



STANFORD LINEAR ACCELERATOR CENTER

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IR-2 RIGGING PROCEDURE and JOB HAZARD ANALYSIS FOR SPECIAL PURPOSE HANDLING FIXTURE FORWARD UPPER FLUX BAR

1.0 Loads:

FWD Upper Center Gap Plate	4093 lbs
Fixture	1817 lbs
Total Load (excluding rigging)	5910 lbs

2.0 Rigging Layout:

Drawing number SK-HJK080104-6

3.0 Rigging Equipment:

The 10 ton hoist shall have a 10,000 lb capacity digital crane scale (Scale 10) supported from the hook. The crane scale shall support a 4-ft long sling of 10,000 lb minimum working load rating plus a 3-ton minimum capacity manual hoist (come-along) and three 6.5 ton minimum capacity screw pin shackles. The 50 ton main hoist shall support a 4-ft long sling of 5,000 lb minimum working load rating plus 6.5 ton minimum capacity screw pin shackles on each end.

4.0 Removal Procedure:

Refer to drawing number SK-HJK080104-6. The fixture is designed such that the CGZ of the unloaded fixture is located at points A and B. Points C and D represent the CGZ of the combined fixture plus the FWD Upper Flux Bar weight.

- 4.1 Zero the crane scale readout with the rigging hardware hanging clear of the ground.
- 4.2 10 ton hoist: Connect the sling shackle to Point C on the fixture. Connect the manual hoist shackle to Point D.
- 4.3 50-ton hoist: Connect shackle to Point E on the fixture.
- 4.4 Lift the fixture using both hoists. Attempt to keep the fixture horizontal. Scale 10 shall read 886 lbs. There are 984 lbs of load on the 50-ton hoist.
- 4.5 Install two flux bar guide pins as far apart as possible on the detector.
- 4.6 Bring the fixture to the detector area.
- 4.7 Place the fixture in the proper position to mate to the FWD Upper Flux Bar using the 10-ton hoist, the bridge, and the crane trolley. It may be necessary to make slight angular adjustments using the manual hoist. Bolt the fixture to the FWD Upper Flux Bar using the two special 1.812-12UN stainless steel bolts.
- 4.8 Gently lift on the 10-ton hoist until Scale 10 reads 5910 lbs.
- 4.9 Gently loosen the FWD Upper Flux Bar bolts.
- 4.10 Readjust fixture/flux bar position using the 10-ton hoist and the manual hoist as needed to minimize side loading on the gap plate bolts until all bolts are removed.

- 4.11 Remove the flux bar.
- 4.12 Bring the flux bar to the IR-2 assembly area.
- 4.13 Lower the gap flux bar on 4x4 wood dunnage.
- 4.14 Place dunnage under the fixture end opposite the flux bar.
- 4.15 Unbolt the fixture from the flux bar.
- 4.16 Take the fixture away.
- 4.17 Remove the two flux bar guide pins on the detector.

5.0 Installation Procedure:

- 5.1 Zero the crane scale readout with the rigging hardware hanging clear of the ground.
- 5.2 10 ton hoist: Connect the sling shackle to Point C on the fixture. Connect the manual hoist shackle to Point D.
- 5.3 50-ton hoist: Connect shackle to Point E on the fixture.
- 5.4 Lift the fixture using both hoists. Attempt to keep the fixture horizontal. Scale 10 shall read 984 lbs. There are 886 lbs of load on the 50-ton hoist.
- 5.5 Bolt the fixture to the FWD Upper Flux Bar using the two special 1.812-12UN stainless steel bolts.
- 5.6 Install two flux bar guide pins as far apart as possible on the detector.
- 5.7 Raise the fixture/flux bar assembly using the 10-ton hoist. Scale 10 should read approximately 5910 lbs.
- 5.8 Bring the flux bar to the detector area.
- 5.9 Position the FWD Upper Flux Bar against the detector in its proper orientation.
- 5.10 Bolt the flux bar to the detector.
- 5.11 Lower the 10-ton hoist until scale 10 reads 886 lbs.
- 5.12 Gently unbolt the fixture from the FWD Upper Flux Bar.
- 5.13 Take fixture away.
- 5.14 Remove the two guide pins on the detector.

6.0 Potential Hazards:

- 6.1 Crushed extremities.
- 6.2 Personnel in path of load movement or under load.
- 6.3 Unexpected load movement.
- 6.4 Operator error.
- 6.5 Equipment failure.

7.0 Hazard Controls:

- 7.1 Crane Operator shall be a SLAC-certified (EFD) rigger.
- 7.2 No one will be allowed under a suspended load or in the path of a load.
- 7.3 Strict controls of crane control box and rigging procedures.
- 7.4 Inspection of equipment prior to use.
- 7.5 Inspection of crane functions.
- 7.6 Current training of personnel.
- 7.7 Crane maintenance current.
- 7.8 Review of procedures with rigging personnel.
- 7.9 Appropriate use of personnel protection equipment.
- 7.10 Appropriate supervision of tasks.
- 7.11 Continuous safety oversight is preferred.

