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Title 29 — Labor

Subtitle B — Regulations Relating to Labor

Chapter XVII — Occupational Safety and Health Administration, Department of Labor

Part 1917 — Marine Terminals

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Subpart C Cargo Handling Gear and Equipment

- § 1917.41 House falls.
- § 1917.42 Miscellaneous auxiliary gear.
- § 1917.43 Powered industrial trucks.
- § 1917.44 General rules applicable to vehicles.
- § 1917.45 Cranes and derricks (See also § 1917.50).
- § 1917.46 Load indicating devices.
- § 1917.47 Winches.
- § 1917.48 Conveyors.
- § 1917.49 Spouts, chutes, hoppers, bins, and associated equipment.
- § 1917.50 Certification of marine terminal material handling devices (See also mandatory appendix I, of this part).
- § 1917.51 Hand tools.

Subpart C—Cargo Handling Gear and Equipment

§ 1917.41 House falls.

- (a) Span beams shall be secured to prevent accidental dislodgement.
- (b) A safe means of access shall be provided for employees working with house fall blocks.
- (c) Designated employees shall inspect chains, links, shackles, swivels, blocks and other loose gear used in house fall operations before each day's use. Defective gear shall not be used.

§ 1917.42 Miscellaneous auxiliary gear.

- (a) *Routine inspection.*
 - (1) At the completion of each use, loose gear such as slings, chains, bridles, blocks and hooks shall be so placed as to avoid damage to the gear. Loose gear shall be inspected and any defects corrected before reuse.

- (2) All loose gear shall be inspected by the employer or his authorized representative before each use and, when necessary, at intervals during its use, to ensure that it is safe. Any gear which is found upon such inspection to be visibly unsafe shall not be used until it is made safe.
- (3) Defective gear shall not be used. Distorted hooks, shackles or similar gear shall be discarded.

(b) **Wire rope and wire rope slings.**

- (1) The employer shall ascertain and adhere to the manufacturer's recommended ratings for wire rope and wire rope slings and shall have such ratings available for inspection. When the manufacturer is unable to supply such ratings, the employer shall use the tables for wire rope and wire rope slings found in American National Safety Standard for Slings, ANSI B30.9–1971. A design safety factor of at least five shall be maintained for the common sizes of running wire used as falls, in purchases or in such uses as light load slings. Wire rope with a safety factor of less than five may be used only:
 - (i) In specialized equipment, such as but not limited to cranes, designed to be used with lesser wire rope safety factors;
 - (ii) In accordance with design factors in standing rigging applications; or
 - (iii) For heavy lifts or other purposes for which a safety factor of five is impracticable and for which the employer can demonstrate that equivalent safety is ensured.
- (2) Wire rope or wire rope slings having any of the following conditions shall not be used:
 - (i) Ten randomly distributed broken wires in one rope lay or three or more broken wires in one strand in one rope lay;
 - (ii) Kinking, crushing, bird caging or other damage resulting in distortion of the wire rope structure;
 - (iii) Evidence of heat damage;
 - (iv) Excessive wear or corrosion, deformation or other defect in the wire or attachments, including cracks in attachments;
 - (v) Any indication of strand or wire slippage in end attachments; or
 - (vi) More than one broken wire in the close vicinity of a socket or swaged fitting.
- (3) Protruding ends of strands in splices on slings and bridles shall be covered or blunted. Coverings shall be removable so that splices can be examined. Means used to cover or blunt ends shall not damage the wire.
- (4) Where wire rope clips are used to form eyes, the employer shall adhere to the manufacturers' recommendations, which shall be made available for inspection. If "U" bolt clips are used and the manufacturers' recommendations are not available, Table C–1 shall be used to determine the number and spacing of the clips. "U" bolts shall be applied with the "U" section in contact with the dead end of the rope.

Table C-1—Number and Spacing of U-Bolt Wire Rope Clips

Improved plow steel, rope diameter (inches/(cm))	Minimum number of clips		Minimum spacing (inches/(cm))
	Drop forged	Other material	
1/2 or less (1.3)	3	4	3 (7.6)
5/8 (1.6)	3	4	3 3/4 (9.5)
3/4 (1.9)	4	5	4 1/2 (11.4)
7/8 (2.2)	4	5	5 1/4 (13.3)
1 (2.5)	5	7	6 (15.2)
1 1/8 (2.9)	6	7	6 3/4 (17.1)
1 1/4 (3.2)	6	8	7 1/2 (19.1)
1 3/8 (3.5)	7	8	8 1/4 (21.0)
1 1/2 (3.8)	7	9	9 (22.9)

- (5) Wire rope shall not be secured by knots.
- (6) Eyes in wire rope bridles, slings, bull wires, or in single parts used for hoisting shall not be formed by wire rope clips or knots.
- (7) Eye splices in wire ropes shall have at least three tucks with a whole strand of the rope and two tucks with one-half of the wire cut from each strand. Other forms of splices or connections which are shown to be equivalently safe may be used.
- (8) Except for eye splices in the ends of wires and for endless rope slings, each wire rope used in hoisting or lowering, or in bulling cargo, shall consist of one continuous piece without knot or splice.

(c) **Natural fiber rope.**

- (1) The employer shall ascertain the manufacturers' ratings for the specific natural fiber rope used and have such ratings available for inspection. The manufacturers' ratings shall be adhered to and a minimum design safety factor of five maintained.
- (2) Eye splices shall consist of at least three full tucks. Short splices shall consist of at least six full tucks, three on each side of the center line.

(d) **Synthetic rope.**

- (1) The employer shall adhere to the manufacturers' ratings and use recommendations for the specific synthetic fiber rope used and shall make such ratings available for inspection.
- (2)
 - (i) Unless otherwise recommended by the manufacturer, when synthetic fiber ropes are substituted for fiber ropes of less than three inches (7.62 cm) in circumference, the substitute shall be of equal size. Where substituted for fiber rope of three inches or more in circumference, the size of the synthetic rope shall be determined from the formula:

$$C = \pm \sqrt{0.6C_s^2 + 0.4C_m^2}$$

Where C = the required circumference of the synthetic rope in inches, Cs= the circumference to the nearest one-quarter inch of a synthetic rope having a breaking strength not less than that of the size fiber rope that is required by paragraph (c) of this section and Cm= the circumference of the fiber rope in inches that is required by paragraph (c) of this section.

- (ii) In making such substitution, it shall be ascertained that the inherent characteristics of the synthetic fiber are suitable for hoisting.

(e) **Removal of natural and synthetic rope from service.** Natural and synthetic rope having any of the following defects shall be removed from service:

- (1) Abnormal wear;
- (2) Powdered fiber between strands;
- (3) Sufficient cut or broken fibers to affect the capability of the rope;
- (4) Variations in the size or roundness of strands;
- (5) Discolorations other than stains not associated with rope damage;
- (6) Rotting; or
- (7) Distortion or other damage to attached hardware.

(f) **Thimbles.** Properly fitting thimbles shall be used where any rope is secured permanently to a ring, shackle or attachment, where practicable.

(g) **Synthetic web slings.**

- (1) Slings and nets or other combinations of more than one piece of synthetic webbing assembled and used as a single unit (synthetic web slings) shall not be used to hoist loads in excess of the sling's rated capacity.
- (2) Synthetic web slings shall be removed from service if they exhibit any of the following defects:
 - (i) Acid or caustic burns;
 - (ii) Melting or charring of any part of the sling surface;
 - (iii) Snags, punctures, tears or cuts;
 - (iv) Broken or worn stitches; or
 - (v) Distortion or damage to fittings.
 - (vi) Display of visible warning threads or markers designed to indicate excessive wear or damage.
- (3) Defective synthetic web slings removed from service shall not be returned to service unless repaired by a sling manufacturer or similar entity. Each repaired sling shall be proof tested by the repairer to twice the slings' rated capacity prior to its return to service. The employer shall retain a certificate of the proof test and make it available for examination.
- (4) Synthetic web slings provided by the employer shall only be used in accordance with the manufacturer's use recommendations, which shall be available.
- (5) Fittings shall have a breaking strength at least equal to that of the sling to which they are attached and shall be free of sharp edges.

