

Troubleshooting for L3VER M2/M1/PMB motor blocks

Suivi des évolutions

Indice	Date	Description de l'évolution	Auteur
0.0	21/10/2022	Création	FBR

Preliminary checks

First we have to acknowledge few things in order to validate a good base for the M1 or the M2/PMB to operate normally

M1

- The Frame is squared
- The Belts are straights (RR ones tends to be curved on few experiences, use a Genuine GATE LL GT2)
- The head motion without the M1 is fluid, without hard point.

M2/PMB

- The Frame is squared
- The Belts are straights (RR ones tends to be curved on few experiences, use a Genuine GATE LL GT2)
- The 55mm rod used is a straight stainless steel one (Straight here is important)

Troubleshooting L3VER M1/M2/PMB Motor block with tensionner		

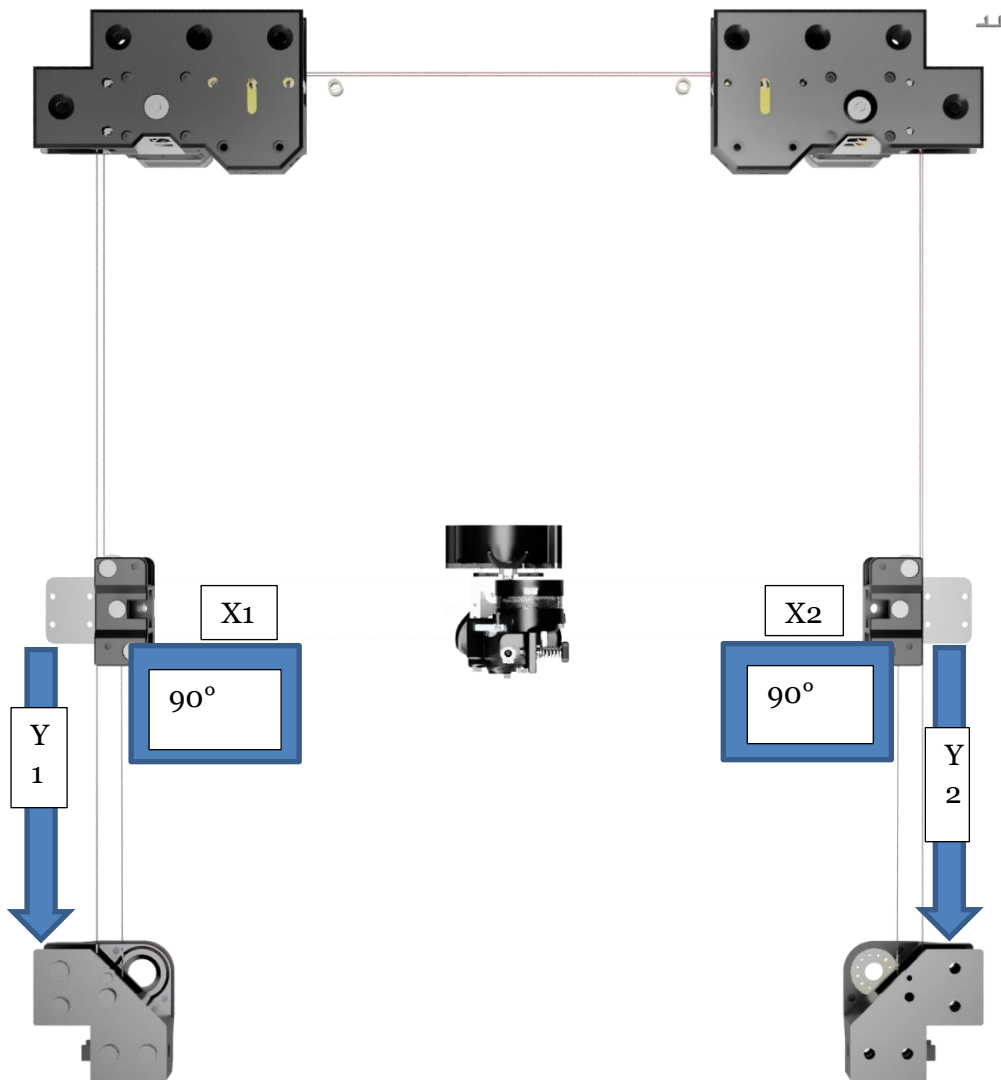
Gantry position tuning

In order to have the best alignment possible, We need to level the gantry accordingly.

