



LIGO Laboratory / LIGO Scientific Collaboration

E1000387-v4

LIGO

21 Oct. 2011

Stage 1-2 Vertical Actuator Assembly

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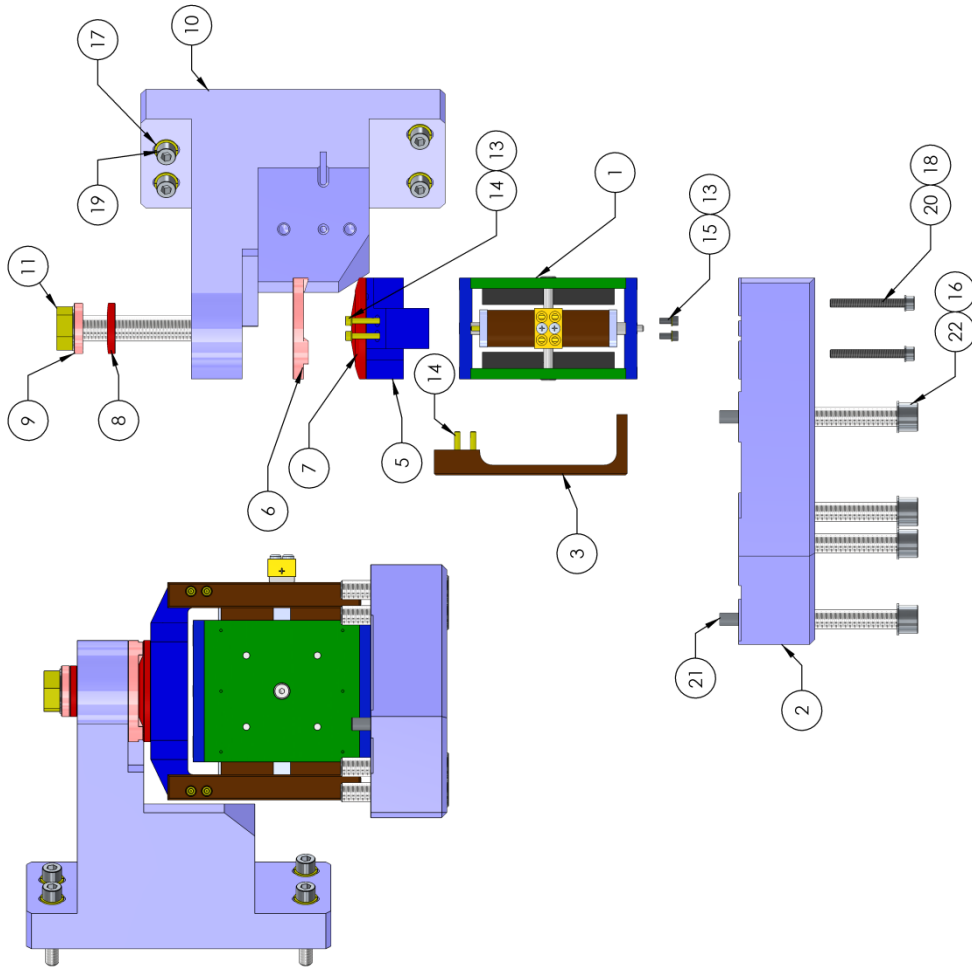
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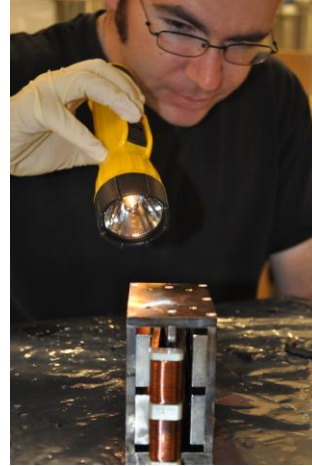
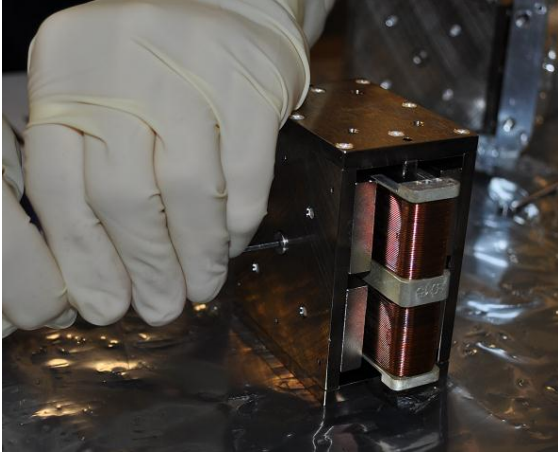
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ITEM NO.	PART NUMBER	DESCRIPTION	RE
23	D1001737	Step Pin, Small Actuator, alIGO BSC ISI	2
22	HOLKROME_78104	SHCS, 3/8"-1.6x1.75"	5
21	McMaster_90145A539	Dowel Pin 1/4" (.2501) x 5/8" L 18.8 SST	2
20	UCC_C-824-NA	SHCS, 8-32 X 1.50 LG. AG PLATED	4
19	HOLKROME_78066	SHCS	4
18	UC_COMPONENTS_WFV-08	Washer Vented, .17 ID X .304 OD X .032 THK #8	4
17	UC_COMPONENTS_WFV-25	Vented Washer, .255 ID X .468 OD X .032 THK #1/4	4
16	UC_COMPONENTS_WFV-38	Washer Vented, .39 ID X .63 OD X .032 THK #3/8"	5
15	MCMASTER_92196A106	SHCS, #4-40x.25"	4
14	MCMASTER_92196A113	SCREW, SHCS 4-40 X .75 LG.	8
13	UCC_WFV-04	Flat Washer, #4, .115 Id x .209 od x .016 thk	8
12	UC_COMPONENTS_WFV-50	Vented Washer, .515 ID X .87 OD X .032 THK #1/2"	1
11	MCMASTER_92240A722	SCREW HEX HEAD, 1/2-13 X 2.5 FULL THD	1
10	D0902236	SMALL ACTUATOR VERTICAL BRACKET, alIGO BSC ISI	1
9	D0902157	SPHERICAL WASHER, 1 IN, OD CONCAVE, alIGO BSC ISI	1
8	D1000679	SPHERICAL WASHER, 1 IN, OD CONVEX, alIGO BSC ISI	1
7	D1000678	SPHERICAL WASHER, 2 IN, OD CONVEX, alIGO BSC ISI	1
6	D0902156	SPHERICAL WASHER, 2 IN, OD CONCAVE, alIGO BSC ISI	1
5	D0902155	SMALL ACTUATOR BOBBIN COIL BRACKET, alIGO BSC ISI	1
4	D0902153	SMALL ACTUATOR THERMAL BAR RIGHT, alIGO BSC ISI	1
3	D0902154	SMALL ACTUATOR THERMAL BAR LEFT, alIGO BSC ISI	1
2	D0902161	SMALL VERTICAL ACTUATOR MAGNET MOUNT, alIGO BSC ISI	1
1	D1000584	SMALL ACTUATOR, alIGO BSC-ISI	1
	PART NUMBER	DESCRIPTION	RE