(h) *Chains and chain slings used for hoisting.*

- (1) The employer shall adhere to the manufacturer's recommended ratings for safe working loads for the sizes of wrought iron and alloy steel chains and chain slings used and shall have such ratings available. When the manufacturer is unable to provide such ratings, the employer shall use the tables for chains and chain slings found in American National Safety Standard for Slings, ANSI B30.9–1971.
- (2) Proof coil steel chain, also known as common or hardware chain, and other chain not recommended by the manufacturer for slinging or hoisting shall not be used for slinging or hoisting.
- (3)
 - (i) Sling chains, including end fastenings, shall be inspected for visible defects before each day's use and as often as necessary during use to ensure integrity of the sling.
 - (ii) Thorough inspections of chains in use shall be made quarterly to detect wear, defective welds, deformation or increase in length or stretch. The month of inspection shall be indicated on each chain by color of paint on a link or by other equally effective means.
 - (iii) Chains shall be removed from service when maximum allowable wear, as indicated in Table C–2, is reached at any point of link.
 - (iv) Chain slings shall be removed from service when stretch has increased the length of a measured section by more than five percent; when a link is bent, twisted or otherwise damaged; or when a link has a raised scarf or defective weld.
 - (v) Only designated persons shall inspect chains used for slinging and hoisting.

Table C–2—Maximum Allowable Wear at Any Point of Link

Chain size		Maximum allowable wear	
Inches	(cm)	Inches	(cm)
$\frac{1}{4}$ ($\frac{9}{32}$)	(0.6)	$\frac{3}{64}$	(0.1)
$\frac{3}{8}$	(1.0)	$\frac{5}{64}$	(0.2)
$\frac{1}{2}$	(1.3)	$\frac{7}{64}$	(0.3)
$\frac{5}{8}$	(1.6)	$\frac{9}{64}$	(0.4)
$\frac{3}{4}$	(1.9)	$\frac{5}{32}$	(0.4)
$\frac{7}{8}$	(2.2)	$\frac{11}{64}$	(0.4)
1	(2.5)	$\frac{3}{16}$	(0.5)
$1\frac{1}{8}$	(2.9)	$\frac{7}{32}$	(0.6)
$1\frac{1}{4}$	(3.2)	$\frac{1}{4}$	(0.6)
$1\frac{3}{8}$	(3.5)	$\frac{9}{32}$	(0.7)
$1\frac{1}{2}$	(3.8)	$\frac{5}{16}$	(0.8)
$1\frac{3}{4}$	(4.4)	$\frac{11}{32}$	(0.9)

- (4) Chains shall be repaired only under qualified supervision. Links or portions of chain defective under any of the criteria of paragraph (h)(3)(iii) of this section shall be replaced with properly dimensioned links or connections of material similar to those of the original chain. Before repaired chains are

returned to service, they shall be tested to the proof load recommended by the manufacturer of the original chain. Tests shall be performed by the manufacturer or shall be certified by an agency accredited for the purpose under part 1919 of this chapter. Test certificates shall be available for inspection.

- (5) Wrought iron chains in constant use shall be annealed or normalized at intervals not exceeding six months. Heat treatment certificates shall be available for inspection. Alloy chains shall not be annealed.
- (6) Kinked or knotted chains shall not be used for lifting. Chains shall not be shortened by bolting, wiring or knotting. Makeshift links or fasteners such as wire, bolts or rods shall not be used.
- (7) Hooks, rings, links and attachments affixed to sling chains shall have rated capacities at least equal to that of the chains to which they are attached.
- (8) Chain slings shall bear identification of size, grade and rated capacity.

(i) **Shackles.**

- (1) If available, the manufacturer's recommended safe working loads for shackles shall not be exceeded. In the absence of manufacturer's recommendations, Table C-3 shall apply.
- (2) Screw pin shackles used aloft in house fall or other gear, except in cargo hook assemblies, shall have their pins moused or otherwise effectively secured.

Table C-3—Safe Working Loads for Shackles

Material size		Pin diameter		Safe working load in 2,000 lb tons
Inches	(cm)	Inches	(cm)	
1/2	(1.3)	5/8	(1.6)	1.4
5/8	(1.6)	3/4	(1.9)	2.2
3/4	(1.9)	7/8	(2.2)	3.2
7/8	(2.2)	1	(2.5)	4.3
1	(2.5)	1 1/8	(2.9)	5.6
1 1/8	(2.9)	1 1/4	(3.2)	6.7
1 1/4	(3.2)	1 3/8	(3.5)	8.2
1 3/8	(3.5)	1 1/2	(3.8)	10.0
1 1/2	(3.8)	1 5/8	(4.1)	11.9
1 3/4	(4.4)	2	(5.1)	16.2
2	(5.1)	2 1/4	(5.7)	21.2

(j) **Hooks other than hand hooks.**

- (1) The manufacturers' recommended safe working loads for hooks shall not be exceeded. Hooks other than hand hooks shall be tested in accordance with § 1917.50(c)(6).
- (2) Bent or sprung hooks shall be discarded.
- (3) Teeth of case hooks shall be maintained in safe condition.

- (4) Jaws of patent clamp-type plate hooks shall be maintained in condition to grip plates securely.
- (5) Loads shall be applied to the throat of the hook only.

(k) **Pallets.**

- (1) Pallets shall be made and maintained to safely support and carry loads being handled. Fastenings of reusable pallets used for hoisting shall be bolts and nuts, drive screws (helically threaded nails), annular threaded nails or fastenings of equivalent holding strength.
- (2) Damaged pallets shall be stored in designated areas and identified.
- (3) Reusable wing or lip-type pallets shall be hoisted by bar bridles or other suitable gear and shall have an overhanging wing or lip of at least three inches (7.62cm). They shall not be hoisted by wire slings alone.
- (4) Loaded pallets that do not meet the requirements of this paragraph shall be hoisted only after being placed on pallets meeting such requirements or shall be handled by other means providing equivalent safety.
- (5) Bridles for handling flush end or box-type pallets shall be designed to prevent disengagement from the pallet under load.
- (6) Pallets shall be stacked or placed to prevent falling, collapsing or otherwise causing a hazard under standard operating conditions.
- (7) Disposable pallets intended only for one use shall not be reused for hoisting.

[48 FR 30909, July 5, 1983, as amended at 62 FR 40198, July 25, 1997; 65 FR 40938, June 30, 2000]

§ 1917.43 Powered industrial trucks.

- (a) **Applicability.** This section applies to every type of powered industrial truck used for material or equipment handling within a marine terminal. It does not apply to over-the-road vehicles.
- (b) **General.**
 - (1) After October 3, 1983, modifications, such as adding counterweights, that might affect the vehicle's capacity or safety shall not be performed without either the manufacturer's prior written approval or the written approval of a professional engineer experienced with the equipment who has consulted with the manufacturer, if available. Capacity, operation and maintenance instruction plates, tags or decals shall be changed to conform to the equipment as modified.
 - (2) Unauthorized personnel shall not ride on powered industrial trucks. A safe place to ride shall be provided when riding is authorized.
 - (3) When a powered industrial truck is left unattended, load-engaging means shall be fully lowered, controls neutralized and brakes set. Unless the truck is in view and within 25 feet (7.62 m) of the operator, power shall be shut off. Wheels shall be blocked or curbed if the truck is on an incline.
 - (4) Powered industrial trucks shall not be operated inside highway vehicles or railcars having damage which could affect operational safety.
 - (5) Powered industrial trucks shall be marked with their rated capacities, which shall be visible to the operator.

