

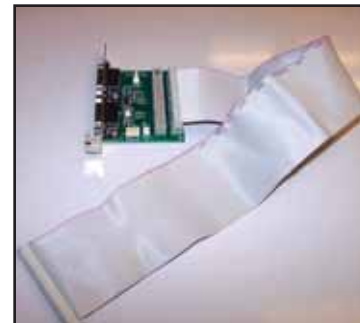
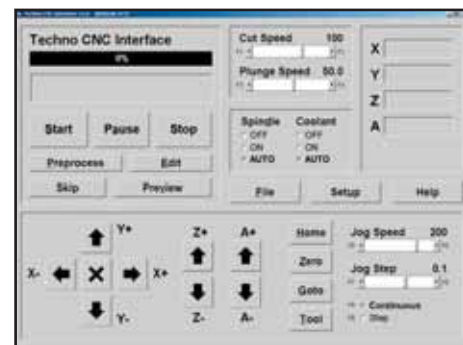


**IMPORTANT! READ THIS SETUP THOROUGHLY BEFORE RUNNING THE MACHINE. HAVE A LICENSED ELECTRICIAN PERFORM ALL ELECTRICAL CONNECTIONS BASED ON YOUR LOCAL CODES.**

This document provides information on how-to setup an LC Plus Series CNC Router. Although this is not the machine manual keep it with your Techno CD-ROM, both contain reference documentation.

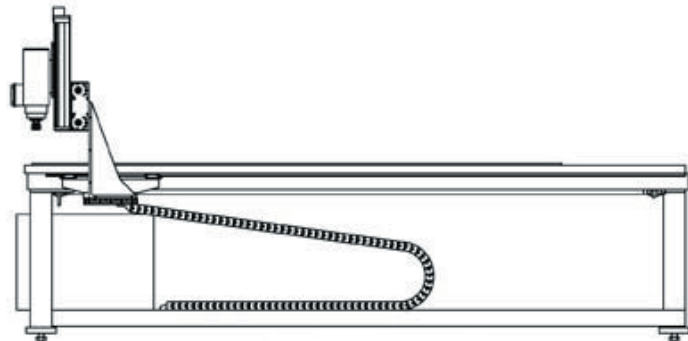
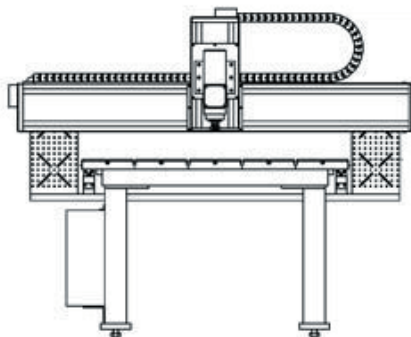
## LC PLUS SERIES SETUP INSTRUCTIONS

- i. Minimum System Requirements
- I. SERVO CONTROLLER CARD
- II. RISER CARD
- III. TECHNO CNC INTERFACE
- IV. TOUCHPAD
- V. E-STOP START STOP BOX
- VI. MACHINE IDENTIFICATIONS
- VII. USING THE VACUUM TABLE
- VIII. SCALE FACTOR SETUP



## APPENDICES

- A. TECHNO ELECTRONICS
- B. COLLETING GUIDELINES
- C. MACHINE MAINTENANCE
- D. ADDITIONAL RESOURCES



## **i. Minimum System Requirements**

- Windows 98, ME, 2000 or XP (does not work w/Vista)
- Pentium 3 or Celeron 600 Mhz Processor
- 1 Available PCI Slot

## **I. INSTALLING SERVO CONTROLLER CARD**

**NOTE<sup>1</sup>:** Make sure to install the Servo Controller and Riser Cards before the software.

**STEP 1:** Turn off and unplug power to your computer. Remove the cover.

**STEP 2:** Remove the Controller Card from its protective packaging and locate a vacant PCI slot. Remove the slot cover. (**PICTURE 1**)

