



Elevator Safety Program
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Acceptance Inspection Checklist

Sidewalk Elevator Checklist

Passenger Elevators

Code References

- ASME A17.1, 2004 – Effective 4/1/2005
- Oregon Structural Specialty Code 2003 – Effective 10/1/2004
- Oregon Electrical Specialty Code 2005 – Effective 4/1/2005
- Oregon Plumbing Specialty Code – Effective 4/1/2005
- NFPA 72, 2002; Fire Alarm Systems
- NFPA 13, 2002; Sprinkler Systems

Note: Potential code violations are not necessarily restricted to this checklist.

The comments used in this checklist give direction only and are not intended to circumvent actual code language. Please refer to the appropriate standard as necessary to clarify any code issues that may arise during this inspection.

The codes referenced in this checklist are applicable to the elevator installation as of the effective date of April 1, 2005. If the structural or electrical permit was issued prior to April 1, 2005, the previous edition of the elevator code may be used to resolve code conflicts providing a the issue date for the electrical or structure permit can be verified by the elevator inspector.

While the Elevator Safety Program does not directly regulate the building code, it is permissible to question code issues and request clarification or validation from the local building department. The elevator inspector cannot require any corrections unless supported by the local building department in such cases.

Indicate elevator type: Electric <input type="checkbox"/> Hydraulic <input type="checkbox"/>			
Site Name:			Code Date: ____/____/____
Contractor:			
Elevator ID: SW-_____			
1 st Inspection Date	2 nd Inspection Date	3 rd Inspection Date	4 th Inspection Date
____/____/____	____/____/____	____/____/____	____/____/____

Machine Rooms	A17.1	Must conform to 2.7	Passed
Equipment in Machine Rooms and Working Clearances Around Machinery. Note: 2.7.2.2.1 & 2.7.2.2.2 are Oregon amendments	2.7.2.1 2.7.2.2.1 2.7.2.2.2	1) Only machinery and equipment used in conjunction with the function or use of the elevator shall be permitted in the elevator machine room. 2) Drains shall not be installed in elevator machine rooms, machinery spaces, control rooms or control spaces. 3) A clear path of not less than 600-mm (24-in.) shall be provided to all components that require maintenance. 4) A clearance of not less than 600-mm (24-in.) shall be provided in the direction(s) required for maintenance access.	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>
Access to and location of Machine Room	5.5.1.7 (see 2.7) 2.7.3.4.4 (Oregon amendment)	1) Hydraulic Elevators: a) Wherever practical, machine rooms shall be located within a nominal radius of 6.0-m (20-ft.) from the hoistway. Access routes from hoistways to machine room doors shall be as direct as possible and not be inhibited by locked doors. 2) Access Doors and Openings..... a) The area in front of all access doors to machine rooms and machinery spaces shall be kept unobstructed. b) A minimum horizontal clearance of 1220-mm (48-in.) shall be maintained in front of access doors. c) In no case shall the unobstructed access space be less than the width of the door plus 155-mm (6-in.) on either side of the door. The 155-mm (6-in.) clearance does not apply where a building wall intersects near the doorframe at right angles. d) Where building equipment (columns, ducts, pipes, etc.) encroach on the dimensions in this rule, all edges or corners below 2000-mm (78-in.) shall be protected to prevent injury.	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>
Machine Room Door & Sign	2.7.3.4.5 (Oregon amendment) 2.7.3.4	1) Door Sign a) "AUTHORIZED PERSONNEL ONLY - Storage or installation of equipment not pertaining to the elevator is prohibited" b) minimum of 10 mm (3/8 in.) high letters c) located at a nominal height from floor level of 1525 mm (60 in.) 2) Machine room door..... a) minimum of 750 mm (29.5 in.) wide b) minimum of 2030 mm (80 in.) in height c) self-closing and self-locking door d) if rating is required check for labeling e) keys to be kept on premises; Group 2 Security	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>
Code Data Plate	8.9	1) Located on mainline disconnect or controller. 2) Indicate code for inspections and tests. 3) State ID tag may be used to supply such information	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>
Headroom	2.7.4	1) Minimum 2130 mm (84 in.) clear throughout entire machine room. Some minor exceptions may be permitted in corners and close to walls.	<input type="checkbox"/>
Enclosure	2.7.1.1	1) Check for proper construction rated or non-rated. Taped sheet rock.	<input type="checkbox"/>
Housekeeping	8.6.4.8.1	1) M/R shall be clean	<input type="checkbox"/>
Temperature and Humidity	2.7.5.2 Oregon amendment	1) Machine rooms shall be provided with natural or mechanical means to keep the ambient air temperature and humidity in the range specified by the elevator equipment manufacturer. 2) The temperature and humidity range shall be permanently posted in the machine room. 3) Where no manufacturer's specifications are available, the machine room temperature shall be maintained within a temperature range between 13° C (55° F) and 38° C (100° F).	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>

