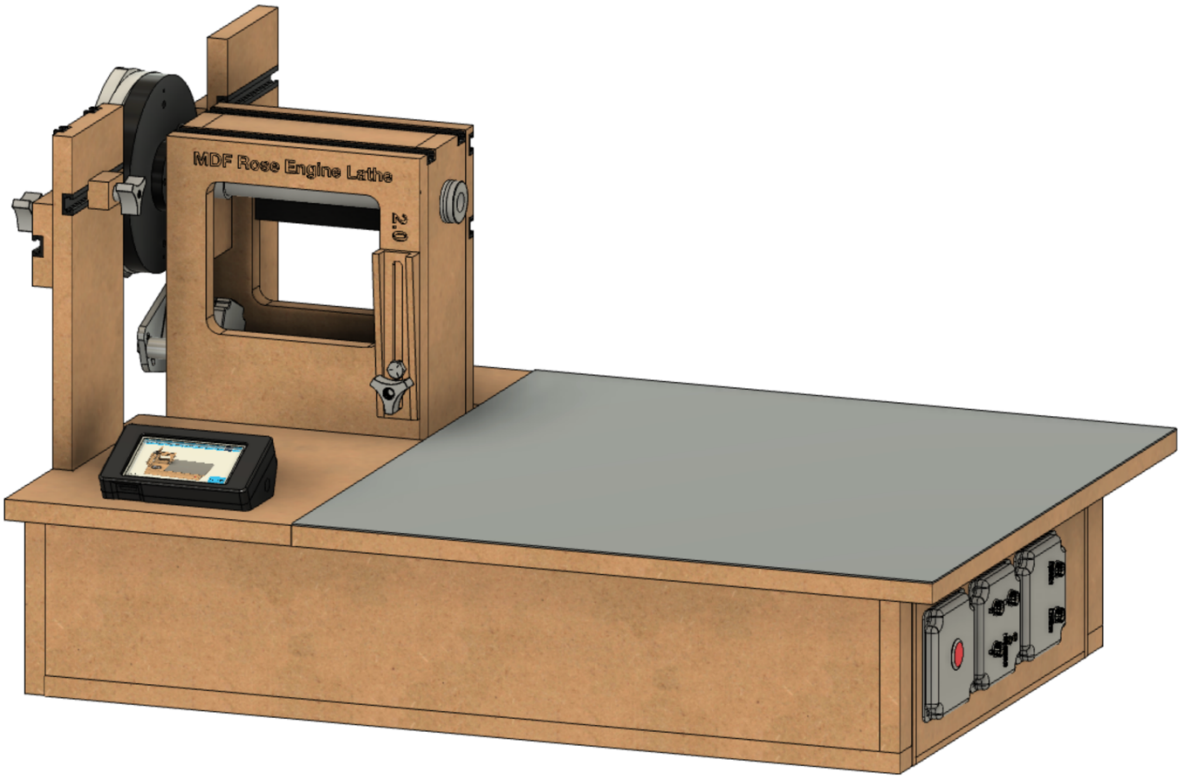
MDF Rose Engine Lathe 2.0
with Stepper Motor Drive



Machined Parts for the Base & Headstock

Version 1.0
23 March 2021

MDF Rose Engine Lathe 2.0

Machined Parts for the Base & Headstock

This document is intended to help one unfamiliar with the MDF rose engine to build one easily. It is designed to go with the kit you can purchase from www.ColvinTools.com.

There are some variations from the ideas documented by Jon Magill at www.rogueturner.com. Where this is the case, we have tried to document such changes and provide the reason for the change.

This document is also designed to use a stepper motor for driving the spindle.

If you have any questions, please contact us at ColvinTools@Gmail.com.

Good luck and we hope you enjoy this machine as much as we.

Rich Colvin & Jack Zimmel

MDF Rose Engine Lathe 2.0
Machined Parts for the Base & Headstock

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Getting Started

As you get started with building this machine, please consider making the machine exactly according to the outlined instructions. There are lots of ways you can modify this, and, quite frankly, the MDF rose engine encourages experimentation. But it is best to attempt those modifications after understanding how it works. Some ideas which sound grand may not appear so after understanding how the machine works (we speak from experience).

If you have any questions on the terminology in this document, check out the "Ornamental Turning Book of Knowledge" (www.OTBoK.info).

