

WAC 296-155-53206 Additional inspection criteria and proof load testing—Tower cranes. (1) Tower cranes and tower crane assembly parts must be inspected by a crane certifier both prior to assembly, following erection of the tower crane, after each climbing operation, or reconfiguring the boom, jib, or counterjib before placing the crane in service.

(2) The accredited crane certifier must verify a registered professional structural engineer, licensed under chapter 18.43 RCW, has certified that the crane foundations/structural supports and underlying soil are adequate support for the tower crane with its maximum overturning moment.

(3) Prior to erecting a tower crane on a nonstandard tower crane base, the accredited crane certifier must verify that the engineering configuration of this base has been reviewed and acknowledged as acceptable by an independent registered professional structural engineer, licensed under chapter 18.43 RCW.

(4) The accredited crane certifier must review the following documents as part of the crane certification process for the current location and inspection period:

(a) Crane maintenance records of critical components to ensure maintenance of these components has been performed in accordance with the manufacturer's recommendations;

(b) Crane monthly and annual inspection documentation.

(5) After it is determined that the crane configurations meet the criteria in WAC 296-155-53200, the accredited crane certifier must visually inspect the following items, if applicable, on tower cranes for sound physical condition and that they are functional within the manufacturer's recommendations (not including removal of inspection covers):

(a) All control and drive mechanisms for interfering with proper operation and for excessive wear or contamination by lubricants or other foreign matter;

(b) Motion limiting devices for proper operation with the crane unloaded; each motion should be inched into its limiting device by carefully running at slow speed;

(c) Load limiting devices for proper operation and accuracy of settings;

(d) Air, hydraulic, and other pressurized lines for deterioration or leakage, particularly those which flex in normal operation;

(e) Hydraulic system for proper fluid level;

(f) Hydraulic, pneumatic and other pressurized hoses, fittings and tubing, as follows:

(i) Flexible hose or its junction with the fittings for indications of leaks.

(ii) Threaded or clamped joints for leaks.

(iii) Outer covering of the hose for blistering, abnormal deformation or other signs of failure/impending failure.

(iv) Outer surface of a hose, rigid tube, or fitting for indications of excessive abrasion or scrubbing;

(g) Hydraulic and pneumatic pumps and motors, as follows:

(i) Performance indicators: Unusual noises or vibration, low operating speed.

(ii) Loose bolts or fasteners.

(iii) Shaft seals and joints between pump sections for leaks;

(h) Hydraulic and pneumatic cylinders, as follows:

(i) Drifting.

- (ii) Rod seals and welded joints for leaks.
- (iii) Cylinder rods for scores, nicks and dents.
- (iv) Case (barrel) for significant dents;
- (i) Electrical components for malfunctioning, signs of apparent excessive deterioration, dirt or moisture accumulation, wiring for cracked or split insulation, and loose or corroded terminations;
- (j) Stationary cranes for manufacturer's recommended grounding of structure and power supply. Rail traveling cranes for grounding of each rail and the power supply per the manufacturer's recommendations;
- (k) Runway rail and clamps. Inspect for loose, broken or missing clamps;
- (l) Hooks and safety latches for deformation, cracks, excessive wear, or damage such as from chemicals or heat;
- (m) Wedges and supports of climbing cranes for looseness or dislocation;
- (n) Braces or guys supporting cranes' masts (towers) and anchor bolt base connections for looseness;
- (o) Crane structure (including the boom, jib and counter jib):
- (i) Structural members: Deformed, cracked, or significantly corroded.
- (ii) Bolts, rivets and other fasteners: Loose, failed or significantly corroded.
- (iii) Welds for cracks.
- (p) Cracked or worn sheaves and drums;
- (q) Worn, cracked, or distorted parts such as pins, bearings, shafts, gears, rollers, locking and clamping devices, sprockets, and drive chains or belts;
- (r) Excessive wear on brake and clutch system parts, linings, pawls, and ratchets;
- (s) Load, wind, and other indicators for inaccuracies outside the tolerances recommended by the manufacturer;
- (t) Travel mechanisms for malfunction, excessive wear or damage;
- (u) A legible and applicable operator's manual and load chart is in the operator's cab;
- (v) Crane cleanliness and housekeeping. Inspect for trash, oil, grease, debris or excessive dirt on crane components and catwalks, if applicable;
- (w) A portable fire extinguisher, with a basic minimum extinguishing rating of 10 BC must be installed in the cab or at the machinery housing;
- (x) When applicable, tower tie-in collars, struts, and connections to building structure are structurally sound, free of cracks, distortion, excessive wear or corrosion. Pins and structural bolts are tight and installed per the manufacturer's specification;
- (y) Ballast blocks in place and secured per manufacturer's recommendations;
- (z) For cranes that telescope, the raising mechanism operates within the manufacturer's specifications;
- (aa) For cranes that top climb, the climbing frame operates within the manufacturer's specifications;
- (bb) A means to prevent traveling tower cranes running into stops while under power;
- (cc) A functional audible warning alarm that automatically sounds whenever the traveling tower crane travels;
- (dd) Wire rope reeving for compliance with the manufacturer's specifications;
- (ee) Wire rope, in accordance with WAC 296-155-53200(5);

(ff) Safety devices and operational aids for proper operation (including significant inaccuracies);

(gg) Legible warning labels and decals as required by the manufacturer;

(hh) Steps, ladders, handrails and guards are in safe and usable condition.

