BS EN 1888:2012

BSI Standards Publication

Child care articles — Wheeled child conveyances — Safety requirements and test methods

raising standards worldwide™

National foreword

This British Standard is the UK implementation of EN 1888:2012. It supersedes BS EN 1888:2003, which will be withdrawn on 30 July 2013.

The UK Committee has agreed a transition period between BS EN 1888:2003+A3:2005 and BS EN 1888:2012 to allow manufacturers time to modify their products. However, attention needs to be drawn to the fact that EN 1888:2003 including Amendment A2:2005 may allow single strollers with independent parking devices and swivel wheels when it is known that there is a risk associated with these types of products. The revised BS EN 1888:2012 has eliminated the associated risk.

The UK participation in its preparation was entrusted to Technical Committee CW/1/2, Conveyances.

A list of organizations represented on this committee can be obtained on request to its secretary.

This publication does not purport to include all the necessary provisions of a contract. Users are responsible for its correct application.

ISBN 978 0 580 68090 8

ICS 97.190

Compliance with a British Standard cannot confer immunity from legal obligations.

This British Standard was published under the authority of the Standards Policy and Strategy Committee on 30 June 2012.

Amendments issued since publication

Date	Text affected

EUROPEAN STANDARD

NORME EUROPÉENNE

EUROPÄISCHE NORM

EN 1888

March 2012

ICS 97.190

Supersedes EN 1888:2003

English Version

Child care articles - Wheeled child conveyances - Safety requirements and test methods

Articles de puériculture - Voitures d'enfant - Exigences de sécurité et méthodes d'essai

Artikel für Säuglinge und Kleinkinder - Transportmittel auf Rädern für Kinder - Sicherheitstechnische Anforderungen und Prüfungen

This European Standard was approved by CEN on 16 December 2011.

CEN members are bound to comply with the CEN/CENELEC Internal Regulations which stipulate the conditions for giving this European Standard the status of a national standard without any alteration. Up-to-date lists and bibliographical references concerning such national standards may be obtained on application to the CEN-CENELEC Management Centre or to any CEN member.

This European Standard exists in three official versions (English, French, German). A version in any other language made by translation under the responsibility of a CEN member into its own language and notified to the CEN-CENELEC Management Centre has the same status as the official versions.

CEN members are the national standards bodies of Austria, Belgium, Bulgaria, Croatia, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Romania, Slovakia, Slovenia, Spain, Sweden, Switzerland, Turkey and United Kingdom.

EUROPEAN COMMITTEE FOR STANDARDIZATION
COMITÉ EUROPÉEN DE NORMALISATION
EUROPÄISCHES KOMITEE FÜR NORMUNG

Management Centre: Avenue Marnix 17, B-1000 Brussels

Ref. No. EN 1888:2012: E

Contents

Page

Foreword

This document (EN 1888:2012) has been prepared by Technical Committee CEN/TC 252 “Child use and care articles”, the secretariat of which is held by AFNOR.

This European Standard shall be given the status of a national standard, either by publication of an identical text or by endorsement, at the latest by September 2012, and conflicting national standards shall be withdrawn at the latest by March 2013.

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. CEN [and/or CENELEC] shall not be held responsible for identifying any or all such patent rights.

This document supersedes EN 1888:2003.

In comparison with this EN 1888:2003, the significant technical changes relates to the following issues:

a) determination of a protected volume;

b) clarification of the protective function;

c) angles measurements test method;

d) holes and openings;

e) locking mechanisms;

f) handle movement;

g) introduction of a bite test;

h) parking and braking devices;

i) stability;

j) handle strength;

k) product information;

l) introduction of rationales in Annex A.

According to the CEN/CENELEC Internal Regulations, the national standards organizations of the following countries are bound to implement this European Standard: Austria, Belgium, Bulgaria, Croatia, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Romania, Slovakia, Slovenia, Spain, Sweden, Switzerland, Turkey and the United Kingdom.

1 Scope

This European Standard specifies the safety requirements and test methods for *wheeled child conveyances*, designed for the carriage of one or more children, up to 15 kg each and additional 20 kg on any integrated platform on which a child can stand.

This European Standard does not cover toys, shopping trolleys; baby carriers fitted with wheels; *wheeled child conveyances* propelled by a motor and *wheeled child conveyances* designed for children with special needs.

Where additional products are designed to be attached to a *wheeled child conveyance*, a hazard and risk analysis should be undertaken to identify any potential hazards.

Where a *wheeled child conveyance* or any part of the *wheeled child conveyance* has several functions or can be converted into another function it shall comply with the relevant standards.

2 Normative references

The following documents, in whole or in part, are normatively referenced in this document and are indispensable for its application. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

EN 71-1, *Safety of toys — Part 1: Mechanical and physical properties*

EN 71-3:1994, *Safety of toys — Part 3: Migration of certain elements*

EN 1103, *Textiles — Fabrics for apparel — Detailed procedure to determine the burning behaviour*

3 Terms and definitions

For the purposes of this document, the following terms and definitions apply.

3.1
wheeled child conveyance
vehicle designed for the carriage of one or more children consisting of a *chassis* to which a *pram body* (bodies) or *car seat(s)* or *seat unit*(s) or combination of these is (are) attached, which can be manually steered while being pushed or pulled

Note 1 to entry: Referred to as the "vehicle" for the purpose of this standard.

3.2
pram body
structure with essentially vertical and continuous sides and ends with an internal base designed to transport one or more children in a primarily horizontal position

3.3
seat unit
structure which may or may not be adjustable to achieve a reclining or recumbent position designed to support one or more children

3.4
car seat
group 0/0+ child restraint system complying with ECE44

3.5
chassis
wheeled framework with extended handle(s) for pushing, pulling and steering, designed to accommodate and transport a *pram body* (bodies) or *car seat(*s) or *seat unit*(s) or a combination of these items

3.6
pram
vehicle comprising a *chassis* and one or more *pram bodies*

3.7
pushchair
vehicle comprising a *chassis* and one or more *seat unit*s or *car seats*

3.8
parking device
device to maintain the vehicle in a stationary position

3.9
restraint system
system to restrain the child within the vehicle

3.10
crotch restraint
device positioned between the child's legs to prevent the child from sliding forwards

3.11
harness anchorage point
device suitable for the attachment of an additional child's harness

3.12
braking device
device to reduce the speed of the vehicle

3.13
platform
integral part of the vehicle designed to support an additional child in a standing position

3.14
junction line
intersection of the seat and the backrest

3.15
folding system
assembly of moving parts which enables the vehicle to be changed from an erected position to a folded position and vice versa under the control of the carer

3.16
locking device
mechanical component that maintains part(s) of the vehicle erected in the position of use (e.g. latch(es), hooks, over centre lock...) which could be deactivated or activated by action(s) on the *operating device*

3.17
operating device
part of the *locking mechanism(s*) designed to be activated by the carer through one or several positive action(s)

3.18
locking mechanism
assembly of components consisting of one or more *locking device(s)* and *one or more operating device(s)*

3.19
automatic locking device
device that engages with no additional voluntary action by the carer, when the vehicle is erected to its position of use

3.20
reversible handle
handle that can be rotated on the chassis to change the direction of pushing

3.21
carry cot (generic term)
product consisting of a base, sides, ends and carrying handle(s), within which a child can be laid down and transported by hand(s)

4 General requirements and test conditions

NOTE Words in *italics* are defined in Clause 3 (Terms and definitions). Additional information on the background and rationale for various requirements is given in Annex A.

