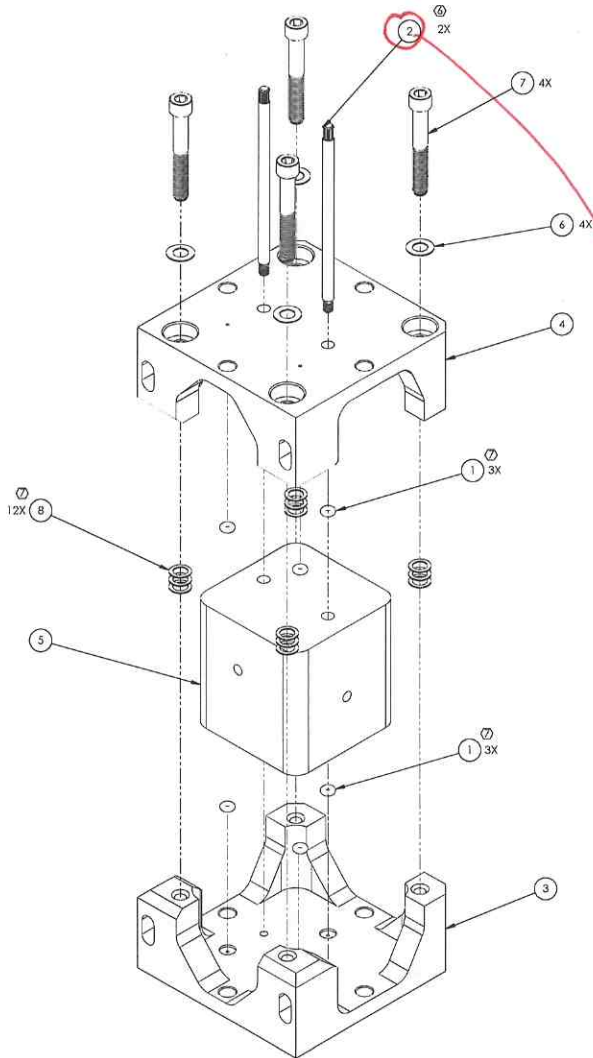


NOTES CONTINUED:

③ SCRIBE, ENGRAVE (A VIBRATORY TOOL MAY BE USED), LASER MARK, OR MECHANICALLY STAMP (NO INKS OR DYES) DRAWING PART NUMBER, REVISION (AND VARIANT OR TYPE # APPLICABLE) ON NOTED SURFACE OF PART FOLLOWED ON THE NEXT LINE WITH A THREE DIGIT SERIAL NUMBER. SERIAL NUMBERS START AT 001 FOR THE FIRST ARTICLE AND PROCEED CONSECUTIVELY. USE MINIMUM 0.12" HIGH CHARACTERS, UNLESS THE SIZE OF THE PART DICTATES SMALLER CHARACTERS. EXAMPLE: DXXXXXXAVY, TYPE-XX, 3/N XXX.

④ REMOVE LOCING PINS, ITEM 8, AFTER INSTALLATION ONTO STRUCTURE.

⑤ ADJUST QUANTITY OF WASHERS, ITEM 6 TO ACHIEVE ~10% COMPRESSION OF O-RINGS, ITEM 7.



① REFER TO
D1100057
ASSEMBLY INSTRUCTIONS

② LOCK PINS
FOR ASSEMBLY,
TRANSPORT &
INSTALL ONLY
(MUST BE
REMOVED PRIOR
TO USE)

SEE SHEET 2 FOR SPECIFIC STRUCTURE CONFIGURATIONS AND CLAMPS/MOUNTING PLATES

BASIC VERTICAL CONFIGURATION

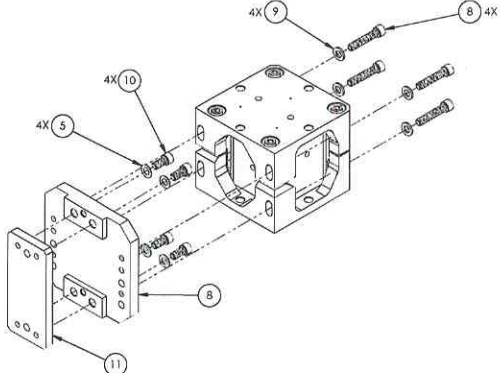
ITEM NO.	PART NUMBER	DESCRIPTION	MATERIAL	REQ	SPARE	TOTAL
8	MCMMASTER_93574A 513	washer 0.375" od, 0.253" id, 0.02" thck	18-8 SS1L	12		12
7	92200A548	SCREW, SHC, 1/4-20 x 1.374, MS16995-65, MC #92200A548	18-8 SS1L	4		4
6	MCMMASTER_99945A 760	Washer .47 od x .26 id x .02-.04 thk	18-8 SS1L	4		4
5	D1002427	Mass for the SEI vibration absorber 5 Lb	304, 316 OR 302 SS1L	1		1
4	D1002426	Top Clamp for the SEI vibration absorber 5 Lb version	6061-T6 Al	1		1
3	D1002425	VIBRATION ABSORBER, 5LB CLAMP BASE	6061-T6 Al	1		1
2	D1002347	PIN, LOCKING, VIBRATION ABSORBER	304 SS1L	2		2
1	ASS548-102	ASS548-102 VITON O-RING	VITON	6		6

NOTES AND TOLERANCES: (UNLESS OTHERWISE SPECIFIED)	
1. INTERPRET DRAWING PER ASME Y14.5-1994.	
2. REMOVE ALL SHARP EDGES, R.02 MIN.	
3. DO NOT SCALE FROM DRAWING.	
4. ALL MACHINING FLUIDS MUST BE FULLY SYNTHETIC, FULLY WATER SOLUBLE AND FREE OF SULFUR, SILICONE, AND CHLORINE.	
DIMENSIONS ARE IN INCHES	
TOLERANCES:	
.XX ± .01	
.XXX ± .005	
ANGULAR ± 0.5°	
MATERIAL	N/A
FINISH	N/A μinch

CALIFORNIA INSTITUTE OF TECHNOLOGY MASSACHUSETTS INSTITUTE OF TECHNOLOGY	
SYSTEM	ADVANCED LIGO
SUB-SYSTEM	SUS
NEXT ASSY	

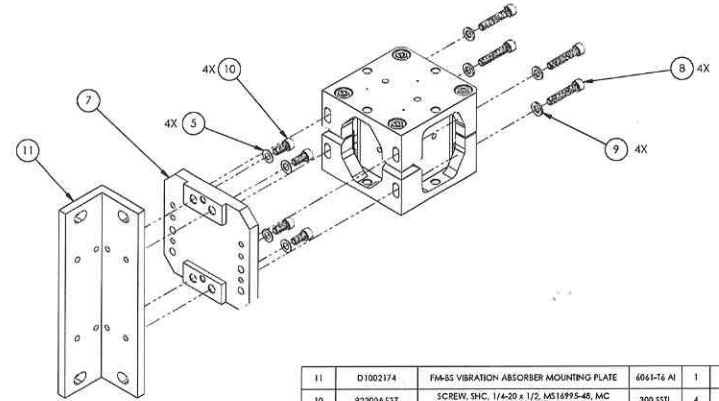
PART NAME		VIBRATION ABSORBER ASSEMBLY			
DESIGNER	K. BUCHLAND	DATE	15 SEPT 2010	SIZE	DWG. NO.
DRAWER	K. BUCHLAND		15 SEPT 2010		D1002424
CHECKER	F. MARCIPIRELLI		5 OCT 2010		v2
APPROVAL	C. TORRE		5 OCT 2010	SCALE: 1:1	PROJECTION:
		SHEET 1 OF 3			

DISCRETION, REVISION, SUPPLEMENT, AND VARIATION, WITH OR WITHOUT PART NUMBER, ARE SUBJECT TO THE DISCRETION OF THE DRAWING OFFICE.



