

ECNY Code Updates

Unintended Car Movement

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Appendix K Single Plunger Brake

APPENDIX K MODIFIED INDUSTRY STANDARDS FOR ELEVATORS AND CONVEYING SYSTEMS

CHAPTER K1 MODIFICATIONS TO ASME A17.1 - 2000, SAFETY CODE FOR ELEVATORS AND ESCALATORS, WITH SUPPLEMENTS A17.1a – 2002 AND A17.1b - 2003

3.8.4.1 Single plunger brakes.

(a)All existing traction elevators with single plunger brakes must comply with either of the following by January 1, 2027: (1) Alteration of single plunger assemblies to dual-plunger type, or (2)Compliance with Unintended Car Movement Protection as specified by Section 2.19.2 of ASME A17.1 (b)Notwithstanding any inconsistent provision of chapter 1 of title 28 of the Administrative Code, the work required to comply with this section may not be performed without a permit from the department.



Single Plunger Verses Dual Plunger Brake







What is Unintended Car Movement (UICM)?

ASME A17.1-19 Section 1.3 Definitions

unintended car movement: any movement of an elevator car that is not intended car movement resulting from a component or system failure.





ASME A17.1-2019 Section 2.19.2 Unintended Car Movement Protection

2.19.2.1 Purpose. Protection shall be provided with a means to detect unintended car movement (see

Section 1.3) and to stop the car movement, as a result of failure in any of the following:

(*a*) electric driving-machine motor, brake, coupling, gear shaft, or gearing

(b) control system

(c) any other component on which intended car movement depends, except the suspension means and drive sheave of the traction machine



ASME A17.1-2019 Section 2.19.2.2 Where Required and Function

2.19.2.2 Where Required and Function. All electric

traction elevators shall be provided with a means (see2.26.2.30) that shall

(a) detect unintended car movement in <mark>either direction</mark> away from the landing with the <mark>hoistway door not in the locked position and the car door</mark> or gate not in the closed position.

Note

(1) If the detection means requires electrical power for its functioning, then

(-a) a loss of electrical power to the unintended

movement detection and control means shall cause the immediate activation of the emergency brake as required in (b)



ASME A17.1-2019 Section 2.19.2.2 Where Required and Function

(-b) any of the following shall not render the detection means inoperative:

(-1) the occurrence of a single ground
(-2) the failure of any mechanically operated
switch that does not meet the requirements of
2.26.4.3.1

(-3) the failure of any single magnetically operated switch, contactor, or relay

(-4) the failure of any single solid-state device

(-5) the failure of a software system not

conforming to 2.26.4.3.2

(2) The failure of any single mechanically operated switch that does not meet the requirements of 2.26.4.3 shall not render the detection means inoperative.

(3) When a fault specified in (1)(-b) or (2) is

detected, the car shall stop at or before the next

landing for which a demand was registered, and shall not be permitted to restart.

(4) Once actuated by unintended movement, the

detection means shall <mark>remain actuated until it is manually reset</mark>, and the car <mark>shall not start or run unless the detection means is reset.</mark>



ASME A17.1-2019 Methods Used to verify Section 2.26.9.3.2 and 2.26.9.4

2.26.9.3.2 Methods used to satisfy 2.26.9.3.1 using software systems are permitted, provided that one of the following applies:

(a) a non-software-controlled means is also used to

remove power from the driving-machine motor and brake.

(b) the software system and related circuits are listed/ certified to a SIL rating that is in accordance with the applicable

requirements of IEC 61508-2 and IEC 61508-3.

This software system and its related circuits shall have a SIL not less than the highest SIL value of the safety function(s) in Table 2.26.4.3.2 used in the circuit. The software system and related circuits shall be identifiable on wiring diagrams [see 8.6.1.2.2(a)] with part identification, SIL, and certification identification information that shall be in accordance with the certifying organization's requirements.

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.



A method to test emergency brake circuits before each run.





