

QueenBee CNC

User guide

+

Maintenance Guide



Safety precautions

Like any power tool, operating and using a CNC machine can be dangerous. Diligence must be applied when operating any machine. It is recommended to wear appropriate PPE such as eye protection and ear muffs for your own safety.

NEVER leave a powered machine unattended at any time!

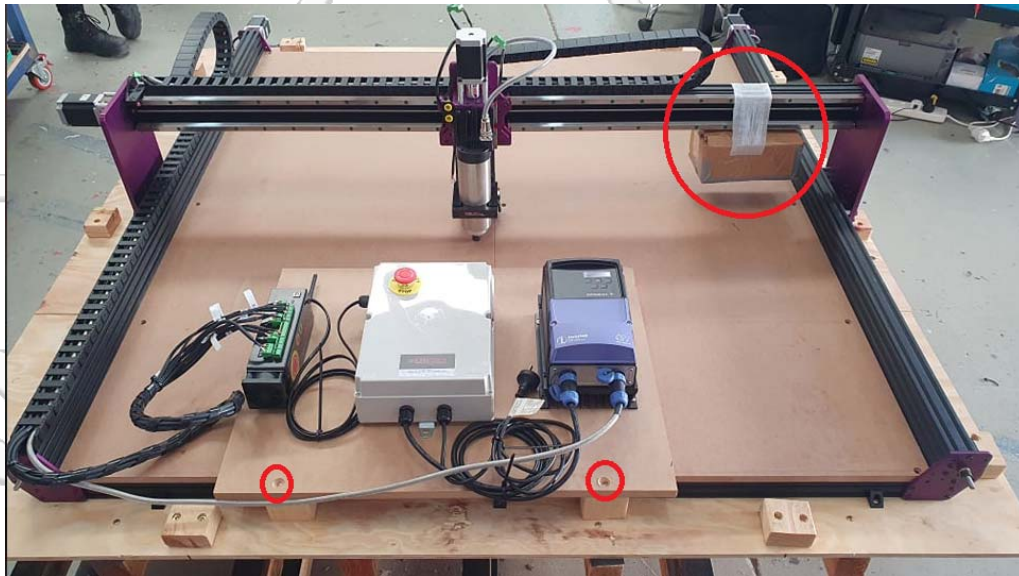
In the event of an issue or if something doesn't seem right, it is recommended to immediately disconnect power to the machine and unplug it from the wall power outlet. Contact our customer support team if you have any concerns about your machine.

Always ensure your machine is free and clear of any swarf, dust or other obstructions that may impact the motion of your machine. We highly recommend the use of a Dust shoe and vacuum system for keeping your machine clean and clear of swarf and dust.

Always ensure to follow the maintenance guide at the bottom of this manual after initial assembly and setup and also periodically to ensure your machine always performs to its optimal capacity.

Unboxing your Machine and setup

1. Unwrap your machine! **DO NOT use a knife as you may cut into cables or cause damage to parts of your machine!**
2. Once your machine is exposed you can unscrew the electronics board from the front of the crate and slide it onto the machines spoil board for easy transport to its home location bench or table. At this point you can also carefully remove the small parts accessories box that is hanging onto the Gantry. This usually contains your endmills, laser goggles, Dust shoe and other accessories you may have purchased with your machine.



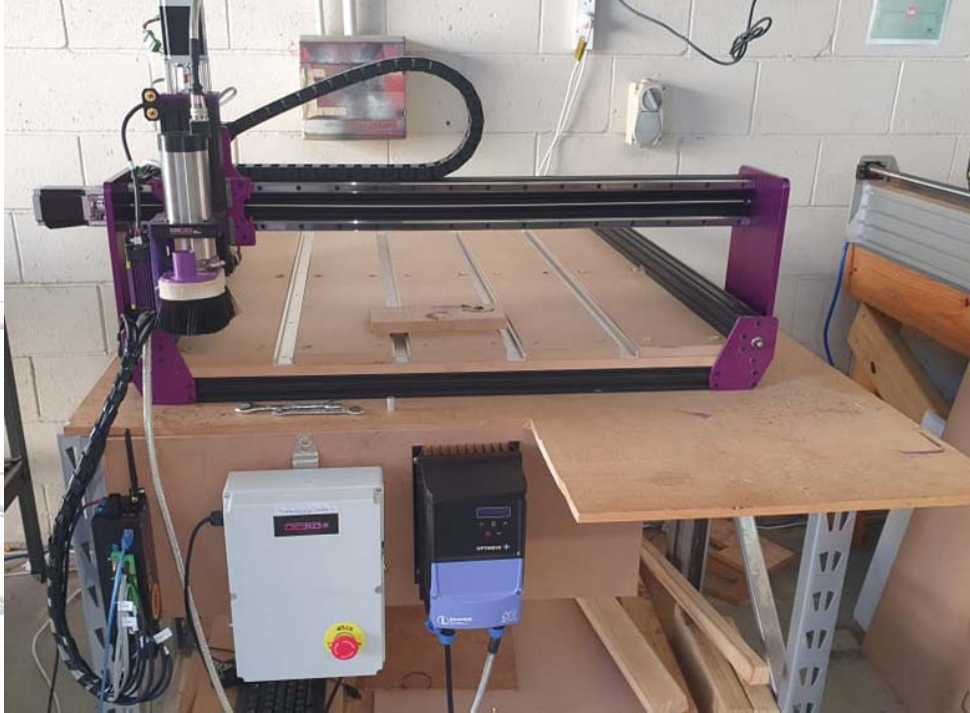
3. Now that we have everything loose it is a good idea to get a friend or 3 to help move your machine on to your table/bench. Be very careful to avoid skewing the machine while transporting it and under no circumstances should you ever grab the leadscrews. Always ensure the leadscrews are protected to avoid bending them. They control your machines movement so keeping them nice and straight and under the right tension is very important.

Some users may choose to move the entire pallet and bottom packaging onto the bench and run the machine from there. This is OK to do also. If doing this, keep the machine fastened to the pallet itself.

If you have removed the pallet and crate baseboard from the machine it is recommended to use the 6 angle brackets; 3 on front, 3 on back (that secured your machine to the pallet originally) to secure the machine down to the new bench. Start with the 3 on the rear of the machine and check squareness of your machine. If the machine is square then secure the front down.

4. Once your machine is in position it is time to find a spot for your electronics. To make it easy, you can mount the existing MDF board that has the electronics fixed to it to the front of your machines table. This will provide easy access to the VFD and E-stop. You can also choose to unmount the electronics from the MDF board and position them where you like as long as cables will reach of course. It is not recommended to power up just yet but we will shortly!

Mounting suggestion using the existing MDF electronics mounting board:



Things to check before powering on!

We're almost there! It's important to do some quick checks to ensure your machine is ready to go. Sometimes in transport, things can wiggle loose. Here are some things to check.

- ❖ Check all nuts and bolts on the machine with the exception of the locking collars holding the leadscrews. Do not adjust the leadscrew locking collars. You will need a 2mm, 2.5mm, 3mm and 4mm allen key set to check your bolts.
- ❖ Check the green connectors that connect all the wires. They should be firm and secure. Try giving each wire a slight tug in each screw terminal to make sure they are definitely secure!

PRO TIP: You can familiarize yourself and follow the maintenance guide at the bottom of these instructions to check that everything is nice and secure after the machine has been moved into its home location.

- ❖ Download and install our CNC3D Commander software if you have a Windows computer. It can be found here:

<https://www.cnc3d.com.au/commander>

Let's plug it in!

Take the single power plug lead and plug it directly into a wall socket. It is NOT recommended to run the machine from a power board. Once powered on, your Nighthawk controller fan will come on and so will the display on your VFD.

You can now either choose to connect to your machine via USB on your PC or wifi via by directly accessing the Nighthawk controllers web interface.

We highly recommend visiting the user manual for the Nighthawk controller found here:

<https://www.cnc3d.com.au/nhc>

PLEASE NOTE

Some key things with the QueenBee

Leadscrew wobble while operating

During assembly of your machine our team precisely line up your X and Y leadscrews. It is OK if your leadscrews wobble slightly when moving. The leadscrews are 8mm in diameter and quite long, especially on 1500mm axes. It relies on the locking collars to keep tension on your leadscrews. Wobble in your leadscrews is perfectly fine and will not interfere with the performance of the machine. This may also cause the machine to make a slight noise when moving. It is nothing to be concerned with. There is an exception to this rule however; if your leadscrews are whipping so badly that it strikes the inside of the machine then some tensioning of your leadscrews may be required.

Varying spacing on Delrin nut blocks

Some machines may have varied spacing on the Delrin nut blocks that drive on your lead screws. Typically, this can be 29-31mm of spacing. This variation is due to the production of the Delrin nut blocks. Some have spacing that is off centre. Our team take this into account during the assembly of your machine. If disassembling your machine for any reason please take note of the spacing of that respective side of the machine.

There are also 2 mini shims that are hidden inside of the Delrin nut blocks. Please ensure when removing delrin nut bolts that these shims are not lost. Keep them in a safe place.

Machine settings

Our trained team preconfigure every aspect of your machine prior to it being sent to you. You do not need to change any settings in your controller and definitely **DO NOT** load any profiles onto your machine within the Profiles tab of our Commander software.

By default, we set soft limits to the maximum travel limits of your X and Y axis. Whenever you first power on your machine you **MUST** home your machine. If your controller is ever in an Alarm state, you can reset it by clicking the “Unlock” button in Commander. If this fails to clear, hit the E-stop button in Commander then the unlock button.

Connecting to Your Nighthawk

There are multiple options that you can use to connect to your Nighthawk – USB, WIFI and Bluetooth.

USB

Your first instinct may be to use USB however this is the **least reliable way** to control and run your machine and it is heavily discouraged! While it's running the spindle will create lots of Electromagnetic Interference (EMI) and electrical noise which can cause the USB connection to drop out resulting in random job stoppages or irregular machine behaviour.

WiFi

The best possible way to run your QueenBee is via WiFi and connecting the machine to an existing WiFi network such as a house or factory network.

The next preferable option is WiFi – Direct Access Point Mode which allows you to connect directly to the Nighthawk instead of connecting the Nighthawk to an existing network. This will be the best option if there is no network in the area where your QueenBee is located or if you are using a mesh network/WiFi range extenders as the Nighthawk cannot connect to these networks. This works the same as connecting to a network, but the drawback is that the computer running the machine will not have access to the internet while running the machine.

Bluetooth

The third option is connecting to the Nighthawk via Bluetooth from a compatible PC or Laptop (not a smartphone!)

Bluetooth works the same as USB without the physical cable so it will eliminate the risk of EMI and unpredictable machine behaviour.

