



LAWS OF MALAYSIA

FACTORIES AND MACHINERY ACT 1967 [64 OF 1967]

P.U.(A) 6/70

FACTORIES AND MACHINERY (ELECTRIC PASSENGER AND GOODS LIFT) REGULATIONS, 1970.

Publication : 8th January 1970

Date of coming into operation : 1st January 1970

ARRANGEMENT OF REGULATIONS

[Preamble](#)

PART I - GENERAL

[Regulation 1. Citation and commencement.](#)

[Regulation 2. Interpretation.](#)

[Regulation 3. Application.](#)

[Regulation 4. Exemption.](#)

[Regulation 5. Owner's liability.](#)

[Regulation 6. Approval of installation of lift.](#)

PART II - DESIGN, CONSTRUCTION, INSTALLATION AND TESTS

[Regulation 7. Lift loading and capacity.](#)

[Regulation 8. Lift machine and supports.](#)

[Regulation 9. Machine rooms.](#)

[Regulation 10. Lift Well.](#)

[Regulation 11. Lift well enclosure.](#)

[Regulation 12. Landing doors.](#)

[Regulation 13. Landing door locking devices.](#)

[Regulation 14. Lift car construction.](#)

PART II - DESIGN, CONSTRUCTION, INSTALLATION AND TESTS.

[Regulation 15. Car doors and gates.](#)

[Regulation 16. Hatches.](#)

[Regulation 17. Ventilation.](#)

[Regulation 18. Lighting.](#)
[Regulation 19. General.](#)
[Regulation 20. Counterweight.](#)
[Regulation 21. Guides.](#)
[Regulation 22. Safety gear.](#)
[Regulation 23. Governors.](#)
[Regulation 24. Buffers.](#)
[Regulation 25. Clearances and overtravels for lift cars and counterweights.](#)
[Regulation 26. Terminal stopping devices.](#)
[Regulation 27. Suspension ropes.](#)
[Regulation 28. Operation and control.](#)
[Regulation 29. Clearances between cars and counterweights, etc.](#)
[Regulation 30. Tests.](#)

PART III - MAINTENANCE

[Regulation 31. Duties of the owner.](#)

PART III - MISCELLANEOUS

[Regulation 32. Notices.](#)
[Regulation 33. Attendants.](#)
[Regulation 34. Penalties.](#)

[FIRST SCHEDULE - page 1](#)
[FIRST SCHEDULE - page 2](#)
[SECOND SCHEDULE](#)

P.U.(A) 6/70
FACTORIES AND MACHINERY (ELECTRIC PASSENGER AND GOODS LIFT)
REGULATIONS, 1970.

Preamble

IN exercise of the powers conferred upon him by section 56 (1) of the Factories and Machinery Act, 1967 [64 / 1967], the Minister of Labour hereby makes the following Regulations:

P.U.(A) 6/70
FACTORIES AND MACHINERY (ELECTRIC PASSENGER AND GOODS LIFT)
REGULATIONS, 1970.
PART I - GENERAL

Regulation 1. Citation and commencement.

These regulations may be cited as the **Factories and Machinery (Electric Passenger and Goods Lift) Regulations, 1970**, and shall come into force on the 1st day of February, 1970.

P.U.(A) 6/70
FACTORIES AND MACHINERY (ELECTRIC PASSENGER AND GOODS LIFT)
REGULATIONS, 1970.
PART I - GENERAL

Regulation 2. Interpretation.

In these regulations, unless the context otherwise requires-

"automatic control" means a method of control by the momentary operation of some automatic device which may be situated at a landing or in the lift car whereby a lift car is set in motion and is caused to stop automatically at any required lift landing;

"bottom overtravel of lift car" means the maximum distance the car floor can travel below the level of the bottom lift landing with full buffer compression;

"bottom overtravel of counterweight" means the maximum distance the counterweight can travel below the position it occupies when the car floor is level with the top lift landing until the counterweight rests on the buffers, with full buffer compression;

"buffer" means a device designed to stop a descending car or counterweight beyond its normal limit of travel by storing or absorbing and dissipating the kinetic energy of the car or counterweight;

"car apron" and "landing apron" mean a protective screen, attached to the underside of the car platform or lift landing respectively, to prevent an object from being trapped between the car platform and landing threshold;

"car door to gate" means the hinged or sliding portion of a lift car controlling access to a lift car;

"car enclosure" means the top and the walls of the lift car resting on and attached to the lift car platform;

"car frame" means the supporting frame or sling to which the car platform, safety gear, guide shoes and the hoisting ropes or hoisting rope sheaves or the plunger of a direct plunger elevator are attached;

"car levelling device" means any mechanism which will, either automatically or under the control of the operator, move the car within the levelling zone toward the landing only, and automatically stop it at the landing;

"car platform" means the structure forming the floor of the lift car, and which directly supports the load;

"centre opening door" means a vertically sliding or horizontally sliding door consisting of two or more panels so arranged that the panels or groups of panels open away from each other from the centre and are so inter-connected that all panels move simultaneously;

"car operating device" means the car switch push button or other device employed to actuate the control equipment of the lift car;

"car switch control" means a method of control whereby the movement of the car is directly under the control of an attendant by means of a switch or of a continuous pressure button in the lift car, such switch or continuous pressure button when released by the attendant resulting in the stopping of the lift car;

"collective control" means a method of control whereby all calls made, whether from a landing or the lift car, are registered and answered by the lift car stopping automatically, in floor sequence, at each landing for which such calls have been registered, but irrespective of the order in which they have been made, until all have had attention;

"compensating ropes" means ropes suspended from the car frame and / or the counterweight to balance the weight, or part of the weight, of the suspension ropes throughout the travel of the lift car, and includes compensating chains;

"contract load" means the load a lift is designed and constructed to carry, as specified in the contract of purchase;

"contract speed" means the speed of ascent or descent specified in the contract of purchase with the contract load;

"control" means the system governing the starting, stopping, direction of motion, acceleration, speed, and retardation of the moving member;

"controller" means a device or group of devices which serves to control in some predetermined manner the apparatus to which it is connected;

"counterweight" means a weight, or series of weights, to counterbalance the weight of the lift car and part of the contract load;

"directional collective control" means a method of collective control having "up" and "down" at the intermediate lift landing by which the landing calls can be registered for the particular direction in which it is desired to travel. The calls are answered by stopping the lift car at the required landings when travelling in the appropriate direction;

"dual collective control" means a method of control applied to directional collective controlled lift and so arranged that the lift car may be operated either by the passengers or by an attendant;

"dual control" means a method of control whereby automatic control or car switch control may be used alternatively but not simultaneously;

"dumbwaiter" means a hoisting and lowering mechanism equipped with a car moving in guides in a substantially vertical direction and being used exclusively for carrying materials. The dimensions of such car shall not exceed-

(i) nine square feet of floor area;

(ii) four feet total inside height whether or not the car is provided with fixed or removable shelves; and

(iii) five hundred pounds capacity;

"door lock" means a mechanical device to lock a lift car door or landing door, the unlocking of which is controlled by the position of the lift car and includes a gate lock;

"door switch" means a switch operated by the movement of a door and includes a gate switch;

"drum drive" means a drive in which the suspension ropes are secured to and wound on a drum;

"electromechanical brake" means a brake consisting of a friction shoe or shoes applied to a brake drum or disc by means of springs or weights and electrically released;

"electromechanical door lock" means a combination in one unit of a door switch with a door lock, and includes an electromechanical gate lock;

"existing lift" means a lift installed before the date of the coming into force of these regulations;

"gearless drive" means a drive without intermediate gearing which has the traction sheave and brake drum mounted directly on the motor shaft;

"goods lift" means a lift primarily used to carry goods but in which an attendant and the persons required to load and unload the goods are permitted to ride;

"governor" means an automatic device which brings the lift car or counterweight or both such car and counterweight to rest by operating the safety gear in the event of the speed in a downward direction exceeding the predetermined limit;

"guides" means the members used to guide the movement of the lift car or counterweight;

"guide bracket" means a member attached to a building or structure and to which the guides are attached;

"guide shoe" means an attachment to the car frame and counterweight are guided;

"landing" means the portion of the floor, balcony or platform of a building or structure used to receive and discharge passengers or goods or both into and from a lift car;

"landing door" means the hinged or sliding portion of a lift well enclosure controlling access to the lift car at a landing;

"levelling zone" means the space between positions not more than eighteen inches above and below the level of a landing;

"lift car" means the load carrying unit including its platform, car frame, enclosure and car door or gate;

"lift machine" means that part of a lift comprising the motor, reduction gear (if any); brake and drum or sheaves by which the lift car is raised or lowered;

"lift pit" means the space in the lift well below the lowest landing served;

"lift well" means the enclosed space in which a lift is designed to operate and includes the lift pit and top clearance;

"lift well enclosure" means the structure which separates the lift well from its surroundings;

"passenger lift" means a lift primarily used to carry persons other than the operator and persons necessary for loading and unloading and such lift includes a hospital bed lift;

"safety gear" means a mechanical device attached to the lift car frame or auxiliary frame or counterweight frame, to stop and hold the car or counterweight in case of predetermined overspeed or a free fall, or if the hoisting ropes are slackened;

"safety rope" means a rope that connects the lift car safety gear to the counterweight or counterweight safety gear and by means of which the safety gear is operated;

"slack rope switch" means a switch designed to open the control circuit of a drum driven lift, if any or all of the suspension ropes slacken by a predetermined amount;

"suspension rope" means a rope by which the lift car and counterweight are suspended;

"top clearance of lift car" means the shortest vertical distance between the car frame and its attachments and the overhead beams or their attachments when the car floor is level with the top landing, that is the greatest distance the car floor could travel above the top landing.

