



EPILOG LASER

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Laser Alignment

For the Epilog Fusion CO2

10/10/2013

Requirements:

Tools:

- 5/32" Allan Wrench
- 3/32" Allan Wrench
- #1 Phillips Screwdriver
- Masking Tape (white)
- Alignment Target (provided with engraver)
- Manual Focus Gauge (provided with engraver)
- Safety Glasses (Lexan or Polycarbonate)

Overview:

This document illustrates the procedures required to align the laser inside of the engraver. Safety glasses are required to be worn throughout the entirety of the following procedures.

SAFETY WARNING:



DO NOT PROCEED UNLESS YOU HAVE READ, AND UNDERSTAND THE FOLLOWING SAFETY WARNINGS.

WARNING:

While performing the laser alignment all persons present in the room during the performance of this procedure must be equipped with adequate eye protection (Lexan safety glasses, eyeglasses or goggles), and that no one looks or places any part of his or her body into the path of the laser beam.

WARNING:

This procedure requires that the laser be operated with the engraver's door safety interlocks defeated or with protective covers removed. While the laser power levels are reduced from those of normal operation, they are sufficient to inflict eye injury or burns.

When to align the laser:

The Laser Alignment Procedure can be performed if any of the following apply to you.

- You are experiencing a general Loss of Power.
- You are experiencing 'Fading' in one of the corners of the table.
- You are losing power in certain positions on the table.
- You have replaced the X-Axis Rail.
- You have replaced a Laser Tube.
- You have replaced a Mirror or Optic.
- The engraver has been moved or transported.

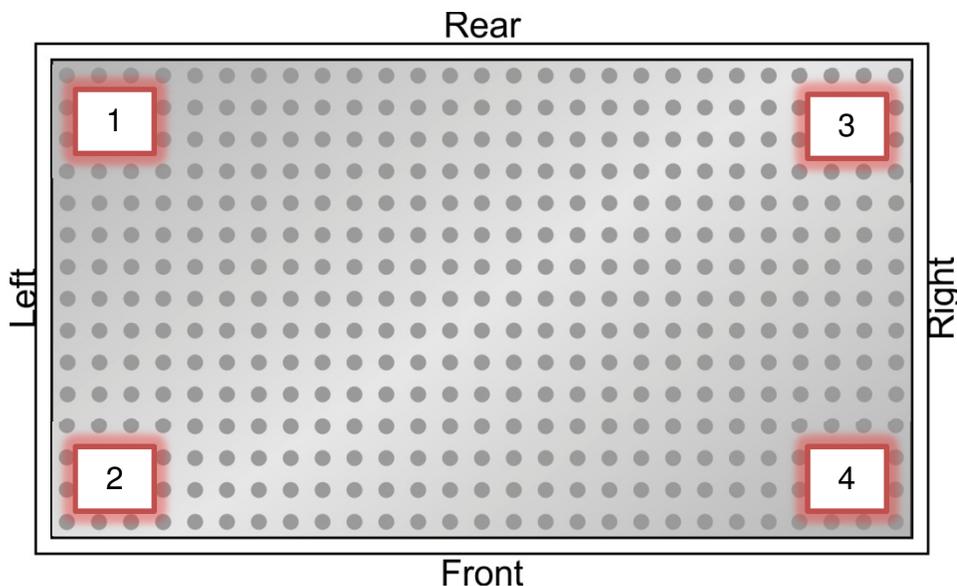
Before you start...

Direction

Many of the instructions provided in this procedure will have a direction given, such as left hand side or right hand side. Unless otherwise stated, these are all provided as though you were facing the machine from the front.

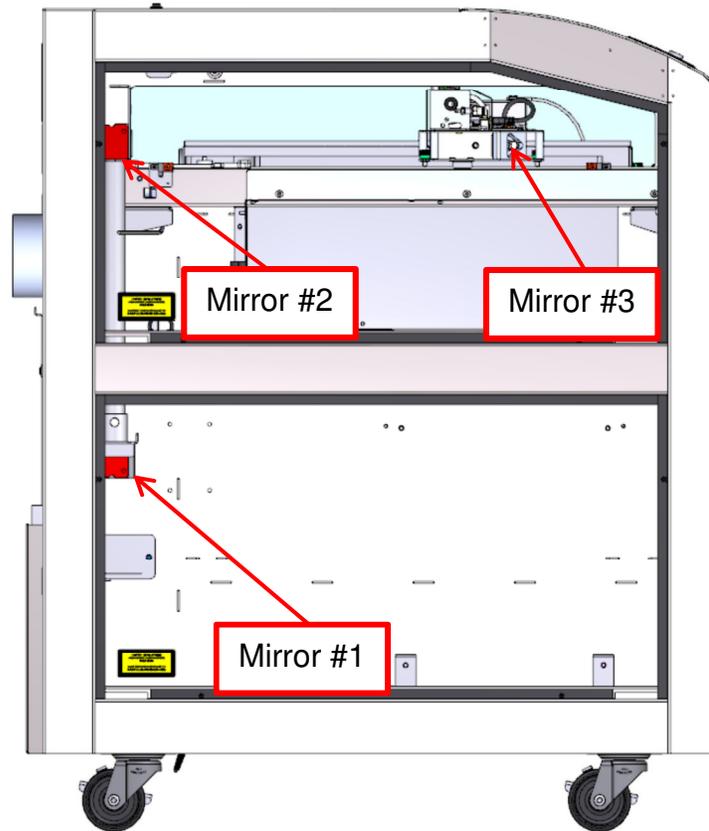
Table Positions

For the following procedures the table will be broken into four (4) positions. Each position is identified by its relative distance to the laser source and corresponds with the mirror to adjust for that position.



