

**Subchapter 7. General Industry Safety Orders**  
**Group 13. Cranes and Other Hoisting Equipment**  
**Article 99. Testing**

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## §5020. Operational Testing:

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(a) In addition to prototype tests by the manufacturer, and prior to initial use, each new crane or derrick, or any crane or derrick which is structurally altered due to repair, shall be inspected and tested by the certified agent to insure compliance with the provisions of these orders, including the following functions where applicable:

- (1) Hoisting and lowering boom and load
- (2) Swing mechanism
- (3) Travel mechanisms, trolley, bridge, carrier
- (4) Limit switches, locking, and other safety devices

(b) Visual examination shall be made of welds and other attachments of the critically stressed members.

(c) Where the complete production crane is not supplied by one manufacturer, such tests shall be conducted at final assembly.

NOTE: Authority cited: Section 142.3, Labor Code. Reference: Section 142.3, Labor Code.

### HISTORY

- 1. Amendment of subsection (a) and new subsections (b) and (c) filed 2-13-75; effective thirtieth day thereafter (Register 75, No. 7).
- 2. New NOTE filed 8-29-86; effective thirtieth day thereafter (Register 86, No. 39).

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## **§5021. Equipment over Three Tons Rated Capacity:**

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(a) All cranes and derricks used in lifting service, exceeding three tons rated capacity, and their accessory gear shall not be used until the employer has ascertained that such equipment has been certificated as evidenced by current and valid documents attesting to compliance with the following:

(1) Tests and examinations shall be conducted annually by a currently licensed certificating agency or designee listed in the certificating agency license, and a certificate shall be issued by the certificating agency;

(2) Certificates (annual and quadrennial) attesting to current compliance with testing and examination standards of requirements shall be maintained for each crane or derrick and shall be in a form acceptable to the Division. (See Section 4885, Plate V.)

NOTE: The term "lifting service" as used in this Section is not intended to include operations of the following equipment:(1) Clamshells, draglines and other similar equipment used for casting-type work;(2) Pile drivers, other than those using gravity (drop) hammers.

NOTE: Authority cited: Section 142.3, Labor Code. Reference: Section 142.3, Labor Code.

### **HISTORY**

1. Amendment of subsection (a) filed 2-13-75; effective thirtieth day thereafter (Register 75, No. 7).

2. Repealer and new subsection (c) filed 1-2-76; effective thirtieth day thereafter (Register 76, No. 1).

3. Amendment of subsection (b) filed 10-4-78 as procedural and organizational; effective upon filing (Register 78, No. 40).

4. Amendment of subsection (c) filed 7-6-79; effective thirtieth day thereafter (Register 79, No. 27).

5. Amendment of subsection (b) filed 12-12-84; effective thirtieth day thereafter (Register 84, No. 50).

6. Amendment filed 8-29-86; effective thirtieth day thereafter (Register 86, No. 39).

7. Amendment of subsections (a)-(a)(1) filed 12-6-95; operative 1-5-96 (Register 95, No. 49).

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## **§5022. Proof Load Test and Examination of Cranes and Their Accessory Gear:**

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(a) Proof load tests of cranes shall be carried out at the following intervals:

(1) In the case of new cranes, before being taken into initial use and every 4 years thereafter.

(2) In the case of uncertificated cranes which have been in use, at the time of initial certification and every 4 years thereafter.

(3) In the case of major modifications or repairs to important structural components, before they are returned to service.

(4) 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 proof load test, shall be performed before the equipment re-enters service.

Note: 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.

(b) Proof load tests of cranes shall be carried out with the boom in the least stable direction relative to the mounting.

(c) Proof load tests shall be based on the manufacturer's load ratings for the conditions of use and shall consist of the application of a proof load as close as possible, but not exceeding 110 percent of the load ratings for the boom on the crane. Proof loads shall be applied at the designed maximum and minimum boom angles or radii or as close to these as practicable and at such intermediate radii as the certifying agency may deem necessary. Trolley equipped monorail cranes and overhead cranes shall be tested to a proof load as close as possible, but not exceeding 125 percent of the manufacturer's load rating. Monorail cranes and overhead cranes shall be tested by traversing the proof load weight the full length of the track, bridge/runway(s) and cross-overs, in all directions capable of operation, where practicable. In cases of foreign manufacture, the manufacturer's specifications shall be subject to approval by the certified agent as being equivalent to U.S. practice. The weight of all auxiliary handling devices such as, but not limited to, magnets, hooks, slings, and clamshell buckets shall be considered part of the load, except lifting devices which are designed as an integral

part of the crane. Other methods of proof load testing may be substituted for the above where acceptable to the Division.