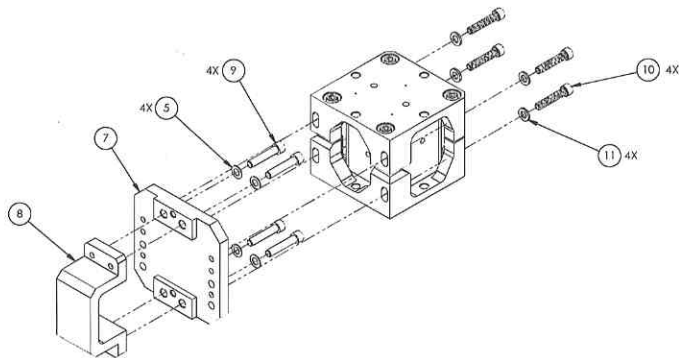
ITEM NO.	PART NUMBER	DESCRIPTION	MATERIAL	REQ	SPARE	TOTAL
11	D1002041	OMC VIBRATION ABSORBER MOUNTING PLATE	6061-T6 Al	1		1
10	92200A537	SCREW, SHC, 1/4-20 x 1/2, MS16995-48, MC #92200A537	300 S5TL	4		4
9	MCMASTER_90945A761	Washer .47 od x .26 id x .06-.07 thk	18-8 S5TL	4		4
8	92200A544	SCREW, SHC, 1/4-20 x 1 1/4, MS16995-53, MC #92200A544	300 S5TL	4		4
7	D100895	Plate 2 for SEI Vibration absorber 5 Lb version	6063-T6	1		1
5	MCMASTER_90945A760	Washer .47 od x .26 id x .02-.04 thk	18-8 S5TL	4		4
4	92200A548	SCREW, SHC, 1/4-20 x 1 3/4, MS16995-55, MC #92200A548	18-8 S5TL	4		0
PARTS LIST						

OMC CONFIGURATION



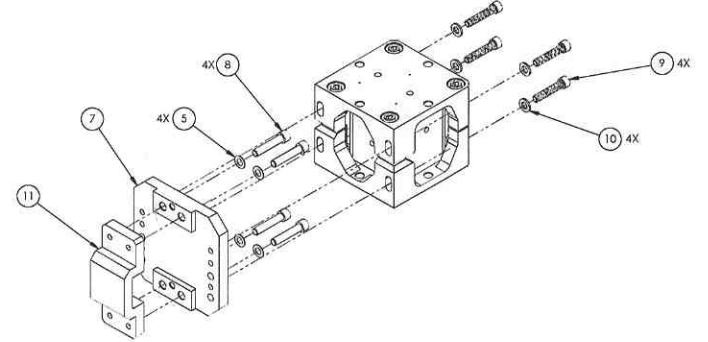
ITEM NO.	PART NUMBER	DESCRIPTION	MATERIAL	REQ	SPARE	TOTAL
11	D1002174	FM/BS VIBRATION ABSORBER MOUNTING PLATE	6061-T6 Al	1		1
10	92200A537	SCREW, SHC, 1/4-20 x 1/2, MS16995-48, MC #92200A537	300 S5TL	4		4
9	MCMASTER_90945A761	Washer .47 od x .26 id x .06-.07 thk	18-8 S5TL	4		4
8	92200A544	SCREW, SHC, 1/4-20 x 1 1/4, MS16995-53, MC #92200A544	300 S5TL	4		4
7	D100895	Plate 2 for SEI Vibration absorber 5 Lb version	6063-T6	1		1
5	MCMASTER_90945A760	Washer .47 od x .26 id x .02-.04 thk	18-8 S5TL	4		4
4	92200A548	SCREW, SHC, 1/4-20 x 1 3/4, MS16995-55, MC #92200A548	18-8 S5TL	4		0
PARTS LIST						

FM/BS CONFIGURATION



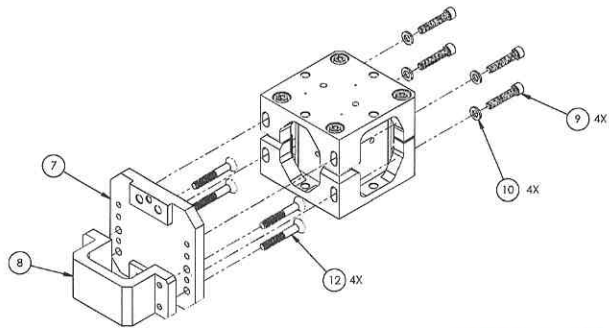
ITEM NO.	PART NUMBER	DESCRIPTION	MATERIAL	REQ	SPARE	TOTAL
11	MCMASTER_90945A761	Washer .47 od x .26 id x .06-.07 thk	18-8 S5TL	4		4
10	92200A544	SCREW, SHC, 1/4-20 x 1 1/4, MS16995-53, MC #92200A544	300 S5TL	4		4
9	MCMASTER_92196A540	SHCS, 1/4-20 x 1.75" [1" to Fully Threaded]	AL61304	4		4
8	D1001040	CLAMP, VIBRATION ABSORBER, HLTS	6061-T6 Al	1		1
7	D100895	Plate 2 for SEI Vibration absorber 5 Lb version	6063-T6	1		1
5	MCMASTER_90945A760	Washer .47 od x .26 id x .02-.04 thk	18-8 S5TL	4		4
4	92200A548	SCREW, SHC, 1/4-20 x 1 3/4, MS16995-55, MC #92200A548	18-8 S5TL	4		0
PARTS LIST						

HLTS CONFIGURATION



ITEM NO.	PART NUMBER	DESCRIPTION	MATERIAL	REQ	SPARE	TOTAL
11	D1001059	CLAMP, VIBRATION ABSORBER, HSTS	6061-T6 Al	1		1
10	MCMASTER_90945A761	Washer .47 od x .26 id x .06-.07 thk	18-8 S5TL	4		4
9	92200A544	SCREW, SHC, 1/4-20 x 1 1/4, MS16995-53, MC #92200A544	300 S5TL	4		4
8	MCMASTER_92196A540	SHCS, 1/4-20 x 1.75" [1" to Fully Threaded]	AL61304	4		4
7	D100895	Plate 2 for SEI Vibration absorber 5 Lb version	6063-T6	1		1
5	MCMASTER_90945A760	Washer .47 od x .26 id x .02-.04 thk	18-8 S5TL	4		4
4	92200A548	SCREW, SHC, 1/4-20 x 1 3/4, MS16995-55, MC #92200A548	18-8 S5TL	4		0
PARTS LIST						

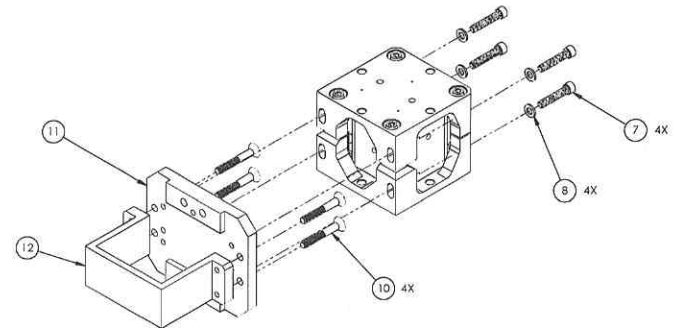
HSTS CONFIGURATION



NOTE 82° FHS

ITEM NO.	PART NUMBER	DESCRIPTION	MATERIAL	REQ	SPARE	TOTAL
12	92210A548	1/4-20 x 1 3/4 82 deg FHS	16-8 S5TL	4		0
10	MCMaster_90945A761	Washer .47 od x .26 kd x .06-.07 lth	16-8 S5TL	4		0
9	92200A544	SCREW, SHC, 1/4-20 x 1 1/4, MS14995-63, MC #92200A544	300 S5TL	4		0
8	D1001060	CLAMP, VIBRATION ABSORBER, HLTS	6061-T6 Al	1		0
7	D1000895	Plate 2 for SEI Vibration absorber 8 Lb version	6063-T6	1		0
PARTS LIST						

LOWER QUAD CONFIGURATION



NOTE 82° FHS

ITEM NO.	PART NUMBER	DESCRIPTION	MATERIAL	REQ	SPARE	TOTAL
12	D1002897	CLAMP, VIBRATION ABSORBER, UPPER QUAD	6061-T6 Al	1		0
11	D1002894	UPPER QUAD VIBRATION ABSORBER MOUNTING PLATE	6061-T6 Al	1		0
10	92210A548	1/4-20 x 1 3/4 82 deg FHS	16-8 S5TL	4		0
8	MCMaster_90945A761	Washer .47 od x .26 kd x .06-.07 lth	16-8 S5TL	4		0
7	92200A544	SCREW, SHC, 1/4-20 x 1 1/4, MS14995-63, MC #92200A544	300 S5TL	4		0
PARTS LIST						