Mirrors

The three (3) adjustment mirrors used for alignment are on the left side of the engraver. The mirror numbers correspond directly with the positions on in the bed; for example, if the lens carriage is in Position #1 than you will only adjust Mirror #1.



Jogging the lens carriage

When moving the lens carriage on the engraver you will be use the “Jog” mode on the keyboard. When asked to move the lens carriage into a position you only need to move it as far as practical. Move the carriage as far into the requested corner as you can while maintaining the ability to see the red dot pointer on the alignment target.

Laser Jog Power

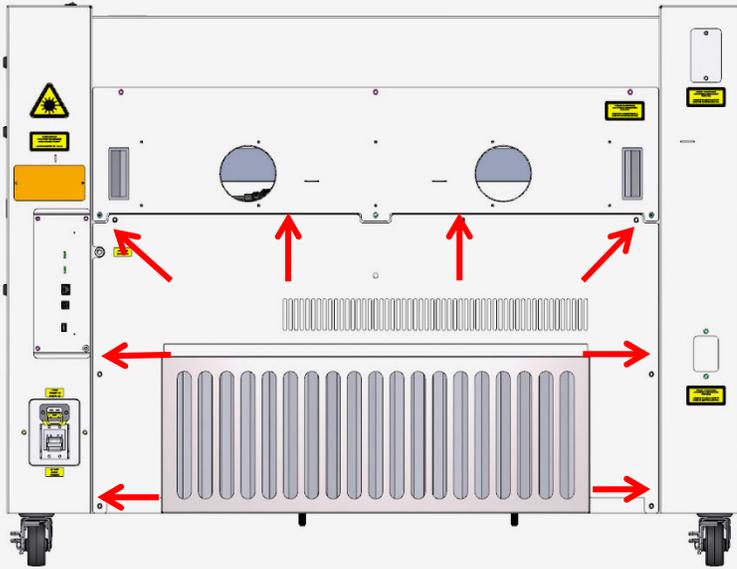
Set the lasers Jog Power to a level that is high enough to mark the tape but not so high as to burn a large hole in the tape and target. Setting the lasers “Jog” power is detailed in your machines owner’s manual. 10% is a good starting point.

Procedure A: Align the Red Dot Pointer to the Cutting Beam

If you are performing the alignment due solely to a replaced Mirror or X-Axis Rail, please move on to procedure B. For all other alignments this procedure must be completed.

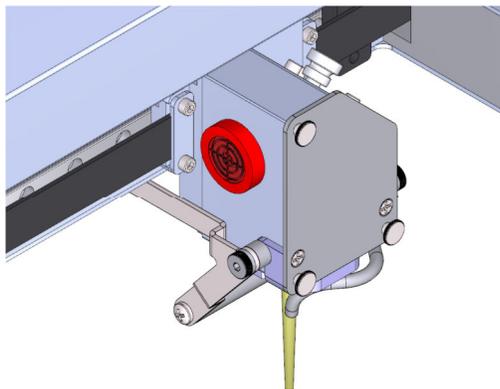
Step 1: Remove rear panel

Locate and remove the eight (8) 5/32" Allen screws which secure the lower rear panel to the engraver. Remove the panel from the engraver.



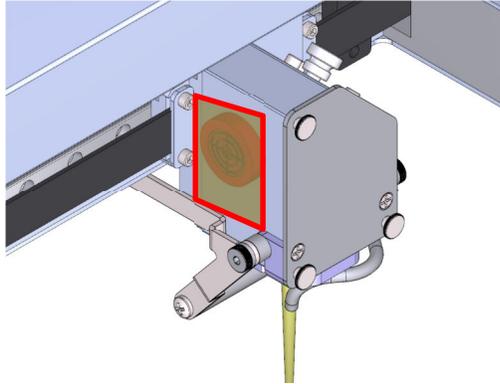
Step 2: Attach alignment target

Locate the alignment target and place it into the left side of the lens carriage.



