

- **Part Number:** 1910
 - **Part Title:** Occupational Safety and Health Standards
 - **Subpart:** N
 - **Subpart Title:** Materials Handling and Storage
 - **Standard Number:** 1910.180
 - **Title:** Crawler locomotive and truck cranes
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1910.180(a)

"Definitions (b)(1) (c) to (d) (e) (f) (g) (h) (i) (j) (k) (l) (m) (n) (o) (p) (q) (r) (s) (t) (u) (v) (w) (x) (y) (z) (aa) (ab) (ac) (ad) (ae) (af) (ag) (ah) (ai) (aj) (ak) (al) (am) (an) (ao) (ap) (aq) (ar) (as) (at) (au) (av) (aw) (ax) (ay) (az) (ba) (bb) (bc) (bd) (be) (bf) (bg) (bh) (bi) (bj) (bk) (bl) (bm) (bn) (bo) (bp) (bq) (br) (bs) (bt) (bu) (bv) (bw) (bx) (by) (bz) (ca) (cb) (cc) (cd) (ce) (cf) (cg) (ch) (ci) (cj) (ck) (cl) (cm) (cn) (co) (cp) (cq) (cr) (cs) (ct) (cu) (cv) (cw) (cx) (cy) (cz) (da) (db) (dc) (dd) (de) (df) (dg) (dh) (di) (dj) (dk) (dl) (dm) (dn) (do) (dp) (dq) (dr) (ds) (dt) (du) (dv) (dw) (dx) (dy) (dz) (ea) (eb) (ec) (ed) (ee) (ef) (eg) (eh) (ei) (ej) (ek) (el) (em) (en) (eo) (ep) (eq) (er) (es) (et) (eu) (ev) (ew) (ex) (ey) (ez) (fa) (fb) (fc) (fd) (fe) (ff) (fg) (fh) (fi) (fj) (fk) (fl) (fm) (fn) (fo) (fp) (fq) (fr) (fs) (ft) (fu) (fv) (fw) (fx) (fy) (fz) (ga) (gb) (gc) (gd) (ge) (gf) (gg) (gh) (gi) (gj) (gk) (gl) (gm) (gn) (go) (gp) (gq) (gr) (gs) (gt) (gu) (gv) (gw) (gx) (gy) (gz) (ha) (hb) (hc) (hd) (he) (hf) (hg) (hh) (hi) (hj) (hk) (hl) (hm) (hn) (ho) (hp) (hq) (hr) (hs) (ht) (hu) (hv) (hw) (hx) (hy) (hz) (ia) (ib) (ic) (id) (ie) (if) (ig) (ih) (ii) (ij) (ik) (il) (im) (in) (io) (ip) (iq) (ir) (is) (it) (iu) (iv) (iw) (ix) (iy) (iz) (ja) (jb) (jc) (jd) (je) (jf) (jg) (jh) (ji) (jj) (jk) (jl) (jm) (jn) (jo) (jp) (jq) (jr) (js) (jt) (ju) (jv) (jw) (jx) (jy) (jz) (ka) (kb) (kc) (kd) (ke) (kf) (kg) (kh) (ki) (kj) (kk) (kl) (km) (kn) (ko) (kp) (kq) (kr) (ks) (kt) (ku) (kv) (kw) (kx) (ky) (kz) (la) (lb) (lc) (ld) (le) (lf) (lg) (lh) (li) (lj) (lk) (ll) (lm) (ln) (lo) (lp) (lq) (lr) (ls) (lt) (lu) (lv) (lw) (lx) (ly) (lz) (ma) (mb) (mc) (md) (me) (mf) (mg) (mh) (mi) (mj) (mk) (ml) (mm) (mn) (mo) (mp) (mq) (mr) (ms) (mt) (mu) (mv) (mw) (mx) (my) (mz) (na) (nb) (nc) (nd) (ne) (nf) (ng) (nh) (ni) (nj) (nk) (nl) (nm) (nn) (no) (np) (nq) (nr) (ns) (nt) (nu) (nv) (nw) (nx) (ny) (nz) (oa) (ob) (oc) (od) (oe) (of) (og) (oh) (oi) (oj) (ok) (ol) (om) (on) (oo) (op) (oq) (or) (os) (ot) (ou) (ov) (ow) (ox) (oy) (oz) (pa) (pb) (pc) (pd) (pe) (pf) (pg) (ph) (pi) (pj) (pk) (pl) (pm) (pn) (po) (pp) (pq) (pr) (ps) (pt) (pu) (pv) (pw) (px) (py) (pz) (qa) (qb) (qc) (qd) (qe) (qf) (qg) (qh) (qi) (qj) (qk) (ql) (qm) (qn) (qo) (qp) (qq) (qr) (qs) (qt) (qu) (qv) (qw) (qx) (qy) (qz) (ra) (rb) (rc) (rd) (re) (rf) (rg) (rh) (ri) (rj) (rk) (rl) (rm) (rn) (ro) (rp) (rq) (rr) (rs) (rt) (ru) (rv) (rw) (rx) (ry) (rz) (sa) (sb) (sc) (sd) (se) (sf) (sg) (sh) (si) (sj) (sk) (sl) (sm) (sn) (so) (sp) (sq) (sr) (ss) (st) (su) (sv) (sw) (sx) (sy) (sz) (ta) (tb) (tc) (td) (te) (tf) (tg) (th) (ti) (tj) (tk) (tl) (tm) (tn) (to) (tp) (tq) (tr) (ts) (tt) (tu) (tv) (tw) (tx) (ty) (tz) (ua) (ub) (uc) (ud) (ue) (uf) (ug) (uh) (ui) (uj) (uk) (ul) (um) (un) (uo) (up) (uq) (ur) (us) (ut) (uu) (uv) (uw) (ux) (uy) (uz) (va) (vb) (vc) (vd) (ve) (vf) (vg) (vh) (vi) (vj) (vk) (vl) (vm) (vn) (vo) (vp) (vq) (vr) (vs) (vt) (vu) (vv) (vw) (vx) (vy) (vz) (wa) (wb) (wc) (wd) (we) (wf) (wg) (wh) (wi) (wj) (wk) (wl) (wm) (wn) (wo) (wp) (wq) (wr) (ws) (wt) (wu) (wv) (ww) (wx) (wy) (wz) (xa) (xb) (xc) (xd) (xe) (xf) (xg) (xh) (xi) (xj) (xk) (xl) (xm) (xn) (xo) (xp) (xq) (xr) (xs) (xt) (xu) (xv) (xw) (xx) (xy) (xz) (ya) (yb) (yc) (yd) (ye) (yf) (yg) (yh) (yi) (yj) (yk) (yl) (ym) (yn) (yo) (yp) (yq) (yr) (ys) (yt) (yu) (yv) (yw) (yx) (yz) (za) (zb) (zc) (zd) (ze) (zf) (zg) (zh) (zi) (zj) (zk) (zl) (zm) (zn) (zo) (zp) (zq) (zr) (zs) (zt) (zu) (zv) (zw) (zx) (zy) (zz)

