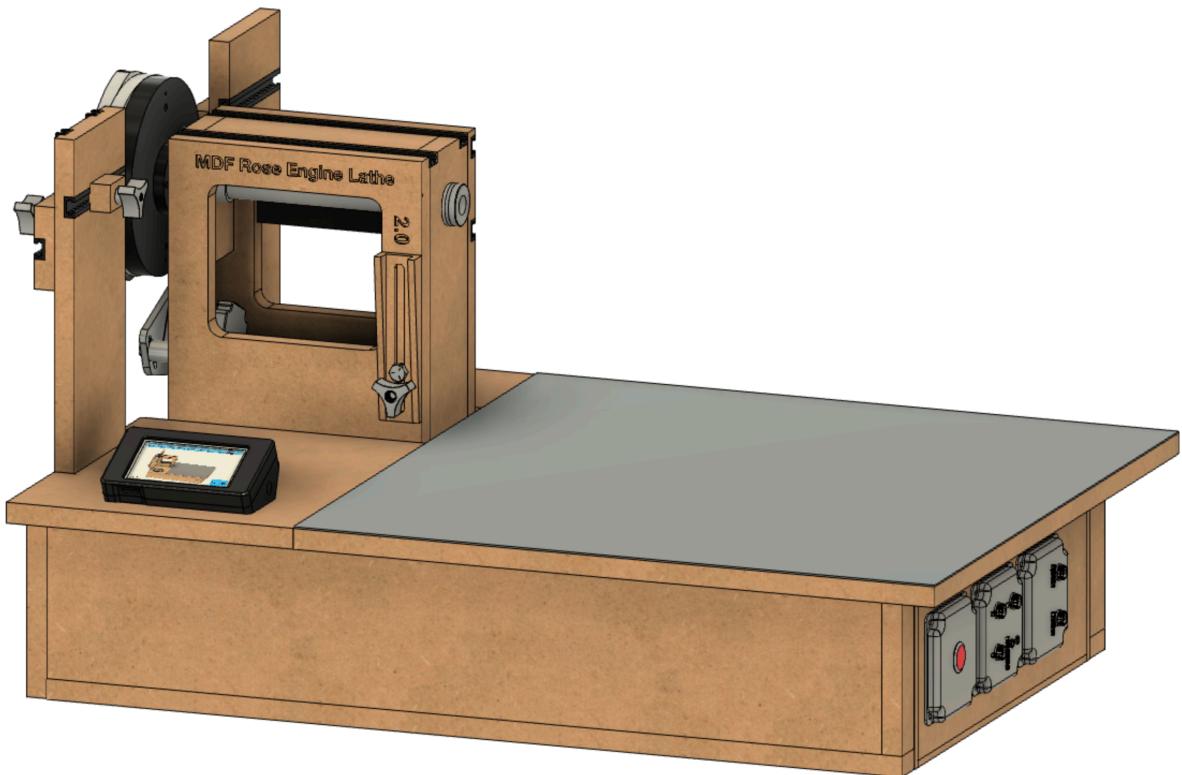


MDF Rose Engine Lathe 2.0 with Stepper Motor Drive



Standards

**Version 1.0
11 August 2020**

MDF Rose Engine Lathe 2.0

Standards

This document is intended to document the standards used in the design of the MDF Rose Engine Lathe 2.0. The kit you can purchase from www.ColvinTools.com, and add-on parts are designed around these standards.

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

Good luck.

