

**Cranes, Derricks, Hoists,
Elevators, and
Conveyors - Subpart N
Section 6**

Robert Poole

St. Paul Fire & Marine Insurance Company

- Cranes and Derricks - 1926.550
- Helicopters - 1926.551
- Material Hoists, Personnel Hoists, and Elevators - 1926.552
- Base-Mounted Drum Hoists - 1926.553
- Overhead Hoists - 1926.554
- Conveyors - 1926.555

CRANES



.....and a few other pieces of equipment

Cranes and Derricks - 1926.550

■ General Requirements

- Follow manufacturer's specs and limits
- Capacities, speeds, warnings, instructions posted in view of operator
- ANSI standard hand signals posted at site
- Annual inspection documented





Improper footing







**Wire ropes must be inspected
prior to use each day.**

**(Synthetic webbing slings must
be inspected according to its
specific standard 1926.251(e).)**

Wire Rope Removed From Use When:

- 6 broken wires in 1 lay, 3 in 1 strand
 - for example 3/4 inch, 6 x 19 IWRC is one lay or six inches.
- Outer wires worn 1/3 original diameter
- Birdcaged, crushed, kinked
- Heat damaged
- Reductions from nominal diameter

Sheave grooves may become grooved if cable's nominal diameter is reduced, indicating wear.



Cranes and Derricks - 1926.550

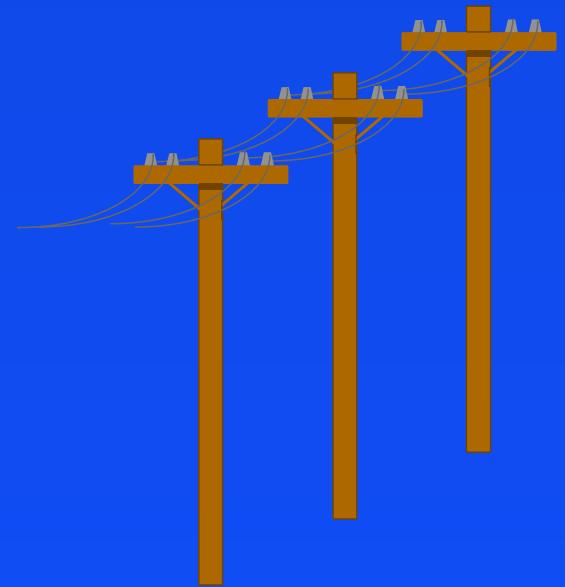
- Belts, gears, shafts, pulleys, etc. guarded
- Swing radius barricaded
- Exhaust pipes guarded or insulated
- Exhaust in enclosed spaces - air monitoring

General Requirements

- Windows in cabs - no distortion
 - Ladder or steps to cab roof
 - Guardrails, handholds, steps to cab
 - Anti-skid walking surfaces
 - Fire extinguisher of 5BC rating

Crane Electrical Hazards

- If operator has no clear view, spotter needed
- Work near transmitter towers may require grounding cables





