*LIGO Laboratory / LIGO Scientific Collaboration*

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Stage 0-1 Horizontal Actuator Assy Procedure

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Distribution of this document:

Advanced LIGO Project

This is an internal working note

of the LIGO Laboratory.

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

Remove the 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.

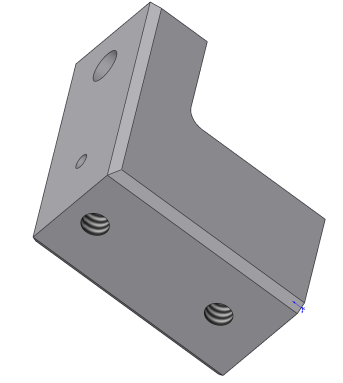
Assembly will be done under a portable clean room. Any time a part of the assembly is not covered by the portable clean room or not being actively worked on it should be covered with appropriate clean covers. (C3 polyester or equivalent).

**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. See E1000402 Current Rev.

Helicoil:

1. D0902424



Helicoil 1/4-20, length 2XDIA, #1185-4EN .500

2. D0902427

Helicoil 1/4-20, length 2XDIA, #1185-4EN .500

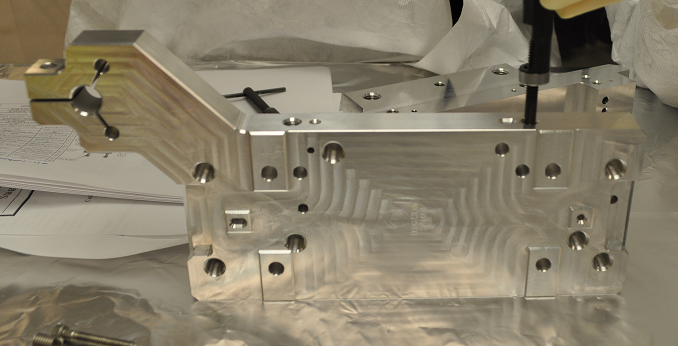
Helicoil 3/8-16, length 2XDIA, #1185-6EN .750

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| Helicoil 10-32, length 1.5XDIA, #1191-3EN .285  Helicoil 1/4-20, length 1.5XDIA, #1185-4EN .375 |  |

3. D0902310

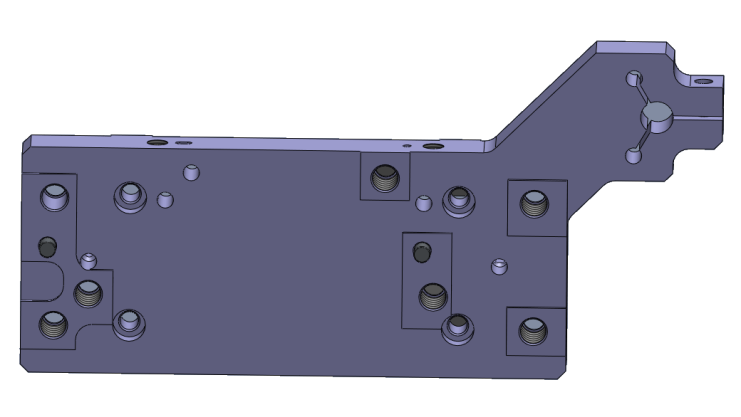
Helicoil 5/16-18, length 2XDIA, #1185-5EN .625

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| Helicoil 1/4-20, length 1.5XDIA, #1185-4EN .375 |  |



Dowel:

1. D0902310



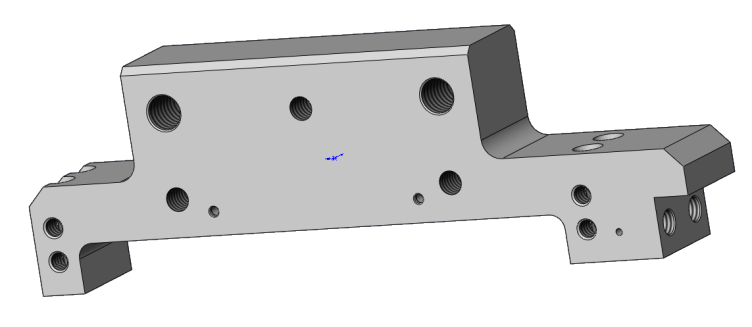
Dowel Pin 1/4X5/8

MC MASTER 90145A539

2. D0902436

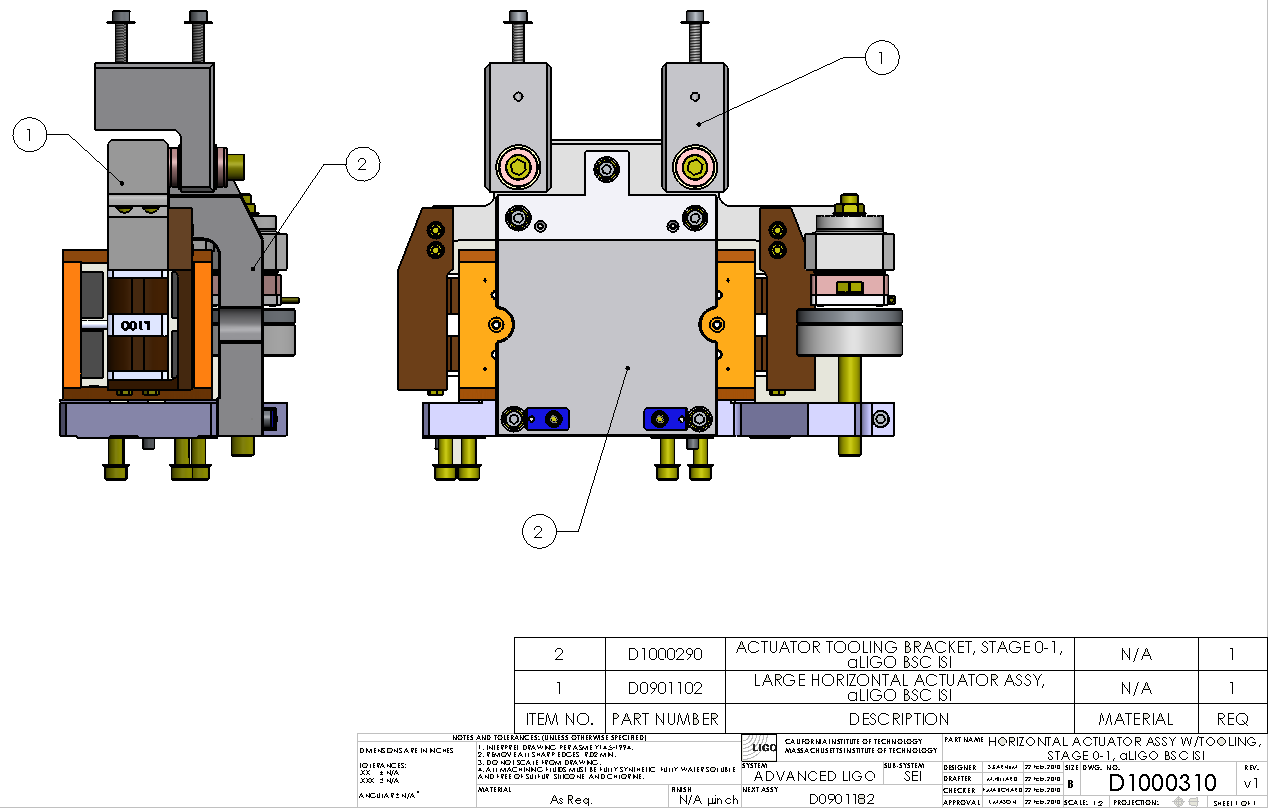
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| Dowel Pin 1/8X11/2  MC MASTER 98380A479 |  |

