

TEST REPORT

BS 5459-2:2000 +A2:2008

Specification for performance requirements and tests for office furniture — Part 2: Office pedestal seating for use by persons weighing up to 150 kg and for use up to 24 hours a day, including type-approval tests for individual components

Report Reference No.....: 08.09.25.0317.01

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Date of issue: 2025-08-26



Testing Laboratory: Anxin Product Test Service Co., Ltd

Address: Floor 2, Yuanjing Building, No.899, Sanyuanli Dadao, Guangzhou

Applicant's name: JH Chairs Ltd

Address: 71-75 Shelton Street, London WC2H 9JQ

Test specification:

Standard: BS 5459-2:2000 +A2:2008

Test procedure: SCT

Non-standard test method.....: N/A

Test Report Form No.....: BS 5459-2:2000 +A2:2008

Test Report Form(s) Originator: SCT

Master TRF: 2025-08

Test item description: Office Chair

Trade Mark: N/A

Manufacturer: JH Chairs Ltd

Address: 71-75 Shelton Street, London WC2H 9JQ

Factory.....: JH Chairs Ltd

Address: 71-75 Shelton Street, London WC2H 9JQ

Model/Type reference: EV

Copy of marking plate:

JH Chairs Ltd

Office Chair

Model: EV

BS 5459-2:2000 +A2:2008

2025-08

71-75 Shelton Street, London WC2H 9JQ



General remarks:

The test results presented in this report relate only to the object tested.

This report shall not be reproduced, except in full, without the written approval of the Issuing testing laboratory.

"(See Enclosure #)" refers to additional information appended to the report.

"(See appended table)" refers to a table appended to the report.

Throughout this report a point is used as the decimal separator.

Summary of testing:

The submitted sample was complied with BS 5459-2:2000 +A2:2008

Possible test case verdicts:

- test case does not apply to the test object.....: N/A
- test object does meet the requirement.....: P(Pass)
- test object does not meet the requirement.....: F(Fail)

Testing

Date of receipt of test item: 2025-07-29

Date (s) of performance of tests: 2025-07-29 to 2025-08-26



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Clause	Requirement - Test	Result - Remark	Verdict
4	Requirements		—
4.1	Durability		P
	After completing 120 000 cycles of the fore-and-aft safety test specified in A.5.1, followed by the tests specified in A.5.2, A.5.3 and A.5.4, the chair shall not fail as specified in 4.6.1.		P
	After completing 120 000 cycles of the locking device fatigue test specified in A.7.9, safe failure is permitted. The number of cycles at which this occurs shall be recorded.		N/A
4.2	Component durability		P
	When tested in accordance with A.7, the components shall not fail as specified in 4.6.1.		P
4.3	Stability		P
	When tested in accordance with A.6, the chair shall not overturn.		P
4.4	Safety		P
	When tested for the remaining 380 000 cycles of the fore-and-aft safety test specified in A.5.1 (see A.1.7), and when tested in accordance with A.5.5, the chair shall not fail as specified in 4.6.1 or shall fail safely as specified in 4.6.2.		P
4.5	Type approval of bases, columns, seat actions, back stems and locking devices		N/A
4.5.1	General		N/A
	Chairs fitted with all the following components which have satisfied the type approval requirements of 4.5 are not required to undergo the tests in A.5.1 and A.5.5: base; column; seat action; back stem; locking device		N/A
4.5.2	Seat actions		P
	When tested in accordance with A.8, seat actions shall show no damage as specified in 4.6.1, or, alternatively, all 12 samples shall fail consistently and safely (see 4.6.2).		P
4.5.3	Columns, bases, back stems and locking devices		P
	When tested in accordance with A.8, columns, bases, back stems and locking devices shall show no damage as specified in 4.6.1.		P
4.5.4	Additional requirements for bases with structural components incorporating plastics When tested in accordance with A.8.3.2, the column shall not pass through the underside of the base by more than 0.5 mm during the first and second applications of the test.		N/A



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Clause	Requirement - Test	Result - Remark	Verdict
4.6	Criteria for failure and safe failure		P
4.6.1	Criteria for failure		P
	The chair is considered to have failed if any of the following occurs:		P
	a) fracture of any member, joint or component (including back support, column, base, seat suspension and castors);		P
	b) loosening of joints or components intended to be rigid, which is shown to be permanent by applying hand pressure;		P
	c) deformation affecting the appearance or function;		P
	d) impairment of the operation of any mechanical part.		P
4.6.2	Criteria for safe failure		P
	The chair is considered to have failed safely if any damage to the chair is such that the sitter would immediately be aware that the chair was impaired but would not be at risk of injury at that time.		P
	Permanent tilting of the chair or structural insecurity are acceptable provided that: a) the chair and its occupant would not overturn at the moment of failure (see note 1); and b) expulsion of internal parts of the chair under pressure is not possible; and c) the seat cannot be detached except by deliberately lifting it. NOTE 1 Safe failures in accordance with 4.6.2a can be assessed by loading the chair with the 13 discs specified in A.3.11. If failure is caused by a specific weakness in the test sample, such as a weld fault or casting porosity, repeat the tests on a new sample. NOTE 2 The following are examples of safe failure: bending of an arm of the chair; fracture of part of an arm (though not the sudden loss of an arm); damage to the tilt mechanism or seat structure (provided that the seat is not suddenly detached from the pedestal), including bending of the base or pedestal and loss of or damage to castors.		P
5	Marking		—
5.1	Complete chairs		P



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Clause	Requirement - Test	Result - Remark	Verdict
	Each item of seating that conforms to this standard shall be marked with the following, or shall be accompanied by the following information: a) the name of the manufacturer, registered trade name, registered trade mark or other means of identifying the manufacturer; b) the number and date of this British Standard, i.e. BS 5459-2:20001); c) the date of manufacture of the item. 5.2 Columns, bases, seat actions, back stems and locking devices		P
	Columns, bases, seat actions, back stems and locking devices which have been tested in accordance with A.8. and found to conform to 4.5 shall be permanently marked with the following:		N/A
	a) the name of the manufacturer, registered trade name, registered trade mark or other means of identifying the manufacturer;		N/A
	b) the model number;		N/A
	c) the date of manufacture.		N/A
	The marking shall be located so that it is visible on the outside of the component.		P
Annex A	Test methods		—
A.1	General		P
	NOTE A summary of the tests is given in Table A.1.		P
A.1.1	Moisture content and conditioning		P
	Before testing, the chair shall be of a sufficient age to ensure that all component materials have developed their full strength. At least 4 weeks shall elapse between the manufacture and testing of chairs which include plastics moulded parts or glued joints in timber. Before testing, parts made of timber products shall be checked with an electric moisture meter to ensure that the moisture content is between 8 % and 12 %. If the moisture content is greater than 12 %, the chair shall be allowed to dry out in a warm ventilated room until the moisture content is between 8 % and 12 %. A.1.2 Assembly		P
	If the seating can be assembled in different ways, the most adverse condition shall be used for each test, taking into account any instructions supplied by the manufacturer. Fastenings shall be checked for tightness before the first test and not retightened thereafter.		P
A.1.3	Inspection		P

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Clause	Requirement - Test	Result - Remark	Verdict
	Before testing, each chair shall be thoroughly inspected. Any defects in the members, joints or attachments shall be noted so that they are not attributed to the effects of the tests. In order to detect any permanent deformation, the critical dimensions of the chair shall be measured and recorded. After completion of each test, the chair shall be thoroughly inspected. Any apparent defects shall be noted and any changes that have taken place since the initial inspection shall be recorded.		P
A.1.4	Positioning and adjustment		P
	The seat height shall be adjusted to its highest position for all tests in A.5, A.6 and A.7 with the exception that, if the chair tends to overturn when the load H1 is applied in A.5.1 (the fore-and-aft safety test), the seat height shall be reduced by the minimum amount necessary to prevent overturning.		P
	Unless otherwise stated, position the chair on the floor surface (A.3.10) with the supporting points restrained by stops (A.3.3). Adjustable arms shall be set at their highest position.		P
	Seat-action locking devices shall not be engaged except during the test specified in A.7.9.		P
	Other adjustable components, e.g. castors, shall be adjusted to their most adverse position, which shall be recorded in the test report.		P
A.1.5	Test loading		P
	The apparatus used to apply seat loading shall not in itself restrain the chair from tipping, nor hinder horizontal movement of the chair when the back force is applied.		P
	NOTE The tests may be carried out by the use of masses as an alternative to the specified forces. For practical purposes, a force of 10 N may be taken to be equal to the downward force due to a mass of 1 kg.		P
A.1.6	Rate of carrying out the tests Fatigue cycles (repeated application and removal of loads) shall be carried out at a rate sufficiently slow to ensure that negligible dynamic load is applied and also to ensure that kinetic heating does not occur.		P
A.1.7	Sequence of tests		P



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Clause	Requirement - Test	Result - Remark	Verdict
	The tests in A.5 shall be carried out in the following sequence: 120 000 cycles of the fore-and-aft safety test specified in A.5.1; the tests specified in A.5.2, A.5.3 and A.5.4; the remaining 380 000 cycles of the fore-and-aft safety test specified in A.5.1; the tests specified in A.5.5 to A.7.9, in sequence.		P
	Tests A.5.1 to A.5.4 shall be performed on the same chair. Tests A.5.5 to A.7.9 may be performed on additional samples of the same chair.		P
	The test results are valid only for the chair tested. When the test results are intended to be applied to other similar chairs, the test specimen has to be truly representative of them.		P
A.1.8	Ranges of chairs		P
	Any chairs from a range of chairs with basically similar construction (see note 1) can be considered likely to conform to this part of BS 5459 if samples of chairs, from the same range, which are most likely to be adversely affected by the tests have been tested and found to conform to this part of BS 5459. This would normally mean subjecting: a) the chair with the highest back and no arms to all tests; and b) the armchair with the highest back to the tests specified in A.5.4, A.6.2.2, A.7.2, A.7.3 and A.7.4.		P
	NOTE 1 Chairs of basically similar construction are those which have similar geometries and are constructed from the same materials and components. From the structural point of view, differences in the fabric or sewing detail of the outer upholstery cover are considered immaterial.		P

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Clause	Requirement - Test	Result - Remark	Verdict	
	Table A. Summary of tests		P	
	Clause no.	Test description		Test parameters
	A.5.1	Fore-and-aft safety		Seat load V1: for chairs with full back inclination, θ , of 75° or less $1\,500\text{ N} \times \sin \theta$ for other chairs $1\,400\text{ N}$ Back load H1: for chairs with full back inclination, θ , of 75° or less $1\,500\text{ N} \times 3 \cos \theta$ for other chairs 400 N Load applied to front edge V2 $1\,400\text{ N}$ Maximum number of cycles $500\,000$
	A.5.2	Seat impact		Drop height 350 mm
	A.5.3	Back impact		Drop height 330 mm Angle 48°
	A.5.4	Drop		Drop height: for leg length $< 200\text{ mm}$ 250 mm for leg length $\geq 200\text{ mm}$ 450 mm
	A.5.5	Side-to-side safety		Downward vertical load 1200 N Maximum number of cycles $250\,000$
	A.6.2.1	Forward overturning for all chairs, and sideways overturning for chairs without arms		Downward vertical force 600 N Horizontal force 20 N
	A.6.2.2	Sideways overturning for armchairs		Downward vertical force on seat 250 N Downward vertical force on arm 350 N Horizontal force 20 N
	A.6.3.1	Rearward overturning		Downward vertical force on seat 600 N Overturning force F: for chairs with $h \geq 720\text{ mm}$ 80 N for chairs with $h < 720\text{ mm}$ $285.7 [12(h/1000)]\text{ N}$
	A.6.3.2	Accidental rearward overturning		See A.6.3.2
	A.6.4	Rearward overturning of tilting and reclining chairs		13 discs
	A.7.2	Arm sideways static load		Outward horizontal force 600 N
A.7.3	Arm downward static load	Downward vertical force $1\,200\text{ N}$		
A.7.4	Arm impact	Angle 48°		

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Clause	Requirement - Test		Result - Remark	Verdict
	A.7.5	Chair swivelling	Downward vertical force 1 200 N Number of cycles 100 000	P
	A.7.6	Seat height adjustment	Downward vertical force 1 200 N Number of cycles 10 000	
	A.7.7	Footrest fatigue	Downward vertical force 1 200 N Number of cycles 200 000	
	A.7.8	Durability of controls	Force 100 N	
	A.7.9	Locking device fatigue	Back load H1 (see A.5.1) Number of cycles 500 000	
	A.8	Type approval of columns, bases, casters, back stems and locking devices	See Tables A.3 to A.7.	
A.2	Principle			P
	The stability and strength of the structure of an office chair is determined by the application of loads or forces simulating normal use and acceptable misuse, to various parts of the article. The test programme consists of the following.			P
	a) Static tests Static tests are used to assess the office seating under high levels of loading which will only occur occasionally.			P
	b) Fatigue tests Fatigue tests are used to assess the strength of the component parts of the chair under the repeated operations, movement or application of load which will occur during normal use of the chair.			P
	c) Impact tests Impact tests are used to assess the impact strength of the chair under the rapid rates of loading which will only occur occasionally.			P
	d) Safety tests Safety tests are used to assess the ability of a chair to withstand impact and fatigue loads which may lead to dangerous failure, or to assess the ability of the chair to fail safely when impact and fatigue loads are applied.			P
	e) Stability tests Stability tests are used to assess the ability of the chair to withstand overturning.			P
A.3	Apparatus			P
A.3.1	General			P



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Clause	Requirement - Test	Result - Remark	Verdict
A.3.1.1	Unless otherwise stated, the following tolerances apply. All forces shall have an accuracy of $\pm 5\%$ of the nominal force. All masses shall have an accuracy of $\pm 0.5\%$ of the nominal mass. All dimensions shall have an accuracy of ± 1 mm. All angles shall have an accuracy of ± 28 . The positioning of loading pads shall have an accuracy of ± 5 mm.		P
A.3.1.2	All loading pads shall be mounted on a ball joint or equivalent and the pivot point shall be as close as practically possible to the load surface.		P
A.3.1.3	All loading pads shall be used in conjunction with a layer of polyether foam (A.3.12).		P
A.3.2	Loading point template (see Figures A.1, A.2 and A.3), consisting of two shaped members fastened together by a pivot at one end. The seat loading member has a total mass of 20 kg applied through the seat loading point. The apparatus is marked as shown in Figure A.1. NOTE The contours of the shaped surfaces are so devised as to sink into the upholstery for a representative distance under moderate loads.		P
A.3.3	Stops, to prevent the chair from sliding but not from overturning, no higher than 12 mm, unless the design of the chair necessitates the use of higher stops, in which case the lowest stop which will prevent the chair from moving is used.		P
A.3.4	Seat loading pad (see Figure A.4 and annex B), a naturalistically shaped rigid indenter with a hard, smooth surface.		P
A.3.5	Small seat loading pad (see Figure A.5), a rigid circular object 200 mm in diameter having a face with a convex spherical curvature of 300 mm radius and a 12 mm edge radius.		P
A.3.6	Back loading pad (see Figure A.6), a rigid rectangular object 200 mm high and 250 mm wide having a face curved across the width of the pad with a convex cylindrical curvature of 450 mm radius and with a 12 mm radius on all front edges.		P
A.3.7	Local loading pad, a rigid cylindrical object 100 mm in diameter having a flat face with a 12 mm radius on the front edge.		P