At LEAST 10 ft. from wires





Cranes and Derricks - 1926.550

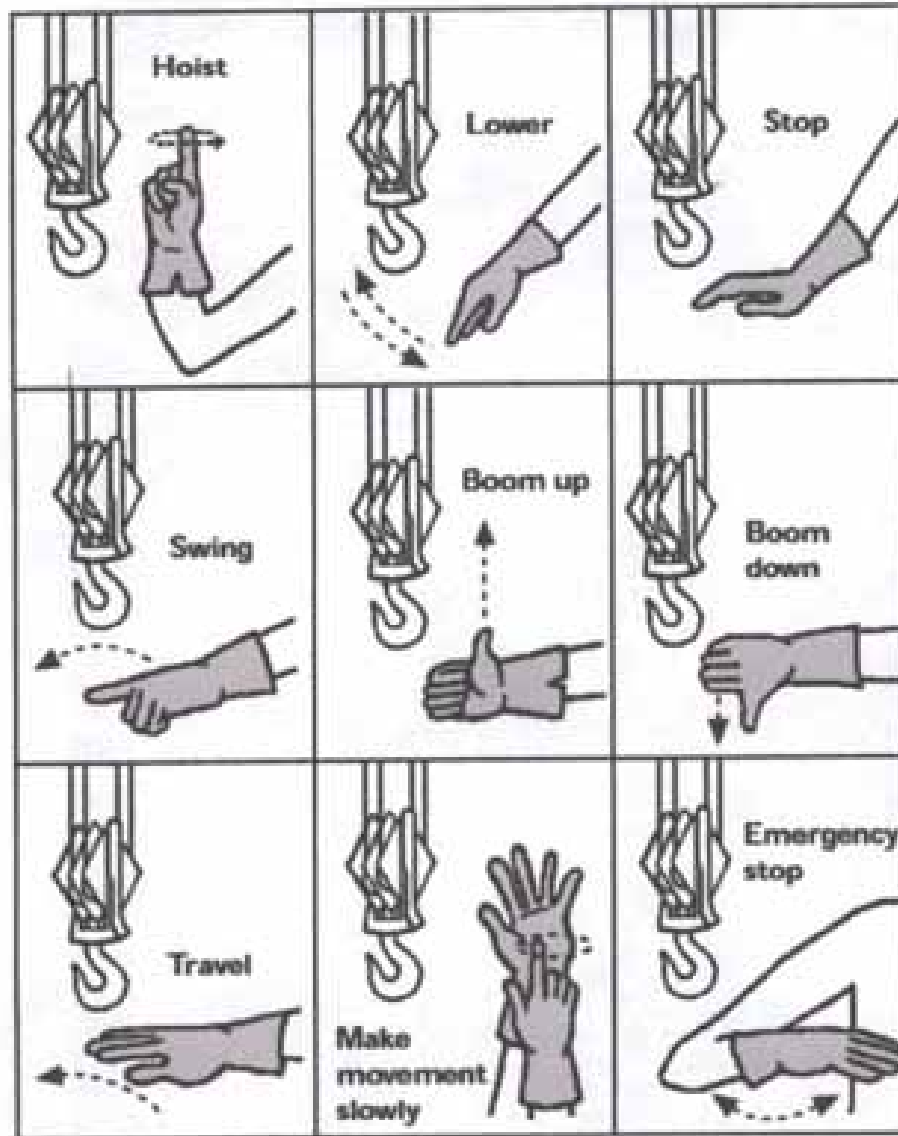
■ General Requirements

- NO modifications or additions without manufacturer's written approval.
- All employees clear of suspended loads at all times.

