

Subchapter 7. General Industry Safety Orders

Group 13. Cranes and Other Hoisting Equipment

Article 100. Inspection and Maintenance

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§5031. Inspection:

(a) A qualified person shall visually inspect the crane's or derrick's controls, rigging and operating mechanism prior to the first operation on any work shift. Any unsafe conditions disclosed by the inspection requirements of this Article shall be corrected promptly. Defective components of equipment which create an imminent safety hazard shall be replaced, repaired or adjusted prior to use.

(b) Frequency of Inspections. Daily visual inspections by the operator or other qualified person shall be made of/for:

(1) All functional mechanisms for maladjustment interfering with proper operation;

(2) The operation of all limit switches without a load on the hook;

(3) Lines, tanks, valves, pumps, and other parts of air or hydraulic systems for deterioration or leakage;

(4) Hooks for deformation and cracks;

(5) Hoist or load attachment chains including end connections for excessive wear, twist, distorted or stretched links interfering with proper function;

(6) Excessive wear, broken wires, stretch, kinking, or twisting of ropes and rope slings, including end connections.

(c) Periodic inspections shall be conducted at least four times a year. The annual certification, as required by Section 5021(a), can serve as one of the required periodic inspections. The periodic inspections shall be evenly spaced or as close to evenly spaced as scheduling permits through the year. Cranes shall not be operated more than 750 hours, between periodic inspections. The inspection shall include the following in addition to the items in subsection (b) above:

(1) Excessive wear of all functional operating mechanisms.

(2) Ropes, brakes, friction clutches, chain drives, and other parts subject to wear which may be readily inspected.

(3) Cranes handling molten metal shall be inspected at least weekly when in use and necessary repairs made.

(4) An inspection record shall be maintained which includes the date of the inspection, the signature of the person who performed the inspection, and the serial number or other identifier of the crane inspected. The most recent inspection record shall be maintained on file.

(d) In any year in which no quadrennial (every four years) proof load test is required on cranes or derricks, such equipment shall be examined by a qualified person as described in Section 5021. Such examination shall be made not later than the anniversary date of the quadrennial certification and shall conform with the requirements of Section 5022 (d) and the following:

(1) Crane hooks with cracks or with deformation of throat opening more than 15 percent in excess of normal opening or more than 10 degree twist from plane of unbent hook shall be removed from service.

(2) Ropes shall be inspected for proper lubrication, excessive wear, broken strands, and proper reeving. Note: Many variable factors are involved in determining the exact time for replacement of rope and timely replacement for safety. Conditions such as the following shall be sufficient reason for replacement:

1. In running ropes, 6 randomly distributed broken wires in one rope lay, or 3 broken wires in one strand in one lay.

2. Wear of $\frac{1}{3}$ the original diameter of outside individual wires.

3. Kinking, crushing, bird caging, or other damage resulting in distortion of the rope structure. Evidence of any heat damage.

4. Reductions from nominal diameter of more than:

$\frac{1}{64}$ inch for diameters up to $\frac{5}{16}$ inch

$\frac{1}{32}$ inch for diameters $\frac{3}{8}$ inch to $\frac{1}{2}$ inch

$\frac{3}{64}$ inch for diameters $\frac{9}{16}$ inch to $\frac{3}{4}$ inch

$\frac{1}{16}$ inch for diameters $\frac{7}{8}$ inch to $1\frac{1}{8}$ inch

$\frac{3}{32}$ inch for diameters $1\frac{1}{4}$ inch to $1\frac{1}{2}$ inch

5. In standing ropes, more than 2 broken wires in one lay in sections beyond end connections or more than one broken wire at an end connection.

6. Reduction of rope diameter below nominal diameter due to loss of core support, internal or external corrosion, or wear of outside wires.

(3) In order to establish data for judging the proper time for replacement of hoisting rope, a continuing inspection record shall be maintained. The record shall cover factors of deterioration as listed in subsections (b), (c) and (d).

