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Procedure For Attachment Of The Pcal Periscope  
Alignment Target To ETM Quad Frame

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LIGO Scientific Collaboration

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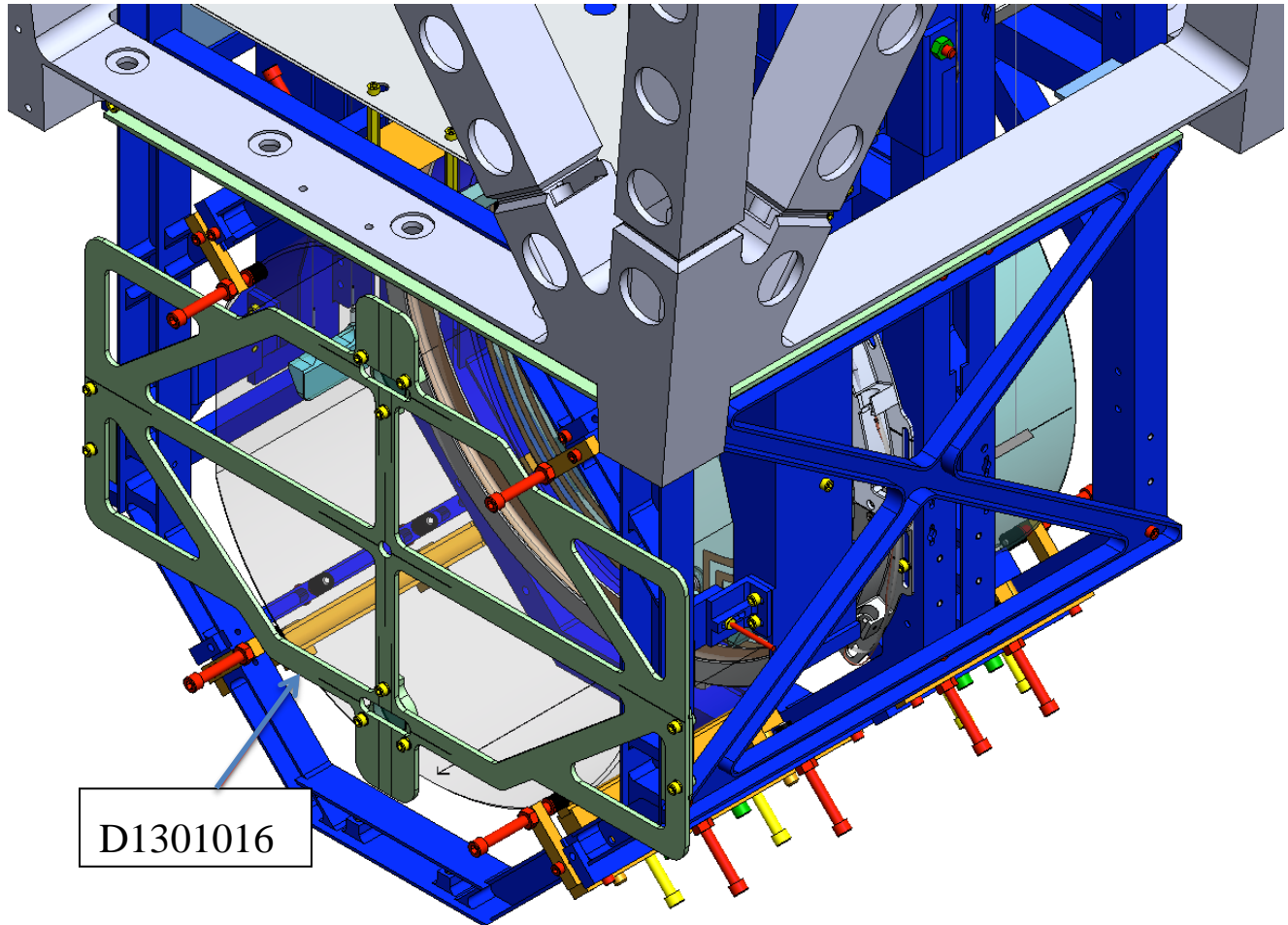
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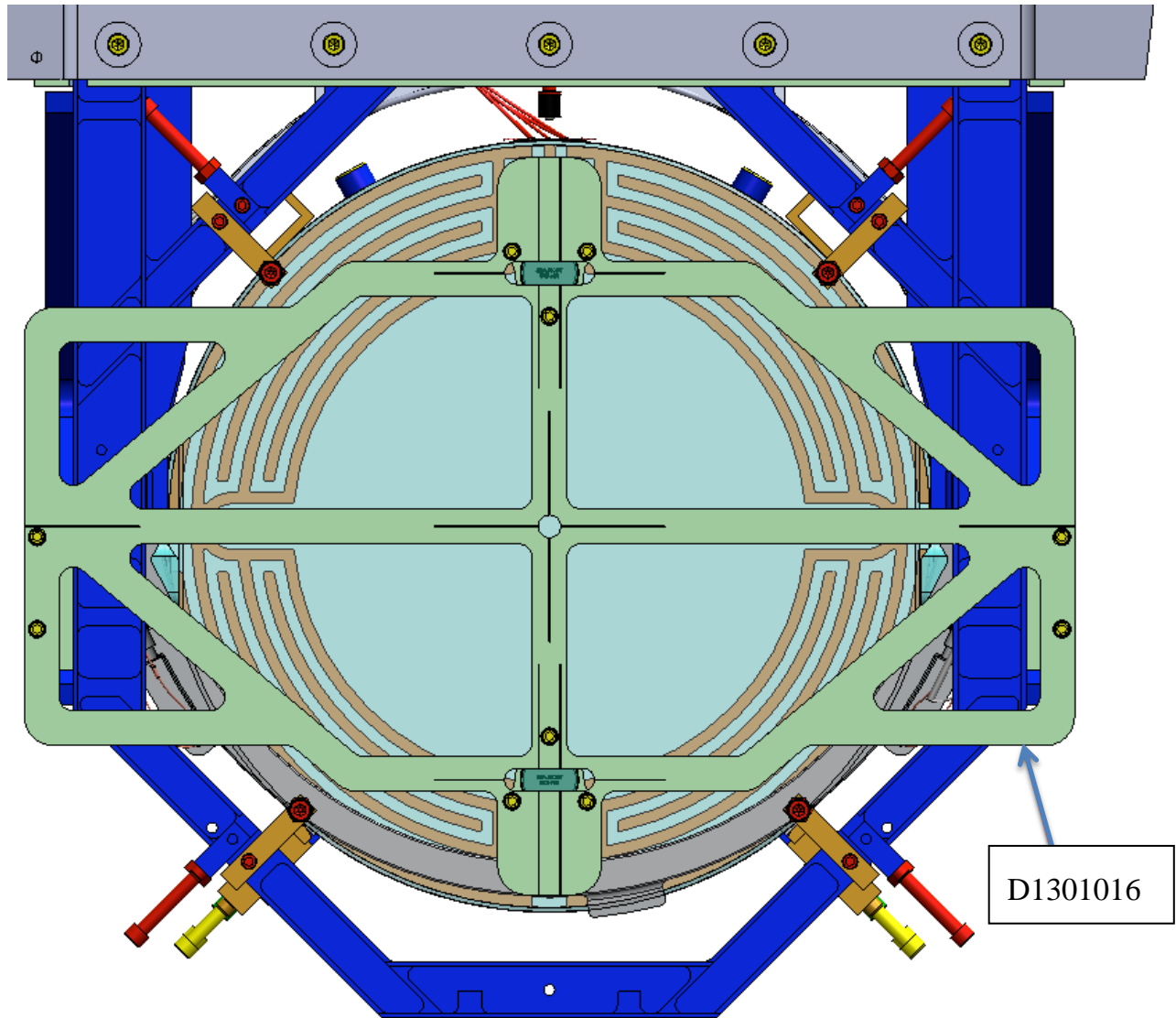
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## Introduction

