

Intensity Autocorrelator



Introduction

Geared toward the characterization of short pulses, the 3DOptix™ intensity autocorrelator splits the pulse under study into two paths where one path is delayed with respect to the other. The beams are then recombined using a nonlinear crystal (not provided) to generate a second harmonic signal which is proportional to the intensity autocorrelation.

Thanks to the precision of 3DOptix's optomechanics, very little alignment is required on the part of the user.

Parts Description:

Parts included in the reference design

| Intensity Autocorrelator Ø1"/25mm - Parts Description | Item Number | Qty |
|--|---------------------------------|-----|
| Premium Box Frame - Floor/ceiling 9 (3X3) mount locations | 20020 / 20020-M | 2 |
| Premium Box Frame - Wall Frame 9 (3X3) mount locations | 20010 / 20010-M | 1 |
| Premium Box Frame - Wall Frame 4 (1X4) mount locations | 20018 / 20018-M | 3 |
| Premium Box Frame - Floor/ceiling 3 (1X3) mount locations | 20022 / 20022-M | 3 |
| Translator Box Frame – Floor/ceiling 9 (3X3) mount locations | 20600 / 20600-M | 1 |
| Fixed Mount - Triangular Ø1"/25mm Mirror/DM Mount | 20100 / 20100-M | 5 |
| Triangular Kinematic Mirror Mount Ø1"/25mm | 20200 / 20200-M | 4 |
| Iris Mount Ultimate | 20502 / 20502-M | 1 |

| Included Hardware and Screws | Qty |
|---|-----|
| Imperial: 4-40 Cap Screw, 1/4" Long | 34 |
| Metric: M2.5-0.45mm Cap Screw 6mm Long | |
| 2.5mm 18-8 Stainless Steel Dowel Pins | 15 |
| Aluminum Unthreaded Spacer - 1/8" Long, 5/8" Outside Diameter | 2 |

The 3DOptix optomechanical elements are compatible with optical elements from any major company. Here we recommend third-party parts that should be purchased. These parts may vary depending on the specific spectral needs of your setup.

Parts not included in the reference design

| Recommended third party optical/optomechanical elements | Qty |
|--|-----|
| Metallic/Dielectric mirrors | 8 |
| Ø1"/25mm Beamsplitter 45° AOI | 1 |
| Threaded Iris Diaphragm, SM1 (1.035" - 40) | 1 |
| 1" Lens Tube ; SM1 (1.035" - 40) | 3 |
| Retaining Ring, SM1 (1.035" - 40) | 3 |
| Fluorescing Alignment Disks | 3 |
| Travel Linear Translation Stage compatible with manual and motorized heads for 1" translator height - Spacers/Washers are provided as part of the reference design. Translator + Spacers/Washers height should be - 1.125" / 28.12mm | 1 |
| Ø1/2"/12.5mm Post Holder, 1.5"/37.5mm Long | 2 |
| Ø1/2"/12.5mm Post, 1"/25mm Long | 2 |
| 1/4"-20 Stainless Steel Cap Screw, 3/8" Long | 4 |

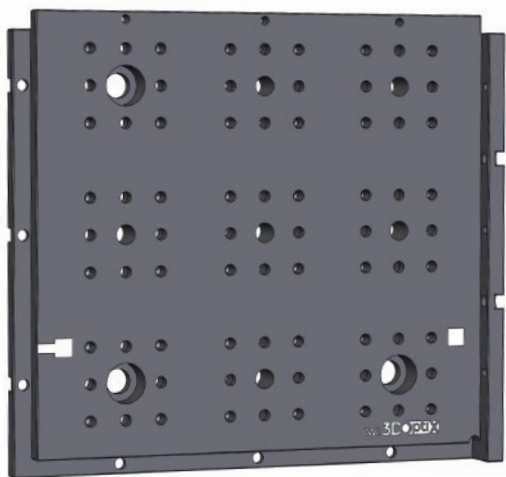


Safety Note:

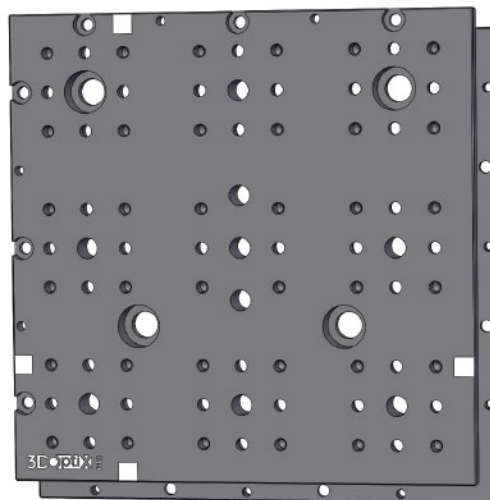
Our reference designs serve as guides for building common optical setups, often found in labs, with the 3DOptix™ parts. They provide a reference for your own designs and a good place to start learning how to build with the 3DOptix™ optomechanical elements. All reference design assembly instructions have passed our quality and safety procedures. Though, there are various ways to assemble the apparatus, we recommend to closely follow the provided assembly instructions as measures have been taken to ensure maximal safety.

Assembly of the optical elements inside the optomechanical parts should always be performed when the light source is blocked, otherwise unwanted reflections can occur. The accuracy of our products guarantees great precision of alignment, therefore make sure that the relevant holes of all structures are blocked in order to avoid stray light beams from passing through. When lasers are on always use proper laser safety eyewear for maximal protection.

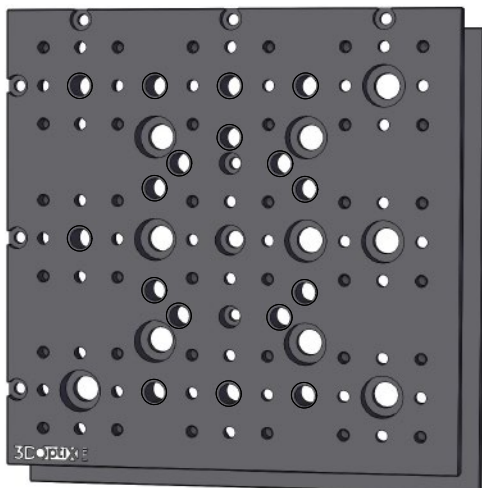
Parts List



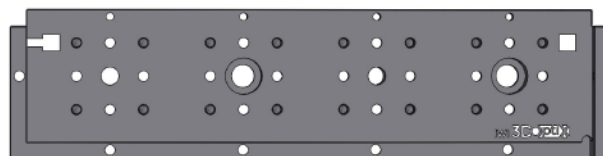
Premium Box Frame - Wall Frame 9 (3X3) mount locations **x1**



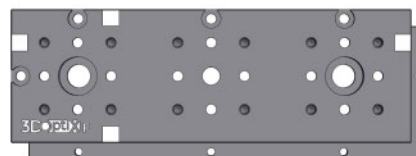
Premium Box Frame - Floor/ceiling 9 (3X3) mount locations **x2**



Translator Box Frame - Floor/ceiling 9 (3X3) mount locations **x1**



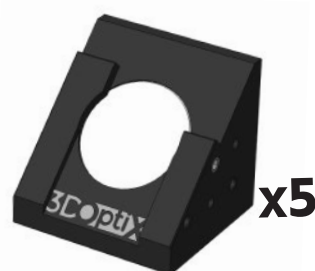
Premium Box Frame - Wall Frame 4 (1X4) mount locations **x3**



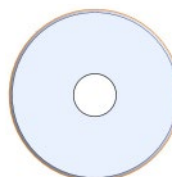
Premium Box Frame - Floor/ceiling 1 (1X3) mount locations **x1**



Elite Triangular Kinematic Mount - Ø1"/25mm **x4**



Fixed Mount - Triangular Ø1"/25mm Mirror Mount **x5**



Aluminum Unthreaded Spacer **x2**

#4-40 \ M2.5-0.45

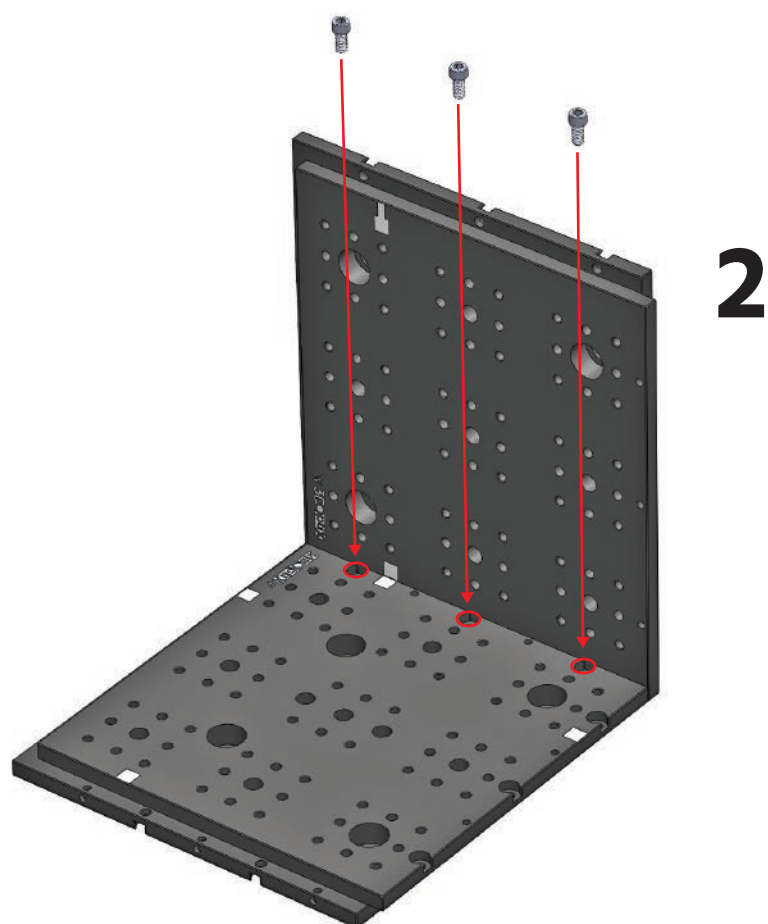
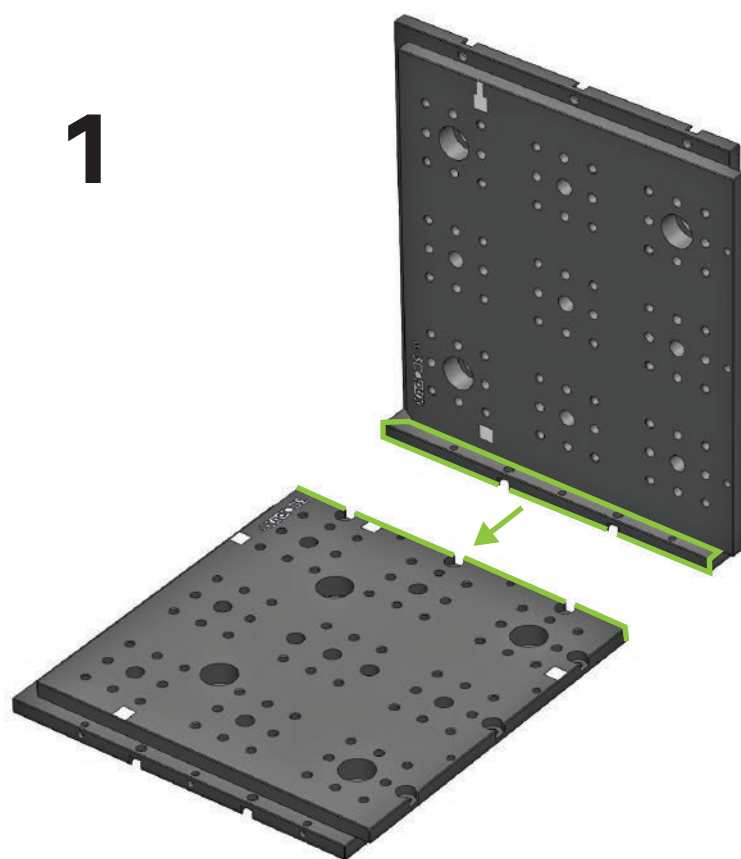


