RAZORGAGE

TECHNICAL SERVICES, INC.

Operation
And
Maintenance
Manual
For Motor Driven
RazorGages

Mounting the RazorGage

Typical RazorGage Cell Assembly

The RazorGage is mounted via the four holes on each end of the front vertical face of the unit. The RazorGage is shipped with screws and weld nuts pre-installed. These are useful for mounting to the RazorGage Leg Assembly or Saw Table or for mounting to many of the slotted aluminum extrusions available at industrial supply vendors. Do not use socket head cap screws in place of button head cap screws provided, as the higher head profile will interfere with the internal workings of the RazorGage. If you are not using the standard RazorGage assemblies for mounting, custom brackets may need to be fabricated. Contact Technical Services, Inc. at (515) 232-3188 for help with these issues.

Use a t-handle ball end Allen wrench to reach thru the dust seal and loosen the button head cap screws that secure the weld nuts.
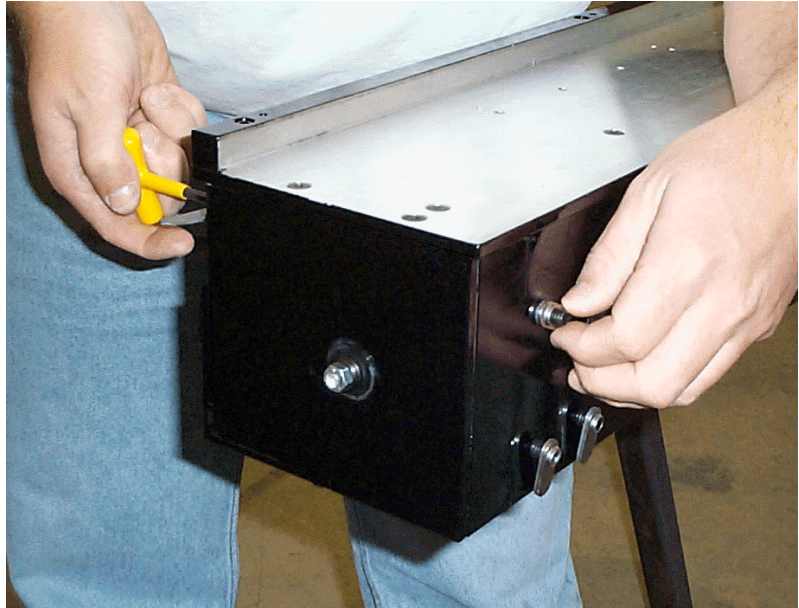
Loosen until there is the maximum gap between the nut and the front mounting surface but not so loose that the nuts might fall off.

Remove the plastic cap from the mounting leg of the Leg Assembly. This is accomplished simply by pressing against the underside of the cap through one of the extruded slots.
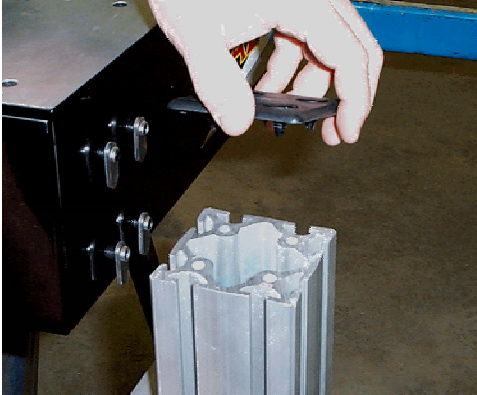
Rest the RazorGage on sawhorses while you engage the weld nuts with the extruded slots.


Use the T-Handle ball driver through the back seal to snug up the mounting screws. Finish leveling and alignment before tightening these screws fully.
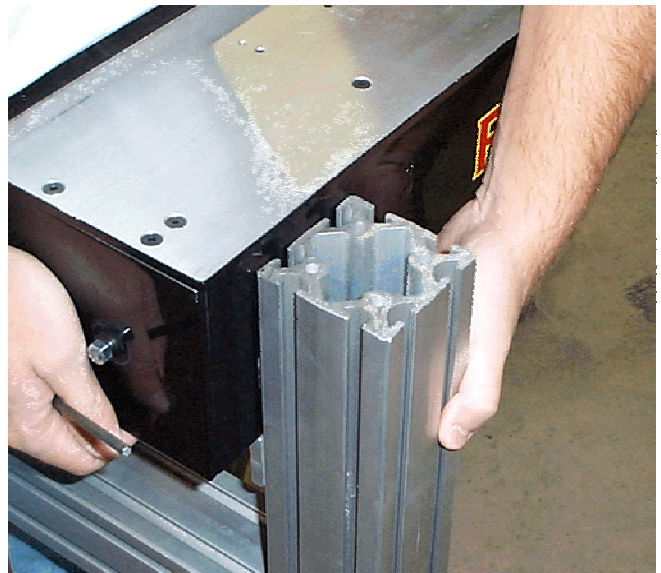
Leveling & Alignment

Alignment is very important to obtaining excellent results in your application. The table and fence surfaces of the RazorGage should share the planes created by the table and fence on your saw.
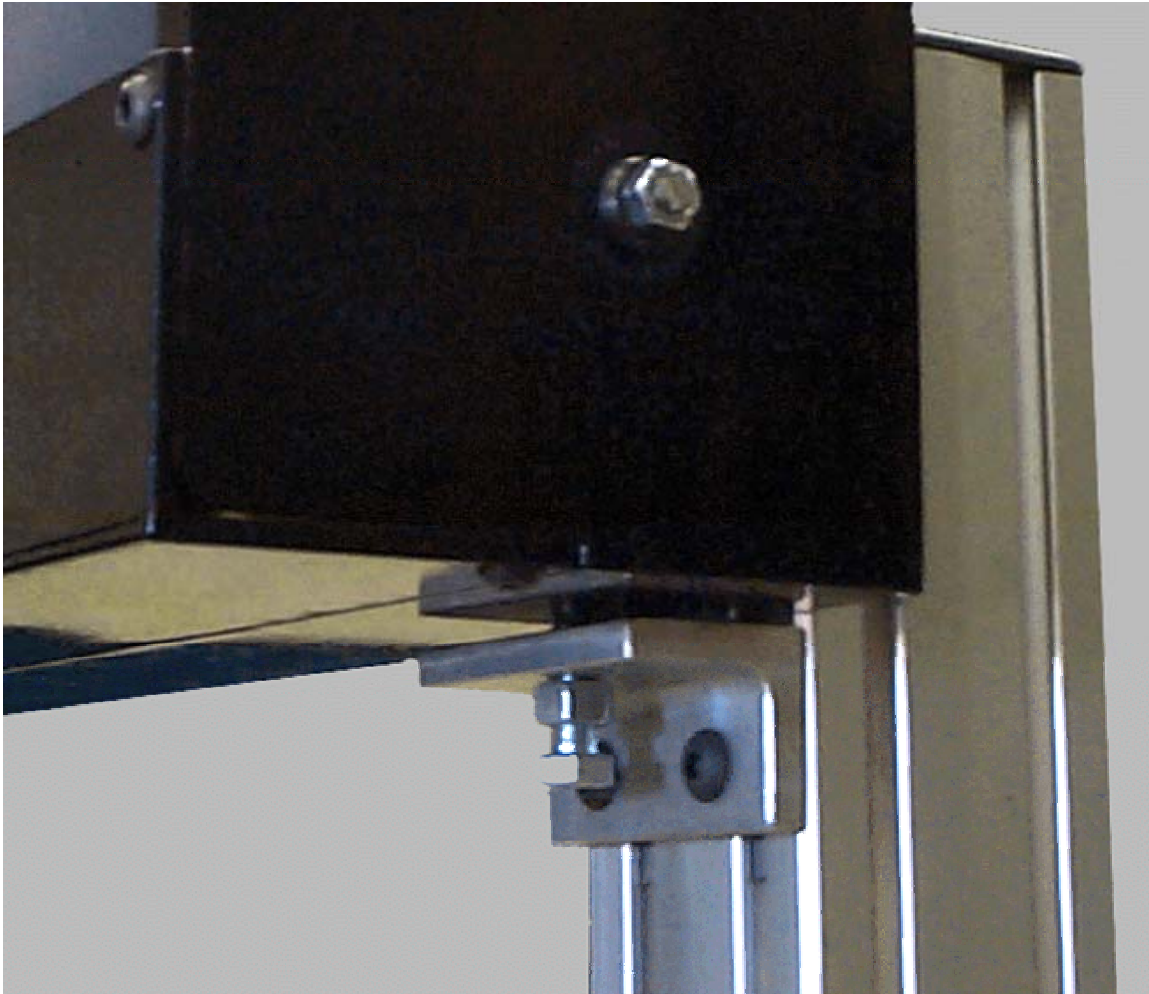
Use the longest straight edge available to you and position the RazorGage to attempt to achieve this condition. A string or line level can also be helpful in aligning and leveling. Use the jackscrews provided on the Standard Leg Assembly to align the tabletop with the table of your saw. Use the slots in the floor-mounting angle of the Standard Leg Assembly to align the fence with the fence on your saw.

Mounting the Electrical Enclosure

You may mount the RazorGage Electrical Enclosure anywhere within reach of the cable assembly that exits from the flexible cable track on the back of the unit. If you are using one of the RazorGage Table Assemblies or the Enclosure Leg Assembly the following procedures apply.

