

LASER INTERFEROMETER GRAVITATIONAL WAVE OBSERVATORY
- LIGO -
CALIFORNIA INSTITUTE OF TECHNOLOGY
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LARGE OPTICS SUSPENSION BALANCING QUALITY CONFORMANCE WORKSHEET
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Distribution of this draft:
detector

This is an internal working note
of the LIGO Project.

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1 SCOPE

This Quality Conformance Worksheet is to be completed during the preparation and balancing of the optic in all Large Optics Suspensions, D960132, and kept with the traveler record for the assembly.

2 PURPOSE

This QCW details the processes that LIGO personnel will use to ensure compliance with LIGO Project Quality requirements for the acceptance/qualification of large optics suspensions. Trained/qualified personnel will follow the instructions outlined in the Large Optics Suspension Assembly Specification, LIGO-E970 for the detection and recording of deficiencies that could indicate failure to meet specifications. Completed worksheets will also be used in the future to streamline these processes and increase reliability and repeatability.

Suspension Serial Number _____

Suspension Name _____

Date _____

3 COMPONENTS

3.1. MAGNETS

Quantity _____

Manufacturer's name _____

Purchase Order No. _____

Serial No./Lot No. _____

Magnet Strengths:

1. _____

2. _____

3. _____

4. _____

5. _____

6. _____

7. _____

8. _____

Within +/- 5% of strength values: _____yes _____no

Table 1: Magnet/Standoff Polarity

<i>Magnet/Standoff Fixture Position</i>	<i>magnet polarity at standoff (+ or -)</i>	<i>standoff (regular or side)</i>
1		
2		
3		
4		
5		
6		
7		
8		
9		
10		
11		
12		
13		
14		
15		
16		
17		
18		
19		
20		
21		

Table 1: Magnet/Standoff Polarity

<i>Magnet/Standoff Fixture Position</i>	<i>magnet polarity at standoff (+ or -)</i>	<i>standoff (regular or side)</i>
22		
23		
24		

3.2. SENSOR/ACTUATOR HEAD ASSEMBLIES

Quantity _____

Serial Nos. _____

Coil Strengths

1. _____

2. _____

3. _____

4. _____

5. _____

6. _____

4 OPTIC PREPARATION

4.1. Magnet-to-Dumbbell Standoff Fixture

Check the fixture for residual glue in each of the holes. Inspect the holes. Occasionally, when removing the assemblies from the fixture, the blunt instrument used to break the adhesive from the insides of the holes will deform the soft Delrin of the fixture. If any of the holes are deformed in shape and out of tolerance, mark the fixture so as not to use that hole in the future. Clean each of the holes thoroughly to remove residual glue.

Adhesive cure start date/time _____

Adhesive cure end date/time _____

Mark magnet polarities in fixture

4.2. Magnet/Standoff Assembly Fixture

Name of optic _____

Serial No. _____

Wedge _____

Sketch of wedge orientation:

Check the fixture for residual glue in each of the holes. Inspect the holes. Be sure to clean each of the holes thoroughly to remove any residual glue.

Adhesive cure start date/time _____

Adhesive cure end date/time _____

Mark up the figure below with the magnet polarities

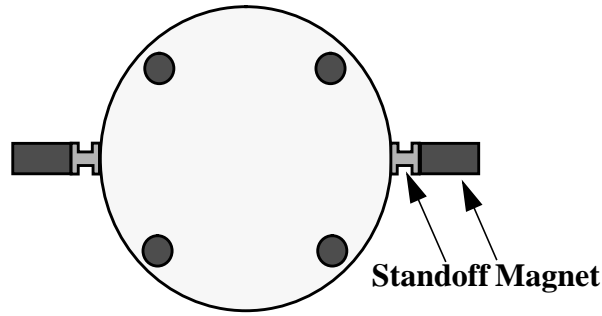


Figure 1

4.3. Guide Rod Fixture

Check to make sure the optic has not moved from its orientation on the base plate.

Mark up Figure 1 with the polarities of the magnet/standoff assemblies used.

Adhesive cure start date/time _____

Adhesive cure end date/time _____

5 OPTIC HANGING AND BALANCING

Relative to the top of the optical table -

Record the level in horizontal position: _____ one end _____ other end.

Record the level in vertical position: _____ one end _____ other end.

Length of lever arm _____

Optic unbalance _____

Adhesive cure start date/time _____

Adhesive cure end date/time _____

Optic unbalance after adhesive curing _____, date/time _____

optic cleaned. time/date _____ initials _____

optic baked. time/date _____ initials _____

6 SENSOR/ACTUATOR HEAD INSTALLATION

Sensor/Actuator Head Positioning

<i>Sensor/Actuator Head</i>	<i>unblocked voltage</i>	<i>positioned head voltage value</i>

Safety stops all have a gap of 1mm to the optic