BRITISH STANDARD

BS 6462:1985

Incorporating Amendment No. 1

Specification for

Mechanical performance of peg-type casement stays and face-fixed wedge-action fasteners

UDC 683.353:683.376.22

Committees responsible for this British Standard

The preparation of this British Standard was entrusted by the Elements and Components (of Diverse Materials) for Buildings (ECB/-) Standards Committee to Technical Committee ECB/41 upon which the following bodies were represented:

Association of Builders Hardware Manufacturers
Association of Burglary Insurance Surveyors
British Hardware Federation
British Lock Manufacturers' Association
British Plastics Federation
British Woodworking Federation
Consumer Standards Advisory Committee of BSI
Department of the Environment (Building Research Establishment)
Department of the Environment (Property Services Agency)
Greater London Council
Guild of Architectural Ironmongers
Incorporated Association of Architects and Surveyors
Institute of Carpenters
Institute of Architectural Ironmongers
Royal Institute of British Architects
Zinc Development Association

This British Standard, having been prepared under the direction of the Elements and Components (of Diverse Materials) for Buildings was published under the authority of the Board of BSI and comes into effect on 30 September 1985

The following BSI references relate to the work on this standard:
Committee reference ECB/41
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Amendments issued since publication

Amd. No.	Date of issue	Comments
7930	February 1994	Indicated by a sideline in the margin

Contents

Foreword

This British Standard has been prepared under the direction of the Elements and Components (of Diverse Materials) Standards Committee.

To date very little work has been done in collecting all the information and knowledge gained in relation to casement stays and fasteners for windows. Because of the complexity of the subject, the material cannot be specified in detail for each piece of every component, likewise dimensions for these pieces cannot be given to suit all materials. Therefore, the scope of this document has been restricted to the mechanical performance of casement stays and fasteners.

The mechanical performance in use of casement stays and fasteners will depend upon the method of fixing employed and the design of the window and related hardware and reference should be made to CP 153 and BS 6375-1 for advice on these topics. Because of the many methods of fixing and the fact that in most cases the fixings are not supplied with the stays and fasteners, the tests specified in this document involve bolting the strays and fasteners to their supports.

CP 153-1 should also be referred to for safety considerations related to provisions for opening and cleaning.

This standard does not cover sampling. It is for the parties concerned to provide for appropriate sampling and testing rates to meet contractual and commercial requirements.

The security of windows against forced entry depends upon many features and is not covered in this document.

In view of the fact that this document covers only the *mechanical* performance of peg-type casement stays and face-fixed wedge-action fasteners it was considered essential that the restricted scope of this document should be brought to the attention of any purchasers of items which are claimed to comply with it. The requirements of clause **3** have, therefore, been incorporated to cover this point.

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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

This British Standard specifies requirements for the mechanical performance of peg-type casement stays and face-fixed wedge-action fasteners for use on top hung and side hung aluminium, plastics, steel and wood casement windows up to 1 m^2 in area.

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

2 Definitions

For the purposes of this British Standard the definitions in BS 565 and BS 6100-4.1, BS 6100-4.2 and BS 6100-4.3 apply, together with the following.

2.1 Casement stays

2.1.1
casement stay

a device used in conjunction with complementary items, to hold the opening casement of a window at various positions for ventilation and which may also be used to hold the opening casement in the closed position

2.1.2
casement stay fittings

complementary parts for a casement stay which enable the casement stay to perform its function, whether keeping the opening casement open or closed, e.g. peg plates, peg and hook plates etc.

2.1.3
peg plate

a device consisting of a locating peg mounted on a base plate as shown in Figure 1

2.1.4
twin peg plate

a device consisting of two locating pegs mounted on a common based plate as shown in Figure 1

2.1.5
hook plate

a device into which the free end of the casement stay can be located so that in conjunction with a peg plate the opening casement can be held in the closed position as shown in Figure 1

2.1.6
casement stay length

the overall length of the stay including its end fittings when measured as shown in Figure 1

2.2 Casement features

2.2.1
casement fastener

a device used in conjunction with complementary items principally to secure the opening casement in the closed position, but in addition, it may be designed to hold the casement slightly opened for ventilation purposes

2.2.2
casement fastener fittings

complementary parts for a casement fastener which enable the casement fastener to perform its functions

3 Marking and claims of compliance[1)]

Casement stays and fasteners shall not be marked with the number of this standard. Any claims of compliance related to this standard shall state clearly that this standard only specifies the mechanical performance of the casement stays and fasteners.

4 Design and construction

4.1 Each item of hardware, including its complementary parts, shall be so designed that when installed in accordance with the manufacturers' fixing instructions, the action of the hardware and the operation of the window shall not be obstructed.

4.2 The hardware shall be free from sharp edges and burrs that might be a hazard to the user.

5 Performance

5.1 General. Casement stays and fasteners shall be prepared for testing in accordance with Appendix A.

Tests shall be carried out in the order in which they are laid down in Appendix B or Appendix C, as appropriate, after the casement stays and fasteners have been checked for compliance with clause **4**.

Each sample shall meet all the relevant requirements of **5.2**.

5.2 Test requirements

5.2.1 *All samples.* When tested in accordance with Appendix B or Appendix C, as appropriate, there shall be no fracture or breakage and it shall be possible to operate the casement stay or fastener.

5.2.2 ***Casement stays***

5.2.2.1 When tested in accordance with **B.1** the force measured shall be not less than 180 N.

[1)] See foreword.

5.2.2.2 When tested in accordance with **B.2** to **B.4** the permanent deformation at any point shall not exceed 1 mm in the direction of loading.

