



The Unauthorized & Annotated Guide to OSHA 1910.179 Overhead and Gantry Cranes

By

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Commented [LD1]: **IMPORTANT NOTICE:**
OSHA interpretations are the responsibility of the crane
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Regulations (Standards - 29 CFR) - Table of Contents

- **Part Number:** 1910
- **Part Title:** Occupational Safety and Health Standards
- **Subpart:** N
- **Subpart Title:** Materials Handling and Storage
- **Standard Number:** 1910.179
- **Title:** Overhead and gantry cranes.

Commented [LD2]: The left side of these pages are the full and unchanged copy of OSHA 1910.179. The right side are my commentary on what has been, in my experience, the most troublesome and/or important points. My comments are my personal view and are not “official” interpretations.

I would welcome comments, questions and differing opinions regarding my commentary as well as viewpoints on those paragraphs to which I didn’t provide a comment. Send your opinions to Larry@OverheadCraneConsulting.com. I will periodically update this document. Please indicate if you prefer to have your comment credited to you or to have it anonymously included.

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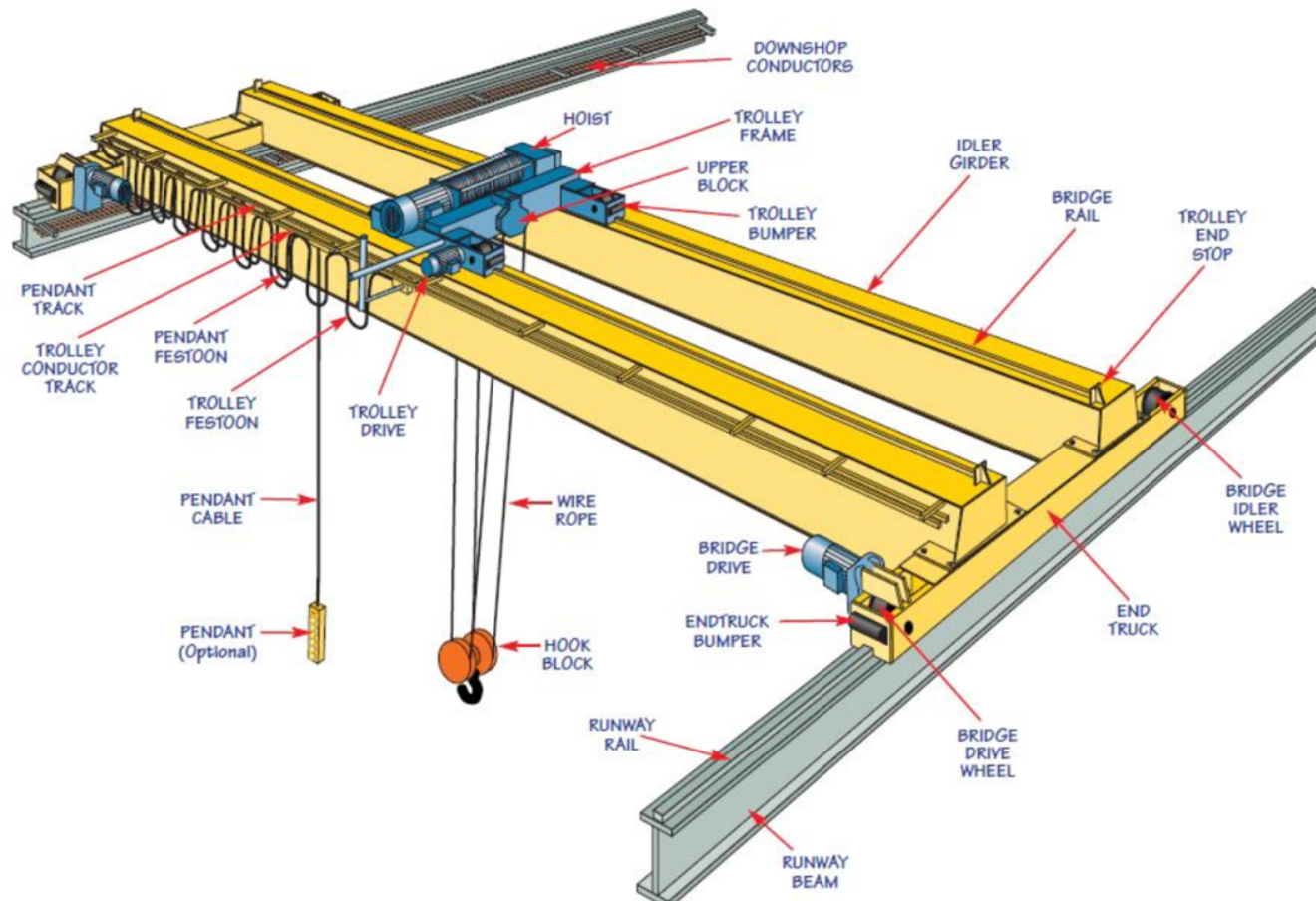


Figure 1- Master Image

1910.179(a): Definitions Applicable to This Section

1910.179(a)(1)

A "**crane**" is a machine for lifting and lowering a load and moving it horizontally, with the hoisting mechanism an integral part of the machine. Cranes whether fixed or mobile are driven manually or by power.

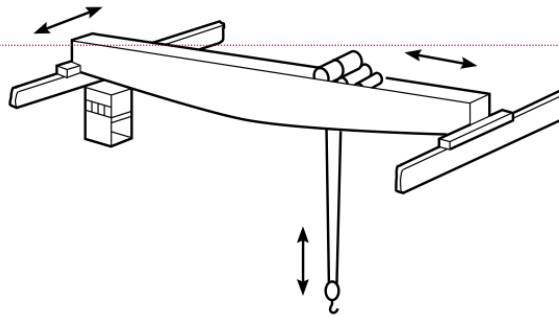


Figure 2: Overhead Crane

Commented [LD3]: The terms crane and hoist are often used interchangeably and that's incorrect. A crane is the structure that holds the hoist. The crane moves laterally (north/south and east/west) while the hoist does the lifting (up/down) motions.

1910.179(a)(2)

An "**automatic crane**" is a crane which when activated operates through a preset cycle or cycles.

1910.179(a)(3)

A "**cab-operated crane**" is a crane controlled by an operator in a cab located on the bridge or trolley.



Figure 3: Cab Operated Overhead Crane



1910.179(a)(4)

"**Cantilever gantry crane**" means a gantry or semigantry crane in which the bridge girders or trusses extend transversely beyond the crane runway on one or both sides.



Figure 4: Cantilever Gantry Crane

1910.179(a)(5)

"**Floor-operated crane**" means a crane which is pendant or nonconductive rope controlled by an operator on the floor or an independent platform.

1910.179(a)(6)

"**Gantry crane**" means a crane similar to an overhead crane except that the bridge for carrying the trolley or trolleys is rigidly supported on two or more legs running on fixed rails or other runway.



Figure 5: Gantry Crane



1910.179(a)(7)

"**Hot metal handling crane**" means an overhead crane used for transporting or pouring molten material.

1910.179(a)(8)

"**Overhead crane**" means a crane with a movable bridge carrying a movable or fixed hoisting mechanism and traveling on an overhead fixed runway structure.

1910.179(a)(9)

"**Power-operated crane**" means a crane whose mechanism is driven by electric, air, hydraulic, or internal combustion means.

1910.179(a)(10)

A "**pulpit-operated crane**" is a crane operated from a fixed operator station not attached to the crane.

1910.179(a)(11)

A "**remote-operated crane**" is a crane controlled by an operator not in a pulpit or in the cab attached to the crane, by any method other than pendant or rope control.

1910.179(a)(12)

A "**semigantry crane**" is a gantry crane with one end of the bridge rigidly supported on one or more legs that run on a fixed rail or runway, the other end of the bridge being supported by a truck running on an elevated rail or runway.

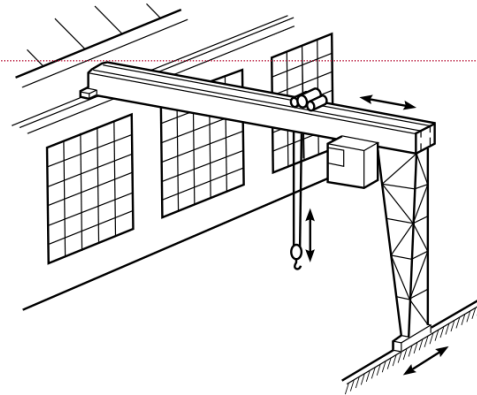


Figure 6: Semigantry Crane

Commented [LD4]: The critical word here is "molten" which really means the hot material has reached a "pouring" state.