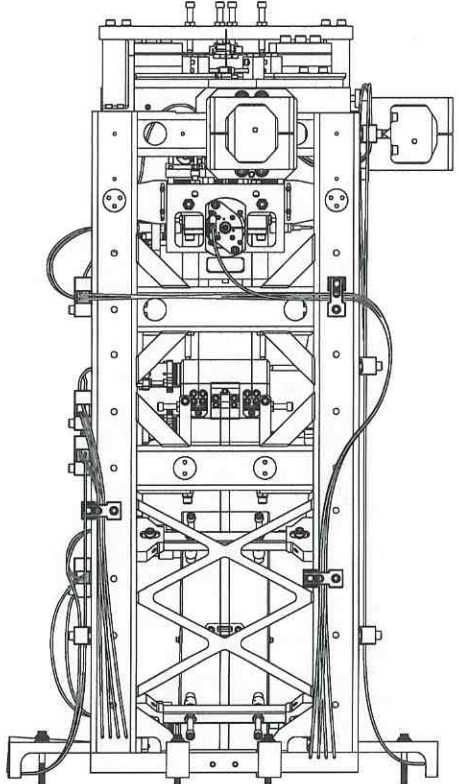
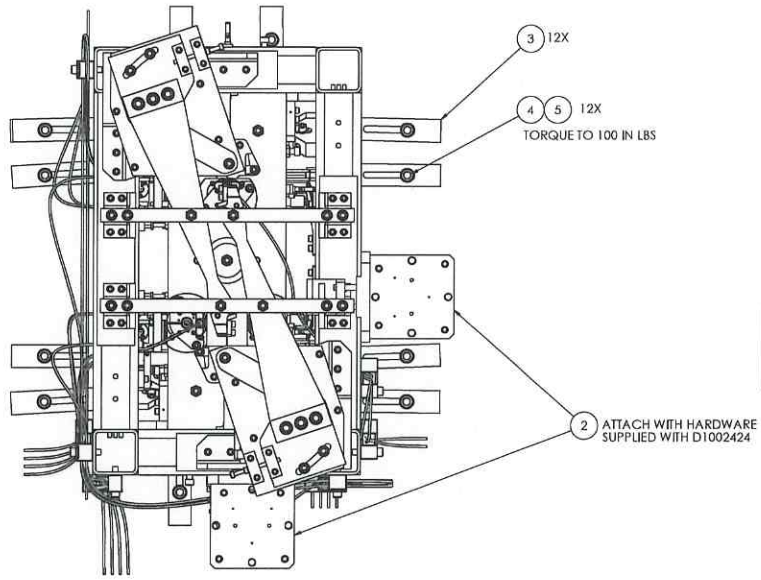
UPPER QUAD & TMS CONFIGURATION

REV.	DATE	DCN #	DRAWING TREE #
V1	10 AUG 2011	-	-
V6	07 DEC 2011	-	-
-	-	-	-

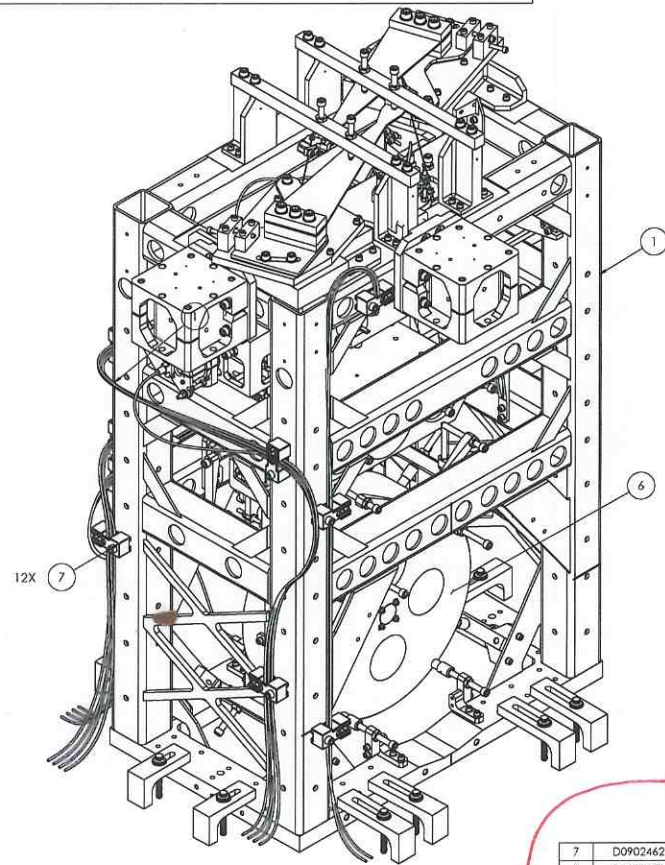
TABLE 1: HAM2-L1 PR3 CABLING SPECIFICATIONS, FROM/TO DES.

ROUTE NO.	FROM OSEM POSITION	TO CB FLOOR DES.	QP LEG DES.	CABLE PART NO.	NOM. CABLE LENGTH (IN)
1	BOT-UL	CB-1 (SECOND)	A	D1000234	78
	BOT-LL		B		
	BOT-UR		C		
	BOT LR		D		
2	(INT.) MID-UL	CB-1 (FIRST)	A	D1000234	60
	(INT.) MID-LL		B		
	(INT.) MID-UR		C		
	(INT.) MID-LR		D		
3	TOP 3	CB-2 (FIRST)	A	D1000234	66
	LEFT (N)		B		
	RIGHT (S)		C		
	SIDE (S)		D		
4	TOP 1	CB-2 (SECOND)	C	D1000234	78
	TOP 2		D		

NOTE: ROUTE NO. 4 IS A SHARED CABLE, SEE D0900415 FOR QP LEGS 'A' AND 'B' ROUTING



SPACER: NOT REQUIRED



INSTALL
CONFIG
!E.
IN CHAMBER
(DOORS CLOSED)

LOCAL PINS REMOVING

LOCAL COORDINATES - REFERENCE

Xmm	Ymm	Zmm	YAW °
381.5	-172.17	-94.5	180.65°

REFER TO DRAWING D1101233 FOR HAM2-L1 INSTALLATION PLATE LAYOUT

ITEM NO.	PART NUMBER	DESCRIPTION	MATERIAL	QTY.
7	D0902462	CLAMP ASSY., UHV COMPATIBLE	N/A	12
6	D1101372	OPTICS ASSY., PR3 L1	N/A	1
5	2AL2.000-12SL	1/4-20 X 2.00 12PT BOLT	450SSTL	12
4	D1100785-530	NITRONIC WASHER, FLAT	N60	12
3	D1001374-02	HAM OPTICS TABLE DOG CLAMP	304SSTL	12
2	D1002424	VIBRATION ABSORBER ASSEMBLY	N/A	2
1	D070447	HLTS OVERALL ASSEMBLY	N/A	1

- SEE E1100109 FOR HAM SUSPENSION CONTROLS ARRANGEMENT.
- SEE SHEETS 4, 5, AND 6 FOR CABLE ROUTE DETAILS, AND CLAMP USAGE.
- FOR SYSTEM CABLING DIAGRAM, CABLE BRACKET LOCATION/ORIENTATION WRT. TO CHAMBER, & ROUTING LAYOUT SEE D1000581.

