Two Spindle Glass Edger MODEL VE2PLUS2

Model VE2PLUS2 Two Spindle Glass Edger  
Starting with Serial No. 68966, Mfr. Date 03/2012



## VE2PLUS2 Machine Specifications

Dimensions:	225" x 30" x 88" high (5715 x 762 x 2235mm high) Conveyor Height 724mm (28.5")
Shipping Weight:	1800 Lbs. (816 kg.)
Motors/HP:	6.1 HP (4 motors, 4.6 Kw total)
Volts:	230V AC / Three Phase
Hertz:	60
Amps:	19.8 FLA
Max RPM:	3450
Grind Wheel Diameter:	178 mm (7")
Polish Wheel Diameter:	203 mm (8")



• HEARING PROTECTION IS OPTIONAL, BUT IS RECOMMENDED.

# CRL Two Spindle Glass Edger MODEL VE2PLUS2

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# CRL Two Spindle Glass Edger

## MODEL VE2PLUS2

### 1.0 INTRODUCTION

#### 1.1 INTRODUCTION

This manual contains installation instructions and operating and maintenance procedures for the VE2PLUS2 Vertical Edger. The edger must be operated and maintained at all times in accordance with the instructions and procedures contained in this manual and on the decals attached to the edger. Only qualified personnel thoroughly familiar with the operating and maintenance should operate and maintain this equipment.

#### Safe Operating Considerations

Safety must be observed through all facets of operation and maintenance. Proper tools and operating procedures must be used at all times to prevent accidents that may cause injury to personnel or damage to equipment.

Safe reliable operation and long service life are dependent upon three important considerations:

- 1) Care exercised during installation.
- 2) Quality and frequency of inspection and maintenance.
- 3) Common sense approach to operation.

#### 1.2 UNCRATING THE MACHINE

Before the edger was crated for shipment, it underwent a successful test operation and was in proper working condition. Therefore, proper uncrating and inspection upon receiving is of the utmost importance to assure that the edger was received in exactly the same condition as it was when shipped from the factory. The edger and all ancillary components are shipped in one large crate.

The crate with the edger weighs approximately 1800 lbs (816kg). Use adequate lifting devices to move the crate and avoid damage to the machine or its components.

### 1.3 SAFETY / NOTES, CAUTIONS, AND WARNINGS

#### NOTE

##### 1) NOTES

The notes contained throughout this manual provide additional information to carry out the operating and maintenance procedures. Any particular note is listed just prior to the procedural step to which it applies. At left is an example of a NOTE format.

#### CAUTION

##### 2) CAUTIONS

The cautions in this manual contain instructions and information concerning operation and maintenance procedures that, if not followed, could cause damage to equipment, parts and facilities. Like notes, cautions are listed just prior to the steps to which they apply. At left is an example of a CAUTION format.

#### WARNING

##### 3) WARNINGS

The warnings in this manual contain instructions and information concerning operation and maintenance procedures that, if not followed, could cause injury to personnel. Warnings also are listed just prior to the steps to which they apply. At left is an example of a WARNING format.

#### GENERAL PRECAUTIONS

The precautions listed here are general in nature. Failure to observe and follow them could result in personal injury or damage to property. These general precautions are not all inclusive. Specific cautions and warnings are listed throughout this manual, and additional ones may occur that are peculiar to a particular operation or industry.

# CRL Two Spindle Glass Edger

## MODEL VE2PLUS2

### 1.3 IMPORTANT SAFETY INFORMATION



1) **Always** operate and maintain the edger in accordance with the instructions and procedures in this manual.



2) **Do not** exceed the capacity of the edger.  
3) **Do not** open inspection doors while unit is in operation except in special circumstances which are addressed later in this manual.



4) **Never** work on the edger or related components unless electrical power and motor drive have been locked out and tagged.



5) **Do not** use edger for any purpose for which it was not designed. It is to be used solely to edge glass within the specification limits listed in this manual.



6) **Do not** poke or prod into the openings of the edger with a bar or stick.



7) **Always** have a clear view of the loading and unloading points and all safety devices of the edger.



8) **Always** keep area around edger, drive and control station free of debris and obstacles.



9) **Never** operate edger without guards and all safety devices in position and functioning.



10) **Always** allow edger to stop naturally. Do not attempt to artificially brake or slow any moving part of the edger.

11) **Always** wear safety glasses, proper gloves, and other necessary safety equipment while operating and maintaining the edger. When in doubt, consult with shop safety representative.

### 2.0 MACHINE DESCRIPTION

The VE2PLUS2 Vertical Edger (herein referred to as "the edger") was designed to fill the need for a versatile production machine to edge the most common range of glass thicknesses and sizes. The edger is ruggedly constructed, easy to operate and maintain, and produces quality edges. The edger consists of a frame with grinding (polishing) compartment, grinding (polishing) wheels and drive motors, conveyor system, glass support frame, coolant tank and pump.

The edger uses two motors to drive separate wheels in line. One spindle is normally set up to grind the glass edge while the next spindle will usually run a polishing wheel. This allows glass to be ground and polished in one pass. Two wheels can be mounted on each spindle. The edger will grind (and polish) edges of glass from a minimum thickness of single strength, 2.28mm (.090") to a maximum thickness of 12mm(1/2"). Wheels can be supplied to provide a pencil, flat-seamed or any special edge desired. The wheels are driven by spindles equipped with height adjustment for setting wheel depth, front-to-back adjustment for centering the wheel on the glass, and angular adjustment to pitch the wheel with respect to glass travel.

While in operation, the wheels are cooled with a diamond wheel coolant that is recirculated by a coolant pump. The purpose of the coolant pump and coolant tank is to supply a constant flow of diamond wheel coolant free of large glass grinds to the grinding (or polishing) wheel while the edger is in operation. Coolant is supplied to the wheels and is returned to the coolant tank where most of the ground glass residue settles in the far chamber, away from the pump. The overflow of coolant to the center chamber supplies the pump reservoir section of the tank for recirculation.

The conveyor system is driven and synchronized by one gearmotor and transmission on the lower right side of the machine. The maximum speed in which the glass is conveyed through the edger is 100 inches per minute (2.5 meters per minute).

The glass support frame supports the glass as it is conveyed through the grinding and/or polishing operations. The frame can handle glass from a minimum size of 4 inches wide by 10 inches long (102 x 254mm) to a maximum of 72 inches wide by 100 inches long (1.8m x 2.5m). The maximum glass weight is 250 pounds (113 kg) and the maximum glass thickness is 1/2 inch (12mm).

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# CRL Two Spindle Glass Edger

## MODEL VE2PLUS2

### 2.0 MACHINE DESCRIPTION -continued

#### GLASS CAPACITY

<b>THICKNESS</b>	Single Strength, .090" to 1/2" (2.28mm To 12mm)
<b>LENGTH</b>	10" to 100" (0.25m To 2.5m) Machine Supported)
<b>HEIGHT</b>	4" to 72 " (0.10m to 1.8m) MAX (without optional extensions)
<b>WEIGHT</b>	250 Pounds (113 kg) MAX
<b>SPINDLE MOTORS</b>	2 motors @3HP (2.2kw): 1 with a 7" (178mm) Diamond Grind Wheel 1 with a 8" (203mm) Polish Wheel Both run at 3000 RPM

### 2.1 RECEIVING AND UNCRATING

Before the edger was crated for shipment, it underwent a successful test operation and was in proper working condition. Therefore, proper uncrating and inspection upon receiving is of the utmost importance to assure that the edger was received in exactly the same condition as it was when shipped from the factory. The edger and all ancillary components are shipped in one large crate.

**The crate with the edger weighs approximately 1800 lbs. (816kg). Use adequate lifting devices to move the crate and avoid damage to the machine. Make sure the crate is kept flat and not tilted at any angle as it can tip over easily. Unloading the crate with a "Lift-Gate" is DANGEROUS and not recommended.**

#### INSPECTING THE CRATE

- 1) Crate damage could indicate mishandling during shipment and the edger could possibly be damaged. Inspecting the crate for exterior damage is an important part of the uncrating procedure.
- 2) Check all surfaces of the crate for gouges, tears or holes that could have been caused by the tines of a fork-lift or other lifting device.
- 3) Check for crushed corners and edges that could indicate the crate was dropped.
- 4) Check for broken support straps that position the edger and coolant tank on the mounting skid.

#### OPENING THE CRATE

- 1) Remove top and side of crate. A claw hammer and prybar are suitable tools for this operation. Remove the protective plastic wrap covering the edger.
- 2) The edger is securely bolted and strapped to the main mounting skid. Carefully remove the bolts and strapping.

#### NOTE

**Small parts and accessories may be found wrapped and placed in the coolant tank, or boxed and attached to the mounting skid.**

- 3) Check the entire edger for damage, especially in the area of any crate damage as mentioned.
- 4) Use a proper lifting device and lifting slings to raise the machine and remove the mounting skid from beneath the edger. Position the machine in the work area. Remember that the main body of the machine weighs about 1000 lbs. (454 kg.).

#### NOTIFICATION

Document any and all damage to the edger and components, if there is any, and notify the carrier and CRL Glass Machinery. Document any damage with clear photographs if possible.



# CRL Two Spindle Glass Edger

## MODEL VE2PLUS2

### 3.0 INSTALLATION

#### FACILITIES REQUIREMENTS

##### SPACE

The required area to operate the edger is 20' x 5' x 7' high (6.1m wide, 1.5m deep and 2.1m high) including work space. The floor area should be clean, level and free of oil, grease and water.

##### PLUMBING

Although the edger requires no direct hookup, a water supply and drain should be easily accessible for filling, cleaning and draining the coolant tank and pump. Ideally, a floor drain should be located very close to the edger for run-off and cleaning. This will make cleaning out the tank much easier and help you avoid the most common problem associated with this machine... lack of coolant tank maintenance.

##### ELECTRICAL REQUIREMENTS

Make sure all electrical connections and service lines DO NOT contact water.

A three phase, 60 Hz, 230 volt, 25 Amp power source with a grounded plug and cord (male receptacle not supplied) is required. All duplex outlets must be connected to earth ground. Do not use on a GFCI line. The power source must also have a safety disconnect switch for servicing the edger. Local electrical codes may require this switch. All wiring must meet local electrical codes.

**If you are not confident with connecting the electrical power correctly, have a certified electrician do this work for you.**



##### ASSEMBLY / SETUP INSTRUCTIONS

Following are the necessary steps to set-up the edger for production:

- 1) Install the supplied steel pads directly beneath the feet of the center section of the edger. Using the leveling screws, level the center section from side to side. Next, level the center section front to back (see Figure 14). A 5° tilt toward the back of the machine will be noticeable at the glass line when this procedure is done correctly. Use a quality level for this procedure .
- 2) Place the coolant tank and pump under the infeed side conveyor (see Figure 15). Attach the coolant output lines to the pump and make sure the large discharge hose is feeding into the far compartment of the tank.
- 3) Install the conveyor rails to the center section with the shoulder screw provided (see Figure 16). Support the opposite end with a stand approximately 30" (760mm) high and install the shoulder screw. Do not tighten it fully at this time.
- 4) Install the end of the conveyor rails to the of the conveyor end supports (see Figure 21). The conveyor end supports have extensions welded on to them that will connect to the outer end of the conveyor rails. Each extension has a 1/2" (12mm) bolt welded to the bottom of it. The conveyor rails will have a tab with a hole in it at the far end. Thread a 1/2" (12mm) nut onto the support rail bolt and place a flat washer on the conveyor tab. Now insert the bolt into the tab and place another washer and 1/2" (12mm) and nut onto the bottom of the bolt. Height adjustments are made to the outer end of the conveyor at this location. Install a washer and 1/2"-13 x 1 1/4" long hex head screw from the front of the conveyor rail, into the conveyor support extension, but do not tighten it at this time.
- 5) Install the supplied steel pads directly beneath both infeed and discharge conveyor end supports and adjust the leveling screws to tilt the supports 5° towards the back, matching the center section (see Figure 18). Check for alignment down the path of the glass when performing this procedure.
- 6) Install the conveyor belts (see figure 19) and tighten to achieve a 1 1/2 to 2" (38 to 50mm) deflection when pressing lightly on the lower part of the belt 12" (305mm) from the pulley. Tighten the hold down screws after adjusting for proper belt tension.
- 7) Install the central support rack onto the top of the rear conveyor of the center section (see figure 20) and tighten the four hex screws. Note: There are (4) 1/4"-20 set screws to align this support with the infeed and discharge conveyor end supports if need be.
- 8) Install 4 vertical rack support extensions (see figure 24) using the wedge washers as illustrated in figure 26.
- 9) Install 4 vertical angle roller track supports. There are 2 long and 2 short supports that attach to the support extensions. These require the wedge washers also. Do not tighten these bolts yet. See figure 24 for reference.
- 10) Install the roller tracks onto the vertical extensions. Start with the lowest track and work up. There are 7 roller tracks on each side of the machine. Each track mounts to the vertical support with an 8" (203mm) long carriage bolt and 7" (178mm) long plastic extension.

-continued on page 8-

# CRL Two Spindle Glass Edger MODEL VE2PLUS2

## 3.0 INSTALLATION -continued

### ASSEMBLY / SETUP -continued

- 11) The lower 3 racks are 86" (2.2 meters) long and there is a 12" (305mm) rack section which needs to be attached with 2 short tie brackets and 3/8" bolts with nuts. This short rack fits between the 2nd and 3rd 86" rails. See figures 23, 25 and 26 on page 9 for reference.
- 12) The upper 3 racks are 112" (2.8 meters) long and there are 2 "types", 3 of each. Open a package of 3 and attach one in the middle of the ingoing side, and the other 2 to the top and bottom of the outgoing side. Notice that one end of each rail will have an open bolt hole. This is the hole that will attach to the center vertical support. Repeat with the other package of 3 racks.
- 13) DO NOT tighten the rack bolts at this time. When one side is done, attach the racks to the other side in the same manner. Make sure that the vertical supports are straight by checking them with a level.
- 14) Sight down the glass path to be sure that the rails are straight and that all supports are at the same 5° angle (See Figure 22). Adjust vertical and center supports if need be, and tighten all the bolts for the racks and their brackets
- 15) Attach the 2 foot operated E-Stops to the bottom of the outer conveyor supports. See figure 13. Attach the E-Stop cables to the conveyor with the clips supplied, as shown in figure 23 on page 9.
- 16) Place a level on the infeed conveyor and adjust the outer leveling screw (figure 21) to obtain a level conveyor. Repeat for the outgoing conveyor.
- 17) Remove the polycarbonate window from the front center section of the machine and install the grind wheel on the left hand spindle hub. Tighten the 4 allen head bolts with lock washers to 20 ft. lbs. Install the orange polish wheel to the right hand spindle hub in the same manner using 4 flat washers provided. Position the coolant lines so they spray at the top right side edge of the wheels, just before the area where the glass meets the wheels. Re-install the clear polycarbonate window.
- 18) Mix 1 part of CRL diamond wheel coolant, Somaca/CRL Cat. No. 2651005, or equivalent, to 100 parts water, or as recommended, in the coolant tank. For mixing purposes, approximate the capacity of the coolant tank at 8 US Gallons (30.2 ltrs.). Use approximately 1.2oz (.036kg.) of coolant.