Machine Rooms	A17.1	Must conform to 2.7	Passed
<p>Electrical Equipment and Wiring</p> <p>Wiring in Hoistways, Machine Rooms, Control Rooms, Machinery Spaces, and Control Spaces.</p> <p>Note: Art. 620.37(A) is provided for additional reference for allowed wiring in machine rooms and hoistways.</p>	<p>2.8.1.1</p> <p>2.8.1.2</p> <p>Art. 620.37(A)</p> <p>5.5.2.17.1</p> <p>5.5.1.8.2</p> <p>5.5.1.8.3</p>	<p>1) Installation of electrical equipment and wiring shall conform to NFPA 70.</p> <p>a) Only such electrical wiring, raceways, and cables used directly in connection with the elevator, including wiring for signals, for communication with the car, for lighting, heating, air conditioning, and ventilating the car, for fire detecting systems, for pit sump pumps, and for heating and lighting the hoistway and/or machine room shall be permitted to be installed inside the hoistway.</p> <p>b) Uses Permitted.....</p> <p>i) Only such electric wiring, raceways, and cables used directly in connection with the elevator or dumbwaiter, including wiring for signals, for communication with the car, for lighting, heating, air conditioning, and ventilating the elevator car, for fire detecting systems, for pit sump pumps, and for heating, lighting, and ventilating the hoistway, shall be permitted inside the hoistway, machine rooms, control rooms, machinery spaces, and control spaces.</p> <p>2) Operating devices and control equipment shall conform to 3.26, 5.5.1.25.1, 5.5.1.25.2, and 5.5.1.25.4; and</p> <p>3) All electrical equipment on the car shall be weatherproof.</p> <p>4) Electrical metal tubing (EMT) shall not be used.</p>	<p><input type="checkbox"/></p> <p>.....</p> <p><input type="checkbox"/></p> <p><input type="checkbox"/></p> <p><input type="checkbox"/></p>
<p>Guarding of Exposed Equipment</p>	<p>2.10.1</p>	<p>1) In machine rooms and secondary machinery spaces, the following shall be guarded to protect against accidental contact:</p> <p>a) Driving machine sheaves and ropes whose vertical projection upon a horizontal plane extends beyond the base of the machine;</p> <p>b) Sheaves;</p> <p>c) Exposed gears, sprockets, tape or rope sheaves, or drums of selectors, floor controllers, or signal machines, and their driving ropes, chains, or tapes; and</p> <p>d) Keys, keyways, and screws in projecting shafts.</p> <p>e) Handwinding wheels and flywheels that are not guarded shall have yellow markings.</p>	<p><input type="checkbox"/></p> <p><input type="checkbox"/></p> <p><input type="checkbox"/></p> <p><input type="checkbox"/></p> <p><input type="checkbox"/></p>
<p>Identification of Equipment</p>	<p>2.29.1</p> <p>2.29.2</p>	<p>1) In buildings with more than one elevator, each elevator in the building shall be assigned a unique alphabetical or numerical identification, a minimum of 50 mm (2 in.) in height unless otherwise specified. The identification shall be painted on, engraved, or securely attached to</p> <p>a) the driving machine;</p> <p>b) MG set;</p> <p>c) controller;</p> <p>d) selector;</p> <p>e) governor;</p> <p>f) main line disconnect switch;</p> <p>g) the crosshead, or where there is no crosshead, the car frame, such that it is visible from the top of the car;</p> <p>h) the car operating panel, minimum of 13 mm (0.5 in.) in height; and</p> <p>i) adjacent to or on every elevator entrance at the designated level, minimum of 75 mm (3 in.) in height.</p> <p>2) Identification of Floors.....</p> <p>a) Hoistways shall have floor numbers, not less than 100 mm (4 in.) in height, on the hoistway side of the enclosure or hoistway doors.</p>	<p><input type="checkbox"/></p> <p>.....</p> <p><input type="checkbox"/></p>

