SLAC Lifting Fixture Load-rating Form

(See page 2 for General Guidelines and Step-by-step Process)

Requester

Print name: Jim Krebs  Date: 2/28/06

Brief Description of Lifting Fixture and object to be lifted:

Bar Backward End Door Platform (5000 lb)

Spreader Bar for above load.

SLAC Drawing number: SK-HJK-022806

Copy of drawing or sketch must accompany this form.

1. Rated Capacity Calculation

Rated capacity: 5,100 lbs

Print name: Jim Krebs  Signature:  Dr. James Krebs  Date: 2/28/06

Qualified engineer who performed calculations. Copy of calculations or vendor documentation must accompany this form.

2. Non-destructive testing of load-bearing welds (pre-2005 non-certified welds only)

Print name: N/A  Signature:  Dr. James Krebs  Date: 3/1/06

Qualified engineer who supervised or contracted testing. Copy of report must accompany this form.

3. Review by Hoisting & Rigging Safety Committee

Print name: Dave Teusig  Signature:  Dr. James Krebs  Date: 3/1/06

H&R Safety Committee Chair

4. Load testing – normally at 125% of rated capacity (see instructions).

Required test weight: 6,375 lbs  Actual test weight: 8,000 lbs  Successful completion (check): X

Print name: David Engesser  Signature:  Dr. James Krebs  Date: 2/24/06

SLAC Rigging Department

5. Label fixture with rated capacity & S/N

Assigned S/N: BBR-001

Crane Custodian or Line Supervisor responsible for fixture

Print name: Jim Krebs  Signature:  Dr. James Krebs  Date: 2/24/06

6. Final Inspection and Approval

Print name: Dave Teusig  Signature:  Dr. James Krebs  Date: 3/1/06

SLAC H&R Inspector

7. Permanent record keeping – retained for the life of the equipment (see instructions).
BABAR ENGINEERING NOTE  
BACKWARD END DOOR PLATFORM SPREADER BAR (BBR-001)  
CALCULATIONS OF RIGGING LOADS

1.0 Load:

- Backward End Door Platform (Estimated at 40 lb/ft²) 5,000 lb  
- Backward End Door Platform Spreader Bar 566 lb

2.0 Background:

This spreader bar is used to install the work platform that spans the two backward end doors on BaBar. It may also be used for other incidental lifts not to exceed 5,100 lb connected at the outermost lifting points with one crane connection at the upper center. A diagram of the loading is shown in Figure 1.

The allowable loads and stresses in this document are dictated by the American Institute of Steel Construction, *Allowable Stress Design*, 9th Edition. A dynamic load factor of 50% is assumed.

3.0 Maximum Bending Stress in the Spreader Bar:

The steel material used to fabricate the spreader bar is unknown. Therefore, a very conservative yield stress of 24 ksi is assumed. The maximum bending stress occurs at the middle of the beam:

\[ \frac{W*L/4*Z}{4*(2''*6''^2)/3} = 14,088 \text{ psi} \]

The maximum allowable bending stress is:

\[ 24,000 \text{ psi} \times 0.6 = 14,400 \text{ psi} \]

Hence, the factor of allowable redundancy is:

\[ 14,400 \text{ psi} / 14,088 \text{ psi} = 1.02 \]
Prepared by:  H. James Krebs, Mechanical Engineer, SLAC

Signature:  H. James Krebs  Date:  2/28/06

Reviewed by: William Sands, Mechanical Engineer, Princeton University

Signature:  William Sands  Date:  2/28/06