Figure 14

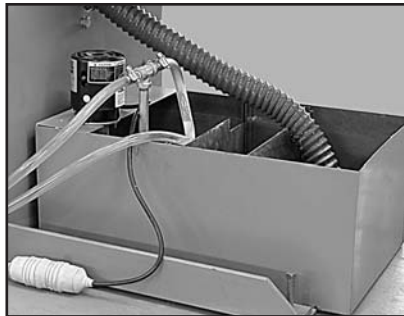


Figure 15

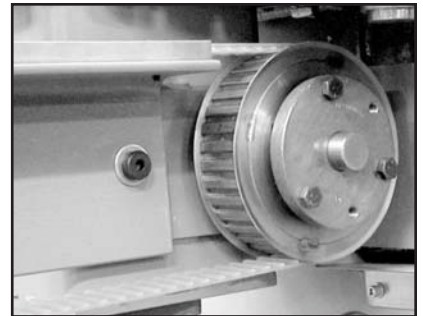


Figure 16



Figure 17

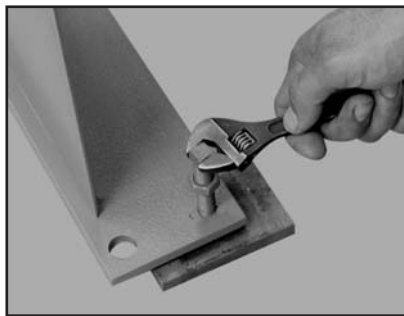


Figure 18

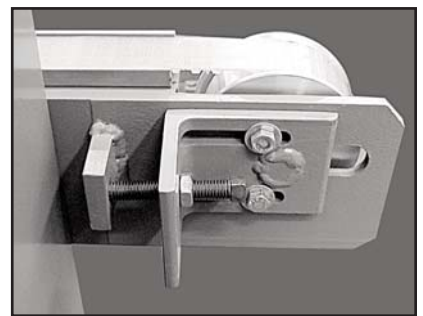


Figure 19



# CRL Two Spindle Glass Edger MODEL VE2PLUS2

## 3.0 INSTALLATION -continued

### Reference Photos



Figure 20

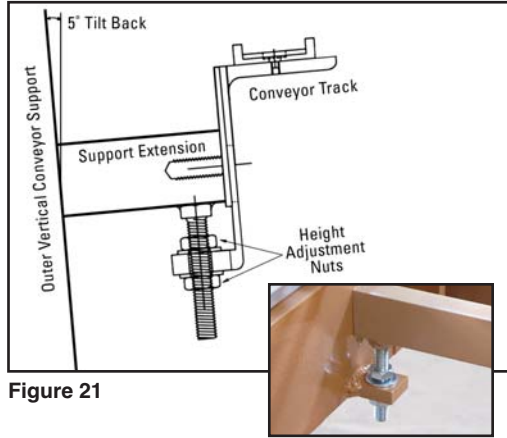


Figure 21



Figure 22

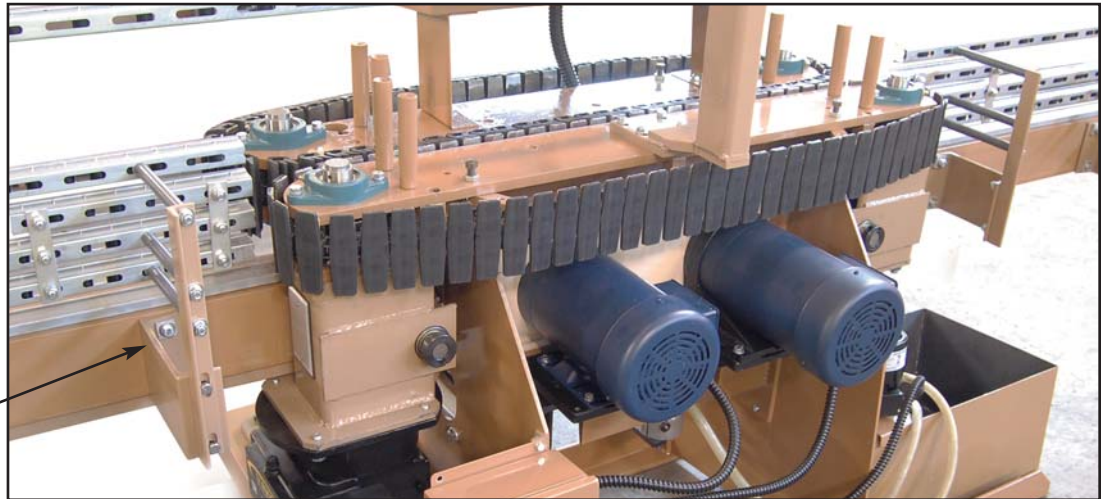


Figure 23

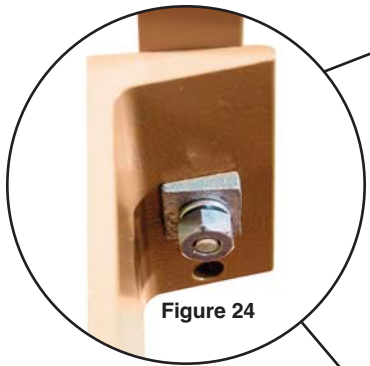


Figure 24



Figure 25

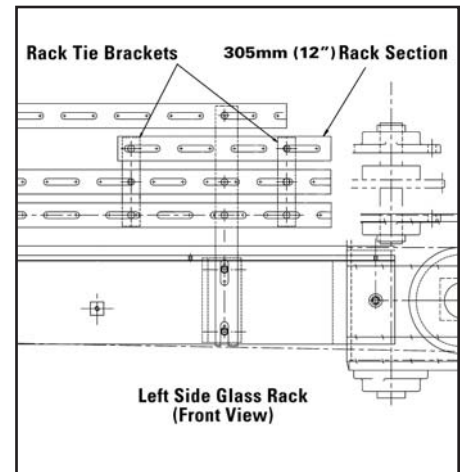


Figure 26

# CRL Two Spindle Glass Edger MODEL VE2PLUS2

## 3.1 TEST OPERATION AND WHEEL ADJUSTMENT

### Master Power Switch and Lock-Out

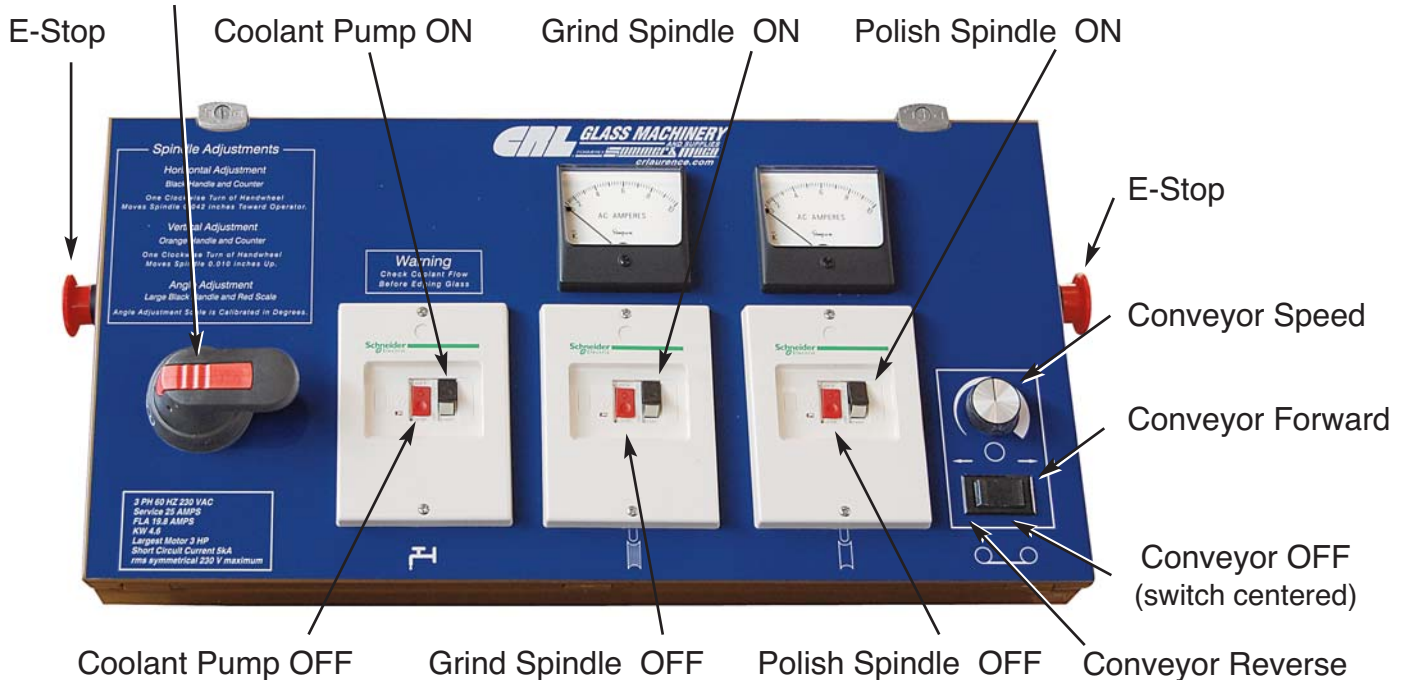


Figure 27

### EDGER OPERATION

Turn on the main power at the back of the machine and deactivate all E-Stops. The E-Stops on the control station will deactivate by turning them. The E-Stops at the conveyor ends deactivate by pulling up on them.



The spindles should be turning Counter-Clockwise when viewed from the front of the machine. If they are running clockwise, 2 legs of the main power connection (L1, L2, L3 / Diagram on page 33) will need to be reversed. **You may want a certified electrician to do this step.**

To start the machine, push the Coolant Pump ON button (check that there is coolant flowing to the wheels), then the Grind Spindle and Polish Spindle ON buttons and finally the Conveyor Forward selector switch. Adjust the conveyor speed to about 1/2. The Conveyor switch has a neutral (off) position which, when selected, will stop the conveyor. The switch also has a Reverse position which is to be used when backing glass out of the machine. Glass should **NOT** be processed from right to left.

**NOTE** The Conveyor WILL NOT RUN unless the coolant pump and spindles are running

### GRINDING AND POLISHING WHEEL ADJUSTMENT

Three adjustments must be made on the grinding and polishing wheels before any glass is run through the machine. The first adjustment is for centering the wheels on the glass. The next adjustment is for the vertical height which controls the amount of glass being removed.

**NOTE** Do not adjust the wheels while the spindles are running. Make sure that the spindles are off. Failure to do so may result in machine damage and risk of serious injury.

Most polishing wheels are not constructed to withstand a 3450 RPM spindle speed, However, the polishing wheel on your VE2PLUS2 is a HI-SPEED polishing wheel and is built to run at 3450 RPM. Wheels must be installed with the screws provided.

# CRL Two Spindle Glass Edger MODEL VE2PLUS2

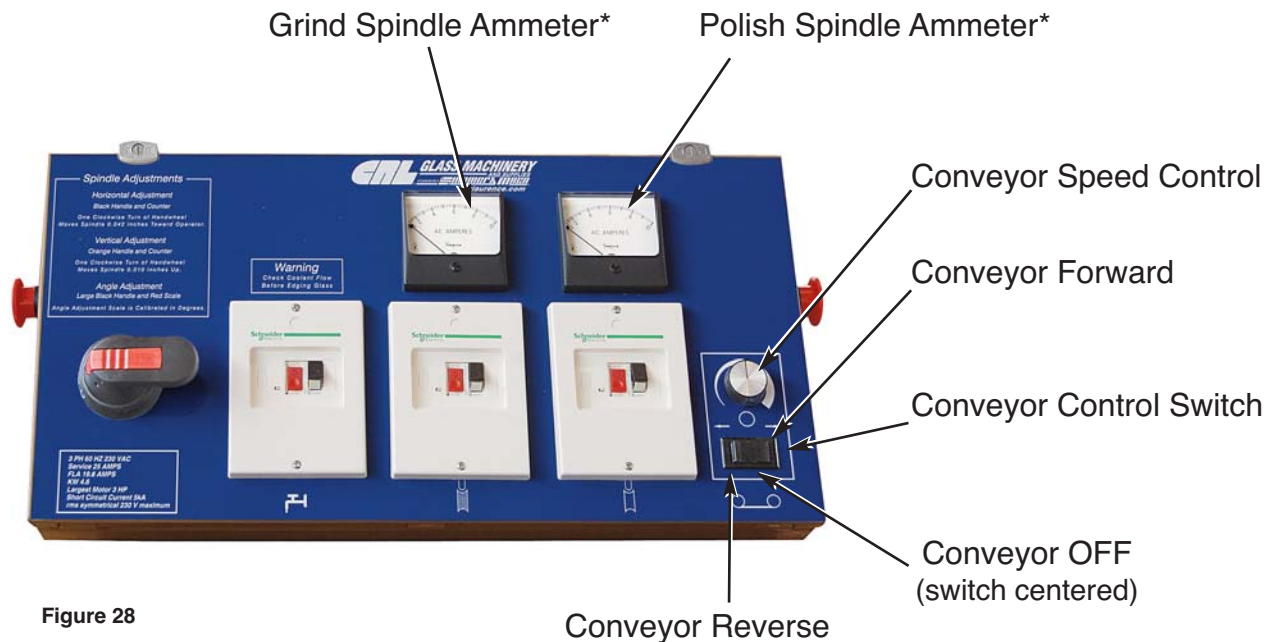
## 3.1 TEST OPERATION AND WHEEL ADJUSTMENT

### CONVEYOR OPERATION

#### NOTE

The conveyor will not run unless the grinding spindle, polishing spindle and the coolant pump are "ON".

1. Select the Forward Position on the Conveyor Control Switch. See Figure 28, below.
2. Set the speed adjustment at 50 percent and press the START buttons for the pump and spindles.
3. Observe that the conveyor belts are moving from left to right when facing the front (operator's side) of the edger. The front conveyor chain (with the "finger" pads) is moving clockwise, and the rear conveyor chain is moving counterclockwise.
4. Alternate the conveyor speed from fast to slow using the Conveyor Speed Control. Confirm the change in conveyor speed as the adjustment varies.
5. Place the Conveyor Control Switch switch in the reverse position. Observe that the belts and conveyor chains are moving in the opposite direction of travel as noted in step 3 above.
6. Repeat step 4 above with the machine running with the travel reversed.
7. Place the Conveyor Control Switch in the forward direction and turn the conveyor and coolant pump "OFF".



\* The Ammeters are provided to show the draw on the motors and the power being used to grind or polish the glass. A high amp draw sometimes be reduced by slightly lowering the wheel away from the glass. Very low or no amp reading could indicate that the glass is not in contact with the wheel.



# CRL Two Spindle Glass Edger MODEL VE2PLUS2

## 3.1 TEST OPERATION AND WHEEL ADJUSTMENT

### HORIZONTAL CENTERING OF THE WHEELS

The initial setup of the wheels is made when the rear pads and the flange of the wheel hubs are in one plane. At that point, the digital indicators should read "0" (zero). Center the grinding wheel on the glass by using the formula as follows:

**1/2 wheel thickness minus 1/2 glass thickness**

Example 1:

If the grind wheel is .629" (16mm) thick and the glass is .220" (6mm) thick.....

$$\frac{16\text{mm}}{2} - \frac{6\text{mm}}{2} = 8.0\text{mm} - 3\text{mm} = 5\text{mm} - \text{or } 5 \text{ turns of the wheel. Number 200 showing in the window.}$$

DO NOT move the slide with the slide lock engaged. To do so will cause damage to the slide resulting in excessive backlash in the adjusting mechanism. See figure AA below.

**All handwheels have some amount of backlash that is felt when reversing direction. Always make sure to make the last movement, when adjusting, in a clockwise direction. If the adjustment is overshoot, back out 2 turns and approach again.**

To adjust for this thickness, turn the handwheel counterclockwise which moves the wheel in until the display reads "202" (see Figure 25). (Note: Each revolution of the handle is 1mm (.040") of horizontal movement shown on the BLACK counter.

Example 2:

If the grind wheel is 25mm thick and the glass is .469" (12mm) thick.....

$$\frac{25\text{mm}}{2} - \frac{12\text{mm}}{2} = 12.5\text{mm} - 6\text{mm} = 6.5\text{mm} - \text{or } 6 \text{ and } 1/2 \text{ turns of the wheel. Number 261 showing in the window}$$

The numbers in the counter windows are not strictly accurate measurements in inches. They are an INDICATION of relative movement. These formulas and readouts will get you close to the desired edge grind. Further adjustments will usually be needed for fine tuning.

**IMPORTANT! When done adjusting, lock the horizontal slide with the locking handle.**

The chart below can be helpful when converting Glass Thickness Measurements from Inches to metric.

