

LASER INTERFEROMETER GRAVITATIONAL WAVE OBSERVATORY  
- LIGO -  
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<b>LARGE OPTICS SUSPENSION FIXTURES AND COMPONENTS QUALITY CONFORMANCE WORKSHEET</b>
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*Distribution of this draft:*  
detector

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# 1 SCOPE

This Quality Conformance Worksheet is to be completed during the first article and production inspection of all the fixtures and components of the Large Optics Suspensions, D960132(reference only - not required for inspection).

**FIXTURES:**

- D970074 Magnet-to-Dumbbell Standoff Fixture
- D960050 Magnet/Standoff Assembly Fixture
- D960147 Guide Rod Fixture
- D960753 Wire and Optics Fixture
- D960763 Test Mass Fixture
- D970169 Magnet Strength Fixture
- D970180 Winch Fixture
- D970616 Coil Strength Fixture
- D960144 LOS Suspension Block
- D970615 PAM Screw
- D970617 Sensor/Actuator PAM Bracket

## 1.1. Mechanical Parts of the Fixtures for the Suspension Assembly

**Table 1: Serial No.** \_\_\_\_\_ **, Date:** \_\_\_\_\_

<b>D970074 Magnet-to-Dumbbell Standoff Fixture</b>				
zone	dimension (in)	inspection value	within spec	out of spec
B3	25X,DIA.077+.002/-.000			

Table 2: Serial No. \_\_\_\_\_, Date: \_\_\_\_\_

<b>D960050 Magnet/Standoff Assembly Fixture, Sheet 2 of 3, Positioning Ring Detail</b>				
zone	dimension (in)	inspection value	within spec	out of spec
G3	DIA 10.375 [BOLT CIRCLE]			
E1	6.364 +/- .001			
C2	6.364 +/- .001			
G5	90 DEG. APART			
G7	.077 DIA +.004/- .000, 4PL			
C6	9.914 DIA +.010/- .000			

Table 3: Serial No. \_\_\_\_\_, Date: \_\_\_\_\_

<b>D960050 Magnet/Standoff Assembly Fixture, Sheet 3 of 3, Holding Ring Detail</b>				
zone	dimension (in)	inspection value	within spec	out of spec
F2	10.375 DIA [BOLT CIRCLE]			
F5	90 DEG. APART			
C6	9.914 +.010 DIA -.000			

Table 4: Serial No. \_\_\_\_\_, Date: \_\_\_\_\_

<b>D960147, Guide Rod Fixture, Sheet 2 of 3, Base Plate</b>				
zone	dimension (in)	inspection value	within spec	out of spec
H4	9.843 DIA+.005 -.000			
C5	2X,.799			
B-C5	2X,1.130+/-0.002			
D3	2X,6.292+/-0.001			
D4	2X,5.172+/-0.001			
C6	4X,.094 DIA			
F-G6	2X,1.058			
D6	2X,.885 +.000 -.001			
G5-6	2X,3.000			
E7	4X,60.0 DEG			
D8	2X,.105 +/-0.001			
B1	FLATNESS .001			
C3	2X,45.0 DEG +/-0.5 DEG			
D3	12.583 +/-0.001			
E1	10.343 +/-0.001			
F5	2X,.750			

Table 5: Serial No. \_\_\_\_\_ Date: \_\_\_\_\_

<b>D960147, Guide Rod Fixture, Sheet 3 of 3, Right Block, Top</b>				
zone	dimension (in)	inspection values	within spec	out of spec
B8	.250			
C7	45.0 DEG +/- .5 DEG			
B7	.982 +/- .001			
C6	1.515 +/- .001			
D8	1.500 +/- .001			
C-D6	.125 +/- .001			
D6	1.241			
D5	.518 +.001 -.000			
F6	2X,.094 DIA			
D-E6	3.000			
F7	2X,60.0 DEG			
G8	.056			
G7	2X,.124			
G7	90.0 DEG			
F6	.268			
G6	.063			
H5	90.0 DEG			
G6	.053			
G5	.190			
G5	.053			

