



PENTA
MACHINE CO.

▶ *QUICK*
START
GUIDE

V2-50

TABLE OF CONTENTS

V2 Shipping Bolt Removal	1
Pocket NC Basics	3
Tooling	3
Work Holding	4
CAM Software Options	5

V2-50 SPINDLE

Safety	7
Maintenance	7
Compressed Air Setup	8
Important Values	9
What's Next?	9

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10/04/22

Congratulations on your new Pocket NC!

Get started with this basic guide and the "Getting Started" playlist on our Youtube channel.

<http://www.youtube.com/c/PocketNC>

For additional information visit: **www.support.pentamachine.com**. For support, service or any other inquiries, contact us at: info@pentamachine.com

Thank you!

▶ **V2 SHIPPING BOLT REMOVAL**

There are four shipping bolts installed in the Pocket NC in order to lock the axes in position and prevent damage to the machine during shipment. The bolts are shown in green circles in Figure 1. They must be removed before the machine may be used.

Do NOT remove any other bolts from the Pocket NC as this could cause damage to the machine.

The shipping bolts are M6 shoulder bolts of three different lengths. The 4 mm hex key needed to remove the bolts is included in the toolkit shipped with the machine. The bolts are installed only hand-tight.

Do not discard the bolts. They should be retained with the rest of the machine packaging in case the user needs to ship the machine in the future.

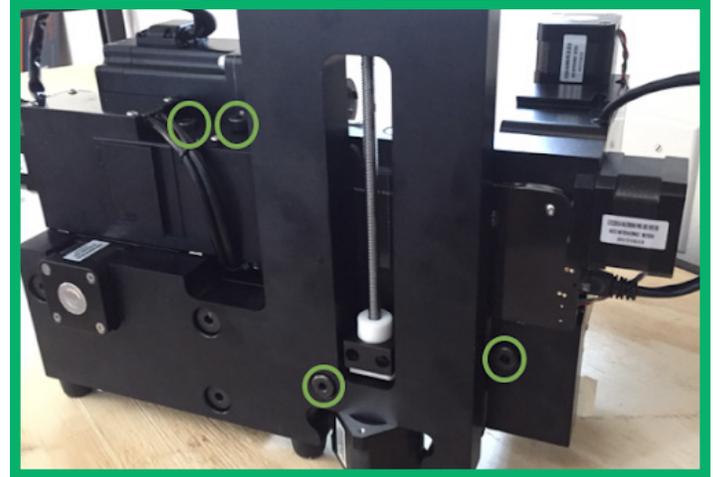


Figure 1: Pocket NC V2 Series all shipping bolt locations shown in green circles.

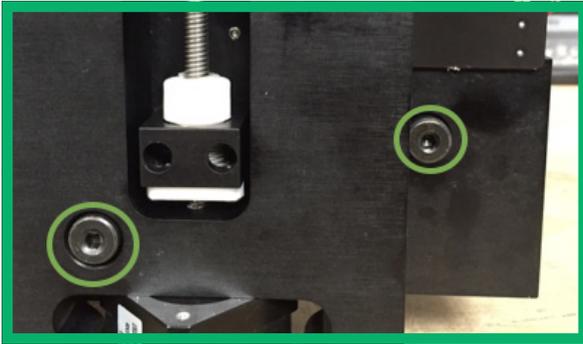


Figure 2: Close up of shipping bolts in green circles behind Y-axis

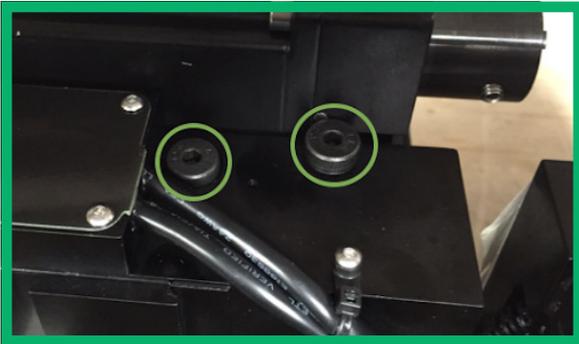


Figure 3: Close up of shipping bolts in green on X-carriage

Two of the shipping bolts are located behind the Y-axis, they are shown in green circles in Figure 2. When the user is looking at the back of the machine they are located in the lower-right quadrant of the machine. One of them locks the trunnion housing to the L-bracket and the other locks the A-table to the A-housing.