Note : ! Make sure there is no trash in the coil !
Remove the two shoulder screws and watch carefully inside the coil.



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.

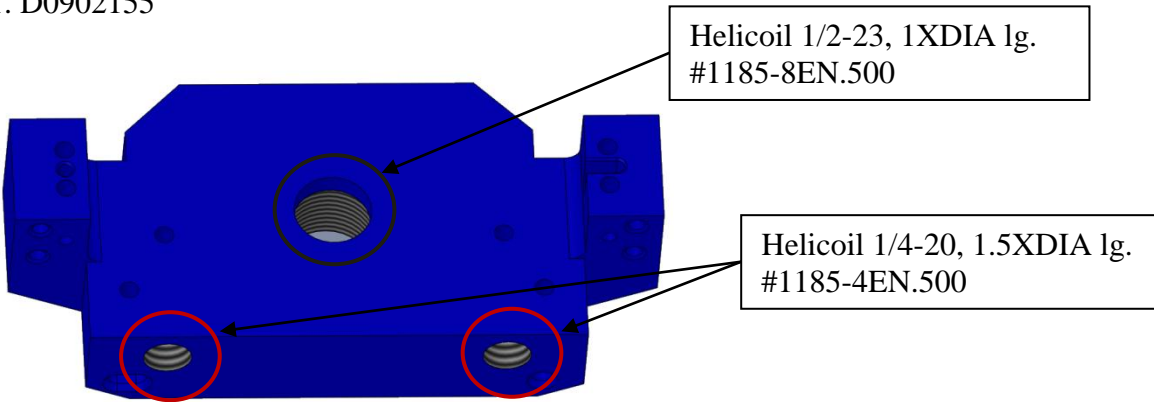
Assembly will be done under a portable clean room. Any time a part of the assembly is not covered by the portable clean room or not being actively worked on it should be covered with appropriate clean covers. (C3 polyester or equivalent).

Parts prep work: alignment pins and helicoils

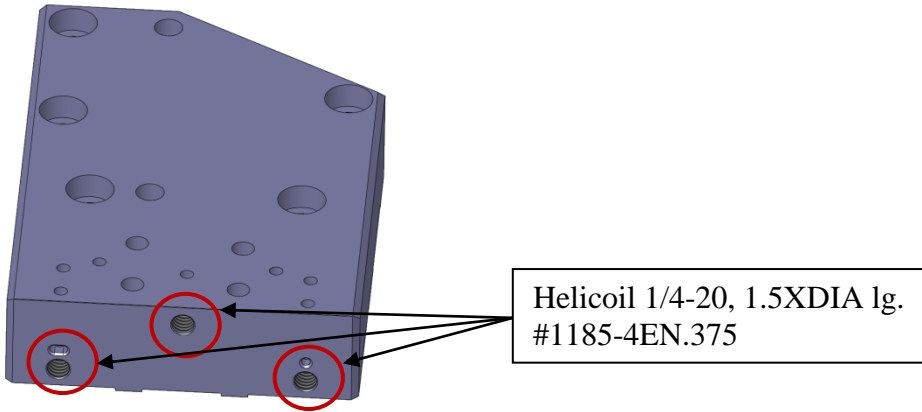
To facilitate assembly, parts requiring helicoils and/or pins to be inserted before assembly will be listed to allow preliminary preparation of the parts, after cleaning and before starting general assembly. Preparation need to be complete on the following. See E1000402 part pre-preparation matrix