Check out this video to learn how to set up each of these connections through our Commander software

<https://www.youtube.com/watch?v=k07Qwe4IduU>

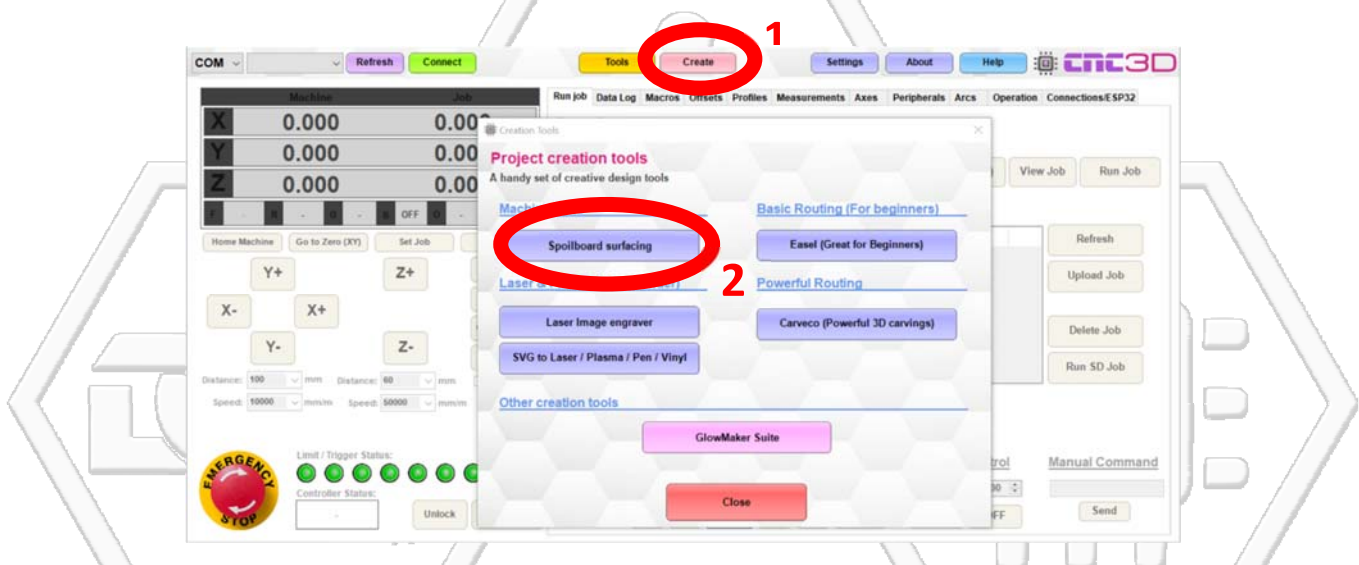
Initial setup steps once powered on

Surfacing your spoil board

It is highly recommended to surface the top of your spoil board. Surfacing the entire working area means that your tool will always be perpendicular to your cutting tool.

To do this, follow the steps below for making a rectangle the size of your actual working area.

First, connect to your Nighthawk controller and home the machine to clear the alarm. Next step is to open the Create window and select Spoilboard Surfacing.



In the Spoilboard Surfacing Generator window that has opened, there is a highlighted box with a Max Size button. When you click this button, it will insert a number into Width (X) and Length (Y). These numbers are mathematically calculated based on numbers that are saved on your Nighthawk controller and will be unique to your machine. You should not need to make any more adjustments to any of these settings.

Spoilboard surfacing generator

Setup a quick job that can be run to surface your spoilboard.

We are going to make a job to surface your spoilboard. This ensures your machine is perpendicular to your cutting tools.

Feel free repeat this process multiple times until your entire spoilboard has been surfaced within the limits of your machine. Simply lower the Z height slightly each time.

This job will move in a ZigZag raster pattern and return to job zero at the end which is set automatically at the start of the job to the current position.

TIPS:

- When using large cutters ensure they are inserted as far as possible into your router or spindle.
- It can help to apply a pencil squiggle all over your spoilboard to observe any areas that are not contacting the cutter.

Cutter Diameter: 22.000 mm
Step over: 40 %
Depth of cut: 0.5 mm
Plunge rate: 200 mm/m
Feed rate: 1000 mm/min

Max Size ? Width (X): mm/m
Length (Y): mm/m

Generate Close

When all your numbers have been entered, click Generate and save the file that it creates then close the Spoilboard Surfacing Generator and the Create window.

Running the Job

To do this you will need to home your machine. Once homed, loosen off your collet nut on your spindle and insert a 6mm collet and the 22mm surfacing bit provided with your QueenBee CNC (Spindle Option Only). Please ensure the surfacing bit is inserted quite high into the collet but not all the way in. Once in, tighten the collet nut up.

Note: Extreme force is not required to tighten your collet nut. Just make sure it is secure.

If you ordered one, attach your dust shoe and vacuum hose at this time as well.

Get a marker and squiggle some lines all over your spoil board. This will allow you to tell if the surface has been machined or not. See photo below of areas that were missed on our first pass trying to surface the spoil board.



Using the jogging buttons in Commander, put a piece of scrap paper under the surfacing bit and lower the Z down until it is just touching the paper. Ensure to reduce your downward travel distance as you get closer to the surface to ensure the machine does not crash into the spoil board.

Machine		Job	
X	0.000	0.000	
Y	0.000	0.000	
Z	0.000	0.000	

Feed: 0 mm/m Speed: 0 Buffer: 0%

Home Machine Go to Zero (XY) Set Job Zero Job

Y+ Z+ My Buttons

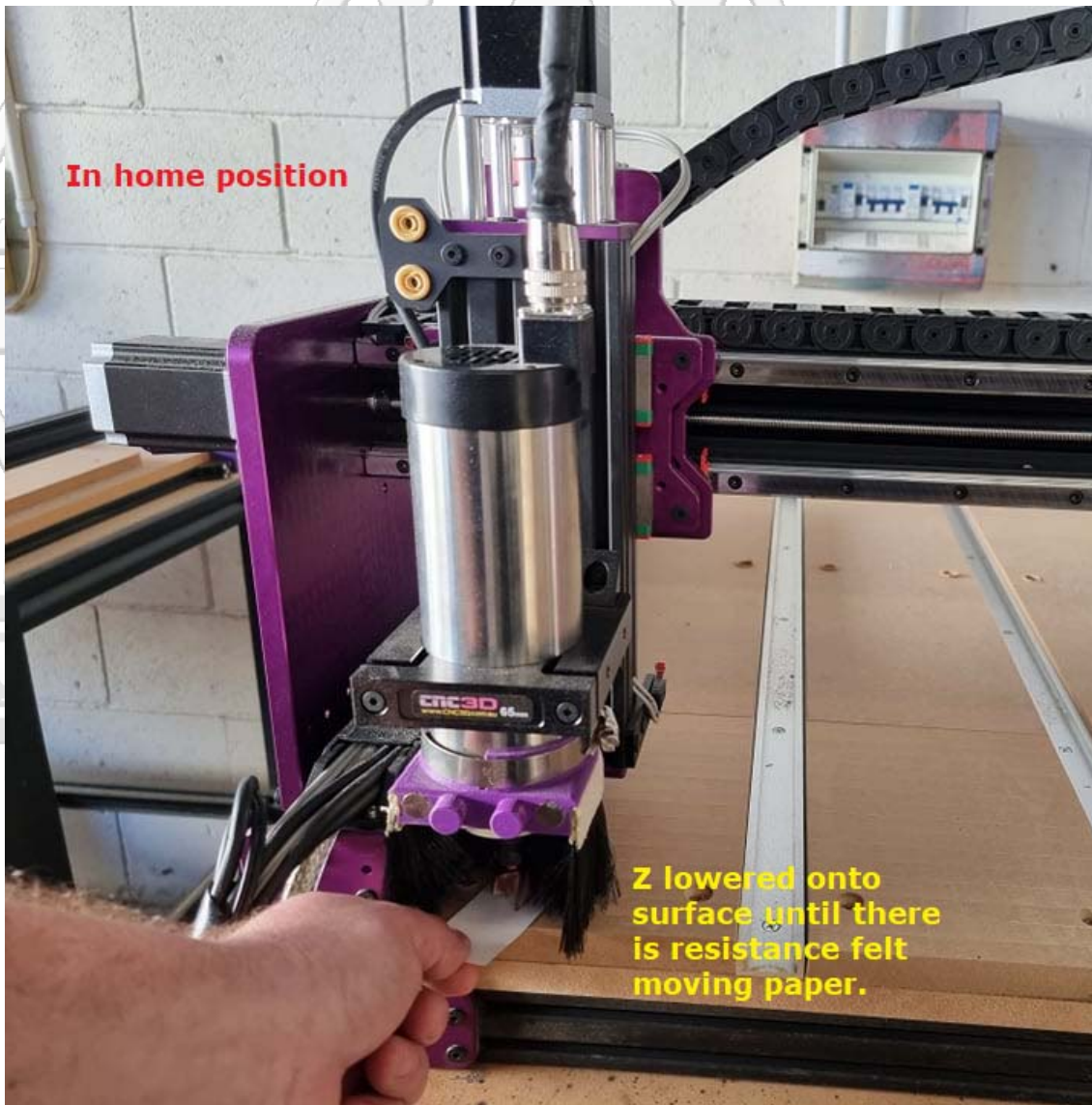
X- X+ **Lowers Z** Probing

Y- Z- Coolant Flood

Distance: 100 mm Distance: 100 mm Coolant Mist

Speed: 100 mm/m Speed: 10 mm/m **Distance**

Once you feel resistance when moving the paper around you can remove the paper and discard it.

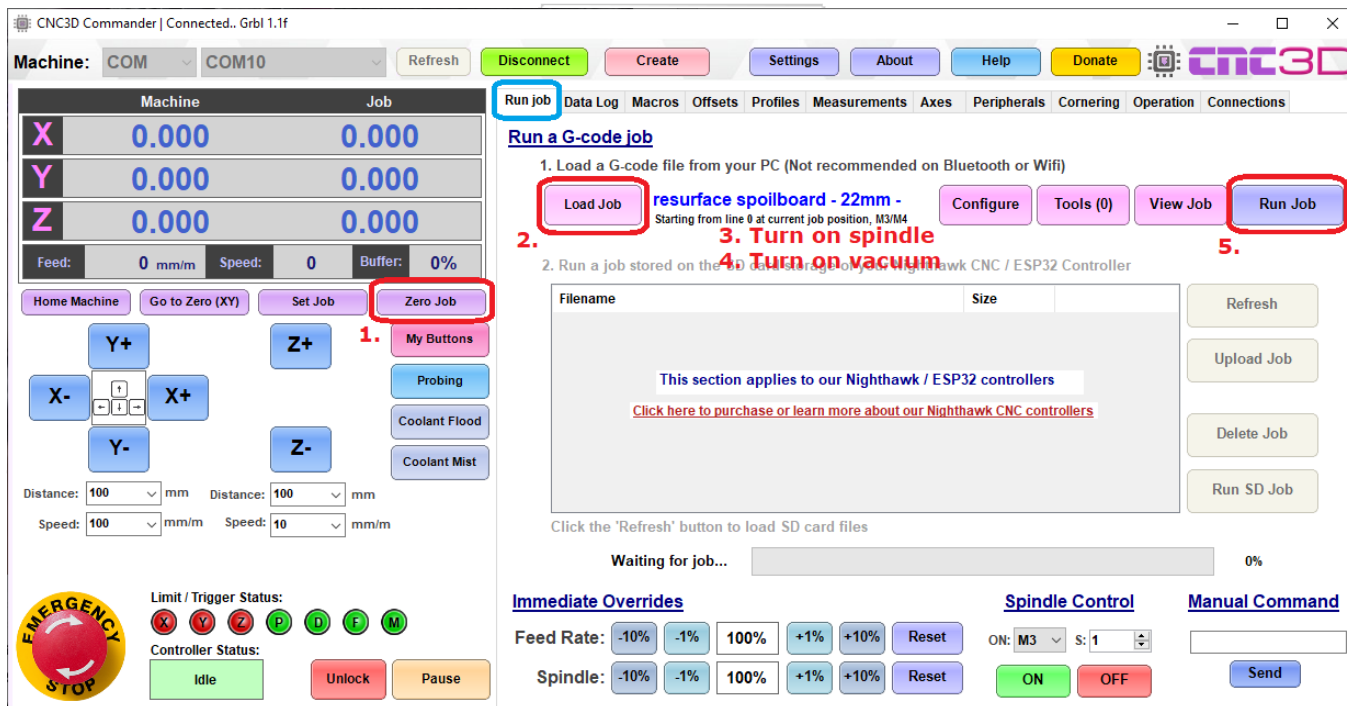


From here it is now time to upload the job and get it started!