Accuracy

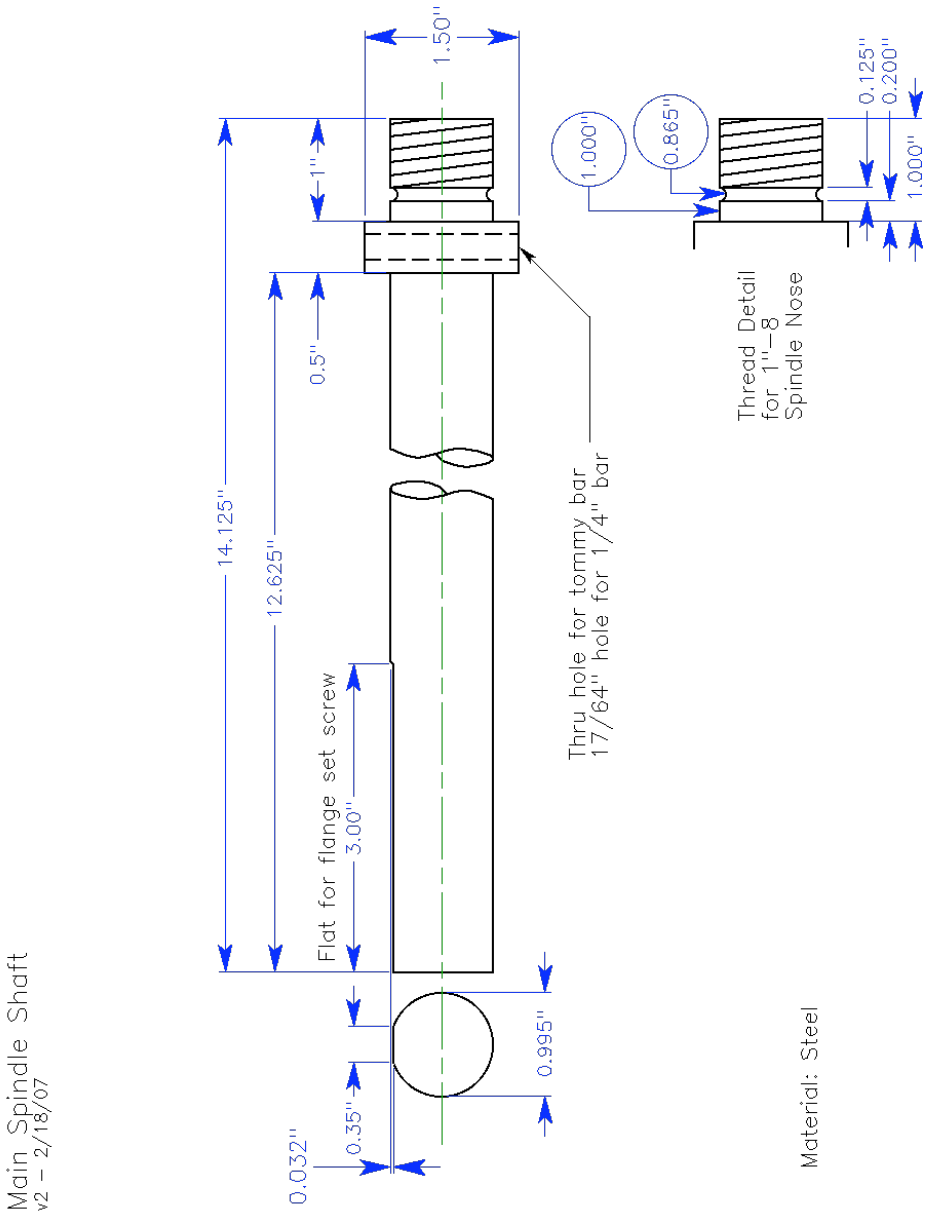
When making the MDF Rose Engine 2.0, these parts must be made quite accurately.

MDF Rose Engine Lathe 2.0

Machined Parts for the Base & Headstock

Spindle Shaft

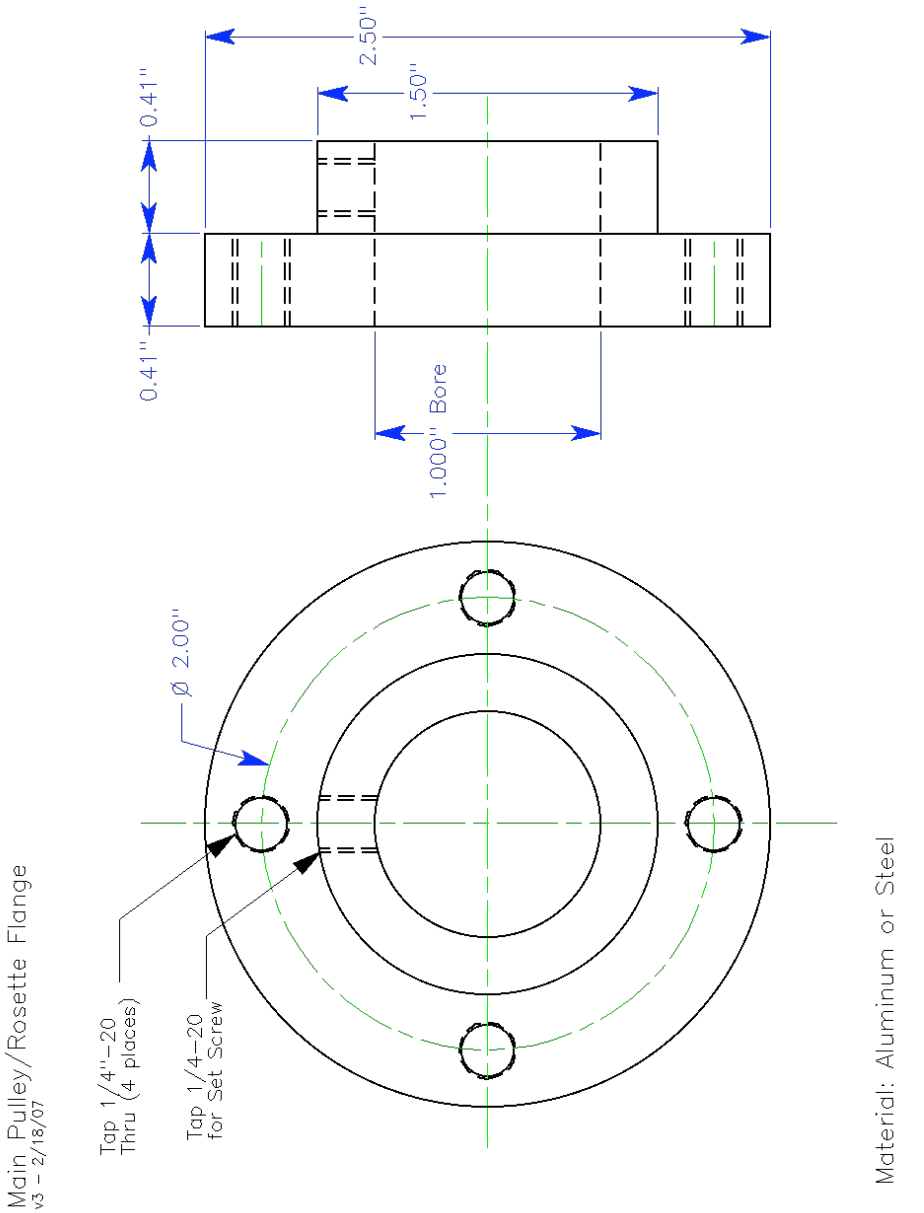
This is the spindle shaft from the original MDF Rose Engine Lathe. The MDF Rose Engine Lathe 2.0 has a spindle with a Morse taper.