Simply handling "hot material" does NOT require meeting all the specific needs of a "hot-metal handling crane." Heat shielding of the hoist and/or lower block may be adequate for a "hot" but not "Hot metal handling" crane

True "hot-metal handling cranes are far more expensive, therefore be careful in using this term.

Yes, the "powers that be" have chosen a confusingly vague term here, but it's been this way for 30+ years, so we're probably going to have to live with it.



1910.179(a)(13)

"**Storage bridge crane**" means a gantry type crane of long span usually used for bulk storage of material; the bridge girders or trusses are rigidly or nonrigidly supported on one or more legs. It may have one or more fixed or hinged cantilever ends.

1910.179(a)(14)

"**Wall crane**" means a crane having a jib with or without trolley and supported from a side wall or line of columns of a building. It is a traveling type and operates on a runway attached to the side wall or columns.



Figure 7: Wall Crane

1910.179(a)(15)

"**Appointed**" means assigned specific responsibilities by the employer or the employer's representative.

1910.179(a)(16)

"**ANSI**" means the American National Standards Institute.

1910.179(a)(17)

An "**auxiliary hoist**" is a supplemental hoisting unit of lighter capacity and usually higher speed than provided for the main hoist.

1910.179(a)(18)

A "**brake**" is a device used for retarding or stopping motion by friction or power means.

1910.179(a)(19)

A "**drag brake**" is a brake which provides retarding force without external control.

1910.179(a)(20)

A "**holding brake**" is a brake that automatically prevents motion when power is off.

Commented [LD5]: The is one of those words with special "OSHA" meaning. Whenever you see this word, pay close attention.

This is a management designated position and should be recorded somewhere in your crane safety paper trail.

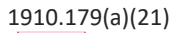
Commented [LD6]: Much of OSHA is comprised of "incorporation by reference" of the ANSI (American National Standards Institute) specifications.

Beware, when interpreting OSHA. For example, the crane section 1910.179 was taken, to a great extent, from the ANSI/ASME B30.2. OSHA 1910.179 is only 11 pages but B30.2 is about 50 pages. Many well-meaning crane owners think they are "free and clear" having met the requirements of the 11 pages of OSHA, but in fact, because of "incorporation by reference" they are also subject to B30.2!

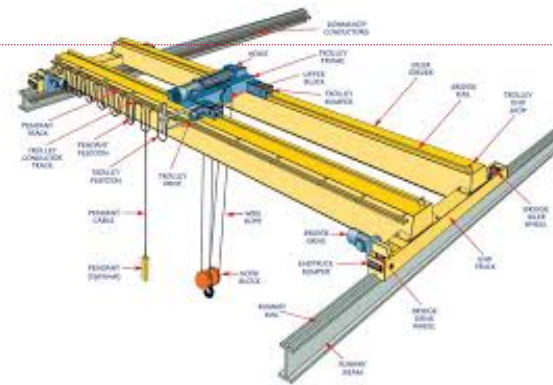
Note, B30.2 is sometimes referenced as ASNI B30.2 and ASME B30.2 and even ANSI/ASME B30.2. Don't worry, they're all the same and the current edition of the printed document is actually written up as ANSI/ASME B30.2.

Commented [LD7]: This is another one of those special "OSHA" words. There are several specific types of brakes. The proper interpretation of OSHA and other specifications requires the more specific term such as "drag brake" or "holding brake" etc (see following definitions).

In other words, using the term "brake" without out a modifier such as "drag brake" just muddles the conversation and may lead to an incorrect interpretation of the regulations.



"Bridge" means that part of a crane consisting of girders, trucks, end ties, footwalks, and drive mechanism which carries the trolley or trolleys.



Commented [LD8]: The “bridge” is the structural steel part of the crane. Often referred to as a “bridge crane.”

1910.179(a)(22)

"Bridge travel" means the crane movement in a direction parallel to the crane runway.

1910.179(a)(23)

A "**bumper**" [buffer] is an energy absorbing device for reducing impact when a moving crane or trolley reaches the end of its permitted travel; or when two moving cranes or trolleys come in contact.





1910.179(a)(24)

The "***cab***" is the operator's compartment on a crane.



Figure 10: Cab Operated Crane

1910.179(a)(25) "**Clearance**" means the distance from any part of the crane to a point of the nearest obstruction.

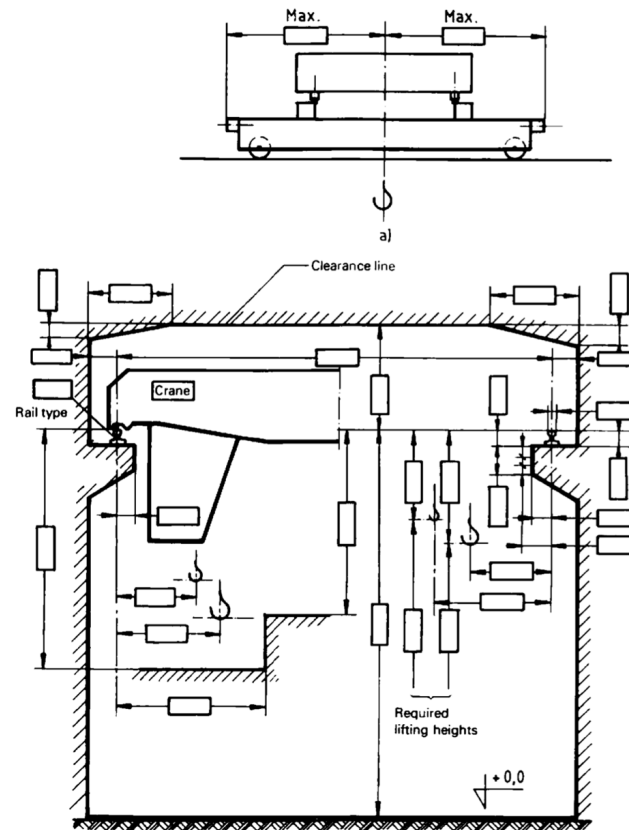


Figure 11: Critical Dimensions

Commented [LD9]: The term "clearance" is a generic term and therefore often causes more confusion than clarification. Make sure to be specific as to the type "clearance" you're referring to such as "clearance above the hoist" or "clearance to bottom of bridge girder", etc.

This drawing may seem needlessly confusing and only a few of the dimensions are relevant to any one application. The problem is that it's a different two or three critical dimensions for every application.



1910.179(a)(26)

"**Collectors current**" are contacting devices for collecting current from runway or bridge conductors.



Figure 12: Collectors

1910.179(a)(27)

"**Conductors, bridge**" are the electrical conductors located along the bridge structure of a crane to provide power to the trolley.

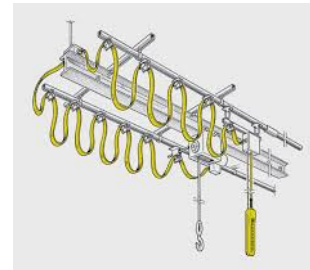


Figure 13: Bridge Conductor

1910.179(a)(28)

"**Conductors, runway**" [main] are the electrical conductors located along a crane runway to provide power to the crane.



1910.179(a)(29)

The "**control braking means**" is a method of controlling crane motor speed when in an overhauling condition.

1910.179(a)(30)

"**Countertorque**" means a method of control by which the power to the motor is reversed to develop torque in the opposite direction.

1910.179(a)(31)

"**Dynamic**" means a method of controlling crane motor speeds when in the overhauling condition to provide a retarding force.

1910.179(a)(32)

"**Regenerative**" means a form of dynamic braking in which the electrical energy generated is fed back into the power system.

1910.179(a)(33) **1910.179(a)(33)**

"**Mechanical**" means a method of control by friction.

1910.179(a)(34)

"**Controller, spring return**" means a controller which when released will return automatically to a neutral position.

1910.179(a)(35)

"**Designated**" means selected or assigned by the employer or the employer's representative as being qualified to perform specific duties.

1910.179(a)(36)

A "**drift point**" means a point on a travel motion controller which releases the brake while the motor is not energized. This allows for coasting before the brake is set.

Commented [LD10]: This is another of the "OSHA" words with very specific meaning. Whenever you see either "appointed" or "designated" make sure to understand the nuanced meaning of the sentence in which it is used.



1910.179(a)(37)

The "**drum**" is the cylindrical member around which the ropes are wound for raising or lowering the load.



Figure 14: Hoist Drum (unpainted portion)

1910.179(a)(38)

An "**equalizer**" is a device which compensates for unequal length or stretch of a rope.

1910.179(a)(39)

"**Exposed**" means capable of being contacted inadvertently. Applied to hazardous objects not adequately guarded or isolated.