The enclosure mounts to the tall leg post by inserting two 5/16" x 5/8" long button head cap screws through the upper and lower mounting holes on either the left or right side. Determine which pair of holes you want to use and knock out the plastic plugs. Hang the screw on your T-Handle allen wrench to insert it through the hole in the back of the enclosure. Thread a weld nut onto the screw to keep it in place. Again, only thread the nut on enough to keep it from falling off. Repeat for the other hole. Remove the plastic cap from the leg post and slide the enclosure into the t-slots. Position the enclosure so that the display is at the desired height and tighten the screws.
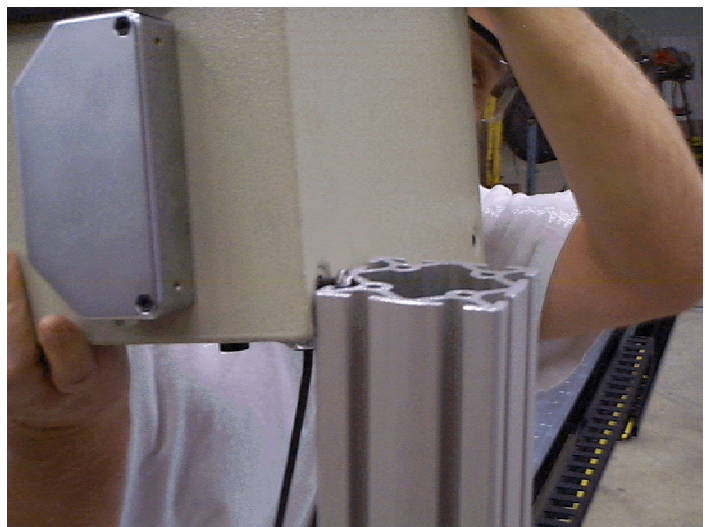
Connecting 120 VAC Power

The bottom of the RazorGage Operator Station has a 7/8" diameter hole through which 110 VAC power can be introduced. Use a 1/2" cord grip or conduit fitting. Terminate your power to the left side of the terminal strip located along the lower part of the panel. The first three terminal blocks from the left are for ground, terminals 4 thru 7 are for neutral, and the tall terminal block is the fuse terminal block for the hot wire. Terminals 9 thru 12 are supplied with 120 VAC from the Master Control Relay (MCR) and can be used to power auxiliary devices that need to be killed with the E-Stop circuit. See the Electrical Schematic for more details.
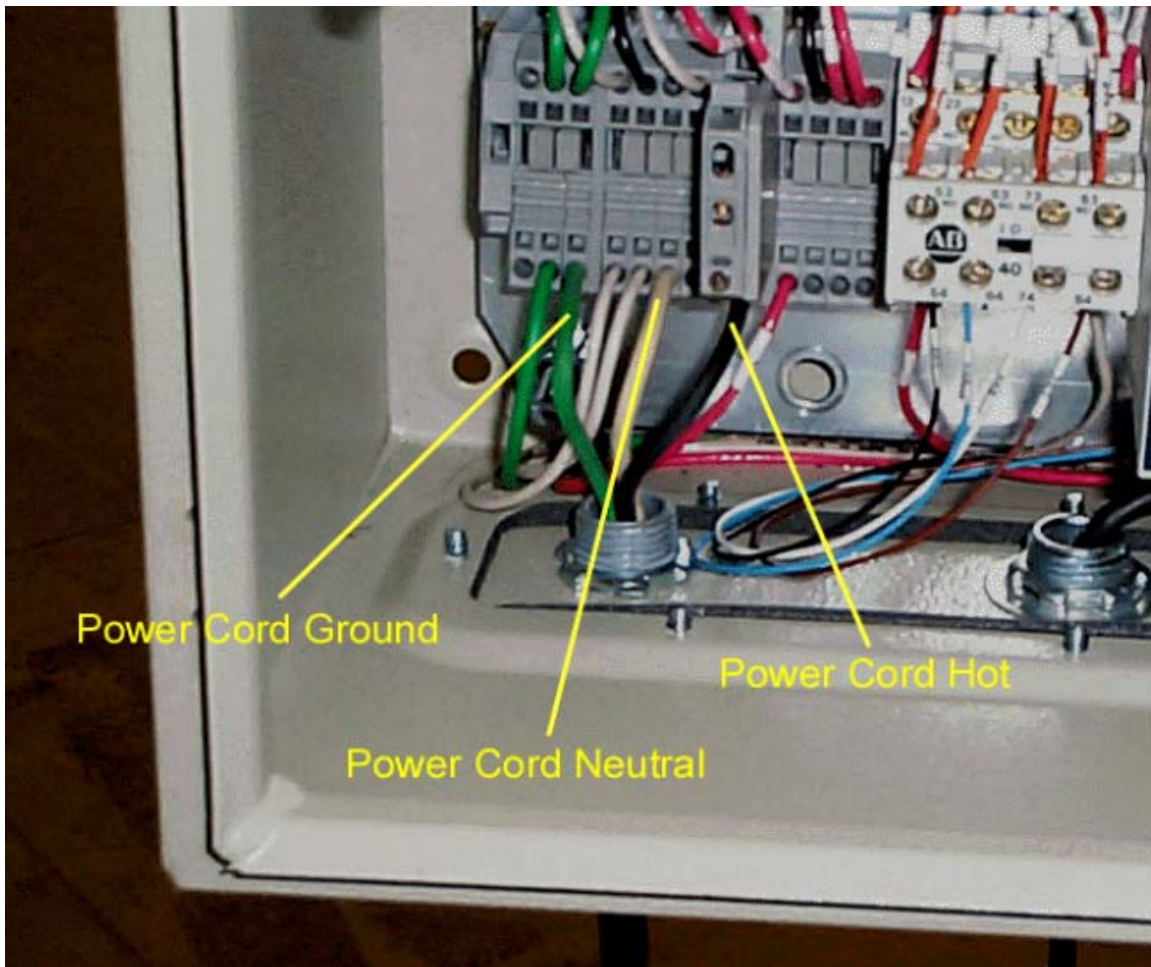
Connecting the Motor & Encoder Cables

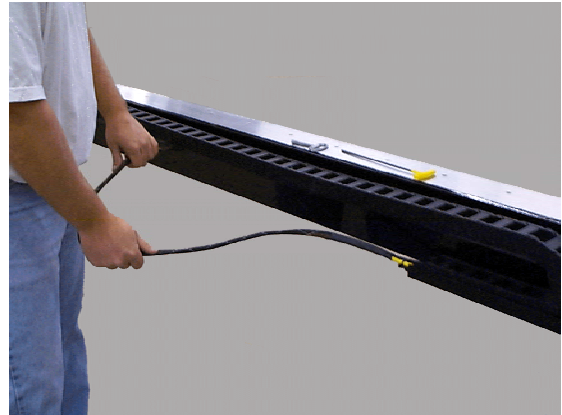WARNING!!!
PLUGGING/UNPLUGGING CABLES WHILE POWER IS
'ON' CAN DAMAGE THE RAZORGAGE CONTROLLER.

On Screw driven (RG-MS) models the motor and encoder cables exit from the stationary end of the cable carrier mounted on the back of the RazorGage as shown at right.

On belt drive rotary encoder models, the motor and encoder cables are configured as shown at right

Motor Cable   Encoder Cable

The Motor Power Cable plugs into a receptacle on the downward facing surface of the controller.

The Encoder Cable plugs into the receptacle on the Linear Encoder Translator Housing mounted on the side of the enclosure or into a DB-9 receptacle on the bottom of the enclosure depending on the revision level of your RazorGage.

The other socket on the Linear Encoder Translator housing (if supplied) is for the black cord that comes out of the main enclosure.

Home Offset Overview

Homing is the process by which the RazorGage controller knows where the positioning carriage is with respect to the outside world. Searching for and accurately determining the location of a fixed reference point on the linear encoder tape accomplishes this. Once this point is found, the position register can be set to a value that is meaningful to the application. This value is referred to as the Home Offset. Your RazorGage may finds its reference point in the approximate center of its stroke or at one end or the other depending on the model. In nearly all applications it is desirable to redefine the Home Offset value. For example, if a RazorGage is mounted next to a saw and the carriage is sent to the zero position there will be some distance between the saw blade and the positioning carriage. If you were to home a 96" RazorGage, butt a board up against the positioning carriage and saw it, the board would be some length. For the purpose of this example let's say that a board cut on this saw with the RazorGage positioning carriage in home position measures 59.856". In this case, 59.856 should be entered as the new Home Offset value. Refer to the next section for instructions on setting the Home Offset.
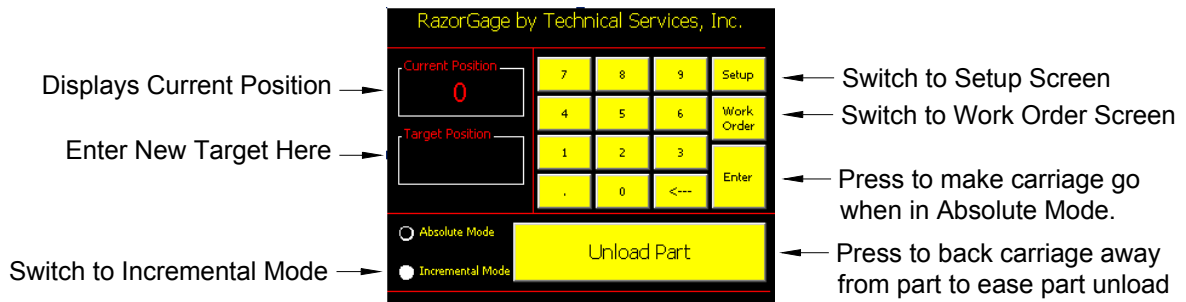
CE Interface

To apply power for the first time, first check the RazorGage table surface to be sure that it is free of obstructions or tools that might get damaged when the RazorGage begins to move. Pull the E-Stop out until it clicks into place and then push and release the "Power On" button.

After a few moments, the CE touchscreen display should boot up and display a message saying to press OK to home. Check the table to ensure that the carriage will encounter no obstructions, then press the OK command button on the touchscreen to continue. The carriage on the RazorGage will begin to move and the screen will say that the RazorGage is homing. After the "Homing" message disappears, wait for the "Saving Data" screen to disappear before continuing.

After the Homing sequence is completed, the Absolute Mode screen will appear and the green ON TARGET light will illuminate. The blinking cursor will be positioned to the right of the label "Target Pos:". In Absolute Mode the carriage goes to the position corresponding to the value you enter.