The other two shipping bolts are located on the X-carriage, behind the spindle. They are both accessed from the top of the machine as shown in Figure 3. The right bolt locks the spindle mount to the X-carriage. The left bolt locks the X-carriage to the main block.

▶ **POCKET NC BASICS**

USER INTERFACE

To connect to your Pocket NC, follow the steps below for accessing the user interface

- With the machine's power switch in the off (o) position, plug the power cord into a wall outlet and then the machine.
- Plug the usb cord into a computer.
- Plug the usb cord into the machine and flip the power switch to the on (-) position. Wait for the machine to boot up fully.
- Once the E-stop button is blinking red, open a new window in a supported browser (Google Chrome, Firefox, Safari) and type 192.168.7.2 into the address bar and press enter.
- When the user interface shows up, confirm that it says "Connected" in the bottom left corner.

If you are experiencing connection issues, please visit our resources page by going to **support.pentamachine.com >> Troubleshooting >> User Interface Connection Issues**. If the issue persists, please reach out to us at service@pentamachine.com.

To help avoid connection issues in the future, please be sure to regularly clear log and g-code files from the machine using the user interface's "Conf." tab. The options to do so will be found under "Status".

It is also recommended that users completely shutdown the Pocket NC when it will be idle for more than a couple of hours. This includes turning the power switch off and unplugging the USB cable.

▶ **TOOLING**

The single flute end mill* that comes with the machine can be used to cut aluminum, wood, plastic, copper, brass and bronze. *Datron Tool 0068630E, shank diameter 1/8", flute diameter 3.0mm, flute length 9.0mm, tool length 38.0mm. If additional tooling is needed for cutting metals or other materials, visit pocketnc.com to see the selection of tools we offer.

If additional tooling is needed for cutting metals or other materials, visit pentamachine.com >> **Shop >> Tooling** to see the selection of Harvey and Datron tools we offer.

INSTALLING OR CHANGING THE TOOL (V2-50)

- Make sure the spindle is off (it can be hard to tell when running at low RPM's).
- Locate the lever on the spindle and pull it until it clicks into the "Open" position.
- Change CHB collet if necessary by using the 10 and 6.1mm wrenches provided.
- Insert the tool into the collet with the desired amount of tool left sticking out.
- Push the lever back to the vertical, "Lock" position.
- Remember to measure the tool offset using the directions below.

INSTALLING OR CHANGING THE TOOL (CHK COLLET)

- Make sure the spindle is off (it can be hard to tell when running at low RPM's)
- Remove the collet nut from the end of the spindle by holding the spindle with the provided 12mm wrench and turning the collet nut with the provided 14mm wrench.
- Snap the appropriately sized CHK collet into the collet nut and lightly thread the collet nut back on the end of the spindle.
- Insert the tool into the collet with the desired amount of tool left sticking out.
- Tighten down the collet nut using the 12mm and 14mm wrenches used in step 2.

MEASURING TOOL OFFSET (telling the machine where the end of the tool is)

- Home machine.
- Navigate to the "Tooling" page of the user interface. (www.support.pentamachine.com >> **Getting Started >> Manuals >> Kinetic Control Software Overview**)
- With the desired tool loaded, click the "Measure Tool XX" button that matches the tool used in your program.

Alternatively, the tool length offset can be measured by hand by following the directions here: www.support.pentamachine.com >> **User Resources >> Legacy Resources >> V2 Legacy Resources >> V2 Series Tool Length Offset**

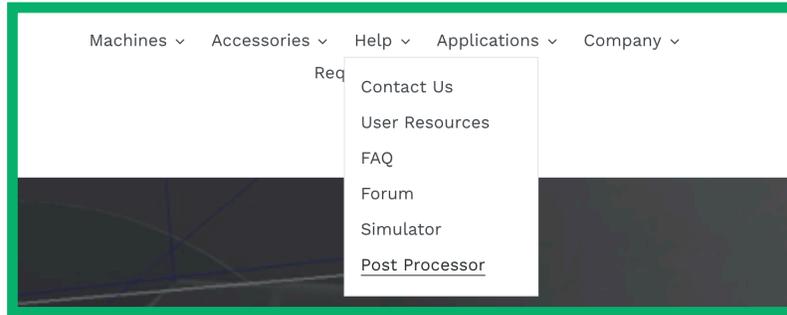
▶ **WORK HOLDING**

For information and instructions on how to set up the various work holding options Penta Machine Company offers, visit www.support.pentamachine.com >> **User Resources** >> **V2 Series Workholding**

▶ **CAM SOFTWARE OPTIONS**

The Pocket NC machines take G-Code, which can be written by hand or by a CAM software.

