*LIGO Laboratory / LIGO Scientific Collaboration*

E1000380-V2 *LIGO* 2 Sept. 2010

Stage 1-2 Horizontal Actuator Assembly Procedure

S.Biscans, M.Hillard

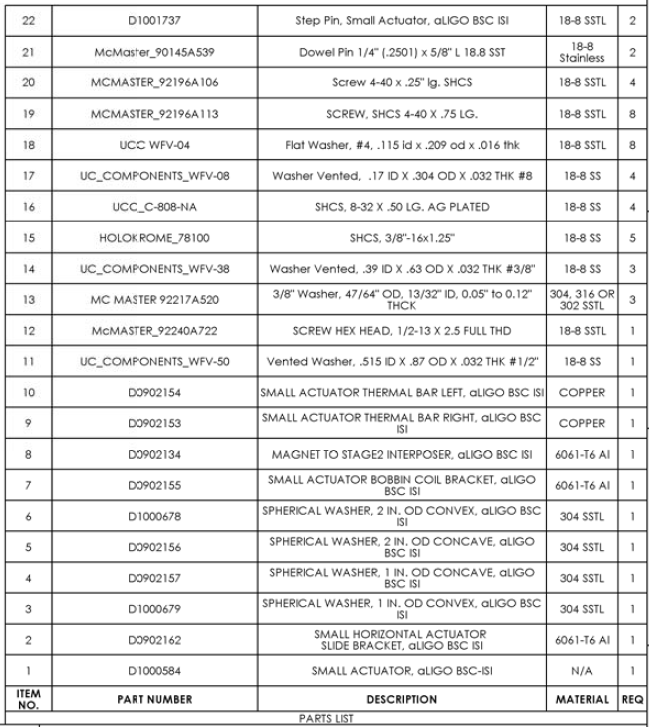
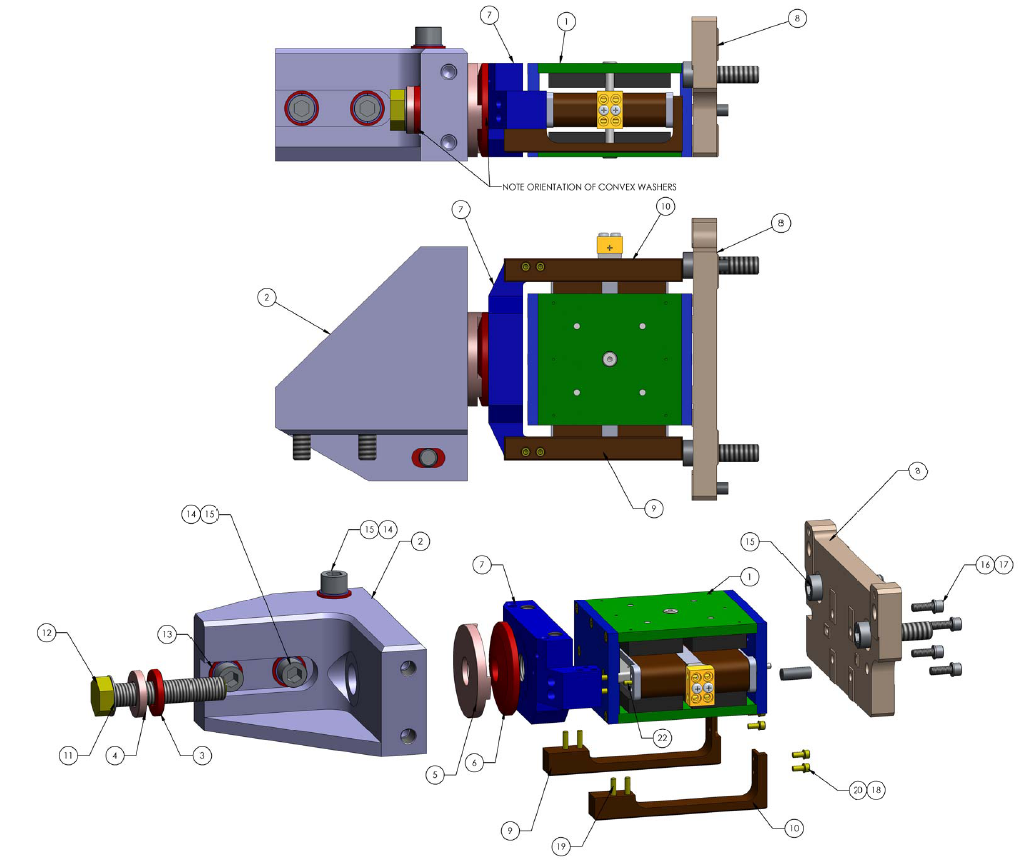
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Advanced LIGO Project