Machine Rooms	A17.1	Must conform to 2.7	Passed																
Main Line Disconnect	620-51(A) 620.51(D)	1) Type: a) The disconnecting means shall be an enclosed externally operable fused motor circuit switch or circuit breaker capable of being locked in the open position. b) The disconnecting means shall be a listed device. c) Located within 24" of open side of M/R door. 2) Identification and Signs..... a) Where there is more than one driving machine in a machine room, the disconnecting means shall be numbered to correspond to the identifying number of the driving machine that they control. b) The disconnecting means shall be provided with a sign to identify the location of the supply side over-current protective device.	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>																
Branch Circuits for Car Lighting, Receptacle(s), Ventilation, Heating, and Air Conditioning. Car Light, Receptacle(s), and Ventilation Disconnecting Means.	Art. 620.22 Art. 620.53	1) Car Light Source. a) A separate branch circuit shall supply the car lights, receptacle(s), auxiliary lighting power source, and ventilation on each elevator car. b) The over-current device protecting the branch circuit shall be located in the elevator machine room or control room/machinery space or control space. 2) Disconnecting means:..... a) Elevators shall have a single means for disconnecting all ungrounded car light, receptacle(s), and ventilation power-supply conductors for that elevator car. b) The disconnecting means shall be an enclosed externally operable fused motor circuit switch or circuit breaker capable of being locked in the open position and shall be located in the machine room or control room for that elevator car. c) Where there is no machine room or control room, the disconnecting means shall be located in the same space as the disconnecting means required by 620.51. d) Disconnecting means shall be numbered to correspond to the identifying number of the elevator car whose light source they control.	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>																
Controller wiring, fuses and grounding	102.1	1) Ensure proper fuses are installed and equipment is properly grounded. 2) Bonding conductors for lightning protection systems allowed in hoistway. 3) Lightning rod grounding down conductor not allowed hoistway.	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>																
Electrical Clearances	110-26a	<table border="1" style="width:100%; border-collapse: collapse;"> <thead> <tr> <th colspan="4" style="text-align: center;">Minimum Clear Distance</th> </tr> <tr> <th style="width: 25%;">Nominal Voltage to Ground</th> <th style="width: 25%;">Condition 1 <input type="checkbox"/></th> <th style="width: 25%;">Condition 2 <input type="checkbox"/></th> <th style="width: 25%;">Condition 3 <input type="checkbox"/></th> </tr> </thead> <tbody> <tr> <td>0-150</td> <td>900 mm (3 ft)</td> <td>900 mm (3 ft)</td> <td>900 mm (3 ft)</td> </tr> <tr> <td>151-600</td> <td>900 mm (3 ft)</td> <td>1 m (31/2 ft)</td> <td>1.2 m (4 ft)</td> </tr> </tbody> </table> <p> Condition 1 — Exposed live parts on one side and no live or grounded parts on the other side of the working space, or exposed live parts on both sides effectively guarded by suitable wood or other insulating materials. Insulated wire or insulated busbars operating at not over 300 volts to ground shall not be considered live parts. Condition 2 — Exposed live parts on one side and grounded parts on the other side. Concrete, brick, or tile walls shall be considered as grounded. Condition 3 — Exposed live parts on both sides of the work space (not guarded as provided in Condition 1) with the operator between. </p>	Minimum Clear Distance				Nominal Voltage to Ground	Condition 1 <input type="checkbox"/>	Condition 2 <input type="checkbox"/>	Condition 3 <input type="checkbox"/>	0-150	900 mm (3 ft)	900 mm (3 ft)	900 mm (3 ft)	151-600	900 mm (3 ft)	1 m (31/2 ft)	1.2 m (4 ft)	<input type="checkbox"/>
Minimum Clear Distance																			
Nominal Voltage to Ground	Condition 1 <input type="checkbox"/>	Condition 2 <input type="checkbox"/>	Condition 3 <input type="checkbox"/>																
0-150	900 mm (3 ft)	900 mm (3 ft)	900 mm (3 ft)																
151-600	900 mm (3 ft)	1 m (31/2 ft)	1.2 m (4 ft)																
Working Clearances (Oregon Amendment)	2.7.2.2.1 2.7.2.2.2	1) A clear path of not less than 600-mm (24-in.) shall be provided to all components that require maintenance. 2) A clearance of not less than 600-mm (24-in.) shall be provided in the direction(s) required for maintenance access.	<input type="checkbox"/> <input type="checkbox"/>																