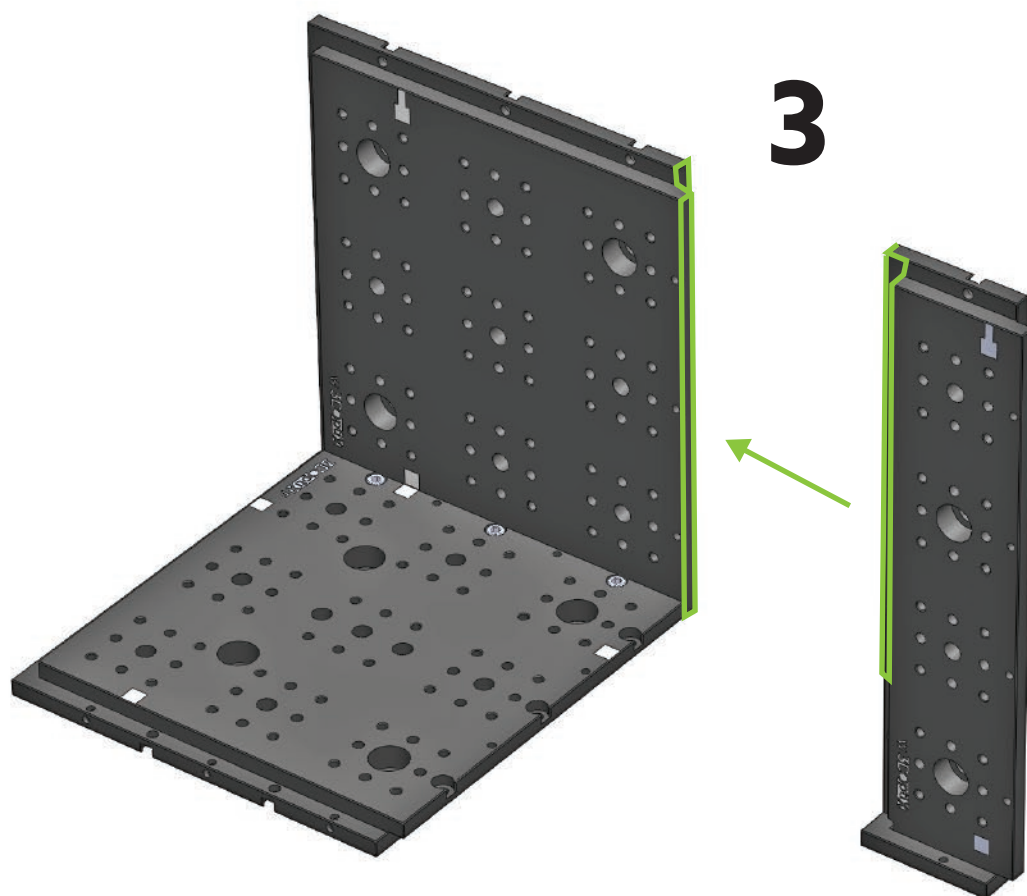
x34

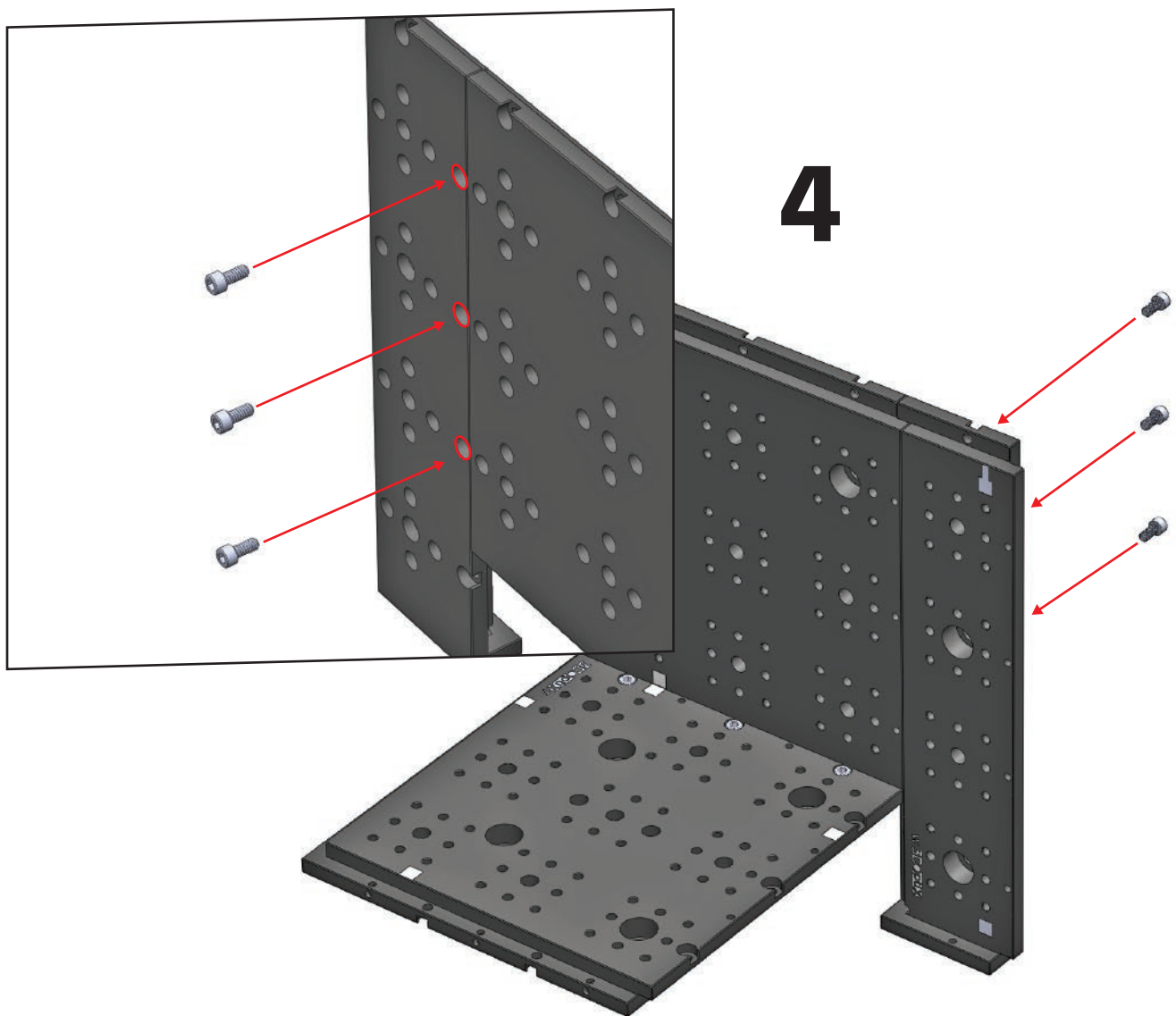
DOWEL PIN

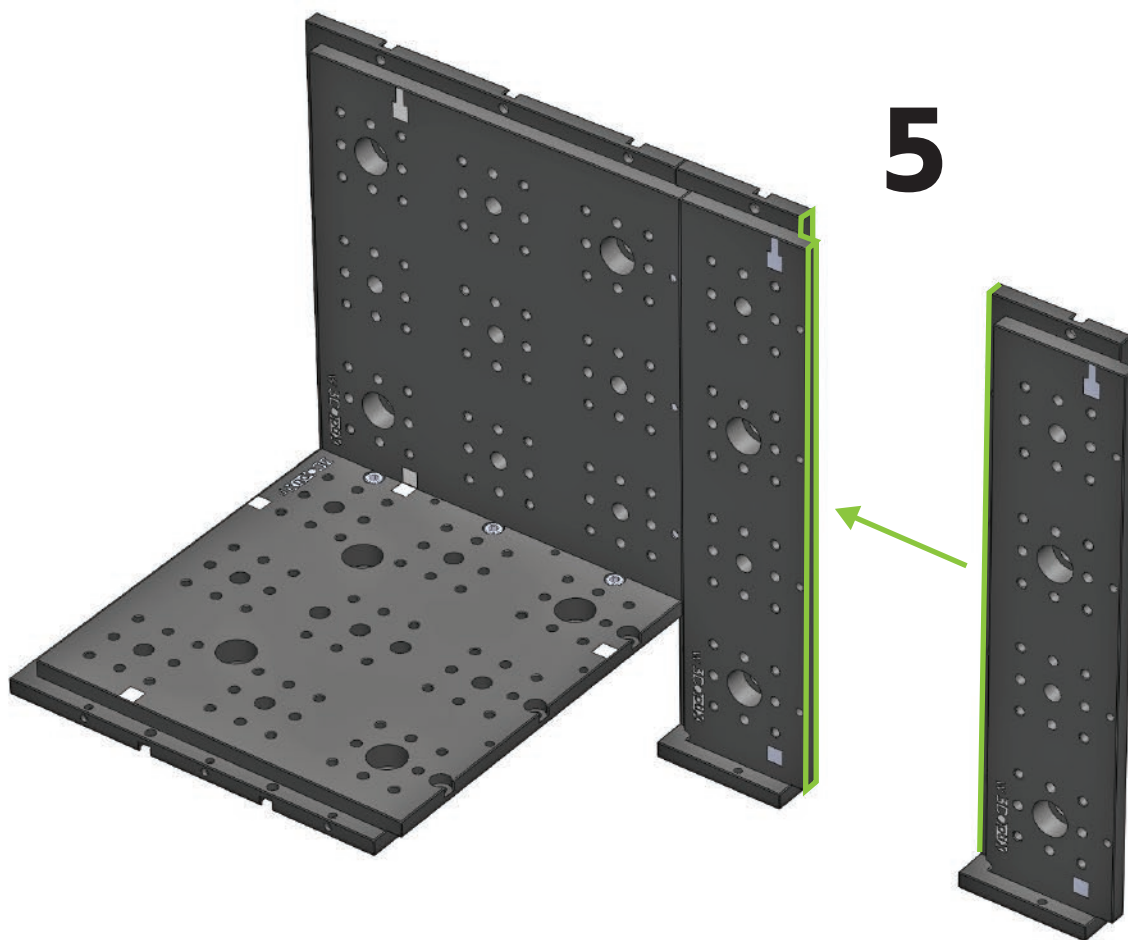


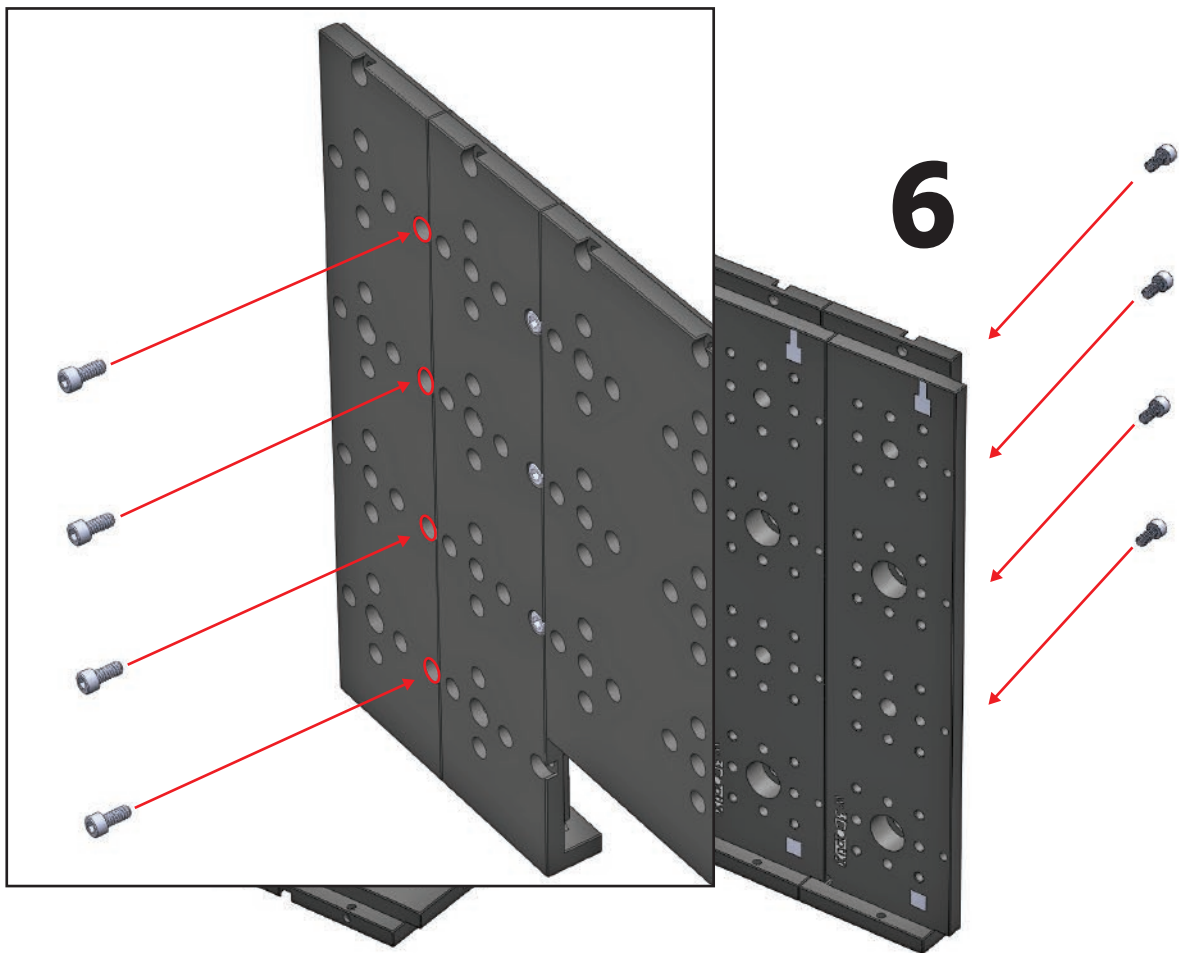
x15

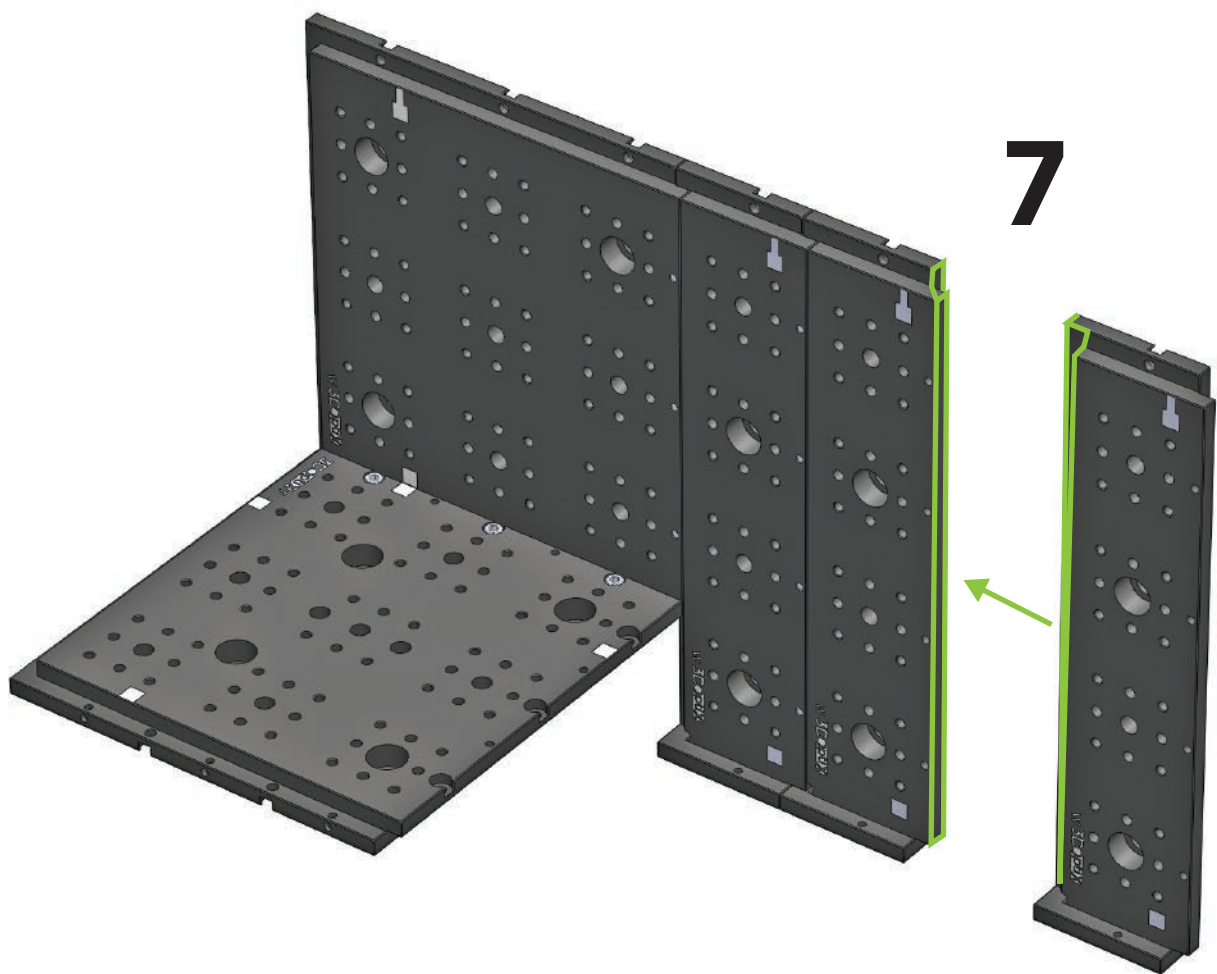


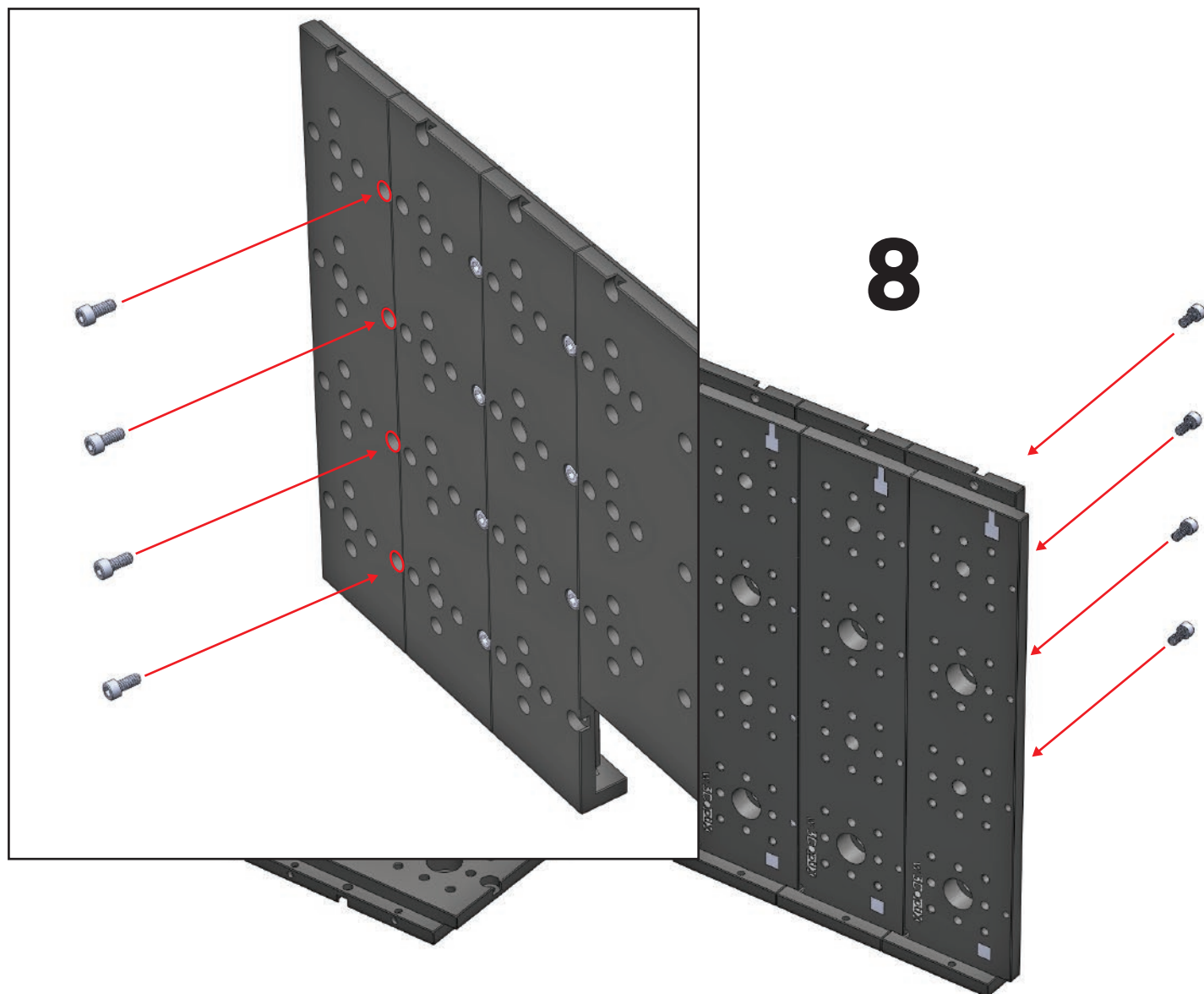




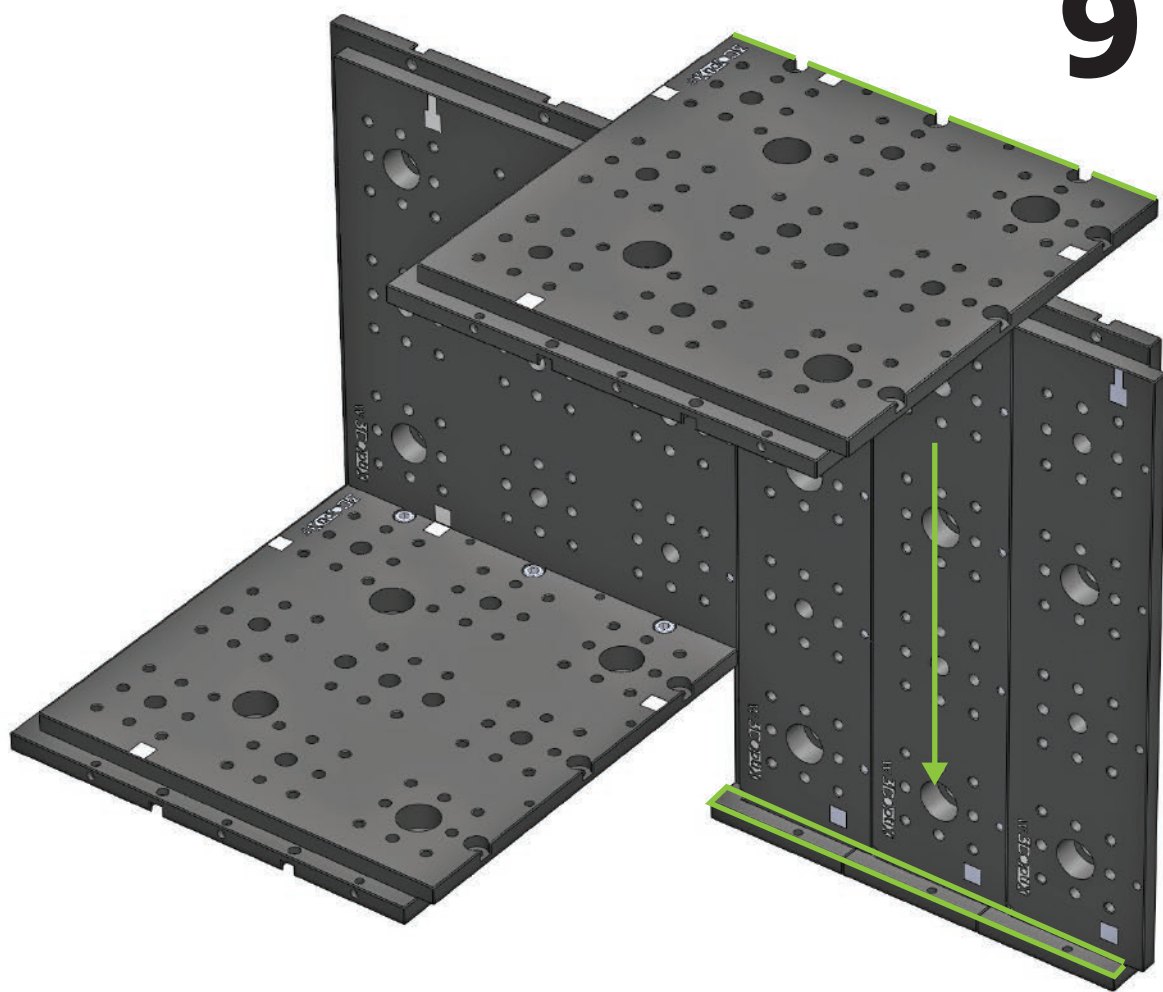


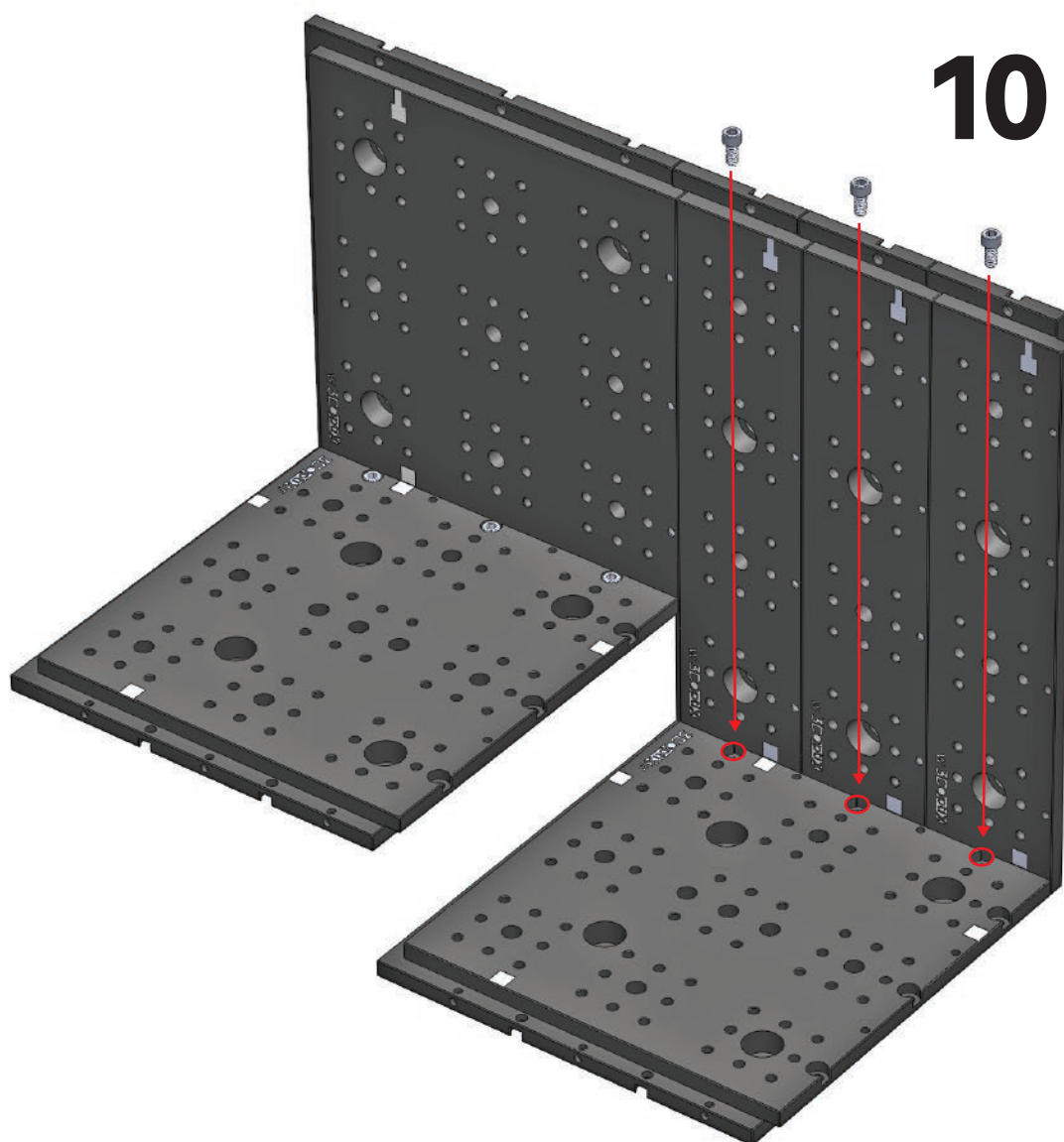