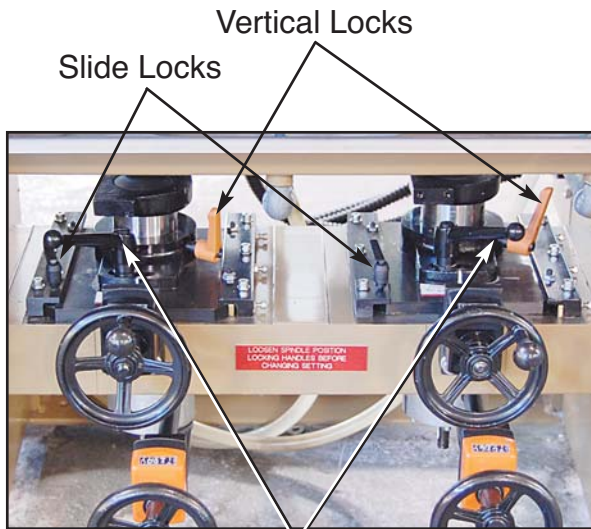


Figure AA

Angle Locks

Glass Thickness Table			
Nominal Thickness in. (mm)	Minimum Thickness in. (mm)	Nominal Thickness in. (mm)	Minimum Thickness in. (mm)
3/32 (2.5)	0.085 (2.16)	1/4 (6.0)	0.219 (5.56)
7/64 (2.7)	0.102 (2.59)	5/16 (8.0)	0.292 (7.42)
1/8 (3.0)	0.115 (2.92)	3/8 (10.0)	0.355 (9.02)
5/32 (4.0)	0.149 (3.78)	1/2 (12.0)	0.469 (11.91)
3/16 (5.0)	0.180 (4.57)	3/4 (19.0)	0.719 (18.26)

# CRL Two Spindle Glass Edger MODEL VE2PLUS2

## 3.2 ADJUSTMENT OF GRINDING AND POLISHING WHEELS

### PIVOTING OF THE WHEELS

The wheels pivot to allow for the use of a wide range of profile wheels on a thinner piece of glass. The range of pivoting is -5° to +15°. An index label placed on the back of the spindle angle sleeve indicates the pivoting range. A clamping bolt holds the angle sleeve in position. See figure AA on page 12.

When pivoting the wheel, the bolt must be loosened and the scribed line on the sleeve must be lined up with the desired angle on the index table.

Due to the specific design of the edger spindle, the position of the wheel should be corrected in relation to the glass. Some wheels, even when pivoted, may not give the desired edge. Caution must be exercised when pivoting grinding wheels since starring and chipping of the glass may result, especially on mirror backing and coatings. C. R. Laurence offers a variety of wheel profiles in stock. Go to [crlaurence.com](http://crlaurence.com) or call the Machinery Division at (773) 242-2871.

Below right is a chart indicating the linear correction that must be applied to the wheel after pivoting (i.e., the wheel must be moved forward).

If desired, angle the wheel to the glass by loosening the angle adjustment lock handle and rotate the spindle assembly to the desired angle as read on the angle scale at the base of the spindle. The table below, left gives some typical angles, but these are examples and individual preferences and wheel profiles will dictate the end results.

WHEEL PROFILE	GLASS THICKNESS				
	1/2" (12mm)	3/8" (10mm)	1/4" (6mm)	3/16" (5mm)	1/8" (3mm)
12mm F&S (1/2") 12mm PE	0°	4° - 8°	8° - 15°	NR	NR
10mm F&S (3/8") 10mm PE	NR	0°	4° - 8°	6° - 10°	8° - 15°
6mm F&S (1/4") 6mm PE	NR	NR	0°	4° - 8°	6° - 10°

PIVOT ANGLE	CORRECTION MM / INCHES
±1	N/A
±2	.076 / .003
±3	.179 / .007
±4	.279 / .011
±5	.457 / .018
±6	.660 / .026
±7	.889 / .035
±8	1.17 / .046
±9	1.47 / .058
±10	1.83 / .072
±11	2.21 / .087
±12	2.64 / .104
±13	3.10 / .122
±14	3.58 / .141
±15	4.11 / .162

**NR** = Not Recommended    **PE** = Pencil Edge    **F&S** = Flat and Seam

### VERTICAL ADJUSTMENT

The vertical adjustment is made as follows:

#### NOTE

The actual travel is 1/2 of what the indicator reads; one revolution with a reading of .020 is actually a change of .010".  
When feeding the wheel "UP" (turning the handwheel clockwise), the numbers on the indicator will decrease.

1. Start the edger.

-continued on page 14-

# CRL Two Spindle Glass Edger

## MODEL VE2PLUS2

### VERTICAL ADJUSTMENT - continued

2. Run a piece of glass of a thickness suitable for the wheel size slowly through the edger. Stop the conveyor when the glass is above the grinding wheel.

### CAUTION

**Always wear heavy glass handling gloves when transporting glass. Failure to do so may result in serious cuts or gashes. Always put the glass on the entry conveyor feed belt and allow the conveyor to pull the glass into the front and rear conveyor pads (center section). Keep your hands away from moving conveyor pads. The pads can clamp onto your hand and pull your arm into the machine causing serious injury. Always use extreme caution when loading glass. Never wear loose clothing that can get caught in the pads and pull you into the machine. Always use extreme caution when loading glass. Know where the four emergency stops are located and be prepared to use them in an emergency.**

3. Unlock the vertical adjustment lock handle and raise the grinding wheel by turning the handwheel clockwise. Continue to raise the spindle assembly until the dial indicator reads the diameter of the wheel. This diameter, 7.000" (178mm) is read directly on the indicator as 7000. As the indicator approaches the reading desired, visually observe the wheel so that it does not touch the glass, but that it is as close as possible without contact.
4. Back the glass out of the machine. Turn the vertical adjustment up (clockwise) 3 ½ turns or .89mm (.035"). One rotation is 0.25 mm (.010") after allowing for backlash. Lock the vertical adjustment.
5. Adjust the conveyor speed to .06 MPM (meters per minute) or 25 IPM (inches per minute), about 1/4 of the full scale on the dial, and start the machine. Run the glass in until it about 76mm (3 inches) is cut by the diamond wheel. Make sure the coolant line is positioned properly. Stop the conveyor and reverse it to back the glass out of the machine.
6. Inspect the partial cut for proper depth (about -1/32" or -.031" (0.79mm) should have been removed) and desired profile. Make adjustments accordingly, noting that the dial indicator for the in/out adjustment reads .001 inch scale and the vertical adjustment indicator reads in the wheel diameter, not travel (wheel diameter is 2X vertical travel). Also, one full turn of the handle is 0.25mm (.010") of travel.
7. Run glass completely through the machine and re-examine to determine if any minor adjustments need to be made.
8. Run a dressing board through the grinding wheel to establish a pattern on the board. This will be used for profiling the polishing wheel.
9. Turn the polishing spindle to a 5° tilt or the same tilt as the grinding spindle, if desired, and run the pattern dressing board in the edger until it is above the polishing wheel. Stop the conveyor, and unlock the vertical adjustment lock handle and raise the polishing wheel by turning the handwheel clockwise. Continue to raise the spindle assembly until a slight amperage draw is seen on the ammeter. Please note the wheel diameter is 8.000". This diameter, (200mm) is read directly on the indicator as 7.87. Restart the conveyor and run the dressing board from left to right over the grinding wheel again several times to establish the pattern on the polishing wheel. When it comes in contact with the wheel a second time, raise the wheel to obtain a 2 to 4 amp draw. Do this several times to establish a pattern on the polishing wheel. (also see dressing procedure)
10. Tighten all lock handles.
11. Run the test glass completely through the edger so that it is both ground and polished. Make additional adjustments in wheel height and groove centering so that .79mm (1/32 or .031) of glass is removed and that the desired edge (pencil or flat and seam) is attained. Tighten all lockscrews. Inspect for a full polish.

### NOTE

**The pitch of the polishing wheel should be between 3° to 5° and centered on the glass. This is to ensure that no silver or backing is removed from the back of the mirror by the edging wheel.**

12. Run a piece of glass 2.1 meters (84") in length through the edger lengthwise. The glass should enter and exit straight and not ride up or down during the grinding and polishing process. The motor load of each spindle should remain constant. If it deviates, the far end of the loading conveyor must be adjusted until the amperage draw remains constant.
13. Next, run a piece of glass at least 1.8 meters (72") long through the edger and listen to the cut. If the sound becomes quieter as the grinding is almost complete, lower the ingoing conveyor ½ turn (on the adjustment screw) and raise the outgoing conveyor ½ turn (adjustment screw, figure 21).
14. Based on the finished edge produced at this point, it is now a matter of fine tuning. Examples of conditions are described on the next page.

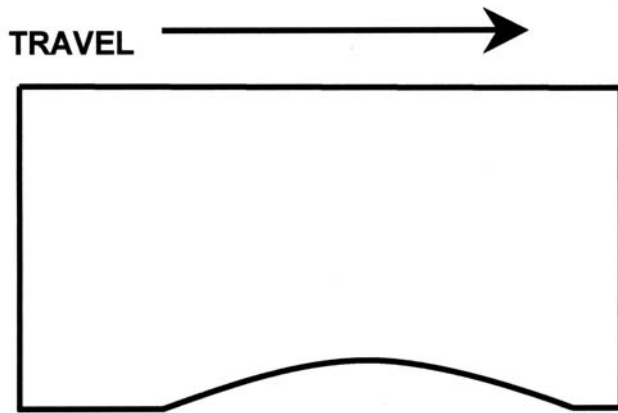


# CRL Two Spindle Glass Edger MODEL VE2PLUS2

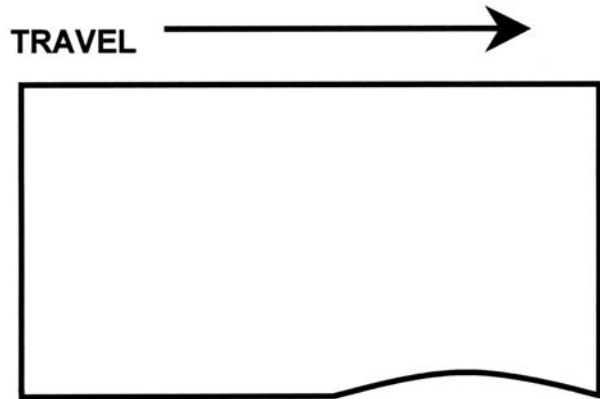
## 3.2 WHEEL ADJUSTMENTS -continued

### CONVEYOR HEIGHT ADJUSTMENT

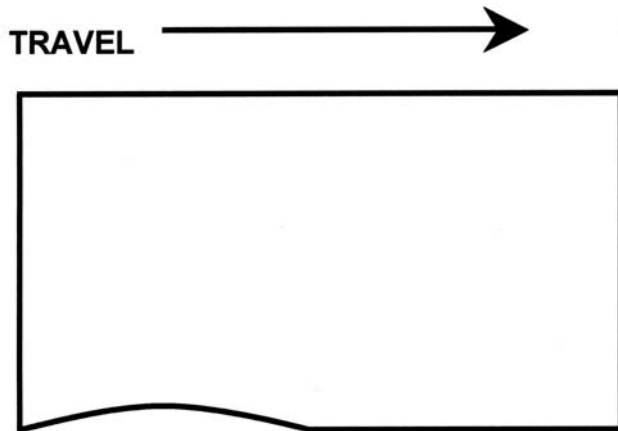
Run a piece of glass at least 72" long and listen to the cut. If the sound becomes quieter toward the end of the cut, lower the ingoing conveyor (½ turn of the adjustment nuts) and raise the outgoing conveyor (½ turn of the adjustment nuts). See next page for Conveyor Operating Instructions.



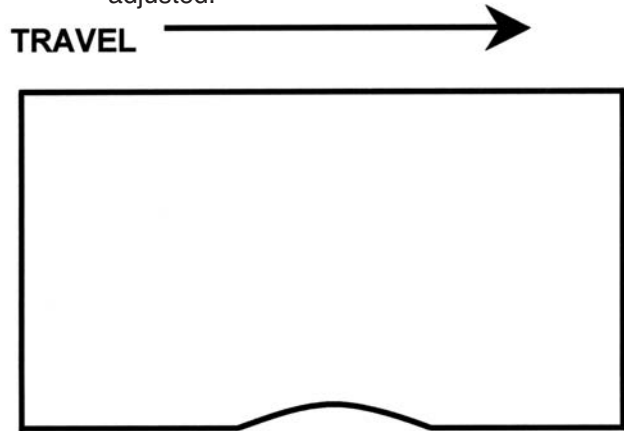
To change this condition, the ingoing conveyor adjustment must be **raised 1/2 turn** and the outgoing conveyor must be **raised 1/2 turn**.



To change this condition, the outgoing conveyor adjustment must be lowered **1/8 turn** and the ingoing conveyor must not be adjusted.



To change this condition, the ingoing conveyor adjustment must be lowered **1/8 turn** and the outgoing conveyor must not be adjusted.



This will move to the left depending on the conveyor being adjusted. To eliminate this condition, adjust both conveyors up **1/8 turn**.

Refer back to STEP#5 in SECTION 3.2 (page 14) to reset depth of cut.

# CRL Two Spindle Glass Edger MODEL VE2PLUS2

## 4.0 OPERATION AND ADJUSTMENTS

### 4.1 OPERATION INSTRUCTIONS

The speed at which glass is ground and polished (speed of the conveyor) is adjustable from 100 inches (0 to 2.5 meters) per minute as noted in Section 2, Description. This speed is dependent upon six factors:

- Hardness of glass
- Thickness of glass
- Type of glass (plate, float or sheet)
- Grit and type of the grinding and polishing wheels
- Depth of grind
- Smoothness of the finished edge that is desired

The softness or hardness of the glass, its thickness and the smoothness of the cut edge will determine the grinding speed. For example, plate glass can be worked faster than the same thickness of sheet or float glass, thinner glass can be edged faster than thick glass, and hard glass is slower to edge than softer grades.

Another important factor is the grit of the diamond wheels to the speed of the grinding. The coarser the grit, the faster the wheel will edge. Conversely, coarse grit wheels will leave rough edges with chipping. Fine grit wheels edge slower, but produce a smoother cut and do not remove as much glass. Another factor of a finer wheel is shorter wear life.

The amount of glass to be removed is another important factor of edging speed. To achieve the fastest edging speed and the longest wheel life, the smallest amount of glass possible should be removed. If the cut edges are straight and without flares or protrusions, then the amount of glass to be removed is minimal. If the cut edges are jagged and uneven, then a greater amount of glass will have to be removed. This may require two passes for satisfactory results.

The desired edge for each glass thickness will be determined through experimentation of grinding speed and depth of cut combinations. The result should be recorded so that the conditions can be duplicated at a later date.

Your own experience in your environment with the VE2PLUS2 Edger will ultimately be the most valuable source of "how to" information on operational parameters. For purposes of startup, tables with recommended settings and speeds for most normal conditions has been provided.



Figure 29

### OPERATION Adjustments

1. Set the grinding and polishing wheels to the proper setting for the thickness of glass to be ground (see Grinding and Polishing Wheel Adjustment, Section 3.1, page 10).
2. Adjust the height of the wheels for the desired depth of cut; typically, this is 1/32" (0.79mm).

# CRL Two Spindle Glass Edger MODEL VE2PLUS2

## 4.1 OPERATING INSTRUCTIONS

### Starting Up the Edger

1. Turn the main power switch, located on the main electrical box on the back of the machine, to "ON".
2. Push the coolant PUMP START switch. Make sure that the coolant stream is directed onto the wheels at the point of contact with the glass. Adjust the coolant lines if necessary.

**DO NOT run glass through the edger unless coolant is flowing to each wheel at the point where the wheel contacts the glass. If a diamond grinding wheel is run dry, the heat generated may break the glass and damage the wheel.**

3. Press the "GRIND START" and "POLISH START" buttons .
4. Select the FORWARD position on the conveyor control. This is done by pressing the right side of the rocker switch.
5. Turn the Speed Control dial to the correct conveyor speed. See chart below.