The D1301016 Pcal Periscope Alignment Target (Target Assembly) attaches to the ETM Quad Frame as shown in **Figures 1 and 2**.



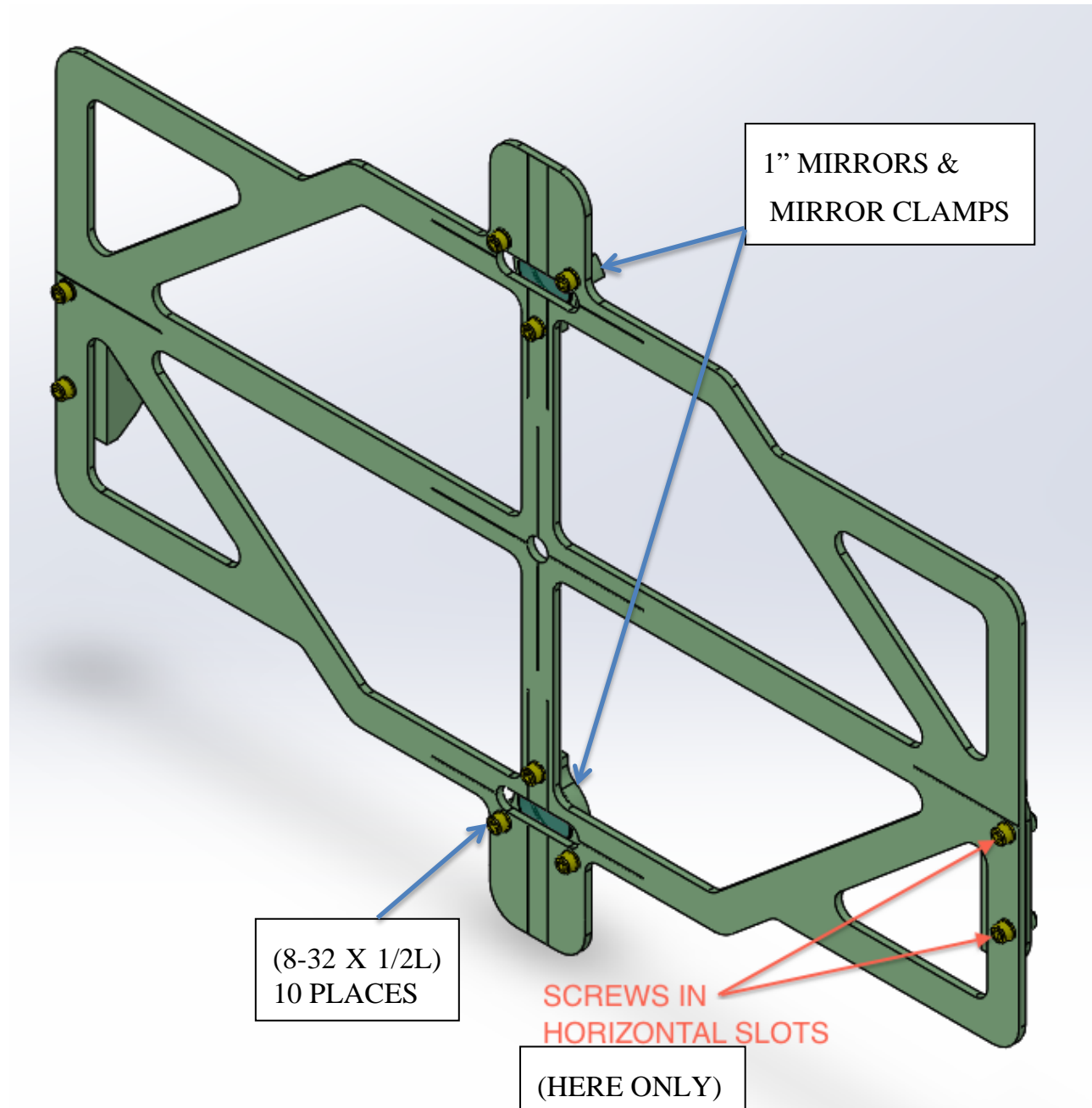
**Figure 1** D1301016 Pcal Periscope Alignment Target Assembly (Target Assembly) attached to the ETM Quad Frame.