There are two different methods depending on how you are connected to your Nighthawk. If you are connected via WiFi then please skip ahead to the next page.

If you are connected to your Nighthawk via USB or Bluetooth

Back in our Commander software, Click the “Zero job” button. Then click on Load Job and select the file you saved out of the surfacing wizard. Once loaded, hit the green run button on your VFD and wait until the spindle is up to speed. Once at speed, turn on your vacuum extraction (if attached) and hit the ‘Run Job’ button. See sequence here:



This will start the process of surfacing your spoil board. It may take a long time to complete this process. If something doesn't seem right then immediately hit the E-stop button on your control box or via our Commander software.

Note: Using the E-stop on your Nighthawk controller or via our Commander software will only stop your machine moving but will not stop your spindle. If you want to stop both the spindle and machine quickly, we recommend using the mechanical E-stop on your control box.

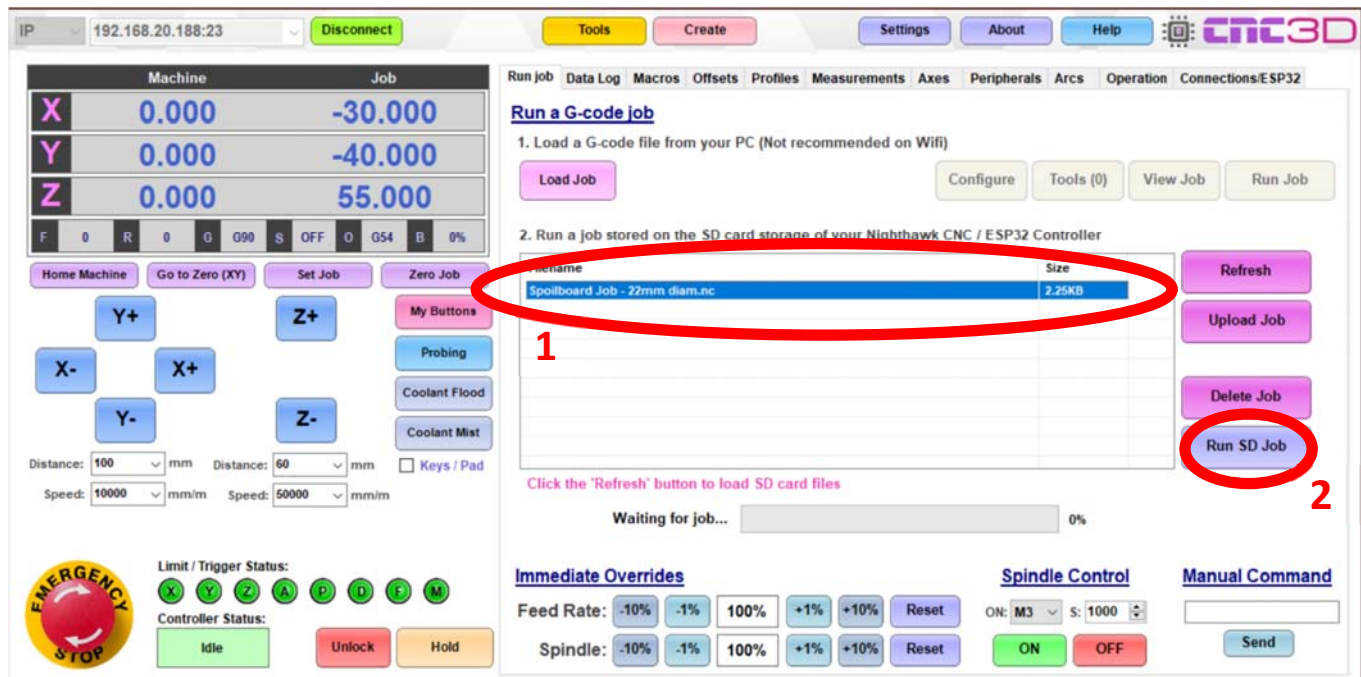
If you are connected to your Nighthawk via WiFi

Back in our Commander software, Click the “Zero job” button. Next, click on the “Upload Job” button, navigate to the location of the job file you just saved and select the correct job file, then click “Open”, this will save the job to the SD card in the Nighthawk Controller. When the upload is successful there will be a popup box to confirm which you can click OK on to close.

The screenshot displays the CNC3D Commander software interface. At the top, there's a status bar with IP address 192.168.20.188:23, a Disconnect button, and navigation buttons for Tools, Create, Settings, About, and Help. Below this is a table showing machine coordinates: X (0.000, -30.000), Y (0.000, -40.000), and Z (0.000, 55.000). The main area is titled 'Run a G-code job' and contains instructions: '1. Load a G-code file from your PC (Not recommended on Wifi)' and '2. Run a job stored on the SD card storage of your Nighthawk CNC / ESP32 Controller'. There are buttons for Load Job, Configure, Tools (0), View Job, and Run Job. On the right side, there's a vertical menu with buttons: Refresh, Upload Job (circled in red with '1'), Delete Job, and Run SD Job. An 'Open' file explorer window is overlaid, showing the path 'This PC > Desktop > CNC Files'. A file named 'Spoilboard Job - 22mm diam.nc' is selected and circled in red with '2'. The 'Open' button at the bottom of the file explorer is circled in red with '3'. The interface also includes a manual command input field and a Send button.



You're now ready to run the job! Attach your vacuum hose to the dust shoe turn on the extraction system, then turn on the spindle by pressing the Green button on the VFD. From there, all you need to do is highlight the spoilboard job in the list and click "Run SD Job"



This will start the process of surfacing your spoil board. It may take a long time to complete this process. If something doesn't seem right then immediately hit the E-stop button on your control box or via our Commander software.

Note: Using the E-stop on your Nighthawk controller or via our Commander software will only stop your machine moving but will not stop your spindle. If you want to stop both the spindle and machine quickly, we recommend using the mechanical E-stop on your control box.

Once the job is complete check to see if all the squiggles on the bed have been machined off. If not, repeat the process again 1mm lower than last time until the entire area is surfaced.

SOME GREAT NEWS!

The process we have just followed here is basically how every job will be run if streaming the job. You will be running all future jobs like this. Also keep in mind you can upload jobs to your Nighthawk controller and run them off your SD card. Saving this handy spoil board job will make it easy next time you want to freshen up your surface OR after you replace your spoil board.

Tramming your spindle

You may notice after surfacing you have some ridges in your spoil board. This is due to the spindle needing some minor adjustments to be truly “flat” with your spoil board.



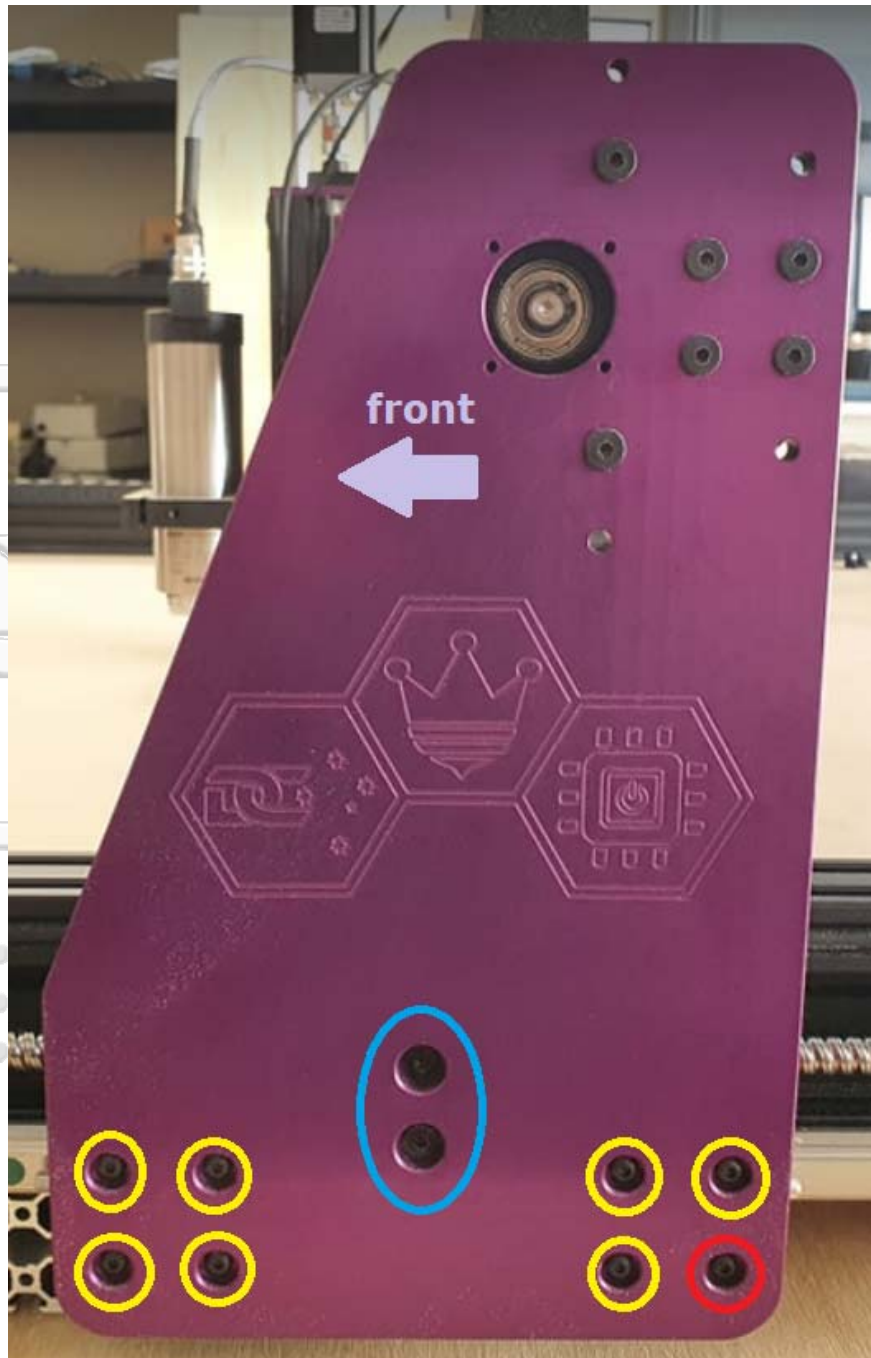
During assembly of your machine our team align your spindle and bracket using engineering squares. This is fine for general tramming but extra tramming steps can be performed to ensure you have smooth bottom results with larger cutting tools. The best way to test your tramming is to create a small rectangle job in Easel or Carbide Create or use the new Spoil board surfacing wizard in Commander’s Creation Tool section. If using the Commander spoil board wizard make a 100x100mm rectangle and insert your supplied 22mm surfacing bit and 6mm collet.

