**MDF Rose Engine Lathe 2.0**

**with Stepper Motor Drive**

**A picture containing indoor, table, desk, sitting

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**Best Practices**

**Version 0.2**

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This document is intended to help one obtain the best output from their MDF rose engine lathe. Special thanks to the Nerds of Woodworking for their help in compiling these.

It is a “back to the basics” document that is good to keep handy and review periodically. Doing so has helped me ensure I do not get into bad habits.

Ornamental turning is not for the impatient, and these steps will help ensure that the result of a slow turning process will not be wasted.

If you have any questions, please contact us at [ColvinTools@Gmail.com](mailto:ColvinTools@Gmail.com).

Good luck.

Rich Colvin & Jack Zimmel

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# Before Starting

Before starting to cut on the rose engine lathe, there are some steps that should be taken to ensure the desired results are achieved. These are detailed below, but a quick reference list is below.

|  |
| --- |
| **MDF Rose Engine 2.0**  **Startup Checklist**  🔲 Step 1: Center the headstock  🔲 Step 2: Align the object in the chuck  🔲 Step 3: Align the cutter  🔲 Step 4: Align the cross slide to the spindle  🔲 Step 5: Choose the cutting or drilling frame to use  🔲 Step 6: Ensure you are cutting in the right direction  🔲 Step 7: Set the speed for cutting  🔲 Step 8: Adjust the overhead  🔲 Step 9: Consider using limit switches  🔲 Step 10: Be sure everything is locked down before starting  🔲 Step 11: Do a test cut |

## A picture containing game Description automatically generatedStep 1: Center the headstock

This set of steps is to ensure that the headstock moves the same amount forward and back. The diagrams shown on the right demonstrate the idea.

* If the headstock swings equally front and back (as shown in the green on the left), then the planned rosette pattern will cut as expected.
* Conversely, if the headstock is set to swing unequally, (as shown in the red to the right), the pattern will be different than expected.

To center the movement as shown in the green diagram, follow these steps.

A close up of a logo

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1. Lock the headstock into a center position.
   1. Drop the centering block into the space between the headstock and the base, on the back side of the headstock.
   2. Lightly hold the headstock against the block and drop the fading wedge down to hold the headstock in place.
2. Set the rubber
   1. Now that the headstock is locked, rotate the spindle until the rubber can be set to be halfway between one of the peaks and valleys of the rosette.
   2. Move the rubber forward to the halfway point and lock it down.
3. Unlock the headstock
   1. Raise the fading wedge and lock it into place.
   2. Remove the centering block.

## Step 2: Align the Object in the Chuck

After transferring an object from a “traditional” lathe to the rose engine lathe, there is a probability that it will not be radially or axially aligned (or both). Before making any cuts, ensure the alignment of the object whilst it turns slowly. A dial indicator is a great tool for this.

|  |  |
| --- | --- |
| **A close up of a sign  Description automatically generated**  **Object is aligned** | **A picture containing front, sign, display  Description automatically generated**  **Object is misaligned** |

The picture on the right is quite exaggerated but shows the idea of having the object misaligned.

Frankly, I find this the most tedious task and when first starting I sometimes wondered about the value, but it is very important. If it is not done, then the cuts on one side of the object will be different than the other side. And, it will get worse the further from the headstock.

A picture containing indoor, sitting, train, clock

Description automatically generatedWhen using the dial indicator (held in a [Noga arm](https://www.otbok.info/OT%20-%20LnT-Term-NogaArm.html) or similar device), I aim for a runout under 0.010”. This may seem quite big, but it is hard to achieve if you don’t have a [leveling chuck](https://www.otbok.info/OT%20-%20LnT-Term-Chuck-Leveling.html).

The picture to the left shows a dial indicator in use on a metal lathe. A similar approach would be used on the MDF rose engine lathe, though it is recommended that the measurements be made at the end furthest from the chuck / headstock.

Of course, if the spindle has a Morse taper, then moving the object whilst still in the chuck from one lathe to another typically has very little misalignment.

## Step 3: Align the Cutter

A picture containing clock

Description automatically generatedThe cutter needs to be aligned on the centerline of the spindle as shown in the picture to the right. This can be achieved by moving the cutting frame (or drilling frame) up or down in the quick-change tool post.

You can test the cutter’s alignment on the end of a piece and see how it matches up with the images of cuts below.

This is where the indexing function in the Nextion Multiple Stepper Control system comes in quite handy. Indexing the cuts 90° after each cut makes the alignment verification easy.

One recommendation is to affix a scrap of wood to the end of the object and make cuts into that. (It can be held there using double-sided tape.)

|  |  |
| --- | --- |
| **A picture containing clock  Description automatically generated**  **Cutter set too high** |  |
| **A picture containing clock  Description automatically generated**  **Cutter set too low** | **A picture containing clock  Description automatically generated**  **Cutter aligned properly** |

## Step 4: Align the Cross Slide to the Spindle (esp. for making a cylinder)

## Step 5: Choose the cutting or drilling frame to use

Esp. 60deg vs 120 deg drilling

## Step 6: Ensure You are Cutting in the Correct Direction

… discuss cutting up hill vs. down

|  |  |
| --- | --- |
| A picture containing device  Description automatically generated | A picture containing device, drawing  Description automatically generated |

## Step 7: Set the Speed for Cutting

x

## Step 8: Adjust the overhead

X

## Step 9: Consider Using Limit Switches (so you can eat)

## Step 10: Being sure everything is locked down before starting

## Step 11: Do a test cut …

Show how to do this with a scrap piece.

# Using a paper chuck

N

# Belt welding

* And adjusting the belt tension

# Protect Your Health

Use a vacuum system to keep the small particles out of your lungs.

Woods that are not as nice for your lungs.

…. Show some pictures of how others do it.

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