Pocket NC has a list of post-processors for an array of CAM packages at pentamachine.com >> **Help Center** >> **Post Processor**. These include Mastercam, Autodesk products (Fusion 360, HSM Works, Feature CAM), RhinoCAM, NX, BobCAD/CAM, SolidCAM, and EspritCAM.



Fusion 360 continues to be one of the best options for affordable, powerful CAD/CAM software and is what most of our tutorials are based on. A standard Fusion 360 commercial license which can be purchased through Autodesk. This license includes multi-axis tool paths. Please see more information on their licenses here: <https://www.autodesk.com/products/fusion-360/pricing>.

If you have any questions about CAM software choices and options please email info@pentamachine.com.

V2-50 SPINDLE

▶ SAFETY

With the spindle on the V2-50 having a much higher maximum RPM than the V2-10, it is important to be extra cautious around the tool and spindle.

Always double check that the tool is not spinning before allowing anything near it. The V2-50 spindle is much quieter than the V2-10 spindle and only spins a tool, not a tool holder, so it can be hard to tell when it is running, especially when at high RPM.

Once the machine is stopped the spin down cycle can take longer than anticipated, be sure that the tool has stopped turning before changing tools or getting near the spindle.

▶ MAINTENANCE

The V2-50 has a few extra requirements when it comes to maintaining and prolonging the life of the spindle.

Air- To ensure that it stays cool and doesn't get any debris in it, it is important that the spindle be attached to filtered, dry air while running at any RPM. We recommend 25 psi or .17 MPa. There are several 4mm hose fittings on the back of the machine and spindle for this. Included with your V2-50 is an air filter and regulator, please refer to the next section to ensure proper set up.

Warm-up- The V2-50 spindle requires warming up after periods of disuse. On the user interface, there is a "Warm-Up" button that will start the warm up program, this program should be run anytime the machine has been cooled down or heated up (i.e. shipping in extreme temps). After starting the warm up cycle the machine will run the spindle for about 50 minutes if it has been off for more than 7 days. If the machine has been off for more than 12 hours, but fewer than 7 days, this program will run for about 10 minutes.

The warm-up cycles the speed of the spindle, increasing the RPM every few minutes. The main reason for the warm-up cycle is to evenly coat the bearings in the spindle with lubrication before cutting. This is necessary in order to avoid damaging the spindle or the motor.

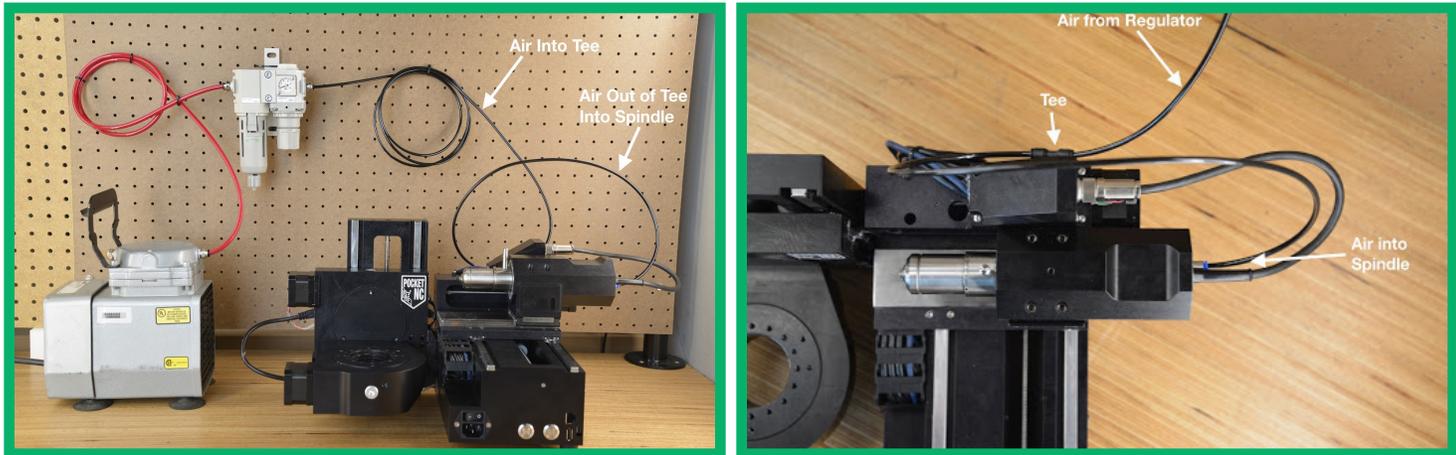
Cleaning- The spindle on the V2-50 should be cleaned regularly. Cleaning the spindle with any sort of liquid, except alcohol, is not recommended. A Q-tip with most of its fluff removed and a little alcohol can be used to clean the inside of the spindle and collet (CHB). When cleaning the outside of the spindle and the spindle housing it is best to have the air on and then use a vacuum and dry rag to remove any chips and dust that has accumulated.