Absolute Mode Screen
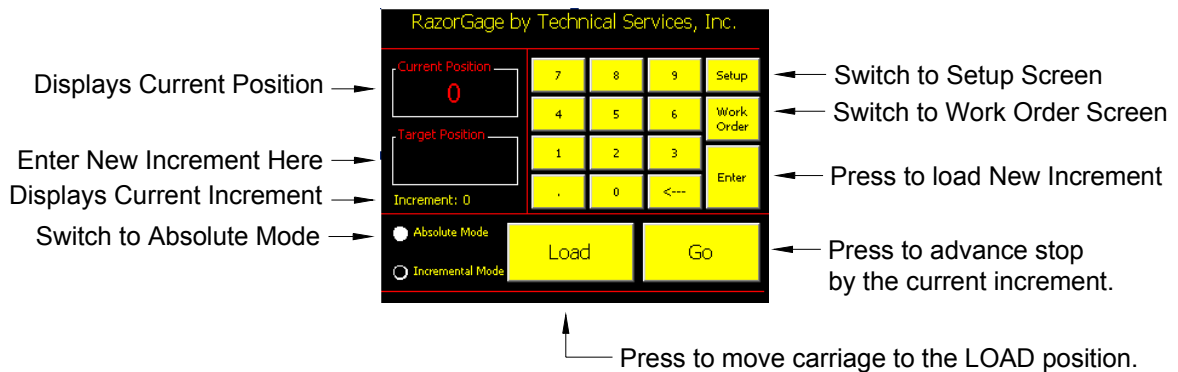
Displays Current Position →

Enter New Target Here →

Switch to Incremental Mode →

← Switch to Setup Screen
← Switch to Work Order Screen

← Press to make carriage go
when in Absolute Mode.

← Press to back carriage away
from part to ease part unload

Incremental Mode Screen

Displays Current Position →

Enter New Increment Here →
Displays Current Increment →
Switch to Absolute Mode →

← Switch to Setup Screen
← Switch to Work Order Screen

← Press to load New Increment

← Press to advance stop
by the current increment.

Press to move carriage to the LOAD position.

To make the RazorGage move to a new position, simply enter a new Target Position. Do this by punching in a number such as 6 or 8.1 or 35.683. If you make a mistake and want to correct an entry, use the ← key to backspace to the cursor position you want to correct and re-enter the number from that point. When you are satisfied with the value displayed, press the ENTER key and the RazorGage Positioning Carriage will move to that position. If you have entered a number smaller than the Home Offset or larger than the Home Offset + Stroke a message will be displayed explaining that you must enter a smaller or larger number. After a few seconds the Absolute Mode screen will reappear so you can re-enter a number that is within the range of the RazorGage.

After the carriage moves to position, a slight delay will occur before the In Position light on the front of the enclosure

illuminates. Once that light is on, the carriage is in position. If you push on the carriage, the light will go out and the controller will work to get the carriage back into the proper position. A relay inside the enclosure is wired in series with the light so that you may lock out your equipment until the RazorGage is in position.
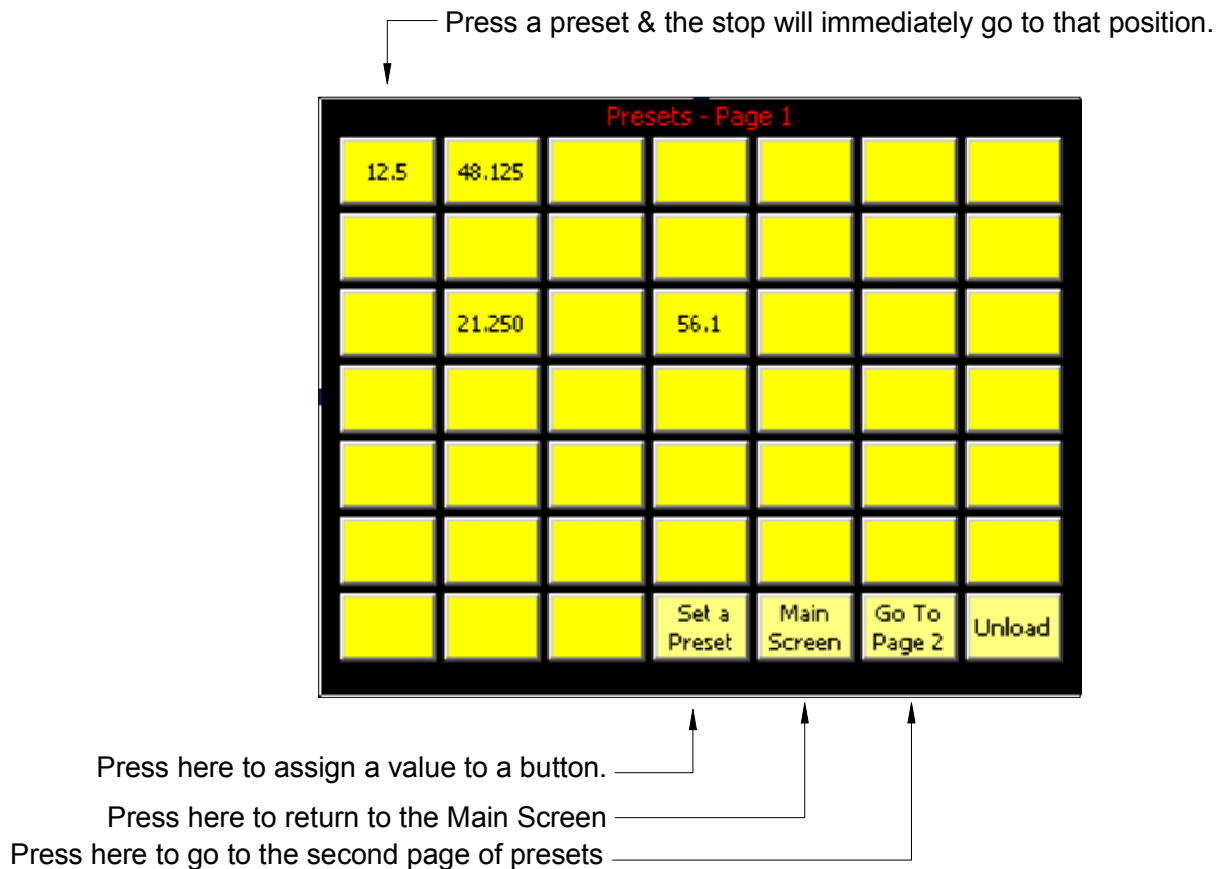
Incremental Mode

In Incremental Mode the carriage advances by the amount you enter in the Increment field every time you press the GO button (F2). Since this function is typically used for feeding applications, a LOAD feature and a Saw Kerf value is available.   When you press the LOAD button (F1) the carriage is moved to the value specified in the Load Pos field on the second setup screen. This is usually defined as a position far at the end of the stroke so that you can move the carriage out for the loading of a new piece of stock. The Saw Kerf value is added to the Increment when the carriage advances so that the length of the parts after sawing equals the value entered for increment. This way you don't have to manually add the kerf to the finished part length before you enter the increment value.   The LOAD position and SAW KERF values can be set in the SETUP Screen.

Presets
The CE option includes two screens full of buttons that can be defined as Presets. To define a preset, press the 'Set a Preset' button. The background of the screen will turn red to indicate that you have entered programming mode. Then just press the button you wish to define or edit. An edit
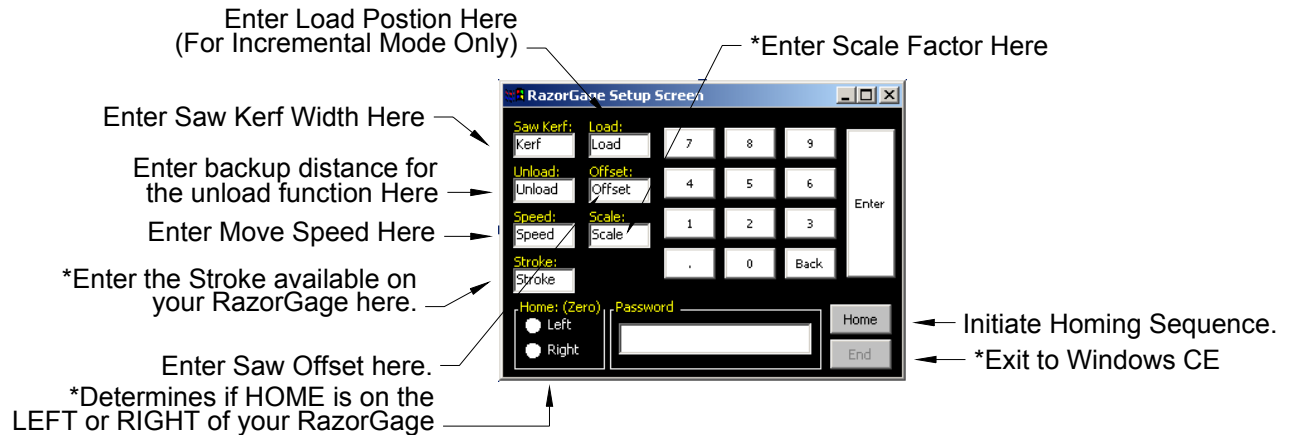
screen will appear in which you simply key in the value you wish to save and press enter. The background of the screen will turn back to black and the value you entered will appear on the button you chose. Now whenever you press that button the stop will immediately go to that position.

Press a preset & the stop will immediately go to that position.

Presets - Page 1						
12.5	48.125					
	21.250		56.1			
		Set a Preset	Main Screen	Go To Page 2	Unload	

Press here to assign a value to a button.
Press here to return to the Main Screen
Press here to go to the second page of presets

Using the Setup Screen

The setup screen is where you set parameters for the operation of the RazorGage. The diagram below describes the function of each parameter.