**WARNING:** Ground yourself during installation.

**NOTE<sup>2</sup>:** The Controller Card connectors mate with the PC Motherboard connectors in only one way.

**STEP 3:** Gently but firmly insert the Controller Card into the vacant PCI slot. Secure with screw (if applicable).

## **II. INSTALLING THE TECHNO RISER CARD**

**NOTE<sup>1</sup>:** The Riser Card connects to the Controller Card with a Ribbon Cable. (**PICTURE 2**)

**STEP 1:** Locate an open slot in your PC and secure the Riser Card (no PCI / Motherboard connections required).

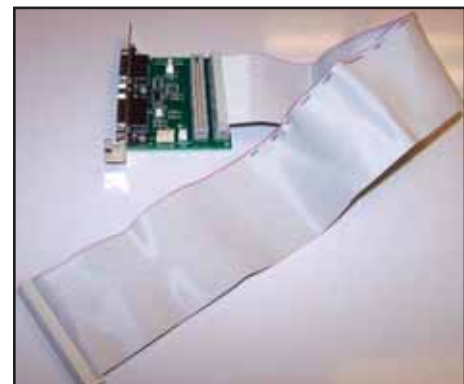
**STEP 2:** Using the Ribbon Cable, connect the Riser Card to the mating connector on the controller card.

**NOTE<sup>2</sup>:** The ribbon cable's colored end MUST be attached to the Pin 1 connector on each card. On the Servo Controller Card, Pin 1 is the end closest to the Techno logo; and on the Riser Card, it is the end closest to where it says "TECHNO IO RISER CARD." Both Pin 1 card connectors also have an indented arrow. **PICTURE 3** shows a flat, table layout of the connection between the two cards, this connection inside your PC looks different.

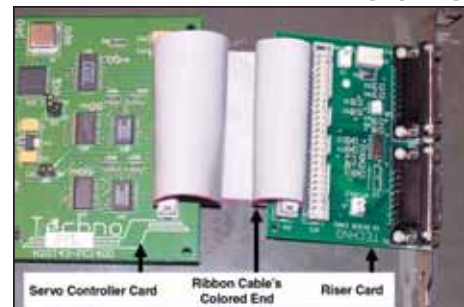
**PICTURE 1**



**PICTURE 2**



**PICTURE 3**



**NOTE<sup>1</sup>:** Upon installation, the cards in your PC may look more like **PICTURE 4**.

**STEP 3:** Replace computer cover, connect the cable between Servo Controller Box and Controller Card. Turn computer on.

**PICTURE 4**



**III. INSTALLING THE TECHNO CNC INTERFACE**

**NOTE<sup>1</sup>:** When you reconnect power, turn your computer on and when Windows starts up it will detect "new hardware."

**STEP 1:** Follow the Window's prompts. When asked to "search" for a suitable driver, insert the Techno CD.

**STEP 2:** When asked for "optional search locations" choose your computer's CD drive.

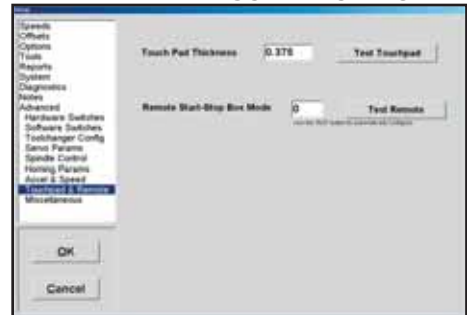
**STEP 3:** Click on **Setup Techno CNC Interface**.

**NOTE<sup>2</sup>:** *KEEP THE TECHNO CD IN A SAFE PLACE, IT CONTAINS ADDITIONAL DOCUMENTATION (PDF FILES).*

**SCREEN CAPTURE 1**



**SCREEN CAPTURE 2**



**IV. TOUCHPAD INTERFACE SETTINGS**

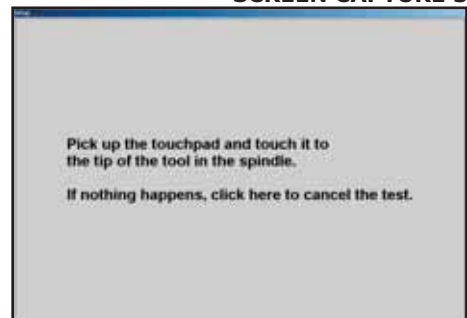
**NOTE<sup>1</sup>:** The settings for the Touchpad need to be tested and/or configured in the Techno CNC Interface prior to using the machine.