ADVANCED LIGO SUS D0900365

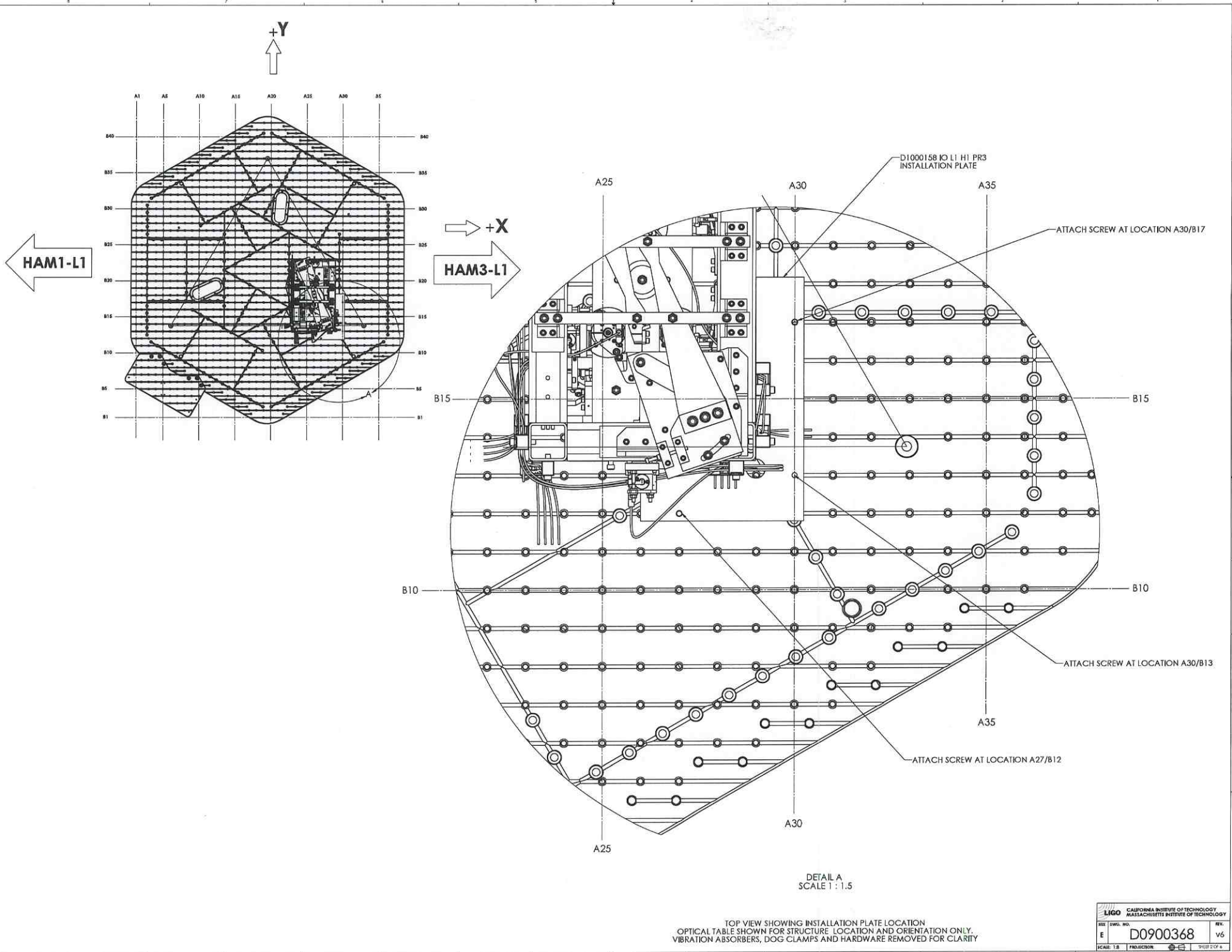
SCALE: 1:2

DATE: 12

PRODUCED:

REV: V6

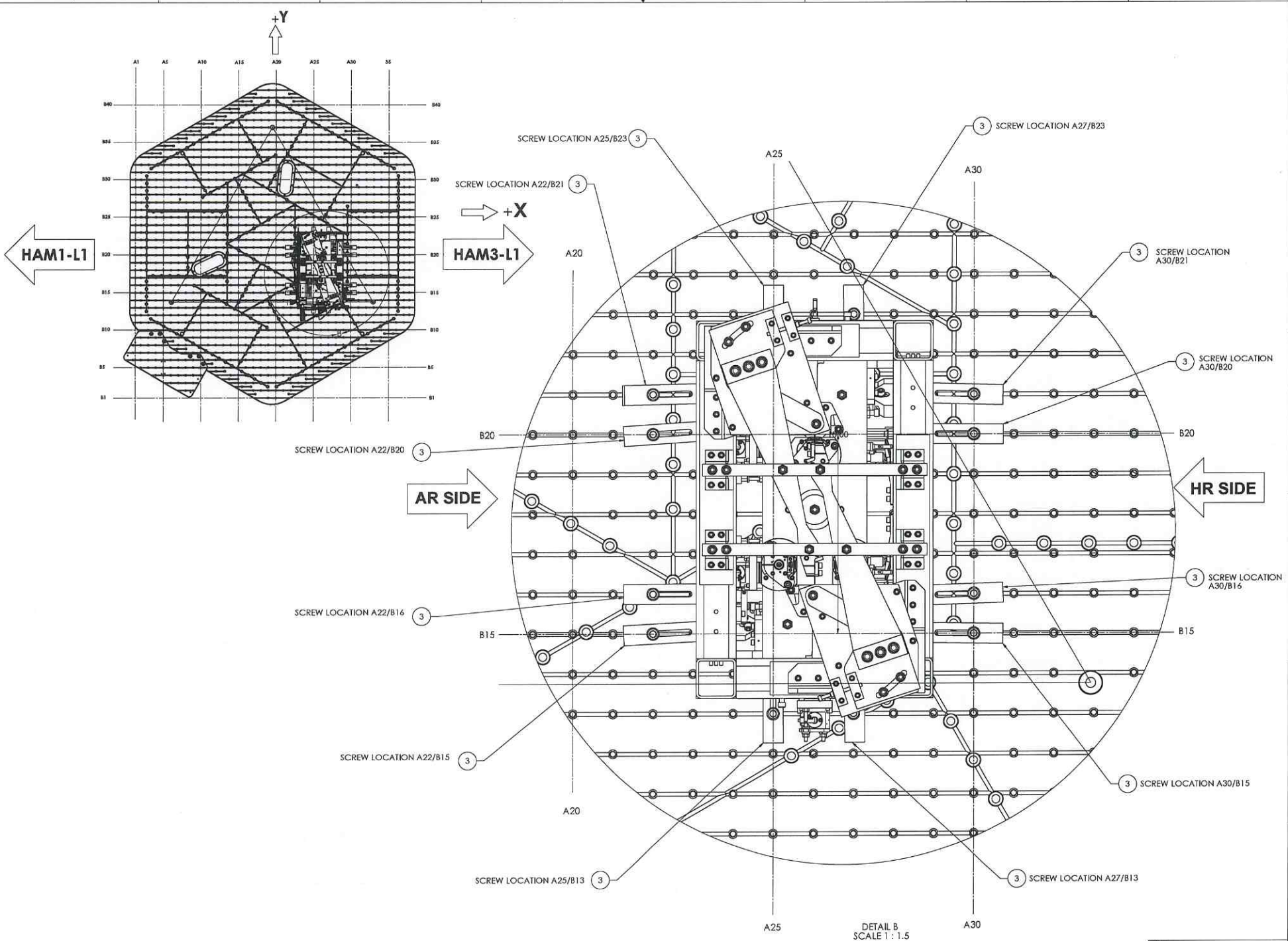
1 OF 6



TOP VIEW SHOWING INSTALLATION PLATE LOCATION
 OPTICAL TABLE SHOWN FOR STRUCTURE LOCATION AND ORIENTATION ONLY.
 VIBRATION ABSORBERS, DOG CLAMPS AND HARDWARE REMOVED FOR CLARITY

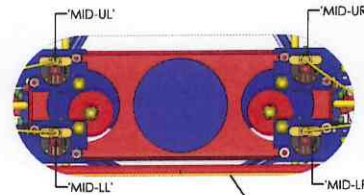
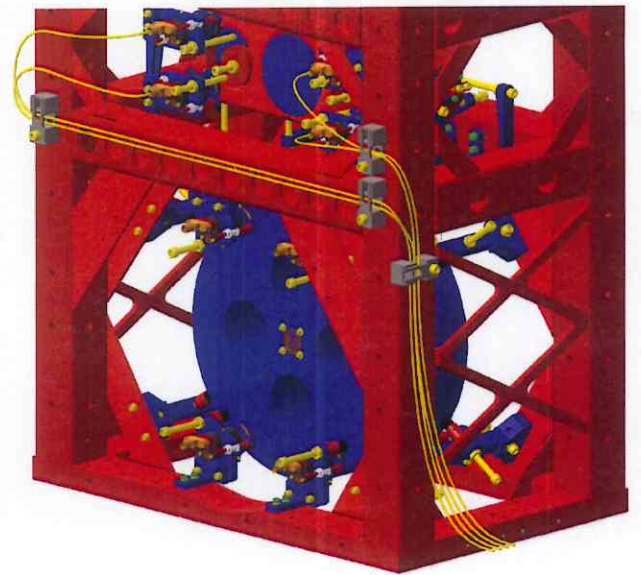
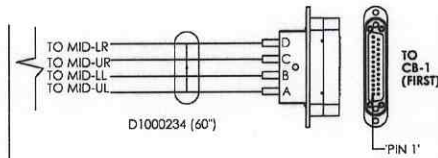
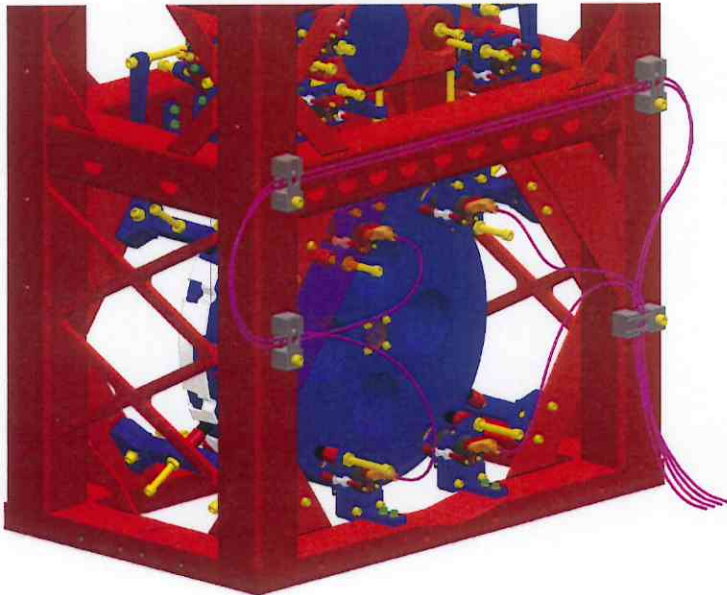
LIGO CALIFORNIA INSTITUTE OF TECHNOLOGY MASSACHUSETTS INSTITUTE OF TECHNOLOGY	
REV. DWG. NO.	REV.
E D0900368	V6
SCALE: 1:8 PROJECTION	SHEET 4 OF 4