(4) Whenever it is considered necessary by the certificating agency or authorized representative and whenever it is practical and advisable to avoid disassembly of equipment, removal of pins, etc., examination of structure or parts by electronic, ultrasonic, or other nondestructive methods shall be carried out.

(e) All rope which has been idle for a period of a month or more due to shutdown or storage of a crane on which it is installed shall be given a thorough inspection before it is placed in service. This inspection shall be for all types of deterioration and shall be performed by a qualified person whose approval shall be required for further use of the rope. A certification record shall be made available for inspection which includes the date of inspection, the signature of the person who performed the inspection, and an identifier of the rope which was inspected.

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 12-12-84; effective thirtieth day thereafter (Register 84, No. 50).
3. Amendment filed 8-29-86; effective thirtieth day thereafter (Register 86, No. 39).
4. Amendment of subsections (c) and (e) filed 3-5-90; operative 4-4-90 (Register 90, No. 12).
5. Amendment of subsection (c) filed 10-16-95; operative 11-15-95 (Register 95, No. 42).
6. Amendment of subsection (c)(3) filed 11-29-2001; operative 12-29-2001 (Register 2001, No. 48).
7. Change without regulatory effect amending subsection (c) and adding subsection (c)(4) designator filed 12-21-2006 pursuant to section 100, title 1, California Code of Regulations (Register 2006, No. 51).

§5032. Molten Metal Cranes: (Repealed)

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

HISTORY

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

§5033. Maintenance:

A preventive maintenance program, based on the certified agent's recommendations, shall be established and dated. Detailed records shall be available to the Division.

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).

§5034. Adjustments and Repairs:

- (a) Adjustments and repairs shall be done by qualified persons.
- (b) Before adjustments and repairs are started on a crane or derrick, the following precautions shall be taken as applicable:
 - (1) Cranes shall be placed where they will cause the least interference to and be least interfered with by other equipment or operations in the area.
 - (2) Boom and load block shall be lowered to the ground or floor, if possible, or otherwise secured against dropping.
 - (3) All power controls shall be locked or otherwise secured in the stop position and starting means rendered inoperative.
 - (4) Warnings and barriers shall be placed to warn others from danger area and protect the crane under repair from being struck by other machines or equipment.
- (c) After all repairs and adjustments have been made, the crane shall not be operated until all guards have been reinstalled, safety devices reactivated, and maintenance equipment removed, including all loose material.
- (d) Adjustments shall be maintained to assure correct functioning of the following components:
 - (1) All functional operating mechanisms.
 - (2) Safety devices.
 - (3) Control systems.
 - (4) Power plants.
 - (5) Brakes.
- (e) When welding repair procedures are required on load sustaining members, instructions shall be provided by the certified agent and those instructions shall be followed where applicable. Welds on all critical crane or derrick parts shall be performed only by qualified welders who are certified to perform high quality welding.

(f) All repair welds performed on critically stressed members, such as boom chord, mast chord, and main deck girders (where permitted by a certified agent), shall be magnetic particle tested or tested by ultrasonic or other suitable nondestructive means as well as visually inspected. All indicated repairs shall be made promptly and records of the most recent test shall be kept until a new test is conducted or until the part is permanently removed from service.

NOTE

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

HISTORY

1. Amendment of subsections (c) and (d) filed 3-7-80; effective thirtieth day thereafter (Register 80, No. 10).
2. Amendment filed 8-29-86; effective thirtieth day thereafter (Register 86, No. 39).
3. Amendment of subsection (f) filed 6-3-2002; operative 7-3-2002 (Register 2002, No. 23).

§5035. Damaged Booms:

(a) Prior to further use, boom sections or boom suspension components that have been damaged shall be repaired, restoring them to not less than the capacity of the original section or components.

(b) Repairs to critically stressed members of a boom or boom extension, such as a boom chord, mast chord, or boom sections, shall be performed in accordance with the manufacturers' or certified agent's recommendations.

(c) New or replacement booms or boom extensions shall be tested before use in accordance with Section 5022.

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).
2. Repealer and new subsection (b) and new subsection (c) filed 10-20-2003; operative 11-19-2003 (Register 2003, No. 43).