Table 6: Serial No. \_\_\_\_\_ Date: \_\_\_\_\_

<b>D960147, Guide Rod Fixture, Sheet 3 of 3, Left Block, Top</b>				
zone	dimension (in)	inspection values	within spec	out of spec
C1	.250			
B-C2	45.0 DEG +/- .5 DEG			
B-C2	.982 +/- .001			
C2	1.515 +/- .001			
C1	1.500 +/- .001			
D2	.125 +/- .001			
D3	1.241			
D4	.518 +.001 -.000			
E2	2X, .094 DIA			
D-E3	3.000			
F2	2X, 60.0 DEG			
H1	.056 +/- .002			
F1	.056			
G2	60.0 DEG			
F3	.345			
F3	.063			
G3	90.0 DEG			
G4	2X, .053			
F4	.086			

Table 7: Serial No. \_\_\_\_\_ Date: \_\_\_\_\_

<b>D960753, Wire and Optics Fixture Assembly, Sheet 2 of 3, Cradle</b>				
zone	dimension (in)	inspection value	within spec	out of spec
C2-3	3.000			
D3	R4.921			
F4	2.452			
F3	1.864			
F4	4.096			
F4	6.844			
E5	2X,3.596			
G7	.020			
F8	.020			



Table 8: Serial No. \_\_\_\_\_ Date: \_\_\_\_\_

<b>D960753, Wire and Optics Fixture Assembly, Sheet 3 of 3, Teflon Bracket, Metal Bracket and Teflon Strap</b>				
zone	dimension (in)	inspection value	within spec	out of spec
A2	3.000			
A2-3	.383			
A3	.410			
B1	5.441			
C2	R4.921			
F1	9.972			
D5-6	.500			
E7	1.000			
D8	5.187			

Table 9: Serial No. \_\_\_\_\_ Date: \_\_\_\_\_

<b>D960763, LOS Test Mass Fixture, 2 Degree Wedge</b>				
zone	dimension (in)	inspection value	within spec	out of spec
B5	2X,1.000 DIA C'BORE			
D4	4X,2.125 DIA			
E3	9.842 DIA			
B6	2.0 DEG			
E6	3.937			
B6	2X,.079 +/- .012 x 45 DEG CHAMFER			

Table 10: Serial No. \_\_\_\_\_, Date: \_\_\_\_\_

<b>D970169, Magnet Strength Fixture</b>				
zone	dimension (in)	inspection value	within spec	out of spec
B2	.250			
B2	.650			
B3	.077 DIA +.005/-.000 down .06			
B-C3	.060 +.002/-.000			
C2	.184 +.002/-.000			

Table 11: Serial No. \_\_\_\_\_ Date: \_\_\_\_\_

<b>D970180, Winch Fixture</b>				
zone	dimension (in)	inspection value	within spec	out of spec
A2	1.75			
B2	.250			
C2	.156			
C3	R.50			

Table 12: Serial No. \_\_\_\_\_, Date: \_\_\_\_\_

<b>D970616, Coil Strength Fixture</b>				
zone	dimension (in)	inspection value	within spec	out of spec
B2	.900			
C2	.250			
B3	1.000 DIA +.010/-.000 down .16			
C3	.060 +.002/-.000			
C2	.184 +.002/-.000			

**Table 13: Serial No.** \_\_\_\_\_ **Date:** \_\_\_\_\_

<b>D960144 Suspension Block</b>				
zone	dimension (in)	inspection value	within spec	out of spec
A2	4.000			
A3	1.250			
C1	.156			
C2	1.327			
C3	4X,.250			
B3	.500			
C4	FLATNESS .002			

**Table 14: Serial No.** \_\_\_\_\_ **Date:** \_\_\_\_\_

<b>D970615, PAM Screw</b>				
zone	dimension (in)	inspection value	within spec	out of spec
C1	.077 DIA +.002/-.000 down .063			
A2	perp. .001 to datum A			

**Table 15: Serial No.** \_\_\_\_\_ **Date:** \_\_\_\_\_

<b>D970617, Sensor/Actuator PAM Bracket</b>				
zone	dimension (in)	inspection value	within spec	out of spec
B2	.125			
B2	.354			
B3	.964			
B3	.256			
B3	.640			
C3	2X,.125 DIA			
C3	#5-40 UNC-2A			
C3	.320			
C2	.162			