When tested in accordance with **B.5** the permanent deformation at any point shall not exceed 3 mm in the direction of loading.

When tested in accordance with **B.6** the initial 100 N force shall not produce a permanent deformation at any point exceeding 3 mm in the direction of loading and the subsequent 200 N force shall be sustained without sign of fracture.

5.2.3 ***Casement fasteners***

5.2.3.1 When tested in accordance with **C.1** the torque required to turn the fastener handle to the fully engaged position shall not exceed 5 N·m.

5.2.3.2 When tested in accordance with **C.2** and **C.3** the maximum permanent deformation shall not exceed 1.0 mm.

5.2.3.3 When tested in accordance with **C.4** the pull-in shall be not less than 0.2 mm, the relative position of the frame shall not have altered by more than 1.0 mm and the operating torque when measured according to **C.1** shall not exceed 5 N·m.

Appendix A Test preparation

The test arrangements shall be as shown in Figure 2 to Figure 10.

The bases, casements and frames shall be made and fixed so as not to distort during any test. The casement stays and fasteners, and their fittings, shall be bolted in position so that the fixings do not distort during any test.

The components of the simulated window/stay/fastener assembly shall be parallel or normal, as appropriate, to within ± 5°. The forces shall be applied within ± 5° of the specified direction and for 60 ± 5 s.

Appendix B Test methods for casement stays

B.1 Operating force characteristics (see Figure 2)

Bolt the peg plate to the base and position the stay with the peg in the first hole. Apply a force of 55^{+5}_{-0} N without shock at 50 mm from the free end of the stay and measure the force which would be applied to the casement, as shown in Figure 2.

B.2 Resistance to excessive operating force (see Figure 2)

Use the same test arrangement as for test **B.1** with the stay plate rigidly fixed in position. Apply a force of 300^{+5}_{-0} N at 50 mm from the free end of the stay in the closing direction. Measure any permanent deformation after the force has been removed.

B.3 Resistance to wind gust loading (closed windows, transverse loading) (see Figure 3)

B.3.1 *Test apparatus and set-up.*The test apparatus shown in Figure 3 consists of a fixed horizontal rigid base above which a cross-beam can be suitably guided to move it both parallel to the base and in the direction of loading shown in Figure 3. The casement stay is securely attached to the cross-beam and the hook plate and/or peg plate(s) are similarly attached to the base plate and/or cross-beam at the locations recommended by the manufacturer (i.e. assuming the test apparatus is an actual casement window with the cross-beam representing its casement member and the base plate representing its fame).

B.3.2 *Test method.* Apply a force of 700^{+5}_{-0} N without shock to the cross-beam in the direction indicated in Figure 3. Measure any permanent deformation after the force has been removed.

B.4 Resistance to wind gust loading (open windows, axial loading) (see Figure 4)

B.4.1 *Test apparatus and set-up.* The test apparatus described in **B.3** is suitable but the test set-up is arranged so that the cross-beam moves parallel to the longitudinal axis of the casement stay and the first ventilation position (excluding any locking position) from the cross-beam is engaged by the peg.

B.4.2 *Test method.* Apply a force of $1\,000^{+5}_{-0}$ N without shock to the cross-beam in the direction indicated in Figure 4. Measure any permanent distortion after the force has been removed.

B.5 Resistance to vertical loading (free) (see Figure 5)

This test applies only to stays with a hold level device to prevent them falling below the sill or transom.

Fix the casement of the simulated window/stay assembly to a rigid base with the stay parallel to the surface of the base. Apply a force of 50^{+5}_{-0} N without shock at a point 50 mm from the end of the stay bar in the same direction as the stay hangs.

B.6 Resistance to vertical loading with the stay position in the first ventilation hole (see Figure 6)

Arrange the test as shown in Figure 6, with the upper surface of the casement stay in a horizontal position and the peg located in the first ventilation hole (excluding any locking hole) from the clevis of the stay. Apply a force of 100^{+5}_{-0} N without shock vertically downwards at a point 50 mm from the end of the stay bar. Remove the force and measure any permanent deformation Subsequently apply a force of 200^{+5}_{-0} N without shock vertically downwards at the same point on the stay bar and record whether it is sustained.

Appendix C Test methods for casement fasteners

C.1 Operating force characteristics (see Figure 7)

Partially engage the spur of the fastener handle with the wedge plate. Apply a force of 40^{+5}_{-0} N to the casement without shock in the direction of opening, with the relative movement of the casement and frame restricted to directions parallel to this applied force. Apply an increasing force without shock to the handle at a point 25 mm from its end and measure the force required to effect fastening. Note that the initial gap between the casement and frame should be sufficiently large to prevent them being pulled fully together when the handle is closed.

C.2 Resistance to wind gust loading (closed windows) (see Figure 8)

With the catch fully engaged apply a force of 700^{+5}_{-0} N without shock to the casement in the opening direction (normal to the base and hence to the plane of the window). Provide means to restrict the relative movement of casement and frame to directions parallel to the applied force.

C.3 Resistance to excessive operating force (axial loading) (see Figure 9)

Apply a force of 300^{+5}_{-0} N without shock to the handle, parallel to the axis and away from the base, and at a point 50 mm from the end of the handle. Measure any permanent deformation after the force has been removed. Repeat with the force applied towards the base.

C.4 Resistance to wear (see Figure 10)

C.4.1 *Test apparatus and set-up*. The test apparatus shall consist of a fixed rigid base to which the casement fastener is secured and a floating frame to which the casement fastener fittings are secured. The movement of the frame shall be restricted to one plane either by vertical guide bars or by a hinged unit where the axis of rotation is 300 mm ± 50 mm from the contact surfaces of the test item.

