Backgauge Troubleshooting

Homing Process Troubleshooting

The homing process involves:

1. Both motors in the X axis activate to push the gantry away from the user until one side hits a limit switch.
2. That limit switch's motor stops while the other side keeps running until the limit switch is hit.
3. Once both limit switches are hit, the machine should be back in alignment. It pulls back to disengage the limit switches.
4. It moves forwards once again to trigger both limit switches. This time it only stops once both limit switches have been triggered.
5. It finally pulls back and ends the homing process for that axis.

If your machine is ramming, then there are a few possibilities.

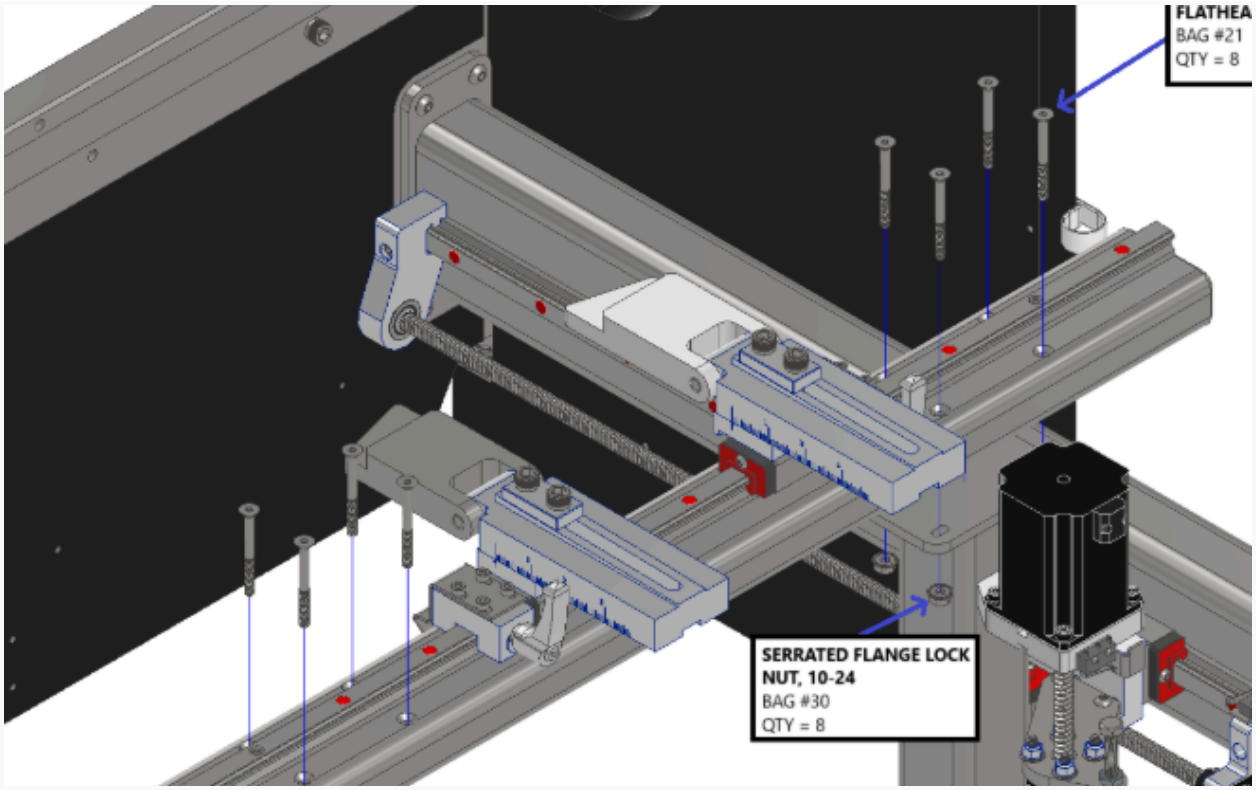
1. The motor wires are swapped then the limit switch will stop the wrong motor in step 1. Swapping the motor wires fixes this. **This is the most common failure mode.**
2. If the limit switch triggers are not extended, then the bearings will ram into the motor mounts instead of triggering either limit switch during step 1. Extending the limit switch triggers fixes this.
3. You have your R axis and X axis motors mixed up entirely. The R axis should be moving the backgauge up and down. The X axis moves the unit towards you and away from you.
4. The Limit switch cables are mixed up. You can test this by triggering a limit switch and watching which icon lights up in the limit switch status report bar (shown below).

R-Axis Movement Troubleshooting

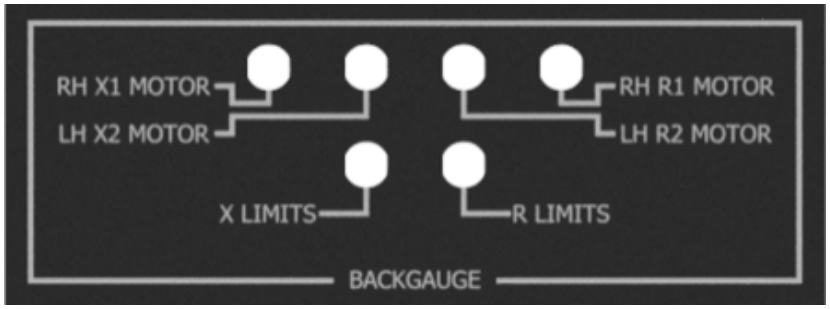
TESTING IF THE ISSUE IS ELECTRICAL OR MECHANICAL

First, run some tests to narrow down the nature of this issue.