Mark's first crane



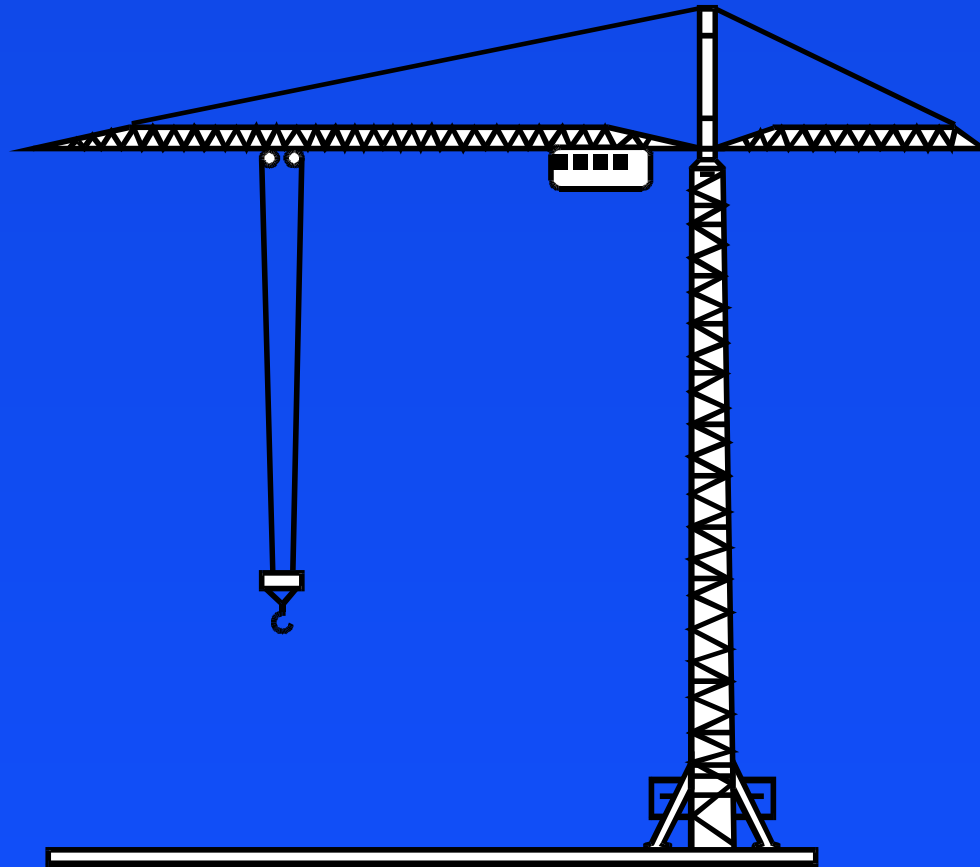
Recommended Hand Signals



Crawlers and Locomotives

- Compliance with ANSI B30.5-1968
- Record of inspections on file
- Jibs have positive stops to prevent overbooming of more than 5 degrees above the straight line of the jib

Tower Cranes





Slewing unit of tower crane



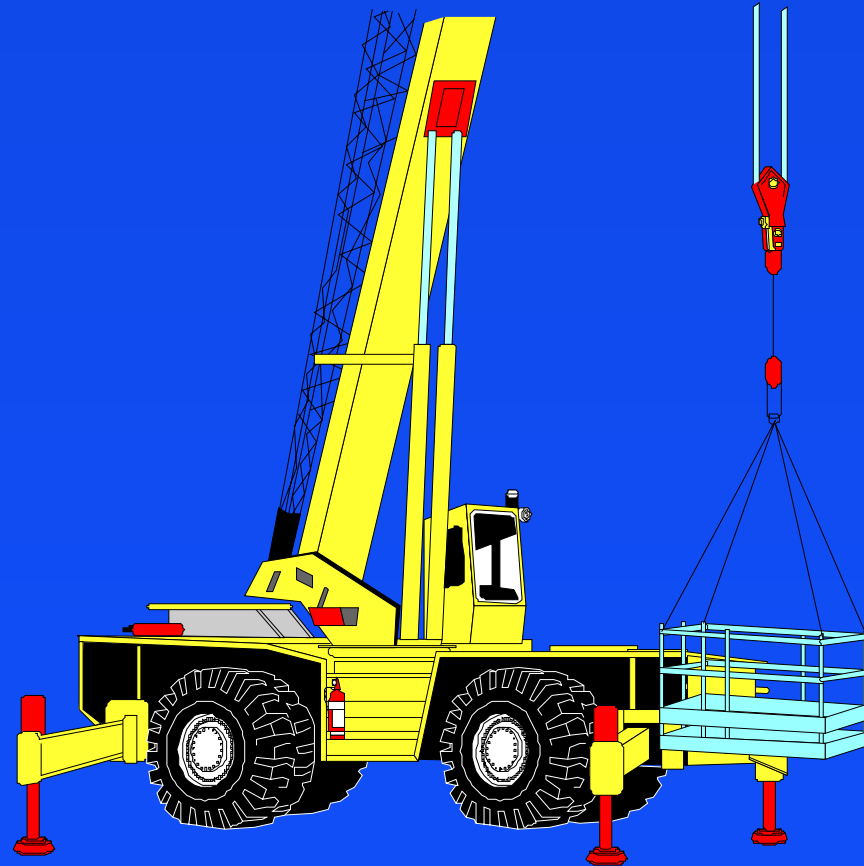




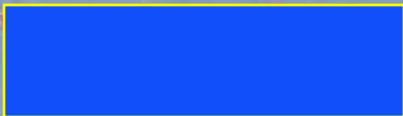
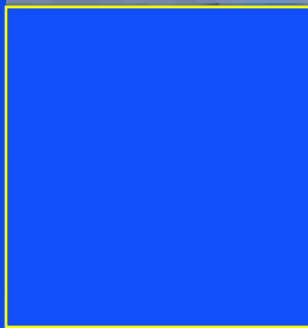
Hammerhead Tower Cranes - 1926.550

- Employees tied off on horizontal booms
- Buffers at each end of trolley
- Limit switches in place
- Manufacturer's recommendations
- Adequate clearances maintained

Suspended Personnel Platforms



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Illegal hoisting of personnel →





Personnel baskets (Personnel platforms)

- Rule #1- May only be used when there is NO OTHER safe means of performing the work! Personnel baskets are the tool of last resort.