- (6) Only stable and safely arranged loads within the rated capacity of the truck shall be handled.
- (7) The employer shall direct drivers to ascend and descend grades slowly.
- (8) The employer shall direct drivers to slow down and sound the horn at crossaisles and other locations where visibility is obstructed.
- (9) If the load obstructs the forward view, the employer shall direct drivers to travel with the load trailing.
- (10) Steering knobs shall not be used unless the truck is equipped with power steering.
- (11) When powered industrial trucks use cargo lifting devices that have a means of engagement hidden from the operator, a means shall be provided to enable the operator to determine that the cargo has been engaged.
- (12) When cargo is being towed on pipe trucks or similar equipment, a safe means shall be provided to protect the driver from sliding loads.

(c) **Maintenance.**

- (1) Only designated persons shall perform maintenance and repair.
- (2) Batteries on all powered trucks shall be disconnected during repairs to the primary electrical system unless power is necessary for testing and repair. On trucks equipped with systems capable of storing residual energy, that energy shall be safely discharged before work on the primary electrical system begins.
- (3) Replacement parts whose function might affect operational safety shall be equivalent in strength and performance capability to the original parts which they replace.
- (4) Braking systems or other mechanisms used for braking shall be operable and in safe condition.
- (5) Powered industrial trucks shall be maintained in safe working order. Safety devices shall not be removed or made inoperative except as otherwise provided in this section. Trucks with a fuel system leak or any other safety defect shall not be operated.
- (6) Those repairs to the fuel and ignition systems of industrial trucks which involve fire hazards shall be conducted only in locations designated as safe for such repairs.

(d) **Approved trucks —**

- (1) **Approved power-operated industrial truck** means one listed or approved for the intended use by a nationally recognized testing laboratory.
- (2) Approved trucks acquired and used after February 15, 1972, shall bear a label or other identification indicating testing laboratory approval.
- (3) When the atmosphere in an area is hazardous and the provisions of United States Coast Guard regulations at 33 CFR 126.15(e) do not apply, only power-operated industrial trucks approved for such locations shall be used.

(e) **Fork lift trucks —**

- (1) **Overhead guards.**

- (i) When operators are exposed to overhead falling hazards, fork lift trucks shall be equipped with securely attached overhead guards. Guards shall be constructed to protect the operator from falling boxes, cartons, packages, or similar objects.
 - (ii) Overhead guards shall not obstruct the operator's view, and openings in the top of the guard shall not exceed six inches (15.24 cm) in one of the two directions, width or length. Larger openings are permitted if no opening allows the smallest unit of cargo being handled to fall through the guard.
 - (iii) Overhead guards shall be built so that failure of the vehicle's mast tilting mechanism will not displace the guard.
 - (iv) An overhead guard, otherwise required by this paragraph, may be removed only when it would prevent a truck from entering a work space and if the operator is not exposed to low overhead obstructions in the work space.
 - (v) Overhead guards shall be large enough to extend over the operator during all truck operations, including forward tilt.
- (2) **Load backrest extensions.** Where necessary to protect the operator, fork lift trucks shall be fitted with a vertical load backrest extension to prevent the load from hitting the mast when the mast is positioned at maximum backward tilt. For this purpose, a "load backrest extension" means a device extending vertically from the fork carriage frame to prevent raised loads from falling backward.
- (3) **Forks.** Forks, fork extensions and other attachments shall be secured so that they cannot be accidentally dislodged, and shall be used only in accordance with the manufacturer's recommendations.
- (4) **Counterweights.** Counterweights shall be so affixed that they cannot be accidentally dislodged.
- (5) **Capacities and weights.**
- (i) Fork lift truck rated capacities, with and without removable counterweights, shall not be exceeded. Rated capacities shall be marked on the vehicle and shall be visible to the operator. The vehicle weight, with and without counterweight, shall be similarly marked.
 - (ii) If loads are lifted by two or more trucks working in unison, the total weight of the load shall not exceed the combined rated lifting capacity of all trucks involved.
- (6) **Lifting of employees.** Employees may be elevated by fork lift trucks only when a platform is secured to the lifting carriage or forks. The platform shall meet the following requirements:
- (i) The platform shall have a railing complying with § 1917.112(c).
 - (ii) The platform shall have toeboards complying with § 1917.112(d) if tools or other objects could fall on employees below.
 - (iii) An employee shall be at the truck's controls whenever employees are elevated.
 - (iv) Employees on the platform shall be protected from exposure to moving truck parts.
 - (v) The platform floor shall be skid resistant.
 - (vi) When the truck has controls elevated with the lifting carriage, means shall be provided for employees on the platform to shut off power to the vehicle.

- (vii) While employees are elevated, the truck may be moved only to make minor placement adjustments.

(f) **Bulk cargo-moving vehicles.**

- (1) Where a seated operator may come into contact with projecting overheads, crawler-type bulk-cargo-moving vehicles that are rider operated shall be equipped with operator's guards.
- (2) Guards and their attachment points shall be so designed as to be able to withstand, without excessive deflection, a load applied horizontally at the operator's shoulder level equal to the drawbar pull of the machine.
- (3) After July 26, 1999 bulk cargo-moving vehicles shall be equipped with rollover protection of such design and construction as to prevent the possibility of the operator being crushed because of a rollover or upset.

(g) **Straddle trucks —**

- (1) **Accessibility.** Straddle trucks shall have a permanent means of access to the operator's station, including any handholds necessary for safe ascent and descent.
- (2) **Guarding.**
 - (i) Main sprockets and chains to the wheels shall be guarded as follows:
 - (A) The upper sprocket shall be enclosed;
 - (B) The upper half of the lower sprocket shall be enclosed; and
 - (C) The drive chain shall be enclosed to a height of eight feet (2.44 m) except for that portion at the lower half of the lower sprocket.
 - (ii) Gears shall be enclosed and revolving parts which may be contacted by the operator shall be guarded.
 - (iii) When straddle trucks are used in the vicinity of employees, personnel-deflecting guards shall be provided around leading edges of front and rear wheels.
- (3) **Visibility.** Operator visibility shall be provided in all directions of movement.

(h) **Trailer-spotting tractors.**

- (1) Trailer-spotting tractors (fifth wheels) shall be fitted with any hand grabs and footing necessary for safe access to the fifth wheel.
- (2) Rear cab windows shall be of safety glass or of equivalent material.