Machine Rooms	A17.1	Must conform to 2.7	Passed
Electrical Assembly* (Approved Testing Labs: UL, CSA, ETL, MET)	2.26.4.2	Drive-machine controllers, logic controllers, and operating devices accessory thereto for starting, stopping, regulating, controlling, or protecting electric motors, generators, or other equipment shall be listed/certified and labeled/ marked to the requirements of CAN/CSA-44.1/ ASME A17.5. (Certification/Listing # _____)	<input type="checkbox"/>
Installation Permit	OAR 918-400-0400	To be located in the M/R in clear view & not to be removed from site until passed.	<input type="checkbox"/>
Limited Elevator Journeyman Licensee or Licensed Electrician (Installer(s) Signature Required)	ORS 479.630(6) or 460.057	Name: _____ License (electrical) #: _____ Name: _____ License (mechanical) #: _____ Permit must be signed by electrical and mechanical installer(s).	<input type="checkbox"/>
GFI 15 & 20 Amp Receptacles	620-85	Must be of the GFI type.	<input type="checkbox"/>
Illumination	2.7.5.1	Minimum 200 lx (19 fc) @ floor level; evenly distributed. Actual reading: _____ ftc.	<input type="checkbox"/>
Fire Extinguisher (Class ABC) with dated inspection tag	8.6.1.6.5	Located within easy reach of the access door.	<input type="checkbox"/>
Tank Fastenings	8.4.11.6	Must be prevented from being overturned	<input type="checkbox"/>
Hydraulic Machines & Piping	A17.1	Must comply with Sections 3.18 & 3.19	
Hydraulic Power Unit	3.24.1.1 (2.16.3) 3.24.3.3 3.24.3.1	1) Working Pressure must appear on plate 2) Liquid level indicator; a) Must be of the type that can be checked without removing covers 3) Covers and venting	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>
Pressure Tanks	3.24.4 (2.16.3)	Unless covered by A17.1, must conform to ASME Boiler and Pressure Vessel Code	<input type="checkbox"/>
Control Valve	3.19.4.3-4 (2.15.3)	1) Ensure valve is of the type that comprises a check valve and manual lowering. 2) Manual lowering speed limited to 0.10 m/s (20 fpm)	<input type="checkbox"/> <input type="checkbox"/>
Flexible Hoses and Fittings Labeling must contain: <i>Mfg. name or trademark;</i> <i>Type of hose & fitting;</i> <i>Min. factory test pressure;</i> <i>Min. bending radius;</i> <i>Date of installation;</i> <i>Inspection procedure.</i>	3.19.3.3 (2.17.3) 8.6.5.6	1) H/P hoses shall: a) Not be installed in hoistways or through walls. b) Be wire reinforced as specified by SAE J5 17D c) Withstand 5 times working pressure d) Must be provided with a line overspeed valve (refer to 3.19.4.7) e) Marked with a replacement date no more than 6 years from installation f) Labeled as indicate in the first column	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>
Supply Line and Shut Off	3.19.4 Ore. Amend (3.19.4.2)	1) Fittings and piping and valves shall: a) Located in M/R (Note: Pit shut-off also required). b) Have a safety factor of 5 c) (Mfg. psi x mfg. SF/5 = allowable working psi) d) Cannot be cast iron, malleable iron or certain brass or bronze materials.	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>
Supply Piping Must comply with Section 3.19	3.19.3.1	1) Ensure piping is of appropriate size. (If piping is not distinguishable as to its rating, require documentation as to its characteristics.) 2) Ensure joints are properly fastened and there are no leaks 3) Connections shall only be one or more of the following types: a) welded b) threaded c) grooved d) bolted flange	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>