This is an internal working note

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Reference D0902530

**Note** : **! Make sure there is no trash in the coil !**

Remove the two shoulder screws and watch carefully inside the coil.

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**Clean room standards**

For a clean assembly all LIGO standards should be followed, as presented in the latest version of the **LIGO Contamination Control Plan (E0900047).** Clean room garb including UHV gloves should be worn when working with parts.

All tools that come in contact with assembly should be cleaned to class B standards.

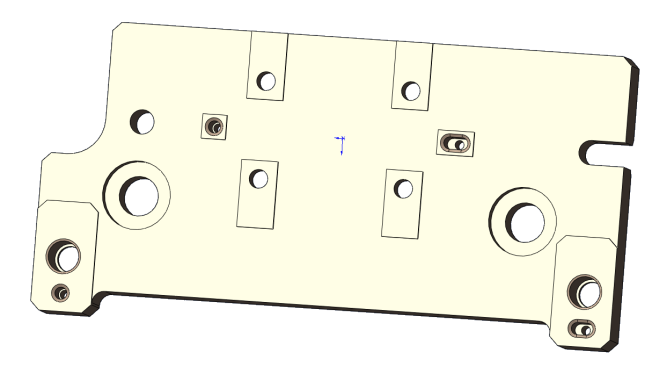
Assembly will be done under a portable clean room. Any time a part of the assembly is not covered by the portable clean room or not being actively worked on it should be covered with appropriate clean covers. (C3 polyester or equivalent).

**Parts prep work: alignment pins and helicoils**

To facilitate assembly, parts requiring helicoils and/or pins to be inserted before assembly will be listed to allow preliminary preparation of the parts, after cleaning and before starting general assembly. Preparation need to be complete on the following.

Helicoil:

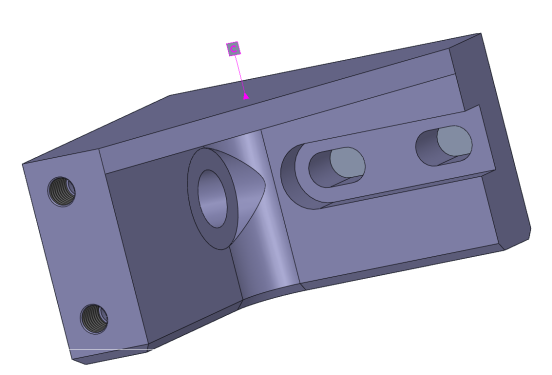
1. D0902134



Helicoil 1/4-20, 1.5XDIA lg.

#1185-4EN.375

2. D0902162



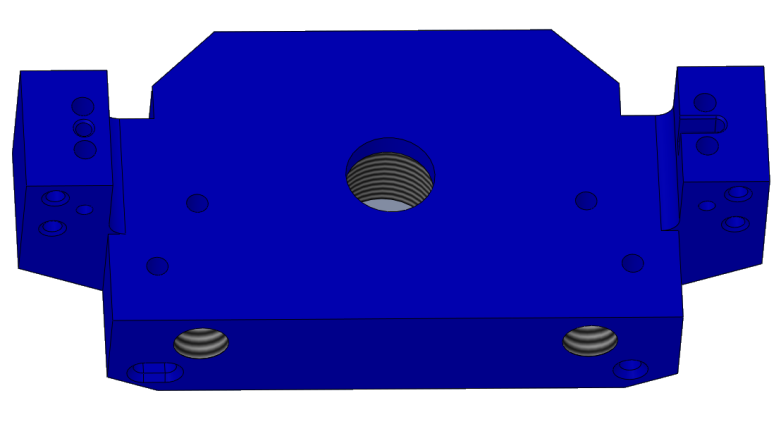
Helicoil 1/4-20, 1.5XDIA lg.

