VWC China 6040z CNC OPERATING CHECKLIST

Step 1: Set Up the Machine

1. ☐   Remove the cover, the front and right panels, and attach the vacuum hose.
2. ☐   Turn on the computer (on top of CPU) and the monitor.
3. ☐   Log In – **(password -   )**
4. ☐   Click the **Mach3** icon.
5. ☐   Accept all choices as is. Click Okay
6. ☐ Read and analyze any warning messages but disregard the virus warnings. This computer is not online.
7. ☐   Put your thumb drive into the USB port.
8. ☐   Windows will display your thumb drive directories.
9. ☐   Find your G-Code file(s).
10. ☐   **Copy and Paste** your files to the Desktop folder **G-Code.** You may now remove your thumb drive.
11. ☐   Use the **Load G-Code** button to load your first toolpath from the PC hard drive.
12. ☐   Activate the **G-Code window**. Click anywhere in the green area on the **G-Code window**. It will change to a lighter green and will allow you to scroll down.
13. ☐   **Check the G-Code.** Scroll down to check that the G-Code is the correct one by, at a minimum, confirming that the file name and date are the correct file and by checking size and type of tool, Speed (S), Feed Rate (F}, and inches (G20). Use your Job Sheet to confirm the correct information. Always **Regen Toolpath** after moving around in the **G-Code window**.
14. ☐   Check that BOTH Round **E-STOPS (red knobs)** are **OUT**. One is on the controller - inside the cabinet and one is below and to the right of the keyboard. Twist the controller E-STOP to release it. Pull the operator station E-STOP to release it.
15. ☐ Turn on the controller. First the **Red** then the **Green** switch. Wait 5 seconds to make sure the DRO (digital read out) zeros out. (I is ON/ 0 is OFF)
16. ☐   Turn on the water cooling unit.   Switch is on the unit located below the keyboard**.**
17. ☐   Make sure the table and spindle are clear.
18. ☐   Move the X,Y axes to approx. 1.5" of their home limits, move Z axis to approx. 0.75" of it's upper limit.
19. ☐   Press the **Ref All Home.** Allow it to complete its moves. **Mach Coord's** (Machine Coordinates) should be 7,5,-1. **Work Coord's** (Work Coordinates) should be 0,0,-1. **Mach Coord's** DRO should be set to **Work Coord's**. **Soft limits** should be on.
20. ☐   Click on the **Display Mode** button to display **Table** mode. Click **Regen Toolpath**. You should see your toolpath as located on the table. If any portion of the toolpath is outside the table either move your part to compensate for its location – followed by **Regen Toolpath**, or see a team leader to Reference the Machine Coordinates.

Step 2: Mount Your Material on the Table

1. ☐ Check to see if the red **Reset** button is flashing. If it is, click on it to reset. It is located in the lower left of the screen.
2. ☐ Move the spindle to a Safe Location.
3. ☐ **Secure your material to the table.** (Attach your material to the spoil board if necessary).
     a. __ Decide the best location for clamps.
     b. __ Loosely clamp down (use small wooden blocks as needed) and square your project to the table using the combination square in the drawer.
     c. __ Make sure the clamps do not interfere with the spindle operation or the gantry!
     d. __ Tighten clamps.

Step 3: Install Your Tool and Set your <u>Material</u> Home X/Y/Z

1. ☐ **Select your first tool, nut and collet.** (Avoid end mills to ensure X,Y=0 accuracy)
     a. __ Get out the box of collects and collet nuts.
     b. __ Make sure the nut and collet are free of any sawdust inside.
     c. __ Place the wood pad (from under the keyboard) under the spindle to make sure the tool doesn't fall and hit the table and/or damage the bit.
2. ☐   **Put the collet inside the nut and push it until it clicks in! Thread nut onto the spindle.**
3. ☐ **Install tool/bit into the collet.**
     a. __ Select your tool/bit from the tool tray that is located under the keyboard.
     b. __ You may want to sit on a stool so you are at eye level to the collet.
     c. __ Use your finger to hold the bit in the collet to keep the bit from falling out.
     d. __ Hand tighten.
4. ☐ **Dime out the tool!** Your tool/bit needs to be lowered down to a coin's thickness above the table. This ensures that the bit will never be able to cut into the table.
     a. __ Set a coin on the bed of the machine, directly under the tool.
     b. __ Lower the spindle (-Z). **The spindle will stop automatically when it reaches end of travel**. The bit may contact the coin and this is okay as long the collet is only hand-tightened. It will seat the bit up into the collect.
     c. __ **Watch the DRO until the numbers stop changing.**
     d. __ Finish tightening the tool with both wrenches. Righty tighty, lefty loosey.
     e. __ Move the spindle up and away.
5. ☐ **Set the X,Y=0 location on your material.**
     a. __ Move the bit until it sits at the exact location you defined as the X,Y=0 on your material. Press **Tab** for the **MPG mode** (**M**anual **P**ulse **G**enerator) to fine tune the router. **DO NOT adjust the knobs on the stepper motors.** Press TAB to remove the **MPG**. Seek help to explain how to use the **Cycle Jog Step** and the **Jog Mode** on the **MPG screen**.
     b. __ Click **Zero X** then **Zero Y** to set material HOME.
     c. __ Move the spindle up and away from zero.

