BRITISH STANDARD

BS 5965:1980

Specification for

Manually driven balanced personal homelifts

Confirmed
January 2012

UDC 69.026.6:621.876.114-871

Cooperating organizations

The Mechanical Engineering Standards Committee, under whose direction this British Standard was prepared, consists of representatives from the following Government departments and scientific and industrial organizations:

Associated Offices Technical Committee*
Association of Consulting Engineers
Association of Hydraulic Equipment Manufacturers
Association of Mining Electrical and Mechanical Engineers
British Compressed Air Society
British Electrical and Allied Manufacturers' Association (BEAMA)*
British Gas Corporation
British Gear Manufacturers' Association
British Internal Combustion Engine Manufacturers' Association
British Pump Manufacturers' Association
British Steel Corporation
British Steel Industry
British Valve Manufacturers' Association
Chartered Institution of Building Services
Crown Agents for Oversea Governments and Administrations
Department of Industry (Mechanical Engineering)*
Department of Industry (National Engineering Laboratory)
Department of the Environment
Department of Trade (Marine Division)
Electricity Supply Industry in England and Wales
Engineering Equipment Users' Association*
Federation of Manufacturers of Construction Equipment and Cranes
Health and Safety Executive*
Institution of Gas Engineers
Institution of Mechanical Engineers*
Institution of Plant Engineers
Institution of Production Engineers
Lloyd's Register of Shipping
London Transport Executive*
Machine Tool Industry Research Association
Ministry of Defence
National Coal Board
Oil Companies' Materials Association
Process Plant Association
Railway Industry Association of Great Britain
Society of Motor Manufacturers and Traders Limited
Telecommunication Engineering and Manufacturing Association (TEMA)
Water-tube Boilermakers' Association

The organizations marked with an asterisk in the above list, together with the following, were directly represented on the committee entrusted with the preparation of this British Standard:

Association of County Councils
Association of Metropolitan Authorities
British Broadcasting Corporation
British Railways Board
Bureau of Engineer Surveyors
Department of Health and Social Security
Department of the Environment (Building Research Establishment)
Department of the Environment (Interdepartmental Construction Development Group)
Department of the Environment (PSA)
Department of Transport
Electrical, Electronic, Telecommunications and Plumbing Union
Engineer Surveyors' Section of ASTMS
Federation of Wire Rope Manufacturers of Great Britain
Fire Offices' Committee
Greater London Council
Institution of Electrical Engineers
Institution of Municipal Engineers
Mechanical Handling Engineers' Association
National Association of Lift Makers
Post Office
Retail Trading-Standards Association
Royal Association for Disability and Rehabilitation
Scottish Development Department
Individual manufacturers

This British Standard, having been prepared under the direction of the Mechanical Engineering Standards Committee, was published under the authority of the Executive Board and comes into effect on
31 July 1980

The following BSI references relate to the work on this standard:
Committee reference MEE/49
Draft for comment 79/73493 DC

ISBN 0 580 11477 5

Amendments issued since publication

Amd. No.	Date of issue	Comments

Contents

Foreword

This British Standard has been prepared under the direction of the Mechanical Engineering Standards Committee.

It is intended that equipment manufactured according to the requirements of this standard is only for installation and use in a private dwelling.

It is assumed that a homelift complying with the requirements of this standard will be used only by a person either capable of using it safely and unaided after having been fully instructed in its use or, if not so capable, when adequately attended by an able-bodied person fully instructed in the safe and proper use of the equipment. Safeguards are incorporated to prevent unauthorized use or misuse by any person other than the intended user.

This British Standard specifies minimum safety requirements for the design, construction, installation, operation and maintenance of manually driven balanced personal homelifts which are specifically to be used by disabled persons, with a view to safeguarding against the risk of accidents associated with the operation of such equipment.

Appendix A is included to assist potential purchasers by highlighting various important aspects that should be investigated when considering the installation of a homelift for a specific user. This appendix also gives guidance on the provision of operation instructions for the user, the services that should be provided and the considerations arising from changes of user or use.

Additional information about homelifts is available from a number of sources, including the Disabled Living Foundation and similar information services, and local authority social services departments.

Two related specifications for similar devices for use by disabled persons in private dwellings are:

BS 5776, *Specification for powered stairlifts.*

BS 5900, *Specification for powered homelifts.*

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 and ii, pages 1 to 12, 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.

1 Scope and field of application

This British Standard specifies minimum safety rules related to the design, construction, installation, operation and maintenance of manually driven balanced homelifts, which are to be specifically used by nominated disabled persons travelling between fixed floor levels, with a view to safeguarding against the risk of accidents associated with the operation of such equipment.

The standard specifies requirements for homelifts that do not normally travel a vertical distance greater than 6 m.

Homelifts complying with this standard are hand wound normally from within the carriage by the user, and may also be hand wound by an attendant standing alongside the homelift, but only when the carriage is loaded in accordance with the manufacturer's instructions.

Equipment manufactured according to the requirements of this standard will be capable of being operated in the normal domestic environment (as regards temperature and humidity); additional features will be necessary in more rigourous conditions.

Besides stating the manufacturers' responsibilities, the standard also details special features and actions that are the responsibility of the purchaser; these can be found in clauses **4.3**, **5**, **7.1.2**, **7.2** and **7.4**, supported by guidance given in Appendix A.