"top clearance of counterweight" means the shortest distance between the counterweight and its attachments and the overhead beams or their attachments when the car floor is level with the bottom landing, that is the greatest distance the counterweight could travel above the position it occupies when the car floor is level with the bottom landing;

"traction drive" means a drive in which the drive sheave is so grooved as to impart its motion to the suspension ropes by friction;

"travel" means the distance between the bottom and top lift landings served.

P.U.(A) 6/70
FACTORIES AND MACHINERY (ELECTRIC PASSENGER AND GOODS LIFT)
REGULATIONS, 1970.
PART I - GENERAL

Regulation 3. Application.

(1) Parts I, III and IV of these regulations shall apply to all electric passenger and goods lifts.

(2) Part II of these regulation shall apply to every electric passenger and goods lift installed in any premises after the date of the coming into force of these regulations and to every existing electric passenger and goods lift substantially altered after such date:

Provided that where the owner of any lift installed after such date can satisfy the Chief Inspector that the lift was contracted for on or before such date the Chief Inspector may, in his discretion, permit such modification in the application of these regulations to the lift as he deems to be reasonable.

(3) For the purpose of these regulations an existing lift shall be deemed to have been substantially altered when, in the opinion of the Chief Inspector-

- (a) it has been converted from a goods lift to passenger lift; or
- (b) its travel has been increased by an additional floor or floors; or
- (c) its contract load has been increased; or
- (d) its contract speed has been increased.

(4) Notwithstanding the provisions of paragraph (2) of this regulation where the Chief Inspector is of the opinion that, owing to special circumstances, the enforcement of any provision of these regulations in respect of any existing lift is necessary to ensure the safety of the public he may in writing order that such provision shall apply to that lift.

P.U.(A) 6/70
FACTORIES AND MACHINERY (ELECTRIC PASSENGER AND GOODS LIFT)
REGULATIONS, 1970.
PART I - GENERAL

Regulation 4. Exemption.

Where the Chief Inspector is of the opinion that, owing to special circumstances, the enforcement of any provision of these regulations in respect of any lift is not necessary or reasonable he may by certificate in writing, which he may in his discretion revoke, exempt that lift from such provision subject to such conditions as he may specify therein.

**P.U.(A) 6/70
FACTORIES AND MACHINERY (ELECTRIC PASSENGER AND GOODS LIFT)
REGULATIONS, 1970.
PART I - GENERAL**

Regulation 5. Owner's liability.

Nothing contained in these regulations shall relieve or exempt the owner of any lift from complying with any other written law.

P.U.(A) 6/70
FACTORIES AND MACHINERY (ELECTRIC PASSENGER AND GOODS LIFT)
REGULATIONS, 1970.
PART I - GENERAL

Regulation 6. Approval of installation of lift.

Pursuant to sub-section (1) of section 36 of the Act, relating to the purpose of obtaining approval for the installation of a lift, the owner shall furnish the Chief Inspector with the following each of which shall be in duplicate-

(a) the dimensions and particulars of the lift in the form shown in the First Schedule to these regulations; and

(b) drawings showing the following particulars and finished sizes-

- (i) size and position of lift well;
- (ii) particulars of lift well enclosure;
- (iii) size, position, number and type of landing door;
- (iv) size and position of machine room relative to the lift well;
- (v) provision of access to machine room;
- (vi) provision for ventilation and if possible, natural lighting of machine room;
- (vii) number of floors served by lift;
- (viii) height between floor levels;
- (ix) number of entrances;
- (x) total headroom;
- (xi) height of machine room;
- (xii) depth of lift pit.

(c) the following lift manufacturer's certificate:

- (i) a certificate declaring that the lift has been designed and constructed in accordance with these regulations insofar as they are applicable;
- (ii) a certificate declaring that the designs of the safety gear and of the oil buffer have satisfactorily withstood type tests, including an overspeed test under full contract load;
- (iii) a certificate declaring that the insulation of the electrical parts of all

controllers, landing door locking devices, terminal stopping device and car gate, lift car door switches and other operating and similar devices has been satisfactorily tested at an alternating current pressure equal to ten times the working voltage, with a maximum of two thousand volts, for not less than one minute when applied:

(a) between the live parts and the case or frame with all circuits completed; and

(b) between main terminals or equivalent parts with all circuits open; and

(c) between any live parts or independent circuits.

(iv) a certificate stating the diameter, construction, quality and tensile breaking strength of the suspension ropes.

P.U.(A) 6/70
FACTORIES AND MACHINERY (ELECTRIC PASSENGER AND GOODS LIFT)
REGULATIONS, 1970.
PART II - DESIGN, CONSTRUCTION, INSTALLATION AND TESTS

Regulation 7. Lift loading and capacity.

(1) Every lift shall be designed and constructed to carry the contract load.

(2) (a) The contract load of every passenger lift and every hospital bed lift shall not be less than given in Table I corresponding to the clear lift car floor area, disregarding any seat and space between car door frames.

(b) The number of persons which can be carried at any one time in any passenger lift shall not be greater than that given in Table I corresponding to the clear lift car floor area.

TABLE I

Clear lift car area in square feet (Permissible tolerance \pm 0.5 square feet)	Maximum No. of persons	Contract load in pounds
2.2 ...	1 ...	150
4.3 ...	2 ...	300
6.4 ...	3 ...	450
8.3 ...	4 ...	600
10.2 ...	5 ...	750
12.0 ...	6 ...	900
13.8 ...	7 ...	1,050
15.6 ...	8 ...	1,200
17.2 ...	9 ...	1,350
18.9 ...	10 ...	1,500
20.4 ...	11 ...	1,650
22.1 ...	12 ...	1,800
23.6 ...	13 ...	1,950
25.2 ...	14 ...	2,100
26.7 ...	15 ...	2,250
28.2 ...	16 ...	2,400
29.5 ...	17 ...	2,550
30.9 ...	18 ...	2,700
32.3 ...	19 ...	2,850
33.7 ...	20 ...	3,000
35.0 ...	21 ...	3,150
36.3 ...	22 ...	3,300
37.5 ...	23 ...	3,450
38.8 ...	24 ...	3,600
40.2 ...	25 ...	3,750
41.3 ...	26 ...	3,900
42.6 ...	27 ...	4,050
43.8 ...	28 ...	4,200
45.1 ...	29 ...	4,350
46.2 ...	30 ...	4,500

47.3 ...	31 ...	4,650
48.5 ...	32 ...	4,800
49.7 ...	33 ...	4,950
50.8 ...	34 ...	5,100
52.1 ...	35 ...	5,250
53.3 ...	36 ...	5,400
54.5 ...	37 ...	5,550
55.7 ...	38 ...	5,700
56.8 ...	39 ...	5,850
57.7 ...	40 ...	6,000

(3) The minimum contract load for goods lift shall be based on the following:

Description of goods lift	Minimum contract load per square foot of inside clear lift car platform area
(a) For general goods loading lift where the load when distributed, the weight of any single piece of goods in the load or of any single hand truck and its load does not exceed one quarter of the contract load of the lift and the load is handled on and off the lift car platform manually or by means of hand trucks.	Not less than fifty pounds.
(b) For motor vehicle loading where the lift is used solely to carry automobile trucks or passenger automobiles up to the contract load of the lift.	Not less than thirty pounds.
(c) For every other type of loading lift.	To be determined by the Chief Inspector.

(4) (a) A capacity plate bearing the contract load of a lift shall be permanently and securely fastened in a conspicuous position in a lift car.

(b) (i) In the case of passenger lifts the contract load shall be given in number of persons and pounds in accordance with Table I shown in paragraph (2) of this regulation.

(ii) In the case of goods lift the contract load shall be given in pounds and also, for emergency purposes, in number of persons calculated at one hundred and fifty pounds per person.

P.U.(A) 6/70
FACTORIES AND MACHINERY (ELECTRIC PASSENGER AND GOODS LIFT)
REGULATIONS, 1970.
PART II - DESIGN, CONSTRUCTION, INSTALLATION AND TESTS

Regulation 8. Lift machine and supports.

- (1) A drum-driven machine shall not be used for
 - (a) any passenger lift; or
 - (b) any goods lift having a contract speed greater than three hundred feet per minute.
- (2) A flat belt or chain-driven machine shall not be used to drive any passenger lift.
- (3) The main driving gear of any lift machine shall not be connected to any drum or traction sheave by friction gearing or friction clutch mechanism.
- (4) Worms and worm gears of cast iron shall not be used in any lift machine.
- (5) A set-screw fastening shall not be used in lieu of a key, pin or other positive fastening where the connection is subject to tension or torsion.
- (6) Every drum, sheave or pulley shall be of cast iron or steel and shall have machined rope grooves; and in the case of every overhung pulley or sheave suitable flanges of rope guards shall be provided.
- (7)
 - (a) The ratio of the diameter of the drum sheave or pulley to the diameter of the rope wound on it shall not be less than forty to one for all lift cars and counterweight suspension ropes.
 - (b) The diameter of a drum, sheave or pulley shall mean the centre to centre measurement of the rope wound on it.
- (8) Every lift machine shall be provided with an electromechanical brake which shall comply with the following requirements-
 - (a) it shall be applied automatically when the operating device is in the "stop" position;
 - (b) it cannot be released in normal operation until the power has been applied to the motor;
 - (c) it cannot be held in the "off" position during normal operation by any emergency release device fitted to it; and
 - (d) no single earth, short-circuit or counter voltage shall prevent it being applied during normal operation.
- (9) Every lift machine shall be provided with means for winding by hand.
- (10) Every lift machine shall be provided with adequate means for lubrication, and every lubrication point shall be readily and safely accessible.