[48 FR 30909, July 5, 1983, as amended at 62 FR 40198, July 25, 1997; 65 FR 40939, June 30, 2000]

§ 1917.44 General rules applicable to vehicles.^[4]

- (a) The requirements of this section apply to general vehicle use within marine terminals. *Exception:* The provisions of paragraphs (c) and (l) of this section do not apply when preempted by applicable regulations of the Department of Transportation.^[5]

- (b) Private vehicle parking in marine terminals shall be allowed only in designated areas.
- (c) Trailers shall not be disconnected from tractors at loading docks until the road wheels have been immobilized. The road wheels shall be immobilized from the time the brake system is disconnected until braking is again provided. Supplementary front end support shall be employed as necessary to prevent tipping when a trailer is entered by a material handling vehicle. Rear end support shall be employed if rear wheels are so far forward as to allow tipping when the trailer is entered.
- (d) The employer shall direct motor vehicle operators to comply with any posted speed limits and other traffic control signs or signals, and written traffic instructions.
- (e) Stop signs shall be posted at main entrances and exits of structures where visibility is impaired, and at blind intersections, unless direct traffic control or warning mirror systems or other systems of equivalent safety are provided.
- (f) Vehicular routes, traffic rules, and parking areas shall be established, identified, and used.
- (g) The employer shall direct vehicle drivers to warn employees in traffic lanes of the vehicle's approach.
- (h) Signs indicating pedestrian traffic shall be clearly posted at vehicular check-in and check-out lines and similar locations where employees may be working.
- (i) A distance of not less than 20 feet (6.1 m) shall be maintained between the first two vehicles in a check-in, check-out, roadability, or vessel loading/discharging line. This distance shall be maintained between any subsequent vehicles behind which employees are required to work.
- (j) No unattended vehicle shall be left with its engine running unless secured against movement (see § 1917.43(b)(3) for powered industrial trucks).
- (k) When the rear of a vehicle is elevated to facilitate loading or discharging, a ramp shall be provided and secured. The vehicle shall be secured against accidental movement during loading or discharging.
- (l) Only highway vehicle floors in safe condition shall be used.
- (m) When flatbed trucks, platform containers or similar conveyances are loaded or discharged and the cargo consists of pipe or other products which could spread or roll to endanger employees, the cargo shall be contained to prevent movement.
- (n) Vehicles used to transport employees within a terminal shall be maintained in safe working order and safety devices shall not be removed or made inoperative.
- (o) ***Servicing multi-piece and single piece rim wheels.*** Servicing of multi-piece and single piece rim wheels is covered by § 1910.177 of this chapter. (See § 1917.1(a)(2)(xii)).
 - (1) ***Scope.*** This paragraph applies to the servicing of vehicle wheels containing tube-type tires mounted on multi-piece rims.

^[5] Department of Transportation regulations in 49 CFR part 393, Subpart C—Brakes, address the immobilization of trailer road wheels prior to disconnection of the trailer and until braking is again provided. Section 49 CFR 393.84 addresses the condition of flooring. These DOT rules apply when the motor carrier is engaged in interstate commerce or in the transport of certain hazardous items wholly within a municipality or the commercial zone thereof.

- (2) **Definition.** “Multi-piece rim” means a vehicle wheel rim consisting of two or more parts, one of which is a (side) locking ring designed to hold the tire on the rim by tension on interlocking components when the tire is inflated, regardless of the relative sizes of the component parts.
- (3) **Employee training.**
 - (i) Only employees trained in the procedures required in paragraph (o)(4) of this section and who have demonstrated their ability to service multi-piece rim wheels shall be assigned such duties.
 - (ii) Employees assigned such duties shall have demonstrated their ability by the safe performance of the following tasks:
 - (A) Tire demounting (including deflation);
 - (B) Inspection of wheel components;
 - (C) Mounting of tires;
 - (D) Inflation of tires, including use of a restraining device;
 - (E) Handling of wheels;
 - (F) Inflation of tires when a wheel is mounted on the vehicle; and
 - (G) Installation and removal of wheels.
- (4) **Servicing procedures.** The following procedures shall be followed:
 - (i) Tires shall be completely deflated before demounting by removal of the valve core;
 - (ii) The valve core shall be removed before the wheel is removed from the axle when:
 - (A) The tire has been operated underinflated at 80% or less of its recommended pressure, or
 - (B) There is discernible or suspected damage to the tire or wheel components;
 - (iii) Mating surfaces shall be free of dirt, surface rust, scale and rubber buildup before mounting;
 - (iv) Rubber lubricant shall be applied to bead and rim mating surfaces upon wheel assembly and inflation of the tire;
 - (v) Air pressure shall not exceed 3 psig (0.21 kg/cm²) when seating the locking ring or rounding out the tube when a tire is being partially inflated without a restraining device;
 - (vi) While the tire is pressurized, components shall not be struck or forced to correct the seating of side or lock rings;
 - (vii) There shall not be any contact between an employee or unit of equipment and a restraining device during tire inflation;
 - (viii) After inflation, tires, rims and rings shall be inspected while within the restraining device to ensure seating and locking. If adjustment is necessary the tire shall first be deflated by valve core removal; and
 - (ix) Before assembly, wheel components shall be inspected, and damaged rim components shall not be reused.
- (5) **Charts and manuals.**

(i) The employer shall provide a chart containing as a minimum the instructions and information provided in the United States Department of Transportation, National Highway Traffic Safety Administration (NHTSA) publication "Safety Precautions for Mounting and Demounting Tube-Type Truck/Bus Tires" and "Multi-Piece Rim Wheel Matching Chart," and pertinent to the type(s) of multi-piece rim wheels being serviced. The chart shall be available in the terminal's service area.^[6]

(ii) A current rim manual containing the manufacturer's instructions for mounting, demounting, maintenance and safety precautions relating to the multi-piece rim wheels being serviced shall be available in the terminal's service area.

(6) Restraining devices.

(i) Except as otherwise noted, inflation shall be done within a restraining device such as a cage, rack or other device capable of withstanding the maximum force that would be transferred to it during an explosive wheel separation occurring at 150% of maximum tire specification pressure for the wheels being serviced. The restraining device shall be capable of preventing rim components from being thrown outside the frame of the device for any wheel position within the device. When the wheel assembly is mounted on a vehicle, tires may be inflated without a restraining device only if they have more than 80% of the recommended pressure and if remote control inflation equipment is used and employees are clear of the danger area.

(ii) Restraining devices shall be kept in good repair and be capable of preventing rim components from being thrown outside the device.

(7) Inflation hoses. Inflation hoses shall have a manual clip-on chuck with sufficient hose to permit an employee to be clear of the danger zone. An in-line, manually operated valve with gauge or a preset pressure regulator shall be used to inflate tires.

(8) Other equipment.

(i) Only tools recommended in the rim manual for the type of wheel being serviced shall be used to service multi-piece rim wheels.

(ii) Wheel components shall not be interchanged except as provided in the applicable chart or manual.

[48 FR 30909, July 5, 1983, as amended at 52 FR 36026, Sept. 25, 1987; 62 FR 40199, July 25, 1997; 65 FR 40939, June 30, 2000]

^[4] The United States Coast Guard at 33 CFR 126.15(d) and (e) has additional regulations applicable to vehicles in terminals.

§ 1917.45 Cranes and derricks (See also § 1917.50).

(a) Coverage.

^[6] NHTSA charts are available from General Services Division, National Highway Traffic Safety Administration, Attention: N48-51, 400 Seventh Street, SW., Washington, D.C. 20590. Industry charts are available upon request from the manufacturer.

- (1) This section applies to every kind of crane and derrick and to any other type of equipment performing the functions of a crane or derrick except as noted in paragraph (a)(2) of this section.
- (2) This section does not apply to small industrial truck-type cranes, container handling top-loaders and sideloaders, chain hoists, and mobile straddle-type cranes incapable of straddling two or more intermodal containers (16 feet (4.88 m) in width).

(b) **Ratings.**

- (1) Except for bridge cranes covered by paragraph (g) of this section, cranes and derricks having ratings that vary with boom length, radius (outreach) or other variables shall have a durable rating chart visible to the operator, covering the complete range of the manufacturer's (or design) capacity ratings. The rating chart shall include all operating radii (outreach) for all permissible boom lengths and jib lengths as applicable, with and without outriggers, and alternate ratings for optional equipment affecting such ratings. Precautions or warnings specified by the owner or manufacturer shall be included along with the chart.
- (2) The manufacturer's (or design) rated loads for the conditions of use shall not be exceeded.
- (3) Designated working loads shall not be increased beyond the manufacturer's ratings or original design limitations unless such increase receives the manufacturer's approval. When the manufacturer's services are not available or where the equipment is of foreign manufacture, engineering design analysis shall be performed or approved by a person accredited for certifying the equipment under part 1919 of this chapter. Engineering design analysis shall be performed by a registered professional engineer competent in the field of cranes and derricks. Any structural changes necessitated by the change in rating shall be carried out.

