

Chapter Ind 44

PERSONNEL HOISTS

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History: Ch. Ind 44 as it existed on August 31, 1974 was repealed and a new Ch. Ind 44 was created effective September 1, 1974.

Ind 44.001 Definition; personnel hoist. A temporary structure designed and installed primarily for the purpose of transporting personnel vertically during the period of building construction or construction projects.

History: Cr. Register, August, 1974, No. 224, eff. 9-1-74.

Ind 44.01 General requirements. (1) Personnel hoists shall be installed to conform with the requirements as outlined in this subsection:

(a) Plans; new installations. 1. Before starting the erection on any new installation of a personnel hoist 3 copies of plans shall be submitted to the department for approval with 2 copies of application for each unit, properly filled out on forms furnished by the department.

(b) Forms. The forms referred to under (a) 1. and section Ind 44.03 are SB-22, application for construction and erection, and may be obtained from the department of industry, labor and human relations, P. O. Box 2209, Madison, Wisconsin 53701.

(c) *Submission of plans and application.* Every manufacturer who furnishes equipment as described in Wis. Adm. Code section Ind 44.01 (1) to be installed by the owner or an agent of the owner shall submit plans and application.

History: Cr. Register, August, 1974, No. 224, eff. 9-1-74.

Ind 44.02 Plan examination fee. A plan examination fee in the amount established by the Wis. Adm. Code, Ch. Ind 69, Fee Schedule, shall be paid for each installation requiring approval.

History: Cr. Register, August, 1974, No. 224, eff. 9-1-74.

Ind 44.03 Application. Before starting the erection of a hoist moved to a new location, application in duplicate, properly filled out, shall be submitted to the department for approval, on forms furnished by the department. (See subsection Ind 44.01 (1) (b).)

History: Cr. Register, August, 1974, No. 224, eff. 9-1-74.

Ind 44.06 Inspection fee. An inspection fee in the amount established by the Wis. Adm. Code, Ch. 69, Fee Schedule, will be charged by the department for each inspection of each personnel hoist.

History: Cr. Register, August, 1974, No. 224, eff. 9-1-74.

Ind 44.091 Personnel hoist installation and dismantling. (1) During installation or dismantling of personnel hoists and accessory equipment, including the tower, no person shall be permitted to ride any part of the equipment.

(a) Before any work is begun on the electrical control system, all personnel elevator hoisting equipment shall be in permanent position including hoisting and counterweight cables, the governor, the governor cable and the safety device.

(b) *Exception to Ind 44.091:* Any personnel hoists having the governor and safety device engaged and/or operational during erection and dismantling of the hoist.

History: Cr. Register, August, 1974, No. 224, eff. 9-1-74.

Ind 44.11 Platforms and sill clearances. (1) Where a platform is provided between the tower and the building, the open or exposed sides shall be provided with a standard guard rail 42 inches in height with an intermediate guard and a toeboard not less than 4 inches in height at the edge of the platform.

(a) The clearance between the car sill and any landing sill shall be not less than $\frac{1}{2}$ inch or more than 3 inches.

History: Cr. Register, August, 1974, No. 224, eff. 9-1-74.

Ind 44.12 Car construction. (1) Every personnel hoist shall have a car frame consisting of a crosshead, uprights (stiles), and a plank located approximately at the middle of the car platform.

(a) Car frames shall be guided on each guide rail by upper and lower guide shoes attached to the frame.

(b) The frame and its guiding members shall be designed to withstand the forces resulting under the loading conditions for which the hoist is designed.

(c) When cars are suspended by hoist cables attached to the car frame by means of cable shackles, the shackles shall be attached to the steel hitch plates or to structural steel shapes. Such plates or shapes shall be secured to the underside or to the webs of the car frame members with bolts or rivets so located that the tensions in the hoisting ropes will not develop direct tension on the bolts or rivets.

(d) Every hoist shall have a platform consisting of a solid floor attached to the platform frame supported by the car frame and extending over the entire area within the car enclosure. The platform frame members and the floors shall be designed to withstand the forces developed under the loading conditions for which the elevator is designed and installed.