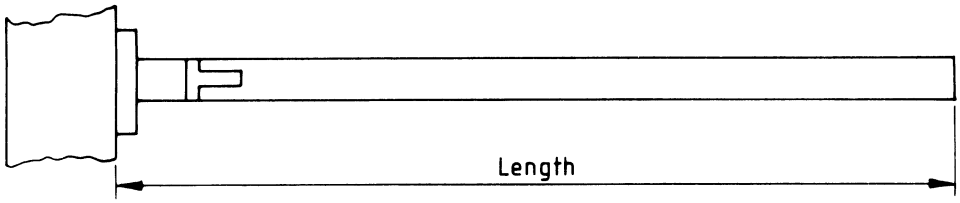
A constant force of 35^{+5}_{-0} N shall be applied to the casement fastener at the point and in the direction indicated in Figure 10.

A suitable stop shall be provided to restrict the movement of the frame. This stop shall be positioned so that when the casement fastener is rotated through $60^{+5}_{-0}{}^{\circ}$ from its fully engaged position any further movement of the frame is restricted by the stop. When the casement fastener is returned to the fully engaged position a force of 15^{+1}_{-0} N shall act through the fastener and its fittings.

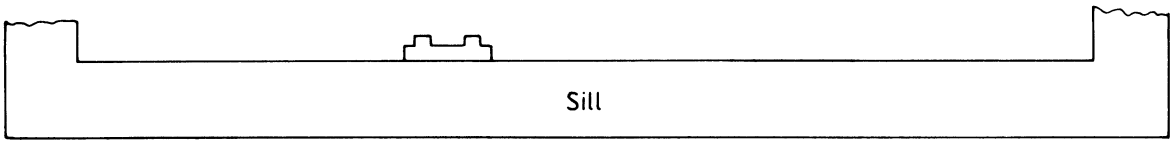
A mechanism capable of operating the casement fastener repeatedly in its normal manner through an angle of $60^{+5}_{-0}{}^{\circ}$ from its fully engaged position shall be attached to the fastener.

C.4.2 *Test method*. With the 35 N force applied, measure to an accuracy of 0.05 mm the vertical movement of the frame, the pull-in, when the casement fastener is rotated through $60^{+5}_{-0}{}^{\circ}$ to its fully engaged position.

With the casement fastener in the fully engaged position remove the 35 N force and record the vertical position of the frame relative to the fixed base. Re-apply the 35 N force and operate the mechanism for 20 000 cycles at a rate of not more than one complete cycle per 10 s. Re-measure the pull-in. With the casement fastener fully engaged remove the 35 N force and record the relative position of the frame.

