

# HELICOPTERS, HOISTS, ELEVATORS AND CONVEYORS **N**

---

## TABLE OF CONTENTS

**NOTE:** OAR 437-003-0081 Crane operator safety training requirements, is now located in Subdivision CC.

**1926.550** Reserved .....N-1

**NOTE:** OAR 437-003-0080 Wind velocity device, is now located in Subdivision DD.

**1926.551** Helicopters .....N-1

**1926.552** Material hoists, personnel hoists, and elevators.....N-5

**1926.553** Base-mounted drum hoists .....N-10

**1926.554** Overhead hoists .....N-11

**1926.555** Conveyors .....N-12



## SUBDIVISION N

### HELICOPTERS, HOISTS, ELEVATORS AND CONVEYORS

**Authority:** Section 3704 of the Contract Work Hours and Safety Standards Act (40 U.S.C. 3701); Sections 4, 6, and 8 of the Occupational Safety and Health Act of 1970 (29 U.S.C. 653, 655, 657); Secretary of Labor's Order Nos. 12-71 (36 FR 8754), 8-76 (41 FR 25059), or 9-83 (49 FR 35736), and 5-2007 (72 FR 31159).

**NOTE:** OAR 437-003-0081 Crane operator safety training requirements, is now located in Subdivision CC.

#### **§1926.550 Reserved.**

**NOTE:** OAR 437-003-0080 Wind velocity device, is now located in Subdivision DD.

#### **§1926.551 Helicopters.**

- (a) Helicopter regulations.** Helicopter cranes shall be expected to comply with any applicable regulations of the Federal Aviation Administration.
- (b) Briefing.** Prior to each day's operation a briefing shall be conducted. This briefing shall set forth the plan of operation for the pilot and ground personnel.
- (c) Slings and tag lines.** Load shall be properly slung. Tag lines shall be of a length that will not permit their being drawn up into rotors. Pressed sleeve, swedged eyes, or equivalent means shall be used for all freely suspended loads to prevent hand splices from spinning open or cable clamps from loosening.
- (d) Cargo hooks.** All electrically operated cargo hooks shall have the electrical activating device so designed and installed as to prevent inadvertent operation. In addition, these cargo hooks shall be equipped with an emergency mechanical control for releasing the load. The hooks shall be tested prior to each day's operation to determine that the release functions properly, both electrically and mechanically.
- (e) Personal protective equipment.**
- (1)** Personal protective equipment for employees receiving the load shall consist of complete eye protection and hard hats secured by chinstraps.
  - (2)** Loose-fitting clothing likely to flap in the downwash, and thus be snagged on hoist line, shall not be worn.

**(f) Loose gear and objects.** Every practical precaution shall be taken to provide for the protection of the employees from flying objects in the rotor downwash. All loose gear within 100 feet of the place of lifting the load, depositing the load, and all other areas susceptible to rotor downwash shall be secured or removed.

**(g) Housekeeping.** Good housekeeping shall be maintained in all helicopter loading and unloading areas.

**(h) Operator responsibility.** The helicopter operator shall be responsible for size, weight, and manner in which loads are connected to the helicopter. If, for any reason, the helicopter operator believes the lift cannot be made safely, the lift shall not be made.

**(i) Hooking and unhooking loads.** When employees are required to perform work under hovering craft, a safe means of access shall be provided for employees to reach the hoist line hook and engage or disengage cargo slings. Employees shall not perform work under hovering craft except when necessary to hook or unhook loads.

**(j) Static charge.** Static charge on the suspended load shall be dissipated with a grounding device before ground personnel touch the suspended load, or protective rubber gloves shall be worn by all ground personnel touching the suspended load.

**(k) Weight limitation.** The weight of an external load shall not exceed the manufacturer's rating.

**(l) Ground lines.** Hoist wires or other gear, except for pulling lines or conductors that are allowed to "pay out" from a container or roll off a reel, shall not be attached to any fixed ground structure, or allowed to foul on any fixed structure.

**(m) Visibility.** When visibility is reduced by dust or other conditions, ground personnel shall exercise special caution to keep clear of main and stabilizing rotors. Precautions shall also be taken by the employer to eliminate as far as practical reduced visibility.

**(n) Signal systems.** Signal systems between aircrew and ground personnel shall be understood and checked in advance of hoisting the load. This applies to either radio or hand signal systems. Hand signals shall be as shown in Figure N-1.

