EBF Checklist - Long

Prior to Turning On the EBF

- ☐ Check the oil in the vacuum pump through the sight glass on back of the unit. Use your phone to take a photo.
- ☐ Check dust collector bags outside and make sure they are not all full. Change if necessary.
- ☐ Move the control cabinet into the red taped area on the floor to be clear of the machine and the metal shop door
- ☐ Make sure that the large air compressor outside is on.
    - Press the green button on the electrical box to the right as you're facing the EBF machine. Check that the timer control is set to the right time.
    - Make sure that compressed air is supplied to the table. Connection is on the front lower left corner of the machine near the floor. The regulator is on the wall to the left of the machine and should read at least 70PSI. If the compressed air is not supplied to the machine, it won't pickup tools.
- ☐ Load cutters/endmills into the tool holders and tool holders into the correct slots.
    - Check and clean any debris out of the collet and tool holder before loading tools. The images to the right show collets in a bad state and need to be cleaned out.
    - The tool slots are numbered 1-8 left to right. This can be done
    - at any time prior to setting tool heights.

- ☐ OPTIONAL - Adjust the dust hood in the event you are using a very long endmill. This is done via the allen head screws on the side of the spindle housing. Adjust them back when your project is complete.
- ☐ If you are using the vacuum table (which is almost always the case), move rubber gasket material to the correct positions for the piece you will be vacuum holding to the table.
- ☐ Check that the dust collection blast gate for the CNC is open. If you are standing in front of the machine, it is above you and it has red paint on it. You will need a long piece of material to reach the gate to open/close it. Close other blast gates in the shop that aren't being used.

Turning Machines On

- ☐ Turn on the EBF on the main circuit breaker in the metal shop.
- ☐ Turn on the local power disconnect via the big red lever to the left of the machine.
- ☐ Make sure the rotary switch on back of the control cabinet is to 'Marche'
- ☐ Turn on the control cabinet power - black switch on left side of the control cabinet.
- ☐ Open the cabinet and push the power button on the computer.

Setting Up To Cut

- ☐ Launch WinCNC
- ☐ Make sure nothing is in the way of the machine's movement either on or next to the machine.
- ☐ Press "Home" on WinCNC
- ☐ Type "G90" into the text input window in WinCNC. This will set the machine to use absolute coordinates in case someone else has used the machine and set it to use relative coordinates.
- ☐ Once the machine is homed, press the "Set X0 Y0 Z0" button OR manually input a "G92 X0 Y0 Z0" command on the machine. This sets the initial 0,0,0 position.
- ☐ Move the spindle out of the way so that you can position your spoil board/fixture. Use the arrow keys on WinCNC, the arrow keys on the keyboard, OR issue a G00 with coordinates command.
- ☐ Position your spoilboard/fixture.
    - ☐ If using the machine pins for positioning
        - Be sure fixtures and spoil boards are clear of the pins.
        - Click "Pins Up" in WinCNC.
        - Position spoilboard/fixturing surface against side and front pins
    - ☐ If not using the machine pins, position spoil board/fixture as needed on the table.
- ☐ Position your material on your spoil board/fixture. This will be either with vacuum hold down, screws, or a fixturing table, depending on how you will secure your work piece.
- ☐ OPTIONAL - Load your saved tool table into WinCNC. This step is for people who bring their own toolholders with tools already installed and with known stick out lengths.
- ☐ Touch-off each tool.
    - ☐ Place the touch-off button on the machine base (aluminum) on the side of the machine - the spot is marked. Load each tool one by one (T#) and move tool to touch-off position using the button "Move to X2 Y17" OR issuing the command "G00 X2 Y17" and then click the "Set Tool Z" button on the WinCNC screen. Do this process for each tool using the T# command to change between tools.
- ☐ Determine the number of vacuum zones required and turn the switches to on (up) on the front of the machine. The zones are 1-4, front to back on the machine with 2 vacuum holes in the table per zone. The switches correspond to zones 1-4 from left to right.