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Clause	Requirement - Test	Result - Remark	Verdict
A.3.8	Impactor (see Figure A.7), a circular body of approximately 200 mm diameter separated from a striking surface by helical compression springs and free to move relative to it on a line perpendicular to the plane of the central area of the striking surface. The body and associated parts, without the springs has a mass of (17 ± 1) kg.		P
	The whole apparatus has a mass of (25 ± 0.1) kg. The springs shall be such that the combined spring system has a nominal spring rate of (6.9 ± 1) N/mm and the total frictional resistance of the moving parts is between 0.25 N and 0.45 N.		P
	The spring system shall be compressed to an initial load of $(1\ 040 \pm 5)$ N (measured statically) and the amount of spring compression movement available from the initial compression point to the point where the springs become fully closed shall be not less than 60 mm.		P
	The striking surface shall be a rigid circular object, 200 mm in diameter, the face of which has a convex spherical curvature of 300 mm radius with a 12 mm front edge radius.		P
A.3.9	Impact hammer (see Figure A.8), cylindrical pendulum head assembly composed of steel, wood and rubber, having a mass of 6.5 kg, supported from a high-tensile steel tube 38 mm in diameter with a wall thickness of 2 mm. The distance between the pivot and centre of gravity of the pendulum head is 1 m. The pendulum arm shall be pivoted on a low-friction bearing.		P
A.3.10	Floor, flat, smooth, rigid and horizontal; except for the test specified in A.5.4, where it shall comprise a surface material 2^{+1}_0 mm thick, having a hardness of (85 ± 5) IRHD, determined in accordance with BS 903-A26:1995, resting on a concrete floor.		P
A.3.11	Thirteen stability discs, of diameter 350 mm, thickness 48 mm and mass 10 kg.		P
A.3.12	Foam, layer of polyether foam 25 mm thick, having a hardness index of $(1\ 100 \pm 100)$ N, determined in accordance with ISO 2439:1997, method A, for use with the loading pads specified in A.3.4, A.3.5, A.3.6 and A.3.7, and with the impactor specified in A.3.8		P



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Clause	Requirement - Test	Result - Remark	Verdict
A.3.13	Test cones, type A full cones and type B plate cones in accordance with Figure A.9. The corners of the holes in the mild steel plates are smoothed and rounded. NOTE If the gas spring seat height adjustment components to be tested are such that the test cones specified in A.3.13 do not fit, then type A cones may be made to the manufacturer's specification and type B cones are sized to engage the gas cylinder between 0 mm and 2 mm above the lower limit of the taper, with a plate thickness of at least 4 mm or equal to the thickness of the outer cylinder wall if this is greater. Cylinders without a tapered top attachment are held in a split clamp over the top 35 mm.		P
A.3.14	Base test spigot, a tapered spigot as specified in Figure A.10.		P
A.3.15	Action test spigot, tapered spigot as specified in Figure A.11.		P
A.4	Determination of seat and back loading points		P
	Position the template (A.3.2) on the centreline of the seating as far towards the rear of the seating as possible.		P
	Adjust the template position by pushing the back loading member into the back of the seating, so levering the seat loading member forward until the shape of the template corresponds to that of the seating (see Figure A.2). Mark the seat loading point and back loading point from the template on to the seating.		P
A.5	Durability and safety tests		P
A.5.1	Fore-and-aft safety (see Figure A.12)		P
A.5.1.1	If the chair is equipped with a locking device, this shall not be engaged during this test.		N/A
A.5.1.2	One test cycle comprises: a) applying a load, V1, (as specified in A.5.1.4 or A.5.1.5) to the seat loading point, using the seat loading pad (A.3.4); b) applying a load, H1, (as specified in A.5.1.4 or A.5.1.5) to the back loading point, using the back loading pad (A.3.6); c) removing the loads applied in a) and b); d) applying a load V2 (as specified in A.5.1.4 or A.5.1.5) to the furthest forward position on the seat to which a load can be applied without the chair overturning, or to a position 100 mm back from the front edge of the seat, whichever is the furthest away from the front edge of the seat.		P
A.5.1.3	Repeat the test cycle 500 000 times (see A.1.7), or until failure occurs.		P

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Clause	Requirement - Test	Result - Remark	Verdict
A.5.1.4	For all chairs except those described in A.5.1.5, the seat load V1 is 1 400 N, the back load H1 is 400 N, and V2 is 1 400 N.		P
A.5.1.5	For chairs with a full back inclination to the horizontal, θ , of 75° or less, V2 is 1 400 N, and the seat load V1, in newtons, and the back load H1, in newtons, are calculated as follows: $V1 = 1\,500\,3 \sin \theta$ $H1 = 1\,500\,3 \cos \theta$		N/A
A.5.2	Seat impact (see Figure A.13)		P
A.5.2.1	Set the seat height to the maximum. Place a piece of foam (A.3.12) on the seat. If it is difficult to measure the drop height (see A.5.2.2) accurately owing to the softness of the upholstery, place a 2 kg mass of diameter 200 mm on the chair and determine the drop height as the distance to the underside of the mass. Remove the mass before proceeding with the test.		P
A.5.2.2	Allow the impactor (A.3.8) to fall freely on to the seat loading point (see A.4) from a height of 350 mm. Repeat four more times.		P
A.5.2.3	Using the same drop height, allow the impactor to fall on to a point as near the front edge of the seat as possible. Repeat four more times.		P
A.5.2.4	Set the seat height to the minimum and repeat the procedure of A.5.2.2 and A.5.2.3.		P
A.5.3	Back impact (see Figure A.14)		P
A.5.3.1	Using stops (A.3.3), restrain the front castors or glides of the chair from moving forward.		P
A.5.3.2	Allow the impact hammer (A.3.9) to fall through a vertical height of 330 mm or an angle of 488 so that it strikes the top of the outside of the back of the chair in the centre with the pendulum arm vertical (see Figure A.14). Perform this operation a total of 10 times.		P
A.5.4	Drop (see Figure A.15)		P
A.5.4.1	Support the chair so that the base lies on a plane inclined at 108 to the horizontal. Position the base so that one leg is at the lowest point on the plane and is just in contact with the floor.		P

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Clause	Requirement - Test	Result - Remark	Verdict
A.5.4.2	Lift the chair up to the height specified in Table A.2 as appropriate to the type of chair. Drop the chair on to the floor (A.3.10) 10 times on a front leg and 10 times on a back leg. NOTE The test may be carried out by lifting the chair with three cords that are adjusted in length, with the chair standing in the correct orientation on a plane inclined at 108 from the horizontal.		P
	Table A.2 D Drop height		P
	Length of pedestal legs mm	Drop height mm	
	< 200	250	
	≥200	450	
A.5.5	Side-to-side safety (see Figure A.16)		P
A.5.5.1	Using the small seat loading pad (A.3.5), apply a load of 1 200 N vertically downwards at a point 50 mm from the side edge of the seat on the transverse line which passes through the top of the pedestal. Remove the load and reapply it at the corresponding point on the opposite side of the seat. This constitutes one cycle of the test.		P
A.5.5.2	Apply the loads alternately, as described in A.5.5.1, for a total of 250 000 cycles, or until failure occurs		P
	After completing 120 000 cycles, safe failure is permitted. The number of cycles at which this occurs shall be recorded.		P
A.6	Stability tests		P
A.6.1	General		P
	For tests on chairs with swivelling bases, rotate the base to the position relative to the seat that is most likely to cause overturning, and tighten any assembly fitting. Set adjustable-height chairs to their maximum height.		P
	Position five-star bases so that two castors or glides are located against stops.		P
	NOTE A suitable linkage arrangement for stability testing is shown in Figure A.17.		P
A.6.2	Forward and sideways overturning		P
A.6.2.1	Forward overturning for all chairs, and sideways overturning for chairs without arms (see Figure A.18)		P
A.6.2.1.1	Position the chair as specified in A.6.1. If the chair is of the reclining or tilting type, or has an adjustable backrest, set or lock the back assembly so that it is inclined as far forward as possible.		P

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Clause	Requirement - Test	Result - Remark	Verdict
	Using the small seat loading pad (A.3.5), apply a force of 600 N vertically downward so as to act at a point 50 mm from the front edge of the seat at any position considered likely to result in instability. (Tests on the centreline are usually sufficient.) While maintaining the downward force, apply a force of 20 N horizontally forward along a line through the point where the base of the loading pad meets the upper surface of the seat (see Figure A.18a).		P
A.6.2.1.2	For chairs without arms, repeat the procedure described in A.6.2.1.1, but applying the downward force so as to act at a point 50 mm from one side edge of the seat, and applying the horizontal force sideways outwards (see Figure A.18b).		N/A
A.6.2.2	Sideways overturning for armchairs (see Figure A.19)		P
A.6.2.2.1	Position the chair as specified in A.6.1.		P
A.6.2.2.2	Apply a downward vertical force of 250 N to the seat at a point 100 mm from the fore-and-aft centreline of the seat on the same side as the stopped castors or glides, and between 175 mm and 250 mm forward of the rear edge of the seat. Maintain this force while proceeding with A.6.2.2.3 and A.6.2.2.4.		P
A.6.2.2.3	Using the small seat loading pad (A.3.5), apply a downward vertical force of 350 N to the arm of the chair on the same side as the stopped castors or glides, at a position 37.5 mm from its outer edge, at the most adverse position along its length. Maintain this force while proceeding with A.6.2.2.4.		P
A.6.2.2.4	Apply a horizontal force of 20 N outward at the upper surface of the armrest to which the 350 N vertical force is applied (see A.6.2.2.3) and acting through the point of application of the vertical force.		P
A.6.3	Rearward overturning (all chairs)		P
A.6.3.1	Rearward overturning (see Figure A.20)		P
A.6.3.1.1	Position the chair as specified in A.6.1. If the angle of the backrest is adjustable, set the backrest at its maximum rearward angle from the vertical, or if this angle is greater than 20°, set the backrest so that it is inclined rearwards from the vertical by an angle of 15° ± 5°. If the chair has a free-swivelling backrest pad, adjust the backrest height so that the axis of rotation coincides with the back loading point (see A.4).		P

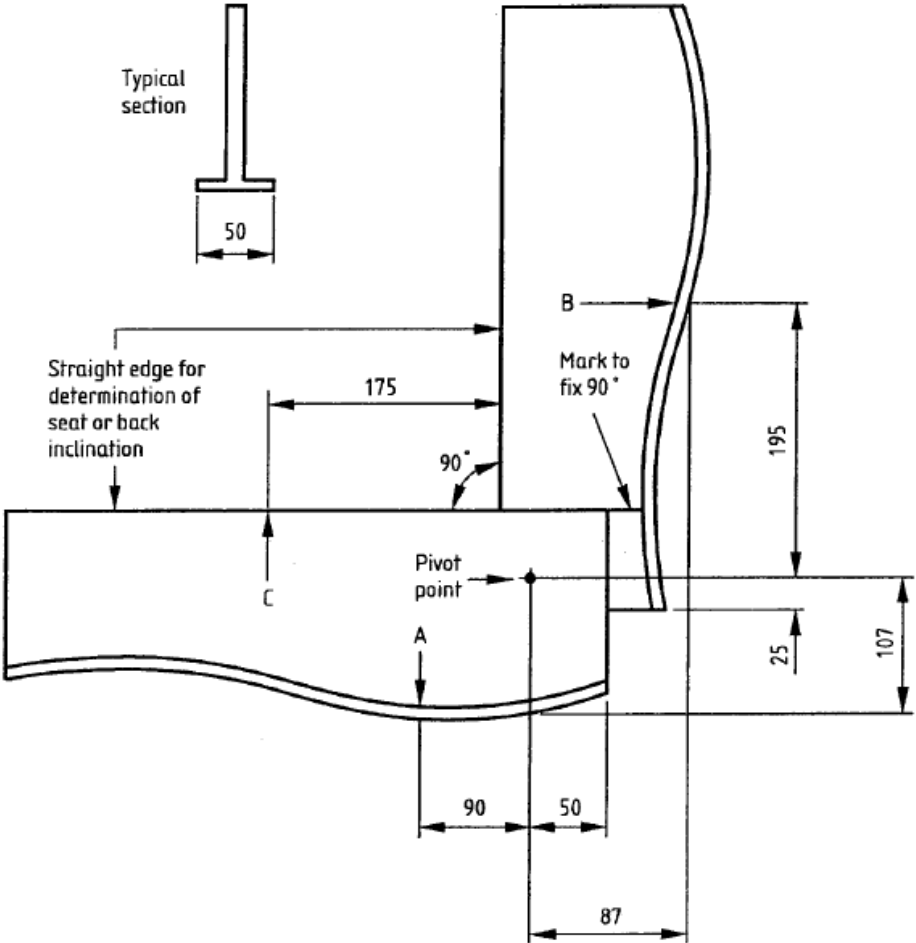
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Clause	Requirement - Test	Result - Remark	Verdict
A.6.3.1.2	Using the small seat loading pad (A.3.5), apply and maintain a downward vertical force of 600 N to the seat at the seat loading point (see A.4).		P
A.6.3.1.3	Determine the distance h, in millimetres, between the upper surface of the loaded seat and the floor.		P
	For chairs having a value of h equal to or greater than 720 mm, use an overturning force F of 80 N (see A.6.3.1.4). For chairs having a value of h of less than 720 mm, calculate the required overturning force F (in newtons) from the following equation: $F = 285.7 \left(1 - \frac{h}{1000} \right)$		P
A.6.3.1.4	Apply the overturning force F horizontally rearwards to the back of the chair at the back loading point, or at the top edge of the backrest, whichever is the lower.		P
A.6.3.2	Accidental rearward overturning (see Figure A.21) Position the chair as specified in A.6.1. Tilt the chair rearwards on its rear feet so that the front edge of the seat moves through a horizontal distance of 100 mm (see Figure A.21). Allow the chair to fall freely.		P
A.6.4	Rearward overturning of tilting and reclining chairs (see Figure A.22) NOTE This is an additional test for chairs that can be reclined or tilted.		N/A
A.6.4.1	The test is valid for all angles of inclination of the chair back (see Figure A.22). This test is not required when the minimum angle of inclination is greater than 70°.		N/A
A.6.4.2	Place 13 discs (A.3.11) on the chair seat and firmly settle them against the contours of the back of the chair. If the discs, stacked on top of each other, exceed the height of the chair back, use a light stick, or other means of support, to prevent the upper discs from sliding off.		N/A
A.7	Durability of components		P
A.7.1	General		P
A.7.1.1	Locking devices which have been type-approved in accordance with 4.5 may be considered capable of conforming to the relevant requirements of 4.4 and do not require testing in accordance with A.7.		N/A
A.7.1.2	Components of a chair that has been tested in accordance with A.7.5 to A.7.9 and found to conform to 4.2, may be considered capable of conforming to 4.2 when fitted on another chair. Evidence of such conformity shall be given in a test report.		P