6. ☐ **Set Z=0.** You may use a piece of paper (steps a. and b.) or the touch-off puck (steps c. thru g.).
   - a. ___ Lower the bit to just above the top of the work piece. Place a piece of paper on top of the work piece. Lower the bit with the **MPG screen** until the bit just touches the paper.
   - b. ___ Once Z height is set, click **Zero Z** button to set **Z=0**. Move Z up and go to step 7.
     - **- OR -**
   - c. ___ Using the touch-off puck, move the bit approximately an inch above your material and place the puck under the bit.
   - d. ___ Touch the puck to the bit. The red LED beside the **Auto Tool Zero** should turn green. The **Auto Tool Zero** button is located midway under the purple Tool Information section.
   - e. ___ Steady the puck with one hand, use the other hand to click the **Auto Tool Zero** button.
   - f. ___ The tool will wait four seconds, lower until it touches the touch-off pad and raise 0.2500". The DRO will read 1.000". (The puck thickness is 0.750".)
   - g. ___ Z=0 is now set. **Do not** manually press the **Zero Z** button.
7. ☐ Move the spindle up and away.
8. ☐ Click on **Go To Zero** to test home position. Spindle should go to your **XYZ** <u>Material</u> Home position.

Step 4: View the Simulation

1. ☐ Click **Regen Toolpath.** This is located under the Table Display window.
2. ☐ **View the Simulation.**
   - a. ___ Click anywhere in the green screen to activate.
   - b. ___ Use the scroll bar to the right on the screen to scroll down and watch the toolpath as it moves in the Display window on the right. Make sure it is moving as you designed it to move.
   - c. ___ Scroll the wheel to zoom, hold both mouse buttons to pan.
3. ☐ **Regen Toolpath** again**.** (Always **Regen Toolpath** if you've scrolled up or down in the G-Code display)

Step 5: Start the Job

4. ☐ **Gently put on the wood dust skirt. DO NOT TWIST IT.** It is held by magnets, keep skirt metal ring flat.
5. ☐ Retest GO TO ZERO (optional)
6. ☐ **Move the spindle Up and Away** so the machine has to travel to X,Y,Z=0 to begin machining.
7. ☐ **Turn the Vacuum on.**
8. ☐ Click the green **Cycle Start** button under the left screen and hover the mouse over the **Reset** button while the router is in operation.

To Change a tool Between Toolpaths

1. __ Bring the spindle forward and up so you can get to the tool easily. Remove skirt.
2. __ Use wrenches to remove tool (wrenches will be pulled together to remove tool).
3. __ Install new tool and hand tighten.
4. __ Put last tool away.
5. __ Dime out the tool. (See Step 3, line 4 above)
6. __ Set **Z=0** again. (See Step 3, line 6 above)
7. __ Move spindle Up and Away from X, Y, Z=0.
8. __ **Close G-Code, Load new G-Code**, find new toolpath and click on it. Check the G-Code, Check the simulation and **Regen Toolpath**
9. __ Click **Go To Zero** button. Spindle should move to your **XYZ** <u>Material</u> Home position.
10. __ Go to Step 5 to continue your project.

Step 6: Ending the Session

1. ☐ Place spindle in a save location.
2. ☐ Use vacuum to remove chips from material.
3. ☐ Turn off vacuum**.**
4. ☐ **Remove tool.**
   a. __ Move spindle closer to you and put the wood pad under the tool.
   b. __ Remove tool, collet, and collet nut.
   c. __ Clean/inspect collet nut for any debris and put away (use air hose if necessary)
   d. __ Clean the spindle shaft internal taper (use cloth/finger).
5. ☐ Remove clamps and material and put away the clamps.
6. ☐ Move the gantry to the center of the bed.
7. ☐ Click **Close G-Code** screen button.
8. ☐ Delete your **G-Code** from the **Desktop/G-Code folder** using Windows File Manager.
9. ☐ Turn off Water Cooling Unit.
10. ☐ Turn off both the green and red controller switches.
11. ☐ Close out /Exit from the Mach3 Program. Answer **No** to Fixture Save.
12. ☐ Shut down Windows Program.
13. ☐ Turn off monitor. Wait until CPU has completely shut down.
14. ☐ Make sure all tools and supplies are put away.
15. ☐ Vacuum the floor around the machine.
16. ☐ Return the dust collector hose to its storage position.
17. ☐ Put doors back on and cover the machine.

*find icon lower right corner