Helicoils

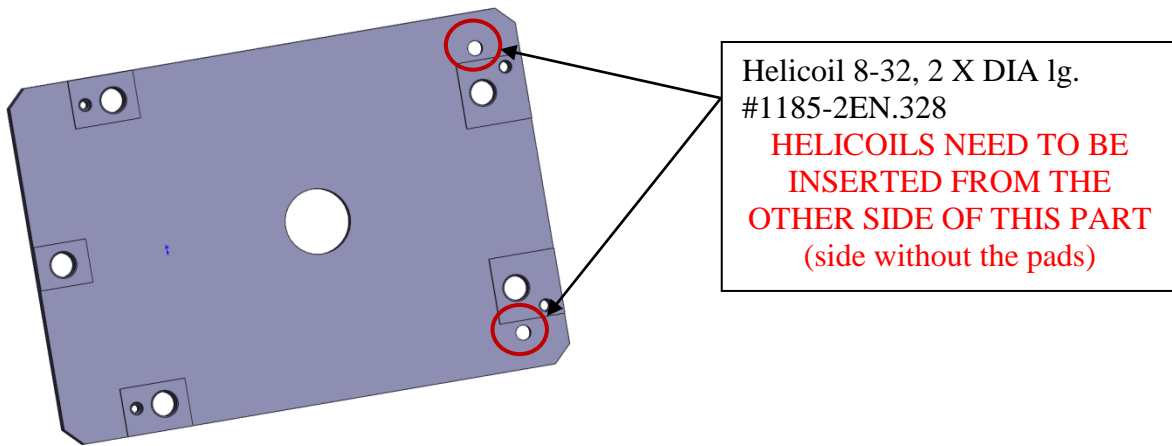
1. D0902155



2. D0902161

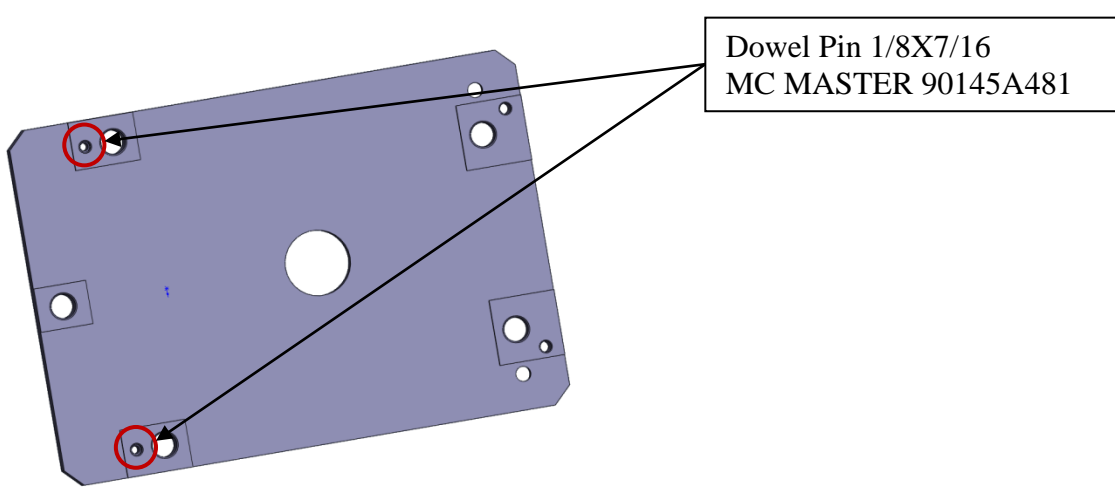


3. D0902137

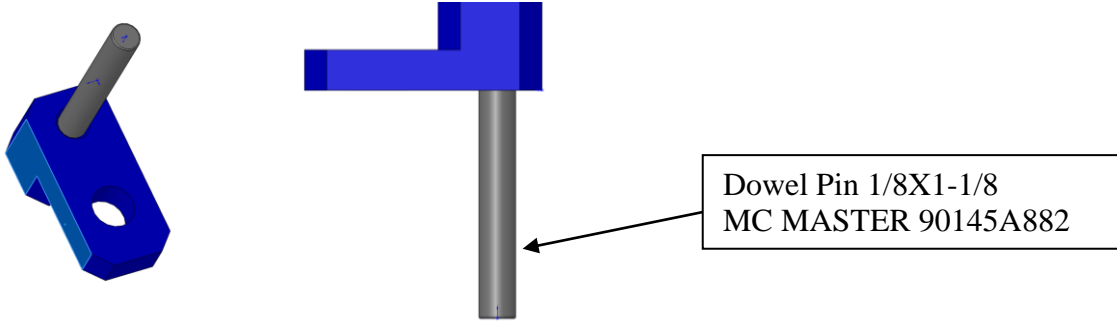


Dowel pins

1. D0902137