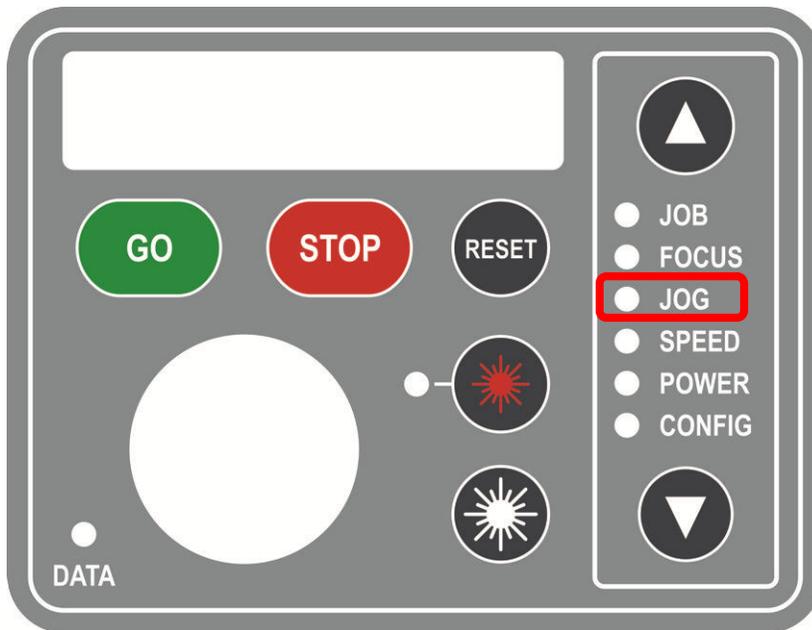
Step 3: Attach alignment target

Place a square of masking tape over the alignment target. The brown square over the alignment target represents a piece of masking tape placed on the alignment target.



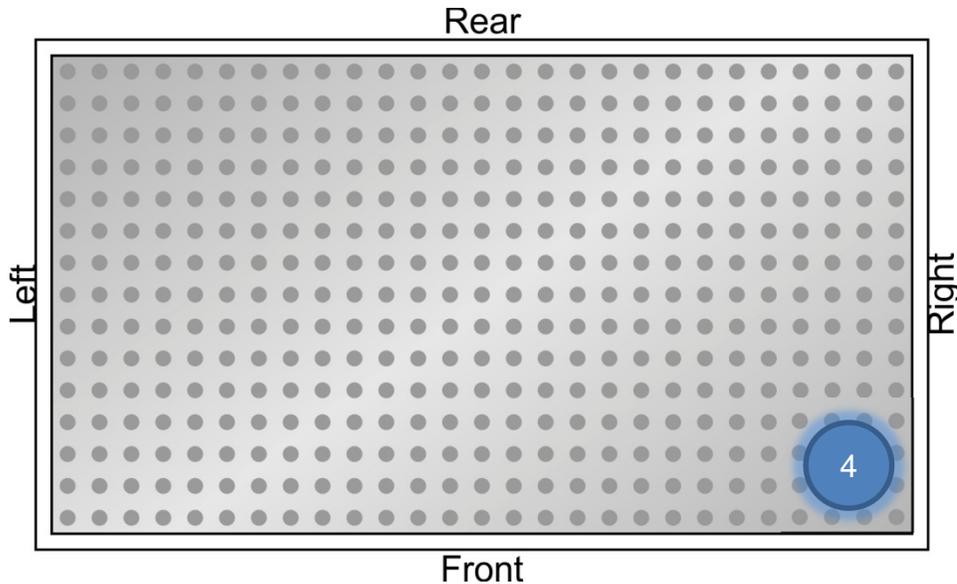
Step 4: Make burn

Make sure the engraver is powered up. Use the arrow keys on the engraver's keypad to select Jog mode.



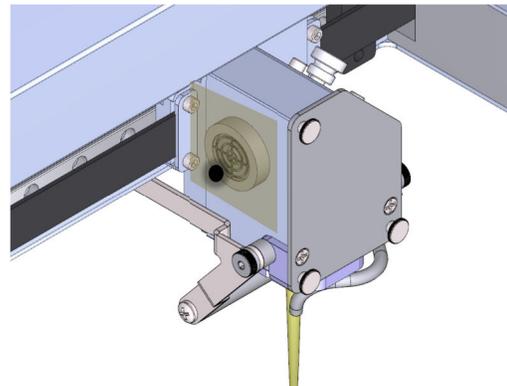
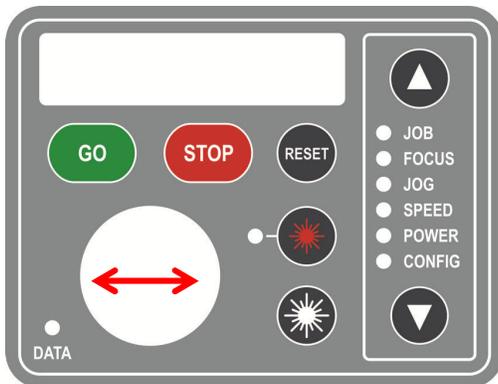
Step 5: Make burn

Use the Joystick on the engraver's keypad to move the Lens Carriage to Position 4 on the bed.



Step 6: Make burn

To fire the laser in Jog mode, Depress the Fire Laser key (indicated by Arrow in picture below) and move the Joy stick to the left or the right. This will need to be done fairly quickly as it takes little power to burn the masking tape.