**STEP 1:** Start Techno CNC Interface. From the main page, click the **Setup** Button.

**STEP 2:** Go to **Setup / Advanced / Touchpad & Remote**, click the **Test Touchpad** Button.

**NOTE<sup>2</sup>:** The message in **SCREEN CAPTURE 3** should then appear. Follow the prompts.

**SCREEN CAPTURE 3**



**PICTURE 1**



**NOTE<sup>3</sup>:** If the “test passed” screen appears, click OK, the test has indicated that the Touchpad is functioning properly. Click OK in the Setup to exit.

If the test failed (nothing happened), you need to click where indicated “click here”. The “test cancelled” screen should appear. Click OK in the “test cancelled” screen.

**STEP 3:** Repeat the test again. If it fails:

1. Turn the power off.
2. Check the connections.
3. Call Techno for further assistance.

**V. E-STOP START/STOP BOX INTERFACE SETTINGS**

**NOTE<sup>1</sup>:** The settings for the E-Stop Start/Stop Box need to be entered and/or configured in the Techno CNC Interface prior to using the machine.

**STEP 1:** Start Techno CNC Interface.

**STEP 2:** Go to **Setup/Advanced/Touchpad & Remote**. Click on the **Test Remote** Button. The **SCREEN CAPTURE 1** should appear.

**STEP 3:** Press the Start button on your remote E-Stop Start/Stop Box. (**SCREEN CAPTURE 2**)

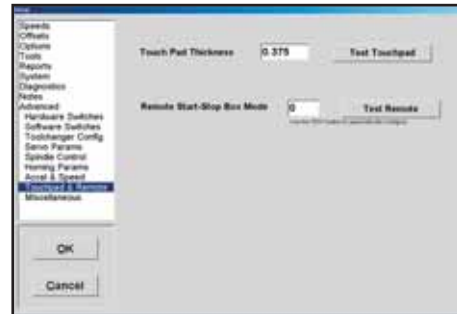
**STEP 4:** Press the Pause button on your remote Start Stop Box.

**NOTE<sup>3</sup>:** If the test passes, you should get the message: Remote test passed. (**SCREEN CAPTURE 3**)

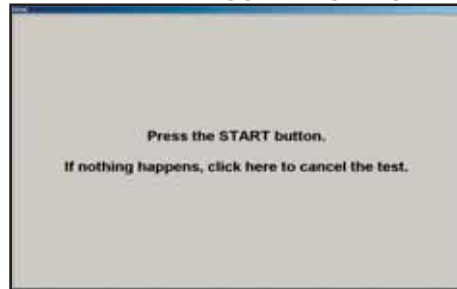
**STEP 3:** Repeat the test again. If it fails:

1. Turn the power off.
2. Check the connections.
3. Call Techno for further assistance.

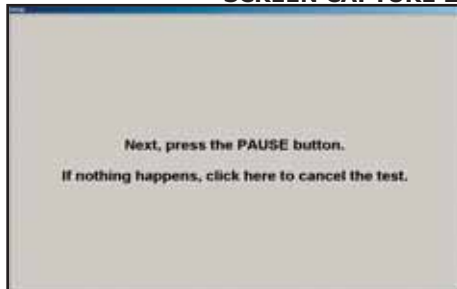
**SCREEN CAPTURE 4**



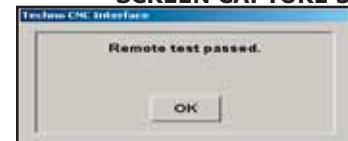
**SCREEN CAPTURE 1**



**SCREEN CAPTURE 2**



**SCREEN CAPTURE 3**





**VI. MACHINE IDENTIFICATIONS**

**1. E-STOP START/STOP BOX (PICTURE 1)**

The green button is the START button, hit this button to reset the machine after having hit the black PAUSE button. The PAUSE button temporarily stops the machine.



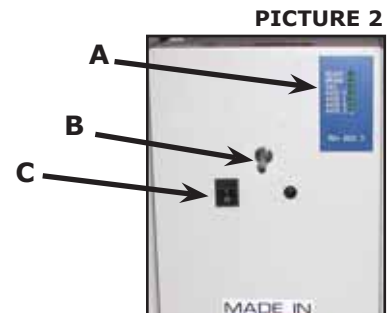
PICTURE 1

**PUSH THE EMERGENCY STOP (E-STOP) BUTTON WHENEVER YOU NEED TO STOP THE MACHINE IMMEDIATELY.** To reset the Start/Stop Box E-stop, twist the E-Stop button clockwise. The machine will not work if the E-Stop is still pushed in.

