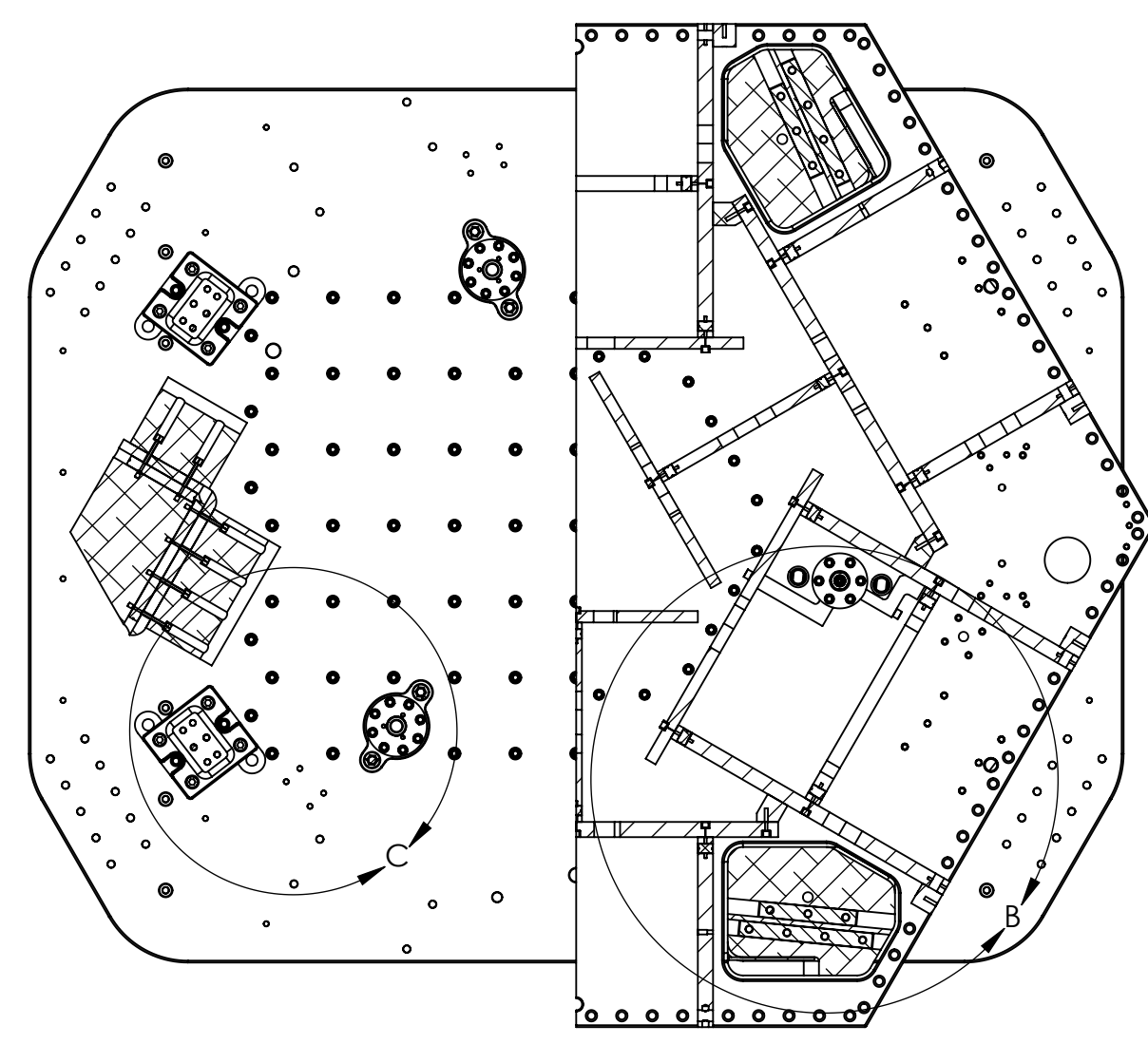
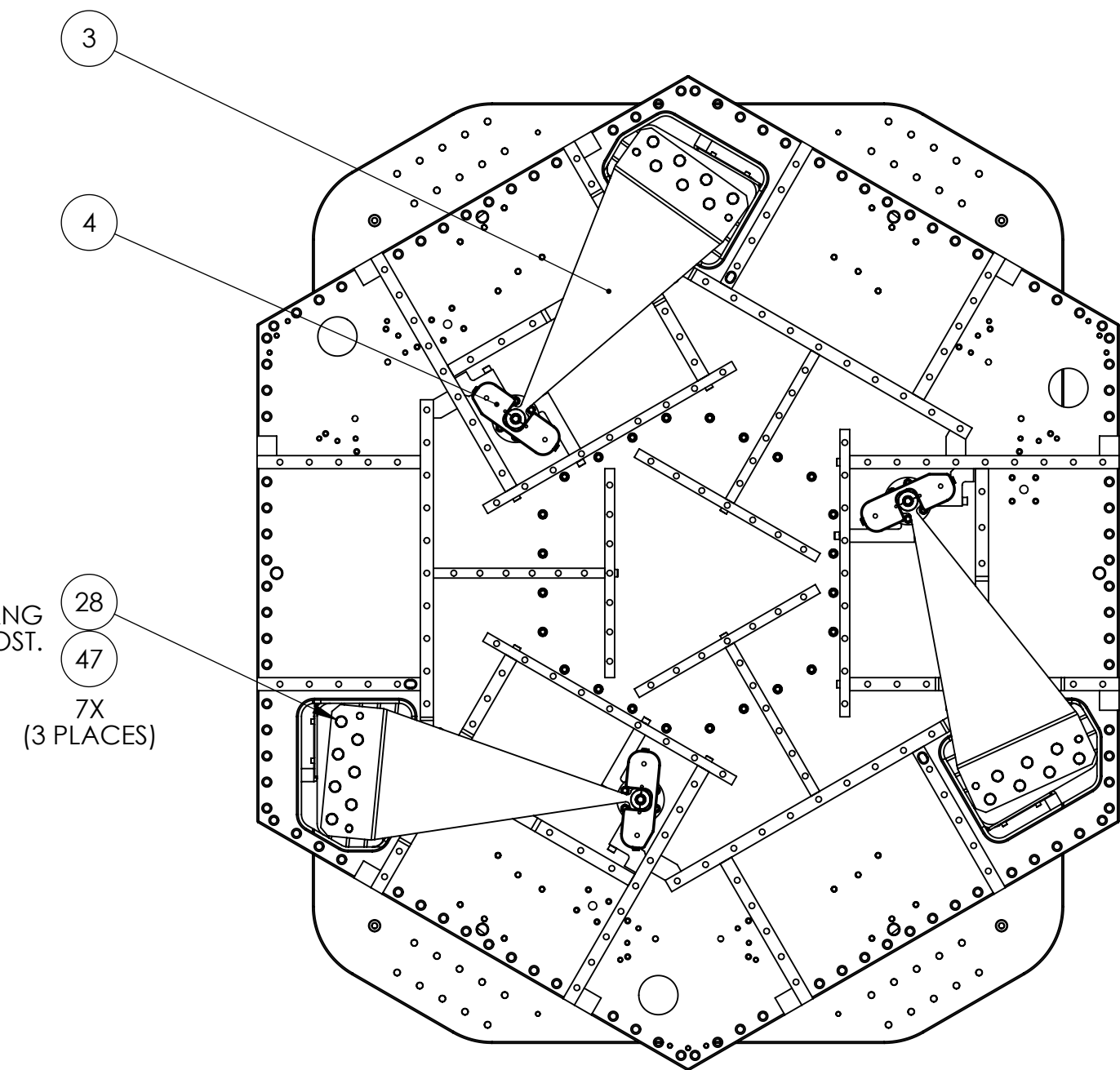


REVISION HISTORY					
REV	DATE	ECO	APPROVAL	DESCRIPTION	
B	01/30/2008	-	A. STEIN	Added detail, Updated BOM.	
C	02/11/2008	-	A. STEIN	Expanded BOM.	