2 References

The titles of the standards publications referred to in this standard are listed on the inside back cover.

3 Definitions

For the purposes of this British Standard the following definitions apply.

3.1
approach ramp

a hinged flat surface, attached to the carriage, that when lowered provides access to the carriage and when raised may restrain a wheelchair

3.2
attendant

a capable person who has been fully instructed in the safe and proper use of the homelift

3.3
balanceweight

a weight or series of weights arranged to closely counterbalance the carriage with its safe working load (see **3.24**)

3.4
braking device

a mechanism employed to bring the homelift to rest without shock and hold it in position

3.5
buffer

a resilient stop at the end of the travel of the carriage or balanceweight

3.6
carriage

the load-carrying unit complete with its platform and supporting structure

3.7
carriageway

the space in which the carriage and balanceweights travel. This space is bounded by the lowest floor, the carriageway enclosure and the ceiling of the top floor served

3.8
carriageway enclosure

any structure that separates the carriageway from its surroundings

3.9
chain

a simplex or duplex transmission chain that, if used as part of a drive system, either transmits rotary motion from one shaft to another or transmits motion directly to the homelift carriage

3.10
chainwheel

a wheel having machine-cut teeth designed to engage with a chain

3.11
disabled person

a person who has limited mobility

3.12
door

the hinged or sliding portion of the carriageway enclosure that closes the access openings between the carriageway and the landings

3.13
door lock

a mechanical device used to lock a landing door, the unlocking of which is controlled by the position of the carriage

3.14
guard

a substantially constructed device designed to prevent accidental contact with a potentially dangerous component

3.15
guides

components that guide the carriage sling or the balanceweight

3.16
guide bracket

a member attached to the structure and to which the guides are fixed

3.17
handwinding mechanism

a device that converts manual energy into carriage movement and which automatically holds the carriage in position when the mechanism is not being operated

3.18
guide shoes

attachments to the carriage frame and the balanceweights that provide continuous alignment with the guides

3.19
homelift

a permanent lifting equipment, installed to serve defined landing levels in a private dwelling, that comprises a carriage, *whose dimensions and means of construction clearly permit the access of a passenger or a passenger in a wheelchair,* running between rigid vertical guides

3.20
landing

the space required at the entrance to the homelift carriage at any defined level to permit the manoevering, boarding or alighting of users, either with or without a wheelchair

3.21
platform

a horizontal structure that is part of the carriage and that supports a person standing, sitting or in a wheelchair

3.22
private dwelling

a house, flat or maisonette occupied by one or more households

3.23
safety factor

the ratio, for a particular material under stated conditions, of the ultimate (i.e. failure) load that can be imposed on a member to the highest load that it is designed to carry

3.24
safe working load

the nominated load that the carriage is designed to carry safely, e.g. the user or the user in a wheelchair

3.25
sustaining device

a mechanical device to stop and prevent movement of the carriage within the guides in the event of drive system failure

3.26
toothed belt

a flexible continuous belt having teeth formed in one or other of its surfaces, and designed to engage with specially cut or moulded teeth in wheels attached to separate shafts in order to provide a drive between the two

3.27
unlocking zone

a zone, extending above and below each stopping level, in which the carriage platform has to be positioned to enable the landing doors and, where relevant, the approach ramp to be unlocked

3.28
user

the disabled person for whom the homelift is installed

4 Design considerations

4.1 Protection against hazards. Protection against all of the following possible hazards shall be incorporated:

a) shearing, crushing, trapping or abrading;

b) falling;

c) physical shock.

4.2 Design features. All components shall be correctly designed and of sound mechanical construction using materials that are free from patent defects and that are of adequate strength and suitable quality.

Means shall be provided to minimize the transmission of noise and vibration to any surrounding walls and other supporting structures.

Materials used in the construction of the homelift and its carriageway enclosure shall not support combustion.

4.3 Special design features. All relevant information concerning the following special design features shall be ascertained by the purchaser and conveyed to the manufacturer in order that the appropriate equipment will be prescribed.

a) *Location of homelift.* Full details of a suitable location for the lift, with sufficient space in front of the lift carriage at each level served. This area shall have sufficient space to allow the opening of the landing door without obstructing the expected use of the area. In addition, if necessary, details of adjoining rooms or areas and the space above and below the floors served. (See **A.1.2**.)

b) *Building construction.* Details (see **A.1.2**) of the building construction where the homelift carriageway is to be located, to ensure that the following requirements are met:

1) that the floors can support any loads imposed by the homelift structure or guides, and that the wall can support suitable fixings for the structure, guides and carriageway enclosure;

2) that an aperture of sufficient size can be cut through the upper floor(s) without loss of structural integrity.

c) *User.* The nature of the disability, the relevant residual function of the user, and the need for personal assistance. In addition, where appropriate, whether the user is to be transported in a wheelchair. (See **A.1.1**.)

5 Building requirements

5.1 Lighting. Adequate lighting of the floor area in front of the carriageway enclosure at each landing level shall be available [see **A.1.2** f)].