**2. RG+ SERVO BOX 3 (PICTURES 2 & 2A)**

Front Panel (PICTURE 2)

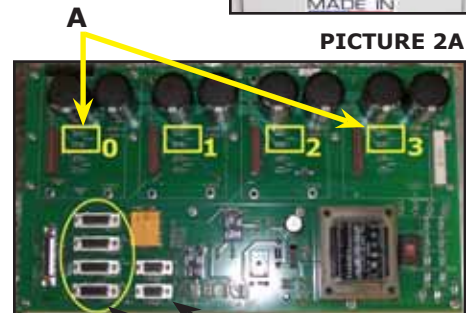
- A. Status LED Panel
- B. Vacuum Pump ON/OFF Switch
- C. Electronics Power Switch



PICTURE 2

RG+ Servo Box 3 Internal Motherboard (PICTURE 2A)

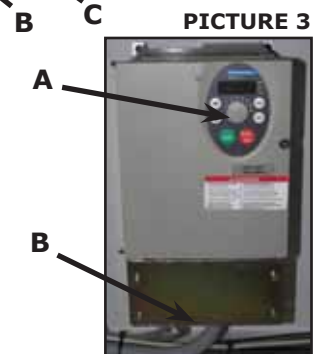
- A. Top Four highlighted squares (numbered 0 through 3) are the four motor connections located within the box. Motor 0 is the Y-axis (closest to the ground), Motor 1 is the X-axis, Motor 2 the Z-axis with the highest altitude, and Motor 3 the A-axis.
- B. Four Encoder connectors shown in order from top to bottom are Encoder 0 (Y-Axis) to Encoder 3 (A-axis).
- C. The AUX I/O Connector can be used for several purposes including a toolchanger controller, Inverter and Relay Box connections.



PICTURE 2A

**3. INVERTER FOR AC SPINDLE MOTOR (PICTURE 3)**

- A. Keyboard for manually changing spindle speeds. The AC Inverter controls the AC Spindle motors. This is NOT used with the Porter Cable or other 120VAC routers.
- B. The front view shows the incoming (220 or 440VAC) power line that you are responsible for having a licensed electrician connect to the AC Inverter. Make sure you replace the cover after connecting the line (See the Inverter Manual for wiring instructions).



PICTURE 3

**4. TOOL CHANGER, TOOL STAND ARM (PICTURE 4)**

- A. The Tool stand arm holds tool stands for tool change spindles.

To set your tool stand positions in the Techno GCODE software, look for the CNC Servo GCODE Manual on your Techno CD-ROM. Follow **Chapter III. Learn Tool Stand Locations Tutorial.**



PICTURE 4

## VII. USING THE VACUUM TABLE SETUP

**NOTE<sup>1</sup>:** **PICTURE 1** is one example of what your machine and pump/blower may look like during shipping. Please take note, the following setup will be the same for all Pumps and Blowers.

### CONNECTING THE VACUUM PUMP/BLOWER CABLE, MOTOR, STARTER BOX, CONNECTOR & HOSE FITTINGS

**NOTE<sup>2</sup>:** Shipped with your Pump/Blower will be a closed Motor Starter Box that looks like the box in **PICTURE 3**. Although the Vacuum Pump/Blower Motor has been wired and tested in the factory prior to shipping, a licensed electrician will have to connect wires to the inside of the Motor Starter Box.

**STEP 1:** Disconnect ALL power sources. Unscrew the Motor Starter Box Cover and remove.

**WARNING: READ THE MANUFACTURERS DOCUMENTATION THAT WAS PROVIDED INSIDE THE MOTOR STARTER BOX BEFORE PROCEEDING WITH THIS SETUP!**

**STEP 2:** Remove the appropriate knockout holes from the outside of the Motor Starter Box according to where you desire the cables to enter the box.