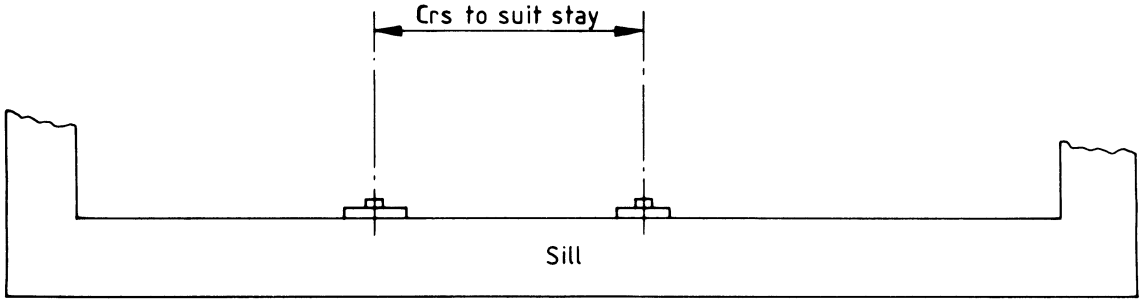


(a) Length of stay



(b) Twin peg plate

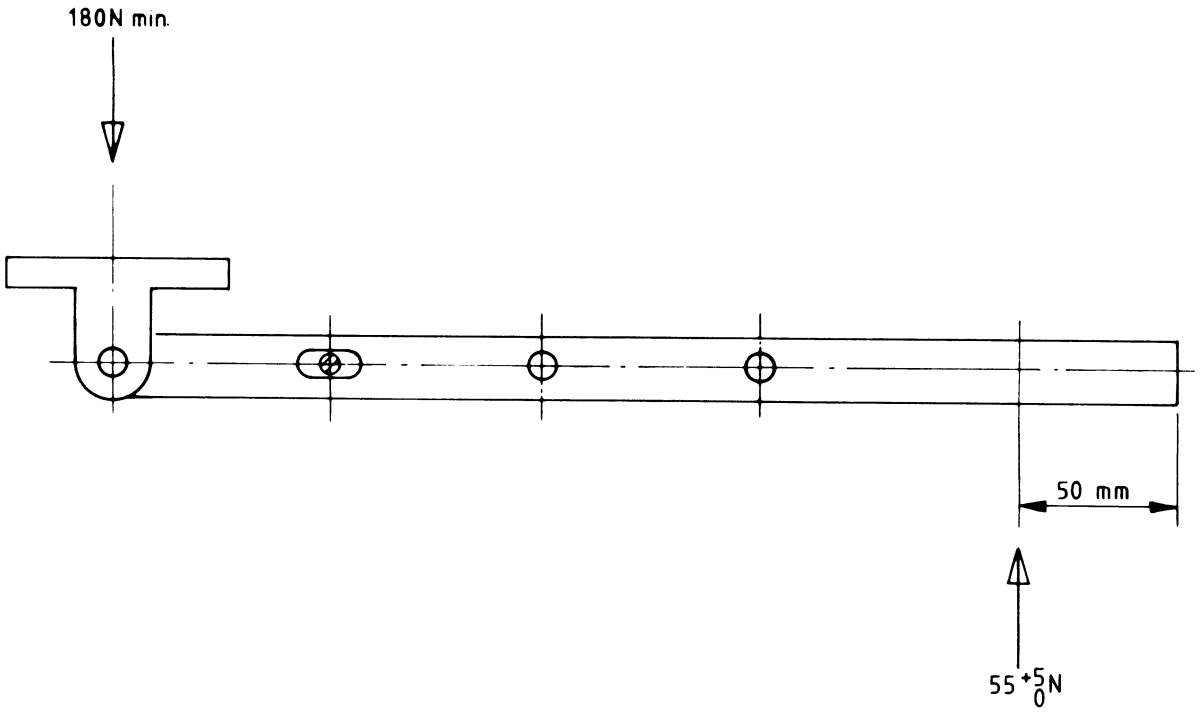
(c) Peg plate and hook plate fitment



(d) Two single peg plates

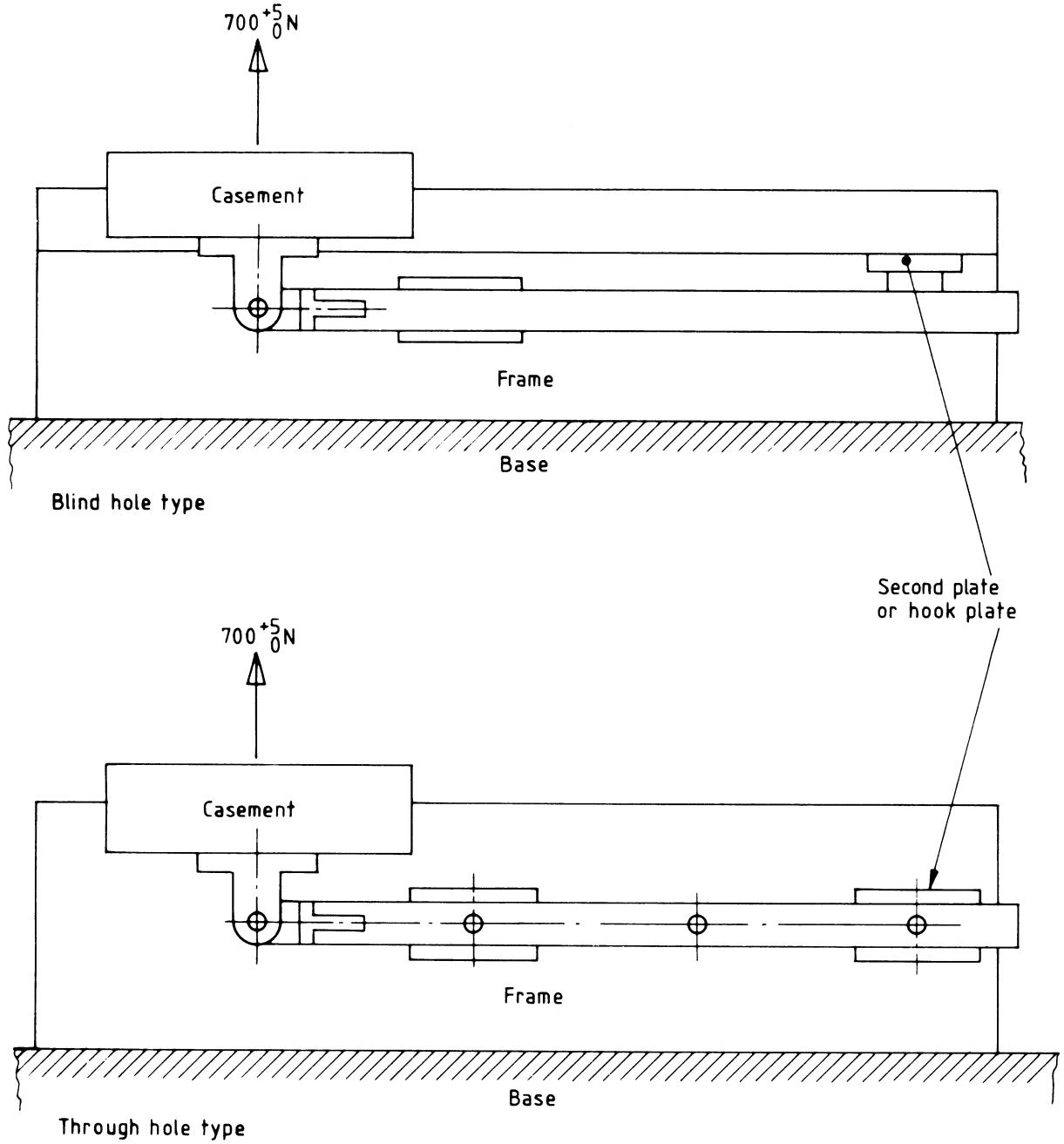
NOTE The diagrams are for illustration only and in no way prejudice the shape of the window or hardware.