5.2 Obstructions. It shall be possible for the homelift installation to be plumb throughout its total height. The carriageway shall also be free from all obstructions and services. Any potential trapping areas, e.g. between carriage and carriageway or carriageway enclosure, shall be made smooth and flush or shall have a minimum running clearance of 50 mm.

6 Technical specification

6.1 General safety factor. Unless otherwise stated in this standard, there shall be a safety factor of not less than 5 for all parts of the equipment, and for parts of the building, e.g. overhead timber beams, which may support the lift. The factor shall be calculated on the basis of maximum imposed forces at maximum suspended loads.

6.2 Safe working load. The lift shall be designed to carry the nominated user and also, where necessary, the user's wheelchair.

6.3 Carriageway enclosure and landing door. Protection against falling through the floor aperture shall be provided at each landing level, except the lowest, by the provision of an imperforate enclosure in the form of a barrier and a landing door having a common height of not less than 1 200 mm.

The inner and outer surfaces of the enclosure and door shall be continuous, smooth and flush throughout their height, i.e. without grillework or openings, other than for access doors and their locking devices. The structure shall have sufficient strength to support it, the landing doors and their locking devices in true alignment.

The enclosure and door shall withstand the application of a force of 300 N evenly distributed over an area of 2 500 mm^2 in round or square section at any point perpendicular to the surface without excessive or permanent distortion.

Every landing door shall be provided with an effective mechanical locking device in accordance with the requirements of **6.3.1**.

NOTE To avoid undue draughts manually operated trap door systems which close the floor apertures may also be installed, provided they are capable of supporting a uniformly distributed load of 250 kg.

6.3.1 *Locking devices.* Every door locking device shall be situated to be reasonably inaccessible from the landing and be designed to prevent unauthorized interference with the mechanism. They shall be of sound construction to ensure that any reasonable wear of the locking components or door mounting components shall not create a hazard or interfere with the safe operation of the homelift.

The failure of a spring shall not render a lock unsafe.

Every locking device shall be of a type which:

a) permits its landing door to be opened from the landing side only when the carriage is within a landing zone of 75 mm at that particular landing;

b) permits the movement of the carriage only when every landing door is fully closed;

c) prevents its landing door from being opened when the carriage is outside the 75 mm unlocking zone at that particular landing.

Provision shall be made for the opening of every landing door by an authorized person, using an emergency key, irrespective of the position of the carriage.

6.4 Guides and supporting structure

6.4.1 Rigid guides shall be used for guiding the carriage and balanceweights throughout the carriageway.

The guides shall be of sufficient length to prevent any of the carriage or balanceweight shoes or rollers from running off the guides.

The guide shall be so jointed and fixed that under normal operation deflection is limited to a maximum of 3 mm.

6.4.2 The guide bracket fixings shall be of sufficient strength to carry the loads imposed when stopping the carriage, with its safe working load, or balanceweight on application of the sustaining device (**6.8.3**) or braking device (**6.8.4**).

The guide and bracket fixings shall be designed to prevent any rotary movement of clips, etc. from releasing the guide.

The supporting structure shall be securely fixed at each floor, and its fixing shall be of sufficient strength to carry the loads imposed when stopping the counterweight and carriage when operating at its safe working load, if the sustaining device (**6.8.3**) is applied.

6.5 Selection and anchorage of suspension ropes and chains. The suspension of the carriage and the balanceweight shall have at least two ropes or chains so arranged to ensure equal tension in each. Suspension shall be achieved by one of the methods given in **6.5.1** to **6.5.4**.

6.5.1 *Wire ropes.* All wire suspension ropes shall comply with the requirements of BS 3530, and shall have a nominal diameter of not less than 3 mm. The safety factor of the ropes shall be not less than 10, based upon the load imposed by the carriage when carrying its safe working load. The minimum breaking load of the ropes shall be not less than 8 kN; test certificates shall be provided for the ropes (see Appendix B).

6.5.2 *Man-made fibre ropes.* Man-made fibre ropes may be used for suspending the carriage and the balanceweights only. They shall not be used to drive the carriage.

The safety factor of the ropes shall be not less than 10, based upon the load imposed by the carriage when carrying its safe working load; test certificates shall be provided for the ropes (see Appendix B).

The ropes shall be either:

a) 3-strand hawser laid or 8-strand plaited polyester or polyamide (nylon) continuous filament ropes in accordance with BS 4928-2, or;

b) 8 plait pre-stretched polyester ropes, which apart from the constructional differences, are in accordance with BS 4928-2.

6.5.3 *Chains*. All chains shall comply with the requirements of BS 228. The safety factor of the chains shall be not less than 10, based upon the load imposed by the carriage when carrying its safe working load. The minimum breaking load of the chains shall be not less than 8 kN; test certificates shall be provided for the chains (see Appendix B).

Connecting links shall have a strength not less than that of the chain.

Each chain shall be so installed that it lies in one plane throughout its entire length.

6.5.4 *Anchorage.* Each suspension rope or chain shall be independently anchored in such a manner that the rope cannot be damaged or cut. The anchorage shall be easily accessible for examination, if necessary by special design provisions.

The strength of anchorage attachments shall be greater than 80 % of the breaking load of the rope or the chain attached thereby.

6.6 Balanceweight. All balanceweights shall be of metal, shall travel within rigid guides, and shall withstand the effect of impact.