**STEP 3:** Connect the AC Power (220 or 440VAC) to L1, L2, and L3 as specified on the Motor Starter Box. (**PICTURE 2**)

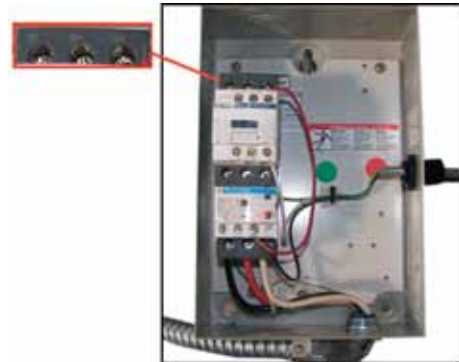
**STEP 4:** Connect the machine end of the vacuum signal connector, behind the front control panel of the RG+ Servo Box 3 (also highlighted in **PICTURE 4**), to the motor starter's mating connector, highlighted in **PICTURE 3**.

**STEP 5:** Connect one end of the Vacuum Hose to the manifold fitting and snake the hose out through the bottom of the machine. (**PICTURE 5** on the following page)

**PICTURE 1**



**PICTURE 2**



**PICTURE 3**



**PICTURE 4**



**STEP 6:** Connect the other end of the vacuum hose to the Vacuum Pump/Blower filter. (PICTURE 6)  
Engage power and test run the Pump/Blower.

**WARNING:** THE DIRECTION OF ROTATION IS CRITICAL. IF THE ROTATION (ARROW ON CASING OF PUMP/BLOWER) IS INCORRECT, EXCHANGE 2 PHASES. IF YOU RUN THE PUMP CONTINUOUSLY IN THE WRONG DIRECTION THE VANES WILL BE DAMAGED!

**NOTE<sup>3</sup>:** It is strongly recommended that all 220 and 440 VAC connections be connected through a power disconnect switch (PICTURE 7) for use with either CNC spindle and/or vacuum pump setups. This switch is required for safety and to meet National Electrical Codes. A licensed electrician should perform this installation.

## DEFINING THE VACUUM HOLD-DOWN WORK AREA

**NOTE<sup>1</sup>:** The Techno Vacuum Table is very effective in "holding down" parts to be routed. For this method to work well, simple procedures need to be followed.

**STEP 1:** Define the area where your workpiece will be positioned on the vacuum table.

**STEP 2:** Using the red rubber plugs, fill-in ALL the vacuum grid holed outside your defined work area, leaving the holes inside that area untouched. (PICTURE 1)

**STEP 3:** Using the black foam rubber gasketing, section (wall-off) your work area from the rest of the table. (PICTURE 2) This will create an area of concentrated vacuum, which will generate the greatest amount of vacuum "hold-down".

**NOTE<sup>2</sup>:** Holes and channels outside your work area but not activated by the vacuum valve do not need to be plugged.

PICTURE 5



PICTURE 6



PICTURE 7



PICTURE 1



PICTURE 2





**NOTE<sup>3</sup>:** DO NOT STRETCH the gasket material while inserting it into the gasket slots. This will produce tears in the gasket material causing leaks leading to the loss of vacuum and secure pieces that fly off the table surface. When joining two separate pieces of gasket material, make sure to push them together so the two pieces form a tight seal.

You can optimize your hold-down by closing off the vacuum table valves. Each valve controls two rows of extrusions.

**STEP 4:** Turn ON (valve vertical) the valves that pertain to your work area and turn OFF (valve horizontal) the ones outside of that area. This concentrates all the vacuum "hold-down" capacity to your defined work area. (PICTURE 3)

**WARNING:** Proper care should be taken to make sure that objects held down with the vacuum table are secure. There is a danger that objects can become loose and could be thrown by the action of the cutting tool. Proper safety precautions against flying debris must be taken. Safety glasses must be worn when the vacuum table is being used.

**PREVENT FIRE HAZARDS** by using the proper feeds, speeds, and tooling while operating your Techno machine. For example, setting feeds and speeds too low and/or using dull tool bits creates friction at the material. The friction generates heat which can result in a fire that can be drawn through the vacuum table without you knowing it. Be very careful when cutting composite material, especially wood composites like MDF and Particleboard.