1910.179(a)(40)

"**Fail-safe**" means a provision designed to automatically stop or safely control any motion in which a malfunction occurs.

1910.179(a)(41)

"**Footwalk**" means the walkway with handrail, attached to the bridge or trolley for access purposes.

1910.179(a)(42)

A "**hoist**" is an apparatus which may be a part of a crane, exerting a force for lifting or lowering.

1910.179(a)(43)

"**Hoist chain**" means the load bearing chain in a hoist.

NOTE: Chain properties do not conform to those shown in ANSI B30.9-1971, Safety Code for Slings.

1910.179(a)(44)

"**Hoist motion**" means that motion of a crane which raises and lowers a load.



Figure 15: Integrated Trolley on Hoist

Commented [LD11]: The mechanical device that does the hoisting/lifting motions as opposed to the crane that performs the lateral motions.

A frequent point of confusion is that some hoists have integrated "trolleys." The Trolleys provide horizontal travel along the bridge beam.



1910.179(a)(45)

"**Load**" means the total superimposed weight on the load block or hook.

1910.179(a)(46)

The "**load block**" is the assembly of hook or shackle, swivel, bearing, sheaves, pins, and frame suspended by the hoisting rope.

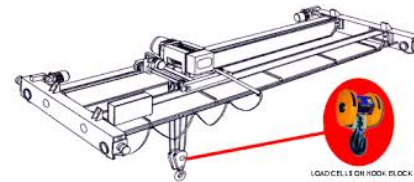


Figure 16: Load Block

1910.179(a)(47)

"**Magnet**" means an electromagnetic device carried on a crane hook to pick up loads magnetically.



Figure 17: Crane Magnet

1910.179(a)(48)

"**Main hoist**" means the hoist mechanism provided for lifting the maximum rated load.

1910.179(a)(49)

A "**man trolley**" is a trolley having an operator's cab attached thereto.

1910.179(a)(50)

"**Rated load**" means the maximum load for which a crane or individual hoist is designed and built by the manufacturer and shown on the equipment nameplate(s).

Commented [LD12]: The "Rated Load" is a critical term with a specific engineering connotation. It's the load capacity the crane was designed to lift and has been load tested to perform. The term "Rated Capacity" has been used in the OSHA era in place of simply using the term "Capacity."



1910.179(a)(51)

"**Rope**" refers to wire rope, unless otherwise specified.

1910.179(a)(52)

"**Running sheave**" means a sheave which rotates as the load block is raised or lowered.

1910.179(a)(53)

"**Runway**" means an assembly of rails, beams, girders, brackets, and framework on which the crane or trolley travels.



Figure 18: Crane Runway (excluding yellow bridge)

Commented [LD13]: Runway is the track system upon which the crane travels. The runway is often supplied by a different vendor from the crane supplier.

1910.179(a)(54)

"**Side pull**" means that portion of the hoist pull acting horizontally when the hoist lines are not operated vertically.

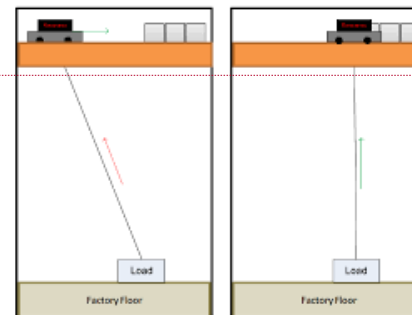


Figure 19: Side Pull

Commented [LD14]: Side pull is a critical term in the crane world. It's the action of not lifting with the rope perpendicular to the floor. Side pulling imposes a load on the crane it was not designed to handle. At worst Side pulling can result in structural failure and at best it results in rapid wire rope wear. Instructions warning against side pulling are to be displayed on every hoist in plain sight of the operator.



1910.179(a)(55) 1910.179(a)(55)

"**Span**" means the horizontal distance center to center of runway rails.

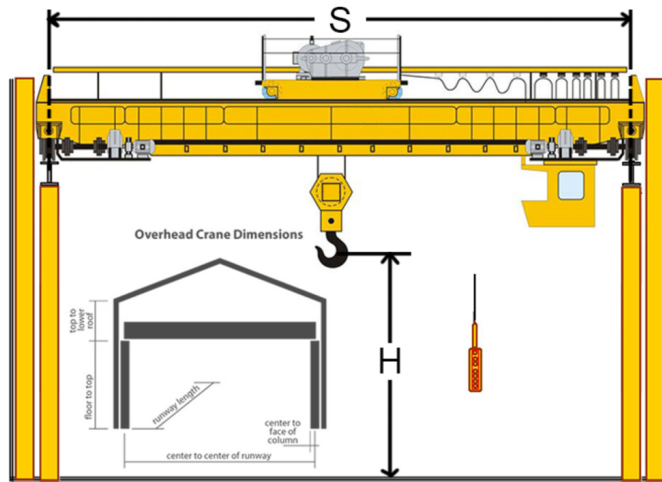


Figure 20: Crane Span

1910.179(a)(56) 1910.179(a)(56)

"**Standby crane**" means a crane which is not in regular service but which is used occasionally or intermittently as required.

Commented [LD15]: Crane span is the width of the crane. The span to end-truck wheel base ratio is to be 7:1 for double girder cranes per CMAA Spec 70 and 8:1 for single girder cranes per CMAA Spec 74.



1910.179(a)(57)

A "**stop**" is a device to limit travel of a trolley or crane bridge. This device normally is attached to a fixed structure and normally does not have energy absorbing ability.



Figure 21: Rail Stop

1910.179(a)(58)

A "**switch**" is a device for making, breaking, or for changing the connections in an electric circuit.

1910.179(a)(59)

An "**emergency stop switch**" is a manually or automatically operated electric switch to cut off electric power independently of the regular operating controls.

1910.179(a)(60)

A "**limit switch**" is a switch which is operated by some part or motion of a power-driven machine or equipment to alter the electric circuit associated with the machine or equipment.

1910.179(a)(61)

A "**main switch**" is a switch controlling the entire power supply to the crane.

1910.179(a)(62)

A "**master switch**" is a switch which dominates the operation of contactors, relays, or other remotely operated devices.



1910.179(a)(63)

The "**trolley**" is the unit which travels on the bridge rails and carries the hoisting mechanism.



Figure 22: Integrated Trolley with Hoist

Commented [LD16]: The trolley is attached to the hoist and provides horizontal motion. The trolley is often an integral part of the hoist, but in reality a separate component with potentially radically different duty cycle demands.

1910.179(a)(64)

"**Trolley travel**" means the trolley movement at right angles to the crane runway.

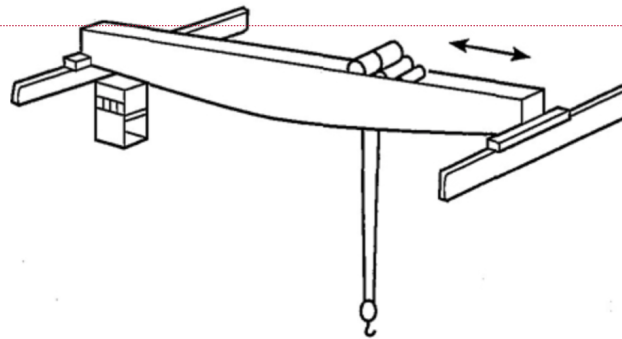


Figure 23: Trolley-travel motion

Commented [LD17]: Conceptually the trolley motion may provide some confusion in that it's a mechanical component of the hoist, but provides horizontal motion.

1910.179(a)(65)

"**Truck**" means the unit consisting of a frame, wheels, bearings, and axles which supports the bridge girders or trolleys.

Commented [LD18]: Usually referred to as an End-truck



Figure 24: Top Running Trolley



Figure 25: Under Running Trolley



1910.179(b): General Requirements

1910.179(b)(1)

Application. This section applies to overhead and gantry cranes, including semigantry, cantilever gantry, wall cranes, storage bridge cranes, and others having the same fundamental characteristics. These cranes are grouped because they all have trolleys and similar travel characteristics.

1910.179(b)(2)

New and existing equipment. All new overhead and gantry cranes constructed and installed on or after August 31, 1971, shall meet the design specifications of the American National Standard Safety Code for Overhead and Gantry Cranes, ANSI B30.2.0-1967, which is incorporated by reference as specified in Sec. 1910.6.

1910.179(b)(3) Modifications.

Cranes may be modified and rerated provided such modifications and the supporting structure are checked thoroughly for the new rated load by a qualified engineer or the equipment manufacturer. The crane shall be tested in accordance with paragraph (k) (2) of this section. New rated load shall be displayed in accordance with subparagraph (5) of this paragraph.

1910.179(b)(4) Wind indicators and rail clamps.