4.1 Samples

Tests should be carried out in the order of the clauses given in this standard, unless otherwise stated. Each test shall be carried out only using one vehicle, unless otherwise stated.

Vehicles with multiple places for *pram bodies* and/or *seat unit*s shall comply with all applicable requirements in any possible arrangement in accordance with the manufacturer's instructions. If a vehicle can be equipped with an additional *seat unit* or *pram body* or group 0/0+ car seat supplied or recommended by the manufacturer, the combination shall comply with this European Standard.

4.2 Principle of the most onerous condition

Unless otherwise stated each test shall be conducted with the vehicle in the most onerous condition for that test in terms of:

— the choice and number of *seat unit*s and/or *pram bodies* and/or *car seats* attached to the *chassis* stated in the manufacturer's instructions;

— the addition of any additional *seat unit*(s) approved by the manufacturer;

— the use of test masses: for vehicles transporting more than one child, at least one place that a child can occupy shall be loaded with a test mass;

— the loading (or not) of any receptacle designed for carrying additional load(s) allowed for in the instructions or otherwise approved by the manufacturer and the placing (or not) of load(s) in any such facility, up to the maximum mass allowed in the manufacturer's instructions, or 2 kg if nothing is indicated; small pockets fitted onto textile parts are not concerned by this condition;

— the addition (or not) of any other accessories supplied or recommended by the manufacturer for use with the vehicle and with accessories loaded according to the manufacturers instructions;

— the adjustment of *seat unit*s, *pram bodies*, handles, *car seats*, and any other adjustable features or accessories, or any other optional arrangement of the vehicle allowed in the manufacturer's instructions or otherwise approved by the manufacturer.

NOTE The heaviest loads do not always produce the most onerous conditions.

4.3 Tolerances for test equipment

Unless otherwise stated, the accuracy of the test equipment shall be:

— forces ± 5 %;

— masses ± 0,5 %;

— dimensions ± 0,5 mm;

— timing ± 1 s;

— angles ± 0,5°.

4.4 Test conditions

The vehicle shall be conditioned at a temperature of (23 ± 5) °C for at least 2 h prior to tests. All tests shall be carried out at a temperature of (23 ± 10) °C unless otherwise specified.

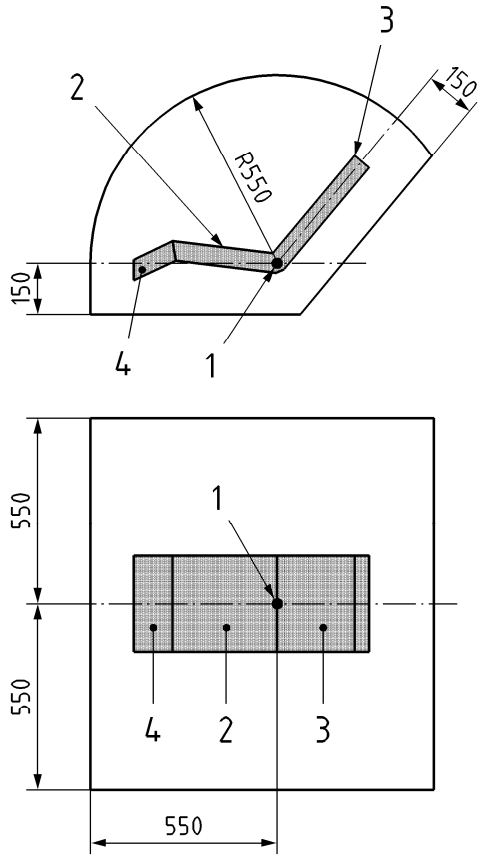
For vehicles fitted with inflatable tyres, the tyre pressure shall be adjusted according to manufacturer's instructions for use before conducting the entire test procedure. If a tyre is punctured during the test procedure, the tyre shall be replaced and the test procedure continued.

4.5 Determination of the protected volume

4.5.1 Protected volume of seat units

The protected volume of seat units shall be determined in accordance with Figure 1 below.

Dimensions in millimetres



Key

1 origin from which the protected volume has been defined (mid-point of the *junction line,* on the uncompressed upper surface of the seat unit*)*

2 seat

3 back rest

4 leg rest

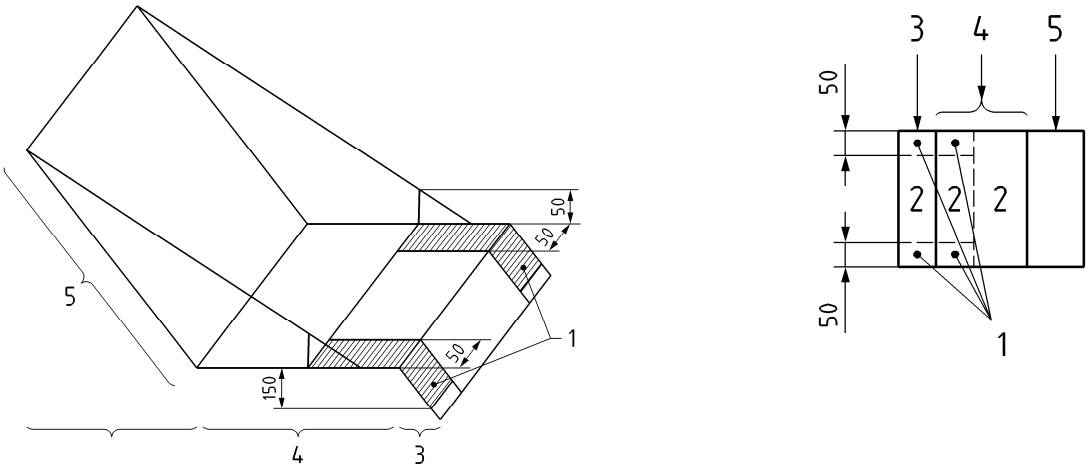
Figure 1 — Protected volume for *seat unit*s

The space located behind the backrest is excluded from the protected volume.

Where a vehicle is suitable for two or more children the space located behind the backrest shall be considered if it enters another protected volume.

The space underneath the seat and underneath the leg rest is excluded from the protected volume, except for a 50 mm wide band measured from the outermost edge of the seat/leg rest sides where the seat/leg rest is not fitted with lateral protections of a height greater than 50 mm (textile or any rigid component), (see Figure 2).

Dimensions in millimetres



a) Side view **b) Bottom view**

Key

1 space to be checked
2 space not to be checked
3 leg rest
4 seat
5 backrest

Figure 2 — Effect of lateral protection on the determination of the protected volume

4.5.2 Protected volume of pram bodies having a length greater than 800 mm

The protected volume of pram bodies having a length greater than 800 mm shall be determined in accordance with Figure 3.

The 550 mm height shall be measured in accordance with 8.1.2.2.

The surface underneath the *pram body* is excluded from the protected volume.