DRAWING AUTOMATICALLY GENERATED BY LIGO L3D TO 2D CONVERSION TOOL (L3D TO 2D)

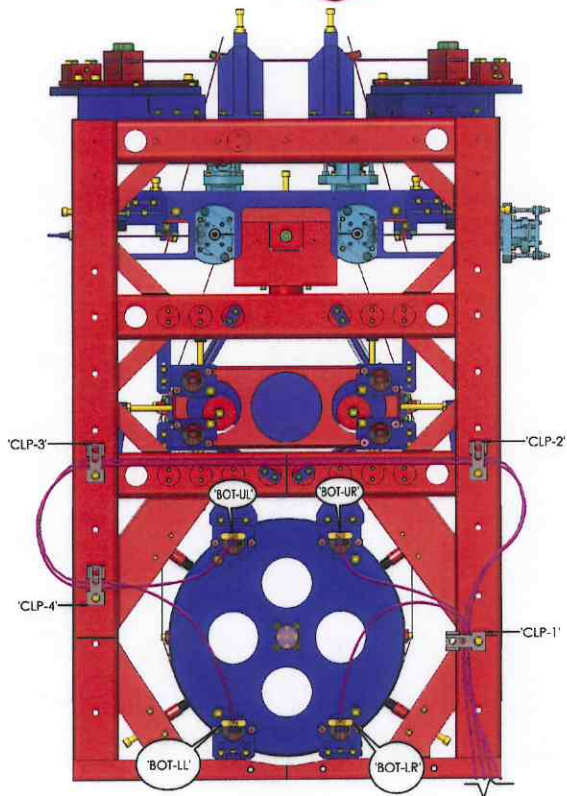


TOP VIEW SHOWING DOG CLAMP INSTALLATION.
 OPTICAL TABLE SHOWN FOR STRUCTURE AND DOG CLAMP LOCATIONS AND ORIENTATION ONLY.
 VIBRATION ABSORBERS REMOVED FOR CLARITY

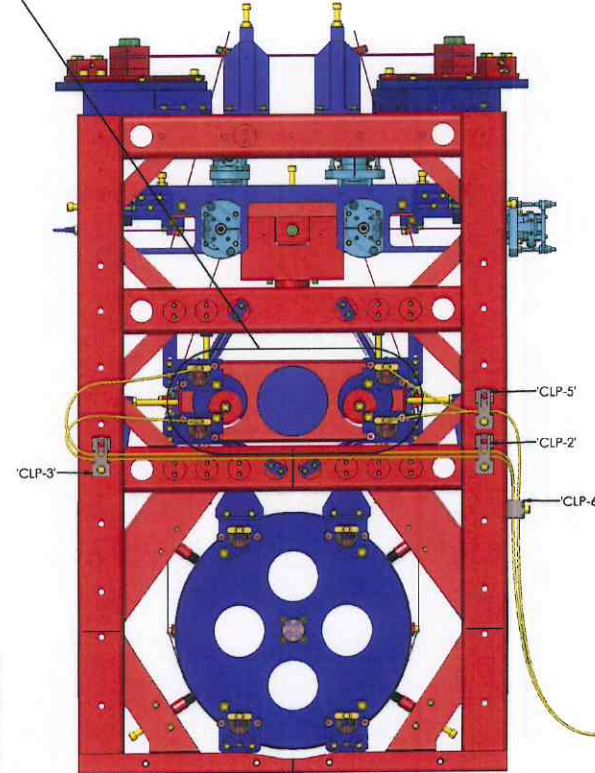
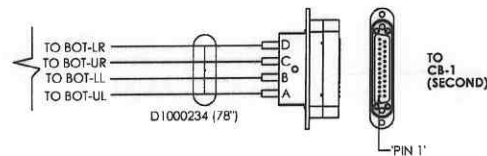
ORIGINAL LIGO DRAWING FILED IN LIGO ARCHIVE UNDER FILE NAME: D0900368.DWG



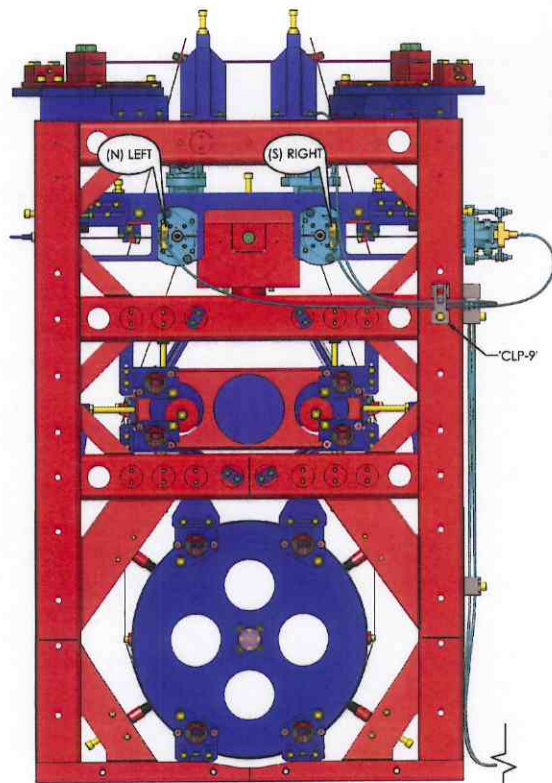
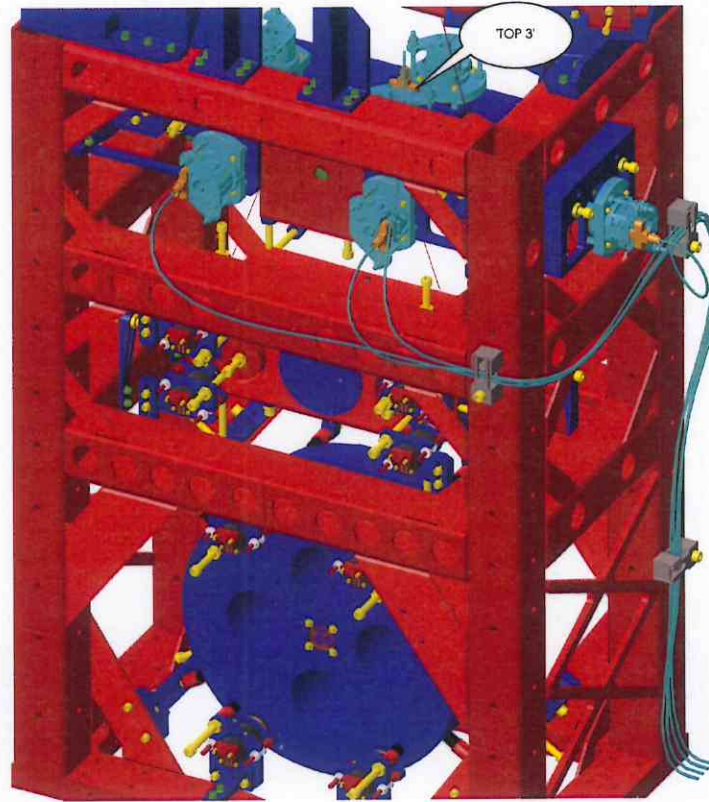
DETAIL C
SCALE 1:1.5



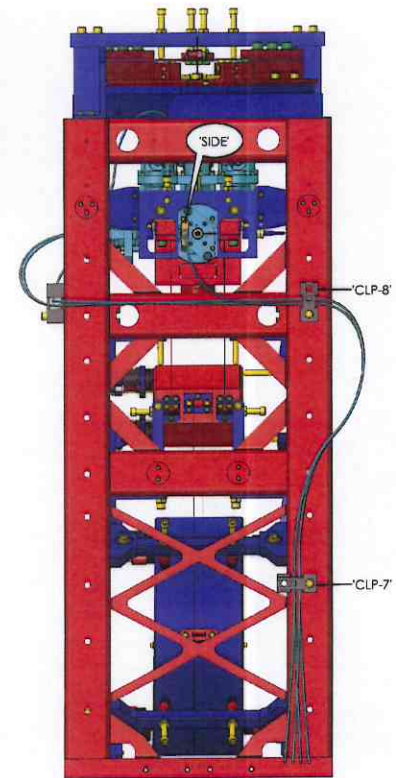
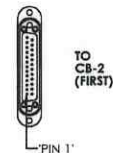
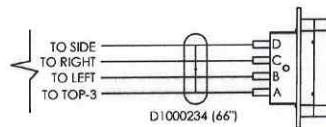
AR SIDE - REAR
ROUTE NO. 1
(END CONNECTORS, NOT SHOWN FOR CLARITY)