3. D0902427



Dowel Pin 3/32X1/2

MC MASTER 90145A438



Reference D1000310 : Intermediate Assembly with tooling

D0901102 Large Horizontal Actuator Assy, Stage 0-1, pic 1.TIF

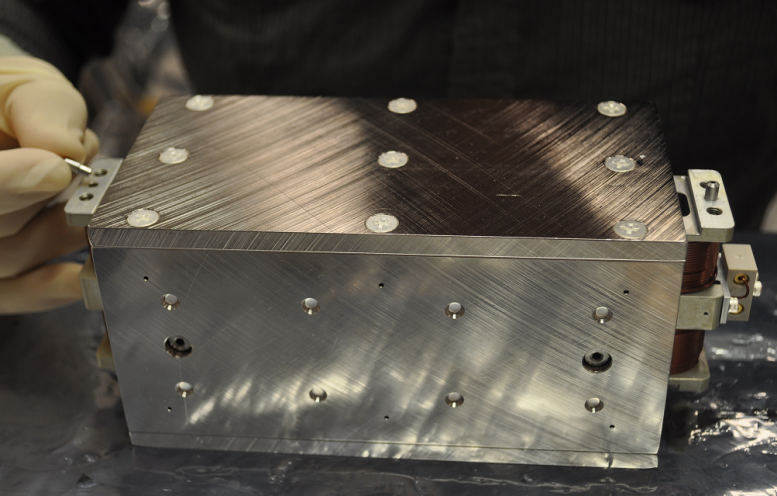
Reference D0901102 : Final assembly between Stage 0 and Stage 1

**Assembly Instructions**

1. Insert Item (23) (D10002282) Step Pin into Item (3) (D0902749) Large Actuator.

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

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|  | D0901102 Large Horizontal Actuator Assy, Stage 0-1, dowel.TIF |



2. Attach Item (2) (D0902427) Actuator Coil Bracket as shown Figure 2, to Item (23) (D10002282) Step Pin and Item (3) (D0902749) Large Actuator using Item (12) vent washer and Item (13) screw.

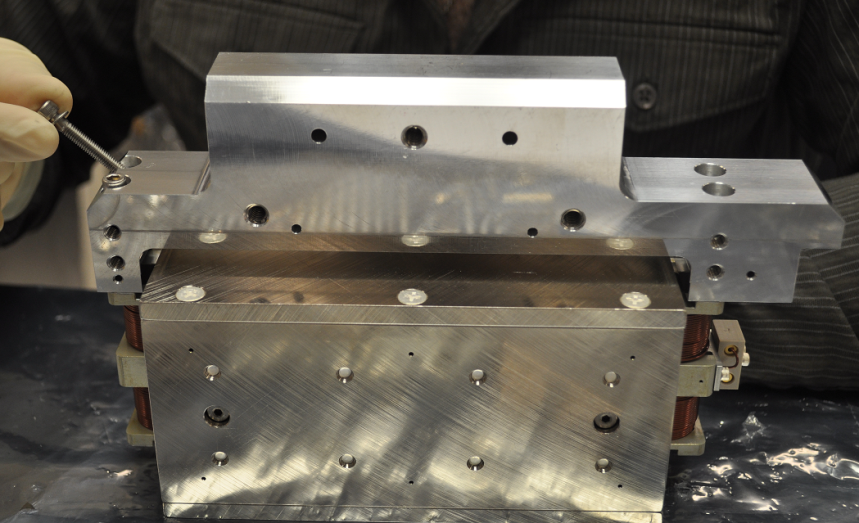
10-32 X 1.375 lg.

MSC 04214292

**Torque value** : 31.7 in-lbs

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|  | 0.195 ID, 0.354 OD, 0.032 THK #10  UC COMPONENTS WFV-10 |