▶ **TOOLING**

The V2-50CHB is equipped with a CHB collet. Though this collet type tends to hold reasonably well, it still doesn't have the gripping power of an ER collet and tool holder or CHK collet. The machine will probe the tool after each tool change (M6) but it is still important to watch for tool pull-out while running parts. *Leaving tooling in the spindle when it is not in use is permitted, but users should watch for development of rust on HSS tooling and the collet if in an area where rust can be a problem.*

▶ **COMPRESSED AIR SETUP**

Below is an example of the air setup required to run the Pocket NC V2-50. Please note that the source of air and inlet hose may differ if the user has chosen a different air supply than the one recommended by Penta Machine Company. If this is the case, the user will need to supply and install the appropriate adapter into the 1/4" BSPT port on the inlet side of the filter in order to hook up the desired air hose.



In the demonstrated setup, the air supply is a Gast air compressor with 1/4" air hose (red) supplying air to the CKD filter and regulator that is included with the V2-50. The 4mm (black) hose supplies air to the tee on the backside of the spindle, which supplies air to the internal air sensor. The tee also carries the air to the spindle using a short length of 4mm hose connected to the blue connection on the end of the spindle motor. It is important that air comes into the tee and then out of the tee and into the spindle so that the machine recognizes that air has been provided.

The recommended air pressure for the V2-50 spindle is 25 psi or .17 MPa. This can be adjusted using the knob on the bottom of the regulator by pulling down to unlock it and then turning to the right for more pressure or the left for less. It is best to push the knob back up into its locked position after adjustment to reduce the risk of accidental pressure adjustments.

The air filter of the CKD assembly also traps any water that is in the air lines. The water is deposited in the bowl that is to the left of the air pressure knob. When the float inside the bowl reaches a certain point, the water is automatically drained through the port at the bottom of the bowl. Included with your machine is a piece of clear hose that can be attached to the port to direct the drained water to a desired location.

Do not use this piece of hose to supply air to any part of the system, it is not rated for pressure. It is important to monitor the level of water in the bowl and make sure it does not fill past the green "max" line, just in case the auto drain function stops working properly.

▶ **IMPORTANT VALUES**

MEASURED "B-TABLE OFFSET": _____IN

(DISTANCE FROM B-TABLE TO THE CENTER OF A AXIS ROTATION)

SHIPPING POSITION – X 1.26 Y 2.51 Z -3.333 A 90.00 B 0.00

V2-10 COLLET TYPE – ER11

MACHINE SERIAL NUMBER: _____

▶ **WHAT'S NEXT?**

If you are new to machining, we have a few resources that will help you become acquainted with your new machine. For the basics start here: www.support.pentamachine.com. From there, go check out our tutorials section found here: www.support.pentamachine.com >> [Help](#) >> [User Resources](#) >> [Tutorials](#). Also, be sure to go through the Fusion 360 Ultimate tutorials found on Autodesk's website to become familiar with CAD/CAM and how it works with CNC machines.

For more information on the CKD air filter and regulator please visit:

<https://www.ckd.co.jp/kiki/en/product/detail/38/M%E2%80%BB000>

<https://www.ckd.co.jp/kiki/en/product/detail/396/>

ENJOY.