1. Realign the backgauge on the X axis so it is in a good position to work with both R-axis assemblies.
2. Completely disconnect the gantry crossbar from the R axis assemblies by removing the attached bolts. You can leave the cross bar resting loose on top.



3. Run the unit up and down and look at the behavior of each R-axis assembly when they are not connected to each other.
4. Unplug the R1 and R2 motor cables in the back of the machine and swap the positions they are plugged into. R1 in the R2 slot and vice versa.

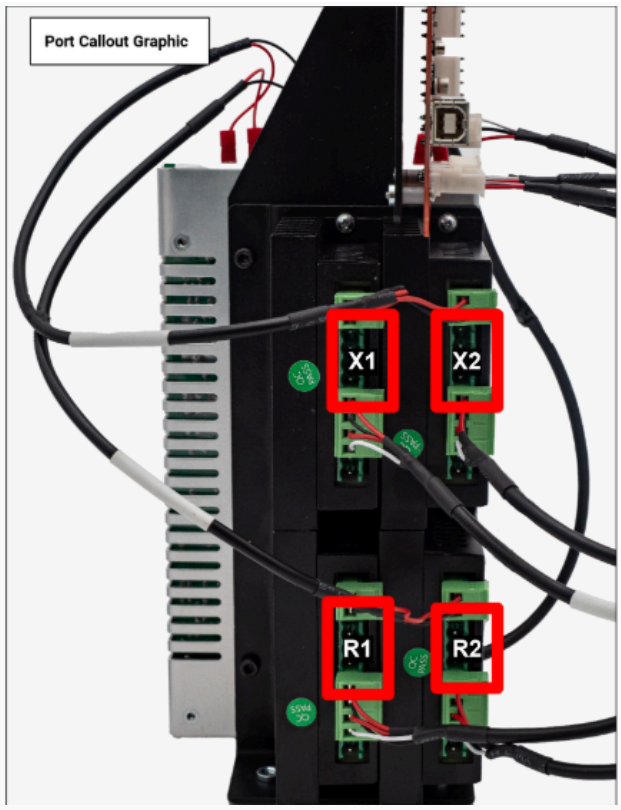


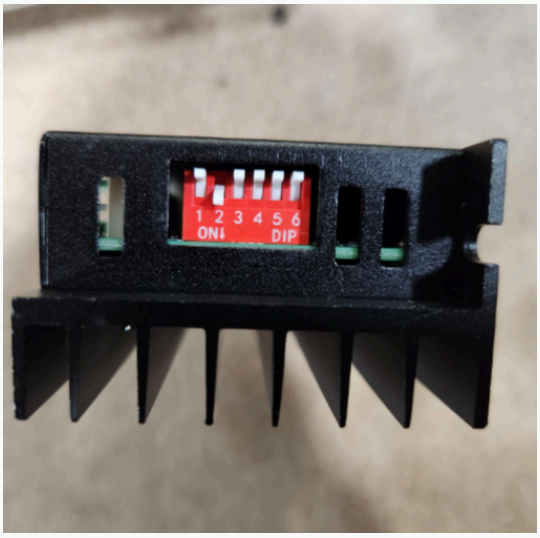
5. Run the R axis up and down and look at the behavior of the motors.

ELECTRICAL ISSUE

If the problem swapped which motor was failing, then the issue is electrical. There are two things you need to check:

1. That all of the green-tipped cable plugins are firmly inserted into the driver in the backgauge electronics assembly.





2. On each backgauge driver, check to see if the switches are in the correct position, depicted above:

MECHANICAL ISSUE

If you found that the issue was mechanical, there are a few things you could do to improve the functionality of your backgauge and prevent binding. You may want to undertake these efforts even if the issue was electrical in the first place.

1. Tighten the motor couplers. Motor slippage along the couplers is the most common failure mode.
2. Lead screw nylon lock-nut is too tight. The nut needs to be tight enough there is no air gap between the lead screw and the bearing, but not so tight that you cannot move the lead screw by hand.

3. Loosen and tighten bolts to ensure the alignment is not causing binding in any areas. If something is straining, then loosening the bolt holding it in place will let it slide to a better alignment, where you can then tighten it again. The best places to loosen/retighten the bolts in order:
    1. The 4 bolts on each lead nut of the r-axis lead screw. These should remain loose enough to move the washer with some force, but not so loose that there is an air gap where the washer can rattle around.
    2. The 8 bolts that hold the x-axis tubes to the ram. In chapter 6 of the assembly guide, you need to loosen them, attach the gantry, bring the gantry to the back of the machine to get a full square, then tighten those 8 bolts.
    3. The R axis motor mount/bearing mount bolts.
    4. The 8 bolts that attach the gantry to the r-axis.
    5. You can slightly loosen the 4 bolts holding the X-axis lead screw nut to the cross bracket assembly - not so tight that there is an air gap. This may help prevent binding in the x-axis direction.