Hydraulic Machines & Piping	A17.1	Must comply with Sections 3.18 & 3.19		
Pipe Supports (restraints)	8.4.11.3	Pipe Support Spacing		
		Pipe Size	Maximum Spacing	
		1"	1525 mm (60")	<input type="checkbox"/>
		1½"	2300 mm (90")	<input type="checkbox"/>
		2"	2600 mm (102")	<input type="checkbox"/>
		2½"	2750 mm (108")	<input type="checkbox"/>
		3"	3000 mm (120")	<input type="checkbox"/>
		4"	3500 mm (138")	<input type="checkbox"/>
Plunger and Cylinder <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> Direct Plunger <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> Holeless	3.18.3.3	1) Ensure the following:	<input type="checkbox"/>	
	3.18.3.7	a) Plunger does not bottom out with car on buffers.	<input type="checkbox"/>	
	3.18.3.8	b) Oil collection not more than 19 L (5 gal.)	<input type="checkbox"/>	
	3.18.3.9	c) Below ground installations are provided with:	<input type="checkbox"/>	
	3.18.4	i) Monitored cathodic protection	<input type="checkbox"/>	
Car Frames & Enclosures	A17.1	Must comply with 2.15		
		Elevators Traveling above Sidewalk Level	5.5.1.15.1	1) Car frames of the under-slung rope-suspended type of elevators shall be of sufficient depth to provide the minimum vertical clearance between the car rope hitches or car sheaves and any obstruction in the hoistway vertically above them, as specified in 2.4.8, when the car floor is level with its upper landing level.
2) The depth of the car frame and the length and spacing of guiding members shall conform to 2.15.4 and, in addition, shall be such as to prevent tipping of the platform when it is at the highest upper landing level.	<input type="checkbox"/>			
3) The car platform shall be provided with metal aprons or guards on all exposed sides conforming to the following:.....	<input type="checkbox"/>			
a) They shall be made of metal of not less than 1.5 mm (0.059 in.) in thickness.	<input type="checkbox"/>			
b) They shall have a straight vertical face flush with the outer edge of the platform having a depth of not less than the distance between the normal upper terminal landing level and the highest upper landing level plus 75 mm (3 in.).	<input type="checkbox"/>			
Bow-Irons and Stanchions	5.5.1.15.2	1) Where hinged doors or vertically lifting covers are provided at the sidewalk or other exterior area, bow-irons or stanchions shall be provided on the car to operate the doors or covers.	<input type="checkbox"/>	
		2) Bow-irons and stanchions shall conform to the following:	<input type="checkbox"/>	
		a) They shall not be less than 2 130 mm (84 in.) high, except that this height may be reduced by an amount necessary to permit the doors or covers to close when the car is at the landing next to the top terminal landing.	<input type="checkbox"/>	
		b) They shall be so designed, installed, and braced as to withstand the impact when striking the doors or covers.	<input type="checkbox"/>	
		c) Bow-irons shall be located approximately symmetrical with respect to the center of the car platform.	<input type="checkbox"/>	
d) Stanchions shall be framed together at their upper ends and provided with spring buffers at the top.	<input type="checkbox"/>			

Roped Hydraulic N/A

<p>Car Safeties</p> <p>Rated Speed: _____ m/s _____ fpm</p> <p>Tripping Speed: _____ m/s _____ fpm</p>	<p>2.17</p>	<p>1) Required on Roped Hydraulic Elevators: a) SOS switch b) governor switch c) overspeed switch for speeds > 150 fpm d) Type A safeties for cars of 150 fpm or less</p> <p>2) Governor tripping speed..... a) 0-125 fpm 175 fpm trip b) 150 fpm 210 fpm trip c) see table 206.2a for faster speeds</p> <p>Note: The safety switches required must cause main drive power to be removed from the pump motor and control valve when safeties are activated.</p>	<p><input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/></p>
<p>Roping</p>	<p>3.18.1.2.1 3.18.1.2.2 3.18.1.2.3 3.18.1.2.4 3.18.1.2.5 3.18.1.2.6 3.18.1.2.7 3.18.1.2.8</p>	<p>1) The driving member of the hydraulic jack shall be vertical. Cars shall be suspended with not less than two wire ropes per hydraulic jack in conformance with 2.15.13 and 2.20.</p> <p>2) Where three or more hydraulic jacks are utilized, one rope per hydraulic jack shall be permitted to be used. Should one hydraulic jack become disconnected, the remaining hydraulic jacks shall be capable of supporting the load without exceeding allowable car frame stresses or hydraulic jack stress. The ropes shall conform to 2.15.13 and 2.20.</p> <p>3) Ropes passing through seals fixed in cylinder heads shall be permitted to have a clear plastic coating applied in order to seal properly and facilitate rope inspection.</p> <p>4) The roping ratio that relates the driving member of the hydraulic jack speed to the car speed shall not exceed 1:2.</p> <p>5) Sheaves used to transfer load from the hydraulic jack to the car frame through wire ropes shall conform to 2.24.2, 2.24.3, and 2.24.5.</p> <p>6) Means shall be provided to prevent the ropes, if slack, from leaving the sheave grooves.</p> <p>7) A slack-rope device with an enclosed manually reset switch shall be provided that shall cause the electric power to be removed from the hydraulic machine pump motor and the control valves should any rope become slack.</p> <p>8) The traveling sheave shall be attached with fastenings having a minimum factor of safety of 4, based upon the ultimate strength of the material used. The load to be used in determining the factor of safety shall be the resultant of the maximum tensions in the ropes leading from the sheave with the elevator at rest and with rated load in the car.</p>	<p><input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/></p>

