

A17.1 2007	A17.1 2010	Oregon Amendment [Ore]
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Elevator Code Comparisons A17.1 2007 vs. A17.1 2010 (with Oregon amendments)

The following table indicates most of the changes in the ASME A17.1 2010 elevator safety standard. Shaded areas are intended to show comparisons to new, altered or deleted language. Obvious changes are not necessarily highlighted. The designation [Ore] indicates an Oregon amendment to the code.

ASME A17.1 2010		
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1.1.2 Equipment not Covered Under this Code (u) platform elevators installed in a ship or offshore drilling rig and used for the purpose of loading and unloading cargo, equipment, and personnel	1.1.2 Equipment not Covered Under this Code (u) platform-type elevators installed on board a marine vessel NOTES: (1) A maritime, industrial use device with no car enclosure. Controls are located outside of the hoistway. Typically utilizes elevator-type rail systems and elevator-type interlock systems. (2) Not a platform lift within scope of A18.1.	NA
2.4.6	2.4.6 through 2.4.9 editorial changes updating cross referencing	NA
2.4.6.1.1 (B) (2) for reduced-stroke oil buffers (see 2.22.4.1.2), the full stroke required by 2.22.4.1.1.	2.4.6.1.1 (B) (2) for reduced stroke buffers (see 2.22.4.1.2), the stroke of the buffer used.	
2.7.5.1.3 When the means required in 2.7.5.1.1 is engaged, egress from the working area shall be provided (see also 2.7.3.4.3).	2.7.5.1.3 When the means required in 2.7.5.1.1 is engaged, egress from the working area shall be provided (see also 2.7.3.4.3 and 8.6.11.7).	NA
2.7.5.2.3 When the means required in 2.7.5.2.1 is in the active position, safe and convenient egress from the working area shall be provided (see also 2.7.3.4.3).	2.7.5.2.3 When the means required in 2.7.5.2.1 is in the active position, safe and convenient egress from the working area shall be provided (see also 2.7.3.4.3 and 8.6.11.7).	NA
2.7.5.3.1 A working platform shall be permanently installed, and it shall be permitted to be retractable. Retractable platforms, that are in the line of movement of the car or counterweight when in the operating position, shall operate a working platform electrical device(s) (see 2.26.2.36) that shall cause the power to be removed from the elevator driving-machine motor and brake unless the platform is in its fully retracted position.	2.7.5.3.1 A working platform shall be permanently installed, and it shall be permitted to be retractable. Retractable platforms, that are in the line of movement of the car or counterweight when in the operating position, shall operate a working platform electrical device(s) (see 2.26.2.36) that shall cause the power to be removed from the elevator driving-machine motor and brake unless the platform is in its fully retracted position. (see 8.6.11.8)	NA
2.7.5.5 Retractable Stops. (b) be permitted to be equipped with an electrical device(s) that permits operation of the car only on inspection operation when the platform is in the operating position and the stops are in the fully extended position. When provided with such an electrical device	2.7.5.5 Retractable Stops. (b) be permitted to be equipped with an electrical device(s) that permits operation of the car only on inspection operation when the platform is in the operating position and the stops are in the fully extended position. When provided with such an electrical device	NA

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<p>and the stop(s) is in the extended position, an additional 30 stopping device conforming to 2.25.3.1 and 2.25.3.3 through 2.25.3.5 shall cause the car to stop before it strikes the movable stop(s). This additional stopping device shall be rendered ineffective when the stop(s) is in the retracted position. Any electrical device(s) used to render the additional stopping device ineffective shall be in conformance with 2.26.4.3, 2.26.9.3(a), and 2.26.9.4.</p>	<p>and the stop(s) is in the extended position, an additional 30 stopping device conforming to 2.25.3.1 and 2.25.3.3 through 2.25.3.5 shall cause the car to stop before it strikes the movable stop(s). This additional stopping device shall be rendered ineffective when the stop(s) is in the retracted position. Any electrical device(s) used to render the additional stopping device ineffective shall be in conformance with 2.26.4.3, 2.26.9.3.1(a), 2.26.9.3.2 and 2.26.9.4.</p>	
<p>2.7.6.5.1 The inspection and test panel shall be required where any of the following are not accessible from outside the hoistway: (a) the “CAR DOOR BYPASS” and “HOISTWAY DOOR BYPASS” switches required by 2.26.1.5; or (b) the devices necessary for the manual reset of the detection means for ascending car overspeed protection [see 2.19.1.2(a)(4)], and protection against unintended car movement [see 2.19.2.2(a)(4)], or (c) the circuits of the following devices: (1) the car-safety mechanism switch (see 2.26.2.9) (2) the car buffer switch, where provided (see 2.26.2.22) (3) the top and bottom final terminal stopping devices (see 2.26.2.11) ASME A17.1-2007/CSA B44-07 (4) the car and counterweight governor switches, where provided (see 2.26.2.10)</p>	<p>2.7.6.5.1 The inspection and test panel shall be required where any of the following are not accessible from outside the hoistway: (a) the devices necessary for the manual reset of the detection means for ascending car overspeed protection [see 2.19.1.2(a)(4)], and protection against unintended car movement [see 2.19.2.2(a)(4)], or (b) the circuits of the following devices: (1) the car-safety mechanism switch (see 2.26.2.9) (2) the car buffer switch, where provided (see 2.26.2.22) (3) the top and bottom final terminal stopping devices (see 2.26.2.11) ASME A17.1-2007/CSA B44-07 (4) the car and counterweight governor switches, where provided (see 2.26.2.10)</p>	NA
<p>2.7.5.2 The inspection and test panel, where provided shall (h) where the circuits of the devices in 2.7.6.5.1(c)(1) through (4) are not accessible from outside the hoistway, include landing inspection operation in conformance with 2.26.1.4.4, and that shall be permitted to render ineffective the following electrical protective devices, individually or as a group or groups, in conformance with the requirements of 2.26.9.3(a) and 2.26.9.4:</p>	<p>2.7.5.2 The inspection and test panel, where provided shall be accessible from outside the hoistway and shall (h) where the circuits of the devices in 2.7.6.5.1(b)(1) through (4) are not accessible from outside the hoistway, include landing inspection operation in conformance with 2.26.1.4.4, and that shall be permitted to render ineffective the following electrical protective devices, individually or as a group or groups, in conformance with the requirements of 2.26.9.3.1(a) and 2.26.9.3.2 and 2.26.9.4.:</p>	NA
<p>2.12.7.3 Operating Requirements. The operation of the switch shall permit movement of the car with the hoistway door at this landing unlocked or not in the closed position, and with the car door or gate not in the closed position, subject to the requirements of 2.12.7.3.1 through 2.12.7.3.8.</p>	<p>2.12.7.3 Operating Requirements. The operation of the switch shall permit movement of the car only when the zone specified in 2.12.7.3.6 or 2.12.7.3.7. The operation of the switch shall permit movement of the car with the hoistway doors at this landing unlocked or not in the closed position, and with the car door or gate not in the closed position, subject to the requirements of 2.12.7.3.1 through 2.12.7.3.8.</p>	NA

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<p>2.12.7.3.8 The access switch shall only control the movement of the car within the zone specified in 2.12.7.3.6 or 2.12.7.3.7. Control circuits related to, or operated by, the hoistway access switches shall comply with 2.26.9.3(c), (d), and (e) and 2.26.9.4.</p>	<p>2.12.7.3.8 Control circuits relate to, or operated by, the hoistway access switches shall comply with 2.26.9.3 (c), (d), and (e) and 2.26.9.4.</p>	<p>NA</p>
<p>2.14.1.8.3 In jurisdictions enforcing the NBCC, type 3C film reinforced silvered mirror glass that conforms to CAN/CGSB-12.5 shall be permitted for lining walls or ceilings.</p>	<p>DELETED</p>	<p>NA</p>
<p>2.14.2.1 Material for Car Enclosures, Enclosure Linings, and Floor Coverings. All materials exposed to the car interior and the hoistway shall be metal, glass, or shall conform to 2.14.2.1.1 through 2.14.2.1.6.</p>	<p>2.14.2.1 Material for Car Enclosures, Enclosure Linings, and Floor Coverings. All materials exposed to the car interior and the hoistway shall be metal, glass, or shall conform to 2.14.2.1.1 through 2.14.2.1.4.</p>	<p>NA</p>
<p>2.14.2.1.1 Materials in their end-use configuration, other than those covered by 2.14.2.1.2 through 2.14.2.1.6 shall conform to the following requirements, based on the tests conducted in accordance with the requirements of ASTM E 84, ANSI/UL 723, NFPA 252, or CAN/ULC-S102.2, whichever is applicable: (a) flame spread rating of 0 to 75 (b) smoke development of 0 to 450</p>	<p>2.14.2.1.1 In jurisdictions not enforcing NBCC (a) materials in their end use configuration, other than those covered by 2.14.2.1(b) and (c), 2.14.2.1.3, and 2.14.2.1.4, shall conform to the following requirements, based on tests conducted in accordance with the requirements of ASTM E 84, AMS/UL 723, or CAN/UCL-S102: (1) flame spread rating of 0 to 75 (2) smoke development of 0 to 450 (b) napped, tufted, woven, looped, and similar materials in their end use configuration on car enclosure walls shall conform to 8.3.7. The enclosure walls to which this material is attached shall conform to 2.14.2.1.1(a). (c) floor covering, underlayment, and its adhesive shall have a critical radiant flux of not less than 0.45 W/cm², as measured by ASTM E 648.</p>	<p>NA</p>
<p>2.14.2.1.2 In jurisdictions enforcing the NBCC, where the building is designated by the building code as a high building, materials in their end-use configuration shall have (a) a flame spread rating for walls and ceiling of 0 to 25 with smoke development of 0 to 100 based on the test conducted in accordance with the requirements of CAN/ULC-S102 (b) a flame spread rating for floor surfaces of 0 to 300 with smoke development of 0 to 300, based on the test conducted in accordance with the requirements of CAN/ULC-S102.2.</p>	<p>2.14.2.1.2 In jurisdictions enforcing the NBCC, (a) materials in their end use configuration other than those covered by 2.14.2.1.2(b), 2.14.2.1.3, and 2.14.2.1.4, shall conform to the following requirements, based on the tests conducted in accordance with the requirements of ASTM E 84, ANSI/UL 723, or CAN/UL-S102: (1) flame spread rating of 0 to 75 (2) smoke development of 0 to 450 (b) floor surfaces shall have a flame spread rating of 0 to 300, based upon the test conducted in accordance with the requirements of CAN/UL-S102-2. (c) where the building is designated by the building code as a high building (1) Materials in their end use configuration shall have a flame spread rating for walls and ceiling of 0 to 25,</p>	<p>NA</p>

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	<p>with smoke development of 0 to 100, based upon the test conducted in accordance with the requirements of CAN/ULC-S102.</p> <p>(2) Floor surfaces shall have a flame spread rating of 0 to 300, with smoke development of 0 to 300, based on the test conducted in accordance with the requirements of CAN/ULC-S102.2</p>	
<p>2.14.2.1.3 Napped, tufted, woven, looped, and similar materials in their end-use configuration on car enclosure walls shall conform to 8.3.7 or the NBCC and NFCC, whichever is applicable. The enclosure walls to which this material is attached shall conform to 2.14.2.1.1.</p>	<p>2.14.2.1.3 Padded protective linings, for temporary use in passenger cars during the handling of freight shall be of materials conforming to either 2.14.2.1.1(a) or (b), or 2.14.2.1.2(a), whichever is applicable. The protective lining shall clear the floor by not less than 100 mm (4 in.).</p>	<p>N/A</p>
<p>2.14.2.1.4 Padded protective linings, for temporary use in passenger cars during the handling of freight, shall be of materials conforming to either 2.14.2.1.1 or 2.14.2.1.3, whichever is applicable. The protective lining shall clear the floor by not less than 100 mm (4 in.).</p>	<p>2.14.2.1.4 Handrails, opening devices, ventilation devices, signal fixtures, audio and visual communication devices, and their housings are not required to conform to 2.14.2.1.</p>	<p>N/A</p>
<p>2.14.2.1.5 Floor covering, underlayment, and its adhesive shall have a critical radiant flux of not less than 0.45 W/cm², as measured by ASTM E648 or conform to the requirements of the NBCC and ULC standard CAN/ULC-S102.2, whichever is applicable.</p> <p>54</p>	<p>DELETED</p>	<p>N/A</p>
<p>2.14.4.5.1 (a) where a swinging-type hoistway door and a car gate are used, 100 mm (4 in.)</p>	<p>2.14.4.5.1 (a) where a swinging-type hoistway door and a car gate or folding gate are used, 100 mm (4 in.)</p>	<p>N/A</p>
<p>2.14.4.5.2</p>	<p>2.14.4.5.2 added (d) where a folding car door is used, between the hoistway door and the car door panel the furthest from the hoistway door, when closed (see 2.12.2.2. and 2.14.4.11)</p>	<p>N/A</p>
<p>2.14.4.6 Strength of Doors, Gates, and Their Guides, Guide Shoes, Tracks, and Hangers. Doors and gates and their guides, guide shoes, tracks, and hangers shall be so designed, constructed, and installed that when the fully closed door or gate is subjected to a force of 335 N (75 lbf), applied on an area 300 mm (12 in.) square at right angles to and approximately at the center of the door or gate, it will not deflect beyond the line of the car sill.</p> <p>When subjected to a force of 1 100N(250 lbf) similarly applied, doors and vertically sliding gates shall not break or be permanently deformed and shall not be displaced from their guides or tracks.</p> <p>Where multisection doors or gates are used, each panel shall withstand the forces specified.</p>	<p>2.14.4.6 Strength of Doors, Gates, and Their Guides, Guide Shoes, Tracks, and Hangers. Doors and gates and their guides, guide shoes, tracks, and hangers shall be so designed, constructed, and installed that when the fully closed door or gate is subjected to a force of 335 N (75 lbf), applied on an area 300 mm (12 in.) square at right angles to and approximately at the center of the door or gate, it will not deflect more than 13mm (0.5 in.) toward the hoistway door.</p> <p>Where a swing-type hoistway door and car gate or folding door are used, the gate or folding door shall not deflect more than 13 mm (0.5 in.) when subject to a force of 335 N (75 lbf) when applied to the hoistway side of the car gate or folding door at the following locations:</p> <p>(a) An area 100 mm (4 in.) square at right angles at the Approximate center of the gate or folding door opening</p> <p>(b) An area 100 mm (4 in.) square at right angles at</p>	<p>N/A</p>

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	<p>25% and 75% of the door width at a height of 450 mm (18 in.) from the floor level.</p> <p>For individual panels of folding doors of a width less than 100 mm (4 in.), the specified forces in (a) and (b) shall be applied over an area 100 mm (4 in.) tall by the width of the individual panel.</p> <p>When subjected to a force of 1 00N(250 lbf) similarly applied, doors and vertically sliding gates shall not break or be permanently deformed and shall not be displaced from their guides or tracks.</p> <p>Where multisection doors or gates are used, each panel shall withstand the forces specified.</p>	
<p>2.14.5.2 Type Required. Horizontally or vertically sliding doors subject to the restrictions of 2.14.5.3 shall be provided at each car entrance.</p>	<p>2.14.5.2 Type Required. Horizontally or vertically sliding doors subject to the restrictions of 2.14.5.3 shall be provided at each car entrance. Folding car doors are not permitted.</p>	<p>NA</p>
<p>2.14.5.9</p>	<p>2.14.5.9 Folding Car Doors Added</p> <p>2.14.5.9.1 Folding car doors shall conform to 2.14.4 except paras. 2.14.4.4, 2.14.4.7, and 2.14.4.9. They shall also conform to all of 2.14.5 except paras. 2.14.5.3, 2.14.5.6.2, 2.14.5.7, and 2.14.5.8.</p> <p>2.14.5.9.2 The effort needed to prevent a folding car door from closing shall conform to 2.13.4.2.3.</p> <p>2.14.5.9.3 Folding car doors shall not be power opened to a distance exceeding one-third of the clear opening, and in no case more than 250 mm (10 in.).</p> <p>2.14.5.9.4 Handles of manually operated folding car doors nearest the car operating device on elevators operated from the car only shall be so located that the nearest handle is not more than 1,220 mm (48 in.) from the care operating device when the folding door is closed, and between 1,220 mm (4 in.) and 380 cm (15 in) above the car floor.</p>	<p>NA</p>
<p>2.14.6.1.1 For elevators designed for Class A loading (see 2.16.2.2), car gates shall be either of the vertically sliding type (see 2.14.6.2) or the horizontally sliding collapsible type (see 2.14.6.3).</p>	<p>2.14.6.1.1 For elevators designed for Class A loading (see 2.16.2.2), car gates shall be either of the vertically sliding type (see 2.14.6.2) or the horizontally sliding collapsible type (see 2.14.6.3), or a car door of the folding type (see 2.14.5.9).</p>	<p>NA</p>
<p>2.14.7.1.1 Not less than two lamps shall be provided</p>	<p>2.14.7.1.1 Not less than two lamps shall be provided the full width of the car entrance opening, and their height shall be determined as follows:</p> <p>(a) car doors and gates shall extend from a point not more than 25 mm (1 in.) above the car floor to a point not less than 1,825 mm (72 in.) above the car floor.</p> <p>(b) where a vertical sliding car gate with a door reopening device is provided, the 25 mm (1 in.) maximum dimension specified shall be measured from the car floor to the bottom of the leading member.</p>	<p>NA</p>

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<p>2.14.7.1.3 Each elevator shall be provided with auxiliary lighting having its power source located on the car. It shall conform to the following:</p> <p>(a) The intensity of auxiliary lighting illumination shall be not less than 2 lx (0.2 fc), measured at any point between 1 225 mm (48 in.) and 890 mm (35 in.) above the car floor and approximately 300mm(12 in.) centered horizontally in front of a car operating panel containing any of the following:</p> <ol style="list-style-type: none"> (1) car operating device(s) (2) door open button (3) rear or side door open button (4) door close button (5) rear or side door close button (6) “HELP” button and operating instructions, or (7) “ALARM” switch <p>(b) Illumination is not required in front of additional car operating panels where the devices listed in 2.14.7.1.3(a) are duplicated.</p> <p>(c) Auxiliary lights shall be automatically turned on in all elevators in service after normal car lighting power fails.</p> <p>(d) The power systems shall be capable of maintaining the light intensity specified in 2.14.7.1.3(a) for a period of at least 4 h.</p> <p>(e) Not less than two lamps of approximately equal wattage shall be used.</p> <p>(f) Battery-operated units, where provided, shall</p> <ol style="list-style-type: none"> (1) comply with CSA C22.2 No. 141 (see Section 4) (2) have a 4h rating minimum (3) be permanently connected to the car light branch circuit (4) have an output rating that includes the auxiliary lights and if connected, the emergency signaling device (see 2.27.1.1.3) 	<p>2.14.7.1.3 Each elevator shall be provided with auxiliary lighting having its power source located on the car. It shall conform to the following:</p> <p>(a) The intensity of auxiliary lighting illumination shall be not less than 2 lx (0.2 fc), measured at any point between 1 225 mm (48 in.) and 890 mm (35 in.) above the car floor and approximately 300mm(12 in.) centered horizontally in front of a car operating panel containing any of the following:</p> <ol style="list-style-type: none"> (1) car operating device(s) (2) door open button (3) rear or side door open button (4) door close button (5) rear or side door close button (6) “PHONE” button and operating instructions, or (7) “ALARM” switch <p>(b) Illumination is not required in front of additional car operating panels where the devices listed in 2.14.7.1.3(a) are duplicated.</p> <p>(c) Auxiliary lights shall be automatically turned on in all elevators in service after normal car lighting power fails.</p> <p>(d) The power source shall be located on the car.</p> <p>(e) The power systems shall be capable of maintaining the light intensity specified in 2.14.7.1.3(a) for a period of at least 4 h.</p> <p>(f) Not less than two lamps or sets of lamps of approximately equal illumination shall be provided. Systems using only one of the two required lamps or sets of lamps to provide the required illumination shall be permitted and shall comply with the following:</p> <ol style="list-style-type: none"> (1) each lamp or set of lamps shall provide the minimum illumination in conformance with 2.14.7.1.3(a) (2) systems shall be arranged to automatically illuminate the unlit lamp or set of lamps immediately following a failure of the first lamp or lamps. (3) systems shall be designed so that an audible or visual signal notifies authorized personnel when one lamp or set of lamps is not functional. <p>(g) Battery-operated units, where provided, shall</p> <ol style="list-style-type: none"> (1) comply with CSA C22.2 No. 141 or UL 624 (see Section 9) (2) have a 4h rating minimum 	<p style="text-align: center;">NA</p>

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	<p>(3) be permanently connected to the car light branch circuit</p> <p>(1) have an output rating that includes the auxiliary lights and if connected, the emergency signaling device (see 2.27.1.1.3)</p> <p>(h) The lamps used for auxiliary lighting are permitted to be the same lamps used for normal illumination in conformance with 2.14.7.1.1.</p>																															
<p>2.16.3.2.2 Data plates shall indicate</p> <p>(a) the weight of the complete car, including the car safety and all auxiliary equipment attached to the car</p> <p>(b) the rated load and speed</p> <p>(c) the wire rope data required by 2.20.2.1</p> <p>(d) the name or trademark of the manufacturer and year manufactured</p> <p>(e) rail lubrication instructions (see 2.17.16)</p>	<p>2.16.3.2.2 Data plates shall indicate</p> <p>(a) the weight of the complete car, including the car safety and all auxiliary equipment attached to the car</p> <p>(b) the rated load and speed</p> <p>(c) the suspension means data required by 2.20.2.1</p> <p>(d) the name or trademark of the manufacturer and year manufactured</p> <p>(e) rail lubrication instructions (see 2.17.16)</p>	N/A																														
<p>2.17.1</p> <p>The car of every elevator suspended by wire ropes shall be provided with one or more car safety devices of one of the types identified in 2.17.5. The safeties shall be attached to the car frame, and one safety shall be located within or below the car frame.</p> <p>All car safeties shall be mounted on a single car frame and shall operate only on one pair of guide rails between which the frame is located.</p>	<p>2.17.1</p> <p>The car of every elevator suspended as required by 2.20.1 shall be provided with one or more car safety devices of one of the types identified in 2.17.5. Safeties shall be attached to the car frame, and at least one safety shall be located within or below the car frame.</p> <p>All car safeties shall be mounted on a single car frame and shall operate only on one pair of guide rails between which the frame is located.</p>	N/A																														
<p>2.18.5.1 Material and Factor of Safety. Governor ropes shall be of iron, steel, monel metal, phosphor bronze, or stainless steel. They shall be of a regular-lay construction and not less than 9.5 mm (0.375 in.) in diameter. The factor of safety of governor ropes shall be not less than 5. Tiller-rope construction shall not be used.</p>	<p>2.18.5.1 Material and Factor of Safety. Governor ropes shall be of iron, steel, monel metal, phosphor bronze, or stainless steel. They shall be of a regular-lay construction and not less than 6 mm (0.25 in.) in diameter. The factor of safety of governor ropes shall be not less than 5. Where provided, ropes of a diameter less than 9.5 mm (0.375 in.) shall have a factor of safety of not less than 8 and shall be of six eight, or nine strand construction. Tiller-rope construction shall not be used.</p>	N/A																														
<p>Table 2.18.7.4 Multiplier for Determining Governor Sheave Pitch Diameter</p> <table border="1"> <thead> <tr> <th>Rated Speed, m/s (ft/min)</th> <th>Number of Strands</th> <th>Multiplier</th> </tr> </thead> <tbody> <tr> <td>1.00 or less (200 or less) 6</td> <td>6</td> <td>42</td> </tr> <tr> <td>1.00 or less (200 or less) 8</td> <td>8</td> <td>30</td> </tr> <tr> <td>Over 1.00 (over 200) 6</td> <td>6</td> <td>46</td> </tr> <tr> <td>Over 1.00 (over 200) 8</td> <td>8</td> <td>32</td> </tr> </tbody> </table>	Rated Speed, m/s (ft/min)	Number of Strands	Multiplier	1.00 or less (200 or less) 6	6	42	1.00 or less (200 or less) 8	8	30	Over 1.00 (over 200) 6	6	46	Over 1.00 (over 200) 8	8	32	<p>Table 2.18.7.4 Multiplier for Determining Governor Sheave Pitch Diameter</p> <table border="1"> <thead> <tr> <th>Rated Speed, m/s (ft/min)</th> <th>Number of Strands</th> <th>Multiplier</th> </tr> </thead> <tbody> <tr> <td>1.00 or less (200 or less) 8</td> <td>8</td> <td>42</td> </tr> <tr> <td>1.00 or less (200 or less) 8 or 9</td> <td>8 or 9</td> <td>30</td> </tr> <tr> <td>Over 1.00 (over 200) 6</td> <td>6</td> <td>46</td> </tr> <tr> <td>Over 1.00 (over 200) 8 or 9</td> <td>8 or 9</td> <td>32</td> </tr> </tbody> </table>	Rated Speed, m/s (ft/min)	Number of Strands	Multiplier	1.00 or less (200 or less) 8	8	42	1.00 or less (200 or less) 8 or 9	8 or 9	30	Over 1.00 (over 200) 6	6	46	Over 1.00 (over 200) 8 or 9	8 or 9	32	N/A N/A
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Over 1.00 (over 200) 8 or 9	8 or 9	32																														

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<p>2.18.7.4 The pitch diameter of governor sheaves and governor tension sheaves shall be not less than the product of the diameter of the rope and the applicable multiplier listed in Table 2.18.7.4, based on the rated speed and the number of strands in the rope</p>	<p>2.18.7.4 Where governor ropes of a diameter of 9.5 mm (0.375 in.) or greater are used, the pitch diameter of governor and governor tension sheaves shall be not less than the product of the diameter of the rope and the applicable multiplier listed in Table 2.18.7.4, based upon the rated speed and the number of strands in the rope. Where governor ropes of a diameter less than 9.5 mm (0.375 in.) are used, the governor sheave shall have a pitch diameter of not less than the product of the diameter of the rope and a multiplier of 30.</p>	<p>NA</p>
<p>2.20.1 Suspension Means Elevator cars shall be suspended by steel wire ropes attached to the car frame or passing around sheaves attached to the car frame specified in 2.15.1. Ropes that have previously been installed and used on another installation shall not be reused. Only iron (low-carbon steel) or steel wire ropes, having the commercial classification "Elevator Wire Rope," or wire rope specifically constructed for elevator use, shall be used for the suspension of elevator cars and for the suspension of counterweights. The wire material for ropes shall be manufactured by the open-hearth or electric furnace process or their equivalent.</p>	<p>2.20.1 Elevator cars and counterweights shall be suspended by steel wire ropes, aramid fiber ropes, or noncircular elastomeric coated steel suspension members attached to the car frame or passing around sheaves attached to the car frame specified in 2.15.1. Suspension means that have previously been installed and used on another installation shall not be reused. All suspension members in a set of suspension means shall be of the same material, grade, construction, and dimensions. A suitable means shall be provided to protect the suspension means during the installation process. Only the following shall be permitted: (a) Steel wire ropes constructed in accordance with ASME A17.6, Part 1 (b) Aramid fiber ropes constructed in accordance with ASME A17.6, Part 2 (c) Noncircular elastomeric-coated steel suspension members constructed in accordance with ASME A17.6, Part 3</p>	<p>NA</p>