Dimensions in millimetres

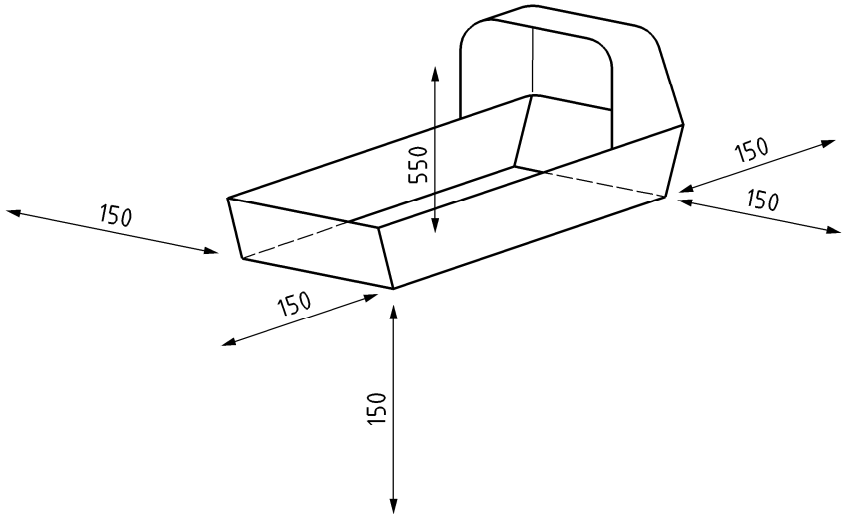


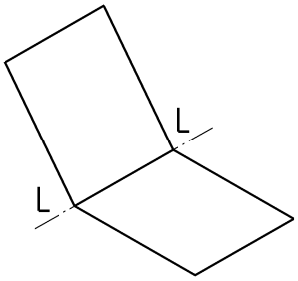
Figure 3 — Protected volume for *pram bodies* having a length greater than 800 mm

4.5.3 Protected volume for pram bodies having a maximum internal length of 800 mm and car seats

For vehicles designed only for children under 6 months of age, *pram bodies* with a maximum internal length of 800 mm and for *car seats*, the protected volume is considered to be the inner upper surface that supports the child and the inner surface of the sides and ends of the pram body.

4.6 Determination of the junction line

The *junction line* shall be determined as the intersection between the seat and the backrest as shown on Figure 4.

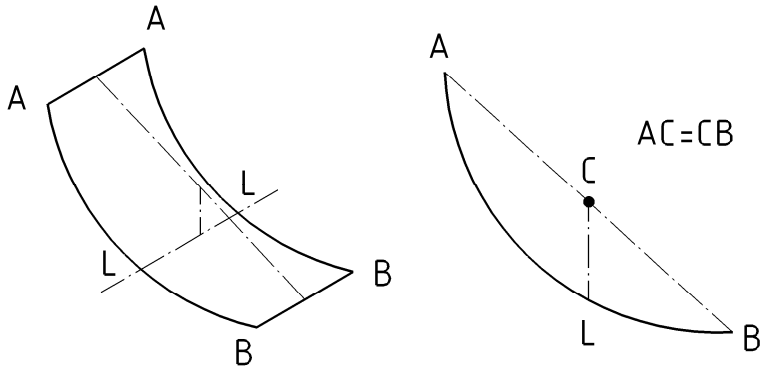


Key

LL *junction line*

Figure 4 — *Junction line*

When the *seat unit* is in the form of a hammock, then a theoretical *junction line*, “LL”, is determined as shown in Figure 5.



Key

LL *junction line*

CL vertical projection of C on the hammock

Figure 5 — *Junction line* for seat unit in form of a hammock

NOTE The *junction line* may vary when the backrest is adjusted to different positions.

5 Test equipment

5.1 Test masses

5.1.1 General

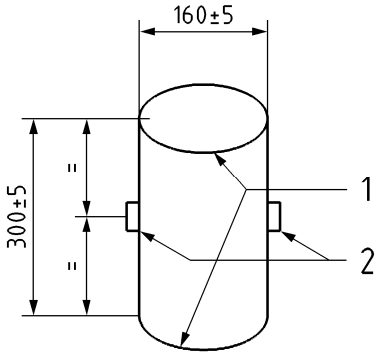
Unless otherwise specified, the test masses shall be those given in 5.1.2 to 5.1.9.

Any damage to fabric which may occur as a result of abrasion by the test masses during tests shall be ignored. Damage can be minimized by using a convenient means of protection of negligible mass. Where damage is not caused by abrasion by the test masses it constitutes a structural failure.

5.1.2 Test mass *A*

Test mass *A* is a rigid cylinder (160 ± 5) mm in diameter and (300 ± 5) mm in height, having a mass of (9 + 0,01/0) kg and with its centre of gravity in the centre of the cylinder. All edges shall have a radius of (5 ± 1) mm. Two anchorage points shall be provided, positioned (150 ± 2,5) mm from the base and at 180° to each other around the circumference as shown in Figure 6.

Dimensions in millimetres



Key

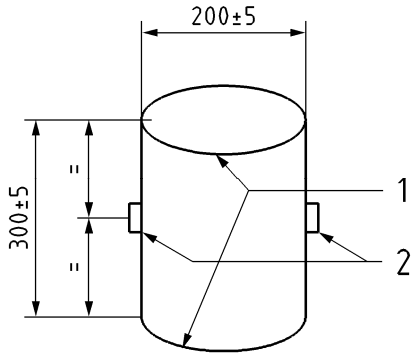
1 radius: (5 ± 1) mm
2 two anchorage points

Figure 6 — Test mass *A*

5.1.3 Test mass *B*

Test mass *B* is a rigid cylinder (200 ± 5) mm in diameter and (300 ± 5) mm in height, having a mass of (15 + 0,01/0) kg and with its centre of gravity in the centre of the cylinder. All edges shall have a radius of (5 ± 1) mm. Two anchorage points shall be provided, positioned (150 ± 2,5) mm from the base and at 180° to each other around the circumference (see Figure 7).

Dimensions in millimetres



Key

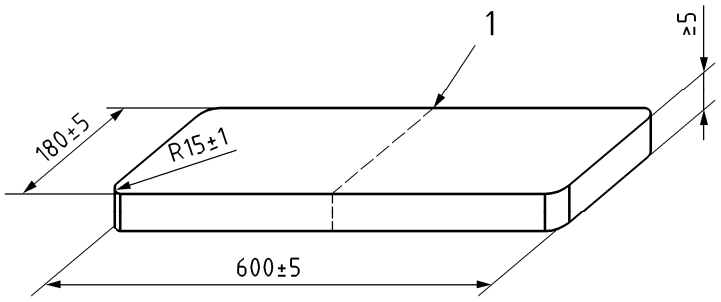
1 radius: (5 ± 1) mm
2 two anchorage points

Figure 7 — Test mass *B*

5.1.4 Test mass *C*

Test mass *C* is a rigid plate (600 ± 5) mm long and (180 ± 5) mm wide, having a minimum thickness of 5 mm and a mass of (9 + 0,01/0) kg hinged along the centre line (see Figure 8).

