



Ohio Administrative Code

Rule 4123:1-5-19 Manlifts of the endless belt type.

Effective: September 1, 2023

(A) Reserved.

(B) Reserved.

(C) General specifications.

(1) Floor openings.

(a) Allowable size.

Floor openings for both the up and down runs will be no less than twenty-eight inches nor more than thirty-six inches in width for a twelve-inch belt; no less than thirty-four inches nor more than thirty-eight inches for a fourteen-inch belt; and no less than thirty-six inches nor more than forty inches for a sixteen-inch belt and will extend no less than twenty-four inches, nor more than twenty-eight inches from the face of the belt.

(b) Uniformity.

All floor openings for a given manlift will be uniform in size and will be approximately circular, and each will be located vertically above the opening below it.

(2) Landings.

(a) Vertical clearance.

The clearance between the floor or mounting platform and the lower edge for the conical guard above it specified in paragraph (C)(3) of this rule will be no less than seven feet six inches. Where this clearance cannot be obtained no access to the manlift will be provided and the manlift runway



will be enclosed where it passes through such floor.

(b) Clear landing space.

The landing space adjacent to the floor openings will be free from obstructions and kept clear at all times. This landing space will be no less than two feet in width from the edge of the floor opening used for mounting and dismounting.

(c) Lighting of landings.

Adequate lighting, no less than five foot candles, will be provided at each floor landing at all times when the lift is in operation.

(d) Landing surface.

The landing surfaces at the entrances and exits to the manlift will be constructed and maintained as to provide safe footing at all times.

(e) Emergency landings.

Where there is a travel of fifty feet or more between floor landings, one or more emergency landings will be provided so that there will be a landing (either floor or emergency) for every twenty-five feet or less of manlift travel.

(i) Emergency landings will be accessible from both the up and down runs of the manlift and will give access to the ladder specified in paragraph (C)(8) of this rule.

(ii) Emergency landings will be completely enclosed with a standard railing and toeboard.

(iii) Platforms constructed to give access to bucket elevators or other equipment for the purpose of inspection, lubrication and repair may also serve as emergency landings under this rule. All such platforms will then be considered part of the emergency landing and will be provided with standard guard railings and toeboards.



(3) Guards on underside of floor openings.

(a) Fixed type.

The ascending side of the manlift floor openings will be provided with a bevel guard or cone meeting the following specifications:

(i) Slope.

The cone will make an angle of no less than forty-five degrees with the horizontal. An angle of sixty degrees or greater will be used where ceiling heights permit.

(ii) Extent.

The lower edge of this guard will extend no less than forty-two inches outward from any handhold on the belt. It will not extend beyond the upper surface of the floor above.

(iii) Material and construction.

The cone will be made of no less than "No. 18 U.S. Gauge" sheet steel or material of equivalent strength or stiffness. The lower edge will be rolled to a minimum diameter of one-half inch and the interior will be smooth with no rivets, bolts or screws protruding.

(b) Floating type.

In lieu of the fixed guards specified in paragraph (C)(3)(a) of this rule, a floating type safety cone may be used, such floating cones to be mounted on hinges no less than six inches below the underside of the floor and so constructed as to actuate a limit switch should a force of two pounds be applied on the edge of the cone closest to the hinge. The depth of this floating cone will not exceed twelve inches.

(4) Protection of entrances and exits.



(a) Guardrail specifications.

The entrance and exits at all floor landings affording access to the manlift will be guarded by a maze (staggered railing) or a handrail equipped with self-closing gates.

(b) Construction.

The rails will be standard guardrails with toeboards meeting the provisions of rule 4123:1-5-02 of the Administrative Code.

(c) Gates.

Gates, if used, will open outward and will be self-closing. Corners of gates will be rounded.

(d) Maze.

Maze or staggered openings will offer no direct passage between enclosure and outer floor space.

(e) Except where building layout prevents, entrances at all landings shall be in the same relative position.

(5) Guards for openings.

(a) Construction.

The floor opening at each landing will be guarded on sides not used for entrance or exit by a wall, a railing and toeboard or by panels of wire mesh of suitable strength.

(b) Height and location.

Such rails or guards will be no less than forty-two inches in height on the up-running side and sixty-six inches in height on the down-running side. Rails or guards will be located no more than one foot



from the edge of the floor opening.

(6) Bottom arrangement.

(a) Bottom landing.

