

## ALIGO BSC HEPI PreStorage Assembly Procedure

APPROVALS	DATE	REV	DCN NO.	BY	CHECK	DCC	DATE
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DCC RELEASE							

### 1 Introduction

The purpose of this document is to specify the assembly of AdvLIGO HEPI components prior to storage waiting for advanced LIGO installation. As prior assembly of HEPI components were done just before installation into the detector, E040011, *HEPI Assembly and Installation Procedures*, must be revised. A number of high value possibly fragile parts exist in this subsystem and must be dealt with appropriately prior to storage.

While many of the components may not be stored in an assembled state, fit checking has value and likely should be done on every part possible.

### 2 Hydraulic Actuator

It is very likely that the Actuator will be installed later possibly during a lull, if there ever is one, before the Advanced LIGO Installation begins. Per E040011, the Vertical Actuator Assembly was installed into the Hydraulic Housing prior to installation of the Housing into the Detector. However, it seems with some consensus, installing the Vertical Actuator can be and was done after this installation of the Housing onto the SEI Pier in the Detector. The Horizontal Actuator was always specified to be installed after the Housing was placed into the Detector.

#### 2.1 subsection

The free body (unconstrained) modes of ...

### 3 Crossbeam Foot Assembly

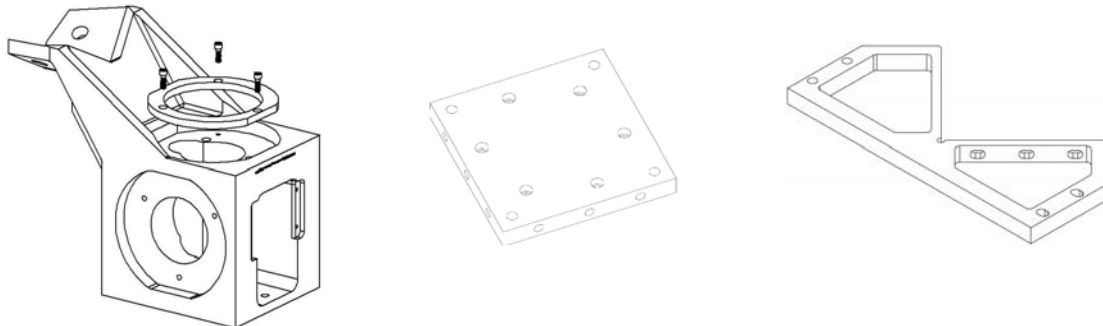
Place Crossbeam Foot upside down on its top and attach the Vertical Actuator Crossbeam Foot Interface (D030323).

Use 3 ¼-20x .50 SHCS.

Revert and place Foot upright on appropriate block.

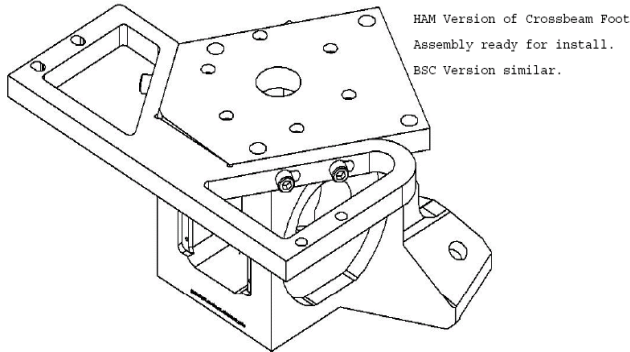
Attach the BSC Crossbeam Attachment Plate (D020008). Use (6) 3/8 –16 x 1.5” SHC screws. Torque to 30 ft-lbs.

To the Attachment Plate, fasten the BSC Boot (Foot) Installation Plate using 4 ½-four ½-20 x 1.50” SHC screws. Firmly hand tighten.





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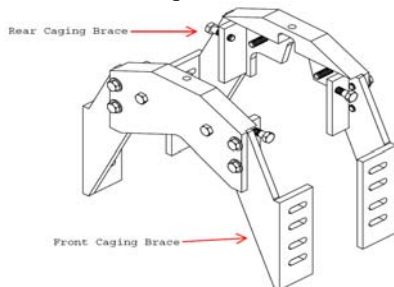
### 4 Hydraulic Housing

The HEPI Hydraulic Housing weldment is heavy and with additional components will require hoist assist. Work on a strong comfortable height table with crane or hoist access. 1000 lb capacity should suffice.

4.1 Place Housing (D020004) on work surface.

#### 4.2 Rear Caging Brace Installation

Assemble as required and install Rear Caging Brace, see D030322-A for parts and fastener list.



Insert a  $\frac{1}{2}$ -20 x 1.50" Hex Head screw into the tapped hole on top of the rear caging brace. Set the height to 1.06" above the top of the plate.

#### 4.3 Install Crossbeam Foot Assembly

Attach the Boot Installation Adjustable Support (D030728) on the left hand side of the housing. Use (3)  $\frac{3}{8}$ -16 x 1.25" SHC screws. Firmly tighten.

Attach the Boot Installation Fixed Support (D030727) on the right hand side of the housing. Use (3)  $\frac{3}{8}$ -16 x 1.25" SHC screws. Firmly tighten.

Lift the BSC Boot Installation Fixture Assembly with the attachment plate and boot carefully onto the top of the boot installation supports and the rear caging brace as shown.

Attach the boot installation plate to the supports. Use (4)  $\frac{1}{2}$ -20 x 1.50" SHC screws. Firmly tighten.



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Carefully insert the vertical L4-C into the front of the boot until it rests on the top of the vertical actuator tripod plate. Attach the Crossbeam Foot Sensor Hold-down (D030325) to the boot as shown. This will clamp the vertical L4-C to the boot. Use (4) 8-32 x 0.375" SHC screws. Firmly tighten.

### 4.4 Front Caging Brace Installation

Assemble as required and install Front Caging Brace, see D030322-A for parts and fastener list.

### 4.5 Capture Crossbeam Foot w/ Caging Brace Set Screws

Install as required, Iteratively tighten with torque wrench. Careful iteration is needed to prevent shifting of Foot after Installation Plate removal.

### 4.6 Remove Installation Plate

Unfasten the Crossbeam Foot Installation Plate as needed. Fasteners should go out and go back in freely indicating the Foot has not shifted.