**WARNING**

**NEVER exceed the glass capacity of the edger as listed in "SPECIFICATIONS" in Section 2.**

**WARNING**

**DO NOT start or stop any operations of the edger while the glass is over the grinding or polishing wheels. If an emergency occurs, press any of the EMERGENCY STOP BUTTONS located on both sides of the control console or the bottom of the conveyor end supports.**



**The EMERGENCY STOP BUTTONS DO NOT disconnect power from all parts of the machine. DO NOT use the Emergency Stop Buttons as a substitute for the main power safety disconnect switch or the main power switch. To do so may result in death or serious injury from electrical shock from live wires or terminals.**

6. Load the glass onto the entrance conveyor (left side when facing the front of the edger) to begin normal operation.
7. Observe the ammeters for each spindle as the glass is passing over the grinding and polishing wheels (see Figure 29). Both meters should read about "4" or less, under normal conditions.

<b>Conveyor Speed Chart (mpm)</b>			
<b>GLASS THICKNESS</b>	<b>DEPTH OF CUT</b>		
	.79mm (1/32)	1.17mm (3/64)	1.57mm (1/16)
3mm (1/8)	1.8-2.5	1.6-2.3	1.5-2.1
5mm (3/16)	1.5-2.1	1.4-1.9	1.3-1.6
6mm (1/4)	1.3-1.6	1.1-1.4	0.9-1.3
10mm (3/8)	0.9-1.3	0.6-0.8	0.6-0.8
12mm (1/2)	0.6-0.8	0.6-0.8	0.6-0.8

**METERS  
PER MINUTE  
CHART**

Conveyor speed range: 0-2.5 meters / minute  
0-100 inches / minute

<b>Conveyor Speed Chart (imp)</b>			
<b>GLASS THICKNESS</b>	<b>DEPTH OF CUT</b>		
	.79mm (1/32)	1.17mm (3/64)	1.57mm (1/16)
3mm (1/8)	72-100	66-92	60-83
5mm (3/16)	60-83	54-75	48-66
6mm (1/4)	48-66	42-58	36-50
10mm (3/8)	36-50	24-33	24-33
12mm (1/2)	24-33	24-33	24-33

**INCHES  
PER MINUTE  
CHART**

# CRL Two Spindle Glass Edger MODEL VE2PLUS2

## 5.0 MAINTENANCE INSTRUCTIONS

### MAINTENANCE CONCEPT

This section is divided into main headings that provide instructions for various maintenance procedures dealing with repairs, lubrication, and grinding and polishing wheels. If you have any questions about working on your VE2PLUS2 edger contact the Service Department of the Sommer & Maca Machinery Division of C R Laurence. Phone (773) 242-2871, your local CRL warehouse or [crlaurence.com](http://crlaurence.com).

**WARNING** Disconnect the main power to the edger before performing any maintenance. Failure to do so could result in serious injury or death.

The MAIN POWER switch is located on the front control panel. Turn the switch from ON to OFF and use a lock to be sure the machine cannot be energized while you are performing maintenance.

### 5.1 REPLACE THE SPINDLE MOTOR

Place the electrical control cabinet main power switch to the "OFF" position.



Remove the cover to the electrical connection box located on the motor being replaced. Tag and disconnect the wiring. (It may be helpful to refer to the wiring schematic drawing on page 33) Loosen the connector to the box and pull the wiring harness from the box.

**NOTE** If you are not confident in your ability to do the wiring, get a certified electrician to do this step for you.

1. From the front of the machine, remove the wheel compartment polycarbonate shield and remove the 4 wheel bolts and the wheel to expose the hub and slinger.
2. Loosen the central bolt securing the hub to the motor shaft and back it out a few turns (To prevent the motor shaft from turning, install a 1/4-20 screw into the hub and wedge a screwdriver or small bar between the screw and the hub).
3. Remove or reposition the coolant lines if necessary.
4. Using a suitable puller, extract the hub from the motor shaft. After the hub comes loose, remove the puller and central bolt and pull the hub free from the shaft. Be sure to collect the shaft key and store it safely for re-use.
5. Remove the 4 nuts that are now exposed on the metal "slinger". This slinger holds the rubber splash shield to the motor. Remove the slinger.
6. From the back of the machine, remove the 4 bolts that hold the motor onto the spindle lifting post.
7. The motor can now be removed. Be careful not to damage the rubber splash shield as you pull the motor out.
8. The grind motor has a face mounted spindle housing assembly as part of the motor spindle assembly. Remove the four socket head cap screws from the front of the spindle housing assembly. Then separate the spindle housing assembly from the motor.
9. Install spindle housing assembly on the new motor using the four socket head cap screws to the front of the spindle housing assembly. Install the motor on the spindle lifting post and secure using four lock washers and bolts.
10. Reconnect the electrical harness and wire motor following the tags applied in disassembly. Reinstall cover on electrical box.
11. At the front of the machine, position the rubber splash shield and slinger on four Allen head set screws and secure using four nuts. (Note: the slinger has a hole in it. The hole must be facing down.)
12. Place key in keyway of the motor shaft and install the hub. Secure the hub to the motor shaft with the washer and bolt. Tighten the motor hub screw to 40 lbs-ft of torque. To prevent the motor shaft from turning, install a 1/4-20 screw into the hub and wedge a screwdriver or small bar between the screw and the hub. Remove the screw from the hub. Position the wheel on the hub before tightening the Allen head screws to 20 lbs-ft of torque.
13. Put the main power switch located on the electrical control cabinet in the "ON" position.

**NOTE** Check the rotation of the motor before putting any wheel into service. The wheels should rotate counterclockwise when viewed from the front. To change rotation, reverse any 2 of the motors leads in the electrical control cabinet. Incorrect rotation can cause equipment damage and personal injury.

# CRL Two Spindle Glass Edger MODEL VE2PLUS2

## 5.2 ENTRY AND EXIT CONVEYORS

### Every 40 Hours of Operation

The hour meter located on the right side of the control cabinet can be monitored to schedule the cleaning of the entry and exit conveyors and other maintenance.

1. Remove the guard from the entry or exit conveyor by removing the three thumbscrews and washers.
2. At the entry conveyor, use clean water with a wire brush to remove any glass grind residue from the drive unit, sprocket, tensioner and tensioner bracket.
3. At the exit conveyor, use clean water and a wire brush to remove any glass grind residue from the drive unit, sprocket, tensioner and tensioner bracket. If necessary, use a putty knife to remove any foreign matter from these parts.
4. If necessary, the conveyor belt can be removed for cleaning and to gain access to the grooves on the pulley. To remove the conveyor belt:
  - a) Loosen the two screws securing the pulley yoke.
  - b) Loosen the tension adjusting screw to obtain slack in the conveyor belt, then slip the conveyor belt off of the pulley and remove.
5. Clean the top and bottom of the conveyor belt to remove foreign matter, using clean water while scrubbing with a hard bristle brush.
6. Remove any glass grind or slurry residue with a wire or other stiff bristle brush from the exterior of the pulleys, pulley grooves, pulley yokes and between the conveyor frame and the pulleys.
7. Remove all foreign matter from the conveyor housing and drain hose, using clean water. Check the drain hole for blockage and clean thoroughly.
8. Clean and remove all foreign matter from belt guide.
9. Lubricate the pulley on the pulley yoke with eight drops of SAE10W oil. Check for free rotation after re-assembly.
10. Install conveyor belt and adjust (see following section).

### Every 80 Hours of Operation or Less

Check and adjust the entry and exit conveyor belt tension:

1. If not already removed, remove the guard from the entry or exit conveyor by removing the three thumbscrews and washers.
2. Check at the middle of the bottom portion of the belt for a deflection of  $\frac{3}{4}$ " or less. If the belt is in excess of this, adjust belt as described in the next steps.
3. Loosen the two screws securing the pulley yoke.
4. Tighten the tension adjusting screw until there is  $\frac{3}{4}$ " or less belt deflection when the bottom portion of the belt is depressed in the middle.
5. Tighten the two screws that secure the pulley yoke.
6. Put the guard back on the conveyor assembly and secure with the three thumbscrews and washers.

## 5.3 FRONT AND REAR CHAIN ASSEMBLIES

### Tighten Front and Rear Chain Assemblies

The front and rear chain pad adjustment screws are located on the left side of the machine. After every 160 hours of operation, tighten the front and rear chain pads as follows:

1. Remove the guards.
2. Check the front and rear chain assemblies for slack.
3. At the front center of the machine, choose a pad. With a slight push, force it towards the machine. There should be about 12mm ( $\frac{1}{2}$  inch) of slack when the pad is pushed towards the machine center.
4. To tighten the front chain assembly, hold the square head bolt with a wrench and loosen the nut. (Figure 30) Turn the square head bolt to increase tension on the chain. Tighten the nut while holding the square head bolt. There are two takeup assemblies on each chain; ensure that they are adjusted evenly.
5. The rear chain assembly is adjusted in the same manner. Ensure that both rear tensioner wheels are adjusted evenly.



Figure 30



# CRL Two Spindle Glass Edger MODEL VE2PLUS2

## 5.4 CHAIN ASSEMBLY PAD REPLACEMENT

To replace a pad on the front or rear chain assembly:

1. Remove the guard.
2. Locate the damaged pad and turn the conveyor "ON" in order to position the damaged pad at a convenient place on the drive or idler sprocket.
3. Using a screwdriver, pry off the chain pad. If more than one pad is damaged, it may be easier to remove the entire chain from the machine and place it on a bench (see Figure 31).
4. This is done by locating the master link on the chain body. The back of the pad on the master link is painted red for locational purposes. Once the pad is removed, the master link can be taken off and the chain assembly can be taken off of the center section.

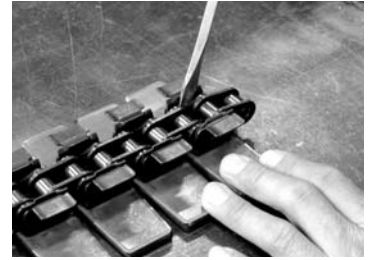


Figure 31

## 5.5 FRONT AND REAR CHAIN ASSEMBLY LUBRICATION Every 40 Hours of Operation

Chain lubrication is extremely important. After cleaning, apply Sommer & Maca part number 59900480 teflon grease (supplied with your machine) to top and bottom portions of the chain and pad assemblies with a small brush (see Figure 33).

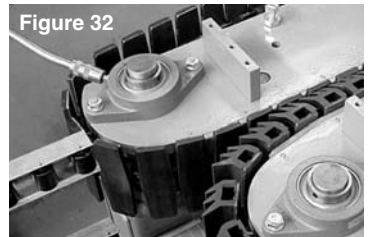


Figure 32

Using a grease gun loaded with moly grease, pump a small amount of the grease into each fitting on the (7) seven sprocket and spur gear shaft flange bearings (see Figure 32). The flange bearing nearest to the large spur gears is located lower than the other six bearings. There are no bearings between the top of the gearboxes on either side of the center chain conveyor drives.



Figure 33

Coat the gear teeth of the large spur gears with Viper-Lube teflon grease, applied with a brush (see Figure 34).



Figure 34

After the first 100 hours of operation, drain the gearbox oil (see Figure 35) and refill with a SAE90 grade gear lube. After every 2500 hours of running, drain and refill. Also, grease the fitting as shown, every 120 hours. Note that there are two gearbox sections, since this is a double reduction gearbox. The smaller gearbox (figure 36) is attached directly to the motor and has fill, drain and level plugs. It also requires SAE90 gear lube.

## 5.6 COOLANT SYSTEM

### NOTE

**This is the most important maintenance procedure that you can perform. Keeping the tank clean will improve edge finish and help prevent future problems with your machine.**

To ensure optimum performance, this procedure must be performed after 8 hours of operation;

- 1) Shut off the main power to the machine
- 2) Remove the pump from the tank and clean the lower section. A high pressure hose may be needed.
- 3) Remove and clean the 2 partitions in the coolant tank and drain and clean the coolant tank. Remove all sediment.
- 4) Flush all coolant from the hoses and the coolant pan in the center section below the wheels. Clean out the discharge hose.
- 5) Clean out the discharge hose.
- 6) After cleaning the tank, refill it with a mixture of 1 part of SOMACA/CRL Cat. No. 2651005 coolant, or equivalent and 100 parts of water, or as recommended. For mixing purposes, the approximate capacity of the coolant tank is 8 gallons (30 ltrs.), leaving a 1" (24mm) head space. The coolant concentrate improves the finish of the grinding (& polishing) operation and inhibits rust formation on the parts of the edger.



Figure 35

### NOTE

**Some polishing wheels do not polish very well with high coolant concentrations. Coolant concentration may be reduced, as necessary, depending on the wheel manufacturer's recommendations.**

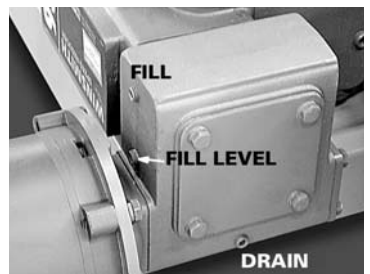


Figure 36



# CRL Two Spindle Glass Edger MODEL VE2PLUS2

## 5.7 DRESSING GRINDING WHEELS

The following steps describe the process for dressing the diamond grinding wheels using stones designed for this purpose. Diamond wheels, depending upon the manufacturer and base metal bond, vary considerably in service life from one half million to over one and one half million linear inches.

### NOTE

**A good indication that a wheel needs dressing is an increase of 3 amperes or more in motor current draw, jumping of the ammeter, or fluctuation in the ammeter reading. When any of these conditions occurs, the groove in the wheel must be dressed.**

Always start and stop the motor and apply the dressing tool as the motor is ramping down. Application of the dressing tool when the motor is under power is dangerous. Apply the stone to the side of the wheel that is rotating upward. Wear heavy leather gloves, protective clothing and eye protection when dressing wheels. Avoid contact with the moving wheel. Failure to exercise these precautions could cause serious injury.

### WARNING

**Be extremely careful while performing the dressing operations. Dressing stones wear quickly. Do not hold your fingers opposite the wheel on the dressing stone. Do not allow the wheel to cut off a piece of the stone as it could act as a projectile and cause serious injury.**

Never attempt to dress a diamond wheel with a dry stone. Either have the coolant pump ON or wet the stone thoroughly before applying the stone to the wheel. The material from the wheel, unless washed away during dressing, will plug the pores of the diamond wheel and inhibit the shaping process.

### Diamond Grinding Wheel

1. The procedure for dressing a diamond grinding wheel:

- a) Start the edger by depressing the START switches on the pump and grind spindle controls.
- b) At the wheel to be dressed, allow the motor to come to full speed and then press the switch to the STOP position. While the motor is coasting to a stop, apply the dressing stone (see Figure 37, page 22) firmly against the working surface of the wheel (see Figure 38). Make sure the stone contacts the entire working area of the wheel. The wheels cut primarily on the inside edges.
- c) Repeat the previous steps three or four times to complete the dressing process. When the wheel cuts the stone freely, the dressing procedure is done.
- d) Rotate wheel clockwise by hand 3 or 4 turns holding pressure on the wheel with the dressing stick. This will clean out the diamond wheel.

### Polishing Wheel

Polishing wheels are made of a composite material, rather than the metal that is used in the grinding wheels. They do require periodic edge dressing if the polishing wheel is overheated due to lack of coolant or excessive cutting loads. The face will become glazed over and it will be necessary to remove this glaze. Also, a new wheel will require the contour to be grooved in before being able to be put into service. This procedure is as follows:

Always start and stop the motor and apply the dressing tool as the motor is ramping down. Application of the dressing tool when the motor is under power is dangerous. Apply the stone to the side of the wheel that is rotating upward. Wear heavy leather gloves, protective clothing and eye protection when dressing wheels. Avoid contact with the moving wheel. Failure to exercise these precautions could cause serious injury.

1. Visually inspect the wheel for glazing, or, if it is a new wheel, any obvious signs of damage. To wear the wheel in:

- a) Start the edger by depressing the START switches on the pump and polish spindle controls.
- b) While running glass through the machine, adjusting the polishing wheel spindle upwards until the entire edge is polished.
- c) Repeat the previous step as many times as is required. For some polishing wheels, this can be a time consuming process. An alternate method is described in the next step.

-continued on page 22-

# CRL Two Spindle Glass Edger MODEL VE2PLUS2

2. Visually inspect the face of the wheel. If a glossy patches or glazing is present:

- a) Start the edger by depressing the START switches for the COOLANT, GRIND, POLISH and CONVEYOR.
- b) Run a dressing board through the grinding and polishing wheels while adjusting the polishing wheel spindle upwards. The board will be ground to shape by the diamond wheel and the polishing wheel will be dressed to the same shape as it passes through the edger.
- c) Repeat the previous steps three or four times to complete the dressing process and ensure that the groove is deep enough.