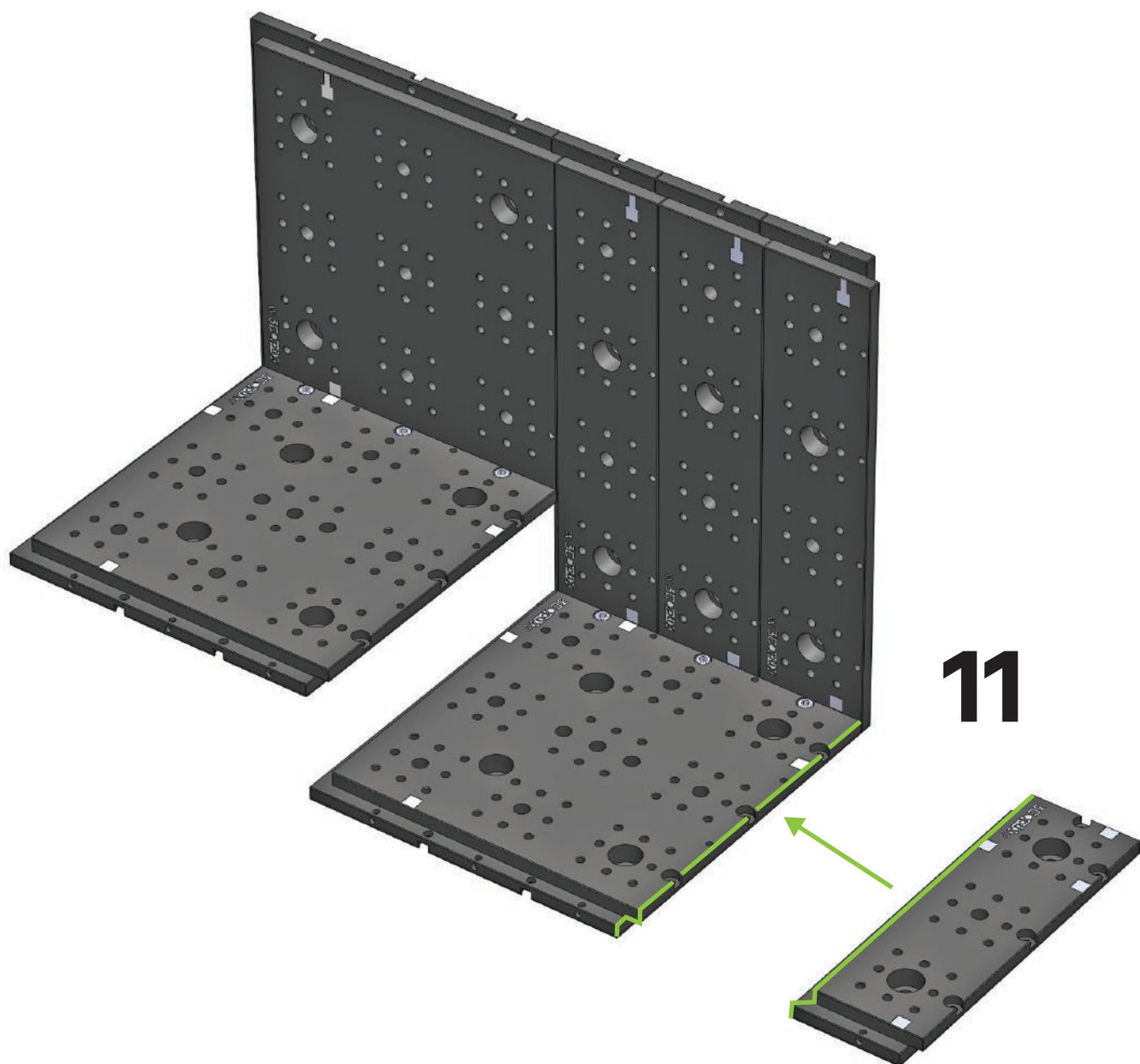


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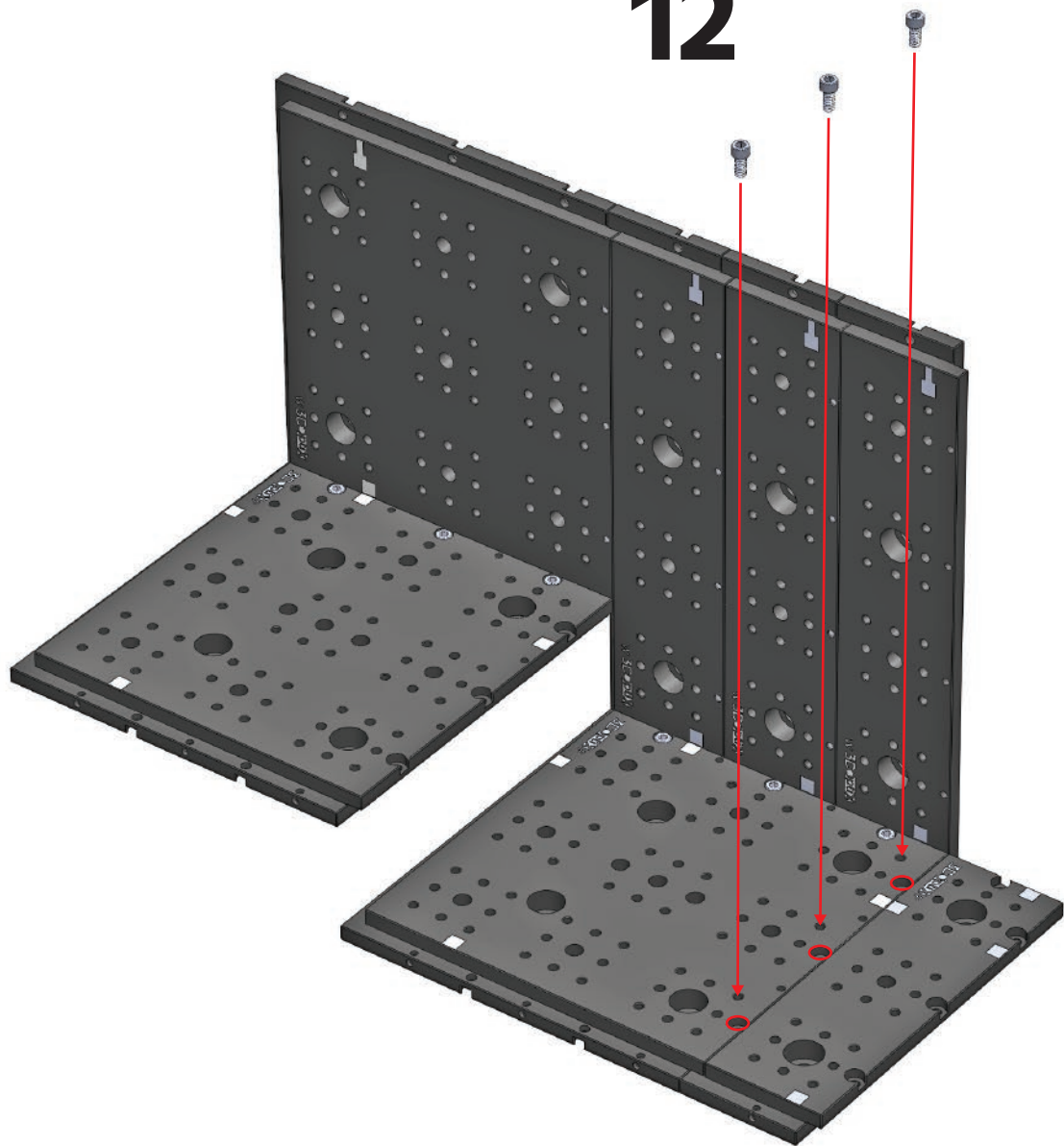




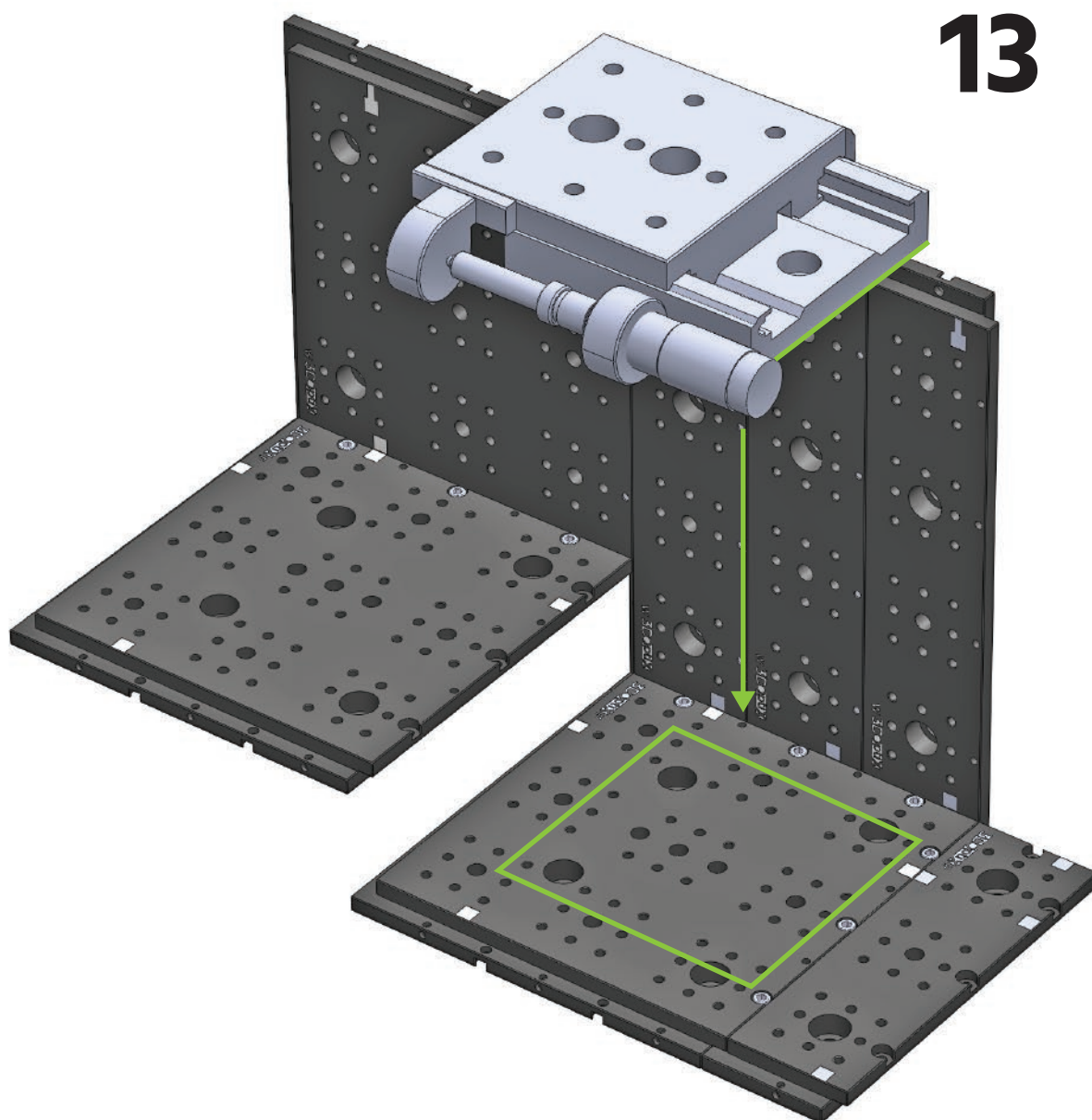
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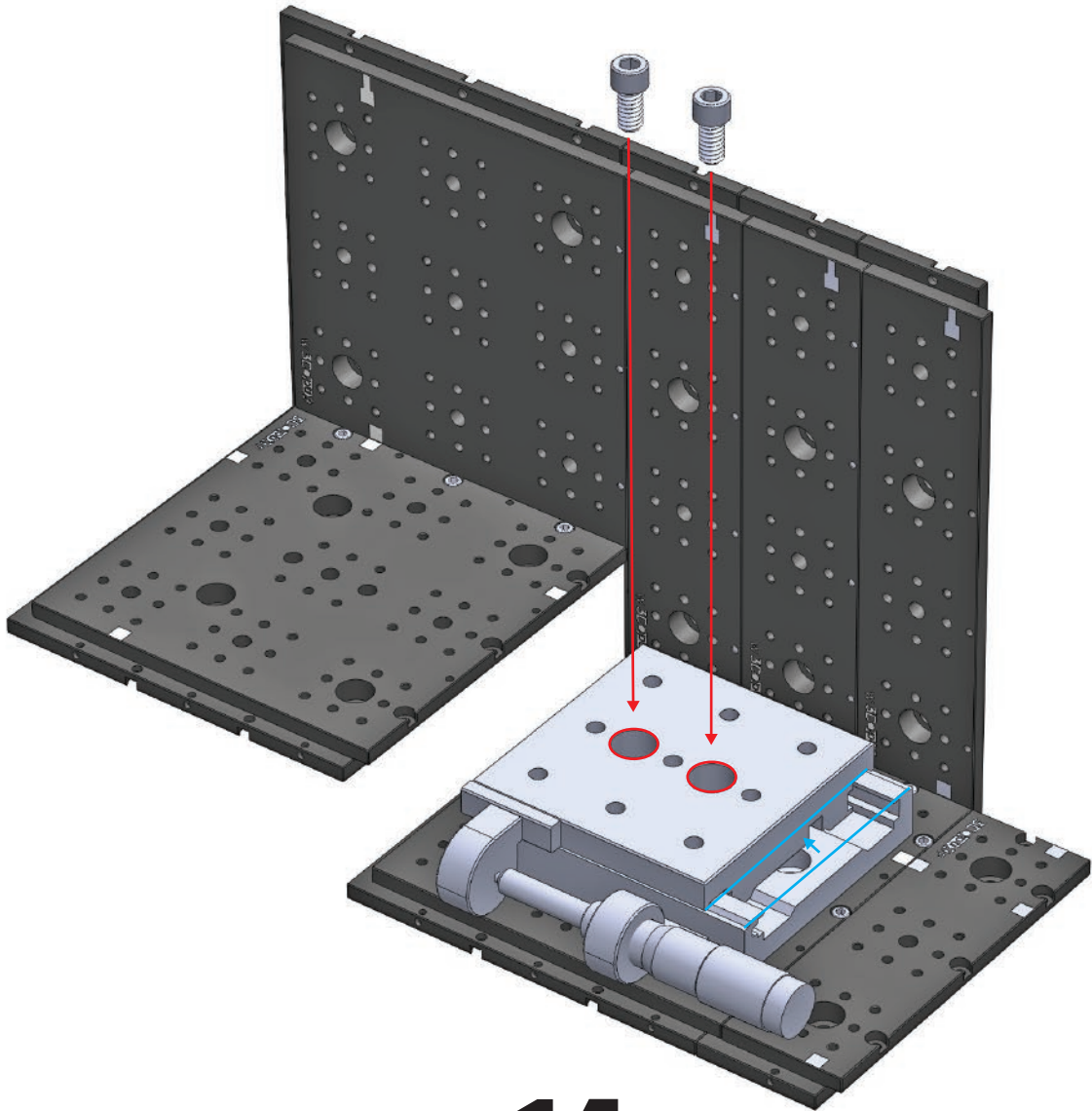


13



15

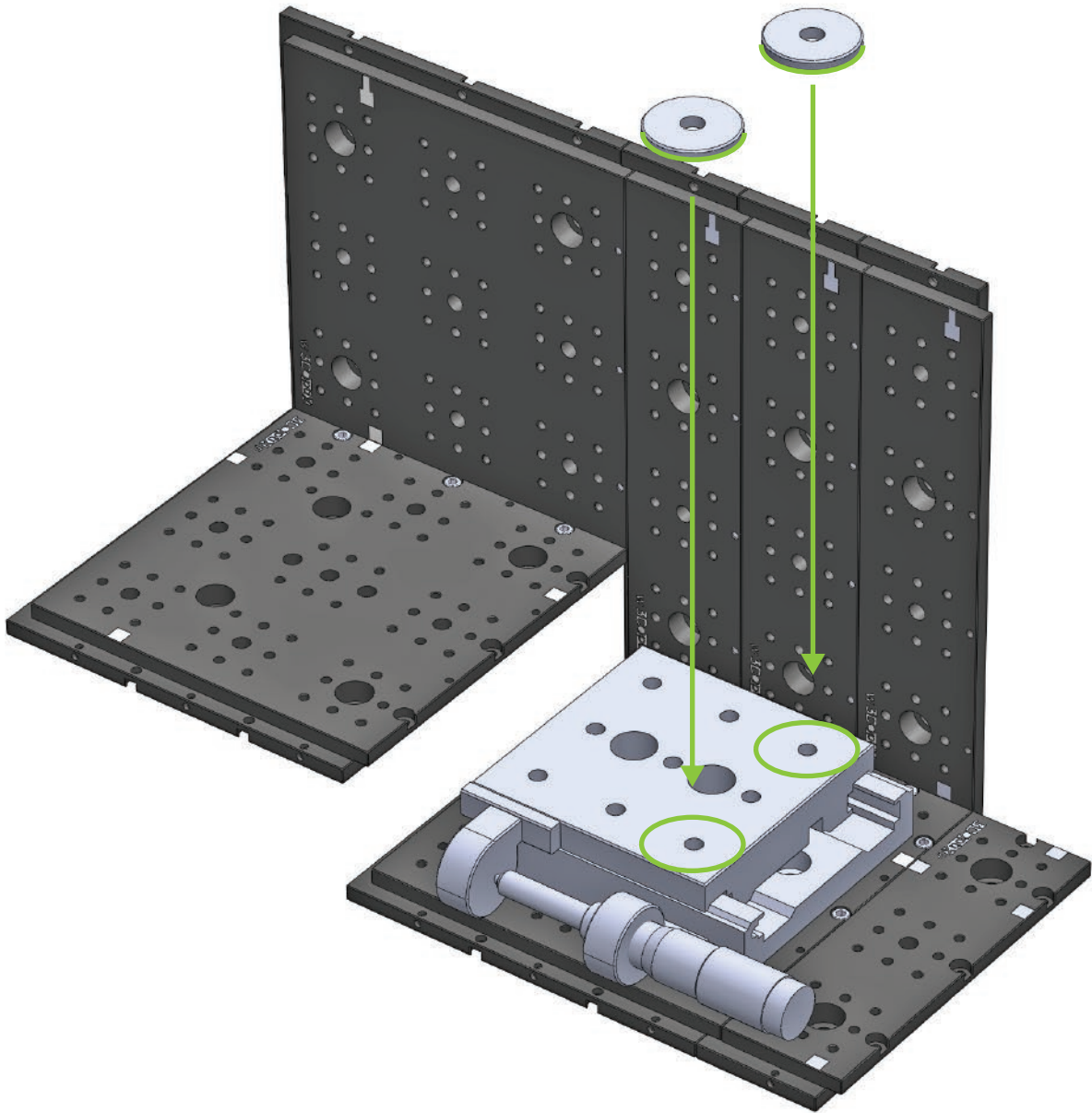
1/4"-20 Stainless Steel Cap Screw, 3/8" Long