SECTION A-A

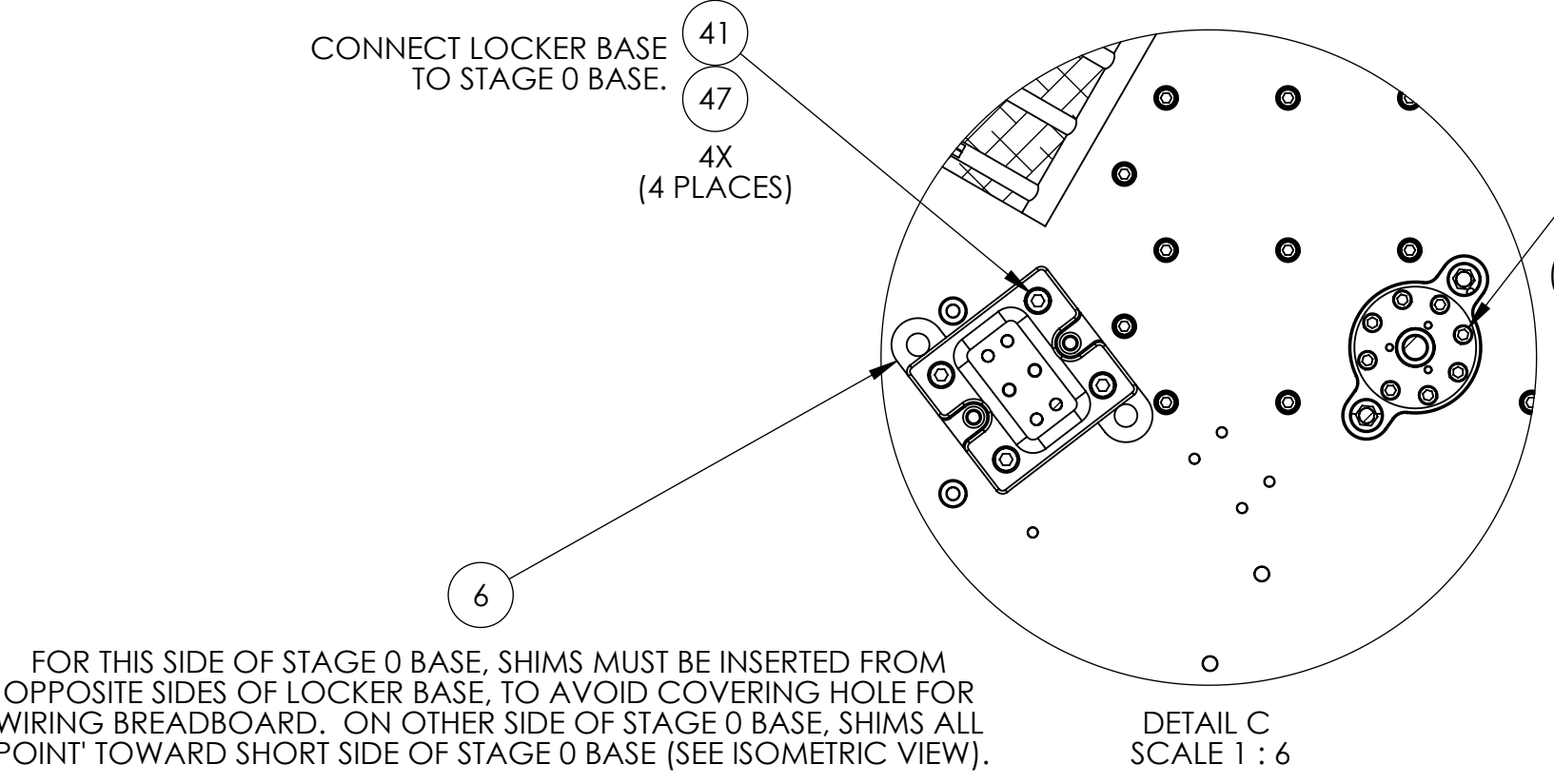
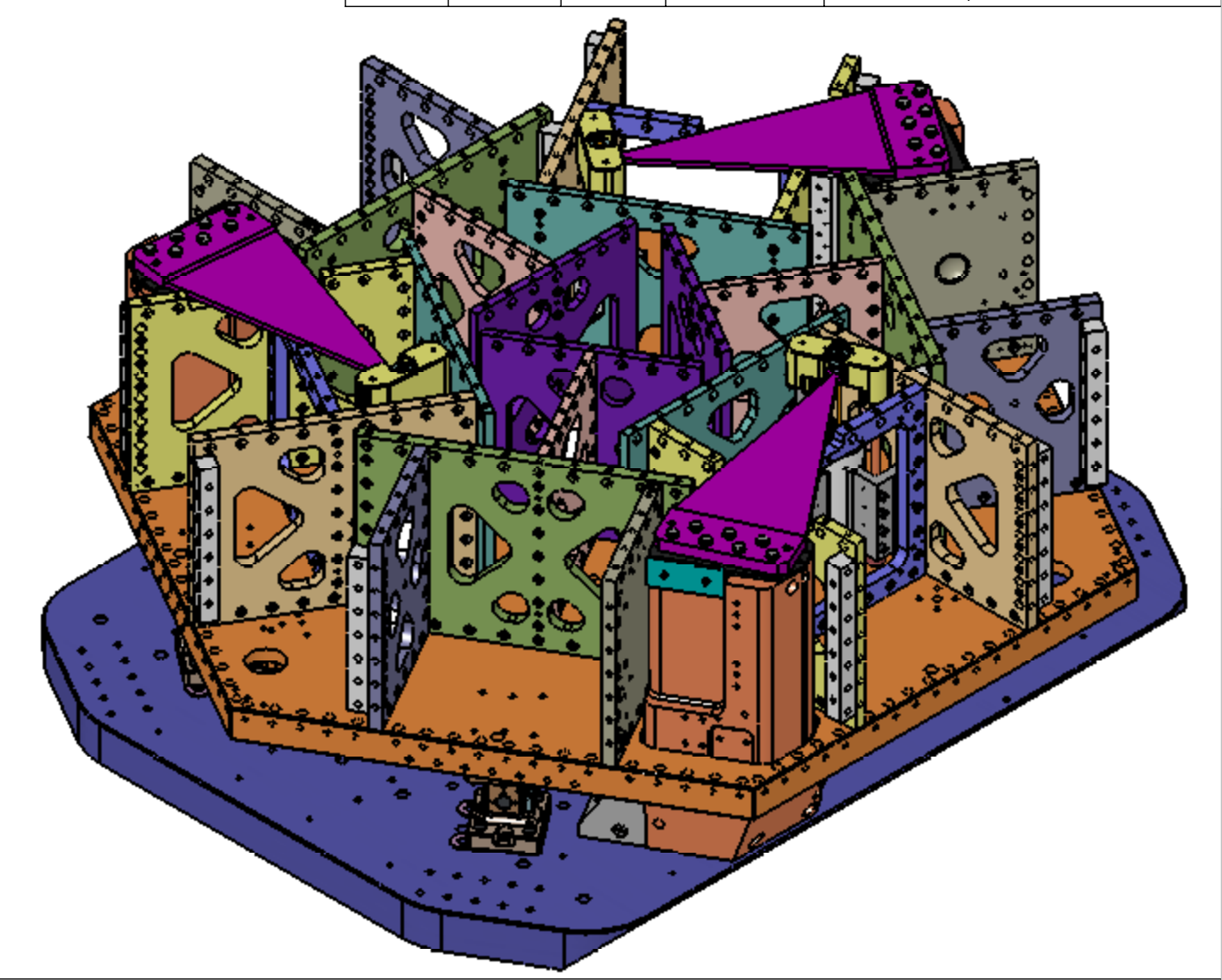
CONNECT SPRING TO GANG BARREL NUTS IN SUPPORT POST.



28
47
7X
(3 PLACES)

NOTES:

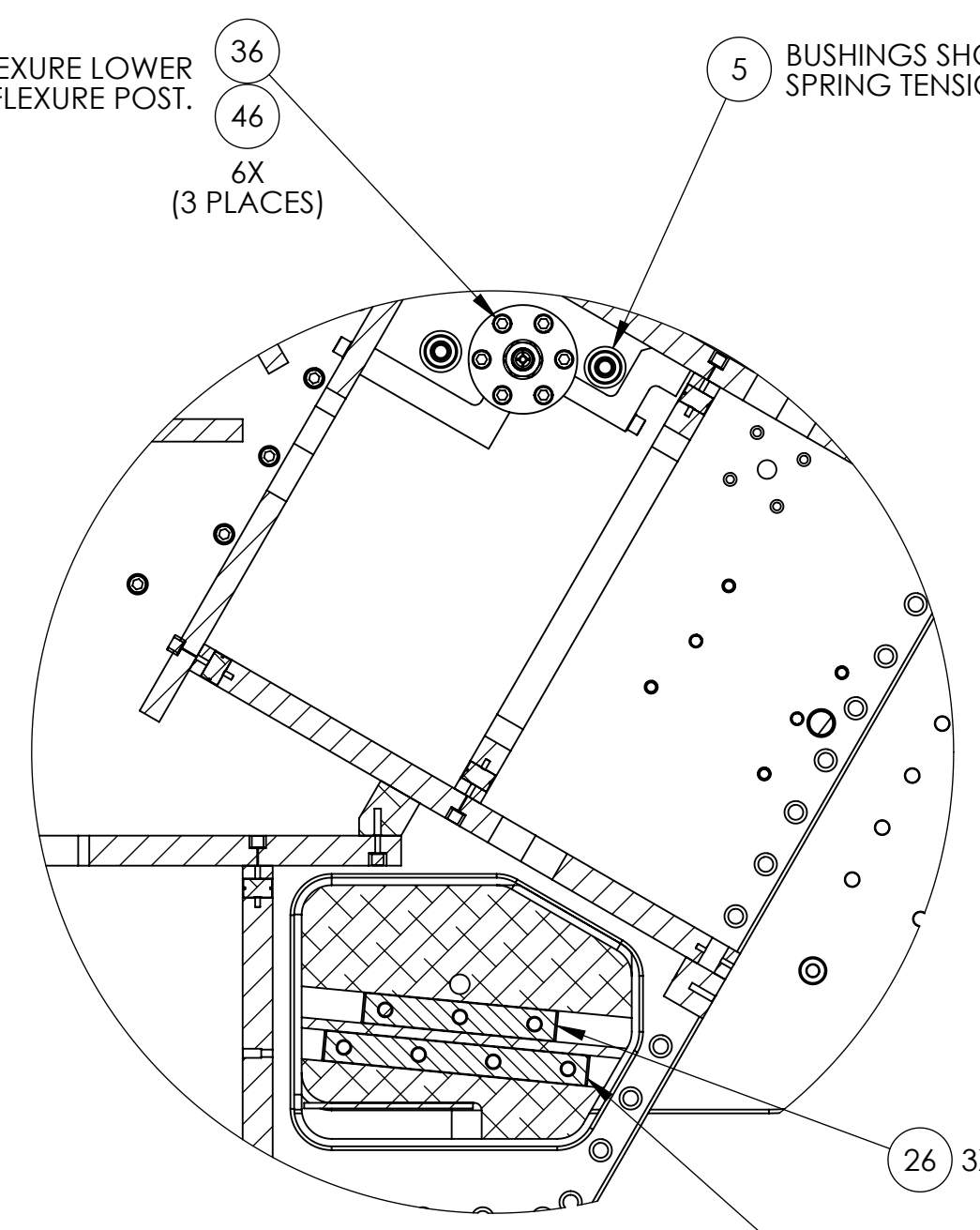
- SEE E070154 (ADVANCED LIGO SINGLE STAGE HAM VIBRATION ISOLATION TABLE ASSEMBLY PROCEDURE) FOR ADDITIONAL ASSEMBLY NOTES AND REQUIREMENTS.
- SYSTEM SHOULD BE ASSEMBLED WITH STAGE 0 BASE MOUNTED ON (2) SUPPORT TUBES (D972610), WHICH SHOULD BE MOUNTED ON (4) TEST STAND FEET (D070278).
- FOR THIS PART OF ASSEMBLY, USE .125" SHIMS UNDER LOCKER BASES. DURING STAGE 1 ALIGNMENT, SHIMS WILL BE REPLACED WITH OTHER THICKNESSES, AS DESCRIBED IN E070154.
- USE CAUTION WHEN LOADING SPRINGS. REFER TO HAZARD ANALYSIS (E070330 OR E080034) FOR MORE DETAIL.



