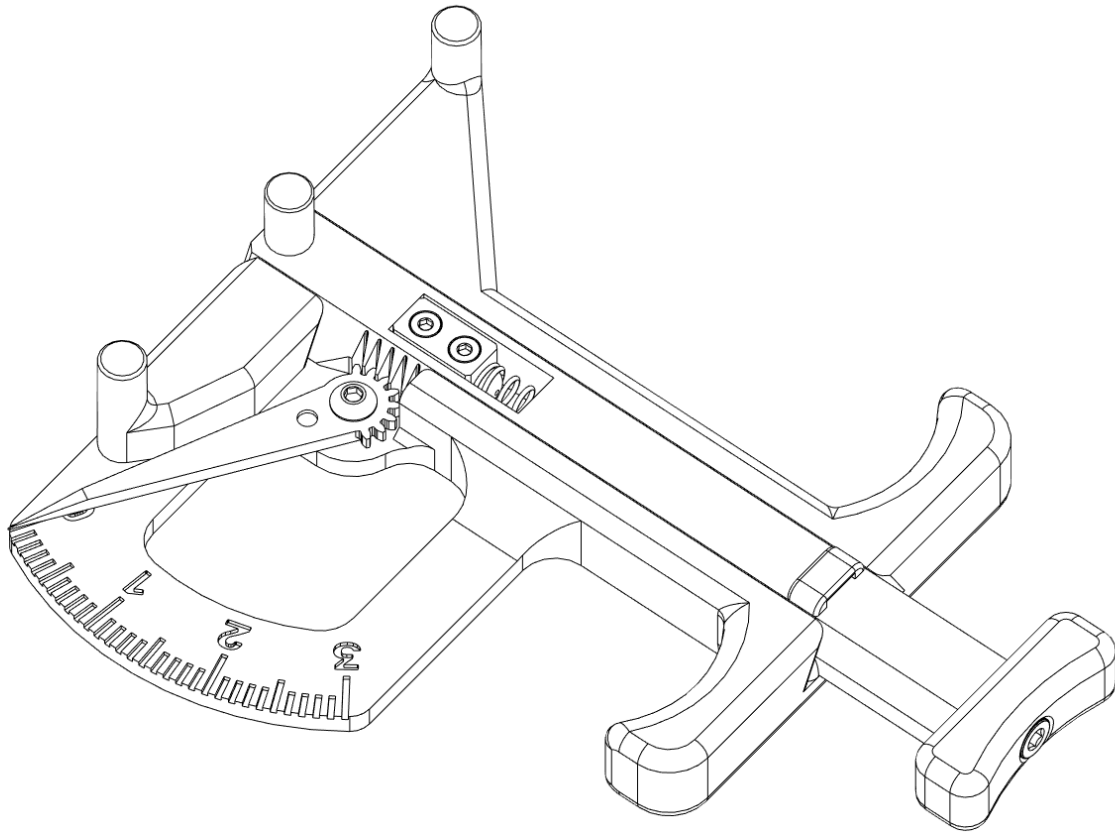


GT2 Belt Tensiometer (RC2)