MDF Rose Engine Lathe 2.0

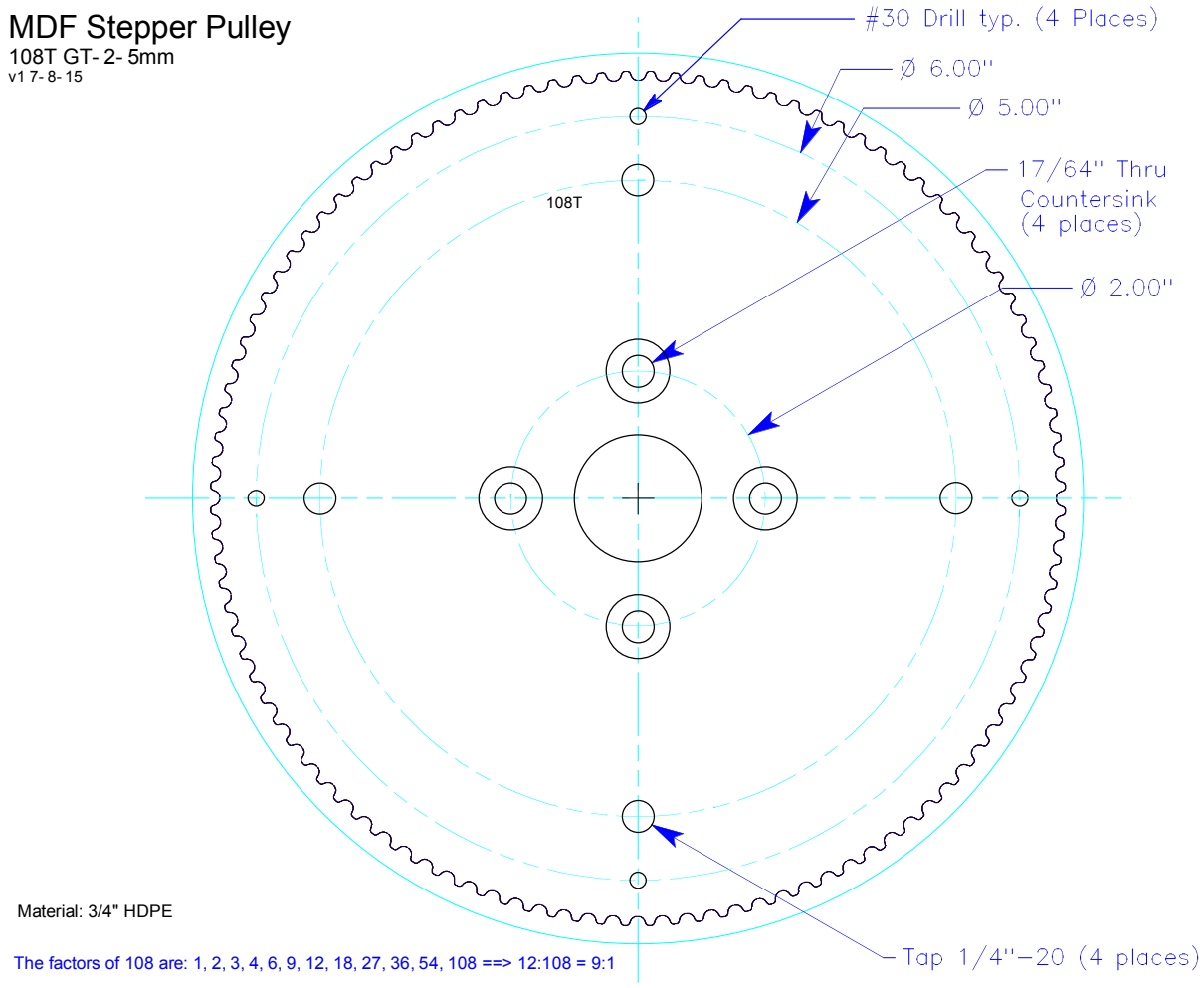
Machined Parts for the Base & Headstock

Spindle Flange



MDF Rose Engine Lathe 2.0
Machined Parts for the Base & Headstock

Stepper Pulley



File for 3D printing at
https://github.com/elfren/RoseEngine_SpindleAndAxis/tree/master/Hardware/GT2-5mm-108t.