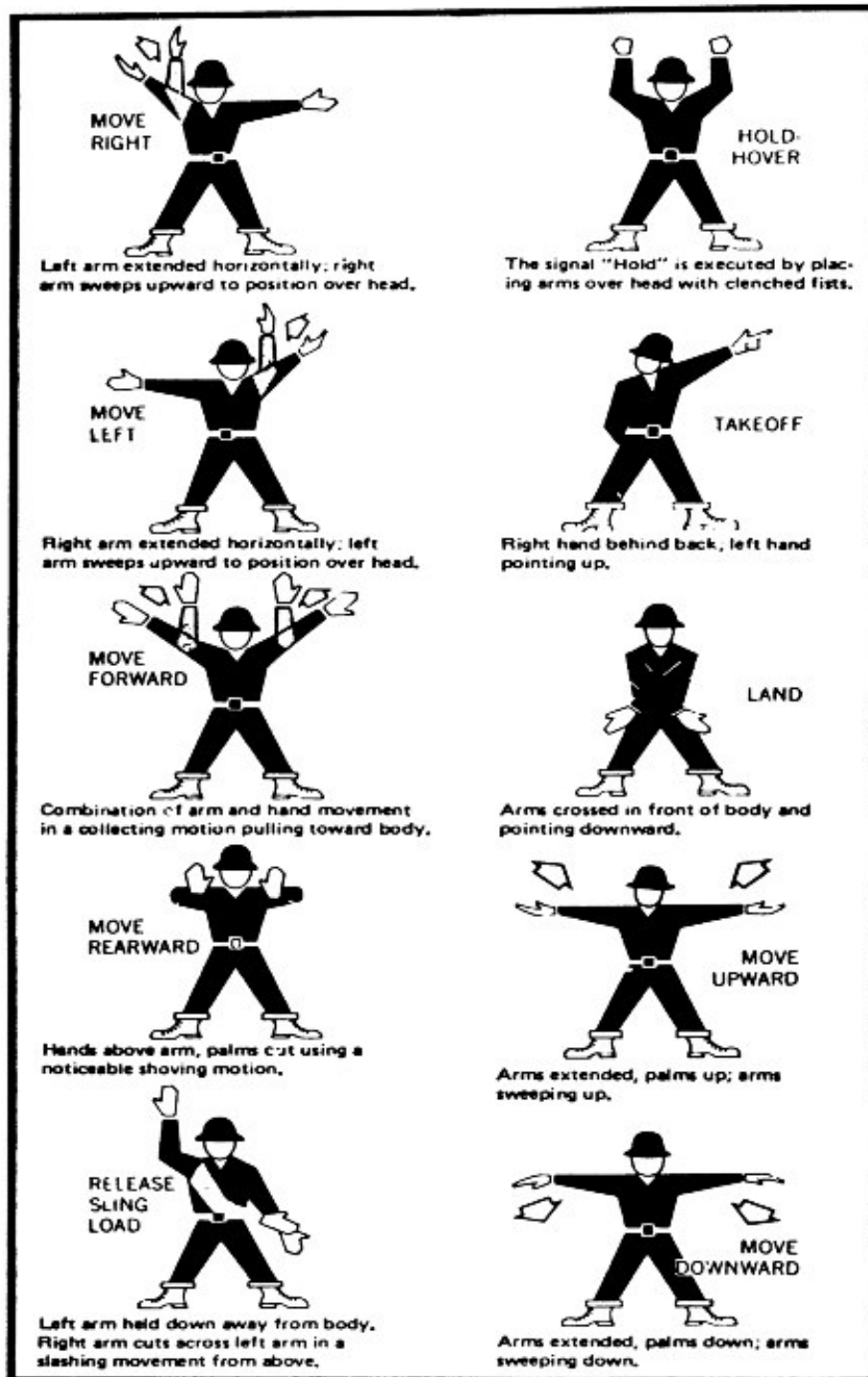


Figure N-1 – Helicopter Hand Signal

**(o) Approach distance.** No unauthorized person shall be allowed to approach within 50 feet of the helicopter when the rotor blades are turning.

**(p) Approaching helicopter.** Whenever approaching or leaving a helicopter with blades rotating, all employees shall remain in full view of the pilot and keep in a crouched position. Employees shall avoid the area from the cockpit or cabin rearward unless authorized by the helicopter operator to work there.

**(q) Personnel.** Sufficient ground personnel shall be provided when required for safe helicopter loading and unloading operations.

**(r) Communications.** There shall be constant reliable communication between the pilot, and a designated employee of the ground crew who acts as a signalman during the period of loading and unloading. This signalman shall be distinctly recognizable from other ground personnel.