1910.180(a)(1)

A "crawler crane" consists of a rotating superstructure with power plant, operating machinery, and boom, mounted on a base, equipped with crawler treads for travel. Its function is to hoist and swing loads at various radii.

1910.180(a)(2)

A "locomotive crane" consists of a rotating superstructure with power-plant, operating machinery and boom, mounted on a base or car equipped for travel on railroad track. It may be self-propelled or propelled by an outside source. Its function is to hoist and swing loads at various radii.

1910.180(a)(3)

A "truck crane" consists of a rotating superstructure with powerplant, operating machinery and boom, mounted on an automotive truck equipped with a powerplant for travel. Its function is to hoist and swing loads at various radii.

..1910.180(a)(4)

1910.180(a)(4)

A "wheel mounted crane" (wagon crane) consists of a rotating superstructure with powerplant, operating machinery and boom, mounted on a base or platform equipped with axles and rubber-tired wheels for travel. The base is usually propelled by the engine in the superstructure, but it may be equipped with a separate engine controlled from the superstructure. Its function is to hoist and swing loads at various radii.

1910.180(a)(5)

An "accessory" is a secondary part or assembly of parts which contributes to the overall function and usefulness of a machine.

1910.180(a)(6)

"Appointed" means assigned specific responsibilities by the employer or the employer's representative.

1910.180(a)(7)

"ANSI" means the American National Standards Institute.

1910.180(a)(8)

An "angle" is the angle between the boom and the horizontal. The angle is measured from the horizontal to the boom.

1910.180(a)(9)

The "axle" is the vertical axis around which the crane superstructure rotates.

1910.180(a)(10)

"Axle" means the shaft or spindle with which or about which a wheel rotates. On truck- and wheel-mounted cranes it refers to an automotive type of axle assembly including housings, gearing, differential, bearings, and mounting appurtenances.

1910.180(a)(11)

"Axle" [bogie] means two or more automotive-type axles mounted in tandem in a frame so as to divide the load between the axles and permit vertical oscillation of the wheels.

..1910.180(a)(12)

1910.180(a)(12)

The "base" (mounting) is the traveling base or carrier on which the rotating superstructure is mounted such as a car, truck, crawlers, or wheel platform.

1910.180(a)(13)

The "boom" [crane] is a member hinged to the front of the rotating superstructure with the outer end supported by ropes leading to a gantry or A-frame and used for supporting the hoisting tackle.

1910.180(a)(14)

The "boom angle" is the angle between the longitudinal centerline of the boom and the

horizontal. The boom longitudinal centerline is a straight line between the boom foot pin (heel pin) centerline and boom point sheave pin centerline.

1910.180(a)(15)

The "boom hoist" is a hoist drum and rope reeving system used to raise and lower the boom. The rope system may be all live reeving or a combination of live reeving and pendants.

1910.180(a)(16)

The "boom stop" is a device used to limit the angle of the boom at the highest position.

1910.180(a)(17)

A "brake" is a device used for retarding or stopping motion by friction or power means.

1910.180(a)(18)

A "cab" is a structure covering the operator's station. On truck-cranes, it is a structure that houses the driver's seat and controls the drum.

1910.180(a)(19)

1910.180(a)(20)

The "clutch" is a friction, electromagnetic, hydraulic, pneumatic, or positive mechanical device for engagement or disengagement of power.

1910.180(a)(21)

The "counterweight" is a weight used to supplement the weight of the machine in providing stability for lifting working loads.

1910.180(a)(22)

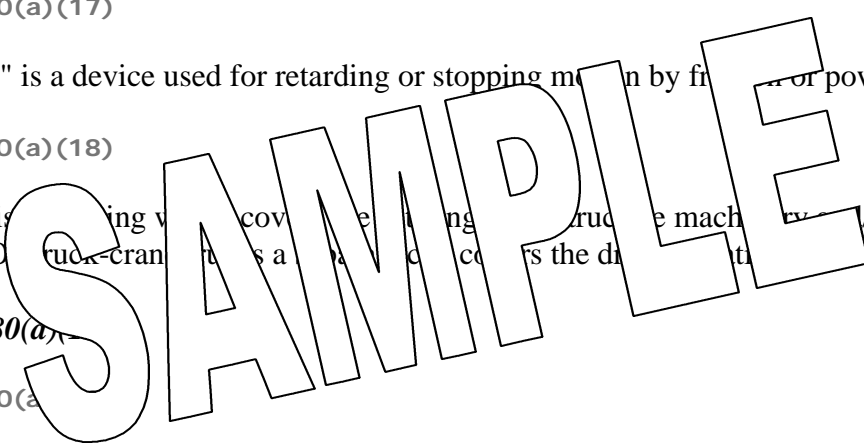
"Designated" means selected or assigned by the employer or the employer's representative as being qualified to perform specific duties.