(11) The factor of safety of every lift machine, based on the ultimate strength of the material used and the static load imposed thereon, shall not be less than eight for wrought steel, and not less than ten for cast and other materials.

(12) (a) Every lift machine and associated equipment shall be effectively supported.

(b) Any supporting beam shall be of steel or reinforced concrete with a factor of safety of five or seven respectively, based on a total static load on the supporting structure equal to twice the maximum static load suspended from the beams plus the weight of all the apparatus resting on the beams.

(c) The deflection under load of any supporting beam referred to in sub-paragraph (b) of this paragraph shall not be greater than $1 / 1500$ of the span of such beam.

P.U.(A) 6/70
FACTORIES AND MACHINERY (ELECTRIC PASSENGER AND GOODS LIFT)
REGULATIONS, 1970.
PART II - DESIGN, CONSTRUCTION, INSTALLATION AND TESTS

Regulation 9. Machine rooms.

(1) A machine room shall be provided for, and restricted to, the housing of the lift machine and associated equipment.

(2) Every machine room shall-

(a) be so designed that the floor can carry a load of not less than one hundred pounds per square foot over the whole area and also any load which may be imposed thereon by the equipment installed in the machine room;

(b) be of such a size as will permit free access to all parts of the machine and equipment located therein for the purposes of inspection, maintenance and dismantling. On at least two sides there shall be a minimum distance of eighteen inches between any part of the machine and adjoining wall and where necessary a still joist shall be provided above the machine to facilitate lifting heavy parts;

(c) be soundly constructed, weather proof, dry and adequately ventilated;

(d) have a clear height of not less than six feet and six inches from the floor provided that where the lift machine is installed on a pedestal on the floor there shall be a clear height of not less than two feet and six inches above the highest point of the lift machine;

(e) be provided with permanent electric lighting and the illumination shall not be less than ten foot candles at floor level. At least one socket and plug for a hand-lamp shall be provided. The light switch shall be fixed adjacent to the machine room entrance;

(f) be kept clear of refuse and shall not be used for the storage of articles or materials other than those required for the maintenance or operation of the lift;

(g) be locked against unauthorised access. A duplicate key shall be provided and retained under a glass-fronted cabinet adjacent to the entrance:

Provided that sub-paragraph (a), (b), and (d) need not apply to machine room for dumbwaiter.

(3) The following notice shall be exhibited in a permanent place adjacent to the entrance of every machine room:

BAHAYA
BILEK JENTERA
DI-LARANG MASOK
DENGAN TIADA KEBENARAN.

P.U.(A) 6/70
FACTORIES AND MACHINERY (ELECTRIC PASSENGER AND GOODS LIFT)
REGULATIONS, 1970.
PART II - DESIGN, CONSTRUCTION, INSTALLATION AND TESTS

Regulation 10. Lift Well.

- (1) No piping, conduct or equipment other than that forming part of the lift or necessary for its maintenance shall be installed in any lift well or lift well enclosure.
- (2) No room passage or thoroughfare shall be permitted under a lift well provided that where a lift well does not extend to the lowest floor of the building, such room, passage, or thoroughfare may be allowed under conditions to be laid down by the Chief Inspector.
- (3) Where the counterweight of one lift travels close to the car of an adjacent lift, a continuous screen of adequate strength shall be fixed from top to bottom of the well to protect any person walking in the well or on the lift car from accidental contact with the counterweight in any part of its travel.
- (4) Not more than four lifts shall be located in any one lift well.
- (5) (a) Every lift pit shall be soundly constructed. The floor of the lift pit shall be substantially level and, where necessary, provision shall be made for permanent drainage.
- (b) Every lift pit shall be of sufficient depth to ensure that there is a vertical clearance of not less than two feet between any fitting attached to and projecting below the bottom of the car frame and the pit floor when the rests on its fully compressed buffers:
- Provided that any guide shoe, apron or other fitting located adjacent to the sides of the car may be ignored in this connection.
- (c) Any equipment installed in the lift pit must leave sufficient clear floor area to permit a person to lie on the pit floor.
- (6) Where the depth of any lift pit is greater than three feet and six inches measured from the bottom terminal landing, suitable footholds and handholds shall, so far as practicable, be arranged in the side of the lift pit to the aid ingress and egress.
- (7) Access to any lift pit shall be by way of the bottom terminal landing only.
- (8) A suitable guard shall be fixed in the lift pit around the path of the counterweight. Such guard shall extend from a height of not less than twelve inches above the floor of the lift pit to a height of not less than six feet and six inches:

Provided that where compensating ropes are fitted a guard need not be provided on the side facing the lift car to which the ropes are attached.

P.U.(A) 6/70
FACTORIES AND MACHINERY (ELECTRIC PASSENGER AND GOODS LIFT)
REGULATIONS, 1970.
PART II - DESIGN, CONSTRUCTION, INSTALLATION AND TESTS

Regulation 11. Lift well enclosure.

- (1) Every lift well enclosure shall extend on all sides throughout the height of the lift well.
- (2) Where the lift travel is greater than forty feet above the ground floor the lift well enclosure shall be made of brickwork or other suitable fire resisting materials.
- (3) The inner sides of the lift well enclosure facing any car entrance shall form a smooth continuous flush surface devoid of any projection other than landing sills, hoistway doors, door tracks and hangers, or recess.
- (4) The clearance between the edge of the landing threshold and the car platform nosing shall not be less than one half of an inch and not greater than one and a half inches.
- (5) The clearance between the lift well enclosure and the loading side of the car platform shall-
 - (a) for passenger lifts, not be greater than five inches; and
 - (b) for goods lifts with vertically sliding hoistway doors, not be greater than seven-and-a-half inches.
- (6) The clearance between the sides of the car or the counterweight and the lift well enclosure shall not be less than one inch.
- (7) The lift well enclosure shall be of sufficient strength to withstand a thrust of seventy-five pounds applied at any point in a direction normal to the surface without permanent deformation.
- (8) There shall be no opening in any lift well enclosure permitting access to the car by passing under a counterweight.
- (9) Where wire grille or similar construction is used for the enclosure, the mesh or opening shall not be greater than one and a quarter inches:

Provided that where the clearance between the inside of such enclosure and any moving part of the lift is less than two inches the openings in the enclosure shall be further protected to a height of seven feet above the floor or nosing of any stair tread by netting of square mesh not greater than one half inch and of wire not less than 20 S.W.G.

- (10) Any glazing in a lift well enclosure shall be of toughened or shatter-proof glass.

P.U.(A) 6/70
FACTORIES AND MACHINERY (ELECTRIC PASSENGER AND GOODS LIFT)
REGULATIONS, 1970.
PART II - DESIGN, CONSTRUCTION, INSTALLATION AND TESTS

Regulation 12. Landing doors.

- (1) Every landing opening in any lift well enclosure shall be protected by a door which shall extend the full height and width of the opening. Such landing door when fully open shall leave no portion of the lift well unprotected at the sides of the car.
- (2) The height of every landing door shall not be less than-
 - (a) six feet six inches in the case of a passenger lift; or
 - (b) six feet in the case of a goods lift.
- (3) The distance between the lift well side of any landing door and the edge of the landing threshold shall not be greater than four inches in the case of hinged doors or two and three quarter inches in the case of sliding doors.
- (4) In no case shall the distance between the lift well side of the landing door and the lift well side of the car door or gate exceed six inches.
- (5) Every landing door and its tracks shall be capable of withstanding a thrust of seventy-five pounds applied normally at any point, excepting any vision panel, without causing permanent deformation and without such door being sprung from its guides.
- (6) Every power operated landing door on every automatically operated lift shall be so designed that closing it is not likely to injure any person.
- (7) Provision shall be made to open manually every power operated landing door, in the event of failure of power operating mechanism, at any landing at which the car is standing.
- (8) Every hinged landing door shall be provided with a vision panel. Every manual or self-closing landing door for a lift with automatic control shall be provided with a vision panel, except at any landing where a car position indicator is provided.
- (9) Any vision panel in a landing door shall be fire resisting and of wired safety glass. The area of any single vision panel shall not be less than twenty-five square inches and the total area of one or more vision panels in any landing door shall not be more than eighty square inches and the centre of the panel shall be located not less than fifty -four inches and not more than sixty-six inches above the landing;

Provided that for vertically sliding centre opening counter balanced door it shall be located to conform with the dimensions specified in so far as the door design will permit:

Provided further that vision panel on horizontally swinging doors shall be located for convenient vision when opening the door from the car side.

P.U.(A) 6/70
FACTORIES AND MACHINERY (ELECTRIC PASSENGER AND GOODS LIFT)
REGULATIONS, 1970.
PART II - DESIGN, CONSTRUCTION, INSTALLATION AND TESTS

Regulation 13. Landing door locking devices.