Testing	8.10.5.1	Comments	Passed
Plunger Gripper (optional)	3.17.3	1) A plunger gripper shall be permitted to be provided for direct acting hydraulic elevators using hydraulic jacks equipped with plungers. A plunger gripper shall be capable of stopping and holding the car with its rated load from the actual measured tripping speed per Table 2.18.2.1 and shall conform to 3.17.3.1 through 3.17.3.9. In Table 2.18.2.1 the words "rated speed" shall be replaced by "operating speed in the down direction."	N/A <input type="checkbox"/>
	3.17.3.1	2) Limits of Application. a) A plunger gripper shall be permitted, provided that:..... i) The external pressure applied to the plunger by the device shall be symmetrically distributed at locations around the circumference of the plunger. The resulting stress in the plunger shall not exceed 67% of the yield strength at any point of the plunger. ii) The external pressure applied to the plunger by the device does not exceed 67% of the value that will cause local buckling. Where the external pressure is applied over substantially the full circumference of the plunger, the maximum value shall be permitted to be determined by 8.2.8.6. iii) During the application, the plunger and the plunger gripper are capable of withstanding any vertical forces imposed upon them, and transfer such forces to the supporting structure. During the application of the device, any loading on the plunger shall not damage the cylinder. iv) Power shall be removed from the hydraulic machine before or at the time of application. <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>
	3.17.3.2	3) Means of Application.....
	3.17.3.2.1	a) A plunger gripper shall mechanically grip the plunger.	<input type="checkbox"/>
	3.17.3.2.1	4) Hydraulic means are permitted to be used to hold the gripper in the retracted position. A loss of hydraulic pressure or fluid causing uncontrolled downward motion is permitted to be used to apply the plunger gripper.	<input type="checkbox"/>
	3.17.3.2.2	5) When electrical means are used to actuate the gripper, the following shall apply:..... a) The plunger gripper shall be fully operational during a primary electrical system power failure. b) In the event of the failure of any single mechanically operated switch, contactor, relay, solenoid, or any single solid-state device, or a software system failure, or the occurrence of a single ground, the elevator shall not be permitted to restart after a normal stop. <input type="checkbox"/> <input type="checkbox"/>
	3.17.3.3	6) Release.....
	3.17.3.3.1	a) The plunger gripper shall be released by establishing at least no-load static pressure on the hydraulic system, or by other means capable of holding the entire car weight.	<input type="checkbox"/>
	3.17.3.3.2	b) The elevator shall not be permitted to be restarted without establishing at least no-load static pressure on the hydraulic system.	<input type="checkbox"/>
	3.17.3.4	7) Clearance.....
	3.17.3.4	a) In the normally retracted position of the plunger gripper, any contact between the gripping surface and the plunger shall not cause degradation of the plunger or premature degradation of the gripping surface.	<input type="checkbox"/>
	3.17.3.5	8) Deceleration.....
	3.17.3.5	a) The deceleration of the elevator upon actuation of the plunger gripper shall comply with the following criteria:	<input type="checkbox"/>
	3.17.3.5	i) The average deceleration rate at rated load shall be not less than 0.1 gravity nor more than 1.0 gravity.	<input type="checkbox"/>
	3.17.3.5	ii) Any peak deceleration rate in excess of 2.0 gravity shall have a duration of not greater than 0.04 s.	<input type="checkbox"/>