To set the Home Offset value go to the setup screen by pressing the SETUP key. To change values you must enter 90210 for the password. Some parameters require the

Enter Load Postion Here
(For Incremental Mode Only)

*Enter Scale Factor Here

Enter Saw Kerf Width Here

Enter backup distance for the unload function Here

Enter Move Speed Here

*Enter the Stroke available on your RazorGage here.

Enter Saw Offset here.
*Determines if HOME is on the LEFT or RIGHT of your RazorGage

Initiate Homing Sequence.

*Exit to Windows CE

*Denotes Parameters that Require Password 5239

higher level password 5239 as indicated on the diagram. Simply enter the new value and press "ENTER". To correct entry errors before pressing "ENTER", use the ← key. A few moments after pressing "ENTER" the ****SAVING DATA**** screen will appear. Wait until that screen disappears before pressing any more keys. After a few seconds, the setup screen will reappear.
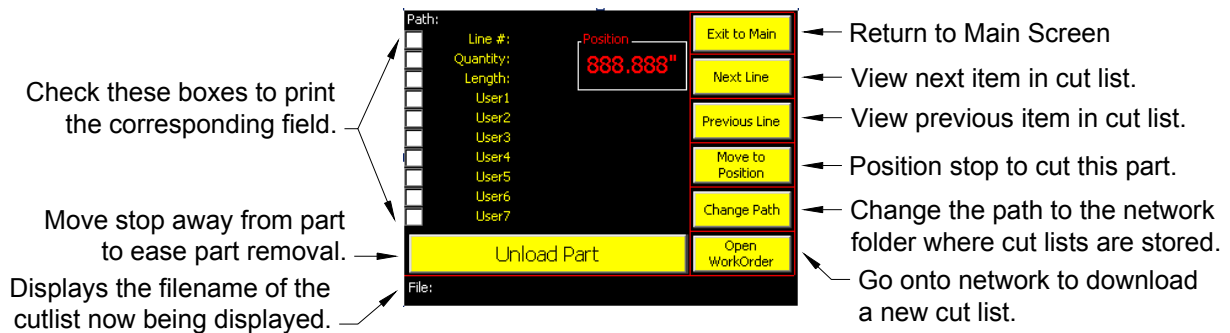
Downloading Cutlists

Cutlists may be created in Microsoft Excel® or by third party software packages. If creating your own cut lists, just open an Excel spreadsheet and create headings as shown in the following example. The first three columns must be Line, Length, & Qty as shown in the example. After that you may create seven more columns using whatever headings you wish. The only stipulation is that if you put a heading in, there must be something in the cell for every line number. Don't leave any cells empty once you've created a heading.
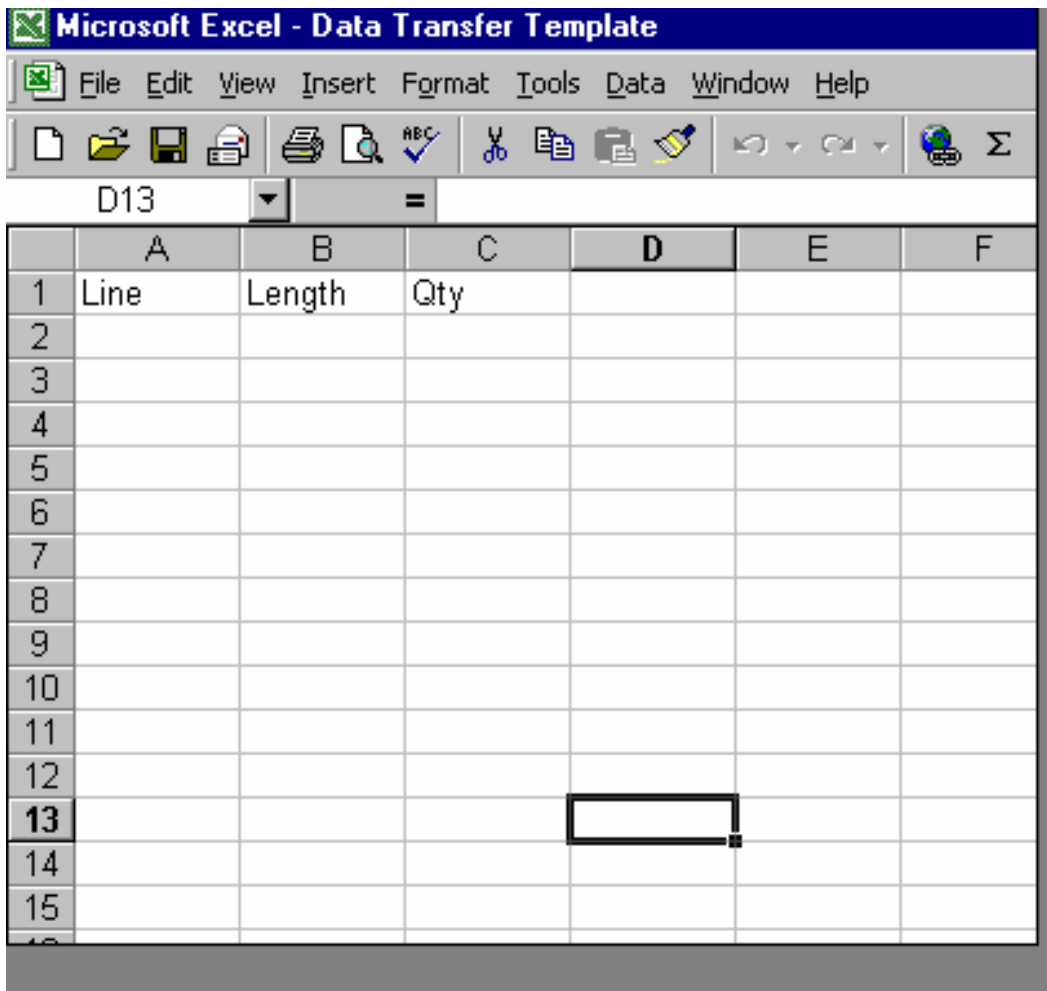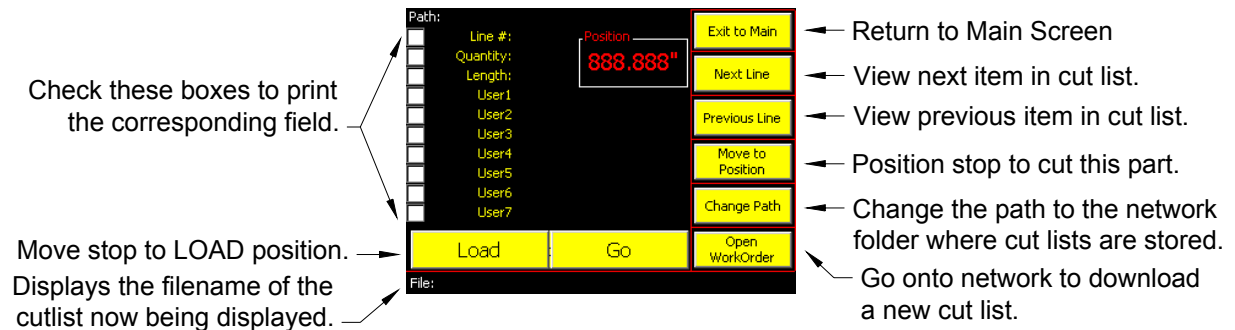
Once you've populated the cut list, save it to a folder designated for use by the RazorGage. To open the cut list at the RazorGage, you must first set the path to the folder to be used by the RazorGage. This only needs to be done once when you first install the RazorGage. This is done by simply pressing the 'Set Path' button as shown on the work order screen below and then by typing in the path. Once done you may simply push the 'Open Work Order' button to show the contents of the designated folder. Then just double-click on the file desired and it will be displayed as shown below. Use the designated buttons to navigate through the file. At any time you may jump back to the Manual Screen without losing your place in the list.

Work Order Screen: Absolute Mode

Check these boxes to print the corresponding field. →

Move stop away from part to ease part removal. →

Displays the filename of the cutlist now being displayed. →

→ Return to Main Screen

→ View next item in cut list.

→ View previous item in cut list.

→ Position stop to cut this part.

→ Change the path to the network folder where cut lists are stored.

→ Go onto network to download a new cut list.

Work Order Screen: Incremental Mode

Check these boxes to print the corresponding field. →

Move stop to LOAD position. →

Displays the filename of the cutlist now being displayed. →

→ Return to Main Screen

→ View next item in cut list.

→ View previous item in cut list.

→ Position stop to cut this part.

→ Change the path to the network folder where cut lists are stored.