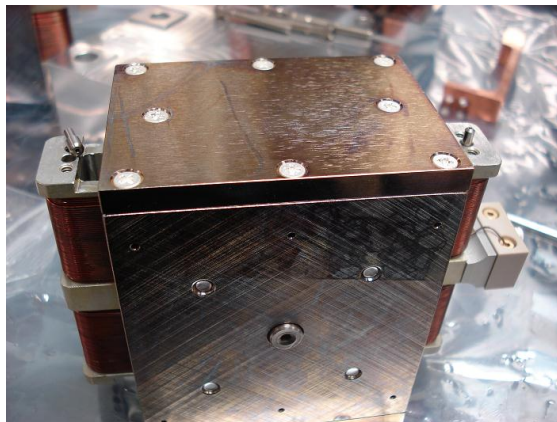
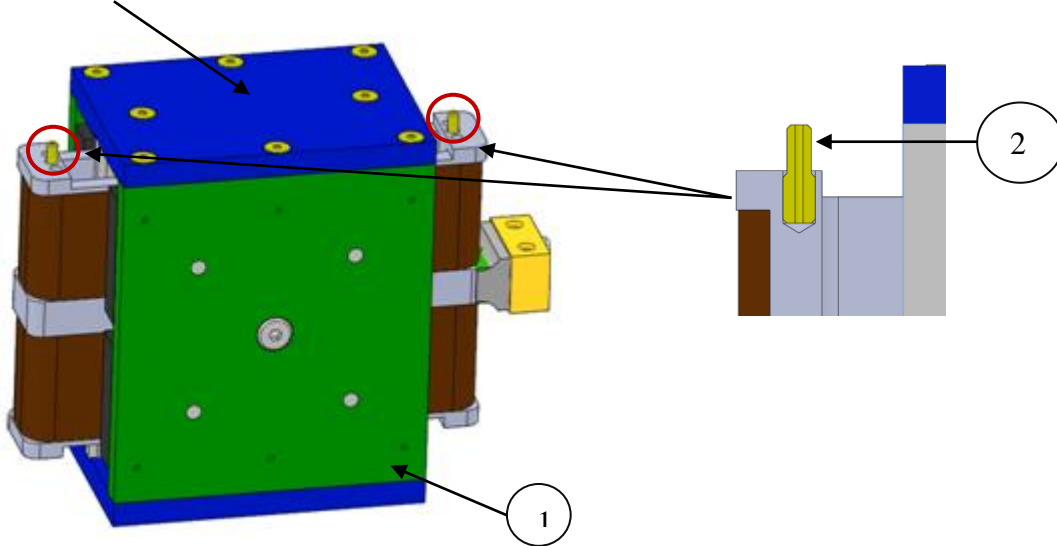
2. D0902435



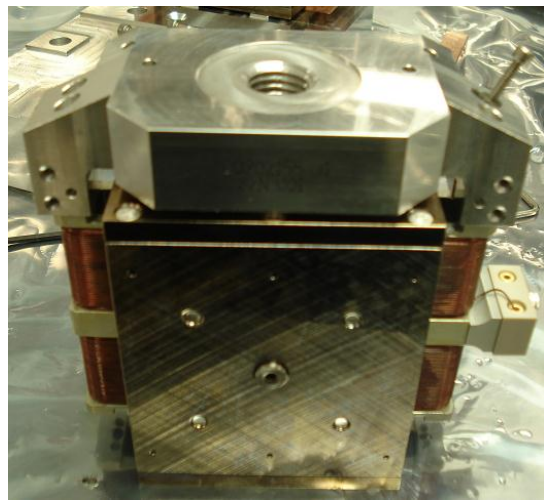
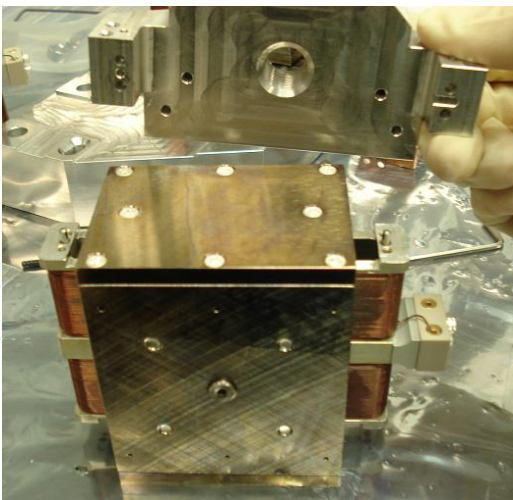
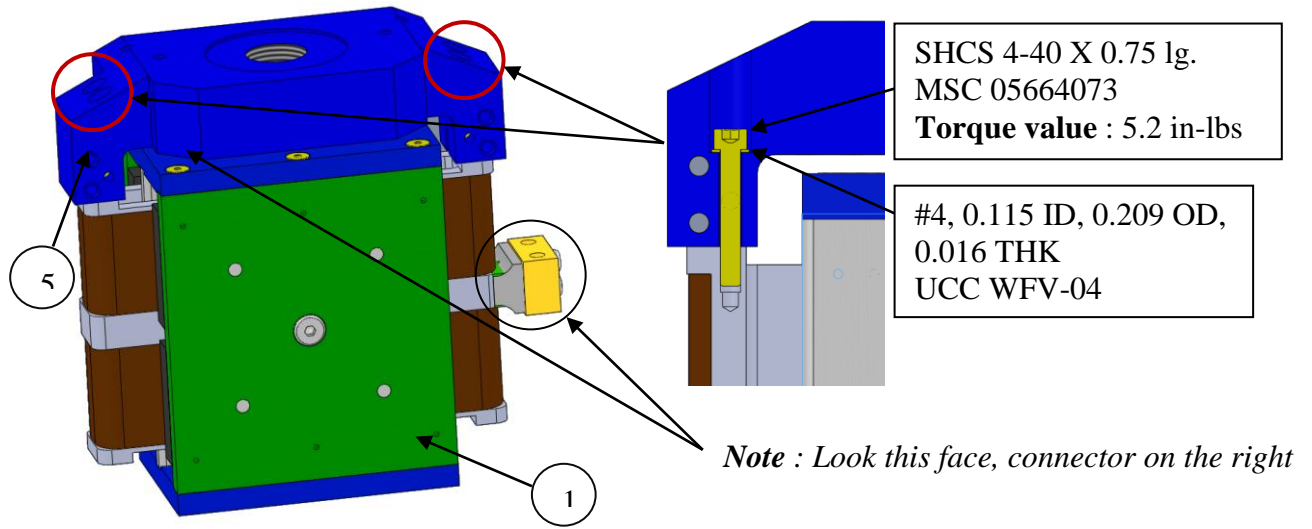
Assembly procedure