Note: The manufacturer's load ratings are usually based upon percentage of tipping loads under some conditions and upon limitations of structural competence under others, as well as on other criteria such as type of crane mounting, whether or not outriggers are used, etc. Some cranes utilizing a trolley may have only one load rating assigned and applicable at any outreach. It is important that the manufacturer's ratings be used.

(d) An examination shall be carried out in conjunction with each proof load test. The certificating agency shall make a determination as to requirements for the correction of deficiencies found. The examination shall cover the following points as applicable:

(1) All functional operating mechanisms for improper function, maladjustment, and excessive component wear, with particular attention to sheaves, pins, and drums. This shall include operation with partial load, in which all functions and movements, including, where applicable, maximum possible rotation in both directions, are performed.

(2) All safety devices for malfunction.

(3) Deterioration or leakage in lines, tanks, valves, drains, pumps, and other parts of air or hydraulic systems.

(4) Loose gear components (i.e. hooks, etc.), including wire rope and wire rope terminals and connections, with particular attention to sections of wire rope exposed to abnormal wear and sections not normally exposed for examination. Cracked or deformed hooks shall be discarded.

(5) Rope reeving for compliance with certified agent's recommendations.

(6) Deformed, cracked, or excessively corroded members in crane structure and boom.

(7) Loose bolts, rivets, or other connections.

(8) Worn, cracked, or distorted parts affecting safe operation.

(9) Excessive wear on and free operation of brake and clutch system parts, linings, pawls, and ratchets.

(10) Load, boom angle, or other indicators shall be checked for any inaccuracy.

(11) It shall be ascertained that there is a durable rating chart visible to the operator, covering the complete range of the certified agent's capacity ratings at all operating radii, for all permissible boom lengths and jib length, with alternate ratings for optional equipment affecting such ratings. Necessary precautions or warnings shall be included and operating controls marked or an explanation of controls shall be posted at the operator's position to indicate function.

(12) Careful examination of the junction areas of removable boom sections, particularly for proper seating, cracks, deformities, or other defects in securing bolts and in the vicinity of such bolts.

(13) It shall be ascertained that no counterweights in excess of the certified agent's specifications are fitted.

(14) Such other examinations deemed necessary under the circumstances.

#### NOTE

Authority and reference cited: Section 142.3, Labor Code.

#### HISTORY

1. Amendment of subsections (b), (c) and (d)(5) filed 2-13-75; effective thirtieth day thereafter (Register 75, No. 7).

2. Amendment of subsection (c) filed 4-27-79; effective thirtieth day thereafter (Register 79, No. 17).

3. Amendment of subsection (d) filed 7-6-79; effective thirtieth day thereafter (Register 79, No. 27).

4. Repealer of subsection (d)(12) and renumbering of subsections (d)(13) and (d)(14) filed 1-17-80; effective thirtieth day thereafter (Register 80, No. 3).

5. New subsection (a)(4) filed 12-12-84; effective thirtieth day thereafter (Register 84, No. 50).

6. Amendment filed 8-29-86; effective thirtieth day thereafter (Register 86, No. 39).

7. Editorial correction of printing error in subsection (c) NOTE (Register 94, No. 18).

8. Editorial correction of History 7 (Register 97, No. 23).

9. Amendment of subsection (c) filed 8-25-2003; operative 9-24-2003 (Register 2003, No. 35)



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### **§5022.1. Test Weights:**

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Scope. This Section applies to test weights manufactured for the purpose of proof load testing of cranes and derricks.

- (a) Test weights shall be legibly marked to indicate the documented weight.
- (b) Lifting attachments on test weights shall be visually inspected prior to each use. Damaged or defective lifting attachments that are not suitable for safe use shall not be used.
- (c) Embedded wire rope and reinforcing steel (rebar) shall not be used as lifting attachments.

Note: Authority cited: Section 142.3, Labor Code. Reference: Section 142.3, Labor Code.

### **HISTORY**

1. New section filed 8-2-2005; operative 9-1-2005 (Register 2005, No. 31).

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## §5023. Proof Load Test and Examination of Derricks and Their Accessory Gear:

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(a) Proof load tests of derricks shall be carried out at the same intervals as specified in Section 5022(a) for cranes.

