

OREGON GENERAL REQUIREMENTS FOR CRANES

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437-002-0228 Oregon General Requirements for Cranes.

(1) General Requirements.

- (a) The user shall comply with the manufacturer's specifications and limitations applicable to the operation of any and all cranes and derricks.*
- (b) Where manufacturer's specifications are not available, the limitations assigned to the equipment shall be based on the determinations of a qualified engineer competent in this field and such determinations will be appropriately documented and recorded.*
- (c) Attachments used with cranes shall not exceed the capacity, rating, or scope recommended by the manufacturer.*
- (d) No modifications or additions which affect the capacity or safe operation of the equipment shall be made without the manufacturer's written approval. 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.*
- (e) If such modifications or changes are made, the capacity, operation, and maintenance instruction plates, tags, or decals, shall be changed accordingly. In no case shall the original safety factor of the equipment be reduced. Only the manufacturer or other competent shop with suitable equipment and with personnel trained for the work shall be permitted to perform welding or other repair work on cranes or derricks.*
- (f) Rated load capacities, and recommended operating speeds, special hazard warnings, or instruction, shall be conspicuously posted on all equipment.*
- (g) Instructional or warning signs shall be visible to the operator while he or she is at his or her control station.*
- (h) The employer shall designate a competent person who shall inspect all machinery and equipment prior to each use, and during use, to make sure it is in safe operating condition.*
- (i) Any deficiencies shall be repaired, or defective parts replaced, before continued use.*
- (j) A thorough, annual inspection of all cranes shall be made by a competent person, or a government or private agency.*
- (k) The employer shall maintain a record of the dates and results of inspections for each hoisting machine and piece of equipment.*
- (l) An unimpaired horizontal clearance of not less than 3 feet shall be maintained between the rotating superstructure of any crane and any adjacent object or surface. If this clearance cannot be maintained, barricades shall be installed to isolate the hazardous area.*

- (m) All windows in cabs shall be of safety glass, or its equivalent, that introduces no visible distortion that will interfere with the safe operation of the machine.*
- (n) Cranes which operate at night shall have their load hooks and working areas adequately lighted.*
- (o) Sufficient light shall be provided in the operator's cage or cab to enable the operator to see clearly enough to perform his or her work.*
- (p) An accessible fire extinguisher of 10 BC rating, or higher, shall be available at all operator stations or cabs of equipment.*
- (q) Belts, gears, and other reciprocating, rotating, or moving parts or equipment shall be guarded as required in OAR 437, Division 2/O, Machinery and Machine Guarding.*

(2) Crane operator training requirements:

- (a) The employer shall establish written procedures for the safe operation of all cranes and derricks.*
- (b) The employer shall see that employees who operate cranes or derricks are properly trained, have sufficient practical experience, and follow operating procedures for the safe operation of the crane or derrick.*
- (c) The level of training and experience received by the employee to meet OAR 437-002-0228(2)(b) above shall be recorded in writing.*
- (d) The employer shall maintain all written records of crane or derrick operators' training and experience, and shall make such records available for review by the Oregon Occupational Safety and Health Division (OR-OSHA) upon request.*

(3) Overhead Wires – Operating Near Electric Power Lines.

- (a) A warning sign, legible at 12 feet, shall be posted and maintained in plain view of the operators of each crane, derrick, or power-shovel. The sign shall read, "UNLAWFUL TO OPERATE THIS EQUIPMENT WITHIN 10 FEET OF HIGH-VOLTAGE LINES."*

NOTE: For operation near overhead electric lines see Division 2/S, Electrical, 1910.333(c)(3).

- (4) Signals.** Class "D" citizens band radio frequencies shall not be used for signaling crane operators.

OREGON GENERAL REQUIREMENTS FOR CRANES

N

Hoisting Equipment and Tackle

(5) Blocks, Sheaves, and Drums.

(a) Blocks, sheaves and drums and all parts thereof shall not be used for heavier strains or greater speeds than that for which they have been designed and constructed.

(b) Sheave and drum diameters shall be as recommended by the wire rope manufacturer for the size rope being used.

(c) All pins, including bearing and yoke pins, of all blocks shall be secured against accidental displacement.

(d) Sheaves supporting boom lines shall not be carried on overhung sheave pins unless equipped with substantial guards passing around the sheave pin and securely held from dislodgment from the pin.

(e) All blocks shall be fitted with line guards or shall be designed and used in a manner that prevents fouling.

(f) Where the slacking of cable around sheaves and idlers would result in injury to workers, line guards shall be provided.

(g) Working line blocks shall be kept in proper alignment.

(h) Snatch (gate) blocks shall be closed and hooked before being used.

(6) Drums. *Ends of lines attached to drums shall be securely fastened by means of clamps, socketing, or other means furnishing equivalent strength. Not less than two wraps of line shall be maintained on drums.*

(7) Chains.

(a) End fastenings shall be capable of sustaining loads up to the breaking strength of the hoisting chain with which they are used.

(b) Hoisting chains shall be repaired or removed from such service when the increase in length (stretch) of the measured section exceeds 5 percent; or when a link is bent, twisted, or otherwise damaged, or when raised scarfs or defective welds appear.

(c) Knots shall not be tied in chain in order to shorten its length.

