

§ 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

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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.

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§ 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.

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(2) An elevated walkway with guard-rail 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.