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

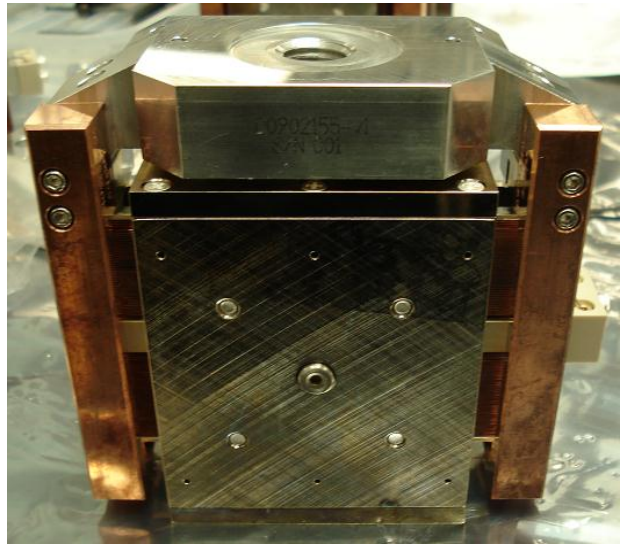
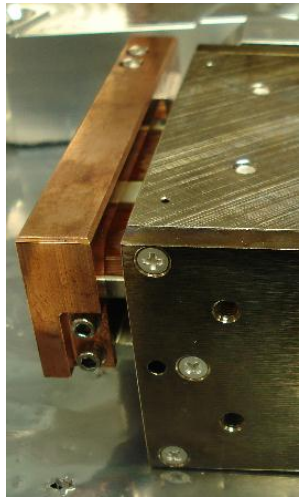
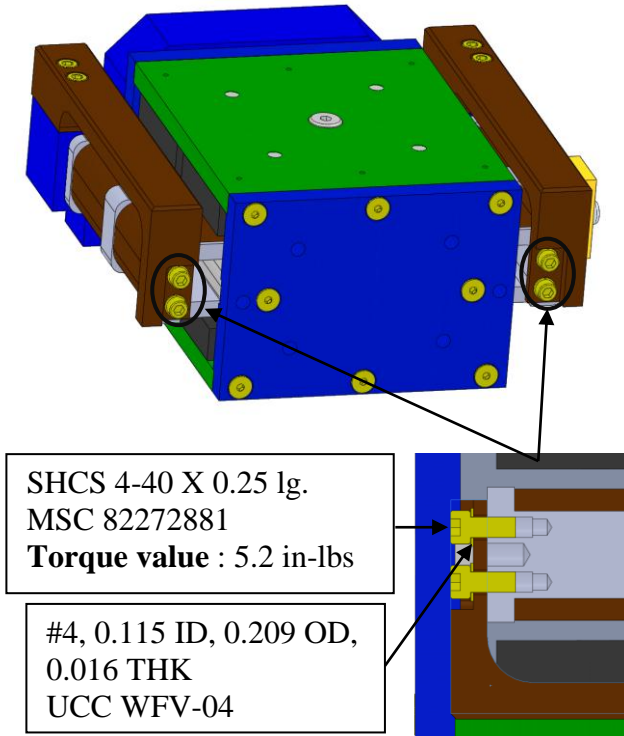
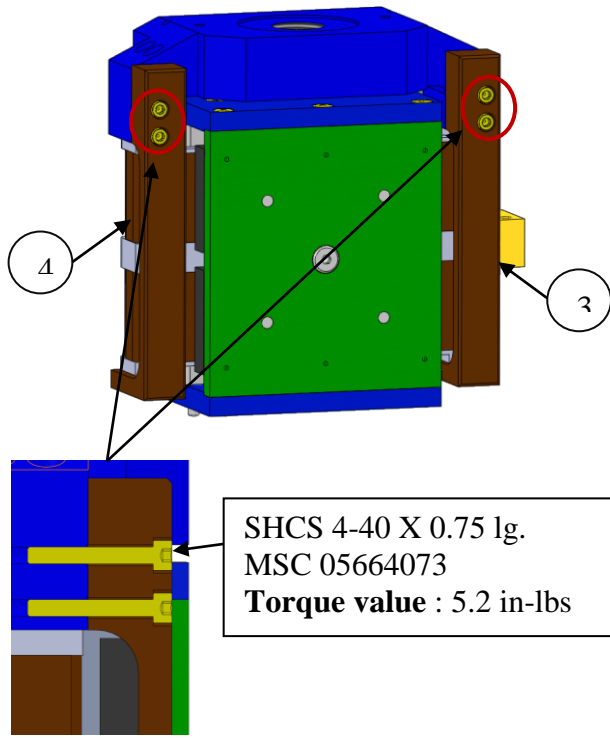
Note : Non pined face