<p>2.20.2 Wire Rope Data</p> <p>2.20.2.1 On Crosshead Data Plate. The crosshead data plate required by 2.16.3 shall bear the following wire-rope data:</p> <ul style="list-style-type: none"> (a) the number of ropes (b) the diameter in millimeters (mm) or inches (in.) (c) the manufacturer's rated breaking strength per rope in kilonewton (kN) or pounds (lb) <p>2.20.2.2 On Rope Data Tag. A metal data tag shall be securely attached to one of the wire-rope fastenings. This data tag shall bear the following wire-rope data:</p> <ul style="list-style-type: none"> (a) the diameter in millimeters (mm) or inches (in.) (b) the manufacturer's rated breaking strength (c) the grade of material used (d) the month and year the ropes were installed (e) the month and year the ropes were first shortened (f) whether the ropes were nonperformed or performed (g) construction classification (h) name of the person or organization who installed the ropes (i) name or trademark of the manufacturer of the ropes (j) lubrication information <p>A new tag shall be installed at each rope renewal. The material and marking of the rope data tag shall conform to 2.16.3.3, except that the height of the letters and figures shall be not less than 1.5 mm (0.06 in.).</p>	<p>2.20.2 Wire Rope Data</p> <p>2.20.2.1 On Crosshead Data Plate. The crosshead data plate required by 2.16.3 shall bear the following suspension means data:</p> <ul style="list-style-type: none"> (a) type of suspension means (b) the number of suspension members (c) either the diameter or the width and thickness in millimeters (mm) or inches (in.), as applicable (d) the elevator manufacturer's required minimum breaking force per suspension member in kilo New tons (kN) or pounds-force (lbf), as applicable. <p>2.20.2.2 Data tag at suspension means fastening</p> <p>2.20.2.2.1 Pertinent data located on the suspension means shall be provided by one of the following:</p> <ul style="list-style-type: none"> (a) a data tag securely attached to one of the suspension means fastenings. (b) Permanent marking of the required information on the suspension means and visible in the vicinity of the suspension means fastening. (c) A combination of (a) and (b) provided that all required information is furnished. (d) If (a) or (c) applies, the material and markings of the tag shall conform to 2.16.3.3, except that the height of the letters and figures shall not be less than 1.5 mm (0.06 in.). (e) If (a) or (c) applies, a new tag shall be installed at each suspension means replacement. <p>2.20.2.2.2 The following data shall be provided:</p> <ul style="list-style-type: none"> (a) type of suspension (steel wire rope, aramid fiber rope, or noncircular elastomeric-coated steel suspension member) (b) either the diameter or the width and thickness in millimeters or inches, as applicable. (c) the suspension means manufacturer's minimum breaking force in kN or lbf, as applicable. (d) the residual strength determined by the elevator manufacturer in kN or lbf, as applicable. (e) the grade of material used or the suspension means manufacturer's designation, as applicable. (f) construction classification, where applicable. (g) for steel wire rope, non-performed, if applicable. (h) for steel wire rope, finish coating, if applicable. (i) for steel wire rope, compacted strands, if applicable. (j) name or trademark if the suspension means manufacturer. (k) name of person or organization who installed suspension means. (l) the month and year suspension means was installed (m) the month and year the suspension means first shortened (n) lubrication information, if applicable 	<p>N/A</p>
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<p>2.20.3 Factor of Safety The factor of safety of the suspension wire ropes shall be not less than shown in Table 2.20.3. Figure 8.2.7 gives the minimum factor of safety for intermediate rope speeds. The factor of safety shall be based on the actual rope speed corresponding to the rated speed of the car. The factor of safety shall be calculated by the following formula: $f = \frac{S}{N} \frac{W}{p}$ where N = number of runs of rope under load. For 2:1 roping, N shall be two times the number of ropes used, etc. S = manufacturer's rated breaking strength of one rope W = maximum static load imposed on all car ropes with the car and its rated load at any position in the hoistway</p>	<p>2.20.3 Factor of Safety The factor of safety of the suspension means shall be not less than shown in Table 2.20.3. Figure 8.2.7 gives the minimum factor of safety for intermediate speeds. The factor of safety shall be based on the actual speed corresponding to the rated speed of the car. Where suspension means are different from traditional steel wire ropes, technical criteria for essential safety requirements and parameters, such as minimum factor of safety, monitoring, residual strength, replacement, etc., shall be selected on the basis of best engineering practice compatible with the product technology, including performance testing under elevator operating conditions for its range of application. The minimum factor for safety for any suspension means shall not be less than the values shown in Table 2.20.3 except that the factor of safety of steel wire suspension ropes with diameters equal to or greater than 8 mm (.0315 in.) but less than 9.5 mm (0.375 in.) shall be not less than 12 or they shall meet the requirements of 2.20.8.2. See also Non mandatory Appendix U.</p> <p>The factor of safety shall be calculated by the following formula: $f = \frac{S}{N} \frac{W}{p}$ where N = number of runs of suspension means under load. For 2:1 roping, N shall be two times the number of ropes used, etc. S = manufacturer's rated breaking strength of one rope W = maximum static load imposed on all suspension members with the car and its rated load at any position in the hoistway</p>	<p>N/A</p>
<p>Table 2.20.3 Minimum Factors of Safety for Suspension Wire Ropes Rope Speed, Minimum Factor of Safety m/s (ft/min) Passenger Freight</p>	<p>Table 2.20.3 Minimum Factors of Safety for Suspension Wire Ropes Suspension Means Speed, Minimum Factor of Safety m/s (ft/min) Passenger Freight</p>	<p>N/A</p>
<p>Table 2.20.3 Minimum Factors of Safety for Suspension Wire Ropes Rope Speed, Minimum Factor of Safety m/s (ft/min) Passenger Freight</p>	<p>Table 2.20.3 Minimum Factors of Safety for Suspension Wire Ropes Suspension Means Speed, Minimum Factor of Safety m/s (ft/min) Passenger Freight</p>	<p>N/A</p>
<p>Table 2.20.9.4.5 10 to 12 inclusive 2.5 larger than nominal rope diameter 3/8 to 7/16 inclusive 3/32 larger than nominal rope diameter.</p>	<p>Table 2.20.9.4.5 8 to 12 inclusive 2.5 larger than nominal rope diameter 5/16 to 7/16 inclusive 3/32 larger than nominal rope diameter.</p>	<p>N/A</p>

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<p>2.24.2.1 Material and Grooving. Sheaves and drums used with suspension and compensating ropes shall be of metal and provided with finished grooves for ropes or shall be permitted to be lined with nonmetallic groove material.</p>	<p>2.24.2.1 Material and Grooving. Sheaves and drums used with suspension and compensating ropes shall be constructed of materials conforming to 2.24.2.1.1 or 2.24.2.1.2 and provided with finished grooves or shall be permitted to be lined with nonmetallic groove material. Sheaves and drums shall comply with 2.24.3.</p>	<p>NA</p>
<p>NA</p>	<p>2.24.2.1.1 Sheaves Driving-machine sheaves shall be integral with or directly attached to driving machine shafts. Sheaves shall be provided with steel shafts and metal bearings. Sheaves constructed of plastic, fiber-reinforced plastic, or combinations thereof shall be non-regroovable. Permanent and legible marking shall be provided on or adjacent to the nonmetallic sheaves stating, "Regrooving of sheave is not permitted".</p>	<p>NA</p>
<p>2.24.2.2 Minimum Pitch Diameter. Sheaves and drums used with suspension and compensating ropes shall have a pitch diameter of not less than (a) 40 times the diameter of the rope where used with suspension ropes (b) 32 times the diameter of the ropes where used with compensating ropes</p>	<p>2.24.2.2 Minimum Pitch Diameter. Sheaves and drums used with suspension and compensating means (see 2.20.1) shall have a pitch diameter of not less than (a) 40 times the diameter of the rope where used with suspension ropes (b) 40 times the cord diameter (see ASME A17.6, 3.3.3.1.1) of noncircular elastomeric-coated steel suspension members where used for suspension (c) 16 times the functional diameter (see ASME A17.6, 2.3.3.1.2) of the load carrying fibers of aramid ropes where used for suspension or compensation (d) 32 times the diameter of the steel wire ropes and cord diameter of noncircular elastomeric-coated steel suspension members where used for compensating ropes</p>	<p>NA</p>
<p>2.24.2.3 Traction 2.24.2.3.1 Where the grooves are used to transmit power, sufficient traction shall be provided between the rope and groove, and in the event of nonmetallic</p>	<p>2.24.2.3 Traction 2.24.2.3.1 For Steel Wire Ropes. Where the grooves are used to provide traction, sufficient traction shall be provided between the rope and groove, and in the event of nonmetallic lining failure, between the rope and the remaining sheave groove, to safely stop and hold the car with rated load [see 2.16.8(c)] from rated speed in the down direction</p>	<p>NA</p>
<p>2.24.2.3.2 If either the car or the counterweight bottoms on its buffers or becomes otherwise immovable (a) the ropes shall slip in the drive sheave grooves and not allow the car or counterweight to be raised; or (b) the driving system shall stall and not allow the car or counterweight to be raised.</p>	<p>2.24.2.3.2 For Aramid Fiber Ropes Where grooves are used to provide traction, sufficient traction shall be provided between the rope cover and the groove, and in the event of failure of the cover, between the load carrying portion of the rope and the sheave groove, to safely stop and hold the car with rated load [see 2.16.8(c)] from rated speed in the down direction.</p>	<p>NA</p>

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N/A	2.24.2.3.3 For Noncircular Elastomeric-Coated Suspension Where surfaces are used to provide traction, sufficient traction shall be provided between the noncircular elastomeric-coated steel suspension member and the surface, and in the event of failure of the elastomeric coating, between the load carrying cords and the sheave contact surface, to safely stop and hold the car with rated load [see 2.16.8(c)] from Rated speed in the down direction.	N/A
N/A	2.24.2.3.4 If either the car or the counterweight bottoms on its buffers or become otherwise immovable (a) the suspension members shall slip on the drive sheave and not allow the car or counterweight to be raised, or (b) the driving system shall stall and not allow the car or counterweight to be raised.	N/A
2.25.3.3.1 Traction machine elevators shall have final terminal stopping switches located in the hoistway and operated by cams attached to the car.	2.25.3.3.1 Traction machines elevators shall have final terminal stopping switches operated by cams. One of the assemblies (i.e., switch or cam) shall be mounted on the car and the other in the hoistway. Where the final terminal stopping devices shall prevent movement of the car by the normal operating devices in both directions of travel.	N/A
2.25.3.4 Controller Switches Controlled by Final Terminal Stopping Device. The normal and final terminal stopping devices shall not control the same controller switches unless two or more separate and independent switches are provided, two of which shall be closed to complete the driving-machine motor and brake circuit in either direction of travel. Where a two- or three-phase AC driving-machine motor is used, these switches shall be of the multipole type. The control shall be so designed and installed that a single ground or short circuit may permit either, but not prevent both, the normal or final stopping device circuits from stopping the car.	2.25.3.4 The normal terminal stopping device and final terminal stopping devices shall not control the same controller switches unless two or more separate and independent controller devices are provided, two of which shall be complete both the driving machine motor and the driving machine brake circuits in either direction of travel. Elevators employing a two or three phase alternating current driving machine motor, which is not driven from a direct current source through a static inverter, shall be provided with a means to inhibit the flow of alternating current in each phase. The control circuits shall be so designed and installed that a single ground or short circuit shall not prevent both the normal terminal stopping device and final terminal stopping device control circuits from stopping the car.	N/A

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<p>2.26.1.4.2 Top-of-Car Inspection Operation. Top of-car inspection operation shall conform to 2.26.1.4.1 and the following:</p> <p>(a) A stop switch (see 2.26.2.8) shall be permanently located on the car top and readily accessible to a person, while standing at the hoistway entrance normally used for access to the car top.</p> <p>(b) The transfer switch [see 2.26.1.4.1(b)] shall be located on the car top and shall be so designed as to prevent accidental transfer from the "INSPECTION" to "NORMAL" position.</p> <p>(c) A separate device of the continuous-pressure type labeled "ENABLE" shall be provided adjacent to the inspection operating devices.</p> <p>(d) The inspection operating devices shall become effective only when the "ENABLE" device is activated.</p> <p>(e) The inspection operating devices [see 2.26.1.4.1(c)], shall be permitted to be of the portable type, provided that</p> <p>(1) the "ENABLE" device [see 2.26.1.4.2(c)], and a stop switch, in addition to the stop switch required in 2.26.1.4.2(a) are included in the portable unit</p> <p>(2) the flexible cord is permanently attached so that the portable unit cannot be detached from the car top</p> <p>(f) Separate additional devices of the continuous pressure type shall be permitted to be provided on the car top to make power door opening and closing and automatic car leveling operative from the top of the car for testing purposes.</p> <p>(g) When on top-of-car inspection operation, a separate additional device shall be permitted to render ineffective the top final terminal stopping device, and the buffer switch for gas spring-return counterweight oil buffers, in conformance with the requirements of 2.26.4.3, 2.26.9.3(a), and 2.26.9.4, and it shall allow the car to be moved to a position in conformance with the requirements of 2.7.4.5 and 2.7.5.1.3(c)..</p>	<p>2.26.1.4.2 Top-of-Car Inspection Operation Top of the car inspection operation shall conform to 2.26.1.4.1 and the following:</p> <p>(a) A stop switch (see 2.26.2.8) shall be permanently located on the car top and readily accessible to a person, while standing at the hoistway entrance normally used for access to the car top.</p> <p>(b) The transfer switch [see 2.26.1.4.1(b)] shall be located on the car top and shall be so designed as to prevent accidental transfer from the "INSPECTION" to "NORMAL" position.</p> <p>(c) A separate device of the continuous-pressure type labeled "ENABLE" shall be provided adjacent to the inspection operating devices.</p> <p>(d) The inspection operating devices shall become effective only when the "ENABLE" device is activated.</p> <p>e) The inspection operating devices [see 2.26.1.4.1(c)], shall be permitted to be of the portable type, provided that</p> <p>(1) the "ENABLE" device [see 2.26.1.4.2(c)], and a stop switch, in addition to the stop switch required in 2.26.1.4.2(a) are included in the portable unit</p> <p>(2) the flexible cord is permanently attached so that the portable unit cannot be detached from the car top</p> <p>(f) Separate additional devices of the continuous pressure type shall be permitted to be provided on the car top to make power door opening and closing and automatic car leveling operative from the top of the car for testing purposes.</p> <p>(g) When on top-of-car inspection operation, a separate additional device shall be permitted to render ineffective the top final terminal stopping device, and the buffer switch for gas spring-return counterweight oil buffers, in conformance with the requirements of 2.26.4.3, 2.26.9.3(a), 2.26.9.3.2 and 2.26.9.4, and it shall allow the car to be moved to a position in conformance with the requirements of 2.7.4.5 and 2.7.5.1.3(c).</p> <p>(h) The inspection operating devices shall be readily accessible to a person while standing in one of the horizontal areas described in 2.14.1.6.2 on the care enclosure top.</p>	<p>NA</p>

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<p>2.26.1.5 Inspection Operation With Open Door Circuits. A single set of switches marked “CAR DOOR BYPASS” and “HOISTWAY DOOR BYPASS” shall be provided in the elevator controller enclosure containing the car door and gate electric contact circuits and hoistway door interlock and hoistway door electric contact circuits (see 2.26.2.14 and 2.26.2.15); except where the switches are not accessible from outside the hoistway, they shall be located in the inspection and test panel (see 2.7.6.5). The switches shall prepare the control systems so that, only when top-of-car or in-car inspection operation is activated, the car shall be permitted to be moved with open door contacts. The switches shall conform to 2.26.1.5.1 through 2.26.1.5.8.</p>	<p>2.26.1.5 Inspection Operation With Open Door Circuits. A single set of switches marked “CAR DOOR BYPASS” and “HOISTWAY DOOR BYPASS” shall be provided. The switches shall be accessible from outside of the hoistway. They shall be located (a) In a controller enclosure for the elevator located outside the hoistway in a common room, a control space, the machine room, a machinery space, or on a motor controllers complying with 2.7.6.3.2; or (b) in the inspection and test panel (see 2.7.6.5) The switches shall prepare the control systems so that, only when top-of-the-car or in car inspection operation is activated, the car shall be permitted to be moved with open door contacts. The switches shall conform to 2.26.1.5.1 through 2.26.1.5.8.</p>	<p>N/A</p>
<p>2.26.2.26 Pit Access Door Electric Contact. An electric contact shall be provided on each pit access door where required by 2.2.4.4.</p>	<p>2.26.2.26 Pit Access Door Electric Contact. An electric contact shall be provided on each pit access door where required by 2.2.4.5.</p>	<p>N/A</p>
<p>2.26.2.33 Firefighter’s Stop Switch. A firefighter’s stop switch that conforms to the requirements of 2.26.2.5(a), (b), and (c) shall be provided where required by 2.27.3.3.1(m).</p>	<p>2.26.2.33 Firefighter’s Stop Switch. Where required by 2.27.3.3.1 (m), a firefighters’ stop switch shall (a) be of the manually opened and closed type (b) have red operating handles or buttons (c) be conspicuously and permanently marked “STOP”, and shall indicate the “STOP” and “RUN” positions. (d) be of a toggle or push-to-stop configuration</p>	<p>N/A</p>
<p>2.26.4.4 Control equipment shall be tested in accordance with the testing requirements of EN 12016 by exposing it to interference levels at the test values specified for “safety circuits.” The interference shall not cause any of the conditions described in 2.26.9.3(a) through (e) and shall not cause the car to move while on inspection operation. If enclosure doors or suppression equipment must remain installed to meet the above requirements, warning signs to that effect shall be posted on the control equipment.</p>	<p>2.26.4.4 Control equipment shall be tested in accordance with the testing requirements of EN 12016 by exposing it to interference levels at the test values specified for “safety circuits.” The interference shall not cause any of the conditions described in 2.26.9.3.1(a) through (e) and shall not cause the car to move while on inspection operation. If enclosure doors or suppression equipment must remain installed to meet the above requirements, warning signs to that effect shall be posted on the control equipment.</p>	
<p>2.26.7 Installation of Capacitors or Other Devices to Make Electrical Protective Devices Ineffective The installation of capacitors or other devices, the operation or failure of which will cause an unsafe operation of the elevator, is prohibited. No permanent device that will make any required electrical protective device ineffective shall be installed except as provided in 2.7.6.5.2(h), 2.12.7.1, 2.26.1.4.2(g), 2.26.1.5, 2.26.1.6, and 2.27.3.1.6(c) (see 8.6.1.6.1).</p>	<p>2.26.7 Installation of Capacitors or Other Devices to Make Electrical Protective Devices Ineffective The installation of capacitors or other devices, the operation or failure of which will cause an unsafe operation of the elevator, is prohibited. No permanent device that will make the traction loss detection or any required electrical protective device ineffective shall be installed except as provided in 2.7.6.5.2(h), 2.12.7.1, 2.26.1.4.2(g), 2.26.1.5, 2.26.1.6, and 2.27.3.1.6(c) (see 8.6.1.6.1).</p>	<p>N/A</p>

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<p>2.26.8.3 The brake shall apply automatically when</p> <ul style="list-style-type: none"> (a) the operating device of a car's switch or continuous pressure operation elevator is in the stop position (b) a normal stopping means functions (c) any electrical protective device is activated (d) there is a loss of power to the driving-machine brake. 	<p>2.26.8.3 The driving machine brake shall apply automatically when</p> <ul style="list-style-type: none"> (a) the operating device of a car's switch or continuous pressure operation elevator is in the stop position (b) a normal stopping means functions (c) any electrical protective device is activated (d) there is a loss of power to the driving-machine brake. (e) The traction loss detection means is actuated [see 2.20.8.1(c)] 	N/A
<p>2.26.9.3 The occurrence of a single ground or the failure of any single magnetically operated switch, contactor, or relay, or any single device that limits the leveling or truck zone, or any single solid-state device not a part of a software system; or a failure of a software system in circuits not in conformance with 2.26.9.4(b), shall not</p> <ul style="list-style-type: none"> (a) render any electrical protective device ineffective (see 2.26.2) (b) permit the car to move beyond the leveling or truck zone if any hoistway-door interlock is unlocked or if any hoistway door or car door or gate electric contact is not in the closed position (see 2.26.1.6) (c) permit speeds in excess of those specified in 2.12.7.3.2, 2.26.1.4.1(d)(1), and 2.26.1.6.6 (d) permit the car to revert to normal operation when the electrical contact required by 2.7.5.2.1(b)(3) is in the open position, or the electrical device as permitted in 2.7.5.5(b) is activated, or on hoistway access switch operation (see 2.12.7.3), or on inspection operation (see 2.26.1.4), or on bypass operation (see 2.26.1.5) (e) continue to make ineffective any hoistway-door interlock or car door or gate electric contact when either a hoistway access switch (see 2.12.7.3) or a "BYPASS" switch (see 2.26.1.5) is turned to the "OFF" position. operated by the locking member, and the contacts shall be maintained in the open position by the action of gravity, or by a restrained compression spring, or by both, or by means of the opening member. <p>(2) The interlock shall hold the door in the locked position by means of gravity, or by a restrained compression spring, or by both, or by means of a positive linkage.</p>	<p>2.26.9.3.1 The occurrence of a single ground or the failure of any single magnetically operated switch, contactor, or relay, or any single device that limits the leveling or truck zone, or any single solid-state device not a part of a software system; or failure of a software system in circuits not in conformance with 2.26.9.3.2(b), shall not</p> <ul style="list-style-type: none"> (a) render any electrical protective device ineffective (see 2.26.2). (b) permit the car to move beyond the leveling or truck zone if any hoistway door interlock is unlocked or if any hoistway door or car door or gate electric contact is not in the closed position (see 2.26.1.6) (c) permit speeds in excess of this specified in 2.12.7.3.2, 2.26.1.4.1(d)(1), and 2.26.1.6.6 (d) permit car to revert to normal operation when the electrical contact required by 2.7.5.2.1(b)(3) is in the open position, or the electrical device as permitted in 2.7.5.5(b) is activated, or on inspection operation (see 2.26.1.4), or on bypass operation (see 2.26.1.5) (e) render ineffective any hoistway door or car door interlock, or car door or gate electric contact, or hoistway door combination mechanical lock and electric contact when either a hoistway access switch (see 2.12.7.3) or a "BYPASS" switch (see 2.26.1.5) is in the "OFF" position. <p>2.26.9.3.2 Methods used to satisfy 2.26.9.3.1 using software systems permitted, provided that</p> <ul style="list-style-type: none"> (a) a non-software controlled means is also used to remove power from the driving machine motor and brake, or (b) the software system and related circuits are listed/certified and labeled/marked for compliance with the applicable requirements of IEC 61508-2 and IEC 61508-3. This software system and its related circuits shall have a SIL of not less than the highest SIL value of the safety function(s) in Table 2.26.4.3.2 used in the circuit. 	N/A
<p>2.26.9.4 Methods used to satisfy 2.26.9.3 shall be checked prior to each start of the elevator from a landing, when on automatic operation. When a single ground or failure, as specified in 2.26.9.3 occurs, the car shall not be permitted to restart. Methods implemented using</p>	<p>2.26.9.4 Methods used to satisfy 2.26.9.3 shall be checked prior to each start of the elevator from a landing, when on automatic operation. When a single ground or failure as specified in 2.26.9.3 occurs, the car shall not be permitted to restart.</p>	N/A

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<p>software systems are permitted, provided that</p> <p>(a) the removal of power from the driving-machine motor and brake is not solely dependent on software-controlled means, or</p> <p>(b) the software system and related circuits are listed/certified and labeled/marked for compliance with the applicable requirements of IEC 61508-2 and IEC 61508-3. This software system and its related circuits shall have a SIL of not less than the highest SIL value of the safety function(s) in Table 2.26.4.3.2 used in the circuit.</p>		
<p>2.26.9.5.3 The electrical protective devices required by 2.26.2 shall control both means, except that leveling shall be permitted to take place with power opening of doors and gates in conformance with 2.13.2.1.1 and 2.13.2.2.1.</p>	<p>2.26.9.5.3 The electrical protective devices required by 2.26.2 and the traction loss detection means required by 2.20.8.1 shall control both means, except that leveling shall be permitted to take place with power opening of doors and gates in conformance with 2.13.2.1.1 and 2.13.2.2.1.</p>	NA
<p>2.26.9.6.3 The electrical protective devices required by 2.26.2 shall control both means that inhibit the flow of alternating current through the solid-state devices, except that leveling shall be permitted to take place with power opening of the doors and gates as restricted by 2.13.2.1.1 and 2.13.2.2.1.</p>	<p>2.26.9.6.3 The electrical protective devices required by 2.26.2 and the traction loss detection means required by 2.20.8.1 shall control both means that inhibit the flow of alternating current through the solid-state devices, except that leveling shall be permitted to take place with power opening of the doors and gates as restricted by 2.13.2.1.1 and 2.13.2.2.1.</p>	NA
<p>2.26.12.4 Identify “HELP” button [see 2.27.1.1.3(b)] and visual indication [see 2.27.1.1.3(c)] with the phone symbol.</p>	DELETED	NA
<p>2.27.1.1.3 The two-way communication means within the car shall comply with the following requirements:</p> <p>(a) In jurisdictions enforcing NBCC, Appendix E of CSA B44, or in jurisdictions not enforcing NBCC, ICC/ANSI A117.1.</p> <p>(b) A push button to actuate the two-way communication means shall be provided in or adjacent to a car operating panel. The push button shall be visible and permanently identified as “HELP.” The identification shall be on or adjacent to the “HELP” button. When the push button is actuated, the emergency two-way communication means shall initiate a call for help and establish two-way communications.</p> <p>(c) A visual indication on the same panel as the “HELP” push button shall be provided, that is activated by authorized personnel, to acknowledge that two-way communications link has been established. The visual</p>	<p>2.27.1.1.3 The two-way communication means within the car shall comply with the following requirements:</p> <p>(a) In jurisdictions enforcing NBCC, Appendix E of CSA B44, or in jurisdictions not enforcing NBCC, ICC/ANSI A117.1.</p> <p>(b) A push button to actuate the two-way communication means shall be provided in or adjacent to a car operating panel. The push button shall be visible and permanently identified with the “PHONE.” Symbol (see 2.26.12.1). The identification shall be on or adjacent to the “PHONE” push button. When the push button is actuated, the emergency two-way communication means shall initiate a call for help and establish two-way communications.</p> <p>(c) A visual indication on the same panel as the “PHONE” push button shall be provided, that is activated by authorized personnel, to acknowledge that two-way</p>	NA

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<p>indication shall be extinguished when the two-way communication link is terminated.</p> <p>(d) The two-way communication means shall provide on demand to authorized personnel, information that identifies the building location and elevator number and that assistance is required.</p> <p>(e) After the call acknowledgement signals are sent [2.27.1.1.3(c)], the two-way voice communications shall be available between the car and authorized personnel.</p> <p>(f) The two-way communications, once established, shall be disconnected only when authorized personnel outside the car terminate the call.</p> <p>(g) The two-way communication means shall not use a handset in the car.</p> <p>(h) The two-way communications shall not be transmitted to an automated answering system. The call for help shall be answered by authorized personnel.</p> <p>(i) Operating instructions shall be incorporated with or adjacent to the “HELP” button.</p>	<p>communications link has been established. The visual indication shall be extinguished when the two-way communication link is terminated.</p> <p>(d) The two-way communication means shall provide on demand to authorized personnel, information that identifies the building location and elevator number and that assistance is required.</p> <p>(e) After the call acknowledgement signals are sent [2.27.1.1.3(c)], the two-way voice communications shall be available between the car and authorized personnel.</p> <p>(f) The two-way communications, once established, shall be disconnected only when authorized personnel outside the car terminate the call.</p> <p>(g) The two-way communication means shall not use a handset in the car.</p> <p>(h) The two-way communications shall not be transmitted to an automated answering system. The call for help shall be answered by authorized personnel.</p> <p>(i) Operating instructions shall be incorporated with or adjacent to the “PHONE” button.</p>	
<p>2.27.3.3.1 When the “FIRE OPERATION” switch is in the “ON” position, the elevator shall be on Phase II Emergency In-Car Operation, for use by emergency personnel only, and the elevator shall operate as follows:</p> <p>(a) The elevator shall be operable only by a person in the car.</p> <p>(b) The car shall not respond to landing calls. Directional lanterns, where provided, shall remain inoperative. Car position indicators, where provided, shall remain operative. Landing position indicators, where provided, shall remain inoperative, except at the designated level and the building fire control station, where they shall remain operative.</p> <p>(c) Door open and close buttons shall be provided for power-operated doors and located as required by 2.27.3.3.7. Buttons shall be a minimum of 19mm(0.75 in.) in the smallest dimension. The door open and door close buttons shall be labeled “OPEN” and “CLOSE.” The door open and close buttons shall be operative when the elevator is stopped within an unlocking zone.</p> <p>(d) The opening of power-operated doors shall be controlled only by a continuous-pressure door open button.</p> <p>If the button is released prior to the doors reaching the normal open position, the doors shall automatically</p>	<p>2.27.3.3.1 When the “FIRE OPERATION” switch is in the “ON” position, the elevator shall be on Phase II Emergency In-Car Operation, for use by emergency personnel only, and the elevator shall operate as follows:</p> <p>(a) The elevator shall be operable only by a person in the car.</p> <p>(b) Floor selection means, lanterns and indicators</p> <ol style="list-style-type: none"> (1) in the car <ol style="list-style-type: none"> (a) floor selection means shall function as required in 2.27.3.3.1(i) (b) car call-registered lights, where provided, shall remain operative (c) car lanterns, where provided, shall remain inoperative (d) position indicators and car-direction indicators, where provided, shall remain operative (2) at the building fire control station <ol style="list-style-type: none"> (a) position indicators and car-direction indicators, where provided, shall remain operative (3) at the designated level <ol style="list-style-type: none"> (a) the car shall not respond to hall calls (b) hall car-registered lights, where provided, shall remain inoperative, except where associated cars of a group have been returned 	NA

reclose. Requirements 2.13.3.3, 2.13.3.4, 2.13.4.2.1(b)(2), and 2.13.4.2.1(c) do not apply.

