TB036 (Rev2) - Measuring Motor Revs. Per Inch or mm's/rev

For imperial machine configurations the number of motor revolutions required to move 1" must be calculated.

1. For metric machine configurations the number of mm's travelled during one revolution of the motor must be calculated.

2. Do a rough check of the current motor/ballscrew ratios using a tape measure. In MDI, type g92 x0y0z0, and press cycle start to set the current XYZ position to 0.

3. Lay a tape measure on the table with the one end at the spindle.

4. In MDI issue a command of G1 X1 F10 (if metric, use X25 F250), press cycle start. Note: If the motors do not move smoothly, press Estop and move the axis manually from to 1"(25mm)

5. Measure the distance the axis actually moved and set your motor revs/inch (or motor mm's/rev if in metric) as follows: Press F1 -Setup → F3 Config, password = 137, Press enter → F2 Mach → F2 Motor

Imperial - How to compute motor revs/inch:

      Commanded distance (DRO) / Distance moved (measured) = multiplier
      Multiplier * Current revs/inch = corrected revs/inch

      Ex: Commanded Distance (DRO) = 1.0000"   = 2 (multiplier) * current revs/in
             Distance moved (measured) =   .5"

(multiplier) 2 * (current revs/inch) 5.0000 = <mark>10   ← New motor revs/inch</mark>

Metric - How to compute motor mm's/rev:

Distance moved (measured) / Commanded Distance (DRO) = multiplier

Multiplier * Current mm's/rev = corrected mm's/revs

      Ex: Distance moved = .125mm = .5 (multiplier) * current mm's/rev
           Commanded Distance=   25mm

(multiplier) .5 * (current mm's/rev) 5.0000 = <mark>2.5 ← New motor mm's/rev</mark>

Axis	Label	Motor revs/in	Encoder counts/rev	Lash Comp. (Inches)	Limit -	Limit +	Home -	Home +	Dir Rev	Screw Comp
			Motor Parameters							Stall detection
1	X	5.00000	8000	0.00000	1	2	1	2	N	N
2	Y	5.00000	8000	0.00000	3	4	3	4	N	N
3	Z	5.00000	8000	0.00000	5	6	5	6	N	N
4	N	5.00000	8000	0.00000	0	0	0	0	N	N
5	N	5.00000	8000	0.00000	0	0	0	0	N	N
6 s	N	0.00000	0	0.00000	0	0	0	0	N	N
7	N	0.00000	0	0.00000	0	0	0	0	N	N
8	N	0.00000	0	0.00000	0	0	0	0	N	N

NOTE: After changing revs/in or mm's/rev, part 0's must be reset (step 1)

5. Fine tuning:

Making sure they are parallel/perpendicular with the table, butt a place a gauge block or anything else that can be measured accurately up against a 123 block - a 6" (150mm) parallel works nicely as shown below:

1. Jog in slowly from 1 direction to take up lash

2. Zero indicator and axes

3. MDI Z to .5" (12mm) to clear

4. MDI command X 6" (150mm)

5. Read indicator to measure distance traveled

6. Compute and enter new motor revs/inch or mm/rev

Set X0, Y0, Z0

Spindle

123 block

Block measured 6" (150mm)
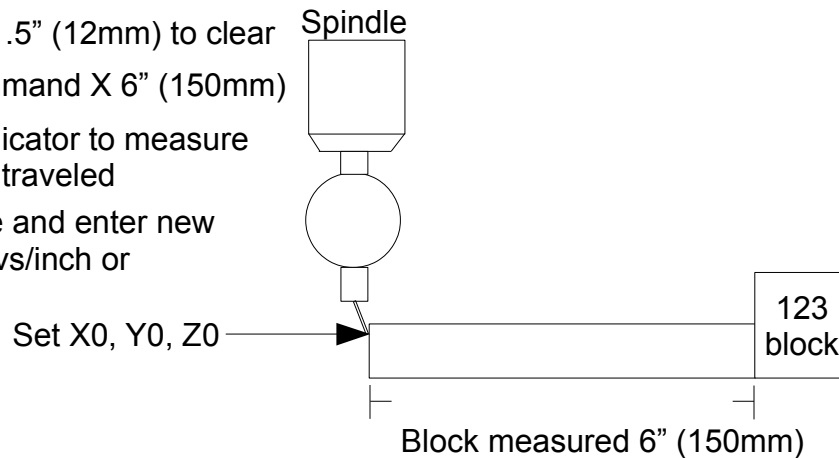
Imperial - How to compute motor revs/inch:

Commanded distance / Distance moved = multiplier

Multiplier * Current revs/inch = corrected revs/inch

Ex: Commanded Distance = 6.0000"   = ~.999417 (multiplier) * current revs/inch
         Distance moved = 6.0035"

(multiplier) .999417 * (current revs/inch) 5.0000 = 4.997085 ← New motor revs/inch

Metric - How to compute motor mm's/rev:

Distance moved (measured) / Commanded distance (DRO) = multiplier

Multiplier * Current mm's/revs = corrected mm's/rev

Ex: Distance moved(meas.) = 150.021mm = 1.00014 (multiplier) * current mm's/rev
Commanded Distance(DRO)=   150mm

(multiplier) 1.00014 * (current mm's/rev) 5.0000 = 5.0007 ← New motor mm's/rev

Perform this procedure 1 or 2 more times (being sure to reset your part zero after any change in the ratios). You should be able to accurately position to within a .0001 (.00254mm).

NOTE: After changing revs/in or mm's/rev, part 0's must be reset