Figure 1 — Stays and fittings



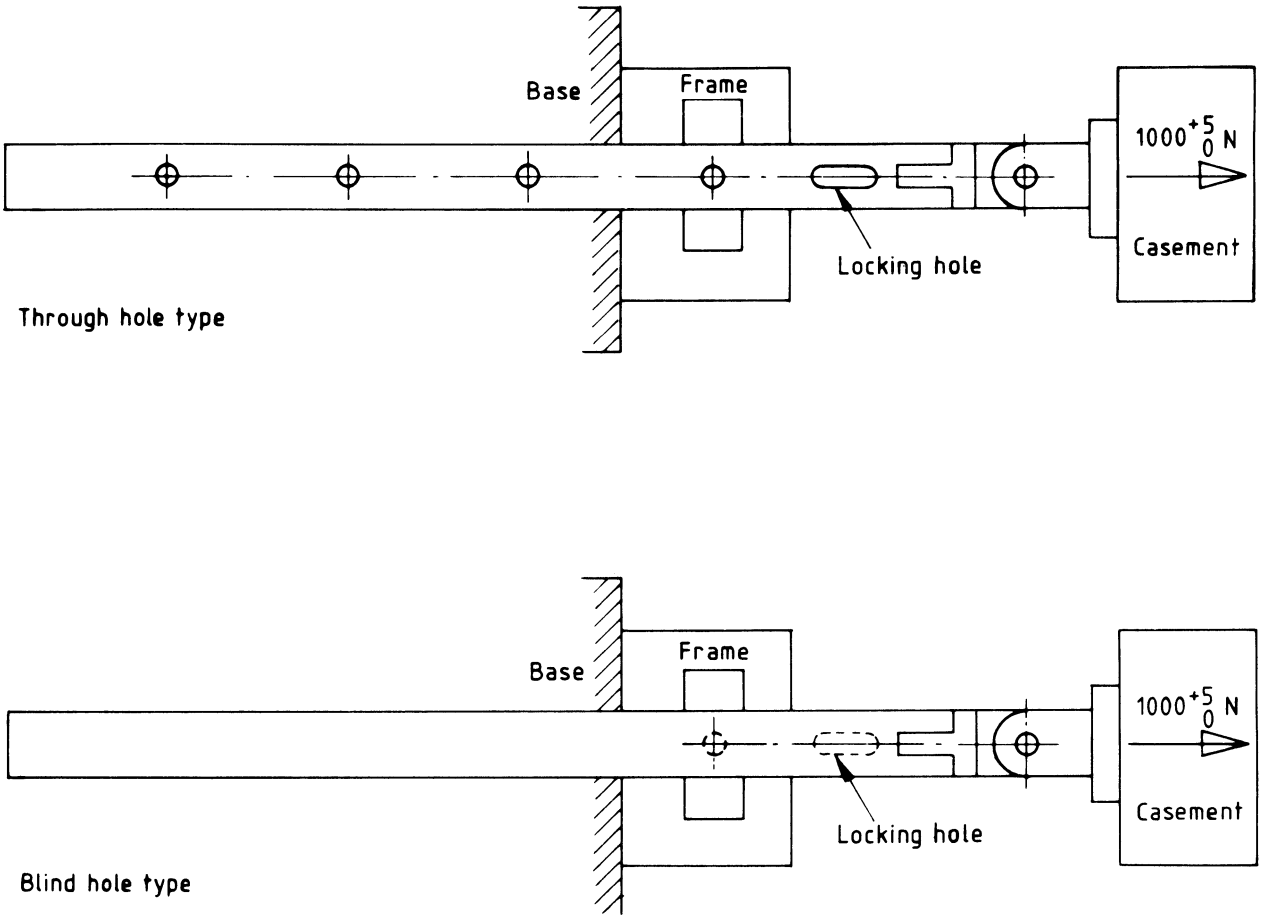
NOTE The diagram is for illustration only and in no way prejudices the shape of the window or hardware.

Figure 2 — Operating force characteristics



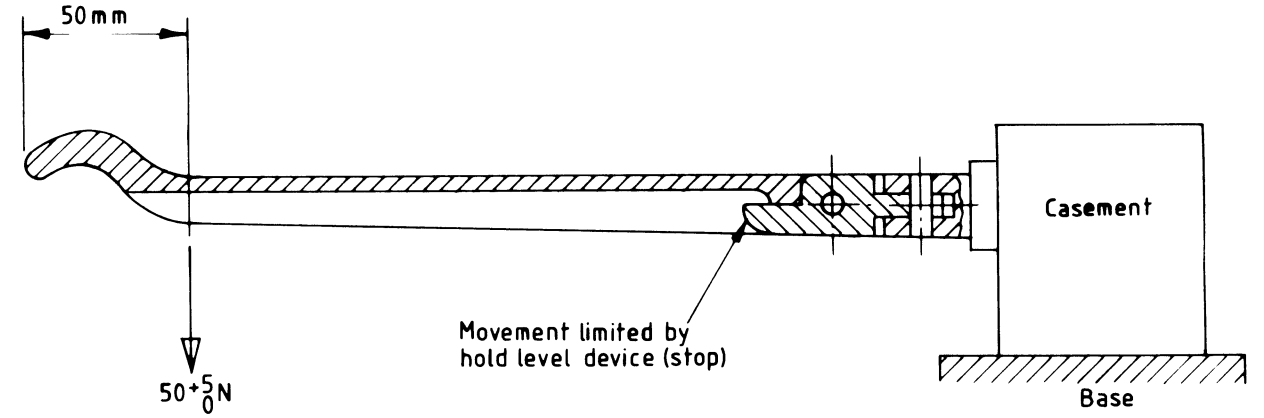
NOTE The diagrams are for illustration only and in no way prejudice the shape of the window or hardware.