Your Z axis plate has 4 bolts that hold it to your X axis plate. These bolts can be loosened off to allow you to tilt the angle of your spindle for tramming. There is a centre locating pin between these plates to make this process easy. It is recommended to loosen off 3 of the bolts quite loosely while keeping one bolt slightly loose to allow some control when tramming. The 4 bolts are located here:



If you need to adjust your tramming front to back then we need to look at adjusting the gantry angle.

To do this, we first need to loosen off the 4 bolts that secure your lead screw. These are highlighted below in **BLUE**. Once these are loose, loosen all bearing block bolts highlighted in **YELLOW** below. With the **RED** bolt, ever so slightly loosen it. It needs to keep the gantry plate in a fixed position.



Repeat this process on the other side of the machine in the exact same pattern as the original side. This will allow us to “swing” the gantry front to back. Make slight adjustments at a time to both sides and re-secure the **RED** bolt first, then the **YELLOW**, then finally the **BLUE** bolts. Check if it is trammed correctly by cutting into your test piece. Repeat these adjustments until the test piece seems to surface quite flat with no ridges showing up as it skims the surface.

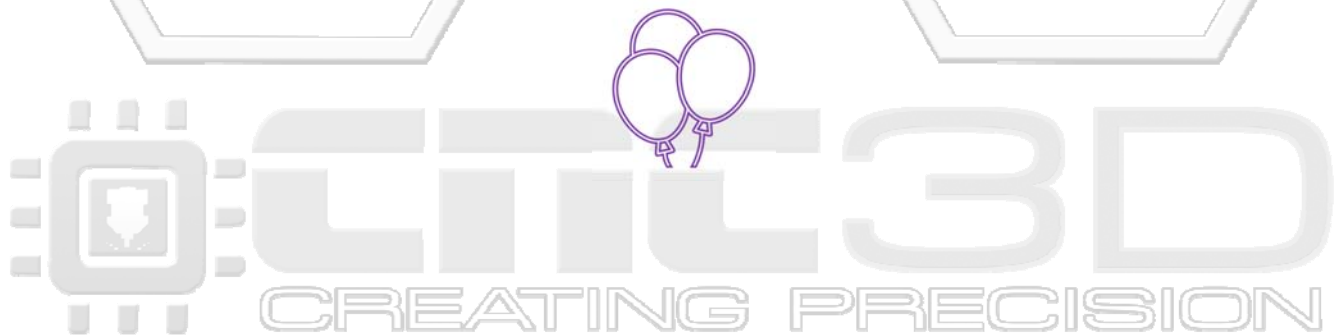
To look up more advanced methods of spindle trammng a quick YouTube search for “spindle trammng” should return a variety of results.

Repeat the process of surfacing your spoil board again until you are happy with the bottom finish of your spoil board.

To look up more advanced methods of spindle trammng a quick YouTube search for “spindle trammng” should return a variety of results.

Repeat the process of surfacing your spoil board again until you are happy with the bottom finish of your spoil board.

Your machine is now correctly set up and ready to go! It's time to start making things!



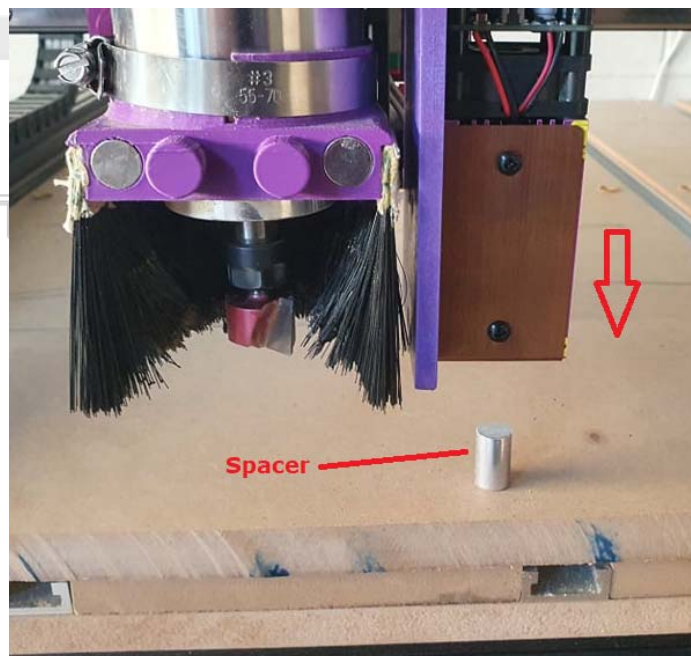
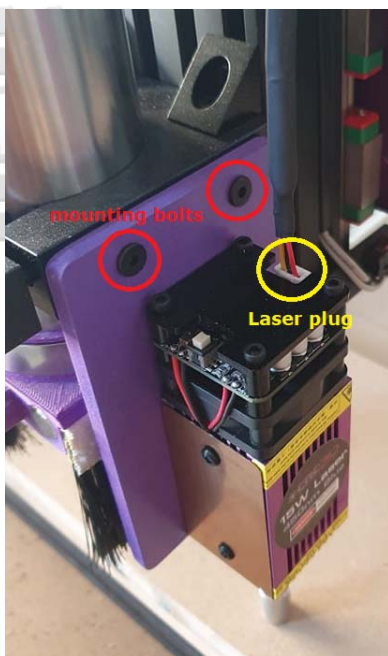
Getting started with your laser

LASER SAFETY WARNING!



Always ensure you are wearing laser safety goggles and other appropriate PPE when using any high-powered lasers. Please ensure the laser is pointing away from people and sensitive materials.

1. Raise your spindle high enough so that you can fit the laser to the side of the Right-hand side of your spindle bracket. Use the 2 bolts provided to secure it to the bracket. We always recommend fitting it to the right-hand side so you can still safely home when the laser is attached. Then connect to white laser plug to the top of the laser.
2. Once attached, Use the alloy spacer provided with your laser to set the correct focal point of the laser. To do this, position the spacer under the laser head and carefully lower your Z axis until the brass laser head is just clearing the alloy spacer. Take care not to damage the laser by crashing into the spacer!

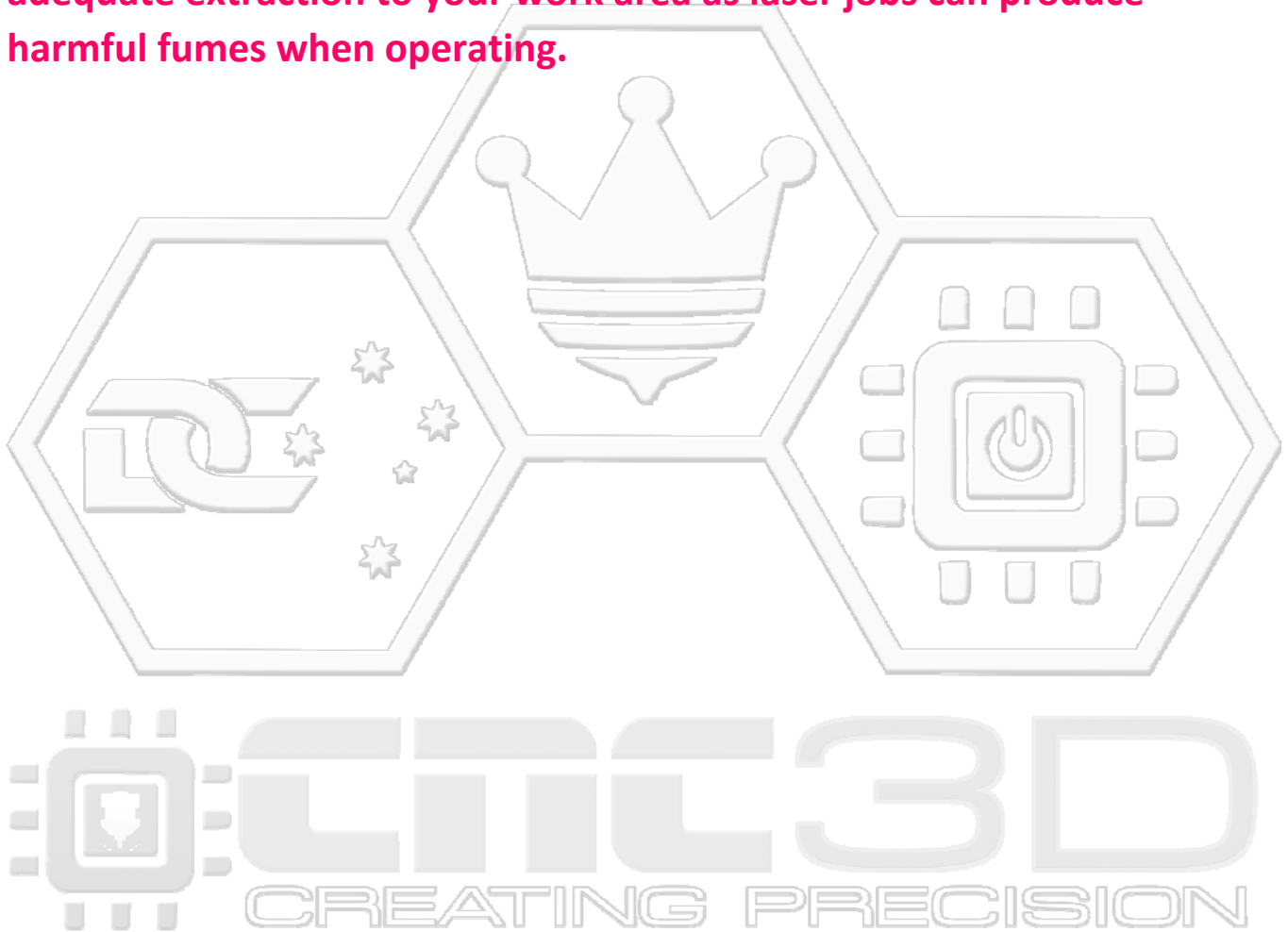


We recommend following our video guide here for using your laser:

<https://www.youtube.com/watch?v=8Syf86xmeZs&t>

Some key laser points!

Always remove your laser when using your spindle and never leave your machine unattended when using it. Also ensure you have adequate extraction to your work area as laser jobs can produce harmful fumes when operating.



QueenBee CNC Maintenance guide

It is recommended to visit this guide immediately after positioning your machine and setting it up. It is also recommended to periodically visit this guide to ensure smooth operation and a long service life of your machine or if something isn't quite right such as cuts not coming out right or Z axis depth inconsistent.