Dimensions in millimetres



Key

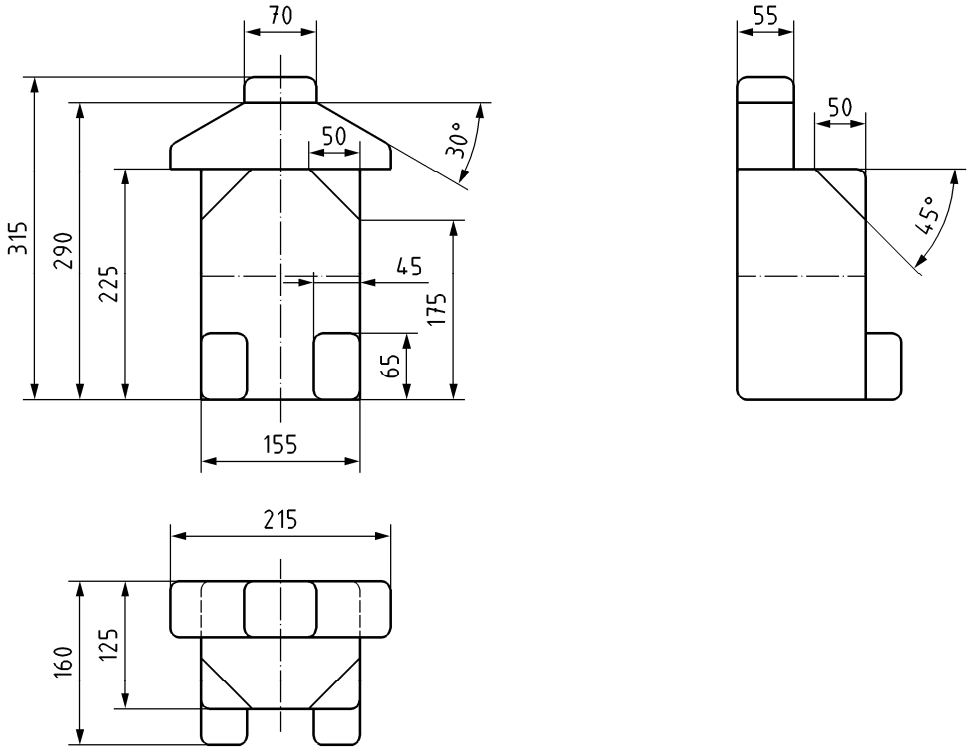
1 hinge line

Figure 8 — Test mass *C*

5.1.5 Test mass *D*

Test mass *D* is made of a rigid material with a smooth finish and a total mass of (9 ± 0,1) kg (see Figure 9).

Dimensions in millimetres



Tolerances

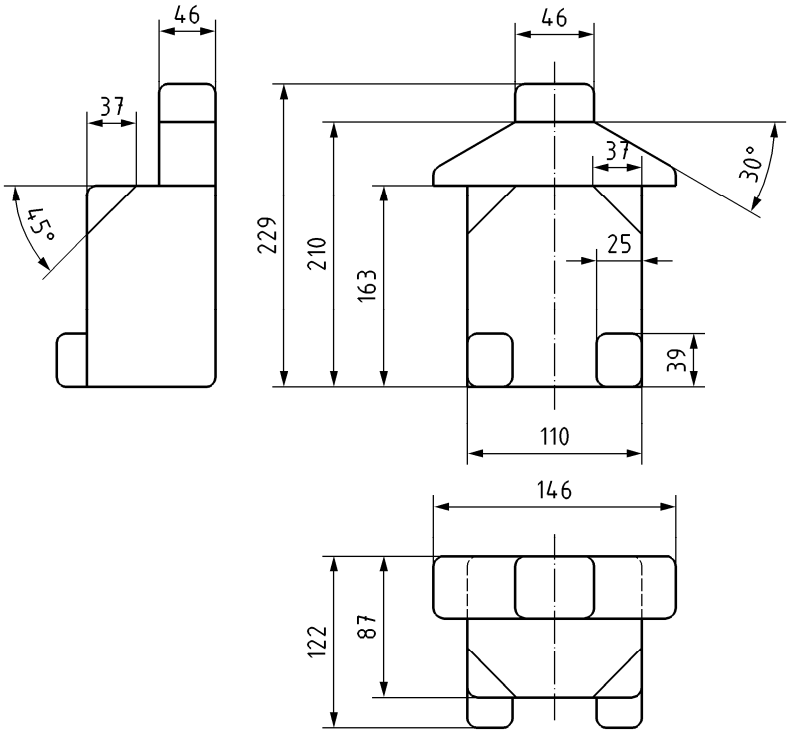
dimensions ± 2 mm
angles ± 2°
where shown, corner radii shall be (10 ± 1) mm

Figure 9 — Test mass *D*

5.1.6 Test mass D_0

Test mass D_0 is made of a rigid material with a smooth finish and a total mass of (3,7 ± 0,1) kg (see Figure 10).

Dimensions in millimetres



Tolerances

dimensions ± 2 mm

angles ± 2 °

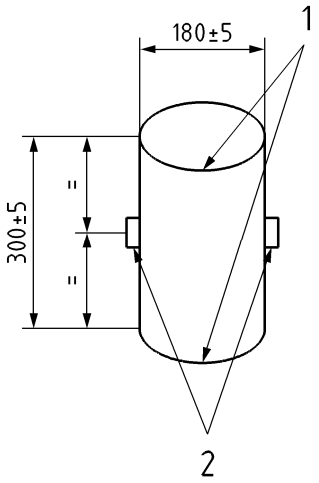
where shown, corner radii shall be (10 ± 1) mm

Figure 10 — Test mass D_0

5.1.7 Test mass F

Test mass F is a rigid cylinder (180 ± 5) mm in diameter and (300 ± 5) mm in height, having a mass of (13 + 0,01/0) kg and with its centre of gravity in the centre of the cylinder. All edges shall have a radius of (5 ± 1) mm. Two anchorage points shall be provided. These shall be positioned (150 ± 2,5) mm from the base and at 180° to each other around the circumference (see Figure 11).

Dimensions in millimetres



Key

1 radius (5 ± 1) mm
2 anchorage points

Figure 11 — Test mass F

5.1.8 Test mass *G*

Test mass *G* comprises two identical parts made of steel and with the dimensions given in Figure 12. Each part shall have a mass of 10 kg.

Dimensions in millimetres

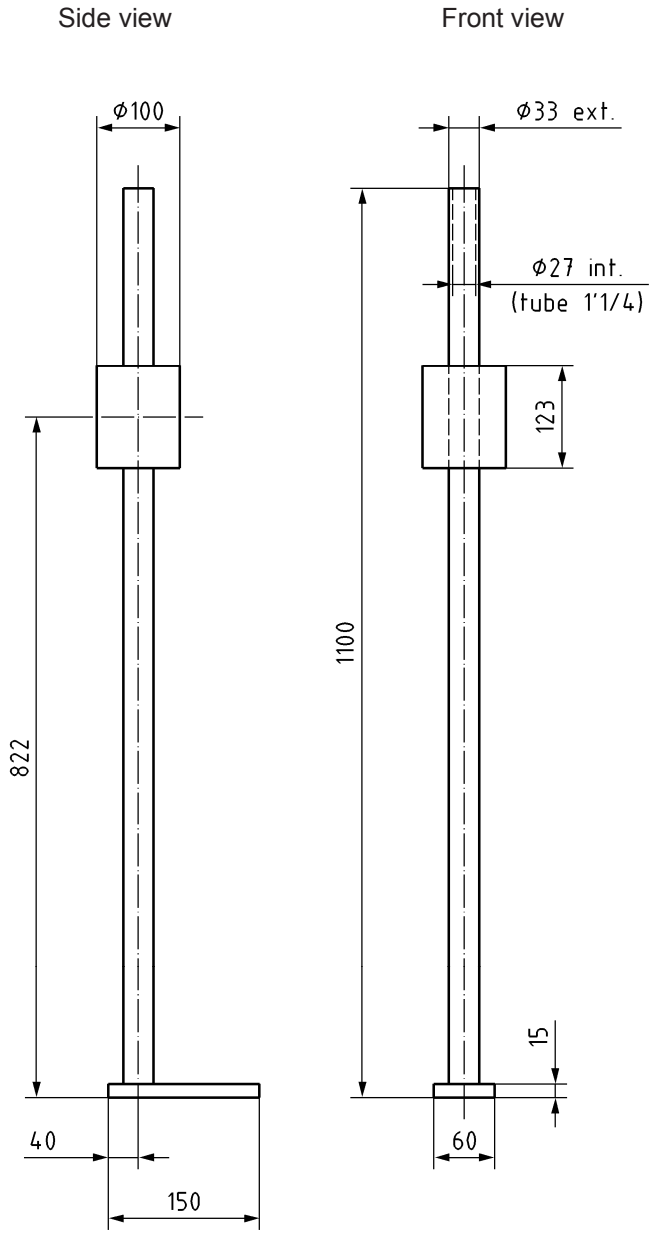


Figure 12 — Test mass *G*

The distance between the two identical parts of test mass G shall be adjusted in accordance with the shape and dimensions of the *platform* that is tested.