#1185-4EN.375

3. D0902155

Helicoil 1/2-23, 1XDIA lg.

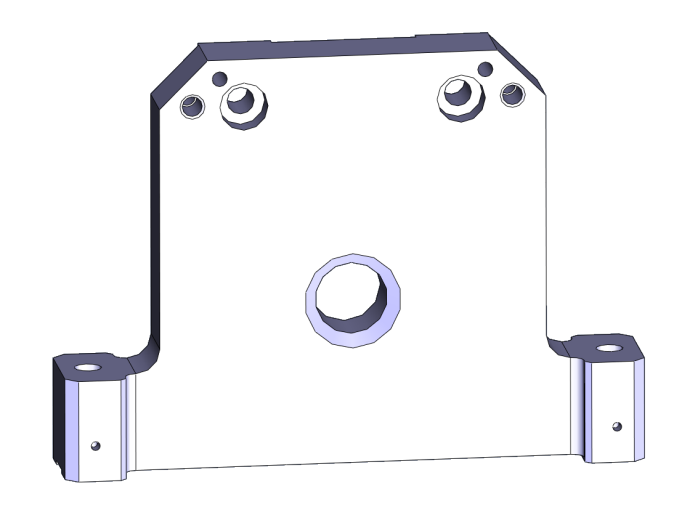
#1185-8EN.500



Helicoil 1/4-20, 1.5XDIA lg.

#1185-4EN.375

4. D0902136

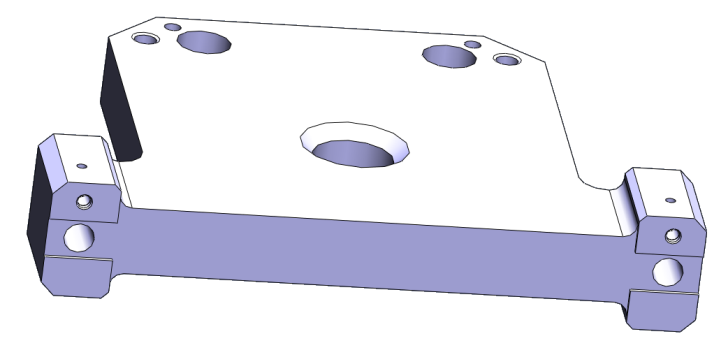


Helicoil 8-32, 2XDIA lg.

#1185-2EN.328

Dowel Pins:

1. D0902136



Dowel Pin 1/8X7/16

MC MASTER 90145A481

2. D0902435

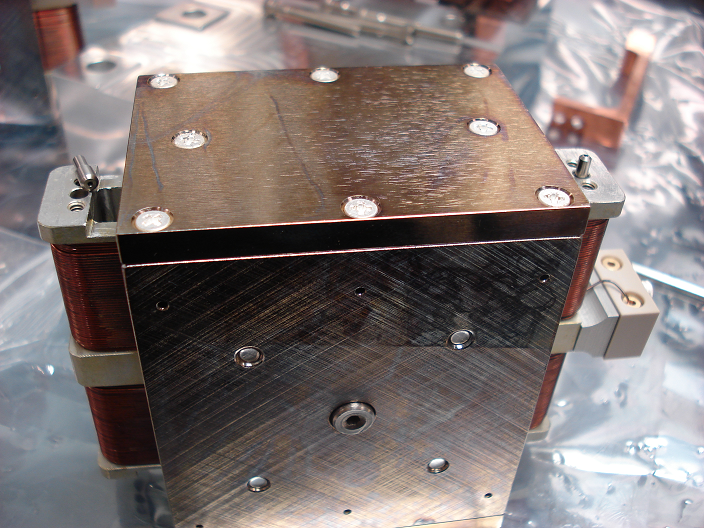
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|  | *The pin has to stick out a little bit*  Dowel Pin 1/8X1-1/8  MC MASTER 90145A882 |

**Assembly procedure**

1. Insert Item (23) (D1001737) Step Pin into Item (1) (D1000584) Small Actuator.

***Note*** *: Non pined face*

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2.Attach Item (5) (D0902155) Actuator Coil Bracket, to Item (23) (D1001737) Step Pin and Item (1) (D1000584) Small Actuator using Item (13) washer and Item (14) screw.