On cars with multiple entrances, if more than one entrance can be opened at the same landing, separate door open buttons shall be provided for each entrance.

(e) Open power-operated doors shall be closed only by continuous pressure on the door close button. If the button is released prior to the doors reaching the fully closed position, horizontally sliding doors shall automatically reopen, and vertically sliding doors shall automatically stop or stop and reopen.

On cars with multiple entrances, if more than one entrance can be opened at the same landing, a separate door close button shall be provided for each entrance.

(f) Opening and closing of power-operated car doors or gates that are opposite manual swing or manual slide hoistway doors shall conform to 2.27.3.3.1(d) and (e).

(g) All door reopening devices, except the door open button, shall be rendered inoperative. Full-speed closing shall be permitted.

Landing door opening and closing buttons, where provided, shall be rendered inoperative.

(h) Every car shall be provided with a button labeled "CALL CANCEL," located as required in 2.27.3.3.7, that shall be effective during Phase II Emergency In-Car Operation. When activated, all registered calls shall be canceled and a traveling car shall stop at or before the next available landing. The button shall be a minimum of 19 mm (0.75 in.) in the smallest dimension.

(i) Floor selection means shall be provided in the car to permit travel to all landings served by the car, and shall be operative at all times, except as in 2.27.3.3.2 and 8.12.1. Means to prevent the operation of the floor selection means or door-operating buttons shall be rendered inoperative. The floor selection means shall be operable without the use of keys, cards, tools, or special knowledge. The floor selection means shall be permitted to be located behind the locked cover specified in 2.27.3.3.7, only if floor selection means for all landings served are included behind the locked cover. Where buttons not accessible to the public are provided they shall be a minimum of 19 mm (0.75 in.) in the smallest dimension.

(j) A traveling car shall stop at the next available landing for which a car call was registered. When a car stops at a landing, all registered car calls shall be canceled.

to group automatic operation

(c) Position indicators, car-direction indicators, and hall lanterns, where provide, shall remain inoperative

(4) at all landings, except the designated level

(a) the car shall not respond to hall calls

(b) hall-call registered lights, where provided, shall remain inoperative, except where associated cars of a group have been returned to group automatic operation

(c) position indicators car-direction indicators, and hall lanterns, where provided, shall; remain inoperative

(c) Door open and close buttons shall be provided for power-operated doors **only** and located as required by 2.27.3.3.7. Buttons shall be a minimum of 19mm(0.75 in.)in the smallest dimension. The door open and door close buttons shall be labeled "OPEN" and "CLOSE" and when applicable "REAR OPEN" and "REAR CLOSE" or "SIDE OPEN" and "SIDE CLOSE" in lettering a minimum of 5 mm (0.25 in.) in height with a contrasting background. The labeling shall be on or adjacent to the buttons. Requirement 2.26.12 does not apply to these buttons. The door open and close buttons shall be operative when the elevator is stopped within an unlocking zone.

(d) The opening of power-operated doors shall be controlled only by a continuous-pressure door open button. If the button is released prior to the doors reaching the normal open position, the doors shall automatically reclose. Requirements 2.13.3.3, 2.13.3.4, 2.13.4.2.1(b)(2), and 2.13.4.2.1(c) do not apply. **All door open button(s) in the car shall be operational.**

On cars with multiple entrances, if more than one entrance can be opened at the same landing, separate door open buttons shall be provided for each entrance **in conformance with 2.27.3.3.7.**

(e) Open power-operated doors shall be closed only by continuous pressure on the door close button. If the button is released prior to the doors reaching the fully closed position, horizontally sliding doors shall automatically reopen, and vertically sliding doors shall automatically stop or stop and reopen.

On cars with multiple entrances, if more than one entrance can be opened at the same landing, a separate door close button shall be provided for each entrance.

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<p>(k) Means used to remove elevators from normal operation shall not prevent Phase II Emergency In-Car Operation, except</p> <p>(l) as specified in this Code</p> <p>(2) as controlled by elevator personnel</p> <p>(l) No device, that measures load, shall prevent operation of the elevator at or below the capacity and loading required in 2.16.</p> <p>(m) Every car shall be provided with a switch, conforming to the requirements of 2.26.2.33 and located as required in 2.27.3.3.7. When the switch is in the “STOP” position, all registered calls shall be canceled and power shall be removed from the elevator driving-machine motor and brake. When the switch is moved to the “RUN” position from the “STOP” position, the car shall not move, except for leveling, until a call is entered. If the type of switch used is a button, it shall be a minimum of 19 mm (0.75 in.) in the smallest dimension.</p> <p>NOTE [2.27.3.3.1(m)]: This requirement does not limit the firefighters’ stop switch to a specific style of switch. Toggle switches and push/pull buttons are two possible styles. A switch, if provided, should be operable to the “STOP” position by a firefighter wearing protective gloves (see NFPA 1971).</p> <p>(n) If the normal power supply, emergency power supply, and standby power supply are not available and the elevator is equipped with an alternate source of power that is insufficient to move the car to all landings, the requirements of 2.27.3.1.6(n)(1) through (5) shall apply.</p>	<p>(f) Opening and closing of power-operated car doors or gates that are opposite manual swing or manual slide hoistway doors shall conform to 2.27.3.3.1(d) and (e).</p> <p>(g) All door reopening devices, except the door open button, shall be rendered inoperative. Full-speed closing shall be permitted.</p> <p>Landing door opening and closing buttons, where provided, shall be rendered inoperative.</p> <p>(h) Every car shall be provided with a button labeled “CALL CANCEL,” located as required in 2.27.3.3.2 and 8.12.1. Means to prevent the operation of the floor selection means or door-operating buttons shall be rendered inoperative. Floor selection means that provide access to all landings served by the elevator shall be located below the firefighters’ operation panel specified by 2.27.3.3.7. The floor selection means shall be operable without the use of keys, cards, tools or special knowledge.</p> <p>(i) The floor selection means shall be permitted to be located behind locked cover specified in 2.27.3.3.7, only if floor selection means for all landings served are included behind the locked cover. Where buttons not accessible to the public are provided they shall be a minimum of 199 mm (0.75 in.) in the smallest dimension</p> <p>(j) A traveling car shall stop at the next available landing for which a car call was registered. When a car stops at a landing, all registered car calls shall be canceled.</p> <p>(k) Means used to remove elevators from normal operation shall not prevent Phase II Emergency In-Car Operation, except</p> <p>(l) as specified in this Code</p> <p>(2) as controlled by elevator personnel</p> <p>(l) No device, that measures load, shall prevent operation of the elevator at or below the capacity and loading required in 2.16.</p> <p>(m) Every car shall be provided with a switch, conforming to the requirements of 2.26.2.33 and located as required in 2.27.3.3.7. When the switch is in the “STOP” position, all registered calls shall be canceled and power shall be removed from the elevator driving-machine motor and brake. When the switch is moved to the “RUN” position from the “STOP” position, the car shall not move, except for leveling, until a call is entered. If the type of switch used is a button, it shall be a minimum of 19 mm (0.75 in.) in the smallest dimension.</p>	

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	<p>NOTE [2.27.3.3.1(m)]: This requirement does not limit the firefighters' stop switch to a specific style of switch. Toggle switches and push/pull buttons are two possible styles. A switch, if provided, should be operable to the "STOP" position by a firefighter wearing protective gloves (see NFPA 1971).</p> <p>(n) If the normal power supply, emergency power supply, and standby power supply are not available and the elevator is equipped with an alternate source of power that is insufficient to move the car to all landings, the requirements of 2.27.3.1.6(n)(1) through (5) shall apply.</p>	
<p>2.27.3.3.7 The "FIRE OPERATION" switch (2.27.3.3), the "CALL CANCEL" button [2.27.3.3.1(h)], the "STOP" switch [2.27.3.3.1(m)], the door open button(s), the door close button(s), the additional visual signal (2.27.3.3.8), and the operating instructions shown in Fig. 2.27.7.2 shall be grouped together at the top of a main car operating panel behind a locked cover. The firefighters' operation panel cover shall be openable by the same key that operates the "FIRE OPERATION" switch. The cover shall be permitted to open automatically when the car is on Phase I Emergency Recall Operation and at the recall level. When the key is in the "FIRE OPERATION" switch, the cover shall not be capable of being closed. When closed, the cover shall be self-locking.</p> <p>Where rear doors are provided, buttons for both the front and rear doors shall be provided in the firefighters' operation panel. The door open and door close buttons for the rear entrance shall be labeled "OPEN REAR" and "CLOSE REAR."</p> <p>All buttons and switches shall be readily accessible, located not more than 1 800 mm (72 in.) above the floor and shall be arranged as shown in Fig. 2.27.3.3.7. Requirement 2.26.12 does not apply to these buttons and switches. The front of the cover shall contain the words "FIREFIGHTERS' OPERATION" in red letters at least 10 mm (0.4 in.) high.</p>	<p>2.27.3.3.7 The "FIRE OPERATION" switch (2.27.3.3), the "CALL CANCEL" button [2.27.3.3.1(h)], the "STOP" switch [2.27.3.3.1(m)], the door open button(s), the door close button(s), the additional visual signal (2.27.3.3.8), and the operating instructions shown in Fig. 2.27.7.2 shall be grouped together at the top of a main car operating panel behind a locked cover. The fire department communication system phone jack shall be permitted to be installed in the fire fighters' operation panel. No other equipment shall be permitted in the fire fighters' operation panel.</p> <p>The firefighters' operation panel cover shall be openable by the same key that operates the "FIRE OPERATION" switch. The key shall be rotated clockwise to allow the panel to be opened. When open, the cover shall not restrict access to the buttons or switches or the view of the instructions.</p> <p>The cover shall be permitted to open automatically when the car is on Phase I Emergency Recall Operation and at the recall level. When the key is in the "FIRE OPERATION" switch, the cover shall not be capable of being closed. When closed, the cover shall be self-locking.</p> <p>Where rear or side doors are provided, buttons for the front, rear, and side doors shall be provided in the firefighters' operation panel. The door open and door close buttons for the rear entrance (where provided) shall be labeled "OPEN REAR" and "CLOSE REAR." The door open and close buttons for the side entrance (where provided) shall be labeled "SIDE OPEN" and "SIDE CLOSE."</p> <p>All buttons and switches and the lock for the panel shall be located more than 1220 mm (48 in.) and less than 1830 mm (72 in.) above the floor as measured to the centerline of the button, switch or lock, and shall be and shall be arranged as shown in Fig. 2.27.3.3.7.</p>	<p>NA</p>

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	<p>Requirement 2.26.12 does not apply to these buttons and switches. The front of the cover shall contain the words “FIREFIGHTERS’ OPERATION” in red letters at least 10 mm (0.4 in.) high.</p> <p>The firefighter’s operation panel shall be located as follows:</p> <ul style="list-style-type: none"> (a) the panel shall be on the same vertical clearance centerline as a floor selection means that provides access to all floors served by the elevator. (b) The panel and the floor selection means shall be located on the wall of the car containing the door that opens to the lobby where the “FIRE RECALL” switch is located or immediately adjacent to that wall on a side wall. 	
<p>2.27.3.4 Interruption of Power. Upon the resumption of power (normal, emergency, or standby), the car shall be permitted to move to reestablish absolute car position. Restoration of electrical power following a power interruption shall not cause any elevator to be removed from Phase I Emergency Recall Operation or Phase II Emergency In-Car Operation.</p> <p>The failure and subsequent restoration of electrical power (normal, emergency, or standby) shall not cause any elevator to be removed from Phase I Emergency Operation or Phase II Emergency In-Car Operation.</p> <p>(a) Elevators on Phase I Emergency Operation shall be permitted to move only to the next floor in the direction of the recall level to reestablish absolute car position prior to conforming to 2.27.3.1 and 2.27.3.2.</p> <p>(b) Elevators on Phase II Emergency In-Car Operation with the key in the “OFF” position shall be permitted to move only to the next floor in the direction of the recall level to reestablish absolute car position prior to conforming to 2.27.3.3.3 and 2.27.3.3.4. If the key is moved to the “ON” or “HOLD” position before the doors are fully closed, 2.27.3.4(c) or (d) shall apply, and automatic power-operated doors shall open if in a level zone.</p> <p>(c) Elevators on Phase II Emergency In-Car Operation with the key in the “HOLD” position shall not move, except for leveling within a leveling zone. Automatic power-operated doors shall open if the doors are not fully closed and the car is in a level zone.</p> <p>(d) Elevators on Phase II Emergency In-Car Operation</p>	<p>2.27.3.4 Interruption of Power. The failure and subsequent restoration of electrical power (normal, emergency, or standby) shall not cause any elevator to be removed from Phase I Emergency Operation or Phase II Emergency In-Car Operation.</p> <p>(a) Elevators on Phase I Emergency Operation shall be permitted to move only to the next floor in the direction of the recall level to reestablish absolute car position prior to conforming to 2.27.3.1 and 2.27.3.2.</p> <p>(b) Elevators on Phase II Emergency In-Car Operation with the key in the “OFF” position shall be permitted to move only to the next floor in the direction of the recall level to reestablish absolute car position prior to conforming to 2.27.3.3.3 and 2.27.3.3.4. If the key is moved to the “ON” or “HOLD” position before the doors are fully closed, 2.27.3.4(c) or (d) shall apply, and automatic power-operated doors shall open if in a level zone.</p> <p>(c) Elevators on Phase II Emergency In-Car Operation with the key in the “HOLD” position shall not move, except for leveling within a leveling zone. Automatic power-operated doors shall open if the doors are not fully closed and the car is in a level zone</p> <p>(d) Elevators on Phase II Emergency In-Car Operation with the key in the “ON” position shall not move, except for leveling within a leveling zone, until a car call is entered. Automatic power-operated doors shall not move until a door open or close button is pressed; after which they shall conform to 2.27.3.3.1(d) and (e). After a car call is entered, the car shall be permitted to move</p>	<p style="text-align: center;">NA</p>

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with the key in the “ON” position shall not move, except for leveling within a leveling zone, until a car call is entered. Automatic power-operated doors shall not move until a door open or close button is pressed; after which they shall conform to 2.27.3.3.1(d) and (e). After a car call is entered, the car shall be permitted to move only to the next floor in the direction of the recall level to reestablish absolute car position prior to answering car calls.	only to the next floor in the direction of the recall level to reestablish absolute car position prior to answering car calls.	
2.27.7.2 A sign containing instructions for operation of elevators under Phase II Emergency In-Car Operation shall be incorporated with or adjacent to the switch in each car and shall be visible only when the cover (2.27.3.3.7) is open. The sign shall include only the wording and graphics shown in Fig. 2.27.7.2, except (a) for elevators with manually operated doors, the instructions for opening and closing the doors shall be permitted to be replaced with short phrases such as “PUSH DOOR” or “PULL DOOR UP” (b) for elevators with vertically sliding doors, the instructions for returning the car to the recall floor shall be permitted to be expanded to include instructions for closing the door	2.27.7.2 A sign containing instructions for operation of elevators under Phase II Emergency In-Car Operation shall be incorporated with or adjacent to the switch in each car and shall be visible only when the cover (2.27.3.3.7) is open. The sign shall include only the wording and graphics shown in Fig. 2.27.7.2, except (a) for elevators with manually operated doors, the instructions for opening and closing the doors shall be permitted to be replaced with short phrases such as “PUSH DOOR” or “PULL DOOR UP” (b) for elevators with vertically sliding doors, the instructions for returning the car to the recall floor shall be permitted to be expanded to include instructions for closing the door	NA
Figure 2.27.9 Revised dimensions clarification		NA
3.26.3.1.5 Only the following, when activated, shall prevent operation of the anticreep device: (a) the electrical protective devices listed in 3.26.4.1 (b) recycling operation (see 3.26.7) (c) inspection transfer switch (d) hoistway access switch (e) low oil protection means (f) oil tank temperature shutdown devices	3.26.3.1.5 Only the following, when activated, shall prevent operation of the anticreep device: (a) the electrical protective devices listed in 3.26.4.1 (b) recycling operation (see 3.26.7) (c) inspection transfer switch (d) hoistway access switch (e) low oil protection means (f) oil tank temperature shutdown devices (see 3.26.5 and 3.26.6.5)	NA NA
N/A ADDED 2010	3.26.6.5 In the pump motor controller for electrohydraulic elevators, when the occurrence of a single ground or failure of any single magnetically operated switch, contactor, or relay; or any single solid state device, or software system failure causes the liquid in the hydraulic driving machine to rise in temperature above its maximum operating temperature, the following shall occur: (a) power shall be removed from the hydraulic driving machine motor. (b) the hydraulic driving machine motor shall not be permitted to restart (c) when the doors are closed, the car shall automatically be brought to the lowest landing and then operate in conformance with 3.26.9.2 and 3.26.9.3.	NA
		NA

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<p>3.27.1 (c) auxiliary power lowering device (see 3.26.10)</p>	<p>3.27.1 (c) auxiliary power lowering (see 3.26.10) added (d) oil tank temperature shutdown (see 3.26.6.5) If the elevator is incapable of returning to the recall level, the car shall descend to an available floor. Upon arrival, automatic power-operated doors shall open, and then reclose within 15 s. The visual signal [2.27.3.1.6(h)] shall extinguish.</p>	<p>N/A</p>
<p>3.27.2 Phase I Emergency Recall Operation Prior to Device Actuation If any of the devices specified in 3.27.1(a), (b), or (c) is activated, while Phase I Emergency Recall Operation is in effect, but before the car reaches the recall level, the car shall do one of the following: (a) complete Phase I Emergency Recall Operation, if the car is above the recall level (b) descend to an available floor, if the car is below the recall level Upon arrival, automatic power-operated doors shall open, and then reclose within 15 s. The door open button shall remain operative. The visual signal [2.27.3.1.6(h)] shall extinguish.</p>	<p>3.27.2 Phase I Emergency Recall Operation Prior to Device Actuation If any of the devices specified in 3.27.1(a), (b), (c), or (d) is activated, while Phase I Emergency Recall Operation is in effect, but before the car reaches the recall level, the car shall do one of the following: (a) complete Phase I Emergency Recall Operation, if the car is above the recall level (b) descend to an available floor, if the car is below the recall level Upon arrival, automatic power-operated doors shall open, and then reclose within 15 s. The door open button shall remain operative. The visual signal [2.27.3.1.6(h)] shall extinguish.</p>	<p>N/A</p>
<p>3.27.3 Device Actuation at Recall Level If either of the devices specified in 3.27.1(a) or (c) is activated while the car is stationary at the recall level and Phase I Emergency Recall Operation is in effect, the following shall apply: (a) automatic power-operated doors shall close within 15 s (b) the door open button shall remain operational (c) the visual signal [see Fig. 2.27.3.1.6(h)] shall illuminate intermittently</p>	<p>3.27.3 Device Actuation at Recall Level If either of the devices specified in 3.27.1(a), (c), or (d) is activated while the car is stationary at the recall level and Phase I Emergency Recall Operation is in effect, the following shall apply: (a) automatic power-operated doors shall close within 15 s (b) the door open button shall remain operational (c) the visual signal [see Fig. 2.27.3.1.6(h)] shall illuminate intermittently</p>	<p>N/A</p>
<p>3.27.4 Device Actuation With Phase II Emergency In-Car Operation in Effect If any of the devices specified in 3.27.1(a), (b), or (c) activate while the elevator is on Phase II Emergency In-Car Operation, a traveling car shall stop and all calls shall be canceled. The visual signal [see Fig. 2.27.3.1.6(h)] shall illuminate intermittently. The elevator shall accept calls only to landings below its location and respond in compliance with the requirements for Phase II Emergency In-Car Operation.</p>	<p>3.27.4 Device Actuation With Phase II Emergency In-Car Operation in Effect If any of the devices specified in 3.27.1(a), (b), (c), or (d) activate while the elevator is on Phase II Emergency In-Car Operation, a traveling car shall stop and all calls shall be canceled. The visual signal [see Fig. 2.27.3.1.6(h)] shall illuminate intermittently. The elevator shall accept calls only to landings below its location and respond in compliance with the requirements for Phase II Emergency In-Car Operation.</p>	<p>N/A</p>

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<p>5.2.1.4.2.1 Where a machinery space or control space is not located in the pit, a nonremovable means shall be provided to mechanically hold the car above the pit floor to provide an area in the pit for maintenance and inspection, conforming to the following:</p> <p>(a) It shall hold the car at a height of not less than 900 mm (35 in.) nor more than 2000 mm (79 in.) above the pit floor and not less than 300 mm (12 in.) above the bottom landing sill, as measured from the underside of the car platform.</p> <p>(b) The means shall be so designed and constructed as to stop and hold the car at governor tripping speed with rated load in the car.</p> <p>(c) It shall not cause the stresses and deflections in car frame and platform members and their connections to exceed the limits specified in 2.15.10 and 2.15.11.</p> <p>(d) If the means does not automatically activate when the lowest hoistway door is opened with the car not at the landing</p> <p>(1) it shall be capable of being operated without complete bodily entry into the pit.</p> <p>(2) a sign conforming to ANSI Z35.1, or CAN/CSA-Z321, whichever is applicable (see Part 9), shall be conspicuously displayed inside the hoistway, which shall include a warning that there is an insufficient bottom car clearance and instructions for operating the device. The letters shall be not less than 25 mm (1 in.) in height.</p>	<p>5.2.1.4.2.1 Where a machinery space or control space is not located in the pit, a nonremovable means shall be provided to mechanically hold the car above the pit floor to provide an area in the pit for maintenance and inspection, conforming to the following:</p> <p>(a) It shall hold the car at a height of not less than 900 mm (35 in.) nor more than 2000 mm (79 in.) above the pit floor and not less than 300 mm (12 in.) above the bottom landing sill, as measured from the underside of the car platform.</p> <p>(b) The means shall be so designed and constructed as to stop and hold the car at governor tripping speed with rated load in the car.</p> <p>(c) It shall not cause the stresses and deflections in car frame and platform members and their connections to exceed the limits specified in 2.15.10 and 2.15.11.</p> <p>(d) If the means does not automatically activate when the lowest hoistway door is opened with the car not at the landing</p> <p>(1) it shall be capable of being operated without complete bodily entry into the pit.</p> <p>(2) a sign conforming to ANSI Z535.2, or ANSI Z535.4, CAN/CSA-Z321, whichever is applicable (see Part 9), shall be conspicuously displayed inside the hoistway, which shall include a warning that there is an insufficient bottom car clearance and instructions for operating the device. The letters shall be not less than 25 mm (1 in.) in height. The sign shall be made of durable material and shall be securely fastened.</p>	<p>N/A</p>
<p>5.2.1.4.4 Alternative to Top Car Clearance Requirements.</p> <p>In existing buildings where the top car clearance conforming to 5.2.1.4.3 cannot be provided, the following shall apply:</p> <p>(a) When the car has reached its maximum upper movement, no part of the car or any equipment attached thereto, other than as permitted by 5.2.1.4.4(b), shall strike the overhead structure or any part of the equipment located in the hoistway.</p> <p>(b) Nonremovable means shall be provided to mechanically and electrically prevent upward movement of the car to provide an area above the car for maintenance and inspection, conforming to the following:</p> <p>(1) The means shall prevent upward movement of the car to provide a refuge space conforming to 2.4.12.</p> <p>(2) The means shall be so designed and constructed as to stop upward movement of the car at governor</p>	<p>5.2.1.4.4 Alternative to Top Car Clearance Requirements.</p> <p>In existing buildings where the top car clearance conforming to 5.2.1.4.3 cannot be provided, the following shall apply:</p> <p>(a) When the car has reached its maximum upper movement, no part of the car or any equipment attached thereto, other than as permitted by 5.2.1.4.4(b), shall strike the overhead structure or any part of the equipment located in the hoistway.</p> <p>(b) Nonremovable means shall be provided to mechanically and electrically prevent upward movement of the car to provide an area above the car for maintenance and inspection, conforming to the following:</p> <p>(1) The means shall prevent upward movement of the car to provide a refuge space conforming to 2.4.12.</p> <p>(2) The means shall be so designed and constructed as to stop upward movement of the car at governor</p>	<p>N/A</p>