At the bottom landing the clear area will be no smaller than the area enclosed by the guardrails on the floors above, and any wall in front of the down-running side of the belt will be no less than forty-eight inches from the face of the belt. This space will not be encroached upon by stairs or ladders.

(b) Location of lower pulley.

The lower (boot) pulley will be installed so that it is supported by the lowest landing served. The sides of the pulley support will be guarded to prevent contact with the pulley or the steps.

(c) Mounting platform.

A mounting platform will be provided in front or to one side of the up-run at the lowest landing, unless the floor level is such that the following specification can be met: the floor or platform will be at or above the point at which the upper surface of the ascending step completes its turn and assumes a horizontal position.

(d) Guardrails.

To guard against employees walking under a descending step, the area on the down side of the manlift will be guarded in accordance with paragraph (C)(4) of this rule. To guard against an employee getting between the mounting platform and an ascending step, the area between the belt and the platform will be protected by a guardrail.

(7) Top arrangements.

(a) Clearance from floor.



A top clearance will be provided of no less than eleven feet above the top terminal landing. This clearance will be maintained from a plane through each face of the belt to a vertical cylindrical plane having a diameter two feet greater than the diameter of the floor opening, extending upward from the top floor to the ceiling on the up-running side of the belt. No encroachment of structural or machine supporting members within this space will be permitted.

(b) Pulley clearance.

(i) There will be a clearance of no less than five feet between the center of the head pulley shaft and any ceiling obstruction.

(ii) The center of the head pulley shaft will be no less than six feet above the top terminal landing.

(c) Emergency grab rail.

An emergency grab bar or rail and platform will be provided at the head pulley when the distance to the head pulley is over six feet above the top landing, otherwise only a grab bar or rail is to be provided to permit the rider to swing free should the emergency stops become inoperative.

(8) Emergency exit ladder.

A fixed metal ladder accessible from both the up and down run of the manlift will be provided for the entire travel of the manlift. Such ladder will be in accordance with paragraph (C)(6) of rule 4123:1-5-03 of the Administrative Code, except that a safety cage will not be provided, notwithstanding the provisions of paragraph (C)(6) of rule 4123:1-5-03 of the Administrative Code.

(9) Superstructure bracing.

Manlift rails will be secured in such a manner as to avoid spreading, vibration and misalignment.

(10) Illumination.

(a) General.



Both runs of the manlift will be illuminated at all times when the lift is in operation. An intensity of no less than one foot candle will be maintained at all points. (See paragraph (C)(2)(c) of this rule for illumination specifications at landings).

(b) Control of illumination.

Lighting of manlift runways will be by means of circuits permanently tied in to the building circuits (no switches), or will be controlled by switches at each landing. Where separate switches are provided at each landing, any switch will turn on all lights necessary to illuminate the entire runway.

(11) Weather protection.

The entire manlift and its driving mechanism will be protected from the weather at all times.

(D) Mechanical specifications.

(1) Machines.

(a) Brakes.

Brakes provided for stopping and holding a manlift will be inherently self-engaging, by requiring power or force from an external source to cause disengagement. The brake will be electrically released, and will be applied to the motor shaft for direct-connected units or to the input shaft for belt-driven units. The brake will be capable of stopping and holding the manlift when the descending-side is loaded with two hundred fifty pounds on each step.

(b) Belt.

(i) Material.

The belt will be of hard-woven canvas, rubber-coated canvas, leather, or other material meeting the strength specifications in paragraph (D)(1)(b)(iii) of this rule and having a coefficient of friction such



that when used in conjunction with an adequate tension device it will meet the brake test specified in paragraph (D)(1)(a) of this rule.

(ii) Width.

The width of the belt will be no less than twelve inches for a travel not exceeding one hundred feet, no less than fourteen inches for a travel greater than one hundred feet but not exceeding one hundred fifty feet and sixteen inches for a travel exceeding one hundred fifty feet.

(iii) Strength.

The strength of the belt will be no less than one thousand five hundred pounds per inch of belt width for belts having a distance between pulley centers not in excess of one hundred feet, and one thousand eight hundred pounds per inch of belt width for belts having a distance between pulley centers of over one hundred feet but not in excess of two hundred feet; for over two hundred feet, two thousand four hundred fifty pounds per inch of belt width.

(iv) Belt fastenings.

Belts will be fastened by a lapped splice or will be butt-spliced with a strap on the side of the belt away from the pulley.