Rich Colvin & Jack Zimmel

MDF Rose Engine Lathe 2.0

Standards

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Standards

Mechanical Standards

Spindle

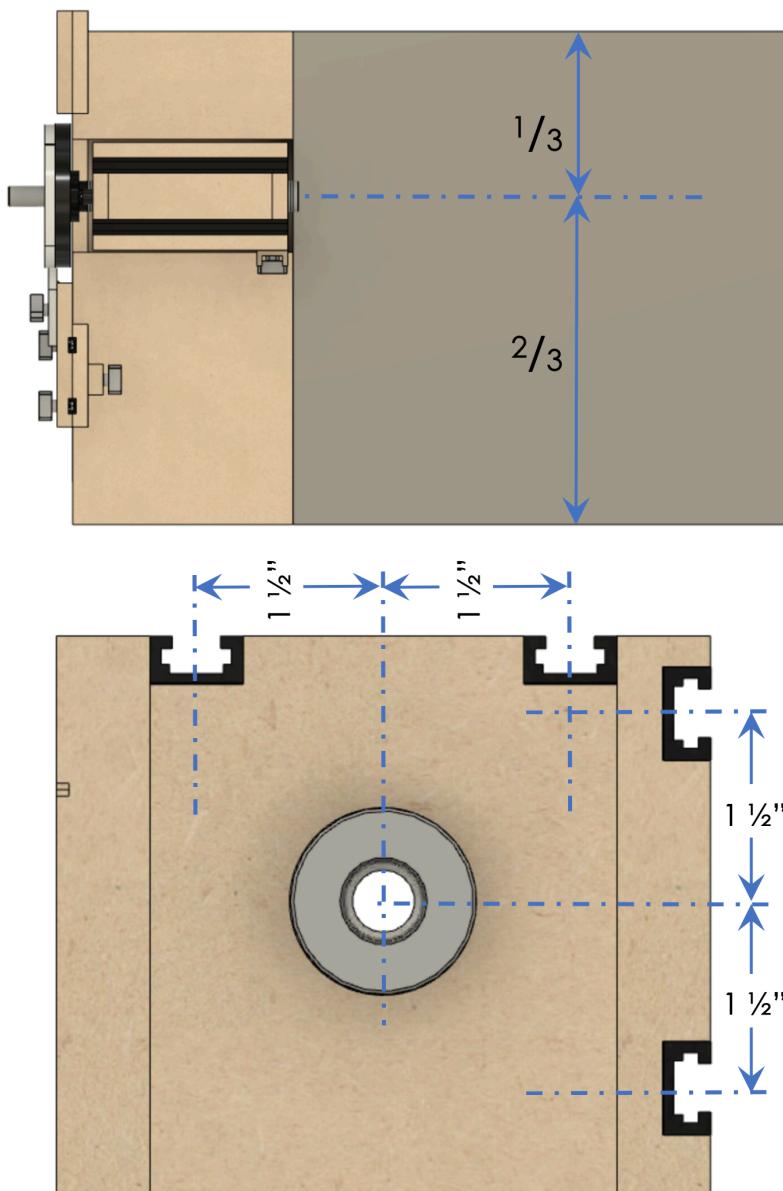
1. Work holding end will have a Morse Taper #2.
2. Shaft will accommodate a $\frac{3}{8}$ "-16 draw bar.
3. Shaft will be able to be used on the original MDF rose engine lathe.

Lathe Bed

1. Lathe bed shall be 24" square.

Headstock

1. Headstock shall be positioned such that:
 - a. $\frac{1}{3}$ of the bed is behind the center line of the spindle
 - b. $\frac{2}{3}$ of the bed is forward of the center line of the spindle
2. Distance between the center line of the spindle and the headstock's pivot points shall be 12".
3. T-Tracks on the headstock shall be $1\frac{1}{2}$ " from the centerline on the spindle.
 - a. Two on top, and
 - b. Two on the rear.



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Standards

Electrical

Conventions in this Document

In this document,

- Standards are documented using green tables
- Recommendations are documented using blue tables

Nextron Display

1. Device

Item	Standard
Model	Nextron Enhanced HMI Display
Size	4.3"

2. Cabling

Item	Standard
Conductor Type	Ethernet Cat-5 (or higher)
Cable Size	8 conductors / cable

3. Connector

Item	Standard
Connector	RJ-45
Cable Ends	Female plug
Control Box	Male Socket
Nextron Box	Male Socket

4. Connector Configuration

Item	Standard
Cabling Color Standard	T568A
Power Pins	Power over Ethernet (PoE) standard 802.3af, 10/100 Mode A (mixed DC & data)