**Figure 2** D1301016 Pcal Periscope Alignment Target Assembly (Target Assembly) attached to the ETM Quad Frame.

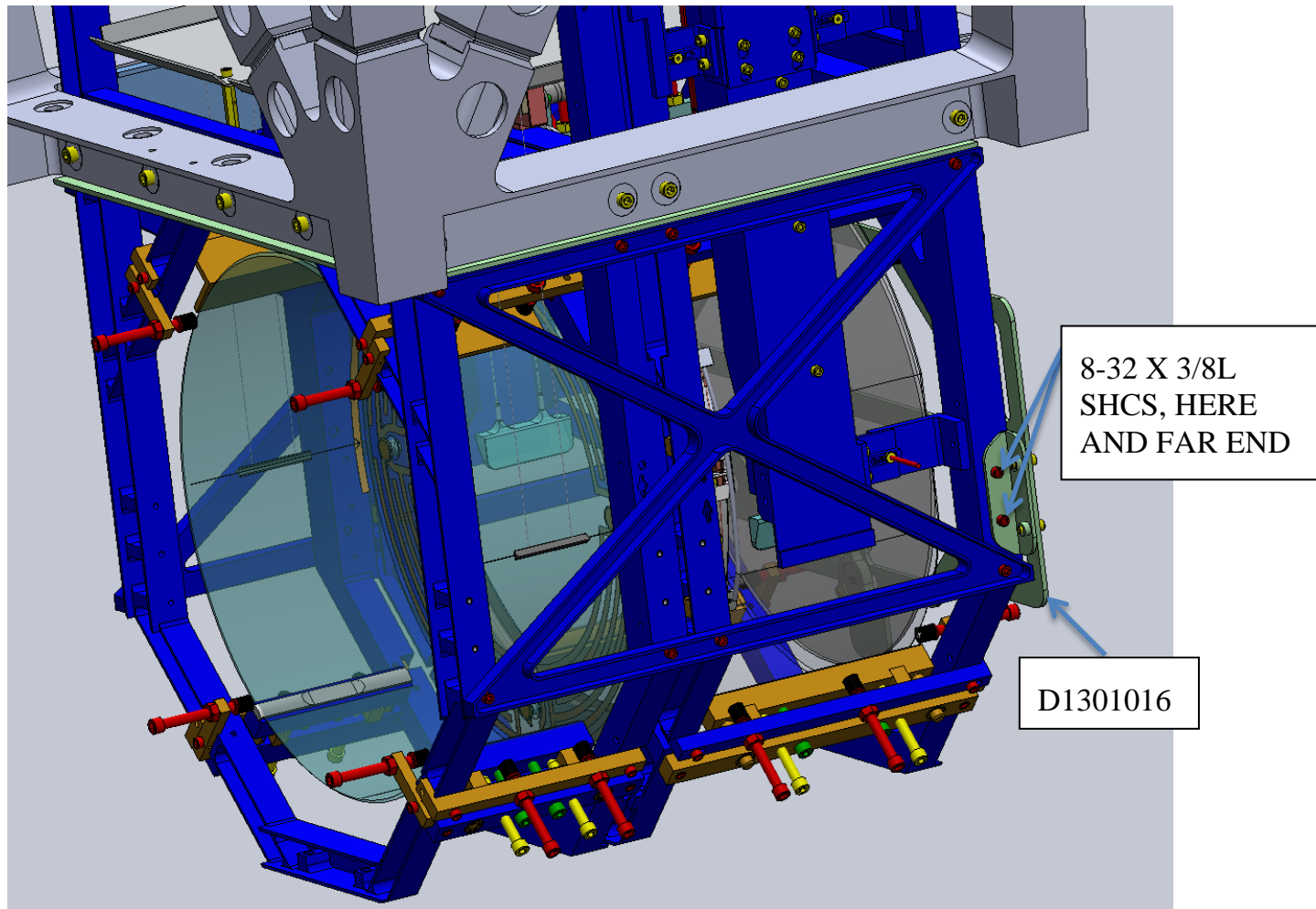
### Attaching the Target Assembly to the Quad Frame

1. At time of mounting Target Assembly to the quad frame, the ETM may have First Contact on its reflective surface. No other reflective surface protection should be on the ETM. The two 1" mirrors (see **figure 3**) are to be included on the Target Assembly only if First Contact is present and left fully intact on the ETM reflective surface.
2. Also at time of mounting Target Assembly to the quad frame, the screws of the right side mounting bracket of the Target Assembly should be slightly loose to allow travel in the clearance slots (see LIGO drawing D1301014 for slots, also see **figure 3**).



**Figure 3** Target Assembly

3. Mount the Target Assembly onto the left side of the Quad frame (as facing the ETM reflective surface) as shown in **figure 4**, using two 8-32 X 3/8L SHCS screws. Ensure that these class-B screws are inspected and have good threads before attempting attachment inside the vacuum envelope. Tighten the 2 said screws on the left side of the Quad frame snugly, while carefully registering the target sheet against the front of the Quad frame. Make sure the mounting bracket is fully driven against the Quad frame by the two 8-32 X 3/8L SHCS screws.



**Figure 4** Showing the left bracket of the Target Assembly mounted to the Quad Frame.

4. Repeat step 3 on the right side of the Quad frame, then snug the two loose screws on the right side of the Target Assembly. If First Contact is not present and left intact on the ETM reflective surface, the Target Assembly attachment is now complete. Otherwise go to next

section.

### **Aligning 1” Target Mirrors to IFO Beam Axis**

5. With assistance from IAS, shim the Alignment Target as necessary to achieve 141  $\mu$ rad maximum IFO Beam Axis parallelism errors in both pitch and yaw, for both 1” mirrors.