→ Go onto network to download a new cut list.
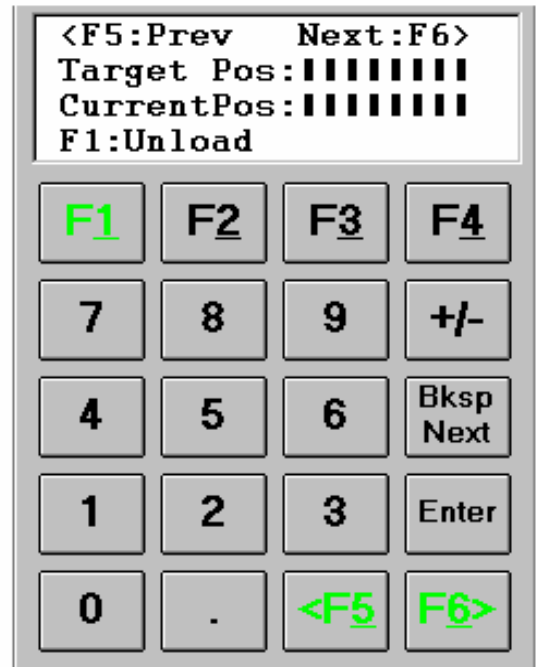
Standard Interface

To apply power for the first time, first check the RazorGage table surface to be sure that it is free of obstructions or tools that might get damaged when the RazorGage begins to move. Pull the E-Stop out until it clicks into place and then push and release the "Power On" button. The green display on the operator interface should light up and you should hear the fan kick in. After a few moments, the backlit LCD display should

look like the picture at right. Once the Welcome Screen appears, you may press the F4 key to initiate the Homing sequence. At this point the positioning carriage should begin to move.
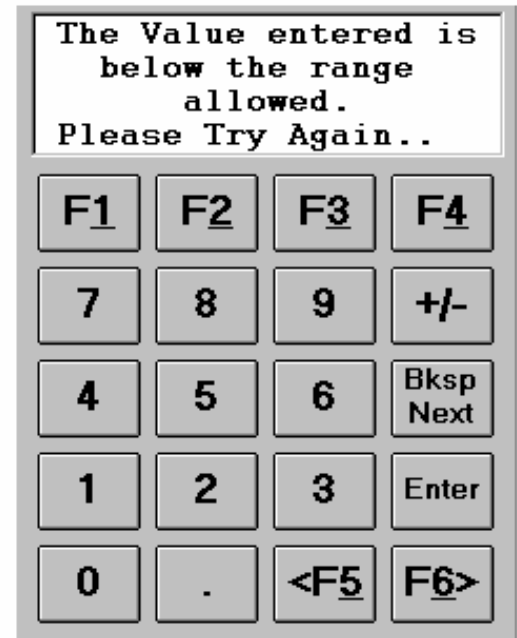
Operating the RazorGage Standard Interface

After the Homing sequence is completed, the Absolute Mode screen will appear and the green ON TARGET light will illuminate. The blinking cursor will be positioned to the right of the label "Target Pos:". In Absolute Mode the carriage goes to the position corresponding to the value you enter. The screen following the Absolute Mode Screen is the Incremental Mode Screen. In Incremental Mode the carriage moves forward a distance equal to the value you entered. This is typically for feeding applications. To make the RazorGage move to a new position, simply enter a new Target Position. Do this by punching in a number such as 6 or 8.1 or 35.683. If you make a mistake and want to correct an entry, use the BKSP/NEXT button to backspace to the cursor position you want to correct and re-enter the number from that point. When you are satisfied with the value displayed, press the ENTER key and the RazorGage Positioning Carriage will move to that position. If you have entered a number smaller than the Home Offset or larger than the Home Offset + Stroke a message will be displayed explaining that you must enter a smaller or larger number. After a few seconds the Absolute Mode screen will reappear

so you can re-enter a number that is within the range of the RazorGage.

After the carriage moves to position, a slight delay will occur before the In Position light on the front of the enclosure illuminates. Once that light is on, the carriage is in position. If you push on the carriage, the light will go out and the controller will work to get the carriage back into the proper position. A relay inside the enclosure is wired in series with the light so that you may lock out your equipment until the RazorGage is in position.

Screen Navigation Map

In order to access the various functions and settings available on the RazorGage you navigate through the screens. Each functional screen has navigational instructions on the top line such as "<F5:Prev   Next:F6>". The <F5 & F6> keys are located in the lower right hand corner of the display. They are used to navigate through the screens. Below is a "map" of the screens in the order in which they appear.
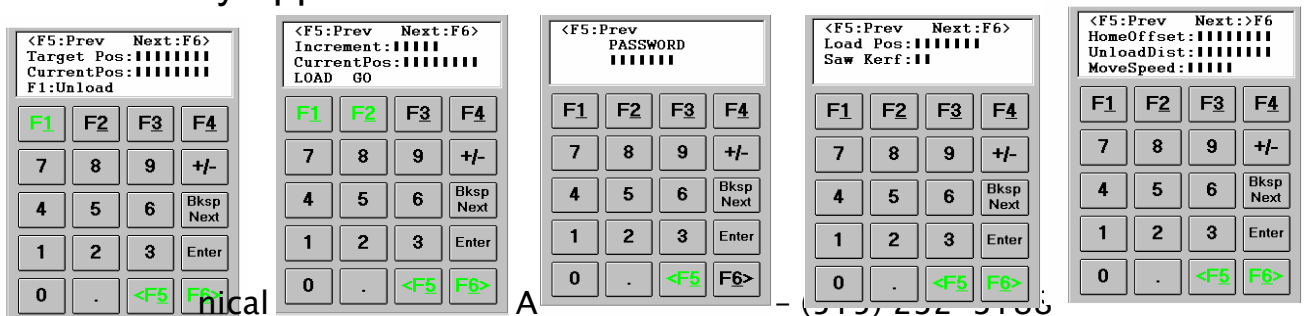
## Setting the Home Offset
Standard Interface

Press the F> key to navigate to the Seutp Screen. You will be prompted for a password. The password is 90210. The blinking cursor will be positioned on the first character to the right of the label "HomeOffset:". Simply enter the new value and press ENTER. To correct entry errors before pressing ENTER, use the BKSP/NEXT key. A few moments after pressing ENTER the ****SAVING DATA**** screen will appear. Wait until that screen disappears before pressing any more keys. After a few seconds, the setup screen will reappear. At this time you can use the BKSP/NEXT key to jump to another field on the setup screen or you may use the PREV or NEXT keys to navigate to the Absolute Mode Screen. Notice that the current position value will have changed to reflect the difference in the previous and current Home Offset values. At this point you may operate the RazorGage with the new Home Offset value in effect.

Using the Unload / Return Feature

The Unload feature allows the operator to cause the carriage to back away from the part in applications where clamps or nesting tooling make unloading difficult. To use this feature you must first enter a value in the UnloadDist field on the setup screen. Use the navigation keys to get to the password screen and enter the password (90210). Press the BKSP/NEXT key to position the cursor to the field right of the BackupDist label. Punch in the distance in inches you wish for the stop to back up for unloading then press the ENTER key. The ***SAVING DATA*** screen will appear. When the setup screen reappears you can set other parameters or use the navigation keys to return to Absolute Mode. Now when you are in Absolute Mode and press the F1 button, the Positioning Carriage will backup the distance you entered. Return to the Target by pressing the F4 key.
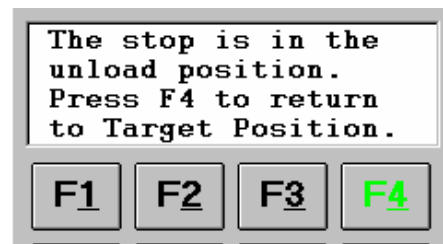
Setting the Speed

To set the Speed value, navigate to the setup screen entering the password (90210) along the way. Use the Bksp/Next key to position the blinking cursor to the right of the MoveSpeed label. Simply enter the new value and press "ENTER". To correct entry errors before pressing "ENTER", use the BKSP/NEXT key. A few moments after pressing "ENTER" the ****SAVING DATA**** screen will appear. Wait until that screen disappears before pressing any more keys. After a few seconds, the setup screen will reappear. The default value for speed is set

to 20 inches per second. You may need to reduce this speed if your application requires the RazorGage Positioning Carriage to overcome friction such as in pushing heavy parts resting on the table. Do not set the speed for more than 20 on screw drive units. Belt Drive units can be set up to 30. When you are finished setting speed, use the navigational keys to exit the screen.

Incremental Mode

The screen shown at right is the Incremental Mode Screen. In Incremental Mode the carriage advances by the amount you enter in the Increment field every time you press the GO button (F2). Since this function is typically used for feeding applications, a LOAD feature and a Saw Kerf value is available. When you press the LOAD button (F1) the carriage is moved to the value specified in the Load Pos field on the second setup screen. This is usually defined as a position far at the end of the stroke so that you can move the carriage out for the loading of a new piece of stock. The Saw Kerf value is added to the Increment when the carriage advances so that the length of the parts after sawing equals the value entered for increment. This way you don't have to manually add the kerf to the finished part length before you enter the increment value. Use the navigational keys to get to the second setup screen (enter the 90210 password along the way) and enter the values as described earlier for the other setup parameters.

Auxiliary I/O

The RazorGage controller has six I/O points on board with provisions for adding another twelve. Each I/O point can be configured as an input or an output. Inputs can be configured as sinking or sourcing, active high or active low. Refer to the Intelligent Motion Systems CD or www.imshome.com for online manuals, which explain wiring and programming inputs. A standard RazorGage has the "In Position" light and the auxillary relay wired to I/O point 21. You may wire through the relay to lock out components while the RazorGage carriage is in motion.
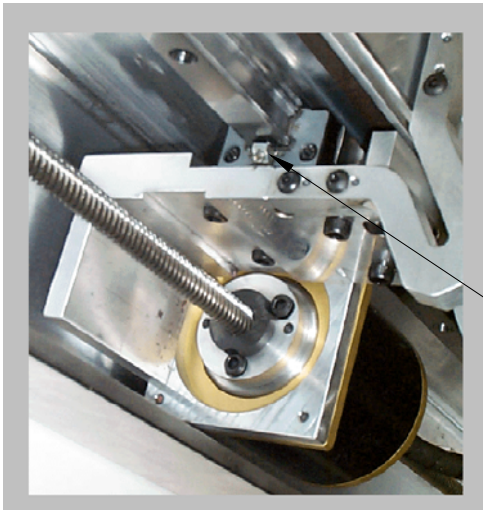
Custom Programming

The RazorGage Controller and Operator Interface can be programmed to suit your application. Messages can be displayed on the screen to prompt for product parameters, from these, equations can be used to determine part descriptions and lengths, and the operator can be prompted to cut a certain part in a certain quantity in a certain order at the specified length. Cut lists can be stored. Analogue inputs can be added if desired for your application. The possibilities are nearly unlimited. If you would like a custom program or would like training to write your own programs, contact Technical Services, Inc. for more information.