**(s) Fires.** Open fires shall not be permitted in an area that could result in such fires being spread by the rotor downwash.

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

**Hist:** APD Admin. Order 4-1989, f. 3/31/89, ef. 5/1/89 (temp).  
APD Admin. Order 8-1989, f. 7/7/89, ef. 7/7/89 (perm).

# MATERIAL HOISTS, PERSONNEL HOISTS, & ELEVATORS **N**

---

## **§1926.552 Material Hoists, Personnel Hoists, and Elevators.**

### **(a) General requirements.**

- (1)** The employer shall comply with the manufacturer's specifications and limitations applicable to the operation of all hoists and elevators. Where manufacturer's specifications are not available, the limitations assigned to the equipment shall be based on the determinations of a professional engineer competent in the field.
- (2)** Rated load capacities, recommended operating speeds, and special hazard warnings or instructions shall be posted on cars and platforms.
- (3)** Wire rope shall be removed from service when any of the following conditions exists:
  - (i)** In hoisting ropes, six randomly distributed broken wires in one rope lay or three broken wires in one strand in one rope lay;
  - (ii)** Abrasion, scrubbing, flattening, or peening, causing loss of more than one-third of the original diameter of the outside wires;
  - (iii)** Evidence of any heat damage resulting from a torch or any damage caused by contact with electrical wires;
  - (iv)** Reduction from nominal diameter of more than three sixty-fourths inch for diameters up to and including three-fourths inch; one-sixteenth inch for diameters seven-eighths to 1-1/8 inches; and three thirty-seconds inch for diameters 1-1/4 to 1-1/2 inches.
- (4)** Hoisting ropes shall be installed in accordance with the wire rope manufacturers' recommendations.
- (5)** The installation of live booms on hoists is prohibited.
- (6)** The use of endless belt-type manlifts on construction shall be prohibited.

### **(b) Material hoists.**

- (1)**
  - (i)** Operating rules shall be established and posted at the operator's station of the hoist. Such rules shall include signal system and allowable line speed for various loads. Rules and notices shall be posted on the car frame or cross-head in a conspicuous location, including the statement "No Riders Allowed."
  - (ii)** No person shall be allowed to ride on material hoists except for the purposes of inspection and maintenance.

# **N MATERIAL HOISTS, PERSONNEL HOISTS, & ELEVATORS**

(2) All entrances of the hoistways shall be protected by substantial gates or bars which shall guard the full width of the landing entrance. All hoistway entrance bars and gates shall be painted with diagonal contrasting colors, such as black and yellow stripes.

(i) Bars shall be not less than 2 by 4 inch wooden bars or the equivalent, located 2 feet from the hoistway line. Bars shall be located not less than 36 inches nor more than 42 inches above the floor.

(ii) Gates or bars protecting the entrances to hoistways shall be equipped with a latching device.

(3) Overhead protective covering of 2-inch planking, 3/4 inch plywood, or other solid material of equivalent strength, shall be provided on the top of every material hoist cage or platform.

(4) The operator's station of a hoisting machine shall be provided with overhead protection equivalent to tight planking not less than 2 inches thick. The support for the overhead protection shall be of equal strength.

(5) Hoist towers may be used with or without an enclosure on all sides. However, whichever alternative is chosen, the following applicable conditions shall be met:

(i) When a hoist tower is enclosed, it shall be enclosed on all sides for its entire height with a screen enclosure of 1/2 inch mesh, No. 18 U.S. gauge wire or equivalent, except for landing access.

(ii) When a hoist tower is not enclosed, the hoist platform or car shall be totally enclosed (caged) on all sides for the full height between the floor and the overhead protective covering with 1/2 inch mesh of No. 14 U.S. gauge wire or equivalent. The hoist platform enclosure shall include the required gates for loading and unloading. A 6-foot high enclosure shall be provided on the unused sides of the hoist tower at ground level.

(6) Car arresting devices shall be installed to function in case of rope failure.

(7) All material hoist towers shall be designed by a licensed professional engineer.

(8) All material hoists shall conform to the requirements of ANSI A10.5-1969, Safety Requirements for Material Hoists.

## **(c) Personnel hoists.**

(1) Hoist towers outside the structure shall be enclosed for the full height on the side or sides used for entrance and exit to the structure. At the lowest landing, the enclosure on the sides not used for exit or entrance to the structure shall be enclosed to a height of at least 10 feet. Other sides of the tower adjacent to floors or scaffold platforms shall be enclosed to a height of 10 feet above the level of such floors or scaffolds.