- ☐ Cover any holes in the vacuum table that are not being used. These will be loose but will ensure that chips don't get down into the vacuum tubes.
- ☐ Turn on the vacuum by pressing the "Vacuum" button on WinCNC.
- ☐ Check the security of your spoilboard, fixture, and/or work piece.
- ☐ With your last tool (after touching off all tools) move the touch-off button to a suitable place on top of your work piece. This should be the highest point on your work surface. If your work surface is completely flat, you can set the touch-off button anywhere.
- ☐ Jog the spindle so that it is over the touch-off button, or move the button to underneath the spindle.
    - ☐ If you are using the vacuum table, make sure to turn on the vacuum before the next step. Setting the material height with the vacuum off will result in the machine thinking the top of the material is higher than it actually is and your first cutting pass either cutting air, or a more shallow cut than you would expect.
- ☐ Press the "Set Material Z" button to set the Z height. As long as you touched off all of the other tools first, the machine will now know where the top of your material is for all tools.
- ☐ Jog the spindle to where you want your material X and Y zero to be.
- ☐ OPTIONAL - Note down the X and Y coordinates before the next step. This is not mandatory but is valuable if you need to restart your project in the same place after homing the machine for some reason.
- ☐ Press the "Set Work X0 Y0" button OR issue the command "G92 X0 Y0" to set the work piece X,Y zero position.

Loading the GCode and Cutting

- ☐ Save your GCode file from your flash drive to the computer. There is a USB hub on the left side of the machine or on the front of the desktop inside the cabinet.
- ☐ Load your GCode from the computer hard drive in WinCNC. (File, Open, yourfile) but DO NOT PRESS ENTER YET! Pressing Enter will start the machine and you don't want to do that yet.
- ☐ Click the "eye" icon  which will let you preview the cut.
    - ☐ In the preview area, left click to the top left of your project (will be shown in blue) and drag a rectangle around the area of your project. This will zoom in. To zoom out, right click the mouse.
    - ☐ The small red circle shows the current position of the endmill. You can jog the machine to the edges of your project to make sure that you are going to be cutting where you expect to be cutting.
- ☐ Drop the machine pins if you raised the pins for aligning your work piece.
- ☐ As an additional safety measure, you can jog the machine away from the start position of your project. This way you have a few extra seconds between pressing start and the spindle moving to the first cutting position to stop the project if you need to.

- ☐ Press Enter - this will start the vacuum table, make the machine pickup the correct tool if it is not already loaded, drop the dust hood, and start the spindle, but the machine will not move to start cutting yet.
    - ☐ If you exported your GCode using the EBF CNC profile in VCarve, all of these things happen automatically. If you exported your GCode from other software, you need to ensure that your code includes instructions to do these things.
- ☐ Listen for or look to make sure that the spindle has started at this point.
    - ☐ If the spindle doesn't start, press the pause button twice  . The first press will start the machine moving and the second will pause it. Then press the red stop button on screen. 
    - ☐ Then reopen your GCode (File, Open, yourfile) and go through the steps in this section again.
- ☐ Once you are sure that the spindle has started, turn on the main workshop dust collector via the green button on the cabinet to the right of the EBF - same cabinet that has the air compressor button. You should have already made sure that all of the other unused dust collector blast gates in the shop are closed if they are not being used and that the gate above the machine is open.
- ☐ Press Enter to begin the project.

Post Cut

- ☐ If you exported your code using the EBF CNC profile in VCarve or added the suggested Footer code, the machine automatically stops the spindle, turns off the vacuum table, and returns the last used tool.
- ☐ If you did not use the suggested Footer
    - ☐ Wait till the spindle stops spinning before doing anything.
    - ☐ Jog the machine out of the way of your material as needed
    - ☐ Turn the vacuum off via the button in WinCNC
    - ☐ Issue the T0 command to return the last tool used
- ☐ Turn dust collection off
- ☐ Press the "Go To Parking" button to move the machine to sit over top of the parking space at the back of the machine. If you turn off the computer, the spindle will drop quickly, so the parking position has had a pad added.
- ☐ Manually lower the spindle Z height to just over the pad in the parking position.
- ☐ Exit WinCNC
- ☐ Remove your material
- ☐ Vacuum top, under and around machine
- ☐ Empty dust collection bag(s) if full
- ☐ Remove all tools and tool holders from the machine - except for the surfacing endmill stored in tool slot 8.

- ☐ Clean dust and debris out of all collets and tool holders used.
- ☐ Shut down Windows
- ☐ Turn off cabinet (black switch on left side of cabinet)
- ☐ Turn switch on the back of the cabinet to “Arrete”.
- ☐ Turn off power at the local breaker box behind the cabinet - big red lever.
- ☐ Turn off EBF breaker in the breaker box in the metal shop.
- ☐ Put the tarp back on top of the machine and move the PC cabinet back out of the way and so that the metal shop door can be opened.