(1) Every landing door shall be fitted with an electromechanical door lock having a retiring cam, which shall ensure:

(a) that the lift car cannot be moved in a direction away from the landing unless every landing door is closed and locked;

(b) that in the event of any landing door being opened the car will come to rest; and

(c) that no landing door can be opened from the landing side unless the car is at rest at that particular landing, or is coasting through that levelling zone with its operating device in the "stop" position, or unless with a special key.

Provided that a retiring cam need not be fitted if the electric lock control contact is positively interrupted before the landing door is unlocked, and the landing door is mechanically locked before the electric lock contact is made.

(2) Such electromechanical door lock shall be so arranged that the landing door is locked mechanically before the electric lock is made. Lock contacts shall be opened positively.

(3) All parts of such electromechanical door lock shall be of substantial construction, and its functioning to prevent movement of the car shall not be solely dependent on the action of a spring or gravity or the closing of an electric circuit. Every lock shall be encased, and the removal of the casing shall not disturb the lock mechanism.

(4) For the purpose of paragraph (1) (a) of this regulation a landing door may be considered to be closed when-

(a) in respect of any lift which requires the presence of an operator in the car, its leading edge is within two and one half inches of the door jamb (or with centre opening door when the leading edges are within two and one half inches of each other); provided that such door cannot be re-opened from the landing side after it has reached the limit of two and one half inches and that it is equipped with a door-closer of a type that will continue to close and lock it; and

(b) in respect of any lift which does not require the presence of an operator in the car or in which the landing door is not equipped with a door-closer, its leading edge is within three eights of one inch of the door jamb (or with centre opening door when the leading edges are within three eights of one inch of each other).

P.U.(A) 6/70
FACTORIES AND MACHINERY (ELECTRIC PASSENGER AND GOODS LIFT)
REGULATIONS, 1970.
PART II - DESIGN, CONSTRUCTION, INSTALLATION AND TESTS

Regulation 14. Lift car construction.

- (1) Every lift car shall comprise a platform, a roof, a car enclosure, gate or door and a supporting frame.
- (2) Every car platform shall be of framed construction, and in the case of any passenger lift shall be designed to support the contract load on the basis of such load being evenly distributed. The platform of any goods lift shall be designed to suit the particular conditions of loading. The factor of safety shall not be less than five for steel and eight for timber, except that in the case of steel platform stringers, the factor of safety may not be less than four.
- (3) Every car frame shall be made of steel, and of sufficient strength to withstand the operation of the safety gear when fully loaded without permanent deformation. The factor of safety of any car frame members and their connections shall not be less than five.
- (4) The deflection of any car frame crosshead and any member carrying the platform shall not exceed one-thousandth of its respective span under static conditions with the contract load evenly distributed over such platform.
- (5) Renewable guide shoes or guide shoes with renewable linings or adjustable roller guides shall be provided at the top and bottom of both sides of every car frame.
- (6) Every car roof shall be of sufficient strength to support a load of two hundred pounds. Any open work in such roof shall reject a sphere of one inch in diameter.
- (7) Every car enclosure shall not be less than six feet and six inches in height and there shall be no open-work panels except ventilation panels, the openings of which shall reject a sphere greater than one half of an inch in diameter within a height of six feet from the car floor:

Provided that the enclosure of a goods lift car shall not be less than six feet in height.

- (8) Every car enclosure shall withstand a thrust of seventy-five pounds applied normally at any point without permanent deformation, and shall be securely fixed to the platform and frame.

P.U.(A) 6/70
FACTORIES AND MACHINERY (ELECTRIC PASSENGER AND GOODS LIFT)
REGULATIONS, 1970.
PART II - DESIGN, CONSTRUCTION, INSTALLATION AND TESTS.

Regulation 15. Car doors and gates.

(1) A door or gate shall be provided at every entrance to a lift car. Every car door or gate when fully closed shall-

(a) in the case of a passenger lift, guard the full width and height of the car entrance opening and shall not be less than six feet and six inches high;

(b) in the case of a goods lift, guard the full width of the car entrance opening and when fully closed shall extend from the car floor to a height of not less than six feet above the car floor;

Provided that where a vertically sliding door or gate is used, it shall extend from a point not more than one inch above the car floor and to a point at least not less than six feet above the car floor.

(2) No lift car shall have more than two entrances.

(3) Every car door or gate and its tracks shall withstand a thrust of seventy-five pounds applied normally at any point (excepting any vision panel) without permanent deformation and without such gate or door being sprung from its guides. In the case of a collapsible gate this thrust may be applied at points on two adjacent pickets so as to divide the load equally.

(4) Any opening in any collapsible gate shall reject a sphere of diameter greater than two and one half inches.

(5) Every car door or gate shall be provided with an electric switch which will prevent the lift car from being started or kept in motion unless all gates and doors are closed. The contacts on such switches shall be opened positively and independently of gravity. The electric switch shall be protected so as to be inaccessible from the car. For the purpose of this paragraph a car door or gate shall be considered to be closed when its leading edge is within two and one half inches of the door jamb or, with centre-opening doors, when the leading edges are within two and one half inches of each other.

(6) (a) Every power operated car door or gate shall be capable of being opened manually.

(b) Every power operated car door or gate on every automatically operated lift shall be so designed that its closure is not likely to injure any person:

Provided that where a car levelling device is fitted the lift car may be moved towards the landing with its door or gate open within the levelling zone. In such cases the car platform shall be provided with a substantial apron of sufficient depth to prevent an object from being trapped between the platform and the landing while the lift car is within the levelling zone.

(7) Any vision panel in a lift car door shall be fire resisting and of wired safety glass. The area between division bars or other supports shall not exceed one square foot. The bottom rail of a

framed and glazed door shall not be less than twelve inches deep. Any projections on or recesses (including vision panels) in sliding car doors shall be kept to a minimum.

P.U.(A) 6/70
FACTORIES AND MACHINERY (ELECTRIC PASSENGER AND GOODS LIFT)
REGULATIONS, 1970.
PART II - DESIGN, CONSTRUCTION, INSTALLATION AND TESTS.

Regulation 16. Hatches.

Emergency hatches.

(1) Every passenger lift car, other than a car equipped with safety gear of the instantaneous type, shall be provided, where practicable in the opinion of the Chief Inspector, with an emergency hatch of such dimensions as will permit the passage of a person.

Side emergency hatch.

(2) where there is a lift located in an adjacent lift well and the distance between the car platforms does not exceed two feet six inches and where there are no intervening hoistway partitions, counter-weights or any fixed obstructions, other than separator beams between the cars, a side emergency hatch may be provided in each such adjacent car, so arranged as to permit safe and direct transfer from one car to the other, and such side emergency hatch shall:

(a) be of the hinged type;

(b) open only into the car;

(c) be provided with a lock so arranged that the door may be opened from inside the car only by a special-shaped removable key, and from outside the car by a non-removable handle. Locks shall be so designed that they cannot be opened from the inside by the use of ordinary tools or instruments. There shall be no obstruction on the inside of the enclosure which will prevent opening of the door from either side;

(d) be fitted with car-door electric contacts so arranged as to prevent the car from being operated unless the door is locked;

(e) be of the same material and construction as required for the car enclosure.

Top emergency hatch.

(3) Every emergency hatch provided in the top of a lift car shall:

(a) be so located as to provide a passage way for a person unobstructed by any fixed equipment located in or on top of the car; and

(b) be so arranged that it can be opened outwards; and

(c) be so hinged or otherwise attached to the car top so that the cover can be opened from the top of the car only.

Keys for emergency hatches.

(4) Keys for unlocking of emergency hatches shall be kept in the premises by the person responsible for the maintenance and operation of the lift and in a location readily available to an authorised person only in the case of emergency.

P.U.(A) 6/70
FACTORIES AND MACHINERY (ELECTRIC PASSENGER AND GOODS LIFT)
REGULATIONS, 1970.
PART II - DESIGN, CONSTRUCTION, INSTALLATION AND TESTS.

Regulation 17. Ventilation.

Provision shall be made for adequate permanent ventilation of every lift car during the periods such lift is available for use, and where ventilating fans or blowers are used they shall be securely fastened in place and located above the car ceiling or outside the car enclosure.

P.U.(A) 6/70
FACTORIES AND MACHINERY (ELECTRIC PASSENGER AND GOODS LIFT)
REGULATIONS, 1970.
PART II - DESIGN, CONSTRUCTION, INSTALLATION AND TESTS.

Regulation 18. Lighting.

- (1) Provision shall be made for illumination of every lift car during the periods such lift is available for use, by at least two lamps in each car.
- (2) Light bulbs or tubes in every lift car shall be so guarded as to prevent injury to persons from breakage of the bulbs or tubes.
- (3) The minimum illumination at the landing edge of a car platform when the car and landing doors are open shall not be less than five foot candles.

P.U.(A) 6/70
FACTORIES AND MACHINERY (ELECTRIC PASSENGER AND GOODS LIFT)
REGULATIONS, 1970.
PART II - DESIGN, CONSTRUCTION, INSTALLATION AND TESTS.

Regulation 19. General.

- (1) No glass other than toughened or shatterproof glass shall be used in any car except to cover certificates, notices, lighting fixtures and appliances necessary for the operation of such car.
- (2) Every car shall be provided with an emergency signal that is operative from the car and is clearly audible outside the lift well.
- (3) A lighting socket for a portable lamp shall be provided on top of and underneath every car.
- (4) An emergency switch shall be provided on the top of every lift car which will prevent the car from being operated when the switch is open.