In both methods ALWAYS turn the coolant pump ON to start the flow of coolant. Press both spindle 1 and 2 start buttons to start the operation of the wheels. Turn the conveyor ON - FORWARD.

The latter method is obviously faster but it can be more damaging to the diamond grinding wheel due to the hard abrasive material the dressing board is comprised of.

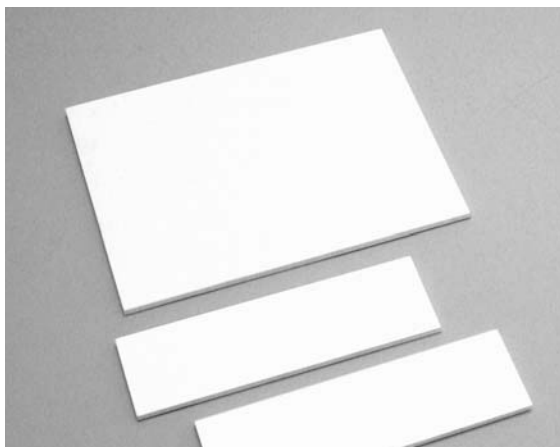


Figure 37



Figure 38

# CRL Two Spindle Glass Edger MODEL VE2PLUS2

## 6.0 REPLACEMENT PARTS

### 6.1 COMMON REPLACEMENT PARTS



#### Diamond Pencil Edge Wheels

178 mm (7") diameter Diamond Wheel for pencil edge profiling.

CAT. NO.	DESCRIPTION
<b>36443205</b>	For 3 to 6 mm (1/8" to 1/4") glass
<b>36881005</b>	For 5 to 10 mm (3/16" to 3/8") glass
<b>38404900</b>	For 6 to 12 mm (1/4" to 1/2") glass

Minimum order is one each.



#### Diamond Flat and Seam Wheels

178 mm (7") diameter Diamond Wheel for Flat and Seam profiling.

CAT. NO.	DESCRIPTION
<b>38533500</b>	For 3 to 6 mm (1/8" to 1/4") glass
<b>38386900</b>	For 5 to 10 mm (3/16" to 3/8") glass
<b>38717504</b>	For 12 mm (1/2") glass

Minimum order is one each.



#### Diamond 30 Degree Miter Wheel

178 mm (7") diameter Diamond Wheel for 30 degree miter profiling.

CAT. NO.	DESCRIPTION
<b>38677802</b>	For 3 to 12 mm (1/8" to 1/2") glass

Minimum order is one each.



#### Wheel Hubs

Each holds 2 wheels and fits the grind or polish spindle motor on the VE2PLUS2.

CAT. NO.	DESCRIPTION
<b>38430302</b>	Grind Wheel Hub
<b>38759900</b>	Polish Wheel Hub

Minimum order is one each.



#### Hi-Speed Orange Polish Wheel (3450 RPM)

For 3 to 12 mm (1/8" to 1/2") glass.  
203 mm x 19 mm (8" diameter x 3/4") thick.

CAT. NO.	DESCRIPTION
<b>39579903</b>	For 3mm to 12mm (1/8" to 1/2") glass

Minimum order is one each.



#### Synthetic Blue Powder Coolant

Biodegradable, anti-foaming Coolant Powder mixes with water for high lubricity. Inhibits rust and dissipates heat. Mix ratio is 100:1.

CAT. NO.	DESCRIPTION
<b>2651005</b>	1 lb. (.453 kg.) Bag of Coolant

Minimum order is one each.

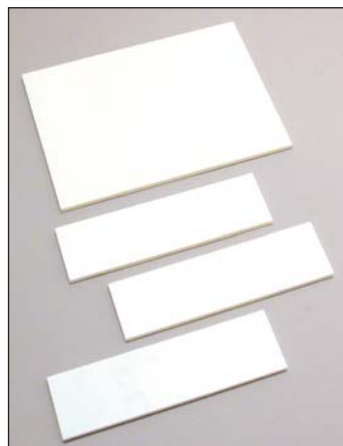


#### Coolant Pump

This is the correct 1/4HP pump to maintain proper coolant circulation.

CAT. NO.	DESCRIPTION
<b>42505612</b>	(for VE2PLUS2 only) 230V Coolant Pump

Minimum order is one each.



#### Board Dressing Plates and Sticks

203 x 152 mm (8" x 6") Board Dressing Plates are used on the Polishing Wheel by running them through the machine like a piece of glass.

152 x 51 mm (6" x 2") Dressing Sticks are used to dress the Diamond Wheels by hand from the front of the machine.

CAT. NO.	DESCRIPTION
<b>46205880</b>	6 mm (1/4") Thick Board Dressing Plate
<b>46205881</b>	10 mm (3/8") Thick Board Dressing Plate
<b>46205882</b>	12 mm (1/2") Thick Board Dressing Plate
<b>46205871</b>	6 mm (1/4") Thick Dressing Stick

Minimum order is one each.

# CRL Two Spindle Glass Edger MODEL VE2PLUS2

## 6.1 COMMON REPLACEMENT PARTS



CAT. NO.	DESCRIPTION
42333006	12" Coolant Hose w/Fittings (no valve)
42333008	Valve only



CAT. NO.	DESCRIPTION
39528200	Kit of 20 Wheel Mounting Bolts



CAT. NO.	DESCRIPTION
46906580	T-Wrench



CAT. NO.	DESCRIPTION
43313022	Glass Conveyor Belt



CAT. NO.	DESCRIPTION
38895400	Rubber Wiper



Screws need to be pressed into plastic knob. This can be done with a bench vice or by driving screw in with a hammer.

CAT. NO.	DESCRIPTION
46980060	Plastic Thumb Knob
15005591	3/4" screw
45007920	5/8" screw
45007830	1/2" screw

All sold separately. See note above. Minimum order is one each.



CAT. NO.	DESCRIPTION
38897200	Top Brush Shield
38895200	End Brush Shield

Minimum order is one each.



CAT. NO.	DESCRIPTION
38864200	Front Conveyor Pad
38864100	Rear Conveyor Pad

Minimum order is one each.



CAT. NO.	DESCRIPTION
46120253	Black Horizontal counter
46120240	Orange Vertical counter

Minimum order is one each.



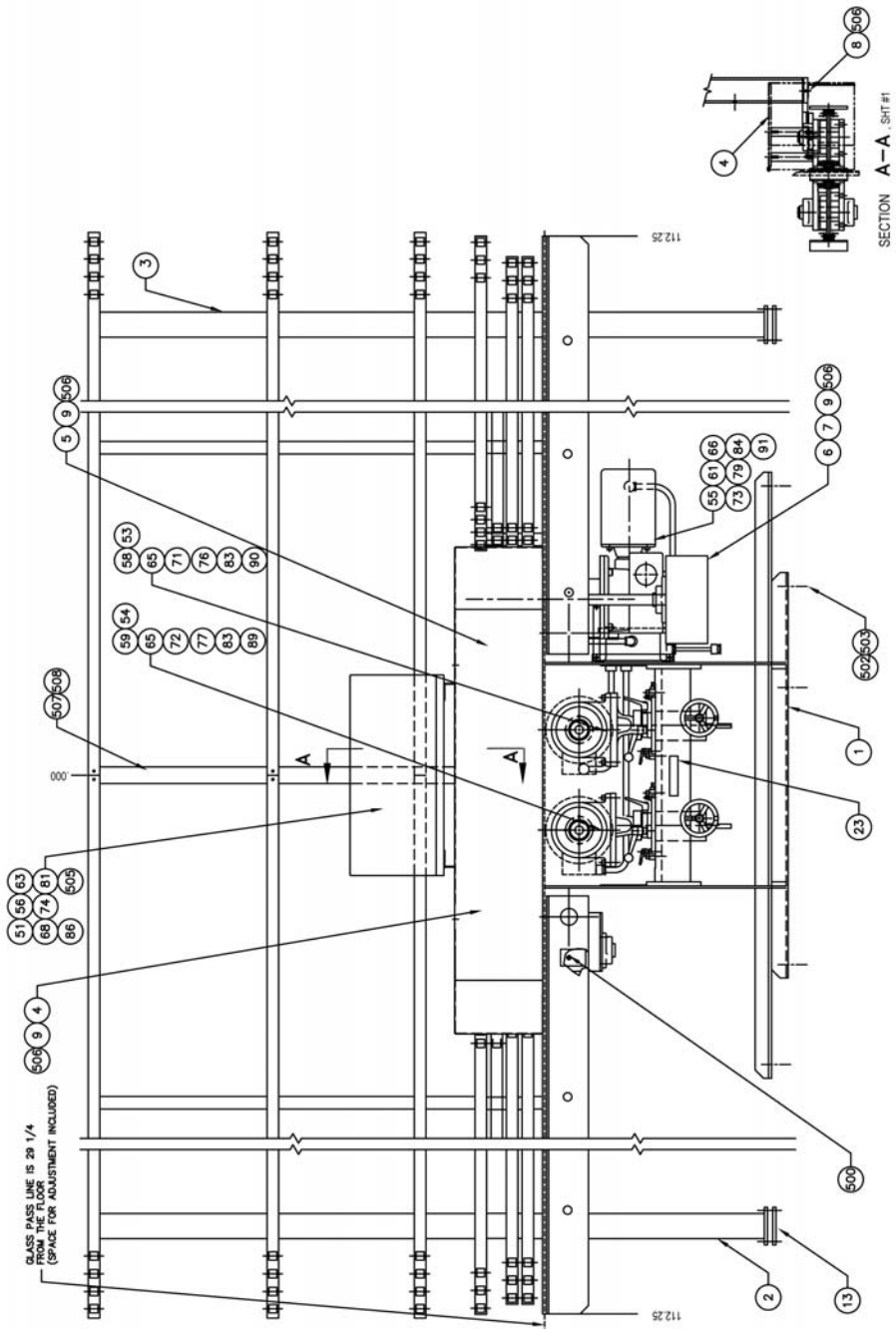
# CRL Two Spindle Glass Edger MODEL VE2PLUS2

## 6.2 MECHANICAL PARTS DRAWINGS

QTY	ITEM	STOCK NO.	MATERIAL
<b>COMMON PARTS</b>			
1	1	3-99375-00	MAIN BODY ASSY
1	2	3-99376-00	INF. CONV. - POWERED
1	3	3-99376-01	DISCH. CONV. - POWERED
1	4	3-99377-00	CONVEYOR GUARD-REAR
1	5	3-99378-00	CONVEYOR GUARD-FRONT
1	6	3-88623-00	DRIVE GUARD - FRONT
1	7	3-88961-00	DRIVE GUARD - REAR
1	8	3-99381-00	CENTER RACK GUARD
14	9	469-8006-0	KNOB FOR 1/4 SCREW
1	10	427-0001-0	EAGLE NAMEPLATE
1	11	427-0003-1	S & M LOGO, SMALL
1	12	3-80431-00	SERIAL # PLATE
2	13	3-86885-00	STRIPES
12	14	3-00126-02	FOOT PAD
1	15	599-0048-0	GREASE-TEFLON
1	16	469-0668-0	WRENCH, ALLEN 3/16" T x 6" LG.
1	17	265-1005	DIAM. COOLANT 1 lb.
3	18	462-0587-1	DRESS. BOARD 7 x 2
1	19	462-0588-0	DRESS. BOARD 8 x 6
8	20	3-86589-00	ANCHOR BRACKET
1	21	299-0280-1	PAINT, MACHINE ENAMEL

<b>OPTIONS</b>			
<b>EXTENSION RACK (F93)</b>			
1	35	3-99395-00	VERT. GLASS SUPPORT
	36		
	37		
<b>3/50/380V CE</b>			
1	49	3-99325-00	PUMP & TANK ASSEMBLY 3/50/380V

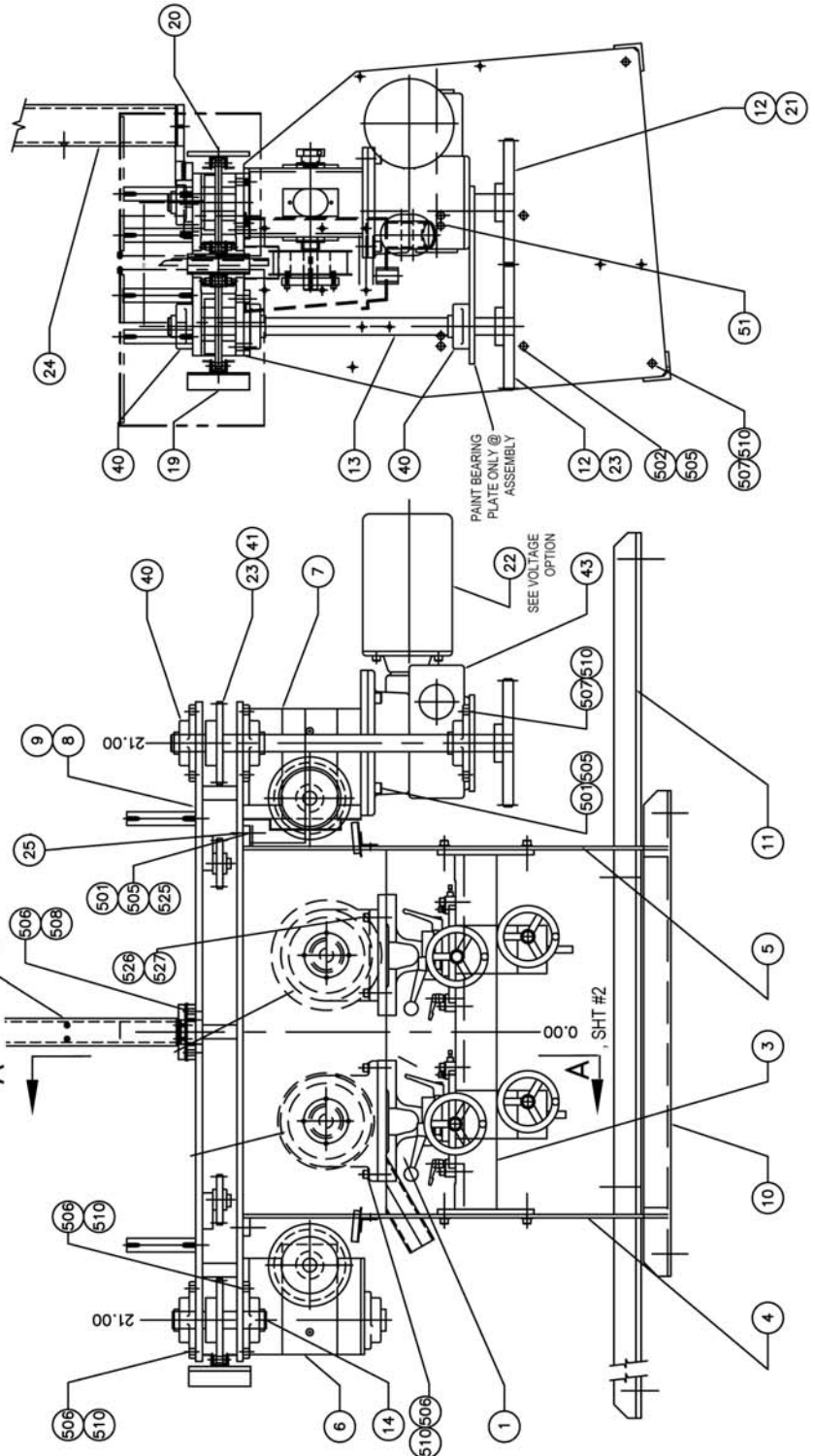
<b>ELECTRICAL SYS 3/50/380V CE</b>			
1	86	3-99437-00	CONSOLE, ASSEM CE
1	87	3-99434-00	PANEL, ELECTRICAL CE
1	88	3-99439-00	MACH MTD ELECTR COMP
1	89	3-90500-01	SPINDLE MOTOR ASS'Y
1	90	3-99442-00	POLISH MOTOR 3HP, 3600 RPM