Once your belts are fixed, without tension induced by the L3VER mechanism, you need to push the gantry against the 2 front idlers. Each ends, Joiners, should touch the metal plate in the same time, meaning they are a 90° from the Y frame section

SQUARNESS IS IMPORTANT HERE

Figure 1:

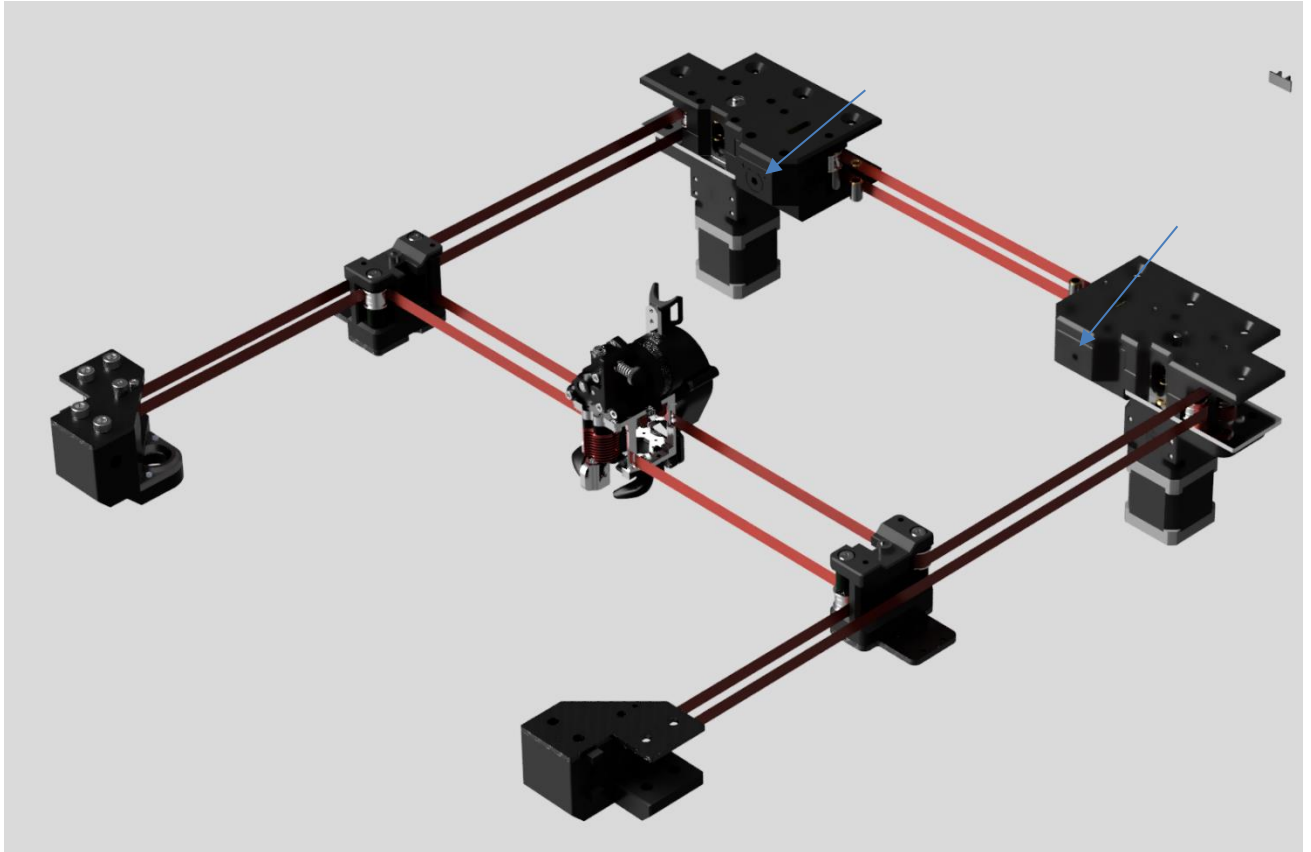


Rules : $Y_1=Y_2$ Angle $X_2 Y_2 = \text{Angle } X_1 Y_1$

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At this point you can apply pre-tension with the 2 Lever screws (M5) and tense the belts enough to not be loosed

Check if the gantry move from this 90° state, each end should be at the same level, or distance be the same. You need to understand that the tension of one module can modify both angle in the same time. You have to be cautious and precise about it to reach the perfect spot.



Apply the tension symetrically to keep an equilibrated tension, use the BRS Belt tensioning procedure (<https://github.com/FlorentBroise/BRS-Printers-Mod/blob/main/manuals/belt.pdf>)

to apply the good one depending the size of your machine.

Don't forget to move the head across the printed area to spread the tension

Once done, check if the gantry is still straight over the idlers and respect [the figure 1](#)

[If yes](#); go to the next chapter

If no: equilibrate the distance by only modifying the tension of one lever side, if it makes it bigger, use the other one, until the distances are equal

Note: Having different lever tensions values is not an issue, at the end only the belt tension are important, measured by spectroid, it can be different across both modules because of the length used in the making, or the pretension applied in the first place.