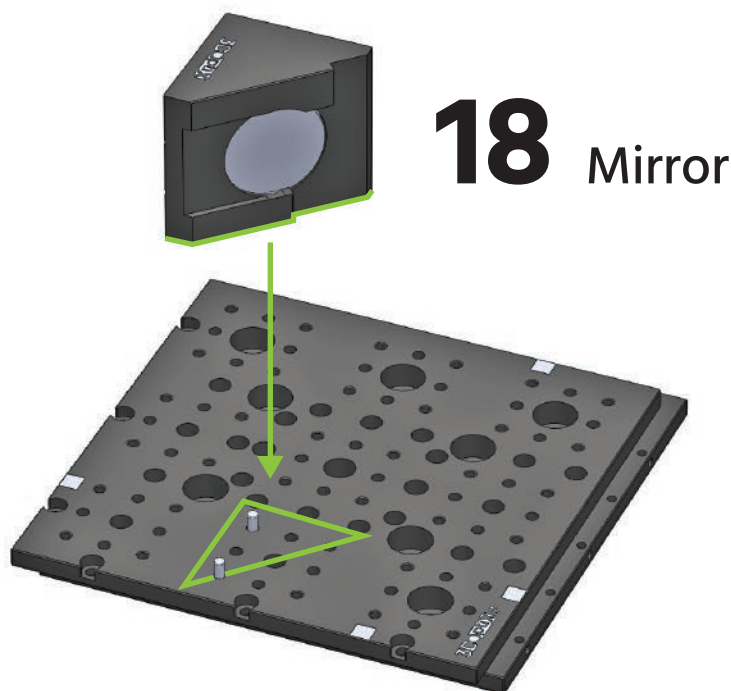
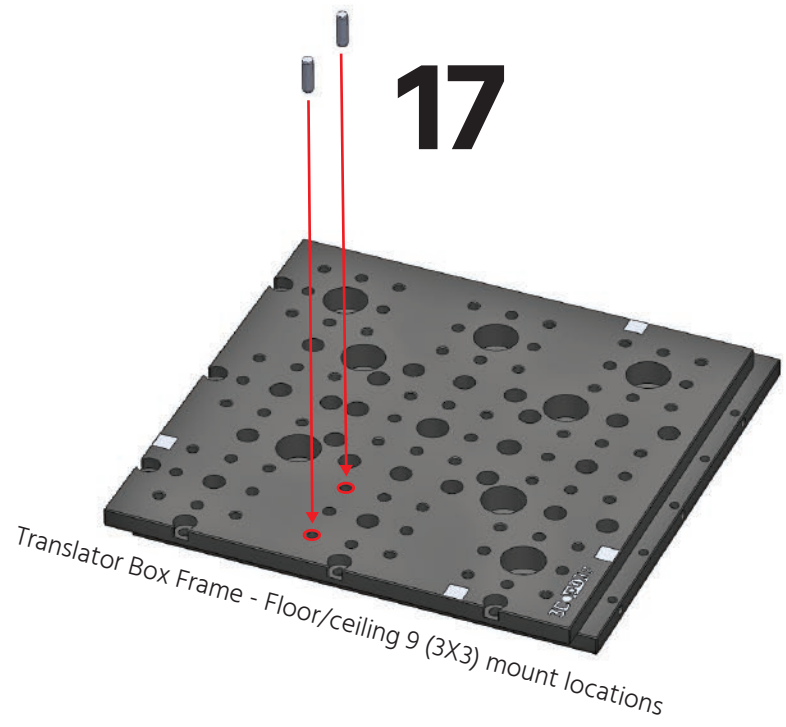
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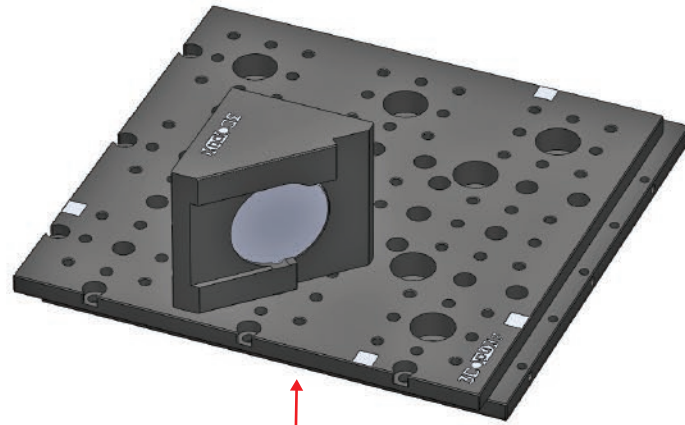
Turn knob until the screw holes are visible.

16

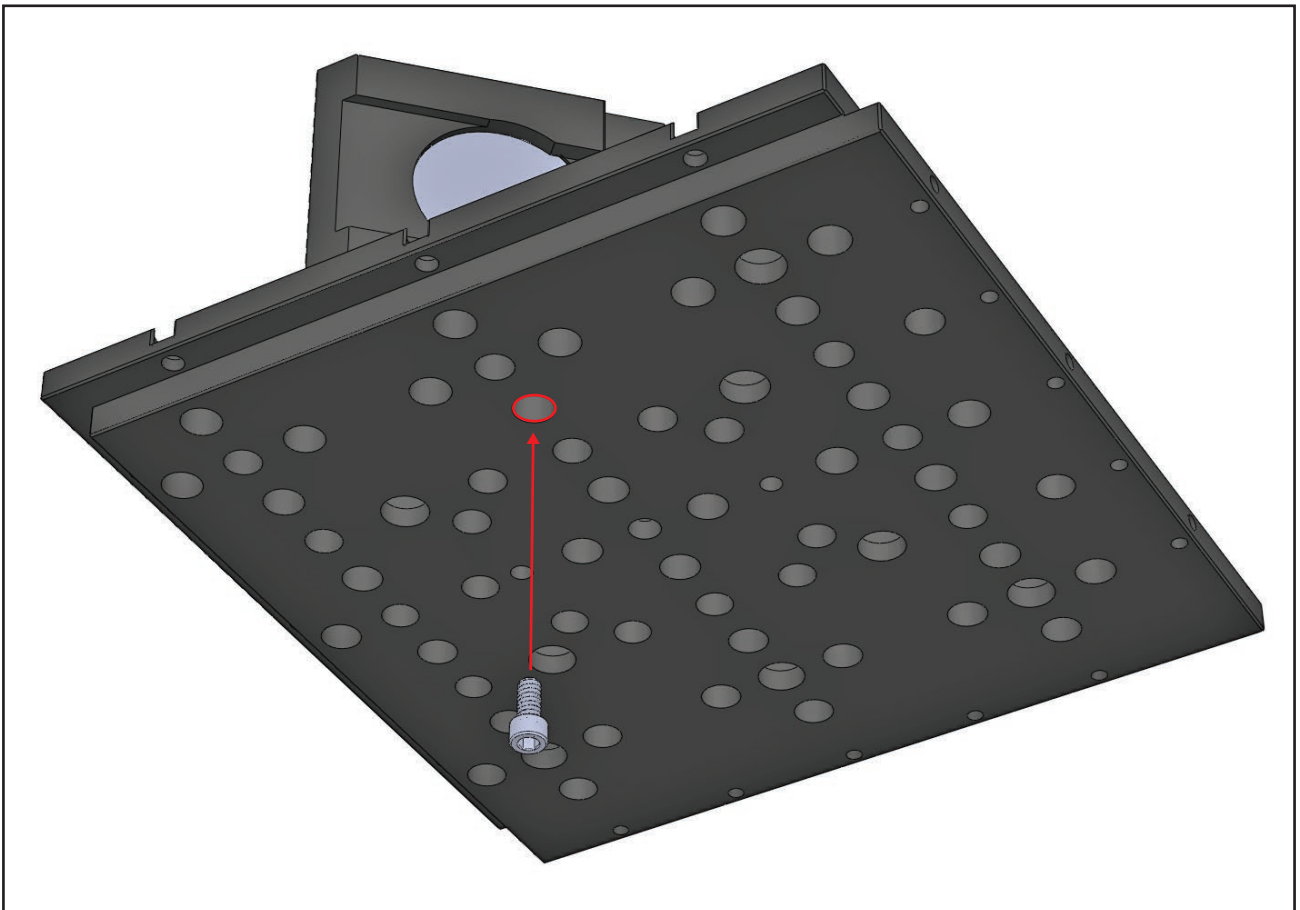


Delay Assembly

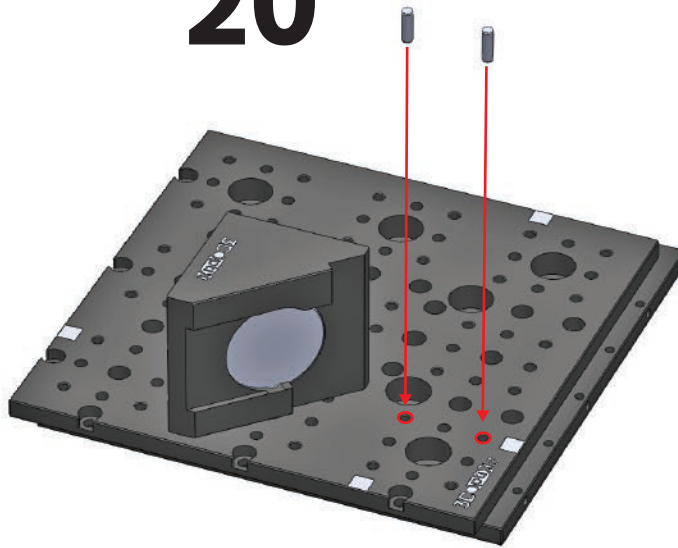




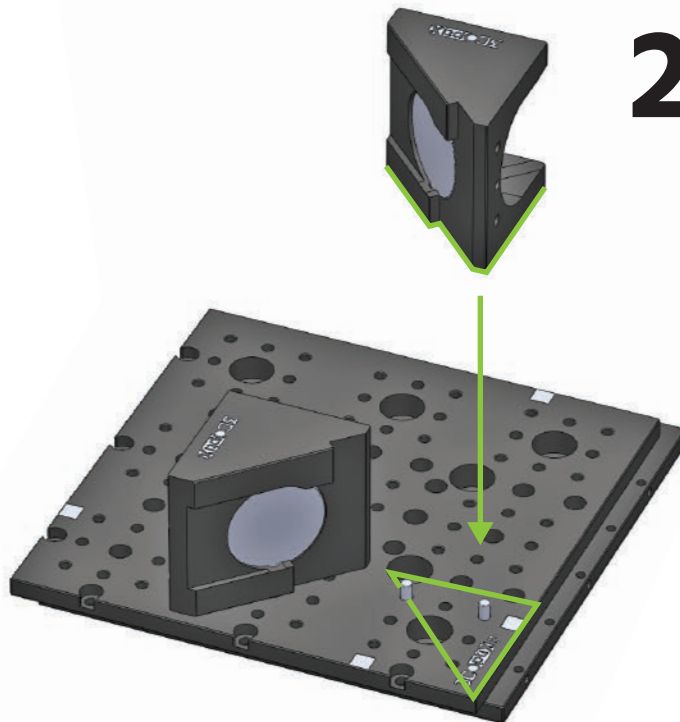
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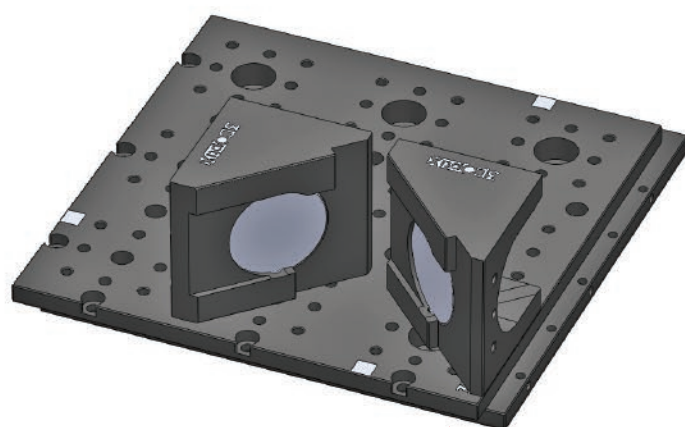


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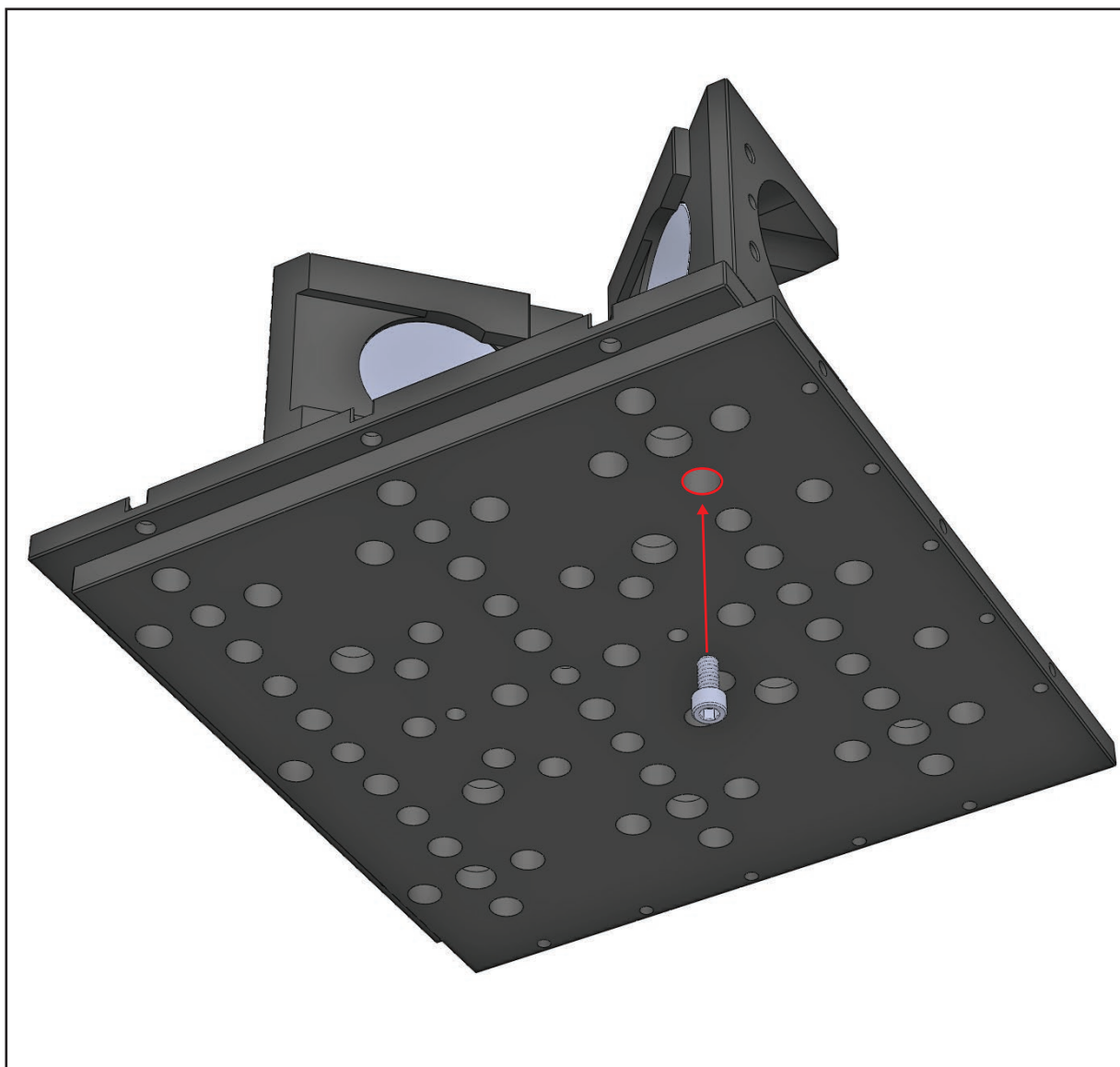