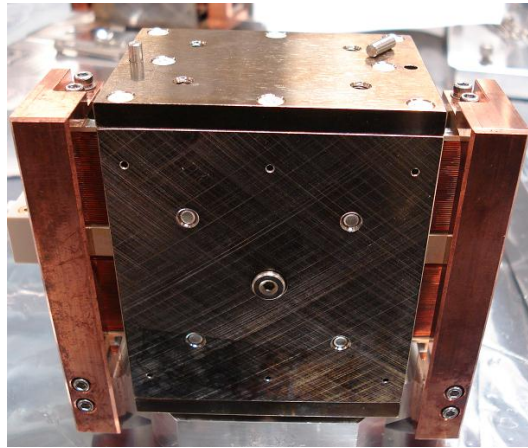
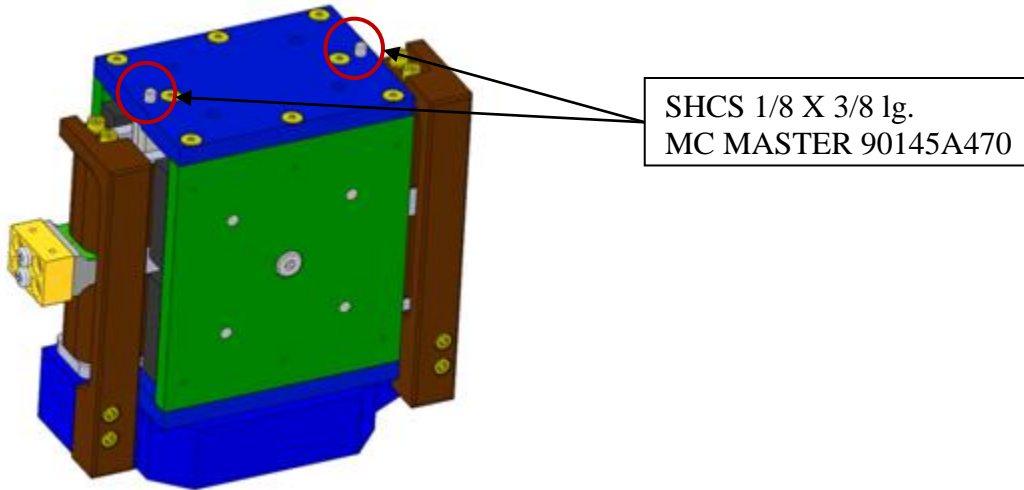
2. Attach Item (5) (D0902155) Actuator Coil Bracket, to Item (23) (D1001737) Step Pin and Item (1) (D1000584) Small Actuator using Item (13) washer and Item (14) screw.