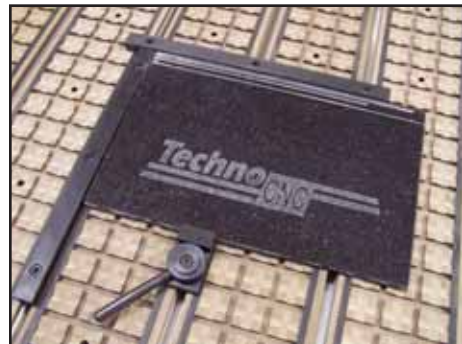
**"DON'T LET THIS HAPPEN  
TO YOUR MACHINE!"**



PICTURE 3



PICTURE 4





## VIII. SCALE FACTOR INTERFACE SETUP

**STEP 1:** Start the Techno CNC Interface.

**STEP 2:** From the Main Menu click on the Setup Button.  
 See **SCREEN CAPTURE 1**.

**STEP 3:** Click on System in the Setup screen's menu list.  
 See **SCREEN CAPTURE 2**.

**NOTE<sup>1</sup>:** The Setup/System screen will appear.

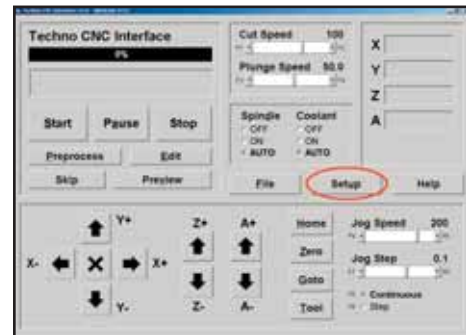
**STEP 4:** Input the numbers printed on the Scale Factor Sticker located on the front leg of the machine.

**NOTE<sup>2</sup>:** See the circled section in **SCREEN CAPTURE 2**. Make sure to type the numbers exactly how they appear on the sticker including any negative values. (I.e. -20320)

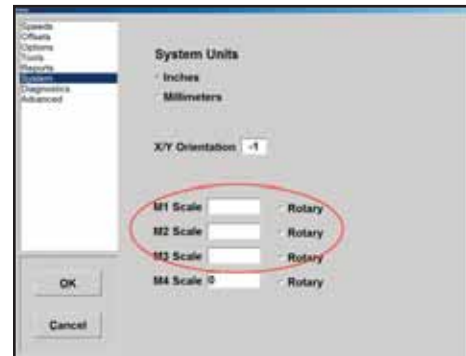
**STEP 5:** Click the OK Button in the Setup/System screen to save the changes made.

**NOTE<sup>3</sup>:** If the values are not written on the front leg of your TECHNO CNC ROUTER then the interface default values should apply.

**SCREEN CAPTURE 1**



**SCREEN CAPTURE 2**



**APPENDIX A - TECHNO ELECTRONICS**

**WARNING:** Make sure to match the correct PCI Card with the corresponding Techno Electronics. Mixing the Interface Card with the MP/HP Electronics, or using the Controller Card with the LP Electronics may cause damage to the Electronics, the PCI Card and your computer.

**CONTROL BOXES**

**1 - LP (LC) ELECTRONICS**

LP or "LC", Electronics are standard on the Servo Lathes (Metal and Wood), Servo DaVinci Series, and standard LC Series machines. This does not include the speed upgrade LC Series machines. They can also be used on Gantry III Tabletop Series machines and as a stand alone product.

**2 - MP ELECTRONICS**

MP Electronics are sometimes referred to as Servo Box 2 (H26T56-SRVBOX2). These may ship with Gantry III Systems, check the router spec. sheet for details.

**3 - HP ELECTRONICS**

HP Electronics are the high-power, speed upgrade electronics. They are sometimes referred to as Servo Box 3 or RG+ Servo Box 3 (H26T56-SRVBOX3).

**4 - CNC CONTROL TOWER**

The HP Electronics Box components are located within the Techno CNC Control Tower, which comes standard with a Premium Class machine.