# MATERIAL HOISTS, PERSONNEL HOISTS, & ELEVATORS **N**

---

- (2) Towers inside of structures shall be enclosed on all four sides throughout the full height.
- (3) Towers shall be anchored to the structure at intervals not exceeding 25 feet. In addition to tie-ins, a series of guys shall be installed.
- (4) Hoistway doors or gates shall be not less than 6 feet 6 inches high and shall be provided with mechanical locks which cannot be operated from the landing side, and shall be accessible only to persons on the car.
- (5) Cars shall be permanently enclosed on all sides and the top, except sides used for entrance and exit which have car gates or doors.
- (6) A door or gate shall be provided at each entrance to the car which shall protect the full width and height of the car entrance opening.
- (7) Overhead protective covering of 2-inch planking, 3/4 inch plywood or other solid material or equivalent strength shall be provided on the top of every personnel hoist.
- (8) Doors or gates shall be provided with electric contacts which do not allow movement of the hoist when door or gate is open.
- (9) Safeties shall be capable of stopping and holding the car and rated load when traveling at governor tripping speed.
- (10) Cars shall be provided with a capacity and data plate secured in a conspicuous place on the car or crosshead.
- (11) Internal combustion engines shall not be permitted for direct drive.
- (12) Normal and final terminal stopping devices shall be provided.
- (13) An emergency stop switch shall be provided in the car and marked "Stop."
- (14) **Ropes:**
  - (i) The minimum number of hoisting ropes used shall be three for traction hoists and two for drum-type hoists.
  - (ii) The minimum diameter of hoisting and counterweight wire ropes shall be 1/2 inch.

# N MATERIAL HOISTS, PERSONNEL HOISTS, & ELEVATORS

(iii) Safety factors:

Minimum Factors of Safety for Suspension Wire Ropes					
Rope speed in feet per minute	Minimum factor of safety	Rope speed in feet per minute	Minimum factor of safety	Rope speed in feet per minute	Minimum factor of safety
50	7.60	200	8.60	400	9.75
75	7.75	225	8.75	450	10.00
100	7.95	250	8.90	500	10.25
125	8.10	300	9.20	550	10.45
150	8.25	350	9.50	600	10.70
175	8.40				

(15) Following assembly and erection of hoists, and before being put in service, an inspection and test of all functions and safety devices shall be made under the supervision of a competent person. A similar inspection and test is required following major alteration of an existing installation. All hoists shall be inspected and tested at not more than 3-month intervals. The employer shall prepare a certification record which includes the date the inspection and test of all functions and safety devices was performed; the signature of the person who performed the inspection and test; and a serial number, or other identifier, for the hoist that was inspected and tested. The most recent certification record shall be maintained on file.

(16) All personnel hoists used by employees shall be constructed of materials and components which meet the specifications for materials, construction, safety devices, assembly, and structural integrity as stated in the American National Standard A10.4-1963, Safety Requirements for Workmen's Hoists. The requirements of this paragraph (c)(16) do not apply to cantilever type personnel hoists.

(17)

(i) Personnel hoists used in bridge tower construction shall be approved by a registered professional engineer and erected under the supervision of a qualified engineer competent in this field.

(ii) When a hoist tower is not enclosed, the hoist platform or car shall be totally enclosed (caged) on all sides for the full height between the floor and the overhead protective covering with 3/4 inch mesh of No. 14 U.S. gauge wire or equivalent. The hoist platform enclosure shall include the required gates for loading and unloading.

(iii) These hoists shall be inspected and maintained on a weekly basis. Whenever the hoisting equipment is exposed to winds exceeding 35 miles per hour it shall be inspected and put in operable condition before reuse.

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

# MATERIAL HOISTS, PERSONNEL HOISTS, & ELEVATORS **N**

---

**(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 three-sixty-fourths inch for diameters to and including three-fourths inch, one-sixteenth inch for diameters seven-eighths inch to 1-1/8 inches inclusive, three-thirty-seconds inch for diameters 1-1/4 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.

**(d)** Permanent elevators under the care and custody of the employer and used by employees for work covered by this Act shall comply with the requirements of American National Standards Institute A17.1-1965 with addenda A17.1a-1967, A17.1b-1968, A17.1c-1969, A17.1d-1970, and inspected in accordance with A17.2-1960 with addenda A17.2a-1965, A17.2b-1967.

