BRITISH STANDARD

BS 5655-14: 1995

Lifts and service lifts —

Part 14: Specification for hand-powered service lifts and platform hoists

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Committees responsible for this British Standard

The preparation of this British Standard was entrusted to Technical Committee MHE/4, Lifts, hoists and escalators, upon which the following bodies were represented:

Associated Offices Technical Committee
Association of District Councils
British Broadcasting Corporation
British Lift Association
British Railways Board
British Retail Consortium
British Telecommunications plc
Chartered Institution of Building Services Engineers
Department of the Environment
Department of Trade and Industry (Standards Policy Unit)
Electrical, Electronic, Telecommunications and Plumbing Union
Engineer Surveyors' Section of the MSF
Health and Safety Executive
Independent Engineering Insurers' Committee
Institution of Electrical Engineers
Institution of Environmental Health Officers
Institution of Incorporated Executive Engineers
Institution of Mechanical Engineers
Institution of Plant Engineers
Lloyd's Register of Shipping
London Underground Ltd.
National Association of Lift Makers
Post Office
Royal Association for Disability and Rehabilitation

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Contents

Foreword

This Part of BS 5655 has been prepared by Technical Committee MHE/4, Lifts, hoists and escalators. It is the fourteenth Part of a British Standard relating to lifts and service lifts. This Part of BS 5655 supersedes section **6** of BS 2655-1:1970 and section **4** of BS 2655-6:1970 which are rendered obsolescent. Additionally, this Part of BS 5655 includes requirements for hand-powered platform hoists, the demand for which has increased since the introduction of the Health and Safety at Work etc. Act 1974 [1]. All of the obsolescent Parts of BS 2655 are retained for reference purposes and to enable existing lift installations to be maintained.

BS 5655 comprises the following Parts.

— *Part 1: Safety rules for the construction and installation of electric lifts.* (implementing EN 81-1, together with PD 6500 *Explanatory supplement to BS 5655-1);*

— *Part 2: Safety rules for the construction and installation of hydraulic lifts* (implementing EN 81-2);

— *Part 3: Specification for electric service lifts*;

— *Part 4:* (Reserved for future publication);

— *Part 5: Specification for dimensions of standard lift arrangements.* (implementing ISO 4190-1 and ISO 4190-2);

— *Part 6: Code of practice for selection and installation*;

— *Part 7: Specification for manual control devices, indicators and additional fittings.* (implementing ISO 4190/5);

— *Part 8: Specification for eyebolts for lift suspension*;

— *Part 9: Specification for guide rails.* (implementing ISO 7465);

— *Part 10: Specification for the testing and inspection of electric and hydraulic lifts;*

— *Part 11: Recommendations for the installation of new, and the modernization of, electric lifts in existing buildings*;

— *Part 12: Recommendations for the installation of new, and the modernization of, hydraulic lifts in existing buildings*;

— *Part 13: Code of practice for vandal resistant lifts*;

— *Part 14: Specification for hand-powered service lifts and platform hoists.*

Further Parts are anticipated.

The internal dimensional limitations on the car in this standard are different from those appearing in the definition of a service lift given in BS 5655-1. This reflects a difference in national practice between the UK and other European countries, but not any significant difference in safety standards.

In order to assist the introduction of this British Standard all new and replacement hand-powered service lifts tendered for before 1996 may conform to the requirements of this standard or those of the earlier standards BS 2655-1:1970 and BS 2655-6:1970.

In the preparation of this standard it has been assumed that all components are correctly designed, of sound mechanical and electrical construction, made of materials with adequate strength and of suitable quality, and free from defects.

In common with passenger carrying lifts, it is important that service lifts should be tested and examined after installation and subsequently examined and serviced at regular intervals. Service lifts should conform to BS 5655-10 where applicable. It is recommended that each service lift installation should be insured by its owners.

Reference should be made to the provisions for safe working recommended in BS 7255 *Code of practice for safe working on lifts,* which is recommended to all those who have duties under the Health and Safety at Work etc. Act, 1974 and other health and safety legislation.