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<p>tripping speed with and without rated load in the car. (3) The means shall not cause the stresses and deflections in car frame and platform members and their connections to exceed the limits specified in 2.15.10 and 2.15.11. (4) A sign conforming to ANSI Z35.1, or CAN/CSA-Z321, whichever is applicable (see Part 9), shall be conspicuously displayed inside the hoistway which shall include a warning that there is an insufficient top car clearance and instructions for operating the means. The letters shall be not less than 25 mm (1 in.) in height.</p>	<p>tripping speed with and without rated load in the car. (3) The means shall not cause the stresses and deflections in car frame and platform members and their connections to exceed the limits specified in 2.15.10 and 2.15.11. (4) A sign conforming to ANSI Z535.2, ANSI Z535.4 or CAN/CSA-Z321, whichever is applicable (see Part 9), shall be conspicuously displayed inside the hoistway which shall include a warning that there is an insufficient top car clearance and instructions for operating the means. The letters shall be not less than 25 mm (1 in.) in height. The sign shall be made of durable material and shall be securely fastened.</p>	
<p>5.2.2.14 Emergency Operations and Signaling Devices. Requirement 5.2.1.27 does not apply. Emergency operations and signaling devices shall conform to 3.27, except firefighters' emergency operations (2.27.3 through 2.27.8) does not apply. When firefighters' emergency operation is provided, it shall conform to 3.27.1 through 3.27.4.</p>	<p>5.2.2.14 Emergency Operations and Signaling Devices. Requirement 5.2.1.27 does not apply. Emergency operations and signaling devices shall conform to 3.27, except as modified 5.2.2.14.1.</p>	NA
<p style="text-align: center;">ADDED</p>	<p>5.2.2.14.1 Phase II Emergency In-Car Operation shall not be provided.</p>	NA
<p>5.3.1.18.2 Control and Operating Circuit Requirements. The design and installation of the operating circuits shall conform to the following:</p>	<p>5.3.1.18.2 Control and Operating Circuit Requirements The design and installation of the operating circuits shall conform to 5.3.1.18.2.1 and 5.3.1.18.2.2.</p>	NA
<p style="text-align: center;">Numerical designator and title added Text was under 5.3.1.18.2</p>	<p>5.3.1.18.2.1 Design and Installation (a) The completion or maintenance of an electric circuit shall be used neither to interrupt the power to the elevator driving machine or brake at the terminal landings, nor to stop the car when any electrical protective device operates. (b) If springs are used to actuate switches, contactors, or relays to stop an elevator at the terminal landings, they shall be of the restrained compression type. (c) In jurisdictions not enforcing NBCC, the occurrence of a single ground or the failure of any single magnetically operated switch, contactor, or relay; or the failure of any single solid-state device; or a software system failure, shall not (1) render any electrical protective device ineffective (2) permit the car to move beyond the leveling or anticreep zones, if any hoistway door interlock is unlocked or if any hoistway door or car door or gate electric contact is not in the closed position (d) In jurisdictions enforcing NBCC, the occurrence of a single ground or the failure of any single magnetically</p>	NA

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	<p>operated switch, contactor, or relay, or the failure of any single solid-state device, or a software system failure, shall not permit the car to start if any hoistway door or car door or gate is not in the closed position. When any failure specified above occurs, the elevator shall not be permitted to restart.</p> <p>(e) If an instantaneous reversible motor is not used, a protective device or circuit shall be provided to prevent the motor from continuing in the same direction if the reversing control is actuated.</p>	
<p>5.3.2.18.2.2 Added 2010</p>	<p>5.3.2.18.2.2 Monitoring of Car Door or Gate Switch The elevator controls shall be designed in such a manner that when the car stops at a floor the landing door or gate contact and its related electric contact are opened and closed and the car door or gate switch contact(s) fails to open, the car shall not be permitted to respond to a call. The car shall be permitted to answer a call only after the car door and gate switch electric contacts have cycled at least once.</p>	<p>NA</p>
<p>SECTION 5.8 SHIPBOARD ELEVATORS</p>	<p>SECTION 5.8 MARINE ELEVATORS</p>	<p>NA</p>
<p>5.8.1 Electric Shipboard Elevators Electric shipboard elevators shall conform to Part 2, except as modified by 5.8.</p>	<p>5.8.1 Electric Shipboard Elevators Electric marine elevators shall conform to Part 2, except as modified by 5.8.</p>	<p>NA</p>
<p>6.1.4.1 Limits of Speed. The rated speed shall be not more than 0.5 m/s (100 ft/min), measured along the centerline of the steps in the direction of travel. The speed attained by an escalator after start-up shall not be intentionally varied.</p>	<p>6.1.4.1 Limits of Speed. The rated speed shall be not more than 0.5 m/s (100 ft/min), measured along the centerline of the steps in the direction of travel. The speed attained by an escalator after start-up shall not be intentionally varied, except as permitted by 6.1.4.1.2.</p>	<p>NA</p>
<p>6.1.6.2.2 Inspection Control. Each escalator shall be equipped with inspection controls not accessible to the general public during normal operation to provide constant pressure operation during maintenance, repair, or inspection by means of a manually operated control device.</p> <p>(a) <i>General Requirements</i> (1) Switches for transferring the control of the escalator to inspection operation shall be provided or a switch shall be provided at each landing in a portable control station; the switch(es) shall function as follows: (a) be through a contact that shall be positively opened mechanically and whose opening shall not depend solely on springs (b) be manually operated (c) be labeled “INSPECTION” (d) have two positions, labeled “INSPECTION” or “INSP” and “NORMAL” or “NORM”</p>	<p>6.1.6.2.2 Inspection Control. Each escalator shall be equipped with inspection controls not accessible to the general public during normal operation to provide constant pressure operation during maintenance, repair, or inspection by means of a manually operated control device.</p> <p>(a) <i>General Requirements</i> (1) Switches for transferring the control of the escalator to inspection operation shall be provided or a switch shall be provided at each landing in a portable control station; the switch(es) shall function as follows: (a) be through a contact that shall be positively opened mechanically and whose opening shall not depend solely on springs (b) be manually operated (c) be labeled “INSPECTION” (d) have two positions, labeled “INSPECTION” or “INSP” and “NORMAL” or “NORM”</p>	<p>NA</p>

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<p>(e) when in the “INSPECTION” position, it shall cause the movement of the escalator to be solely under the control of constant pressure operating devices at that landing or in that portable control station</p> <p>(f) be arranged so that if more than one inspection transfer switch is in the “INSPECTION” position, then all constant pressure operating devices at all locations shall be inoperative</p> <p>(g) be protected against accidental contact</p> <p>(h) the completion or maintenance of an electric circuit shall not be used to initiate inspection control</p> <p>(2) Constant pressure operating devices shall</p> <p>(a) allow movement of the escalator only by constant application of manual pressure</p> <p>(b) be distinctly recognizable from indications on the device as to the direction of travel controlled</p> <p>(c) be protected against accidental contact</p> <p>(d) be located so that the escalator steps are within sight</p> <p>(3) A stop switch conforming to 6.1.6.3.15 shall be provided adjacent to the constant pressure operating devices.</p> <p>(4) When portable control stations are used, the cord length shall not exceed 3 000mm(120 in.) in length.</p> <p>(b) <i>Plug-in Portable Control Station.</i> A plug-in portable control station shall be permitted, provided that</p> <p>(1) either a transfer switch conforming to 6.1.6.2.2(a)(1) is complied with, or when plugged in, the escalator shall automatically transfer to inspection operation</p> <p>(2) when the switch, if provided, is in the “INSPECTION” position, or when the control station is plugged in, it shall cause the movement of the escalator to be solely under the control of constant pressure operating devices contained in the portable unit</p> <p>(3) the plug-in portable control station is stored at the upper landing machinery space</p>	<p>(e) when in the “INSPECTION” position, it shall cause the movement of the escalator to be solely under the control of constant pressure operating devices at that landing or in that portable control station</p> <p>(f) be arranged so that if more than one inspection transfer switch is in the “INSPECTION” position, then all constant pressure operating devices at all locations shall be inoperative</p> <p>(g) be protected against accidental contact</p> <p>(h) deleted</p> <p>(2) Constant pressure operating devices shall</p> <p>(a) allow movement of the escalator only by constant application of manual pressure</p> <p>(b) be distinctly recognizable from indications on the device as to the direction of travel controlled</p> <p>(c) be protected against accidental contact</p> <p>(d) be located so that the escalator steps are within sight</p> <p>(3) A stop switch conforming to 6.1.6.3.15 shall be provided adjacent to the constant pressure operating devices.</p> <p>(4) When portable control stations are used, the cord length shall not exceed 3 000mm(120 in.) in length.</p> <p>(b) <i>Plug-in Portable Control Station.</i> A plug-in portable control station shall be permitted, provided that</p> <p>(1) either a transfer switch conforming to 6.1.6.2.2(a)(1) is complied with, or when plugged in, the escalator shall automatically transfer to inspection operation</p> <p>(2) when the switch, if provided, is in the “INSPECTION” position, or when the control station is plugged in, it shall cause the movement of the escalator to be solely under the control of constant pressure operating devices contained in the portable unit</p> <p>(3) the plug-in portable control station is stored at the upper landing machinery space</p>	<p style="text-align: center;">NA</p>

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<p>6.1.6.3.2 Speed Governor. A speed governor shall be provided, except as specified in 6.1.6.3.2(b). (a) The operation of the governor shall cause the electric power to be removed from the driving machine motor and brake should the speed of the steps exceed a predetermined value, which shall not be more than 40% above the rated speed. (b) The speed governor is not required where an alternating current, squirrel cage induction motor is used, and the motor is directly connected to the driving machine. (c) All escalators equipped with variable frequency drive motor controls shall be provided with an overspeed governor. (d) The device shall be of the manual-reset type.</p>	<p>6.1.6.3.2 Escalator Speed Monitoring Device An escalator speed-monitoring device shall be provided. (a) The operation of the device shall cause the electric power to be removed from the driving machine motor and brake should the speed exceed the rated speed by more than 20%. (b) The device shall be of the manual reset type</p>	<p>N/A</p>
<p>6.1.6.10 Control and Operating Circuits. The design and installation of the control and operating circuits shall conform to 6.1.6.10.1 through 6.1.6.10.3.</p>	<p>6.1.6.10 Control and Operating Circuits. The design and installation of the control and operating circuits shall conform to 6.1.6.10.1 through 6.1.6.10.4.</p>	<p>N/A</p>
<p>6.1.6.15 Contactors and Relays for Use in Critical Operating Circuits. Where electromechanical contactors or relays are provided to fulfill the requirements of 6.1.6.10.1 through 6.1.6.10.3, they shall be considered to be used in critical operating circuits. If contact(s) on these electromechanical contactors or relays are used for monitoring purposes, they shall be prevented from changing state if the contact(s) utilized in a critical operating circuit fail to open in the intended manner. The monitoring contact(s) shall be positively actuated and shall not be solely dependent upon springs.</p>	<p>6.1.6.15 Contactors and Relays for Use in Critical Operating Circuits. Where electromechanical contactors or relays are provided to fulfill the requirements of 6.1.6.10.1 through 6.1.6.10.4, they shall be considered to be used in critical operating circuits. If contact(s) on these electromechanical contactors or relays are used for monitoring purposes, they shall be prevented from changing state if the contact(s) utilized in a critical operating circuit fail to open in the intended manner. The monitoring contact(s) shall be positively actuated and shall not be solely dependent upon springs.</p>	<p>N/A</p>
<p>6.1.7.4.3 Control equipment shall be tested in accordance with the testing requirements of EN 12016 by exposing it to interference levels at the test values specified for “safety circuits.” The interference shall not cause any of the conditions described in 6.1.6.10.1(a) and (b). If enclosure doors or suppression equipment must remain installed to meet the above requirements, warning signs to that effect shall be posted on the control equipment.</p>	<p>6.1.7.4.3 Control equipment shall be tested in accordance with the testing requirements of EN 12016 by exposing it to interference levels at the test values specified for “safety circuits.” The interference shall not cause any of the conditions described in 6.1.6.10.1(a) through (f). If enclosure doors or suppression equipment must remain installed to meet the above requirements, warning signs to that effect shall be posted on the control equipment.</p>	<p>N/A</p>

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<p>6.2.4 Rated Speed The maximum speed of a treadway shall depend on the maximum slope at any point on the treadway. The speed shall not exceed the value determined by Table 6.2.4. The speed attained by a moving walk after startup shall not be intentionally varied.</p>	<p>6.2.4.1 Rated Speed The maximum speed of a treadway shall depend on the maximum slope at any point on the treadway. The speed shall not exceed the value determined by Table 6.2.4. The speed attained by a moving walk after startup shall not be intentionally varied, except as permitted by 6.2.4.1.2.</p>	<p>N/A</p>
<p>6.2.6.2.2 Inspection Control. Each moving walk shall be equipped with inspection controls not accessible to the general public during normal operation to provide constant pressure operation during maintenance, repair, or inspection by means of a manually operated control device.</p> <p><i>(a) General Requirements</i> (1) Switches for transferring the control of the moving walk to inspection operation shall be provided or a switch shall be provided at each landing in a portable control station; the switch(es) shall function as follows: (a) be through a contact that shall be positively opened mechanically and whose opening shall not depend solely on springs (b) be manually operated (c) be labeled “INSPECTION” (d) have two positions, labeled “INSPECTION” or “INSP” and “NORMAL” or “NORM” (e) when in the “INSPECTION” position, it shall cause the movement of the moving walk to be solely under the control of constant pressure operating devices at that landing or in that portable control station (f) be arranged so that if more than one inspection transfer switch is in the “INSPECTION” position, then all constant pressure operating devices at all locations shall be inoperative (g) be protected against accidental contact (h) the completion or maintenance of an electric circuit shall not be used to initiate inspection control (2) Constant pressure operating devices shall (a) allow movement of the moving walk only by constant application of manual pressure (b) be distinctly recognizable from indications on the device as to the direction of travel controlled (c) be protected against accidental contact (d) be located so that the moving walk treadway surface is within sight</p>	<p>6.2.6.2.2 Inspection Control. Each moving walk shall be equipped with inspection controls not accessible to the general public during normal operation to provide constant pressure operation during maintenance, repair, or inspection by means of a manually operated control device.</p> <p><i>(a) General Requirements</i> (1) Switches for transferring the control of the moving walk to inspection operation shall be provided or a switch shall be provided at each landing in a portable control station; the switch(es) shall function as follows: (a) be through a contact that shall be positively opened mechanically and whose opening shall not depend solely on springs (b) be manually operated (c) be labeled “INSPECTION” (d) have two positions, labeled “INSPECTION” or “INSP” and “NORMAL” or “NORM” (e) when in the “INSPECTION” position, it shall cause the movement of the moving walk to be solely under the control of constant pressure operating devices at that landing or in that portable control station (f) be arranged so that if more than one inspection transfer switch is in the “INSPECTION” position, then all constant pressure operating devices at all locations shall be inoperative (g) be protected against accidental contact (h) deleted (2) Constant pressure operating devices shall (a) allow movement of the moving walk only by constant application of manual pressure (b) be distinctly recognizable from indications on the device as to the direction of travel controlled (c) be protected against accidental contact (d) be located so that the moving walk treadway surface is within sight (3) A stop switch conforming to 6.2.6.3.12 shall be</p>	

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<p>(3) A stop switch conforming to 6.2.6.3.12 shall be provided adjacent to the constant pressure operating devices.</p> <p>(4) When portable control stations are used, the cord length shall not exceed 3 000mm(120 in.) in length.</p> <p>(b) <i>Plug-in Portable Control Station.</i> A plug-in portable control station shall be permitted provided that</p> <p>(1) either a transfer switch conforming to 6.2.6.2.2(a)(1)(a), (a)(1)(b), and (a)(1)(c) is complied with,</p> <p>or when plugged in, the moving walk shall automatically transfer to inspection operation</p> <p>(2) when the switch, if provided, is in the “INSPECTION” position, or when the control station is plugged in, it shall cause the movement of the moving walk to be solely under the control of constant pressure operating devices contained in the portable unit</p> <p>(3) the plug-in portable control station is stored at the upper landing machinery space</p>	<p>provided adjacent to the constant pressure operating devices.</p> <p>(4) When portable control stations are used, the cord length shall not exceed 3 000mm(120 in.) in length.</p> <p>(b) <i>Plug-in Portable Control Station.</i> A plug-in portable control station shall be permitted provided that</p> <p>(1) either a transfer switch conforming to 6.2.6.2.2(a)(1)(a), (a)(1)(b), and (a)(1)(c) is complied with,</p> <p>or when plugged in, the moving walk shall automatically transfer to inspection operation</p> <p>(2) when the switch, if provided, is in the “INSPECTION” position, or when the control station is plugged in, it shall cause the movement of the moving walk to be solely under the control of constant pressure operating devices contained in the portable unit</p> <p>(3) the plug-in portable control station is stored at the upper landing machinery space</p>	
<p>6.2.6.3.2 Speed Governor. A speed governor shall be provided, except as specified in 6.2.6.3.2(c).</p> <p>(a) The operation of the governor shall cause the electric power to be removed from the driving-machine motor and brake should the speed of the tread way exceed a predetermined value, which shall be not more than 40% above the rated speed.</p> <p>(b) The device shall be of the manual-reset type.</p> <p>(c) The speed governor is not required where an alternating current, squirrel cage induction motor is used, and the motor is directly connected to the driving machine.</p> <p>(d) All moving walks equipped with variable frequency drive-motor controls shall be provided with an overspeed governor.</p>	<p>6.2.6.3.2 Moving Walk Speed Monitoring Device An escalator speed-monitoring device shall be provided.</p> <p>(a) The operation of the device shall cause the electric power to be removed from the driving machine motor and brake should the speed exceed the rated speed by more than 20%</p> <p>The device shall be of the manual reset type</p>	NA
<p>6.2.6.9 Control and Operating Circuits. The design and installation of the control and operating circuits shall conform to 6.2.6.9.1 through 6.2.6.9.3.</p>	<p>6.2.6.9 Control and Operating Circuits. The design and installation of the control and operating circuits shall conform to 6.2.6.9.1 through 6.2.6.9.4.</p>	NA

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<p>6.2.6.14 Contactors and Relays for Use in Critical Operating Circuits. Where electromechanical contactors or relays are provided to fulfill the requirements of 6.2.6.9.1 through 6.2.6.9.3, they shall be considered to be used in critical operating circuits. If the contact(s) on these electromechanical contactors or relays is used for monitoring purposes, it shall be prevented from changing state if the contact(s) utilized in a critical operating circuit fails to open in the intended manner. The monitoring contact(s) shall be positively actuated and shall not be solely dependent upon springs.</p>	<p>6.2.6.14 Contactors and Relays for Use in Critical Operating Circuits. Where electromechanical contactors or relays are provided to fulfill the requirements of 6.2.6.9.1 through 6.2.6.9.4, they shall be considered to be used in critical operating circuits. If the contact(s) on these electromechanical contactors or relays is used for monitoring purposes, it shall be prevented from changing state if the contact(s) utilized in a critical operating circuit fails to open in the intended manner. The monitoring contact(s) shall be positively actuated and shall not be solely dependent upon springs.</p>	NA
<p>6.2.7.4.3 Control equipment shall be tested in accordance with the testing requirements of EN 12016 by exposing it to interference levels at the test values specified for “safety circuits.” The interference shall not cause any of the conditions described in 6.2.6.9.1(a) and (b). If enclosure doors or suppression equipment must remain installed to meet the above requirements, warning signs to that effect shall be posted on the control equipment.</p>	<p>6.2.7.4.3 Control equipment shall be tested in accordance with the testing requirements of EN 12016 by exposing it to interference levels at the test values specified for “safety circuits.” The interference shall not cause any of the conditions described in 6.2.6.9.1(a) through (e). If enclosure doors or suppression equipment must remain installed to meet the above requirements, warning signs to that effect shall be posted on the control equipment.</p>	NA
<p>6.2.8.2.1 When the moving walk is subjected to blowing snow or freezing rain, heating systems shall be operated to prevent accumulation of snow or ice on the treadway, landings, and skirt deflector devices. The heating systems operation shall be thermostatically controlled and independent of the moving walk operation.</p>	<p>6.2.8.2.1 When the moving walk is subjected to blowing snow or freezing rain, heating systems shall be operated to prevent accumulation of snow or ice on the treadway, landings. The heating systems operation shall be thermostatically controlled and independent of the moving walk operation.</p>	NA
<p>7.2.12.37 Requirement 2.26.12 does not apply.</p>	<p>7.2.12.37 Requirement 2.26.9.3.1(c), (d), and (e) do not apply</p>	NA
<p>7.2.12.38 Added</p>	<p>7.2.12.38 Requirement 2.26.9.3.2 and 2.26.9.4 do not apply.</p>	NA
<p>7.2.12.39 Added</p>	<p>7.2.12.39 Requirement 2.26.12 does not apply.</p>	NA
<p>7.3.11.7 Control and Operating Circuits. Requirements 3.26.6 and 2.26.9.3(a) and (b) apply hydraulic dumbwaiters.</p>	<p>7.3.11.7 Control and Operating Circuits. Requirements 2.26.9.3.1(a) and (b) and 3.26.6 apply hydraulic dumbwaiters.</p>	NA
<p>7.5.12.1.21 Requirements 2.26.9.3(c), (d), and (e) do not apply.</p>	<p>7.5.12.1.21 Requirements 2.26.9.3.1(c), (d), and (e) do not apply.</p>	NA
<p>7.5.12.1.22 Requirement 2.26.9.4 does not apply. When a single ground or failure as specified in 2.26.9.3(a) or (b) occurs the car shall not be permitted to restart.</p>	<p>7.5.12.1.22 Requirement 2.26.9.3.2 and 2.26.9.4 do not apply. When a single ground or failure as specified in 2.26.9.3.1(a) or (b) occurs, the car shall not be permitted to restart.</p>	NA
<p>7.5.12.2.26 Requirement 2.26.11 does not apply.</p>	<p>7.5.12.2.26 Requirement 2.26.9.3.1(c), (d) and (e) do not apply.</p>	NA
<p>7.5.12.2.27 Requirement 2.26.12 does not apply.</p>	<p>7.5.12.2.27 Requirement 2.26.9.3.2 and 2.26.9.4 do not</p>	NA

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	apply. When a single ground or failure as specified in 2.26.9.3.1(a) or (b) occurs, the car shall not be permitted to restart.	
8.3(b) (6) Added	8.3(b) (6) suspension member, as required in 2.20.11 (see 8.3.12)	NA
8.3.12 Suspension Member Tests Added	8.3.12 Suspension Member Tests Added Suspension member tests required in 2.20.11 shall be performed as required by 8.3.12.1 through 8.3.12.3. Test results shall be documented as required by 8.3.12.4.	NA
8.4.3.1 Rope Retainers Rope retainers shall be provided on deflecting and secondary sheaves, driving machine sheaves and drums, compensating sheaves, governor sheaves, governor tension sheaves, and suspension sheaves on cars and counterweights to inhibit the displacement of ropes, except as specified in 8.4.3.1.4.	8.4.3.1 Retainers for Suspension Means Retainers for suspension members shall be provided on deflecting and secondary sheaves, driving machine sheaves and drums, compensating sheaves, governor sheaves, governor tension sheaves, and suspension sheaves on cars and counterweights to inhibit the displacement of ropes, except as specified in 8.4.3.1.4.	NA
8.4.3.1.2 The retainer shall be continuous over not less than two-thirds of the arc of contact between the rope and its sheave or drum and shall be so located that not more than one-sixth of the arc of contact is exposed at each end of the retainer.	8.4.3.1.2 The retainer shall be continuous over not less than two-thirds of the arc of contact between the suspension members and its sheave or drum and shall be so located that not more than one-sixth of the arc of contact is exposed at each end of the retainer.	NA
8.4.3.1.3 For double-wrap traction applications, the arc of contact for drums and secondary sheaves shall be that length of arc that is uninterrupted by the entry/ exit of the ropes leading to/from the car or counterweight (see Fig. 8.4.3.1.3).	8.4.3.1.3 For double-wrap traction applications, the arc of contact for drums and secondary sheaves shall be that length of arc that is uninterrupted by the entry/ exit of the suspension members leading to/from the car or counterweight. (see Fig. 8.4.3.1.3).	NA
8.4.3.1.4 Rope restraints shall be permitted to be used in lieu of continuous guards, provided they conform to the following: (a) Where the arc of contact is 30 deg or less and one rope restraint, located at the midpoint of the arc of contact, is provided. (b) Where the arc of contact exceeds 30 deg and restraints are provided at intervals not exceeding 30 deg of arc along the arc of contact and a restraint is located at each end of the arc of contact.	8.4.3.1.4 Restraints for suspension members shall be permitted to be used in lieu of continuous guards, provided they conform to the following: (a) Where the arc of contact is 30 deg or less and one suspension member restraint, located at the midpoint of the arc of contact, is provided. (b) Where the arc of contact exceeds 30 deg and restraints are provided at intervals not exceeding 30 deg of arc along the arc of contact and a restraint is located at each end of the arc of contact.	NA