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Main mechanical potential issues

1/ when I move the tool head across X, I feel a great continuous resistance

- Check if the belt is not rubbing at some point against something
- Are all the bearings free to roll?
- Are the Bearing stack assembly made correctly: All shims are here?
- All the bearing are ok?
- Does the L3VER 55mm shaft correctly installed?
- Does the toothed pulleys at the good height?

2/ when I move the tool head across Y, I feel a great continuous resistance

- Check if the belt is not rubbing at some point against something
- Are all the bearings free to roll?
- Are the Bearing stack assembly made correctly: All shims are here?
- All the bearing are ok?
- Does the L3VER 55mm shaft correctly installed?
- Does the toothed pulleys at the good height?

3/ when I move the tool head across X, I feel a repetitive resistance

- All the bearing are ok?
- Does the L3VER 55mm shaft correctly installed? Is it bent?
- Are the 625zz correctly installed, are they in good condition?
- Check the assembly alignment Motor/Coupler/shaft/625zz/pulley/625zz

If this alignment is not good, a precession can occurs and give those looped resistances

4/ when I move the tool head across Y, I feel a repetitive resistance

- All the bearing are ok?
- Does the L3VER 55mm shaft correctly installed? Is it bent?
- Are the 625zz correctly installed, are they in good condition?
- Check the assembly alignment Motor/Coupler/shaft/625zz/pulley/625zz

If this alignment is not good, a precession can occurs and give those looped resistances

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Methods to investigate

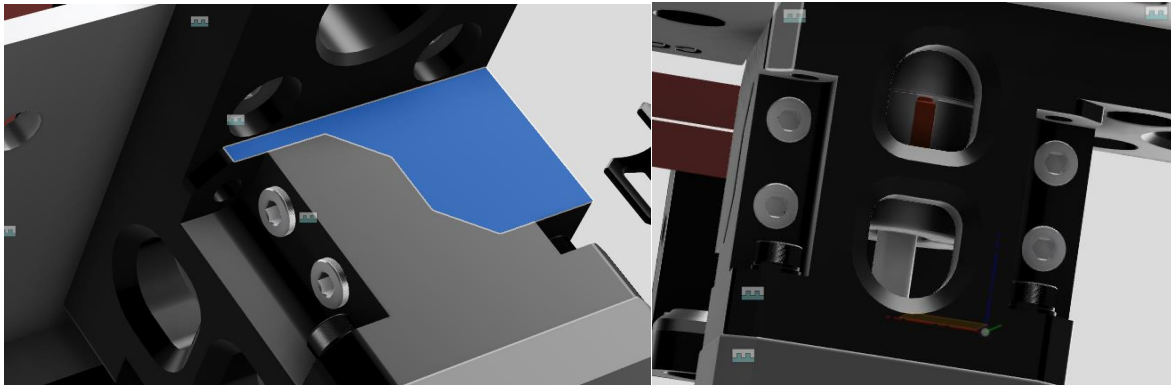
To ensure the good Lever assembly alignment, untight the coupler on one end, in order to allow a free move from the shaft

You can do 45° head motion to isolate the motion on a specific lever block and focus the issue search here. It divides by 2 the items to check, and gives indications about which side is potentially faulty.

At this point repeat the head motion by hand, If the 1/ or 2/ is still happening, check the belt paths, something is either not free to move, or rub the frame/printed part when moving

If you have the 3/ or 4/, look for a shim missing a Lever module not correctly assembled, or a defective bearing

If you don't have 1/, 2/, 3/ or 4/, the stepper give a rotational resistance over the shaft, meaning either the join picture here is too tight, too loose, or have not enough tolerances to match coaxiality



Try to screw or unscrew the 4 m3x30 screw to tune this coaxiality

You can use a sandpaper to remove a bit of material on the edges (explained in the PMB manual)

Make shure the couple is centered in the middle of the 2 shaft (motors and pulleys)

**You can easily confirm if the shaft is not driven properly by checking a precession during the rotation at his end on the top Lever/PMB plate*

Input shaper

At this point, the M1/M2/PMB haven't shown issues induced to the shaper measuring tool, by his nature

That said, all loosed parts, screws, shafts, can induce vibrations and cause issues or spikes to the shaper graphs

You need to be sure everything is tight correctly, like every singles part of the printer, especially moving part.

In instance to avoid any issues with the shaper, once the tightening of the belt is made and have settled over time (few days), don't forget to tight back the top m4 nyloc nut to lock the bolt in place.

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	Motor block with tensionner	

This troubleshooting guide has been made upon personal experiences on those module, and customers feedback, solved atm. If you encounter an issue, you can contact me !

Thanks for following this document