***Note*** *: edge of Item 7 and the yellow block are on the same side*

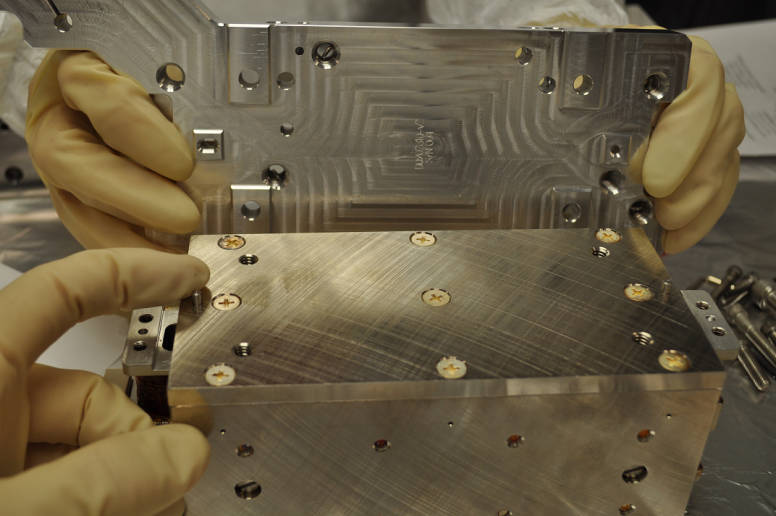
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3. Attach Items (7) (D1000175) Left Thermal Bar and Item (6) (D1000176) Right Thermal Bar, to Item (3) (D0902749) Large Actuator and Item (2) (D0902427) Actuator Coil Bracket using Item (12) washer and Items (10)/(11) screws.

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| 0.195 ID, 0.354 OD, 0.032 THK #10  UC COMPONENTS WFV-10  10-32 X 0.62 lg.  MSC 05678065  **Torque value** : 31.7 in-lbs | Hex machine screw10-32 X 3/8 lg. vented  UC COMPONENT H-1006 |

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4. Insert Item Dowel Pin into Item (3) (D0902749) Large Actuator.



1/8 X 7/16 lg.

MC MASTER 90145A481

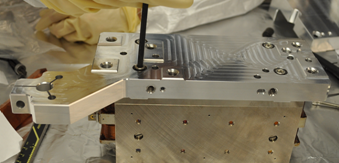
5. Attach Item (1) (D0902310) Actuator Magnet Bracket to the Bottom of Item (3) Actuator as shown Figure 4 using Items (17) vent washer and Item (18) screw.

1/4-20X0.875 lg.

HOLOKROME 78060

**Torque value** : 100 in-lbs

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| ***Note*** *: the two edges are on the same side* | 0.255 ID, 0.46 OD, 0.032 THK  UCC WFV-25 |

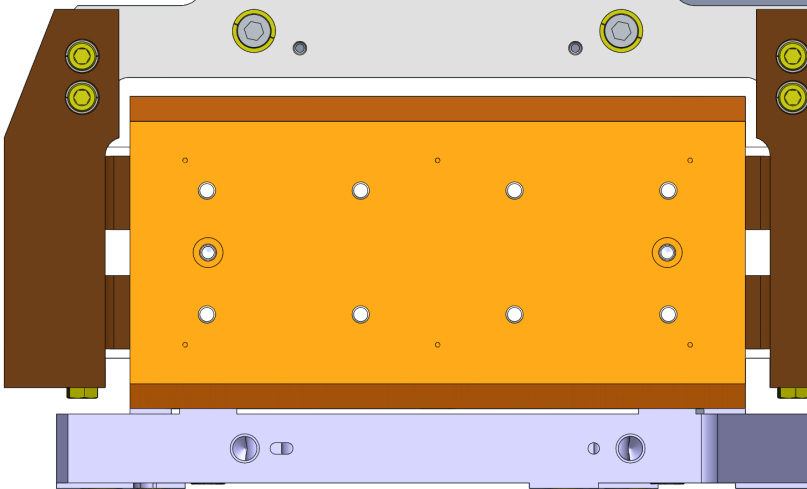


6. **Tooling Bracket Assembly**

Attach **only the top** of Item (2) (D1000290) tooling Bracket Assembly with 3 screws.

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| **Torque value** : 100 in-lbs |  |

7. **Loose** the 4 shoulder screws of Item (3) (D0902749) Large Actuator.



8. Slide Pin Carrier (D0902436) into the Tooling Bar and Item 1 (D0902310).

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9. **Remove** the 4 shoulder screws of Item (2) (D0902749) Large Actuator.

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

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|  | 0.255 ID X 0.468 OD X 0.032 THK  UC COMPONENT WFV-25  1/4-20X1.5 lg.  HOLOKROME 78066  **Torque value** : 100 in-lbs |

11. Remove the Pin Carrier (D0902436).

**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