1910.180(a)(23)

The "drum" is the cylindrical members around which ropes are wound for raising and lowering the load or boom.

1910.180(a)(24)

"Dynamic" (loading) means loads introduced into the machine or its components by forces in motion.



1910.180(a)(24)

The "gantry" (A-frame) is a structural frame, extending above the superstructure, to which the boom support ropes are reeved.

1910.180(a)(25)

A "jib" is an extension attached to the boom point to provide added boom length for lifting specified loads. The jib may be in line with the boom or offset to various angles.

1910.180(a)(26)

"Load" (working) means the external load, including the weight of load-attaching equipment, such as hoists, shackles, and cables.

1910.180(a)(27)

1910.180(a)(28)

"Load block" [upper] means the assembly of hook or shackle, swivel, sheaves, pins, and frame suspended by the boom point.

1910.180(a)(28)

"Load block" [lower] means the assembly of hook or shackle, swivel, sheaves, pins, and frame suspended by the hoisting ropes.

1910.180(a)(29)

A "load hoist" is a hoist drum and rope reeving system used for hoisting and lowering loads.

1910.180(a)(30)

"Load ratings" are crane ratings in pounds established by the manufacturer in accordance with paragraph (c) of this section.

1910.180(a)(31)

"Outriggers" are extendable or fixed metal arms, attached to the mounting base, which rest on supports at the outer ends.

1910.180(a)(32)

"Rail clamp" means a tong-like metal device, mounted on a locomotive crane car, which can be connected to the track.

1910.180(a)(33)

"Reeving" means a rope system in which the rope travels around drums and sheaves.

1910.180(a)(34)

"Rope" refers to a wire rope unless otherwise specified.

1910.180(a)(35)

"Side loading" means a load applied at an angle to the vertical plane of the boom.

..1910.180(a)(36)

1910.180(a)(36)

A "standby crane" is a crane which is not in regular service but which is used occasionally or intermittently as required.

1910.180(a)(37)

A "standing eye" is a type of eye which is attached to a structure and contains a constant distance between the points of attachment to two drums which are connected to the rope.

1910.180(a)(38)

"Structural capacity" means the ability of the machine and its components to withstand the stresses imposed by applied loads.

1910.180(a)(39)

"Superstructure" means the rotating upper frame structure of the machine and the operating machinery mounted thereon.

1910.180(a)(40)

"Swing" means the rotation of the superstructure for movement of loads in a horizontal direction about the axis of rotation.

1910.180(a)(41)

"Swing mechanism" means the machinery involved in providing rotation of the superstructure.

1910.180(a)(42)

"Tackle" is an assembly of ropes and sheaves arranged for hoisting and pulling.

1910.180(a)(43)

"Transit" means the moving or transporting of a crane from one jobsite to another.

..1910.180(a)(44)

1910.180(a)(44)

"Travel" means the function of the machine moving from one location to another, on a jobsite.

1910.180(a)(45)

The "travel mechanism" is the machinery involved in providing travel.

1910.180(a)(46)

"Wheelbase" means the distance between the centers of the front and rear axles. For a multiple axle assembly the axle center for the heaviest axle is taken as the reference point of the assembly.

1910.180(a)(47)

The "whipline" is a hoist rope system of lighter load capacity and higher speed than provided by the main hoist.

1910.180(a)(48)

A "winch head" is a power driven spool for handling of loads by means of friction between fiber or wire rope and spool.