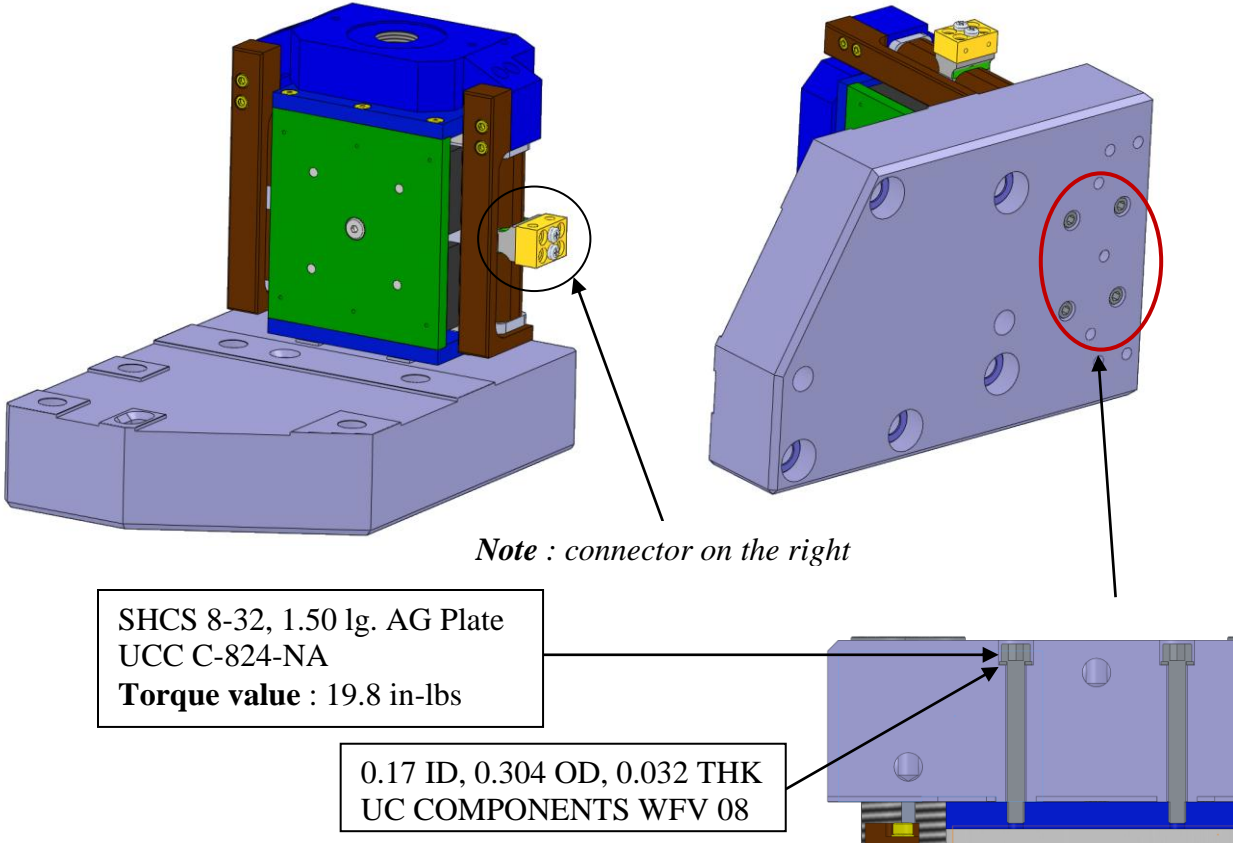
3. Attach Items (3) (D0902154) Left Thermal Bar and Item (4) (D0902153) Right Thermal Bar, to Item (1) (D1000584) Small Actuator and Item (5) (D0902155) Actuator Coil Bracket using Item (13) washer and Items (14)/(15) screws.



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

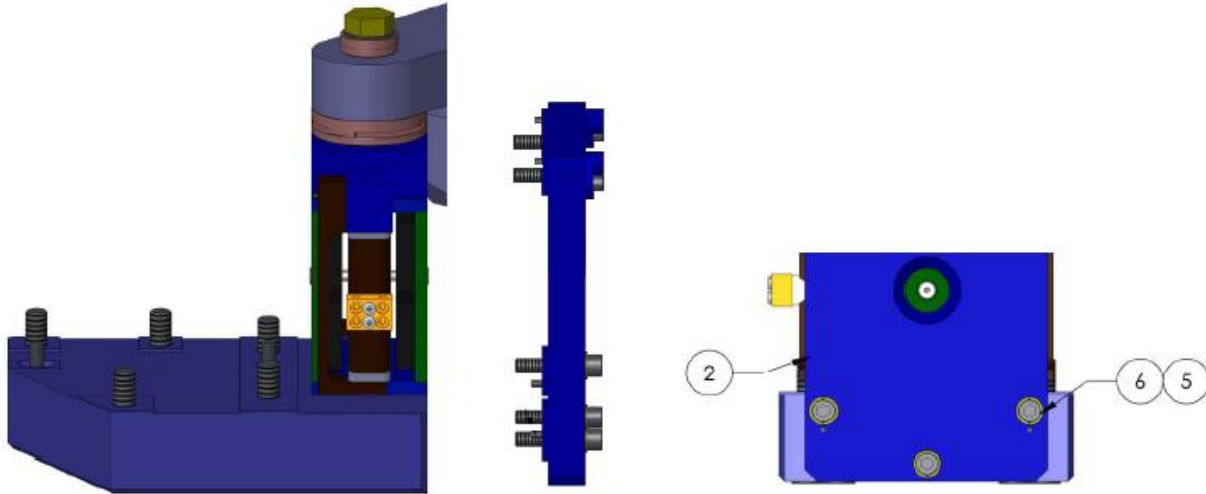


5. Attach Items (2) (D0902161) Small Actuator Mount, to Item (1) (D1000584) Small Actuator using Item (18) vent washer and Items (20) screw.



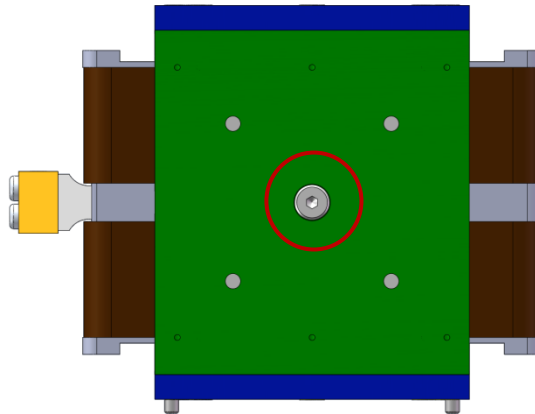
6. Tooling Bracket Assembly

Attach Part D0902137 Tooling Bracket (**only the bottom**), to Step Pin and Item (1) (D1000584) Small Actuator using vent washers and screws.