A rigid bar of negligible mass shall be used to maintain the test mass along the *platform* and both parts shall be maintained apart from each other by any connecting means of negligible mass.

5.1.9 Test bar

Rigid square bar with a cross section of (25×25) mm, having a length greater than the length of the *pram body* and a mass of 0,75 kg.

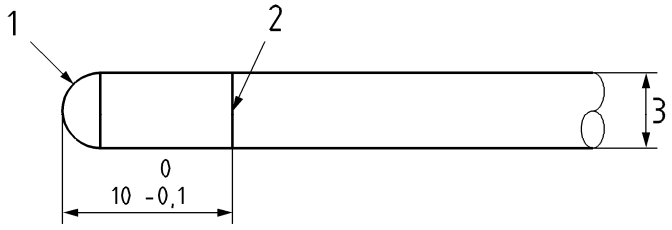
5.2 Test probes

5.2.1 Finger probes

5.2.1.1 Finger probe with hemispherical end

Probes made from plastics or other hard, smooth material of diameters $5\,^{0}_{-0,1}$ mm, $7\,^{0}_{-0,1}$ mm and $12\,^{+0,1}_{0}$ mm, with a full hemispherical end (see Figure 13).

Dimensions in millimetres



Key

1 hemispherical end
2 scribed line around circumference
3 Ø 5 mm 7 mm and 12 mm

Figure 13 — Probes with hemispherical end

5.2.1.2 Conical probe for mesh

Probe for assessing mesh made from plastics or other hard, smooth material as shown in Figure 14 which shall be capable of being mounted on a force measuring device, so that the conical end can be presented to the opening being assessed.

Dimensions in millimetres

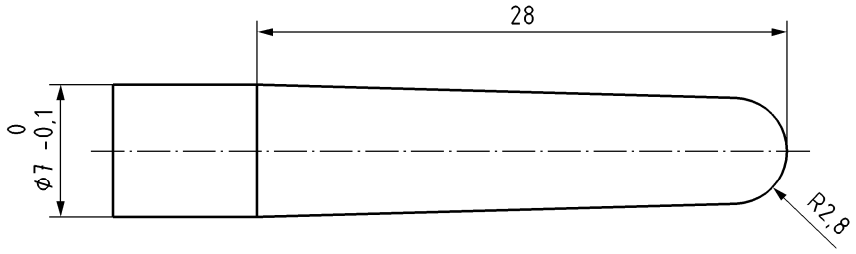


Figure 14 — Conical probe for mesh

The tolerance on the radius is ± 0,2 mm.

5.2.1.3 Conical probes

Probes made from plastics or other hard smooth material of diameters (25 0 / –0,1) mm and (45 + 0,1 / 0) mm with one conical end (with an angle of 30°), that can be mounted on a force measuring device (see Figure 15).

Dimensions in millimetres

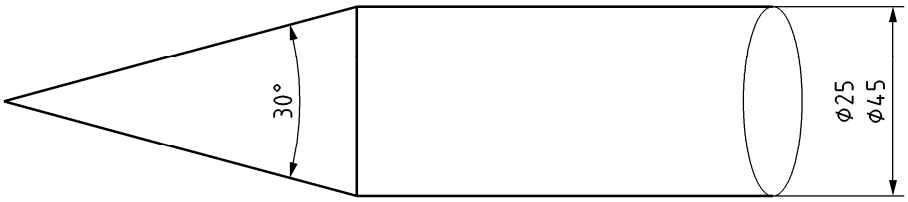
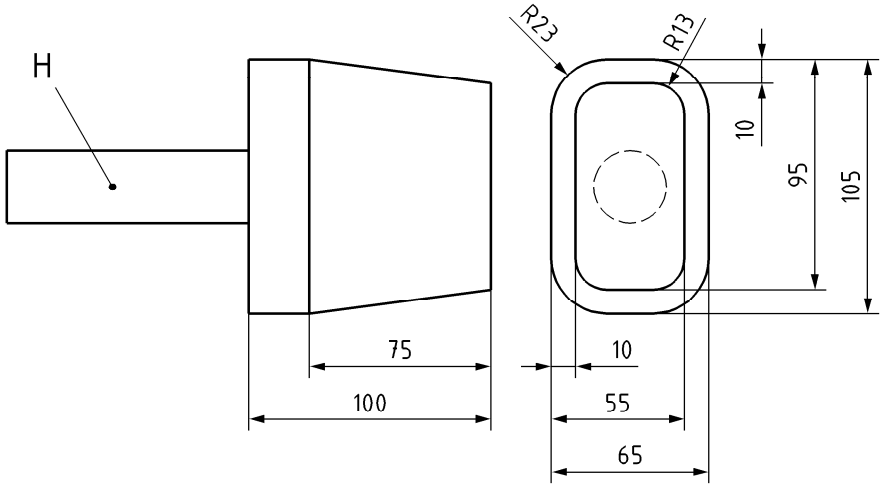


Figure 15 — Conical probes

5.2.2 Hip probe

The hip probe shall be made from plastics or other hard, smooth material with the dimensions given in Figure 16.

Dimensions in millimetres



Key

H handgrip

tolerances on dimensions:

- 65 (0 / –0,5) mm
- 105 (0 /–0,5) mm

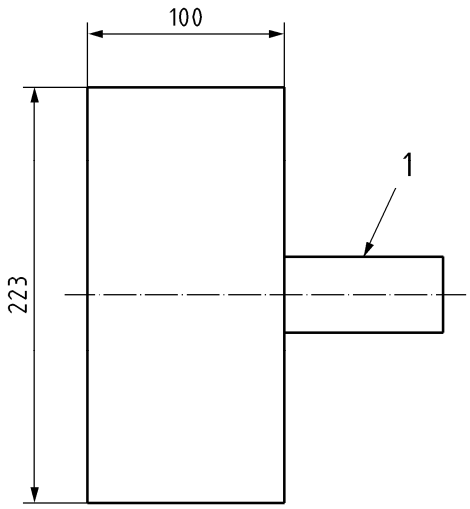
all other dimensions shall be ± 1 mm.

Figure 16 — Hip probe

5.2.3 Large head probe

The large head probe shall be made from plastic or other hard smooth material, with dimensions as shown in Figure 17.