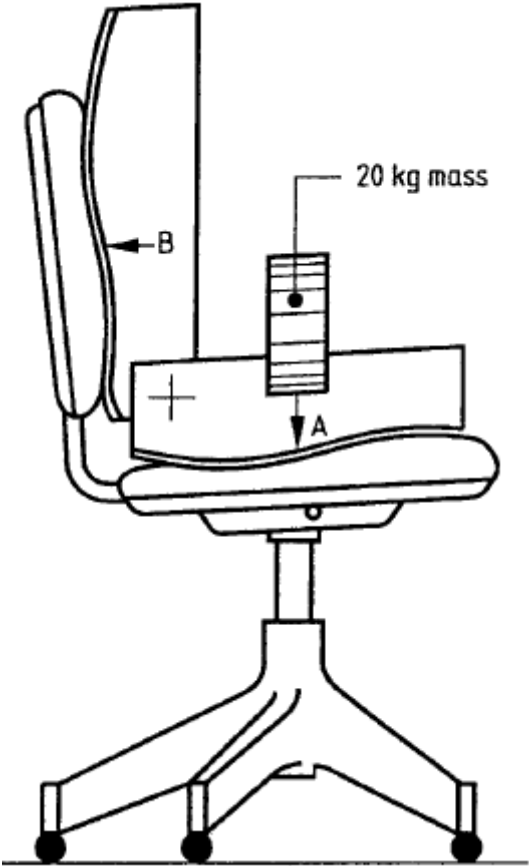
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Clause	Requirement - Test	Result - Remark	Verdict
A.7.1.3	It is unlikely that the operational durability of components referred to in this clause can be affected by the design or structure of any chair to which they are fitted, and therefore the tests in A.7 may be carried out on an additional sample of the chair.		P
A.7.2	Arm sideways static load (see Figure A.23) Using local loading pads (A.3.7), apply an outward horizontal force of 600 N simultaneously to each arm of the chair at the point along the arm most likely to cause failure. Apply the forces 10 times in total.		P
A.7.3	Arm downward static load (see Figure A.24)		P
A.7.3.1	Using the small seat loading pad (A.3.5), apply a downward vertical force of 1 200 N to the point along one arm most likely to cause failure.		P
A.7.3.2	If the chair tends to overturn, apply a balancing load of sufficient magnitude to prevent the chair from overturning. Apply the balancing load on the surface of the seat on the side opposite to the arm to which the vertical force is applied.		N/A
A.7.3.3	Apply the vertical force 10 times in total.		P
A.7.4	Arm impact (see Figure A.25)		P
A.7.4.1	Place stops against the castors or glides of the chair on the opposite side of the chair to the arm being tested.		P
A.7.4.2	Allow the impact hammer (A.3.9) to fall through a vertical height 330 mm, or fall through an angle of 48°, so that when the pendulum arm is vertical, the hammer strikes the outside face of the arm at the position most likely to cause failure. If the chair has a swivel base, ensure that the direction of impact passes through the vertical axis of the swivel.		P
A.7.4.3	Strike the arm in this way a total of 10 times.		P

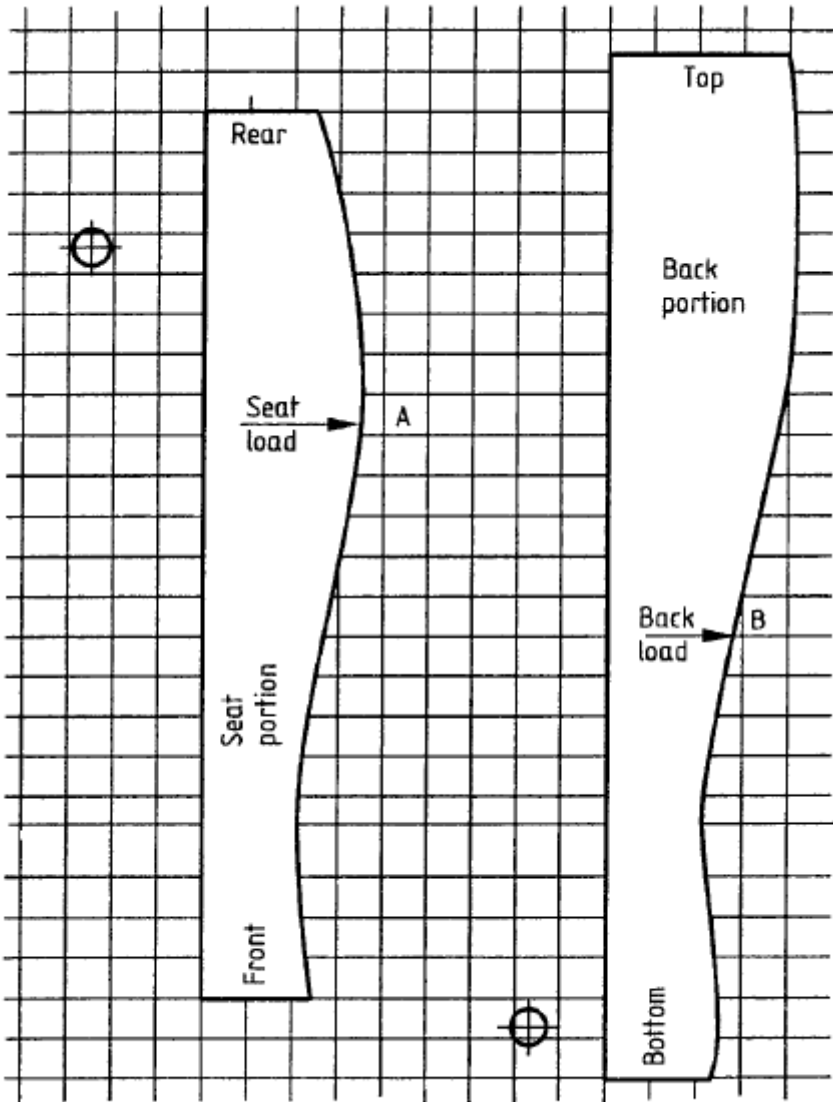
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Clause	Requirement - Test	Result - Remark	Verdict
	 Figure A.1 Loading point template		P

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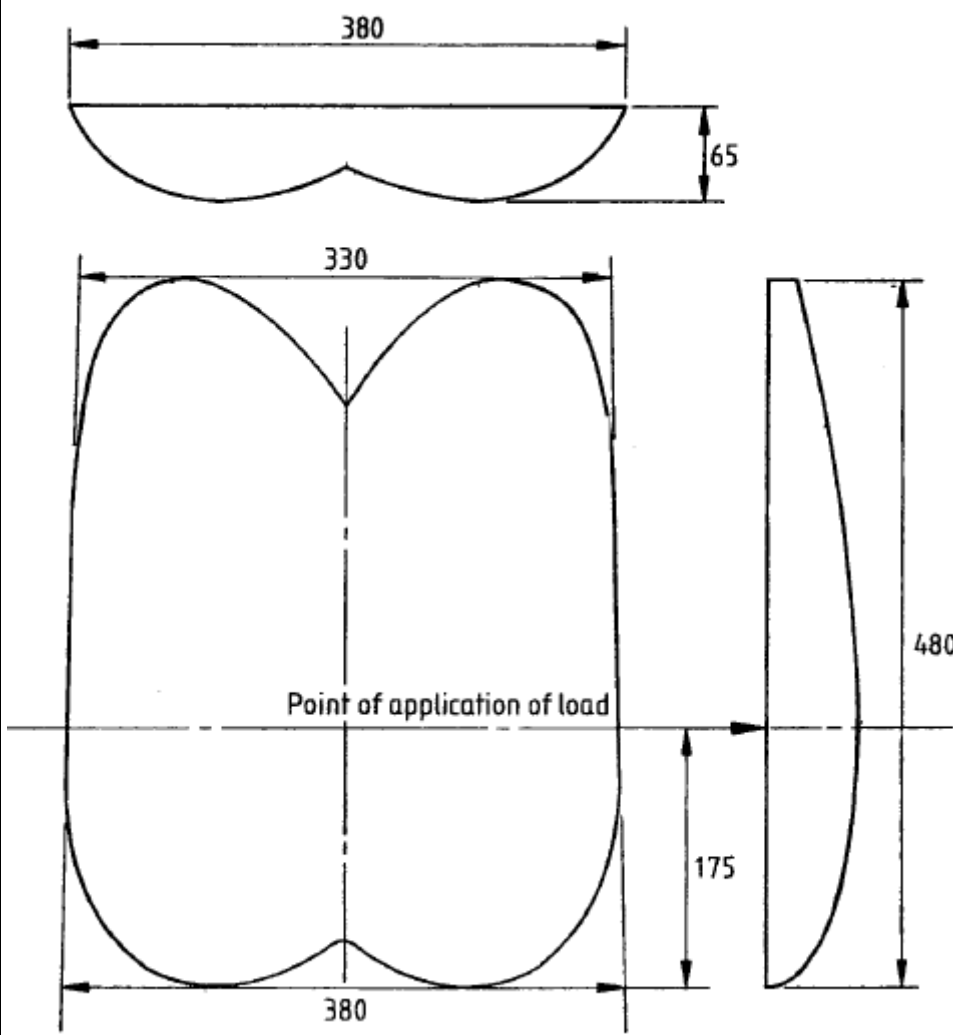
Clause	Requirement - Test	Result - Remark	Verdict
	 Figure A.2 Position of loading point template		P