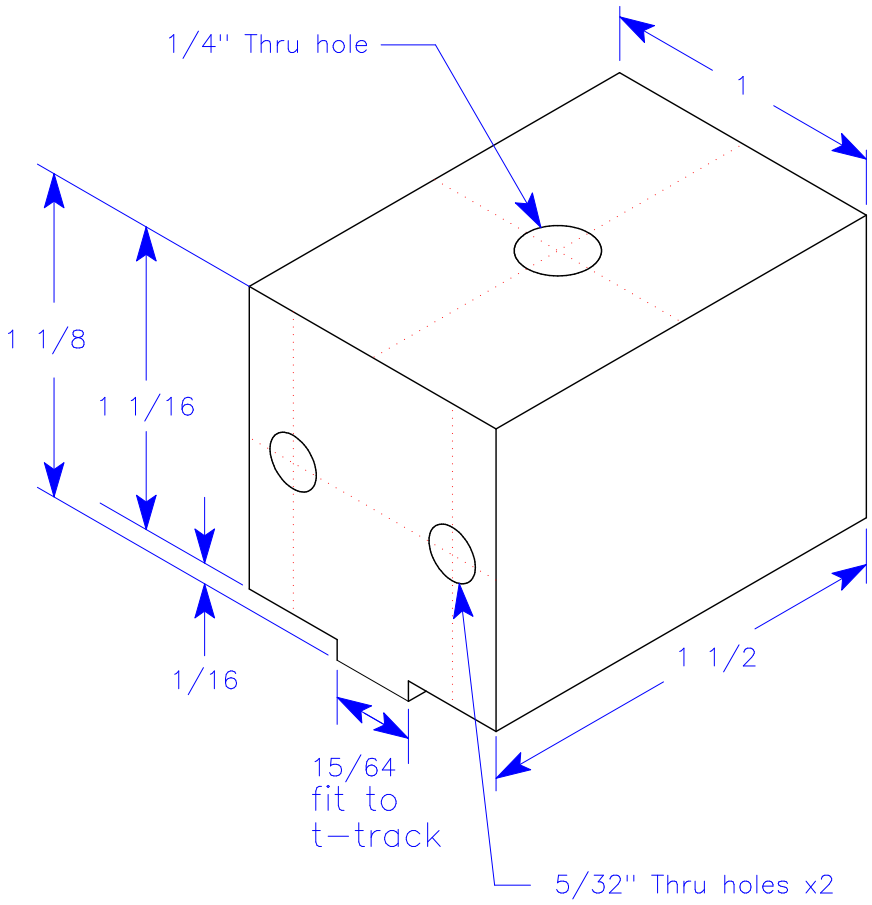
MDF Rose Engine Lathe 2.0

Machined Parts for the Base & Headstock

Bungee Block

Bungee Block
v1 5-17-20

Notes:
- 1/4" hole for through hex head bolt into t-track
- 5/32" through holes for 1/8" bungee cord
- 1/16" x 15/64" boss on bottom to slide in t-track