P.U.(A) 6/70
FACTORIES AND MACHINERY (ELECTRIC PASSENGER AND GOODS LIFT)
REGULATIONS, 1970.
PART II - DESIGN, CONSTRUCTION, INSTALLATION AND TESTS.

Regulation 20. Counterweight.

- (1) Every traction drive lift shall be provided with a counterweight.
- (2) Every counterweight shall travel in guides and be provided with renewable guide shoes or linings.
- (3) All counterweight sections, whether carried in frames or not, shall be adequately secured. The factor of safety of the threaded portion of any tie rods shall not be less than eight. The tie rods shall have lock nuts secured by cotter pins at each end.

P.U.(A) 6/70
FACTORIES AND MACHINERY (ELECTRIC PASSENGER AND GOODS LIFT)
REGULATIONS, 1970.
PART II - DESIGN, CONSTRUCTION, INSTALLATION AND TESTS.

Regulation 21. Guides.

- (1) Every lift car and counterweight shall be guided throughout its travel by means of rigid steel guides of round or T-section and of such length that it is not possible for the car or counterweight shoes to run off the guides.
- (2) Every guide joint shall be torqued and grooved, or dowelled, and fitted with fishplates each secured with not less than four substantial bolts through each rail. The working faces of every joint shall form a smooth continuous surface.
- (3) The variation in the distance between guides shall be not greater than three-sixteenths of one inch.
- (4) Every guide shall be fastened to suitable supports and every guide and its supports shall withstand the application of the safety gear when stopping a fully loaded car or counterweight.
- (5) Guide brackets and any shims shall be of steel and shall be bolted to the walls, stairs, structure or building steelwork. Wood blocks, plugs, or similar method shall not be used for fixing guide brackets.
- (6) The distance between guide brackets shall be such that the guides shall not deflect more than one-quarter of one inch under normal operation.

P.U.(A) 6/70
FACTORIES AND MACHINERY (ELECTRIC PASSENGER AND GOODS LIFT)
REGULATIONS, 1970.
PART II - DESIGN, CONSTRUCTION, INSTALLATION AND TESTS.

Regulation 22. Safety gear.

- (1) Every lift car shall be provided with one or more safety gear which shall, singly or combined, be capable of stopping and sustaining the lift car with the contract load. Safety gears shall be fitted to the car frame, and at least one safety gear shall be located within or below the lower members of the car frame.
- (2) The safety gear shall operate to stop and sustain the car with the contract load in the event of failure of all suspension ropes, or in the event of the car exceeding a predetermined speed in the descending direction when a governor is fitted.
- (3) No safety gear shall stop an ascending car. If an ascending car is to be stopped on account of overspeed a safety gear shall be fitted to the counterweight or a governor may be used to cause the motor and brake control circuits to be opened.
- (4) The application of the safety gear of the non-instantaneous type shall stop the lift car with contract load from the governor tripping speed within the limits shown in Table II. Such stopping distance shall be the actual slide as observed from the marking on the guide.

TABLE II

Contract speed in feet per minute	Maximum governor tripping Speed in feet per minute	Stopping distances in feet and inches	
		Minimum	Maximum
0-125	175	0-6	1-3
150	210	0-6	1-4
175	250	0-8	1-7
200	280	0-9	1-10
225	308	0-10	2-0
250	337	0-11	2-3
300	395	1-1	2-9
350	452	1-3	3-4
400	510	1-6	4-0
450	568	1-9	4-10
500	625	2-1	5-8
600	740	2-9	7-7
700	855	3-7	9-10
800	970	4-6	12-6
900	1,085	5-5	15-3
1,000	1,200	6-8	18-6

- (5) The application of the safety gear shall not cause the car platform to become out of level in

excess of one in twenty-four, measured in any direction, and no decrease in the tension of any rope used to apply the safety gear, or motion of the lift car in the downward direction shall release such safety gear.

(6) The motor control and brake control circuits shall be opened at the time or before the safety gear is applied.

(7) No safety gear shall depend upon the completion or maintenance of an electric circuit for its operation.

(8) The safety gear shall be designed to grip each guide equally and to operate on both guides simultaneously.

(9) Any rope used for applying the safety gear shall be supported by its own pulley which shall be constructed so as to prevent such rope leaving the pulley when slack. Such rope shall be not less than five-sixteenths of one inch diameter and shall be of iron, steel, monel metal, phosphor bronze or stainless steel. The pulley shall be mounted independently of any shaft carrying the suspension ropes.

(10) Any releasing carrier or other mechanism for actuating the safety gear shall be carried by the car frame and not by the car enclosure.

(11) Provision shall be made for releasing car safety gear from inside the lift car mechanically, and no decrease in tension of the governor rope nor motion of the car in the down direction shall release the safety gear. Such safety gear may be released by the motion of the car in the up direction.

(12) Safety gear of the instantaneous type shall not be used on any car having a contract speed greater than one hundred and sixty feet per minute, or any counterweight having a contract speed greater than two hundred and fifty feet per minute.

P.U.(A) 6/70
FACTORIES AND MACHINERY (ELECTRIC PASSENGER AND GOODS LIFT)
REGULATIONS, 1970.
PART II - DESIGN, CONSTRUCTION, INSTALLATION AND TESTS.

Regulation 23. Governors.

(1) A governor shall be fitted to operate the safety gear of every lift car having a travel between terminal landings greater than twenty feet.

(2) The governor shall be adjusted to cause application of the car safety gear at a speed of not less than fifteen per centum above the contract speed and not greater than the tripping speed shown in Table II in paragraph (4) of regulation 22 against the contract speed.

(3) Every governor shall be marked with its tripping speed in feet per minute.

(4) Every governor rope shall be iron, steel, monel metal, phosphor bronze or stainless steel not less than five-sixteenths of one inch in diameter and any deformation of such rope resulting from the application of the governor jaws shall not prevent proper operation of the safety gear.

(5) (a) Where a governor is fitted to operate a counterweight safety gear, such governor shall be adjusted to cause application of the counterweight safety gear at a speed greater than that at which the car safety gear is applied:

Provided that such speed is not more than ten per centum greater.

(b) The application of such safety gear shall stop the counterweight within the limits prescribed in Table II in paragraph (4) of regulation 22.

P.U.(A) 6/70
FACTORIES AND MACHINERY (ELECTRIC PASSENGER AND GOODS LIFT)
REGULATIONS, 1970.
PART II - DESIGN, CONSTRUCTION, INSTALLATION AND TESTS.

Regulation 24. Buffers.

(1) Buffers shall be installed under every car and counterweight and shall be located symmetrically with reference to the vertical centre line of the car frame or the counterweight frame within a tolerance of two inches, and shall be so arranged that the car or counterweight in normal operation does not engage them.

(2) Where the contract speed of the car is greater than seventy-five feet per minute solid buffers shall not be installed.

(3) Where the contract speed of the car is greater than two hundred feet per minute spring buffers shall not be installed.

(4) Spring buffers shall be capable of stopping a lift car with contract load from contract speed without permanent deformation.

(5) The stroke of any spring buffer shall not be less than -

(a) one and one half inches at a contract speed of one hundred feet per minutes or less;
or

(b) two and one half inches at a contract speed in excess of one hundred feet per minute but not more than one hundred and fifty feet per minute; or

(c) four inches at a contract speed in excess of one hundred and fifty feet per minute but not more than two hundred feet per minute.

(6) The minimum stroke of an oil buffer shall be such that the lift car or the counterweight on striking the buffer at one hundred and fifteen per cent of contract speed shall be brought to rest with an average retardation of not more than thirty-two point two feet per second per second.

(7) Every oil buffer shall be -

(a) provided with a means of readily ascertaining the adequacy of the oil supply;

(b) self re-setting; and

(c) marked by the maker with the stroke, range of speed and load for which it has been designed.

P.U.(A) 6/70
FACTORIES AND MACHINERY (ELECTRIC PASSENGER AND GOODS LIFT)
REGULATIONS, 1970.
PART II - DESIGN, CONSTRUCTION, INSTALLATION AND TESTS.

Regulation 25. Clearances and overtravels for lift cars and counterweights.

- (1) A clear space shall be provided at the top and bottom limits of travel of every car and counterweight.
- (2) The top clearance for the lift car and counterweight where spring, timber or similar buffers are used shall be as given in Table III:

TABLE III

TOP CLEARANCES

Contract speed	Minimum top clearance for lift car and counterweight	
ft/min.	ft	in.
0-100	1	6
101-200	2	0

- (3) The top clearance for the lift car where oil buffers are used shall be at least the sum of the following dimensions:
- (i) the distance between the counterweight buffer and its block, which shall be at least six inches;
 - (ii) the stroke of the counterweight buffer used;
 - (iii) six inches; and
 - (iv) the counterweight buffer stroke corresponding to governor tripping speed, less one-half the stroke of the counterweight buffer used.
- (4) The top clearance for the counterweight where oil buffers are used shall be at least the sum of the following dimensions:
- (i) the distance between the car buffer and the buffer striking plate, which shall be at least six inches;
 - (ii) the stroke of the car buffer used;
 - (iii) six inches; and
 - (iv) the car buffer stroke corresponding to governor tripping speed, less one-half the stroke of the car buffer used.

- (5) The bottom overtravel for lift cars and counterweights where spring, timber or similar buffers are used shall be as given in Table IV:

TABLE IV

BOTTOM OVERTRAVEL

Contract speed ft/min.	Minimum bottom overtravel for lift car and counterweight	
	ft	in.
0-100	1	1
101-200	1	4

(6) The bottom overtravel of lift cars and counterweights where oil buffers are used shall not be less than six inches.

