



**SECTION 11**

**CRANES AND DERRICKS**



1. **CRANES AND DERRICKS:** These rules apply to all Maul Electric, Inc employees and subcontractors. Additional specific information can be obtained from the referenced OSHA Standard.
  - A. **OSHA Reference:** 29 CFR 1926.1400
  - B. **Cranes And Derricks:**
    1. Only qualified and designated individuals may operate cranes, lifting equipment, and derricks. Operators must meet the physical qualifications, pass a physical, a written examination, understand and be able to use a load chart as well as calculate loads for the crane type. Part of the qualification to include medical certification per the API 2D physical requirements. Operators should be properly trained in the use of fire extinguishers. Whenever there is a safety concern, the operator has the authority to stop and refuse to handle loads until a qualified person has determined that safety has been assured
      - a) Vision of at least 20/30 Snellen in one eye and 20/50 in the other eye with or without glasses, and have depth perception.
      - b) Be able to determine between red, yellow and green.
      - c) Hearing, with or without a hearing aid, adequate for the specific operation.
      - d) And no history of disabling medical condition which may be sufficient reason for disqualification.
- Note: Follow-up evaluations to be performed at least every four years.**
2. All windows, windshields, mirrors, and other devices provided for visibility will be clean, free from cracks, and unobstructed.
3. All cranes shall be equipped with at least 1 ABC rated fire extinguisher or in the immediate vicinity of the crane.
4. The manufacturer's name and specifications applicable to the operation of the specific equipment will be attached to the equipment.
5. Rated load capacities, the most recent load test and recommended rules for safe operation will be conspicuously posted on all equipment at the operator's station. The Maul Electric, Inc shall keep written record of all load tests.



6. A competent person shall inspect all machinery and equipment prior to each use and during use to ensure that it is in safe operating condition. Ropes shall also be inspected. An initial inspection, monthly, and prior to each use inspections are required to be completed and documented. The inspection shall be documented and include date of the inspection, ID of the rope being inspected, and signature of person performing the inspection. The inspections are to be turned into the Site Supervisor or designated Site Safety Representative no later than 12 hours after the inspection period.
7. All crawler, truck, or locomotive cranes shall meet the requirements of ANSI Standard B30.5-1968, Safety Code for Crawler, Locomotive, and Truck Cranes.
8. Passengers will not be transported on cranes.
9. Cranes and Derricks will not operate booms, loads, or rigging within 10 feet of overhead electrical lines rated at 50kV or below, 0.4 inches will be added to 10 feet for each 1kV over 50kV. The work zone shall be identified by demarcating boundaries such as flag and range limiting devices, or defining the work zone as 360 degrees around the equipment up to the maximum working radius. The hazard assessment must determine if any part of the equipment could get closer than 20 feet to a power line.
  - a. If it is determined that any part of the equipment, load line or load could get closer than 20 feet to a power line then at least one of the following measures must be taken:
    - 1) Ensure the power lines have been deenergized and visibly grounded.
    - 2) Ensure no part of the equipment, load line or load gets closer than 20 feet to the power line
    - 3) Determine the line's voltage and minimum approach distance permitted in Table A



KV RATING	MINIMUM DISTANCE
<b>Set Crane</b>	
50 Kv or Below	Ten feet (10')
Over 50 Kv	Ten feet (10') plus 0.4 inches (.04") for each additional Kv
<b>Moving Crane w/Boom Lowered and No Load</b>	
50 Kv or Below	Four feet (4')
Between 50 Kv and 345 Kv	Ten feet (10')
Between 345 Kv and 750 Kv	Sixteen feet (16')

10. A competent person must be assigned to observe and take prompt action in situations where the operator does not have clear visibility.
11. Accessible areas within the swing radius of the rear of rotating superstructure will be properly barricaded to prevent employees from being struck or crushed by the crane.
12. The operator and the qualified signal person providing hand signals to the crane or derrick operator must know and use the proper hand signals for the equipment. The signals must be posted at the site.
13. Tag lines should be used on all loads that may spin or swing.
14. Do not pull the crane load-block to one side to attach the load. It must be positioned over the load in accordance with safe rigging procedures.
15. Crane outriggers must be in place at all times, except when traveling. Outriggers may need to be extended, however, when traveling with a load.
16. Cranes must be operated on firm, level ground. Mats, plating, etc. acceptable for the weight of the equipment and the lift, must be used when the ground is soft or recently excavated or when the load is near lift capacity.
17. Maul Electric, Inc or its Subcontractor shall comply with the manufacturer's specifications and limitations applicable to the operation of any and all cranes and derricks. 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. Attachments used with



cranes shall not exceed the capacity, rating, or scope recommended by the manufacturer.

18. Rated load capacities, and recommended operating speeds, special hazard warnings, or instruction, shall be conspicuously posted on all equipment. Instructions or warnings shall be visible to the operator while he is at his control station.
19. Modifications or additions which affect the safe operation of the equipment may only be made with the manufacturer's written approval.
20. All hooks and chains shall be inspected monthly; records of inspections shall be kept on files by Maul Electric, Inc

### **C. Lifts and Hoists:**

1. The employees shall comply with the manufacturer's specifications and limitations.
2. Rated load capacities, recommended operating speeds, and special hazard warnings or instructions will be posted on cars and platforms.
3. Hoist way entrances of material hoists shall be protected by substantial full width gates or bars.
4. Hoist way doors or gates of personnel hoists shall not be less than 6 feet 6 inches high and protected with mechanical locks, which cannot be operated from the landing side and are accessible only to persons on the car.
5. Overhead protective coverings shall be provided on the top of the hoist cage or platform.
6. All material hoists shall conform to the requirements of ANSI A 10.5-1969 (Safety Requirements for Material Hoists)
7. The supporting structure, to which a hoist is attached, must have a safe working load equal to or greater than that of the hoist.
8. Loose tools or materials will not "ride" on the load.
9. Do not ride the load.
10. Do not walk under or position yourself (or anyone else) under a load.