The mass of the balanceweights shall equal that of the carriage with its safe working load, within the design limits stated by the manufacturer.

Balanceweights may be composed of a number of individual units and, if so arranged, they shall be contained within a suitable casing which shall withstand the maximum design impact conditions.

If the balanceweight travels between rigid guides, two guide shoes shall be fitted each side of the weight and shall either be capable of being renewed or shall have renewable pads.

If the weight is accessible at any point in its travel, it shall be totally guarded.

6.7 Balanceweight buffers. Rubber or timber buffers or stops shall be positioned under each balanceweight.

Sufficient clearance shall be provided between each balanceweight and its buffer to permit effective operation of the carriage latching mechanism. (See **6.10.8**.)

6.8 Method of drive. Several methods of driving the carriage are permissible but each of these is subject to certain limitations.

The following are examples, but other types are not excluded provided that they shall meet the safety requirements stipulated in this standard:

a) chain and chainwheel (see **6.8.5**);

b) screw and nut (see **6.8.6**).

6.8.1 ***General requirements for handwinding mechanism.***

6.8.1.1 All handwinding mechanisms shall be located in accordance with the requirements of **6.10.9** and **6.10.10**, and shall be designed to respond to a manual input to achieve both upward and downward motions of the carriage. They shall be guarded, where necessary, and encased with imperforate material. The mechanism, its gearing and its sustaining device shall be assembled and mounted so that proper alignment is maintained under all operating conditions.

6.8.1.2 All shouldered shafts shall be provided with adequate fillets.

Unless forming an integral part of its shaft or driving unit every separate sheave, rope drum, spur gear, worm and worm-wheel, any form of wheeldrive or brake drum shall be fixed to its shaft or other driving unit by one of the following methods:

a) sunk keys;

b) splines.

6.8.2 *Gearing.* The safety factor used in the design of geared drive units shall be based on the static loads imposed on the handwinding mechanisms by the fully laden carriage when operating at its safe working load and shall be not less than 8 for wrought steel and not less than 10 for cast iron, cast steel or other materials.

Friction gearing mechanisms (i.e. drives depending on friction between the surfaces of adjacent pulleys or friction clutch mechanisms for connecting the handwinding mechanism to the drum, chainwheel, nut or other final output component) shall not be used.

6.8.3 *Sustaining device.* When chain, rope or toothed belt drives are employed a sustaining device shall be provided which prevents uncontrolled movement of the carriage if either the chain or toothed belt slackens or breaks.

6.8.4 *Braking device.*The handwinding mechanism shall be provided with a means of braking capable of bringing the carriage smoothly to rest and of holding it firmly in position, under any load condition. This device shall operate positively to stop the final output shaft.

Any brake linings shall be of non-combustible material and shall be so secured to the brake shoes that normal wear will not weaken their fastenings.

If springs are used to apply the brake shoes, such springs shall be in compression and adequately supported.

The brake shall be released by the movement of the hand winding mechanism and shall brake, automatically and instantaneously, when the hand winding effort ceases.

No toggle or other device that could be left in a locked position shall be used to hold off the brake.

6.8.5 ***Chain and chainwheel drive***

6.8.5.1 *General.* This type of drive requires considerable care to be exercised in its design.

6.8.5.2 *Construction details*

6.8.5.2.1 *Chainwheels.* All chainwheels shall be made from steel and have a minimum of 12 machine-cut teeth. Driving chainwheels shall be fixed to the drive shaft in accordance with **6.8.1.2**.

When the safe working load of the carriage is driven directly the minimum number of teeth in engagement with the chain shall be not less than six. In closely counterbalanced designs, with sustaining or breaking devices in accordance with the requirements of **6.8.3** or **6.8.4**, the minimum number of teeth in engagement with the chain may be reduced to not less than four, provided that full engagement is assured by the use of suitable chain guides.

6.8.5.2.2 *Protection and guarding.* Guards shall be fitted to prevent any trapping hazard between chainwheel and chain or chain and any other part (see BS 5304 for examples of guards).

Means shall be provided to avoid jamming owing to misfeeding or slackening of the chains and to prevent the chains from leaving the chainwheels or riding over the teeth of the chainwheels.

6.8.6 ***Screw and nut drive.***

6.8.6.1 *Screw.* The screw shall be machined from steel with an adequate impact strength, shall be designed to resist wear and shall have a safety factor of not less than 10.

6.8.6.2 *Nut.* The nut shall be made from a material which is compatible with the screw with respect to wear and impact strength, and shall possess an equivalent safety factor.

6.8.6.3 *Screw/nut assembly.* The drive to the rotating component shall be directly controlled by a sustaining device. The rotating component shall be restrained against axial or radial movement by means of adequately supported anti-friction bearings.

6.8.6.4 *Protection and guarding.* Means shall be provided to guard effectively all moving parts and to prevent the fouling of the screw threads with dirt or other foreign matter.

6.9 Rope and chain suspension. Ropes and chains used for suspension shall comply with the requirements of **6.5**.

6.9.1 *Rope pulleys.* All pulleys shall have a smooth machined surface with rounded-edges. Pulleys for wire ropes shall be of metal and pulleys for synthetic fibre ropes shall be made from metal or a suitable engineering grade of plastics material.