(A) For lapped splices, the overlap of the belt at the splice will be no less than three feet where the travel of the manlift does not exceed one hundred feet and no less than four feet, if the travel exceeds one hundred feet. Where butt splices are used the straps will extend no less than three feet on one side of the butt for a travel not in excess of one hundred feet and four feet for a travel in excess of one hundred feet.

(B) For twelve-inch belts, the joint will be fastened with no less than twenty special elevator bolts, each of a minimum diameter of one-fourth inch. These bolts will be arranged as to cover the area of the joint effectively.

(C) The minimum number of bolts for a belt width of fourteen inches will be no less than twenty-



three and for a belt width of sixteen inches, the number of bolts will be no less than twenty-seven.

(v) Repairs not permitted.

A belt that has become torn while in use on a manlift will not be spliced and put back in service.

(vi) Flush bolt heads.

All bolts used for splicing the belt or securing handholds or steps to the belt will be installed and maintained so that the heads do not project beyond the inner surface of the belt.

(c) Pulleys.

Drive pulleys and idler (boot) pulleys will have a diameter no less than given in the following table to this rule.

Table 19-1

BELT CONSTRUCTION	MINIMUM STRENGTH POUNDS PER INCH OF WIDTH	MINIMUM PULLEY DIAMETER INCHES
5 ply	1500	20
6 ply	1800	20
7 ply	2100	22

(The above values are based on thirty-two-ounce duck; three hundred pounds per linear inch per ply.)

(d) Pulley protection.

The machine will be designed and constructed as to catch and hold the driving pulley in event of shaft failure.

(e) Belt location.



Manlift belts will be centered in the floor openings.

(f) Pulley lagging.

All head pulleys will be lagged (i.e., covered with non-slip material securely fastened in place).

(2) Speed.

No manlift designed for a speed in excess of eighty feet per minute will be installed.

(3) Steps.

(a) Minimum depth.

Steps will be no less than twelve inches nor more than fourteen inches deep, measured from the belt to the edge of the step.

(b) Width.

The width of the step will be no less than the width of the belt to which it is attached.

(c) Distance between steps.

The distance between steps will be equally spaced and not less than sixteen feet measured from the upper surface of one step to the upper surface of the next step above it.

(d) Angle of step.

The surface of the step will make approximately a right angle with the up and down run of the belt, and will travel in the approximate horizontal position with the up and down run of the belt.

(e) Surfaces.



The upper or working surfaces of the step will be of a material having inherent nonslip characteristics (coefficient of friction no less than 0.5) or will be covered completely by a nonslip tread securely fastened to it.

(f) Strength of step supports.

When subjected to a load of four hundred pounds applied at the approximate center of the step, step frames or supports and their guides will be of adequate strength to:

(i) Prevent the disengagement of any step roller.

(ii) Prevent any appreciable misalignment.

(iii) Prevent any visible deformation of the step or its support.

(g) Prohibition of steps without handholds.

No step will be provided unless there is a corresponding handhold above or below it meeting the specifications in paragraph (D)(4) of this rule. If a step is removed for repairs or permanently, the handholds immediately above and below it will be removed before the lift is again placed in service.

(4) Handholds.

(a) Location.

Handholds attached to the belt will be provided and so installed that they are no less than four feet nor more than four feet eight inches above the step tread. These will be so located as to be available on both up and down run of the belt.

(b) Size.

The grab surface of the handhold will be no less than four and one-half inches in width, no less than



three inches in depth and provide two inches of clearance from the belt. Fastenings for handholds will be located no less than one inch from the edge of the belt.

(c) Strength.

The handhold will be capable of withstanding, without damage, a load of three hundred pounds applied parallel to the run of the belt.

(d) Prohibition of handhold without steps.

No handhold will be provided without a corresponding step. If a handhold is removed permanently or temporarily, the corresponding step and handhold for the opposite direction of travel will also be removed before the lift is again placed in service.

(e) Type.

All handholds will be of the closed type.

(5) Up limit stops.

(a) Specifications.

Two separate automatic stop devices will be provided to cut off the power and apply the brake when a loaded step passes the upper terminal landing. One of these will consist of a split-rail switch or equivalent mechanically operated by the step roller and located no more than six inches above the top terminal landing. The second automatic stop device may consist of any of the following:

(i) A split-rail switch placed six inches above and on the side opposite the first limit switch.

(ii) An electronic device.

(iii) A switch actuated by a lever, rod or plate, the latter to be placed on the up side of the head pulley so as to just clear a passing step.