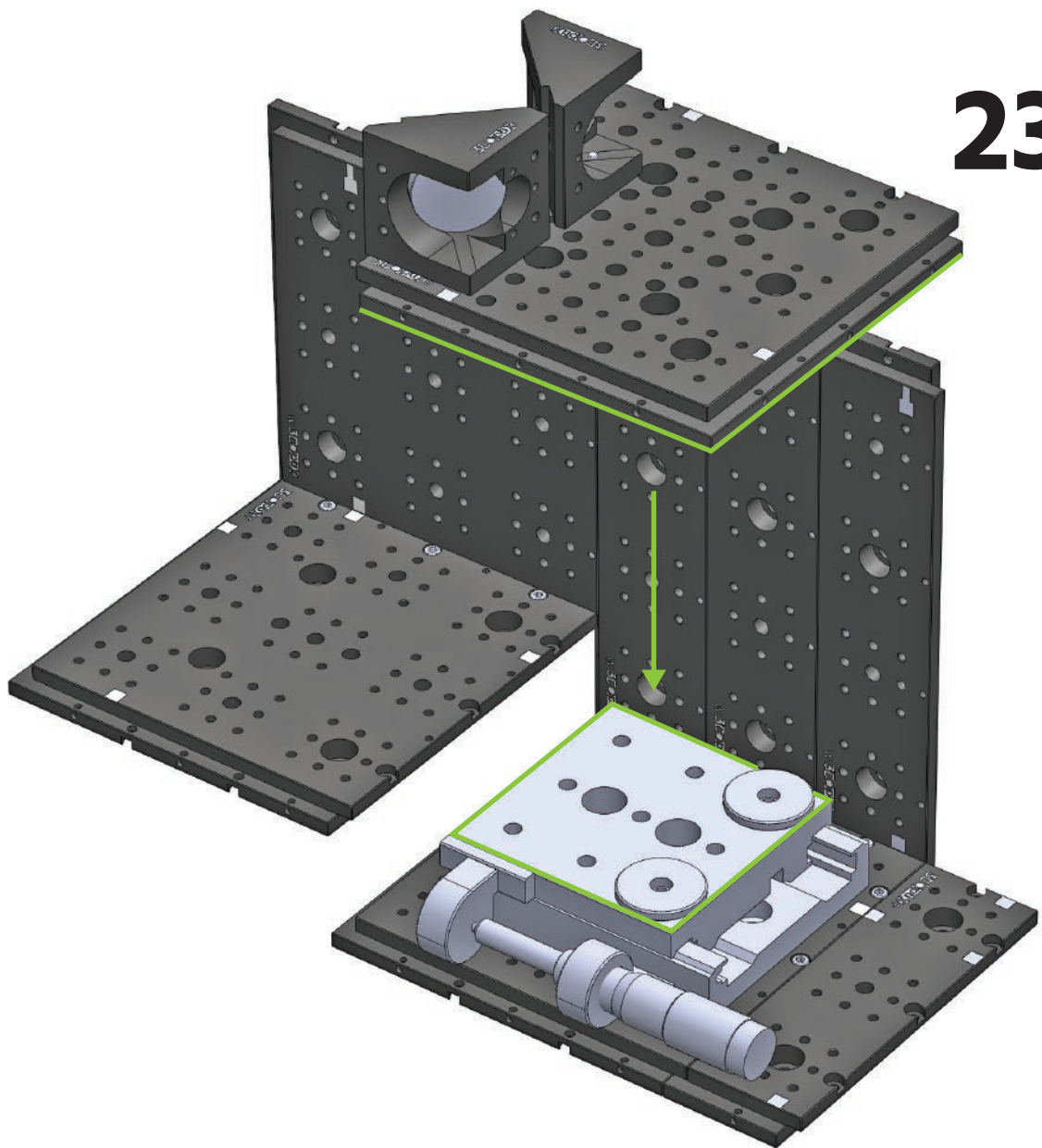
21 Mirror





22

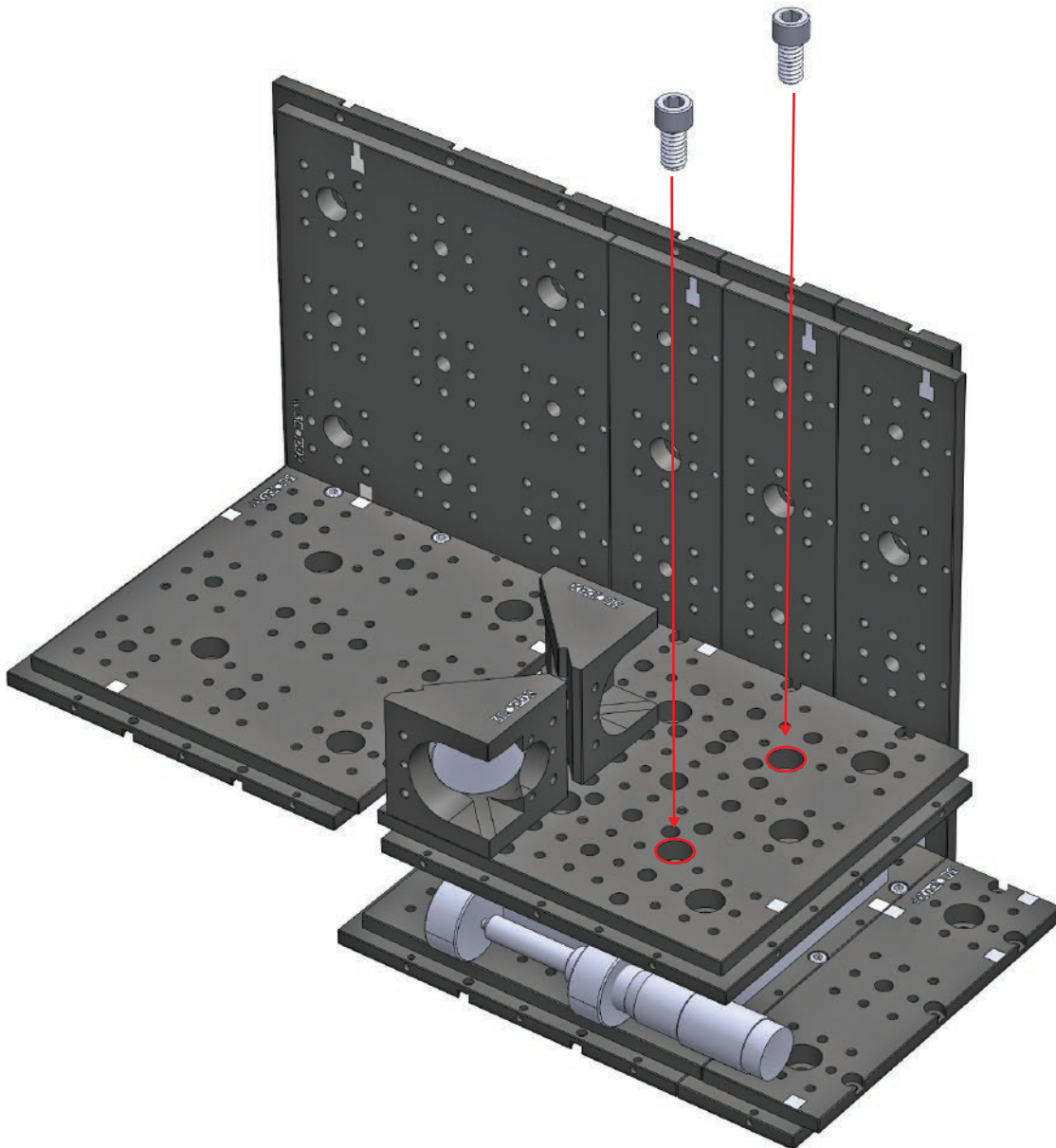




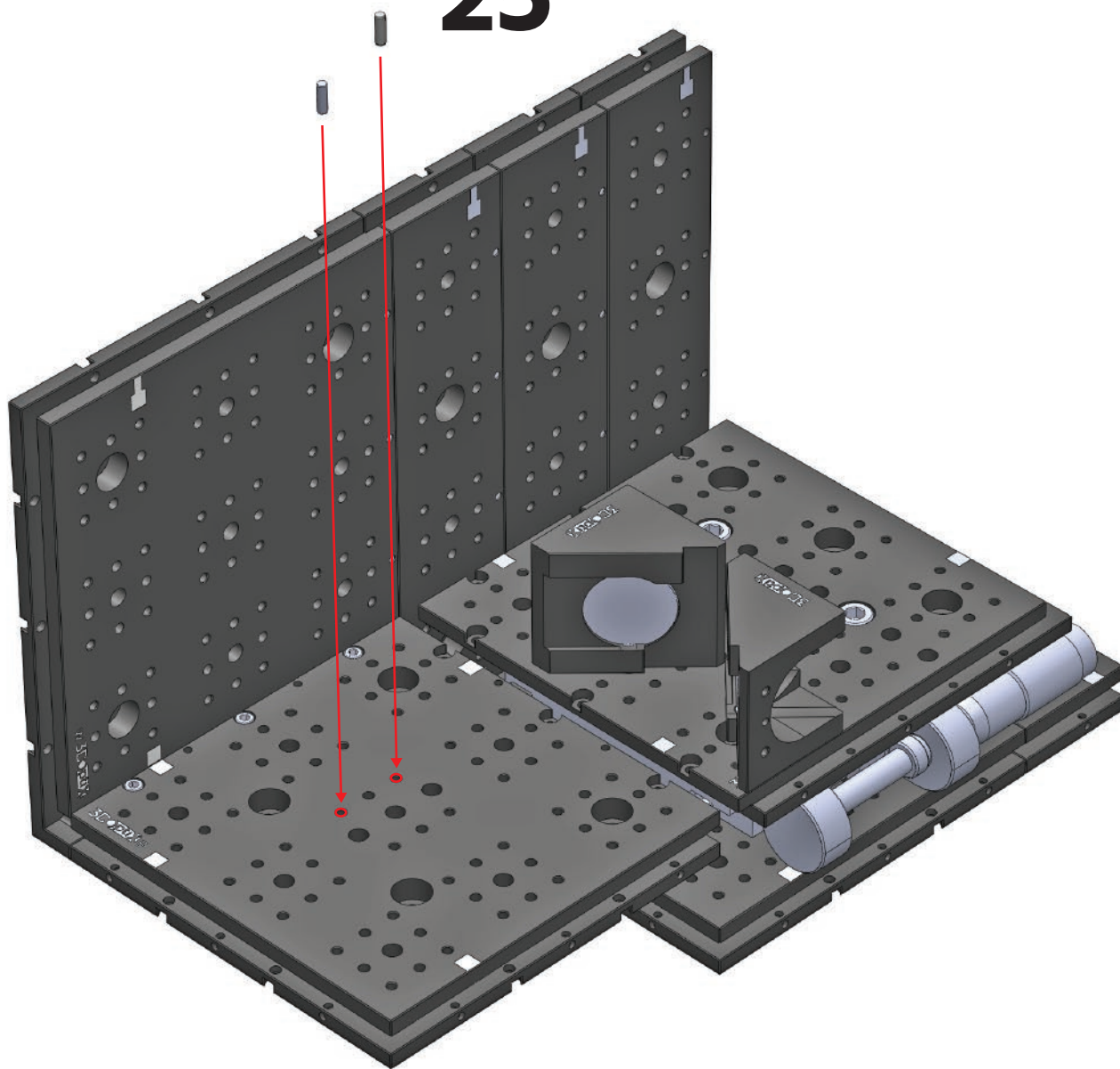
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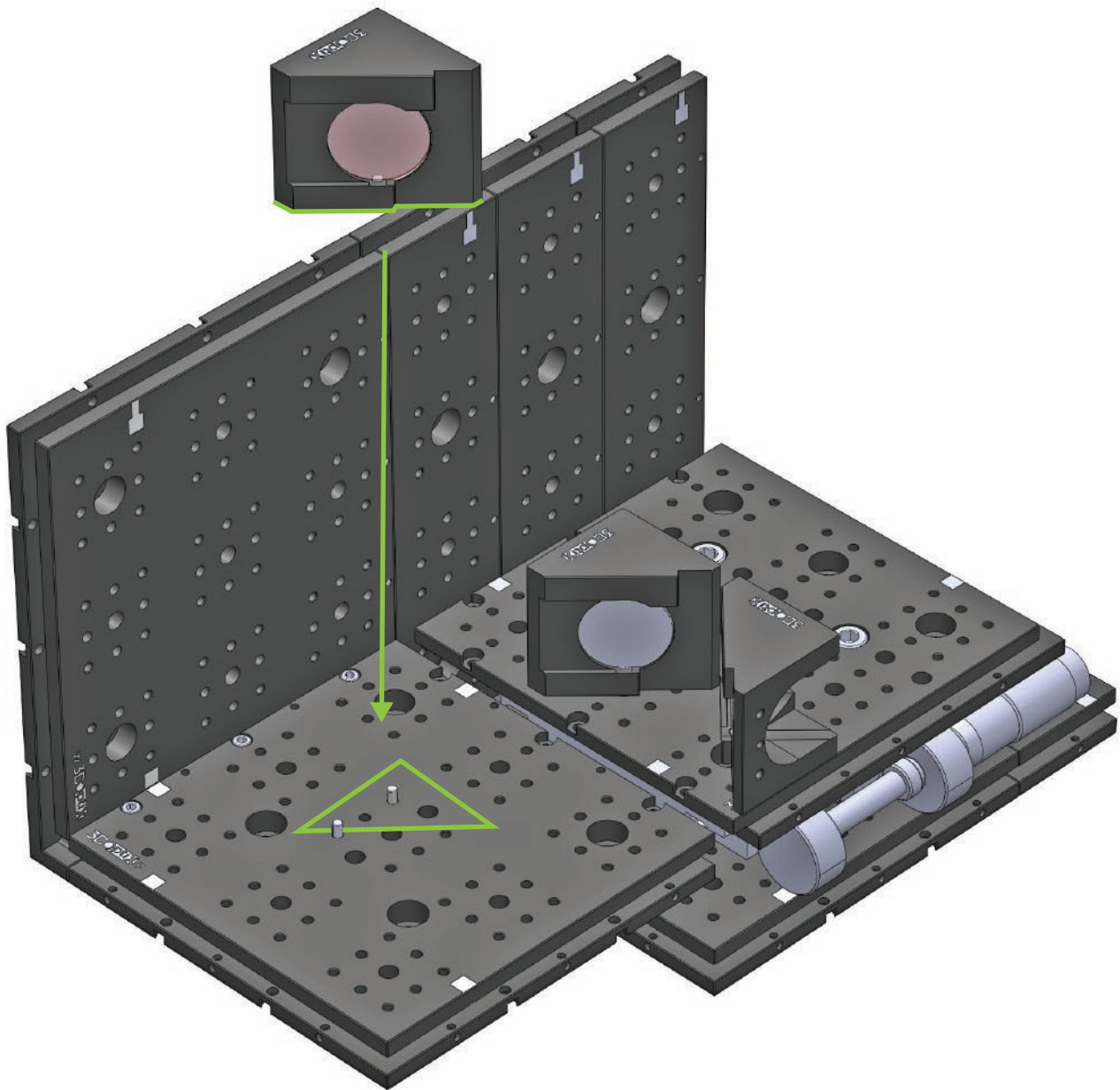
1/4"-20 Stainless Steel Cap Screw, 3/8" Long