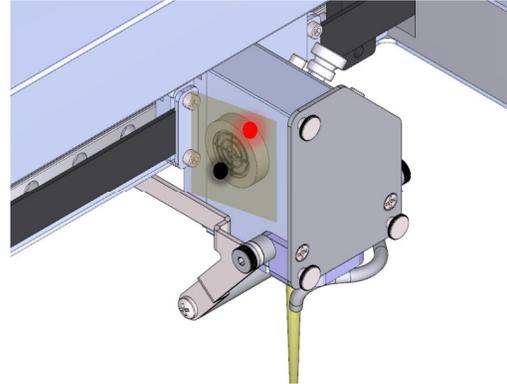
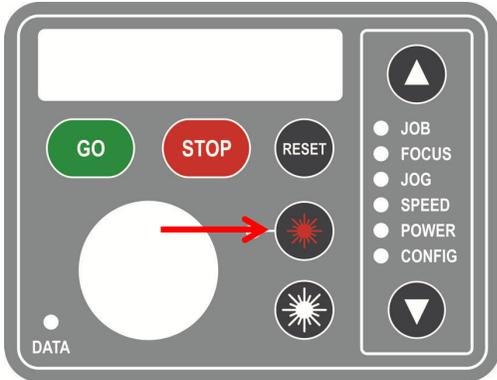
Burn simulated for photo

NOTE:

If you cannot get a burn in this position, please contact Epilog technical support.

Step 7: Activate red dot pointer

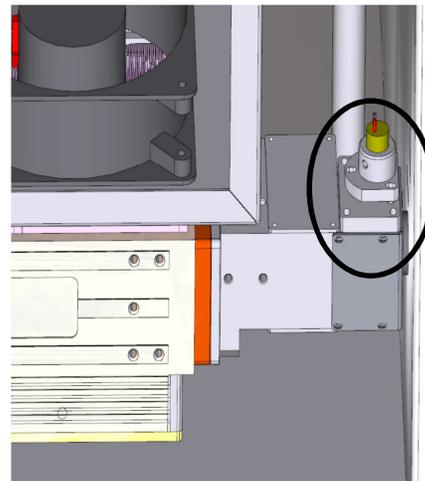
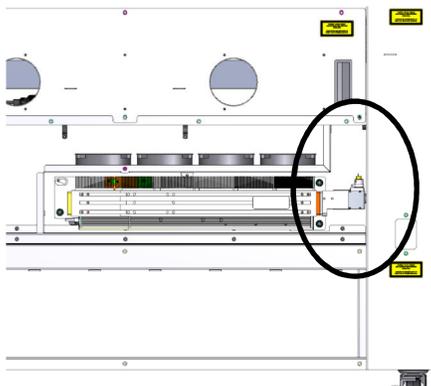
Press the Pointer key on the engraver's keypad to activate the Red Dot Pointer. The pointer should appear on the tape covering the Alignment Target.



Marks simulated for photo

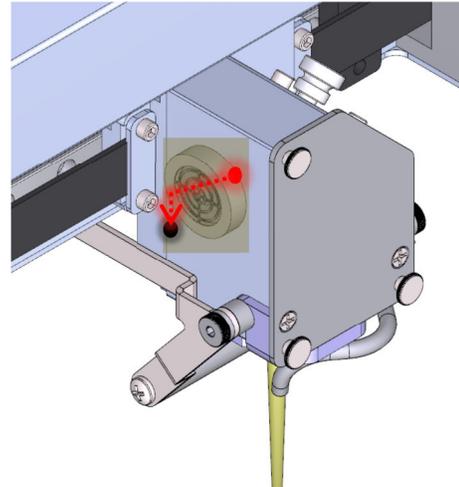
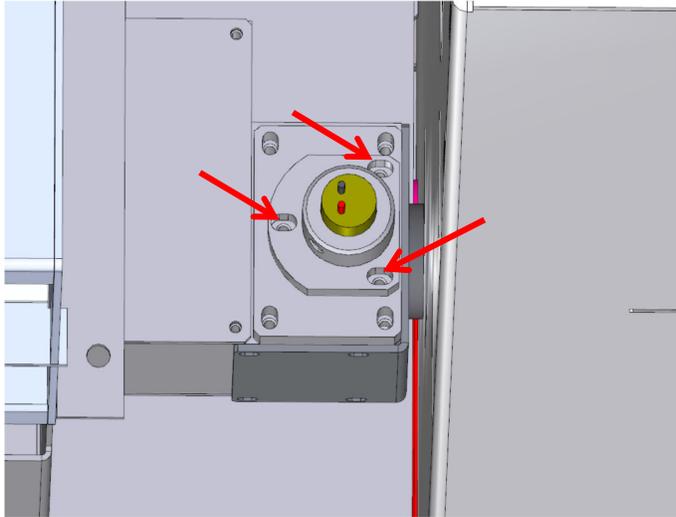
Step 8: Align red dot to burn

Locate the Red Dot Pointer Mount in the rear of the engraver.



Step 9: Align red dot to burn

Use the adjustment screws on the Red Dot Pointer Mount to move the Red Dot Pointer to the burn mark on the tape.



