TBDM Lifting Fixture Test Specification

TBDM-00001

Prepared By:
Name(s) and Signature(s)  Date
K L Gonzales  3/6/2019

Approved By
Name and Signature  Title  Date
PI  Technical Division Manager
K L Gonzales  Project Manager  3/6/2019
W Davison  Responsible Engineer  3/6/2019
## TBDM Lifting Fixture Test Specification

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### Revision History

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<td>3/1/19</td>
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<td>Update test payload requirement, add rigging supply by RFCML.</td>
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2 Purpose

This document defines the loads required and methods to be used to verify the integrity of a new 6.5m Lifting Fixture. Per OSHA regulation section 1926.251, regarding inspection and testing of special below-the-hook lifting devices, users shall follow the methods of testing defined in ASME section B30.20. Per ASME B30.20, the 6.5m Lifting Fixture must be load tested to 125% of the safe working payload.

3 Definitions

Lifting Fixture Assembly – The full structural assembly is defined in drawing XXXXX “TBD”. The drawing does not include the mirror interface pads. See Figure 1 below.

![Lifting Fixture Assembly](image)

Figure 1 - Lifting Fixture Assembly

Pad Spreader Assemblies – These six assemblies are defined in drawing XXXXX “TBD”. The spreader assemblies (Sub-Stars) interface to the mirror via rubber pads (not shown). See Figure 2 below.

![Pad Spreader Assemblies](image)
4 Payload Requirements

The expected maximum safe working payload for the Lifting Fixture is 48,000 lbs. The fully operational Lifting Fixture Assembly itself is expected to weigh no more than 17,500 lbs (for reference). Since the mirror interface pads will not be included in the fabricated assembly delivery (to be added by RFCML), the test payload must be incremented by the expected weight of the mirror interface pads (estimated at 3000 lbs).

1. The total test payload on the Lifting Fixture shall be $1.25 \times 48,000 \text{ lbs} + 3,000 \text{ lbs} = 63,000 \text{ lbs} \pm 2000/0 \text{ lbs}$.

5 Load Test Requirements

Since the weight of the mirror to be lifted is distributed over 36 interface pads, a truly representative load test, using hanging weights would be difficult. This section describes the method of testing the lifting fixture using a minimal number of surrogate weights, while meeting the requirements of a 125% load test.

1. Load testing shall be completed prior to painting of the Lifting Fixture components.
2. A crane scale shall be used to determine loading, and this load data shall be recorded.
3. The entire Lifting Fixture shall be tested by supporting at all 6 lifting points on the Lifting Fixture Assembly indicated in the drawing. See Figure 3 below for lifting lug position. RFCML shall supply the appropriate rigging for this support case.
4. The tare weight of the complete fabricated assembly shall be recorded.

5. The test payload surrogate weights shall be suspended from each Pad Spreader Assembly using nylon rigging slings (or similar, non-marring supports) on each square tube “leg” at the cross brace support location. See Figure 4 for illustration of support sling position. RFCML shall supply nylon slings (qty 18), represented in the illustration as the yellow lines, for this test. Any additional rigging required (shackles, d-rings, etc.) shall be supplied by the fabricator/testing body.
6. This test payload shall be divided evenly over the spreader assemblies such that the entire assembly is not “bound” by the surrogate weights (see Figure 5). The load at each Sub-Star Assembly shall deviate less than +/-5% of the required applied load.

Figure 4 - Illustration of sling position on Pad Spreader Assembly

Figure 5 - Illustration of weight application
7. The test payload shall be suspended on the assembly for a minimum of 3 minutes.
8. The complete loaded assembly weight shall be recorded.
9. All welds shall be visually inspected for damage at the conclusion of the test.
10. The load test shall be witnessed by RFCML representative(s).

Details of the surrogate weights used or overhead support apparatus (i.e. crane) are the choice of the testing body.