A British Standard does not purport to include all the necessary provisions of a contract. Users of British Standards are responsible for their correct application.

Compliance with a British Standard does not of itself confer immunity from legal obligations.

Summary of pages

This document comprises a front cover, an inside front cover, pages i to iv, pages 1 to 8, an inside back cover and a back cover.

This standard has been updated (see copyright date) and may have had amendments incorporated. This will be indicated in the amendment table on the inside front cover.

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Section 1. General

1.1 Scope

This Part of BS 5655 specifies requirements for the design, construction and installation of hand-powered service lifts and platform hoists which are designed for a maximum rated load of 250 kg. Such lifts are not suitable for carrying passengers.

This standard also specifies the minimum safety provisions relating to the operation and maintenance of these lifts and hoists.

This standard is applicable to lifts and hoists which are loaded either at floor level or above floor level and that are suspended by either steel-wire ropes or chains.

This standard does not apply to builders' hoists or similar apparatus.

1.2 Informative references

This Part of BS 5655 refers to other publications that provide information or guidance. Editions of these publications current at the time of issue of this standard are listed on the inside back cover, but reference should be made to the latest editions.

1.3 Definitions

For the purposes of this Part of BS 5655, the following definitions apply.

1.3.1
buffer

a resilient stop at the end of the travel which consists of a means of braking using fluid, springs, or other similar means

1.3.2
counterweight

a counterbalancing mass attached by suspension ropes or chains to the lift car/platform

NOTE This may take the form of a counterbalancing car in an adjacent well.

1.3.3
guides

the components which provide guidance for the lift car/platform or the counterweight

1.3.4
hand-powered platform hoist

hand-powered permanent hoisting equipment designed and used exclusively for the carrying of goods serving defined loads. The part of the hoist designed to carry the load is a flat platform with an undercarriage enabling the hoist to serve the top floor, at floor level, through a single or pair of hinged floor flap(s) or into an enclosure

the platform runs between vertical rigid guides

1.3.5
hand-powered service lifts

hand-powered permanent lifting equipment designed and used exclusively for the carrying of goods serving defined levels. It consists of a lift car, the interior of which is inaccessible to persons on account of its dimensions and means of construction, running between vertical rigid guides or rigid guides whose inclination from the vertical is less than 15°

1.3.6
lift car

a part of the hand-powered service lift which carries the load and which is normally of integral construction to avoid the need for a separate sling

1.3.7
lift machine

a hand-operated mechanism which drives and stops the lift car

1.3.8
pit

the part of the well situated below the lowest landing level served

1.3.9
platform

a part of the hand-powered platform hoist which carries the load and which is constructed as a platform with undercarriage

1.3.10
rated load

the load for which the equipment has been built and for which normal operation is guaranteed by the vendor

1.3.11
well

the space in which the lift car/platform and counterweight travels. This space is bounded by the bottom of the pit, the walls and the roof of the well

1.3.12
winch

a hand-operated winding mechanism which drives and stops the platform

Section 2. Hand-powered service lifts

2.1 Well construction

2.1.1 The well shall be constructed to accommodate the lift car, counterweight (if fitted) and the lift machine (unless it is housed separately).

2.1.2 The well shall not contain ducts, pipes, cables or devices other than those for the hand-powered service lift.

2.1.3 The well shall not form part of the ventilation system of the building.

2.1.4 Where the hauling rope passes through floors or serving levels etc., fairings shall be provided.

2.1.5 The well shall be provided with permanent electric lighting, allowing it to be lit during repair, servicing and cleaning. This lighting shall consist of at least one lamp in the machine room and/or the upper part of the well and a lamp in the pit. Where the distance between lamps exceeds 7 m, intermediate lamp(s) shall be provided.

2.2 Well enclosure

2.2.1 Construction

2.2.1.1 Well enclosures shall be provided and shall be continuous on all sides to the top of the lift well. Well enclosures shall be imperforate except for the provision of doors and necessary access panels.