Marks simulated for photo

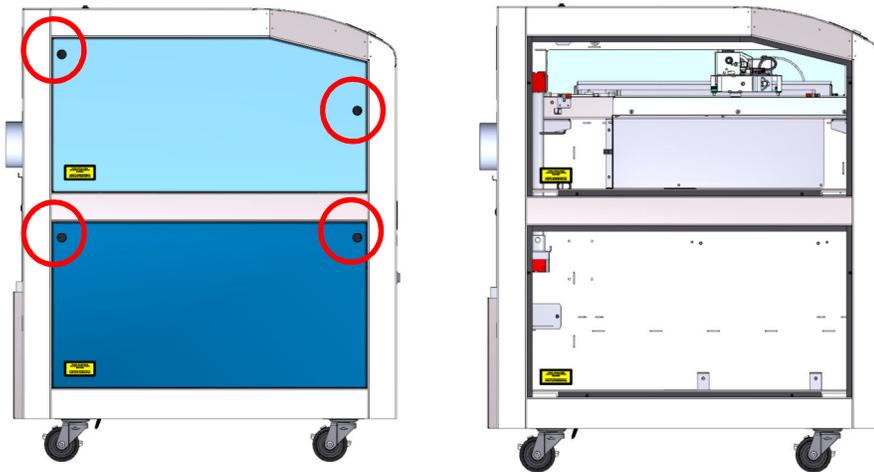
Procedure A Complete

Once the Red Dot Pointer is aligned with the burn mark on the tape in Position 4, it will accurately represent the path of the Cutting Laser for the rest of the alignment. You may now remove the masking tape from the Alignment Target.

Procedure B: Aligning the laser

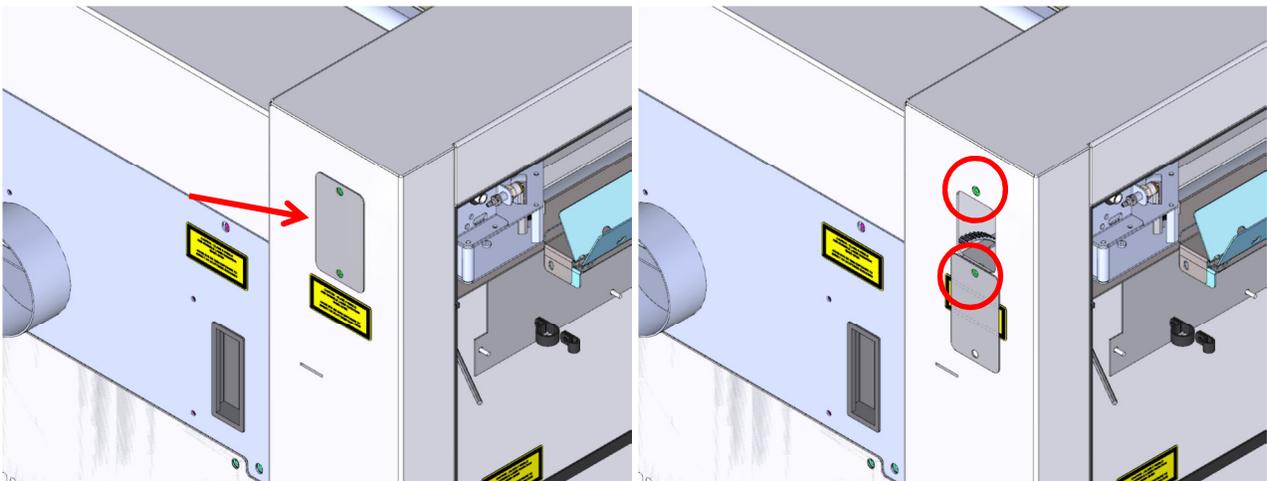
Step 1: Remove the left hand panels.

With the engraver powered on. Remove both the Left side Access Panels to gain access to the mirrors. There are two black Panel Locks per panel holding them in place. Using a 5/32" Allen wrench, turn the black Panel Locks $\frac{3}{4}$ of a turn counterclockwise. Place the panels aside.



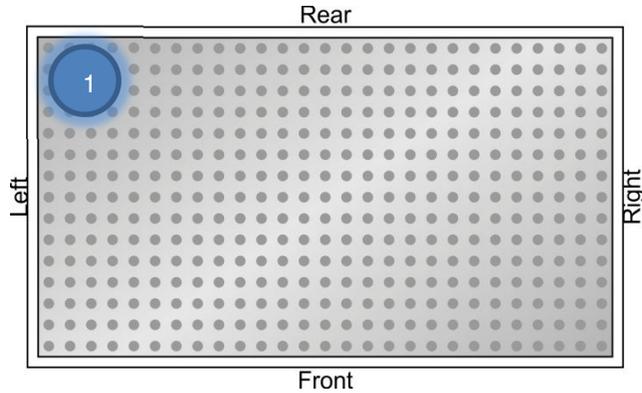
Step 2: Remove upper mirror access panel

Using the #1 Screwdriver, remove the Upper Mirror Access Panel.



Step 3: Align mirror 1

Ensure that the engraver is on and that the Red Dot Pointer is active [\[See A-7\]](#). Jog the lens carriage to Position 1.



Quick Tip!
The key to a good alignment is repetition and patience. For the best results take your time to dial it in.

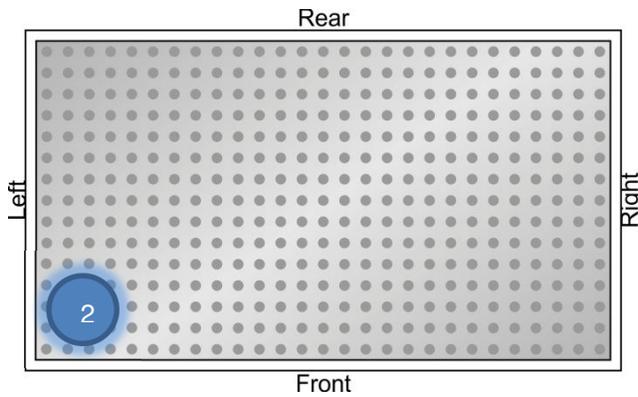
Step 4: Align mirror 1

Locate Mirror #1. Using the 3/32" Allan Wrench, adjust the screws on Mirror #1 so that the Red Dot Pointer is in the center of the alignment target.