Personnel basket crane specs

Brakes set, level within 1% of grade

Derate machine capacity 50%

Load line safety factor 7-10 times

No live boom machines

Telescoping boom length indicator

No free fall- power up & power down

Positive anti-two block device



Anemometer



Cranes and Derricks - 1926.550

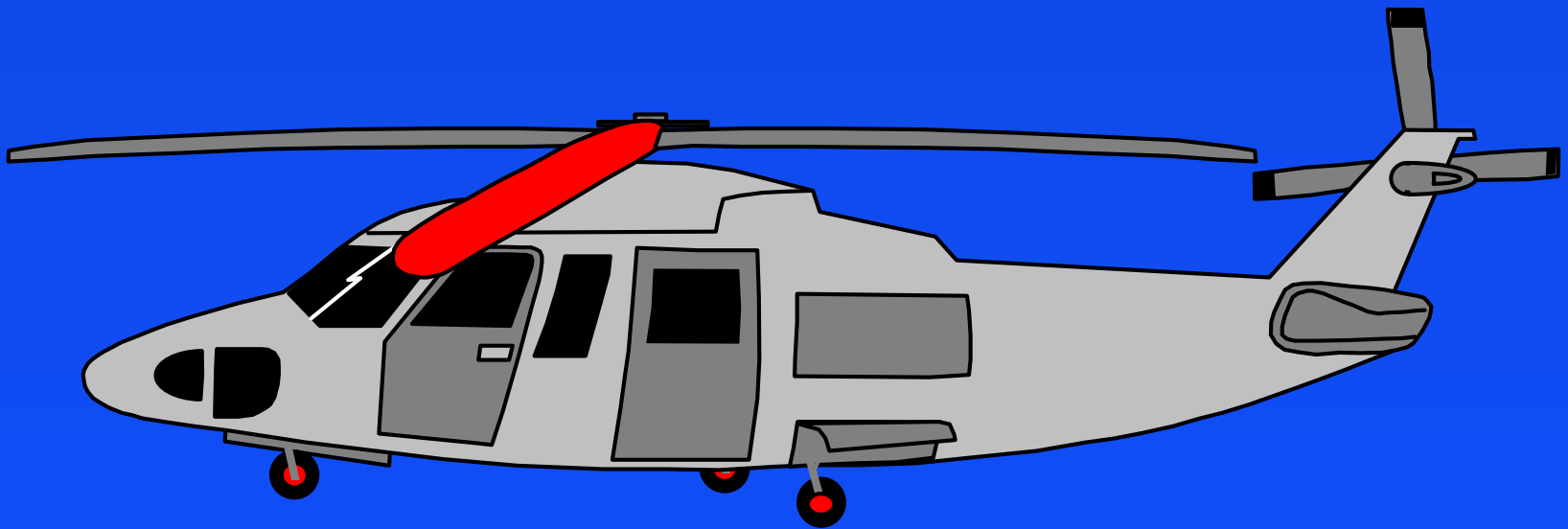
■ Suspended Personnel Platforms Design

- Support 5 times intended load
- Guardrail, enclosed from midrail to toeboard, grab rail installed inside
- Hard hats and overhead protection
- Welding by qualified welder
- Weight of platform and rated capacity marked

Suspended Personnel Platforms - 1926.550

- Master link or shackle for bridle legs
 - Eyes fabricated with thimbles
- Rigging used only for personnel basket
- Basket landed or secured before entry
- Employees tied off to basket

Helicopters



Helicopters - 1926.551

- Federal Aviation Administration regulations
- Briefing (includes emergency drop zone)
- Slings and tag lines, cargo hooks
- Personnel Protective Equipment
- Hooking and unhooking (static electricity)
- Signal systems, visibility, & communication
- Approach distance and approaching
- Fires

Air crane at McKee Foods







Material Hoists, Personnel Hoists, and Elevators - 1926.552

■ General Requirements

- Manufacturer's specifications and limitations
- Capacities, speeds, hazard warnings posted
- Removal of damaged wire rope





Material Hoists

- Operating rules established and posted at operator station - No riders
- Entrances to hoistways protected
- Overhead protection - cages, platforms, operator stations
- Hoist tower enclosures
- Car arresting devices in case of rope failure
- Designed by professional engineer