1. Check ALL of the nuts and bolts on your machine.

Visit all of the nuts and bolts on your machine. You will need a 2mm, 2.5mm, 3mm and 4mm allen keys and a small flat blade screwdriver to check every connection. Test each bolt and tighten them if they are loose. This includes the green connectors that join the wires together on your limit switches and stepper motors. This EXCLUDES the locking collars that secure the leadscrews on the X & Y axes. It is not recommended to loosen these off unless adjustments to the X & Y leadscrews need to be made.

You have been provided a tensioning tool for applying tension on leadscrews but only if needed.

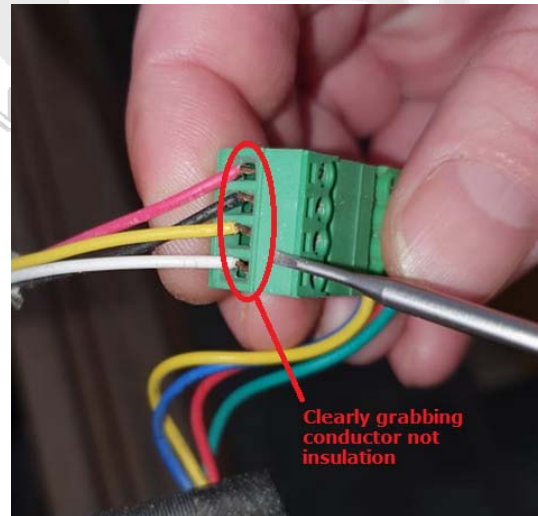
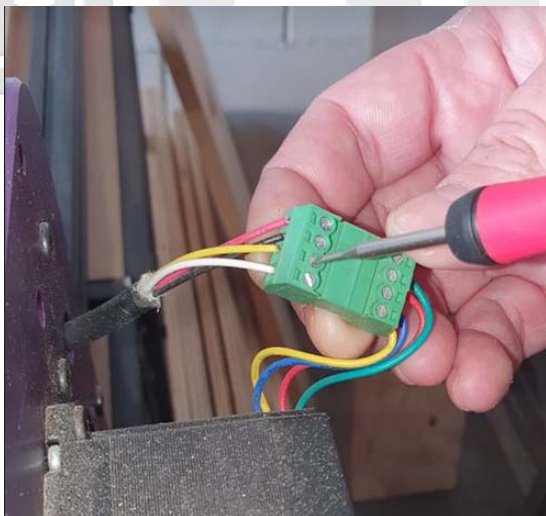
IMPORTANT: When tightening any allen key bolts it is recommended to use a solid allen key end NOT any ball end side of an allen key or you run the risk of stripping the bolt heads.

It is important to ensure your machine frame stays square. Use a tape measure or ruler to make sure both sides of the machine are equal distance from the front. To do this, measure from the gantry side plate to the front plate. Repeat the same process on the other side of the machine and record the results. If one side is more than 1mm out from the other side you need to manual turn the lead screw on one side of the machine until it is within 1mm of the other side. You can look at repeating this simple process daily or every 1-2 weeks. The more frequently it is performed, the better your machine will operate.



Checking connectors

Check every green connector and its screw terminals with a small flat head screwdriver and ensure they are tight and secure and make sure you are grabbing the conductor of the wire and NOT the insulation. Give wires a tug to ensure they are secure.



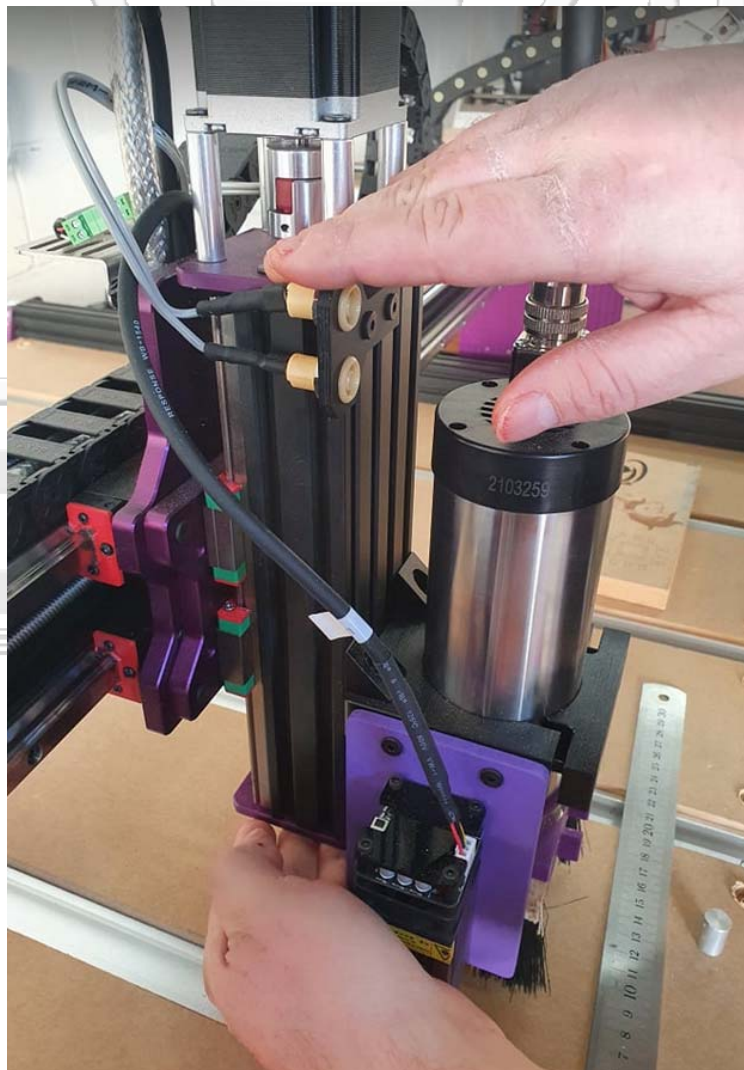
Checking your axes are working as expected

Z axis lead screw and Delrin nut block maintenance and checking

There is an 8mm leadscrew that controls your Z axis motion up and down. It is held captive on the Z axis by 2 locking collars and 2 radial bearings with 8mm shims in between (One on each end). The Z motor is coupled directly to the leadscrew via a motor coupler.

Try grabbing your Z axis with your hands and try to move it up and down. If it feels like it's slipping and rocks up and down then you may need to tighten your locking collars and reposition them.

NOTE: The supplied tensioning tool is not required to do the Z axis!

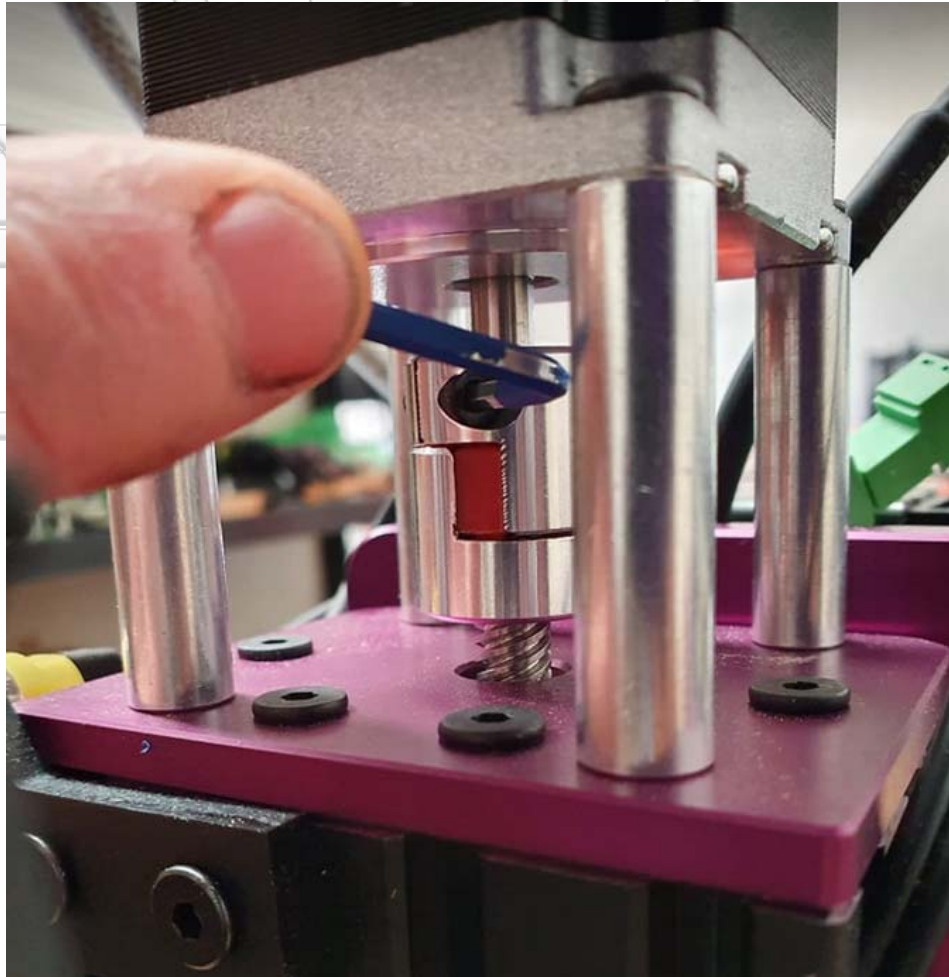


The Z axis is NOT rocking up and down?

Awesome! It's likely your Z axis is fine and you can skip the adjustment step below but it's still a good idea to check the locking collars and motor coupler are definitely secure with an allen key.

The Z axis IS rocking up and down?

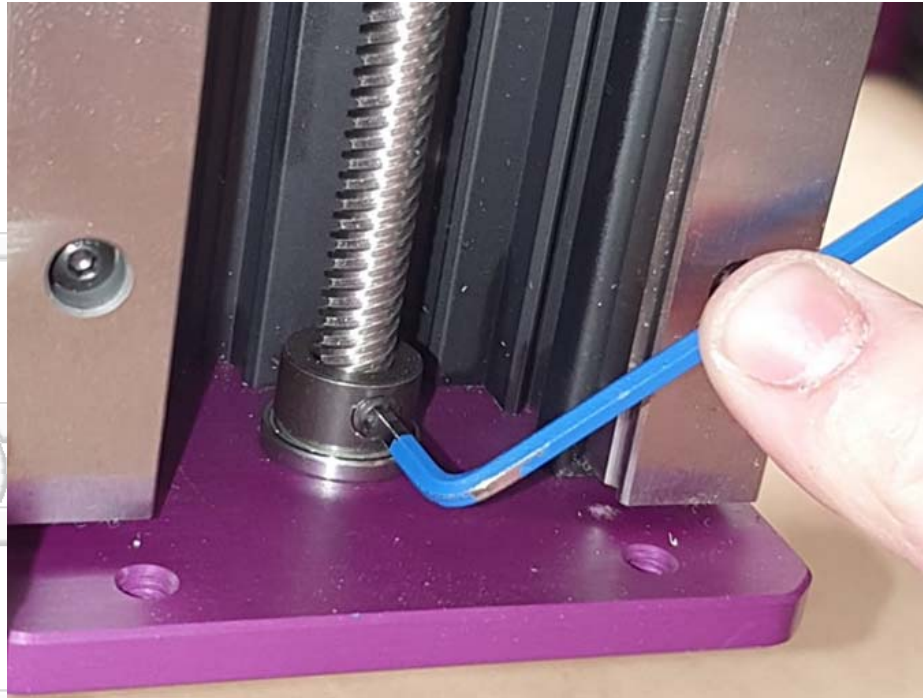
If you DO have play in your Z axis then we need to first check the locking collars. To do this, we need to make sure first that the motor coupler is definitely secured to both the motor shaft and the lead screw. Get a 2.5mm allen key in and tighten the Grub screws on the motor coupler. Please note you may have more than one grub screw on each side of the coupler, make sure both are tight and ideally, ensure the flat section of your motor shaft is directly under one of the grub screws. It is also recommended to check these grub screws periodically also.