(b) Proof load tests and safe working load ratings shall be based on the designed load ratings at the ranges of boom angle or operating radii. Proof loads shall exceed the safe working load (SWL) as follows:

SWL	Proof Load
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Up to 20 tons.....	25 percent in excess
20-50 tons.....	5 tons in excess
Over 50 tons.....	10 percent in excess

Proof loads shall be applied at the designed maximum and minimum boom angles or radii or, if this is impracticable, as close to these as practicable. The angles or radii of test shall be in the certificate of test. Proof loads shall be swung as far as possible in both directions. The weight of all auxiliary handling devices such as blocks, hooks, etc., shall be considered a part of the load.

(c) After satisfactory completion of a proof load test, the derrick and all component parts thereof shall be carefully examined in all applicable respects to the requirements of Section 5022(d).

NOTE: Authority cited: Section 142.3, Labor Code. Reference: Section 142.3, Labor Code.

### HISTORY

1. Amendment filed 8-29-86; effective thirtieth day thereafter (Register 86, No. 39).

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## **§5024. Examination of Bulk Cargo Handling Devices:**

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All bulk cargo handling devices, together with any portable extension, rigging components, outriggers, and attachment points, supporting them or any of their components vertically, need not be tested but shall be examined by a certificating agency when first certificated and annually thereafter. The examination shall be carried out with particular attention to the condition of rope and accessories. The equipment shall not be considered satisfactory unless, in the opinion of the certificating agency as stated in Section 5021, it is deemed fit to serve its intended function.

NOTE: Authority cited: Section 142.3, Labor Code. Reference: Section 142.3, Labor Code.

### **HISTORY**

1. Amendment filed 8-29-86; effective thirtieth day thereafter (Register 86, No. 39).

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## **§5025. Certificates:**

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If the equipment meets the requirements set forth in Sections 5021, 5022, 5023 and 5024, a certificate shall be issued indicating that the required tests and/or examinations have been performed and that any defects found by such examination and tests have been corrected and that the equipment is in safe operating condition at the time of examination. A copy of such certificate shall be available with each crane and derrick or at the project site.

NOTE: Authority cited: Section 142.3, Labor Code. Reference: Section 142.3, Labor Code.

### **HISTORY**

1. Amendment filed 7-6-79; effective thirtieth day thereafter (Register 79, No. 27).
2. Amendment filed 8-29-86; effective thirtieth day thereafter (Register 86, No. 39).

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**§5026. Determination of Crane or Derrick Safe Working Loads and Limitations in Absence of Manufacturer's Data:**

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(a) In the event neither manufacturer's data nor design data on safe working loads (including any applicable limitations) are obtainable, the safe working load ratings assigned shall be based on the certified agent's analysis. Test certificates shall state the basis for any such safe working load assignment. For mobile cranes, stability shall also be determined by the certified agent in accordance with SAE J 765, October 1980.

(b) Analysis test reports shall be readily available.

NOTE: Authority cited: Section 142.3, Labor Code. Reference: Section 142.3, Labor Code.

**HISTORY**

1. Amendment of subsection (a) and new subsection (b) filed 2-13-75; effective thirtieth day thereafter (Register 75, No. 7).
2. Amendment filed 8-29-86; effective thirtieth day thereafter (Register 86, No. 39).

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### **§5027. Safe Working Load Reduction:**

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If the operation in which equipment is engaged never utilizes more than a fraction of the safe working load rating, the owner of such equipment may have the crane or derrick certificated for and operated at a lesser maximum safe working load in keeping with the use and based on radius and other pertinent factors; provided, however, that the equipment concerned is physically capable of operation at the load rating and load reduction is not for the purpose of avoiding correction of any deficiency. Load rating charts shall be changed accordingly.

NOTE: Authority cited: Section 142.3, Labor Code. Reference: Section 142.3, Labor Code.

#### **HISTORY**

1. Amendment filed 2-13-75; effective thirtieth day thereafter (Register 75, No. 7).
2. Amendment filed 8-29-86; effective thirtieth day thereafter (Register 86, No. 39).

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## **§5028. Safe Working Load Increase:**

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In no case shall safe working loads be increased beyond the manufacturer's ratings or the original design limitations unless such increase meets with the manufacturer's approval. Where the manufacturer's services are not available, or where the equipment is of foreign manufacture, engineering design analysis by, or acceptable to, the certified agent is required. All necessary structural changes shall be carried out.

NOTE: Authority and reference cited: Section 142.3, Labor Code.

### **HISTORY**

1. Amendment filed 4-27-79; effective thirtieth day thereafter (Register 79, No. 17).