Clause	Requirement - Test	Result - Remark	Verdict
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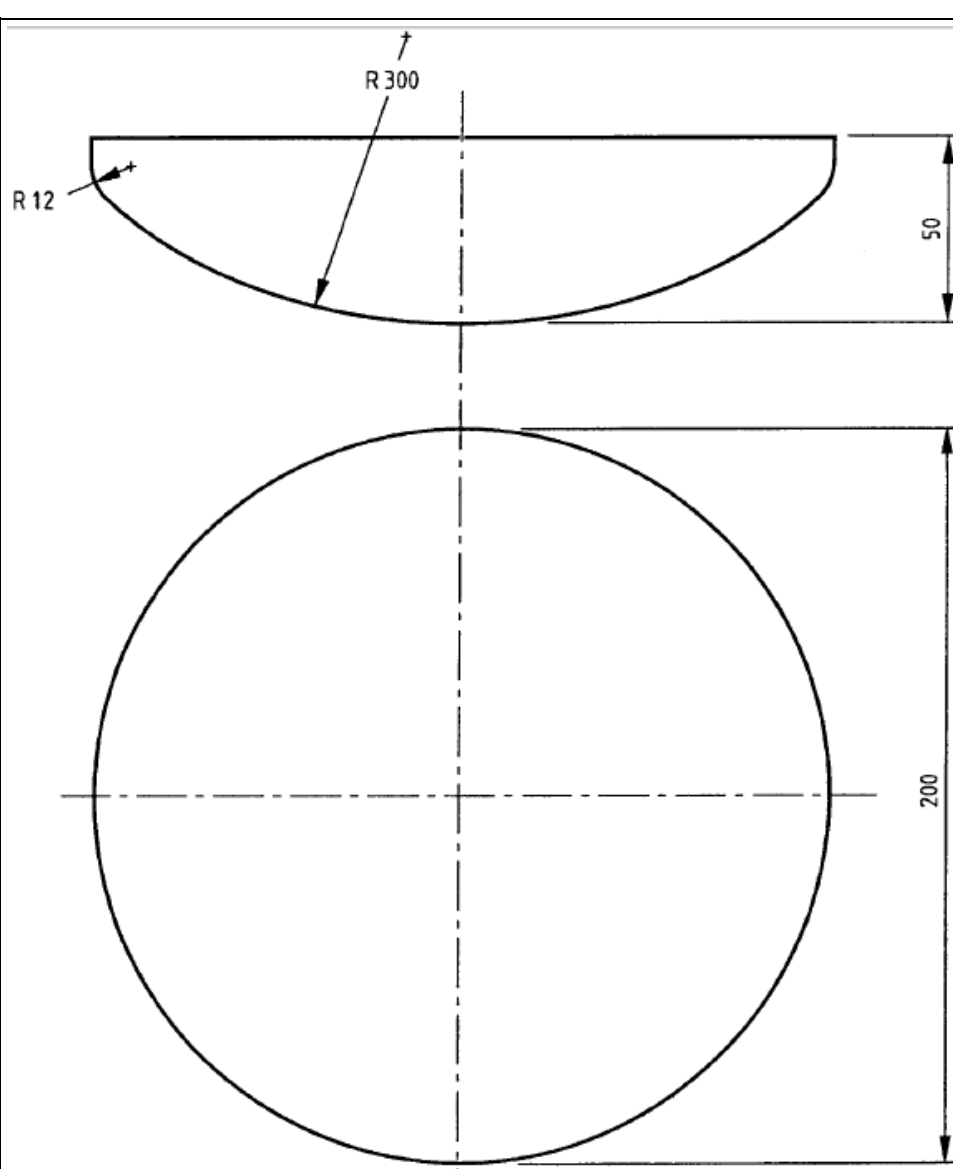
	 Scale: one square = 20 mm Figure A.3 Loading surface curves for seat and back loading point template		P
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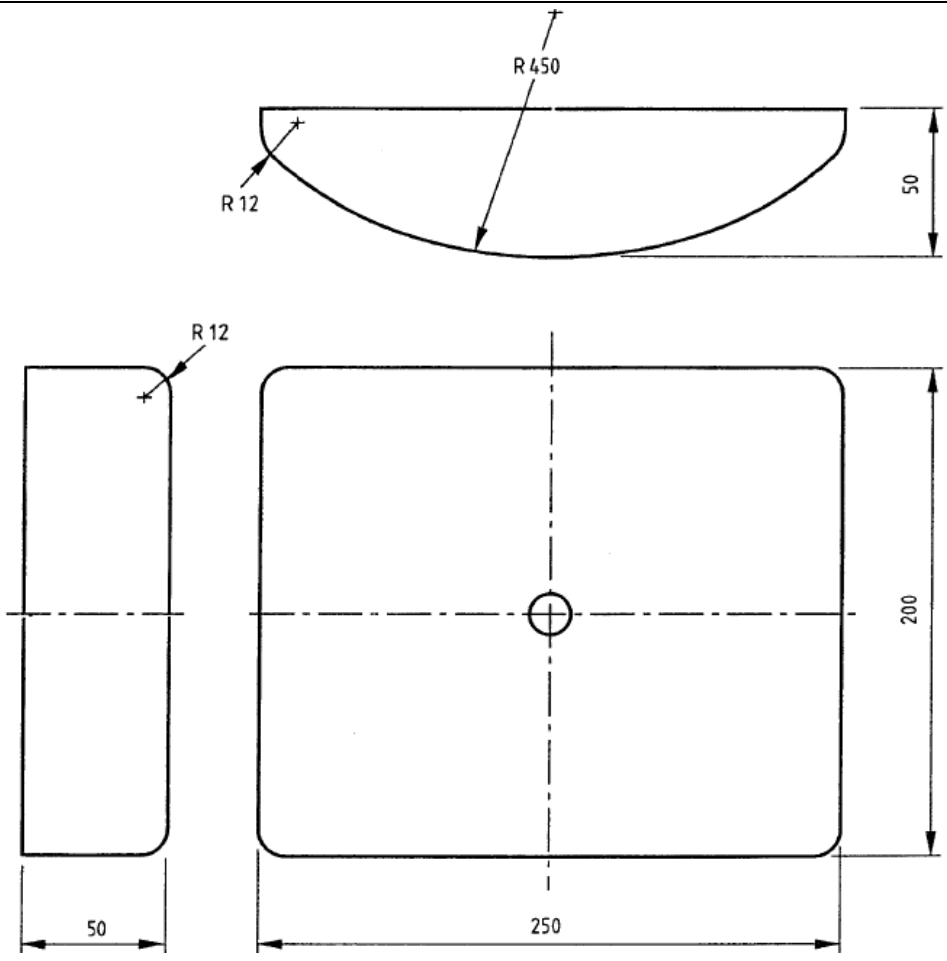
Clause	Requirement - Test	Result - Remark	Verdict
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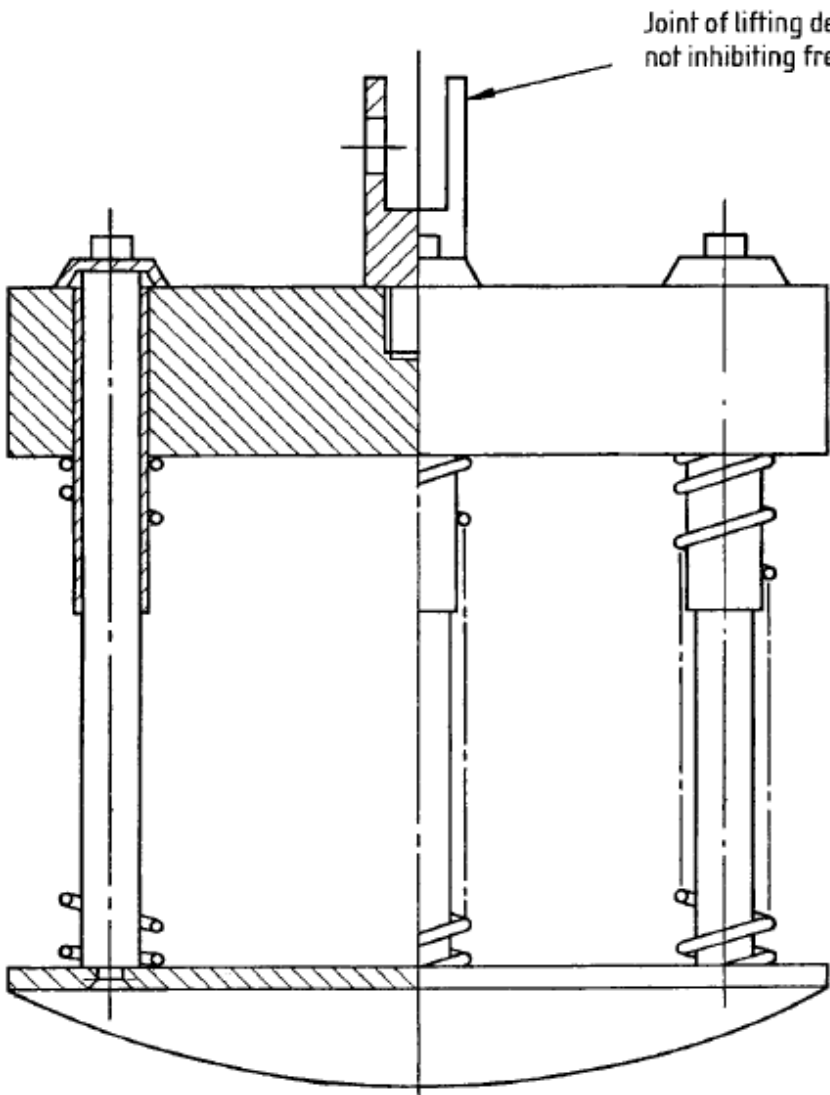
	 Figure A.4 Seat loading pad (plan and side elevations)	P
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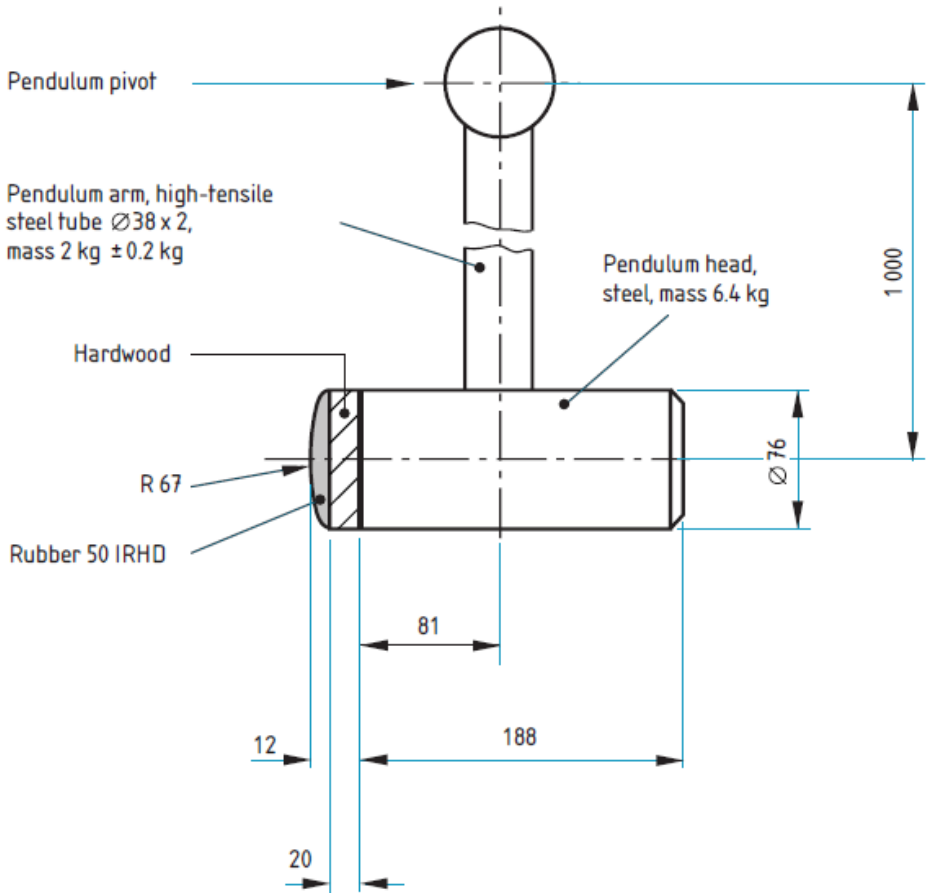
Clause	Requirement - Test	Result - Remark	Verdict
	 Figure A.5 Small seat loading pad		P

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Clause	Requirement - Test	Result - Remark	Verdict
	 Figure A.6 Back loading pad		P

Clause	Requirement - Test	Result - Remark	Verdict
	 Joint of lifting device not inhibiting free fall Figure A.7 Impactor		P

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Clause	Requirement - Test	Result - Remark	Verdict
	 Figure A.8 Impact hammer		P

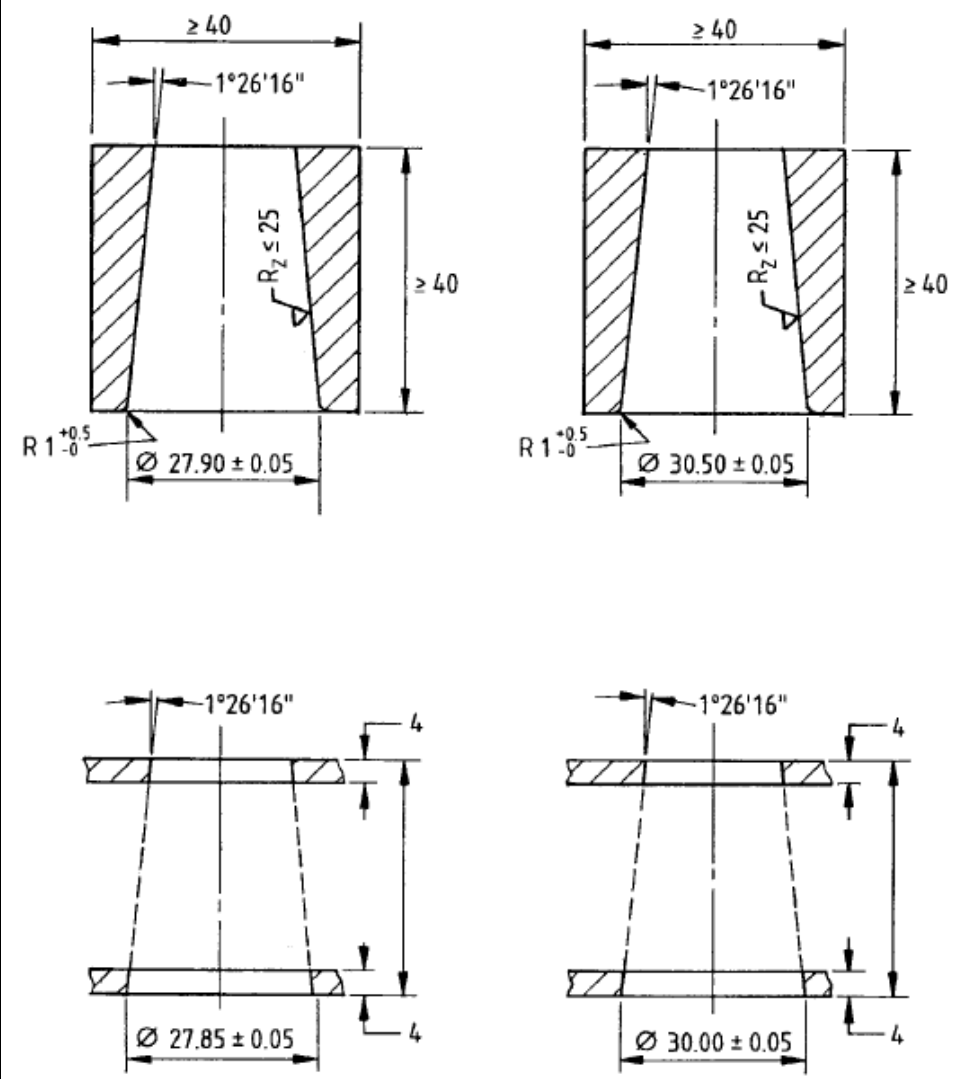
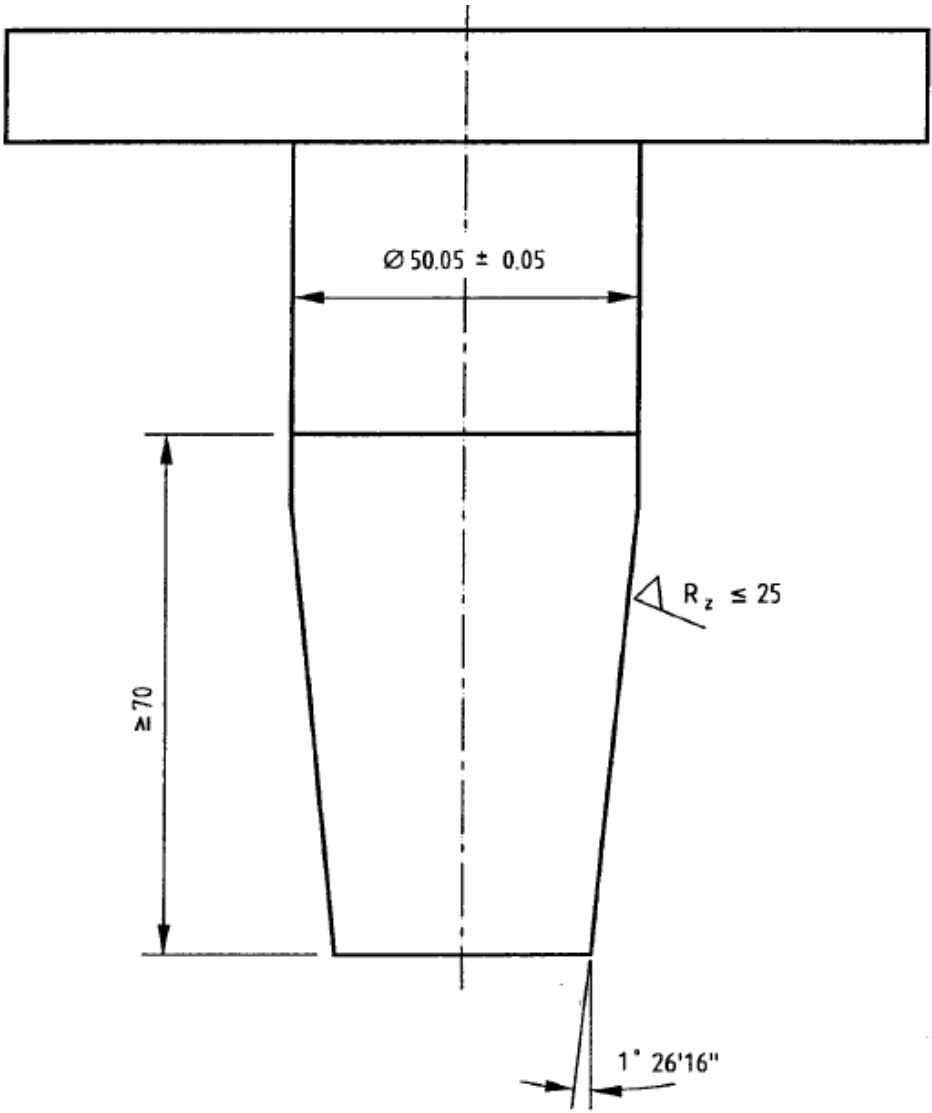
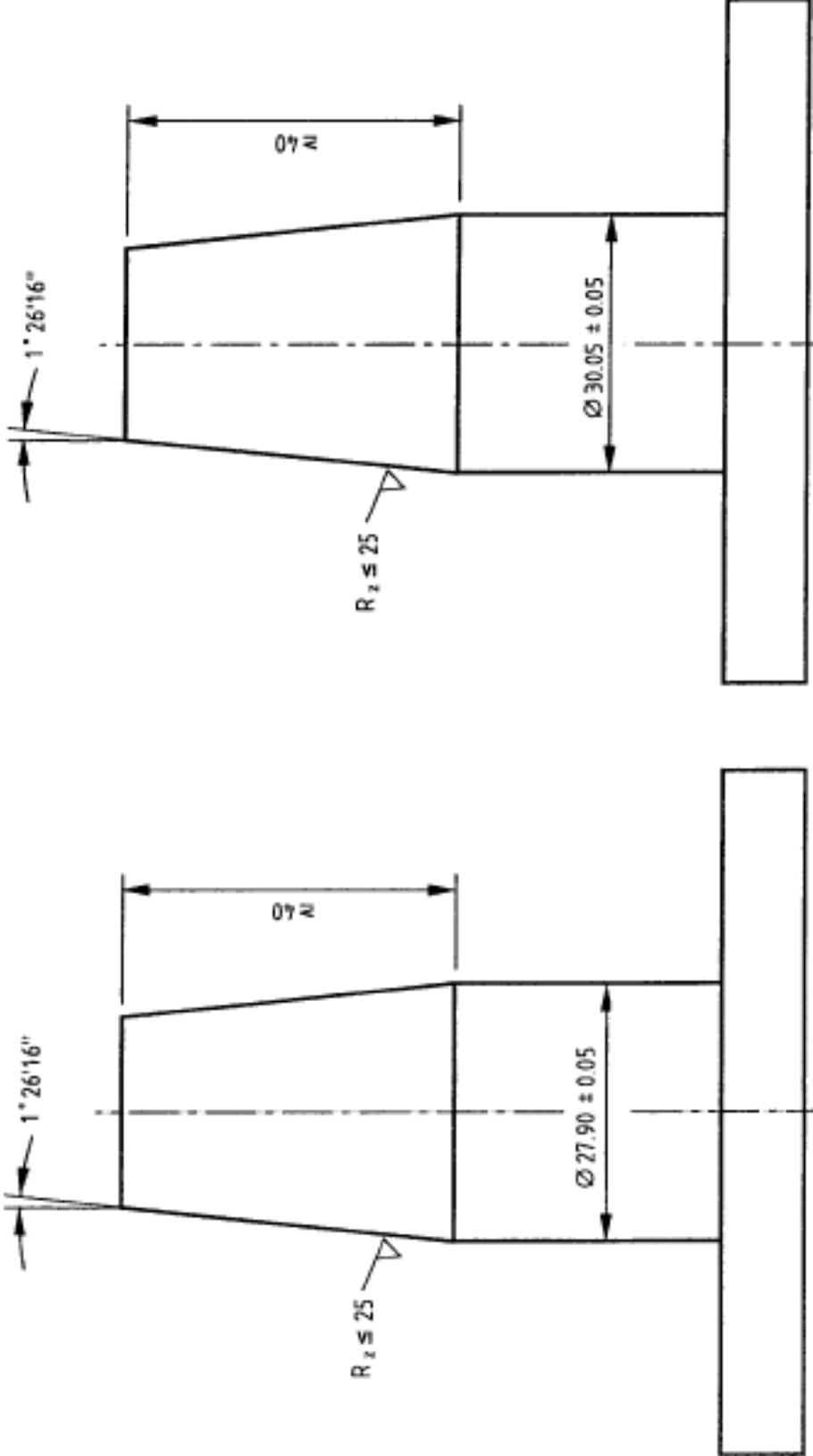
Clause	Requirement - Test	Result - Remark	Verdict
			P