- (c) **Radius indicator.** When the rated load varies with the boom radius, the crane or derrick shall be fitted with a boom angle or radius indicator visible to the operator.

(d) **Prohibited usage.**

- (1) Equipment shall not be used in a manner that exerts sideloading stresses upon the crane or derrick boom.
- (2) No crane or derrick having a visible or known defect that affects safe operation shall be used.

(e) **Protective devices.**

- (1) When exposed moving parts such as gears, chains and chain sprockets present a hazard to employees during crane and derrick operations, those parts shall be securely guarded.
- (2) Crane hooks shall be latched or otherwise secured to prevent accidental load disengagement.

(f) **General –**

(1) **Operating controls.**

- (i) Crane and derrick operating controls shall be clearly marked, or a chart indicating their function shall be posted at the operator's position.
- (ii) After October 3, 1984, overhead bridge and container gantry crane operating control levers shall be self-centering so that they will automatically move to the "off" position when the operator releases the control.

- (2) **Booms.** Cranes with elevatable booms and without operable automatic limiting devices shall be provided with boom stops if boom elevation can exceed maximum design angles from the horizontal.
- (3) **Foot pedals.** Foot pedals shall have a non-skid surface.
- (4) **Access.** Ladders, stairways, stanchions, grab irons, foot steps or equivalent means shall be provided as necessary to ensure safe access to footwalks, cab platforms, the cab and any portion of the superstructure which employees must reach.
 - (i) Footwalks shall be of rigid construction, and shall be capable of supporting a load of 100 pounds (4.79 kPa) per square foot.
 - (ii) If more than 20 feet (6.1 m) in height, vertical ladders shall comply with § 1917.118 (d), (e)(1), (e)(2)(iii), and (e)(2)(iv).
 - (iii) Stairways on cranes shall be equipped with rigid handrails meeting the requirements of § 1917.112(e).
 - (iv) If the top of a ladder or stairway or any position thereof is located where a moving part of a crane, such as a revolving house, could strike an employee ascending or descending the ladder or stairway, a prominent warning sign shall be posted at the foot of the ladder or stairway. A system of communication (such as a buzzer or bell) shall be established and maintained between the foot of the ladder or stairway and the operator's cab.
- (5) **Operator's station.**
 - (i) The cab, controls and mechanism of the equipment shall be so arranged that the operator has a clear view of the load or signalman, when one is used. Cab glass, when used, shall be safety plate glass or equivalent. Cranes with missing, broken, cracked, scratched, or dirty glass (or equivalent) that impairs operator visibility shall not be used. Clothing, tools and equipment shall be stored so as not to interfere with access, operation, and the operator's view.
 - (ii) A seat (lap) belt, meeting the requirements of 49 CFR 571.208–210 for a Type 1 seat belt assembly, shall be installed on the operator's seat of high speed container gantry cranes where the seat trolleys.
- (6) **Counterweights or ballast.** Cranes shall be operated only with the specified type and amount of ballast or counterweights. Ballast or counterweight shall be located and secured only as provided in the manufacturer's or design specifications, which shall be available.
- (7) **Outriggers.** Outriggers shall be used according to the manufacturers' specifications or design data, which shall be available. Floats, when used, shall be securely attached to the outriggers. Wood blocks or other support shall be of sufficient size to support the outrigger, free of defects that may affect safety and of sufficient width and length to prevent the crane from shifting or toppling under load.
- (8) **Exhaust gases.** Engine exhaust gases shall be discharged away from the normal position of crane operating personnel.
- (9) Electrical equipment shall be so located or enclosed that live parts will not be exposed to accidental contact. Designated persons may work on energized equipment only if necessary during inspection, maintenance, or repair.

(10) **Fire extinguisher.**

- (i) At least one portable fire extinguisher of at least 5-BC rating or equivalent shall be accessible in the cab of the crane or derrick.
- (ii) No portable fire extinguisher using carbon tetrachloride or chlorobromomethane extinguishing agents shall be used.

(11) **Rope on drums.** At least three full turns of rope shall remain on ungrooved drums, and two turns on grooved drums, under all operating conditions. Wire rope shall be secured to drums by clamps, U-bolts, shackles or equivalent means. Fiber rope fastenings are prohibited.

(12) **Assembly or disassembly of boom sections.** Mobile crane booms being assembled or disassembled on the ground with or without the support of the boom harness shall be blocked to prevent dropping of the boom or boom sections.

(13) **Brakes.**

- (i) Each independent hoisting unit of a crane shall be equipped with at least one holding brake, applied directly to the motor shaft or gear train.
- (ii) Each independent hoisting unit of a crane, except worm geared 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 a controlled braking means to control lowering speeds.
- (iii) Holding brakes for hoist units shall have not less than the following percentage of the rated load hoisting torque at the point where the brake is applied:
 - (A) 125 percent when used with an other than mechanically controlled braking means; or
 - (B) 100 percent when used with a mechanically-controlled braking means.
 - (C) 100 percent when two holding brakes are provided.
- (iv) All power control braking means shall be capable of maintaining safe lowering speeds of rated loads.

(g) **Rail-mounted cranes (excluding locomotive types).**

(1) For the purposes of this section, rail-mounted cranes include bridge cranes and portal cranes.

(2) **Rated load marking.** The rated loads of bridge cranes shall be plainly marked on each side of the crane and in the cab. If there is more than one hoisting unit, each hoist shall have its rated load marked on it or on its load block. Marking shall be legible from the ground level.

(3) **Wind-indicating devices.**

- (i) After October 3, 1983, each rail-mounted bridge and portal crane located outside of an enclosed structure shall be fitted with an operable wind-indicating device.
- (ii) The wind indicating device shall provide a visible or audible warning to alert the operator of high wind conditions. That warning shall be transmitted whenever the following circumstances are present:
 - (A) When wind velocity reaches the warning speed, not exceeding the crane manufacturer's recommendations; and

- (B) When wind velocity reaches the shutdown speed, not exceeding the crane manufacturer's recommendations, at which work is to be stopped and the crane secured.
 - (iii) **Instructions.** The employer shall post operating instructions for high wind conditions in the operator's cab of each crane. Operators shall be directed to comply with these instructions. The instructions shall include procedures for responding to high wind alerts and for any coordination necessary with other cranes.
- (4) **Securing of cranes in high winds.**
- (i) When the wind reaches the crane's warning speed:
 - (A) Gantry travel shall be stopped; and
 - (B) The crane shall be readied for shutdown.
 - (ii) When the wind reaches the crane's shutdown speed:
 - (A) Any portion of the crane spanning or partially spanning a vessel shall be moved clear of the vessel if safe to do so; and
 - (B) The crane shall be secured against travel, using all available means of securing.
- (5) The employer shall monitor local weather conditions by subscribing to a weather service or using equally effective means.
- (6) **Stops and bumpers.**
- (i) The ends of all tracks shall be equipped with stops or bumpers. If a stop engages the tread of the wheel, it shall be of a height not less than the radius of the wheel.
 - (ii) When more than one crane operates on the same runway or more than one trolley on the same bridge, each crane or trolley shall be equipped with bumpers or equivalent devices at adjacent ends subject to impact.
- (7) **Employee exposure to crane movement.** When employees may be in the vicinity of the tracks, crane trucks shall be equipped with personnel-deflecting guards.
- (8) **Pedestrian clearance.** If the track area is used for employee passage or for work, a minimum clearance of three feet (.91 m) shall be provided between trucks or the structures of rail-mounted cranes and any other structure or obstruction. When the required clearance is not available on at least one side of the crane's trucks, the area shall not be used and shall be marked and identified.
- (9) **Warning devices.** Rail-mounted cranes shall be equipped with an effective travel warning device which shall be used to warn employees who may be in the path of the moving crane.
- (10) **Communications.** Means of communication shall be provided between the operator's cab and the base of the gantry of all rail-mounted cranes. This requirement may be met by telephone, radio, sound-signalling system or other effective methods, but not solely by hand-signalling.
- (11) Limit switch bypass systems shall be secured during all cargo operations. Such bypass systems shall not be used except in an emergency or during non-cargo handling operations such as stowing cranes or derricks or performing repairs. When a situation requiring the use of a bypass system or the readjustment of a limit switch arises, it shall be done only under the direction of a crane mechanic.