<p>Location Of Adjustment Screws</p>	<p>Adjustment Screw Movement Diagram</p>
<p>Before Adjustment</p>	<p>After Adjustment</p>

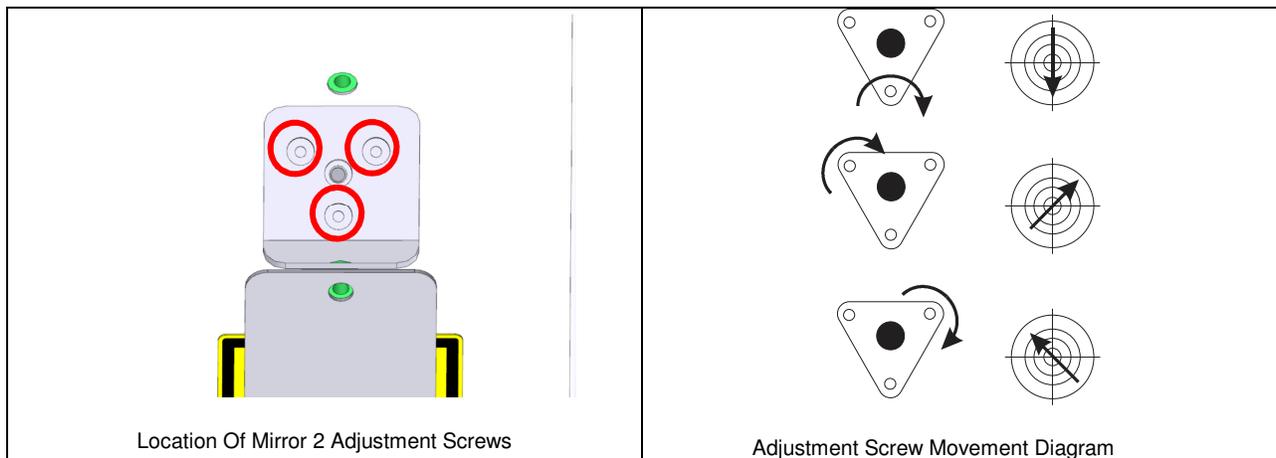
Step 5: Align mirror 2

Jog the lens carriage to Position 2.



Step 6: Align mirror 2

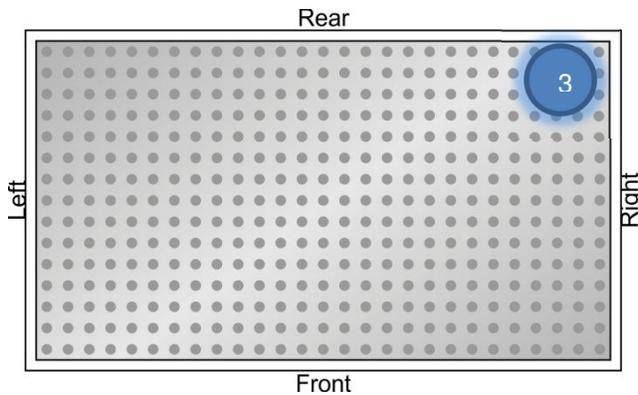
Locate Mirror #2. Using the 3/32" Allan Wrench, adjust the screws on Mirror #2 so that the Red Dot Pointer is in the center of the alignment target.



Once complete return to [\[Step 3\]](#). Continue to align Mirror #1 and #2 until you can jog between them without the Red Dot leaving the Center of the alignment target.