P.U.(A) 6/70
FACTORIES AND MACHINERY (ELECTRIC PASSENGER AND GOODS LIFT)
REGULATIONS, 1970.
PART II - DESIGN, CONSTRUCTION, INSTALLATION AND TESTS.

Regulation 26. Terminal stopping devices.

(1) Every lift shall be provided with stopping devices designated the upper and lower normal terminal stopping devices arranged to stop the car automatically at or near the upper and lower terminal landings respectively, with any load up to and including contract load in the car and from any speed attained in normal operation. Such devices shall function independently of the operating devices used by the car attendant, and the final terminal stopping devices.

(2) In the case of a lift having attraction drive, the normal terminal stopping devices may be situated in the machine room. In such cases, they shall be mounted on, and operated by, a mechanism positively connected to and driven by the car without dependence on friction. An automatic switch shall be provided which will stop the machine in the event of failure of such connecting mechanism.

(3) The normal terminal stopping device shall remain open until the corresponding final terminal stopping device functions.

(4) Every lift shall also be provided with stopping devices designated the upper and lower final terminal stopping devices, which shall automatically stop the car independently of the operating devices and the normal terminal stopping devices. Such devices shall function as close to the respective terminal landings as practicable but so that under normal operating conditions, they will not function when the car is stopped by the normal terminal stopping device. Where spring buffers are provided the final lower terminal stopping device shall function before the buffer is engaged.

(5) The upper final terminal stopping device shall be held open until the car has travelled above the terminal landing a distance equal to the bottom counterweight clearance plus one-half the buffer stroke, but in no case a distance less than two feet.

(6) The lower final terminal stopping device shall be held open until the car rests on fully compressed buffers.

(7) Final terminal stopping devices shall act so as to prevent the movement of the car in either direction.

(8) Every drum-driven machine shall have a final terminal stopping device operated by the machine, in addition to that operated by the movement of the car.

(9) The contacts of all terminal stopping devices shall be opened directly and positively by the movement of the car, except as provided in paragraph (2) and paragraph (8) of this regulation.

(10) The normal and final terminal stopping devices shall not control the same switches on the controller unless two or more separate and independent switches are provided, two of which shall be closed to complete the motor and brake circuits for each direction of travel.

(11) All terminal stopping devices shall be of the enclosed type and all cams for operating such devices shall be of metal.

P.U.(A) 6/70
FACTORIES AND MACHINERY (ELECTRIC PASSENGER AND GOODS LIFT)
REGULATIONS, 1970.
PART II - DESIGN, CONSTRUCTION, INSTALLATION AND TESTS.

Regulation 27. Suspension ropes.

- (1) Every lift car and counterweight shall be provided with steel suspension ropes having a diameter not less than three-eighths of one inch.
- (2) Every traction-drive lift shall be fitted with not less than three ropes, independent of one another, and every drum-drive lift shall be fitted with not less than two ropes, independent of one another, for the car and not less than two ropes, independent of one another, for the counterweight.
- (3) Every suspension rope on a lift shall be identical in size, construction, strength and quality, be free from any joint and each end of every suspension rope shall have its own independent attachment to the car, counterweight or anchorage. No rope shall be reeved round a pulley, pin or other device in place of using two ropes.
- (4) Every suspension rope on a lift shall be independently fastened to the car frame, counterweight or fixed anchorage in such a manner that all ropes bear an equal share of the load. Means shall be provided to adjust the length of any rope.
- (5) Every rope shall comply with the requirements of British Standard Specification No. 329 or 621 or an equivalent specification, in respect of materials, quality and construction.
- (6) The factor of safety of car and counterweight ropes, based on maximum static loads, shall not be less than ten in the case of lifts having a contract speed not greater than three hundred and fifty feet per minute, and shall not be less than twelve in the case of lifts having a contract speed of three hundred and fifty feet per minute and above. For this purpose the maximum static load on the car suspension ropes shall be the contract load plus the weight of the car and suspension ropes and compensation.
- (7) A plate giving the number, size and ultimate strength of the ropes required shall be permanently fixed to the machine or to the car crosshead.
- (8) Every rope anchored to a winding drum shall have not less than one and one-half turns of the rope on the drum when the car or counterweight has landed. The anchorage of every rope shall be effected by passing the rope through a hole in the drum and effectively clamping it inside.
- (9) The car, counterweight, or anchorage ends of every suspension rope shall be fastened by spliced or clipped return loops, or in metallised sockets. Spliced return loops shall have not less than three steel clips, the bridge of which shall be fitted on the working part of each rope. Every loop shall be lined with a metal thimble, eye or equivalent protection. Every metallised socket shall have a length not less than four and three quarter times the diameter of the rope to which it is fitted.
- (10) Every rope thimble, socket or clip shall conform to the requirements of the appropriate British Standard or equivalent specification.

P.U.(A) 6/70
FACTORIES AND MACHINERY (ELECTRIC PASSENGER AND GOODS LIFT)
REGULATIONS, 1970.
PART II - DESIGN, CONSTRUCTION, INSTALLATION AND TESTS.

Regulation 28. Operation and control.

- (1) Means shall be provided in every automatically controlled lift to prevent interference with its journey to a given landing by pressing any landing button, except that where collective controls are fitted, it shall be possible to stop a car at any intermediate landing.
 - (2) Provision shall be made for a reasonable time lag between stopping and restarting of the car.
 - (3) The handle of every car switch operating device shall be arranged to return to the "stop" position when released.
 - (4) Every lift operated by a hand rope or similar device shall be so arranged that in the event of interruption of the power supply it is necessary to return such device to the "stop" position before the lift can be restarted.
 - (5) Every drum-drive lift shall be provided with a slackrope switch which shall automatically cut off the current and stop the lift should the suspension ropes become slack from any cause whatsoever. Such switch shall be enclosed and so constructed that it will not automatically reset when the slack is removed.
 - (6) No emergency switch for short circuiting the landing door interlock circuit shall be provided in any lift car.
 - (7) The frames of the lift machine, the controller and all electric appliances in or on the car shall be effectively earthed.
 - (8) The control circuits shall be protected by fuses or similar means independently of the main circuits. Where one side of the control circuit is earthed, safety devices shall be connected to the unearthed side of the circuit.
 - (9) No control system shall be used which depends on the completion or maintenance of an electric circuit for the interruption of the power and the application of the brakes at the terminal landings or for the operation of the safety gear, or for the closing of a contractor by emergency stop button.
- Provided that this paragraph shall not apply to dynamic braking or to speed control devices.
- (10) The sticking or freezing of any single magnetically operated switch, contactor or relay, or the occurrence of a single accidental earth shall not permit the lift car to start or run if any landing door, interlock of any landing door or car door or gate contact is in the open position.
 - (11) In the case of an automatic control lift, neither the operation of a spring nor the completion of another electric circuit shall be depended upon to open the circuit to stop such a lift at the terminal landings. The interruption of the electric circuit shall prevent the movement of the car.

P.U.(A) 6/70
FACTORIES AND MACHINERY (ELECTRIC PASSENGER AND GOODS LIFT)
REGULATIONS, 1970.
PART II - DESIGN, CONSTRUCTION, INSTALLATION AND TESTS.

Regulation 29. Clearances between cars and counterweights, etc.

(1) The clearance between the car and the counter-weight or between the car or counter-weight and conductor cables or any ropes that normally move shall not be less than one and one-half inches.

(2) The clearance between the cars and between the counterweights of adjacent lifts and between the car and the counterweight of adjacent lifts shall not be less than two inches.

P.U.(A) 6/70
FACTORIES AND MACHINERY (ELECTRIC PASSENGER AND GOODS LIFT)
REGULATIONS, 1970.
PART II - DESIGN, CONSTRUCTION, INSTALLATION AND TESTS.

Regulation 30. Tests.

(1) Every new lift or substantially altered new lift shall be tested by the suppliers or erectors of such lift before it is put into service, with the contract load in the car. During such test the Inspector shall require that any brake, terminal stopping device, buffer, safety gear, overspeed governor or other apparatus be caused to function.

(2) Where the safety gear is -

(a) of the governor controlled instantaneous type the test shall be carried out at a contract speed and the governor tripped by hand; or

(b) of the broken-rope instantaneous type the test shall be carried out by obtaining sufficient slack rope to cause the gear to function; or

(c) other than the instantaneous type the test shall be carried out at governor tripping speed, when practicable, and when this is not practicable the governor shall be tripped by hand at the maximum speed obtainable.

(3) A test of the safety gear and governor shall be made following the painting of such equipment and also after a new governor rope has been fitted.

P.U.(A) 6/70
FACTORIES AND MACHINERY (ELECTRIC PASSENGER AND GOODS LIFT)
REGULATIONS, 1970.
PART III - MAINTENANCE

Regulation 31. Duties of the owner.

(1) The owner of every lift shall ensure that such lift is maintained.

(2) For the purpose of complying with paragraph (1) of this regulation such owner shall enter into an agreement with an approved firm for the periodic examination and maintenance of such lift. For the purposes of this regulation, an approved firm means a firm which has satisfied the Chief Inspector that it employs persons suitably qualified and trained (hereinafter referred to as the competent person) and controls equipment and facilities to ensure a proper standard of lift examination, service and maintenance:

Provided that such agreement shall not relieve the owner from the responsibility of maintaining the lift well enclosure where such enclosure forms an integral part of the building in which the lift is installed.