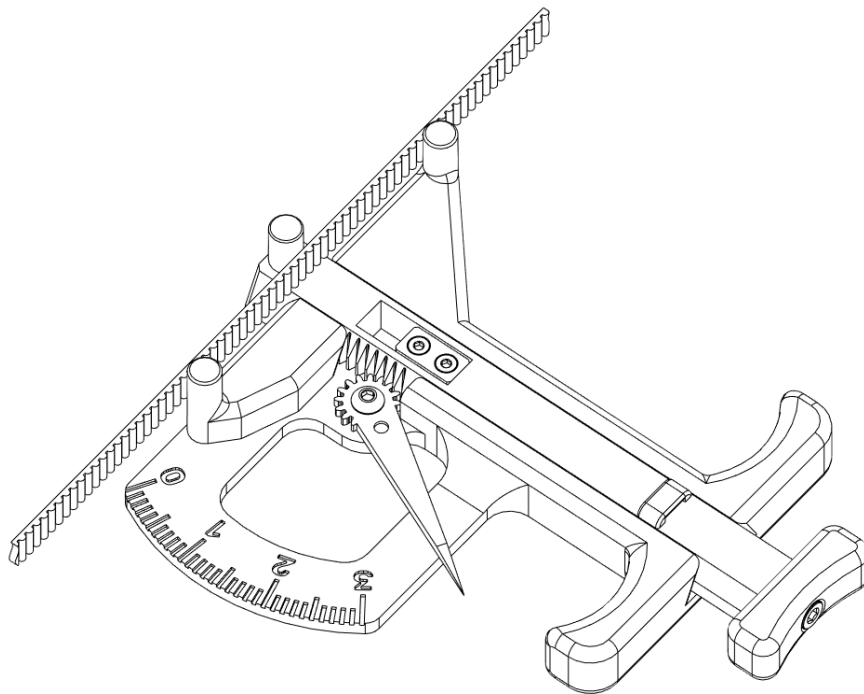


DETAILS:

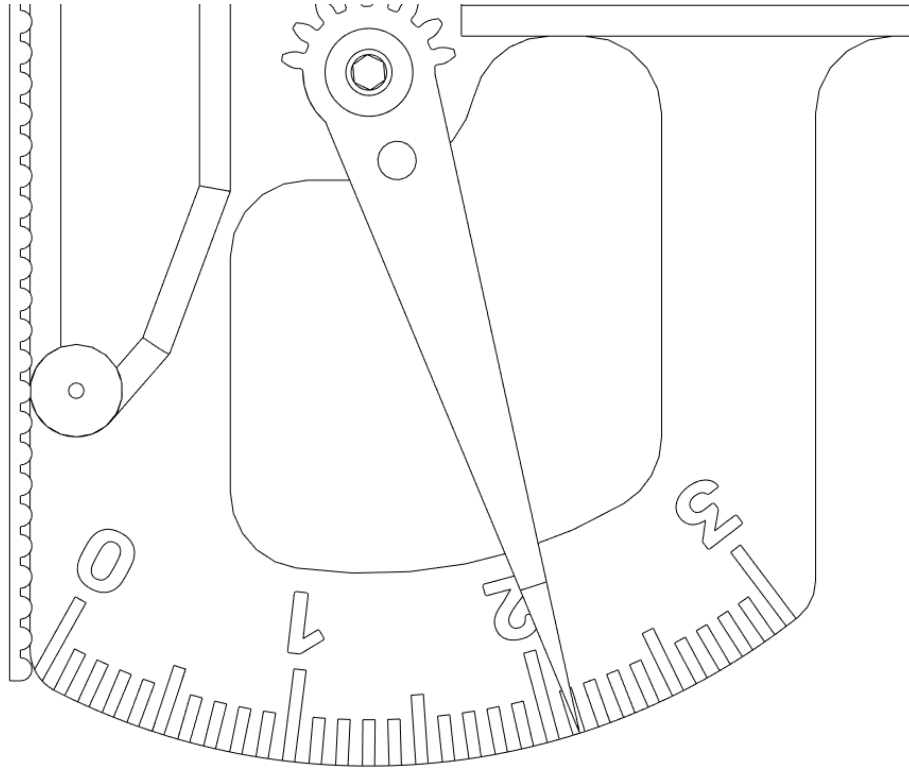
This 3D printed tension meter is designed to measure belt deflection to determine belt tension for Gates 6 and 9mm GT2 belts. The goal is to eliminate the need for phone apps that use frequency to determine tension and to provide an easily quantifiable and repeatable number to use when tensioning belts on a 3D printer.

TENSION MEASUREMENT A/B BELTS:

1. Refer to your printer's documentation for proper belt tension.
2. Issue G28 to home printer. Printer should be cold for this test.
3. Center toolhead on X and then move Y until the X/Y idler centers are 150mm from the front idler centers. Motors should be on for this test.
4. Depress plunger and place meter on the 150mm belt span so that belt is routed through the gauge pins as shown.



5. Slowly release the plunger and note the reading on the dial. *rocking the meter very slightly fore and aft or lightly “pumping” plunger can help to settle the needle and get an accurate reading.
6. Repeat three times to ensure you are getting consistent readings.
7. Adjust belt tension then repeat steps 3-5 until you reach the desired tension (see table below) The A/B belt tensions can affect each other. Tightening one will also tighten the other. Go back and forth adjusting each until they are equal.