Routine Maintenance

Clean the air intake filter on the electrical enclosure as often as possible. This will ensure cool operation of the electrical components inside and prolong their life.
The RazorGage requires very little maintenance under normal operating conditions. In conditions of extreme dust or chips it you can prolong the life of the drive nut and screw by periodically clearing chips or sawdust from the drive

screw threads with a soft rag. If your environment is extreme, you should inspect the screw often at first to determine an appropriate inspection and/or cleaning interval. Grease the linear bearing every 1000 kilometers of linear travel with a grease lubricant to DIN 51825-K2K.

Grease Here

To access the inside of the RazorGage, remove the four button head cap screws that secure the guard and lower the guard onto the rear facing knee formed by the leg assemblies.

To avoid damaging the guard, remove the bottom screw on each end of the guard first, then the rear facing screws.
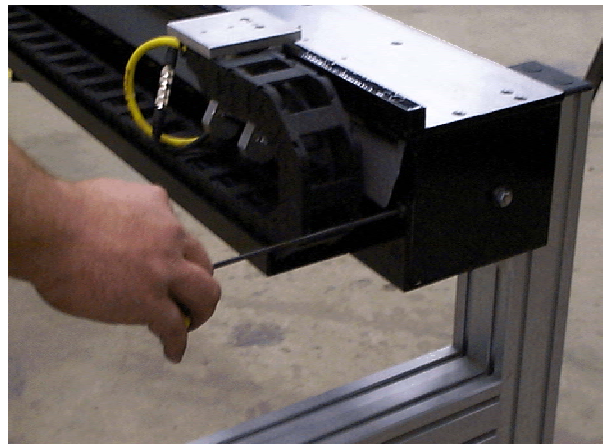
Belt Tensioning (Belt Drive Units Only)

In the unlikely event the belt requires tension adjustment, first remove the rear guard as described earlier. DON'T TENSION THE BELT UNLESS NECESSARY. The only reason to tension the belt is if the belt is jumping a tooth on the pulley or if it is dragging on the bottom of the inside of the RazorGage. Most people tend to overtension the belt. This puts unnecessary side load on the gear box bearings and will prematurely wear out your gearbox. A tight belt offers no performance benefits, only increased wear!
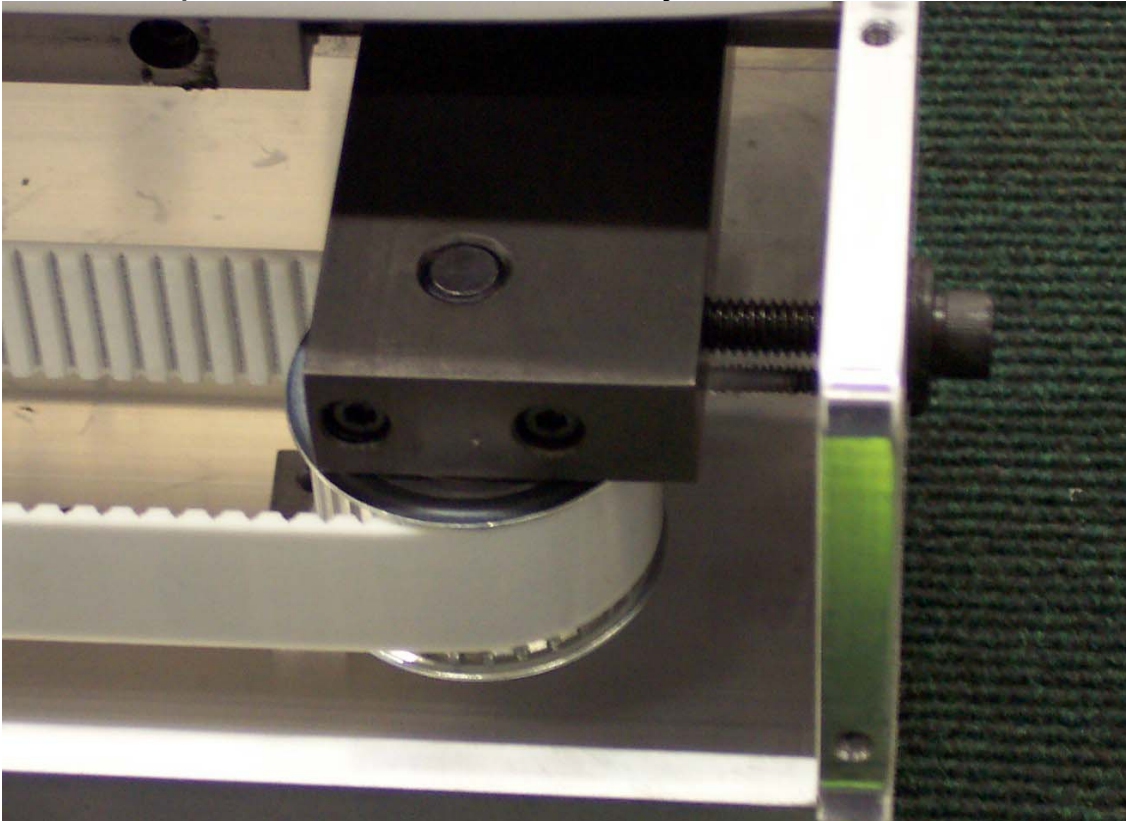
In the picture above you can see the idler pulley block and the adjustment screw. Loosen the two screws that hold the block to the main extrusion then turn the tensioning screw to draw the block and pulley in to tighten the belt. Tighten the belt enough to keep it from dragging on the bottom of the inside of the RazorGage. A good rule of thumb is to tension the belt to the point that if measured in the center of the

stroke with the carriage fully at one end, the sag would measure about ¼". On RazorGages with strokes longer than 12 feet this sag might be as much as ½". Overtightening is far more dangerous than undertightening.

Troubeshooting

If you are experiencing difficulty with your RazorGage, troubleshooting is generally a simple matter if you follow the instructions outlined below. These steps check all the vital functions and if you do them in order, they should uncover most problems.

1) Check to ensure that the motor and encoder cables are properly plugged at both their ends. You may have to remove the guard to check the connections at the motor and encoder. If you have just installed a new drive, make sure that the DIP switch for I/O 26 is switched to the ON position. Check to see that the communications cable between the MicroLynx and the display is plugged into both devices.
2) Check the AC fuse in the fuse terminal block on the DIN rail.
3) Use a meter to check the incoming power to the MicroLynx. The power should be just below 70 VDC. Check the power coming from the 24VDC power supply mounted on the DIN rail. It should be 24 VDC.
4) The rest of the steps require that you have a laptop with Lynx Terminal software installed and a straight thru serial cable for communications with the RazorGage controller. Lynx Terminal software may be downloaded free of charge from the IMS website www.imshome.com. If you have a Standard RazorGage interface this cable will have a female DB-9 on one end, a male DB-9 on the other, and pins 2,

3, & 5 wired straight thru. If you have the CE option, you will need a standard Microlynx communication cable available from either Technical Services, Inc. or your local IMS distributor. See www.imshome to find your local IMS distributor. Or you may make the cable by purhcasing a Newark 90F5193 connector and a length of 10-conductor ribbon cable with .05" spacing. Install it on the ribbon cable in exactly the same way the display cable is connected. The wire with the red strip is wire #1. Solder wire #2 to pin 2 of the DB-9 that goes into your laptop serial port. Do the same with wires #3, and #5.

5) When you have your laptop connected to the MicroLynx controller inside the RazorGage enclosure and the Lynx Terminal software running first make sure you have a terminal window open. Typically the terminal window will appear on the right side of the programming environment and will be labeled Terminal 1. If there is no terminal window, click the View pulldown menu and click New Comm Window.

6) Make sure the software is connected to the comm port. Look at the bottom of the Terminal window just to the right of center and you will see the word "Disconnected" or "Connected". If you are disconnected, click the button on the toolbar that looks like a phone with the receiver on the hook. The word at the bottom of the Terminal Window should change to "Connected". This does not necessarily mean you are communicating with the MicroLynx. It just means that the software is supposed to have control of the serial port on your laptop. If you have Palm Pilot software or any other software running that constantly monitors the comm port, exit that software and restart Lynx Terminal. Even if it is only displayed as a tray icon, it is probably still monitoring the comm port so

you must shut that software down completely before continuing. The Lynx Terminal software will display the word "Connected" even though it is not really "connected" so you must be sure your comm port is available.

7) Check to see if Lynx Terminal is communicating with the MicroLynx by pressing the ESC key a few times. If you see a prompt and a pound sign (>#) appear, then you have successfully established communication. The ESC key stops any program that is currently running.

8) Now you can begin troubleshooting the system. Type the following commands. Press enter after each line. Do not type > before each line. It is shown in the example simply to simulate what you will see on the screen. ***All of the changes we make below can be undone by simply pressing "ctrl C"***. That will perform a soft reboot of the MicroLynx controller and all parameters will be reset to those specified in the program.:

9) >PFMT=10,4,2

10) >MUNIT=50000

11) >EE=0

12) Now we'll see if we can make the motor move. Make sure no one will be harmed if the carriage moves and that no tools, cords, or other obstructions might get caught when the carriage begins to move. Then type the command "SLEW 1" and press Return. The motor should begin to move. Press ESC to make it stop. If you want to see if the motor will move the carriage faster, type "SLEW 5" or "SLEW 10". The number in the command indicates the speed in Inches per Second that you want the carriage to move. Usually, the motor will move in this state. The command we typed earlier (EE=0) turns off all encoder feedback

functions and allows the drive to turn the motor without verification from the encoder. In this way, we isolate the motor function from the encoder to pinpoint problems. If the motor does not turn, either the motor is bad, the cable is bad or not plugged in, the motor power connector on the MicroLynx itself is not plugged in, or the MicroLynx amplifier portion is fried. Give a quick look at the connections. If they look okay, install a new controller, dump the program in if not already preloaded, and see if it works.