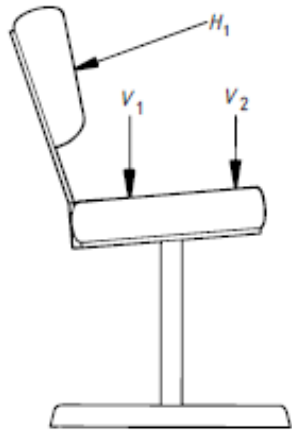
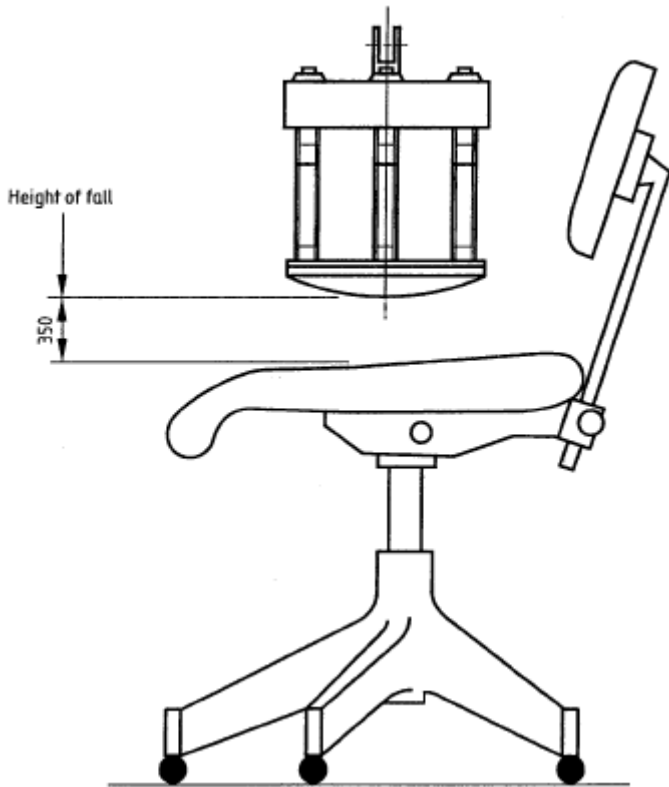
Figure A.9 Test cones

Clause	Requirement - Test	Result - Remark	Verdict
	 Figure A.10 Base test spigot		P

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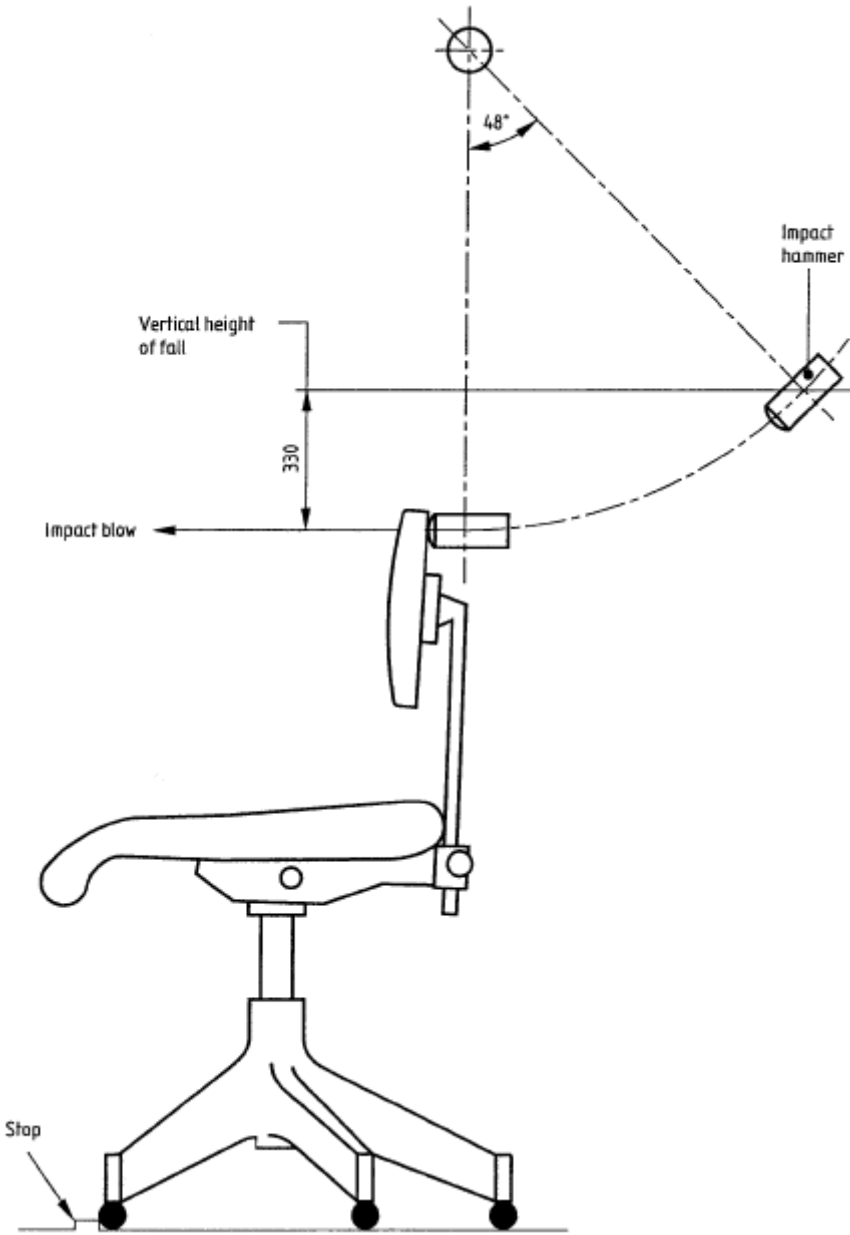
Clause	Requirement - Test	Result - Remark	Verdict
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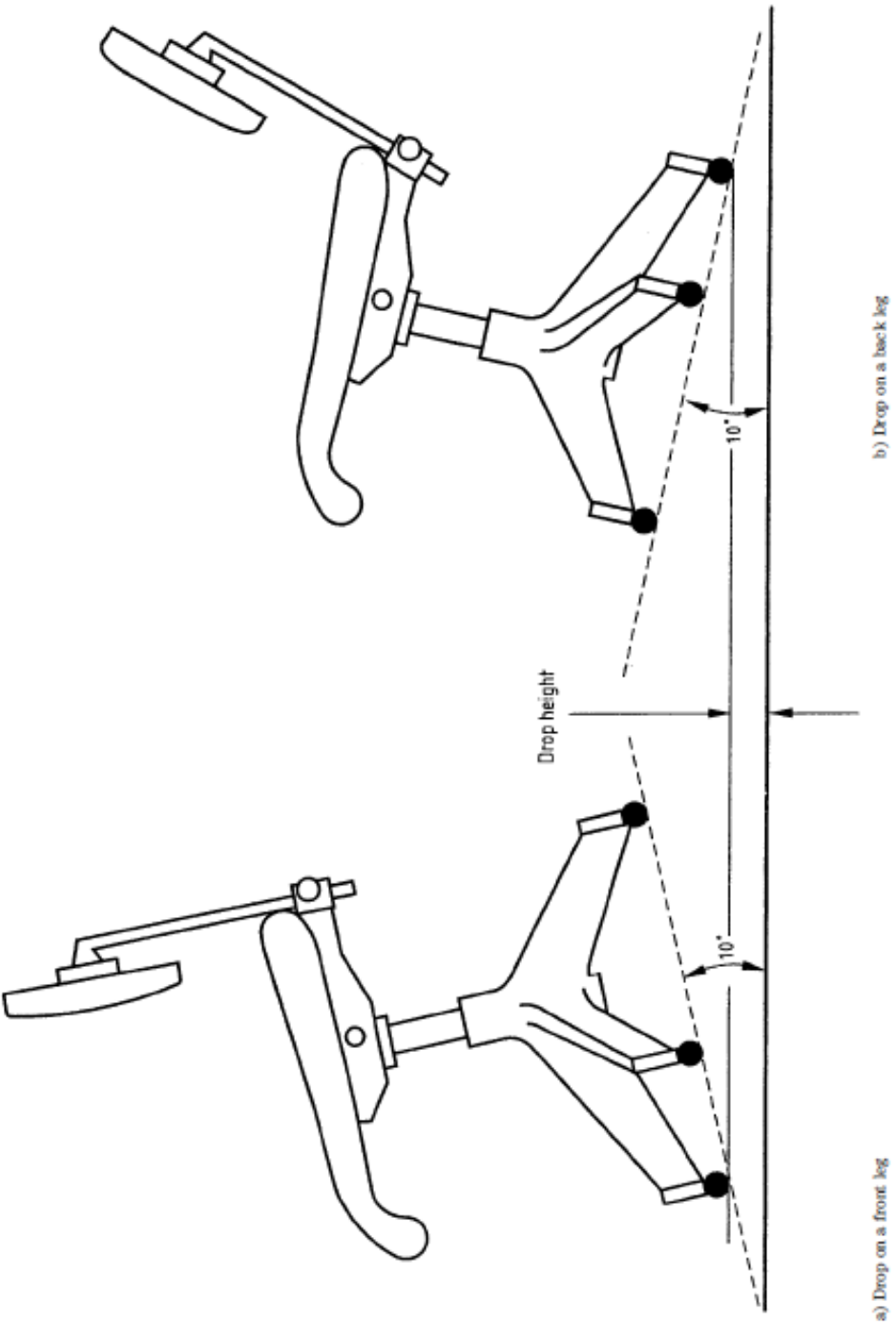
	 Figure A.11 Action test spigot	P
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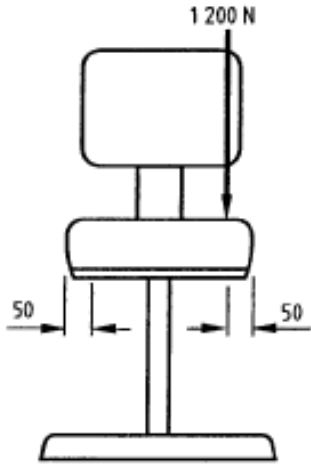
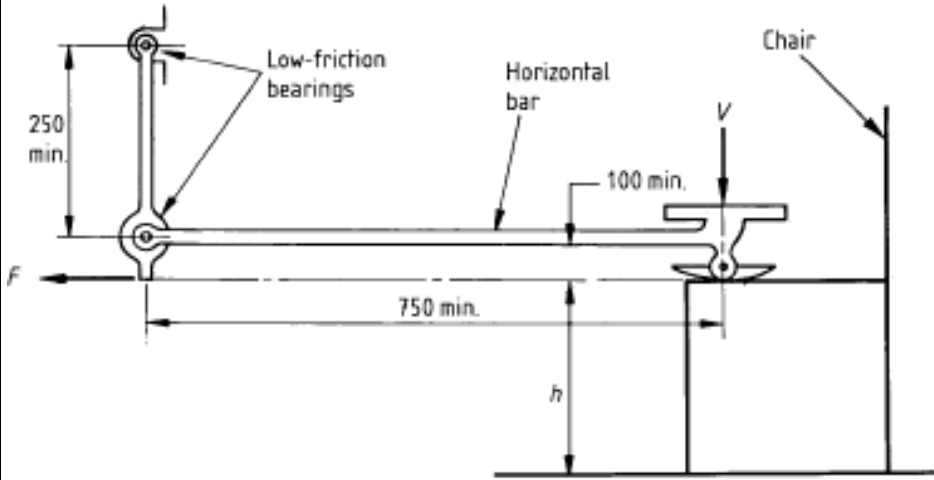
Clause	Requirement - Test	Result - Remark	Verdict
	 Figure A.12 Fore-and-aft safety test		P
	 Figure A.13 Seat impact test		P