# CRL Two Spindle Glass Edger MODEL VE2PLUS2

## 6.2 MECHANICAL PARTS DRAWINGS

3-95139-00	52	TROUGH FLAP	2
452-0623-0	51	PIN, #1/2 x 1 LG DOWEL	4
3-88567-00	50	LABEL, INDEX	2
452-2998-1	48	RETAINING RING	1
3-91233-00	47	SLINGER, POLISH	1
3-95110-01	43	GEARBOX, 300:1, 1-1/4" BORE	1
430-0433-1	41	SPROCKET 60824,1.25B,1/4KWY	4
441-0808-0	40	BEARING, 2-BOLT, 1-1/4" BORE	7
3-88570-00	39	SLINGER	1
3-87599-00	38	HUB, POLISH WHEEL	1
3-84303-02	37	HUB, GRIND WHEEL	1
3-95919-00	36	COVER SUPPORT	2
3-95918-00	35	PROTECTING COVER	1
3-95917-01	34	DRIP TROUGH	1
3-88558-00	33	SPACER	2
3-99141-00	32	WINDOW ASS'Y	1
3-88954-00	31	RUBBER WIPER	2
3-88953-00	30	WIPER PLATE	2
3-88952-00	29	END BRUSH SHIELD	2
3-95917-00	28	DRIP TROUGH	1
3-95990-00	27	COOLANT PAN ASSY	1
461-0436-4	26	CLAMP HANDLE	2
452-0242-1	25	ROLL PIN 3/8 X 1 1/4 LG.	4
3-99319-00	24	SUP'T RACK-CENTER	1
3-79287-04	23	KEY 1/4 x 1 1/2 LG	5
3-79286-03	22	KEY 3/16 x 1 1/4 LG	1
3-79287-24	21	KEY 1/4 x 6 LG	1
3-95274-00	20	REAR CHAIN ASSY	1
3-95275-02	19	FRONT CHAIN ASSY	1
3-88555-00	18	SPINDLE BASE CLAMP GIBB SIDE	2
3-88568-00	17	GIBB	2
3-88556-00	16	SPINDLE BASE CLAMP	2
3-88646-00	14	INF IDLER SHAFT-FRONT	1
3-88645-01	13	DRIVE SHAFT-FRONT	1
3-87116-00	12	GEAR	2
3-88971-02	11	REAR STABILIZER	1
3-88971-01	10	FRONT STABILIZER	1
3-95276-02	9	REAR TUBE ASSY	1
3-95914-01	8	FRONT TUBE ASSY	1
3-95273-01	7	DISCH DRIVE HOUSING ASSY	1
3-95272-00	6	INF DRIVE HOUSING ASSY	1
3-95909-02	5	SIDE BAR -DISCHARGE	1
3-95909-01	4	SIDE BAR -INFED	1
3-88625-00	3	SPINDLE SUPPORT	1
3-95284-00	2	HORIZONTAL ADJUSTMENT ASSY	2
3-97617-01	1	SPINDLE LIFTING ASSY	2
STOCK NO.	ITEM	MATERIAL	REQ

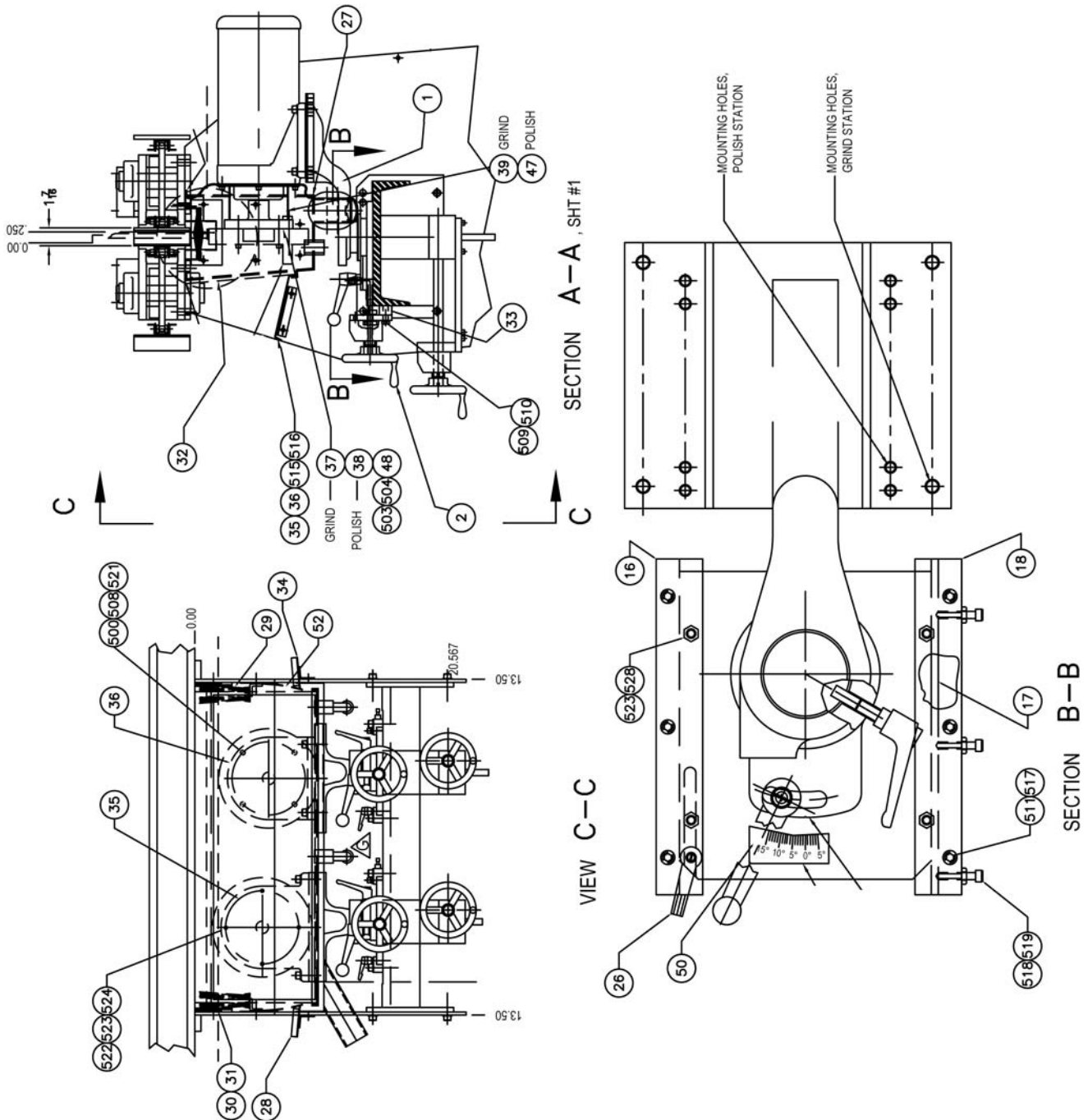




# CRL Two Spindle Glass Edger MODEL VE2PLUS2

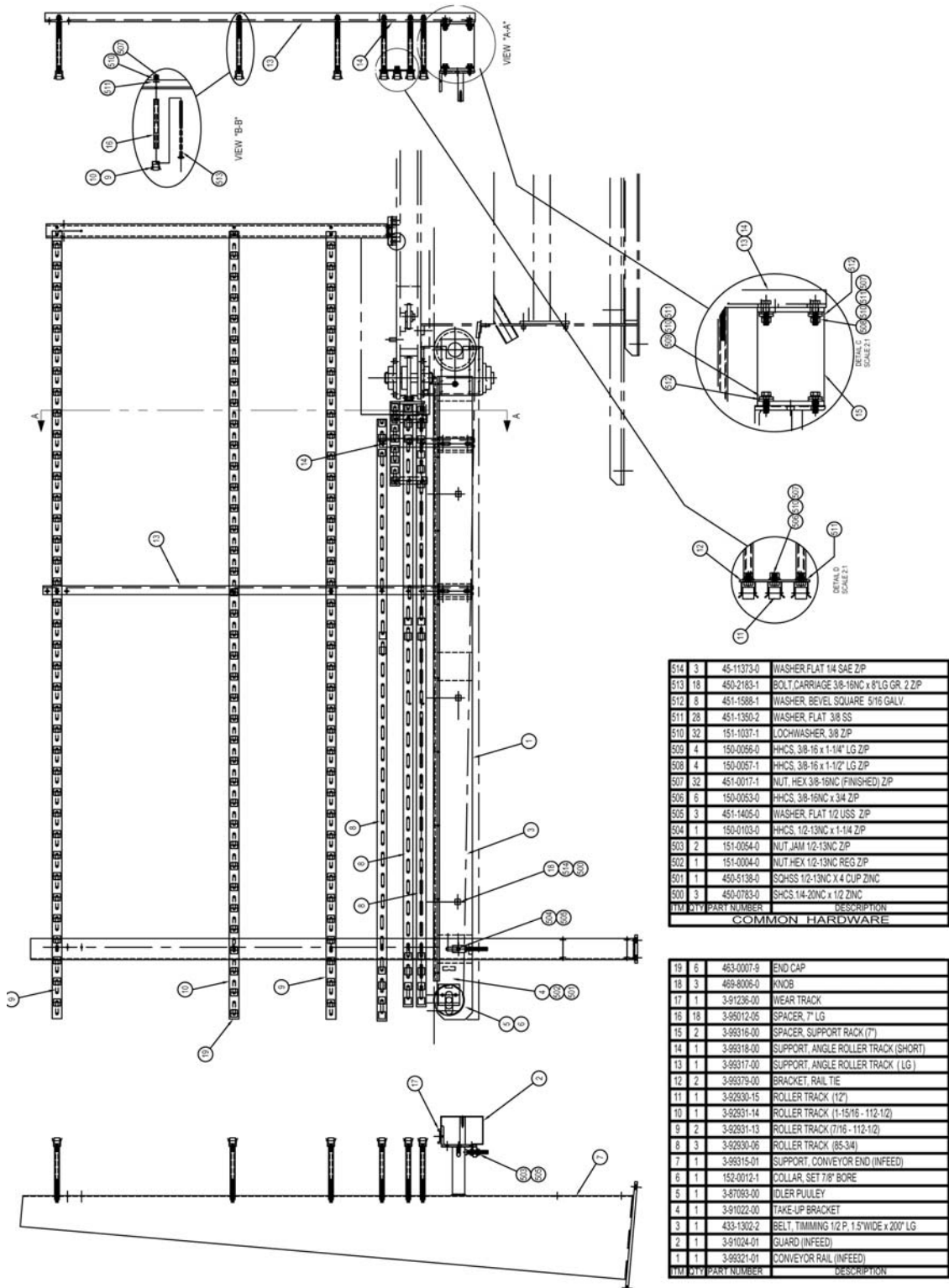
## 6.2 MECHANICAL PARTS DRAWINGS

Refer to list on previous page for part numbers



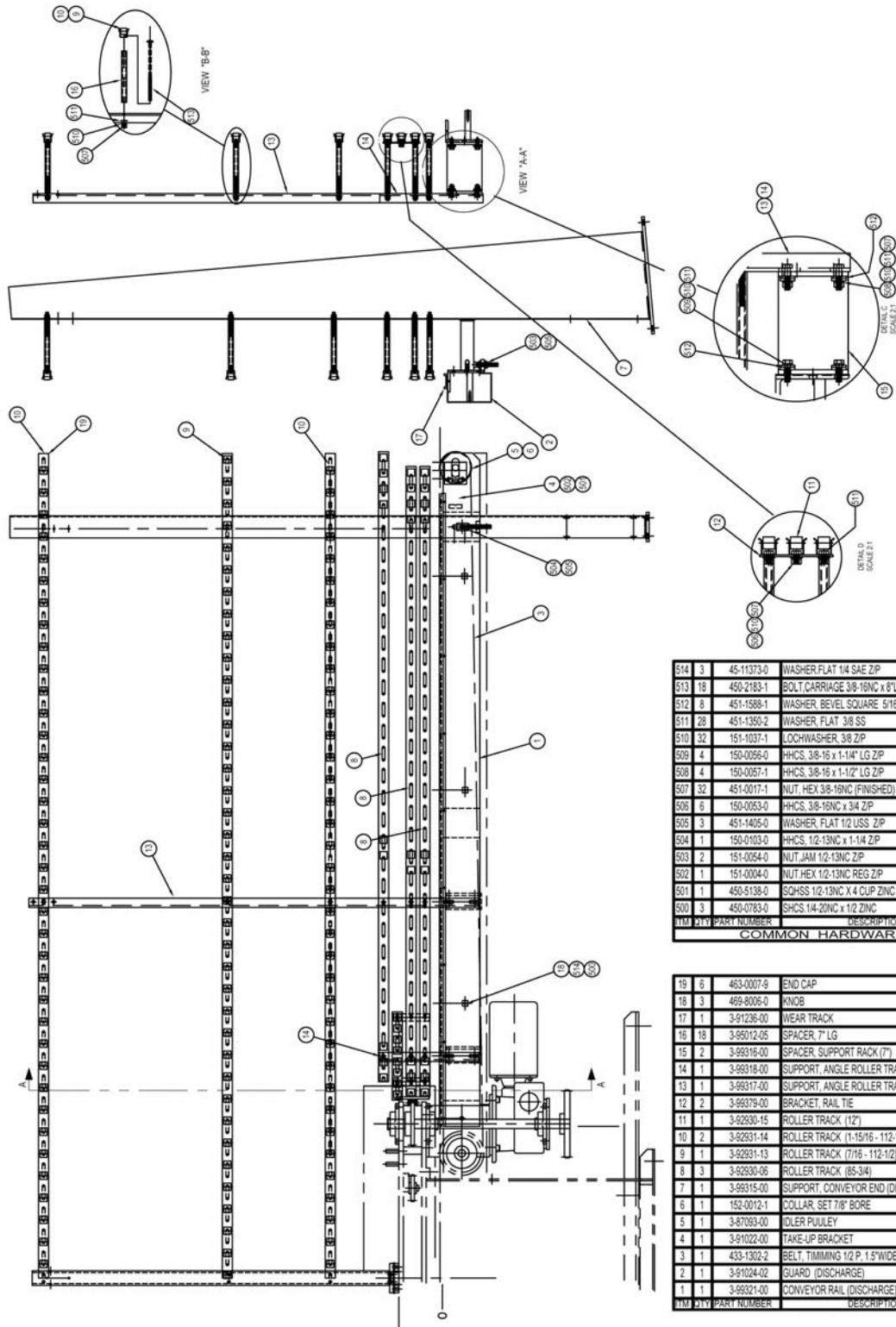
# CRL Two Spindle Glass Edger MODEL VE2PLUS2