(8) Hooks. *When necessary to prevent lifting attachments from inadvertently lifting out of the hook, a safety type hook or other device or means shall be used.*

(9) Wire Rope.

(a) *Wire rope and replacement wire rope shall be of the same size, same or better grade, and same construction as originally furnished by the equipment manufacturer or contemplated in the design, unless otherwise recommended by the equipment or the wire rope manufacturer.*

(b) *Wire rope with an independent wire-rope center or other heat-resisting center shall be used as hoisting rope wherever exposed to excessive temperatures such as ingot-pouring, ladle cranes, and similar operations.*

(c) *Running wire ropes shall be guarded if within 7 feet of the floor or platform.*

(d) *Care shall be taken to prevent friction of ropes with other objects which will cause chafing or breaking of wires.*

(e) *Wire rope shall be taken out of service when any of the following conditions exist:*

(A) *In running ropes, six randomly distributed broken wires in one lay or three broken wires in one strand in one lay;*

(B) *Wear of one-third the original diameter of outside individual wires. Kinking, crushing, bird caging, or any other damage resulting in distortion of the rope structure;*

(C) *Evidence of any heat damage from any cause;*

(D) *Reductions from nominal diameter of more than 1/64-inch for diameters up to and including 5/16-inch, 1/32-inch for diameters 3/8-inch to and including 1/2-inch, 3/64-inch for diameters 9/16-inch to and including 3/4-inch, 1/16-inch for diameters 7/8-inch to 1 1/8 inches inclusive, 3/32-inch for diameters 1 1/4 inches to 1 1/2 inches inclusive;*

(E) *In standing ropes, more than two broken wires in one lay in sections beyond end connections or more than one broken wire at an end connection.*

(F) *Corroded, damaged, or improperly applied end connections.*

(f) *Wire rope safety factors shall be in accordance with American National Standards Institute B30.5-1989 or SAE J959-1966, Lifting Crane, Wire-Rope Strength Factors.*

Note: *The margin of line to be used in making a long splice shall be indicated in the following table. The full length of the splice will be twice the length "to be unraveled."*

OREGON GENERAL REQUIREMENTS FOR CRANES

N

<i>Rope Diameter</i>	<i>To Be Unraveled</i>	<i>Rope Diameter</i>	<i>To Be Unraveled</i>
<i>1/4-inch</i>	<i>6 feet</i>	<i>1 1/4 inches</i>	<i>25 feet</i>
<i>1/2-inch</i>	<i>8 feet</i>	<i>1 1/2 inches</i>	<i>30 feet</i>
<i>3/4-inch</i>	<i>15 feet</i>	<i>1 3/4 inches</i>	<i>35 feet</i>
<i>1-inch</i>	<i>20 feet</i>	<i>2 inches</i>	<i>40 feet</i>

(g) All cable shall be kept lubricated as conditions of use require.

(h) When U-bolt wire rope clips are used for form eyes, the following table shall be used to determine the number and spacing of clips:

<i>NUMBER AND SPACING OF U-BOLT WIRE CLIPS</i>			
<i>Number of Clips</i>			
<i>Improved Plow Steel Rope Diameter Inches</i>	<i>Drop Forged</i>	<i>Other Material</i>	<i>Minimum Spacing (Inches)</i>
<i>1/2</i>	<i>3</i>	<i>4</i>	<i>3</i>
<i>5/8</i>	<i>3</i>	<i>4</i>	<i>3 3/4</i>
<i>3/4</i>	<i>4</i>	<i>5</i>	<i>4 1/2</i>
<i>7/8</i>	<i>4</i>	<i>5</i>	<i>5 1/4</i>
<i>1</i>	<i>5</i>	<i>6</i>	<i>6</i>
<i>1 1/8</i>	<i>6</i>	<i>6</i>	<i>6 3/4</i>
<i>1 1/4</i>	<i>6</i>	<i>7</i>	<i>7 1/2</i>
<i>1 3/8</i>	<i>7</i>	<i>7</i>	<i>8 1/4</i>
<i>1 1/2</i>	<i>7</i>	<i>8</i>	<i>9</i>

(i) When used for eye splices, the U-bolt shall be applied so that the “U” section is in contact with the dead end of the rope.

(j) The use of cable clips or clamps may be accepted only when used in locations where they are readily accessible and subjected to frequent inspection. Clips and clamps when used shall be of the correct size and shall be properly applied. Allowance shall be made for the reduced strength of the line.

(k) The use of cable clips or clamps for joining lines is prohibited, except where used for transferring of slack lines from one place to another.

Stat. Auth.: ORS 654.025(2) and 656.726(3).

Hist: WCB Admin. Order, 11-1974, f. 3/20/74, ef. 4/15/74.
WCB Admin. Order, Safety 1-1977, f. 1/4/77, ef. 1/4/77.
WCB Admin. Order, Safety 7-1977, f. 5/20/77, ef. 6/15/77.
OR-OSHA Admin. Order 1-1989, f. 10/12/89, ef. 8/1/90.
OR-OSHA Admin. Order 11-1991, f. 9/13/91, ef. 10/1/91.
OR-OSHA Admin. Order 13-1993, f. 8/20/93, ef. 11/1/93.

