

## LASER ALIGNMENT GUIDE TMX machines (rev.1)

To check your laser alignment on a TMX laser machine from CTR, you will need:

- a roll of masking tape

### IMPORTANT

The laser machine will need to be turned on during this process, so that the laser can fire to indicate where the alignment is currently directed. During this process, you should **always close the laser machine lid before pressing the relevant button to fire the laser**, to ensure the laser beam is kept enclosed in the laser machine frame at all times.

### Which Controller Do You Have?

- For **RD Controllers with LightBurn software**, please ignore the below (Leetro) section and go to step 1 to complete the following instructions.
- For **Leetro** controllers, you must first check the Laser Time Set. To do this;
  - Press **Esc** on your laser machine keypad until you are in the home menu and nothing is highlighted.
  - Press **Menu > Down Arrow > Enter/Return**. The below screen will display.



- Use the up/down arrows to change the Laser Time Set value to **00030 MS**.
- Press **Enter/Return** to set this value and exit this menu, then press **Esc** to return to the home menu.

To check your laser alignment, complete the following steps.

### SECTION 1: Back Left Mirror

NOTE: During this section, you should only adjust the brass mirror adjustment screws which are on the back of the mirror which is located in the back-left hand side of the machine.



1. Put two pieces of masking tape on top of each other, sticky side down (two thicknesses of masking tape). Stick the two layers of masking tape over the laser beam hole on the left-hand side of the top of the laser nozzle assembly (as shown below).

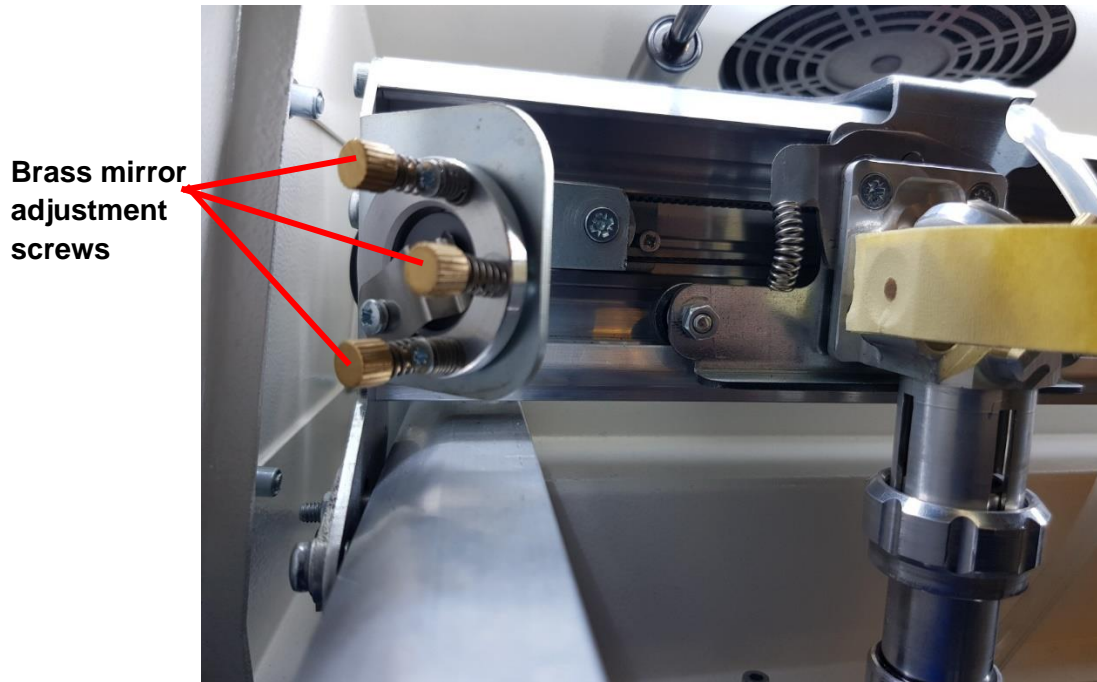
NB: This is the hole where the laser beam will enter the top of the lens assembly, before being reflected down through the lens and onto your material(s).



2. Move the laser head to the **back left-hand corner** of the laser machine bed.  
NB: the back-left corner and other positions in these instructions are identified when you are standing in front of the laser machine with the lid open in front of you.

3. Close the laser machine lid and press the **Laser** (on Leetro) or **Pulse** (on RD Controller) key on the laser machine keypad firmly for one second. The laser should fire, leaving a burn mark on the masking tape (image below).