Figure 3 — Resistance to wind gust loading (transverse loading)



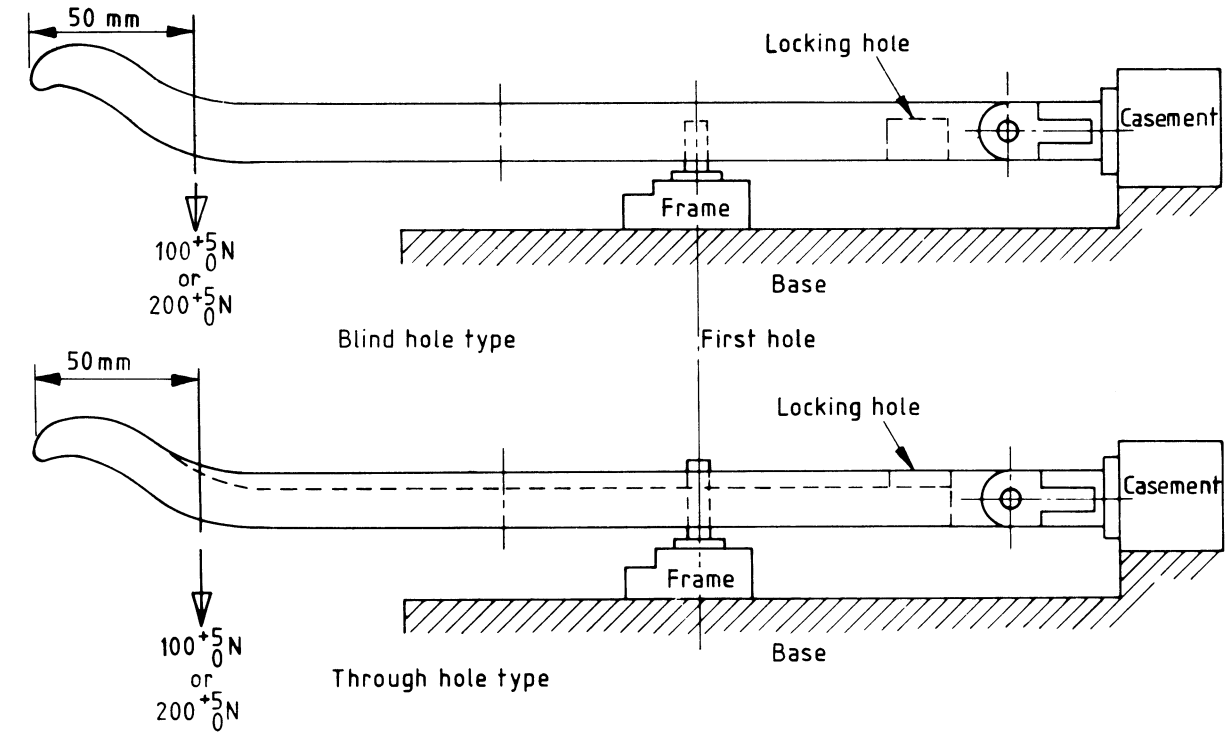
NOTE The diagrams are for illustration only and in no way prejudice the shape of the window or hardware.

Figure 4 — Resistance to wind gust loading (axial loading)



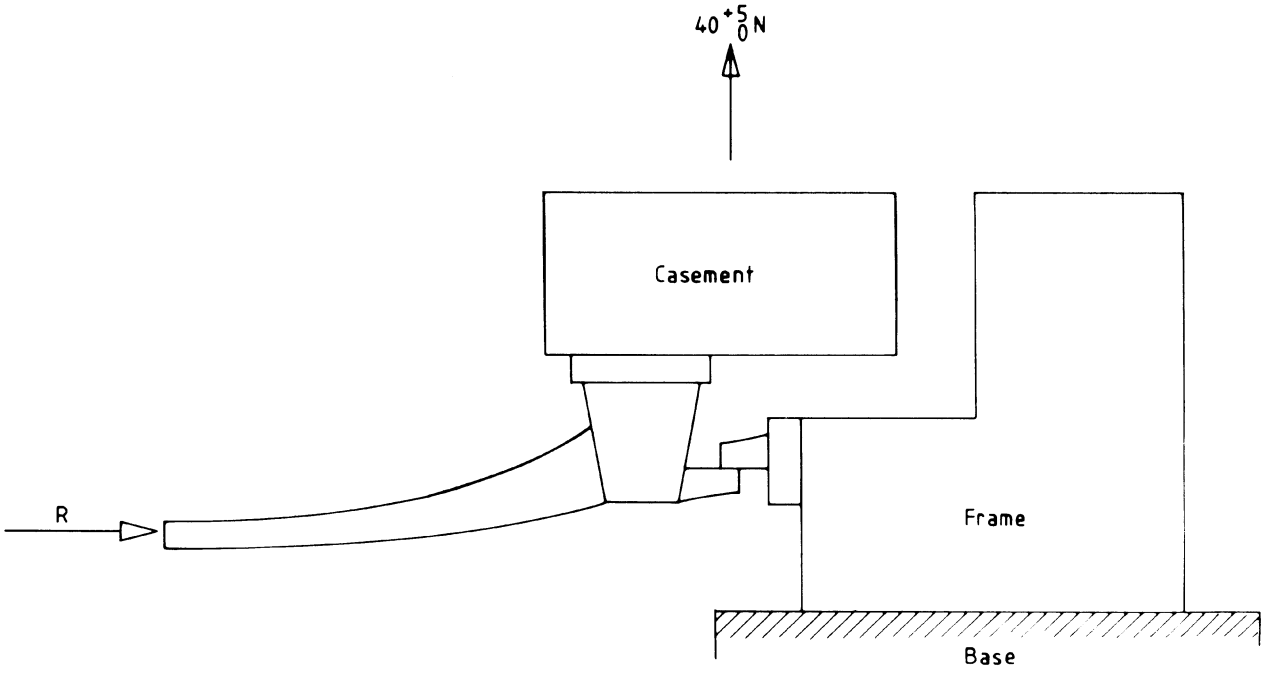
NOTE The diagram is for illustration only and in no way prejudices the shape of the window or hardware.