Outdoor storage bridges shall be provided with automatic rail clamps. A wind-indicating device shall be provided which will give a visible or audible alarm to the bridge operator at a predetermined wind velocity. If the clamps act on the rail heads, any beads or weld flash on the rail heads shall be ground off.

Commented [LD19]: This is an important paragraph. This is where OSHA extends its coverage to other types of cranes with the phrase, "...and others having the same fundamental characteristics."

It's my interpretation this paragraph extends coverage to jib cranes, traveling jib cranes, work-station cranes etc.

Commented [LD20]: "Shall" means it is required, as opposed to the other term "Should" which means suggested or advised but not legally mandated.

Commented [LD21]: Much of OSHA 1910.179 was taken directly from ANSI B30.2 and because it's "incorporated by reference" 100% of ANSI/ASME B30.2 has the legal force of OSHA 1910.179.

IOW, you're flying blind if you don't purchase a copy of ANSI/ASME B30.2. It's available from a number of sources. Just "Google" B30.2 and you'll see a number of vendors. It's available in both print and PDF format and it costs \$60.

Commented [LD22]: "Incorporate by Reference"
These are critical words that mean that those specifications that are "incorporated by reference" have the same weight of law as the OSHA spec itself!

Commented [LD23]: Once a crane is modified, it must be re-qualified as if it were a new crane. IOW, a full inspection and load test.



1910.179(b)(5) Rated load marking.

The rated load of the crane shall be plainly marked on each side of the crane, and if the crane has more than one hoisting unit, each hoist shall have its rated load marked on it or its load block and this marking shall be clearly legible from the ground or floor.

Commented [LD24]: The "Rated Capacity" must be plainly marked on the crane. This is one of the most elementary checks, even by the "newbie" OSHA inspector.

Commented [LD25]: Cranes with dual hoist can provide a point of confusion. I have had clients that needed a 10 ton crane with (2) 10 ton hoists. Some lifts required a single hook capable of a full 10 tons while other lifts required two hooks, each capable of 5 tons.

In this case it is my suggestion to get a load limiting system that is call "load summing" which prevents the aggregate total being lifted not to exceed the capacity of the bridge crane.

This is not an OSHA requirement but advisable.

1910.179(b)(6) Clearance from obstruction.

Commented [LD26]: The clearances referred to here are the vertical/overhead crane to building clearance and the horizontal/lateral clearance of crane to stationary building component.

CRITICAL NOTE, buildings settle and footings, columns and trusses therefore move. I would never use the minimum dimensions unless I had a gun to my head. My suggestion is to use 6 inches vertical and 4 inches horizontal. At minimum, at least give yourself an additional inch.



1910.179(b)(6)(i)

Minimum clearance of 3 inches overhead and 2 inches laterally shall be provided and maintained between crane and obstructions in conformity with Crane Manufacturers Association of America, Inc, Specification No. 61, which is incorporated by reference as specified in Sec. 1910.6, (formerly the Electric Overhead Crane Institute, Inc).

Commented [LD27]: Minimum of 3 inches' vertical clearance is a mandated requirement. See above warning.

Commented [LD28]: Minimum of 2 inches lateral clearance is mandated. See above warning.

Commented [LD29]: Note another "incorporated by reference". This specification was written by the precursor to the CMAA (EOCI, Electric Overhead Crane Institute) in 1961. OSHA 1910.6 actually references the more modern CMAA Spec 70.

1910.179(b)(6)(ii)

Where passageways or walkways are provided obstructions shall not be placed so that safety of personnel will be jeopardized by movements of the crane.

1910.179(b)(7) Clearance between parallel cranes.

If the runways of two cranes are parallel, and there are no intervening walls or structure, there shall be adequate clearance provided and maintained between the two bridges.

1910.179(b)(8) Designated personnel –

Only designated personnel shall be permitted to operate a crane covered by this section.

Commented [LD30]: Important Note: Only "designated personnel are permitted to operate a crane. To me this begs the question, who is designated and how is a person designated? Because nothing is stated, my advice is to have an "in-house" written policy and make sure you conform to your policy as evidenced by a paper trail.



1910.179(c): Cabs

1910.179(c)(1) Cab location.

1910.179(c)(1)(i)

The general arrangement of the cab and the location of control and protective equipment shall be such that all operating handles are within convenient reach of the operator when facing the area to be served by the load hook, or while facing the direction of travel of the cab. The arrangement shall allow the operator a full view of the load hook in all positions.



1910.179(c)(1)(ii)

The cab shall be located to afford a minimum of 3 inches clearance from all fixed structures within its area of possible movement.

1910.179(c)(2) Access to crane.

Access to the cab and/or bridge walkway shall be by a conveniently placed fixed ladder, stairs, or platform requiring no step over any gap exceeding 12 inches. Fixed ladders shall be in conformance with the American National Standard Safety Code for Fixed Ladders, ANSI A14.3-1956, which is incorporated by reference as specified in Sec. 1910.6.

1910.179(c)(3) Fire extinguisher.

Carbon tetrachloride extinguishers shall not be used.

1910.179(c)(4) Lighting.

Light in the cab shall be sufficient to enable the operator to see clearly enough to perform his work.

Commented [LD31]: Another "incorporation by reference." It's available from a number of sources. Just "Google" A14.3 and you'll see a number of vendors. It's available in both print and PDF format (not a free spec).



1910.179(d): Footwalks and Ladders

1910.179(d)(1) Location of footwalks.

1910.179(d)(1)(i)

If sufficient headroom is available on cab-operated cranes, a footwalk shall be provided on the drive side along the entire length of the bridge of all cranes having the trolley running on the top of the girders.

1910.179(d)(1)(ii)

Where footwalks are located in no case shall less than 48 inches of headroom be provided.



1910.179(d)(2) Construction of footwalks.

1910.179(d)(2)(i)

Footwalks shall be of rigid construction and designed to sustain a distributed load of at least 50 pounds per square foot.

1910.179(d)(2)(ii) **1910.179(d)(2)(ii)**

Footwalks shall have a walking surface of antislip type.

NOTE: Wood will meet this requirement.

1910.179(d)(2)(iii)

[Reserved]

1910.179(d)(2)(iv)

The inner edge shall extend at least to the line of the outside edge of the lower cover plate or flange of the girder.

Commented [LD32]: This is a question that comes up more frequently than you might expect. Note the answer invokes the term "shall."



1910.179(d)(3)

Toeboards and handrails for footwalks. Toeboards and handrails shall be in compliance with section 1910.23 of this part.

1910.179(d)(4) Ladders and stairways.

1910.179(d)(4)(i)

Gantry cranes shall be provided with ladders or stairways extending from the ground to the footwalk or cab platform.

1910.179(d)(4)(ii)

Stairways shall be equipped with rigid and substantial metal handrails. Walking surfaces shall be of an antislip type.

1910.179(d)(4)(iii)

Ladders shall be permanently and securely fastened in place and shall be constructed in compliance with 1910.27.



1910.179(e): Stops, Bumpers, Rail Sweeps, and Guards

1910.179(e)(1) Trolley stops.

1910.179(e)(1)(i)

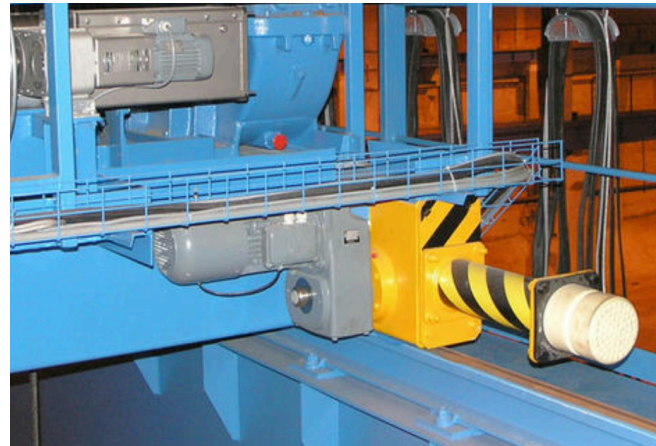
Stops shall be provided at the limits of travel of the trolley.

1910.179(e)(1)(iii)

Stops shall be fastened to resist forces applied when contacted.

1910.179(e)(1)(iii)

A stop engaging the tread of the wheel shall be of a height at least equal to the radius of the wheel.



1910.179(e)(2) Bridge bumpers -

1910.179(e)(2)(i)

A crane shall be provided with bumpers or other automatic means providing equivalent effect, unless the crane travels at a slow rate of speed and has a faster deceleration rate due to the use of sleeve bearings, or is not operated near the ends of bridge and trolley travel, or is restricted to a limited distance by the nature of the crane operation and there is no hazard of striking any object in this limited distance, or is used in similar operating conditions. The bumpers shall be capable of stopping the crane (not including the lifted load) at an average rate of deceleration not to exceed 3 ft/s/s when traveling in either direction at 20 percent of the rated load speed.