(44 FR 8577, Feb. 9, 1979; 44 FR 20940, Apr. 6, 1979, as amended at 52 FR 36382, Sept. 28, 1987)

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

**Hist:** APD Admin. Order 4-1989, f. 3/31/89, ef. 5/1/89 (temp).

APD Admin. Order 8-1989, f. 7/7/89, ef. 7/7/89 (perm).

## §1926.553 Base-mounted Drum Hoists.

### (a) General requirements.

- (1) Exposed moving parts such as gears, projecting screws, setscrews, chain, cables, chain sprockets, and reciprocating or rotating parts, which constitute a hazard, shall be guarded.
- (2) All controls used during the normal operation cycle shall be located within easy reach of the operator's station.
- (3) Electric motor operated hoists shall be provided with:
  - (i) A device to disconnect all motors from the line upon power failure and not permit any motor to be restarted until the controller handle is brought to the "off" position;
  - (ii) Where applicable, an overspeed preventive device;
  - (iii) A means whereby remotely operated hoists stop when any control is ineffective.
- (4) All base-mounted drum hoists in use shall meet the applicable requirements for design, construction, installation, testing, inspection, maintenance, and operations, as prescribed by the manufacturer.

### (b) Specific requirements. (Reserved)

(c) This section does not apply to base-mounted drum hoists used in conjunction with derricks. Base-mounted drum hoists used in conjunction with derricks must conform to § 1926.1436(e).

**Stat. Auth.:** ORS 654.025(2) and 656.726(4).

**Stats. Implemented:** ORS 654.001 through 654.295.

**Hist:** APD Admin. Order 4-1989, f. 3/31/89, ef. 5/1/89 (temp).  
APD Admin. Order 8-1989, f. 7/7/89, ef. 7/7/89 (perm).  
OR-OSHA Admin. Order 1-2011, f. 2/9/11, ef. 2/9/11.

## §1926.554 Overhead Hoists.

### (a) General requirements.

- (1) The safe working load of the overhead hoist, as determined by the manufacturer, shall be indicated on the hoist, and this safe working load shall not be exceeded.
- (2) The supporting structure to which the hoist is attached shall have a safe working load equal to that of the hoist.
- (3) The support shall be arranged so as to provide for free movement of the hoist and shall not restrict the hoist from lining itself up with the load.
- (4) The hoist shall be installed only in locations that will permit the operator to stand clear of the load at all times.
- (5) Air hoists shall be connected to an air supply of sufficient capacity and pressure to safely operate the hoist. All air hoses supplying air shall be positively connected to prevent their becoming disconnected during use.
- (6) All overhead hoists in use shall meet the applicable requirements for construction, design, installation, testing, inspection, maintenance, and operation, as prescribed by the manufacturer.

### (b) Specific requirements. (Reserved)

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

**Hist:** APD Admin. Order 4-1989, f. 3/31/89, ef. 5/1/89 (temp).  
APD Admin. Order 8-1989, f. 7/7/89, ef. 7/7/89 (perm).

**§1926.555 Conveyors.****(a) General requirements.**

- (1)** Means for stopping the motor or engine shall be provided at the operator's station. Conveyor systems shall be equipped with an audible warning signal to be sounded immediately before starting up the conveyor.
- (2)** If the operator's station is at a remote point, similar provisions for stopping the motor or engine shall be provided at the motor or engine location.
- (3)** Emergency stop switches shall be arranged so that the conveyor cannot be started again until the actuating stop switch has been reset to running or "on" position.
- (4)** Screw conveyors shall be guarded to prevent employee contact with turning flights.
- (5)** Where a conveyor passes over work areas, aisles, or thoroughfares, suitable guards shall be provided to protect employees required to work below the conveyors.
- (6)** All crossovers, aisles, and passageways shall be conspicuously marked by suitable signs, as required by Subpart G of this part.
- (7)** Conveyors shall be locked out or otherwise rendered inoperable, and tagged out with a "Do Not Operate" tag during repairs and when operation is hazardous to employees performing maintenance work.
- (8)** All conveyors in use shall meet the applicable requirements for design, construction, inspection, testing, maintenance, and operation, as prescribed in the ANSI B20.1-1957, Safety Code for Conveyors, Cableways, and Related Equipment.

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

**Hist:** APD Admin. Order 4-1989, f. 3/31/89, ef. 5/1/89 (temp).  
APD Admin. Order 8-1989, f. 7/7/89, ef. 7/7/89 (perm).

– END OF DOCUMENT –