13) If the motor moved in Step 7 then chances are the motor function is alright. Let's check the encoder function. After stopping the motion initiated above by pressing the ESC key, type the following commands:

14) >DRVEN=FALSE

15) >PRINT CTR2

16) The first command kills the amplifier so the motor can turn freely. The last command should return a value which is the number of counts currently stored in the Encoder Counter Register. This may be zero or it may be a big positive or negative integer. Type the "PRINT CTR2" command several times and compare the results. If the value being returned is jumping around a general target number, then a new encoder reader head may be necessary. If it is continually increasing or decreasing then a connection or cable may be bad and need replacement. Possibly the counter card on the MicroLynx needs to be replaced. If the numbers returned by subsequent requests to print CTR2 don't change or change only by a one count then proceed to the next step.

17) Write down the number returned by the Print CTR2 command. Make a mark to show where the carriage is now and then move the carriage by hand one inch. Be as precise as you can but there's no need to go

overboard. Type "PRINT CTR2" again. Did the number change? If you moved the carriage exactly one inch the difference between this number and the number returned before should be equal to the Scale Factor printed on the sticker inside the enclosure and on the Operator's Manual for this RazorGage. How does it look? If the number didn't change, then the drive is receiving not encoder counts. It may be that the gap between the reader head and tape is not right, a bad High Speed Differential I/O card in the MicroLynx, or it may be the cable or the connection. Check all the connections. If they look okay, then try changing the high speed differential I/O card in the MicroLynx. If you have a replacement drive with a new I/O card in it then I would change them both. If that fixes the problem send the old drive with the card in it in for repair. If it was just the I/O card then that's all they will fix. If it still doesn't work, try a new reader head. If that doesn't work replace the cable.

18) If everything looks good up to this point, then check to see that the controller is seeing the Marker pulse. This would only happen during homing so if the RazorGage is homing properly you may skip this step. Earlier we disabled the drive by typing the command DRVEN=FALSE. If the drive is still disabled then continue to the next step. Otherwise hit the ESC key to make sure that the program is not running and re-enter DRVEN=FALSE.

19) Now type this command: IOS 17=0,0,1,1

20) The previous command changes IO 17 (the marker pulse input) from level triggered to edge triggered. A level triggered input changes from 0 to 1 when the input is on and then back to 0 when the input goes off. An edge triggered input changes from 0 to 1 when the input changes state but stays high even after the input

goes off. If will stay high until it has been read either by you in terminal mode or by the program. In this way, you can read inputs that are only on for a very short duration. That's what we need to do now. We need to see if the MicroLynx is catching the index marker on the linear encoder tape by moving the carriage across the portion of the tape where the marker is placed and then checking to see if IO 17 went high. If we were to leave IO 17 as a level triggered input, then we would have to check the state of that IO point at exactly the time when the marker was being read by the reader head. That's why we change IO 17 to an edge triggered input for this test.

21) Now move the carriage across the area where the RazorGage usually finds home. Since the carriage moves rather slowly when looking for the marker, it is best to move the carriage rather slowly now. After you are sure you have moved the carriage past the marker, go back the Lynx Terminal and type this: PRINT IO 17

22) The MicroLynx should return either a zero or a one. If it returns a one then type that same command again. It should now read zero because we read t he input and that resets it. In this way you can be sure you have successfully changed the input from level to edge triggered. If the print command returns a zero the second time then move the carriage back across the marker area and repeat the print command. If the MicroLynx is seeing the marker pulse then the Microlynx should have returned a one. Do this several times at different speeds to be sure that the encoder is reliably reporting the marker pulse. If it is not then regap the reader head to the tape. Repeat the process above. If it still doesn't work replace the reader head.

Downloading a Program
Connect to the Microlynx as described in steps 4 through 8 above. Press ESC to stop any program that may currently be running in the MicroLynx. At the terminal prompt, type the following commands:

>CP 1,1

Then click the download button in the toolbar of Lynx Terminal software. It looks like an arrow pointing down. If you haven't downloaded in the current software session a dialogue box will appear in which you will have to answer some questions. Choose "Program" for data type, "File" for Source Type, and then browse your computer for the file you want to download. When you are done, press the "Download" button and you will see the file being sent and echoed back to the terminal window as it downloads. If you get a message saying that the data type requested is not found just press the continue button. If you program quits scrolling in the terminal window but the "Downloading" dialogue box doesn't disappear, just press the cancel button. After the program is done downloading type the following command:

>SAVE

Wait for the prompt to reappear. Cycle the power. The program should run on power up. If you don't type save after downloading, the previous program will run instead of the one you just downloaded.

Initializing the Drive
If you need to initialize the drive, type the following commands:

>IP ALL
>DVF
>CP 1,1
>SAVE

This will delete all variables and flags stored in the controller and basically allow you to start with the controller as it is when it comes out of the box.   After initializing the controller, download a program as described above. Most standard RazorGage programs will ask for the stroke, scale factor, speed, and home direction (HOMDIR). Enter the stroke in inches. Usually enter 20 for the speed. Enter the scale factor as it appears on the sticker on this manual or on the inside of the electrical enclosure.
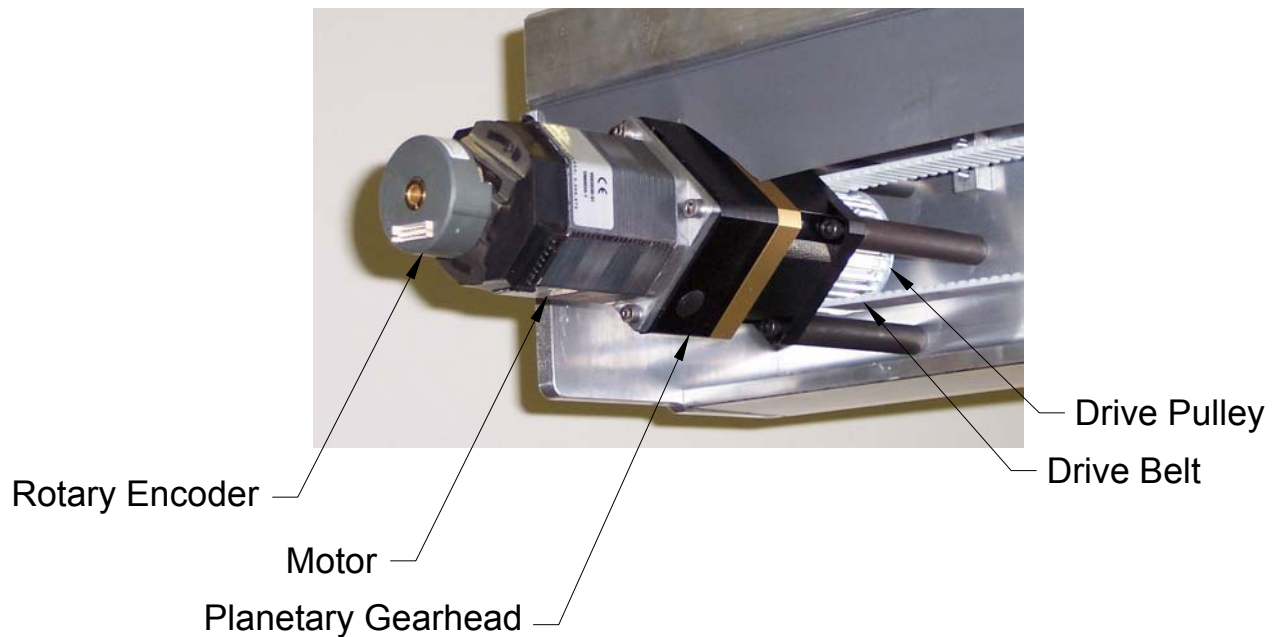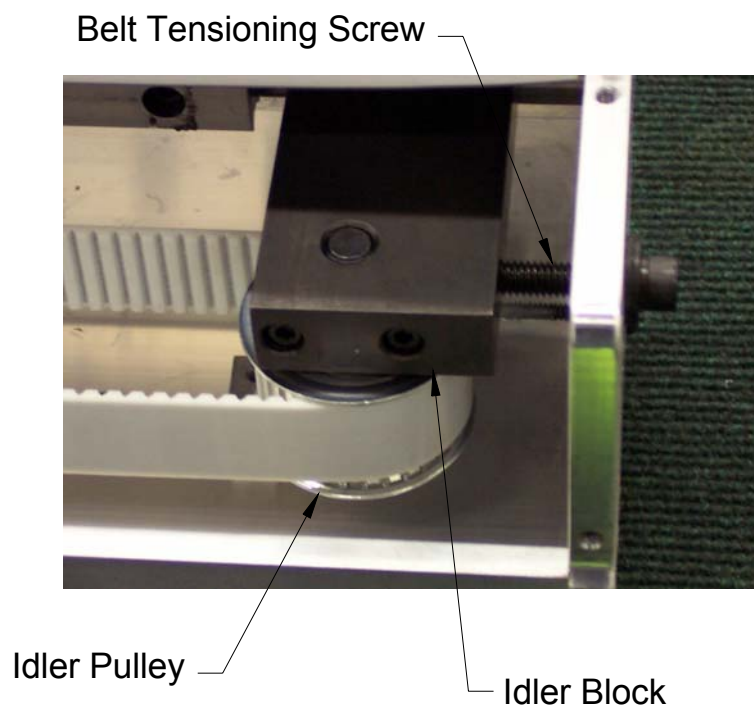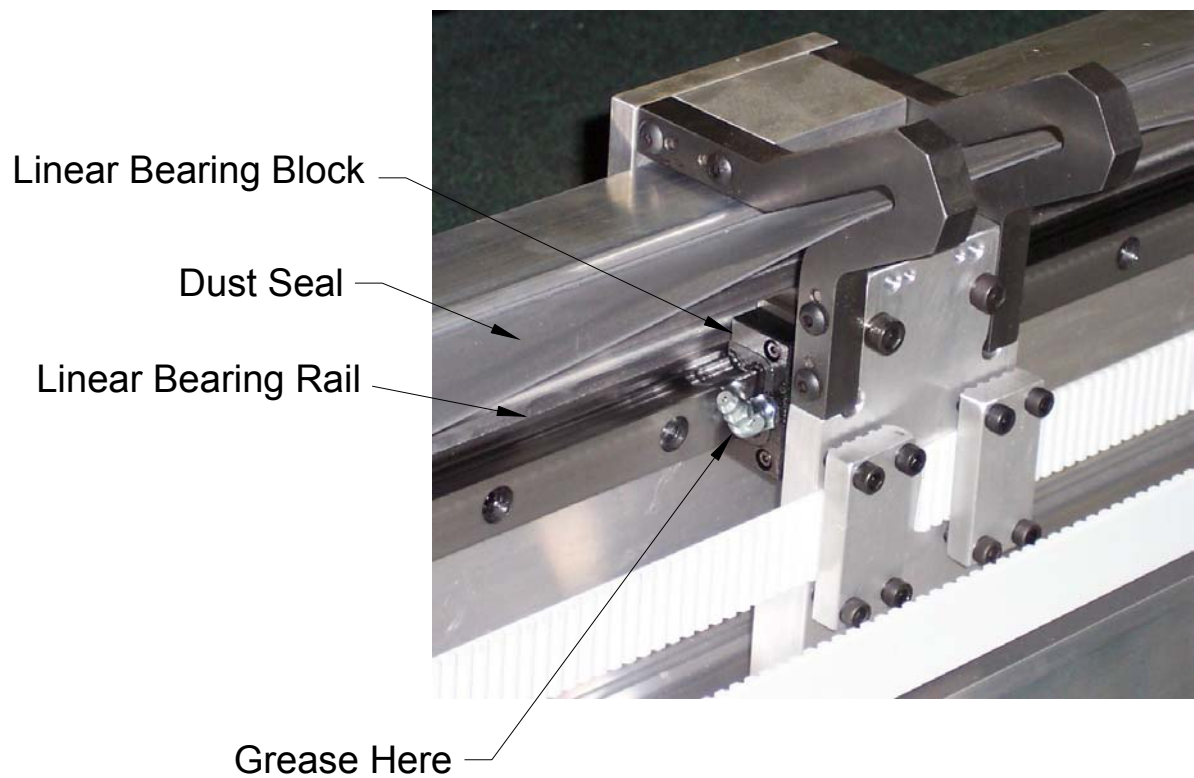
Replacement Parts