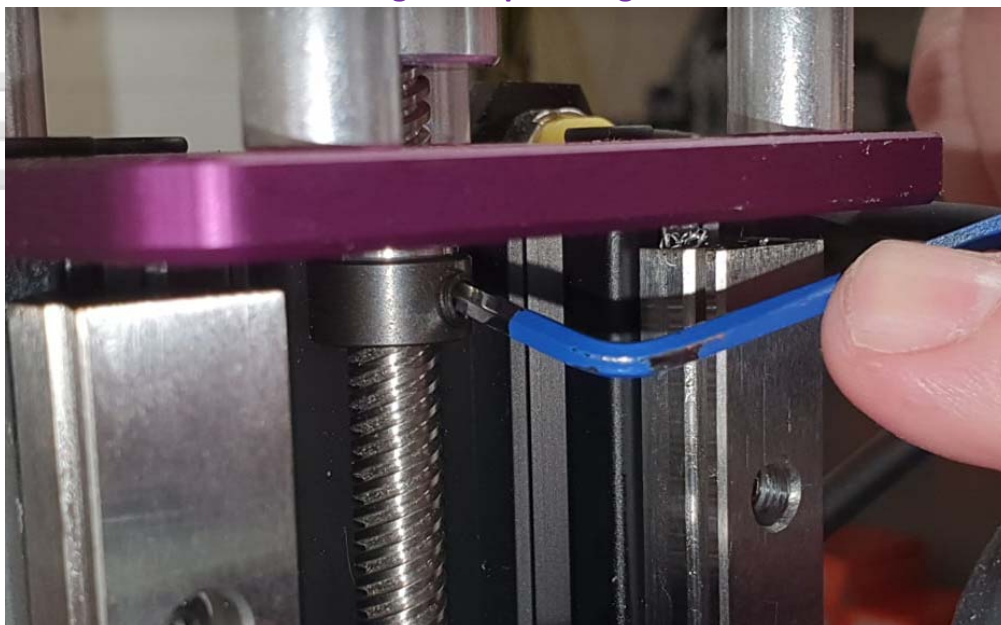
Securing your Z axis locking collars

With the motor coupler tight loosen the locking collar on the bottom of your Z axis and use your finger to put downward pressure on it before locking it in place securely using an allen key. Once the bottom is tight repeat the process on the top locking collar but force the locking collar upwards towards the motor with your finger. This should put compression on the bearing and shim. The bearings on both top and bottom **MUST** sit in the recess in the plates to secure the leadscrew correctly.

Securing the bottom locking collar:



Securing the top locking collar:

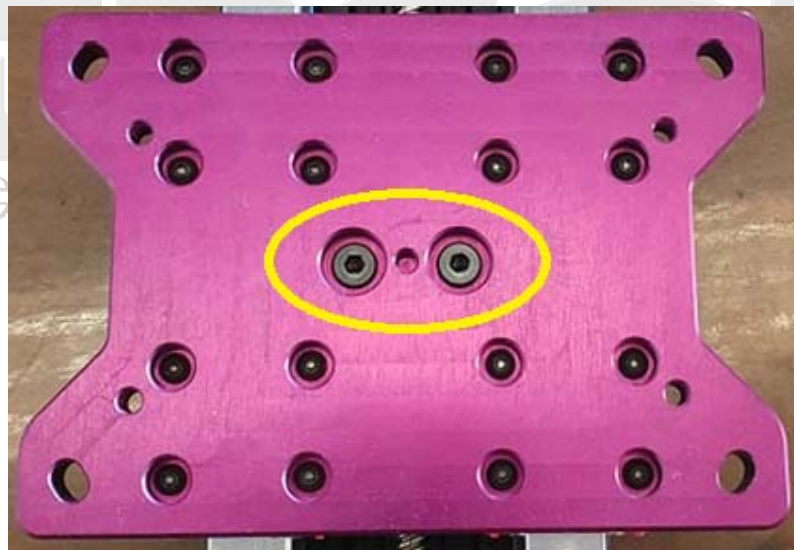


Checking Z axis Delrin nut block

If you still have movement in your Z axis, you may need to tighten the Delrin nut block that controls its movement. To do this, carefully unplug your spindle, limit switch, laser, Probe connectors and Z stepper motor cables. Once unplugged, remove the 4 bolts that hold the Z axis plate to the X axis plate as shown below, be careful when removing the Z axis, ensure it is supported with one hand when undoing the last bolt so that it doesn't fall off. Also make sure to retain the steel locking pin that allows you to tram your spindle easily.



Once it is removed, let's take a look at the rear of the Z axis assembly. There are 2 bolts that secure your Delrin nut block. Ensure these are tightened up.



Once you have tightened your Delrin nut block, it is time to re-attach your Z axis. Firstly ensure the locking pin is in place and then re-attach the 4 bolts to that marry the Z plate to the X plate. You can now re-attach all of your cabling back to the correct spot.

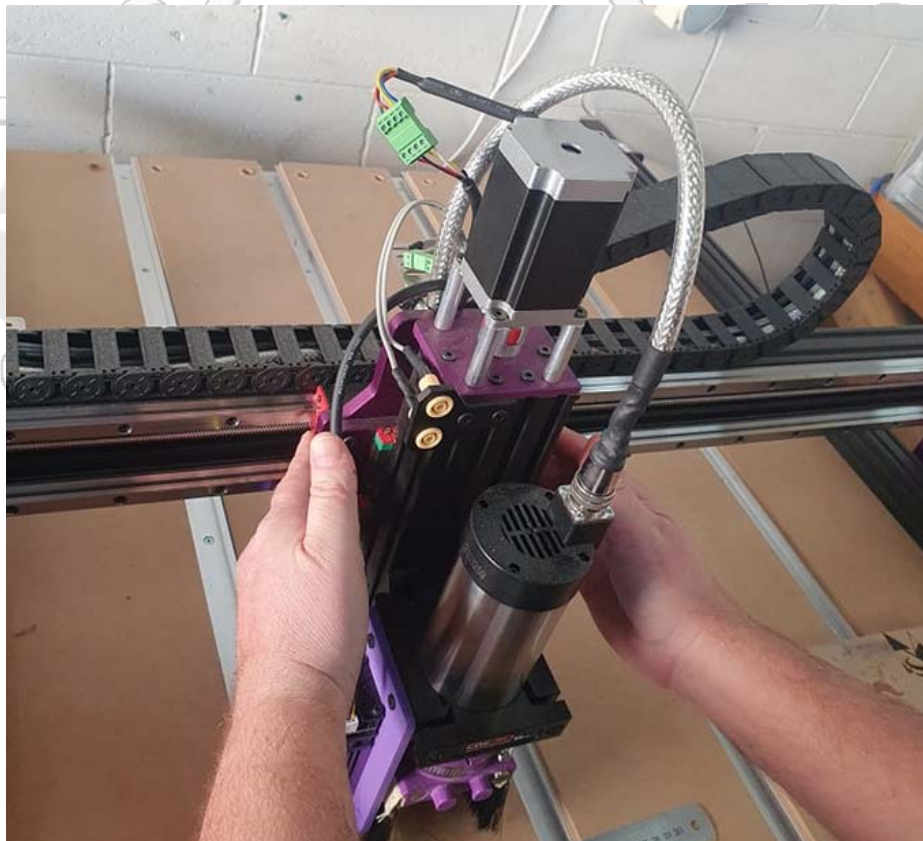
NOTE: If disassembling your X axis, it is highly recommended to tram your spindle again to ensure it is definitely perpendicular to the spoil board.

X and Y axis maintenance and checking

Like your Z axis, there is an 8mm leadscrew that controls your X axis, with 2 on the Y axis. It is also held captive on these axes by 2 locking collars and 2 radial bearings with 8mm shims in between in the INSIDE of the frame. The OUTSIDE of the frame has a thrust bearing, shim and locking collar on both sides. These outer locking collars are used for applying and keeping tension on your leadscrews.

X axis

The first thing to do is check for any slop on the X axis first. Try grabbing your X axis as shown below and try rock it side to side see if there is any play.



The X axis is NOT rocking side to side?

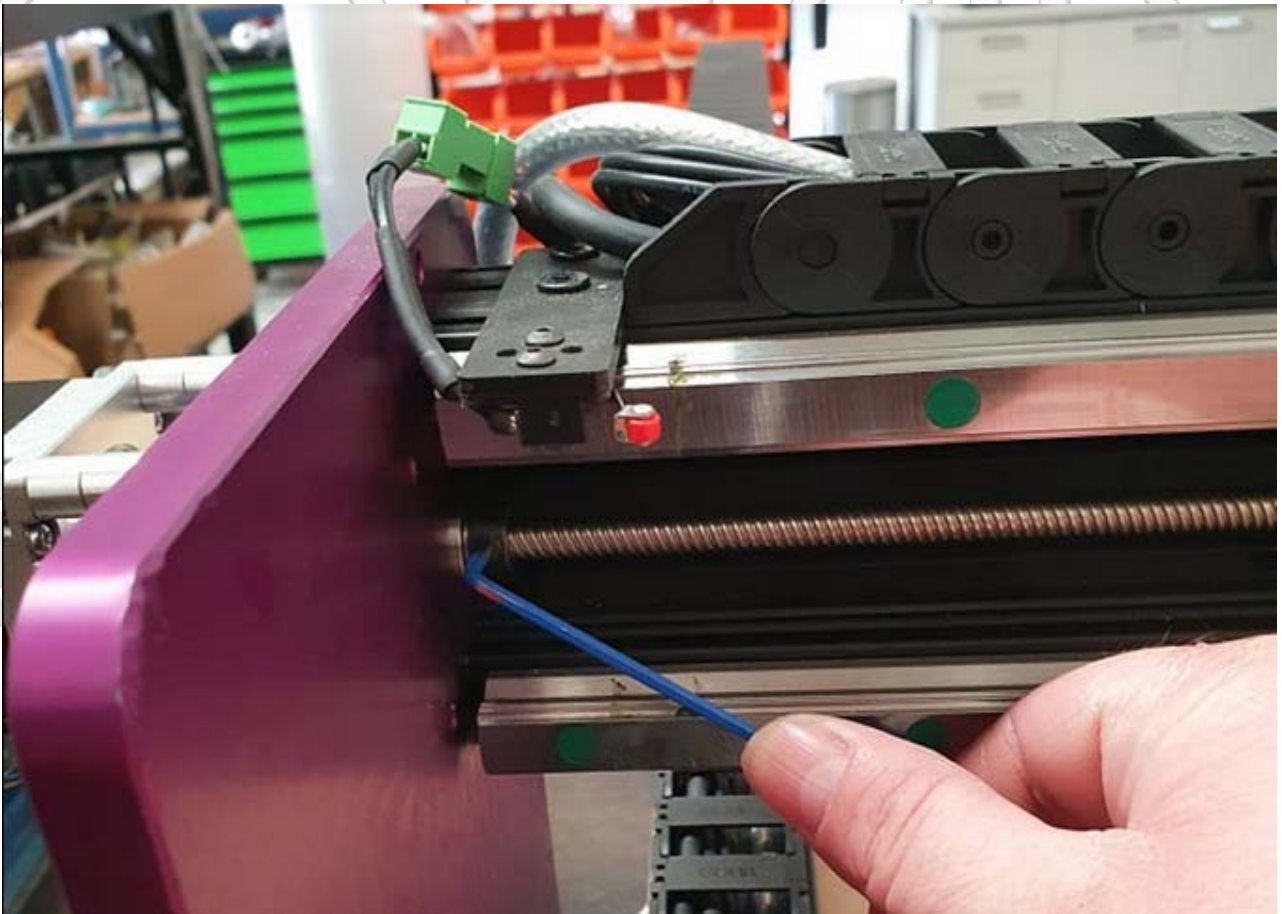
Awesome! It's likely your X axis is fine and you can skip the adjustment step below but it's still a good idea to check the inner locking collars and motor coupler are definitely secure with an allen key.