Dimensions in millimetres



Key

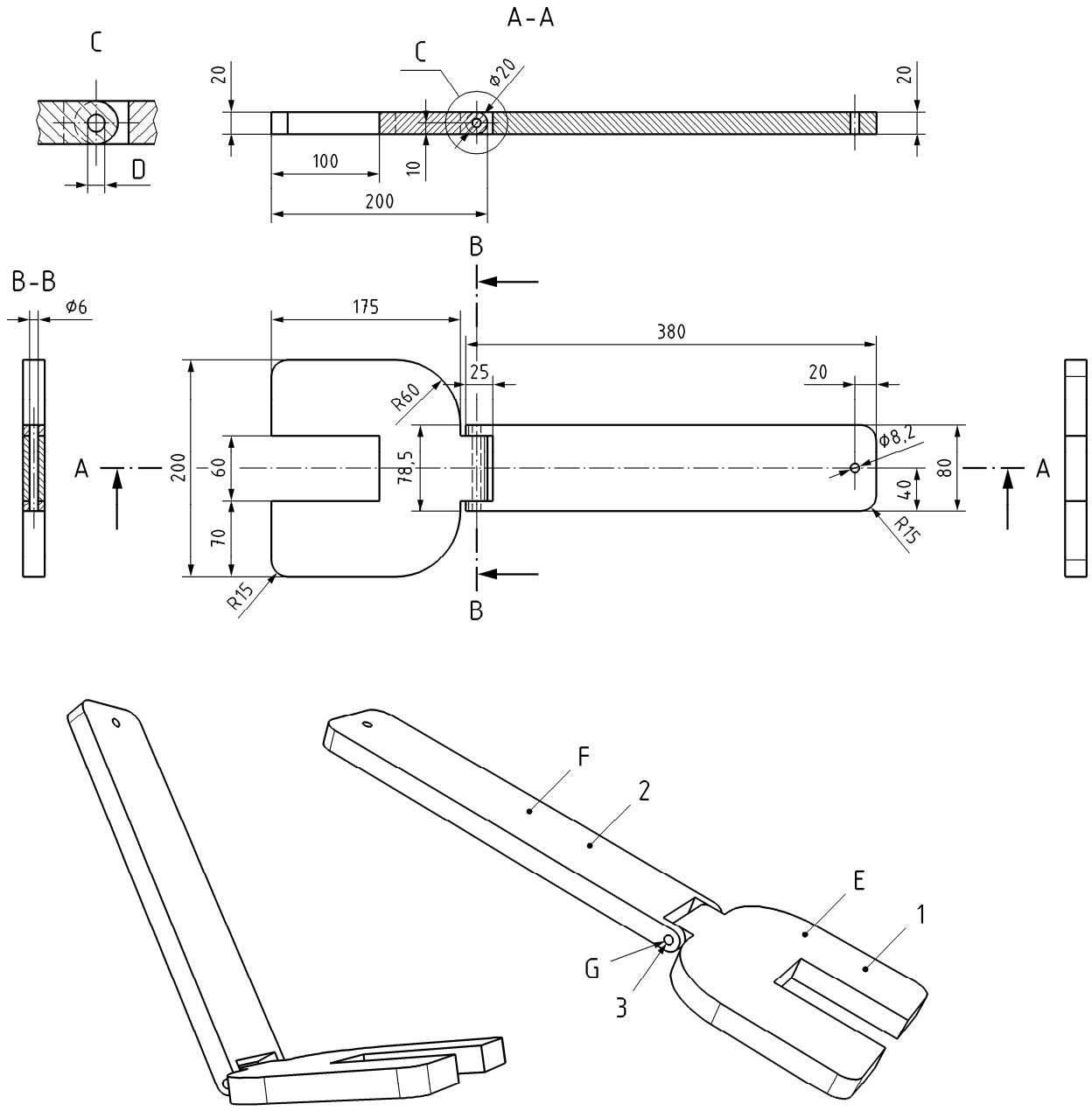
1 handgrip

Figure 17 — Large head probe

5.3 Angle measuring device

A 9 kg articulated steel device used to measure the angle between the seat and the backrest (see Figure 18).

Dimensions in millimetres



Key

1 part to be placed onto the seat surface made of steel
2 part to be placed onto the backrest surface made of steel
3 hinge pin made of steel
E mass: (4495 ± 50) g
F mass: (4501 ± 50) g
G mass of hinge axle: (17 ± 0,5) g, length: 79,5 mm.
total mass tolerance: (9 ± 0,1) kg
dimensions tolerance: ± 2 mm
All edges shall be chamfered.

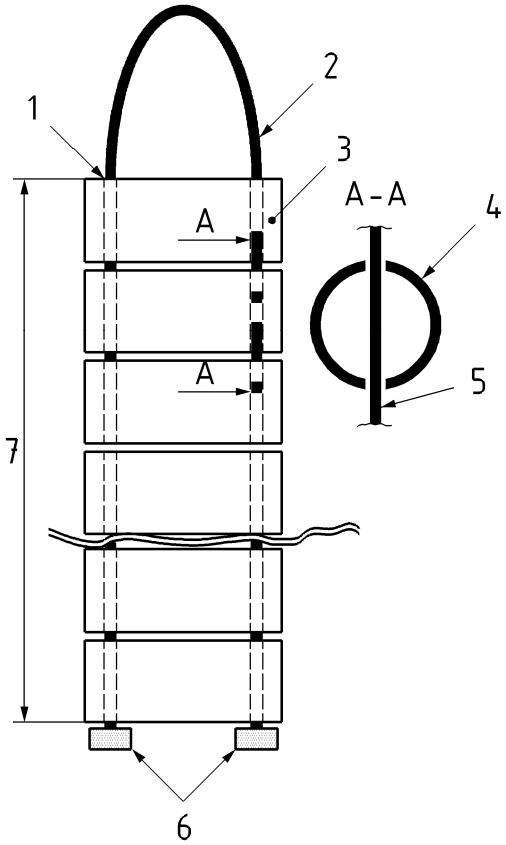
Figure 18 — Angle measuring device

5.4 Test ball

Sphere with a hard smooth surface of 120 mm diameter and 5 kg mass.

5.5 Hinged board

Articulated board used to allow slackness while adjusting the straps of the *restraint system* around test mass D_0 (see Figure 19).



Key

1 hole Ø 3 mm
2 steel cable Ø 1,5 mm
3 tube Ø 25 mm
4 tube Ø 25 mm
5 steel cable Ø1,5 mm
6 cable ends cycle type
7 total length = 13 tubes
length of each tube: 60 mm

Figure 19 — Hinged board

5.6 Small parts cylinder

Cylinder having dimensions as shown in Figure 20.