..1910.180(b)

1910.180(b)

"General requirements" -

1910.180(b)(1)

"Application." This section applies to crawler cranes, locomotive cranes, wheel mounted cranes of both truck and self-propelled wheel type, and any variations thereof which retain the same fundamental characteristics. This section includes only cranes of the above types, which are basically powered by internal combustion engines or electric motors and which utilize drums and ropes. Cranes designed for railway and automobile wreck clearances are excepted. The requirements of this section are applicable only to machines when used as lifting cranes.

1910.180(b)(2)

"New and existing equipment." All new crawler, locomotive, and truck cranes constructed

and utilized on or after August 31, 1971, shall meet the design specifications of the American National Standard Safety Code for Crawler, Locomotive, and Truck Cranes, ANSI B30.5-1968, which is incorporated by reference as specified in Sec. 1910.6. Crawler, locomotive, and truck cranes constructed prior to August 31, 1971, should be modified to conform to those design specifications by February 15, 1972, unless it can be shown that the crane cannot feasibly or economically be altered and that the crane substantially complies with the requirements of this section.

1910.180(b)(3)

"Designated personnel." Only designated personnel shall be permitted to operate a crane covered by this section.

..1910.180(c)

1910.180(c)

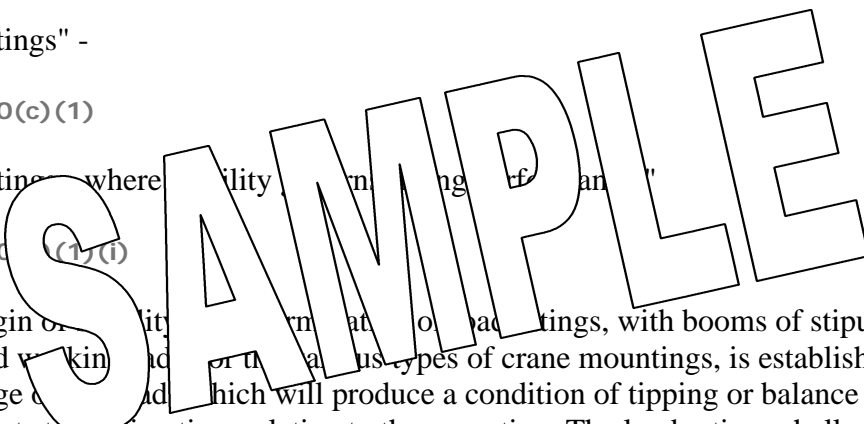
"Load ratings" -

1910.180(c)(1)

"Load ratings" where stability is not a factor.

1910.180(c)(1)(i)

The margin of stability for cranes, with booms of stipulated lengths at stipulated working loads, for all types of crane mountings, is established by taking a percentage of load which will produce a condition of tipping or balance with the boom in the least stable direction, relative to the mounting. The load ratings shall not exceed the following percentages for cranes, with the indicated types of mounting under conditions stipulated in paragraphs (c)(1)(ii) and (iii) of this section.



Type of crane mounting	Maximum load ratings (percent of tipping loads)
Locomotive, without outriggers:	
Booms 60 feet or less	(1) 85
Booms over 60 feet	(1) 85
Locomotive, using outriggers fully extended...	80
Crawler, without outriggers.....	75
Crawler, using outriggers fully extended.....	85
Truck and wheel mounted without outriggers or using outriggers fully extended.....	85

Footnote(1) Unless this results in less than 30,000 pound-feet net stabilizing moment about the rail, which shall be minimum with such booms.

1910.180(c)(1)(ii)

The following stipulations shall govern the application of the values in paragraph (c)(1)(i) of this section for locomotive cranes:

1910.180(c)(1)(ii)(a)

Tipping with or without the use of outriggers occurs when half of the wheels farthest from the load leave the rail.

1910.180(c)(1)(ii)(b)

The crane shall be standing on track which is level within 1 percent grade.

1910.180(c)(1)(ii)(c)

Radius of the load is the horizontal distance from the center of rotation to the rail support surface before tipping. The radius shall be measured to the center of gravity of the load. The radius shall be measured to the center of gravity of the load. The radius shall be measured to the center of gravity of the load.

