

WAC 296-155-34010 Vacuum lifters. (1) Vacuum lifting devices must be constructed in accordance with ASME B30.20-2010, Below-the-Hook Lifting Devices.

(2) **Rated load.**

(a) The rated load of each lifter and each pad must be legibly marked on the main structure or on a tag attached to it where it is visible. The marking must refer to the instruction manual for information about decreases in rating due to loads:

- (i) Rigidity;
- (ii) Strength;
- (iii) Overhang;
- (iv) Surface condition;
- (v) Angle of load;
- (vi) Temperature;
- (vii) Number of pads;
- (viii) Elevation and vacuum level.

(b) If the vacuum lifting device has shut-off valves on individual pads or groups of pads, the rated load of each pad must also be marked.

(3) The vacuum lifter must be clearly marked on the main structure with all of the following:

- (a) Manufacturer's name and address;
- (b) Model number;
- (c) Serial number;
- (d) Lifter weight;
- (e) Electrical power requirements, if applicable;
- (f) Pressure and volume of compressed air required, if applicable;
- (g) Rated load, as required in subsection (2) of this section;
- (h) If repaired or modified, the name, address, and lifter identification of repairer or modifier.

(4) **Installation.**

(a) Vacuum lifters must be assembled and installed according to manufacturer's instructions.

(b) The installer must check:

(i) That the power supply is the same as what is shown on the nameplate.

(ii) For correct rotation of all motors.

(c) Connect the electrical power supply to the vacuum lifter to either:

(i) The line side of the crane disconnect; or

(ii) An independent circuit.

(5) **Inspection.**

(a) A qualified person must inspect all new, altered, repaired, or modified vacuum lifters. A qualified person can limit the inspection of altered, repaired or modified lifters to the affected parts.

(b) The operator must inspect the lifter before and during every lift for any indication of damage, including all of the following:

(i) Surface of the load for debris;

(ii) Seal of the vacuum pad for debris;

(iii) Condition and operation of the controls;

(iv) Condition and operation of the indicators, meters and pumps when installed.

(c) Lifters must be inspected, by the operator or another competent person, according to Table 22.

(d) A qualified person must determine whether signs of damage indicate a hazard.

(e) You must correct hazardous conditions before continuing use.

(f) A qualified person must perform a periodic inspection of vacuum lifters according to Table 23. Include the items in Table 22 of this section.

(g) You must keep dated inspection records on all critical items such as supporting structure, motors, controls, and other auxiliary components.

(h) You must correct hazardous conditions before continuing use.

**Table 22
Vacuum Lifter Frequent Inspection**

Inspect for:	How often:
Structural members for: <ul style="list-style-type: none"> • Deformation. • Cracks. • Excessive wear. 	<ul style="list-style-type: none"> • Normal service - Monthly. • Heavy service - Weekly to monthly. • Severe service - Daily to weekly. • Special or infrequent service - As recommended by a qualified person before and after each occurrence. • Before using, when a lifting device has been idle for more than one month.
The vacuum generator for output.	
The vacuum pad seal rings for: <ul style="list-style-type: none"> • Cuts. • Tears. • Excessive wear. • Foreign particles. 	
Vacuum lines and connections for: <ul style="list-style-type: none"> • Leakage. • Cuts. • Kinks. • Collapsed areas of hoses. 	
The vacuum reservoir for: <ul style="list-style-type: none"> • Leaks. • Visible damage. 	
The entire vacuum system including indicator lights, gages, horns, bells, pointers or other warning devices, and vacuum level indicators: <ul style="list-style-type: none"> • Attach a nonporous, clean surface to the vacuum pad or pads. • Stop the vacuum source. 	

Inspect for:	How often:
<ul style="list-style-type: none"> • Check that the vacuum level in the system does not decrease by more than the manufacturer's specified rate. 	

**Table 23
Vacuum Lifting Device Periodic Inspection**

Inspect for:	How often:
External evidence of: <ul style="list-style-type: none"> • Looseness. • Wear. • Deformation. • Cracking. • Corrosion. 	<ul style="list-style-type: none"> • Normal service for equipment in place - Yearly. • Heavy service - Semiannually. • Severe service - Quarterly. • Special or infrequent service - As recommended by a qualified person before the first such occurrence and as directed by the qualified person for any subsequent occurrences.
External evidence of damage to: <ul style="list-style-type: none"> • Supporting structure. • Motors. • Controls. • Other auxiliary components. 	
Clear warning labels.	