ASME A17.1-2019 Section 2.19.2.2 Where Required and Function

(b) upon detection of unintended car movement, stop and hold the car, with any load up to rated load [see also2.16.8(h)], by applying an emergency brake conforming to 2.19.3. The stopped position of the car shall be limited in both directions, to a maximum of 1 220 mm (48 in.) as measured from the landing sill to the car sill. The car shall not start or run unless the emergency brake provided for the unintended movement protection is reset.





ASME A17.1-2019 Section 2.24.8.4 Means for Manual Release

2.24.8.4 Means for Manual Release. Means shall be permitted for manual release of the driving-machine brake. The means shall permit car movement in a gradual, controllable manner. Provision shall be made to prevent unintended actuation of the device. The manual release device shall be designed to be hand applied only with continuous effort. The brake shall reapply at its fully adjusted capacity in the absence of the hand-applied effort. Devices required in accordance with Section 2.19 are permitted to be temporarily disabled when the manual release device is in use.



ASME A17.1-2019 Section 1.3 Definitions

brake, emergency: a mechanical device independent of the braking system used to retard or stop an elevator should the car overspeed or move in an unintended manner. Such devices include, but are not limited to, those that apply braking force on one or more of the following:

(a) car rails

(b) counterweight rails

- (c) suspension or compensation ropes
- (d) drive sheaves
- (e) brake drums



Emergency Brake: Rope Gripper

Activated by Elevator Controller When:

- 1 Up or Down Overspeed
- 2 Unintended Movement / Doors Open
- 3 Loss of Power

Features: Electromechanical Activation Constant Pressure on Ropes Smooth Stop Won't Damage Cable Hydraulically Reset or Mechanical Reset on L model





Maintenance Requirements



Maintenance Criteria

3.5.5 Gripper Self-Test

The Rope Gripper® is equipped with self-monitoring functionality to ensure that it functioned properly. It is recommended that the controller periodically activate the Rope Gripper® to test proper functioning. It is suggested the controller self-test be done with the elevator doors closed and the normal service brake "set". If the Rope Gripper® functions properly, the controller will reopen the Rope Gripper® and the elevator will go back into normal operation. It is recommended that this self-test occur at regular intervals such as every three months with the car at the top of the hoist way at a low traffic time in accordance with all standard and local elevator regulations and protocols. Please contact your controller manufacture for further implementation considerations.



Maintenance Requirements

LUBRICATION INSTRUCTIONS

GRIPPER LUBRICATION: MAINTAIN A THIN LAYER OF GENERAL PURPOSE GREASE ON CAM AND FOUR GUIDES.

WIRE ROPE LUBRICATION:

USE A HIGH FRICATION LUBRICANT SUCH AS: NYLUBE CABLE CARE #65 OR AMERICAN OIL VITALIFE #600. CARE SHOULD BE TAKEN TO NOT OVER LUBRICATE ROPES.

Figure 21 – Lubrication Instructions

The linings will wear, especially after multiple high-speed stops. When clamping, the rotating shaft will move towards the upper end of the cam as the linings wear. Near the end of the cam, the excessive wear micro switch Figure 16 will open and the Rope Gripper® will not automatically reopen (reload).

Number of trips depend on speed and capacity, but bare minimum is 10 high speed trips.



