10/14/2009

Balfour Beatty Construction

CONSTRUCTION EQUIPMENT

SUSPENSION HOISTING & RIGGING

The Qualified & Certified (Forklift) Operator

(Employer Certification)

1910.178 Powered Industrial Trucks

(i) Operator Training

(3) Training program content

1 - General Operation
2 - Machine Specific Operation
3 - Site Conditions
4 - Proficiency Demonstration
5 - Retraining (as indicated)

(6) Certification. The employer shall certify that each operator has been trained and evaluated as required by this paragraph (i). The certification shall include the name of the operator, the date of the training, the date of the evaluation, and the identity of the person(s) performing the training or evaluation.

Note: Machine and Operator must be Licensed in DC
Trained / Certified Operator?

Apparently Skilled Operators, but following Safe Operating Procedures??
Suspension Hoisting

Advantages
(to forklift suspension-hoisting in lieu of crane-hoisting)

- 2 fer 1 – Can lift from below i.e. “fork lift” and from above i.e. “suspension hoist.”
- Can maneuver in tight locations and on rough terrain.
- Eliminates need for additional hoisting equipment such as small Rough Terrain (RT) or Carry-Deck type cranes.
Suspension Hoisting

Disadvantages

- Must carry forks much higher to have load suspended below forks versus load being fork-lifted from beneath.

- Deceptively changes perceived Center of Gravity. Operators tend to forget this and not think as if load is on forks even though often suspended far below.

- Overturning of Forklift while suspension hoisting/carrying a load is not unusual.

- Load radius is increased with lifting boom.
- Center of Gravity – Must consider as though load is on forks.
- “Load Sway” creates potential for side loading and increased radius.
- Lower load by lowering boom can significantly increase radius.
- Fork-mounted lifting beams increase radius and load weight, and must be factored into load weight and capacity calculations.

Operator of this forklift attempted to “jump free”...
... and was nearly crushed by the overhead/rollover protection structure.

Operator jumped - fell here.
(Not wearing seat-belt)
Suspension Hoisting

Disadvantages continued.

- Load tends to swing, even on level ground.
- Difficult to steady load without two tag-lines or load “bridled” (guyed) to forklift frame.
- Employees attempting to steady load are exposed to struck-by injury from the load and/or the forklift.

Off-Center loading, no positive connection and no tag line and worker exposed
Single Web Sling – Can chafe/cut sling – Load can roll side-to side
Disadvantages continued.

- Rigging to fork(s) can:
  - damage rigging
  - place torsion (twisting) force on the boom when fork(s) are not centered.
  - risk rigging and load slipping off fork(s) if not positively secured to the fork(s) or mast.
Short, eye & eye, wire-rope sling
Nice Heavy-Duty Chain Slings

Not likely to be damaged, and “mean lean” up on fork tips, but…

- Not positively attached, and
- Not rigged to center.
Better: Centered fork, short slings, folks tipped-up, but... not positively attached.

Off-Center Loading
Poor Suspension Hoisting Practices are not Limited to Forklifts
Suspension Hoisting

Example of Good Rigging Methods for Hoe-Hoisting equipment.

Note:
• Hardware (for hard wear)
• Closed pad-eye on bucket
• All positive attachment connections
Generally good rigging method, but attachment point (back-rest) may not be strong enough for capacity loads.

Beefy, but shop-made? Engineered and marked with weight and capacity?
Suspension Hoisting

Best Practice Options

For

Proper Rigging/Devices

May Include:
Latching Safety Hook (versus sorting hook) necessary for "high-hoisting."
- Properly stowed when not in use.

Positive connection
- Structural member
- Close to center

Taper of forks could allow device to loosen.
Bottom Line: Proper Forklift Suspension-Hoisting, or…

...One of These.

BBC SUSPENSION-HOISTING POLICY

No rigging may be directly attached to the forks (tines) of a forklift (Powered Industrial Truck) or the teeth of an earthmoving equipment bucket for the purpose of suspension-hoisting or "Free-Rigging." (see OSHA Letter of Interpretation - October 22, 1999 regarding "Free-Rigging")

Rigging used for suspension hoisting must be positively attached to the equipment or to a purpose-designed, suspension-hoisting device with hardware (shackles, latched safety hooks, etc.) at all connection points.

Fork-mounted suspension-hoisting devices must be engineered for use with the intended forklift, and have a load-chart specifically designed for the device.

Suspended load weights must be known by the Operator to be within the capacity of the equipment in its current configuration. (e.g. charted capacity, engineered lift)

An Activity Hazard Analysis must be submitted to Balfour Beatty, and authorization to proceed given by Balfour Beatty Project Supervision/Safety prior to complex or unusual suspension-hoisting.