2.2.1.2 All landing entrances shall be fitted with doors or shutters.

2.2.2 Strength

2.2.2.1 Well enclosures shall be of sufficient strength to support the landing doors and operating mechanism in true alignment.

2.2.2.2 The well structure shall be capable of supporting the loads that will be imposed by the lift machine, guides, buffers, etc.

2.2.2.3 The well enclosure, including doors/shutters, shall be capable of withstanding a horizontal force of 300 N applied at any point without undergoing elastic deformation of more than 25 mm.

2.2.3 Fire resistance

NOTE Where there is a statutory requirement for fire resistance of well enclosures, the current issue of the Building Regulations [2] should be considered.

The degree of fire resistance of the doors of entrances giving access to the well (automatically and manually closed) shall be at least half that required for the well enclosure (see note).

2..2.4 Well inner surface

The inner surface of the well enclosure facing any lift car entrance shall form a smooth continuous flush surface without projections or recesses.

2.2.5 Clearances

The clearance between the front of the lift car and landing sill shall not exceed 25 mm.

2.2.6 Lift pit

2.2.6.1 The well shall be constructed with a pit which may be provided as part of the well enclosure. Where a lift pit is provided below ground level it shall be of water-proof construction and its design shall take into account any fixings for the lift equipment. The floor shall be approximately level and have a smooth finish. Where the lift pit is part of the well enclosure, access doors shall be provided in the enclosure giving access for cleaning purposes. These doors shall be located so that access cannot be gained by passing under the counterweight (if fitted).

2.2.6.2 Although it is undesirable to have an accessible space under a lift pit, where such a space is unavoidable either of the following is applicable.

a) The pit floor shall be of sufficient strength to withstand impact loads imposed by free-falling counterweights (if fitted) and loaded lift cars.

b) A safety gear shall be provided for the counterweight (if fitted) and lift car.

2.2.7 Machine room

2.2.7.1 It is usual to accommodate the lift machine with its ancillary equipment within the well, but where it is separate from the well it shall be provided with a machine room with a clear height of at least 1.2 m. The machine room shall have a safe and convenient means of access, be soundly constructed, weather-proof, dry and provided with adequate ventilation. It shall provide safe access to all parts of the equipment.

2.2.7.2 A permanent notice reading "Lift machinery. Unauthorized access prohibited. Doors to be kept locked" shall be displayed on the outside of the machine room door. The characters shall be not less than 13 mm high.

2.3 Guides and fixings

2.3.1 Car and counterweight (if fitted) guides shall be rigid and made of steel or straight grained seasoned wood which is free from knots, shakes or other imperfections. All joints in the guides shall be smooth, flush and parallel.

2.3.2 The guides shall be securely fastened and of such strength and fixing spacing that they will not suffer permanent deformation under normal working conditions.

The guides shall be of such a length that the guide shoes cannot come out of the guides.

2.3.3 Where safety gears are provided, the guides shall withstand the application of the safety gear, under rated load conditions, without permanent deformation.

2.4 Buffers

2.4.1 Buffers shall be installed under all cars and counterweights (if fitted).

2.4.2 The car and counterweight (if fitted) buffers shall be positioned to give a maximum car runby of 25 mm.

2.5 Lift car

2.5.1 Lift cars shall be of rigid construction and totally enclosed except for service openings.

2.5.2 One pair of renewable guide shoes shall be fitted, to the lift car, for each guide rail.

2.5.3 Any removable shelves shall be so retained that they cannot be displaced by movement of the lift car.

2.5.4 Lift cars constructed with openings on opposite or adjacent sides shall be provided with protection to prevent goods projecting outside the car.

NOTE 1 Where gates are used they may have pickets spaced at a maximum of 130 mm centres.
NOTE 2 Lift cars with openings in the front only, need not be provided with car entrance protection.