NOTE: Do not loosen or adjust the outer locking collars!

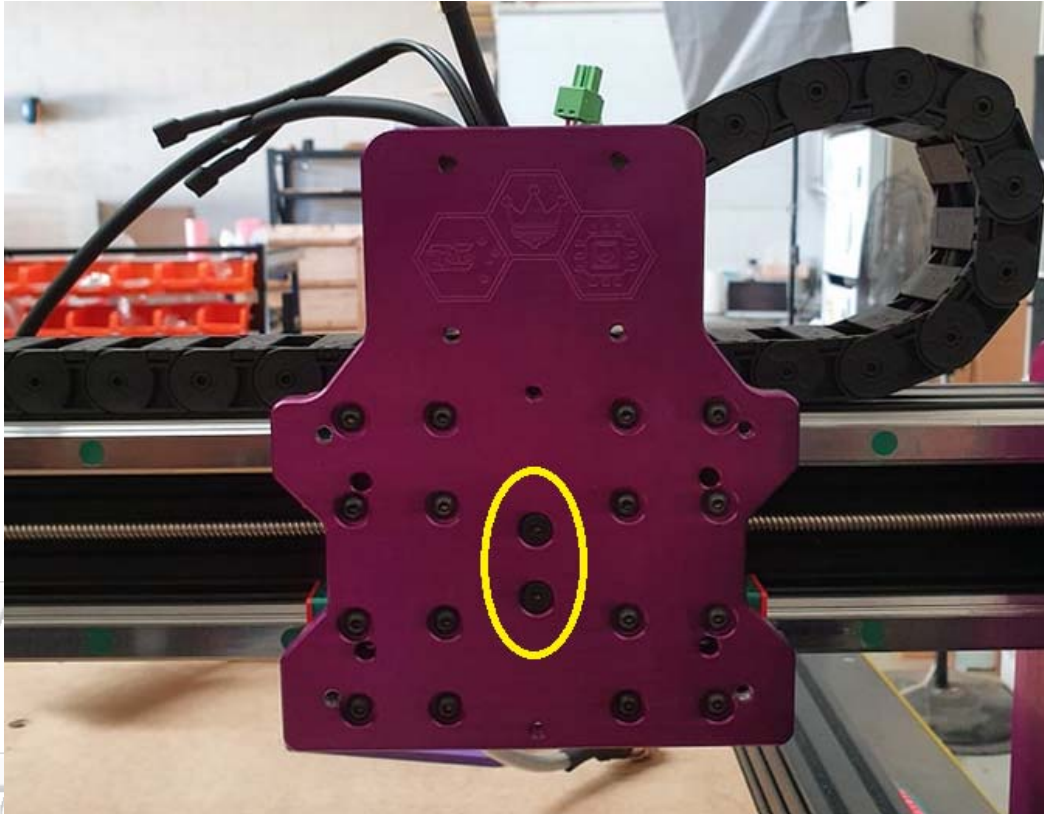
The X axis IS rocking side to side?

If you DO have play in your X axis then the first thing to do is check the internal locking collars. To do this, let's follow similar steps we did on the Z axis leadscrew; Loosen the inner locking collar closest to the motor side first and use your finger to put pressure on the locking collar. Secure it while under pressure. Repeat this process on the other side of the leadscrew.

Where the X axis inner locking nuts can be found.



If you still have your Z axis removed it may be a good idea to check your X axis Delrin nut block. To do this, tighten up the 2 bolts in the centre of the X axis plate.



Repeat the process of rocking your X axis side to side. It will also be a good idea, if removed to re-attach your Z axis using the 4 bolts you removed earlier and connect up all wires again.

The X axis is NOT rocking side to side?

Awesome! It's likely your X axis is fine and you can skip the adjustment step below but it's still a good idea to check the inner locking collars and motor coupler are definitely secure with an allen key from time to time.

NOTE: Do not loosen or adjust the outer locking collars unless absolutely required!

The X axis IS still rocking side to side?

We may need to re-apply tension to your leadscrews. To do this. Loosen off both the inner and the outer locking collars on both sides of your X axis lead screw. Ensure your X axis motor coupler is definitely secured first by tightening the grub screws that hold it in place.

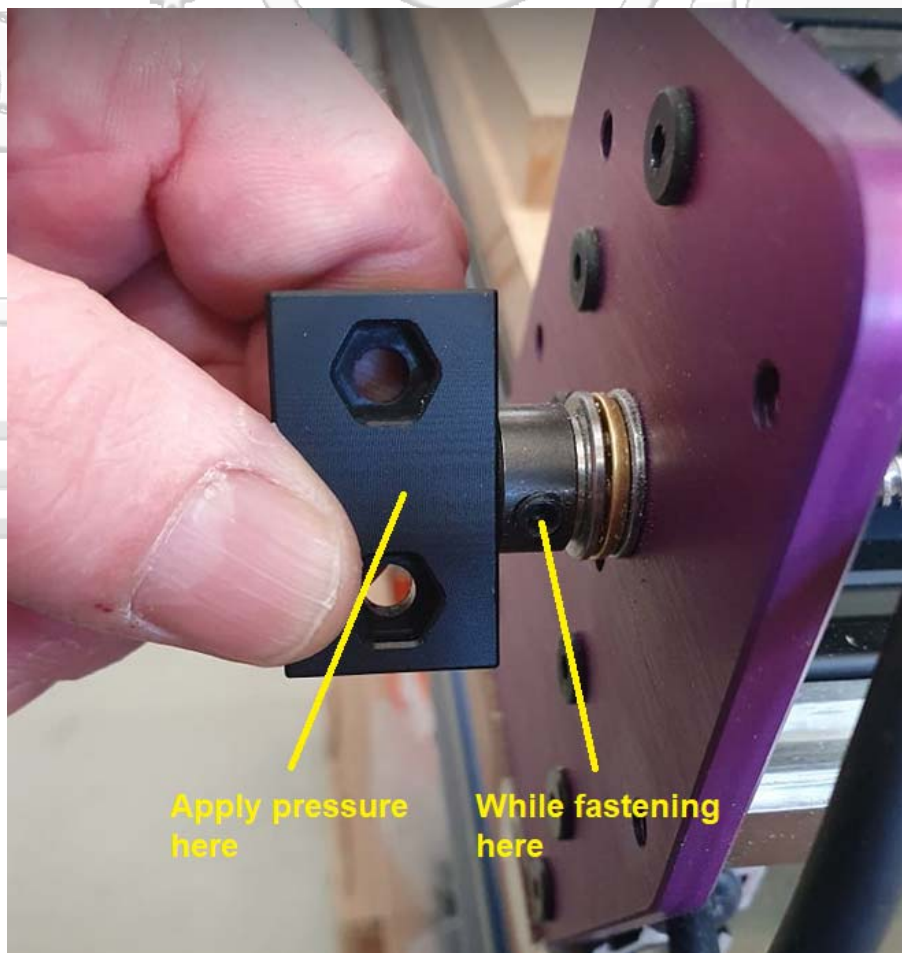
Once this is completed, tighten the outer locking collar closest to the motor side. Once this is tight, power up your machine so your X axis motor has holding torque. You will notice you cannot turn the motor very easily via hand.

Take your supplied leadscrew tensioning tool and go to the opposite side of the machine and thread the tool onto your lead screw end. Apply gentle force to the tool until the leadscrew “clicks” once then hold that tension while fastening up the outer locking collar with a 2.5mm allen key. It is recommended to make sure this connection is definitely secure. Always use a solid end of the an allen key, not a ball end.

Please note: Massive amounts of tension are not required for the leadscrew. It is not recommended to use additional tools to hold your leadscrew still to increase the tenson you can apply to it.

Once this is complete, give your leadscrew a gentle strum once like a guitar. It is feels like it has tension it is likely fine.