8. Home X and Y to seat the belts then repeat steps 2-5 to verify that tension is correct and make followup adjustments as needed.
9. Your belts should now be properly tensioned.

Note: Depending on your printer your belt tension may increase slightly when utilizing a heated chamber so keep this in mind when selecting tensions in the higher range. When checking tension always remember to run the printer through its full range of travel before measuring to normalize the tension in the belt path.

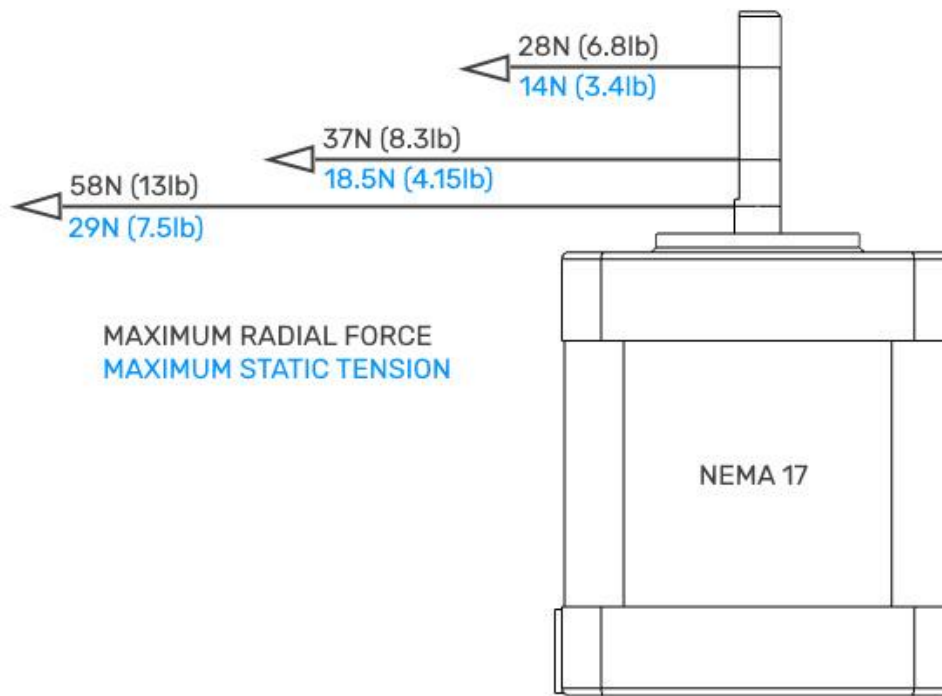
6mm & 9mm GT2		
STATIC BELT TENSION N (lb)	METER READING (NEOPRENE)	METER READING (EPDM)
8.90 (2.0)	1.8	1.9
11.12 (2.5)	2.0	2.1
13.34 (3.0)	2.1	2.2
15.57 (3.5)	2.3	2.4
17.8 (4.0)	2.4	2.5
20.02 (4.5)	2.5	2.6
22.24 (5.0)	2.6	2.7
24.47 (5.5)	2.7	2.8
26.69 (6.0)	2.8	2.9

Common NEMA 17 Stepper Motor Maximum Radial Force Ratings

Distance from Step Motor Flange:	5mm	10mm	20mm
recommended Radial force:	20N (4.5lb)	13N (2.9lb)	9N (2.0lb)
maximum Radial force:	58N (13lb)	37N (8.3lb)	28N (6.8lb)