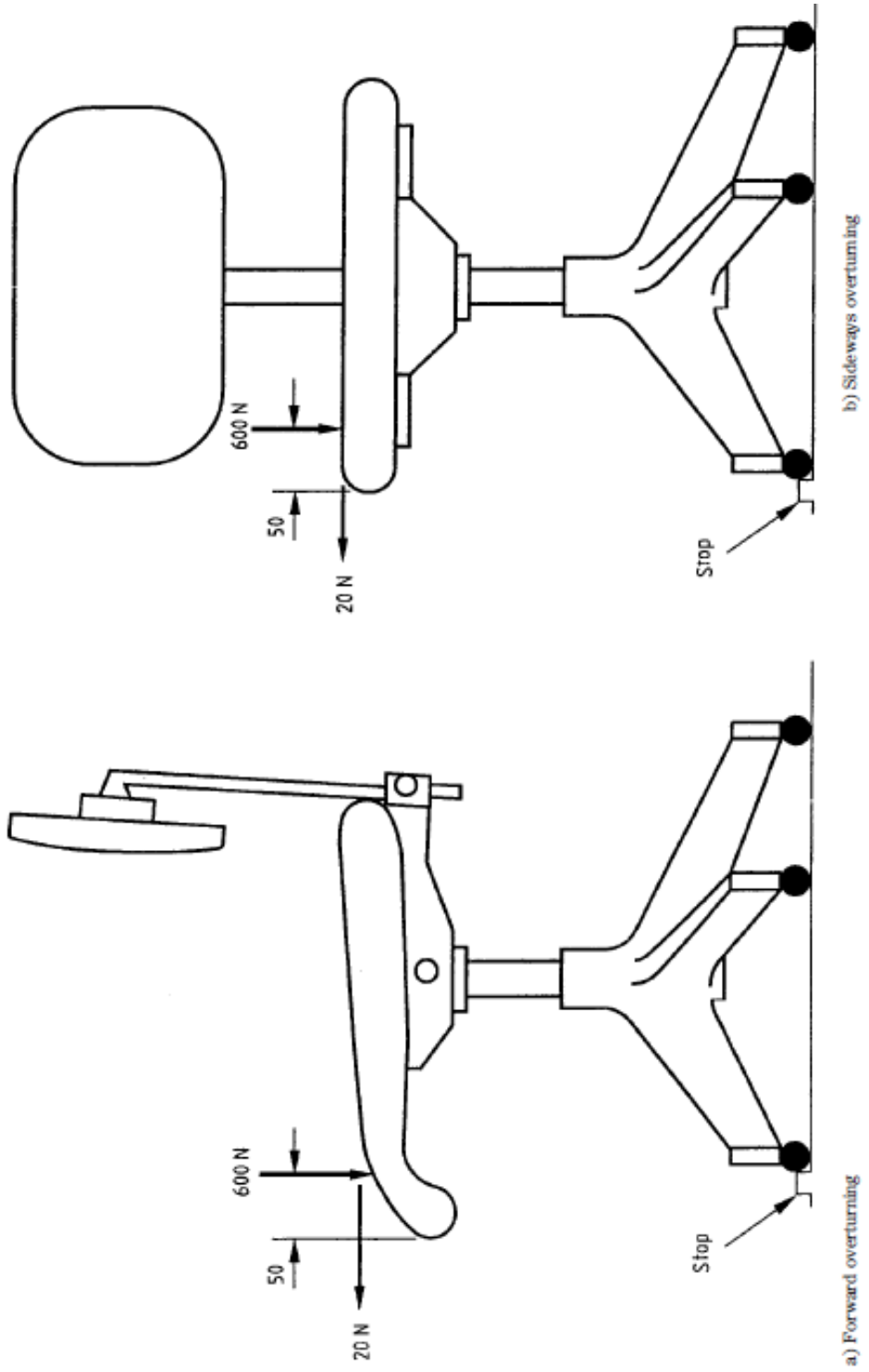
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Clause	Requirement - Test	Result - Remark	Verdict
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	 Figure A.14 Back impact test		P
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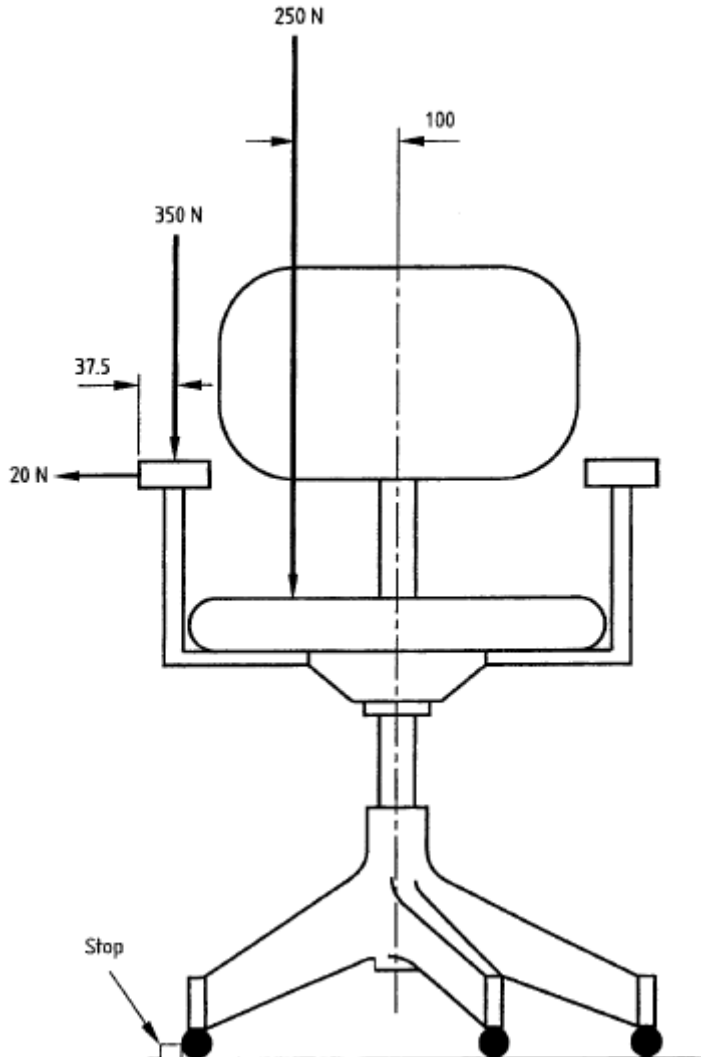
Clause	Requirement - Test	Result - Remark	Verdict
	 Figure A.15 Drop test		P

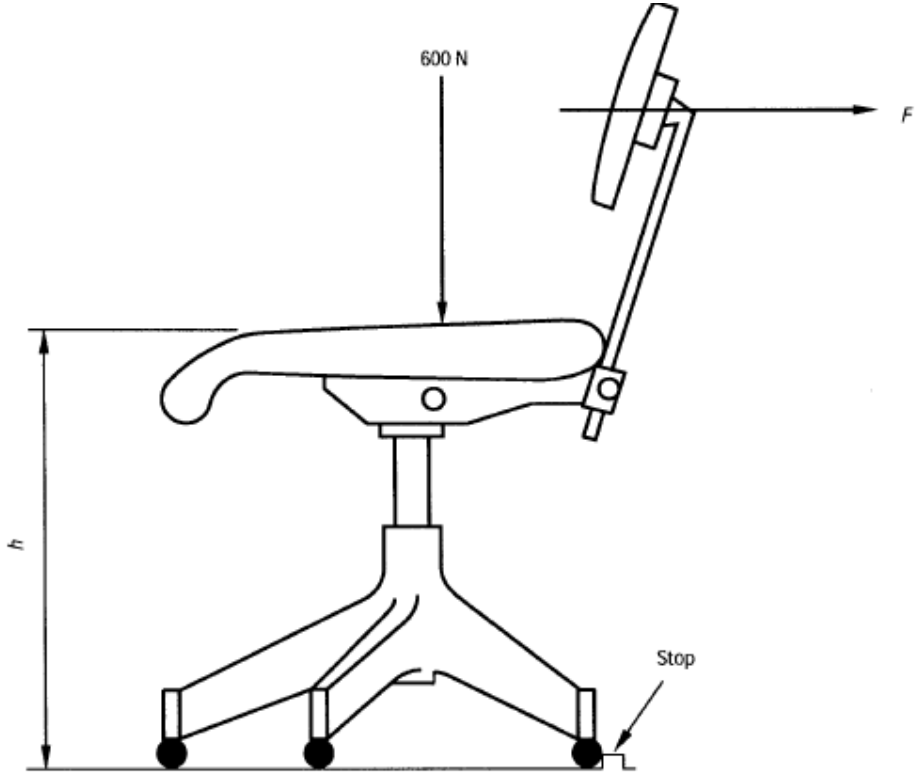
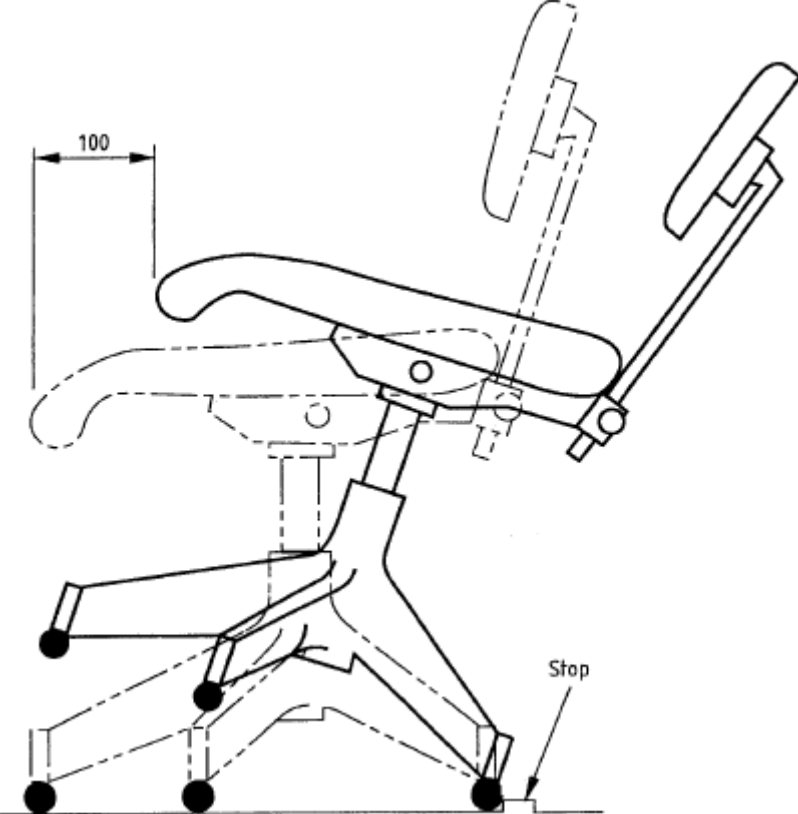
Clause	Requirement - Test	Result - Remark	Verdict
	 Figure A.16 Side-to-side safety test		P
	 Key h is the loaded test height V is the vertical load F is the horizontal load Figure A.17 Suitable linkage arrangement for constraining loading pad		P

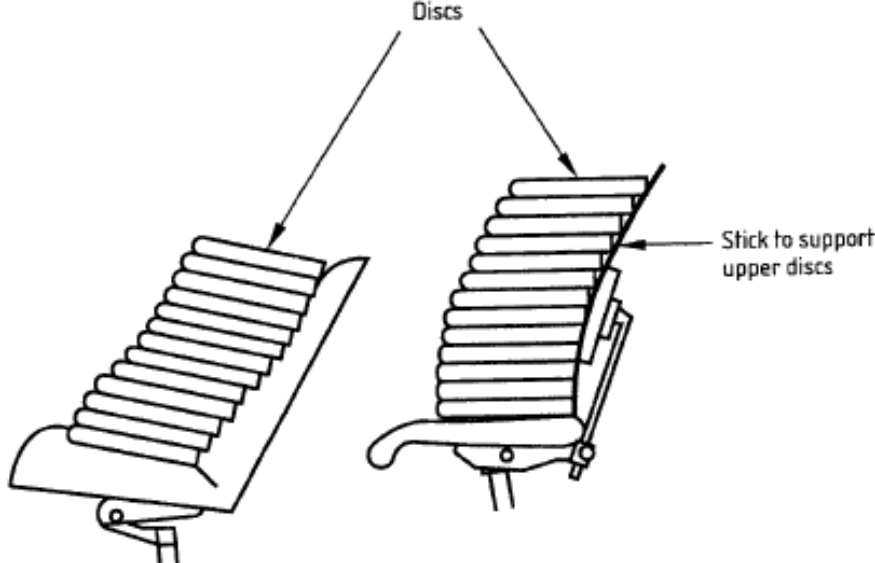
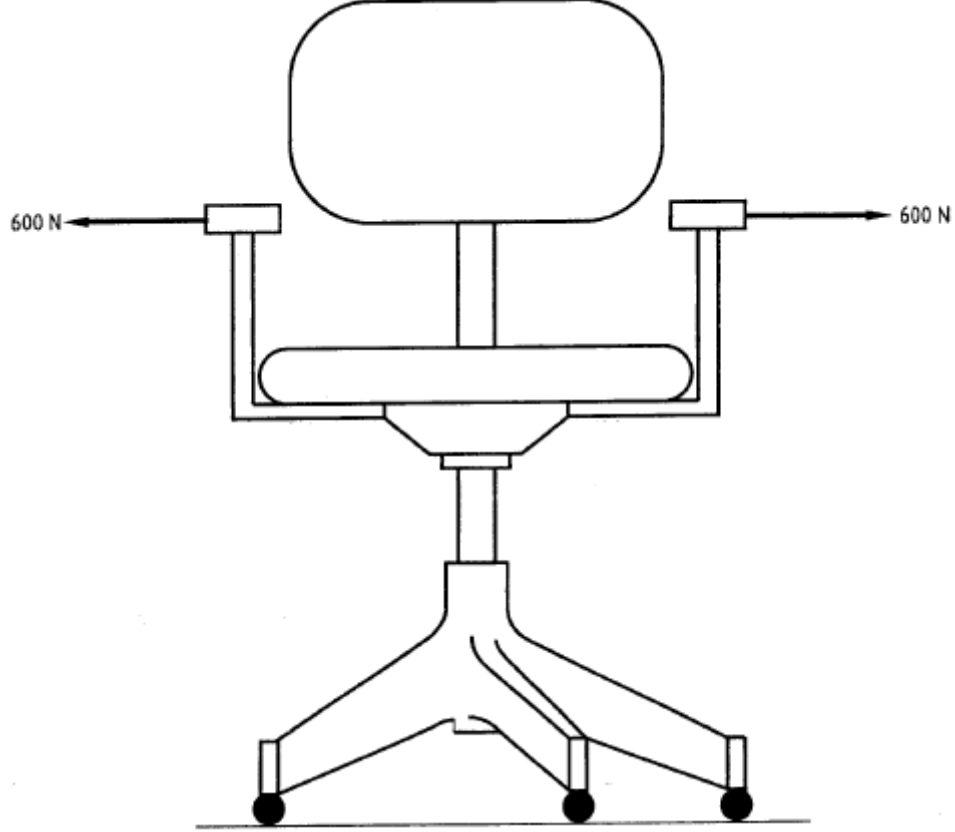
Clause	Requirement - Test	Result - Remark	Verdict
	 Figure A.18 Forward overturning test, and sideways overturning test for chairs without arms		N/A