The profile of the bottom of pulley groove shall be a circular arc with a radius of not less than 7.5 % in excess of, not more than 10 % in excess of, the nominal radius of the suspension rope. The depth of the groove shall be not less than 1.5 times the nominal diameter of the rope. The angle of flare of the sides of the pulley grooves shall be approximately 52°.

The diameter of the pulleys, measured at the bottom of the groove, shall not be less than:

a) 21 times the nominal diameter of the wire rope;

b) 10 times the nominal diameter of the man-made fibre rope.

6.9.2 *Angle of fleet.* The angle of fleet between the rope and a plane perpendicular to the axis of the pulley, as illustrated in Figure 1, shall not exceed 2°.

6.9.3 *Chain pulleys and chainwheels.* Chain pulleys and chainwheels shall be made of metal, or a suitable engineering grade of plastics, with a profile compatible with the chain. They shall be installed in such a manner that the chain is in-line throughout its entire length.

6.9.4 *Protection and guarding.* The rope or chain shall be retained on its pulleys or chainwheels under all circumstances and any trapping hazard between the rope and pulley or chain and chainwheel shall be prevented by means of a guard.

6.10 Carriage

6.10.1 *Types of carriage.* Various forms of carriage are permissible for conveying the intended user, depending upon individual needs. The broad classifications are as follows:

a) chair carriage (**6.10.3**);

b) standing platform (**6.10.4**);

c) wheelchair platform (**6.10.5**);

d) special adaptations (**6.10.6**).

6.10.2 ***General requirements***

6.10.2.1 *Construction.* The carriage shall either have an integral metal frame or be carried in a metal frame. When supporting the safe working load, evenly distributed over its platform, the frame shall be sufficiently rigid to withstand the operation of the sustaining devices without permanent deformation.

The surface of the platform shall be covered with slip resistant material.

When the platform is stationary in its normal position at the upper landing, the platform surface shall be aligned as closely as possible with the floor surface.

NOTE At the lower level, there may be a minimum clearance between the underside of the platform and solid floor to allow for the subsequent laying of floor coverings.

Anchorage points shall be provided for a safety belt or safety straps.

Exit from the platform shall only be possible at each landing level.

6.10.3 *Chair carriage.* The chair shall be so positioned as to carry the user centrally on the carriage platform and shall provide a safe support for the user. The chair shall consist of a seat with a backrest to form an integral part of the foot supporting platform. Arms or handgrips shall be provided but designed so that the efficient operation of the hand winding mechanism is not affected. Subject to the requirements of **4.3** c), the height of the seat above the platform shall normally be between 400 mm to 450 mm, to suit the user, and the top of the backrest shall be not less than 300 mm above the surface of the seat.

Where a carriage is not enclosed on all sides a restraining device shall be provided which shall safely restrain the user within the confines of the carriage and which shall prevent movement of the carriage until the device is located fully in its travelling position. (See **4.1**.)

The chair may be capable of rotation or sliding, to provide safer or easier access, but designed to avoid any injury to the user. Such a chair shall be capable of being securely latched in the normal travelling position. A notice shall be displayed instructing the user to secure the seat before commencing a journey (see **4.1**).

6.10.4 *Standing carriage.*The standing carriage shall include a platform having sufficient area to allow the user to manoeuvre and stand safely.

Handgrips and supports shall be provided for the user when travelling or when stepping on and off the platform.

Where a carriage is not enclosed on all sides a restraining device shall be provided which shall safely restrain the user within the confines of the carriage and which shall prevent movement of the carriage until the device is located fully in its travelling position. (See **4.1**.)

6.10.5 *Wheelchair carriage.* Subject to the requirements of **4.3** c), the platform shall be of sufficient area to accommodate a wheelchair with user and be provided with an approach ramp. The platform shall be provided with a means for locating the wheelchair and preventing it from moving off the carriage before the carriage can be set in motion, and also to ensure that user and wheelchair shall clear any obstruction during transit of the carriage between floors (see **4.1**).

6.10.6 *Special adaptations.* If special adaptations or combinations of any of the foregoing constructions are necessary to cope with individual user circumstances, the safety features shall correspond to those specified in **6.10.3** to **6.10.5**. (See also **4.1**.)

6.10.7 *Safety.* In general, protection shall be provided against the hazards listed in **4.1**. There shall be no sharp edges or dangerous profiles in any part of the carriage which is accessible to the user.

6.10.8 *Latching mechanism.* A device shall be provided which operates automatically and which holds the carriage stationary within a distance of 20 mm of each landing level.

It shall be possible to lock this device to prevent inadvertent release of the carriage at all landing levels.

To guard against failure of the latching mechanism an additional device shall be provided which is connected to the user restraint system (see **6.10.2.1**) and which prevents the carriage being raised or lowered when the restraint system is not in the fully closed position.

Terminal stops shall be provided to prevent overtravel of the carriage beyond the upper level specified stopping distance.

6.10.9 *User hand winding.* A handwinding mechanism shall be provided for use by the user on the carriage, which, when the handle is released or if the carriage is stopped by an obstruction in the carriageway, automatically holds the carriage in the manner specified in **6.8.4**.