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<p>8.4.3.2 Guarding of Snag Points. Snag points created by rail brackets, rail clip bolts, fishplates, vanes, and similar devices shall be provided with guards to prevent snagging of the following:</p> <p>(a) the counterweight end of compensating ropes or chains where located 760 mm (30 in.) or less from a counterweight rail bracket</p> <p>(b) compensating chains where any portion of their loop below the mid-point of the elevator travel is located 915 mm (36 in.) or less horizontally from a snag point</p> <p>(c) governor ropes where located 500 mm (20 in.) or less from a snag point</p> <p>(d) suspension ropes where located 300 mm (12 in.) or less from a snag point</p> <p>(e) traveling cables where any portion of their loop below the mid-point of the elevator travel is located 915 mm (36 in.) or less horizontally from a snag point</p>	<p>8.4.3.2 Guarding of Snag Points. Snag points created by rail brackets, rail clip bolts, fishplates, vanes, and similar devices shall be provided with guards to prevent snagging of the following:</p> <p>(a) the counterweight end of compensating means or chains where located 760 mm (30 in.) or less from a counterweight rail bracket</p> <p>(b) compensating chains where any portion of their loop below the mid-point of the elevator travel is located 915 mm (36 in.) or less horizontally from a snag point</p> <p>(c) governor ropes where located 500 mm (20 in.) or less from a snag point</p> <p>(d) suspension members where located 300 mm (12 in.) or less from a snag point</p> <p>(e) traveling cables where any portion of their loop below the mid-point of the elevator travel is located 915 mm (36 in.) or less horizontally from a snag point</p>	NA
<p>8.4.8.9.3 Added</p>	<p>8.4.8.9.3 Where an expansion joint is located within the elevator installation, the location and maximum design displacement shall be indicated on the layout drawings.</p>	NA
<p>8.4.14 Reserved</p>	<p>8.4.14 Reserved</p>	NA
<p>8.4.15 Reserved</p>	<p>8.4.15 Reserved</p>	NA
<p>8.4.16 Added</p>	<p>8.4.16 Where all electric elevator equipment cannot be located on one side of an expansion joint, the maximum displacement across the expansion joint as provided by the building design shall not impair the function of the elevator.</p>	NA
<p>8.6.1.2 General Maintenance Requirements</p> <p>(1) (e) improved technology</p> <p>(2) (g) Added</p>	<p>8.6.1.2.1 General Maintenance Requirements</p> <p>(1) (e) improved technology</p> <p>(2) (g) Procedures for tests; periodic inspections; maintenance; replacements; adjustments; and repairs for traction-loss detection means, broken-suspension member detection means; residual strength detection means, and related circuits shall be incorporated into and made part of the Maintenance Control Program. [See 2.20.8.1, 2.20.8.2, 2.20.8.3, 8.6.11.10, 8.6.11.10, 8.10.2.2.2(c)(2), 8.10.2.2.2 (ss), and 8.6.4.19.12.]</p>	NA
<p>8.6.7.1.2 Added</p>	<p>8.6.7.1.2 Periodic Test Tags A metal tag with the applicable code requirement(s) and date(s) performed, and the name of the person or firm performing the test, shall be plainly visible and securely attached to the controller of each unit for all periodic tests.</p>	NA
<p>8.6.2.5 Repair of Ropes. Suspension, governor, and compensating ropes shall not be</p>	<p>8.6.2.5 Repair of Suspension and Compensating Means and Governor Ropes Suspension and compensation members and governor ropes shall not be lengthened or repaired by splicing (see 8.7.2.21).</p>	NA

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<p>8.6.3.2 Replacement of a Single Suspension Rope. If one rope of a set is worn or damaged and requires replacement, the entire set of ropes shall be replaced, except, where one rope has been damaged during installation or acceptance testing prior to being subjected to elevator service, it shall be permissible to replace a single damaged rope with a new rope, provided that the requirements of 8.6.3.2.1 through 8.6.3.2.6 are met.</p>	<p>8.6.3.2 Replacement Suspension Means. Suspension means, compensating means and governor ropes shall be replaced when they no longer conform to the requirements of ASME A17.6. Replacement of suspension means, compensating means, and governor ropes shall conform to the requirements of ASME A17.6 as stated in 8.6.3.2.1 through 8.6.3.2.3.</p>	<p>NA</p>
<p>8.6.3.2.1 The wire rope data for the replacement rope must correspond to the wire rope data specified in 2.20.2.2(a), (b), (c), (f), and (g) for the other ropes.</p>	<p>8.6.3.2.1 For steel wire rope, ASME A17.6, Section 1.10 shall apply</p>	<p>NA</p>
<p>8.6.3.2.2 The replacement rope shall be provided with a wire rope data tag conforming to 2.20.2.2.</p>	<p>8.6.3.2.2 For aramid fiber ropes, ASME A17.6, Section 2.9 shall apply</p>	<p>NA</p>
<p>8.6.3.2.3 The suspension ropes, including the damaged rope, shall not have been shortened since their original installation.</p>	<p>8.6.3.2.3 for noncircular elastomeric-coated steel suspension members, ASME A17.6, Section 3.7 Shall apply.</p>	<p>NA</p>
<p>8.6.3.3 Replacement of Ropes Other Than Governor Ropes DELETED and REPLACED with new language</p>	<p>8.6.3.3 Replacement of Suspension Means Fastenings and Hitch Plates Replacement of suspension means fastenings and hitch plates shall conform to the requirements in 8.6.3.3.1 through 8.6.3.3.5.</p>	<p>NA</p>
<p>8.6.3.3.1 Replacement of all ropes, except governor ropes (see 8.6.3.4), shall conform to the following: (a) Replacement ropes shall be as specified by the original elevator manufacturer or be at least equivalent in strength, weight, and design. (b) Ropes that have been previously used in another installation shall not be reused. (c) When replacing suspension, compensating, and car or drum counterweight ropes, all ropes in a set shall be replaced, except as permitted by 8.6.3.2. (d) The ropes in the set shall be new, all from the same manufacturer, and of the same material, grade, construction, and diameter. (e) Data tags conforming to 2.20.2.2 shall be applied. (f) Suspension, car, and drum counterweight rope fastenings shall conform to 2.20.9.</p>	<p>8.6.3.3.1 When the suspension means fastenings are replaced with an alternate means that conforms to 2.20.9, load-carrying ropes shall be in line with the shackle rod.</p>	<p>NA</p>

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<p>8.6.3.3.2 Rope Fastenings and Hitchplates. Replacement of rope fastenings and hitchplates shall conform to the following:</p> <p>(a) When the suspension-rope fastenings are replaced with an alternate means that conforms to 2.20.9, existing hitch plates that cause interference between the replacement fastening shall have the replacement fastening staggered, or the hitch plates shall be replaced with a design that provides clearance between replacement shackles.</p> <p>(b) Replacement hitch plates shall conform to 2.15.13.</p> <p>(c) Replacement fastenings shall be permitted to be installed on the car only, the counterweight only, at either of the dead-end hitches, or at both attachment points.</p> <p>(d) Rope fastenings at the drum connection of winding-drum machines shall comply with 8.6.4.10.2.</p>	<p>8.6.3.3.2 Existing hitch plates that do not permit the load carrying ropes to remain in line with the shackle rods shall have the replacement fastening staggered in the direction of travel of the elevator and counterweight, or the hitch plates replaced.</p>	<p>NA</p>
<p>8.6.3.3.3 Runby and Clearances After Reropeing or Shortening. The minimum car and counterweight clearances specified in 2.4.6 and 2.4.9 shall be maintained when new suspension ropes are installed or when existing suspension ropes are shortened. The minimum clearances shall be maintained by any of the following methods (see 8.6.4.11).</p> <p>(a) Limit the length that the ropes are shortened.</p> <p>(b) Provide blocking at the car or counterweight strike plate. The blocking shall be of sufficient strength and secured in place to withstand the reactions of buffer engagement as specified in 8.2.3. If wood blocks are used to directly engage the buffer, a steel plate shall be fastened to the engaging surface or shall be located between that block and the next block to distribute the load upon buffer engagements.</p> <p>(c) Provide blocking under the car and/or counterweight buffer of sufficient strength and secured in place to withstand the reactions of buffer engagement as described in 8.2.3.</p>	<p>8.6.3.3.3 replacement hitch plates shall conform to 2.15.13 and shall provide proper alignment of load carrying ropes and shackles.</p>	<p>NA</p>

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8.6.3.12 Added	8.6.3.12 Runby and Clearances After Reropeing or shortening The minimum car and counterweight clearances specified in 2.4.6 and 2.4.9 shall be maintained when new suspension means are installed or when existing suspension means are shortened. The minimum clearances shall be maintained by any of the methods described in 8.6.12.1 through 8.6.3.12.3 (see 8.6.4.11).	N/A
8.6.4.1 Suspension and Compensating Wire Ropes	8.6.4.1 Suspension and Testing of Electric Elevators	N/A
8.6.4.1.1 Suspension and compensating ropes shall be kept lightly lubricated and clean so that they can be visually inspected.	8.6.4.1.1 Suspension and compensating means shall be kept sufficiently clean so that they can be visually inspected.	N/A
8.6.4.1.2 Precautions shall be taken in lubricating suspension wire ropes to prevent the loss of traction. Lubrication shall be in accordance with instructions on the rope data tag [see 2.20.2.2(j)], if provided.	8.6.4.1.2 Steel wire ropes shall be lightly lubricated. Precautions shall be taken in lubricating suspension steel wire ropes to prevent loss of traction. Lubrication shall be in accordance with instructions on the rope data tag [see 2.20.2.2.2(n)], if provided.	N/A
8.6.4.1.3 Equal tension shall be maintained between individual ropes in each set. When suspension rope tension is checked or adjusted, an anti-rotation device conforming to the requirements of 2.20.9.8 shall be permitted.	8.6.4.1.3 Equal tension shall be maintained between individual suspension members in each set. When suspension member tension is checked or adjusted, an anti-rotation device conforming to the requirements of 2.20.9.8 shall be permitted.	N/A
8.6.4.7.4 Water and oil shall not be allowed to accumulate on pit floors. See also 8.6.10.3.	8.6.4.7.4 Water and oil shall not be allowed to accumulate on pit floors.	N/A
8.6.4.19.2 Safeties (a) Examinations. All working parts of car and counterweight safeties shall be examined to determine that they are in satisfactory operating condition and that they conform to the applicable requirements of 8.7.2.14 through 8.7.2.28 (see 2.17.10 and 2.17.11; Division 112). Check the level of the oil in the oil buffer and the operation of the buffer compression-switch on Type C safeties.	8.6.4.19.2 Safeties (a) Examinations. All working parts of car and counterweight safeties shall be examined to determine that they are in satisfactory operating condition and that they conform to the applicable requirements of 8.7.2.14 through 8.7.2.28 (see 2.17.10 and 2.17.11). Check the level of the oil in the oil buffer and the operation of the buffer compression-switch on Type C safeties.	N/A
8.6.4.19.3 titled Added	8.6.4.19.3 Governors	N/A
8.6.4.19.6 Firefighters' Emergency Operation. Firefighters emergency operation shall be tested to determine conformance with the applicable requirements (Division 6).	8.6.4.19.6 Firefighters' Emergency Operation. Firefighters emergency operation shall be tested to determine conformance with the applicable requirements (Part 6).	N/A
8.6.4.19.8 Power Operation of Door System. The closing forces of power-operated hoistway door systems shall be tested to determine conformance with the applicable requirements (Item 1.10.2).	8.6.4.19.8 Power Operation of Door System. The closing forces of power-operated hoistway door systems shall be tested to determine conformance with the applicable requirements (Item 1.8.1). For elevators required to comply with 2.13.4.2.4, the time in the door Code zone distance shall be measured and compared with the time specified on the data plate.	N/A

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<p>8.6.4.19.11 Ascending Car Overspeed Protection and Unintended Car Motion Devices. In jurisdictions enforcing NBCC</p>	<p>8.6.4.19.11 Ascending Car Overspeed Protection and Unintended Car Movement.</p>	<p>NA</p>
<p>8.6.4.19.12 Added</p>	<p>8.6.4.19.12 Traction Loss Detection Means Where provided, conformance with the traction loss detection means specified in 2.20.8.1 shall be demonstrated by</p> <ul style="list-style-type: none"> (a) causing relative motion between the drive sheave and the suspension means either by bottoming the car or counterweight [see 8.6.4.20.10(b)], or (b) An alternative test provided in the Maintenance Control Program. 	<p>NA</p>
<p>8.6.4.19.13 Added</p>	<p>8.6.4.19.13 Broken Suspension Member and Residual Strength Detection Means Where provided, testing of broken suspension and residual strength detection means shall comply with the following:</p> <ul style="list-style-type: none"> (a) The broken suspension member detection means shall be tested by simulating a slack suspension member or a loss of a suspension member as appropriate (see 2.20.8.2). (b) Suspension member residual strength detection means shall be tested to simulate a reduction of residual strength to 2.20.8.3. 	<p>NA</p>
<p>8.6.4.20.1 Car and Counterweight Safeties. Types A, B, and C car safeties, except those operating on wood guide rails, and their governors, shall be tested with rated load in the car. Counterweight safety tests shall be made with no load in the car. Tests shall be made by manually tripping the governor at the rated speed. The following operational conditions shall be checked (Item 2.29.2.1):</p> <ul style="list-style-type: none"> (a) Type B safeties shall stop the car with the rated load within the required range of stopping distances for which the governor is tripped (Item 2.29.2.1). (b) For Type A safeties and Type A safety parts of Type C safeties, there shall be sufficient travel of the safety rollers or dogs remaining after the test to bring the car and its rated load to rest on safety application at governor tripping speed. <p>A metal tag shall be attached to the safety-releasing carrier in a permanent manner, giving the date of the safety test, together with the name of the person or firm who performed the test.</p>	<p>8.6.4.20.1 Car and Counterweight Safeties. Types A, B, and C car safeties, except those operating on wood guide rails, and their governors, shall be tested with rated load in the car. Counterweight safety tests shall be made with no load in the car. Tests for governor operated safeties shall be made by manually tripping the governor at the rated speed. The overspeed switch on the governor shall be made ineffective during the test. Type A safeties without governors that are operated as a result of breaking or slackening of the hoisting ropes shall be tested by obtaining the necessary slack rope to cause it to function (Item 2.29.2.1). The following operational conditions shall be checked (Item 2.29.2.1):</p> <ul style="list-style-type: none"> (a) Type B safeties shall stop the car with the rated load within the required range of stopping distances for which the governor is tripped (Item 2.29.2.1). (b) For Type A safeties and Type A safety parts of Type C safeties, there shall be sufficient travel of the safety rollers or dogs remaining after the test to bring the car and its rated load to rest on safety application at governor tripping speed. <p>NOTE: To ensure that the safety will retard the car with the minimum assistance from the elevator driving machine and minimize the development of slack rope and fallback of the counterweight, the switch on the car operated by the car safety mechanism should, for the duration of the test, be temporarily adjusted to open as close as possible to the position at which the car safety mechanism is in the fully applied position.</p>	<p>NA</p>

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<p>8.6.4.20.2 Governors (a) The tripping speed of the governor and the speed at which the governor overspeed switch, where provided, operates shall be tested to determine conformance with the applicable requirements and the adjustable means shall be sealed (Item 2.13.2.1). (b) The governor rope pull-through and pull-out forces shall be tested to determine conformance with the applicable requirements, and the adjustment means shall be sealed (Item 2.13.2.1).</p>	<p>8.6.4.20.2 Governors (a) The tripping speed of the governor and the speed at which the governor overspeed switch, where provided, operates shall be tested to determine conformance with the applicable requirements and the adjustable means shall be sealed (Item 2.13.2.1). (b) The governor rope pull-through and pull-out forces shall be tested to determine conformance with the applicable requirements, and the adjustment means shall be sealed (Item 2.13.2.1). (c) After these two tests in jurisdictions enforcing NBCC, a metal tag indicating the date of the governor tests, together with the name of the person or firm that performed the tests, shall be attached to the governor in a permanent manner.</p>	<p>N/A</p>
<p>8.6.4.20.3 Oil Buffers (a) Car oil buffers shall be tested to determine conformance with the applicable requirements by running the car with its rated load onto the buffer at rated speed, except as specified in 8.6.4.20.3(b) and (c) (Item 5.9.2.1). Counterweight oil buffers shall be tested by running the counterweight onto its buffer at rated speed with no load in the car, except as specified in 8.6.4.20.3(b) and (c) (Item 5.9.2.1). (b) For reduced stroke buffers, this test shall be made at the reduced striking speed permitted (Item 5.9.2.1). (c) This test is not required where a Type C safety is used (see 8.6.4.20.1). (d) In making these tests, the normal and emergency terminal stopping devices shall be made temporarily inoperative. The final terminal stopping devices shall remain operative and be temporarily relocated, if necessary, to permit full compression of the buffer during the test. (e) After completion of the test, a metal tag, indicating the date of the test, together with the name of the person or firm who performed the test, shall be attached to the buffer [Item 5.3.2(b)].</p>	<p>8.6.4.20.3 Oil Buffers (a) Car oil buffers shall be tested to determine conformance with the applicable requirements by running the car with its rated load onto the buffer at rated speed, except as specified in 8.6.4.20.3(b) and (c) (Item 5.9.2.1). Counterweight oil buffers shall be tested by running the counterweight onto its buffer at rated speed with no load in the car, except as specified in 8.6.4.20.3(b) and (c) (Item 5.9.2.1). (b) For reduced stroke buffers, this test shall be made at the reduced striking speed permitted (Item 5.9.2.1). (c) This test is not required where a Type C safety is used (see 8.6.4.20.1). (d) In making these tests, the normal and emergency terminal stopping devices shall be made temporarily inoperative. The final terminal stopping devices shall remain operative and be temporarily relocated, if necessary, to permit full compression of the buffer during the test.</p>	<p>N/A</p>

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<p>8.6.4.20.10 Emergency Stopping Distance. Counterweight traction elevators shall be tested for traction drive limits to ensure that</p> <p>(a) during an emergency stop initiated by any of the electrical protective device(s) listed in 2.26.2 (except 2.26.2.13), except buffer switches for oil buffers used with Type C car safeties at the rated speed in the down direction, with passenger elevators and freight elevators permitted to carry passengers carrying 125% of their rated load, or with freight elevators carrying their rated load, cars shall stop and safely hold the load</p> <p>(b) if either the car or the counterweight bottoms on its buffers or becomes otherwise immovable</p> <p>(1) the ropes shall slip in the drive sheave and not allow the car or counterweight to be raised</p> <p>(2) the driving system shall stall and not allow the car or counterweight to be raised.</p>	<p>8.6.4.20.10 Emergency Stopping Distance. Counterweight traction elevators shall be tested for traction drive limits to ensure that</p> <p>(a) during an emergency stop initiated by any of the electrical protective device(s) listed in 2.26.2 (except 2.26.2.13), (except buffer switches for oil buffers used with Type C car safeties) at the rated speed in the down direction, with passenger elevators and freight elevators permitted to carry passengers carrying 125% of their rated load, or with freight elevators carrying their rated load, cars shall stop and safely hold the load</p> <p>(b) if either the car or the counterweight bottoms on its buffers or becomes otherwise immovable</p> <p>(1) the ropes shall slip in the drive sheave and not allow the car or counterweight to be raised</p> <p>(2) the driving system shall stall and not allow the car or counterweight to be raised.</p>	<p>NA</p>
<p>8.6.4.21 ADDED</p>	<p>8.6.4.21 Drive Sheaves with Nonmetallic Groove Surfaces and Steel Wire Ropes. Where steel wire ropes have worn through a nonmetallic drive-sheave groove surface and have not been damaged the supporting sheave surface beneath the nonmetallic sheave groove surface, the groove surfaces shall be replaced and the steel wire ropes shall be inspected for conformance to the criteria of ASME A17.6, Section 1.10, and replaced, if necessary. Where the sheave-supporting surfaces have been damaged, the drive sheave shall also be replaced or repaired and the groove surfaces shall be replaced.</p>	<p>NA</p>
<p>8.6.5.5.1 Examination and Maintenance. Where valves and cylinders use packing glands or seals, they shall be examined and maintained to prevent excessive loss of fluid.</p>	<p>8.6.5.5.1 Examination and Maintenance. Where pressure piping, valves and cylinders use packing glands or seals, they shall be examined and maintained to prevent excessive loss of fluid. When a cylinder packing or seal or a pressure-piping seal is replaced, the integrity of the entire hydraulic system shall be verified by operating it at relief-valve-pressure for not less than 15 sec.</p>	<p>NA</p>
<p>8.6.5.13 Overspeed Valve Setting. All elevators provided with field adjustable overspeed valves shall have the adjustment means examined to ensure the seal is intact. If the overspeed adjustment seal is not intact, compliance with 8.11.3.4.5 shall be verified and a new seal shall be installed.</p>	<p>8.6.5.13 Overspeed Valve Setting. All elevators provided with field adjustable overspeed valves shall have the adjustment means examined to ensure the seal is intact. If the overspeed adjustment seal is not intact, compliance with 8.6.5.16.5 shall be verified and a new seal shall be installed.</p>	<p>NA</p>
		<p>NA</p>

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<p>8.11.3.2.2 Hydraulic Cylinders and Pressure Piping. This test shall be performed after the relief valve setting and system pressure test in 8.11.3.2.1.</p> <p>(a) Cylinders and pressure piping that are exposed shall be visually inspected.</p> <p>(b) Cylinders and pressure piping that are not exposed shall be tested for leakage, which cannot be accounted for by the visible inspection in 8.11.3.2.2(a) (Item 2.36.2).</p> <p>The duration of this test shall be for a minimum of 15 min (Item 2.36.2).</p>	<p>8.6.5.14.2 Cylinders and Pressure Piping. This test shall be performed after the relief valve setting and system pressure test in 8.6.5.14.1.</p> <p>(a) Cylinders and pressure piping which are exposed shall be visually examined.</p> <p>(b) Cylinders and pressure piping which are not exposed shall be tested for leakage, which cannot be accounted for by the visual examination in 8.6.5.14.2(a) (Item 2.36.2).</p> <p>The duration of the test shall be for a minimum of 15 min (Item 2.36.2).</p>	
<p>8.11.3.2.3 Additional Tests. The following tests shall also be performed:</p> <p>(a) Normal Terminal Stopping Devices (8.11.2.2.5) (Item 3.5)</p> <p>(b) Governors, Overspeed Switch, and Seals (8.11.2.2.3) (Item 2.13)</p> <p>(c) Safeties (8.11.2.2.2) (Items 3.29 and 5.8)</p> <p>(d) Oil Buffers (8.11.2.2.1)</p> <p>(e) Firefighter's Emergency Operation (8.11.2.2.6) (Items 6.3 and 6.4)</p> <p>(f) Standby Power Operation (8.11.2.2.7) (Item 1.17) NOTE: Absorption of regenerated power (2.26.10) does not apply to hydraulic elevators.</p> <p>(g) Power Operations of Door System (8.11.2.2.8) (Items 4.6 and 4.7)</p> <p>(h) Emergency Terminal Speed Reducing Devices (3.25.2) (Item 3.6)</p> <p>(i) Low Oil Protection Operation (3.26.9) (Item 2.23.2)</p>	<p>8.6.5.14.3 Additional Tests. The following tests shall also be performed:</p> <p>(a) Normal Terminal Stopping Devices (8.6.4.19.5) (Item 3.5.2)</p> <p>(b) Governors, Overspeed Switch, and Seals (8.6.4.19.3) (Item 2.13.2.2)</p> <p>(c) Safeties (8.6.4.19.2) (Items 5.8.2)</p> <p>(d) Oil Buffers (8.6.4.19.1)</p> <p>(e) Firefighter's Emergency Operation (8.6.4.19.6) (Items 6.3 and 6.4)</p> <p>(f) Standby Power Operation (8.6.4.19.7) (Item 1.17.2.2) NOTE: Absorption of regenerated power (2.26.10) does not apply to hydraulic elevators.</p> <p>(g) Power Operations of Door System (8.6.4.19.8) (Items 4.6 and 4.7)</p> <p>(h) Emergency Terminal Speed Reducing Devices (3.25.2) (Item 3.6.2.2)</p> <p>(i) Low Oil Protection Operation (3.26.9) (Item 2.23.2)</p>	
<p>8.6.5.14.6 ADDED</p>	<p>8.6.5.14.6 Power Operation of Door System. The closing forces and speed of power-operated hoistway door systems shall be tested to determine conformance with the applicable requirements (Item 1.8.2). For elevators required to comply with 2.13.4.2.4, the time in the door Code zone distance shall be measured and compared with the time specified on the data plate.</p>	

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8.6.5.14.7 ADDED	8.6.5.14.7 Slack-Rope Device. The slack-rope device shall be tested on a roped hydraulic elevator by causing a slack rope condition to occur and verify that it will remove power in compliance with 3.18.1.2.7 (Item 3.31.2)	N/A
8.11.3.3.1 Unexposed Portions of Pistons. Piston rods of roped water hydraulic elevators shall be exposed, thoroughly cleaned, and examined for wear or corrosion. The piston rods shall be replaced if at any place the diameter is less than the root diameter of the threads (Item 5.11).	8.6.5.15.1 Unexposed Portions of Pistons. Piston rods of roped water hydraulic elevators shall be exposed, thoroughly cleaned, and examined for wear or corrosion. The piston rods shall be replaced if at any place the diameter is less than the root diameter of the threads (Item 5.11).	N/A
<p>8.11.4.2.19 Step/Skirt Performance Index (a) The escalator skirt shall not be cleaned, lubricated, or otherwise modified in preparation for testing. The escalator instantaneous step/skirt index measurements [6.1.3.3.7(a)] shall be recorded at intervals no larger than 150 mm (6 in.) from each side of two distinct steps along the inclined portion of the escalator, where the steps are fully extended. Test steps shall be separated by a minimum of 8 steps. (b) A load of 110 N (25 lbf) shall be laterally applied from the step to the adjacent skirt panel. The applied load shall not deviate from 110 N (25 lbf) by more than ±11 N (2.5 lbf). The load shall be distributed over a round or square area not less than 1940 mm² (3 in.²) and not more than 3870 mm² (6 in.²). (c) No vertical load exceeding 220 N (50 lbf) shall be applied to the test step and adjacent steps. (d) The coefficient of friction shall be measured with the test specimen conforming to the requirements of 6.1.3.3.7(b) sliding in the direction of the step motion under a 110 N (25 lbf) normal force at the operating speed of the escalator and shall be measured with devices having sensitivity better than ±2.2 N (0.5 lbf). The direction of step motion shall be the direction of normal operation. If the escalator is operated in both directions, the down direction shall be used for the test. (e) For both the coefficient of friction measurement and the loaded gap measurements, the center of the applied load shall be between 25 mm (1 in.) and 100 mm (4 in.) below the nose line of the steps. The center of the applied load shall be not more than 250 mm (10 in.) from the nose of the step. See Fig. 8.11.4.2.19(e). (f) Verify that the step/skirt performance index conforms to the requirements in 6.1.3.3.7 and 8.6.8.3 (Item 7.17).</p>	<p>8.6.8.3.1 Step/Skirt Performance Index The step/skirt performance index, when the escalator is subject to the test specified in 8.6.8.15.19, shall be the maximum value of the recorded instantaneous step/skirt index $eY/(ey+1)$, where</p> <p><i>(SI Units)</i> $e = 2.7183$ $y = -3.77 + 2.37(\mu) + 0.37(Lg)$ μ = the sliding coefficient of friction of a polycarbonate test specimen on the skirt panel at the measurement point calculated when subjected to 110 N normal load. The coefficient of friction shall be measured without addition of any field applied lubrication. Lg = the clearance between the step and the adjacent skirt panel when 110 N is applied from the step to the skirt panel, mm The applied load shall not deviate from the 110 N by more than ± 11 N. The load shall not be distributed over a round or square area not less than 1940 mm² and not more than 3870 mm².</p> <p><i>(Imperial Units)</i> $e = 2.7183$ $y = -3.77 + 2.37(\mu) + 0.37(Lg)$ μ = the sliding coefficient of friction of a polycarbonate test specimen on the skirt panel at the measurement point calculated when subjected to 25 lbf normal load. The coefficient of friction shall be measured without addition of any field applied lubrication. Lg = the clearance between the step and the adjacent skirt panel when 25 lbf is applied from the step to the skirt panel, mm The applied load shall not deviate from the 25 lbf by more than ± 2.5 lbf. The load shall not be distributed over a round or square area not less than 3 in.² and not more than 6 in.².</p>	OR Amendment