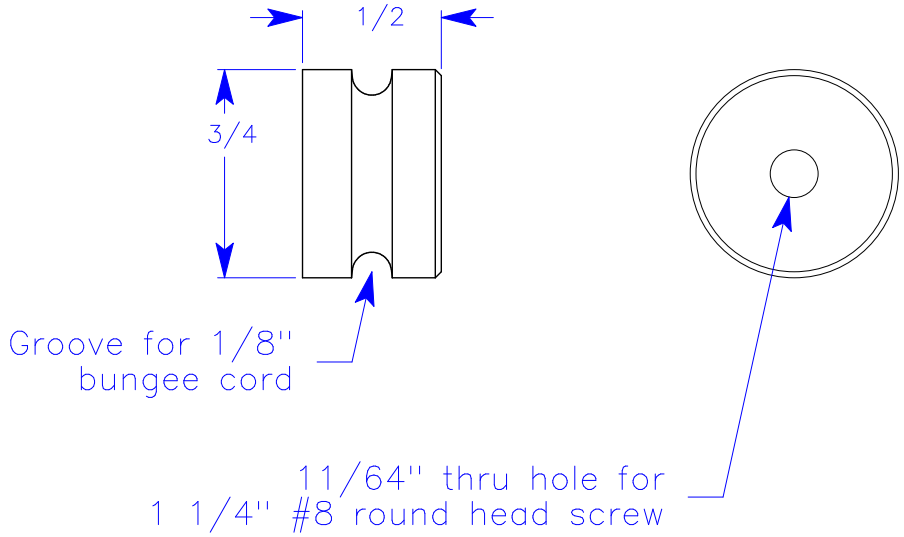
Material: Suitable hardwood

MDF Rose Engine Lathe 2.0

Machined Parts for the Base & Headstock

Bungee Button

Bungee Button
v1 5-17-20



Material: 3/4" diameter HDPE rod or equal

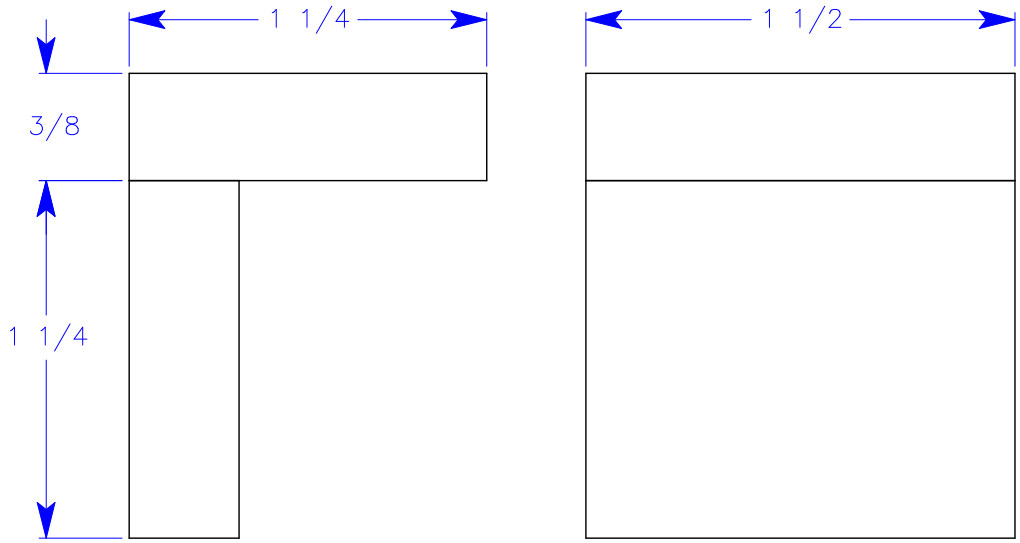
MDF Rose Engine Lathe 2.0

Machined Parts for the Base & Headstock

Rear Stop Block

Rear Stop Block
v2 5-17-20

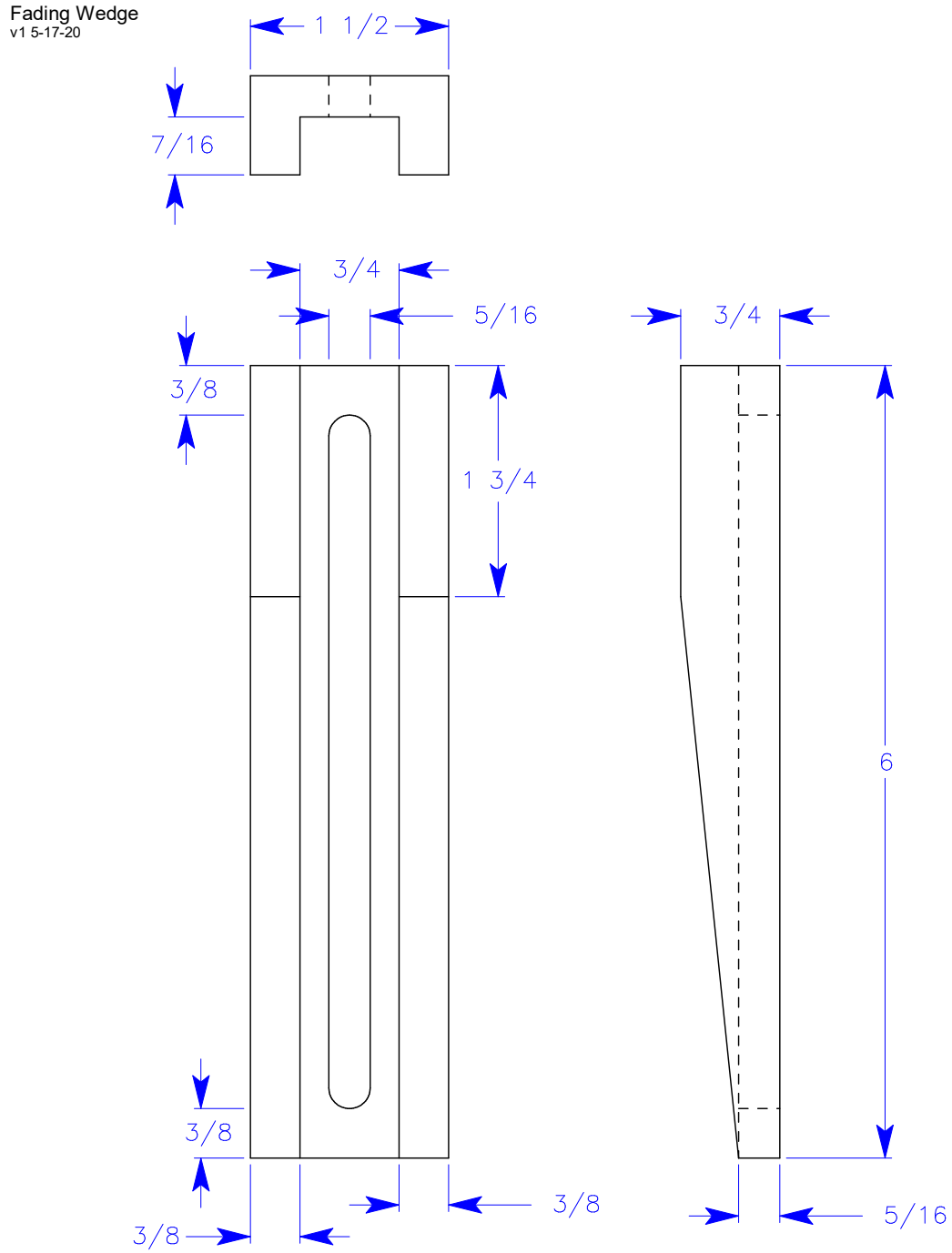
Notes:
- Made from strip of 1 1/4" x 3/8" stock
- Glue and pin nail strips, then cut to length