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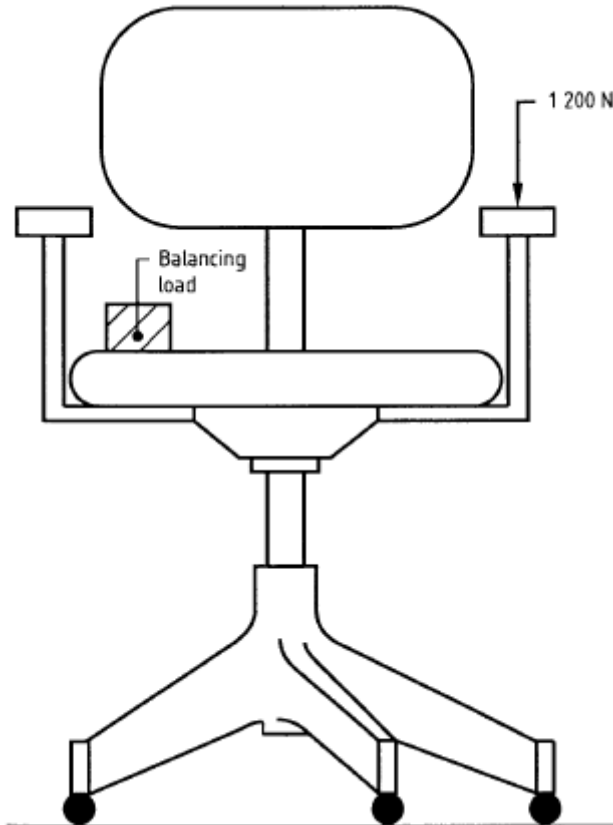
Clause	Requirement - Test	Result - Remark	Verdict
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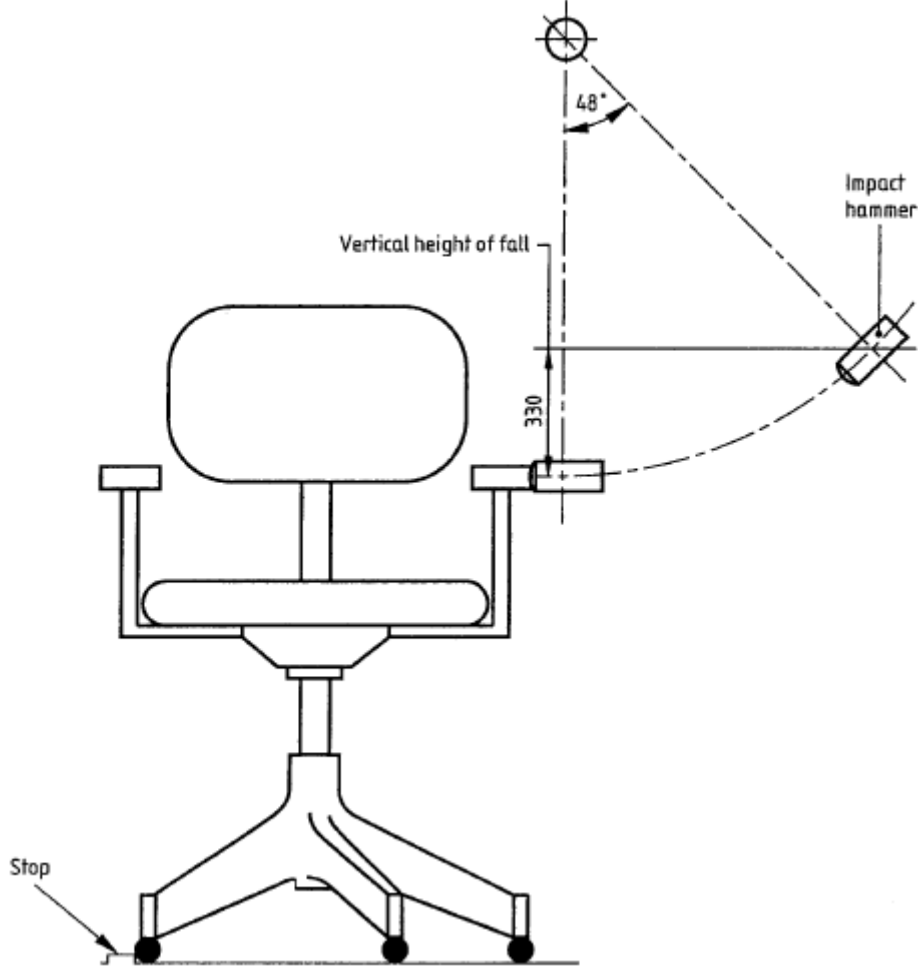
	 Figure A.19 Sideways overturning test for chairs with arms	P
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Clause	Requirement - Test	Result - Remark	Verdict
	 Figure A.20 Rearward overturning test		P
	 Figure A.21 Accidental rearward overturning test		P

Clause	Requirement - Test	Result - Remark	Verdict
	 Figure A.22 Test for tilting and reclining chairs	N/A	N/A
	 Figure A.23 Arm sideways static load test	P	P

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Clause	Requirement - Test	Result - Remark	Verdict
	 Figure A.24 Arm downward static load test		P

Clause	Requirement - Test	Result - Remark	Verdict
	 Figure A.25 Arm impact test		P
A.7.5	Chair swivelling		P
A.7.5.1	Using the seat loading pad (A.3.4), apply a downward vertical force of 1 200 N to the seat at the seat loading point (see A.4).		P
A.7.5.2	Rotate the seat of the chair through an angle of 458 relative to the base, and then back again. Repeat this operation for a total of 100 000 cycles, maintaining the vertical force throughout.		P
A.7.6	Seat height adjustment NOTE 1 This test assesses semi-automatic mechanisms designed to lower the seat under the mass of a sitting person and to raise the seat when unloaded. NOTE 2 When this test is carried out on a chair previously subjected to the tests specified in A.5.1 or A.5.5, any fatigue failures due to the effective repetition of the seat fatigue loading need not be reported.		P
A.7.6.1	Set the seat of the chair to its maximum height.		P

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Clause	Requirement - Test	Result - Remark	Verdict
A.7.6.2	Using the seat loading pad (A.3.4), apply a downward vertical force of 1 200 N to the seat at the seat loading point (see A.4). Maintain the force for at least 3 s, and then remove it.		P
A.7.6.3	Lower the seat until it rests just above the lowest position of its height adjustment. Reapply the downward force. maintain the force for at least 3 s, and then remove it. Return the seat to its maximum height.		P
A.7.6.4	Repeat the loading cycle of A.7.6.2 and A.7.6.3 for a total of 10 000 cycles. At the end of the test, maintain the seat loading force for 1 h with the seat at its maximum height.		P
A.7.7	Footrest fatigue Using the small seat loading pad (A.3.5) or the local loading pad (A.3.7), apply a downward vertical force of 1 200 N to the periphery of the footrest and/or the centre of the footrest area at any point likely to cause failure. Apply the force for a total 200 000 cycles.		N/A
A.7.8	Durability of controls Apply a force of 100 N to all control levers and knobs at any point and in any direction likely to cause failure. Maintain the force for at least 3 s. Apply the force 10 times in total.		P
A.7.9	Locking device fatigue		N/A
A.7.9.1	Engage the locking device at the middle of its adjustment range and restrain the seat or the pedestal so that it cannot move.		N/A
A.7.9.2	Apply the load H1, as specified in A.5.1, at the back loading point (see A.4). Apply the load for a total of 500 000 cycles.		N/A
A.8	Type-approval tests for columns, bases, actions, back stems and locking devices		P
A.8.1	General		P
A.8.1.1	When applying the 90 kg·m or 75 kg·m bending moment (see Table A.3), the rate of application shall be (300 ± 15) kgm/s. When applying all other bending moments, the rate of application shall not exceed 1 cycle per second.		P
A.8.1.2	A total of 20 samples are required for the seat height adjustment components test. A total of 12 samples are required for all other type-approval tests.		P
A.8.2	Columns incorporating seat height adjustment components		P

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Clause	Requirement - Test	Result - Remark	Verdict	
A.8.2.1	Using a full cone (A.3.13), apply alternating bending moments, as specified in A.8.2.2, acting at a distance of 300 mm on either side of the centreline of the column. If the column is not symmetrical about its longitudinal axis, apply the bending moments in the directions that will generate the highest stress on the outer casing.		P	
A.8.2.2	Apply the bending moments as specified for the appropriate type of seat height adjustment component in Table A.3, each for the number of cycles specified in Table A.3. Apply the bending moments in the sequence given in Table A.3 (i.e. a total of 1 101 010 cycles).		P	
A.8.2.3	Repeat the procedure of A.8.2.2 on a further nine columns.		P	
A.8.2.4	Using the plate cone (A.3.13), repeat the procedure of A.8.2.2 using a further 10 samples.		P	
	Table A.3 Type approval for seat height adjustment components		P	
	Number of cycles	Bending moment (kg.m)		
		Mechanical		Gas spring
	10	90		75
	1 000	70		60
	100 000	37		37
	1 000 000	24		24
A.8.3	Bases		P	
A.8.3.1	All bases		P	
A.8.3.1.1	Support the base on castor spigots and position it in the orientation most likely to cause failure. Load the base through the base test spigot (A.3.14).		P	
A.8.3.1.2	Apply an alternating bending moment, as specified in A.8.3.1.3, acting at a distance of 300 mm on either side of the centre.		P	
A.8.3.1.3	Apply the bending moments as specified in Table A.4 for the number of cycles and in the sequence given in Table A.4.		P	
A.8.3.1.4	Repeat the procedure of A.8.3.1.3 on a further 11 samples.		P	
A.8.3.2	Additional test for bases with structural components incorporating plastics		N/A	
A.8.3.2.1	This test shall be performed after the test specified in A.8.3.1 and using the same sample.		N/A	
A.8.3.2.2	Mount the base as specified in A.8.3.1.1 and apply a load of 300 kg acting downwards on the centreline of the base test spigot. Remove the load and measure the extension of the loading spigot below the lower surface of the base.		N/A	

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Clause	Requirement - Test	Result - Remark	Verdict
A.8.3.2.3	Reapply the 300 kg load and maintain it for 4 days.		N/A
A.8.3.2.4	After 4 days, remove the load and again measure the extension of the loading spigot below the lower surface of the base. If there has been movement greater than 0.5 mm, repeat the test.		N/A
	Table A.4 Type approval of bases		P
	Number of cycles	Bending moment (kg·m)	
	10	90	
	1 000	70	
	100 000	45	
	1 000 000	33	
A.8.4	Actions		P
A.8.4.1	Mount the unlocked action on the action test spigot (A.3.15).		P
A.8.4.2	Apply alternating bending moments, as specified in A.8.4.3, acting at a distance of 300 mm on either side of the column mounting point on the fore-and-aft centreline of the action.		P
A.8.4.3	Apply the bending moments as specified in Table A.5 for the number of cycles and in the sequence given in Table A.5.		P
A.8.4.4	Repeat the procedure of A.8.4.3 on a further 11 actions.		P
A.8.4.5	Mount the action as in A.8.4.1 and fit a seat board, using the appropriate attachment screws. Apply alternating bending moments of 30 kgm a total of 100 000 times, at a distance of 200 mm on either side of the column mounting point and perpendicular to the fore-and-aft centreline. Repeat the procedure on a further 11 actions.		P
	Table A.5 Type approval of actions		P
	Number of cycles	Bending moment (kg·m)	
	10	90	
	1 000	70	
	100 000	37	
	1 000 000	24	
A.8.5	Back stems NOTE Tests A.8.5 and A.8.6 may be carried out together.		P
A.8.5.1	The back stem shall only be tested in conjunction with a designated seat action.		P
A.8.5.2	Mount the back stem on the designated seat action in the most adverse position, and mount the seat action on the action test spigot (A.3.15).		P

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Clause	Requirement - Test	Result - Remark	Verdict
A.8.5.3	Apply the test force at a point 100 mm below the top of the stem up to a maximum of 400 mm above the underside of the action mounting point, using an ancillary loading beam if necessary.		P
A.8.5.4	Apply the force rearwards on the centreline of the back stem and perpendicular to it. The size of the forces shall be such as to generate the bending moments specified in Table A.6 about a point on the upper surface of the action at the column mounting point.		P
A.8.5.5	Apply the bending moment for the number of cycles and in the sequence given in Table A.6		P
A.8.5.6	Repeat the procedure A.8.5.2 to A.8.5.5 on a further 11 back stems.		P
	Table A.6 Type approval of back stems		P
	Test	Number of cycles	
	Static load	10	
	Horizontal fatigue	1 000 000	
A.8.6	Locking actions NOTE Tests A.8.5 and A.8.6 may be carried out together.		N/A
A.8.6.1	With the locking action mounted on the action test spigot (A.3.15) and with the locking device engaged, apply the test force at a point 100 mm below the top of the stem up to a maximum of 400 mm above the underside of the action mounting point, using an ancillary loading beam if necessary.		N/A
A.8.6.2	Apply the force rearwards on the centreline of the back stem and perpendicular to it. The size of the forces shall be such as to generate the bending moments specified in Table A.7 about a point on the upper surface of the action at the column mounting point.		N/A
A.8.6.3	Apply the bending moment for the number of cycles and in the sequence given in Table A.7		N/A
	Table A.7 Type approval of locking actions		N/A
	Test	Number of cycles	
	Static load	10	
	Horizontal fatigue	1 000 000	
A.9	Test report		P
	The test report shall include the following:		P
	a) the number and date of this British Standard, i.e. BS 5459-2:2000;		P
	b) details of the item tested, or, for components that are type-tested, details of the component and its mounting;		P
	c) details of any defects found during the inspection before testing;		P



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Clause	Requirement - Test	Result - Remark	Verdict
	d) details of any defects found during the inspection after testing;		P
	e) whether the chair overturned during the stability test;		P
	f) details of any damage that does not impair the function of the chair, and the number of test cycles at which it occurred;		P
	g) details of any deviation from the test procedures, including any reduction in loads to prevent overturning.		P

Durability and safety tests		
Test conditions	Test result	Verdict
One test cycle comprises: a) applying a load, V1, (as specified in A.5.1.4) to the seat loading point, using the seat loading pad (A.3.4); b) applying a load, H1, (as specified in A.5.1.4) to the back loading point, using the back loading pad (A.3.6); c) removing the loads applied in a) and b); d) applying a load V2 (as specified in A.5.1.4) to the furthest forward position on the seat to which a load can be applied without the chair overturning, or to a position 100 mm back from the front edge of the seat, whichever is the furthest away from the front edge of the seat. Repeat the test cycle 500 000 times (see A.1.7), or until failure occurs. For the chairs, the seat load V1 is 1 400 N, the back load H1 is 400 N, and V2 is 1 400 N.	a) any member, joint or component no fracture (including back support, column, base, seat suspension and castors); b) joints or components intended to be rigid no loosening, which is shown to be permanent by applying hand pressure; c) deformation no affecting the appearance or function; d) the operation of any mechanical part no impairment	Pass

Seat impact (see Figure A.13) test		
Test conditions	Test result	Verdict
Set the seat height to the maximum. Place a piece of foam (A.3.12) on the seat. If it is difficult to measure the drop height (see A.5.2.2) accurately owing to the softness of the upholstery, place a 2 kg mass of diameter 200 mm on the chair and determine the drop height as the distance to the underside of the mass. Remove the mass before proceeding with the test. Allow the impactor (A.3.8) to fall freely on to the seat loading point (see A.4) from a height of 350 mm. Repeat four more times. Using the same drop height, allow the impactor to fall on to a point as near the front edge of the seat as possible. Repeat four more times. Set the seat height to the minimum and repeat the procedure of A.5.2.2 and A.5.2.3.	a) any member, joint or component no fracture (including back support, column, base, seat suspension and castors); b) joints or components intended to be rigid no loosening, which is shown to be permanent by applying hand pressure; c) deformation no affecting the appearance or function; d) the operation of any mechanical part no impairment	Pass