Dimensions in millimetres

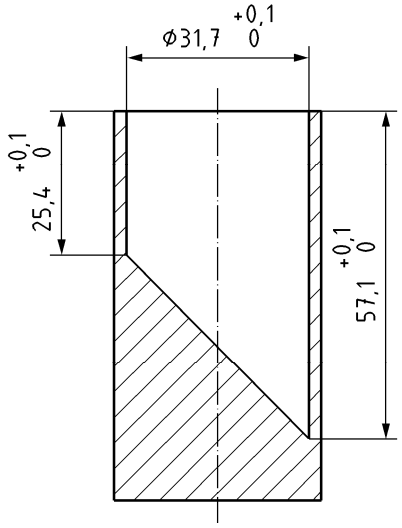


Figure 20 — Small parts cylinder

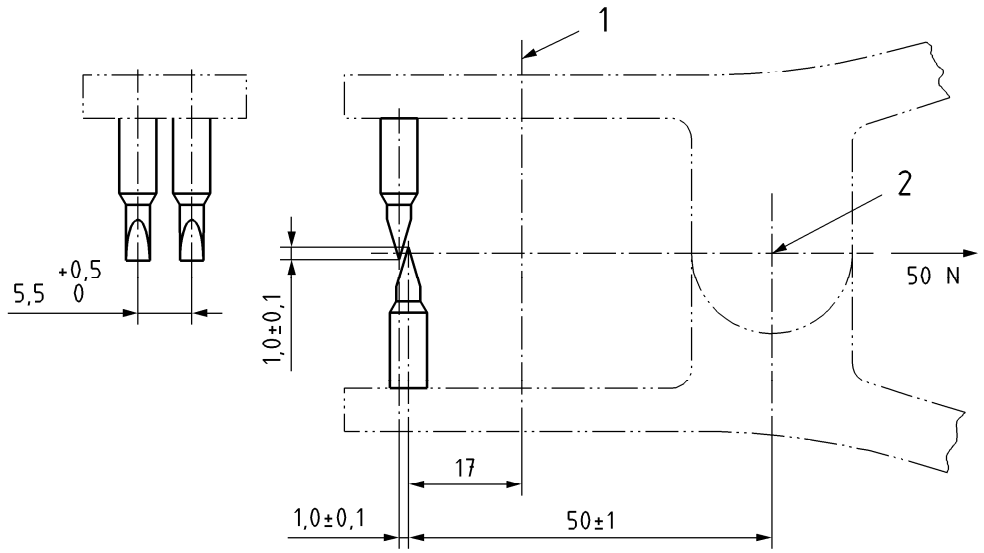
5.7 Bite tester

The bite tester, see Figure 21, consists of two sets of teeth, see Figure 22, made from H13 high chrome tool steel or equivalent and hardened to 45-50 Rockwell C. There are two teeth at the top and two at the bottom of the bite tester, positioned so that the vertical centre line of one pair of teeth is (1 ± 0,1) mm in front of the centre line of the other set of teeth. In the fully closed position, the teeth shall overlap each other by (1 ± 0,1) mm. The outer most corners of the teeth shall have a radius of (0,3 ± 0,1) mm.

The teeth shall be mounted so as to pivot about a point (50 ± 1) mm from the rear most pair of teeth and positioned so that when closed the centre lines of the two pairs of teeth are parallel to each other. The bite tester shall be equipped with a stop to prevent the distance between the teeth from exceeding (28 ± 1) mm when fully opened. The closing force of the teeth shall be set at (50 ± 5) N.

The bite tester shall be provided with a guide to prevent items entering further into the fully opened jaws by more than (17 ± 1) mm. The bite tester shall be equipped with a means whereby a force of (50 ± 5) N may be applied along its centre line in a direction tending to pull the teeth off the sample.

Dimensions in millimetres



Key

1 position of guide
2 pivot point

Figure 21 — Bite tester

Dimensions in millimetres

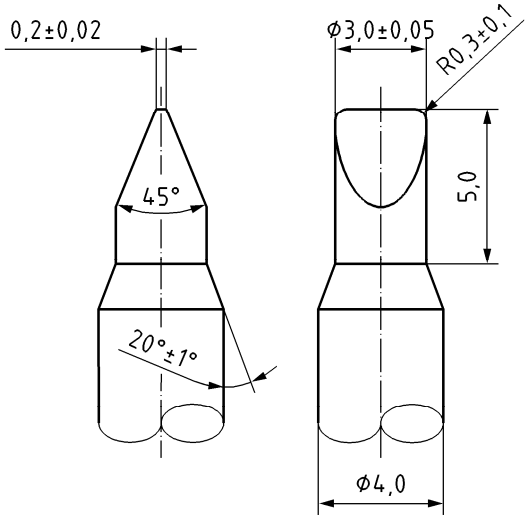


Figure 22 — Test teeth

5.8 Test surface

Test surface, capable of inclination at an angle of 9° (0/+0,5)°, 12° (0/+0,5)° or 45° (0/+0,5)° to the horizontal and covered with aluminium oxide paper of grade 80.

5.9 Rectangular stops

Rectangular stops of height 25 mm.

5.10 Irregular surface test equipment

5.10.1 Obstacles

The surface of the irregular surface test equipment shall comprise two types of obstacles: Type A and Type B as shown in Figures 23 and 24.

These obstacles shall be mounted on a conveyor system as shown in Figure 25 so that the wheels on each side of the vehicle are lifted alternately. The conveyor system shall run at a speed of (5 ± 0,1) km/h.

Dimensions in millimetres

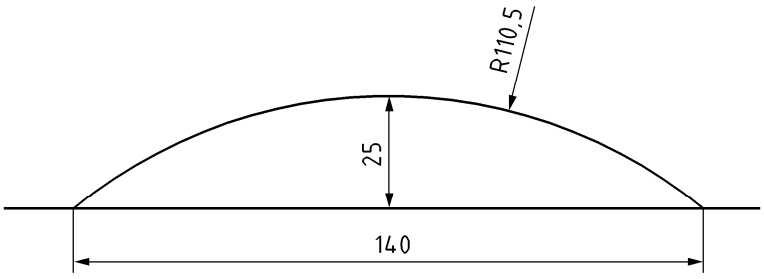
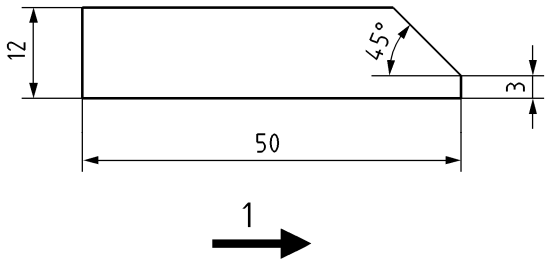


Figure 23 — Type "A" obstacle for the irregular surface test

Dimensions in millimetres

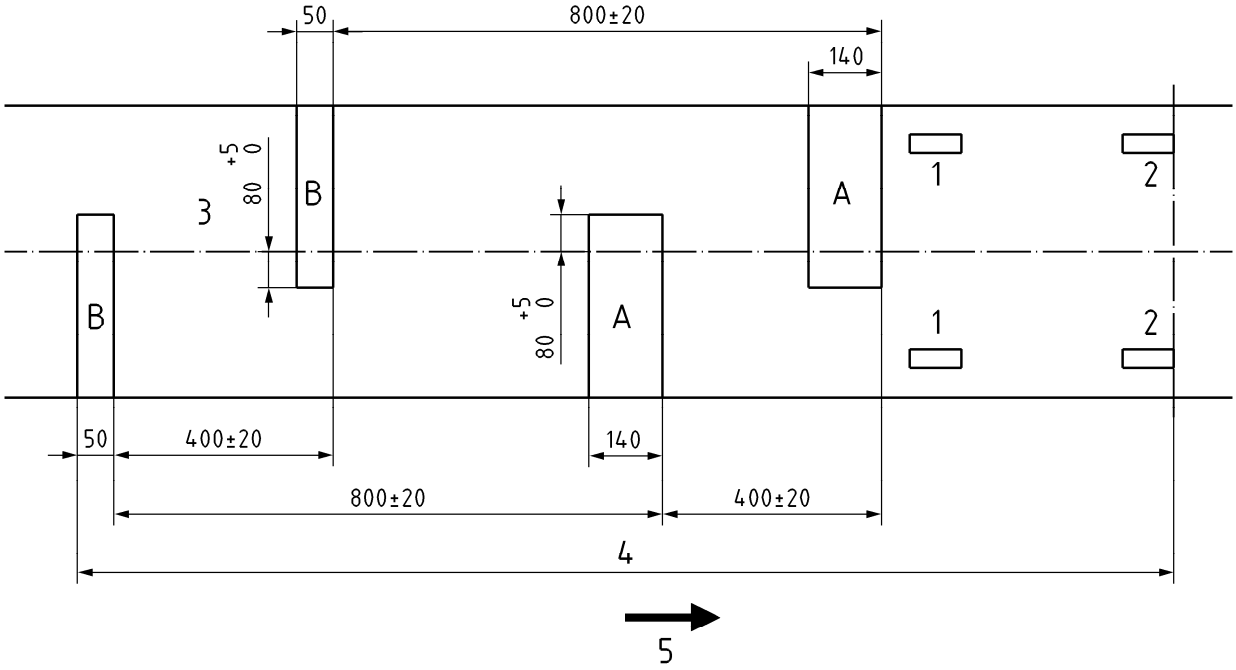


Key

1 direction of travel

Figure 24 — Type "B" obstacle for the irregular surface test

Dimensions in millimetres



Key

1 front wheels
2 back wheels
3 centre line
4 length of 1 cycle
5 direction of the travel of obstacles

Figure 25 — Arrangement for the irregular surface test

5.10.2 Articulating arms (see Annex B)

The test apparatus comprises two independent articulating arms capable of moving independently of each other in the vertical plane.