A17.1 2007	A17.1 2010	Oregon Amendment [Ore]
<p>8.11.4.2.18 Comb-Step or Comb-Pallet Impact Device</p>	<p>8.6.8.15.18 Comb-Step or Comb-Pallet Impact Device For escalators or moving walks required to comply with Rules 805.1u, 8053n, 905.1r, or 905.3k in A17.1d-2000 or earlier editions, or requirements 6.1.6.3.13 or 6.2.6.3.11, the comb-step/pallet-impact devices shall be tested in both the vertical and horizontal directions by placing a vertical or horizontal force on the combplate to cause operation of the device. The vertical and horizontal tests shall be independent of each other. The horizontal force shall be applied at the front edge center and both sides; the force shall be applied in the direction of travel into the combplate. The vertical force shall be applied at the front edge center. Both the vertical and horizontal forces required to operate the device shall be recorded (6.1.6.3.13 and 6.2.6.3.11; Items 7.7.2 and 9.7.2). See 8.6.9.2.3 for horizontal forces required.</p>	<p>N/A</p>
<p>8.6.8.15.19 Step/Skirt Index</p>	<p>8.6.8.15.19 Step/Skirt Index (a) The escalator skirt shall not be cleaned, lubricated, or otherwise modified in preparation for testing. The escalator instantaneous step/skirt index measurements [6.1.3.3.9(a)] shall be recorded at intervals no larger than 150 mm (6 in.) from each side of two distinct steps along the inclined portion of the escalator, where the steps are fully extended. Test steps shall be separated by a minimum of 8 steps. (b) A load of 110 N (25 lbf) shall be laterally applied from the step to the adjacent skirt panel. The applied load shall not deviate from 110 N (25 lbf) by more than ±11 N (2.5 lbf). The load shall be distributed over a round or square area not less than 1 940 mm² (3 in.²) and not more than 3 870 mm² (6 in.²). (c) No vertical load exceeding 220 N (50 lbf) shall be applied to the test step and adjacent steps. (d) The coefficient of friction shall be measured with the test specimen conforming to the requirements of 8.6.8.3.2 sliding in the direction of the step motion under a 110 N (25 lbf) normal force at the operating speed of the escalator and shall be measured with devices having sensitivity better than ±2.2 N (0.5 lbf). The direction of step motion shall be the direction of normal operation. If the escalator is operated in both directions, the down direction shall be used for the test. (e) For both the coefficient of friction measurement and the loaded gap measurements, the center of the applied load shall be between 25 mm (1 in.) and 100 mm (4 in.) below the nose line of the steps. The center of the applied load shall be not more than 250 mm (10 in.) from the nose of the step. See Fig. 8.6.8.15.19(e). (f) Verify that the step/skirt performance index conforms to the requirements in 8.6.8.3 or A17.3, Requirement 5.1.11 (Item 7.17).</p>	<p>Or Amendment</p>

A17.1 2007	A17.1 2010	Oregon Amendment [Ore]
8.6.8.15.23 Added	8.6.8.15.23 Seismic Risk Zones 2 or Greater. Verify that operation of the seismic switch complies with requirements of 8.5.4 (Items 7.20.2 and 9.20.2).	NA
8.6.11.6 Operating Instructions for Means Specified in 2.7.5.1.1 or 2.7.5.2.1. A written procedure for operating the means shall be provided and kept on the premises where the elevator is located (see 2.7.5.1.2 or 2.7.5.2.1).	8.6.11.7 Operating Instructions for Means Specified in 2.7.5.1.1 or 2.7.5.2.1 A written procedure for operating the means shall be posted in a permanent manner in plain view at an appropriate location on or adjacent to the means (see 2.7.5.1.1 or 2.7.5.2.1). The posting shall conform to ANSI Z535.4 or CAN/CSA Z321, whichever is applicable (see Part 9).	NA
8.6.11.7 Egress and Reentry Procedure From Working Areas in 2.7.5.1.3 or 2.7.5.2.3. A written procedure to outline the method for egress and reentry shall be provided and kept on the premises where the elevator is located (see 2.7.5.1.3 or 2.7.5.2.3).	8.6.11.8 Egress and Reentry Procedure From Working Areas in 2.7.5.1.3 or 2.7.5.2.3. A written procedure to outline the method for egress and reentry shall be posted in a permanent manner in plain view at an appropriate location on or adjacent to the working platform (see 2.7.5.1.3 or 2.7.5.2.3). The posting shall conform to ANSI Z535.4 or CAN/CSA Z321, whichever is applicable (see Part 9).	NA
8.6.11.8 Operating Instructions for Retractable Platforms. A written procedure to outline the method for the use of retractable platforms shall be provided and kept on the premises where the elevator is located (see 2.7.5.3.1).	8.6.11.9 Operating Instructions for Retractable Platforms. A written procedure to outline the method for the use of retractable platforms shall be posted in a permanent manner in plain view at an appropriate location on or adjacent to the retractable platform (see 2.7.5.3.1). The posting shall conform to ANSI Z535.4 or CAN/CSA Z321, whichever is applicable (see Part 9).	NA
8.6.11.10 ADDED	8.6.11.10 Examination After Shutdown Due to Traction Loss. Where the traction-loss detection means has been actuated [see 2.20.8.1 and 8.6.1.2.1(g)], the elevator shall not be returned to service until a physical examination of the drive sheave and suspension means has been conducted. The elevator shall not be moved until all passengers are out of the elevator and the elevator is posted out-of-service. In addition to the suspension means evaluation criteria in 8.11.2.1.3(cc), any suspension means or drive sheave condition that would adversely affect the traction capability of the system (see 2.24.2.3) shall be corrected before returning the elevator to service. NOTE: See lockout/tagout procedures in <i>Elevator Industry Field Employees Safety Handbook</i> for procedures for removing from the elevator from service.	NA

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8.6.11.11 ADDED	8.6.11.11 Examination After Safety Application After any safety application on a traction elevator has occurred, whether due to testing or during normal service, the driving machine sheave, all other sheaves, where furnished, and retainers and suspension members shall be examined throughout their complete length to ensure that all suspension members are properly seated in their respective sheaves, and that no damage has occurred to the sheaves, suspension members, or retainers. The elevator shall not be returned to service until this physical examination has been conducted and any repairs made, if necessary.	NA
8.6.11.12 ADDED	28.6.11.12 Examination After Shutdown Due to Broken Suspension Member Detection Means. After any application of the broken suspension member detection means, whether due to testing or during normal service, the driving machine sheave, all other sheaves, where furnished, and retainers and suspension members shall be examined throughout their complete length to ensure that all suspension members are properly seated in their respective sheaves, and that no damage has occurred to the sheaves, suspension members, or retainers. The elevator shall not be returned to service until this physical examination has been conducted and any repairs made, if necessary. Where a single suspension member has been damaged or broken, the entire suspension means shall be replaced in accordance with 8.6.3.2.	NA
8.7.2.21 Suspension Ropes and Their Connections	8.7.2.21 Suspension Means and Their Connections.	NA
8.7.2.21.1 Change in Ropes. Where the material, grade, number, or diameter of ropes is changed, the new ropes and their fastenings shall conform to 2.20. When existing sheaves are retained using ropes different from those originally specified, the original elevator manufacturer or a licensed professional engineer shall certify the sheave material to be satisfactory for the revised application.	8.7.2.21.1 Where the material, grade, number, or size of suspension means is changed, the new suspension means and their fastenings shall conform to 2.20. When existing sheaves are retained using, suspension members different from those originally specified, the original elevator manufacturer or a licensed professional engineer shall certify the sheave material to be satisfactory for the revised application.	NA
		NA

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<p>8.7.2.21.2 Addition of Rope Equalizers. Where rope equalizers are installed, they shall conform to 2.20.5.</p>	<p>8.7.2.21.2 Addition of Suspension-Member Equalizers. Where suspension member equalizers are installed, they shall conform to 2.20.5.</p>	<p>NA</p>
<p>8.7.2.21.3 Addition of Auxiliary Rope-Fastening Devices. Where auxiliary rope-fastening devices are installed, they shall conform to 2.20.</p>	<p>8.7.2.21.3 Addition of Auxiliary Suspension Member Fastening Devices. Where auxiliary suspension member fastening devices are installed, they shall conform to 2.20.</p>	<p>NA</p>
<p>8.7.2.21.4 ADDED</p>	<p>8.7.2.21.4 Exception for Suspension Means Monitoring and Protection. Elevators installed to editions prior to A17.1-2007, including A17.1a-2008, are exempt from all of the requirements of 2.20.8 and 2.20.11 provided that there is no change to the type of suspension means and that there is no alteration to the means themselves. If a traction loss detection system is provided, it shall comply with 2.20.8.1. If a broken suspension means detection means is provided, it shall comply with 2.20.8.2.</p>	<p>NA</p>
<p>8.7.3.31.10 In-Car Stop Switch. On passenger elevators equipped with nonperforated car enclosures, the emergency stop switch, including all markings, shall be permitted to be removed if an in-car stop switch conforming to 2.26.2.21, 2.26.4.3, 2.26.9.3(a), and 3.26.4.2 is provided.</p>	<p>8.7.3.31.10 In-Car Stop Switch. On passenger elevators equipped with nonperforated car enclosures, the emergency stop switch, including all markings, shall be permitted to be removed if an in-car stop switch conforming to 2.26.2.21, 2.26.4.3, 2.26.9.3.1(a), and 3.26.4.2 is provided.</p>	<p>NA</p>
<p>8.7.6.2.7 Treadway System <i>(a)</i> An alteration to the treadway systems shall require conformance with 6.2.3.2.3, 6.2.3.3.5, 6.2.3.3.6, 6.2.3.5, 6.2.3.6 [except as specified in 8.7.6.2.7(b)], 6.2.3.8, 6.2.3.9, 6.2.3.10, 6.2.3.11, 6.2.3.12.4, 6.2.3.12.5, 6.2.3.13, 6.2.6.3.3, 6.2.6.5, and 6.2.6.3.9. <i>(b)</i> The minimum width of the moving walk shall be permitted to be less than that required by 6.2.3.7. The existing width, if less than required by 6.2.3.7, shall not be decreased by the alteration.</p>	<p>8.7.6.2.7 Treadway System <i>(a)</i> An alteration to the treadway systems shall require conformance with 6.2.3.2.3, 6.2.3.3.5, 6.2.3.3.6, 6.2.3.5, 6.2.3.6 [except as specified in 8.7.6.2.7(b)], 6.2.3.8, 6.2.3.9, 6.2.3.10.4, 6.2.3.11.5, 6.2.3.12, 6.2.6.3.3, 6.2.6.5, and 6.2.6.3.9. <i>(b)</i> The minimum width of the moving walk shall be permitted to be less than that required by 6.2.3.7. The existing width, if less than required by 6.2.3.7, shall not be decreased by the alteration.</p>	<p>NA</p>
<p>8.7.6.2.9 Trusses and Girders. Any alterations or welding, cutting, and splicing of the truss or girder shall conform to 8.7.1.4. Alterations shall result in the moving walk's conforming to 6.2.3.9, 6.2.3.10.1, and 6.2.3.12.1. The installation of a new moving walk into an existing truss shall conform to all of the requirements of 6.2.</p>	<p>8.7.6.2.9 Trusses and Girders. Any alterations or welding, cutting, and splicing of the truss or girder shall conform to 8.7.1.4. Alterations shall result in the moving walk's conforming to 6.2.3.9, 6.2.3.10.1, and 6.2.3.11.1. The installation of a new moving walk into an existing truss shall conform to all of the requirements of 6.2.</p>	<p>NA</p>

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<p>8.7.6.2.12 Driving Machine, Motor, and Brake <i>(a) Driving Machine.</i> An alteration to the driving machine shall result in the moving walk's conforming to 6.2.3.10.2, 6.2.3.11.2, 6.2.3.11.3, 6.2.3.13, 6.2.3.14, 6.2.3.15, 6.2.4, 6.2.5.1, 6.2.5.3.1, 6.2.5.3.2, 6.2.6.3.4, and 6.2.6.3.8. <i>(b) Drive Motor.</i> An alteration to the drive motor shall result in the moving walk's conforming to 6.2.3.10.2, 6.2.3.11.2, 6.2.3.11.3, 6.2.4, 6.2.5.2, 6.2.5.3.1, 6.2.6.3.2, 6.2.6.3.7, and 6.2.6.3.8. <i>(c) Machine Brake.</i> An alteration to the machine brake shall result in the moving walk's conforming to 6.2.3.10.3, 6.2.3.11.2, 6.2.3.12.3, 6.2.5.3.1, and 6.2.5.3.2.</p>	<p>8.7.6.2.12 Driving Machine, Motor, and Brake <i>(a) Driving Machine.</i> An alteration to the driving machine shall result in the moving walk's conforming to 6.2.3.10.2, 6.2.3.11.2, 6.2.3.11.3, 6.2.3.14, 6.2.3.15, 6.2.4, 6.2.5.1, 6.2.5.3.1, 6.2.5.3.2, 6.2.6.3.4, and 6.2.6.3.8. <i>(b) Drive Motor.</i> An alteration to the drive motor shall result in the moving walk's conforming to 6.2.3.10.2, 6.2.3.11.2, 6.2.3.11.3, 6.2.4, 6.2.5.2, 6.2.5.3.1, 6.2.6.3.2, 6.2.6.3.7, and 6.2.6.3.8. <i>(c) Machine Brake.</i> An alteration to the machine brake shall result in the moving walk's conforming to 6.2.3.10.3, 6.2.3.11.2, 6.2.3.12.3, 6.2.5.3.1, and 6.2.5.3.2.</p>	<p style="text-align: center;">NA</p>
<p>8.9.1 Required Information Data plate shall be provided and maintained that shall indicate the Code to be used for inspections and tests (see 8.10.1.2). The data plate shall indicate the Code and edition in effect at the time of installation. The data plate shall also indicate the Code in effect at the time of any alteration and indicate the applicable requirements of 8.7.</p>	<p>8.9.1 Required Information An individual data plate shall be provided and maintained for each unit (see 1.1.1). The data plate that shall indicate the Code to be used for inspections and tests (see 8.10.1.2). The data plate shall indicate the Code and edition in effect at the time of installation. The data plate shall also indicate the Code in effect at the time of any alteration and indicate the applicable requirements of 8.7.</p>	<p style="text-align: center;">NA</p>
<p>8.9.2 Location The data plate shall be in plain view, securely attached to the main line disconnect or on the controller. An additional data plate shall be installed in the vicinity of the starting switch on the exterior of escalators and moving walks.</p>	<p>8.9.2 Location The data plate shall be in plain view, securely attached to the main line disconnect or on the controller. It shall also be permitted to locate the data plate in the controller as long as it is in plain view with the controller door open. An additional data plate shall be installed in the vicinity of the starting switch on the exterior of escalators and moving walks.</p>	<p style="text-align: center;">NA</p>

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<p>8.9.3 Material and Construction The data plate shall be of such material and construction that the letters and figures stamped, etched, cast, or otherwise applied to the face shall remain permanently and readily legible. The height of the letters and figures shall be not less than 3.2 mm (0.125 in.).</p>	<p>8.9.3 Material and Construction The data plate shall be of such material and construction that the letters and figures stamped, etched, cast, or otherwise applied to the face shall remain permanently and readily legible. The height of the letters and figures shall be not less than 3.2 mm (0.125 in.). All data plates not located in the controller shall be provided with either: (a) a durable means to prevent common contaminants (such as paint, adhesives, oil and grease) from adhering to the data plate parent surface and permit the removal of these contaminants, without obscuring the Code required data, or (b) letters and figures that are raised or depressed a minimum of 0.8 mm (0.03125 in.) from the plate surface face, and have a minimum character stroke width of 0.5 mm (0.02 in.). If the plates are exposed to weathering or a chemical atmosphere, then a durable means shall be provided to protect the information from deterioration while permitting the information to be easily read.</p>	<p>N/A</p>
<p>8.10.1.1.2 The person installing or altering the equipment shall perform all of the tests required by 8.10.2 through 8.10.5 in the presence of the inspector specified in 8.10.1.1.</p>	<p>8.10.1.1.2 The person installing or altering the equipment shall perform all of the tests required by 8.10.2 through 8.10.5 in the presence of the inspector specified in 8.10.1.1.1.</p>	<p>N/A</p>
<p>8.10.1.4 Unique or Product-Specific Procedures or Methods. Where unique or product-specific procedures or methods are required to inspect or test equipment, such procedures or methods shall be provided by the manufacturer or installer.</p>	<p>8.10.1.4 Unique or Product-Specific Procedures or Methods. Where unique or product-specific procedures or methods are required to inspect or test equipment, such procedures or methods shall be provided by the manufacturer or installer. These procedures and any unique devices required by the procedures for inspection and testing shall be accessible on site to elevator personnel [see also 8.6.1.2.1(f)].</p>	<p>N/A</p>
<p>8.10.2.2.1 Inside Car (m) Emergency Exit (Item 1.13)</p>	<p>8.10.2.2.1 Inside Car (m) Emergency Exit (Item 1.13 and 1.20)</p>	<p>N/A</p>

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<p>8.10.2.2.2 Machine Room/Spaces, Control Room/Spaces</p> <p>(3) traction limits (2.24.2.3 and 2.16.6) shall be Verified</p> <p>(a) During an emergency stop initiated by any of the electrical protective devices listed in 2.26.2 (except 2.26.2.13), at the rated speed in the down direction, with passenger elevators and freight elevators permitted to carry passengers carrying 125% of their rated load, or with freight elevators carrying their rated load, cars shall stop and safely hold the load.</p> <p>(b) Traction shall slip, or the hoist machine shall stall, if either the car or the counterweight bottoms on its buffer.</p> <p>(2)(cc)(3) Note: added (qq) added (rr) added (ss) added</p>	<p>8.10.2.2.2 Machine Room/Spaces, Control Room/Spaces</p> <p>(3) traction limits (2.20.8.1, 2.24.2.3, and 2.16.6) shall be Verified</p> <p>(a) During an emergency stop initiated by any of the electrical protective devices listed in 2.26.2 (except 2.26.2.13), at the rated speed in the down direction, with passenger elevators and freight elevators permitted to carry passengers carrying 125% of their rated load, or with freight elevators carrying their rated load, there shall be sufficient traction to safely stop and safely hold the load.</p> <p>(b) Traction shall slip, or the driving machine shall stall, if either the car or the counterweight bottoms on its buffer.</p> <p>(2)(cc)(3) Note: [8.10.2.2.2(cc)(3)(b) and 8.10.2.2.2(cc)(3)(c)] Demonstration need not involve an actual loss of traction, for example, where the method of protection used to meet 2.20.8.1 prevents a loss of traction.</p> <p>(qq) Rope Retainers or Restraints for Seismic Risk Zones (Item 2.42)</p> <p>(rr) Seismic and Displacement Switches Operation and Door Operation (Item 2.42)</p> <p>(ss) Testing of broken suspension and residual strength detection means</p> <p>(1) The broken suspension member detection means shall be tested by simulating a slack suspension member or a loss of a suspension member as appropriate (2.20.8.2).</p> <p>(2) Suspension member residual strength detection means shall be tested to simulate a reduction of residual strength to 2.20.8.3.</p>	<p>NA</p>
<p>8.10.2.2.3 Top-of-Car</p> <p>(g) Normal Terminal Stopping Devices (Item 3.5). Verify location and type of switches (2.25.2). [See also 8.10.2.2.2(y).]</p> <p>(jj) Added (kk) Added</p>	<p>8.10.2.2.3 Top-of-Car</p> <p>(g) Normal Terminal Stopping Devices (Item 3.5). Verify location and type of switches (2.25.2). [See also 8.10.2.2.2(ff).]</p> <p>(jj) For seismic risk zones, horizontal clearance for car and counterweight, snag point clearance, and rail fastening.</p> <p>(kk) for seismic risk zones, snag guards, location of compensating ropes/chains, and traveling cables</p>	<p>NA</p>

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<p>8.10.2.2.5 Pit (1)(e) (e) Normal Terminal Stopping Devices (Item 5.4). verify location, operation and type of switches for conformance with 2.25.2 [see 8.10.2.2.2(y)]. (1)(h) (h) Compensating Chains, Ropes, and Sheaves (Item 5.10) (2)(q) Added (2)(r) Added</p>	<p>8.10.2.2.5 Pit (1)(e) (e) Normal Terminal Stopping Devices (Item 5.4). verify location, operation and type of switches for conformance with 2.25.2 [see 8.10.2.2.2(ff)]. (1)(h) (h) Compensating Chains, Ropes, and Sheaves (Item 5.10 and 5.16.3(a)) (2)(q) Snag guards for governor rope and traveling cables in seismic risk zones (Item 5.16.3) (2)(r) Added Verify information shown on layout drawing [Item 5.16.3(d)]</p>	<p>NA</p>
<p>8.10.2.3.2 Tests shall be performed when the following alterations are made: (b) Where alterations have been made to the car or counterweight guide rails, guide-rail supports, or guiderail fastenings, or where the stresses have been increased by more than 5% (8.7.2.24), tests shall be performed as specified in 8.10.2.2.1(s); 8.10.2.2.2(bb) and (cc); and 8.10.2.2.3(t), (x), and (y). (d) Where an alteration results in the increase in deadweight of the car that is sufficient to increase the sum of the deadweight and the rated load, as originally installed, by more than 5% (see 8.7.2.15.2), tests shall be performed as specified in 8.10.2.2.1(p) and (q); 8.10.2.2.2(o), (p), (q), (s), (t), (u), (v)(3), (y), (bb), (cc), and (dd); 8.10.2.2.3(k) and (x); and 8.10.2.2.5(c) and (i). (e) Where the alteration consists of the installation of new car or counterweight safeties, or where alterations are made to existing safeties (see 8.7.2.18), tests shall be performed as specified in 8.10.2.2.2(aa) and (bb); 8.10.2.2.3(n), (y), and (aa); and 8.10.2.2.5(j). (f) Where any alteration is made to a speed governor (see 8.7.2.19), tests shall be performed as specified in 8.10.2.2.2(aa), (bb)(1), (bb)(2), and (bb)(4); and 8.10.2.2.3(aa). (g) Where an alteration involves an increase in the rated load (see 8.7.2.16.4), tests shall be performed as specified in 8.10.2.2.1(p), and (q); 8.10.2.2.2(o) through (u), (v)(3), (y), (bb), (cc), and (dd); 8.10.2.2.3(k) and (x); and 8.10.2.2.5(c) and (i).</p>	<p>8.10.2.3.2 Tests shall be performed when the following alterations are made: (b) Where alterations have been made to the car or counterweight guide rails, guide-rail supports, or guiderail fastenings, or where the stresses have been increased by more than 5% (8.7.2.1), tests shall be performed as specified in 8.10.2.2.1(s); 8.10.2.2.2(ii) and (jj); and 8.10.2.2.3(t), (x), and (y). (d) Where an alteration results in the increase in deadweight of the car that is sufficient to increase the sum of the deadweight and the rated load, as originally installed, by more than 5% (see 8.7.2.15.2), tests shall be performed as specified in 8.10.2.2.1(p) and (q); 8.10.2.2.2(v), (w), (x), (z), (aa), (bb), (cc)(3), (ff), (ii), (jj), and (kk); 8.10.2.2.3(k) and (x); and 8.10.2.2.5(c) and (i). (e) Where the alteration consists of the installation of new car or counterweight safeties, or where alterations are made to existing safeties (see 8.7.2.18), tests shall be performed as specified in 8.10.2.2.2(hh) and (ii); 8.10.2.2.3(n), (y), and (aa); and 8.10.2.2.5(j). (f) Where any alteration is made to a speed governor (see 8.7.2.19), tests shall be performed as specified in 8.10.2.2.2(hh), (ii)(1), (ii)(2), and (ii)(4); and 8.10.2.2.3(aa). (g) Where an alteration involves an increase in the rated load (see 8.7.2.16.4), tests shall be performed as specified in 8.10.2.2.1(p), and (q); 8.10.2.2.2(o) through (u), (v)(3), (y), (bb), (cc), and (dd); 8.10.2.2.3(v) through (bb), (cc)(3), (ff), (jj), and (kk); 8.10.2.2.3(k) and (x); and 8.10.2.2.5(c) and (i).</p>	<p>NA</p>