**PCI CARDS**

**5 - PCI INTERFACE CARD (5.75" h)**

This card works with:

- LP (LC) Electronics
- CNC Lathes (Metal & Wood)
- Servo DaVinci
- Gantry III Systems

**6 - THE PCI CONTROLLER CARD (9.25" h)**

This card works with:

- MP Electronics
- HP Electronics
- Premium Class Electronics
- LC Speed Upgrades
- Some Gantry III Systems



**APPENDIX B - COLLETING GUIDELINES**

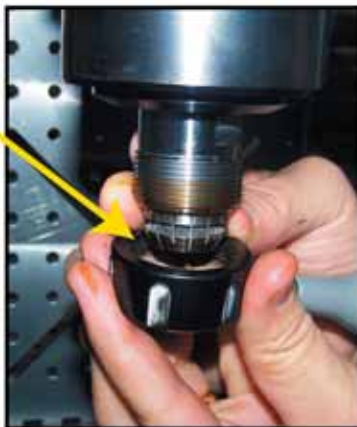
**COLLETING GUIDELINES**  
**WRONG!**



This picture shows an improper assembly. Notice the gap and angle of the collet in relation to the nut. The collet is not flush to the end of the collet nut. Correct this assembly before using.

**DO NOT  
 PUSH THE  
 COLLET  
 INTO THE  
 SPINDLE AT  
 ANY TIME!**

Only the proper assembly should be screwed onto the spindle.



**THE SPINDLE WILL BE DAMAGED IF  
 UNBALANCED EQUIPMENT IS USED!**

**RIGHT!**



The picture above is how your collet nut assembly should look: the end of the collet is flush with the bottom surface of the collet nut. You will hear and feel a "SNAP" as the collet properly goes into the collet nut. Once it is assembled, then "SCREW" the nut onto the threaded spindle end.

**FOR TOOLCHANGE  
 AND FIXED COLLET  
 SPINDLES:**

**ONLY USE TOOLHOLDERS,  
 COLLET NUTS AND TOOLS  
 THAT ARE BALANCED TO  
 MEET OR EXCEED THE MAX  
 RATED SPEED OF  
 THE SPINDLE.**



**APPENDIX C - LUBRICATION SPECS.**

**LUBRICATION SPECS. FOR LC / LCP / LCX SERIES MACHINES**

| <u>AVAILABLE ACCESSORIES</u> |                           |                 |
|------------------------------|---------------------------|-----------------|
| TECHNO ISEL LUBE KIT         | PART NO.: H90Z00-LUBEKIT3 | PRICE: \$75.00  |
| THK LUBE KIT                 | PART NO.: H90Z00-LUBEKIT4 | PRICE: \$105.00 |

**Y-Axis (Long Axis) – THK Products**

**Grease:** Lithium-based grease (JIS NO. 2) or Urea-based Grease (JIS No. 2), such as AFB Grease (THK), Alvania Grease No. 2 (Shell), Daphne Eponex Grease No. 2 (Idemitsu Kosan) or equivalent.

**Oil:** Sliding surface oil or turbine oil (ISOVG32-68), such as Super Multi 32 to 68 (Idemitsu Kosan), Vactra No. 2S (Mobile), DT Oil (Mobile), Tonner Oil (Showa Shell or equivalent).

| <b>TABLE 1 - THK</b> |           |      |          |
|----------------------|-----------|------|----------|
|                      | BALLSCREW | RAIL | CARRIAGE |
| GREASE               | √         | √    | √        |
| OIL                  | √         | √    |          |

**Note:** On some items you can use either the grease or oil.

**X and Z-Axes – ISEL Products**

**Grease:** Alvania-1, -2, -3 (Shell) for light, med. and heavy-duty apps, respectively.

**Oil:** Renolin CLP 100 (Part No. 299020).

| <b>TABLE 2 - ISEL</b> |           |      |          |
|-----------------------|-----------|------|----------|
|                       | BALLSCREW | RAIL | CARRIAGE |
| GREASE                | √         |      | √        |
| OIL                   |           | √    | √        |

**Note:** On some items you can use either the grease or oil.



**APPENDIX C - LUBRICATION SPECS cont.  
 LC/LCP/LCX SERIES LUBRICATION MAINTENANCE**

For regular work loads, machine maintenance is required at least once a month. The machine should also be lubricated once it is received.

**WARNING:** Before inserting any object into them machine, press the E-Stop Button. DO NOT use WD-40 or silicon spray on the machine, it may damage the drive components.

Use the Grease and Oil Recommendations listed on the previous page, paying close attentions to what grease and/or oil must be used. It is different for the three axes.