2.5.5 The lift car floor area shall be proportional to rated load as shown in Table 1. The lift car floor area shall not exceed 1.25 m^2 and the rated load shall not exceed 250 kg.

Table 1 — Maximum lift car floor area and rated load

Maximum car floor area m^2	**Rated load** kg
0.15	10
0.30	25
0.50	50
0.75	100
1.00	200
1.25	250
NOTE 1 For a given rated load, lift car floor areas up to the related maximum car floor area may be selected NOTE 2 Intermediate values for maximum lift car floor area shall be obtained by linear interpolation.	

2.5.6 The internal width, internal depth and overall internal height of the lift car shall not exceed 1.40 m.

NOTE 1 It is recommended that the lift car is compartmentalized to discourage the entry of persons.
NOTE 2 These dimensions follow those currently used in the United Kingdom. They are at variance with those specified for service lifts in BS 5655-1:1986 and ISO 4190-3:1982.

2.5.7 The rated load of the lift in kilograms shall be prominently displayed on a notice either in the lift car or at each landing entrance. The lift identification number shall also be included on this notice.

The minimum height of the characters used for the notice shall be:

a) 10 mm for upper case letters and numbers;

b) 7 mm for lower case letters.

2.6 Landing entrance and locking devices

2.6.1 There shall be no entrance in the well enclosure that permits access into the lift car by passing under the counterweight (if fitted).

2.6.2 Doors/shutters and their frames shall be constructed such that they will not become deformed during normal operation.

2.6.3 Where a hand-powered service lift has a landing door shutter opening in excess of 1.20 m in height, a mechanical lock shall be provided. The lock shall lock the lift car in position within the releasing zone and prevent the lift car from moving away from the landing until the landing doors/shutters are closed. The lock shall engage the door shutters when they are closed and the lift has moved from the landing level. The lock shall be released only by the lift car being within the landing zone.

2.6.4 Doors/shutters, with their locks, in the locked position shall resist a force of 300 N applied at right angles to the panel at any point on either face, being evenly distributed over an area of 5 cm^2 in round or square section, such that

a) there is no permanent deformation;

b) there is no elastic deformation greater than 15 mm;

c) they operate satisfactorily after such a test.

2.6.5 Each of the landing doors/shutters shall be capable of being unlocked from the outside with the aid of a lock release key which will fit the unlocking triangle shown in Figure 1.

Written instructions shall be provided, detailing the essential precautions to be taken to prevent accidents which could result from an unlocking not being followed by effective re-locking.

The lock release key shall have a label attached detailing the essential precautions to be taken to prevent accidents which could result from an unlocking not being followed by effective re-locking.

After an emergency unlocking, the locking device shall not be able to remain in the unlocked position with the landing door closed and with the car outside of the unlocking zone.

In the case of landing doors driven by the car door, a device (either weights or springs) shall ensure the automatic closing of the landing door if this door becomes open, for whatever reason, when the car is outside the unlocking zone.

2.7 Lift here indication

Where a hand-powered service lift serves more than two levels a "lift here" indication shall be provided at each level.

2.8 Lift machine

2.8.1 The design of the lift machine shall be such that the maximum manual force required to operate the lift in the upward direction, with the rated load, does not exceed 150 N.

2.8.2 When a sheave is provided with a traction "V"" groove the angle of the groove shall be between 35° and 40° and the design of the sheave shall ensure traction at all times.

2.8.3 A lift machine shall incorporate a self-sustaining device which will operate automatically, in either direction of motion of the car, after release of the hauling rope, and be capable of stopping and holding the car under 125 % load conditions.

2.8.4 The hauling rope shall be at least 20 mm in diameter and shall be situated outside the landing doors. This rope shall be spliced in such a way that increase in its diameter is minimal.

2.9 Top clearances

2.9.1 There shall be a top clearance of not less than 50 mm:

a) above the lift car when the counterweight (if fitted) is resting on its buffers; and

b) above the counterweight (if fitted) when the lift car is resting on its buffers.