DETAIL C
SCALE 1 : 6

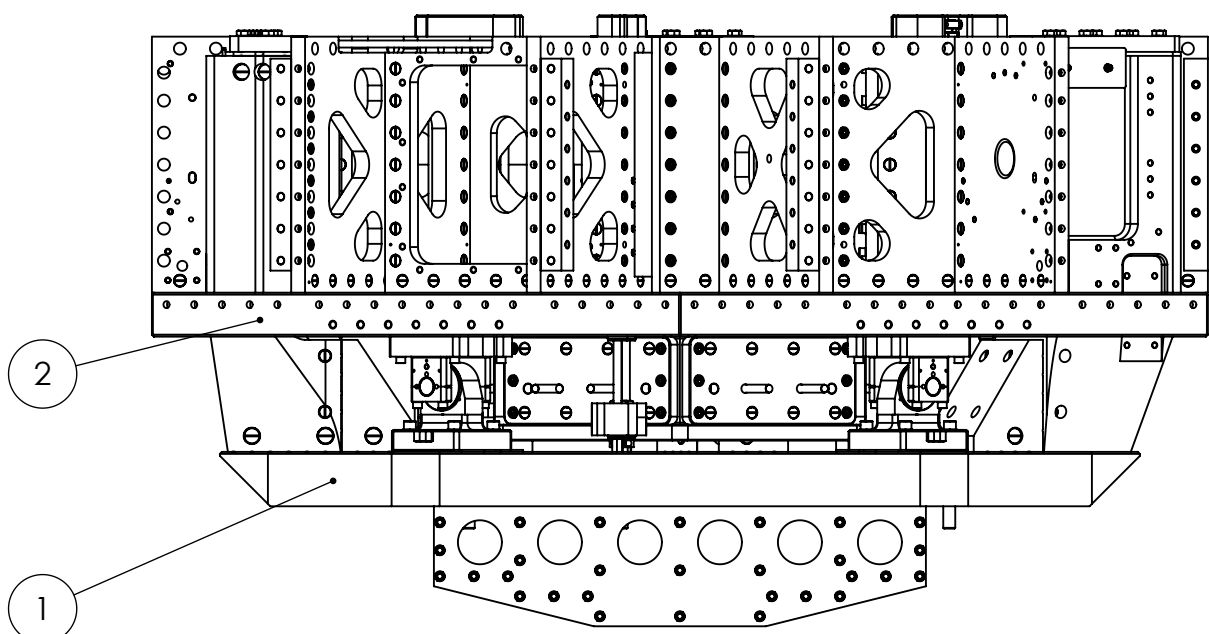
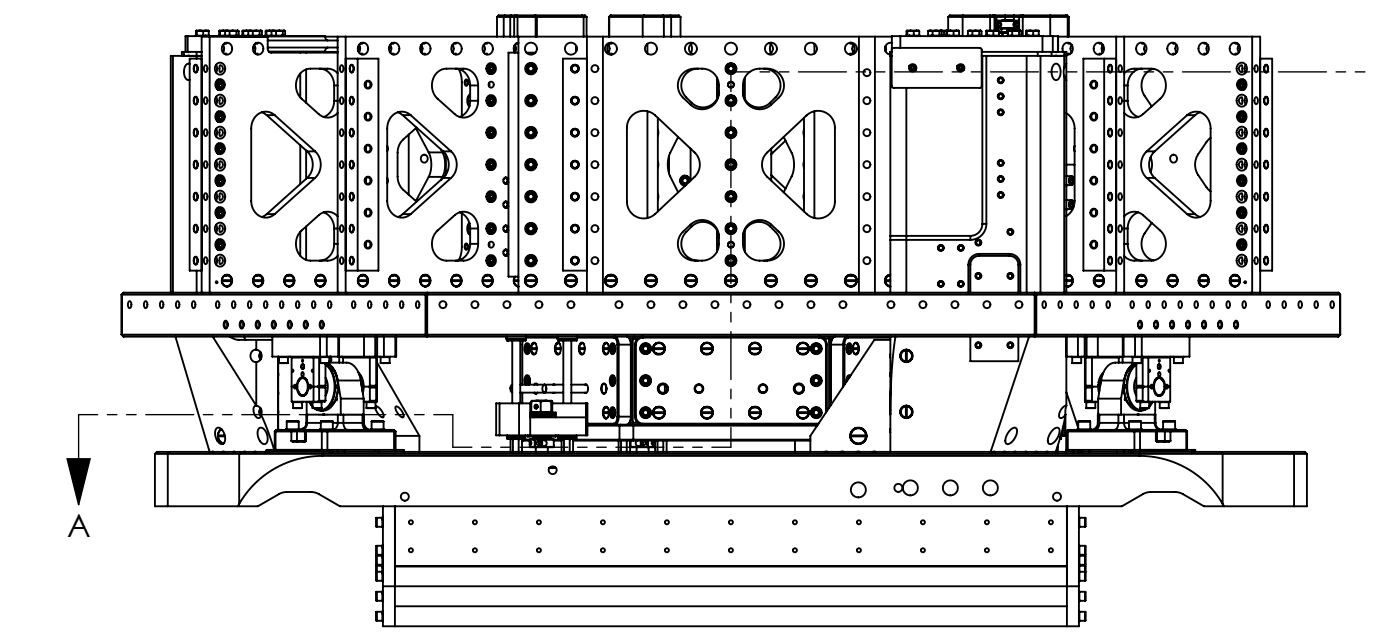
FOR THIS SIDE OF STAGE 0 BASE, SHIMS MUST BE INSERTED FROM OPPOSITE SIDES OF LOCKER BASE, TO AVOID COVERING HOLE FOR WIRING BREADBOARD. ON OTHER SIDE OF STAGE 0 BASE, SHIMS ALL 'POINT' TOWARD SHORT SIDE OF STAGE 0 BASE (SEE ISOMETRIC VIEW).

CONNECT FLEXURE LOWER PLATE TO FLEXURE POST.



DETAIL B
SCALE 1 : 6

BUSHINGS SHOULD BE REMOVED AFTER SPRING TENSIONERS ARE REMOVED.



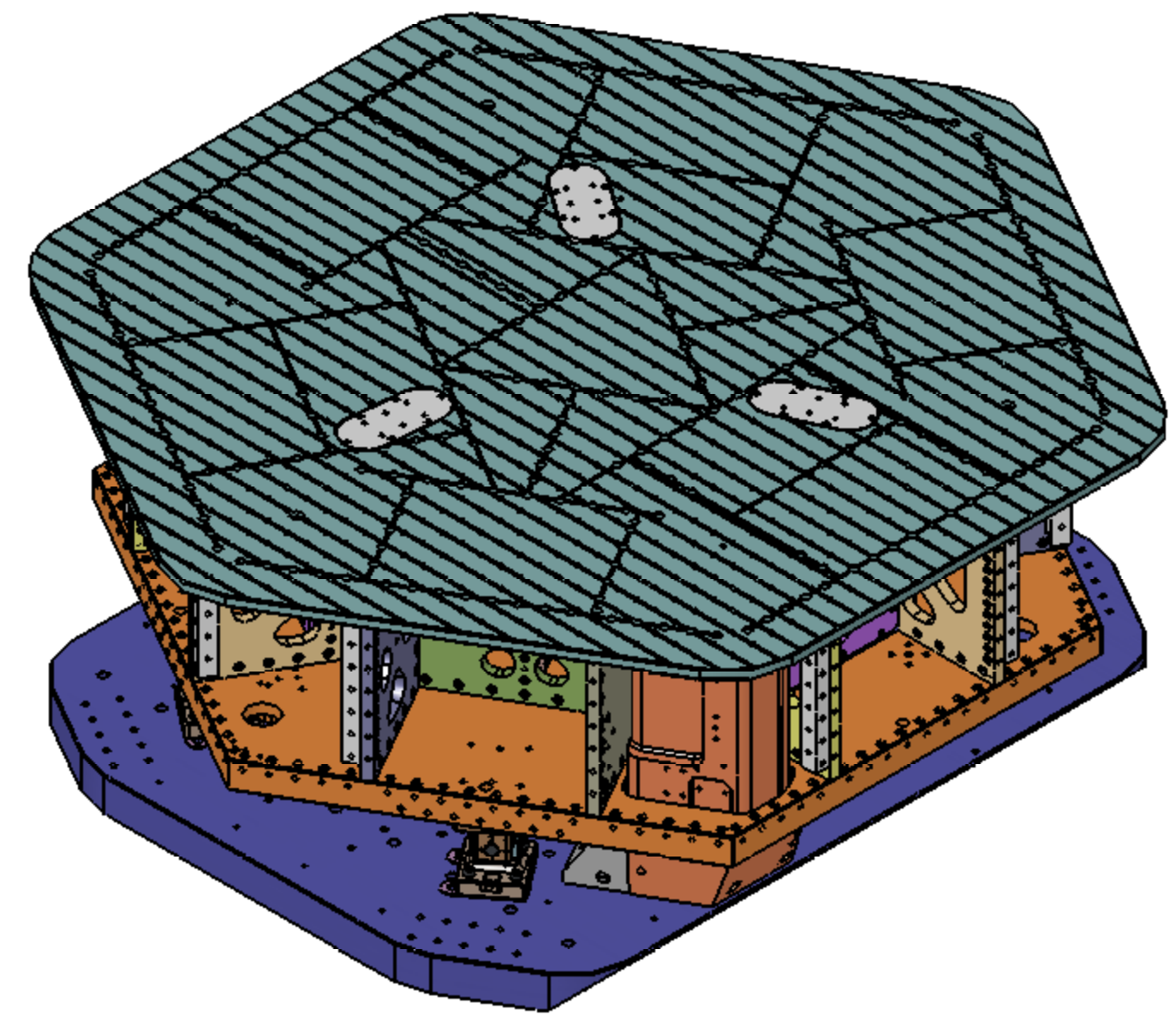
BILL OF MATERIALS									
ITEM NO.	SPRINGS LOADED/ QTY.	OPTICAL TABLE MOUNTED/ QTY.	ACTUATORS AND SENSORS/ QTY.	COMPLETE ASM/ QTY.	PART NUMBER	DESCRIPTION	CONFIG DESCRIPTION	MATERIAL	
1	1	1	1	1	D071410	ASM, STAGE 0	-	See BOM	
2	1	1	1	1	D071421	ASM, STAGE 1 PRE-ASM	-	See BOM	
3	3	3	3	3	D071430	ASM, SPRING AND FLEXURE	-	See BOM	
4	3	0	0	0	D071500	ASM, SPRING TENSIONER	-	See BOM	
5	6	0	0	0	D071321	SPRING TENSION BUSHING	-	PTFE	
6	8	8	8	0	D071141	SHIM	.125" THICK	304 SS	
7	0	0	0	8	D071141	SHIM	.120-.130	304 SS	
8	0	3	3	3	D071072	RIB, TAN, FLEXURE MID COVER	-	6061-T6	
9	0	1	1	1	D071050	OPTICAL TABLE	-	6061-T6	
10	0	3	3	3	D071067	SPRING HATCH, OPTICS TABLE	-	6061-T6	
11	0	0	3	3	D071442	ASM, ACTUATOR	HORIZONTAL	See BOM	
12	0	0	3	3	D071442	ASM, ACTUATOR	VERTICAL	See BOM	
13	0	0	6	6	D071463	ASM, POSITION SENSOR TARGET	-	See BOM	
14	0	0	3	3	D071464	ASM, POSITION SENSOR	HORIZONTAL	See BOM	
15	0	0	3	3	D071464	ASM, POSITION SENSOR	VERTICAL	See BOM	
16	0	0	3	3	D071470	ASM, GS-13 WITH FIXTURES	HORIZONTAL	See BOM	
17	0	0	3	3	D071470	ASM, GS-13 WITH FIXTURES	VERTICAL	See BOM	
18	0	0	0	3	D071057	OUTER WALL, HORIZ GS-13	-	6061-T6	
19	0	0	0	3	D071058	OUTER WALL, FLEXURE ACCESS	-	6061-T6	
20	0	0	0	9	D071427	ASM, OUTER WALL, SMALL PANEL	-	See BOM	
21	0	0	0	6	D071060	OUTER WALL, BRACKET 120	STAGE 1 BRACKET (LONG)	6061-T6	
22	0	0	0	8	D071255	WIRING BREADBOARD, LARGE	-	6061-T6	
23	0	66	66	66	D071250	BARREL NUT	3/8"-16x.75"L	6061-T6	
24	0	303	303	303	D071250	BARREL NUT	3/8"-16x1.0"L	6061-T6	
25	0	0	0	108	D071250	BARREL NUT	3/8"-16x1.3"L Ref.	6061-T6	
26	3	3	3	3	D071251	GANG BARREL NUT	3x 1/2"-13 (spaced 2.5")	17-4 PH H1150	
27	3	3	3	3	D071251	GANG BARREL NUT	4x 1/2"-13 (spaced 2.5")	17-4 PH H1150	
28	21	21	21	21	MCMMASTER 98253A499	HHCS	1/2"-13x3.0", FULL THREAD	A286	
29	0	18	18	18	HOLOKROME 78056	SHCS	1/4"-20x.625"	18-8 SS	
30	0	0	0	16	HOLOKROME 78058	SHCS	1/4"-20x.75"	18-8 SS	
31	0	0	24	24	HOLOKROME 78060	SHCS	1/4"-20x.875"	18-8 SS	
32	0	48	48	48	HOLOKROME 78062	SHCS	1/4"-20x1.0"	18-8 SS	
33	0	0	24	24	HOLOKROME 78066	SHCS	1/4"-20x1.5"	18-8 SS	
34	0	0	18	18	MCMMASTER 92196A551	SHCS	1/4"-20x2.25"	18-8 SS	
35	24	0	0	0	HOLOKROME 78098	SHCS	3/8"-16x1.0"	18-8 SS	
36	18	18	18	18	HOLOKROME 78100	SHCS	3/8"-16x1.25"	18-8 SS	
37	0	0	3	87	HOLOKROME 78102	SHCS	3/8"-16x1.5"	18-8 SS	
38	0	177	177	540	HOLOKROME 78104	SHCS	3/8"-16x1.75"	18-8 SS	
39	0	0	3	3	MCMMASTER 92196A633	SHCS	3/8"-16x2.25"	18-8 SS	
40	0	0	12	12	HOLOKROME 78108	SHCS	3/8"-16x2.5"	18-8 SS	
41	16	16	16	16	MCMMASTER 92196A722	SHCS	1/2"-13x2.5"	18-8 SS	
42	0	0	18	18	MCMMASTER 90313A205	FENDER WASHER	.266"IDx.875"ODx.063"	18-8 SS	
43	0	0	6	6	MCMMASTER 92141A051	FLAT WASHER	.406"IDx1.00"ODx.050"	18-8 SS	
44	0	0	12	12	MCMMASTER 98370A021	FENDER WASHER	.406"IDx1.00"ODx.123"	18-8 SS	
45	0	66	114	130	UCC WFV-25	VENTED WASHER	.255"IDx.468"OD	18-8 SS	
46	42	195	195	642	UCC WFV-38	VENTED WASHER	.39"IDx.625"OD	18-8 SS	
47	37	37	37	37	UCC WFV-50	VENTED WASHER	.515"IDx.875"OD	18-8 SS	
48	0	0	0	216	MCMMASTER 98408A152	E-STYLE RETAINING RING	3/4" SHAFT DIA	15-7 MO PH SS	