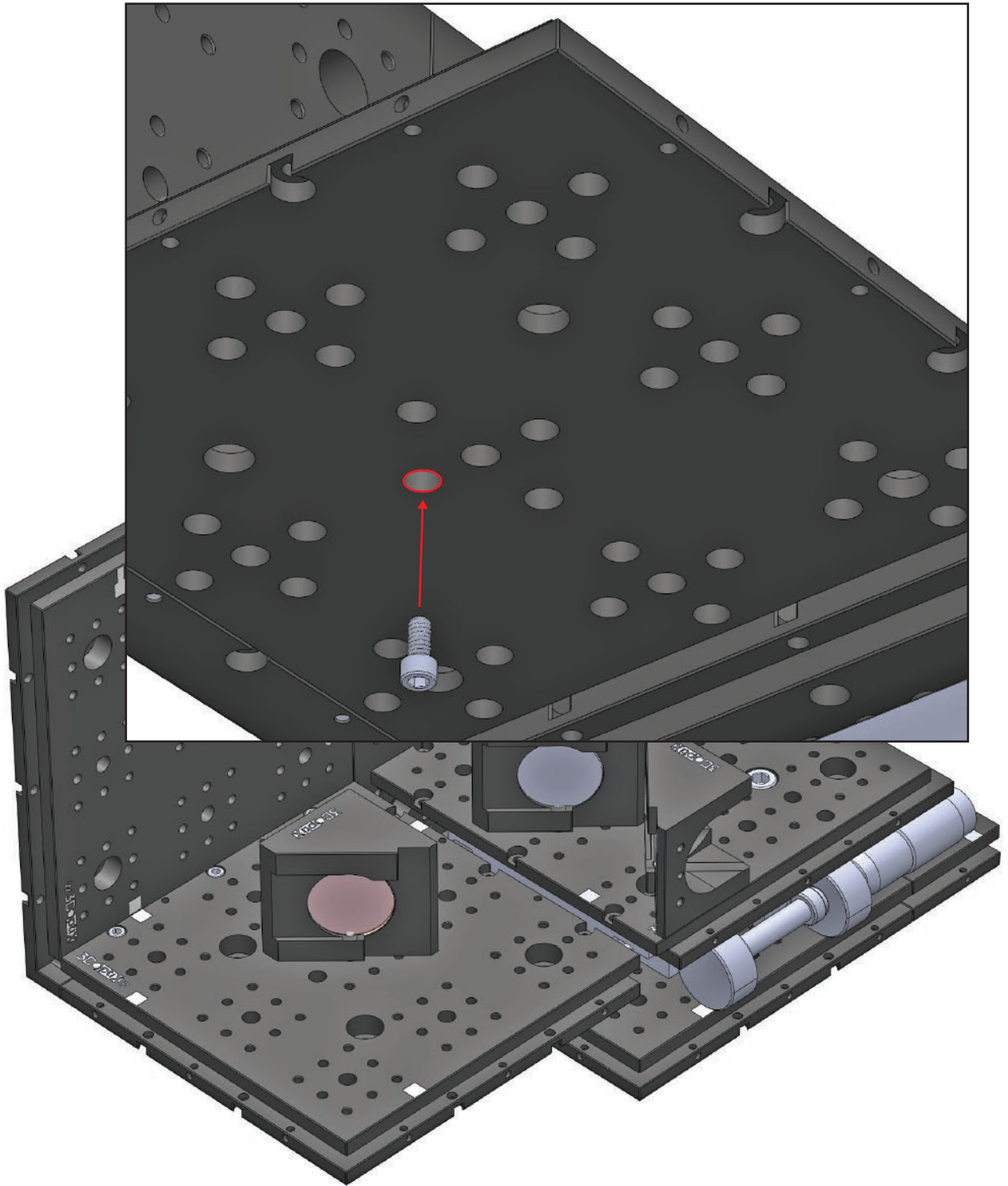


25



26 Beam Splitter

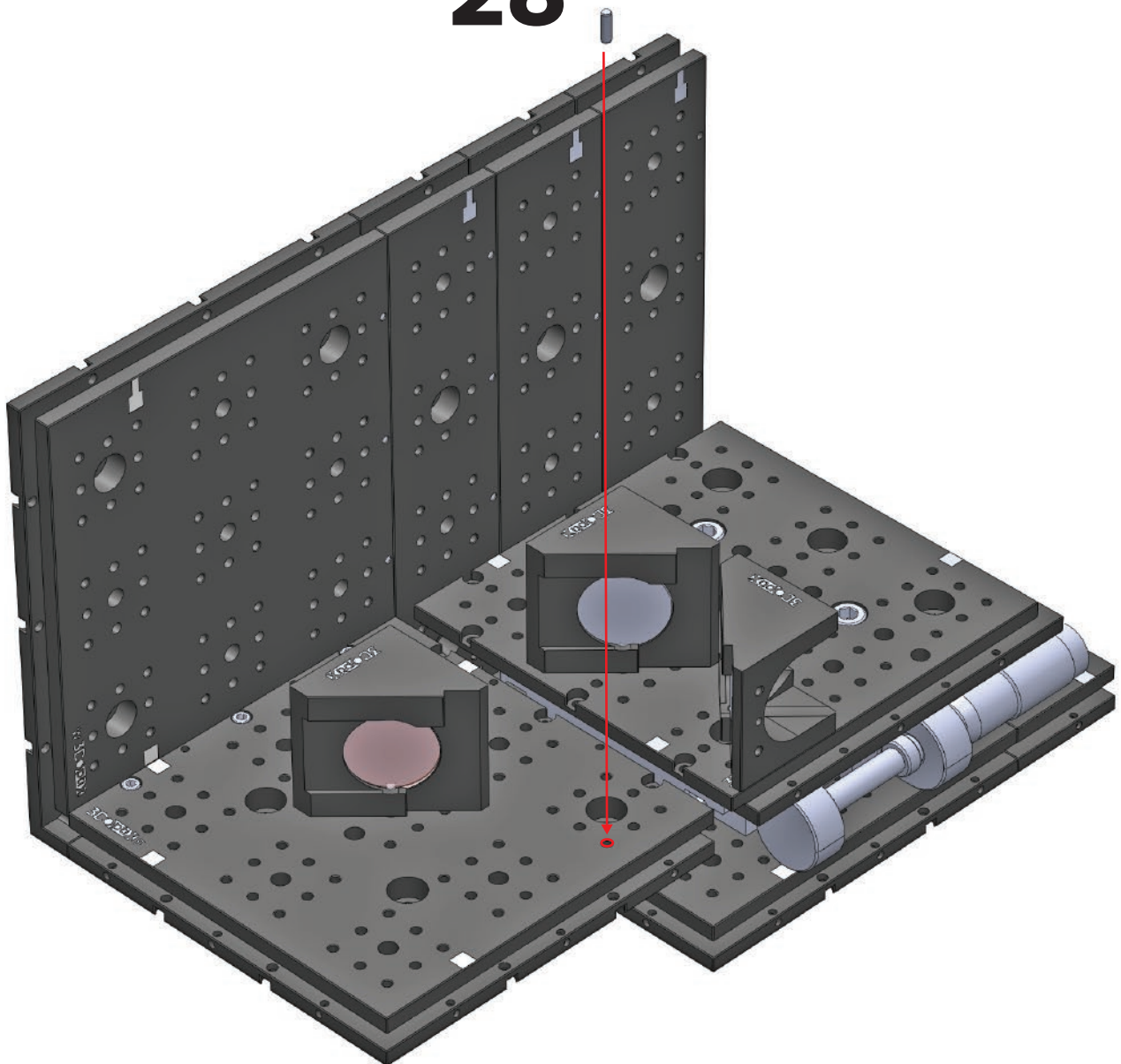


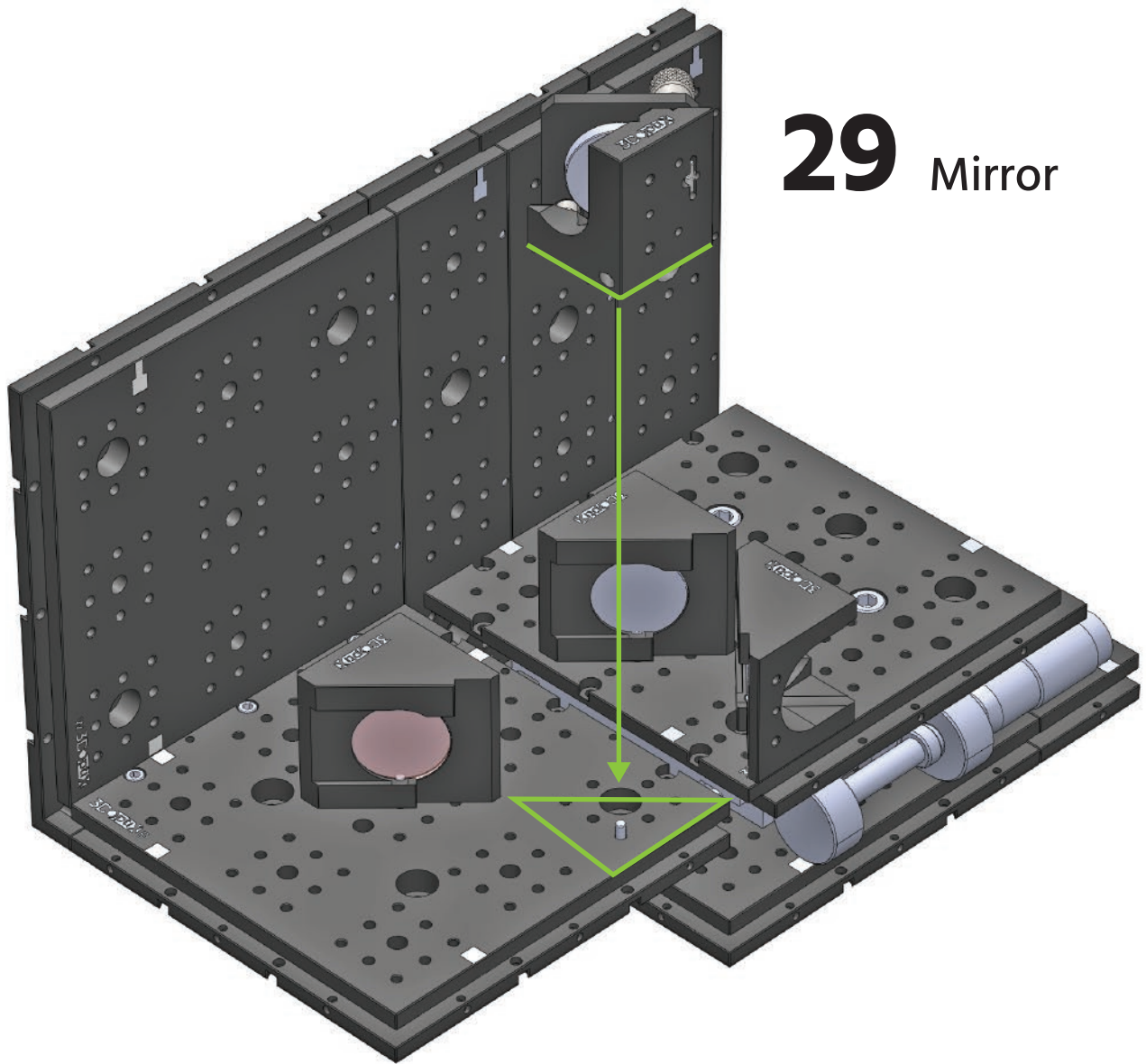


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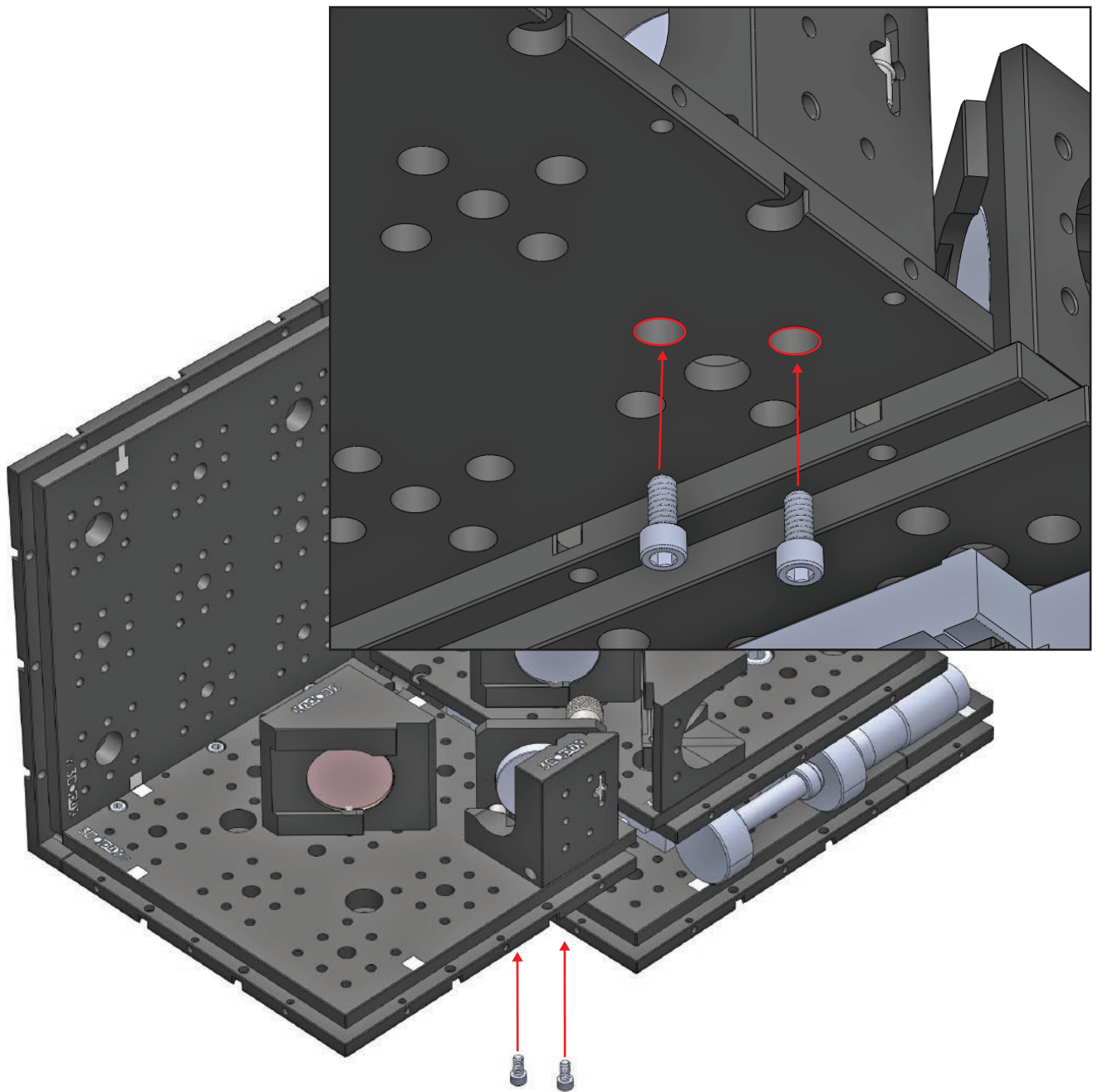


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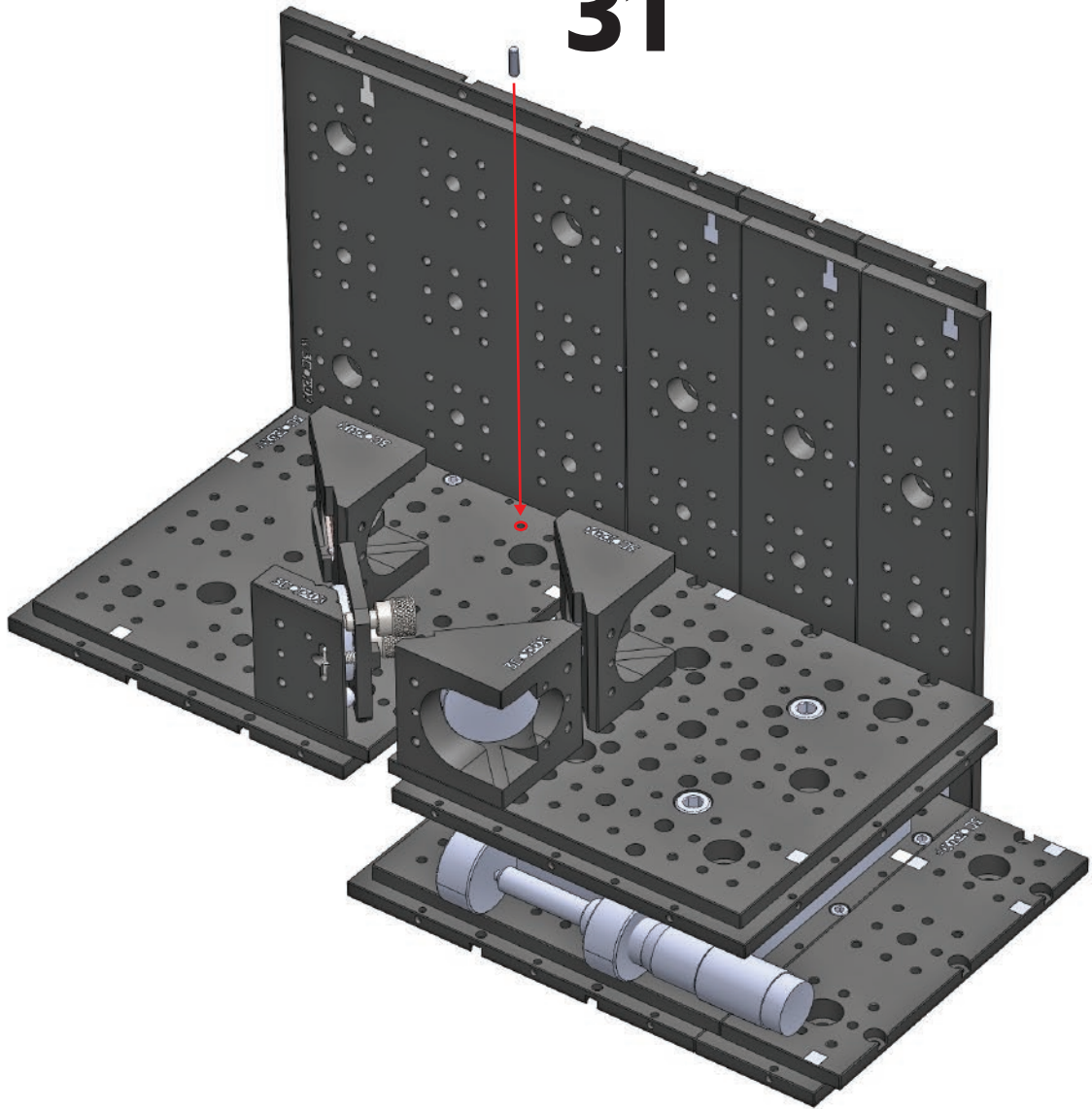


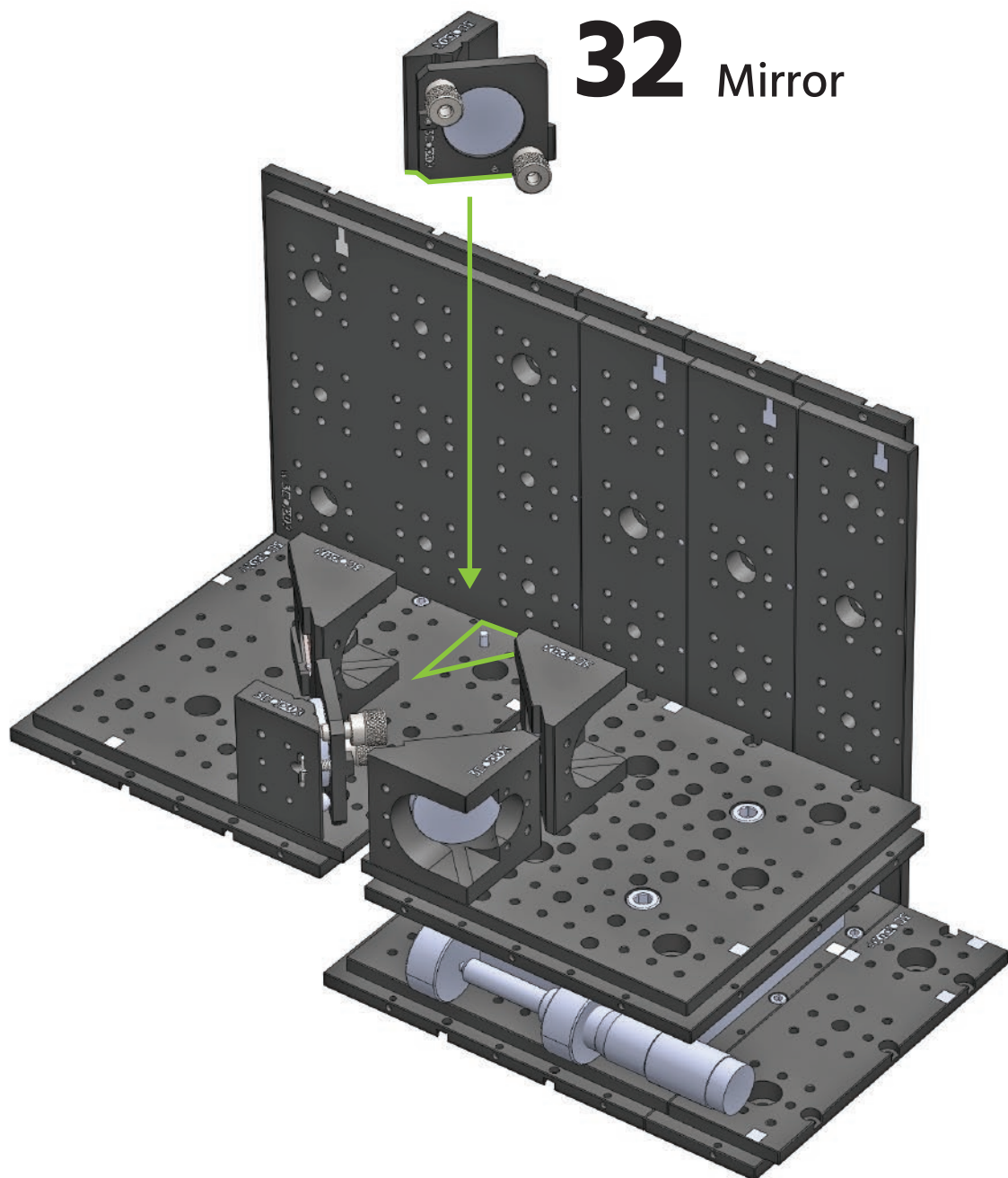
29 Mirror



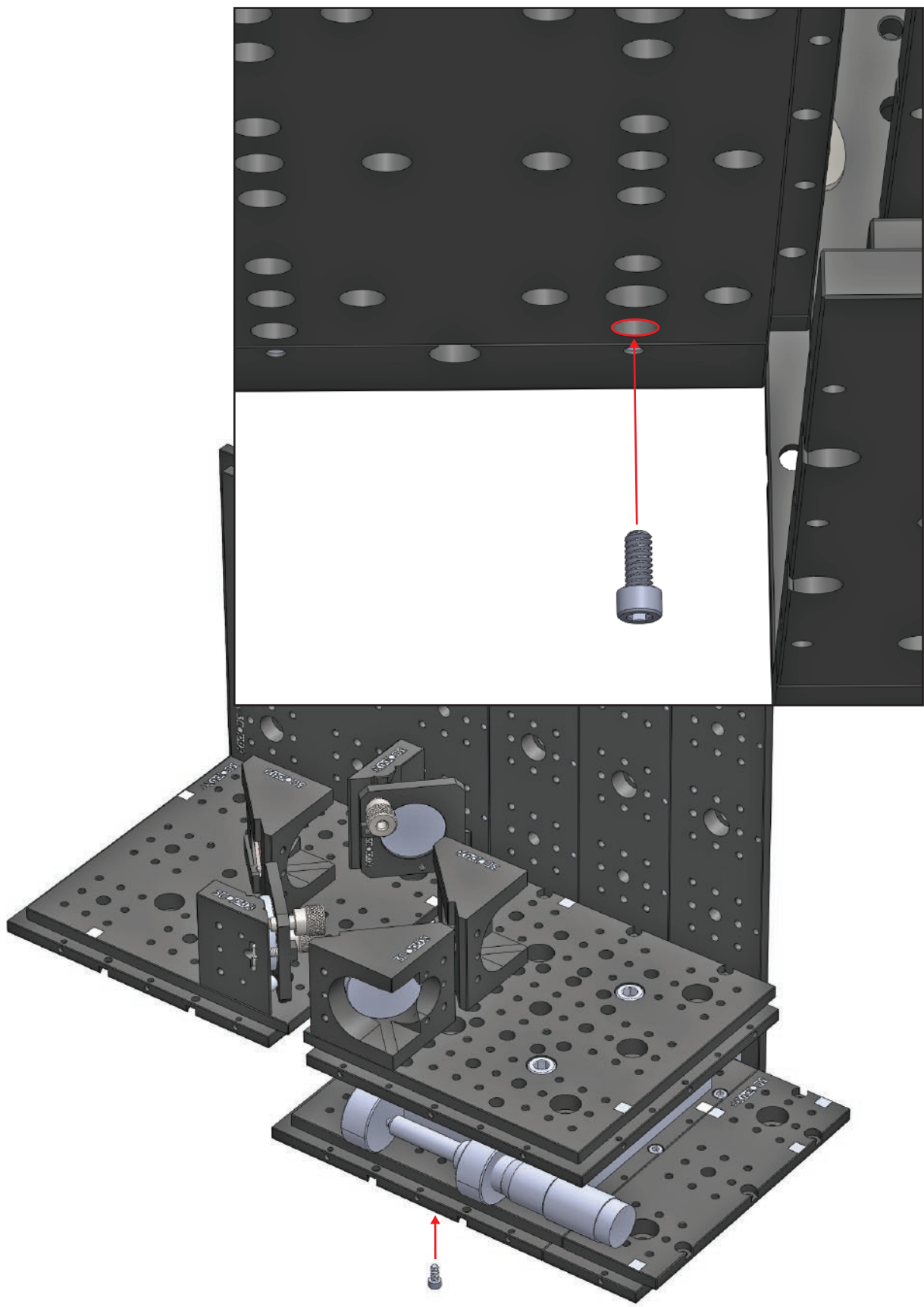
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31