Material: Suitable hardwood

MDF Rose Engine Lathe 2.0
Machined Parts for the Base & Headstock

Fading Wedge



Material: 3/4" thick MDF, or equal

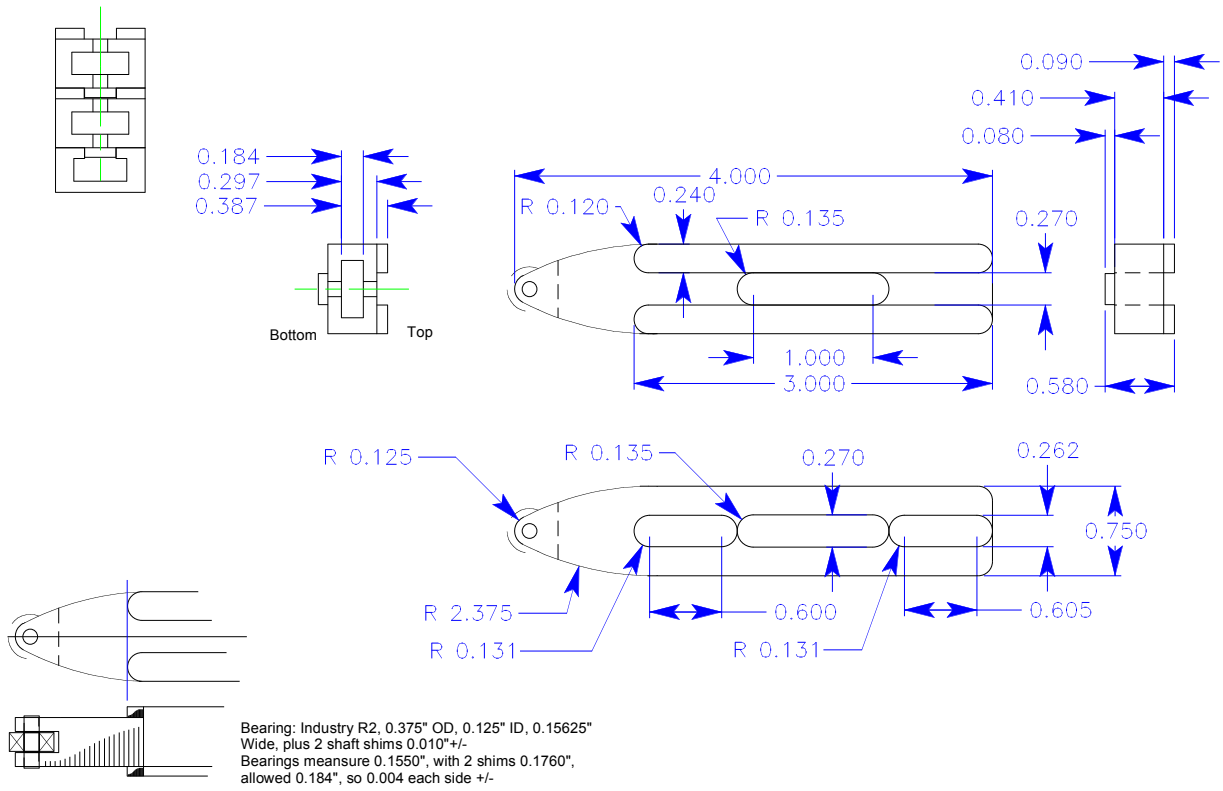
MDF Rose Engine Lathe 2.0

Machined Parts for the Base & Headstock

Double Rubbers

Double Rubber Layout

v5 5-2-16



Bearing: Industry R2, 0.375" OD, 0.125" ID, 0.15625" Wide, plus 2 shaft shims 0.010"+/-
Bearings meansure 0.1550", with 2 shims 0.1760", allowed 0.184", so 0.004 each side +/-

MDF Rose Engine Lathe 2.0
Machined Parts for the Base & Headstock

Double Rubber Parts for MDF Rose Engine “Double Rubber Kit”
- v1 – 6-19-15
- v2 - 8-3-15
- v3 - 11-14-20 - updated comments for Rich Colvin, Jack Zimmel

One “Double Rubber” kit consists of:

- 2 rubbers made up from:
  - Anodized aluminum rubber bodies x2
  - Bearings x2
  - Shaft shims x4
  - Dowel pins x2

- 2 long thumbscrews - now replaced by a pre-assembled part, see below
  - 1/4”-20 x 1.5”L SHCS x2
  - Pressed on knobs x2

- 1 spindle shim (no longer needed with update, see below)

Components required to make Double Rubber “kits”:

Rubbers
- Raw material – 6061 aluminum 3/4” x 3/4” rectangular bar (or 5/8” x 3/4” if available)
- Finished part is 4” long, so rough cut allowance of 4-1/4”, minus kerf, figure 4-1/2”
- Yield from:
  6’ stick = 16 pieces, or 8 kits
  12’ stick = 32 pieces, or 16 kits (normal aluminum stick length)
  20’ stick = 53 pieces, or 26 kits

Dowel pins – (Note: each batch has to be mic’ed to select slightly undersized pins)
- 1/8” dia. x 7/16” long
- Alloy Steel Dowel Pin, 1/8" Diameter, 7/16" Length
- McMaster-Carr part #98381A218 $13.95 per pack of 100 as of 11-14-20

Bearings
- Industry size R2-2Z, double shielded, for 1/8” shaft & 3/8” OD, 5/32” wide
- Steel Ball Bearing, ABEC-1, Double Shielded, R2 for 1/8" Shaft Diameter, 3/8" OD
- McMaster-Carr part: #60355K41, $6.56 Each as of 11-14-20

Shaft Shims for Bearings
- For shaft size 0.125” x 0.010” thick

MDF Rose Engine Lathe 2.0
Machined Parts for the Base & Headstock

Stepper Motor Mount Bracket

Off-the-shelf Parts:

4 - #8-32 x 3/8" screws (Phillips or BHCS) for NEMA 23 motor
2 - 1/4"-20 x 2-1/2" Hex head bolts
3 - 1/4" washers, 2 for plate and 1 for idler
1 - 1/4"-20 x 5/8" FH hex drive screw
1 - 1/4"-20 x 3/8" BHCS

2 - 1/4"-20 dowel nuts for wood (.39" OD x .63" L) McM-C #90835A210
https://www.mcmaster.com/90835A210/

1 - 12T GT2 5mm pulley with .25" bore, 2 flanges, aluminum, for 9mm wide belt, SDP-SI #A 6A55-012DF0908 http://shop.sdp-si.com/catalog/product/?id=A%206a55-012df0908

2 - 3/8" x 7/8" x 9/32" shielded ball bearings MSC #01377498
https://www.mscdirect.com/product/details/01377498

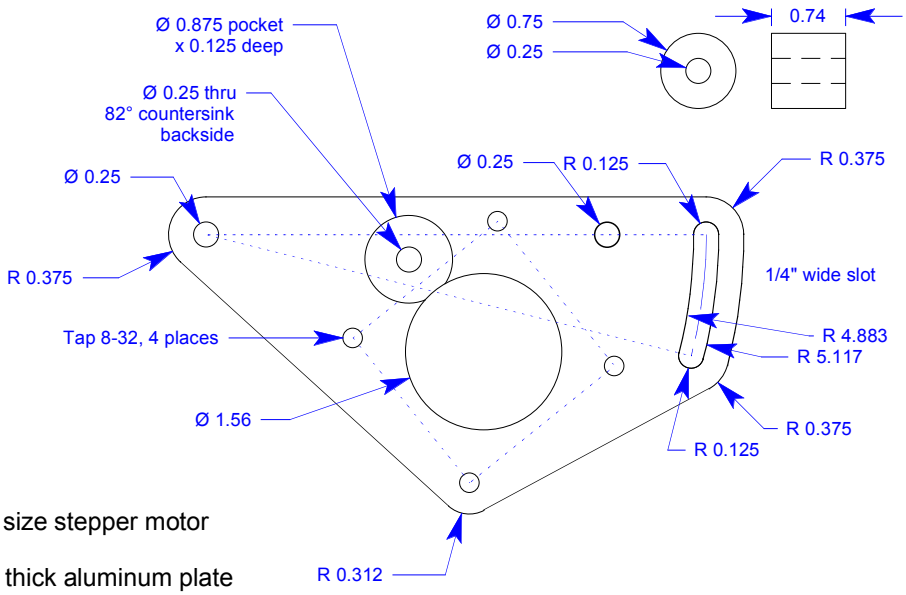
1 - GT3 5mm pitch, 131T / 655mm long, 9mm wide Timing belt, Misumi #GBN655EV5GT-90
https://us.misumi-ec.com