AR SIDE - REAR
ROUTE NO. 2
(END CONNECTORS, NOT SHOWN FOR CLARITY)



AR SIDE - REAR
ROUTE NO. 3
(END CONNECTORS, NOT SHOWN FOR CLARITY)

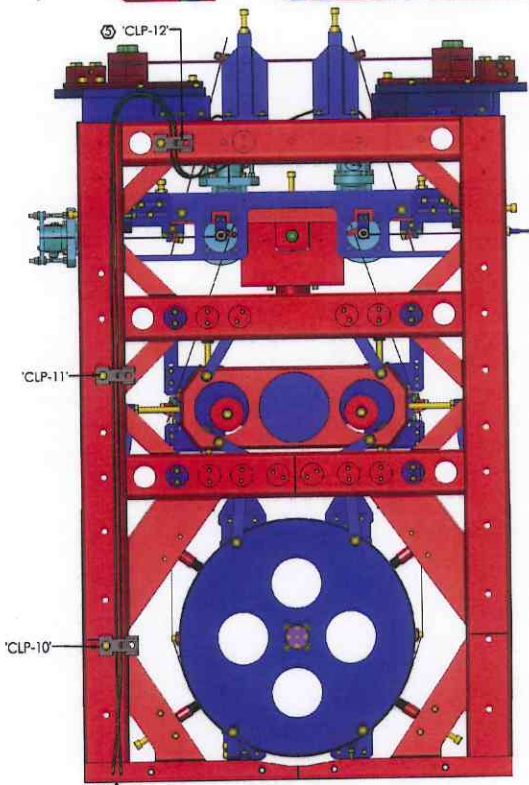
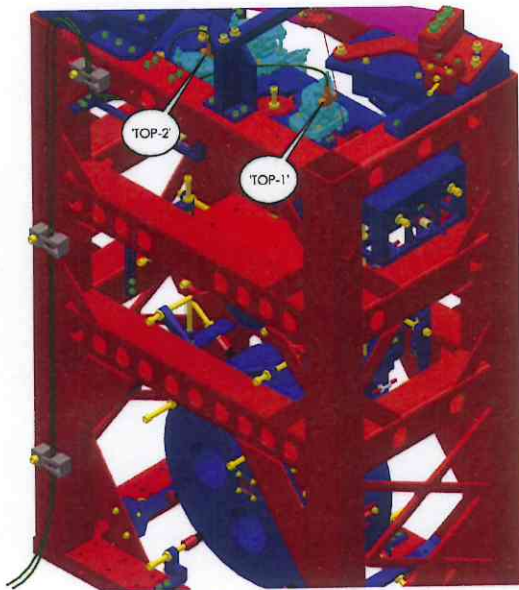


LEFT-SIDE
ROUTE NO. 3
(END CONNECTORS, NOT SHOWN FOR CLARITY)

SEE SHEET 1, TABLE 1; FOR CABLING SPECIFICATIONS.

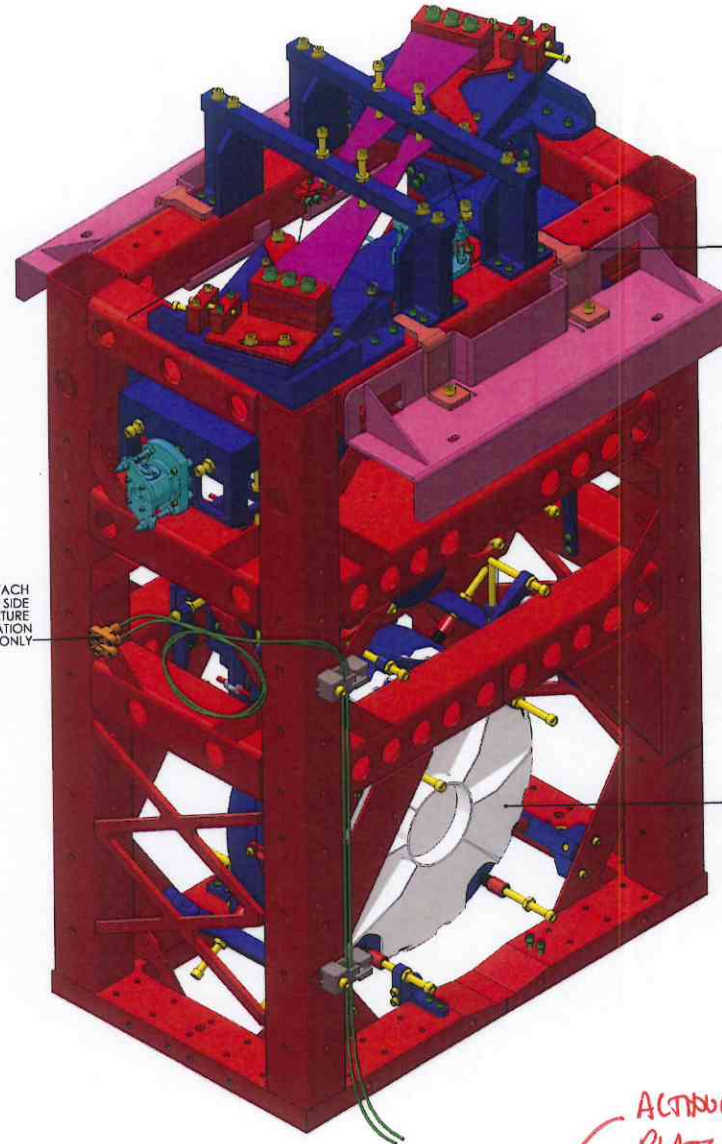
- ④ INDICATED ITEMS FOR TRANSPORTATION PURPOSES ONLY. AND ARE NOT PART OF FINISHED ASSEMBLY. SEE D1101674 FOR REFERENCE.
- ⑤ REMOVE INDICATED ITEM FOR TRANSPORTATION PURPOSES. BUNDLE CABLES AS SHOWN.

(SHARED)



FR SIDE - FRONT
ROUTE NO. 4
(SHARED)
(END CONNECTORS, NOT SHOWN FOR CLARITY)

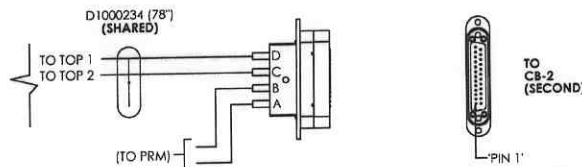
⑤ BUNDLE CABLES AND ATTACH AS SHOWN TO THE SIDE OF THE STRUCTURE FOR TRANSPORTATION PURPOSES ONLY



D1001791 ④
HLTS LIFT BRACKET CLAMP
QTY. 4

D1001790 ④
HLTS LIFT BRACKET
QTY. 2

D1101127 ④
HLTS OPTICS CAP
QTY. 1



HLTS STRUCTURE TRANSP.
VIBRATION ABSORBERS: NOTE SHOWN
(REMOVED FOR TRANSP. PURPOSES)

ONLY FACE
ABS. REMOVED

AS INDICATED WITH LIFT BRACKETS.

ALTHOUGH VIB. ABS.
PLATES SHOULD REMAIN
+ FOREND ABS. IT
CAN BE SHOWN IN PLACE
WITH LOCK PINS

LIGO CALIFORNIA INSTITUTE OF TECHNOLOGY MASSACHUSETTS INSTITUTE OF TECHNOLOGY	
REV. DRWG. NO. E	D0900368
SCALE: 1:8	PRODUCTION: [] SHEET 6 OF 7
	REV. V6



LIGO Laboratory / LIGO Scientific Collaboration

LIGO-T1100057-v1	<i>LIGO</i>	24 Jan 2011
<p>D1002424 Vibration Absorber Assembly Instructions</p>		
<p>Kurt Buckland</p>		

Distribution of this document:
LIGO Scientific Collaboration

This is an internal working note
of the LIGO Laboratory.