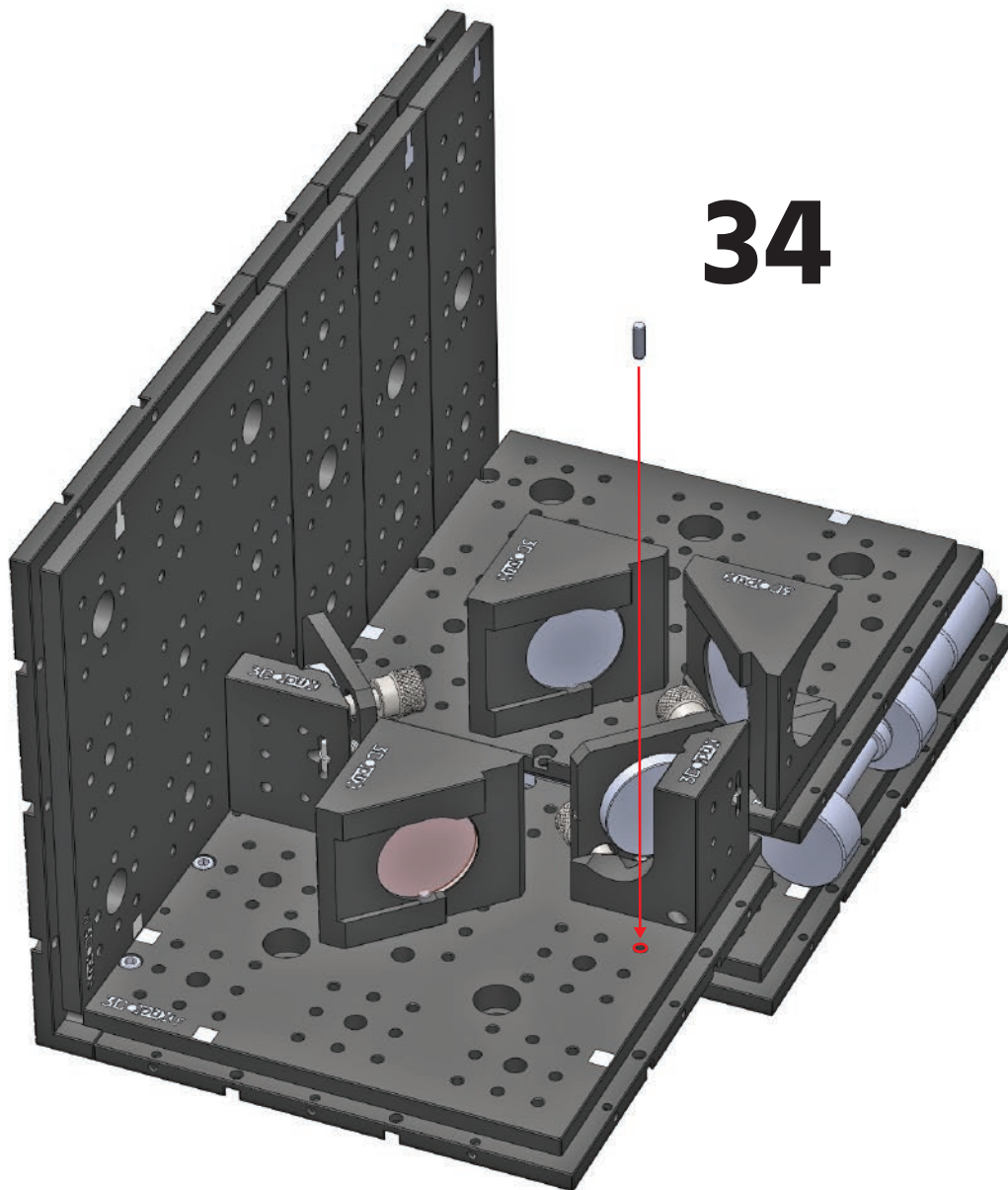


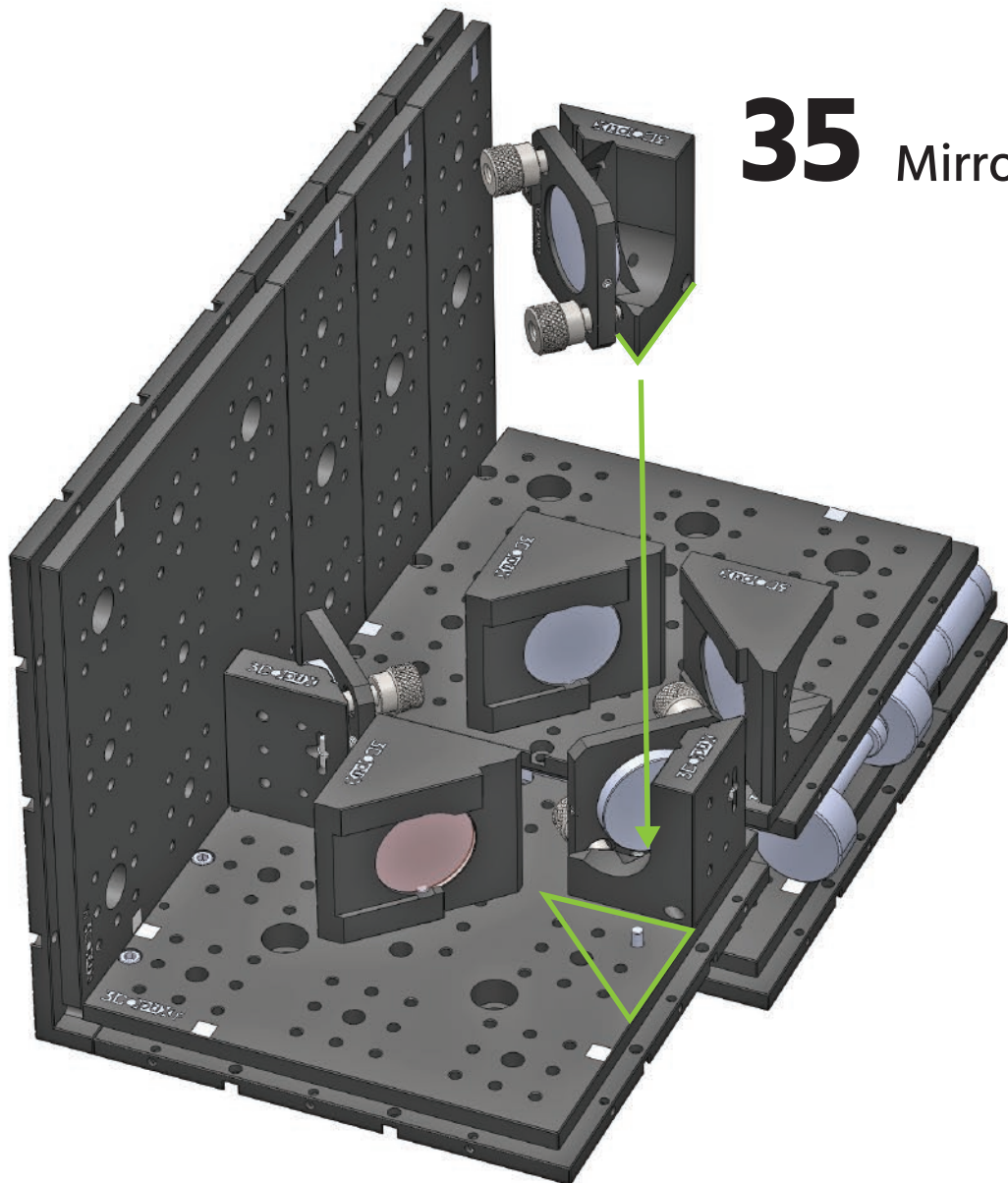
32 Mirror



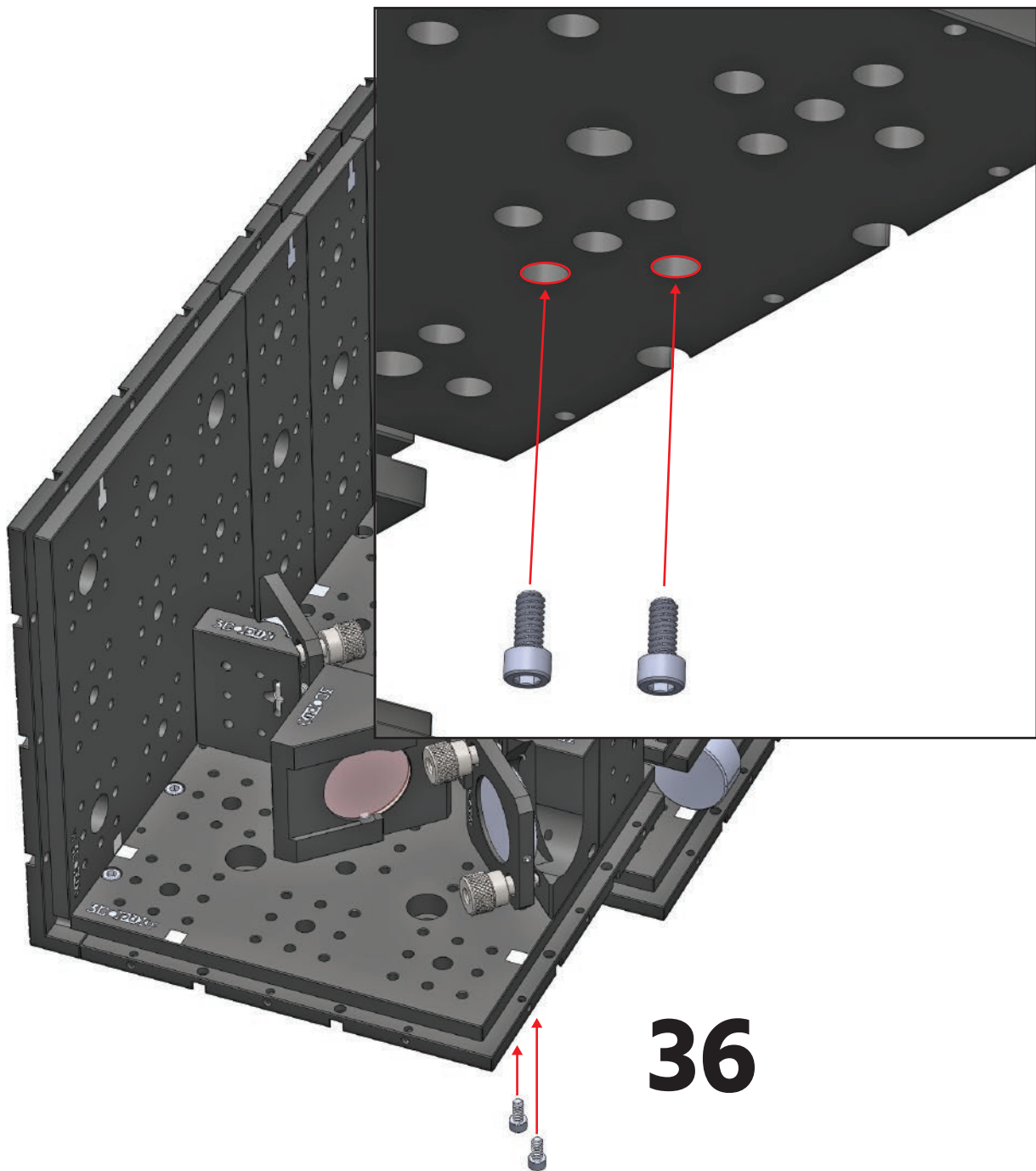
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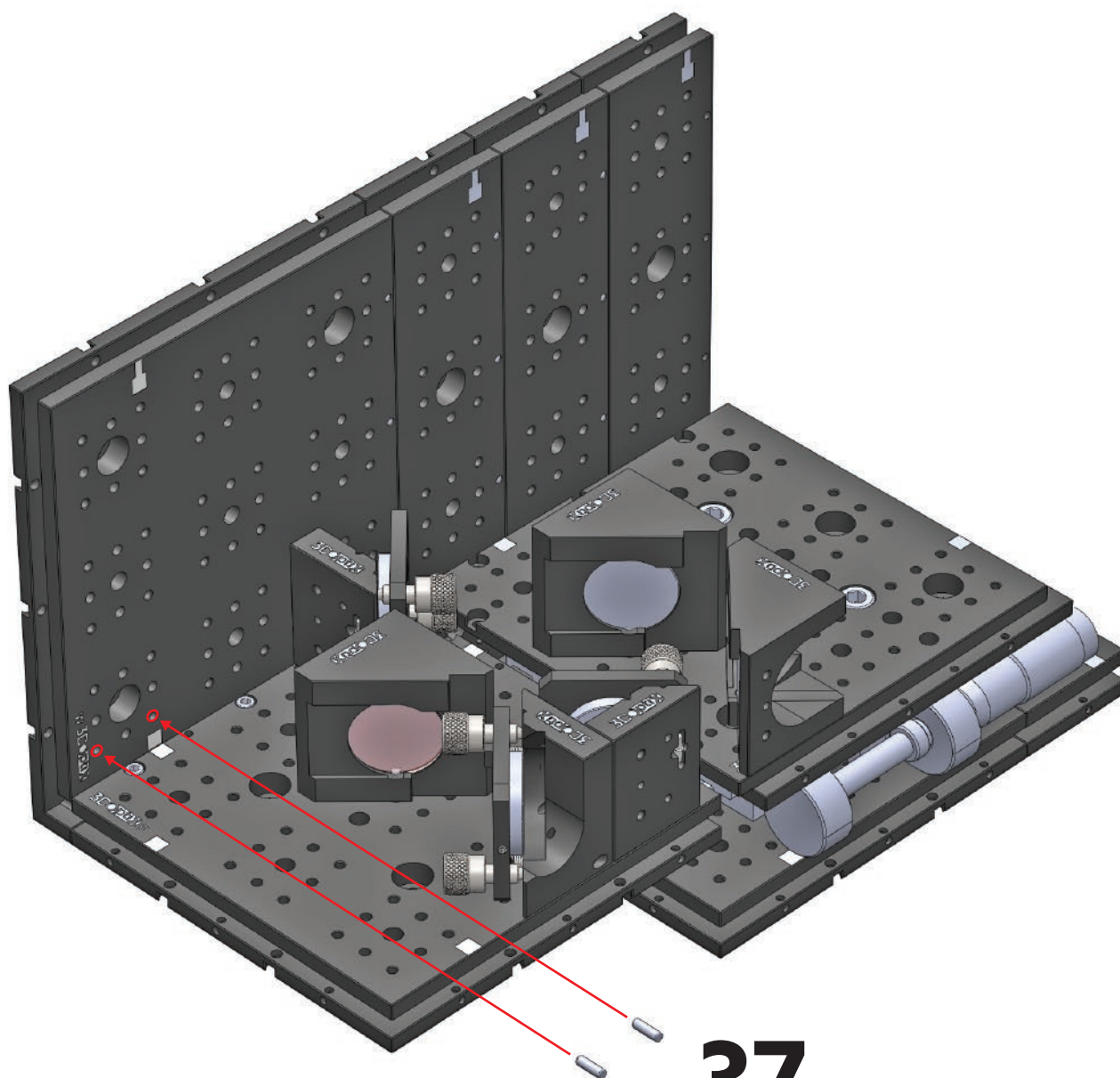
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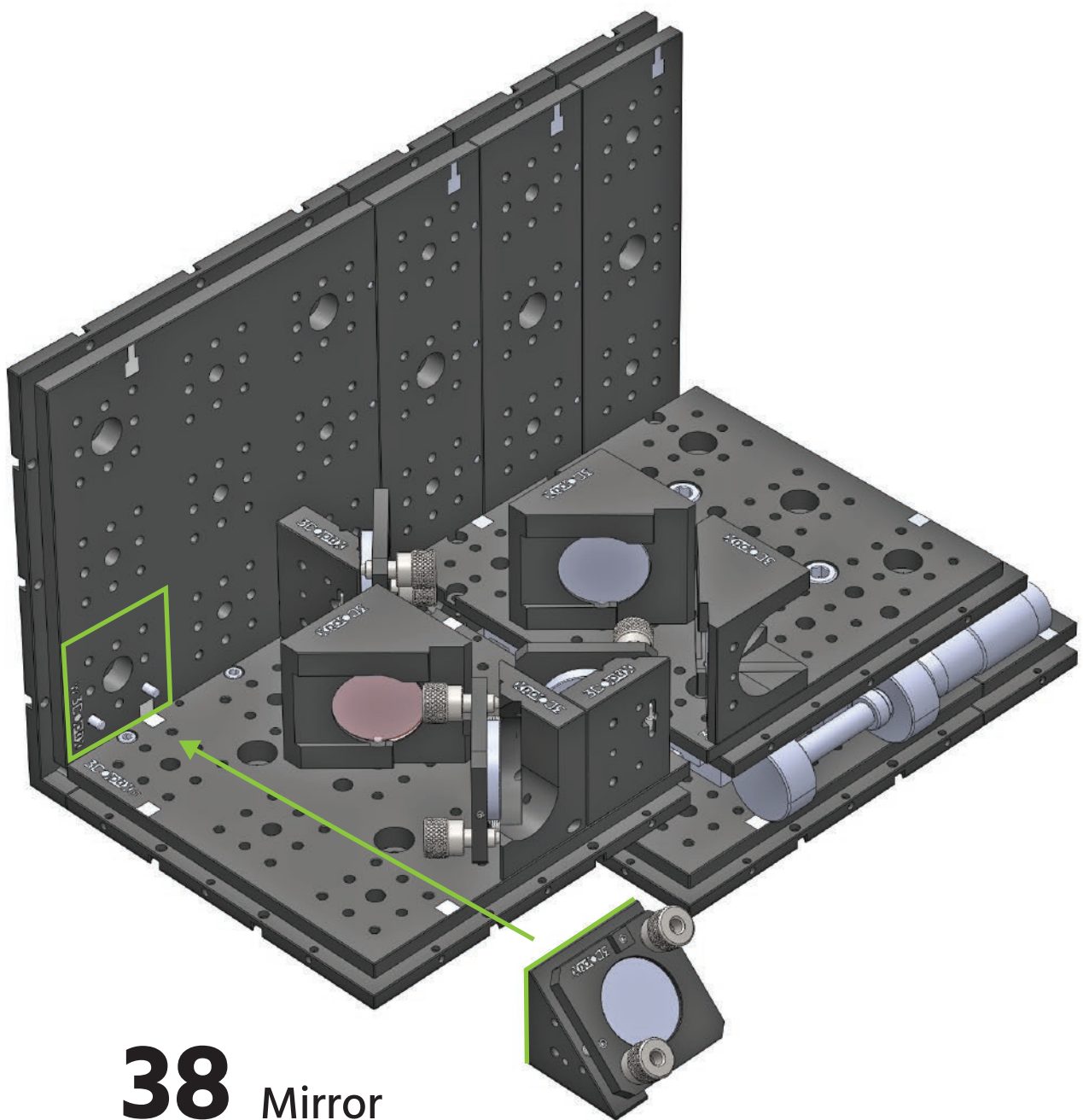