(e) Cast iron shall not be used for any part subject to tension, torsion, or bending.

(f) The car frame members shall be securely welded, bolted and/or riveted and braced.

History: Cr. Register, August, 1974, No. 224, eff. 9-1-74.

Ind 44.16 Cable (wire rope) terminal fastenings. (1) The car and counterweight cable fastenings shall comply with one of the following methods:

(a) Shackle rods, or, approved clamps.

1. Where cable sockets and shackle rods are used not more than one cable shall be fastened in the same shackle.

2. Cable sockets and shackle rods shall be of forged steel and shall

have a strength of at least equal to the manufacturer's strength of the cable.

3. The threaded length of each shackle rod shall be provided with lock nuts and cotter pinned.

(b) Where approved clamps are used they shall be provided with metal thimbles and shall conform with the following:

1. Clamps shall not be of the U-bolt type.
2. Both members of the clamps shall be provided with seats conforming to the lay of the cable.
3. Clamps shall be drop forgings.
4. The cables to be clamped shall be passed around metal thimbles having not less than the following dimensions and fastened by at least the number of clamps specified, with not less than the spacing indicated in this subsection.

Diameter Wire Rope Inch	Inside Width of Thimble Inches	Length of Thimble Inches	Minimum No. of Clamps	Minimum Spacing of Clamps Inches
$\frac{1}{2}$	$1\frac{1}{2}$	$2\frac{3}{4}$	3	3
$\frac{5}{8}$	$1\frac{3}{4}$	$3\frac{1}{4}$	3	$3\frac{3}{4}$
$\frac{3}{4}$	2	$3\frac{3}{4}$	4	$4\frac{1}{2}$

History: Cr. Register, August, 1974, No. 224, eff. 9-1-74.

Ind 44.18 Cable guards for sheaves and idlers. Every sheave or idler under which is led any hoisting or governor cable shall be provided with a guard that will keep the cables on the sheave or idler if the cables become slack.

History: Cr. Register, August, 1974, No. 224, eff. 9-1-74.

Ind 44.19 Hoist cable data. There shall be posted for permanent record in a conspicuous place on the car beam a metal sign bearing the following original data:

CABLE SPECIFICATIONS

Kind of cable -----
 Number of cables -----
 Diameter in inches -----
 Rated ultimate strength -----
 Date of installation -----

History: Cr. Register, August, 1974, No. 224, eff. 9-1-74.

Ind 44.22 Guide rails. (1) Every hoist shall have T-section steel guide rails and shall be not less than 15 pounds for the car and not less than 8 pounds for the counterweight.

Exception: Guides other than T-sections or guides of sizes different from that outlined in Wis. Adm. Code section Ind 44.22 (1) may be used, providing that the tensile strength is not less than the requirement outlined in Wis. Adm. Code section Ind 44.22 (1) (a).

(*Note:* See Wis. Adm. Code section Ind 44.22 (1) (b).)

(a) Guide rails, brackets, clips, fish plates and their fastenings shall be made of open hearth steel or its equivalent having a tensile strength of not less than 55,000 pounds per square inch and having an elongation of not less than 22% in a length of 2 inches, and shall conform with the requirements outlined in this subsection.

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1. The ends of the guide rails shall be accurately machined with tongue and matching groove or doweled.

2. The ends of each rail shall be joined together with fish plates and not less than 4 bolts which shall be not less than $\frac{1}{2}$ inch for 8 pound guide rails and not less than $\frac{3}{8}$ inch for 15 pound guide rails.

3. The width of the fish plate shall be not less than the width of the back of the rail and shall be not less than $\frac{1}{8}$ inch in thickness for 8 pound guide rails and not less than $\frac{1}{4}$ inch in thickness for 15 pound guide rails.

4. The top and bottom of each guide rail shall be so located in relation to the extreme position of the travel of the car and counterweight that the car and counterweight guiding members cannot travel beyond the ends of the guide rails.

5. The guide rails shall not be used to support the overhead machinery.

6. The guide rail bracket spacings for car and counterweight shall not exceed 14 feet and the total rail deflection shall not exceed $\frac{1}{4}$ inch.