## 6.2 MECHANICAL PARTS DRAWINGS - INGOING SIDE



# CRL Two Spindle Glass Edger MODEL VE2PLUS2

## 6.2 MECHANICAL PARTS DRAWINGS - OUTGOING SIDE



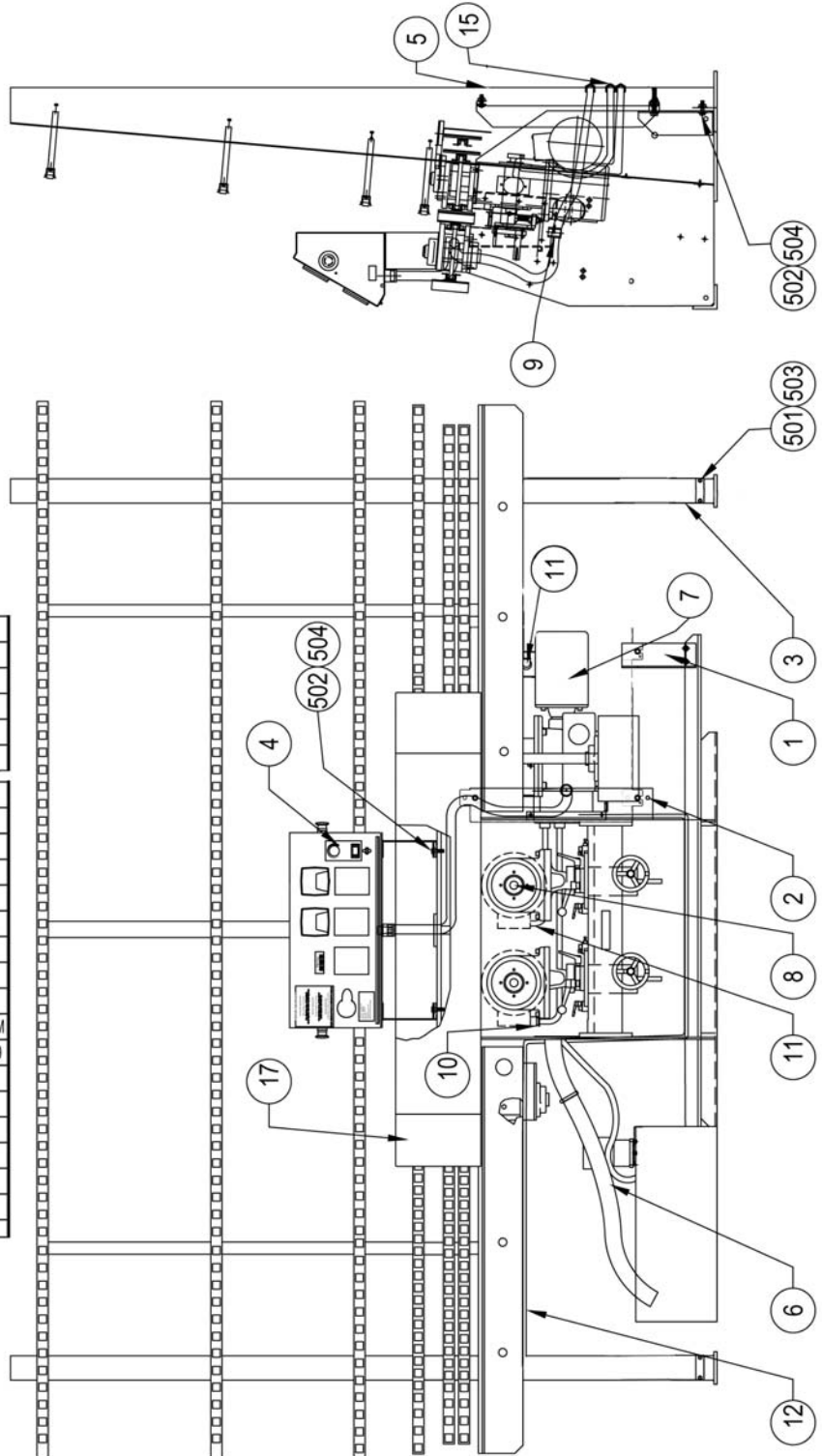
514	3	45-11373-0	WASHER FLAT 1/4 SAE Z/P
513	18	450-2183-1	BOLT CARRIAGE 3/8-16NC x 8' LG GR. 2 Z/P
512	8	451-1589-1	WASHER BEVEL SQUARE, 5/16 GALV.
511	28	451-1350-2	WASHER FLAT 3/8 SS
510	32	151-1037-1	LOCHWASHER, 3/8 Z/P
509	4	150-0056-0	HHCS, 3/8-16 x 1-1/4" LG Z/P
508	4	150-0057-1	HHCS, 3/8-16 x 1-1/2" LG Z/P
507	32	451-0017-1	NUT, HEX 3/8-16NC (FINISHED) Z/P
505	6	150-0053-0	HHCS, 3/8-16NC x 3/4 Z/P
505	3	451-1405-0	WASHER FLAT 1/2 USS Z/P
504	1	150-0103-0	HHCS, 1/2-13NC x 1-1/4 Z/P
503	2	151-0054-0	NUT JAM 1/2-13NC Z/P
502	1	151-0004-0	NUT HEX 1/2-13NC REG Z/P
501	1	450-5138-0	SQSHS 1/2-13NC X 4 CUP ZINC
500	3	450-0783-0	SHCS, 1/4-20NC x 1/2 ZINC
ITEM		PART NUMBER	DESCRIPTION
COMMON HARDWARE			

19	6	463-0007-9	END CAP
18	3	469-8005-0	KNOB
17	1	3-91236-00	WEAR TRACK
16	18	3-95012-05	SPACER, 7" LG
15	2	3-99316-00	SPACER, SUPPORT RACK (7")
14	1	3-99318-00	SUPPORT, ANGLE ROLLER TRACK (SHORT)
13	1	3-99317-00	SUPPORT, ANGLE ROLLER TRACK (LG)
12	2	3-99379-00	BRACKET, RAIL TIE
11	1	3-92930-15	ROLLER TRACK (12")
10	2	3-92931-14	ROLLER TRACK (1-15/16 - 112-1/2)
9	1	3-92931-13	ROLLER TRACK (7/16 - 112-1/2)
8	3	3-92930-06	ROLLER TRACK (85-3/4)
7	1	3-99315-00	SUPPORT, CONVEYOR END (DISCHARGE)
6	1	152-0012-1	COLLAR, SET 7/8" BORE
5	1	3-87093-00	IDLER PULLEY
4	1	3-91022-00	TAKE-UP BRACKET
3	1	433-1302-2	BELT, TIMMING 1/2 P, 1.5"WIDE x 200' LG
2	1	3-91024-02	GUARD (DISCHARGE)
1	1	3-99321-00	CONVEYOR RAIL (DISCHARGE)
ITEM		PART NUMBER	DESCRIPTION

# CRL Two Spindle Glass Edger MODEL VE2PLUS2

## 7.0 ELECTRICAL PARTS DRAWINGS - MAIN

506	5	15100540	NUT, JAM, 1/2-13, Z/P
505	1	45073140	HHCS, 1/2-13 x 3.00, FULLY THREADED, Z/P
504	9	15000561	HHCS, 3/8-16 x 1.00, Z/P
503	8	45000121	HHCS, 10-24 x .50, Z/P
502	15	45113671	WASHER, FLAT, 1/2 SAE, Z/P
501	8	45115952	WASHER, FLAT, #10, SS
17	52'	23402670	COPPER CONDUCTOR #14AWG BLACK
16	20'	23402691	COPPER CONDUCTOR #14AWG GRN/YEL
14	20	41425040	CABLE TIE, 0.187" WIDE x 11.6" LG
13	1	39943700	CONSOLE, OPERATOR ASSM. EU2PLUS2
12	35'	23600590	CONDUIT, LIQUID TIGHT, 3/8" PVC, BLACK
11	3	41401120	CONNECTOR, 90D, 3/8", BLACK NYLON
10	9	41400550	CONNECTOR, STRAIGHT, 3/8", BLACK NYLON
9	1	2360068	MOUNTING CLIP, 3/4 LIQUID TIGHT
8	1	39944200	3 HP MTR 3PH 208-230/460VAC, 145TECF, 3490RPM
7	1	41013510	MOT.AC 1HP 1750RPM 56C FR 3/60Hz/208-230/460
6	1	39932500	ASSEMBLY TANK & PUMP
5	1	39943400	PANEL, ELECTRICAL EU2PLUS2
4	1	39943700	CONSOLE, OPERATOR ASSM. EU2PLUS2
2	1	39933300	SUPPORT, ENCLOSURE
1	1	39932300	BRACE, ENCLOSURE
ITM	QTY	PART NUMBER	DESCRIPTION

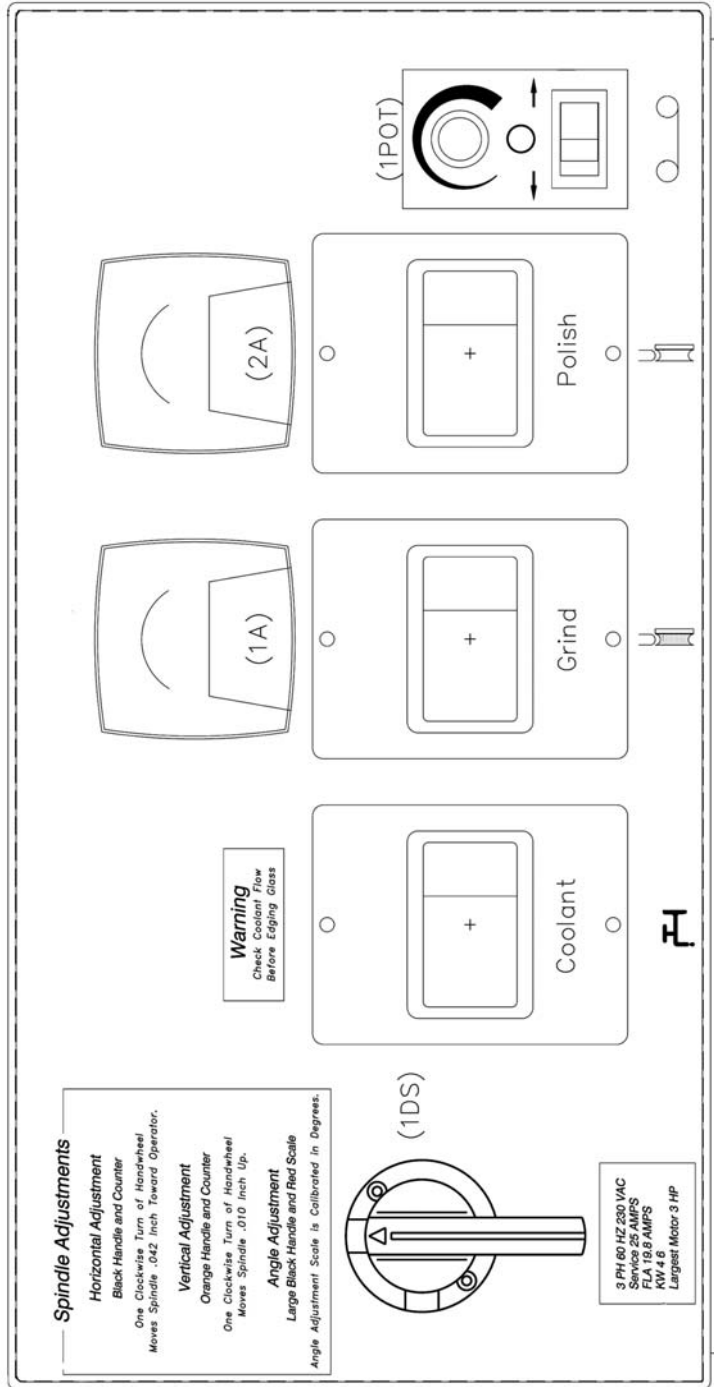




# CRL Two Spindle Glass Edger MODEL VE2PLUS2

## 7.0 OPERATOR CONTROL STATION DETAILS

ELEC SYM	STOCK NO.	ITEM	MATERIAL	REQ
	39713000	39	Panel Internal Labeling	Ref
P4	41437643	38	Conn Plug 4 Circuit 11A 600V	1
P4	41437641	37	Conn Acc Pin 11A 14-20Ga Male	4
	41425020	36	CABLE TIE T&B #TY524M	8
	23600611	35	LIQUID TIGHT CONDUIT 3/4"	5ft
	41400560	34	CONN STR 3/4"LT BLK NYLON	2
1C	41611010	33	CAPACITOR, 1.0uFD 250V NON-POL	1
	41437640	32	Conn Acc Pin 11A 14-20Ga Fem	50
P4	41437642	31	Conn Recept 4 Circuit 11A 600V	1
P1-3	41437644	30	Conn Recept 15 Circuit 11A 600V	3
1-2A	41206316	29	AC AMMETER 0-10 RANGE UL RATED	2
	39713200	28	GRAPHIC OVERLAY VE-2+2	1
1POT	41561850	27	KNOB AND DIAL PLATE	1
1RS	41420230	26	SWITCH,ROCKER SPDT	1
1DS	41129511	25	HANDLE PISTOL SHORT 2.4"	1
	41430101	24	CABLE TIE MOUNTS	5
	41426000	23	CABLE MTG CLAMP TB#13-200	5
	41425000	22	CABLE TIE TB#TY523M	15
40L	41535440	21	OVERLOAD HEATER #W44	1
40L	41528000	20	RELAY OVLD 40A 1-POLE EUT ALLY	1
	41423430	19	TERM QD 16-14GA 1/4FEM NONIN	7
1SC	41561000	18	CONT. DC MTR REGEN 115/230VAC	1
6-7FU	11130570	17	FUSE,CLASS RK5 9A 250V	2
	11136520	16	DUCT COVER WRING 1"W	20
	11135100	15	WIRING DUCT PANDUIT#E1X2LG6	0.3
1ET	41219150	14	TIMER,TOTALIZING 1-HR BATT PWR	1
1CR	41216389	13	SOCKET,RELAY 14-PIN DIN MTG	1
1CR	41216386	12	RELAY GP ELEX 4PDT 230VAC	1
CT1-2	41206322	11	XFRM CURRENT 500:50 RATIO 600V	2
4-7FU	41130032	10	FUSE HOLDER 2-POLE CLASS RK5	2
1-2PB	41239020	9	22MM PUSHLOCK TURN RESET	2
4-5FU	11130350	8	FUSE,CLASS RK5 1/2A 250V	2
1-3FU	41130051	7	FUSE HOLDER CLASS RK5 3-POLE	1
1-3FU	11130630	6	FUSE,CLASS RK5 25A 250V TD	3
	41424001	5	TERM LUG 14-6GA 1/4 STD NONIN	1
1DS	41129353	4	SHAFT EXT FOR DISC SW .2"SQ	1
1DS	41129032	3	SW DISC 60A 600V 3-POLE NOFUSE	1
	38786700	2	SUBPANEL	1
1E	39713100	1	ELECTRICAL ENCLOSURE DETAIL	1

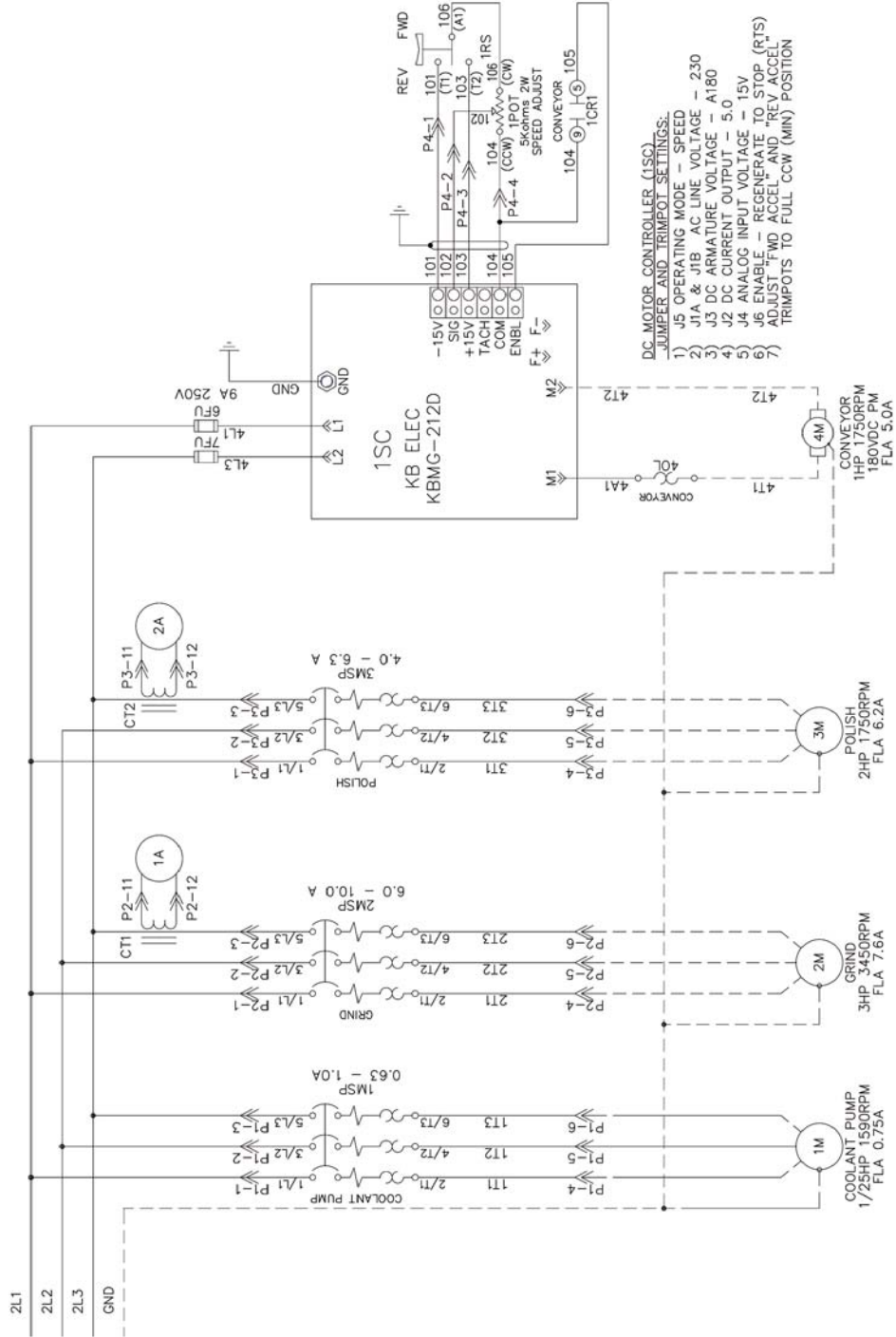
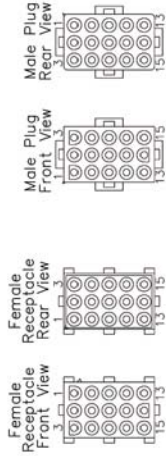