Pin	Cable Wire Color	Use
1	White/Green	Rx
2	Green	DC+ (5V)
3	White/Orange	Tx
4	Blue	(unused)
5	White/Blue	(unused)
6	Orange	DC- / GND
7	White/Brown	(unused)
8	Brown	(unused)

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Standards

Stepper Motors

Spindle Stepper Motor

Item	Standard
Size	NEMA 23
Motor Type	Bipolar Stepper
Step Angle	1.8 deg
Microstep Resolution	6400
Min. Holding Torque	1.9Nm (269oz.in)
Max. Rated Current/phase	4A

Other Stepper Motors

Item	Required	Recommended
Size	- n/a -	NEMA 17
Motor Type	Bipolar Stepper	
Step Angle	1.8 deg	
Microstep Resolution	- n/a -	6400
Min. Holding Torque	- n/a -	(as needed)
Max. Rated Current/phase	4A	

General

1. Cabling

Item	Standard
Conductor Type	Stranded copper
Conductor Size	20 AWG
Cable Size	4 conductors / cable

2. Connector

Item	Standard
Connector	GX-16, 4 pins
Cable Ends	Female plug
Control Box	Male Socket
Stepper Motor	Male Socket

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Standards

3. Connector Configuration Standard

Pin	Use
1	A+ / A1
2	A- / A2
3	B+ / B1
4	B- / B2

4. Connector Connection Recommendation

Pin	Use	Cable Wire Color	Stepper Motor Lead Color
1	A+ / A1	Black	Black
2	A- / A2	Yellow	Green
3	B+ / B1	Red	Red
4	B- / B2	White	Blue

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Standards

Stepper Motor Drivers

1. Device

Item	Standard
Model	DM542T

2. Power Cabling

Item	Standard
Conductor Type	Stranded copper
Conductor Size	20 or 22 AWG
Cable Size	2 conductors / cable

3. Power Cabling Configuration

Item	Cable Wire Color
Positive (+)	Red
Negative (-)	White (or Black)

4. Signal Cabling

Item	Standard
Conductor Type	Stranded copper
Conductor Size	20 AWG
Cable Size	4 conductors / cable

5. **Connectors:** Cable conductors are directly connected to the DM542T using the provided screw terminals.

6. Power Cabling Configuration

Item	Cable Wire Color
Pulse +	Black
Pulse -	White (GND) *
Direction +	Red
Direction -	White (GND) *
Enable +	Yellow
Enable -	White (GND) *

* GND wires tied / bonded together.

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Standards

DC Power Supply

1. Device

Item	Standard
Model (USA)	Mean Well EDR-120-24
Output	24 VDC

2. DC Power Cabling

Item	Standard
Conductor Type	Stranded or solid copper
Conductor Size	20 or 22 AWG
Cable Size	2 conductors / cable

3. DC Power Cabling Configuration

Item	Cable Wire Color
Positive (+)	Red
Negative (-)	White (or Black)

4. AC Power Cabling

Item	Standard
Conductor Type	Stranded copper
Conductor Size	16 AWG (min)
Cable Size	3 conductors / cable

5. AC Power Cabling Configuration

Item	Cable Wire Color
Hot (or live or active)	Black
Neutral	White
Ground	Green

6. AC Power Switching Configuration:

Hot (or live or active) is switched on the infeed to the DC power supply.

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Standards

Limit Switches

General

1. Cabling

Item	Standard
Conductor Type	Stranded copper
Conductor Size	22 AWG
Cable Size	2 conductors / cable

2. Connector

Item	Standard
Connector	3.5mm (1/8") mono
Cable Ends	Female plug
Control Box	Male Socket
Limit Switch	(directly cabled)

3. Connector Configuration

Pin	Standard	Cable Wire Color
Tip	DC+	Red
Sleeve	GND	White

Limit Switch

Item	Standard
Switch Type	Normally open, momentary close

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Standards

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