A direction label, such as that shown in Figure 2 , shall be fitted in a prominent position adjacent to the hand winding mechanism. The height of the lettering used on the direction label shall be as shown in the figure.

6.10.10 *Attendant handwinding.* A handwinding mechanism and direction label, in accordance with the requirements of **6.10.9**, shall also be provided for use by an attendant. This mechanism shall be mounted externally on the structure at a position from which the attendant can observe the carriage throughout its travel.

6.11 Winding instructions. Prominent notices shall be displayed stating that the winding operation shall be undertaken only in accordance with the correct procedure detailed in step-by-step instructions. These instructions shall be fitted adjacent to each winding position so that they can be easily read by the user and/or attendant (see **6.10.9** and **6.10.10**).

6.12 Load plate. A load plate shall be securely mounted in a prominent and visible position on the carriage. The plate shall carry a legend similar in content and layout to the following:

WARNING

THIS LIFT IS BALANCED FOR

.....

THIS IS THE ONLY SAFE WORKING LOAD

An example of such a load plate is shown in Figure 3.

The height of lettering used on the load plate shall be as specified in Figure 3.

6.13 Nameplate. In addition to the load plate (see **6.12**) a nameplate shall be securely mounted in a prominent position stating the manufacturer's name and address together with the serial number of the machine.

7 Testing, inspection and servicing

7.1 Test and examination after installation

7.1.1 Immediately upon completion of installation and prior to being put into service, homelifts shall be subjected to a thorough examination and test, by the manufacturer or his representative, to verify conformity with this specification.

7.1.2 A test and examination certificate in the form laid down in Appendix B shall be completed; one copy of this shall be handed to the purchaser or purchaser's representative and one copy shall be kept on file by the supplier as a permanent record.

7.1.3 A copy of each of the appropriate supporting test certificates as required in **6.5.1**, **6.5.2** and **6.5.3**, shall be handed to the owner or purchaser and copies kept on file by the supplier.

7.2 Periodic examinations and tests. The homelift shall be thoroughly examined within 12 months of commissioning, and thereafter at intervals not exceeding 12 months.

Particular attention shall be given, upon which a report shall be prepared, to the effectiveness of the following features:

a) landing door locking devices;

b) ropes, chains, racks or screw and nut (as applicable);

c) handwinding mechanism;

d) sustaining device;

e) balance between balanceweight and the user on the carriage;

f) clearance under balanceweight (see **6.7**);

g) alarm system (if fitted) (see **A.5**).

Copies of the report shall be distributed to the owner, or his representative, and a copy retained by the examining authority.

At every examination, the competent person making the examination shall:

1) advise whether more frequent examinations and servicing will be necessary to ensure continued safety and operation;

2) report any difficulties the user may have in operating the equipment;

3) report any alterations or modifications which may have been made since the previous periodic inspection.

If any defect affecting safety is reported and immediate repair is necessary, the homelift shall be taken out of service and the user advised.

If other defects are reported, the recommended repair and the period within which the repair must be executed shall also be stated.

7.3 Test and examination after major modifications.

If any major modifications are carried out on the homelift, the procedure specified in **7.2** shall be repeated.

In particular, the following shall be considered as being major modifications:

a) change of safe working load;

b) change of travel;

c) change of position or type of handwinding mechanism;

d) change of carriage safety equipment.

7.4 Servicing. The homelift installation and its accessories shall be maintained in good working order. To this end, regular servicing by a competent person shall be carried out at the same frequency as that specified in **7.2**. Particular attention shall be paid to any alarm system batteries, if fitted (see **A.5**).

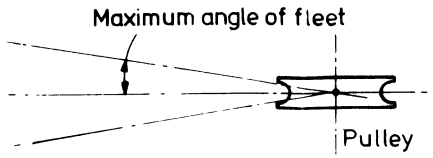
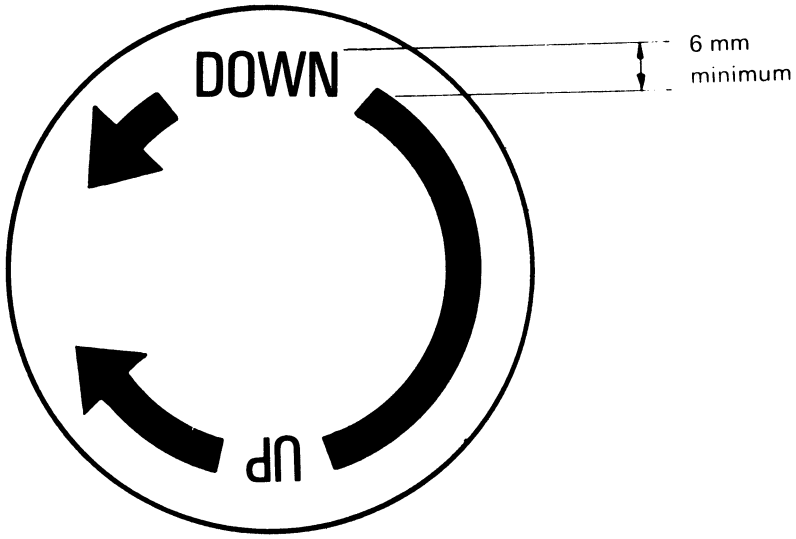


Figure 1 — Angle of fleet



NOTE The proportions of the arrow are detailed in ISO 4196*.

