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Overhead Crane Safety 29 CFR 1910.179

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Introduction

Overhead cranes are used in many industries to move heavy and oversized objects that other material handling methods cannot. These cranes have a railed support structure called a bridge, and a wheeled trolley that travels across the bridge horizontally. Several varieties of overhead cranes exist including gantry, semi-gantry, cantilever gantry, storage bridge and wall cranes.

OSHA regulates overhead cranes through 29 CFR 1910.179 Overhead and Gantry Cranes. This regulation covers general requirements, design, inspection, and maintenance requirements, as well as operations.

General Requirements

- All overhead cranes installed after August 31, 1971, must meet the specifications of the American National Standard Safety Code for Overhead and Gantry Cranes, ANSI B30.2.
- Cranes can be modified and load capacity rerated as long as the modifications and associated structure is thoroughly checked for the new rated load by a qualified engineer or the equipment manufacturer.
- The rated load of the crane shall be plainly marked on each side of the crane. If more than one hoist is present, each hoist will have its rating shown.
- Clearance must be maintained above and to the side of cranes. Walkways cannot be placed in a crane operating zone that would compromise employee safety when the crane is in operation. Parallel cranes must have adequate clearance between the two bridges if no walls or structures are between them.
- Only designated personnel will be permitted to operate a crane.

Design Requirements

All overhead cranes are required to have characteristics to

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promote their safe use. The OSHA regulation specifies design requirements on the construction of the cab and its controls; footwalks, ladders and stairways; bridge and trolley bumpers; hoist, holding, trolley and bridge brakes; electrical components; hoisting equipment; and warning devices.

Inspection Requirements

Due to the large and heavy objects often being transported by overhead cranes, routine inspections are necessary to ensure continued operation of the crane and the safety of the employees around the crane. An initial inspection of the crane prior to initial use of new and altered cranes is necessary. Once placed into service, overhead cranes will require two different types of inspections. Frequent inspections are done at daily to monthly intervals, while periodic inspections are completed at monthly to annual intervals. The purpose of the two inspection types is to detect critical components of the crane and to determine the extent of wear, deterioration or malfunction.

Initial Inspection

Items to be Inspected

- Hoisting and lowering
- Trolley travel
- Bridge travel
- Limit switches, locking and safety devices
- Load test of not more than 125% of rated load

Frequent Inspections

<i>Items to be Inspected</i>	<i>Frequency</i>
Operating mechanisms for maladjustment	Daily
Deterioration or leakage in pneumatic and hydraulic parts	Daily
Hooks with deformation or cracks (visual)	Daily
Hooks with deformation or racks (written record with signature of inspector and date)	Monthly
Hoist chains and end connections for wear, twist or distortion (visual)	Daily
Hoist chains and end connections for wear, twist, or distortion (written record with signature of inspector and date)	Monthly
Running Rope and end connections for wear, broken strands, etc. (written record with signature of inspector, rope identity and date)	Monthly
Functional operating mechanisms for excessive wear	As needed
Rope reeving according to manufacturers recommendations	As recommended

Periodic Inspections

Items to be inspected

- Deformed, cracked or corroded members
- Loose bolts or rivets
- Cracked or worn sheaves and drums
- Worn, cracked or distorted parts such as bearings, gears, rollers, etc.
- Excessive wear on brake system parts
- Inaccuracies in load, wind and other indicators
- Electric or fossil-fuel motors
- Excessive wear of chain drive sprockets and chain
- Deteriorated electrical components such as pushbuttons, limit switches or contactors

Maintenance Requirements

A preventive maintenance program based on the crane manufacturer's recommendations must be implemented. If any deteriorated components or unsafe conditions are detected during the required inspections, they must be completed before the crane is allowed to be used. Only designated personnel may perform the required maintenance and repairs. The requirements of 29 CFR 1910.147, The Control of Hazardous Energy or lockout/tagout, should be used to de-energize the crane (See EZ Facts Document #170 for more information).

Operation

The manufacturer's instructions must be followed when operating the crane. Attach the load to the block hook by means of slings or other approved devices, making sure the sling is clear of all obstacles. Once the load is properly secured and balanced in the untwisted sling, slowly raise the load. Horizontal movement must also begin slowly to prevent the load from swinging or coming into contact with other obstacles.

The crane warning signal or horn must be sounded when the load or hook comes near or over personnel. Carrying loads over personnel is not recommended. A load should not be left suspended.

Audible and discernible voice communication should be kept with the operator at all times. If this cannot be accomplished, a signal system should be used. Standard signals as shown on the next page; however, it may be necessary to create special signals in certain circumstances. In these circumstances, the signals must be understood and agreed upon by all individuals using the crane.

Commonly Asked Questions

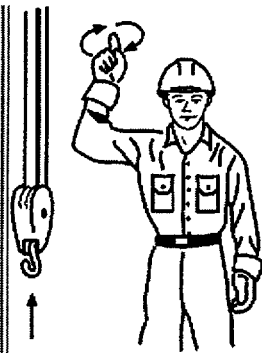
Q. Where are the standard crane signals located?

A. The signals are located in ANSI B30.2-1983. These are standard signals recommended by ANSI; however, OSHA does not require the signal system in its Overhead and Gantry Crane regulation. The manufacturers of overhead cranes may also provide their own version of crane signals.