Single Plunger Brake Upgrade FMG1 and Rope Gripper



Single Plunger Brake Upgrade

Rope Grippers

Application Details

	MODEL 620L 1:1 ROPING		MODEL 620L 2:1 ROPING		MODEL 622L 1:1 Roping		MODEL 622L 2:1 Roping			
Out-to-out (max)	5 1/4 in	1 33 mm	5 1/4 in	133 mm	6 1/2 in	165 mm	6 1/2 in	165 mm		
Power	1A, 110 - 240VAC, 1 PH, 50/60Hz for 620L units					2A, 110 - 240VAC, 1 PH, 50/60Hz for 622L units				
Contact ratings	5A, 250VAC / 5A, 30VDC for all units									
Closing time	0.3 seconds for all units									
Door zone (max)	± 3 in. (6 in. total) [± 76.2 mm (152.4 mm total)] for all units									
Rated speed (max)	350 f/m	1.78 m/s	250 f/m	1.27 m/s	600 f/m	3.05 m/s	400 f/m	2.03 m/s		
Tripping speed	402 f/m	2.04 m/s	303 f/m	1.54 m/s	690 f/m	3.51 m/s	459 f/m	2.33 m/s		
Car rated load (max)*	2,560 lbs	1,161 kg	5,120 lbs	2,322 kg	5,000 lbs	2,268 kg	10,000 lbs	4,536 kg		
Car rated load (min)*	600 lbs	272 kg	1,500 lbs	680 kg	1,500 lbs	680 kg	2,500 lbs	1,134 kg		
System mass (max)**	12,070 lbs	5,475 kg	24,140 lbs	10,950 kg	18,600 lbs	8,437 kg	38,000 lbs	17,237 kg		
Car and CWT (min)**	2,280 lbs	1,034 kg	6,000 lbs	2,722 kg	6,000 lbs	2,722 kg	8,000 lbs	3,629 kg		
Shipping weight	80 lbs	36 kg	80 lbs	36 kg	120 lbs	54 kg	120 lbs	54 kg		

SPECIFICATIONS	MODEL 624	MODEL 624	MODEL 625	MODEL 625	MODEL 626	MODEL 626						
	1:1 ROPING	2:1 ROPING	1:1 ROPING	2:1 ROPING	1:1 ROPING	2:1 ROPING						
Out-to-out (max)	10 in.	10 in.	11 1/2 in.	11 1/2 in.	10 / 13 3/4 in.	10 / 13 3/4 in.						
	(254 mm)	(254 mm)	(292 mm)	(292 mm)	(254 / 349 mm)	(254 / 349 mm)						
Power	6A, 120VAC, 1 PH, 60Hz for all units											
Contact ratings	6A, 250VAC, 0.15A, 250VDC for all units											
Closing time	0.3 seconds for all units											
Door zone (max)	± 3 in. (6 in. total) [± 76.2 mm (152.4 mm total)] for all units											
Rated speed (max)	1,200 f/m	800 f/m	1,200 f/m	800 f/m	1,200 f/m	800 f/m						
	(6.10 m/s)	(4.06 m/s)	(6.10 m/s)	(4.06 m/s)	(6.10 m/s)	(4.06 m/s)						
Tripping speed	1,368 f/m	921 f/m	1,368 f/m	921 f/m	1,368 f/m	921 f/m						
	(6.95 m/s)	(4.68 m/s)	(6.95 m/s)	(4.68 m/s)	(6.95 m/s)	(4.68 m/s)						
Car rated load (max)*	5,000 lbs	10,000 lbs	5,000 lbs	10,000 lbs	10,000 lbs	20,000 lbs						
	(2,268 kg)	(4,536 kg)	(2,268 kg)	(4,536 kg)	(4,536 kg)	(9,072 kg)						
Car rated load (min)*	1,500 lbs	2,500 lbs	1,500 lbs	2,500 lbs	2,500 lbs	5,000 lbs						
	(680 kg)	(1,134 kg)	(680 kg)	(1,134 kg)	(1,134 kg)	(2,268 kg)						
System mass (max)**	18,600 lbs	38,000 lbs	18,600 lbs	38,000 lbs	38,000 lbs	76,000 lbs						
	(8437 kg)	(17,236 kg)	(8437 kg)	(17,236 kg)	(17,236 kg)	(34,472 kg)						
Car and CWT (min)**	6,000 lbs	8,000 lbs	<mark>6,000 lbs</mark>	8,000 lbs	8,000 lbs	16,000 lbs						
	(2,722 kg)	(3,629 kg)	(2,722 kg)	(3,629 kg)	(3,629 kg)	(7,258 kg)						
Shipping weight	300 lbs	300 lbs	300 lbs	300 lbs	335 lbs	335 lbs						
	(136 kg)	(136 kg)	(136 kg)	(136 kg)	(152 kg)	(152 kg)						



Thank You!