(6) Additional requirements for tower cranes prior to performing a proof load test.

Note: General requirements relating to preproof load tests for all cranes are located in WAC 296-155-53200.

(a) When tower cranes are erected, and before placing in service, all functional motions, motion limiting, load limiting devices, locking and safety devices, brakes and clutches must be tested for operation and be within the manufacturer's specification prior to placing the crane in operation.

(b) Proof load tests require the use of certified weights, or scaled weights using a certified scale with a current certificate of calibration.

(c) Functional motion test must be at crane manufacturer's rated load. Each test must include:

(i) Load hoisting and lowering;

(ii) Jib (boom) hoisting and lowering, or trolley travel;

(iii) Slewing motion;

(iv) Travel motion when rail mounted;

(v) Brakes and clutches; and

(vi) Limit, locking, and safety devices.

Note: Functional motion tests made after climbing or telescoping may be performed without a load.

(d) The functional motion test listed in (c) of this subsection must continue until all controls, drives, and braking systems have been engaged and have functioned per the crane manufacturer's specifications.

(e) Order in which tests of tower cranes are to be performed is as follows:

(i) Functional motion test without rated load;

(ii) Functional motion test at crane manufacturer's rated load. For other than traveling cranes, these tests may be combined with test of base structural support or foundation system given in (c) of this subsection;

(iii) Test of base structural support or foundation under (f) of this subsection.

(f) During functional motion tests, the crane's base structural support or foundation system must be visually checked by the accredited crane certifier. If any part of the crane's base structural support or foundation system shows excessive visual displacement, visual distress, or audible distress, then the lifted load must be lowered at hoist creep speed and all crane operations are to cease. An evaluation must then be made by the accredited crane certifier.

(7) **Proof load testing of tower cranes.** Setting hoist load limits for tower cranes.

(a) **Annual proof load testing.** After the crane has passed the visual and operational tests, the accredited crane certifier must ensure a proof load test is conducted and must be performed according to the manufacturer's recommendations. This test must be documented on the form or in the format approved by the department. A copy of this completed form and inspection worksheets must be sent to the department within 10 working days upon completion of the examination.

(b) Tower crane hoist load limit switches must be set in accordance with the manufacturer's specifications using specified certified weights. Procedure is to be verified by the accredited crane certifier. In the absence of the manufacturer's specifications, hoist load limit switches must be verified by means of a static test using test loads of 102 1/2% to 110% of the applicable ratings. Test loads are to be lifted at creep speed until just clear of the ground.

(c) Setting of hoist load limits must be documented on the form provided by the department. A copy of the completed form and inspection worksheets must be sent to the department within 10 days upon completion of the examination.

(d) After erection of fixed freestanding tower cranes, the base structural support or foundation system on which the crane is supported must be tested before placing the crane in service. The test must be conducted with the crane manufacturer's rated load placed at maximum radius permitted by site conditions. When the base structural support or foundation is symmetrical, the crane's jib (boom) must be rotated through 90 degrees with 10 minute stops at the starting position and at each 45 degree position. When the support is asymmetrical, the crane's jib (boom) must be rotated through 360 degrees with 10 minute stops at the starting position and at each 45 degree position.

(e) After erection of rail traveling tower cranes, the base structural support or foundation system to which the rail is attached must be tested before placing the crane in service. The test must be conducted with the crane manufacturer's rated load placed at maximum radius permitted by site conditions. The jib (boom) must be located over the bogie. The crane must travel the entire length of runway, returning with the same load over the bogie on the opposite rail.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, 49.17.060. WSR 16-09-085, § 296-155-53206, filed 4/19/16, effective 5/20/16. Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, 49.17.440, 49.17.060, and 29 C.F.R. 1926, Subpart CC. WSR 12-01-086, § 296-155-53206, filed 12/20/11, effective 2/1/12. Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, 49.17.060, and chapter 49.17 RCW. WSR 10-14-100, § 296-155-53206, filed 7/6/10, effective 9/1/10. Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, 49.17.060, 49.17.400, 49.17.410, 49.17.420, 49.17.430, and 49.17.440. WSR 08-22-080, § 296-155-53206, filed 11/4/08, effective 1/1/10.]