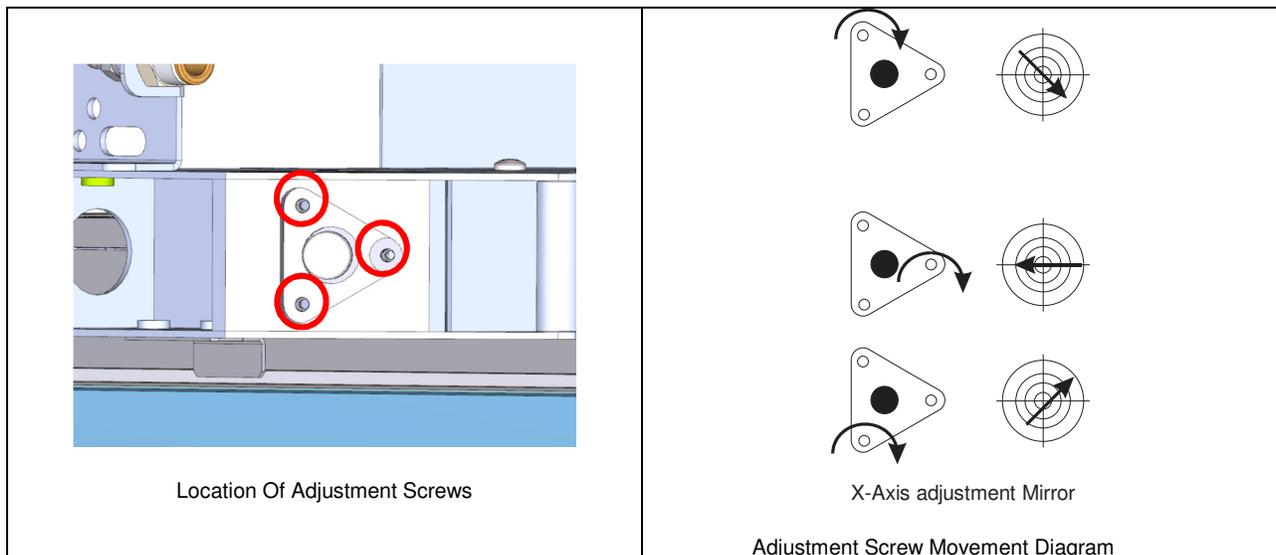
Step 7: Align mirror 3

Jog the lens carriage to Position 3.



Step 8: Align mirror 3

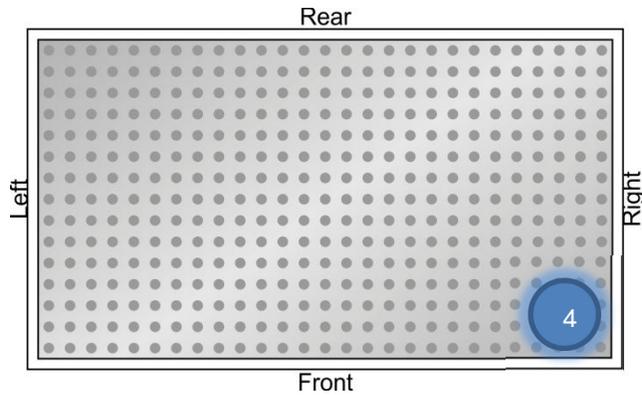
Locate Mirror #3. Using the 3/32" Allan Wrench, adjust the screws on Mirror #3 so that the Red Dot Pointer is in the center of the alignment target.



Once complete return to [\[Step 3\]](#) and then [\[Step 5\]](#). Continue to align Mirrors #1, #2 and #3 until you can jog between them without the Red Dot leaving the Center of the Alignment Target.

Step 9: Check

Once you are confident that you can between Positions #1, #2 and #3, jog the lens carriage to Position #4.



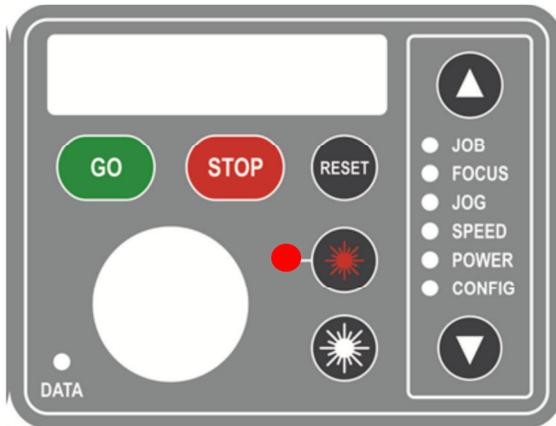
If all of the mirrors are aligned correctly, the red dot pointer should appear within the center ring on the alignment target. If so; you may remove the alignment target, replace the panels and run a test engraving file. If not; please return to [\[Step 3\]](#) and continue alignment.



Procedure C: Perpendicular Alignment

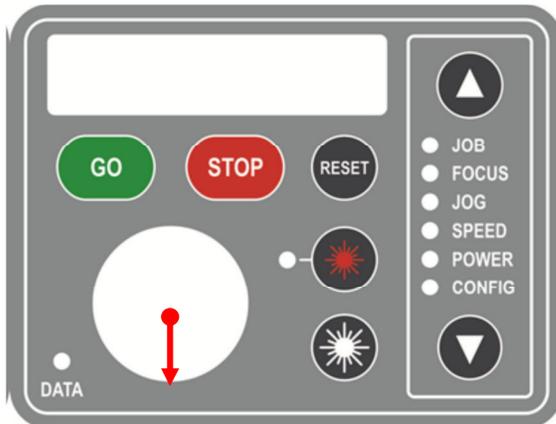
Step 1:

Ensure that the engraver is on and that the Red Dot Pointer is active [\[See A-7\]](#). Use the Arrow Keys on the engraver's keypad to navigate to Focus mode and double click the joystick.