1910.179(e)(2)(i)(a)

The bumpers shall have sufficient energy absorbing capacity to stop the crane when traveling at a speed of at least 40 percent of rated load speed.



1910.179(e)(2)(i)(b) 1910.179(e)(2)(i)(b)

The bumper shall be so mounted that there is no direct shear on bolts.

1910.179(e)(2)(ii) 1910.179(e)(2)(ii)

Bumpers shall be so designed and installed as to minimize parts falling from the crane in case of breakage.

1910.179(e)(3) Trolley bumpers -

1910.179(e)(3)(i)

A trolley shall be provided with bumpers or other automatic means of equivalent effect, unless the trolley travels at a slow rate of speed, or is not operated near the ends of bridge and trolley travel, or is restricted to a limited distance of the runway and there is no hazard of striking any object in this limited distance, or is used in similar operating conditions. The bumpers shall be capable of stopping the trolley (not including the lifted load) at an average rate of deceleration not to exceed 4.7 ft/s/s when traveling in either direction at one-third of the rated load speed.

1910.179(e)(3)(ii)

When more than one trolley is operated on the same bridge, each shall be equipped with bumpers or equivalent on their adjacent ends.

1910.179(e)(3)(iii)

Bumpers or equivalent shall be designed and installed to minimize parts falling from the trolley in case of age.

1910.179(e)(4) Rail sweeps.

Bridge trucks shall be equipped with sweeps which extend below the top of the rail and project in front of the truck wheels.

1910.179(e)(5) Guards for hoisting ropes.

1910.179(e)(5)(i)

If hoisting ropes run near enough to other parts to make fouling or chafing possible, guards shall be installed to prevent this condition.



1910.179(e)(5)(ii)

A guard shall be provided to prevent contact between bridge conductors and hoisting ropes if they could come into contact.

1910.179(e)(6) Guards for moving parts.

1910.179(e)(6)(i)

Exposed moving parts such as gears, set screws, projecting keys, chains, chain sprockets, and reciprocating components which might constitute a hazard under normal operating conditions shall be guarded.

1910.179(e)(6)(ii)

Guards shall be securely fastened.

1910.179(e)(6)(iii)

Each guard shall be capable of supporting without permanent distortion the weight of a 200-pound person unless the guard is located where it is impossible for a person to step on it.



1910.179(f): Brakes

1910.179(f)(1) Brakes for hoists.

1910.179(f)(1)(i)

Each independent hoisting unit of a crane shall be equipped with at least one self-setting brake, hereafter referred to as a holding brake, applied directly to the motor shaft or some part of the gear train.

1910.179(f)(1)(ii)

Each independent hoisting unit of a crane, except worm-gear hoists, the angle of whose worm is such as to prevent the load from accelerating in the lowering direction shall, in addition to a holding brake, be equipped with control braking means to prevent overspeeding.

1910.179(f)(2) Holding brakes.

1910.179(f)(2)(i)

Holding brakes for hoist motors shall have not less than the following percentage of the full load hoisting torque at the point where the brake is applied.

1910.179(f)(2)(i)(a)

125 percent when used with a control braking means other than mechanical.

1910.179(f)(2)(i)(b)

100 percent when used in conjunction with a mechanical control braking means.

1910.179(f)(2)(i)(c)

100 percent each if two holding brakes are provided.



Commented [LD33]: This is often referred to as a secondary brake. Note this brake is not a “stopping” brake, but rather a brake that prevents “over-speeding.” In other words, it prevents “free fall” and usually restricts the lower speed to equal to or less than the lifting speed.



1910.179(f)(2)(ii)

Holding brakes on hoists shall have ample thermal capacity for the frequency of operation required by the service.

1910.179(f)(2)(iii)

Holding brakes on hoists shall be applied automatically when power is removed.

1910.179(f)(2)(iv)

Where necessary holding brakes shall be provided with adjustment means to compensate for wear.

1910.179(f)(2)(v)

The wearing surface of all holding-brake drums or discs shall be smooth.

1910.179(f)(2)(vi)

Each independent hoisting unit of a crane handling hot metal and having power control braking means shall be equipped with at least two holding brakes.

1910.179(f)(3) Control braking means.

1910.179(f)(3)(i)

A power control braking means such as regenerative, dynamic or countertorque braking, or a mechanically controlled braking means shall be capable of maintaining safe lowering speeds of rated loads.

1910.179(f)(3)(ii)

The control braking means shall have ample thermal capacity for the frequency of operation required by service.

1910.179(f)(4) Brakes for trolleys and bridges.

1910.179(f)(4)(i)

Foot-operated brakes shall not require an applied force of more than 70 pounds to develop manufacturer's rated brake torque.

Commented [LD34]: In other words, holding brakes are "normally on" when not powered and are disengaged when powered.

Commented [LD35]: Special braking requirement of "hot metal handling" applications. Remember, when you see the term "hot-metal handling," think "pourable" and not simply high temperature.

Commented [LD36]: The term braking here needs to be clarified. Braking is usually interpreted as stopping but in this case only means a "controlled" slowing of the speed.

Commented [LD37]: In this case, "power controlled braking" means that it prevents "free fall" and a "safe lowering speed" is mandated. A "safe lowering speed" is usually defined as a speed equal to or less than the lifting speed



1910.179(f)(4)(ii)

Brakes may be applied by mechanical, electrical, pneumatic, hydraulic, or gravity means.

1910.179(f)(4)(iii)

Where necessary brakes shall be provided with adjustment means to compensate for wear.

1910.179(f)(4)(iv)

The wearing surface of all brakedrums or discs shall be smooth.

1910.179(f)(4)(v)

All foot-brake pedals shall be constructed so that the operator's foot will not easily slip off the pedal.

1910.179(f)(4)(vi)

Foot-operated brakes shall be equipped with automatic means for positive release when pressure is released from the pedal.

1910.179(f)(4)(vii)

Brakes for stopping the motion of the trolley or bridge shall be of sufficient size to stop the trolley or bridge within a distance in feet equal to 10 percent of full load speed in feet per minute when traveling at full speed with full load.

1910.179(f)(4)(viii)

If holding brakes are provided on the bridge or trolleys, they shall not prohibit the use of a drift point in the control circuit.

1910.179(f)(4)(ix)

Brakes on trolleys and bridges shall have ample thermal capacity for the frequency of operation required by the service to prevent impairment of functions from overheating.

1910.179(f)(5) Application of trolley brakes.

1910.179(f)(5)(i)

On cab-operated cranes with cab on trolley, a trolley brake shall be required as specified under paragraph (f)(4) of this section.

Commented [LD38]: In other words,, stopping distance for a bridge or trolley traveling at 30 fpm "shall" be no greater than 3 feet (at full load).



1910.179(f)(5)(ii)

A drag brake may be applied to hold the trolley in a desired position on the bridge and to eliminate creep with the power off.

1910.179(f)(6) Application of bridge brakes.

1910.179(f)(6)(i)

On cab-operated cranes with cab on bridge, a bridge brake is required as specified under paragraph (f)(4) of this section.

1910.179(f)(6)(ii)

On cab-operated cranes with cab on trolley, a bridge brake of the holding type shall be required.

1910.179(f)(6)(iii)

On all floor, remote and pulpit-operated crane bridge drives, a brake of noncoasting mechanical drive shall be provided.



1910.179(g): Electric Equipment

1910.179(g)(1) General.

1910.179(g)(1)(i)

Wiring and equipment shall comply with subpart S of this part.

1910.179(g)(1)(ii)

The control circuit voltage shall not exceed 600 volts for a.c. or d.c. current.

1910.179(g)(1)(iii)

The voltage at pendant push-buttons shall not exceed 150 volts for a.c. and 300 volts for d.c.



1910.179(g)(1)(iv)

Where multiple conductor cable is used with a suspended pushbutton station, the station must be supported in some satisfactory manner that will protect the electrical conductors against strain.

1910.179(g)(1)(v)

Pendant control boxes shall be constructed to prevent electrical shock and shall be clearly marked for identification of functions.

1910.179(g)(2) Equipment.

1910.179(g)(2)(i)

Electrical equipment shall be so located or enclosed that live parts will not be exposed to accidental contact under normal operating conditions.

1910.179(g)(2)(ii)

Electric equipment shall be protected from dirt, grease, oil, and moisture.



1910.179(g)(2)(iii)

Guards for live parts shall be substantial and so located that they cannot be accidentally deformed so as to make contact with the live parts.