Manufactured Parts:

1 - Stepper Plate - 1/4" thick plate, rough 5-3/4" x 3-1/4"
2 - Stepper plate spacers - 3/4" diameter aluminum rod
1 - Idler shaft - 7/8" diameter steel rod
1 - Idler shaft spacer - 5/8" diameter HDPE rod or similar
1 - Idler body - 1-1/4" diameter HDPE rod or similar

MDF Rose Engine Lathe 2.0
Machined Parts for the Base & Headstock

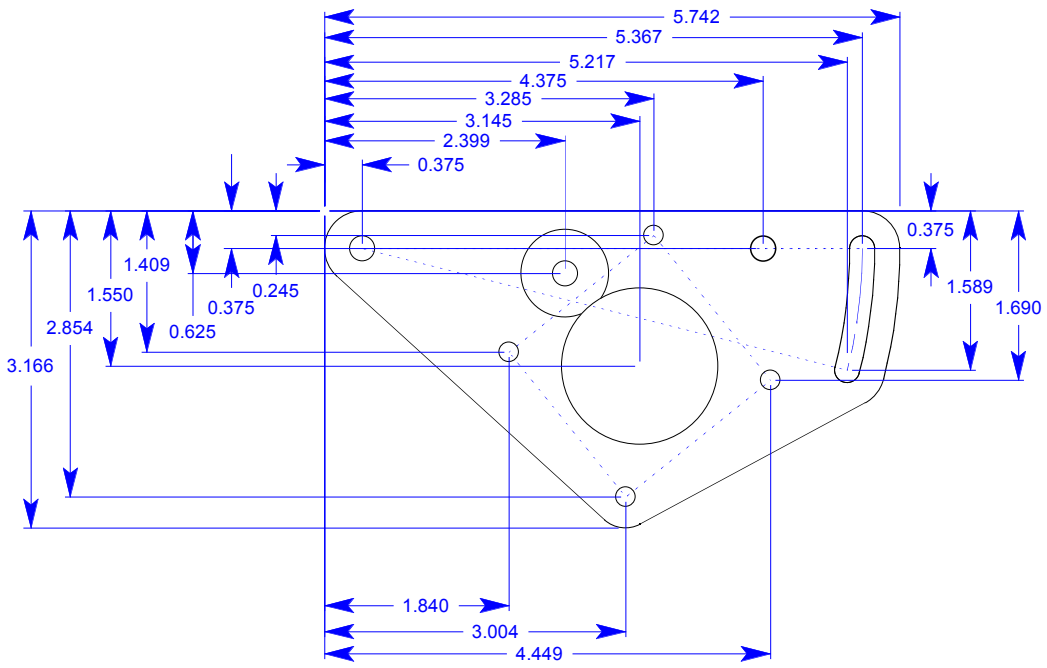
MDF Stepper Motor Plate
v4 8-2-20



For NEMA 23 size stepper motor

Material: 1/4" thick aluminum plate

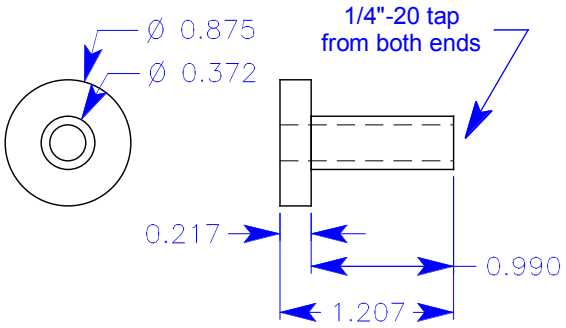
Stepper Plate Spacers
- 2 required, with 1/4" washers and 1/4"-20 x 2-1/2" bolts



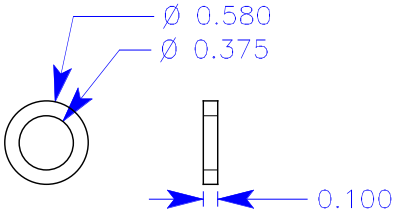
MDF Rose Engine Lathe 2.0
Machined Parts for the Base & Headstock