35 Mirror



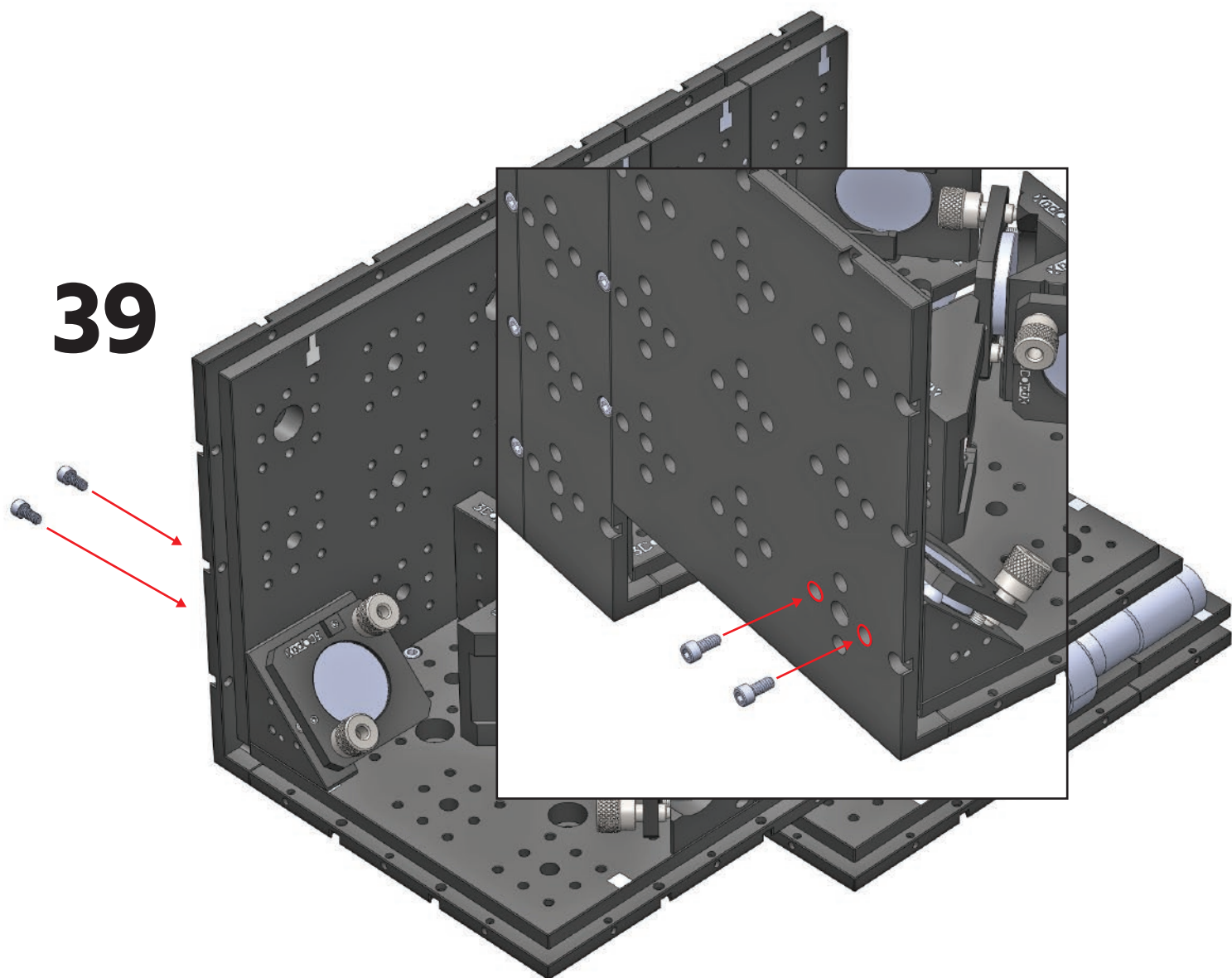


37



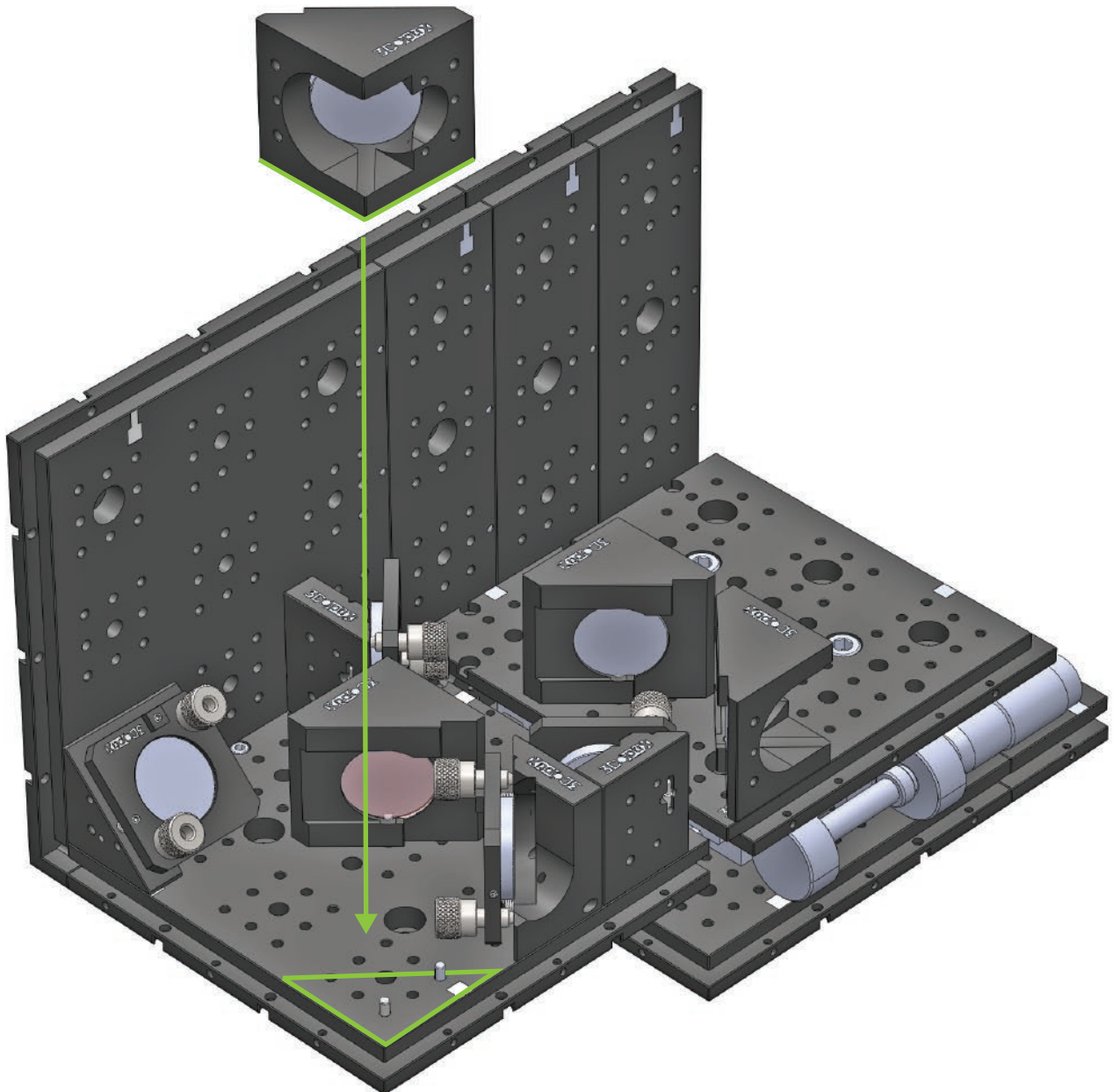
38 Mirror

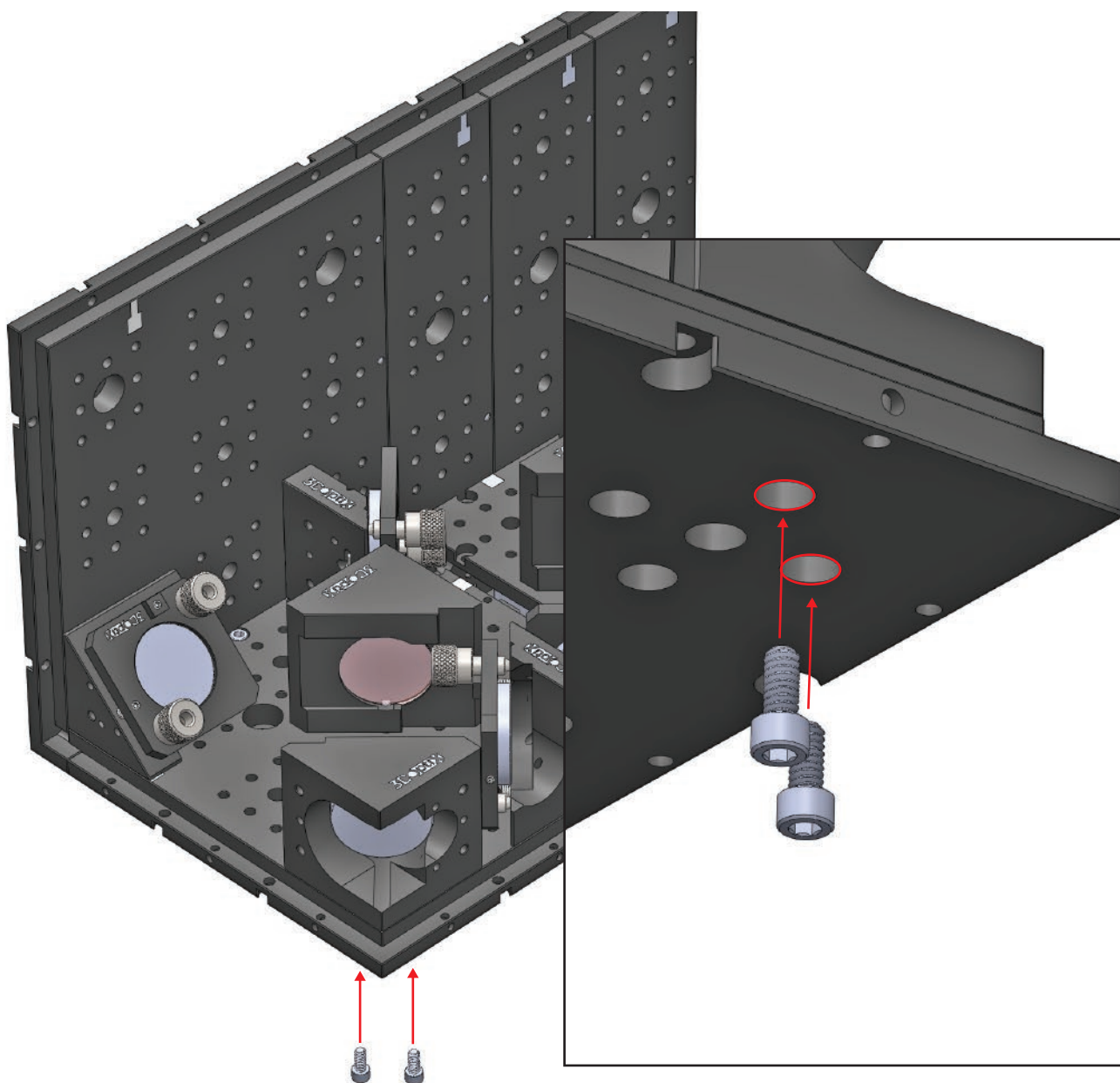
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A detailed 3D CAD model of a mechanical assembly. The assembly is built on a modular base consisting of a horizontal plate and a vertical plate, both featuring a grid of circular holes. Several black, rectangular components are mounted on the base using screws. Two red lines with arrows point from the top of the vertical plate down to specific holes in the horizontal plate, indicating alignment or mounting points. The components include a central block with a red circular feature, a block with a blue circular feature, and a block with a blue cylindrical feature. The assembly is shown in an isometric view.

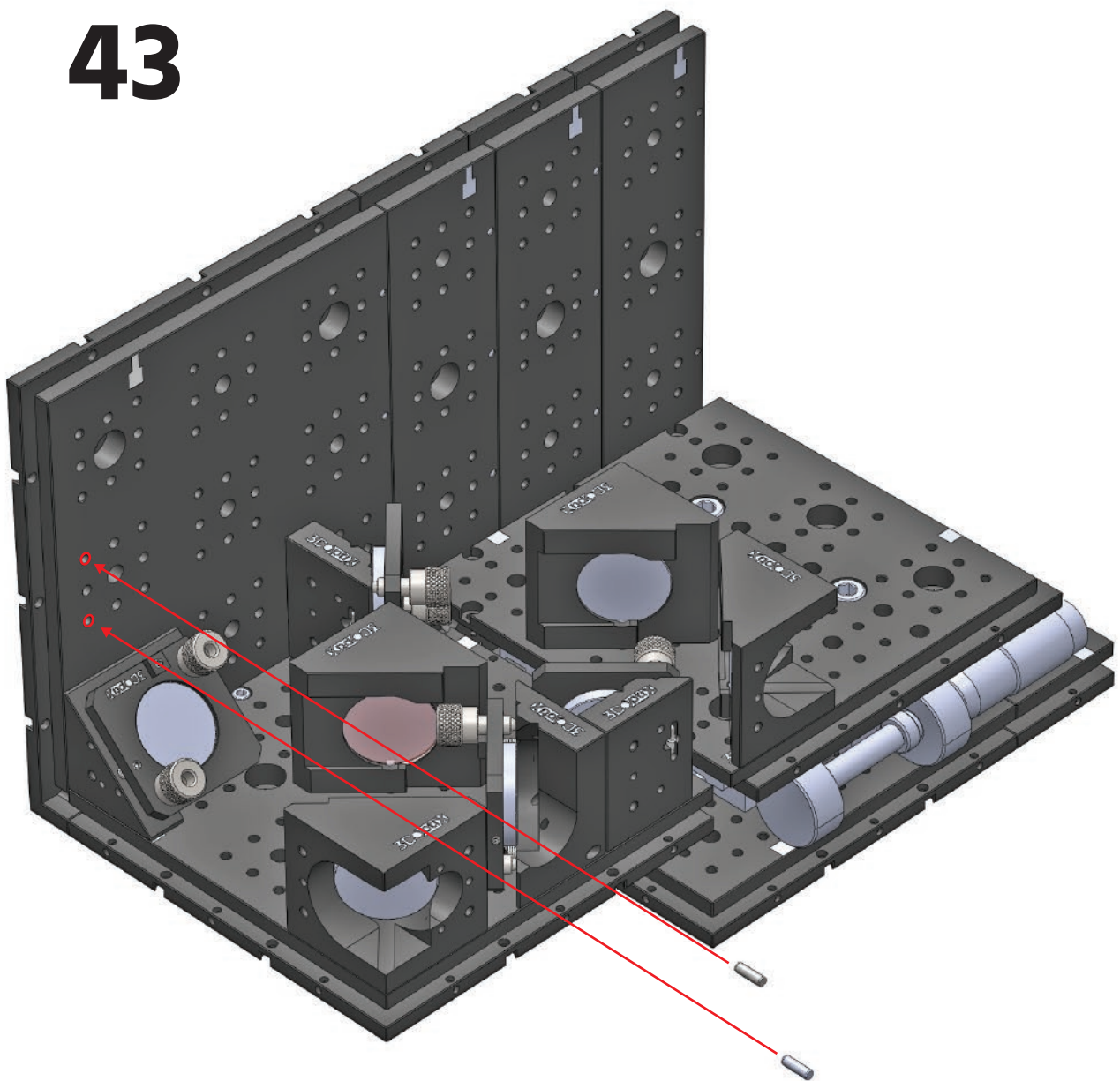
41 Mirror

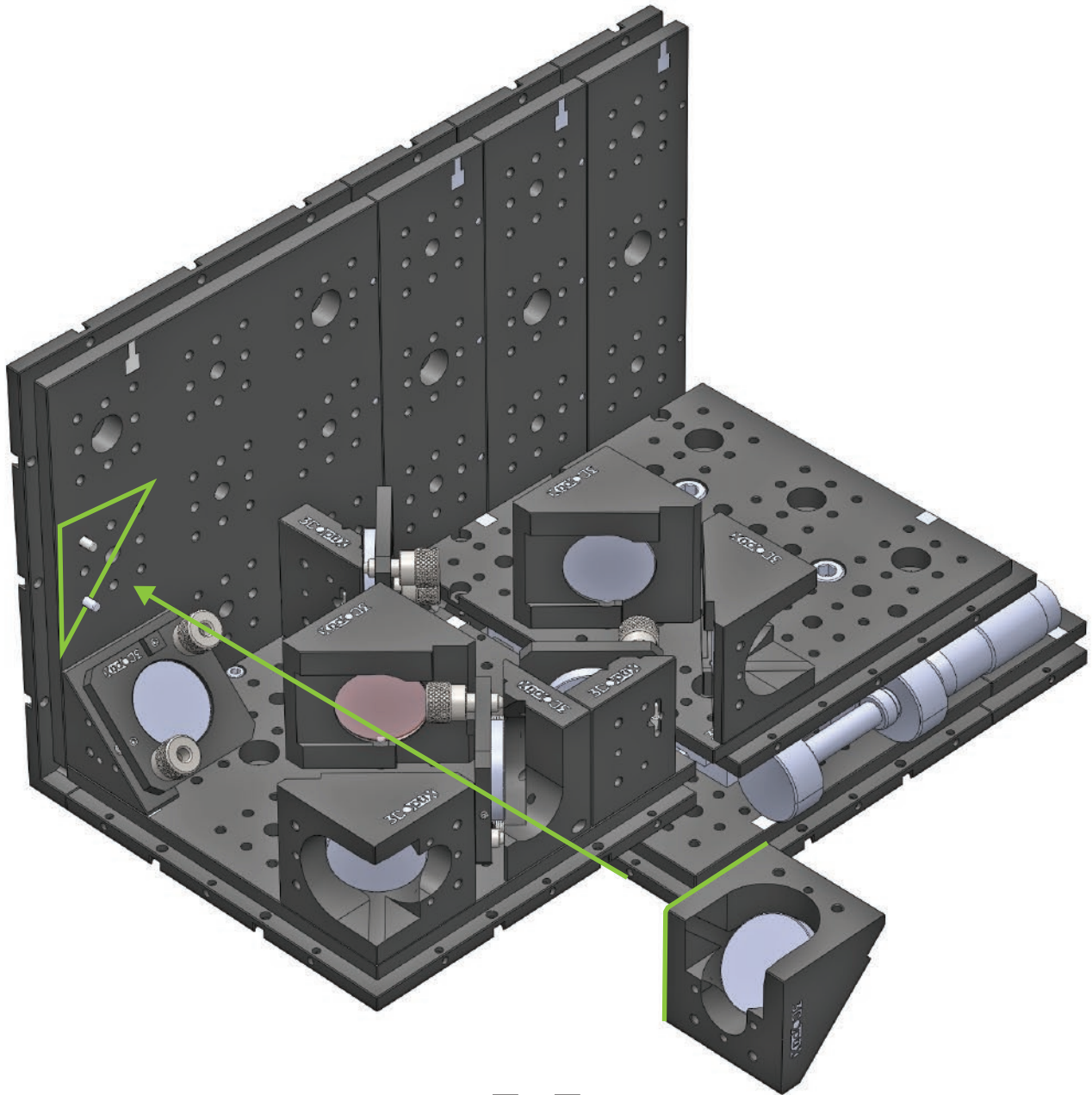




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43





44 Mirror

45