Figure 5 — Resistance to vertical loading (free)



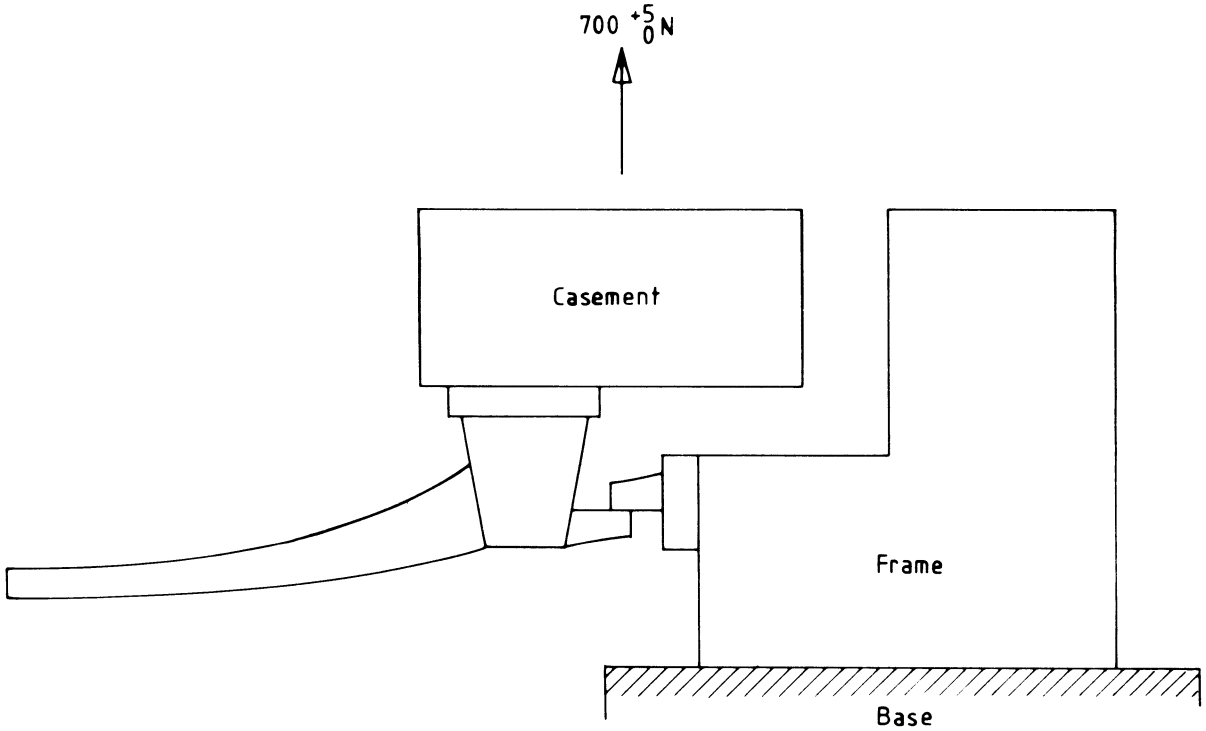
NOTE The diagrams are for illustration only and in no way prejudice the shape of the window or hardware.

Figure 6 — Resistance to vertical loading (engaged)



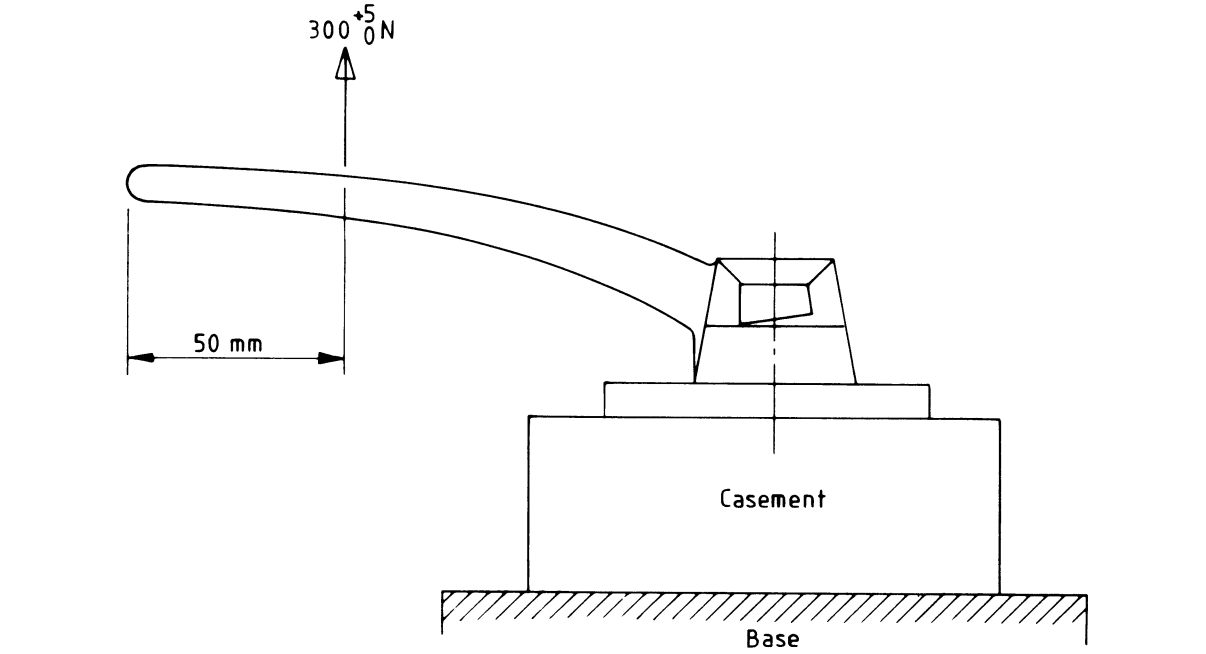
NOTE The diagram is for illustration only and in no way prejudices the shape of the window or hardware.