Figure 2 — Typical direction plate for hand winding mechanism

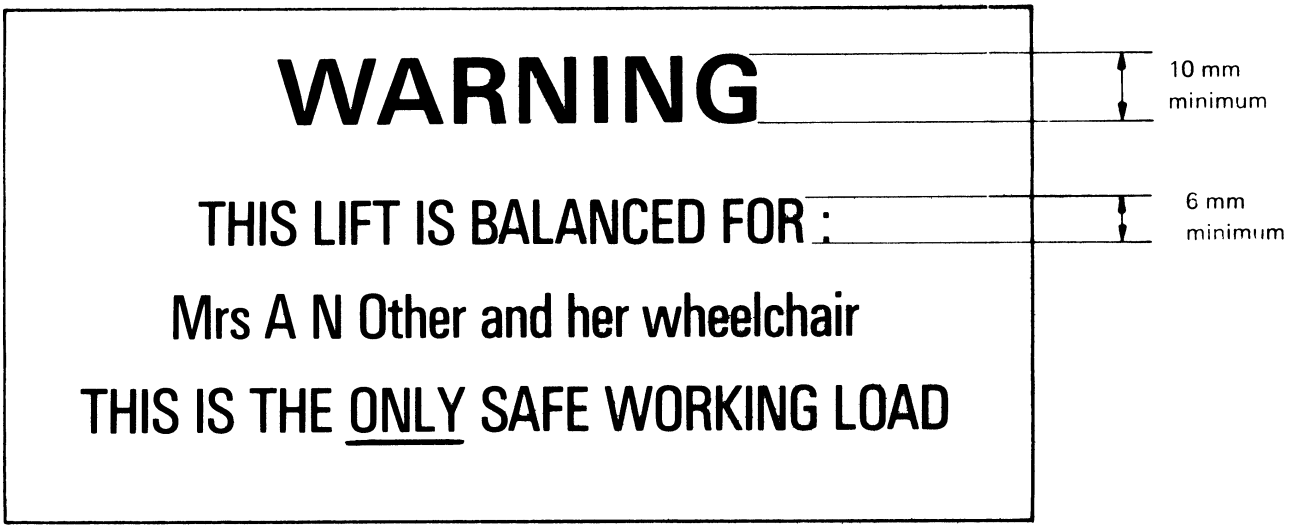


Figure 3 — Typical load plate

Appendix A Guidance to purchaser

A.0 Introduction. The following guidance is provided to assist potential purchasers to select and specify an appropriate manually driven balanced personal homelift for installation in a private dwelling and to remind purchasers and owners of new and existing homelifts of additional features that will require their attention. Additional guidance is also obtainable from the information sources mentioned in the foreword to this British Standard.

NOTE The clause numbers in the brackets refer to the appropriate text in the specification.

A.1 Selection of type of homelift

A.1.1 ***Suitability of homelift for the type of disability***

A.1.1.1 Choose a homelift that is suitable not only at the time of purchase [**4.3** c)] but that which, if the disabled person is suffering from a progressive disorder, will still be suitable should their disability worsen.

A.1.1.2 Consider the best position of the user in the homelift, i.e. standing, sitting or seated in a wheelchair (**6.10.1**).

A.1.1.3 Determine any limits to the ability of the user to rise from a sitting position at a given height or to step on to a raised platform.

A.1.1.4 Determine any limits to the ability of the user with respect to the carriage entrance and approach ramp, e.g. adjacent openings in the carriage and position of car floor with respect to landing floors, and manoeuvering space on the landings.

A.1.1.5 *Controls*

a) Note any need to position the handwinding mechanism for the benefit of a user having use of the right or the left hand only.

b) Identify any difficulties the user may have in manipulating the handwinding mechanism and discuss alternatives with the manufacturer.

A.1.1.6 *Safety belts.* Consider the desirability of specifying safety belts (or restraining devices) to give added protection to the user, i.e. to suit the anchor points specified in **6.10.2.1**.

A.1.2 *Suitability of the building.* Seek expert advice as to the positioning of the homelift with respect to the construction of the building, e.g.:

a) is it adequate for the fixing of the homelift? [**4.3** b)];

b) are there potential trapping areas?;

c) are adequate landing spaces available for getting on and off the homelift especially where a wheelchair is to be used? [**4.3** a)];

d) is sufficient freeway available in passages on all floors served by the homelift for wheelchairs or any other special devices?;

e) will the landing doors obstruct or be obstructed by any other entrances? [**4.3** a)];

f) will the lighting at all entrances be adequate and will it be available at all times? (**5.1**).

A.2 Operating instructions

A.2.1 Ensure that, as purchaser, the correct and safe use of the homelift is demonstrated, and instructions given, to you.

A.2.2 Ensure that the correct use of the homelift is explained and demonstrated to the user and attendant at the time of installation. In addition ensure that written instructions are given to the user covering normal operation and breakdown.

A.2.3 Only when you, as purchaser, are satisfied that the user fully understands all the safe operating procedures, as demonstrated in **A.2.2**, should this fact be acknowledged in the manner shown in Appendix C.