PRIOR P/N: **p06109-400-0**
 APPROVALS: _____ DATE: _____
 MANUFACTURING: _____
 QUALITY: _____
 MATL: See BOM
 FINISH: See BOM

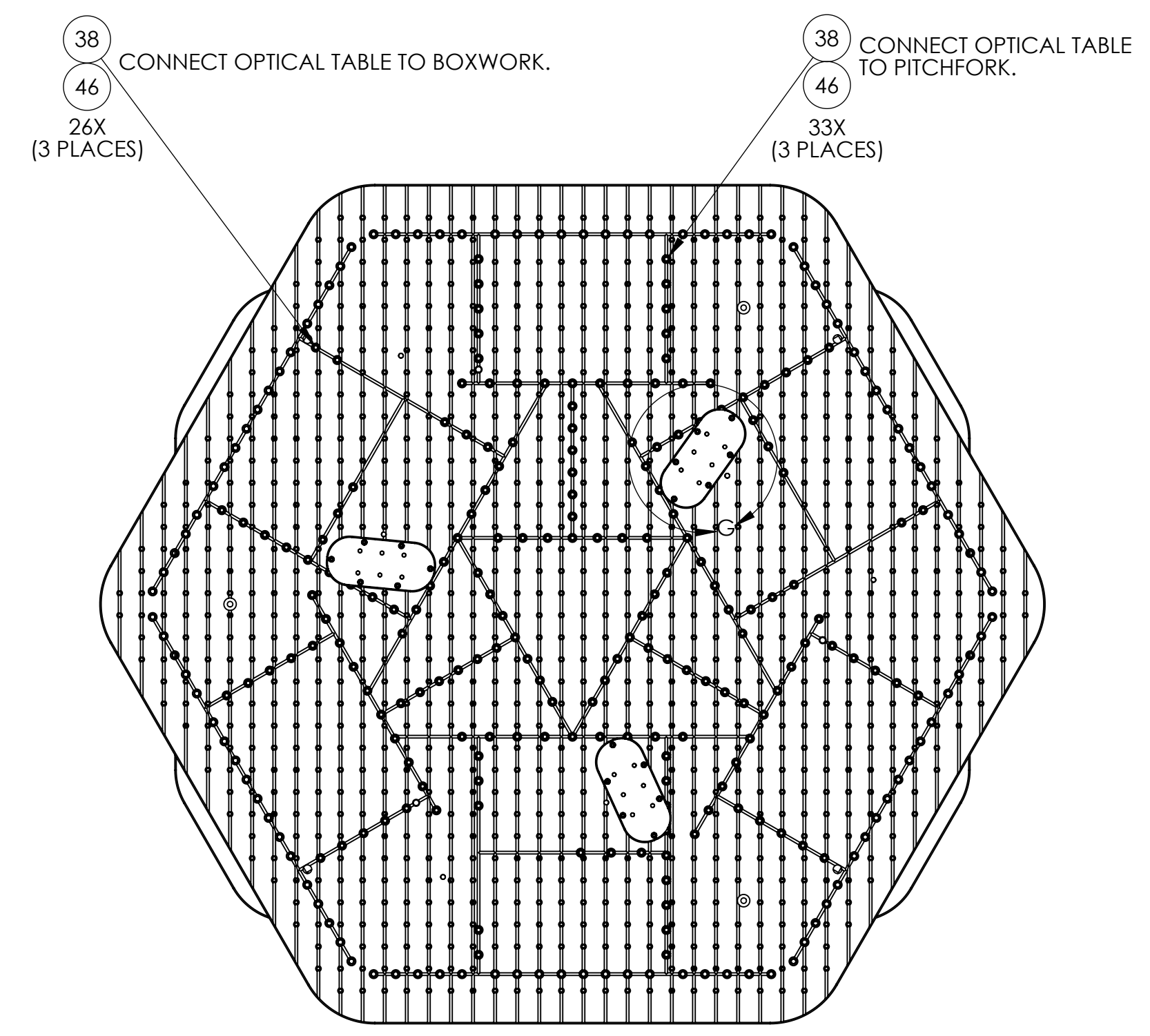
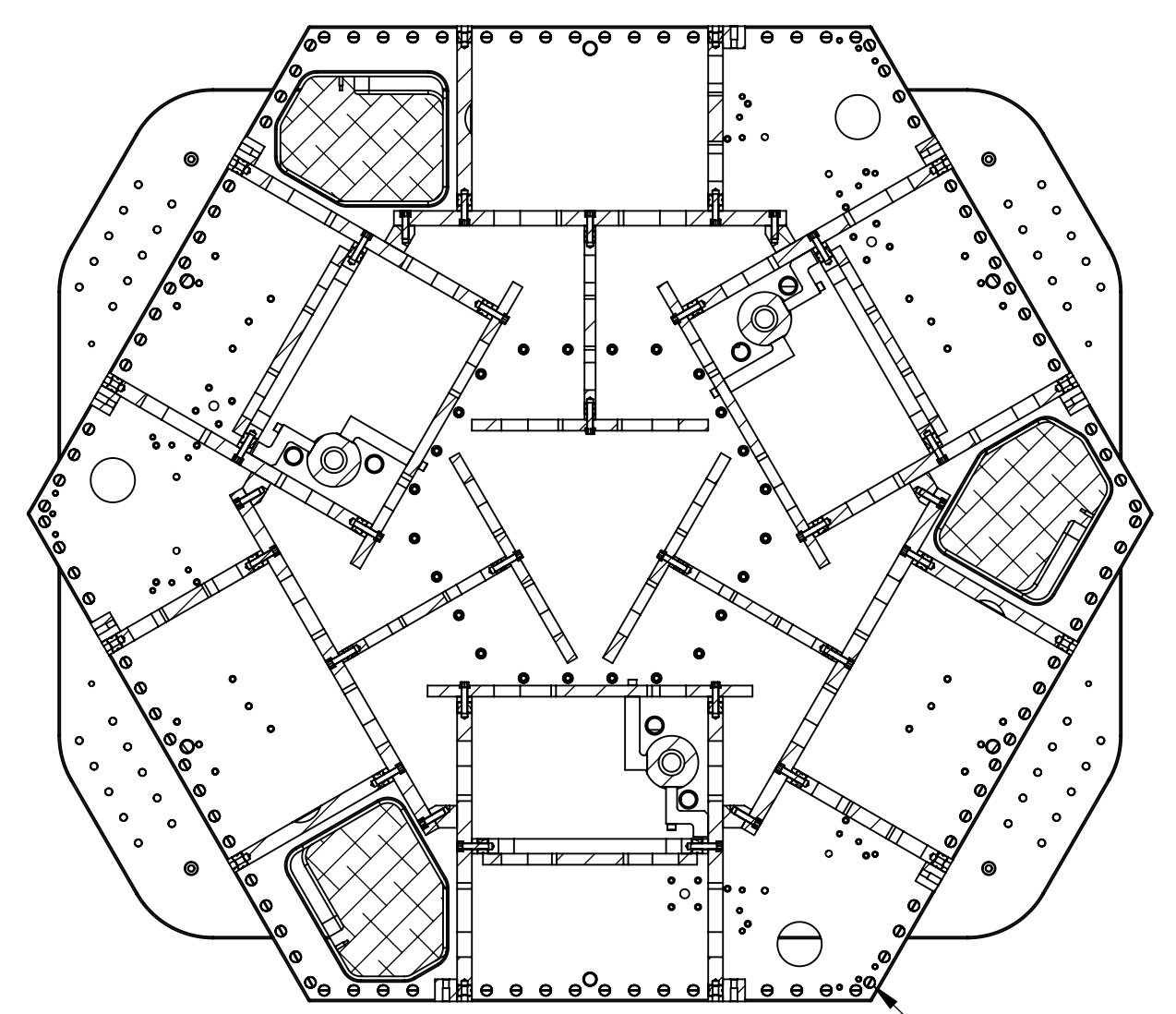
High Precision Devices
 1688 Valtec Lane, Suite C, Boulder, Colorado 80301
 Phone: (303) 447-2558 Fax: (303) 447-2548 Web Site: www.hpd-online.com
 DESCRIPTION: **HAM ISOLATION TABLE**
 P/N: **D071400** CONFIG: **SPRINGS LOADED**
 FILE NAME: D071400-C HAM Isolation Table
 FOLDER: _____
 SIZE: **D** SCALE: **1:12** DRAWN BY: **A. STEIN** REV: _____
 SHEET **1** OF **4** DATE PRINTED: **3/18/2008** C

UNLESS OTHERWISE SPECIFIED:
 DIMENSIONS ARE IN INCHES
 DECIMAL TOLERANCES:
 .XX ±.015 .XXX ±.005
 ANG TOL: ±1° SURFACE ROUGHNESS: .43
 INTERNAL AND EXTERNAL INTERSECTIONS SHALL BE UNIFORMLY FINISHED WITH A CHAMFER .005".010 X 45° OR RADIUS .005".010
 CHAMFER ALL THREADED HOLES 110% OF MAJOR DIAMETER X 45°
 THIS PRINT & ITS RELATED MODEL ARE THE DOCUMENTATION OF RECORD. UNLESS OTHERWISE SPECIFIED, ALL FEATURES MUST CONFORM TO .010 TOTAL WIDE PROFILE OF A SURFACE. INTERPRET DWG PER ASME Y14.5M 1994