(b) Manual reset location.

After the manlift has been stopped by a stop device it will be necessary to reset the automatic stop manually. The device will be so located that a person resetting it will have a clear view of both the up and down runs of the manlift. It will not be possible to reset the device from any step or platform.

(c) Cut-off point.

The initial limit stop device will function so that the manlift will be stopped before the loaded step has reached a point twenty-four inches above the top terminal landing.

(d) Electrical specifications.

(i) Where such switches open the main motor circuit directly they will be of the multipole type.

(ii) Where electronic devices are used they will be so designed and installed that failure will result in shutting off the power to the driving motor.

(iii) Where flammable vapors or dusts may be present all electrical installations will be of a type approved for use in such locations.

(iv) Unless of the oil-immersed type, controller contacts carrying the main motor current will be copper to carbon or equal, except where the circuit is broken at two or more points simultaneously.

(6) Emergency stop.

(a) Specifications.

An emergency stop means will be provided.

(b) Location.



This stop means will be within easy reach of the ascending and descending runs of the belt.

(c) Operation.

This stop means will be so connected with the control lever or operating mechanism that it will cut off the power and apply the brake when pulled in the direction of travel.

(d) Rope.

If rope is used, it will be no less than three-eighths inch in diameter. Wire rope, unless marlin-covered, will not be used.

(7) Factor of safety.

All parts of the machine will have a factor of safety of six based on a load of two hundred pounds on each horizontal step on the up and down runs.

(8) Instruction and warning signs and devices.

(a) Instruction signs at landings or belt.

Signs of conspicuous and easily read style giving instructions for the use of the manlift will be posted at each landing or stenciled on the belt.

(i) Size and legibility.

Such signs will be of letters no less than two inches in height and of a color having high contrast with the surface on which it is stenciled or painted (white or yellow on black or black on white or gray).

(ii) Inscription.

The instructions shall read approximately as follows: "Face the belt. Use the handholds. To stop -



pull rope."

(b) Top floor warning sign and light.

(i) Specifications.

At the top floor an illuminated sign will be displayed bearing the following wording: "Top floor - get off". The sign will be in block letters no less than two inches in height. This sign will be located within easy view of an ascending passenger and no more than two feet above the top terminal landing.

(ii) Additional warning light.

In addition to the sign specified in paragraph (D)(8)(b)(i) of this rule, a red warning light of no less than forty-watt rating will be provided immediately below the upper landing terminal and so located as to shine in the passenger's face.

(c) A visual or audible warning system will be provided to alert passengers and others in the vicinity when a manlift is started or re-started.

(d) Visitor warning.

A conspicuous sign having the following legend, "Authorized Personnel Only", will be displayed at each landing. The sign will be of block letters no less than two inches in height and will be of a color offering high contrast with the background color".

(E) Recommended minimum instructions in the proper use of manlifts.

(1) Only authorized personnel, trained in their use, will be permitted to use manlifts.

(2) When riding a manlift, the passenger will stand squarely on the step, face the belt and grip the handhold securely. Jumping on the step, yanking on the handhold or engaging in horseplay of any kind is not permitted.



(3) No freight, packaged goods, pipe, lumber or construction materials of any kind will be handled on any manlift.

(4) No tools, except those which will fit entirely within a pocket in usual working clothes is carried on any manlift.

(5) Before starting or re-starting the manlift, it will be necessary to alert all passengers on the manlift and all others in its vicinity.

(F) Inspection and maintenance.

(1) Frequency.

All manlifts will be inspected by a competent designated person at intervals of no more than thirty days. Limit switches will be checked weekly. Manlifts found to be unsafe will not be operated until properly repaired.

(2) Items covered.

The inspection will cover but is not limited to the following items:

(a) Steps;

(b) Steps fastenings;

(c) Rails;

(d) Rail supports and fastenings;

(e) Rollers and slides;

(f) Belt and belt tension;



- (g) Handholds and fastenings;
- (h) Floor landings;
- (i) Guardrails;
- (j) Lubrication;
- (k) Limit switches;
- (l) Warning signs and lights;
- (m) Illumination;
- (n) Drive pulley;
- (o) Bottom (boot) pulley and clearance;
- (p) Pulley supports;
- (q) Motor;
- (r) Driving mechanism;
- (s) Brake;
- (t) Electrical switches;
- (u) Vibration and misalignment;
- (v) Skip on up or down run when mounting step (indicating worn gears).