7. Foundation plates or other structural shapes shall be mounted under and fastened to the bottom end of the car guide rails.

8. Guide rails shall be secured to the tower by clips or by bolts.

(b) Steel tubing used in lieu of T-section guide rails shall be equal in design and construction to conform with the following:

1. Shall be not less than 3 inches O.D. Seamless Tubing 100,000 psi Tensile; 90,000 psi Minimum Yield.

2. The car safety device shall be equipped with a supporting member to prevent the collapse of the tubing upon setting of the car safety device with contract load at governor tripping speed.

3. A form shall be submitted covering a certified test used in the tower construction.

History: Cr. Register, August, 1974, No. 224, eff. 9-1-74.

Ind 44.23 Minimum size of sheaves. The diameter of sheaves for traction machines shall be not less than 40 times the diameter of cable.

History: Cr. Register, August, 1974, No. 224, eff. 9-1-74.

Ind 44.24 Machinery, general requirements. (1) The factor of safety to be used in the design of driving machines and in design of sheaves and drums used in hoisting shall be not less than the requirements as outlined in this subsection.

(a) Eight (8) for steel, bronze, or for other metals having an elongation of at least 14% in a length of 2 inches.

(b) Ten (10) for cast iron, or for other metals having an elongation of less than 14% in a length of 2 inches.

(c) Set screws or threaded portions of bolts or screws shall not be used to transmit torque.

(d) The fillet shall be provided at any point of change in the diameter of driving machine shafts and sheave shafts to prevent excessive stress concentrations in the shafts. Shafts which support sheaves, couplings and other members and which transmit torque shall be provided with tight-fitting keys.

(2) Gear housings for machines shall have openings so located as to permit proper inspection of gears and gear spider fastenings.

(3) The motor drive on traction machines shall be directly con-

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nected to the gearing provided and mounted on a continuous steel or cast iron bed plate.

History: Cr. Register, August, 1974, No. 224, eff. 9-1-74.

Ind 44.25 Prohibited installations. (1) Automatic operation.

(2) Cast iron worm gears shall not be used in any hoisting equipment.

(3) Emergency hoistway landing door or gate and/or car gate by-pass switches.

History: Cr. Register, August, 1974, No. 224, eff. 9-1-74.

Ind 44.32 Electrical protection. (1) Every electrically driven personnel hoist shall be provided with a potential switch which will cause and maintain interruption of power to the main circuit during failure of supply voltage, and the operation of any emergency stopping switches.

(2) A reverse phase relay shall be provided which will prevent starting the motor if the phase rotation is in the wrong direction.

(a) *Exception.* Alternating-current motors used in motor generator sets.

(3) Directional and final limit switches shall be provided to stop the car at each terminal of travel.

(4) A slack cable switch shall be provided on the hoist cables of every drum-type driving machine which shall automatically shut off the power to the driving machine motor in the event the cables break or become slack. This switch shall not reset automatically when the slack in the cable is removed.

History: Cr. Register, August, 1974, No. 224, eff. 9-1-74.

Ind 44.34 Lighting. (1) Cars shall be provided with illumination of an intensity of not less than 5 foot-candles at the edge of the car platform.

(a) A warning or signal light shall be provided on the top and bottom of every car.

History: Cr. Register, August, 1974, No. 224, eff. 9-1-74.

Ind 44.35 Operation. (1) Hoist shall be operated by authorized personnel.

(2) Material shall not be carried on the car when transporting

History: Cr. Register, August, 1974, No. 224, eff. 9-1-74.

Ind 44.36 Maintenance. (1) Hoists shall be kept in safe operating condition.

(2) Material which is not a permanent part of the hoist shall not be permitted on top of the hoist cover.

(3) Machines located at the lower level shall be protected from falling objects; and shall be enclosed on all open sides to the height of not less than 42 inches.

History: Cr. Register, August, 1974, No. 224, eff. 9-1-74.

Note: Chapter Ind 44 is a supplement to the Wisconsin Safety and Health Code, Ind 1000.