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|  | ***Note*** *: Look this face, connector on the right*  #4, 0.115 ID, 0.209 OD, 0.016 THK  UCC WFV-04  SHCS 4-40 X 0.75 lg.  MSC 05664073  **Torque** **value** : 5.2 in-lbs |

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3.Attach Items (3) (D0902154) Left Thermal Bar and Item (4) (D0902153) Right Thermal Bar, to Item (1) (D1000584) Small Actuator and Item (5) (D0902155) Actuator Coil Bracket using Item (13) washer and Items (14)/(15) screws.

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|  | SHCS 4-40 X 0.25 lg.  MSC 82272881  **Torque** **value** : 5.2 in-lbs |
| SHCS 4-40 X 0.75 lg.  MSC 05664073  **Torque** **value** : 5.2 in-lbs | #4, 0.115 ID, 0.209 OD, 0.016 THK  UCC WFV-04 |

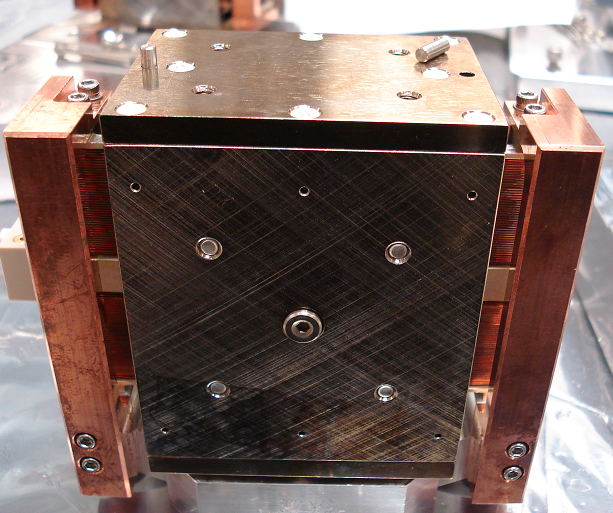
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4. Insert Item Dowel Pin into Item (1) (D0902749) Large Actuator.



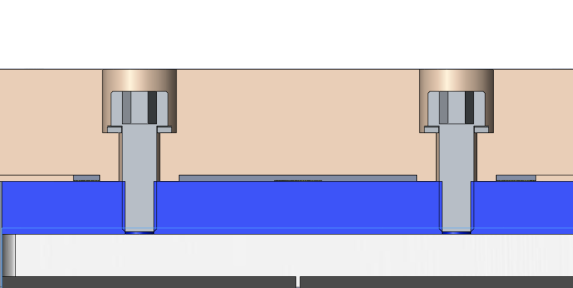
Dowel Pin 1/8 X 3/8 lg.

MC MASTER 90145A470



5. Attach Items (8) (D0902134) Small Actuator Interposer, to Item (1) (D1000584) Small Actuator using Item (16) vent washer and Items (15) screw.

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SHCS 8-32, 0.50 lg. AG Plate