A.2.4 Advise the user to keep the written instructions in a safe place together with any emergency service telephone numbers.

A.2.5 Ensure that the user has been re-instructed in the operation of the homelift following any modifications which affect its operation.

A.3 Maintenance. Follow the manufacturer's guidance about maintenance, which should only be undertaken by a competent person who has received adequate instruction from the equipment manufacturer.

A.4 Breakdowns. Ensure that the user is advised whom to contact in the event of a breakdown.

A.5 Special considerations for those living alone for long periods

A.5.1 Consideration should be given to the desirability of an alarm system that would alert a dependable assistant or summon help beyond the bounds of the household. Recommendations for such alarm systems are given in BS 5613.

A.5.2 Ensure that the electrical supplies for **A.5.1** are not dependant upon the mains power supply and are capable of being operated by the user at any point throughout the travel of the homelift.

A.6 Change of use. Any change in the use of the homelift should be discussed with the manufacturer since certain alterations may be necessary; examples of such changes are:

a) change of type and weight of wheelchair;

b) change of user disability;

c) change of user;

d) installation at another site.

Any such changes will require a review of all the foregoing guidance in this appendix (see also **7.3**).

Appendix B Type of certificate required for test and examination after installation of a manually driven balanced personal homelift

B.1 Description

Location .....

Manufacturer .....

Homelift serial no. .....

Travel .....m

Safe working load .....kg (see **3.24**)

Number of levels served .....

Name of user .....

Details of wheelchair (mass) .....kg (description) .....

B.2 Static examination

a) Is the rope/chain test certificate for the suspension system available and in order? .....

b) Have the ropes/chains and their anchorages been examined and found to comply with the requirements of **6.5.4**? .....

c) Does the automatic latching mechanism (see **6.10.8**) operate correctly at each landing level? .....

d) Does the user restraint interlock (see **6.10.8**) operate correctly? .....

e) Does the carriage sustaining device (see **6.8.3**), if fitted, operate satisfactorily? (See note.) .....

f) Does the carriage braking device (see **6.8.4**) operate correctly? (See note.) .....

NOTE For reasons of safety, tests e) and f) are best carried out with the carriage located at the upper level, bearing the examiner and correctly balanced to match his weight. The carriage should then be lowered 300 mm when the examiner should make an exit from the carriage. The carriage should be sustained in position.

B.3 Declaration

I/we certify that on..... 19 .....this homelift was thoroughly examined and found to be free from obvious defects, and to comply with the requirements of BS 5965 and that the foregoing is a correct report of that examination.

Signature(s) .....

Qualification(s) .....

Address.....

.....

Date .....

If employed by a Company or Association give their name and address .....

.....

.....

Appendix C Certificate of acceptance by purchaser/user

I/we being the purchaser/user of this homelift (serial no .....) have received, and fully understood, verbal and written instructions, in association with a demonstration, from[1)] ..... on its correct and safe use and found it to be in working order.

Signature .....

Date .....

Address .....

.....

[1)] Manufacturer's name, social services representative, etc.

Publications referred to

BS 228, *Transmission precision roller chains and chainwheels.*
BS 3530, *Small wire ropes.*
BS 4928, *Man-made fibre ropes.*
BS 4928-2, *Polyamide (nylon), polyester and polyethylene filament ropes.*
BS 5304, *Code of practice for safeguarding of machinery.*
BS 5613, *Recommendations for alarm systems for the elderly and others living at risk.*
BS 5776, *Specification for powered stairlifts*[2)].
BS 5900, *Specification for powered homelifts*[2)].
ISO 4196, *Guide to the use of arrows in graphic symbols*[3)].

[2)] Referred to in the foreword only.
[3)] In course of preparation.

BSI — British Standards Institution

BSI is the independent national body responsible for preparing British Standards. It presents the UK view on standards in Europe and at the international level. It is incorporated by Royal Charter.

Revisions

British Standards are updated by amendment or revision. Users of British Standards should make sure that they possess the latest amendments or editions.

It is the constant aim of BSI to improve the quality of our products and services. We would be grateful if anyone finding an inaccuracy or ambiguity while using this British Standard would inform the Secretary of the technical committee responsible, the identity of which can be found on the inside front cover. Tel: 020 8996 9000. Fax: 020 8996 7400.

BSI offers members an individual updating service called PLUS which ensures that subscribers automatically receive the latest editions of standards.

Buying standards

Orders for all BSI, international and foreign standards publications should be addressed to Customer Services. Tel: 020 8996 9001. Fax: 020 8996 7001.

In response to orders for international standards, it is BSI policy to supply the BSI implementation of those that have been published as British Standards, unless otherwise requested.

Information on standards

BSI provides a wide range of information on national, European and international standards through its Library and its Technical Help to Exporters Service. Various BSI electronic information services are also available which give details on all its products and services. Contact the Information Centre. Tel: 020 8996 7111. Fax: 020 8996 7048.

Subscribing members of BSI are kept up to date with standards developments and receive substantial discounts on the purchase price of standards. For details of these and other benefits contact Membership Administration. Tel: 020 8996 7002. Fax: 020 8996 7001.

Copyright

BSI
389 Chiswick High Road
London
W4 4AL