Mechanical Replacement Parts for Screw Drive	
Description	Part Number
Linear Bearing Rail	8163-M302
Linear Bearing Block	8163-M303
Drive Screw	8163-M304
Drive Screw Nut	8163-M307
Motor	8163-M404
Motor Cable	8163-M701
Linear Encoder Reader Head	8163-M402
Linear Encoder Cable	8163-M402
Cable Carrier	8163-M703
Dust Seal	8163-M605
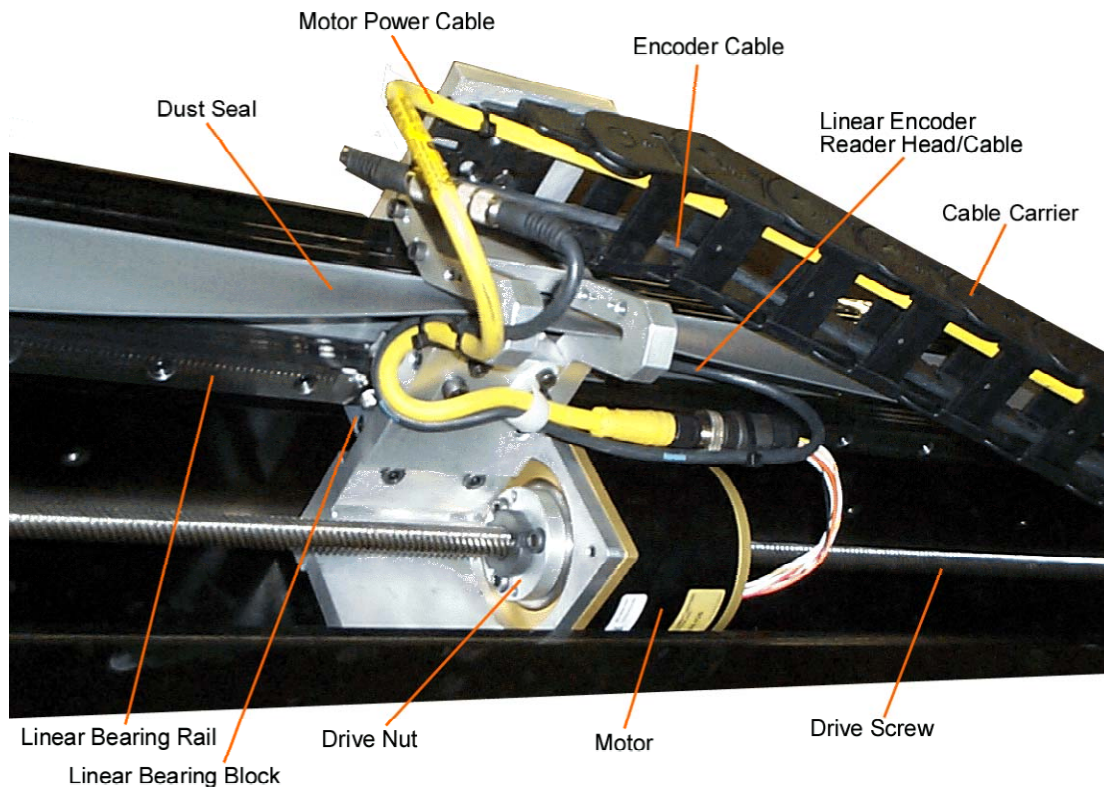
Mechanical Replacement Parts for Belt Drive	
Description	Part Number
Linear Bearing Rail	8163-M302
Linear Bearing Block	8163-M303
Drive Belt	8163-M902
Drive Pulley	8163-M1103
Motor	8163-M1101
Gearbox	8163-M1102
Rotary Encoder	8163-M1110
Belt Tensioning Screw	8163-M906
Idler Pulley	8163-M901
Dust Seal	8163-M605
Idler Block	8163-M900

Rotary Encoder

Motor

Planetary Gearhead

Drive Pulley

Drive Belt

Linear Bearing Block

Dust Seal

Linear Bearing Rail

Grease Here

Belt Tensioning Screw

Idler Pulley

Idler Block

Fan

Transformer

Bridge Rectifier

Programmable Controller

Capacitor

Operator Interface

Fuse

Master Control Relay

24 VDC Power Supply

E-Stop Lamp

On Target Lamp
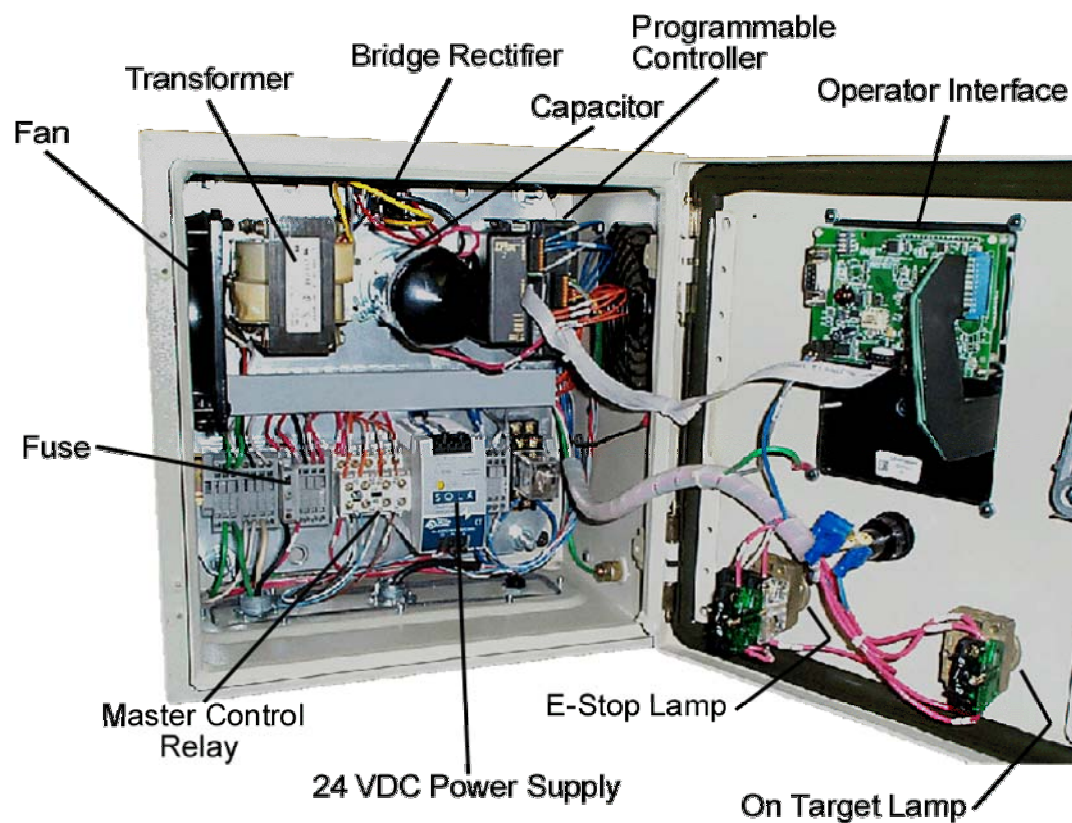
Electrical Replacement Parts	
Description	Part Number
Transformer	8163-E300
Bridge Rectifier	8163-E304
Capacitor	8163-E232
Programmable Controller	8163-E214
Operator Interface	8163-E100
Fuse	8163-E230
Master Control Relay	8163-E235
24 VDC Power Supply	8163-E200
E-Stop	8163-E104
On Target Bulb	8163-E108
Fan	8163-E211