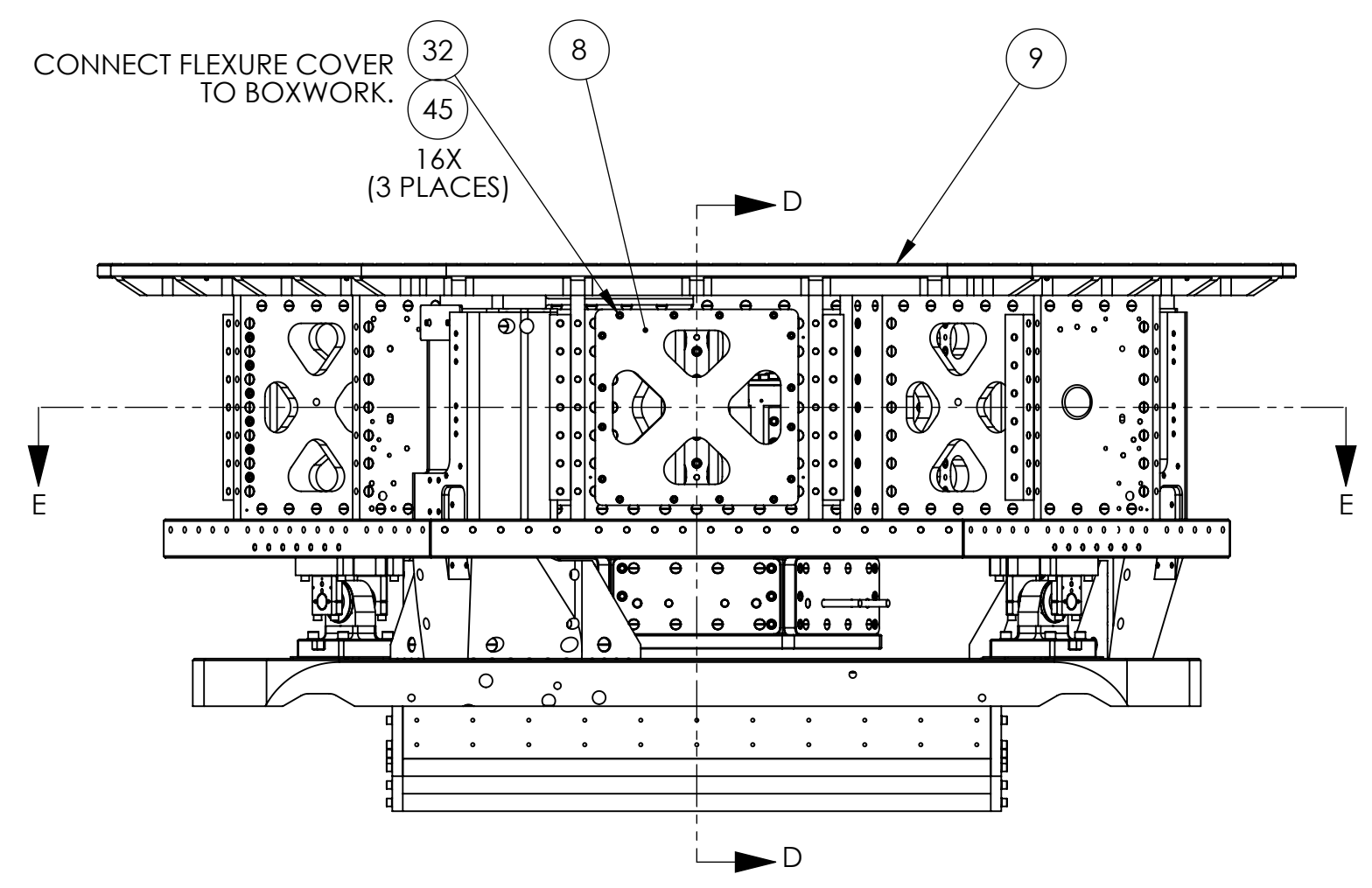
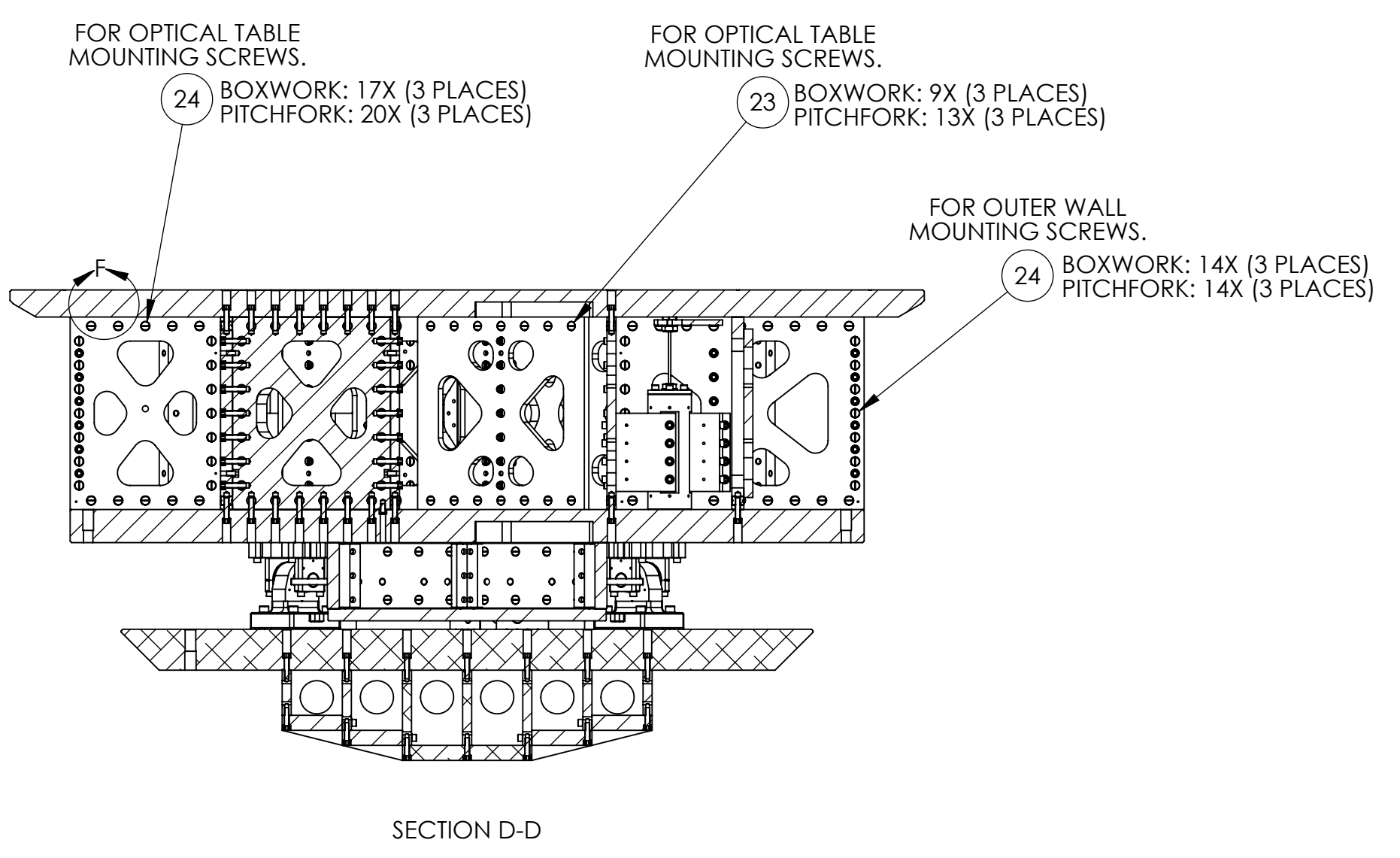
REVISION HISTORY				
REV	DATE	ECO	APPROVAL	DESCRIPTION
-	-	-	-	See Sheet 1



- NOTES:
- SEE E070154 (ADVANCED LIGO SINGLE STAGE HAM VIBRATION ISOLATION TABLE ASSEMBLY PROCEDURE) FOR ADDITIONAL ASSEMBLY NOTES AND REQUIREMENTS.
 - MOUNT OPTICAL TABLE TO STAGE 1 BEFORE RELEASING SPRINGS/REMOVING SPRING TENSIONERS. TIGHTEN SHAFT COLLAR ON TOP OF FLEXURE ASSEMBLY BEFORE PLACING SPRING HATCHES.



BILL OF MATERIALS									
ITEM NO.	SPRINGS LOADED/ QTY.	OPTICAL TABLE MOUNTED/ QTY.	ACTUATORS AND SENSORS/ QTY.	COMPLETE ASM/ QTY.	PART NUMBER	DESCRIPTION	CONFIG DESCRIPTION	MATERIAL	
1	1	1	1	1	D071410	ASM, STAGE 0	-	See BOM	
2	1	1	1	1	D071421	ASM, STAGE 1 PRE-ASM	-	See BOM	
3	3	3	3	3	D071430	ASM, SPRING AND FLEXURE	-	See BOM	
4	3	0	0	0	D071500	ASM, SPRING TENSIONER	-	See BOM	
5	6	0	0	0	D071321	SPRING TENSION BUSHING	-	PTFE	
6	8	8	8	0	D071141	SHIM	.125" THICK	304 SS	
7	0	0	0	8	D071141	SHIM	.120-.130	304 SS	
8	0	3	3	3	D071072	RIB, TAN, FLEXURE MID COVER	-	6061-T6	
9	0	1	1	1	D071050	OPTICAL TABLE	-	6061-T6	
10	0	3	3	3	D071067	SPRING HATCH, OPTICS TABLE	-	6061-T6	
11	0	0	3	3	D071442	ASM, ACTUATOR	HORIZONTAL	See BOM	
12	0	0	3	3	D071442	ASM, ACTUATOR	VERTICAL	See BOM	
13	0	0	6	6	D071463	ASM, POSITION SENSOR TARGET	-	See BOM	
14	0	0	3	3	D071464	ASM, POSITION SENSOR	HORIZONTAL	See BOM	
15	0	0	3	3	D071464	ASM, POSITION SENSOR	VERTICAL	See BOM	
16	0	0	3	3	D071470	ASM, GS-13 WITH FIXTURES	HORIZONTAL	See BOM	
17	0	0	3	3	D071470	ASM, GS-13 WITH FIXTURES	VERTICAL	See BOM	
18	0	0	0	3	D071057	OUTER WALL, HORIZ GS-13	-	6061-T6	
19	0	0	0	3	D071058	OUTER WALL, FLEXURE ACCESS	-	6061-T6	
20	0	0	0	9	D071427	ASM, OUTER WALL, SMALL PANEL	-	See BOM	
21	0	0	0	6	D071060	OUTER WALL, BRACKET 120	STAGE 1 BRACKET (LONG)	6061-T6	
22	0	0	0	8	D071255	WIRING BREADBOARD, LARGE	-	6061-T6	
23	0	66	66	66	D071250	BARREL NUT	3/8"-16x.75"L	6061-T6	
24	0	303	303	303	D071250	BARREL NUT	3/8"-16x1.0"L	6061-T6	
25	0	0	0	108	D071250	BARREL NUT	3/8"-16x1.3"L Ref.	6061-T6	
26	3	3	3	3	D071251	GANG BARREL NUT	3x 1/2"-13 (spaced 2.5")	17-4 PH H1150	
27	3	3	3	3	D071251	GANG BARREL NUT	4x 1/2"-13 (spaced 2.5")	17-4 PH H1150	
28	21	21	21	21	MCMMASTER 98253A499	HHCS	1/2"-13x3.0", FULL THREAD	A286	
29	0	18	18	18	HOLOKROME 78056	SHCS	1/4"-20x.625"	18-8 SS	
30	0	0	0	16	HOLOKROME 78058	SHCS	1/4"-20x.75"	18-8 SS	
31	0	0	24	24	HOLOKROME 78060	SHCS	1/4"-20x.875"	18-8 SS	
32	0	48	48	48	HOLOKROME 78062	SHCS	1/4"-20x1.0"	18-8 SS	
33	0	0	24	24	HOLOKROME 78066	SHCS	1/4"-20x1.5"	18-8 SS	
34	0	0	18	18	MCMMASTER 92196A551	SHCS	1/4"-20x2.25"	18-8 SS	
35	24	0	0	0	HOLOKROME 78098	SHCS	3/8"-16x1.0"	18-8 SS	
36	18	18	18	18	HOLOKROME 78100	SHCS	3/8"-16x1.25"	18-8 SS	
37	0	0	3	87	HOLOKROME 78102	SHCS	3/8"-16x1.5"	18-8 SS	
38	0	177	177	540	HOLOKROME 78104	SHCS	3/8"-16x1.75"	18-8 SS	
39	0	0	3	3	MCMMASTER 92196A633	SHCS	3/8"-16x2.25"	18-8 SS	
40	0	0	12	12	HOLOKROME 78108	SHCS	3/8"-16x2.5"	18-8 SS	
41	16	16	16	16	MCMMASTER 92196A722	SHCS	1/2"-13x2.5"	18-8 SS	
42	0	0	18	18	MCMMASTER 90313A205	FENDER WASHER	.266"IDx.875"ODx.063"	18-8 SS	
43	0	0	6	6	MCMMASTER 92141A051	FLAT WASHER	.406"IDx1.00"ODx.050"	18-8 SS	
44	0	0	12	12	MCMMASTER 98370A021	FENDER WASHER	.406"IDx1.00"ODx.123"	18-8 SS	
45	0	66	114	130	UCC WFV-25	VENTED WASHER	.255"IDx.468"OD	18-8 SS	
46	42	195	195	642	UCC WFV-38	VENTED WASHER	.39"IDx.625"OD	18-8 SS	
47	37	37	37	37	UCC WFV-50	VENTED WASHER	.515"IDx.875"OD	18-8 SS	
48	0	0	0	216	MCMMASTER 98408A152	E-STYLE RETAINING RING	3/4" SHAFT DIA	15-7 MO PH SS	