Figure 7 — Operating force characteristics (fasteners)



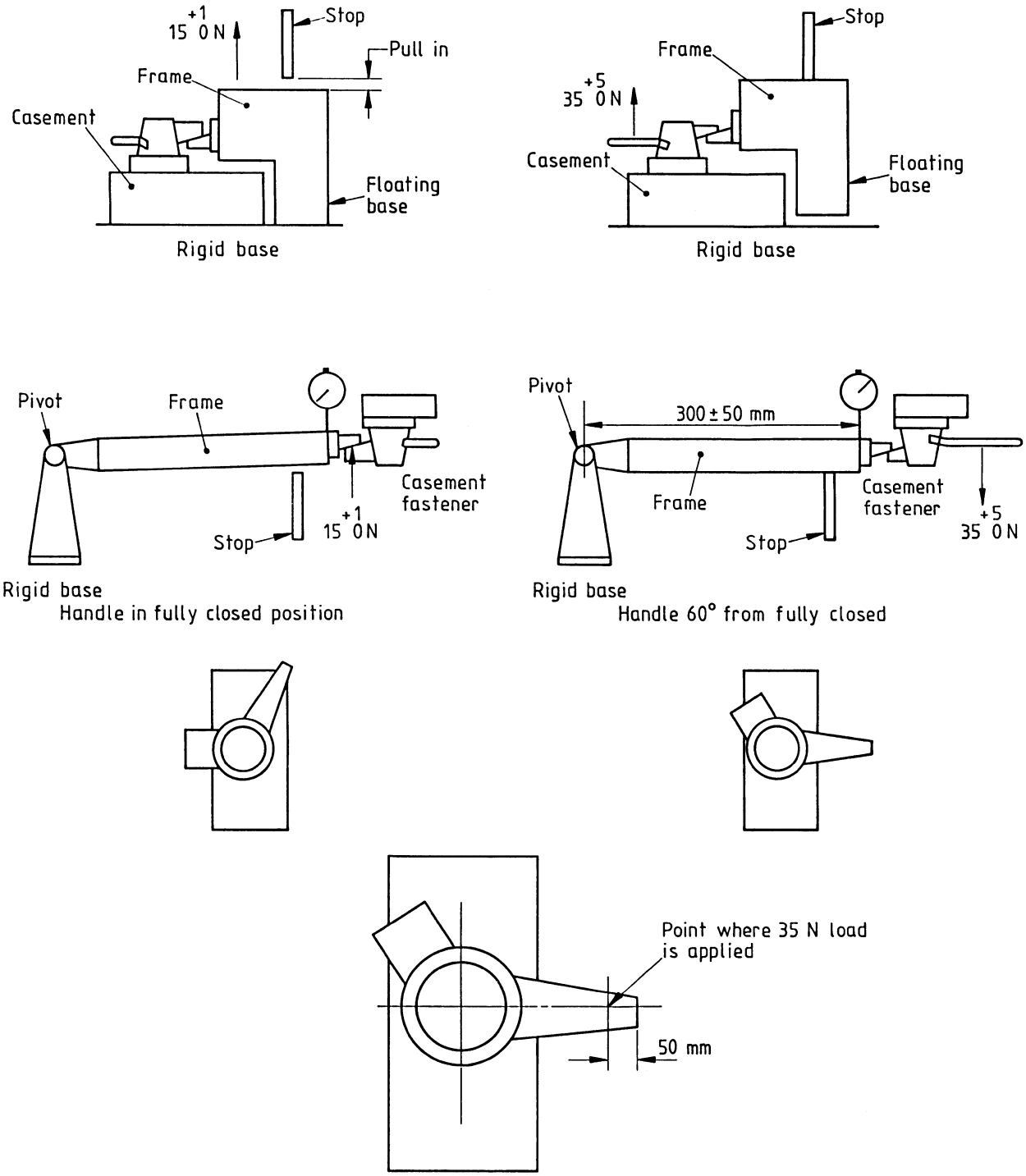
NOTE The diagram is for illustration only and in no way prejudices the shape of the window or hardware.

Figure 8 — Resistance to wind gust loading (fasteners)



NOTE The diagram is for illustration only and in no way prejudices the shape of the window or hardware.

Figure 9 — Resistance to excessive operating force (fasteners)



NOTE The diagrams are for illustration only and in no way prejudice the shape of the window hardware.

Figure 10 — Resistance to wear (fasteners): two typical examples of test apparatus

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Publications referred to

BS 565, *Glossary of terms relating to timber and woodwork.*
BS 6100, *Glossary of building and civil engineering terms.*
BS 6100-4.1, *Characteristics and properties of timber and wood based panel products.*
BS 6100-4.2, *Sizes and quantities of solid timber.*
BS 6100-4.3, *Wood based panel products.*
BS 6375, *Performance of windows*[2)].
BS 6375-1, *Classification for weathertightness (including guidance on selection and specification).*
CP 153, *Windows and rooflights*[2)].
CP 153-1, *Cleaning and safety.*
CP 153-2, *Durability and maintenance.*
CP 153-3, *Sound insulation.*
CP 153-4, *Fire hazards associated with glazing in buildings.*

[2)] Referred to in the foreword only.

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