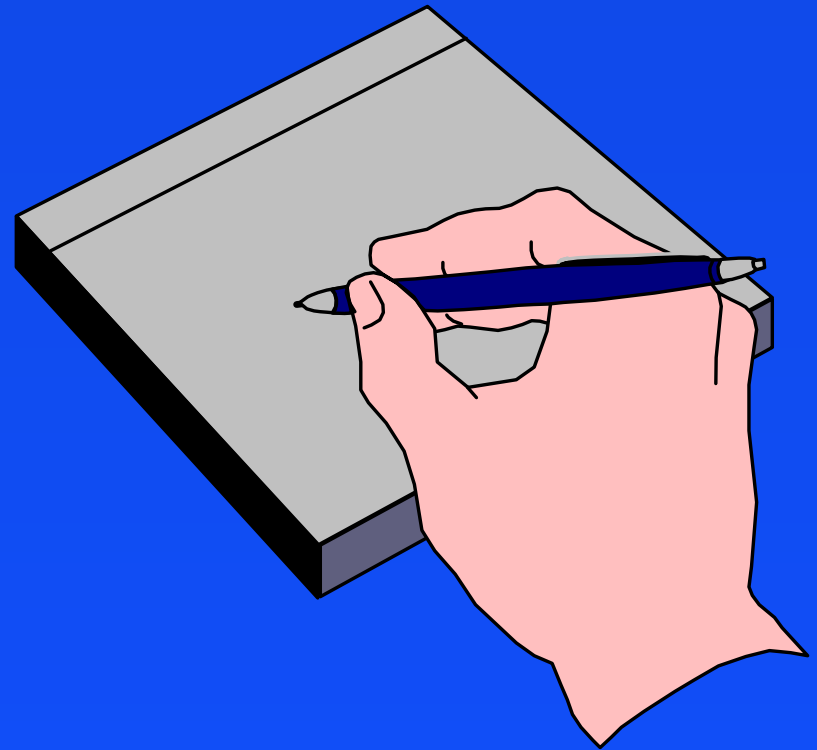


Personnel Hoists and Elevators - 1926.552

- Tower anchored to structure every 25 ft.
- Cars permanently enclosed on all sides except entrance
- Doors or 78"-high gates at each level
- Electric safety contacts on doors/gates
- Capacity and data posted
- Emergency stop switch inside car
- Inspection and testing before use and every 3 months

The Most Frequent Citations:

- Failure to guard swing radius
- Operating near power lines
- No load chart
- Unnecessary use of personnel basket



**This lift should have been stopped before it
got this far**







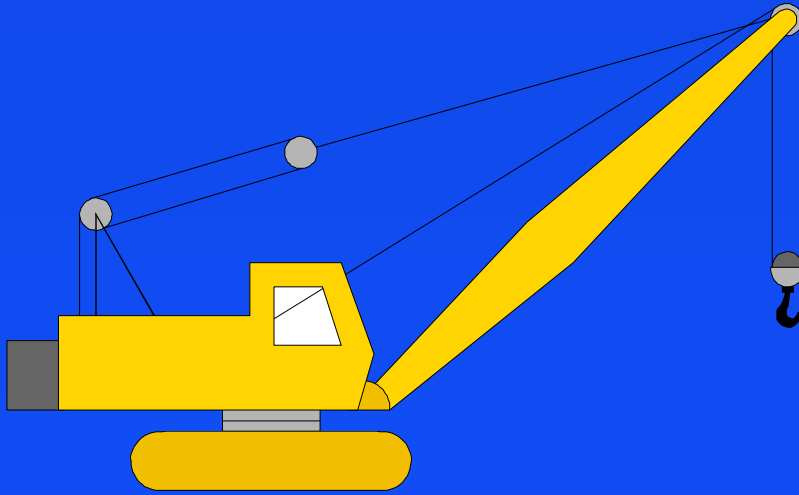
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What Questions Do You Have On Cranes, Derricks, Hoists, and Conveyors?



- Now I have a few questions
- Please turn to the Crane Test page in your handout material

Crane, Derricks, Hoists

1. The CLOSEST crane approach to live power line?
2. Suspended personnel platforms may ONLY be used when?
3. Are broken wires allowed?
4. The size extinguisher for a crane?

Answers

1. No CLOSER than 10 feet
2. When there's no other safe way to work
3. No more than 6 in 1 lay, 3 in 1 strand
4. 5 BC Extinguisher (minimum)