(3) It shall be the duty of an owner to inform an Inspector of -

- (a) the name and postal address of the approved firm; and
- (b) the date of commencement of such agreement; and
- (c) the date of expiry of such agreement.

(4) Such agreement shall be for a period of not less than one year, and shall state the name of the competent person employed by the approved firm who is to make such periodic examination and be responsible for such maintenance.

(5) Such person shall thoroughly examine the lift at least once in every three months and cause the lift to be serviced and adjusted once in every month.

(6) A register in respect of every lift in the form shown in the Second Schedule to these regulations shall be kept on the premises in which the lift is installed wherein shall be recorded -

- (a) details of every examination, servicing and adjustment referred to in paragraph (5) of this regulation;
- (b) details of any repair to the lift considered necessary by the competent person and subsequently the date when such repair has been effected;
- (c) details of the breakage of any suspension rope, the failure of any part of the lift machine, over-speeding of the car whether or not safety gear functioned and any other occurrence resulting in the lift being immobilised; and
- (d) such other information as the Chief Inspector may from time to time direct.

(7) Such entries as are referred to in paragraph (6) of this regulation shall be made by the competent person within one week after the event to which it relates.

(8) Such register as is referred to in paragraph (6) of this regulation shall be produced for the Inspector's examination at every regular inspection of the lift and as and when requested by the Inspector.

(9) On receipt of advice from the approved firm that repairs to the lift are necessary the owner shall forthwith arrange to have such repairs effected, or if in doubt as to the necessity therefor refer the matter to an Inspector. For the purpose of this regulation, any recommended repair recorded in the register in accordance with sub-paragraph (b) of paragraph (6) of this regulation shall be deemed to constitute receipt of advice.

(10) If after receipt of such advice as aforesaid the owner neither causes the repairs to be effected nor refers the matter to the Inspector within a period of one week the approved firm shall forthwith inform the Inspector of the facts of the case.

(11) It shall be the duty of the owner of every lift to ensure that, in respect of such lift -

(a) the lift well and pit is maintained in a dry and clear condition, and no rubbish allowed to accumulate therein, nor any part used for storage;

(b) no material not forming part of the lift equipment is placed on the top of the lift car;

(c) the lift is not operated at a load greater than the contract load as specified in the certificate of registration and the car plate fitted in accordance with paragraph (4) of regulation 7;

(d) in the case of any lift other than an automatic control lift, it is not operated unless in the charge of a car attendant who shall be not less than eighteen years of age; and

(e) no wire or current carrying device is substituted for the proper fuse or circuit-breaker in any lift control circuit.

P.U.(A) 6/70
FACTORIES AND MACHINERY (ELECTRIC PASSENGER AND GOODS LIFT)
REGULATIONS, 1970.
PART III - MISCELLANEOUS

Regulation 32. Notices.

- (1) The owner of every lift shall cause the certificate of registration thereof to be posted in the lift car or adjacent to the bottom terminal landing.
 - (2) The owner of a goods lift shall cause suitable notices to be posted in the lift car and at each landing prohibiting unauthorised persons from riding in or on the car.
 - (3) The owner of every lift shall cause notices to be posted -
 - (a) at the ground floor landing showing the name and telephone number of the person to be contacted should any failure of the lift occur; and
 - (b) inside the lift car instructing passengers to sound the alarm bell should any failure of the lift occur.
-

P.U.(A) 6/70
FACTORIES AND MACHINERY (ELECTRIC PASSENGER AND GOODS LIFT)
REGULATIONS, 1970.
PART III - MISCELLANEOUS

Regulation 33. Attendants.

Where it appears to an Inspector that any lift attendant is incompetent the Inspector may direct such person to cease to work, operate or be in charge of any lift without the authority in writing of the Inspector which authority may be revoked at any time at the discretion of the Inspector.

P.U.(A) 6/70
FACTORIES AND MACHINERY (ELECTRIC PASSENGER AND GOODS LIFT)
REGULATIONS, 1970.
PART III - MISCELLANEOUS

Regulation 34. Penalties.

Any person who commits an offence against these regulations for which no corresponding penalty is provided by the Act shall be liable to a fine not exceeding one thousand dollars.

P.U.(A) 6/70
FACTORIES AND MACHINERY (ELECTRIC PASSENGER AND GOODS LIFT)
REGULATIONS, 1970.

FIRST SCHEDULE - page 1

FACTORIES AND MACHINERY (ELECTRICAL PASSENGER AND GOODS LIFT)
REGULATIONS, 1970

[Regulation 6 (a)]

PARTICULARS OF ELECTRICLIFT

Name and postal address of owner
Name and postal address of manufactures
Lift to be installed/ altered at
Name and address of installing firm
No. of floors served Total travel Contract speed
Contract load..... Power: AC/DC

Drive: Traction/Drum Geared/Gearless Motor Horse Power Lift Serial No.
Drawing No.
Operation Control

<i>Regulation</i>		<i>Particulars</i>		<i>FOR OFFICIAL USE ONLY</i>			
				<i>Requirement</i>	<i>Chief Inspector's remarks</i>	<i>Inspector's check figure</i>	<i>Inspector's remarks</i>
Lift loading capacity	7 (2) (a)	Passenger lift car floor area	.....			
		No. of person	.....			
		Contract load	.....			
	7 (3)	Type of goods lift	.....			
		Minimum contract load/ sq.ft	.....			
Lift machine and support	8 (1) (2)	Type of driving machines	Traction/Drum/Flat belt/Chain driven				
	8 (3)	Method of connecting main driving gear to drum or traction sheave	.....	Friction gearing or friction clutch mechanism not permitted			
	8 (4)	Material for worms and worm gears	.....	Cast iron not permitted			

	8 (5)	Method of fastening used where connection is subject to tension or torsion	.....	Set-screw fastening not permitted			
	8 (6)	Material for drum, sheave or pulley	.....	Cast iron or steel			
	8 (7)	Diameter of drum, sheave or pulley	.....	.	
		Ratio of diameter, drum sheave or pulley to diameter of rope	.....	Not less than 40 : 1			
	8 (8)	Type of brake provided	.....	Electromechanical			
	8 (11)	Factor of safety of lift machine	.....	Not less than 8 for steel			
		Type of material for lift machine	.....	Not less than 10 for other material			
	8 (12) (b)	Material for supporting beam	.....	Steel or reinforced concrete			
		Factor of safety	.....	5 for steel			
	(c)	Span of supporting beam	.....	7 for reinforced concrete			
		Deflection of supporting beam under load	.....	Not greater than 1/1500 span			
Machinery room	9 (2) (a)	The maximum load the floor is designed to carry per square foot	.....	Not less than 100 lb/sq.ft			
	(b)	Minimum distance between any part of machine and wall	.....	18" on at least two sides			
	(d)	Clear height of machine room	.....	Not less than 6' 6"			
		Clear height above highest point of machine if machine installed on pedestal on the floor		Not less than 2' 6"			

Lift well	10 (1)	What piping, conduit or equipment other than that forming part of lift or necessary for its maintenance is installed in the lift well?	Not permitted			
	10 (2)	Is there a room, passage or thoroughfare under the lift well	Yes/ No	Not permitted unless by special permission			
	10 (3)	Is a screen provided for the counterweight from the top to bottom of the well?	Yes/ No	Required			
	10 (4)	Number of lifts located in one lift well	.....	Maximum 4		
	10 (5) (b)	Clearance between any fitting attached to and projecting below the bottom of the car frame and the pit floor when the car rests on its fully compressed buffer	.....	Minimum 2 feet		
	10 (6)	Depth of lift pit	.....	Required if pit greater than 3' 6"		
		Are footholds and handholds fitted?	Yes/ No	.			
	10 (7)	Access to lift pit by way of	.....	Bottom terminal landing only		
	10 (8)	Is a guard fixed in the lift pit around the path of the counterweight?	Yes/ No	Required			
		Height of guard	.....	6' 6"		
Lift well enclosure	11 (1)	Does the enclosure extend on all sides throughout the height of the lift well?	Yes/ No	Required			

	11 (2)	Lift travel	Enclosure to be of bricks or other fire resisting materials if lift travel is greater than 40'			
		Type of material for lift well enclosure	.....	.	
	11(4)	Clearance between edge of landing threshold and car platform nosing	.....	Not less than 1/2" and not greater than 1 1/2" Not more than 5" for passenger lifts		
	11 (5)	Clearance between lift well enclosure and the loading side of car platform	.....	Not more than 7 1/2" for goods lifts with vertically sliding hoistway doors		
	11 (6)	Clearance between sides of car or counterweight and lift well enclosure	.....	Not less than 1"		
	11 (7)	Maximum thrust well enclosure car withstand without deformation when the thrust is applied at any point in a direction normal to the surface	.....	Not less than 75 pounds		
	11 (8)	Is there an opening in the lift well enclosure which permits access to the car by passing under a counterweight?	Yes/ No	Not permitted			
	11 (9)	If wire grille is used for the enclosure, the size of the mesh or opening	.....	Not greater than 1 1/4"		
	11 (10)	If there is any glazing in a lift well enclosure is it of toughened or shatter-proof glass?	Yes/ No	Only toughened or shatterproof glass permitted			