PRIOR P/N: **p06109-400-0**

APPROVALS: _____ DATE: _____

MANUFACTURING: _____

QUALITY: _____

MATL: **See BOM**

FINISH: **See BOM**

High Precision Devices
1688 Valtec Lane, Suite C, Boulder, Colorado 80301
Phone: (303) 447-2558 Fax: (303) 447-2548 Web Site: www.hpd-online.com

DESCRIPTION: **HAM ISOLATION TABLE**

P/N: **D071400** CONFIG: **OPTICAL TABLE ON**

FILE NAME: D071400-C HAM Isolation Table

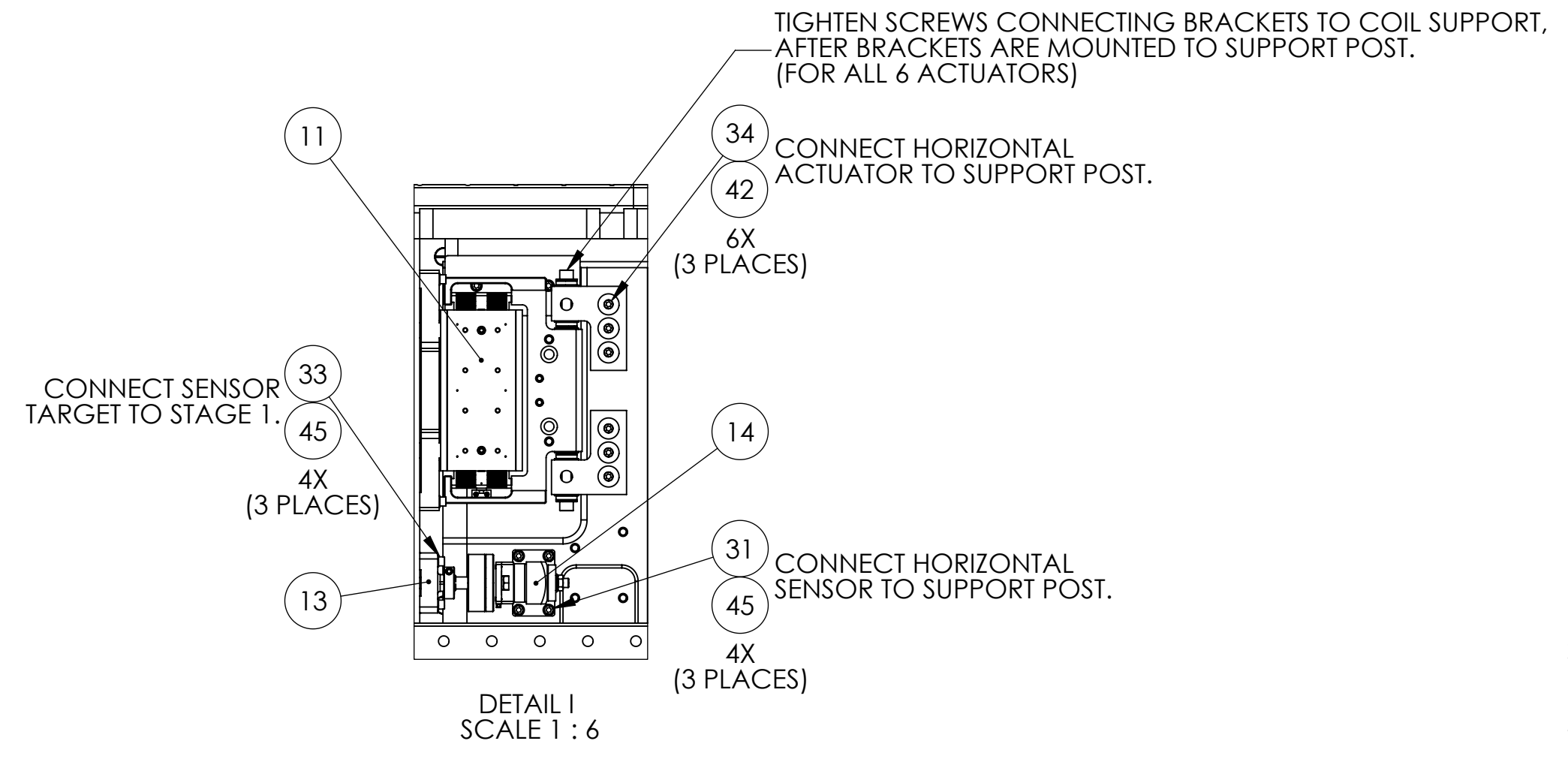
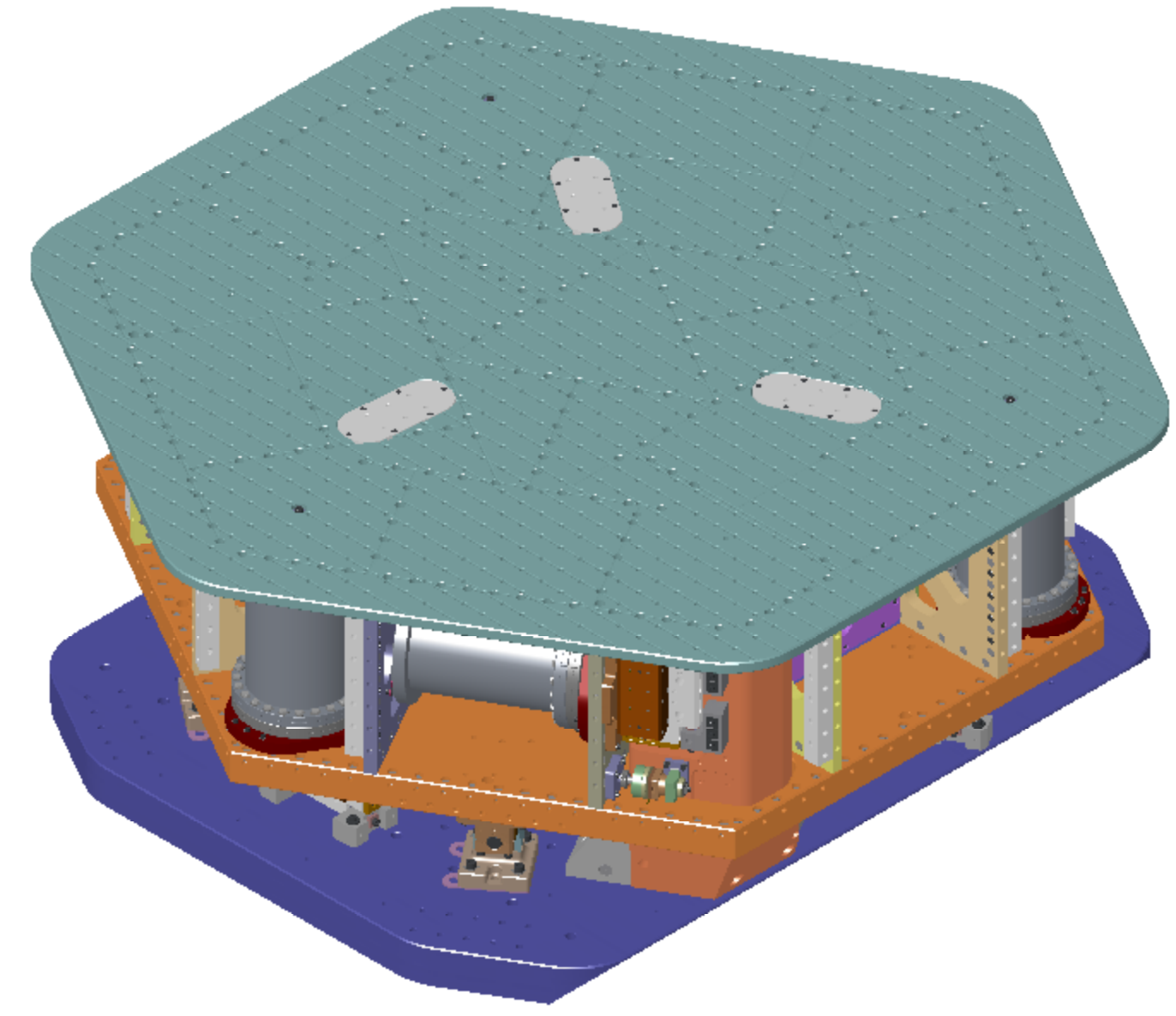
FOLDER: _____