1910.179(g)(3) Controllers.

1910.179(g)(3)(i)

Cranes not equipped with spring-return controllers or momentary contact pushbuttons shall be provided with a device which will disconnect all motors from the line on failure of power and will not permit any motor to be restarted until the controller handle is brought to the "off" position, or a reset switch or button is operated.

1910.179(g)(3)(ii)

Lever operated controllers shall be provided with a notch or latch which in the "off" position prevents the handle from being inadvertently moved to the "on" position. An "off" detent or spring return arrangement is acceptable.

1910.179(g)(3)(iii)

The controller operating handle shall be located within convenient reach of the operator.

1910.179(g)(3)(iv)

As far as practicable, the movement of each controller handle shall be in the same general directions as the resultant movements of the load.

1910.179(g)(3)(v)

The control for the bridge and trolley travel shall be so located that the operator can readily face the direction of travel.

1910.179(g)(3)(vi)

For floor-operated cranes, the controller or controllers if rope operated, shall automatically return to the "off" position when released by the operator.

1910.179(g)(3)(vii)

Pushbuttons in pendant stations shall return to the "off" position when pressure is released by the crane operator.



1910.179(g)(3)(viii)

Automatic cranes shall be so designed that all motions shall fail-safe if any malfunction of operation occurs.

1910.179(g)(3)(ix)

Remote-operated cranes shall function so that if the control signal for any crane motion becomes ineffective the crane motion shall stop.

1910.179(g)(4) Resistors

1910.179(g)(4)(i)

Enclosures for resistors shall have openings to provide adequate ventilation, and shall be installed to prevent the accumulation of combustible matter too near to hot parts.

1910.179(g)(4)(ii)

Resistor units shall be supported so as to be as free as possible from vibration.

1910.179(g)(4)(iii)

Provision shall be made to prevent broken parts or molten metal falling upon the operator or from the crane.

1910.179(g)(5) Switches

1910.179(g)(5)(i)

The power supply to the runway conductors shall be controlled by a switch or circuit breaker located on a fixed structure, accessible from the floor, and arranged to be locked in the open position.

1910.179(g)(5)(ii)

On cab-operated cranes a switch or circuit breaker of the enclosed type, with provision for locking in the open position, shall be provided in the leads from the runway conductors. A means of opening this switch or circuit breaker shall be located within easy reach of the operator.



1910.179(g)(5)(iii)

On floor-operated cranes, a switch or circuit breaker of the enclosed type, with provision for locking in the open position, shall be provided in the leads from the runway conductors. This disconnect shall be mounted on the bridge or footwalk near the runway collectors. One of the following types of floor-operated disconnects shall be provided:

1910.179(g)(5)(iii)(a)

Nonconductive rope attached to the main disconnect switch.

1910.179(g)(5)(iii)(b)

An undervoltage trip for the main circuit breaker operated by an emergency stop button in the pendant pushbutton in the pendant pushbutton station.

1910.179(g)(5)(iii)(c)

A main line contactor operated by a switch or pushbutton in the pendant pushbutton station.

1910.179(g)(5)(iv)

The hoisting motion of all electric traveling cranes shall be provided with an overtravel limit switch in the hoisting direction.

1910.179(g)(5)(v)

All cranes using a lifting magnet shall have a magnet circuit switch of the enclosed type with provision for locking in the open position. Means for discharging the inductive load of the magnet shall be provided.

1910.179(g)(6) Runway conductors

Conductors of the open type mounted on the crane runway beams or overhead shall be so located or so guarded that persons entering or leaving the cab or crane footwalk normally could not come into contact with them.

1910.179(g)(7) Extension lamps

If a service receptacle is provided in the cab or on the bridge of cab-operated cranes, it shall be a grounded three-prong type permanent receptacle, not exceeding 300 volts.



1910.179(h): Hoisting Equipment

1910.179(h)(1) Sheaves.

1910.179(h)(1)(i)

Sheave grooves shall be smooth and free from surface defects which could cause rope damage.

1910.179(h)(1)(ii)

Sheaves carrying ropes which can be momentarily unloaded shall be provided with close-fitting guards or other suitable devices to guide the rope back into the groove when the load is applied again.

1910.179(h)(1)(iii)

The sheaves in the bottom block shall be equipped with close-fitting guards that will prevent ropes from becoming fouled when the block is lying on the ground with ropes loose.

1910.179(h)(1)(iv)

Pockets and flanges of sheaves used with hoist chains shall be of such dimensions that the chain does not catch or bind during operation.

1910.179(h)(1)(v)

All running sheaves shall be equipped with means for lubrication. Permanently lubricated, sealed and/or shielded bearings meet this requirement.

1910.179(h)(2) Ropes

1910.179(h)(2)(i)

In using hoisting ropes, the crane manufacturer's recommendation shall be followed. The rated load divided by the number of parts of rope shall not exceed 20 percent of the nominal breaking strength of the rope.



Commented [LD39]: The bottom block must have a "close fitting" guard. This is one of the more common OSHA violations.

Commented [LD40]: See 1910.179(h)(2)(viii)



1910.179(h)(2)(iii)

Socketing shall be done in the manner specified by the manufacturer of the assembly.

1910.179(h)(2)(iii)

Rope shall be secured to the drum as follows:

1910.179(h)(2)(iii)(a)

No less than two wraps of rope shall remain on the drum when the hook is in its extreme low position.

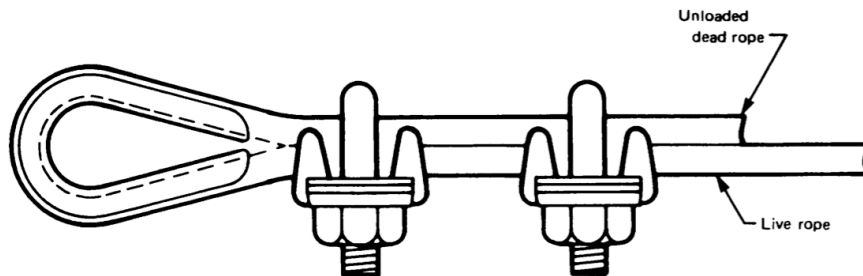
1910.179(h)(2)(iii)(b)

Rope end shall be anchored by a clamp securely attached to the drum, or by a socket arrangement approved by the crane or rope manufacturer.

1910.179(h)(2)(iv) Eye splices. [Reserved]

1910.179(h)(2)(v)

Rope clips attached with U-bolts shall have the U-bolts on the dead or short end of the rope. Spacing and number of all types of clips shall be in accordance with the clip manufacturer's recommendation. Clips shall be drop-forged steel in all sizes manufactured commercially. When a newly installed rope has been in operation for an hour, all nuts on the clipbolts shall be retightened.



Commented [LD41]: This seemingly simple statement can be a point of real contention. The problem comes with the definition of "its extreme low position." This can in reality be three different points from which to measure;

- 1.Touching the floor
- 2.Touching the floor of a pit or loading dock
- 3.The lowest point as dictated by a geared lower limit switch (which could be many feet above the ground level).

See linked OSHA clarification.



1910.179(h)(2)(vi)

Swaged or compressed fittings shall be applied as recommended by the rope or crane manufacturer.

1910.179(h)(2)(vii)

Wherever exposed to temperatures, at which fiber cores would be damaged, rope having an independent wire rope or wire-strand core, or other temperature-damage resistant core shall be used.

1910.179(h)(2)(viii)

Replacement rope shall be the same size, grade, and construction as the original rope furnished by the crane manufacturer, unless otherwise recommended by a wire rope manufacturer due to actual working condition requirements.

1910.179(h)(3) Equalizers.

If a load is supported by more than one part of rope, the tension in the parts shall be equalized.

1910.179(h)(4) Hooks.

Hooks shall meet the manufacturer's recommendations and shall not be overloaded.

Commented [LD42]: This can be a point of real contention. The hoist manufactures replacement ropes are often very expensive and owners seek a local (cheaper) supplier. Be careful to use the exact specified rope as a replacement. If there should be an subsequent accident, the owner is accepting a huge liability if the wrong rope was found to be used.

Special attention should be paid to interchanging domestic sized (inches) rope with metric rope. Their design and manufacture are often significantly different. For example, one German hoist vendor I'm aquatinted with used a "flatten" rope lay with a Teflon lining between lays. If a hoist owner were to use a conventional domestic replacement rope and had an accident, the opposing lawyer would have a field day.



1910.179(i): Warning Device

Except for floor-operated cranes a gong or other effective warning signal shall be provided for each crane equipped with a power traveling mechanism.





1910.179(j)(1)(i) Initial inspection.