- (h) **Stabilizing of locomotive cranes.** Loads may be hoisted by locomotive cranes only if outriggers are in place, unless means are taken to prevent the load being carried by the truck springs of the crane.
- (i) **Operations.**
 - (1) Use of cranes together. When two or more cranes hoist a load in unison, a designated person shall direct the operation and instruct personnel in positioning, rigging of the load and movements to be made.
 - (2) **Guarding of swing radius.** Accessible areas within the swing radius of the body of a revolving crane shall be physically guarded during operations to prevent an employee from being caught between the body of the crane and any fixed structure or between parts of the crane.
 - (3) **Securing mobile crane components in transit.** The crane's superstructure and boom shall be secured against rotation and carried in line with the direction of travel except when negotiating turns with an operator in the cab or when the boom is supported on a dolly. The empty hook or other attachment shall be secured.
 - (4) **Unattended cranes.** The following steps shall be taken before leaving a crane unattended between work periods:
 - (i) Suspended loads, such as those hoisted by lifting magnets or clamshell buckets, shall be landed unless the storage position or maximum hoisting of the suspended device will provide equivalent safety;
 - (ii) Clutches shall be disengaged;
 - (iii) The power supply shall be shut off;
 - (iv) The crane shall be secured against accidental travel; and
 - (v) The boom shall be lowered or secured against movement.
 - (5) **Operating near electric power lines.**
 - (i) **Clearance.** Unless electrical distribution and transmission lines are de-energized and visibly grounded at the point of work, or unless insulating barriers not a part of or attached to the crane have been erected to prevent physical contact with lines, cranes may be operated near power lines only in accordance with the following:
 - (A) For lines rated 50 kV or below, minimum clearance between the lines and any part of the crane or load shall be 10 feet (3.05 m);
 - (B) For lines rated over 50 kV, minimum clearance between the lines and any part of the crane or load shall be either 10 feet (3.05 m) plus 0.4 inch (10.16 mm) for each 1 kV over 50 kV, or twice the length of the line insulator, but never less than 10 feet; and
 - (C) In transit with no load and boom lowered, the clearance shall be a minimum of 4 feet (1.22 m).
 - (ii) **Boom guards.** Cage-type boom guards, insulating links or proximity warning devices may be used on cranes, but they shall not be used in place of the clearances required by paragraph (i)(5)(i) of this section.
 - (iii) **Determination of energized lines.** Any overhead line shall be presumed to be energized until the owner of the line indicates that it is not energized.

(j) *Protection for employees being hoisted.*

- (1) No employee shall be hoisted by the load hoisting apparatus of a crane or derrick except:
 - (i) On intermodal container spreaders, equipped in accordance with paragraph (j)(8) of this section; or
 - (ii) In a boatswain's chair or other device rigged to prevent it from accidental disengagement from the hook or supporting member; or
 - (iii) On a platform meeting the following requirements:
 - (A) Enclosed by a railing or other means providing protection equivalent to that described in § 1917.112(c). If equipped with open railings, the platform shall be fitted with toe boards;
 - (B) Having a safety factor of four based on ultimate strength;
 - (C) Bearing a plate or permanent marking indicating maximum load rating, which shall not be exceeded, and the weight of the platform itself;
 - (D) Equipped with a device to prevent access doors, when used, from opening accidentally;
 - (E) Equipped with overhead protection for employees on the platform if they are exposed to falling objects or overhead hazards;
 - (F) Secured to the load line by means other than wedge and socket attachments, unless the free (bitter) end of the line is secured back to itself by a clamp placed as close above the wedge as possible.
- (2) Except in an emergency, the hoisting mechanism of all cranes or derricks used to hoist personnel shall operate only in power up and power down, with automatic brake application when not hoisting or lowering.
- (3) Variable radius booms of a crane or derrick used to hoist personnel shall be so constructed or secured as to prevent accidental boom movement.
- (4) Platforms or devices used to hoist employees shall be inspected for defects before each day's use and shall be removed from service if defective.
- (5) Employees being hoisted shall remain in continuous sight of and communication with the operator or signalman.
- (6) Operators shall remain at the controls when employees are hoisted.
- (7) Cranes shall not travel while employees are hoisted, except in emergency or in normal tier to tier transfer of employees during container operations.
- (8) When intermodal container spreaders are used to transfer employees to or from the tops of containers, the spreaders shall be equipped with a personnel platform equipped with fixed railings, provided that the railings have one or more openings for access. The openings shall be fitted with a means of closure, such as chains with hooks. Existing railings shall be at least 36 inches (0.91 m) in height. New railings installed after October 3, 1983 shall be 42 inches (1.07 m), plus or minus 3 inches (7.62 cm), in height. The provisions of paragraphs (j)(1)(iii)(C), (j)(1)(iii)(D), and (j)(1)(iii)(F) of this section also apply to personnel platforms when such container spreaders are used.
- (9) Employees shall not be hoisted on intermodal container spreaders while a load is engaged.

(10) All cranes and derricks used to hoist personnel shall be equipped with an anti-two-blocking device.

(k) **Routine inspection.**

(1) Designated persons shall visually inspect each crane and derrick on each day of use for defects in functional operating components and shall report any defect found to the employer. The employer shall inform the operator of the findings.

(2) A designated person shall thoroughly inspect all functional components and accessible structural features of each crane or device at monthly intervals.

(3) Any defects found during such inspections which may create a safety hazard shall be corrected before further equipment use. Repairs shall be performed only by designated persons.

(4) A record of monthly inspections shall be maintained for six months in or on the crane or derrick or at the terminal.

[48 FR 30909, July 5, 1983, as amended at 62 FR 40199, July 25, 1997; 65 FR 40940, June 30, 2000]

§ 1917.46 Load indicating devices.

(a) (1) Except as provided in paragraph (a)(1)(viii) of this section, every crane after October 3, 1984 shall be fitted with a load indicating device or alternative device in proper working condition which shall meet the following criteria:

(i) The type or model or any load indicating or alternate device which is used shall provide:

(A) A direct indication in the cab of actual weight hoisted or a means of determining this by referencing a weight indication to crane ratings posted and visible to the operator, except that the use of a dynamometer or simple scale alone will not meet this requirement; or

(B) Indications in the cab according to the radius and load at the moment; or

(C) A direct means to prevent an overload from occurring.

(ii) The accuracy of the load indicating device, weight-moment device, or overload protection device shall be such that any indicated load (or limit), including the sum of actual weight hoisted and additional equipment or "add ons" such as slings, sensors, blocks, etc., is within the range between 95 percent (5 percent underload) and 110 percent (10 percent overload) of the actual true total load. Such accuracy shall be required over the range of daily operating variables reasonably anticipated under the conditions of use.