# CRL Two Spindle Glass Edger MODEL VE2PLUS2

## 7.1 WIRING SCHEMATICS

Connector Pin LO



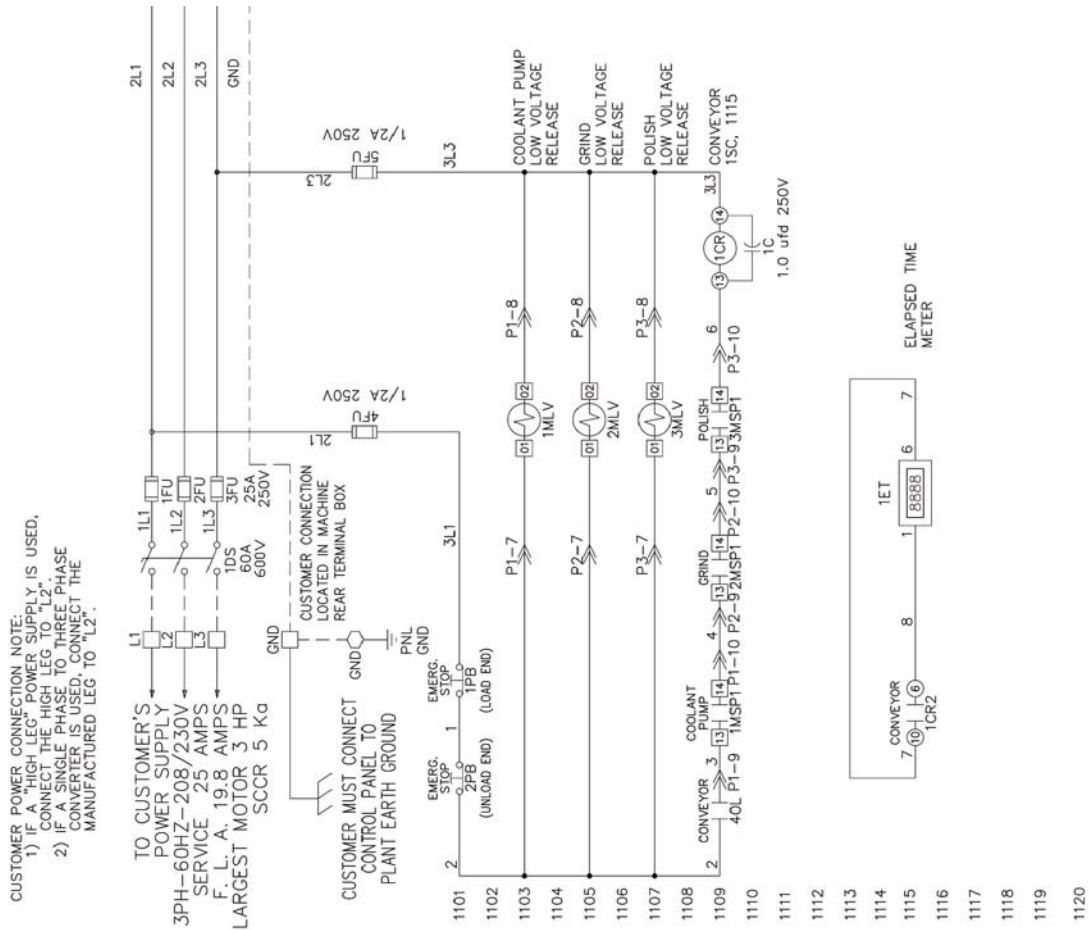
- DC MOTOR CONTROLLER (1SC) JUMPER AND TRIMPOT SETTINGS:
- 1) J5 OPERATING MODE - SPEED
  - 2) J1A & J1B AC LINE VOLTAGE - 230
  - 3) J3 DC ARMATURE VOLTAGE - A180
  - 4) J2 DC CURRENT OUTPUT - 5.0
  - 5) J4 ANALOG INPUT VOLTAGE - 15V
  - 6) J6 ENABLE - REGENERATE TO STOP (RTS)
  - 7) ADJUST "FWD ACCEL" AND "REV ACCEL" TRIMPOTS TO FULL CCW (MIN) POSITION

Continues on next page

# CRL Two Spindle Glass Edger MODEL VE2PLUS2

## 7.1 WIRING WIRING SCHEMATICS

Continued from page 32



# CRL Two Spindle Glass Edger MODEL VE2PLUS2

## 8.0 TROUBLESHOOTING

### 8.1 Troubleshooting Chart

PROBLEM	SOLUTIONS
Motor ammeters read over 5 amperes or higher than normal	<ol style="list-style-type: none"><li>1. Dress the wheels</li><li>2. Re-true the diamond wheel</li><li>3. Slow down the conveyor speed</li><li>4. Tighten the conveyor with the takeup and lubricate the chain</li><li>5. Check the position of the coolant lines</li></ol>
Glass rides up in the main section conveyor	<ol style="list-style-type: none"><li>1. Dress the wheels</li><li>2. Check the infeed and outfeed conveyors for level</li><li>3. Check outfeed conveyor for glass interference</li><li>4. Check conveyor pads for damage due to overcompression or unevenness</li><li>5. Reduce the conveyor speed</li><li>6. Check the racks or rollers for glass interference</li><li>7. Check infeed sprocket alignment with the tracks</li></ol>
Choppy edge	<ol style="list-style-type: none"><li>1. Check the outfeed conveyor for glass interference</li><li>2. Re-dress diamond wheel and polishing wheel</li><li>3. Slow down the conveyor</li><li>4. Re-true diamond wheel</li><li>5. Check the tightness of the motor mount and adjustment locking screws</li><li>6. Check the coolant lines</li></ol>
Chipped edge or starred edge	<ol style="list-style-type: none"><li>1. Is the wheel profile suitable for the glass thickness? Try a different profile</li><li>2. Make sure the wheel is not turned too far so the steel body is contacting the glass</li><li>3. Is the wheel worn out? Try a new or retrued wheel</li><li>4. Try a finer grit diamond wheel</li><li>5. Slow down the conveyor speed</li></ol>
Glass drops in conveyor	<ol style="list-style-type: none"><li>1. Check the infeed and outfeed conveyor levels</li><li>2. Check outfeed conveyor for glass interference</li><li>3. Check conveyor pads for damage</li><li>4. Are all of the rubber pads in place?</li></ol>
Motor ammeters change substantially on long pieces of glass	<ol style="list-style-type: none"><li>1. Level the infeed and outfeed conveyors</li><li>2. Dress the wheels</li><li>3. Check the outfeed conveyor for glass interference</li><li>4. Check the coolant line positioning</li><li>5. Is the cut glass straight or are there large flares?</li></ol>

### General Problem Solving

In general, most problems will be minimized if the coolant is clean and flowing correctly and you are not trying to remove too much glass in one pass. Check this first. The next course of action is to dress the diamond wheel with a stone. Follow the procedures outlined on page 21. If a diamond wheel is worn out, there will be places in the diamond groove that have gone down to steel. A wheel in this condition is unserviceable. It must be replaced. If a polish wheel is burned or glazed from too much pressure, it can be cut down and redressed leaving fresh polishing surface and requiring a new profile groove to be cut in.

Other problems will usually be solved by keeping the machine and infeed and outfeed rollers level. See page 8.

Making sure all bolts and fasteners are tight will go a long way toward keeping the machine running smoothly.

**If you have a problem that can't be solved by following these tips, you can talk directly to a service technician by calling (866) 583-1377 or for international calls: (773) 242-2871.**



## Methods of Ordering

### Online at [crlaurence.co.uk](http://crlaurence.co.uk) or [crlaurence.de](http://crlaurence.de)

Many of our customers have found the most convenient method of ordering from CRL is through our full service web site. When you use [crlaurence.co.uk](http://crlaurence.co.uk) or [crlaurence.de](http://crlaurence.de) to place your orders you have so many options that other methods don't provide. You set the schedule and the pace because you can log on 24 hours a day, seven days a week. You can build a personal catalog; even make changes or additions to your orders online. There's no easier way!



## Freefax / Kostenlose Faxnummer

When we introduced toll free fax service in the '80's we had no idea how popular it would become, but now our customers send us up to 1,000 orders or quote requests every business day! Fax ordering is very convenient because you can fill out your own purchase orders and then just fax them to us. You can be specific about shipping instructions or other details that will help us serve you. **To send your orders or quote requests by Freefax from anywhere in EUROPE: 00 800 0262 3299**



## Freephone Customer Service Order Desk

For over 30 years CRL has provided toll free ordering. When you call our Customer Service Order Desk you'll find CRL people who are trained to provide assistance with CRL products and services. They have instant access to pricing, stock availability, and the status of your account, plus they can connect you to CRL Technical Sales personnel if you need specialized product assistance.

**C.R. Laurence Europe UK / DE Freephone: 00 800 0421 6144**



## Will Call/Trade Counter

Every CRL regional warehouse has a Will Call/Trade Counter where you can place and pick up your orders in person. And when you place your order in advance by phone, fax, or over the Internet we can have it ready and waiting for you, which can save you a lot of time. Will Call/Trade Counter hours are 8 am to 5 pm Monday through Friday. Some of our most experienced people staff our Will Call/Trade Counters, and they are always happy to see you. Remember, to save time place your order in advance.

## Who May Buy

C.R. Laurence is a manufacturer and wholesale distributor. Possession of our catalogs, or any other CRL sales literature, does not constitute an offer to sell. Orders from individuals (except professional tradesmen) may not be accepted.

# CRL Two Spindle Glass Edger MODEL VE2PLUS2

## TERMS AND CONDITIONS

### MACHINERY WARRANTY STATEMENT

C.R. LAURENCE CO., INC. ("SELLER") WARRANTS PRODUCTS OF ITS MANUFACTURE TO BE FREE FROM DEFECTS IN MATERIALS OR WORKMANSHIP IN NORMAL USE FOR (12) MONTHS FROM THE DATE OF SHIPMENT (UNLESS A SHORTER PERIOD IS PROVIDED ELSEWHERE IN THIS DOCUMENT). SELLER'S OBLIGATION AND BUYER'S EXCLUSIVE REMEDY SHALL BE LIMITED TO REPAIR OR REPLACEMENT, AT SELLER'S SOLE OPTION, OF DEFECTIVE PARTS WITHIN THE WARRANTY PERIOD, PROVIDED BUYER GIVES SELLER IMMEDIATE WRITTEN NOTICE OF SUCH ALLEGED DEFECTS, AND, IF REQUESTED BY SELLER, RETURNS THE DEFECTIVE PARTS TO SELLER'S FACTORY PREPAID BY BUYER FOR SELLER'S INSPECTION. THE WARRANTIES CONTAINED HEREIN ARE IN LIEU OF ANY OTHER WARRANTY, EXPRESSED OR IMPLIED, INCLUDING ANY WARRANTY OF MERCHANTABILITY OR FITNESS FOR PURPOSE. SELLER SHALL IN NO EVENT BE LIABLE FOR CONSEQUENTIAL DAMAGES. WARRANTIES HEREUNDER SHALL NOT APPLY TO ANY EQUIPMENT THAT HAS BEEN DAMAGED BY MISUSE, NEGLIGENCE, ACCIDENT, OR FAILURE TO PERFORM MAINTENANCE. THIS WARRANTY SHALL BE NULL AND VOID (1) IF THE MACHINE IS USED IN A MANNER CONTRARY TO INSTRUCTIONS OR AFTER MALFUNCTION IS NOTICED; (2) IF THE BUYER DOES NOT HONOR TERMS OF PAYMENT; (3) IF THE MACHINE IS MODIFIED OR ALTERED.

### EQUIPMENT RESOLD BY SELLER

IN THE CASE OF EQUIPMENT FURNISHED BY SELLER BUT NOT OF SELLER'S MANUFACTURE, SELLER'S LIABILITY TO BUYER HEREUNDER IS LIMITED TO SUCH WARRANTY AS THE MANUFACTURER MAKES TO SELLER, BUT IN NO CASE GREATER THAN (12) MONTHS FROM DATE OF SHIPMENT BY SELLER.

### LIMITATION OF LIABILITY

SELLER'S SOLE REMEDY SHALL BE REPAIR OR REPLACEMENT OF DEFECTIVE PRODUCT. IN NO EVENT SHALL SELLER BE LIABLE FOR ANY OTHER REMEDY (INCLUDING, BUT NOT LIMITED TO, INCIDENTAL OR CONSEQUENTIAL DAMAGES FOR LOST PROFITS, LOST SALES, INJURY TO PERSONS OR PROPERTY OR ANY OTHER INCIDENTAL OR CONSEQUENTIAL LOSS) OR PUNITIVE DAMAGES.

### DISPUTE RESOLUTION

ANY DISPUTE BETWEEN THE CUSTOMER AND SELLER SHALL BE SETTLED BY ARBITRATION BETWEEN THE PARTIES, UNDER THE RULES OF THE AMERICAN ARBITRATION ASSOCIATION, CHICAGO, IL. SUCH ARBITRATION SHALL TAKE PLACE IN CHICAGO, IL, USA WITHIN 90 DAYS AFTER A REQUEST FOR ARBITRATION HAS BEEN FILED BY ONE OF THE PARTIES. BOTH PARTIES IRREVOCABLY CONSENT TO JURISDICTION IN COOK COUNTY, ILLINOIS.

### LAW

ALL CONTRACT AND OTHER CLAIMS (WHETHER BASED ON CONTRACT, TORT, EQUITY, TREATY, OR CODE) WITH RESPECT TO THE PRODUCTS SOLD AND ALL CLAIMS WITH RESPECT TO THE OPERATION AND USE OF THE PRODUCTS SHALL BE GOVERNED BY, AND CONSTRUED IN ACCORDANCE WITH THE LAWS OF THE STATE OF ILLINOIS, USA. THE SALES CONTRACT SHALL NOT BE GOVERNED BY THE UNITED NATIONS CONVENTION ON CONTRACTS FOR THE INTERNATIONAL SALES OF GOODS.

### INVALIDITY OF PROVISIONS

IF ANY PROVISIONS OF THESE TERMS AND CONDITIONS ARE HELD TO BE INVALID, ILLEGAL OR UNENFORCEABLE, THE REMAINING PROVISIONS OF THESE TERMS AND CONDITIONS SHALL NOT IN ANY WAY BE AFFECTED OR IMPAIRED THEREBY.

## C.R. Laurence Co., Inc.

Glass Machinery Division  
5501 West Ogden Avenue, Cicero, IL 60804, U.S.A.

### Important Information

Date of Delivery \_\_\_\_\_

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

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

Date of Manufacture \_\_\_\_\_

Model Number  
Serial Number  
Date of Manufacture



It is important to have all of the information from the Machine Identification Plate if you need to email or call for parts or service advice. Record the numbers from your machine in the space above.

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C. R. Laurence Co., Inc. • 2503 E. Vernon Ave., Los Angeles, California USA 90058 (323) 588-1281  
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