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<p>(h) Where alterations are made to a driving machine brake (see 8.7.2.25), tests shall be performed as specified in 8.10.2.2.2(o) and (v)(3).</p> <p>(i) Where the location of the driving machine has been changed (8.7.2.25.2), for alterations as described in 8.7.2.25.2(a), tests shall be performed as specified in 8.10.2.2.2(d), (i), (n), and (v)(3). For alterations as described in 8.7.2.25.2(b), tests shall be performed as specified in 8.10.2.2.</p> <p>(j) Where an alteration increases the rated speed (8.7.2.17.2), tests shall be performed as specified in 8.10.2.2.1(c), (p), and (s); 8.10.2.2.2(l), (m), (o), (t), (u), (v), (w), (y), (aa), (bb), (cc), and (dd); 8.10.2.2.3(d), (e), (g), (h), (i), (k), (m), (n), and (cc); 8.10.2.2.4(e); and 8.10.2.2.5(b) through (e) and (j).</p> <p>(k) Where an alteration is made to any terminal stopping device (8.7.2.26), tests shall be performed as specified in 8.10.2.2.2(y); 8.10.2.2.3(g) and (h); and 8.10.2.2.5(c)(4), (d), and (e).</p> <p>(n) Where an alteration increases or decreases the rise (see 8.7.2.17.1), tests shall be performed as specified in 8.10.2.2.2(x), and (y); 8.10.2.2.3(d) through (h), (t), (w), and (y); 8.10.2.2.4(b), (c), (e) through (h), and (j); and 8.10.2.2.5(a), (b), (d), (e), (g), and (h).</p> <p>(o) Where an alteration is made such that a hoistway entrance is added (see 8.7.2.10.1), tests shall be performed as specified in 8.10.2.2.1(a), (c)(3), (h), (i), (j), (r), and (t); 8.10.2.2.2(z)(2); 8.10.2.2.3(c)(3)(w); 8.10.2.2.4(b) through (g), and (j); and 8.10.2.2.6.</p> <p>(p) Where an alteration is made such that there is a change in class of loading (see 8.7.2.16.2), tests shall be performed as specified in 8.10.2.2.1(p); 8.10.2.2.2(o), (p), (v), (bb), and (cc); and 8.10.2.2.5(i)(1).</p> <p>(q) Where an alteration is made that results in a freight elevator being permitted to carry passengers (see 8.7.2.16.3), tests shall be performed as specified in 8.10.2.2.1(a), (g), (i), (j), (l), (p), and (q); and 8.10.2.2.2(o), (u), (y), (bb), (cc)(2), and (dd).</p>	<p>(h) Where alterations are made to a driving machine brake (see 8.7.2.25), tests shall be performed as specified in 8.10.2.2.2(v) and (cc)(3).</p> <p>(i) Where the location of the driving machine has been changed (8.7.2.25.2), for alterations as described in 8.7.2.25.2(a), tests shall be performed as specified in 8.10.2.2.2(i), (n), and (cc)(3). For alterations as described in 8.7.2.25.2(b), tests shall be performed as specified in 8.10.2.2.</p> <p>(j) Where an alteration increases the rated speed (8.7.2.17.2), travel (8.7.2.17.1), rated load (8.7.2.4), type of service (8.7.2.16.1), class of loading (8.7.2.16.2) or from freight to passenger (8.7.2.16.3) tests shall be performed as specified in 8.10.2.2.1(c), (p), (q) and (s); 8.10.2.2.2(s), (t), (v), (aa), (bb), (cc), and (dd), (ff), (ii), (jj) and (kk); 8.10.2.2.3(d), (e), (g), (h), (i), (k), (m), (n), and (cc); 8.10.2.2.4(e); and 8.10.2.2.5(b) through (e) and (j).</p> <p>(k) Where an alteration is made to any terminal stopping device (8.7.2.26), tests shall be performed as specified in 8.10.2.2.2(ff); 8.10.2.2.3(g) and (h); and 8.10.2.2.5(c)(4), (d), and (e).</p> <p>(n) Where an alteration increases or decreases the rise (see 8.7.2.17.1), tests shall be performed as specified in 8.10.2.2.2(cc), and (ff); 8.10.2.2.3(d) through (h), (t), (w), and (y); 8.10.2.2.4(b), (c), (e) through (h), and (j); and 8.10.2.2.5(a), (b), (d), (e), (g), and (h).</p> <p>(o) Where an alteration is made such that a hoistway entrance is added (see 8.7.2.10.1), tests shall be performed as specified in 8.10.2.2.1(a), (c)(3), (h), (i), (j), (r), and (t); 8.10.2.2.2(gg)(2); 8.10.2.2.3(c)(3), (o), and (w); 8.10.2.2.4(b) through (g), and (j); and 8.10.2.2.6.</p> <p>(p) Where an alteration is made such that there is a change in class of loading (see 8.7.2.16.2), tests shall be performed as specified in 8.10.2.2.1(p); 8.10.2.2.2(v), (w), (cc), (ii), and (jj); and 8.10.2.2.5(i)(1).</p> <p>(q) Where an alteration is made that results in a freight elevator being permitted to carry passengers (see 8.7.2.16.3), tests shall be performed as specified in 8.10.2.2.1(a), (g), (i), (j), (l), (p), and (q); and 8.10.2.2.2(v), (bb), (ff), (ii), (jj)(2), and (kk).</p>	<p>N/A</p>

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<p>(r) Where an alteration is made that results in a new drive machine (see 8.7.2.25.1), tests shall be performed as specified in 8.10.2.2.2(j), (n) through (s), (v), (w), (cc), and (dd); and 8.10.2.2.1(q).</p> <p>(s) Where a controller is installed as part of an alteration without any change to the type of operation or control (see 8.7.2.27.4), tests shall be performed as specified in 8.10.2.2.1(c), (j), (q), and (t); 8.10.2.2.2(k), (l), (m), (t), (u), (y), (z), (cc), and (dd); and 8.10.2.2.6.</p> <p>(t) Where an alteration is made that results in a change in the type of motion or operation control (8.7.2.27.5 and 8.7.2.27.6), tests shall be performed as specified in 8.10.2.2.2(l) and (m). All electrical protective devices shall be tested for proper operation.</p> <p>(u) Where an alteration is made that results in a new replacement of a hoistway door, car door, or car gate controller without any change to the operation or control [see 8.7.2.27.4(b)], tests shall be performed as specified in 8.10.2.2.1(i) and (j); and 8.10.2.2.2(l)(1), (l)(2), (l)(3), and (l)(5).</p>	<p>(r) Where an alteration is made that results in a new drive machine (see 8.7.2.25.1), tests shall be performed as specified in 8.10.2.2.2(o), (u) through (z), (cc), (dd), (jj), and (kk); and 8.10.2.2.1(q).</p> <p>(s) Where a controller is installed as part of an alteration without any change to the type of operation or control (see 8.7.2.27.4), tests shall be performed as specified in 8.10.2.2.1(c), (j), (q), and (t); 8.10.2.2.2(r), (s), (t), (v), (aa), (bb), (ff), (gg), (jj) and (kk); and 8.10.2.2.6., and 8.10.2.2.3.(o)</p> <p>(t) Where an alteration is made that results in a change in the type of motion or operation control (8.7.2.27.5 and 8.7.2.27.6), tests shall be performed as specified in 8.10.2.2.2(s) and (l). All electrical protective devices shall be tested for proper operation.</p> <p>(u) Where an alteration is made that results in a new replacement of a hoistway door, car door, or car gate controller without any change to the operation or control [see 8.7.2.27.4(b)], tests shall be performed as specified in 8.10.2.2.1(i) and (j); and 8.10.2.2.2(s)(1), (s)(2), (s)(3), and (s)(5).</p>	<p style="text-align: center;">NA</p>
<p>8.10.3.2.1 Inside Car (m) Emergency Exit [3.14 and 8.10.2.2.1(m)] (Item 1.13)</p>	<p>8.10.3.2.1 Inside Car (m) Emergency Exit [3.14, 8.9, and 8.10.2.2.1(l)] (Item 1.13 and 1.20)</p>	<p style="text-align: center;">NA</p>
<p>8.10.3.2.2 Machine Room/Spaces, Control Room/Spaces. (ii) ADDED</p>	<p>8.10.3.2.2 Machine Room/Spaces, Control Room/Spaces. (ii) Location of machine room/space and hoistway related to expansion joint (Item 2.42.3.2).</p>	<p style="text-align: center;">NA</p>
<p>8.10.3.2.3 Top-of-Car (b) Car Top Light and Outlet [3.14 and 8.10.2.2.2(e)] (Item 3.2) (i) Top Emergency Exit [3.14 and 8.10.2.2.2(s)] (Item 3.8) (u) Governor, Safety, Ropes, and Counterweights (Item 3.20). Use procedures in 8.10.2.2.2(aa) and (bb); and 8.10.2.2.3(m), (n), (z) through (cc); car and counterweight safeties (3.17.1 and 3.17.2).</p>	<p>8.10.3.2.3 Top-of-Car (b) Car Top Light and Outlet [3.14 and 8.10.2.2.3(b)] (Item 3.2) (i) Top Emergency Exit [3.14 and 8.10.2.2.3(l)] (Item 3.8) (u) Governor, Safety, Ropes, and Counterweights (Item 3.20). Use procedures in 8.10.2.2.2(hh) and (ii); and 8.10.2.2.3(m), (n), (z) through (cc); car and counterweight safeties (3.17.1 and 3.17.2).</p>	<p style="text-align: center;">NA</p>
<p>8.10.3.2.5 Pit (i) Supply Piping (Item 5.14) (o) Overspeed Valve and Seal. Overspeed valves, where provided, shall be inspected and tested to verify that they will stop the car, traveling down with rated load within the specified limits of 3.19.4.7.5(a), using a written procedure supplied by the valve manufacturer or installer.</p>	<p>8.10.3.2.5 Pit (i) Supply Piping (Item 5.14) (o) Overspeed Valve and Seal. Overspeed valves, where provided, shall be inspected and tested to verify that they will stop the car, traveling down with rated load within the specified limits of 3.19.4.7.5(a), using a written procedure supplied by the valve manufacturer or installer. (Item 5.25.3.2).</p>	<p style="text-align: center;">NA</p>

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<p>8.10.3.3.2 Tests shall be performed when the following alterations are made:</p> <p>(b) Where alterations have been made to the car or counterweight guide rails, guide-rail supports, or guiderail fastenings, or where the stresses have been increased by more than 5% (8.7.3.28), tests shall be performed as specified in 8.10.3.2.1(s), 8.10.2.2.2(bb), if safeties are provided, 8.10.3.2.3(o), (s), and (t).</p> <p>(d) Where an alteration results in an increase in the deadweight of the car that is sufficient to increase the sum of the deadweight and the rated load, as originally installed, by more than 5% (8.7.3.21), tests shall be performed as specified in 8.10.3.2.3(u) and 8.10.2.2.2(bb) if safeties are provided; 8.10.2.2.5(c) if oil buffers are provided; and 8.10.3.2.1(q), 8.10.3.2.2(m), (n), (q), and (r), 8.10.3.2.3(h) and (cc).</p> <p>(g) Where an alteration involves an increase in the rated load (8.7.3.20), tests shall be performed as specified in 8.10.2.2.2(bb); and 8.10.3.2.3(u) if safeties are provided; and 8.10.2.2.5(c) if oil buffers are provided, and as specified in 8.10.3.2.1(p), (q)(1), 8.10.3.2.2(m), (n), (r), and 8.10.3.2.3(h) and (cc).</p> <p>(q) Where an alteration is made that results in a new hoistway door, car door, or car gate controller without any change to the operation or control [8.7.3.31.5(b)], tests shall be performed as specified in 8.10.3.2.2(l)(1), (2), (3), and (5).</p> <p>(s) Where an alteration is made and results in a replacement of a new controller without any change to the type of operation control or motion (8.7.3.31.5), tests shall be performed as specified in 8.10.2.2.2(l), (m)(1), (m)(2), (m)(4), and (ee); and 8.10.2.2.1(t). All electrical protective devices shall be tested for proper operation.</p>	<p>8.10.3.3.2 Tests shall be performed when the following alterations are made:</p> <p>(b) Where alterations have been made to the car or counterweight guide rails, guide-rail supports, or guiderail fastenings, or where the stresses have been increased by more than 5% (8.7.3.28), tests shall be performed as specified in 8.10.3.2.1(s), 8.10.2.2.2(ii), if safeties are provided, 8.10.3.2.3(o), (s), and (t).</p> <p>(d) Where an alteration results in an increase in the deadweight of the car that is sufficient to increase the sum of the deadweight and the rated load, as originally installed, by more than 5% (8.7.3.21), tests shall be performed as specified in 8.10.3.2.3(u) and 8.10.2.2.2(ii) if safeties are provided; 8.10.2.2.5(c) if oil buffers are provided; and 8.10.3.2.1(q), 8.10.3.2.2(m), (n), (q), and (r), 8.10.3.2.3(h) and (cc).</p> <p>(g) Where an alteration involves an increase in the rated load (8.7.3.20), tests shall be performed as specified in 8.10.2.2.2(ii); and 8.10.3.2.3(u) if safeties are provided; and 8.10.2.2.5(c) if oil buffers are provided, and as specified in 8.10.3.2.1(p), (q)(1), 8.10.3.2.2(m), (n), (r), and 8.10.3.2.3(h) and (cc).</p> <p>(q) Where an alteration is made that results in a new hoistway door, car door, or car gate controller without any change to the operation or control [8.7.3.31.5(b)], tests shall be performed as specified in 8.10.2.2.2(j), 8.10.3.2.2(s)(1), (s)(2), (s)(3), and (s)(5).</p> <p>(s) Where an alteration is made and results in a replacement of a new controller without any change to the type of operation control or motion (8.7.3.31.5), tests shall be performed as specified in 8.10.2.2.2(q), (s), (t)(1), (t)(2), (t)(4), and (II); and 8.10.2.2.1(t) and 8.10.2.2.3(o). All electrical protective devices shall be tested for proper operation.</p>	<p style="text-align: center;">NA</p>
	<p>8.10.4.1.1 External Inspection and Tests</p> <p>(o) Ceiling Intersection Guards (6.1.3.3.11 or 6.2.3.3.7) (Items 7.16 and 9.16)</p>	<p style="text-align: center;">OR Amendment</p>

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<p>8.10.4.1.1 External Inspection and Tests (o) Ceiling Intersection Guards (6.1.3.3.9 or 6.2.3.3.7) (Items 7.16 and 9.16) (t) Step/Skirt Performance Index (1) The escalator skirt shall not be cleaned, lubricated, or otherwise modified in preparation for testing. The escalator instantaneous step/skirt index measurements [6.1.3.3.7(a)] shall be recorded at intervals no larger than 150 mm (6 in.) from each side of two distinct steps along the inclined portion of the escalator, where the steps are fully extended. Test steps shall be separated by a minimum of eight steps. (2) A load of 110N(25 lbf) shall be laterally applied from the step to the adjacent skirt panel. The applied load shall not deviate from 110 N (25 lbf) by more than ±11 N (2.5 lbf). The load shall be distributed over a round or square area no less than 1 940 mm² (3 in.²) and no more than 3 870 mm² (6 in.²). (3) No vertical load exceeding 220 N (50 lbf) shall be applied to the test step and adjacent steps. (4) The coefficient of friction shall be measured with the test specimen conforming to the requirements of 6.1.3.3.7(b) sliding in the direction of the step motion under a 110 N (25 lbf) normal force at the operating speed of the escalator and shall be measured with devices having sensitivity better than ±2.2 N (0.5 lbf). The direction of step motion shall be the direction of normal operation. If the escalator is operated in both directions, the down direction shall be used for the test. (5) For both the coefficient of friction measurement and the loaded gap measurements, the center of the applied load shall be between 25 mm (1 in.) and 100 mm (4 in.) below the nose line of the steps. The center of the applied load shall be not more than 250 mm (10 in.) from the nose of the step. See Fig. 8.11.4.2.19(e). (6) Verify that the step/skirt performance index conforms to the requirements in 6.1.3.3.7 (Item 1.17.2) and in jurisdictions not enforcing NBCC (8.6.8.3).</p>	<p>8.10.4.1.1 External Inspection and Tests (o) Ceiling Intersection Guards (6.1.3.3.11 or 6.2.3.3.7) (Items 7.16 and 9.16) (t) Step/Skirt Performance Index (1) The escalator skirt shall not be cleaned, lubricated, or otherwise modified in preparation for testing. The escalator instantaneous step/skirt index measurements [6.1.3.3.9(a)] shall be recorded at intervals no larger than 150 mm (6 in.) from each side of two distinct steps along the inclined portion of the escalator, where the steps are fully extended. Test steps shall be separated by a minimum of eight steps. (2) A load of 110N(25 lbf) shall be laterally applied from the step to the adjacent skirt panel. The applied load shall not deviate from 110 N (25 lbf) by more than ±11 N (2.5 lbf). The load shall be distributed over a round or square area no less than 1 940 mm² (3 in.²) and no more than 3 870 mm² (6 in.²). (3) No vertical load exceeding 220 N (50 lbf) shall be applied to the test step and adjacent steps. (4) The coefficient of friction shall be measured with the test specimen conforming to the requirements of 6.1.3.3.9(b) sliding in the direction of the step motion under a 110 N (25 lbf) normal force at the operating speed of the escalator and shall be measured with devices having sensitivity better than ±2.2 N (0.5 lbf). The direction of step motion shall be the direction of normal operation. If the escalator is operated in both directions, the down direction shall be used for the test. (5) For both the coefficient of friction measurement and the loaded gap measurements, the center of the applied load shall be between 25 mm (1 in.) and 100 mm (4 in.) below the nose line of the steps. The center of the applied load shall be not more than 250 mm (10 in.) from the nose of the step. See Fig. 8.11.4.2.19(e). (6) Verify that the step/skirt performance index conforms to the requirements in 6.1.3.3.9 (Item 1.17.2) and in jurisdictions not enforcing NBCC (8.6.8.3).</p>	<p>NA</p>

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<p>8.10.4.1.2 Internal Inspection and Tests (a)(5) Added (w) Added (x) Added</p>	<p>8.10.4.1.2 Internal Inspection and Tests (a)(5) Verify that the connection and restraints between the truss and the building structures comply with seismic risk zone requirements (Items 8.16 and 10.17). (w) verify that the balustrades are installed as shown on the manufacturer's drawing for seismic requirements [Item 7.20.3(a)]. (x) Verify the installation, location, and function of the seismic switch [Item 7.20.3(a), and 9.20.3(b) and (c)].</p>	<p>N/A</p>
<p>8.11.1.2 Applicability of Inspection and Test Requirements. Inspections and tests required by 8.11.2 through 8.11.5 are to determine that the existing equipment conforms with the following applicable Code requirements: (a) the Code at the time of installation (b) the Code effective as applicable to and for each alteration (c) the ASME A17.3 Code, if adopted by the authority having jurisdiction NOTES (8.11.1.2): (1) The appropriate ASME A17.2 Inspectors' Manual (see Preface, ASME Elevator Publications) is a guide for inspections and tests. (2) References to "Items" and "Divisions" of the Inspectors' Manual, and to the requirements of this Code, are indicated in parentheses as a convenient reference to the applicable testing procedures and requirements.</p>	<p>8.11.1.2 Applicability of Inspection and Test Requirements. Inspections and tests required by 8.11.2 through 8.11.5 are to determine that the existing equipment conforms with the following applicable Code requirements: (a) the Code at the time of installation (b) the Code effective as applicable to and for each alteration (c) the ASME A17.3 Code, if adopted by the authority having jurisdiction NOTES (8.11.1.2): (1) The appropriate ASME A17.2 Inspectors' Manual (see Preface, ASME Elevator Publications) is a guide for inspections and tests. (2) References to "Items" and "Divisions" of the A17.2 Inspectors' Manual, and to the requirements of this Code, are indicated in parentheses as a convenient reference to the applicable testing procedures and requirements.</p>	<p>N/A</p>
<p>8.11.1.7 Unique or Product-Specific Procedures or Methods. Where unique or product-specific procedures or methods are required to inspect or test equipment, such procedures or methods shall be provided by the manufacturer or installer [see 8.6.1.2.1(e)].</p>	<p>8.11.1.7 Unique or Product-Specific Procedures or Methods. Where unique or product-specific procedures or methods are required to inspect or test equipment, such procedures or methods shall be provided by the manufacturer or installer. These procedures and any unique devices required by the procedures for inspection and testing shall be accessible on site to elevator personnel. [see 8.6.1.2.1(f)].</p>	<p>N/A</p>
<p>8.11.2.1.1 Inside Car (m) Emergency Exit (Item 1.13)</p>	<p>8.11.2.1.1 Inside Car (m) Emergency Exit (Item 1.13 and 1.20)</p>	<p>N/A</p>

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<p>8.11.2.1.2 Machine Room/Spaces, Control Room/Spaces (mm) Added (nn) Added</p>	<p>4.1.2 Machinery Rooms and Machinery Spaces (mm) Rope Retainers or Restraints for Seismic Risk Zones (Item 2.42) (nn) Seismic and Displacement Switches (Item 2.42)</p>	<p>N/A</p>
<p>8.11.2.1.3 Top-of-Car <i>(I) (t) Hoistway Clearances (Item 3.14).</i> <i>(z) Governor Rope (Item 3.20).</i> Governor ropes shall be inspected and replaced as specified in 8.11.2.1.3(cc)(1) and (cc)(3) for traction elevator suspension and compensating ropes. (bb) Wire Rope Fastening and Hitch Plate (Item 3.22). (cc) Wire Suspension and Compensating Ropes (Item 3.23). (dd) Compensation Ropes and Chains (Item 3.34). (2) (jj), (kk), (ll), (mm), (nn), (oo), (pp), and (qq) Added.</p>	<p>8.11.2.1.3 Top-of-Car <i>(t) Hoistway Clearances (Item 3.14 and 3.34.1(a) and (f).</i> <i>(z) Governor Rope (Item 3.20).</i> Governor ropes shall be inspected and replaced as specified in ASMEA 17.6, Part 1. (bb) Fastening and Hitch Plate (Item 3.22). (cc) Suspension Means (Item 3.23) shall be inspected and replaced as specified in ASMEA 17.6. (dd) Compensation Means (Item 3.34). (2) (jj) Anchoring of Beams and supports in seismic risk zone 2 or greater [Item 3.34.1(b)]. (kk) Rope retainers and snag point guards in seismic zone 23 or greater [Items 3.34.1(c) and (d)]. (ll) Position restraints in seismic risk zone 2 or greater [Item 3.34.1(e) and (g)]. (mm) Car and counterweight guide rail systems in seismic zone 2 or greater [Item 3.34.1(h)]. (nn) for seismic risk zones 2 or greater, horizontal clearance for car and counterweight, snag point clearance and rail fastening. (oo) Seismic risk zone 2 of greater rope retainers/restraints and snag guards (Item 5.16.1) (pp) Seismic risk zone 2 or greater rope retainer and snag guard for compensating ropes or chains and compensating tension sheave fastening. (qq) Sheaves with nonmetallic groove surfaces (see 8.6.4.18 (Item 3.34)).</p>	<p>N/A</p>
<p>Table 8.11.2.1.3 (cc)(1)</p>	<p>Table 8.11.2.1.3 (cc)(1) DELETED</p>	<p>N/A</p>
<p>Table 8.11.2.1.3 (cc)(3)</p>	<p>Table 8.11.2.1.3 (cc)(3) DELETED</p>	<p>N/A</p>
<p>8.11.3.1.1 Inside the Car <i>(m) Emergency Exit (Item 1.13)</i></p>	<p>8.11.3.1.1 Inside the Car <i>(m) Emergency Exit (Item 1.13 and 1.20)</i></p>	<p>N/A</p>
<p>8.11.3.1.2 <i>(r) Hydraulic Power Unit (Item 2.30)</i></p>	<p>8.11.3.1.2 <i>(r) Hydraulic Power Unit (Item 2.30 and 2.42.1.2)</i></p>	<p>N/A</p>
<p>8.11.3.1.5 (q) Added</p>	<p>8.11.3.1.5 (q) Controller wiring, fuses, grounding, etc. (Item 2.12).</p>	<p>N/A</p>
<p>Section 9 updated to reflect revised references</p>	<p>Section 9 updated to reflect revised references</p>	<p>N/A</p>

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NONMANDATORY APPENDIX M INERTIA APPLICATION FOR TYPE A SAFETY DEVICE LOCATION OF TEST WEIGHT [8.10.2.2.2(bb)(2)]	NONMANDATORY APPENDIX M INERTIA APPLICATION FOR TYPE A SAFETY DEVICE LOCATION OF TEST WEIGHT [8.10.2.2.2(ii)(2)]	N/A
NONMANDATORY APPENDIX T Added	NONMANDATORY APPENDIX T INSPECTION AND REPLACEMENT OF STEEL WIRE ROPES	N/A
NONMANDATORY APPENDIX U Added	NONMANDATORY APPENDIX U DESIGN REQUIREMENTS – TRACTION ELEVATOR SUSPENSION SYSTEM	N/A

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ASME A17.6 2010		
	New Code Standard for Elevator Suspension, Compensation, and Governor Systems	
	Book Review	
	Move for adoption in It's entirety	
ASME A18.1 – 2008 Standard for Platform Lifts and Stairway Chairlifts		
A18.1 – 2005	A18.1 - 2010	
1.3 door or gate, self-closing: a manually operated door or gate that closes when released .	1.3 door or gate, self-closing: a manually operated door or gate that closes when released or a power-operated door or gate.	N/A
1.3 full passenger enclosure: an assembly inclusive of the platform top, minimum 2000 mm (80 in.) tall walls, minimum 2000 mm (80 in.) tall platform doors and platform floor.	1.3 full passenger enclosure: an assembly inclusive of the platform top, minimum 2000 mm (79 in.) tall walls, minimum 2000 mm (79 in.) tall platform doors and platform floor	N/A
2.1 Runways shall be installed in accordance with paras. 2.1.1, 2.1.2, or 2.1.3. Runway construction for lifts that penetrate a floor must comply with para. 2.1.1 and with the building code.	2.1 Runways shall be installed in accordance with paras. 2.1.1, 2.1.2, 2.1.3, or 2.1.4. Runway construction for lifts that penetrate a floor must comply with para. 2.1.1 and with the building code. Lifts conforming to para. 2.1.4 shall be located in courtroom areas not open to the public under the supervision of court officials.	N/A
Table 1.5.1	Added reference to QE added	N/A
2.1.1.1 The runway shall be guarded by a solid enclosure from the lowest landing to a height of at least 1100 mm (42 in.) above the uppermost landing. The enclosure shall withstand, without permanent deformation, a force of 550 N (125lbf) applied on any 100 mm (4 in.) by 100 mm (4 in.) area. The interior of the runway enclosure shall present a smooth surface.	2.1.1.1 The runway shall be guarded by a solid enclosure from the lowest landing to a height of at least 1100 mm (42 in.) above the uppermost landing. The enclosure shall withstand, without permanent deformation, a force of 550 N (125lbf) applied on any 100 mm (4 in.) by 100 mm (4 in.) area. The interior of the runway enclosure shall present a smooth surface of all sides except where the platform enclosure walls extend to a minimum height of 2000 mm (79 in.) above platform floor.	