SCALE: **1:12** DRAWN BY: **A. STEIN** REV: _____

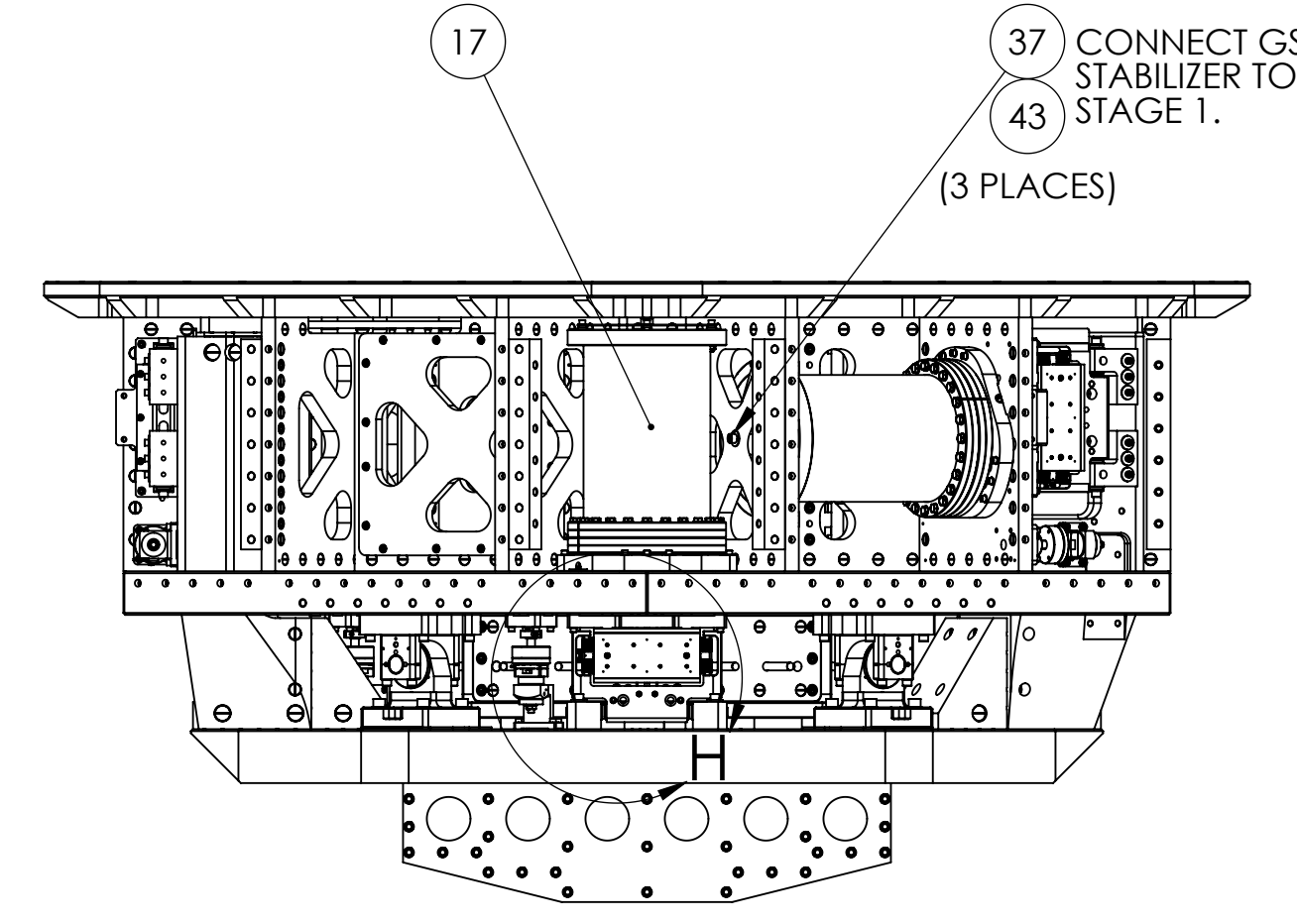
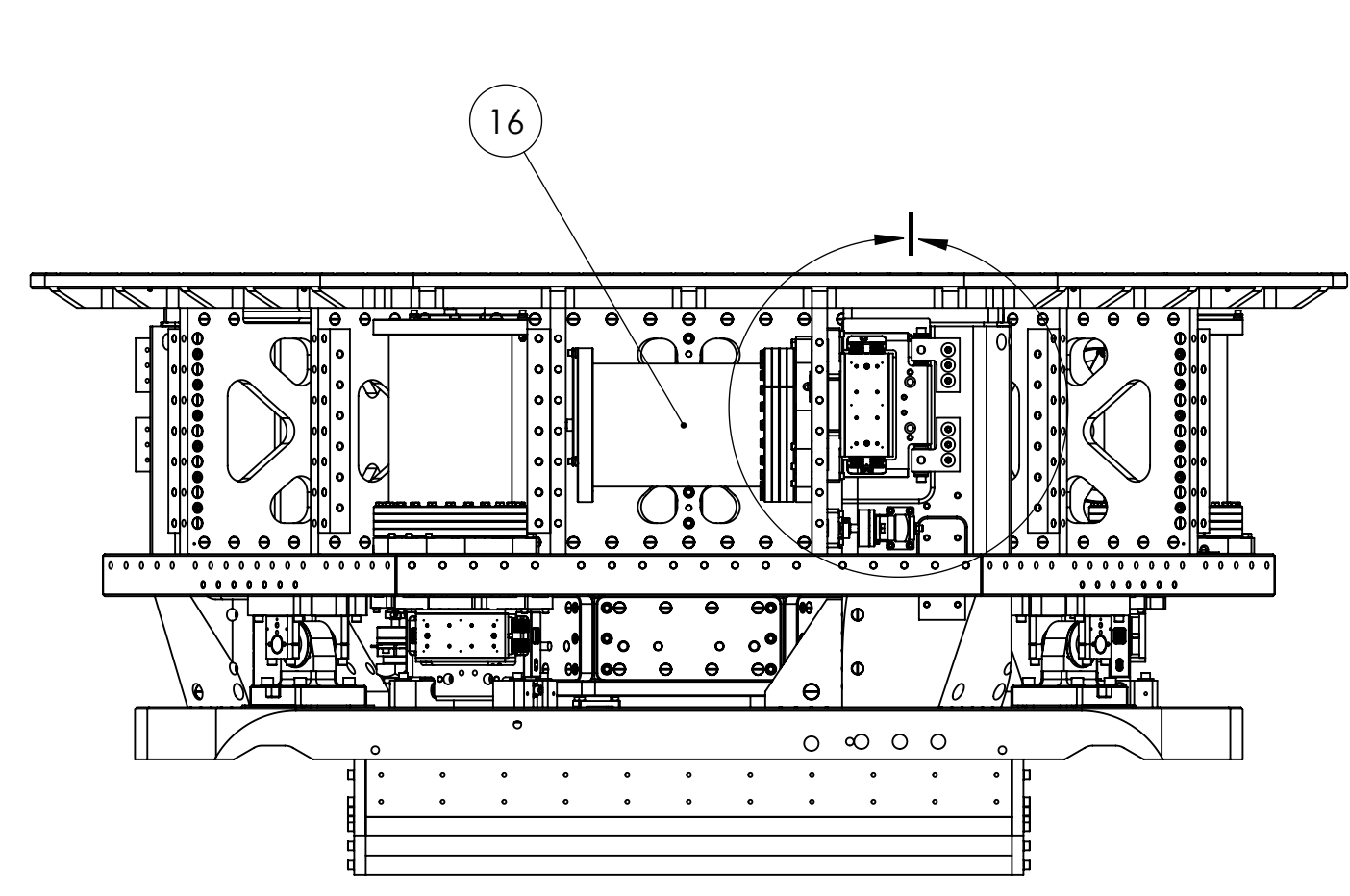
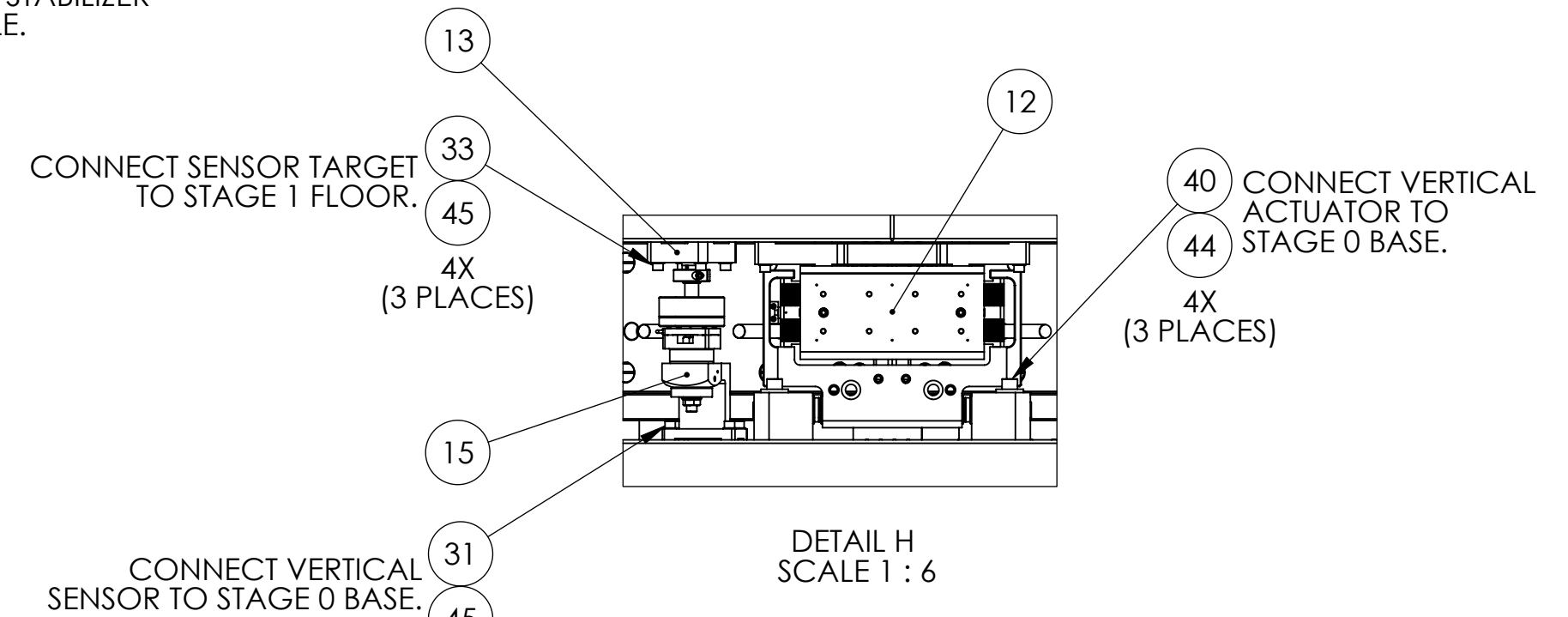
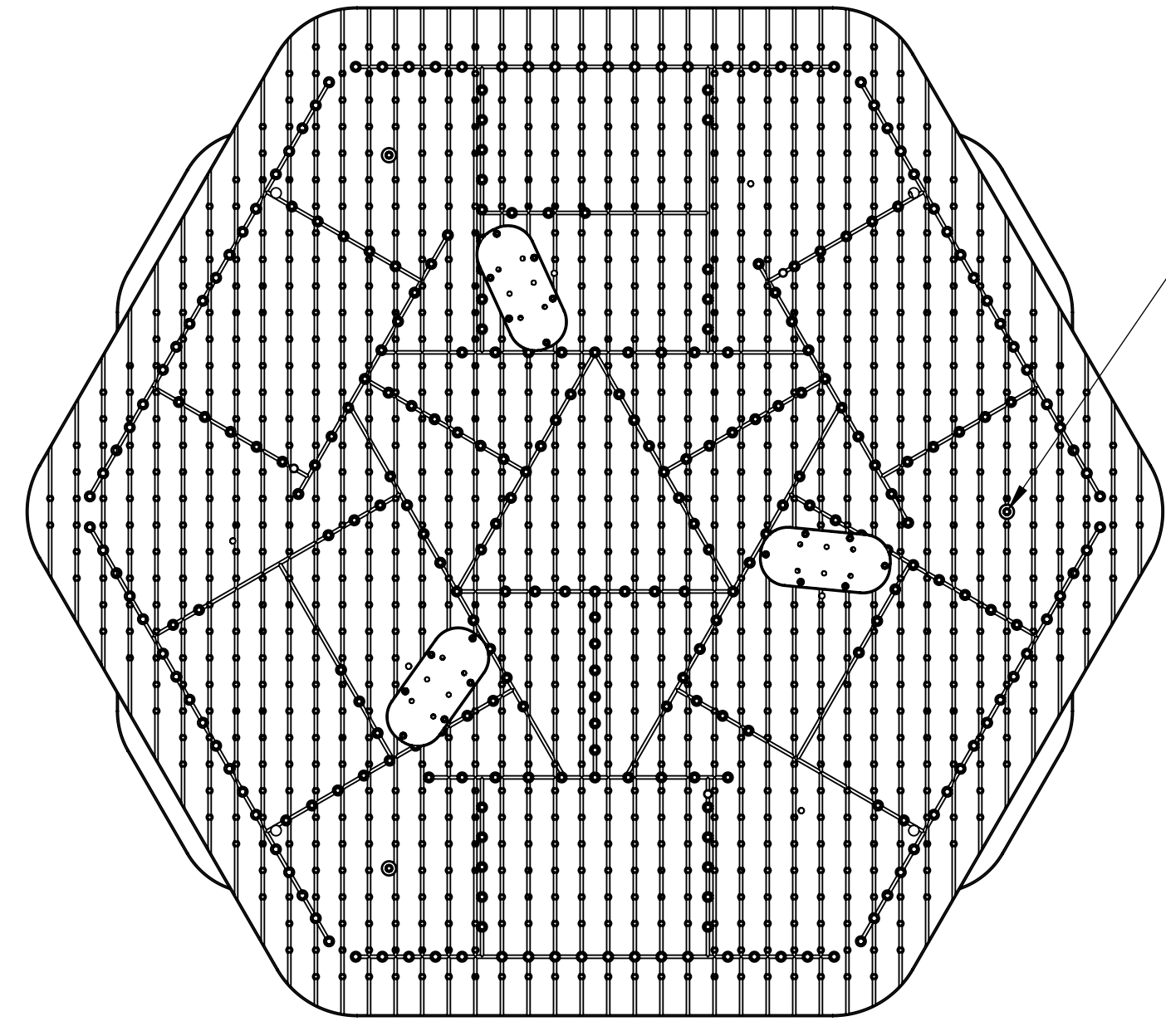
SHEET **2** OF **4** DATE PRINTED: **3/18/2008** C