11. Tag lines should be used on all loads that may spin or swing.
12. A qualified rigger **MUST** be utilized in employees must enter the fall zone for any reason.
13. A qualified signal person must be provided for the following situations:
  - a. The point of operation is not in full view of the operator
  - b. The view is obstructed when the equipment is traveling
  - c. The operator or the person handling the load determines it is necessary due to site specific concerns

**D. Wire Ropes:** Wire ropes must be taken out of service when one of The following conditions occur.

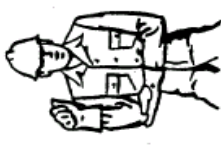
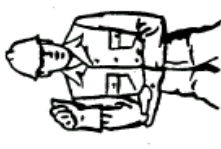

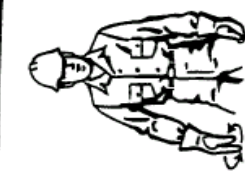
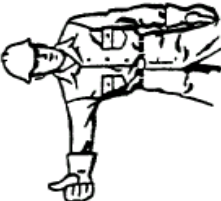
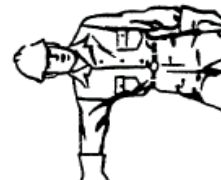

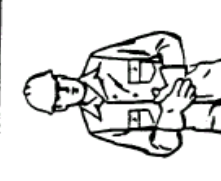






1. Running ropes are found to have 6 randomly distributed broken wires in one lay, or 3 broken wires in one stand or one lay.
2. Wear has reduced the diameter or outside individual wires to 2/3 of its original diameter.
3. Kinking, crushing, bird caging, heat damage, or any other damage resulting in distortion of the rope structure has been found.
4. In standing ropes, more than two broken wires in one lay in sections beyond end connections, or more than one broken wire at end connections.

**E. Slings:** Each sling shall be inspected before every use. Safe work practices shall be used with all slings.

1. Slings, fastenings, and all attachments shall be inspected by a qualified competed person who is designated by Maul Electric, Inc
2. Whenever any sling is used specific safety practices shall be observed.
3. Proper care and use of all slings (alloy steel chain slings, wire rope slings, metal mesh slings, natural and synthetic fiber rope slings, and synthetic when slings) when utilized must be conducted in accordance with manufacturer's instructions.



- F.** Whenever internal combustion engine powered equipment exhausts in enclosed spaces, tests shall be made and recorded to see that employees are not exposed to unsafe concentrations of toxic gases or oxygen deficient atmospheres.
  
- G.** A Preventative Maintenance plan shall be set up for all lifting, hoisting equipment, and cranes. The preventative maintenance plan shall be set up as per manufacturer specifications. An out of order sign shall be posted when maintenance and repairs are conducted.

<p><b>CRANE SIGNALS</b></p> <p>Extracted from the American National Standard B30.5-1968, <i>Cranes, Locomotives and Truck Cranes</i>, with the permission of the publisher and copyright holder, The American Society of Mechanical Engineers, United Engineering Center, 345 East 47th St., New York 10017.</p>	
 <p><b>USE WHISPLINE</b>          (Auxiliary Hoist)</p> <p>Tap elbow with one hand, then use regular signals.</p>	 <p><b>MOVE SLOWLY</b></p> <p>Use one hand to give any motion signal and place other hand motionless in front of hand giving the motion signal (Hoist slowly shown as example).</p>
 <p><b>HOIST</b></p> <p>With forearm vertical, forefinger pointing up, move hand in small horizontal circle.</p>	 <p><b>LOWER</b></p> <p>With arm extended downward, forefinger pointing down, move hand in small horizontal circle.</p>
 <p><b>RAISE BOOM</b></p> <p>Arm extended, fingers closed, thumb pointing upward.</p>	 <p><b>LOWER BOOM</b></p> <p>Arm extended, fingers closed, thumb pointing downward.</p>
 <p><b>TRAVEL</b>          (One Track)</p> <p>Lock the track on side indicated by raised fist. Travel indicated by circular motion of other fist, rotated in front of body. (For crawler cranes only.)</p>	 <p><b>TRAVEL</b>          (Both Tracks)</p> <p>Use both fists in front of body, making a circular motion about each other, indicating direction of travel; forward or backward. (For crawler cranes only.)</p>
 <p><b>RAISE THE BOOM &amp; LOWER THE LOAD</b></p> <p>With arm extended, thumb pointing up, flex fingers in and out as long as load movement is desired.</p>	 <p><b>LOWER THE BOOM &amp; RAISE THE LOAD</b></p> <p>With arm extended, thumb pointing down, flex fingers in and out as long as load movement is desired.</p>
 <p><b>RETRACT BOOM</b>          (Telescoping Booms)</p> <p>Both fists in front of body with thumbs pointing toward each other.</p>	 <p><b>EXTEND BOOM</b>          (Telescoping Booms)</p> <p>Both fists in front of body, with thumbs pointing outward.</p>
 <p><b>EMERGENCY STOP</b></p> <p>Arm extended, palm down, move hand rapidly right and left.</p>	 <p><b>STOP</b></p> <p>Arm extended, palm down, hold position rigidly.</p>