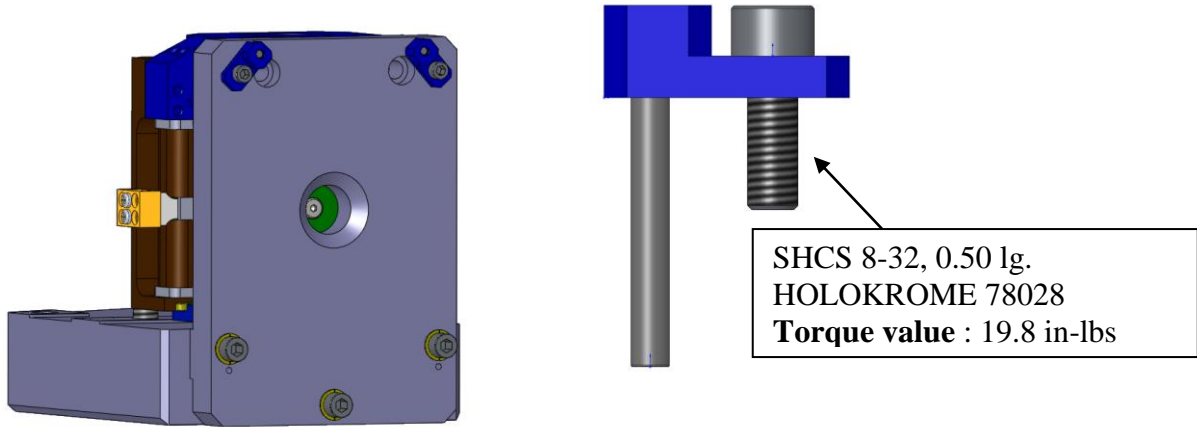


7	McMASTER_90145A481	DOWEL PIN .125 DIA X .43 LG.
6	HOLOKROME_78064	SHCS, 1/4"-20x1.25"
5	UC_COMPONENTS_WFV-25	Vented Washer, .255 ID X .468 OD X .032 THK #1/4
4	HOLOKROME_78062	SHCS, 1/4"-20x1.0"
3	D0902434	Pin Key, Small Actuator Tooling Bar
2	D0902137	MAGNET ASSEMBLY TO BOBBIN TOOLING BRACKET VERTICAL, aLIGO BSC ISI

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

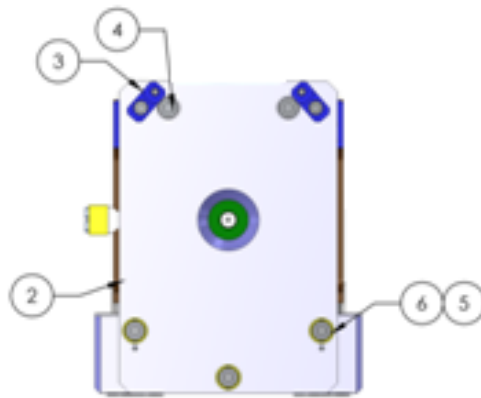


8. Slide Pin Carrier (D0902434) into the Tooling Bar and Item (5) (D0902155).



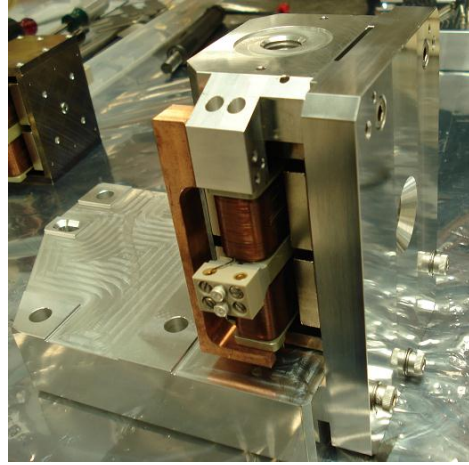
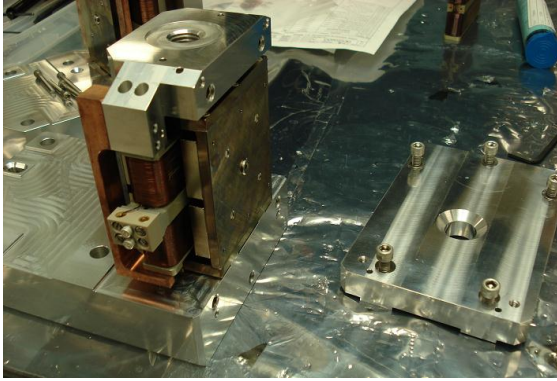
9. **Remove** the 2 shoulder screws of Item (1) (D1000584) Small Actuator.

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



7	McMASTER_90145A481	DOWEL PIN .125 DIA X .43 LG.
6	HOLOKROME_78064	SHCS, 1/4"-20x1.25"
5	UC_COMPONENTS_WFV-25	Vented Washer, .255 ID X .468 OD X .032 THK #1/4
4	HOLOKROME_78062	SHCS, 1/4"-20x1.0"
3	D0902434	Pin Key, Small Actuator Tooling Bar
2	D0902137	MAGNET ASSEMBLY TO BOBBIN TOOLING BRACKET VERTICAL, aLIGO BSC ISI

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