THIS PRINT & ITS RELATED MODEL ARE THE DOCUMENTATION OF RECORD. UNLESS OTHERWISE SPECIFIED, ALL FEATURES MUST CONFORM TO 010 TOTAL WIDE PROFILE OF A SURFACE. INTERPRET DWG PER ASME Y14.5M 1994

REVISION HISTORY				
REV	DATE	ECO	APPROVAL	DESCRIPTION
-	-	-	-	See Sheet 1



- NOTES:
- SEE E070154 (ADVANCED LIGO SINGLE STAGE HAM VIBRATION ISOLATION TABLE ASSEMBLY PROCEDURE) FOR ADDITIONAL ASSEMBLY NOTES AND REQUIREMENTS.
 - USE CAPTIVE SCREWS (D071136) IN ACTUATOR AND GS-13 ASSEMBLIES, TO MOUNT THESE COMPONENTS TO STAGE 1.
 - USE HORIZONTAL GS-13 INSTALL FIXTURE (D071496) TO AID INSERTION OF HORIZONTAL GS-13.



BILL OF MATERIALS								
ITEM NO.	SPRINGS LOADED/ QTY.	OPTICAL TABLE MOUNTED/ QTY.	ACTUATORS AND SENSORS/ QTY.	COMPLETE ASM/ QTY.	PART NUMBER	DESCRIPTION	CONFIG DESCRIPTION	MATERIAL
1	1	1	1	1	D071410	ASM, STAGE 0	-	See BOM
2	1	1	1	1	D071421	ASM, STAGE 1 PRE-ASM	-	See BOM
3	3	3	3	3	D071430	ASM, SPRING AND FLEXURE	-	See BOM
4	3	0	0	0	D071500	ASM, SPRING TENSIONER	-	See BOM
5	6	0	0	0	D071321	SPRING TENSION BUSHING	-	PTFE
6	8	8	8	0	D071141	SHIM	.125" THICK	304 SS
7	0	0	0	8	D071141	SHIM	.120-.130	304 SS
8	0	3	3	3	D071072	RIB, TAN, FLEXURE MID COVER	-	6061-T6
9	0	1	1	1	D071050	OPTICAL TABLE SPRING HATCH, OPTICS TABLE	-	6061-T6
10	0	3	3	3	D071067	ASM, ACTUATOR	HORIZONTAL	See BOM
11	0	0	3	3	D071442	ASM, ACTUATOR	VERTICAL	See BOM
12	0	0	3	3	D071442	ASM, ACTUATOR	VERTICAL	See BOM
13	0	0	6	6	D071463	ASM, POSITION SENSOR TARGET	-	See BOM
14	0	0	3	3	D071464	ASM, POSITION SENSOR	HORIZONTAL	See BOM
15	0	0	3	3	D071464	ASM, POSITION SENSOR	VERTICAL	See BOM
16	0	0	3	3	D071470	ASM, GS-13 WITH FIXTURES	HORIZONTAL	See BOM
17	0	0	3	3	D071470	ASM, GS-13 WITH FIXTURES	VERTICAL	See BOM
18	0	0	0	3	D071057	OUTER WALL, HORIZ GS-13	-	6061-T6
19	0	0	0	3	D071058	OUTER WALL, FLEXURE ACCESS	-	6061-T6
20	0	0	0	9	D071427	ASM, OUTER WALL, SMALL PANEL	-	See BOM
21	0	0	0	6	D071060	OUTER WALL, BRACKET 120	STAGE 1 BRACKET (LONG)	6061-T6
22	0	0	0	8	D071255	WIRING BREADBOARD, LARGE	-	6061-T6
23	0	66	66	66	D071250	BARREL NUT	3/8"-1.6x.75"L	6061-T6
24	0	303	303	303	D071250	BARREL NUT	3/8"-1.6x1.0"L	6061-T6
25	0	0	0	108	D071250	BARREL NUT	3/8"-1.6x1.3"L Ret.	6061-T6
26	3	3	3	3	D071251	GANG BARREL NUT	3x 1/2"-13 (spaced 2.5")	17-4 PH H1150
27	3	3	3	3	D071251	GANG BARREL NUT	4x 1/2"-13 (spaced 2.5")	17-4 PH H1150
28	21	21	21	21	MCMMASTER 98253A499	HHCS	1/2"-13x3.0", FULL THREAD	A286
29	0	18	18	18	HOLOKROME 78056	SHCS	1/4"-20x.625"	18-8 SS
30	0	0	0	16	HOLOKROME 78058	SHCS	1/4"-20x.75"	18-8 SS
31	0	0	24	24	HOLOKROME 78060	SHCS	1/4"-20x.875"	18-8 SS
32	0	48	48	48	HOLOKROME 78062	SHCS	1/4"-20x1.0"	18-8 SS
33	0	0	24	24	HOLOKROME 78066	SHCS	1/4"-20x1.5"	18-8 SS
34	0	0	18	18	MCMMASTER 92196A551	SHCS	1/4"-20x2.25"	18-8 SS
35	24	0	0	0	HOLOKROME 78098	SHCS	3/8"-1.6x1.0"	18-8 SS
36	18	18	18	18	HOLOKROME 78100	SHCS	3/8"-1.6x1.25"	18-8 SS
37	0	0	3	87	HOLOKROME 78102	SHCS	3/8"-1.6x1.5"	18-8 SS
38	0	177	177	540	HOLOKROME 78104	SHCS	3/8"-1.6x1.75"	18-8 SS
39	0	0	3	3	MCMMASTER 92196A633	SHCS	3/8"-1.6x2.25"	18-8 SS
40	0	0	12	12	HOLOKROME 78108	SHCS	3/8"-1.6x2.5"	18-8 SS
41	16	16	16	16	MCMMASTER 92196A722	SHCS	1/2"-13x2.5"	18-8 SS
42	0	0	18	18	MCMMASTER 90313A205	FENDER WASHER	.266"IDx.875"ODx.063"	18-8 SS
43	0	0	6	6	MCMMASTER 92141A051	FLAT WASHER	.406"IDx1.00"ODx.050"	18-8 SS
44	0	0	12	12	MCMMASTER 98370A021	FENDER WASHER	.406"IDx1.00"ODx.123"	18-8 SS
45	0	66	114	130	UCC WFV-25	VENTED WASHER	.255"IDx.468"OD	18-8 SS
46	42	195	195	642	UCC WFV-38	VENTED WASHER	.39"IDx.625"OD	18-8 SS
47	37	37	37	37	UCC WFV-50	VENTED WASHER	.515"IDx.875"OD	18-8 SS
48	0	0	0	216	MCMMASTER 98408A152	E-STYLE RETAINING RING	3/4" SHAFT DIA	15-7 MO PH SS

PRIOR P/N: **p06109-400-0**

APPROVALS: _____ DATE: _____

MANUFACTURING: _____

QUALITY: _____

MATL: **See BOM**

FINISH: **See BOM**

High Precision Devices
1668 Valtec Lane, Suite C, Boulder, Colorado 80301
Phone: (303) 447-2558 Fax: (303) 447-2548 Web Site: www.hpd-online.com

DESCRIPTION: **HAM ISOLATION TABLE**

P/N: **D071400** CONFIG DESC: **ACTUATORS & SENSORS IN**

FILE NAME: D071400-C HAM Isolation Table

FOLDER: _____

SCALE: **1:12** DRAWN BY: **A. STEIN**

SHEET **3** OF **4** DATE PRINTED: **3/18/2008**

UNLESS OTHERWISE SPECIFIED:
DIMENSIONS ARE IN INCHES
DECIMAL TOLERANCES:
XX ±.015 XXX ±.005
ANG TOL: ±1° SURFACE ROUGHNESS: 43

INTERNAL AND EXTERNAL INTERSECTIONS SHALL BE UNIFORMLY FINISHED WITH A CHAMFER .005/.010 X 45° OR RADIUS .005/.010.
CHAMFER ALL THREADED HOLES 110% OF MAJOR DIAMETER X 45°

THIS PRINT & ITS RELATED MODEL ARE THE DOCUMENTATION OF RECORD. UNLESS OTHERWISE SPECIFIED, ALL FEATURES MUST CONFORM TO 010 TOTAL WIDE PROFILE OF A SURFACE. INTERPRET DWG PER ASME Y14.5M 1994