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<p>2.1.1.3 vertical clearance height of 2000 mm (80 in.)</p>	<p>2.1.1.3 vertical clearance height of 2000 mm (79 in.)</p>	<p>N/A</p>
<p>2.1.1.7 The platform enclosure walls on the sides not used for entrance or exit shall be of a smooth construction to a height of at least 1100 mm (42 in.) above the platform floor with no openings other than those necessary for operation. Openings necessary for operation shall reject a ball of 12 mm (0.5 in.) in diameter. A grab rail extending the full length of either side wall shall be provided at a height of 850 mm (34 in.) to 1000 mm (38 in.). The running clearance between the platform enclosure walls and the runway enclosure shall not be less than 50 mm (2 in.) nor more than 75 mm (3 in.).</p>	<p>2.1.1.7 Platform sides not used for entrance or exit shall be guarded by enclosure of a smooth construction to a height of at least 1100 mm (42 in.) above the platform floor with no openings other than those necessary for operation. Openings necessary for operation shall reject a ball of 12 mm (0.5 in.) in diameter. A grab rail extending the full length of either side wall shall be provided at a height of 850 mm (34 in.) to 1000 mm (38 in.). The running clearance between the platform enclosure walls that extend less than 2000 mm (79 in.) above the platform floor and runway enclosure walls, vertical face of the machine housing, or other rigid surfaces shall not be less than 50 mm (2 in.). Running clearance between enclosure wall ends and the entrance and exit side of the runway shall not be less than 50 mm (2 in.) nor more than 75 mm (3 in.).</p>	<p>N/A</p>
<p>2.1.2.1 The area under the platform shall be fully enclosed by smooth guards, either telescoping or stationary, on all accessible platform sides. The guards shall withstand, without permanent deformation, a force of 550 N (125 lbf) applied on any 100 mm (4 in.) by 100 mm (4 in.) area. The height of stationary guards, if provided, shall be at least equal to the maximum upward travel of the platform floor plus 75 mm (3 in.). The running clearance between the platform enclosure walls and any stationary guard panel shall not be less than 50 mm (2 in.) nor more than 75 mm (3 in.). Shutter type (telescoping) guards, if provided, shall be securely fastened to the lower landing level and to the platform. Openings necessary for operation of shutter type guard panels shall reject a ball 12 mm (0.5 in.) in diameter.</p>	<p>2.1.2.1 The area under the platform shall be fully enclosed by smooth guards, either telescoping or stationary, on all accessible platform sides. The guards shall withstand, without permanent deformation, a force of 550 N (125 lbf) applied on any 100 mm (4 in.) by 100 mm (4 in.) area. The height of stationary guards, if provided, shall be at least equal to the maximum upward travel of the platform floor plus 75 mm (3 in.). The running clearance between the platform enclosure walls and any stationary guard panel, vertical face of the machine housing, or other rigid surfaces shall not be less than 50 mm (2 in.) nor more than 75 mm (3 in.). Shutter type (telescoping) guards, if provided, shall be securely fastened to the lower landing level and to the platform. Openings necessary for operation of shutter type guard panels shall reject a ball 12 mm (0.5 in.) in diameter.</p>	<p>N/A</p>
<p>2.1.2.1.1 Added</p>	<p>2.1.2.1.1 Where stationary guards are used, the runway entrance at the lower landing shall be guarded by an unperforated self closing door. The vertical opening created in the runway by this door shall provide a minimum clearance of 2000 mm (79 in.). The horizontal opening created when the door is in its open position, shall not exceed the interior width of the runway. The door shall guard the entire area of the opening except for space necessary for operation. Space necessary for operation shall reject a ball 12 mm (0.5 in.) in diameter. The platform side of the landing door shall present a smooth surface located not less than 50 mm (2 in.) nor more than 75 mm (3 in.) from the platform door. The landing doorsill shall be located not closer than 10 mm (0.375 in) nor more than 20 mm (0.75 in.) from the platform floor.</p>	<p>N/A</p>
<p>2.1.2.8 The running clearance between the platform enclosure and the vertical face of the machine housing shall be not less than 50 mm (2 in.) nor more than 75 mm (3 in.). The surface shall not be permitted to deform when a force of 550 N (125 lbf) is applied to any 100 mm (4 in.) by 100 mm (4 in.) area.</p>	<p>2.1.2.8 The running clearance between the platform enclosure and the vertical face of the machine housing shall be not less than 50 mm (2 in.). The continuous surface shall be located on the left hand side of the obstruction not closer than 50 mm (2 in.) to the platform enclosure walls.</p>	<p>N/A</p>

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<p>2.1.3.5 Added</p>	<p>2.1.3.5 The running clearance between the platform enclosure walls and the machine housing or any other rigid surface shall not be less than 50 mm (2 in.). Where an obstruction or surface less than 1100 mm (42 in.) above the top landing other than the machine housing is within 300 mm (12 in.) of the platform enclosure walls and presents a pinching, shearing, or crushing hazard, a smooth continuous surface shall be provided extending from the lower landing to a height of not less than 1100 mm (42 in.) above the top landing. Where an obstruction or surface is between 1100 mm (42 in.) and 2000 mm (80 in.) above the top landing, a smooth continuous surface shall be provided extending from the lower landing to a height of not less than 75 mm (3 in.) above the obstruction.</p>	<p>N/A</p>
<p>2.1.3.6.1 The underside of the platform shall be equipped with a device which, if the platform is obstructed in its underside in its downward travel, shall cause electric power to be removed from the driving machine motor and brake, if provided, and cause the platform to stop its downward motion within 50 mm (2 in.). The stroke of the device shall be not less than the stopping distance of the platform. The force required to operate the device shall not exceed 70 N (15 lbf). The lift shall be permitted to operate away from the obstruction. Downward motion shall be permitted to resume when the obstruction is removed.</p>	<p>2.1.3.6.1 The underside of the platform shall be equipped with a device that, if the platform is obstructed anywhere on its underside in its downward travel, shall cause electric power to be removed from the driving machine motor and brake, if provided, and cause the platform to stop its downward motion within 50 mm (2 in.). The stroke of the device shall be not less than the stopping distance of the platform. The force required to operate the device shall not exceed 70 N (15 lbf). The lift shall be permitted to operate away from the obstruction. Downward motion shall be permitted to resume when the obstruction is removed.</p>	<p>N/A</p>
<p>2.1.4 Courtroom Lifts Section Added</p>	<p>2.1.4 Courtroom Lifts 2.1.4.1 The runway entrance shall be guarded at the uppermost landing by a door of unperforated construction. The door shall be self-closing or power-operated, at a height of no less than 900 mm (36 in.), and withstand, without permanent deformation, a force of 550 N (1252 lbf) applied on any 100 mm (4 in.) by 100 mm (4 in.) area. The door shall be located not more than 75 mm (3 in.) from the platform sill. 2.1.4.2 Intermediate landing entrances shall be guarded in accordance with the requirements of para. 2.1.4.2.1 or 2.1.4.2.2. 2.1.4.2.1 The runway entrance at any intermediate landing entrance shall be guarded by a self-closing or power operated door of unperforated construction not wider than the entrance to the platform plus 25 mm (1 in.). The door shall be a minimum height of 150 mm (6 in.) and extend to the top landing plus 75 mm (3 in.). The lift side of the door and sill shall present a smooth surface located not closer than 10 mm (0.375 in.) nor more than 20 mm (0.75 in.) from the edge of the platform floor.</p>	<p>N/A</p>

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	<p>2.1.4.2.2 Any intermediate landing entrance shall be guarded by a self closing or power operated guard of smooth, solid construction not wider than the entrance to the entrance to the platform plus 25 mm (1 in.) and of a height not less than 150 mm (6 in.). The side of the platform facing the intermediate landing shall be provided with a platform mounted guard of smooth, solid construction, at least the width of the landing entrance and of a height not less than 150 mm (6 in.).</p> <p>2.1.4.3 The area under the platform shall be fully enclosed by smooth guards, wither telescoping or stationary, on all accessible platform sides. The guards shall withstand, without permanent deformation, a force of 550 N (125 lbf) applied on any 100 mm (4 in.) by 100 mm (4 in.) area. Shutter type guards, if provided, shall be securely fastened to the lower landing level and to the platform. Openings necessary for operation of guards shall reject a ball 12 mm (0.5 in.) in diameter.</p> <p>2.1.4.4 A vertical fascia shall be provided from the top terminal landing sill and any intermediate landing sill to the level of the bottom terminal landing sill. Opening necessary for operation shall reject a ball 12 mm (0.5 in.) in diameter. The clearance between the vertical fascia and platform edge shall be not less than 10 mm (0.375 in.) nor more than 20 mm (0.75 in.).</p> <p>2.1.4.5 The runway entrance shall be guarded at the lower landing by a door of unperforated construction. The door shall be self closing or power operated, at a height not less than 900 mm (36 in.), and withstand a force of 550 N (125 lbf) applied on any 100 mm (4 in.) by 100 mm (4 in.) area. The clearances between the lower landing door and platform edge shall be not less than 10 mm (0.375 in.) nor more than 20 mm (0.75 in.).</p> <p>2.1.4.6 The sides of the platform not used for entrance or exit shall be guarded by stationary runway or platform mounted sidewalls of solid construction with no openings, other than those necessary for the operation of the lift.</p> <p>2.1.4.7 All doors/guards shall be provided with a combination mechanical lock and electric contact. Locking devices shall be protected against tampering from the landing side. The locking device shall permit a door/guard to be opened only if the platform floor is within 50 mm (2 in.) of the respective landing.</p>	
2.1.5 (was 2.1.4 under 2005 version)	2.1.5 Pipes in Runway Vicinity. New numerical designation	NA
2.1.6 (was 2.1.5 under 2005 version)	2.1.6 Lower Level Access Ramps New numerical designation	NA

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2.1.7(was 2.1.6 under 2005 version)	2.1.7 Electrical Equipment Wiring New numerical designation	NA
2.1.8(was 2.1.7 under 2005 version)	2.1.8 Structural Support New numerical designation	NA
2.1.9(was 2.1.8 under 2005t version)	2.1.9 Structural Support New numerical designation	NA
2.3.6 Guiding Member Enclosures The guiding members shall be enclosed with a solid enclosure to prevent accidental contact. If openings are necessary in this enclosure for operation, they shall reject a ball 20 mm (0.75 in.) in diameter.	2.3.6 Guiding Member Enclosures The guiding members shall be enclosed shall be guarded to prevent accidental contact. Any opening necessary in guards for operation, they shall reject a ball 20 mm (0.75 in.) in diameter.	NA
2.3.8 Guarding of Driving Machines and Suspension Means The driving machine and suspension means shall be enclosed with a solid enclosure. If openings are necessary in this enclosure for operation, they shall reject a ball 20 mm (0.75 in.) in diameter. Access shall be provided by a removable panel for inspecting and servicing. The panel shall be screw ed, locked, or bolted in place.	2.3.8 Guarding of Driving Machines and Suspension Means The driving machine and suspension means shall be guarded to prevent accidental contact. Any openings required for operation shall reject a ball 20 mm (0.75 in.) in diameter. Any guard(s) required to be removed for inspecting and servicing. shall be screw ed, locked, or bolted in place.	NA
2.6.5 Floor Area The inside net floor area shall not exceed 1.7 m ² (18 ft ²).	2.6.5 Floor Area The inside net floor area of lifts conforming to paras. 2.1.1, 2.1.2, and 2.1.3 shall not exceed 1.7 m ² (18 ft ²). The inside net floor area of lifts conforming to para. 2.1.4 shall not exceed 2.3 m ² (25 ft ²)..	NA
2.7.1 Limitation of Load, Speed, and Travel. The rated load shall be not less than 200 kg (450 lb) nor more than 340 kg (750 lb). The lift shall be capable of sustaining and low ering a load as specified in Fig. 9.7. The rated speed shall not exceed 0.15 m/s (30 ft/min). The travel shall not exceed 4250 mm (168 in.). Travel of lifts conforming to para. 2.1.3 shall not exceed 1500 mm (60 in.). Platforms with a floor greater than 1.4 m ² (15 ft ²) shall have rated load of not less than 340 kg (750 lb).	2.7.1 Limitation of Load, Speed, and Travel. The rated load shall be not less than 200 kg (450 lb) nor more than 475 kg (1050 lb). Platforms with a floor greater than 1.4 m ² (15 ft ²) shall have rated load of not less than 340 kg (750 lb). Platforms with a floor greater than 1.7 m ² (18 ft ²) shall have rated load of not less than 475 kg (1050 lb). The lift shall be capable of sustaining and low ering a load as specified in Fig. 9.7. The rated speed shall not exceed 0.15 m/s (30 ft/min). Travel of lifts conforming to paras 2.1.1 and 2.1.2 shall not exceed 4250 mm (168 in.). Travel of lifts conforming to para. 2.1.3 shall not exceed 1500 mm (60 in.). Travel of lifts conforming to para. 2.1.4 shall not exceed 600 mm (24 in.)	NA
2.10.1 Operating Devices and Control Equipment. Operation of the lift from the landing and from the platform shall be controlled by “UP” and “DOWN” control sw itches at all stations, and shall be by means of continuous pressure type.	2.10.1 Operating Devices and Control Equipment. Operation of the lift from the landing and from the platform shall be controlled control sw itches at all stations, and shall be by means of the continuous pressure type. Controls shall be 1200 mm (48 in.) maximum and 380 mm (15 in.) minimum above the platform floor or facility ground level. Operating devices shall be designed so that both the “UP” and “DOWN” circuits cannot be operated at the same time	NA

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<p>2.10.6 Emergency Stop Switch An emergency stop switch shall be provided on the platform and located in or adjacent to each platform operating panel.</p>	<p>2.10.6 Emergency Stop Switch An emergency stop switch shall be provided on the platform and located in or adjacent to each platform operating panel. An emergency stop switch shall not be provided on any landing control, except as required by para. 2.10.2.2.</p>	NA
<p>2.10.10 Manual Operations Means shall be provided to permit authorized personnel from a position outside the platform to raise or lower the platform manually in the event of power failure, unless standby (emergency) power is provided.</p>	<p>2.10.10 Manual Operations Means shall be provided to permit authorized personnel from a position outside the platform to raise or lower the platform manually in the event of power failure, unless standby (emergency) power is provided. The means to raise or lower the platform shall be capable of being accessed and operated without working directly above the platform.</p>	NA
<p>3.1.2.1 Headroom clearance where the platform is positioned for boarding shall not be less than 2000 mm (80 in.) as measured vertically from all points of the surface of the platform.</p>	<p>3.1.2.1 Headroom clearance where the platform is positioned for boarding shall not be less than 2000 mm (79 in.) as measured vertically from all points of the surface of the platform.</p>	NA
<p>3.1.2.3 If the headroom is less than 2000 mm (80 in.)</p>	<p>3.1.2.3 If the headroom is less than 2000 mm (79 in.)</p>	NA
<p>3.6.9 The upward and downward facing edges of the platform floor and the entire underside shall be equipped with obstruction devices. The obstruction devices shall stop the platform lift from traveling in the direction of the obstruction within a distance of 2 in. (50 mm) if the obstruction exerts a force of 20 N (4 lbf) or more. The platform lift shall be permitted to operate in the direction away from the obstruction.</p>	<p>3.6.9 The upward and downward facing edges of the platform floor and the entire underside shall be equipped with obstruction devices. The force required to operate the devices shall not exceed 70 N (15 lbf). The obstruction devices shall stop the platform lift from traveling in the direction of the obstruction within a distance of 50 mm. (2 in.) The platform lift shall be permitted to operate in the direction away from the obstruction.</p>	NA
<p>3.10.1 Operation of the lift from the landings and from the platform shall be controlled by "UP" and "DOWN" control switches at all stations, and shall be by means of continuous pressure type. Controls shall be 1200 mm (48 in.) maximum and 380 mm (15 in.) minimum above the platform floor or facility ground level. Controls shall be located within forward or side reach of the passenger as defined in ANSI A117.1. Operating devices shall be designed so that both the "UP" and "DOWN" circuits cannot be operated at the same time</p>	<p>3.10.1 Operation of the lift from the landings and from the platform shall be controlled by "UP" and "DOWN" control switches at all stations, and shall be by means of continuous pressure type. Controls shall be 1200 mm (48 in.) maximum and 380 mm (15 in.) minimum above the platform floor or facility ground level. Controls shall be located within forward or side reach of the passenger as defined in ANSI A117.1. Operating devices shall be designed so that both the "UP" and "DOWN" circuits cannot be operated at the same time</p>	NA
<p>3.10.6 Added sentence</p>	<p>3.10.6 An emergency stop switch shall not be provided on any landing control except as required by para. 3.10.2.</p>	NA
<p>4.10.1 Operation of the chairlift from the landings and from the upper or lower landing and from the chair shall be controlled by "UP" and "DOWN" control switches at all stations, and shall be by means of continuous pressure type. Controls shall be 1200 mm (48 in.) maximum and 380 mm (15 in.) minimum above the platform floor or facility ground level. Controls shall be located within forward or side reach of the passenger as defined in ANSI A117.1. Operating devices shall be designed so that both the "UP" and "DOWN" circuits cannot be operated at the same time</p>	<p>4.10.1 Operation of the chairlift from the landings and from the upper or lower landing and from the chair shall be by control switches at all stations, and shall be by means of continuous pressure type. Controls shall be 1200 mm (48 in.) maximum and 380 mm (15 in.) minimum above the platform floor or facility ground level. Operating devices shall be designed so that both the "UP" and "DOWN" circuits cannot be operated at the same time</p>	NA

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<p>5.1.1.7.1 The underside of the platform shall be equipped with a device that, if the platform is obstructed in its downward travel by a force not to exceed 70 N (15 lbf) applied anywhere on its underside, will actuate a minimum of two sensing devices which shall cause electric power to be removed from the driving machine motor and brake, if provided, and cause the platform to stop its downward motion within 50 mm (2 in.). The stroke of the device shall be not less than the stopping distance of the platform. The force required to operate the device shall not exceed 70 N (15 lbf). The lift shall be permitted to operate away from the obstruction. Downward motion shall be permitted to resume when the obstruction is removed. When the installation conforms to the requirements of para. 2.1.1 or 2.1.2, the sensing device on the underside of the platform is not required.</p>	<p>5.1.1.7.1 The underside of the platform shall be equipped with a device that, if the platform is obstructed anywhere on its underside in its downward travel, shall cause electric power to be removed from the driving machine motor and brake, if provided, and cause the platform to stop its downward motion within 50 mm (2 in.). The stroke of the device shall be not less than the stopping distance of the platform. The force required to operate the device shall not exceed 70 N (15 lbf). The lift shall be permitted to operate away from the obstruction. Downward motion shall be permitted to resume when the obstruction is removed. When the installation conforms to para. 2.1.1 or 2.1.2, the sensing device on the underside of the platform is not required.</p>	NA
<p>5.1.6 Headroom clearance (80 in)</p>	<p>5.1.6 Headroom clearance (79 in)</p>	NA
<p>5.10.1 Operation of the chairlift from the landings and from the upper or lower landing and from the chair shall be controlled by "UP" and "DOWN" control switches at all stations, and shall be by means of continuous pressure type. Controls shall be 1200 mm (48 in.) maximum and 380 mm (15 in.). Operating devices shall be designed so that both the "UP" and "DOWN" circuits cannot be operated at the same time</p>	<p>5.10.1 Operation of the lift from the landings and from the upper or lower landing and from the chair shall be by control switches at all stations, and shall be by means of continuous pressure type. Controls shall be 1200 mm (48 in.) maximum and 380 mm (15 in.) minimum above the platform floor or facility ground level. Operating devices shall be designed so that both the "UP" and "DOWN" circuits cannot be operated at the same time</p>	NA
<p>5.10.6 Added sentence</p>	<p>5.10.6 An emergency stop switch shall not be provided on any landing control except as required by para. 5.10.2.1.</p>	NA
<p>5.10.10 Manual Operations Means shall be provided to permit authorized personnel from a position outside the platform to raise or lower the platform manually in the event of power failure, unless standby (emergency) power is provided.</p>	<p>5.10.10 Manual Operations Means shall be provided to permit authorized personnel from a position outside the platform to raise or lower the platform manually in the event of power failure, unless standby (emergency) power is provided. The means to raise or lower the platform shall be capable of being accessed and operated without working directly above the platform.</p>	NA
<p>6.1 Paragraph 6.1.1 deleted</p>	<p>6.1.2 now 6.1.1; 6.1.3 now 6.1.2; 6.1.3 now 6.1.4; 6.1.4 now 6.1.5.</p>	NA
<p>6.6.8 The entire underside and lower edges of the platform floor facing the upper and lower landings shall be equipped with a device that will stop the platform traveling within a distance of 50 mm (2 in.) or less if it is obstructive in its travel in either direction, by a force of 20 N (4 lbf) or more.</p>	<p>6.6.8 The entire underside and lower edges of the platform floor facing the upper and lower landings shall be equipped with a device that will stop the platform traveling within a distance of 50 mm (2 in.) or less if it is obstructive in its travel in either direction, by a force of 70 N (15 lbf) or more.</p>	NA

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<p>6.8 All platforms shall be provided with a safety except for platforms of direct plunger hydraulic lifts. The safety shall be actuated by the action of speed governor or by the breakage or slacking of the suspension or support means. Where actuation is by a governor, the safety shall be set at a maximum speed of 0.4 m/s (75 fpm). Where actuation is by breakage or slacking of the suspension or support means, the safety shall be set without delay, and independent of the speed governor, if provided.</p>	<p>6.8 All platforms shall be provided with a safety, except for platforms of direct plunger hydraulic lifts or self-locking drives utilizing a lead screw or other positive gearing that will stop and hold the carriage with rated load within 100 mm (4 in.) of down travel after power is removed.</p> <p>The safety shall be actuated by the action of speed governor or by the breakage or slacking of the suspension or support means. Where actuation is by a governor, the safety shall be set at a maximum speed of 0.4 m/s (75 fpm). Where actuation is by breakage or slacking of the suspension or support means, the safety shall be set without delay, and independent of the speed governor, if provided.</p> <p>Safety parts shall conform to the requirements of para. 6.8.1. Governor ropes, where provided, shall conform to the requirements of para. 6.8.2.</p> <p>The application and release of safeties shall conform to the requirements of paras. 6.8.3, 6.8.4, and 6.8.5.</p>	<p>NA</p>
<p>6.10.1 Operation of the chairlift from the landings and from the upper or lower landing and from the chair shall be controlled by "UP" and "DOWN" control switches at all stations, and shall be by means of continuous pressure type. Controls shall be 1200 mm (48 in.) maximum and 380 mm (15 in.). Operating devices shall be designed so that both the "UP" and "DOWN" circuits cannot be operated at the same time</p>	<p>6.10.1 Operation of the chairlift from the landings and from the upper or lower landing and from the platform shall be controlled at all stations, and shall be by means of the continuous pressure type. Controls shall be 1200 mm (48 in.) maximum and 380 mm (15 in.). Operating devices shall be designed so that both the "UP" and "DOWN" circuits cannot be operated at the same time</p>	<p>NA</p>
<p>6.10.8 Added sentence</p>	<p>6.10.8 An emergency stop switch shall not be provided on any landing control except as required by para. 6.10.2.</p>	<p>NA</p>
<p>7.1.1</p>	<p>7.1.1 deleted; 7.1.2 now 7.1.1; 7.1.2 now 7.1.3; 7.1.4 now 7.1.3;</p>	<p>NA</p>
<p>7.8 All carriages shall be provided with a safety except for platforms of direct plunger hydraulic lifts. The safety shall be actuated by the action of speed governor or by the breakage or slacking of the suspension or support means. Where actuation is by a governor, the safety shall be set at a maximum speed of 0.4 m/s (75 fpm). Where actuation is by breakage or slacking of the suspension or support means, the safety shall be set without delay, and independent of the speed governor, if provided. Safety parts shall conform to the requirements of para. 7.8.2. The application and release of safeties shall conform to the requirements of 7.8.3, 7.8.4, and 7.8.5.</p>	<p>7.8 All platforms shall be provided with a safety, except for platforms of direct plunger hydraulic lifts or self-locking drives utilizing a lead screw or other positive gearing that will stop and hold the carriage with rated load within 100 mm (4 in.) of down travel after power is removed.</p> <p>The safety shall be actuated by the action of speed governor or by the breakage or slacking of the suspension or support means. Where actuation is by a governor, the safety shall be set at a maximum speed of 0.4 m/s (75 fpm). Where actuation is by breakage or slacking of the suspension or support means, the safety shall be set without delay, and independent of the speed governor, if provided.</p> <p>Safety parts shall conform to the requirements of para. 6.8.1. Governor ropes, where provided, shall conform to the requirements of para. 7.8.2.</p> <p>The application and release of safeties shall conform to the requirements of paras. 7.8.3, 7.8.4, and 7.8.5.</p>	<p>NA</p>
		<p>NA</p>

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<p>7.10.1 Operation of the lift from the landings and from the upper or lower landing and from the chair shall be controlled by “UP” and “DOWN” control switches at all stations, and shall be by means of continuous pressure type. Controls shall be 1200 mm (48 in.) maximum and 380 mm (15 in.). Operating devices shall be designed so that both the “UP” and “DOWN” circuits cannot be operated at the same time</p>	<p>7.10.1 Operation of the lift from the landings and from the upper or lower landing and from the chair shall be controlled at all stations, and shall be by means of the continuous pressure type. Controls shall be 1200 mm (48 in.) maximum and 380 mm (15 in.). Operating devices shall be designed so that both the “UP” and “DOWN” circuits cannot be operated at the same time</p>	<p>NA</p>
<p>8.1.4.10 The cylinder shall be provided with a means to release air or other gas.</p>	<p>8.1.4.10 The cylinder shall be provided with a flow control device, installed at the cylinder oil inlet, that will prevent the platform from descending at a rate in excess of 0.4 m/s (75 fpm).</p>	<p>NA</p>
<p>10.1.4 Added</p>	<p>10.1.4 All inspectors shall meet the qualifications requirements of ASME QEI-1. Inspectors and inspection supervisors shall be certified by an organization accredited by ASME in accordance with the requirements of ASME QEI-1.</p>	<p>Per OAR 918-400-0320 Applicants for certification of competency as a division elevator inspector, shall pass a written examination; and one of the following: Pass a practical examination, which tests knowledge of elevator equipment and the proper operation of elevators: Be a Qualified Elevator Inspector certified through an ASME approved certification program, or Demonstrate previous elevator industry experience to the satisfaction of the division. ORS460.085 authority ORS 460.055 implementation</p>

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ASME A90.1 - 2003 Safety Standard for Belt Manlifts	ASME A90.1 - 2009 Safety Standard for Belt Manlifts	NA
4.3.2 Clear Landing Space. The landing space adjacent to the floor opening shall be free from obstruction and kept clear at all times. The landing space shall be at least 2 ft (610 mm) in width from the edge of the floor opening used for mounting and dismounting (see figs. 2 and 3).	4.3.2 Clear Landing Space The landing space adjacent to the floor opening shall be free from obstruction and kept clear at all times. The landing space shall be at least 2 ft (610 mm) in width from the edge of the floor opening used for mounting and dismounting (see figs. 2 and 3 or 4 for typical landing spaces).	NA
Fig. 4	Fig 4. Formerly Fig. 5	NA
Fig. 5	Fig. 5 Formerly Fig. 4	NA
4.4.2 Where the fixed hood specified in para. 4.4.1 is not used, a floating type hood may be used; such floating hoods shall be mounted on hinges a maximum of 6 in. (150 mm) below the underside of the floor, and so constructed as to actuate a safety switch that shuts off the manlift should a force of 2 lb (9 N) be applied on the edge of the hood closest to the hinge.	4.4.2 Where the fixed hood specified in para. 4.4.1 is not used, a floating type hood may be used; such floating hoods shall be mounted on hinges a maximum of 6 in. (150 mm) below the underside of the floor, and so constructed as to actuate a safety switch that shuts off the manlift should a force of 2 lb (9 N) be applied on the edge of the hood closest to the hinge. The depth of this floating hinge need not exceed 12 in (305 mm)	NA
4.6.3 Sentence added	4.6.3 If a mounting platform is used, the edge of this platform should be in line with the outer edge of the openings at the upper floors.	NA
Fig. 6 title repositioned on page		NA
7.1 (e) No tools, except those fitting entirely within a pocket, tool pouch, or holster designed specifically for small hand tools and attached to an employee's belt or body harness (the kind from which no tools are able to protrude) shall be carried on any manlift.	7.1 (e) No tools, except those fitting entirely within a pocket, tool pouch, or holster designed specifically for small hand tools and attached to an employee's belt (the kind from which no tools are able to protrude) shall be carried on any manlift.	NA
8.2.1 All manlifts shall be inspected by a competent, designated person at intervals of not more than 30 days. Safety stops and rope control shall be checked weekly. Manlifts found to be unsafe shall not be operated until properly repaired.	8.2.1 All manlifts shall be inspected by a competent, designated person on a monthly basis at approximately 30 day intervals . Safety stops and rope control shall be checked weekly. Manlifts found to be unsafe shall not be operated until properly repaired.	NA
		NA
		NA
		NA
		NA
		NA
		NA