MDF Stepper Plate Idler Assembly
v2 8-2-20

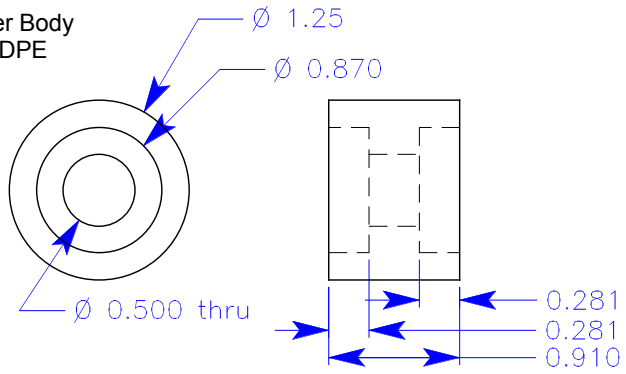
Idler Shaft
- Steel



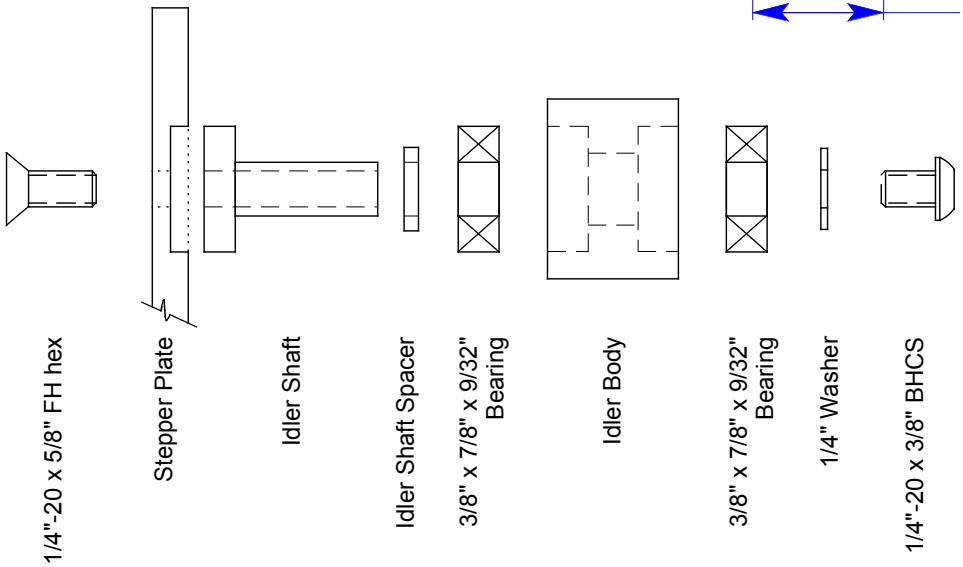
Idler Shaft Spacer
- HDPE



Idler Body
- HDPE



Idler Assembly
- Use blue Loctite on screws



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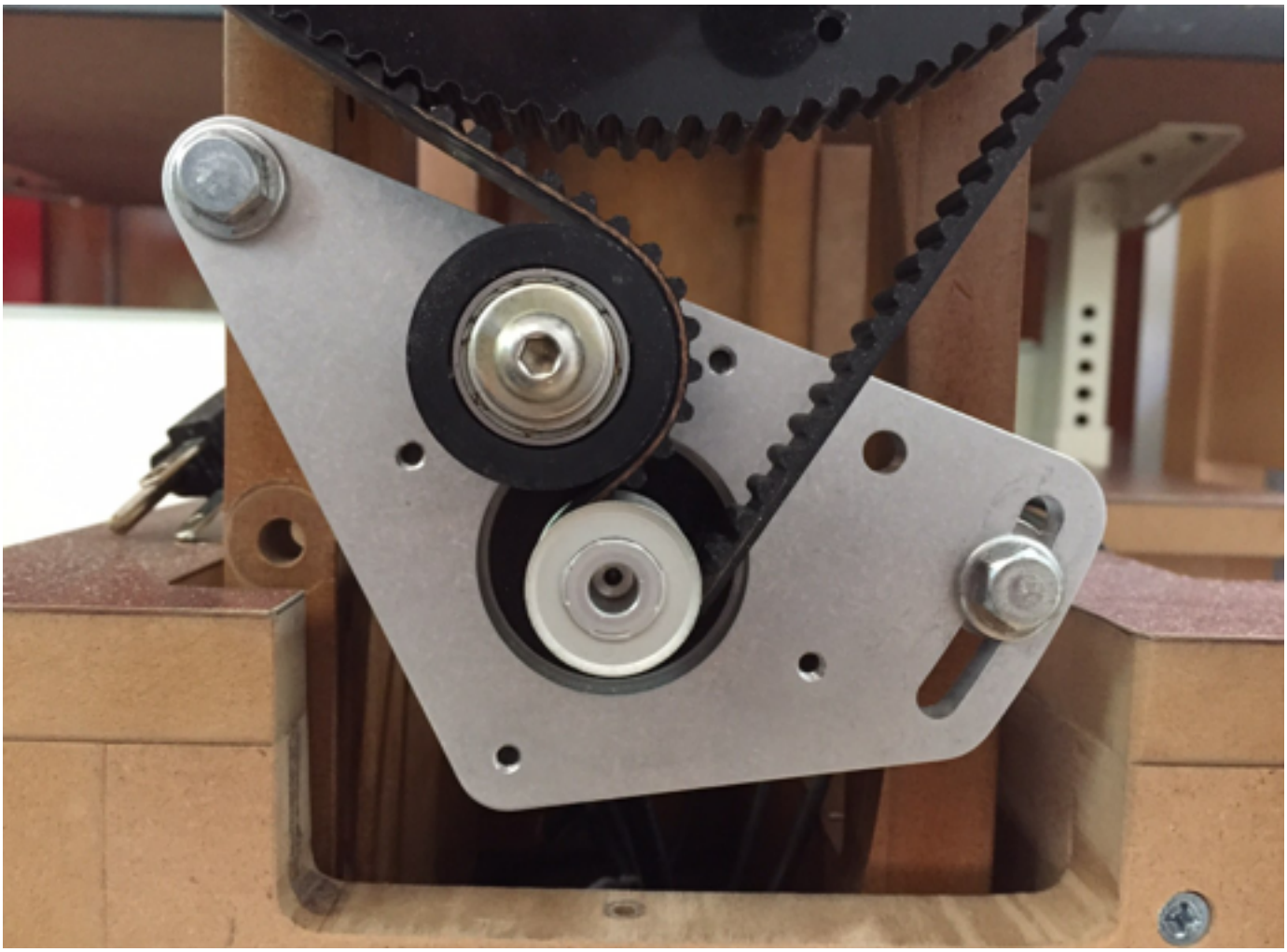
Machined Parts for the Base & Headstock



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