[illegible]

Inspection procedure for cranes in regular service is divided into two general classifications based upon the intervals at which inspection should be performed. The intervals in turn are dependent upon the nature of the critical components of the crane and the degree of their exposure to wear, deterioration, or malfunction. The two general classifications are herein designated as "frequent" and "periodic" with respective intervals between inspections as defined below:

Frequent inspection - Daily to monthly intervals.

CMAA Duty Cycle Classification could be an excellent yardstick by which to assign inspection intervals. Number of shifts performed weekly should also be part of the equation.



1910.179(j)(1)(ii)(b)

Periodic inspection - 1 to 12-month intervals.

1910.179(j)(2) Frequent inspection.

The following items shall be inspected for defects at intervals as defined in paragraph (j)(1)(ii) of this section or as specifically indicated, including observation during operation for any defects which might appear between regular inspections. All deficiencies such as listed shall be carefully examined and determination made as to whether they constitute a safety hazard:

1910.179(j)(2)(i)

All functional operating mechanisms for maladjustment interfering with proper operation. Daily.

Commented [LD46]: Inspection type #2) Periodic Inspections, which are required anywhere from 1 to 12 month intervals. The interval is again dependent on the usage of the crane.

CMAA Duty Cycle Classification could be an excellent yardstick by which to assign inspection intervals. Number of shifts performed weekly should also be part of the equation. Hard facts like the CMAA Classification and number of shifts would make for an excellent criteria to show an OSHA inspector to justify an inspection policy.



1910.179(j)(2)(ii)

Deterioration or leakage in lines, tanks, valves, drain pumps, and other parts of air or hydraulic systems. Daily.

1910.179(j)(2)(iii)

Hooks with deformation or cracks. Visual inspection daily;

monthly inspection with a certification record which includes the date of inspection, the signature of the person who performed the inspection and the serial number, or other identifier, of the hook inspected. For hooks with cracks or having more than 15 percent in excess of normal throat opening or more than 10° twist from the plane of the unbent hook refer to paragraph (l)(3)(iii)(a) of this section.

1910.179(j)(2)(iv)

Hoist chains, including end connections, for excessive wear, twist, distorted links interfering with proper function, or stretch beyond manufacturer's recommendations. Visual inspection daily;

monthly inspection with a certification record which includes the date of inspection, the signature of the person who performed the inspection and an identifier of the chain which was inspected.

1910.179(j)(2)(v)

[Reserved]

1910.179(j)(2)(vi)

All functional operating mechanisms for excessive wear of components.

1910.179(j)(2)(vii)

Rope reeving for noncompliance with manufacturer's recommendations.

1910.179(j)(3) Periodic inspection.

Complete inspections of the crane shall be performed at intervals as generally defined in paragraph (j)(1)(ii)(b) of this section, depending upon its activity, severity of service, and environment, or as specifically indicated below. These inspections shall include the requirements of paragraph (j)(2) of this section and in addition, the following items. Any deficiencies such as listed shall be carefully examined and determination made as to whether they constitute a safety hazard:



1910.179(j)(3)(i)

Deformed, cracked, or corroded members.

1910.179(j)(3)(ii)

Loose bolts or rivets.

1910.179(j)(3)(iii)

Cracked or worn sheaves and drums.

1910.179(j)(3)(iv)

Worn, cracked or distorted parts such as pins, bearings, shafts, gears, rollers, locking and clamping devices.

1910.179(j)(3)(v)

Excessive wear on brake system parts, linings, pawls, and ratchets.

1910.179(j)(3)(vi)

Load, wind, and other indicators over their full range, for any significant inaccuracies.

1910.179(j)(3)(vii)

Gasoline, diesel, electric, or other powerplants for improper performance or noncompliance with applicable safety requirements.

1910.179(j)(3)(viii)

Excessive wear of chain drive sprockets and excessive chain stretch.

1910.179(j)(3)(ix)

[Reserved]

1910.179(j)(3)(x)

Electrical apparatus, for signs of pitting or any deterioration of controller contactors, limit switches and pushbutton stations.



1910.179(j)(4)

Cranes not in regular use.

1910.179(j)(4)(i)

A crane which has been idle for a period of 1 month or more, but less than 6 months, shall be given an inspection conforming with requirements of paragraph (j)(2) of this section and paragraph (m)(2) of this section before placing in service.

Commented [LD47]: Partial inspection required of crane out of use from over 1 month but less than 6 months.

1910.179(j)(4)(ii)

A crane which has been idle for a period of over 6 months shall be given a complete inspection conforming with requirements of paragraphs (j)(2) and (3) of this section and paragraph (m)(2) of this section before placing in service.

Commented [LD48]: Cranes idle for more than 6 months require a full inspection prior to being put back into service.

1910.179(j)(4)(iii)

Standby cranes shall be inspected at least semi-annually in accordance with requirements of paragraph (j)(2) of this section and paragraph (m)(2) of this section.

This is a full inspection including a load test per ANSI/ASME B30.2.



1910.179(k): Testing

1910.179(k)(1) Operational tests.

1910.179(k)(1)(i)

Prior to initial use all new and altered cranes shall be tested to insure compliance with this section including the following functions:

1910.179(k)(1)(i)(a)

Hoisting and lowering.

1910.179(k)(1)(i)(b)

Trolley travel.

1910.179(k)(1)(i)(c)

Bridge travel.

1910.179(k)(1)(i)(d)

Limit switches, locking and safety devices.

1910.179(k)(1)(ii)

The trip setting of hoist limit switches shall be determined by tests with an empty hook traveling in increasing speeds up to the maximum speed. The actuating mechanism of the limit switch shall be located so that it will trip the switch, under all conditions, in sufficient time to prevent contact of the hook or hook block with any part of the trolley.

1910.179(k)(2) Rated load test.

Test loads shall not be more than 125 percent of the rated load unless otherwise recommended by the manufacturer. The test reports shall be placed on file where readily available to appointed personnel.



Commented [LD49]: The full requirements of load testing are included in ASME B30.2



1910.179(l): Maintenance

1910.179(l)(1) Preventive maintenance.

A preventive maintenance program based on the crane manufacturer's recommendations shall be established.

1910.179(l)(2) Maintenance procedure.

1910.179(l)(2)(i)

Before adjustments and repairs are started on a crane the following precautions shall be taken:

1910.179(l)(2)(i)(a)

The crane to be repaired shall be run to a location where it will cause the least interference with other cranes and operations in the area.

1910.179(l)(2)(i)(b)

All controllers shall be at the off position.

1910.179(l)(2)(i)(c)

The main or emergency switch shall be open and locked in the open position.

1910.179(l)(2)(i)(d)

Warning or "out of order" signs shall be placed on the crane, also on the floor beneath or on the hook where visible from the floor.

1910.179(l)(2)(i)(e)

Where other cranes are in operation on the same runway, rail stops or other suitable means shall be provided to prevent interference with the idle crane.





1910.179(l)(2)(ii)

After adjustments and repairs have been made the crane shall not be operated until all guards have been reinstalled, safety devices reactivated and maintenance equipment removed.

1910.179(l)(3) Adjustments and repairs.

1910.179(l)(3)(i)

Any unsafe conditions disclosed by the inspection requirements of paragraph (j) of this section shall be corrected before operation of the crane is resumed. Adjustments and repairs shall be done only by designated personnel.

Commented [LD50]: Note "designated personnel."

1910.179(l)(3)(ii)

Adjustments shall be maintained to assure correct functioning of components. The following are examples:

1910.179(l)(3)(ii)(a) All functional operating mechanisms.

1910.179(l)(3)(ii)(b)

Limit switches.

1910.179(l)(3)(ii)(c)

Control systems.

1910.179(l)(3)(ii)(d)

Brakes.

1910.179(l)(3)(ii)(e)

Power plants.

1910.179(l)(3)(iii)

Repairs or replacements shall be provided promptly as needed for safe operation. The following are examples:



1910.179(l)(3)(iii)(a)

Crane hooks showing defects described in paragraph (j)(2)(iii) of this section shall be discarded. Repairs by welding or reshaping are not generally recommended. If such repairs are attempted they shall only be done under competent supervision and the hook shall be tested to the load requirements of paragraph (k)(2) of this section before further use.

1910.179(l)(3)(iii)(b)

Load attachment chains and rope slings showing defects described in paragraph (j)(2) (iv) and (v) of this section respectively.

1910.179(l)(3)(iii)(c)

All critical parts which are cracked, broken, bent, or excessively worn.

1910.179(l)(3)(iii)(d)

Pendant control stations shall be kept clean and function labels kept legible.

Commented [LD51]: Note this is an common area for an inspector to levy an infraction. Pendants are banged around and abused. This is compounded by the fact they are usually bright yellow and located such that an inspector doesn't need to climb a ladder.