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LIGO Hanford Observatory
 P.O. Box 159
 Richland WA 99352
 Phone 509-372-8106
 Fax 509-372-8137

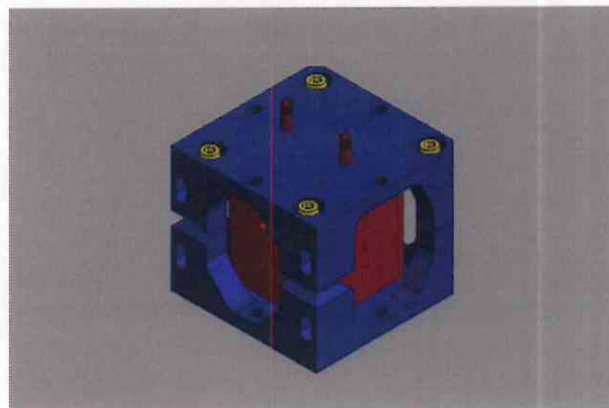
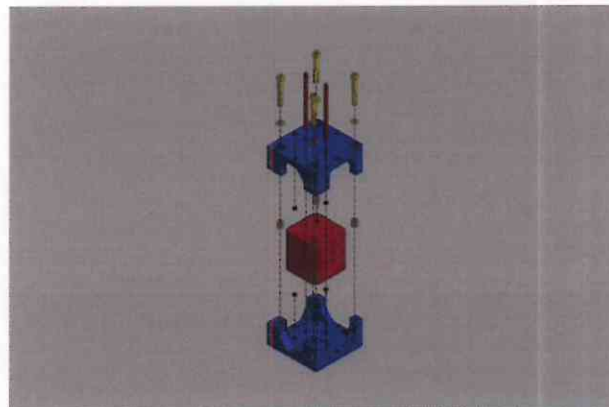
LIGO Livingston Observatory
 P.O. Box 940
 Livingston, LA 70754
 Phone 225-686-3100
 Fax 225-686-7189

<http://www.ligo.caltech.edu/>

1. Introduction

The purpose of this document is to describe the assembly process for the D1002424 Vibration Absorbers to yield an approximat 10% compression of the Viton® O-Rings. (See [D1002424](#) for component part numbers & BOM).

2. Vibration Absorber exploded and completed views

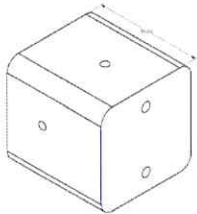


Related docs E1200009
 TESTING DOC, DCC # ?
 VIB. ABS. ASSEMBLY D1002424
 MINI VIB ABS - DCC # ??

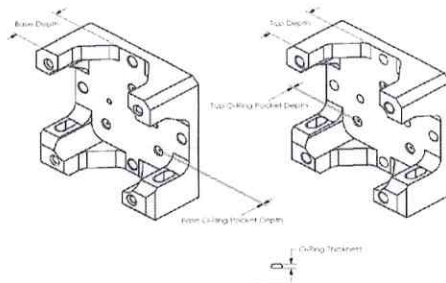
3. Step by step instructions

Step 1: Determine washer stack (can be determined by inspection report for each lot of parts)

Measure D1002427 Mass thickness



Measure D1002425 Clamp Base, D1002426 Clamp Top, O-Ring pocket depths and O-Ring thickness



Washer stack thickness=
Mass + 2x O-Ring thickness - 2x 10% O-Ring thickness - clamp base, clamp top, O-ring pocket thickness's.

Example:

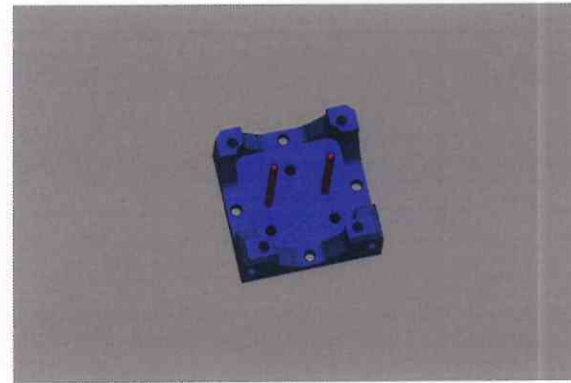
$$2.500 \text{ (mass)} + .206 \text{ (2x O-ring thickness)} - .021 \text{ (2x 10\% O-ring thickness)} - 1.273 \text{ (base)} - 1.273 \text{ (top)} - .040 \text{ (base pocket)} - .040 \text{ (top pocket)} = \underline{.059}$$

3

JEFF - DOES THIS STILL MATCH
YOUR LAB WORK?

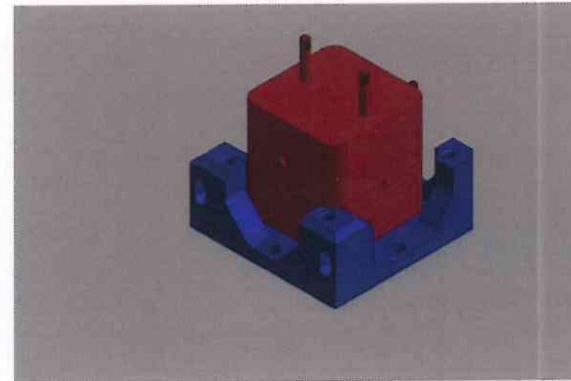
Step 2:

Install AS568-102 Viton O-Rings and D1002347 Locking Pins to D1002425 Clamp Base



Step 3:

Install D1002427 Mass and an additional locking pin or 3/16 dia pin to aid in flipping assembly over.

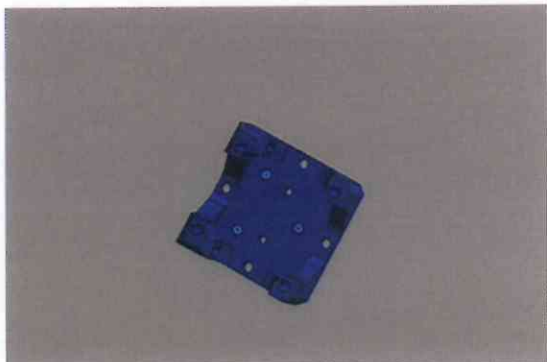


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LIGO

LIGO-T1100057-v1

Step 4:
Install AS568-102 Viton O-Rings onto D1002426 Clamp Top



Step 5:
Carefully turn over the clamp base with O-rings and pins using the extra, horizontal, pin to keep the mass down on the O-rings and install onto the top clamp.

Step 6:
Carefully turn the assembly over and remove the top clamp without moving the top clamp O-rings.

Step 7:
Place washer stacks over mounting holes.

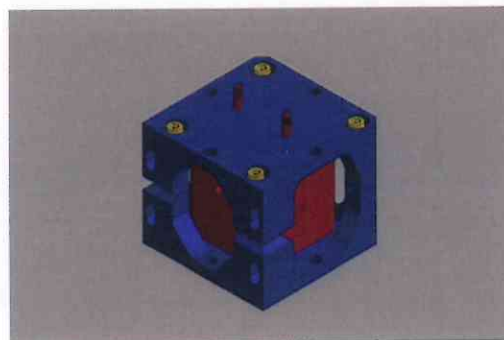


NOTE: DOWN WITH LOCK PINS
MUST BE REMOVED BY DOORS CLOSED

LIGO

LIGO-T1100057-v1

Step 8:
Re-install D1002526 Clamp Top and carefully add screws without moving washer stacks. Tighten screws.



ASSEMBLY
INSTALL
TRANSPORT
ONLY!

4. Structure mounting hardware

Once the basic vibration absorber is assembled, the following mounting plates and clamps are required to mount them to the various structures. (see D1002424 assembly drawing).

OMC Structure:

- D1000895 Mounting plate
- D1002081 Mounting plate

Lower Quad and HLTS Structures:

- D1000895 Mounting plate
- D1001060 Clamp

FM/BS Structure:

- D1000895 Mounting plate
- D1002174 Mounting plate

HSTS Structure:

- D1000895 Mounting plate
- D1001059 Clamp

Upper Quad and TMS Structures:

- D1002594 Mounting plate
- D1002597 Clamp

E1200009

NOTE NO LOCK PINS

Introduction

This document describes the B&K Modal testing of the Vibration Absorbers installed on various aLIGO suspension systems. This testing was performed at the LIGO Hanford Observatory by the aLIGO Suspension Assembly group, to ensure the units were assembled correctly, and to establish the resonance frequency and relative stiffness of each of the Vibration Absorber units.

The Vibration Absorbers were assembled in accordance with the Vibration Assembly Instructions (D1002424). For the Vibration Absorbers to function correctly, they need to have a 10% crush on the Viton O-Rings that the central mass sits upon. Following the guidelines set out in the assembly instructions, based on measurements, and testing performed at Hanford, it was determined that a single 0.060" shim (McMaster-Carr #97022A535) was best to set the gap between the top and bottom clamp. 50ip of torque was used on the 1/4-20 SHCS to secure the top and bottom clamps together.

1.0 B&K Modal System Setup

It is assumed that the reader has a working knowledge of the LIGO Contamination Control Policies (E0900047) and B&K Modal testing system and its setup. The Simple Hammer test configuration worked best for testing the Vibration Absorbers. The project, "Vib-Abs-Test-Setup.pls", has the configuration parameters used at Hanford to conduct these tests and can be used as a model for future testing.