2.9.2 In addition to the top clearance requirement of **2.9.1** the top car or counterweight (if fitted) clearance shall be such that any part of the anchorage shall be not less than 50 mm from the contact between the suspension rope and the sheave or drum measured at the two extremes of travel.

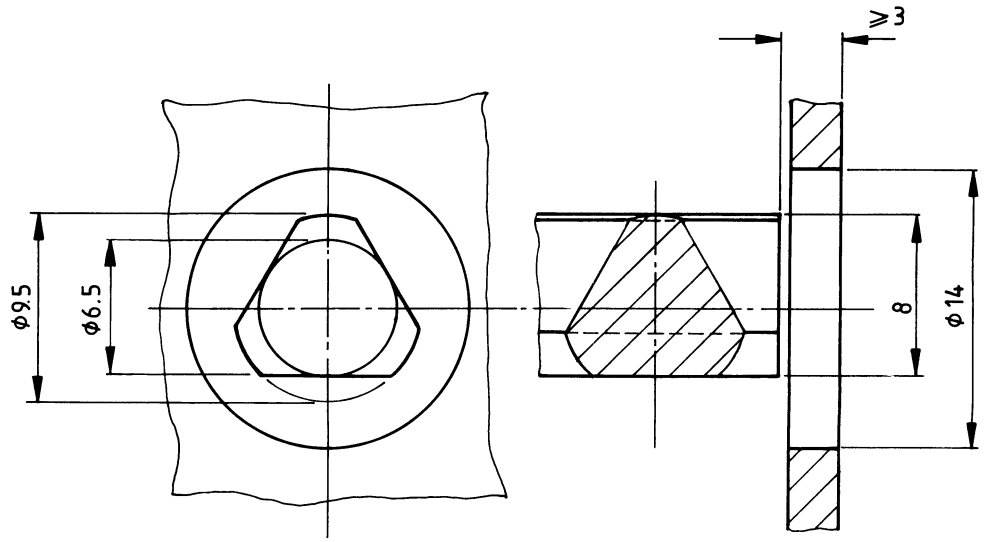

Figure 1 — Unlocking triangle

2.10 Suspension

2.10.1 The size and number of suspension ropes shall ensure the necessary traction to hold the lift car under 125 % load conditions.

Winding-drum ends of suspension ropes shall be secured by a clamp or splice and when the lift car or counterweight (where fitted) is resting on the buffer at least one complete turn shall be left round the winding-drum.

2.10.2 The factor of safety of suspension ropes or chains shall be not less than 8 when calculated from the following expression:

$$\frac{Fnk}{W}$$

where

F is the minimum breaking load of rope or chain (as given by the rope or chain supplier);

n is the number of separate suspension ropes or chains;

k is the reeving factor, i.e.:

1 for 1 : 1 roping;
2 for 2 : 1 roping;
3 for 3 : 1 roping.

W is the maximum static load imposed on the lift car ropes or chains with the lift car and its rated load at any position in the lift well.

2.10.3 Where connecting links are used for termination, they shall have a breaking load at least equal to that of the chain to which they are attached.

2.10.4 Where two or more suspension ropes or chains are used, means of equalizing tension shall be provided.

2.10.5 The ratio between the pitch diameter of sheaves, pulleys or drums and the nominal diameter of the suspension ropes shall be at least 20, regardless of the number of strands.

2.10.6 The ends of the ropes shall be attached independently to the lift car, counterweight (if fitted) or suspension points by one of the following methods:

a) metal or resin filled sockets; or

b) self-tightening wedge type sockets; or

c) heart-shaped thimbles with at least three rope grips; or

d) ferrule-secured eyes; or

e) eye-splice over a heart-shaped thimble.

2.10.7 Steel-wire suspension ropes shall have a minimum diameter of 6 mm.

2.11 Counterweight

NOTE These requirements do not apply to the counterbalancing car referred to in **1.3.2**.