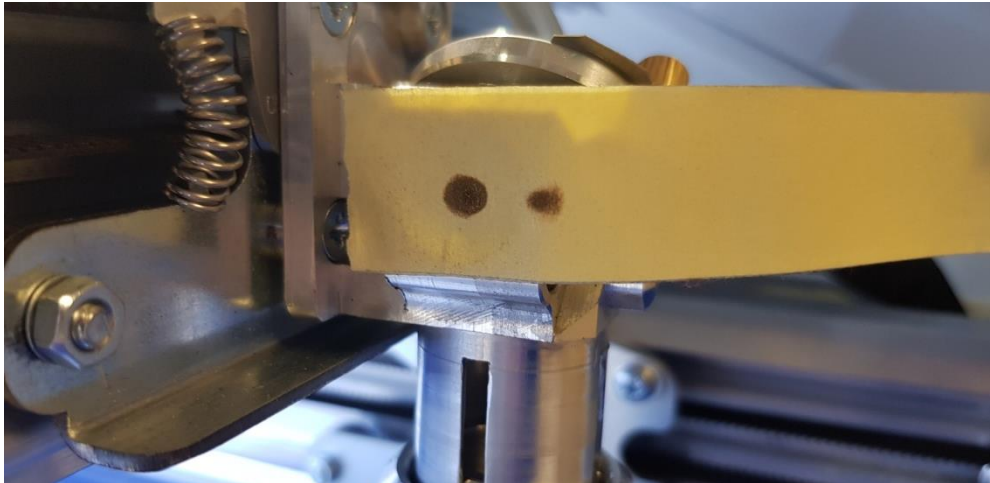
NB: If the laser doesn't fire, press **Esc** on the laser machine keypad and repeat this step.



The above image shows an example of the laser having fired and burned a mark onto the masking tape at the top of the lens assembly.

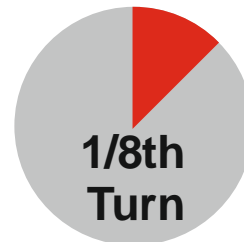
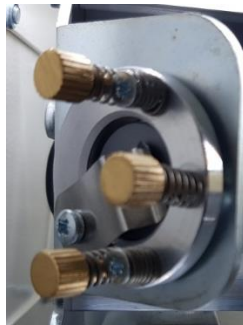
4. With the masking tape left in place, move the laser head to the front left-hand side of the laser machine bed.
5. Close the laser machine lid and press the **Laser** (on Leetro) or **Pulse** (on RD Controller) on the laser machine keypad firmly for one second, so that the laser machine fires a second burn mark on the masking tape.

The two burn marks should be on top of each other. If they aren't (image example below), you will need to adjust the brass mirror adjustment screws to correct the alignment, so that the two burn marks are on top of each other.



The aim is to have the two burn marks aligned on top of each other, NOT like the above (in the above image, the alignment needs correcting). The two burn marks should look like a single burn mark on the masking tape.

**IMPORTANT: Only turn the brass mirror adjustment screws  $1/8^{\text{th}}$  of a turn during each adjustment, and then re-check the alignment.** Turning the screws more than this can move the laser beam too far and make re-alignment much more difficult.



To do this, you may need to remove the masking tape from the lens assembly and replace it with a fresh piece of two thicknesses of masking tape, so that you can more clearly see the burn marks, and to prevent the masking tape catching fire through the laser firing excessively. If you do this, you will need to fire the laser once in the top left corner of the bed, to re-create the first burn mark, before moving the laser head to the front left corner of the bed to continue with the alignment process.

Each time you adjust the brass mirror adjustment screws, you will need to close the lid and fire again as per the above instructions, to check if the two burn marks are aligned to the same point.

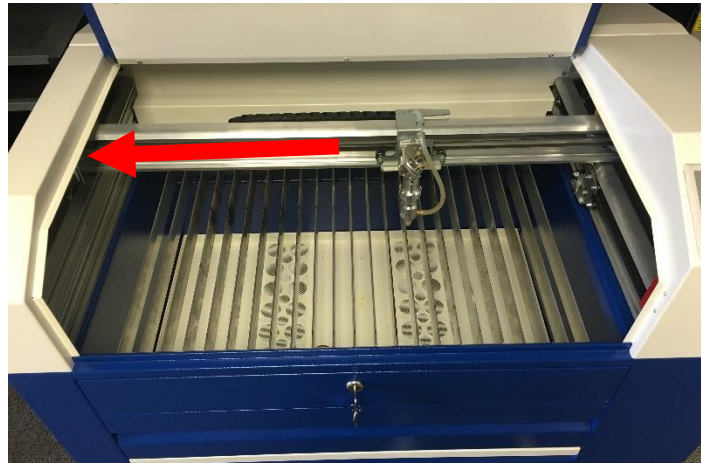
6. When it looks like the alignment is correct (the two burn marks are on top of each other on the masking tape), double-check the alignment once more by moving the laser head to the back left corner of the bed and firing the laser, then moving the laser head to the front left corner of the bed and firing the laser again.