(iii) The device shall permit the operator to determine, before making any lift, that the indicating or substitute system is operative. In the alternative, if a device is so mounted or attached to preclude such a determination, it may not be used unless it has been certified by the manufacturer to remain operable within the limits stated in paragraph (a)(1)(ii) of this section for a specific period of use. Checks for accuracy, using known values of load, shall be performed at the time of every certification survey (see § 1917.50) and at such additional times as may be recommended by the manufacturer.

(iv) When a load indicating device or alternative system is so arranged in the supporting system (crane structure) that its failure could cause the load to be dropped, its strength shall not be the limiting factor of the supporting system (crane structure).

- (v) Marking shall be conspicuously placed giving: units of measure in pounds or both pounds and kilograms, capacity of the indicating system, accuracy of the indicating system, and operating instructions and precautions. In the case of systems utilizing indications other than actual weights, the marking shall include data on: the means of measurement, capacity of the system, accuracy of the system, and operating instructions and precautions. If the system used provides no readout, but is such as to automatically cease crane operation when the rated load limit under any specific condition of use is reached, marking shall be provided giving the make and model of the device installed, a description of what it does, how it is operated, and any necessary precautions regarding the system. All weight indications, other types of loading indications, and other data required shall be readily visible to the operator.
- (vi) All load indicating devices shall be operative over the full operating radius. Overall accuracy shall be based on actual applied load and not on full scale (full capacity) load.

Explanatory Note: For example, if accuracy of the load indicating device is based on full scale load and the device is arbitrarily set at plus/minus 10 percent, it would accept a reading between 90,000 and 110,000 lbs., at full capacity of a machine with 100,000 lbs., maximum rating, but would also allow a reading between zero and 20,000 lbs., at that outreach (radius) at which the rating would be 10,000 lbs., capacity—an unacceptable figure. If, however, accuracy is based on actual applied load under the same conditions, the acceptable range would remain the same with the 100,000-lb. load but becomes a figure between 9,000 and 11,000 lbs., a much different and acceptable condition, at the 10,000-lb. load.

- (vii) When the device uses the radius as a factor in its use or in its operating indications, the indicated radius (which may be in feet and/or meters, or degrees of boom angle, depending on the system used) shall be a figure which is within the range of a figure no greater than 110 percent of the actual radius to a figure which is no less than 97 percent of the actual (true) radius. A conversion chart shall be provided whenever it is necessary to convert between degrees of radius and feet or meters.
- (viii) The load indicating device requirements of this subparagraph do not apply to a crane:
 - (A) Of trolley equipped bridge type or overhead type while handling intermodal containers known to be identified as empty, or loaded, and in either case in compliance with the provisions of § 1917.71, or while hoisting other lifts by means of a lifting beam supplied by the crane manufacturer for the purpose, and in all cases within the crane rating;
 - (B) While handling bulk commodities or cargoes by means of clamshell bucket or magnet;
 - (C) While used to handle or hold hoses in connection with transfer of bulk liquids or other hose handled products; or
 - (D) While the crane is used exclusively to handle cargo or equipment the total actual gross weight of which is known by means of marking of the unit or units hoisted, when such total actual gross weight never exceeds 11,200 lbs., and when 11,200 lbs., is less than the rated capacity of the crane at the maximum outreach that is possible under the conditions of use at the time.

[48 FR 30909, July 5, 1983, as amended at 62 FR 40199, July 25, 1997]

§ 1917.47 Winches.

- (a) Moving winch parts which present caught-in hazards to employees shall be guarded.
- (b) Winches shall have clearly identifiable and readily accessible stop controls.
- (c) Portable winches shall be secured against accidental shifting while in use.
- (d) Portable winches shall be fitted with limit switches if employees have access to areas from which it is possible to be drawn into the winch.
- (e) The provisions of § 1917.45(f)(11) shall apply to winches.

§ 1917.48 Conveyors.

- (a) **Guards.**
 - (1) Danger zones at or adjacent to conveyors shall be guarded to protect employees.
 - (2) An elevated walkway with guardrail or equivalent means of protection shall be provided where employees cross over moving conveyors, and suitable guarding shall be provided when employees pass under moving conveyors.
- (b) **Moving parts.** Conveyor rollers and wheels shall be secured in position.
- (c) **Positioning.** Gravity conveyor sections shall be firmly placed and secured to prevent them from falling.
- (d) **Braking.**
 - (1) When necessary for safe operation, provisions shall be made for braking objects at the delivery end of the conveyor.
 - (2) Conveyors using electrically released brakes shall be constructed so that the brakes cannot be released until power is applied, and so that the brakes are automatically engaged if the power fails or the operating control is returned to the "stop" position.
- (e) **Stability.** Portable conveyors shall be stable within their operating ranges. When used at variable fixed levels, the unit shall be secured at the operating level.
- (f) **Emergency stop devices.** Readily accessible stop controls shall be provided for use in an emergency. Whenever the operation of any power conveyor requires personnel to work in the immediate vicinity of the conveyor, the Conveyor or controls shall not be left unattended while the conveyor is in operation.
- (g) **Starting powered conveyors.** Powered conveyors shall not be started until all employees are clear of the conveyor or have been warned that the conveyor is about to start.
- (h) **Loading and unloading.** The area around conveyor loading and unloading points shall be kept clear of obstructions during conveyor operations.
- (i) **Lockout/Tagout.**
 - (1) Conveyors shall be stopped and their power sources locked out and tagged out during maintenance, repair, and servicing, unless power is necessary for testing.
 - (2) The starting device shall be locked out and tagged out in the stop position before an attempt is made to remove the cause of a jam or overload of the conveying medium, unless it is necessary to have the power on to remove the jam.

(j) **Safe practices.**

- (1) Only designated persons shall operate, repair or service powered conveyors.
- (2) The employer shall direct employees to stay off operating conveyors.
- (3) Conveyors shall be operated only with all overload devices, guards and safety devices in place and operable.

[48 FR 30909, July 5, 1983, as amended at 62 FR 40200, July 25, 1997]

§ 1917.49 Spouts, chutes, hoppers, bins, and associated equipment.

- (a) Standing and running rigging and associated gear used as a permanent part of spouts, chutes or similar devices shall be inspected before each use and shall not be used if it has any functional defects. (See also § 1917.50(c)(2) for certification requirements.)
- (b) Direct communication shall be provided between the discharge or shipboard control end of loading spouts and chutes and the point in the terminal from which the flow of cargo is controlled.
- (c) Chute and hopper openings which present a hazard shall be guarded to prevent employees from falling through them.
- (d) When employees are working on hoppers, the hopper shall be equipped with a safe walkway and means of access.
- (e) When necessary for the safety of employees, chutes shall be equipped with sideboards to afford protection from falling objects.
- (f) Chutes shall be firmly placed and secured to prevent them from falling.
- (g) When necessary for the safety of employees, provisions shall be made for braking objects other than bulk commodities at the delivery end of the chute.
- (h) Before an employee enters an empty bin:
 - (1) Personnel controlling the flow of cargo into the bin shall have been notified of the entry; and
 - (2) The power supply to the equipment carrying the cargo to the bin shall be turned off, locked out and tagged.
- (i) Before an employee enters a bin containing a bulk commodity such as coal or sugar, the employer shall ensure that:
 - (1) Personnel controlling the flow of cargo into the bin have been notified of the entry;
 - (2) The power supply to the equipment carrying the cargo to the bin is turned off, locked out and tagged.
 - (3) The employee entering the bin wears a lifeline and safety harness; and
 - (4) A standby attendant equipped to perform a rescue is continuously stationed outside the bin until the employee has left the bin.
- (j) Bin top openings that present a hazard to employees shall be covered to prevent employees from falling into bins.
- (k) Chutes and hoppers shall be repaired only by designated persons.