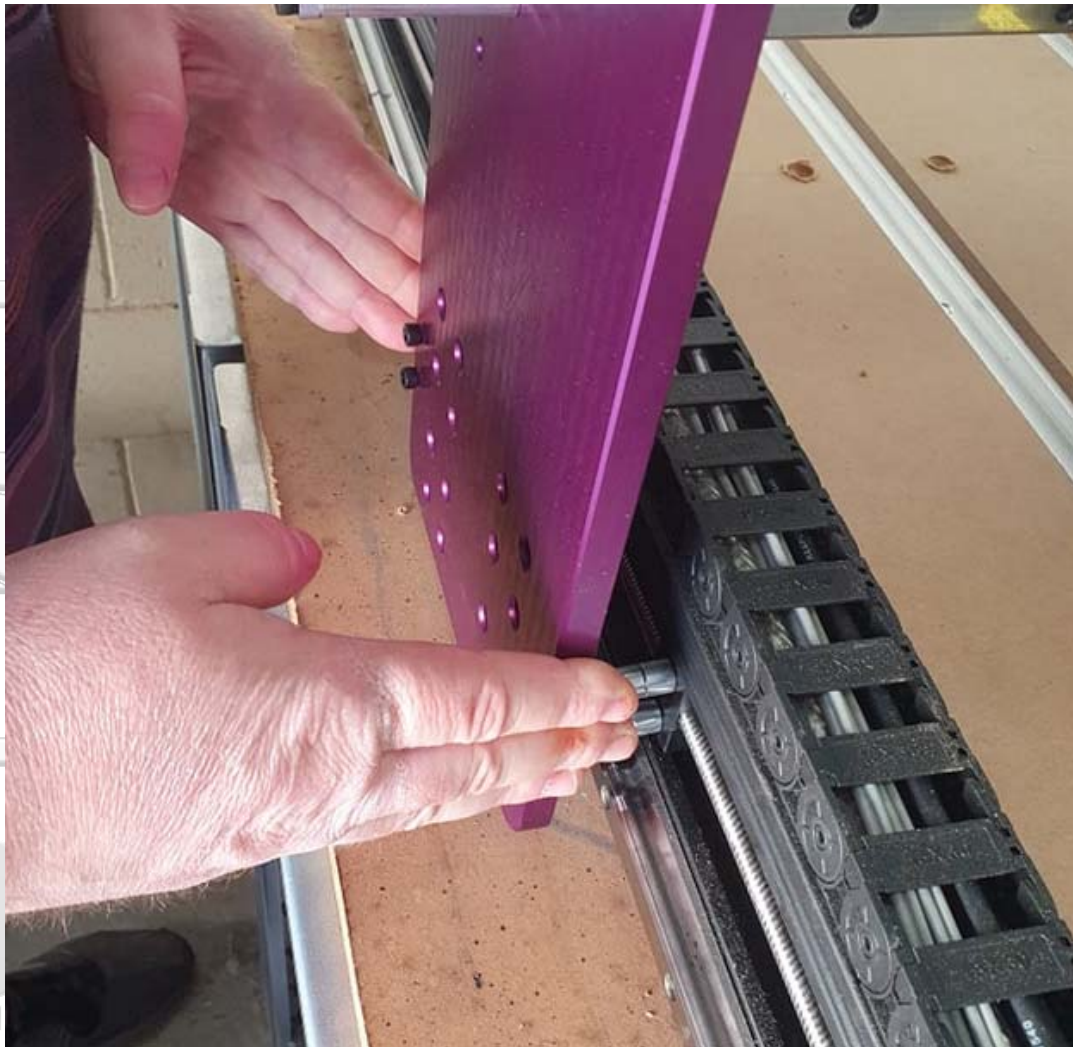
Proceed to tightening the inner locking collar the same way you have before. Ensure that any radial bearings are definitely seated in the bearing recess.



Y axis

In this section we will focus on one side of the machines Y axis. This process needs to be repeated on both sides. After following and completing one side then repeat on the other side.

The first thing to do is check for any slop on the X axis first. Try grabbing your X axis as shown below and try rock it side to side see if there is any play.



The Y axis is NOT rocking side to side?

Awesome! It's likely that that side of your Y axis is fine and you can skip the adjustment step below and repeat the process on the other side of the Y axis if it's fine too then your Y axis is fine. It's still a good idea to check the inner locking collars and motor coupler are definitely secure with an allen key.

NOTE: Do not loosen or adjust the outer locking collars unless absolutely required!

The Y axis IS rocking side to side?

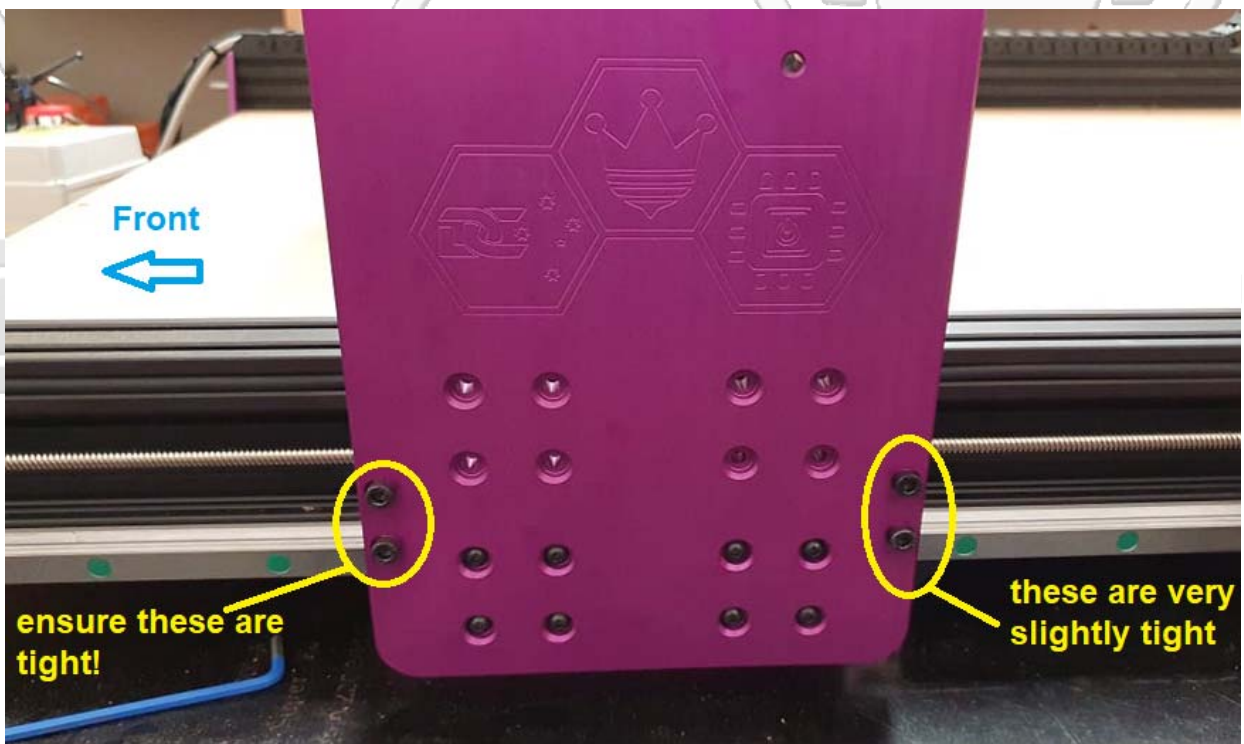
If you DO have play in your Y axis side then we must complete the same process we did on our X axis but on each side of the Y axis for the leadscrews.

Please Note: Make sure power is off to your machine until required when performing this maintenance.

Y axis Delrin nut block

Your Y axis is different to your X and Z axes. It has 2 delrin nut blocks on each side of the Y as opposed to 1. In order to fasten these correctly and provide good backlash compensation you should loosen both delrin nut blocks, each block has 2 bolts.

Once loose, tighten both bolts in the first nut block closest to the front of the machine quite firmly. With the rear nut block, tension it until you can just feel it is getting tight then loosen it off a very small amount (1/8 of a turn). Check for any rocking, if no rocking then repeat this process on the Y axis on the other side of the machine.



1. Lubricating your linear rails

PLEASE TAKE CARE when lubricating the linear rails on your machine not to drip any lubricant on the silver leadscrews. The Delrin nut blocks on the screw will deteriorate when exposed to petroleum-based lubricants such as lithium grease.

PLEASE NOTE: This process is NOT required for new machines; we have already lubricated things perfectly for you in our factory before shipping.

To keep your linear motion system in great condition it is recommended to keep the linear rails rust free and lubricated. As a quick and easy solution, you can apply a fine coating of lithium grease aerosol on the rails screws and run the machine back and forward a few times to spread the lubricant on the rails. This will coat the surface and keep them in good condition for years to come.

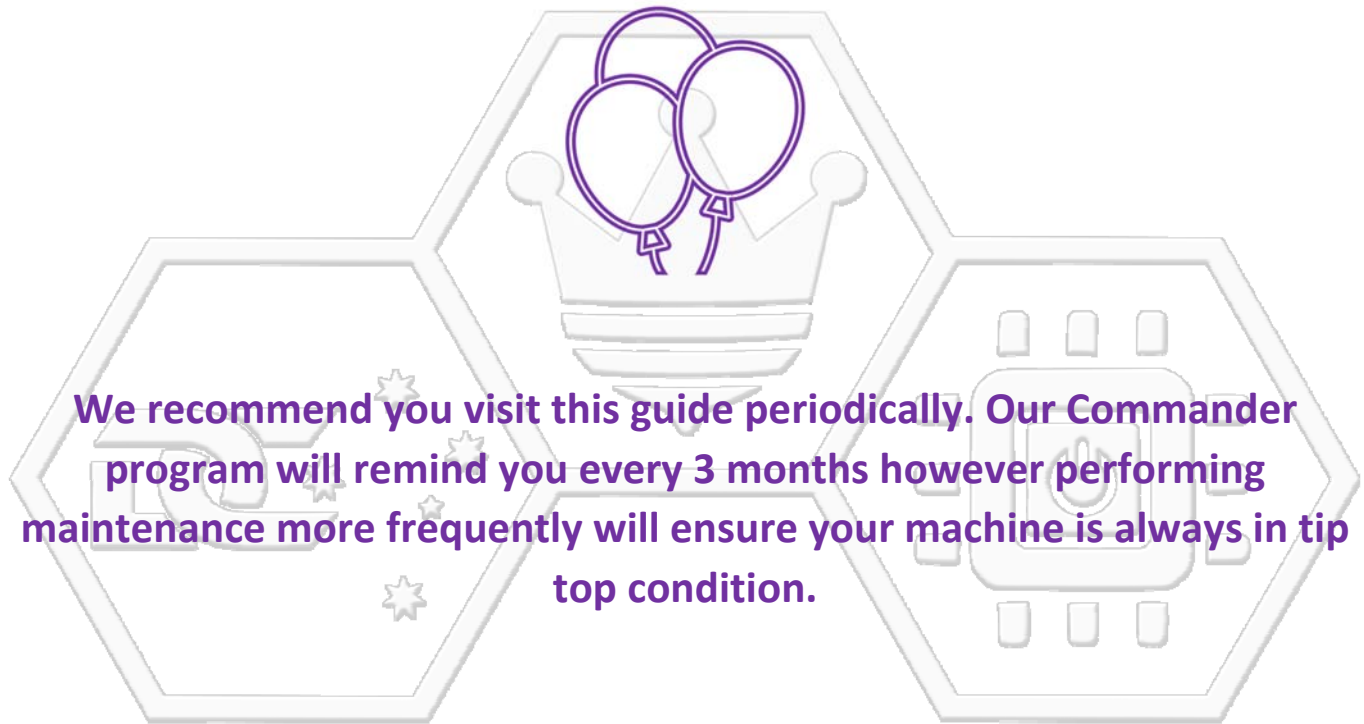
A more advanced and better method is to use a grease gun and use the grease nipples provided on your linear bearings to lubricate them. For your rails a Kingchrome mini grease gun works well. They can be special ordered from most hardware stores or directly from Kingchrome. See this video on how to lubricate using a Kingchrome mini grease gun: <https://www.youtube.com/watch?v=ccsnIOzvoWI&t>

If choosing to do the grease gun option, ensure that no more than 1 or 2 pumps is used or you run the risk of blowing out the seals on the bearing blocks. This should be performed no more than once per month with daily use of your machine. The recommended lubricant is lithium grease or bar and chain oil.

The photo below shows where the grease nipples are located and how you can lubricate them.



You have now completed your machine maintenance!



For more information or have an issue with your machine, please reach out to our friendly support team via email at solutions@cnc3d.com.au, via Facebook or via phone at

+617 5522 0619

You can also join our friendly user group on Facebook and collaborate with thousands of our other users.

<https://www.facebook.com/groups/cnc3dplayground>