1.1 Configure the B&K System:

1. Analyzer Setup Dialog
 - a. Set the frequency to 800 Lines and 800 Span.
 - b. Set the Averaging Mode to Linear.
2. Hammer Setup Dialog
 - a. Run the Trigger Level Setup. Note: A Trigger Level of 20N worked best.
 - b. Run Window Setup, making sure to set the Window Type to Uniform.
 - c. Press the Apply button to save the changes.
3. Response Setup Dialog
 - a. Set the Window Type to Uniform.
 - b. Run the Response View test and look for a uniform ring down.
 - c. Press the Apply button to save the changes.

The B&K system should now be ready to test the Vibration Absorbers.

1.2 Testing platform:

To ensure a true test of the Vibration Absorber's resonance frequency, the unit must be secured to stable surface that will not induce a resonance frequency near that of the Vibration Absorber. At Hanford, we used a Quad Dummy Test Mass (D060358) placed on an optics table. The Vibration Absorber was dog clamped to the mass for the test.

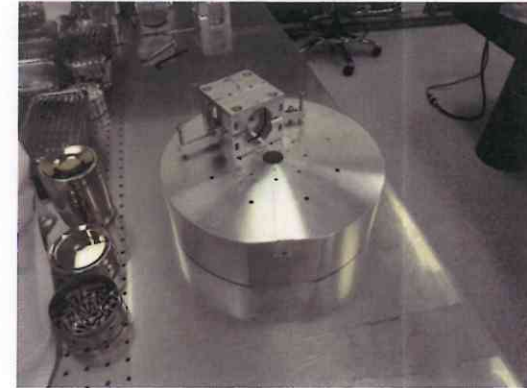


Figure 1: Vibration Absorber Test Bed

The accelerometer was attached to the Vibration Absorber using a custom fabricated mount.



Figure 2: Custom Accelerometer Mount

The long stud on the mount is put through the hole in the central mass perpendicular to the locking pins. The stud should be tight enough to keep the mount from moving. The accelerometer should be positioned with the Z-axis point upward and the Y-axis parallel to the top and bottom of the Vibration Absorber.

NEED TROUBLE SHOOT SECTION

I.E. WHAT TO DO IF VIB. ABS.

NOT PERFORMING — DURING HAMMER TESTS.

1. REMOVE & DIS-ASSEMBLE (FOLLOW T1100057) & RE-ASSEMBLE
2. TEST ON BENCH (INDIVIDUAL)

3. RE-STACK WABITERS / VITON AS REQUIRED

4. REPLACE VITON IF APPEARS "CRACKED" OR IF PROBLEMS PERSIST...



Figure 3: Vibration Absorber ready for test

2.0 Testing

With the B&K software configured, the Vibration Absorber dogged down to the test bed, and the accelerometer secured to the Vibration Absorber testing can proceed. It is best to have one person dedicated as "clean" to mount/dismount the Vibration Absorbers from the test bed and a "dirty" person to work the hammer and the computer. Since the hammer is not clean, (1). Wipe the tip of the hammer with Isopropanol, and (2). Cover the hammer with a clean glove. We cut the tip off the glove to expose the hammer tip so as not to bias the measurement.

2.1 Running the Test:

1. Remove the Locking Pins from the Vibration Absorber
2. Open the Measurement Dialog
3. Click on Initialize to configure the test.
 - a. Wait until the Response Bars drop into the Blue zone.
4. Click on Start to start the measurement.
 - a. Wait until the Status Monitor has changed from Green to Yellow.
5. Tap the Vibration Absorber close to the mounting stud nut.
 - a. The tap should be as light as possible without causing a double hit error.
6. Repeat the tapping five times.
 - a. At the fifth successful tap, the Status Monitor should change from Yellow to Red signaling the completed measurement. If not, click on Stop to complete the measurement. Note: If this happens, open the Analyzer Setup Dialog and set the Averaging Mode to Linear.

3

2.2 Processing the Data:

While the "clean" person removes the tested unit and prepares the next unit for testing, the "dirty" person should process the data just taken, according to the following checklist.

1. Right click on the top graph to open the MesaDisplay sub dialog and select Properties.
2. If the cursor is not at 100Hz, select the Cursor tab and enter 100 in the Main cursor field.
3. Select the Function tab.
 - a. Click on the third blue highlighted entry (for Response 3), to remove the Z-axis plot from the graph.
 - b. Click on the first blue highlighted entry (for Response 1) to remove the X-axis from the graph.
 - c. Click on the same entry (for Response 1) to add the X-axis back to the graph as the blue (active) trace.
4. Repeat steps 1 – 3 for the second graph.
5. Close the MesaDisplay dialog.
6. Press the Print Scr key to put a screen shot of the results in the clipboard.
7. Open the MS Paint application.
8. Click on the Paste icon to paste the screen shot into Paint.
9. Position the output so as much of the graphs as possible appears in the display.
10. Click on the Select Icon and select the graph areas. Note: you can select below the status bar if part of the graph is covered.
11. Copy the selected graph area to the clipboard.
12. Open MS Word (or similar application), and click on Paste to copy the graphs from the clipboard.
13. Save the file as "VA-nnn.pdf", (nnn is the serial number of the tested unit). Note: To save the file as a PDF you can
 - a. Add "PDF" to the file name.
 - b. Open the Save as type dropdown and select PDF.
14. Close MS Word and MS Paint. If prompted do not save either.
15. Return to section 2.1 **Running the Test**: to test the next Vibration Absorber.

2.3 Sample Results Data File:

This is an example of a Vibration Absorber results data file. There are several points to consider when evaluating whether the Vibration Absorber is within specifications and is ready for installation on a suspension.

1. The X-Axis (blue trace) should have a relatively smooth ascending slope topping out near the Y cursor (red crosshair).
2. The X-axis trace should have no strange peaks below the 100Hz cursor (red crosshair). Note: The bump around 10Hz is OK.
3. The X-axis trace should cross the 16Hz line between -20 and -30 dB.
4. The Resonance Frequency should be below approximately 120Hz. (This can be somewhat complicated as there could be a higher Resonance Frequency that is

4

OK). Any extreme values may indicate an assembly problem and the unit should be rebuilt.

5. The X-axis (blue) trace in the lower graph should slope up to the Y cursor (red crosshair) line and then follow roughly along the cursor crosshair line.

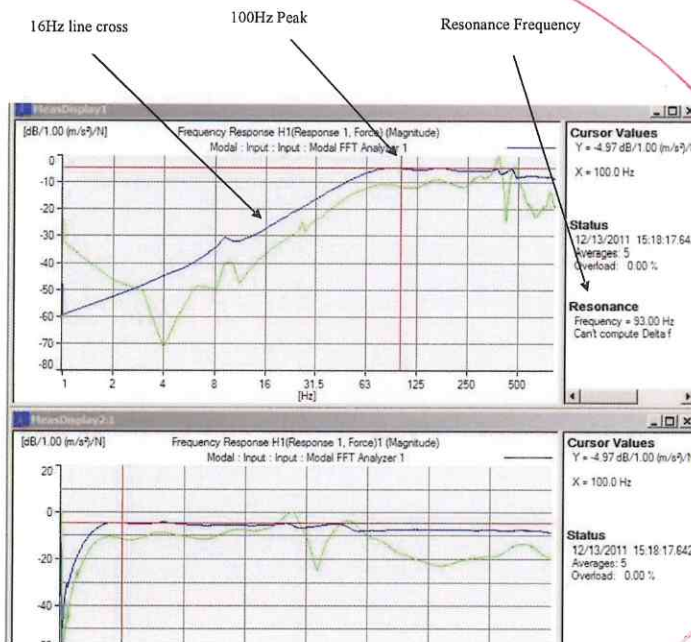


Figure 4: Sample Results Data File

IS THIS LATEST GRAPH?

3.0 Moving Results Data files to the DCC.

The testing result files for the Vibration Absorbers are linked to the DCC under the Master document E1101122. The individual test result files are attached to an E-Traveler document, using the template S1107579.

1. Use the DCC E-Traveler process to generate bulk (up to 20 at one time) copies of the S1107579 template.
2. Copy the document numbers generated by the E-Traveler to the Metadata of the Master document E1101122.
 - a. Open E1101122.
 - b. Select Change Metadata.
 - c. Paste the document numbers into the Related Documents section and save the Metadata.
 - d. Press F5 to refresh the Master document, so the new file links will be displayed.
3. Hold CTRL and Click on the several of the S110nnnn documents to stage a group for editing.
4. Select the first template document and attach the data file.
 - a. Click on Create LIGO-S110nnnn to open the file.
 - b. Append the unit serial number to the Title.
 - c. Under the Local file upload: section, browse to results data file location and select the results file for the Vibration Absorber that will be added to the Template.
 - d. Click Upload Documents.
5. Close the edited document.
6. Select the next Template, and repeat the above steps until all result files have been uploaded into the Templates.