(l)

- (1) Before power shoveling operations begin, a designated person shall inspect the equipment to be used. The inspection shall include at least the eye bolts, wires, and sheaves.
- (2) Power shovels and associated equipment with defects affecting safe operation shall not be used.
- (3) Before adjustments are made to a power shovel, wire, or associated equipment, the power supply to the shovel shall be turned off, locked out, and tagged, the belt stopped, and the hopper closed.

§ 1917.50 Certification of marine terminal material handling devices (See also mandatory appendix I, of this part).

- (a) The employer shall not use any material handling device listed in paragraph (c) of this section until he has ascertained that the device has been certificated, as evidenced by current and valid documents attesting to compliance with the requirements of paragraph (b) of this section.
 - (1) Certification surveys are to be completed for the conditions of use found at the time such surveys are completed, with the understanding that equipment owners/users can change the configurations of the equipment according to the manufacturer's specifications without affecting the established certification status for the equipment.
 - (2) In cases of foreign manufactured cranes, there shall be an owner's warranty that the design is adequate for the intended use. The warranty shall be based on a thorough examination of the design specifications by a registered professional engineer familiar with the equipment.
- (b) The certifications required by this section shall be performed:
 - (1) In accordance with part 1919 of this chapter, by persons then currently accredited by the Occupational Safety and Health Administration as provided in that part; or
 - (2) In accordance with standards established and enforced by the state in which the device is located or by a political subdivision thereof, which have been found by the Secretary to be compatible with part 1919 of this chapter, by persons designated as competent to perform such certification by competent state authority and recognized as such by the Secretary.
- (c) The marine terminal material handling devices listed below shall be certificated in the following manner:
 - (1) Each crane and derrick shall be tested as a unit quadrennially, and shall be examined annually. Certificates of tests and examinations shall be made readily available for inspection.
 - (2) Bulk cargo spouts and suckers, together with any portable extensions and rigging or outriggers supporting them vertically, shall be examined annually. Certificates attesting to the required examination shall be made readily available for inspection.
 - (3) Vertical pocket or bucket conveyors such as banana, sugar, and grain marine legs (other than those within a grain elevator structure) used within a marine terminal facility shall be examined annually. The annual examination shall include all supporting structures, rigging and mechanical components and observation of all steps of operations. Certificates attesting to the required examinations shall be readily available for inspection.
 - (4)

- (i) House fall cargo-handling gear in use shall be proof load tested as a unit upon initial certification and every fourth year thereafter. An examination shall be carried out in conjunction with each unit proof load test and annually thereafter. The unit test shall consist of a proof load of 25 percent in excess of the rated safe working load. Examinations shall include all supporting structures and components. Certificates attesting to the required tests and examinations shall be readily available for inspection.
- (ii) House fall span beams or other house fall block supports shall be marked with the safe working load, which shall not be exceeded.

(5) **Special gear.**

- (i) Special stevedoring gear provided by the employer, the strength of which depends upon components other than commonly used stock items such as shackles, ropes, or chains, and that has a Safe Working Load (SWL) greater than five short tons (10,000 lbs or 4.54 metric tons) shall be inspected and tested as a unit before initial use (see Table A in paragraph (c)(5)(ii) of this section). In addition, any special stevedoring gear that suffers damage necessitating structural repair shall be inspected and retested after repair and before being returned to service.
- (ii) Special stevedoring gear provided by the employer that has a SWL of five short tons (10,000 lbs or 4.54 metric tons) or less shall be inspected and tested as a unit before initial use according to paragraphs (d) and (e) of this section or by a designated person (see Table A in this paragraph (c)(5)(ii)).

Table A

Safe working load	Proof load
Up to 20 short tons (18.1metric tons)	25 percent in excess.
From 20 through 50 short tons (18.1 to 45.4 metric tons)	5 short tons in excess.
Over 50 short tons (45.4 metric tons)	10 percent in excess.

- (iii) Every spreader that is not a part of ship's gear and is used for handling intermodal containers shall be inspected and tested before initial use to a proof load equal to 25 percent greater than its rated capacity. In addition, any spreader that suffers damage necessitating structural repair shall be inspected and retested after repair and before being returned to service.
 - (iv) All cargo handling gear covered by this section with a SWL greater than five short tons (10,000 lbs. or 4.54 metric tons) shall be proof load tested according to Table A of this section every 4 years in accordance with paragraph (b) of this section or by a designated person.
 - (v) Certificates and inspection and test records attesting to the tests required by this section shall be available for inspection.
- (6) Wire rope and loose gear obtained after October 3, 1983, and used for material handling shall have been tested and certificated before being placed into use in accordance with the provisions of paragraphs (a), (c), and (d) of §§ 1919.31 and 1919.32 through 1919.34 of this chapter as applicable. Certificates attesting to the required tests, inspections and examinations shall be available.

- (d) Disassembly and reassembly of equipment does not require recertification of the equipment provided that the equipment is reassembled and used in a manner consistent with its certification.
- (e) For equipment certificated in accordance with paragraph (b)(2) of this section and transferred to a job site in another state, the current certification shall remain valid until the next inspection or examination becomes due.
- (f) Certification procedures shall not be construed as a substitute for, or cause for elimination of, normal operational inspection and maintenance routine throughout the year.
- (g)
 - (1) Every unit of equipment requiring quadrennial certification shall have had such quadrennial certification within the previous 48 months. Equipment requiring annual certification shall have had such annual certification within the previous 12 months, except that no annual certification is required within 12 months after any required quadrennial certification. Annual examinations for certification may be accomplished up to one month early without effect on subsequent due dates.
 - (2) When certificated equipment is out of service for 6 months or more beyond the due date of a certification inspection, an examination equivalent to an initial certification, including unit proof load test, shall be performed before the equipment re-enters service.
- (h) Loose gear obtained after October 3, 1983 shall bear a legible mark indicating that it has been tested (see paragraph (c)(6) of this section). Single sheave blocks shall be marked with safe working loads and proof test loads. Marks relating to testing shall be identifiable on the related certificates, which shall be available.
- (i) **Safe working load.**
 - (1) The safe working load of gear as specified in this section shall not be exceeded.
 - (2) All cargo handling gear provided by the employer with a safe working load greater than five short tons (10,000 lbs. or 4.54 metric tons) shall have its safe working load plainly marked on it.
- (j) **Exceptions:** The certification requirements of this section do not apply to the following equipment:
 - (1) Small industrial crane trucks as described on page 8 and illustrated on page 13 of ASME B56.1, 1959, "Safety Code for Powered Industrial Trucks", and powered industrial trucks;
 - (2) Any straddle truck not capable of straddling two or more intermodal containers 16 feet (4.88 m) in width; and
 - (3) Gear used only for handling or holding hoses, handling ship's stores or handling the gangway.

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§ 1917.51 Hand tools.

- (a) Hand tools used by employees shall be maintained in safe operating condition.
- (b)
 - (1) Hand-held portable electric tools shall be equipped with switches that must be manually held in a closed position to operate the tool.

- (2) Portable power-driven circular saws shall be equipped with guards above and below the base plate or shoe. The upper guard shall cover the saw to the depth of the teeth, except for the minimum arc needed to permit the base to be tilted for bevel cuts. The lower guard shall cover the saw to the depth of the teeth, except for the minimum arc needed to allow proper retraction and contact with the work. When the tool is withdrawn from the work, the lower guard shall automatically and instantly return to the covering position.
- (c) Only cutting tools shall be used to cut metal strapping or banding used to secure cargo.