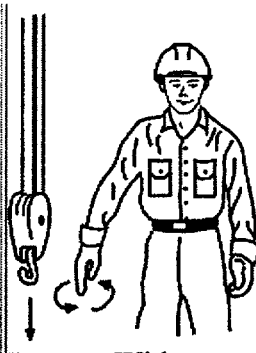
Q. Do standards exist for other types of cranes?

A. Yes, several. Here are just a few: OSHA 29 CFR 1910.180 regulates the operation of Crawler Locomotive and Truck Cranes; 29 CFR 1910.181 covers Derricks; 29 CFR 1910.183 covers Helicopter Cranes; and 29 CFR 1910.178 covers Powered Industrial Trucks. The American National Standards Institute's ANSI B30.2 covers Portal Tower and Pillar Cranes; ANSI B30.5 covers Mobile and Locomotive Cranes; and ANSI B30.11 covers Monorails and Underhung Cranes.

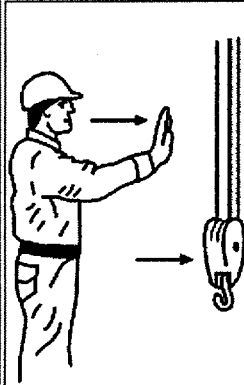
Standard Hand Signals for Controlling Overhead and Gantry Cranes



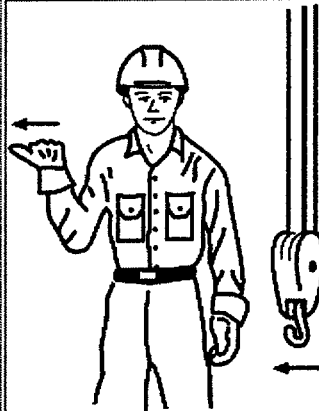
Hoist: With forearm vertical, forefinger pointing up, move hand in small horizontal circle.



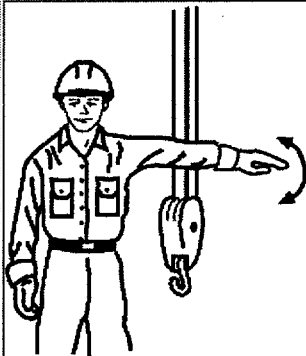
Lower: With arm extended downward, forefinger pointing down, move hand in small horizontal circles.



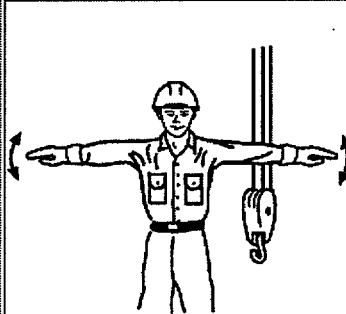
Bridge Travel: Arm extended forward, hand open and slightly raised, make pushing motion in direction of travel.



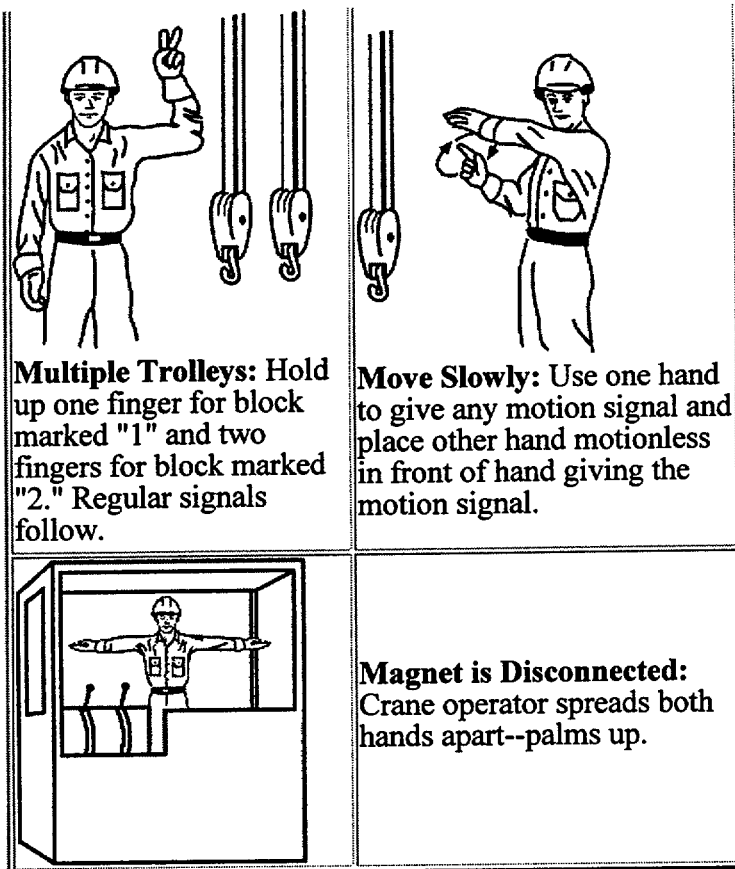
Trolley Travel: Palm up, fingers closed, thumb pointing in direction of motion, jerk hand horizontally.



Stop: Arm extended, palm down, move arm back and forth horizontally.



Emergency Stop: Both arms extended, palms down, move arms back and forth horizontally.



Sources for More Information

29 CFR 1910.179, Overhead and Gantry Cranes

ANSI B30.2-1983, Overhead and Gantry Cranes

ANSI B30.2a-1985, Addenda to Overhead and Gantry Cranes

ANSI B30.2b-1986, Addenda to Overhead and Gantry Cranes

ANSI B30.2c-1987, Addenda to Overhead and Gantry Cranes

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