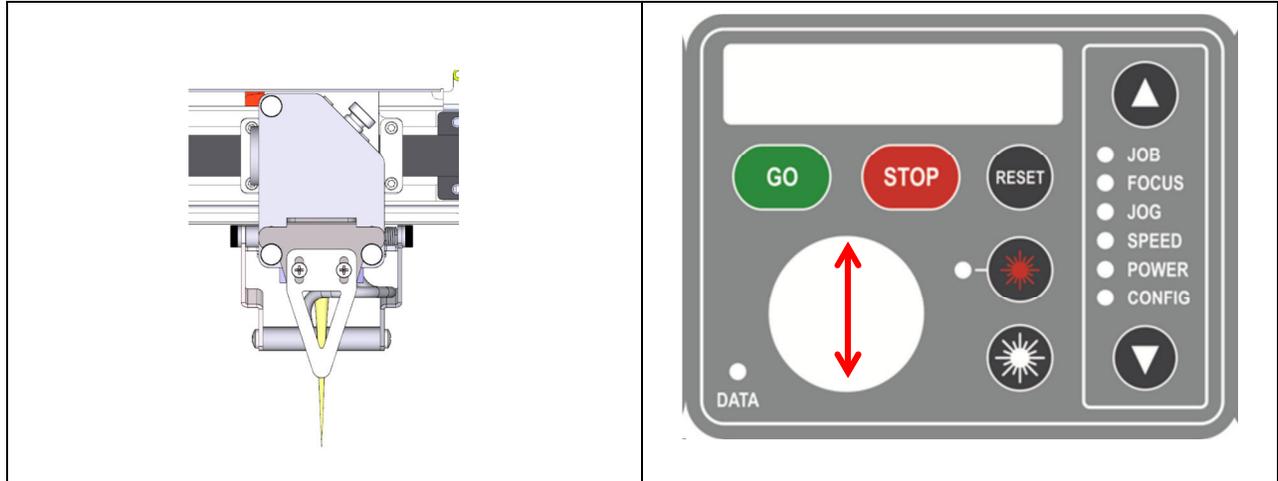
Step 2:

Push Down on the joystick to bring the engraver head onto the table. The joystick is represented by the large circle in the lower left side of the display.



Step 3:

Place the manual focus gauge on the lens carriage, and use the joystick to focus the engraver to the table. Click the joystick to set the focus to 0.000



Step 4:

Position the alignment target on the table so that the Red Dot Pointer is in the center of the target.



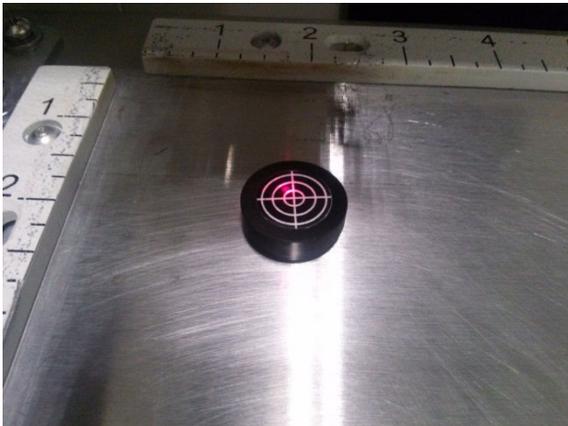
Step 5:

Using the joystick on the keypad, lower the bed of the table until the display reads around +3.000.



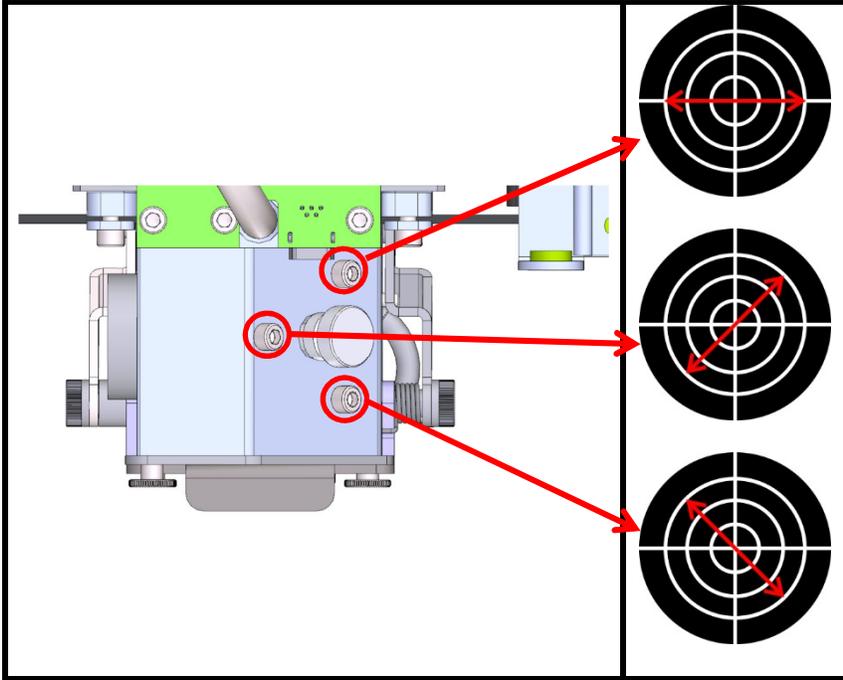
Step 6:

Check the location of the Red Dot Pointer and see if it has moved off of the center of the alignment target.



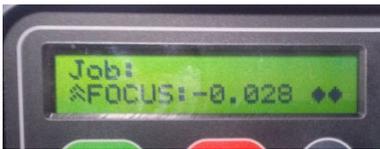
Step 7:

Use the adjustment screws on the Carriage Mirror to move the Red Dot Pointer back onto the center of the target.



Step 8:

Using the joystick on the engraver's keypad, bring the bed back up until the display reads around 0.000.



Step 9:

Repeat [\[Step 4\]](#) through [\[Step 8\]](#) until you can rise and lower the table without the Red Dot moving on the Alignment Target.

Conclusion

If you encounter any problems please contact Epilog Tech Support at (303) 215-9171.