Landing doors	12 (2)	Height of landing door	.....	6' 6" for passenger lift 6' 0" for goods lift			
	12 (3)	Distance between lift well side of landing door and edge of landing threshold	.....	Not greater than 4" for hinged door 23/4" for sliding door			
		Type of door	Hinged/ Sliding	.			
	12 (4)	Distance between lift well side of landing door and lift well side of car door or gate	.....	No greater than 6"			
	12 (5)	Maximum thrust the landing door and its track car withstand without causing permanent deformation and without such door being sprung from its guides when the thrust is applied at any point (excepting any vision panel) normal to the surface of the door	.....	Not less than 75 pounds			
	12 (7)	Can the power operated landing door be opened manually at any landing at which the car is standing in the event of failure of power operating mechanism?	Yes/ No	Required			
	12 (8)	Is vision panel provided?	Yes/ No	Required for hinged doors			
		Is car position indicator provided?	Yes/ No	Required in lieu of vision panel			
	12 (9)	If vision panel is provided; Total area of vision panels	.....	Not more than 80 sq in			

		Minimum area of any single vision panel	No less than 25 sq in			
		Height of centre of panel above landing	.....	Not less than 54" and not more than 66"		
		Material of vision panel	.....	Fire resisting and of wired safety glass		
Landing door locking device	13 (1)	Is landing door fitted with electromechanical lock having a retiring cam?	Yes/ No				
		If retiring cam is not fitted, is the electric lock controlling device contact positively interrupted before the landing door is unlocked?	Yes/ No				
		And is the landing door mechanically locked before the electric lock contact is made?	Yes/ No				
Lift car construction	14 (2)	Materials of car platform				
		Factor of safety of car platform	.....	Not less than 5 for steel Not less than 8 for timber		
	14 (3)	Material for car frame	.....	Steel		
		Factor of safety of car frame members and their connection	.....	Not less than 5		
	14(4)	Span of car frame cross head	.....			
		Deflection of crosshead under static conditions with contract load	.....			
		Span of member carrying the platform	.....			

		Deflection of member under static conditions with contact load	.....	Not to exceed 1/1000th of span			
	14 (5)	Are guides provided at the top and bottom of both sides of car frame?	Yes/ No	Required			
	14 (6)	Maximum load car roof can support	.....	200 pounds			
		Is there any open work in the roof?	Yes/ No	.			
		If so can it reject a sphere of one inch?	Yes/ No	.			
	14 (7)	Height of car enclosure	.....	Not less than 6' 6"			
		Are there any open work panels (other than ventilation panels)?	Yes/ No	.			
		Distance of such open work panels from car floor	.....	.	
		Size of such open work panels	.....	.	
	14 (8)	Is the car enclosure securely fixed to the platform and frame?	Yes/ No	.			
		Maximum thrust the car enclosure can withstand without permanent deformation when the thrust is applied at any point normal to the surface of the car enclosure	.....	Not less than 75 pounds Not less than 6' 6" for passenger lift Not less than 6' 0" for goods lift			
Lift car gates and	15 (1)	Height of gate or door	.....	.	

doors		Does the gate or door cover the full width and height of the car entrance opening?	Yes/ No				
	15 (2)	Number of entrances of lift car	.....	Not more than 2			
	15 (3)	Maximum thrust the gate or door and its track car withstand without permanent deformation and without such gate or door being sprung from its guides when the thrust is applied at any point (excepting any vision panel) normal to the surface of the door	.....	Not less than 75 pounds			
	15 (4)	Size of opening in collapsible gate, if fitted	Yes/ No	Should reject a sphere of diameter greater than 2 1/2"			
	15 (5)	Is the door or gate fitted with an electric switch which will prevent the lift car from being started or kept in motion unless all gates and doors are closed?	Yes/ No				
	15 (6)	Can the gate or door be opened manually?	Yes/ No				
		Is a car levelling device fitted?	Yes/ No				
		If so is the car platform provided with a suitable apron?	Yes/ No				
	15 (7)	Material of vision panel if provided	.....	Fire resisting and of wired safety glass			

Emergency hatches	16 (1)	Is emergency hatch provided?	Yes/ No	Required for lift with non instantaneous safety gear			
	16 (2)	If side emergency hatch is provided, distance between car platforms	.....	Not to exceed 2' 6"		
	16 (3)	If top emergency hatch is provided, can it be opened from the top only?	Yes/ No	.			
Ventilation	17	State provision made for ventilation of lift car	.....	.	

[<Cont. next page>](#)

P.U.(A) 6/70
FACTORIES AND MACHINERY (ELECTRIC PASSENGER AND GOODS LIFT)
REGULATIONS, 1970.

FIRST SCHEDULE - page 2

<i>Regulation</i>		<i>Particulars</i>		<i>FOR OFFICIAL USE ONLY</i>			
				<i>Requirement</i>	<i>Chief Inspector's remarks</i>	<i>Inspector's check figure</i>	<i>Inspector's remarks</i>
Lighting	18 (3)	Minimum illumination at landing edge of car platform	Not less than 5 foot candles			
General	19 (1)	Is glass other than toughened or shatterproof glass used in lift car?	Yes/ No				
	19 (2)	Is an alarm bell provided that can be operated from the car?	Yes/ No				
	19 (3)	Is a lighting socket for a portable lamp provided at the top of and underneath the car?	Yes/ No				
	19 (4)	Is an emergency switch provided on the top of the car?	Yes/ No				
		Can the car be operated when the switch is opened?	Yes/ No				
Counterweight	20 (1)	Is a counterweight provided?	Yes/ No				
	20 (2)	Does the counterweight travel in guides?	Yes/ No				
		Are guide shoes or linings provided?	Yes/ No				
Guides	21 (1)	Guide section for lift car	T or round			
		Guide section for counterweight	T or round			
	21 (3)	Variation in distance between guides	Not greater than 3/16"			

	21 (4)	Are the guides and their supports able to withstand the application of the safety gear when stopping a fully loaded car on counterweight?	Yes/ No				
	21 (5)	Method of fixing guide brackets to wall	.....			
	21 (6)	Distance between guide brackets	.....			
		Deflection of guide under normal operation	.....			
Safety gear	22 (1)	Number of safety gear provided	Not more than 1/4"			
		Location of safety gear	.....			
	22 (3)	Can the safety gear stop the car when it is ascending?	Yes/ No				
	22 (4)	Type of safety gear (Instantaneous/ Non Instantaneous Instantaneous with oil buffer) Stopping distance with rated load	.....			
	22 (7)	Means of application of safety gear	.....			
	22 (10)	Location of any releasing carrier or other mechanism for actuating the safety gear	.....			
	22 (11)	Is provision made for releasing car safety from inside the car mechanically?	Yes/ No				
		Can a decrease in tension of the governor rope or the motion of the car in the downward direction release the safety gear?	Yes/ No				
Governor	23 (1)	Is a governor fitted?	Yes/ No	Required for travel over			

	23 (2)	Tripping speed of governor	.....	20 ft			
	23 (4)	Material of governor rope	.....	Not less than 5/ 16			
		Diameter of governor rope	.....			
Buffers	24	Type of buffers used	.....			
		Stroke of buffers	.....			
Clearances and over-travels	25	Top clearance of car	.....			
		Top clearance of counterweight	.....			
		Bottom clearance of car	.....			
		Bottom clearance of counterweight	.....			
Terminal stopping devices	26 (1)	Is the car provided with upper and lower normal terminal stopping devices?	Yes/ No				
	26 (4)	Is the car provided with upper and lower final terminal stopping devices?	Yes/ No				
	26 (5)	Distance the car can travel above the terminal landing before the upper final terminal stopping device closes	.....			
	26 (6)	Position of car when lower final stopping device closes	.....			
	26 (7)	Can the terminal stopping devices act so as to prevent the movement of the car in either direction?	Yes/ No				
Suspension ropes	27 (1)	Diameter of steel suspension ropes	.....	Not less than 3/8"			
	27 (2)	Number of ropes	.....			
	27 (6)	Factor of safety of ropes:	.				
		Car	.....			
		Counterweight	.....			

Clearances between cars and counterweights	29 (1)	Clearance between car and counterweight	.....			
Maintenance	31	Name and address of maintenance firm	.....			
		Name of "competent person" employed by maintenance firm	.....			
		Period of maintenance contract	.....			

Remarks:

Date

.....
Signature of owner of representative

P.U.(A) 6/70
FACTORIES AND MACHINERY (ELECTRIC PASSENGER AND GOODS LIFT)
REGULATIONS, 1970.

SECOND SCHEDULE

FACTORIES AND MACHINERY (ELECTRIC PASSENGER AND GOODS LIFT)
REGULATIONS, 1970

Regulation 31 (6)

REGISTER OF LIFTS

Name and postal address of the owner of the lift

Location of the lift

No. of Certificate of Registration Date of issue

Name and postal address of approved maintenance firm

Name of competent person

Date of competent person's examination

Safety gear last tested

Condition of safety gear

Condition of governor

Landing door locking devices last tested on

Condition of ropes

Dated ropes last renewed

Condition of controller

Condition of brake

Date brake linings last changed

Reduction gear: thrust bearings
main bearings
worm gear

spur wheel

Condition of gear oil

Date oil last changed

Normal terminal stopping devices tested on

Condition of normal terminal stopping devices

Final terminal stopping devices tested on

Condition of final terminal stopping devices

Condition of wiring

Details of any repairs necessary

Any other marks

Date

Signature of competent person

.....
Signature of owner

Dated this 25th day of November, 1969.
[JK/ KB. No. 414; P.N. 250/ 54- 258B.]

V. MANICKAVASAGAM,
Minister of Labour