1910.180(c)(1)(ii)(d)

Tipping loads for cranes with slings determined shall be applied under static conditions only, i.e., without the dynamic effect of hoisting, lowering, or swinging.

1910.180(c)(1)(ii)(e)

The weight of all auxiliary handling devices such as hoist blocks, hooks, and slings shall be considered a part of the load rating.

..1910.180(c)(1)(iii)

1910.180(c)(1)(iii)

Stipulations governing the application of the values in paragraph (c)(1)(i) of this section for crawler, truck, and wheel-mounted cranes shall be in accordance with Crane Load-Stability Test Code, Society of Automotive Engineers (SAE) J765, which is incorporated by reference as specified in Sec. 1910.6.

1910.180(c)(1)(iv)

The effectiveness of these preceding stability factors will be influenced by such additional factors as freely suspended loads, track, wind, or ground conditions, condition and inflation

of rubber tires, boom lengths, proper operating speeds for existing conditions, and, in general, careful and competent operation. All of these shall be taken into account by the user.

1910.180(c)(2)

"Load rating chart." A substantial and durable rating chart with clearly legible letters and figures shall be provided with each crane and securely fixed to the crane cab in a location easily visible to the operator while seated at his control station.

1910.180(d)

"Inspection classification" -

1910.180(d)(1)

"Initial inspection." Prior to initial use all new and altered cranes shall be inspected to insure compliance with provisions of this section.

1910.180(d)(2)

1910.180(d)(2)

"Regular inspection." Inspection procedures for cranes in regular service shall be provided into two general classifications based upon the type of crane. Inspection shall be performed. The intervals between inspections shall be determined by the manufacturer of the crane and the degree of their exposure to wear, operating conditions, or maintenance. The two general classifications shall be designated as "frequent" and "periodic", with respective intervals between inspections.

1910.180(d)(2)

Frequent inspection: Daily to monthly intervals.

1910.180(d)(2)(ii)

Periodic inspection: 1- to 12- month intervals, or as specifically recommended by the manufacturer.

1910.180(d)(3)

"Frequent inspection." Items such as the following shall be inspected for defects at intervals as defined in paragraph (d)(2)(i) of this section or as specifically indicated including observation during operation for any defects which might appear between regular inspections. Any deficiencies such as listed shall be carefully examined and determination made as to whether they constitute a safety hazard:

1910.180(d)(3)(i)

All control mechanisms for maladjustment interfering with proper operation: Daily.

1910.180(d)(3)(ii)

All control mechanisms for excessive wear of components and contamination by lubricants or other foreign matter.

1910.180(d)(3)(iii)

All safety devices for malfunction.

1910.180(d)(3)(iv)

Deterioration or leakage in air or hydraulic systems: Daily.

..1910.180(d)(3)(v)

1910.180(d)(3)(v)

Crane hooks with deformations, cracks, or other defects with cracks or more than 15 percent in excess of normal throat opening or 1/4 in. twist from the plane of the unbent hook.

1910.180(d)(3)(vi)

Rope reeving for no more than manufacturer's recommendations.

1910.180(d)(3)(vii)

Electrical apparatus for malfunctioning, signs of excessive deterioration, dirt, and moisture accumulation.

1910.180(d)(4)

"Periodic inspection." Complete inspections of the crane shall be performed at intervals as generally defined in paragraph (d)(2)(ii) of this section depending upon its activity, severity of service, and environment, or as specifically indicated below. These inspections shall include the requirements of paragraph (d)(3) of this section and in addition, items such as the following. Any deficiencies such as listed shall be carefully examined and determination made as to whether they constitute a safety hazard:

1910.180(d)(4)(i)

Deformed, cracked, or corroded members in the crane structure and boom.

1910.180(d)(4)(ii)

Loose bolts or rivets.