2.11.1 Counterweights (if fitted) shall be made of metal.

2.11.2 Those counterweights consisting of sections without frames shall have not less than two suspension rods extending through the counterweight. The nuts on the suspension rods shall be retained by split pins.

2.11.3 Guide shoes shall be provided.

2.12 Safety gear

Where the lift car travel exceeds 4.5 m, a safety gear shall be fitted.

Safety gear (where fitted) shall be of the instantaneous type operated as a result of the breaking or slackening of the rope or chain or by tripping by a safety rope, i.e. not operated by an overspeed governor.

Where the lift car travel exceeds 12 m, lift machines having hand-operated brakes shall be fitted with an automatic speed brake.

Section 3. Hand-powered platform hoists

3.1 Well construction

The well shall be constructed to accommodate the platform and the counterweight (if fitted).

3.2 Well enclosure

3.2.1 Construction

3.2.1.1 Well enclosures shall be provided and shall be continuous on all sides from the lower floor served to the underside of the upper floor level served.

3.2.1.2 If perforated materials are used in the construction of the well enclosure, the size of perforations shall not exceed 25 mm.

3.2.1.3 Where access to the platform at the upper level is not by use of flap(s), an enclosure shall be provided.

3.2.1.4 Where access doors are provided in the well enclosure they shall have a maximum height of 1.2 m.

3.2.2 Strength

3.2.2.1 Well enclosures shall be of sufficient strength to support the landing doors in true alignment.

3.2.2.2 Where a hinged floor flap(s) is used, it shall be of sufficient strength to withstand the likely forces to which it might be subjected.

3.2.2.3 The well structure shall be capable of supporting the loads that will be imposed by the winch, guides, buffers, etc.

3.2.2.4 The well enclosure shall be capable of withstanding a horizontal force of 300 N applied at any point without undergoing elastic deformation of more than 25 mm.

3.2.3 Fire resistance

NOTE Where there is a statutory requirement for fire resistance of well enclosures, the current issue of the Building Regulations [1] should be consulted.

The degree of fire resistance of the doors of entrances giving access to the well (automatically and manually closed) shall be at least half that required for the well enclosure (see note).

3.2.4 Lift pit

3.2.4.1 The well should be constructed with a pit which may be provided as part of the well enclosure. Where a lift pit is provided below ground level it shall be of water-proof construction and its design shall take into account any fixings for the hoist equipment. The floor shall be approximately level and have a smooth finish. Where the lift pit is part of the well enclosure, access doors shall be provided in the enclosure giving access for cleaning purposes.

3.2.4.2 Although it is undesirable to have an accessible space under a lift pit, where such a space is unavoidable either of the following is applicable.

a) The pit floor shall be of sufficient strength to withstand impact loads imposed by free-falling counterweights (if fitted) and loaded platforms.

b) A safety gear shall be provided for the counterweight (if fitted) and platform.

3.3 Guides and fixings

3.3.1 Car and counterweight (if fitted) guides shall be rigid and made of steel or straight grained seasoned wood which is free from knots, shakes or other imperfections. All joints in the guides shall be smooth, flush and parallel.

3.3.2 The guides shall be securely fastened and of such strength and fixing spacing that they will not suffer permanent deformation under normal working conditions.

The guides shall be of such a length that the guide shoes cannot come out of the guides.

3.3.3 Where safety gears are provided, the guides shall withstand the application of the safety gear under rated load conditions without permanent deformation.

3.4 Buffers

Unless provisions are made within the winch to prevent the landing of the platform, buffers shall be installed under all platforms and counterweights (if fitted).

3.5 Platform

3.5.1 The platform shall be of rigid construction.

3.5.2 One pair of renewable guide shoes or rollers shall be fitted to the lift car for each guide rail.

3.5.3 The platform floor area shall not exceed 1.25 m^2 and the rated load shall not exceed 250 kg.

3.5.4 The rated load of the hoist in kilograms shall be prominently displayed on a notice either on the platform or at each loading entrance. The hoist identification number shall also be included on this notice.