- Note:**
- Normal service means service that involves operation with various weights within the rated load limit, averaging less than 65% of rated load limits.
 - Heavy service means service that involves operation within the rated load limit, that exceeds the limits of normal service.
 - Severe service means service that involves normal or heavy service with abnormal operating conditions.

(6) Operational tests.

(a) A qualified person must perform an operational test on new, altered, repaired, or modified vacuum lifters before use. The qualified person can limit the testing of altered, repaired or modified lifters to the parts affected.

(b) The following items must be tested:

- (i) Moving parts;
- (ii) Latches;
- (iii) Stops;
- (iv) Limit switches;
- (v) Control devices;
- (vi) Vacuum lines;

(vii) The seals and connections must be tested for leaks by attaching a smooth nonporous clean material to the vacuum pad or pads and then stopping the vacuum source. The vacuum level in the system must not decrease more than the manufacturer's specified rate.

(c) You must keep dated reports of all operations tests on file.

(7) **Load tests.**

(a) Prior to initial use, all new, altered, repaired, or modified vacuum lifting devices must be load tested and inspected by a qualified person. The qualified person can limit the test to the areas affected by the alteration, repair or modification.

(b) Test loads must not be more than 125% of the rated load of the system, unless otherwise recommended by the manufacturer or a qualified person.

(c) You must keep written reports confirming the load rating of the vacuum lifting device.

(d) The load test must consist of one of the following procedures:

(i) **Actual load test:**

(A) Attach pads to the designated test load.

(B) Raise the test load a small distance to make sure the load is supported by the vacuum-lifting device.

(C) Hold the load for two minutes.

(D) Lower the load for release.

(ii) **Simulated load test.** Using a test fixture, apply forces to all load bearing components either individually or in assemblies equivalent to the forces encountered by the components if they were supporting a load that was 125% of the rated load.

(e) After the test, you must visually inspect the vacuum lifting device. You must correct any condition that constitutes a hazard before the lifting device is placed in service. If the correction affects the structure, then you must retest the lifter.

(8) **Repair.**

(a) You must repair vacuum lifting devices as follows:

(i) Adjustments and testing must be done only by a qualified person;

(ii) Use replacement parts that are at least equal to the original manufacturer's specification;

(iii) The lifting device must be inspected before returning to service as required in subsection (5) of this section.

(b) You must take the following precautions before repairs on a lifting device are started:

(i) You must move the vacuum-lifting device to an area where it will cause the least interference with other operations;

(ii) You must disconnect, lock out and tag all sources of power "Out of Service," if applicable;

(iii) You must tag the lifting device removed from service for repair "Out of Service."

(9) Lifting devices must be operated only by qualified personnel.

(10) Operators must do the following:

(a) Test all controls before use during a shift;

(b) Consult a competent person before handling the load whenever safety is in doubt;

(c) Respond only to instructions from competent persons, except for stop orders. The operator must obey a stop order at all times, no matter who gives it;

(d) Do not load the lifter in excess of its rated load or with any load that it isn't specifically designed for;

(e) Apply the lifter to the load according to the manufacturer's instructions;

(f) Check that:

(i) Ropes or chains are not kinked.

(ii) Multiple part lines are not twisted around each other.

- (iii) The pad contact surface is clean and free of loose particles.
- (g) Check that vacuum lines are not:
 - (i) Kinked or twisted.
 - (ii) Wrapped around or looped over parts of the lifting device that will move during the lift.
- (h) Bring the lifter over the load in a way that minimizes swinging;
 - (i) Lift the load a few inches to make sure that the lifting device was correctly applied;
 - (j) Keep the load or lifter from contacting any obstruction;
 - (k) Do the following if power goes off while making a lift:
 - (i) Warn all people in the area;
 - (ii) Set the load down if possible.
 - (l) Set down any attached load and store the lifting device before leaving it;
 - (m) Check that all personnel are clear of the load;
 - (n) Using the lifter for side pulls or sliding the load is prohibited, unless specifically authorized by a qualified person;
 - (o) Riding on the load or the lifter is prohibited.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, 49.17.060. WSR 16-09-085, § 296-155-34010, filed 4/19/16, effective 5/20/16. Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, 49.17.060 and chapter 49.17 RCW, and 29 C.F.R. 1926, Subpart CC. WSR 13-02-068, § 296-155-34010, filed 12/31/12, effective 2/1/13.]