**LONG AXIS (Y) - THK BALL SCREW**

1. Clean the ball screw with a dry rag removing old grease and debris that may have collected.
2. Apply grease (See Table 1) on the ball screw and run the machine back and forth several times to spread the grease out. By applying the grease and running the axis back and forth, small particles that may have collected in the ball nut may be flushed out. Repeat Steps 1 and 2 again. **(PICTURE 1)**

**THK CARRIAGES AND RAILS:**

By THK specifications indicated that a small amount of grease needs to be applied to the rails after 4 months of use. PICTURE X indicated the location of a grease fitting. There are 4 bearing carriages total, 2 on the left and 2 on the right. **(PICTURE 2)**

**GANTRY (X AND Z AXES) - BALL SCREWS AND RAILS**

1. Remove black end caps at the top and bottom of Z-axis and both ends of (X-axis) Gantry, there are 4 spots per axis. See alternate lubrication instructions (1B, 2B) for nylon wipes below. **(PICTURE 3 - GANTRY)**
2. Jog the axis to end of travel or until lube point is visible. Using the a grease gun, insert a small amount of grease (see TABLE 2). This lube point greases both the bearing and ball screw simultaneously. Run the machine back and forth 1/2 dozen times. **(PICTURE 3A - Z-AXIS)**

If you can not reach the lube points then you can apply grease and oil (see TABLE 2) through the nylon wipes.

- 1B. Apply oil to an acid brush. Spread apart the rubber guards and brush oil onto the rails. When applying oil to the rail behind the ball screw, it may be necessary to bend the acid brush to reach the rails. **(PICTURE 4)**
- 2B. Apply grease to a second acid brush or your finger and apply grease to the ball screw.

**PICTURE 1**



**PICTURE 2**



**PICTURE 3**



**PICTURE 3A**



**PICTURE 4**



**APPENDIX D - ADDITIONAL RESOURCES**

|  |                |
|--|----------------|
| <b>Techno CNC Servo GCode Interface Manual</b>             | <b>HTM0325</b> |
| <b>Terms and Conditions</b>                                | <b>HTT0345</b> |
| <b>Feeds and Speeds</b>                                    | <b>HTT0335</b> |
| <b>Limited Warranty</b>                                    | <b>HTT0324</b> |
| <b>Techno CNC Servo GCODE Interface Beginner Tutorials</b> | <b>HTT0313</b> |
| <b>LC Reindication</b>                                     | <b>HTT0326</b> |
| <b>ATC Spindle Sheet for LC-RG</b>                         | <b>HTT0322</b> |
| <b>LC ATC Retrofit 012407</b>                              | <b>HTT0400</b> |
| <b>Safety Slide Test and Adjustments</b>                   | <b>HTT0298</b> |

**CUSTOMER SUPPORT WEBSITE**

<http://support.technocnc.com/>

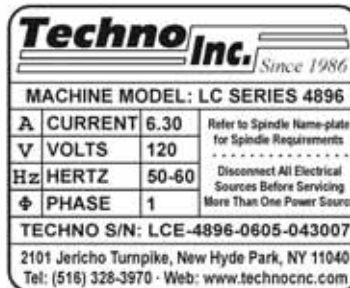
*Visit this site for software updates and the Tech-Support Wizard.  
 This Wizard is password protected for our customers.*

**Username:** technocnc

**Password:** multiaxis

**MACHINE SERIAL NUMBERS**

There are *two* machine serial number labels on your machine. The larger label is located on your control box and contains the Serial Number with Machine Voltage Information. The second smaller label contains the machine serial number identical to the larger label and is located on the front base of the machine under the table top extrusion. Examples of both are pictured to the right. Record the serial number and have readily available when contacting Techno.



**TO REORDER VACUUM SUPPLIES:  
 Call Techno Today at: 516-328-3970**

| <u>ITEM</u>           | <u>PART NUMBER</u> |
|-----------------------|--------------------|
| Rubber Plugs          | H91X30-PL006-001   |
| Foam Rubber Gasketing | HX4892-W0002       |



**TO ORDER CNC TOOLING ROUTER BITS:**

Ray Jakas, Tooling Sales Manager  
 516-328-3970 ext. 163

[tooling@technocnc.com](mailto:tooling@technocnc.com) · [www.technocnc.com/tooling/](http://www.technocnc.com/tooling/)