1910.179(m): Rope Inspection

1910.179(m)(1) Running ropes.

A thorough inspection of all ropes shall be made at least once a month and a certification record which includes the date of inspection, the signature of the person who performed the inspection and an identifier for the ropes which were inspected shall be kept on file where readily available to appointed personnel. Any deterioration, resulting in appreciable loss of original strength, shall be carefully observed and determination made as to whether further use of the rope would constitute a safety hazard. Some of the conditions that could result in an appreciable loss of strength are the following:



1910.179(m)(1)(i)

Reduction of rope diameter below nominal diameter due to loss of core support, internal or external corrosion, or wear of outside wires.

1910.179(m)(1)(ii)

A number of broken outside wires and the degree of distribution or concentration of such broken wires.

1910.179(m)(1)(iii)

Worn outside wires.

1910.179(m)(1)(iv)

Corroded or broken wires at end connections.

1910.179(m)(1)(v)

Corroded, cracked, bent, worn, or improperly applied end connections.

Commented [LD52]: An almost universally overlooked inspection requirement. Note “thorough” and “record” is called out.

A OSHA inspector has to be a “jack of all trades.” They will inspect everything from cranes to the water fountains. Understanding all these specs is near impossible, but understanding the lack of required documentation is easy for even the newest inspector hire.

From the point of view of an OSHA inspection, the quality of your paper work is more important than the quality of the actual inspections. Of course, the correct answer is to get them both right, quality inspections AND quality paperwork!



1910.179(m)(1)(vi)

Severe kinking, crushing, cutting, or unstranding.

1910.179(m)(2) Other ropes.

All rope which has been idle for a period of a month or more due to shutdown or storage of a crane on which it is installed shall be given a thorough inspection before it is used. This inspection shall be for all types of deterioration and shall be performed by an appointed person whose approval shall be required for further use of the rope. A certification record shall be available for inspection which includes the date of inspection, the signature of the person who performed the inspection and an identifier for the rope which was inspected.



1910.179(n): Handling the Load

1910.179(n)(1) Size of load.

The crane shall not be loaded beyond its rated load except for test purposes as provided in paragraph (k) of this section.

1910.179(n)(2) 1910.179(n)(2) Attaching the load.

1910.179(n)(2)(i)

The hoist chain or hoist rope shall be free from kinks or twists and shall not be wrapped around the load.

1910.179(n)(2)(ii)

The load shall be attached to the load block hook by means of slings or other approved devices.

1910.179(n)(2)(iii)

Care shall be taken to make certain that the sling clears all obstacles.

1910.179(n)(3) Moving the load.

1910.179(n)(3)(i)

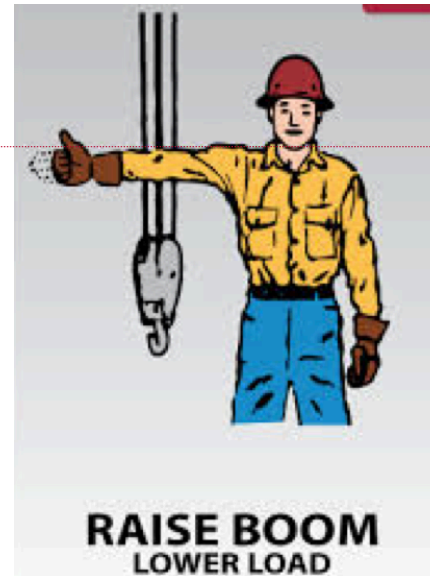
The load shall be well secured and properly balanced in the sling or lifting device before it is lifted more than a few inches.

1910.179(n)(3)(ii)

Before starting to hoist the following conditions shall be noted:

1910.179(n)(3)(ii)(a)

Hoist rope shall not be kinked.



Commented [LD53]: "Rated Load" is the critical term here. The exceptions are really two, 1) load testing and 2) and the "engineered lift." More on "engineered lifts in ASME B30.2.



1910.179(n)(3)(ii)(b)

Multiple part lines shall not be twisted around each other.

1910.179(n)(3)(ii)(c)

The hook shall be brought over the load in such a manner as to prevent swinging.

1910.179(n)(3)(iii)

During hoisting care shall be taken that:

1910.179(n)(3)(iii)(a)

There is no sudden acceleration or deceleration of the moving load.

1910.179(n)(3)(iii)(b)

The load does not contact any obstructions.

1910.179(n)(3)(iv)

Cranes shall not be used for side pulls except when specifically authorized by a responsible person who has determined that the stability of the crane is not thereby endangered and that various parts of the crane will not be overstressed.

1910.179(n)(3)(v)

While any employee is on the load or hook, there shall be no hoisting, lowering, or traveling.

1910.179(n)(3)(vi)

The employer shall require that the operator avoid carrying loads over people.

1910.179(n)(3)(vii)

The operator shall test the brakes each time a load approaching the rated load is handled. The brakes shall be tested by raising the load a few inches and applying the brakes.

1910.179(n)(3)(viii)

The load shall not be lowered below the point where less than two full wraps of rope remain on the hoisting drum.

Commented [LD54]: It is not unusual to see twisted cables, especially on longer lifts. Technically, this could result in an OSHA violation.

On hoist with lifts in excess of 30 feet, buyers should look into using "non-rotating" or "twist-resistant" wire rope.

Commented [LD55]: Side pull warning.

Commented [LD56]: Unlike the "old days," there can be no riding of the hook.

Commented [LD57]: Carrying loads over people can result in an OSHA violation.



1910.179(n)(3)(ix)

When two or more cranes are used to lift a load one **qualified** responsible person shall be in charge of the operation. He shall analyze the operation and instruct all personnel involved in the proper positioning, rigging of the load, and the movements to be made.

Commented [LD58]: Note "qualified person."

1910.179(n)(3)(x)

The employer shall insure that the operator does not leave his position at the controls while the load is suspended.

Commented [LD59]: This is a common source of OSHA violation. A load cannot be left in a "suspended" position.

1910.179(n)(3)(xi)

When starting the bridge and when the load or hook approaches near or over personnel, the warning signal shall be sounded.

1910.179(n)(4) Hoist limit switch.

1910.179(n)(4)(i)

At the **beginning of each operator's shift**, the upper limit switch of each hoist shall be tried out under no load. Extreme care shall be exercised; the block shall be "inched" into the limit or run in at slow speed. If the switch does not operate properly, the appointed person shall be immediately notified.

Commented [LD60]: Pre-shift operator inspection is required every day. No documentation is required. Remember, the owners responsibility is not only to the potential OSHA inspector, but also the Plaintiff's Attorney in the case of an accident. Owners need to have this policy in place and proof of it being required of the operators. See ANSI/ASME B30.2 for more detailed information.

1910.179(n)(4)(ii)

The hoist limit switch which controls the upper limit of travel of the load block shall never be used as an operating control.

Commented [LD61]: The upper limit switch cannot be used as an operating control. I once had an application in which the object being lifted had to be carried over a tall machine. To make sure he had clearance, the operator would lift the load until it the lower block hit the upper limit switch. He did this on every lift. This resulted in the premature failure of the upper limit switch and upon it's failure, a dropped load.

The upper travel limit is not designed to take that kind of a duty cycle. If your process requires the frequent engagement of the upper limit switch, a two limit switch layout is required. The lower of the two limit switches is called an "Operational" limit switch and the higher switch is a conventional upper limit switch.

The Operational limit switch is designed for a frequent engagement while the Upper limit switch is designed as a backup protection.



1910.179(o): Other Requirements, General

1910.179(o)(1) Ladders.

1910.179(o)(1)(i)

The employer shall insure that hands are free from encumbrances while personnel are using ladders.

1910.179(o)(1)(ii)

Articles which are too large to be carried in pockets or belts shall be lifted and lowered by hand line.

1910.179(o)(2) Cabs.

1910.179(o)(2)(i)

Necessary clothing and personal belongings shall be stored in such a manner as not to interfere with access or operation.

1910.179(o)(2)(ii)

Tools, oil cans, waste, extra fuses, and other necessary articles shall be stored in the tool box, and shall not be permitted to lie loose in or about the cab.

1910.179(o)(3) Fire extinguishers.

The employer shall insure that operators are familiar with the operation and care of fire extinguishers provided.

[39 FR 23502, June 27, 1974, as amended at 40 FR 27400, June 27, 1975; 49 FR 5322, Feb. 10, 1984; 51 FR 34560, Sept. 29, 1986; 55 FR 32015, Aug. 6, 1990; 61 FR 9227, March 7, 1996]

Commented [LD62]: ***IMPORTANT NOTICE:***
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