Make sure the burn marks are indeed aligned (firing to the same point on the masking tape).

7. If the two burn marks are aligned correctly, replace the masking tape with two thicknesses of fresh masking tape on the top left of the laser nozzle.

## **SECTION 2: Left Hand Mirror**

NOTE: During this section of the instructions, you should only adjust the brass mirror adjustment screws on the back of the mirror on the far left side of the X axis rail (the left side of the machine, NOT in the back left corner).



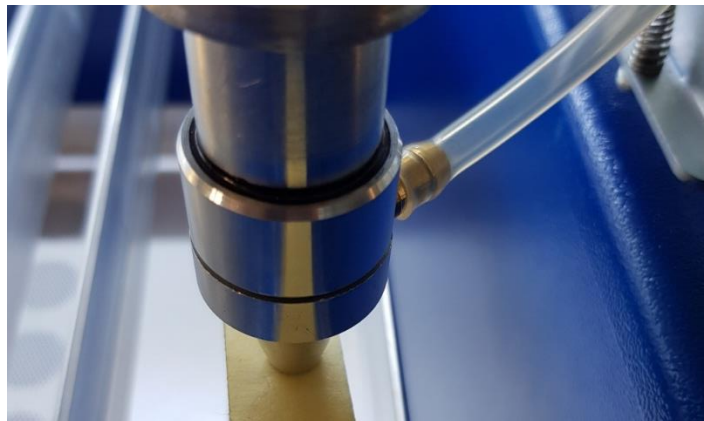
8. Move the laser head to the front left corner of the work bed, close the lid and fire the laser briefly.
9. Move the laser head over to the front right corner of the work area and fire the laser briefly.
10. Check if the two burn marks are aligned on top of each other on the masking tape. If they are not aligned correctly, you will need to adjust the brass mirror adjustment screws, and repeat the process you have used previously until the two burn marks are aligned on top of each other.
11. Remember to do a final burn mark in the front left corner and then the front right corner of the laser work area as a final check.

### **SECTION 3: Top Mirror (aka Lens Nozzle Mirror)**

NOTE: During this section of the instructions, you should only adjust the brass mirror adjustment screws at the top of the lens nozzle assembly.

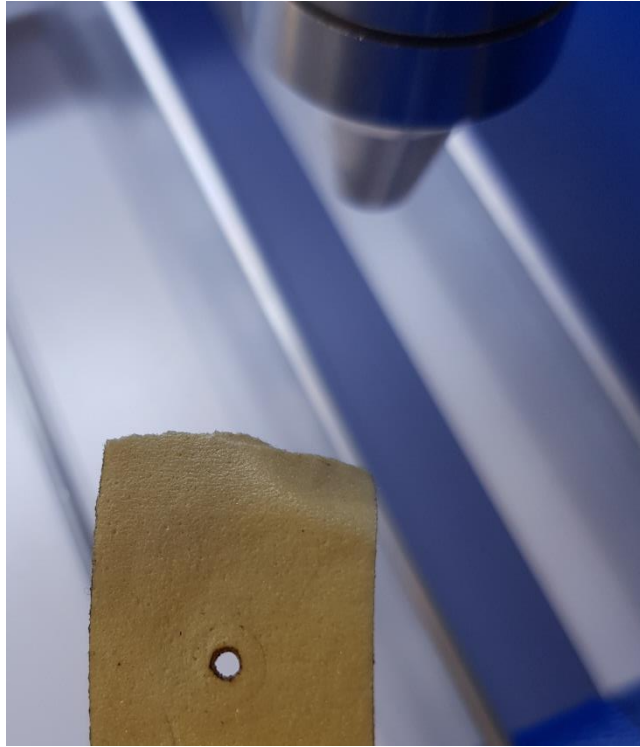


12. To check the laser beam alignment down through the nozzle itself, remove all existing masking tape from inside the machine, then stick a single thickness of masking tape over the hole in the bottom of the nozzle (sticky side up against the bottom of the nozzle) – see image below.



Rub the masking tape against the nozzle with your finger if necessary, so that the hole of the nozzle is clearly dented into the masking tape (you will need to be able to see where the circular hole of the nozzle is, when you have removed the masking tape from the end of the nozzle).

13. Close the lid and fire the laser briefly once. The laser should burn a small hole into the masking tape. This burn mark should be centrally located through the circular lens nozzle hole (image below).



14. If the burn mark is not located centrally through the circular nozzle hole, you will need to adjust the brass mirror adjustment screws until it is.