The minimum height of the characters used for the notice shall be:

a) 10 mm for upper case letters and numbers;

b) 7 mm for lower case letters.

3.5.5 The platform shall be provided with means to prevent unstable loads falling from the platform.

3.6 Winch

3.6.1 The design of the winch shall be such that the maximum manual force required to operate the lift in the upward direction with the rated load does not exceed 150 N.

3.6.2 When a sheave is provided with a traction "V" groove the angle of the groove shall be between 35° and 40° and the design of the sheave shall ensure traction at all times.

3.6.3 The winch shall incorporate a self-sustaining device which will operate automatically, in either direction of motion of the platform, after release of the operating mechanism, and be capable of stopping and holding the platform under 125 % load conditions.

3.7 Overtravel

Permanent stops shall be provided to stop the platform travelling more than 25 mm above the top floor.

3.8 Suspension

3.8.1 For hand-powered platform hoists with a rated load below 200 kg at least one steel-wire suspension rope or chain shall be used. For hoists with a rated load of 200 kg or more, at least two steel-wire suspension ropes or chains shall be used.

Where the anchorage on the winding-drum is used to hold the platform clear of the pit floor, it shall withstand the working tension of the rope or chain.

3.8.2 The factor of safety of suspension ropes or chains shall not be less than 8 when calculated from the following expression:

$$\frac{Fnk}{W}$$

where

F is the minimum breaking load of rope or chain; (as given by the rope or chain supplier)

n is the number of separate suspension ropes or chains;

k is the reeving factor, i.e.

1 for 1 : 1 roping;

2 for 2 : 1 roping;

3 for 3 : 1 roping.

W is the maximum static load imposed on the platform ropes or chains with the platform and its rated load at any position in the well.

3.8.3 Where connecting links are used for termination, they shall have a braking load at least equal to that of the chain to which they are attached.

3.8.4 Where two or more suspension ropes or chains are used, means of equalizing tension shall be provided.

3.8.5 The ratio between the pitch diameter of sheaves, pulleys or drums and the nominal diameter of the suspension ropes shall be at least 20, regardless of the number of strands.

3.8.6 The ends of the ropes shall be attached independently to the platform counterweight (if fitted) or suspension points by one of the following methods:

a) metal or resin filled sockets; or

b) self tightening wedge type sockets; or

c) heart-shaped thimbles with at least three rope grips; or

d) ferrule-secured eyes; or

e) eye-splice over a heart-shaped thimble.

3.8.7 Steel-wire suspension ropes shall have a minimum diameter of 6 mm.

3.9 Counterweight

3.9.1 Counterweights (if fitted) shall be made of metal.

3.9.2 Those counterweights consisting of sections without frames shall have not less than two suspension rods extending through the counterweight. The nuts on the suspension rods shall be retained by split pins.

3.9.3 Guide shoes shall be provided.

3.10 Safety gear

Where the platform travel exceeds 4.5 m, a safety gear shall be fitted.

Safety gear (where fitted) shall be of the instantaneous type operated as a result of the breaking or slackening of the rope or chain or by tripping by a safety rope ie. not operated by an overspeed governor.

Where the platform travel exceeds 12 m, winches having hand-operated brakes shall be fitted with an automatic speed brake.

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List of references

Informative references

BSI publications

BRITISH STANDARDS INSTITUTION, London

BS 5655, *Lifts and service lifts.*
BS 5655-1:1986, *Safety rules for the construction and installation of electric lifts.*

ISO publications

INTERNATIONAL ORGANIZATION FOR STANDARDIZATION (ISO), Geneva
(All publications are available from BSI sales)

ISO 4190, *Passenger lift installations.*
ISO 4190-3:1982, *Service lifts class V.*

Other references

[1] GREAT BRITAIN. Health and Safety at Work etc. Act 1974.
[2] GREAT BRITAIN. The Building Regulations 1991. London: HMSO

BSI — British Standards Institution

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