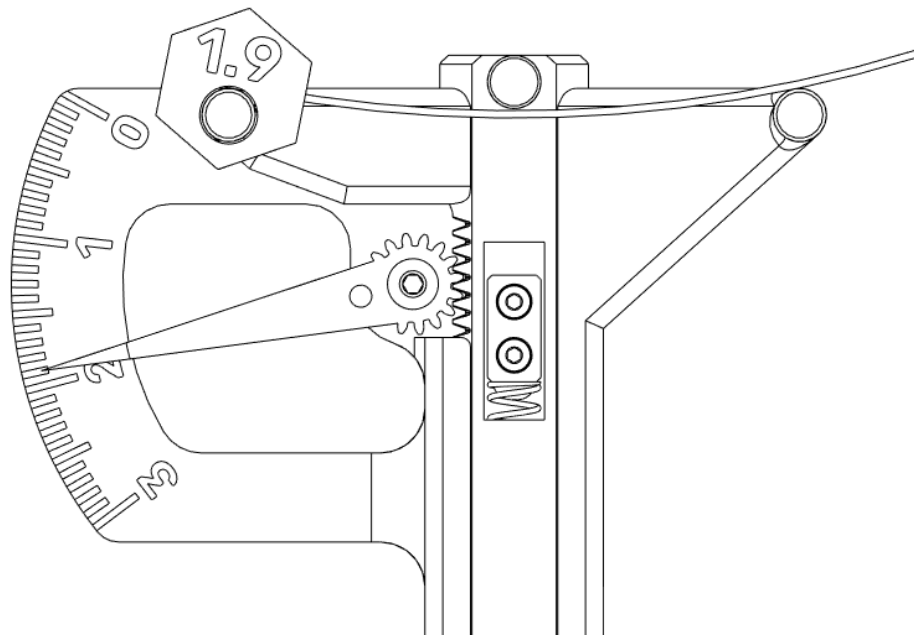
Radial Force = Static Belt Tension * 2

NEMA 17 MAXIMUM BELT TENSION RELATIVE TO PULLEY POSITION ON MOTOR SHAFT



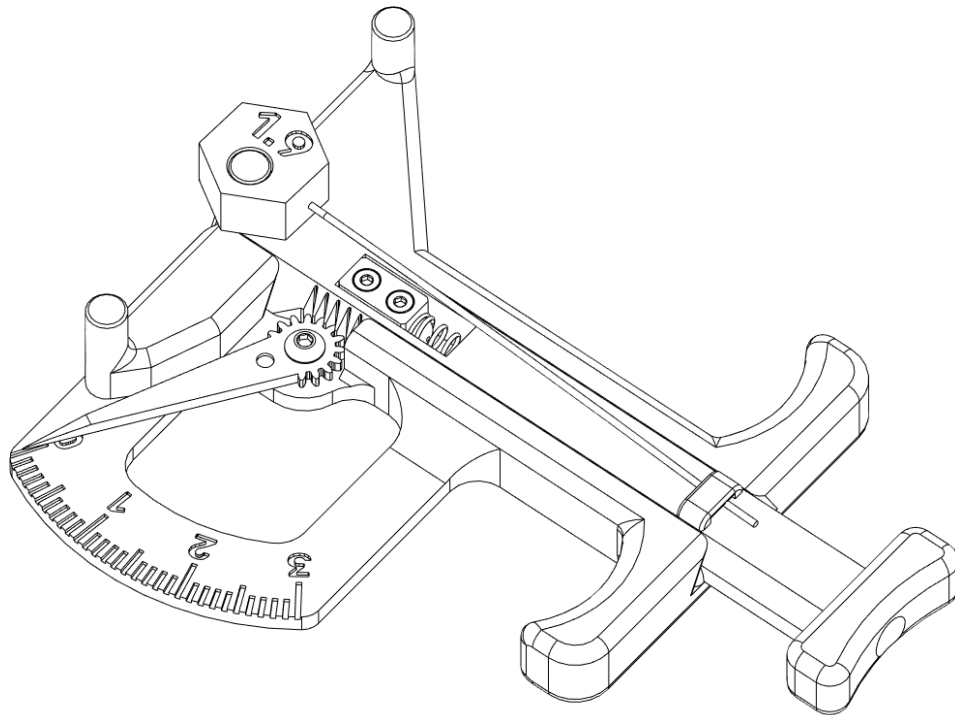
CALIBRATION:

1. Depress plunger and place calibration wire into the jaws making sure the pivot is seated all the way on the left pin as shown. Eye protection is recommended for this step.



2. Release the plunger and note the reading on the dial. Lightly tapping or “pumping” the plunger handle can help to settle the needle and get a better reading.
3. Tighten the screw one turn then depress and release the plunger again. Note that the reading has changed.
4. Repeat steps 3 and 4 until your meter consistently reads 1.9 when checking the deflection of the music wire.
5. Your meter is now calibrated and ready for use.

Calibration wire can be stowed on the center pin with wire secured beneath the slides wire keeper.



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