Back impact (see Figure A.14) test		
Test conditions	Test result	Verdict
Using stops (A.3.3), restrain the front castors or glides of the chair from moving forward. Allow the impact hammer (A.3.9) to fall through a vertical height of 330 mm or an angle of 48° so that it strikes the top of the outside of the back of the chair in the centre with the pendulum arm vertical (see Figure A.14). Perform this operation a total of 10 times.	a) any member, joint or component no fracture (including back support, column, base, seat suspension and castors); b) joints or components intended to be rigid no loosening, which is shown to be permanent by applying hand pressure; c) deformation no affecting the appearance or function; d) the operation of any mechanical part no impairment	Pass

Drop (see Figure A.15) test

Test conditions	Test result	Verdict
Support the chair so that the base lies on a plane inclined at 10° to the horizontal. Position the base so that one leg is at the lowest point on the plane and is just in contact with the floor. Lift the chair up to the height 450 mm. Drop the chair on to the floor (A.3.10) 10 times on a front leg and 10 times on a back leg. NOTE The test may be carried out by lifting the chair with three cords that are adjusted in length, with the chair standing in the correct orientation on a plane inclined at 10° from the horizontal.	a) any member, joint or component no fracture (including back support, column, base, seat suspension and castors); b) joints or components intended to be rigid no loosening, which is shown to be permanent by applying hand pressure; c) deformation no affecting the appearance or function; d) the operation of any mechanical part no impairment	Pass

Side-to-side safety (see Figure A.16) test		
Test conditions	Test result	Verdict
Using the small seat loading pad (A.3.5), apply a load of 1 200 N vertically downwards at a point 50 mm from the side edge of the seat on the transverse line which passes through the top of the pedestal. Remove the load and reapply it at the corresponding point on the opposite side of the seat. This constitutes one cycle of the test. Apply the loads alternately, as described in A.5.5.1, for a total of 250 000 cycles After completing 120 000 cycles, safe failure is permitted. The number of cycles at which this occurs shall be recorded.	a) any member, joint or component no fracture (including back support, column, base, seat suspension and castors); b) joints or components intended to be rigid no loosening, which is shown to be permanent by applying hand pressure; c) deformation no affecting the appearance or function; d) the operation of any mechanical part no impairment	Pass

Forward overturning test		
Test conditions	Test result	Verdict
Position the chair as specified in A.6.1. Using the small seat loading pad (A.3.5), apply a force of 600 N vertically downward so as to act at a point 50 mm from the front edge of the seat at any position considered likely to result in instability. (Tests on the centreline are usually sufficient.) While maintaining the downward force, apply a force of 20 N horizontally forward along a line through the point where the base of the loading pad meets the upper surface of the seat (see Figure A.18a).	the chair no overturn	Pass

Sideways overturning test		
Test conditions	Test result	Verdict
Position the chair as specified in A.6.1. Apply a downward vertical force of 250 N to the seat at a point 100 mm from the fore-and-aft centreline of the seat on the same side as the stopped castors or glides, and between 175 mm and 250 mm forward of the rear edge of the seat. Maintain this force while proceeding with A.6.2.2.3 and A.6.2.2.4.	the chair no overturn	Pass

Using the small seat loading pad (A.3.5), apply a downward vertical force of 350 N to the arm of the chair on the same side as the stopped castors or glides, at a position 37.5 mm from its outer edge, at the most adverse position along its length. Maintain this force while proceeding with A.6.2.2.4. Apply a horizontal force of 20 N outward at the upper surface of the armrest to which the 350 N vertical force is applied (see A.6.2.2.3) and acting through the point of application of the vertical force.		
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Rearward overturning (see Figure A.20) test		
Test conditions	Test result	Verdict
Position the chair as specified in A.6.1. the angle of the backrest is adjustable, set the backrest at its maximum rearward angle from the vertical. Using the small seat loading pad (A.3.5), apply and maintain a downward vertical force of 600 N to the seat at the seat loading point (see A.4). Determine the distance h, in millimetres, between the upper surface of the loaded seat and the floor. For chairs having a value of h of less than 720 mm, calculate the required overturning force F (in newtons) from the following equation: $F = 285.7 \left(1 - \frac{h}{1000} \right)$ F=285.7(1-612/1000)=110.9N Apply the overturning force F horizontally rearwards to the back of the chair at the back loading point, or at the top edge of the backrest, whichever is the lower.	the chair no overturn	Pass

Accidental rearward overturning (see Figure A.21) test		
Test conditions	Test result	Verdict
Position the chair as specified in A.6.1. Tilt the chair rearwards on its rear feet so that the front edge of the seat moves through a horizontal distance of 100 mm (see Figure A.21). Allow the chair to fall freely.	the chair no overturn	Pass

Arm sideways static load (see Figure A.23) test		
Test conditions	Test result	Verdict
Using local loading pads (A.3.7), apply an outward horizontal force of 600 N simultaneously to each arm of the chair at the point along the arm most likely to cause failure. Apply the forces 10 times in total.	a) any member, joint or component no fracture (including back support, column, base, seat suspension and castors); b) joints or components intended to be rigid no loosening, which is shown to be permanent by applying hand pressure; c) deformation no affecting the appearance or function; d) the operation of any mechanical part no impairment	Pass

Arm downward static load (see Figure A.24) test		
Test conditions	Test result	Verdict
Using the small seat loading pad (A.3.5), apply a downward vertical force of 1 200 N to the point along one arm most likely to cause failure. Apply the vertical force 10 times in total.	a) any member, joint or component no fracture (including back support, column, base, seat suspension and castors); b) joints or components intended to be rigid no loosening, which is shown to be permanent by applying hand pressure; c) deformation no affecting the appearance or function; d) the operation of any mechanical part no impairment	Pass

Arm impact (see Figure A.25) test		
Test conditions	Test result	Verdict
Place stops against the castors or glides of the chair on the opposite side of the chair to the arm being tested. Allow the impact hammer (A.3.9) to fall through a vertical height 330 mm, or fall through an angle of 48°, so that when the pendulum arm is vertical, the hammer strikes the outside face of the arm at the position most likely to cause failure. If the chair has a swivel base, ensure that the direction of impact passes through the vertical axis of the swivel. Strike the arm in this way a total of 10 times.	a) any member, joint or component no fracture (including back support, column, base, seat suspension and castors); b) joints or components intended to be rigid no loosening, which is shown to be permanent by applying hand pressure; c) deformation no affecting the appearance or function; d) the operation of any mechanical part no impairment	Pass

Chair swivelling test		
Test conditions	Test result	Verdict
Using the seat loading pad (A.3.4), apply a downward vertical force of 1 200 N to the seat at the seat loading point (see A.4). Rotate the seat of the chair through an angle of 45° relative to the base, and then back again. Repeat this operation for a total of 100 000 cycles, maintaining the vertical force throughout.	a) any member, joint or component no fracture (including back support, column, base, seat suspension and castors); b) joints or components intended to be rigid no loosening, which is shown to be permanent by applying hand pressure; c) deformation no affecting the appearance or function; d) the operation of any mechanical part no impairment	Pass

Seat height adjustment test		
Test conditions	Test result	Verdict
Set the seat of the chair to its maximum height Using the seat loading pad (A.3.4), apply a downward vertical force of 1 200 N to the seat at the seat loading point (see A.4). Maintain the force for at least 3 s, and then remove it. Lower the seat until it rests just above the lowest position of its height adjustment. Reapply the downward force. maintain the force for at least 3 s, and then remove it. Return the seat to its maximum height. Repeat the loading cycle of A.7.6.2 and A.7.6.3 for a total of 10 000 cycles. At the end of the test, maintain the seat loading force for 1 h with the seat at its maximum height. Durability of controls Apply a force of 100 N to all control levers and knobs at any point and in any direction likely to cause failure. Maintain the force for at least 3 s. Apply the force 10 times in total.	a) any member, joint or component no fracture (including back support, column, base, seat suspension and castors); b) joints or components intended to be rigid no loosening, which is shown to be permanent by applying hand pressure; c) deformation no affecting the appearance or function; d) the operation of any mechanical part no impairment	Pass

Durability of controls test		
Test conditions	Test result	Verdict
Apply a force of 100 N to all control levers and knobs at any point and in any direction likely to cause failure. Maintain the force for at least 3 s. Apply the force 10 times in total.	a) any member, joint or component no fracture (including back support, column, base, seat suspension and castors); b) joints or components intended to be rigid no loosening, which is shown to be permanent by applying hand pressure; c) deformation no affecting the appearance or function; d) the operation of any mechanical part no impairment	Pass

Columns incorporating seat height adjustment components test									
Test conditions		Test result	Verdict						
Using a full cone (A.3.13), apply alternating bending moments, as specified in A.8.2.2, acting at a distance of 300 mm on either side of the centreline of the column. Apply the bending moments as specified for the appropriate type of seat height adjustment component in Table A.3, each for the number of cycles specified in Table A.3. Apply the bending moments in the sequence given in Table A.3 (i.e. a total of 1 101 010 cycles). Repeat the procedure of A.8.2.2 on a further nine columns. Using the plate cone (A.3.13), repeat the procedure of A.8.2.2 using a further 10 samples. Table A.3 Type approval for seat height adjustment components <table><tr><td>Number of cycles</td><td>Gas spring</td></tr><tr><td></td><td>Bending moment (kg.m)</td></tr><tr><td>10</td><td>75</td></tr></table>		Number of cycles	Gas spring		Bending moment (kg.m)	10	75	a) any member, joint or component no fracture (including back support, column, base, seat suspension and castors); b) joints or components intended to be rigid no loosening, which is shown to be permanent by applying hand pressure; c) deformation no affecting the appearance or function; d) the operation of any mechanical part no impairment	Pass
Number of cycles	Gas spring								
	Bending moment (kg.m)								
10	75								

1 000	60			
100 000	37			
1 000 000	24			

Bases test													
Test conditions		Test result	Verdict										
Support the base on castor spigots and position it in the orientation most likely to cause failure. Load the base through the base test spigot (A.3.14). Apply an alternating bending moment, as specified in A.8.3.1.3, acting at a distance of 300 mm on either side of the centre. Apply the bending moments as specified in Table A.4 for the number of cycles and in the sequence given in Table A.4. Repeat the procedure of A.8.3.1.3 on a further 11 samples. Table A.4 Type approval of bases <table><tr><th>Number of cycles</th><th>Bending moment (kg´m)</th></tr><tr><td>10</td><td>90</td></tr><tr><td>1 000</td><td>70</td></tr><tr><td>100 000</td><td>45</td></tr><tr><td>1 000 000</td><td>33</td></tr></table>		Number of cycles	Bending moment (kg´m)	10	90	1 000	70	100 000	45	1 000 000	33	a) any member, joint or component no fracture (including back support, column, base, seat suspension and castors); b) joints or components intended to be rigid no loosening, which is shown to be permanent by applying hand pressure; c) deformation no affecting the appearance or function; d) the operation of any mechanical part no impairment	Pass
Number of cycles	Bending moment (kg´m)												
10	90												
1 000	70												
100 000	45												
1 000 000	33												

Actions test												
Test conditions	Test result	Verdict										
Mount the unlocked action on the action test spigot (A.3.15). Apply alternating bending moments, as specified in A.8.4.3, acting at a distance of 300 mm on either side of the column mounting point on the fore-and-aft centreline of the action. Apply the bending moments as specified in Table A.5 for the number of cycles and in the sequence given in Table A.5. Repeat the procedure of A.8.4.3 on a further 11 actions. Mount the action as in A.8.4.1 and fit a seat board, using the appropriate attachment screws. Apply alternating bending moments of 30 kgm a total of 100 000 times, at a distance of 200 mm on either side of the column mounting point and perpendicular to the fore-and-aft centreline. Repeat the procedure on a further 11 actions. Table A.5 Type approval of actions <table><tr><th>Number of cycles</th><th>Bending moment (kg´m)</th></tr><tr><td>10</td><td>90</td></tr><tr><td>1 000</td><td>70</td></tr><tr><td>100 000</td><td>37</td></tr><tr><td>1 000 000</td><td>24</td></tr></table>	Number of cycles	Bending moment (kg´m)	10	90	1 000	70	100 000	37	1 000 000	24	a) any member, joint or component no fracture (including back support, column, base, seat suspension and castors); b) joints or components intended to be rigid no loosening, which is shown to be permanent by applying hand pressure; c) deformation no affecting the appearance or function; d) the operation of any mechanical part no impairment	Pass
Number of cycles	Bending moment (kg´m)											
10	90											
1 000	70											
100 000	37											
1 000 000	24											

Back stems test				
Test conditions		Test result		Verdict
The back stem shall only be tested in conjunction with a designated seat action. Mount the back stem on the designated seat action in the most		a) any member, joint or component no fracture (including back support,		Pass

adverse position, and mount the seat action on the action test spigot (A.3.15). Apply the test force at a point 100 mm below the top of the stem up to a maximum of 400 mm above the underside of the action mounting point, using an ancillary loading beam if necessary. Apply the force rearwards on the centreline of the back stem and perpendicular to it. The size of the forces shall be such as to generate the bending moments specified in Table A.6 about a point on the upper surface of the action at the column mounting point. Apply the bending moment for the number of cycles and in the sequence given in Table A.6 Repeat the procedure A.8.5.2 to A.8.5.5 on a further 11 back stems. Table A.6 Type approval of back stems Table A.6 Type approval of back stems <table border="1"> <thead> <tr> <th>Test</th><th>Number of cycles</th><th>Bending moment (kg'm)</th></tr> </thead> <tbody> <tr> <td>Static load</td><td>10</td><td>50</td></tr> <tr> <td>Horizontal fatigue</td><td>1 000 000</td><td>15</td></tr> </tbody> </table>	Test	Number of cycles	Bending moment (kg'm)	Static load	10	50	Horizontal fatigue	1 000 000	15	column, base, seat suspension and castors); b) joints or components intended to be rigid no loosening, which is shown to be permanent by applying hand pressure; c) deformation no affecting the appearance or function; d) the operation of any mechanical part no impairment	
Test	Number of cycles	Bending moment (kg'm)									
Static load	10	50									
Horizontal fatigue	1 000 000	15									

Photos
Details of: EV

View:

- ☐ general
- ☐ front
- ☐ rear
- ☐ right
- ☐ left
- ☐ top
- ☐ bottom



Details of: General view

View:

- ☐ general
- ☐ front
- ☐ rear
- ☐ right
- ☐ left
- ☐ top
- ☐ bottom



Details of: General view

View:

☐ general

☐ front

☐ rear

☐ right

☐ left

☐ top

☐ bottom



Details of: General view

View:

☐ general

☐ front

☐ rear

☐ right

☐ left

☐ top

☐ bottom



Details of: General view

View:

☐ general

☐ front

☐ rear

☐ right

☐ left

☐ top

☐ bottom



Details of: General view

View:

☐ general

☐ front

☐ rear

☐ right

☐ left

☐ top

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The end of report