UCC C-808-NA

**Torque value** : 19.8 in-lbs

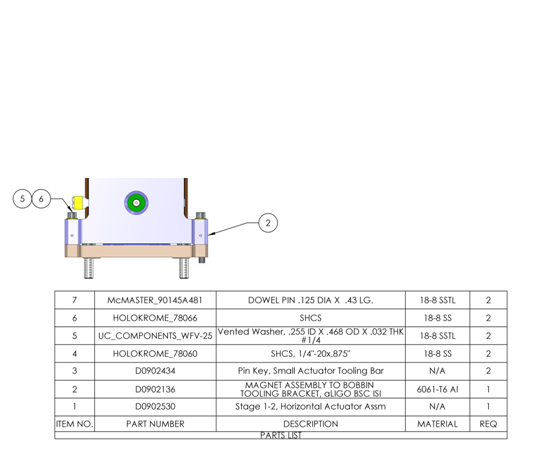
0.17 ID, 0.304 OD, 0.032 THK

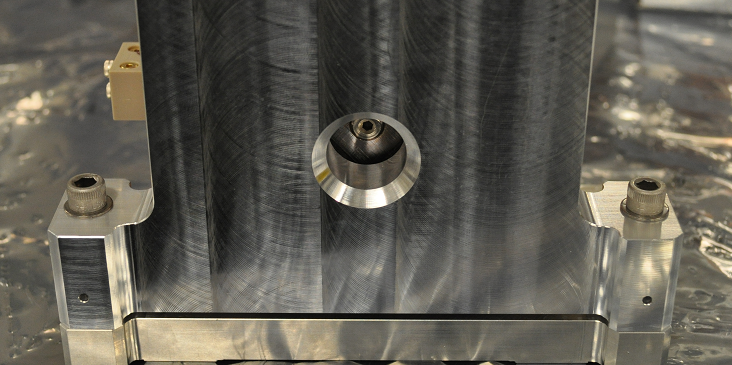
UC COMPONENTS WFV 08

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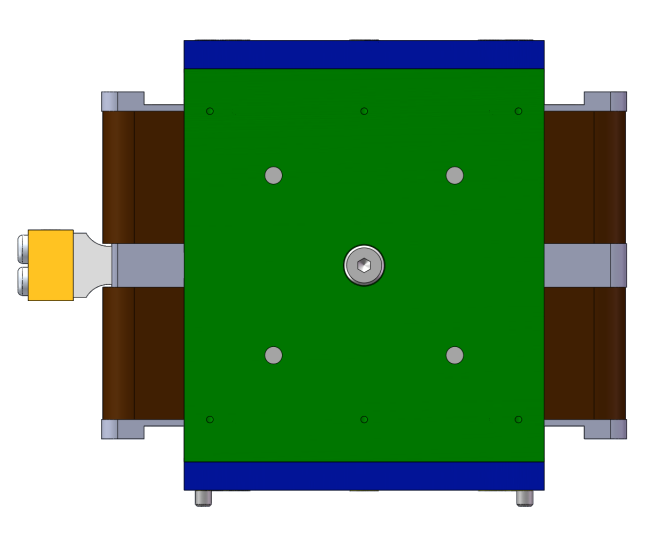
6. **Tooling Bracket Assembly**

Attach Part **only the bottom** of D0902136 Tooling Bracket, to Item (8) (D0902134) Small Actuator Interposer using vent washer and screw (5)/(6), as shown on Figure below.





**7. Loose** the 2 shoulder screws of Item (1) (D1000584) Small Actuator.

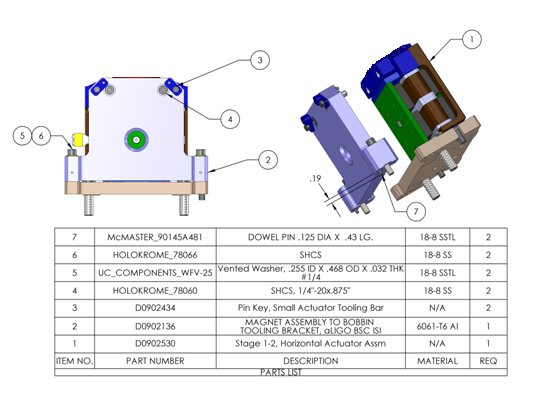


8. Slide Pin Carrier (D0902434) into the Tooling Bar and Item (7) (D0902155).

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|  | SHCS 8-32, 0.50 lg.  HOLOKROME 78028  **Torque value** : 19.8 in-lbs |

9. **Remove** the 2 shoulder screws of Item (1) (D1000584) Small Actuator.

10. Add the two last screws and washers in the Tooling Bar



11. Remove the Pin Carrier (D0902434).

**Gap Test : Go / No Go**

* Check the gap between the coil and the magnet with shims on both sides.

Go : 0.085 inches

No Go : 0.115 inches

