Voron Design

High on One Side and Low on the Other (Twisted X Extrusion)

If you cannot get your first layer to print after a QGL and you are always high on one side and low on the other you may have a twisted X extrusion.

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INTRODUCTION

If you cannot get your first layer to print after a QGL and you are always high on one side and low on the other you may have a twisted X extrusion.

Non-Teardown X Extrusion Twist Check (Values in parentheses are used only as examples and assume 300mm build)

Please remember to clear any mesh you might be running while completing this guide, as it will interfere with your ability to correctly measure the various heights in this guide.

TOOLS: Piece of paper (1)

Step 1 — Homing Procedure



(i) Perform the standard homing procedure.

- G28
- QUAD_GANTRY_LEVEL
- G28

Step 2 — Measure Center of Bed



- (i) Go to the center of the bed
 - G0 X150 Y150 Z5
 - Drop down Z slowly and touch a piece of paper.
 - Record the Z value (ex 0.10)

Step 3 — Measure Left Side



- (*i*) Move to the left side of the bed (X50) and keep the same Y (Y150)
 - G0 X50 Y150 Z5
 - Drop down and touch your paper.
 - Record the Z value (ex 0.40)

Step 4 — Measure Right Side



- Move to the right side of the bed
 (X250 on a 300) and keep the same
 Y (Y150)
 - G0 X250 Y150 Z5
 - Drop down and touch your paper.
 - Record the Z value (ex -0.15)

Step 5 — Calculation



(i) You are now 0.30 (0.40-0.10) high on the left and 0.25 (-0.15-0.10) low on the right

• Formula (Recorded Z Value - Center Z Value) = Z offset

Step 6 — Measure Front Points



- Move to the front (Y50) and repeat the above at the same three X positions
 - G0 X50 Y50
 - G0 X150 Y50
 - G0 X250 Y50

Step 7 — Measure Rear Points



- Move to the the back (Y250 on a 300) and repeat the above at the same three X positions
 - G0 X50 Y250
 - G0 X150 Y250
 - G0 X250 Y250

Step 8 — Conclusion



(i) If the Z offsets match for the same three X positions along the different Y values you have a twisted X extrusion - (or your bed is a perfect taco)

Step 9 — What's Happening?



Your sensor is correctly offset from your bed based on the Quad_Gantry_Level, but your nozzle is ~25mm in front. As you move along the twisted X extrusion the toolhead is rotating about the X axis swinging the nozzle in an arc. Moving along Y should not change this rotation.