The test apparatus shall allow the articulating arms to be adjustable in height and across the width of the irregular surface test equipment to accommodate different types and sizes of vehicle.

The articulating arms shall pivot around their fixing point.

When in the horizontal position, each arm shall exert a vertical force on the handles of (20 ± 1) N.

6 Chemical hazards (see A.2)

A separate sample may be used for these tests.

Migration of elements from coatings of paint, varnish, lacquer, printing ink, polymer and similar coatings and from any other accessible surfaces of materials within the protected volume whether mass coloured or not shall not exceed the following amounts:

— Antimony: 60 mg/kg;

— Arsenic: 25 mg/kg;

— Barium: 1 000 mg/kg;

— Cadmium: 75 mg/kg;

— Chromium: 60 mg/kg;

— Lead: 90 mg/kg;

— Mercury: 60 mg/kg;

— Selenium: 500 mg/kg.

These limits shall be verified in accordance with the test method given in EN 71-3:1994.

Where a surface is coated with a multi-layer of paint or similar coating, the test sample shall not include the base material.

7 Thermal hazards (see A.3)

Fabrics shall not produce a surface flash when applying a flame as described in EN 1103.

A separate sample may be used for these tests.

8 Mechanical hazards (see A.4)

8.1 Protective function (see A.4.2)

8.1.1 Suitability of vehicle

8.1.1.1 Requirements

8.1.1.1.1 Vehicles intended for use from birth

Vehicles intended for children from birth shall comprise one of the following:

a) a *pram body* conforming to the requirements of 8.1.2 ; or

b) a *seat unit* where the angle between the backrest and the seat (angle "1" in Figure 26) is capable of adjustment to an angle of 150° or more measured in accordance with 8.1.1.2.1 and conforming to 8.1.2: any parts, whose function is essential for complying to 8.1.2, shall not allow the test ball to fall from the *seat unit* when tested in accordance with 8.1.1.2.2. In this configuration the *restraint system* shall be

capable of being removed or hidden or covered in accordance with the manufacturer's instructions to avoid any risk of strangulation; or

c) a *seat unit* where the angle between the backrest and the seat (angle "1" in Figure 26) is capable of adjustment to an angle of 150° or more measured in accordance with 8.1.1.2.1 and equipped with a *restraint system* suitable from birth complying with 8.1.3;

d) any "*car seat*" suitable from birth conforming to ECE 44.

8.1.1.1.2 Vehicles intended for use from 6 months of age

Car seats which comply with ECE 44 are exempt from this requirement.

Vehicles intended for children from 6 months of age shall have a *restraint system* complying with the relevant requirements of 8.1.3.

*Seat unit*s intended to be used from 6 months of age shall be marked with the warning in 10.2.5. The warning shall be visible during folding, unfolding or adjustment of the vehicle.

8.1.1.1.3 Seat units

Car seats which comply with ECE 44 are exempt from these requirements.

When measured in accordance with 8.1.1.2.1:

— the angle (1) between the seat and the backrest (see Figure 26) shall not be less than 95°; and

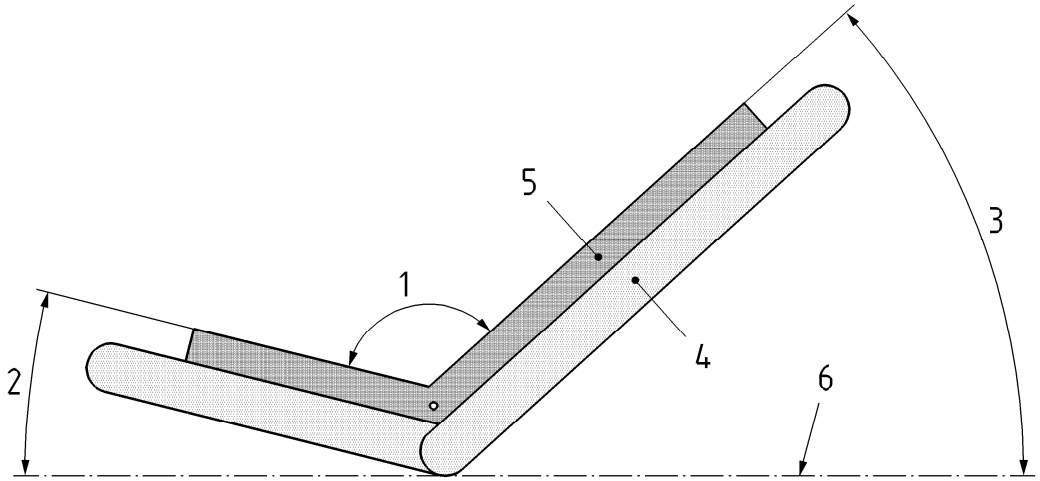
— the angle (2) between the seat and the horizontal (see Figure 26) shall not be less than 0°; and

— the angle (3) between the backrest and the horizontal (see Figure 26) shall not be less than 0°.

NOTE Angles below the horizontal line are considered to be less than 0°.

The length of the backrest shall not be less than 380 mm. When tested in accordance with 8.1.1.2.1 the top of the backrest of the *seat unit* shall be equal to or higher than the top of part 2 of the angle measuring device.

Car seats which comply with ECE 44 are exempt from these requirements.



Key

1 angle between the seat and the backrest
2 angle between the seat and the horizontal
3 angle between backrest and the horizontal
4 seat unit
5 angle measuring device
6 horizontal

Figure 26 — Measurement of angle of backrest

8.1.1.2 Test methods

8.1.1.2.1 Measurement of angle and length of the backrest

Adjust the backrest of the *seat unit* to its most upright position.

Any removable head cushion shall be removed before performing the measurements

NOTE Any component that may impair the correct positioning of part 1 of the angle measuring device (crotchstrap, padded parts, buckle etc...) should be positioned such as to ensure part 1 of the device is correctly placed onto the seat.

Place the angle measuring device (see 5.3) on the *seat unit* with part 1 against the seat and with part 2 (Figure 18) against the backrest as shown in Figure 26.

Raise the whole device for at least 50 mm from the seat with part 2 (Figure 18) maintaining complete contact with the backrest. With the device in this position fold up part 1 to its maximum reach. Then lower the whole device as far as possible by its own weight, with part 2 (Figure 18) maintaining complete contact with the backrest. Then slowly unfold part 1 (Figure 18) in such a way that it leans fully on the seat as far as possible under its own weight.

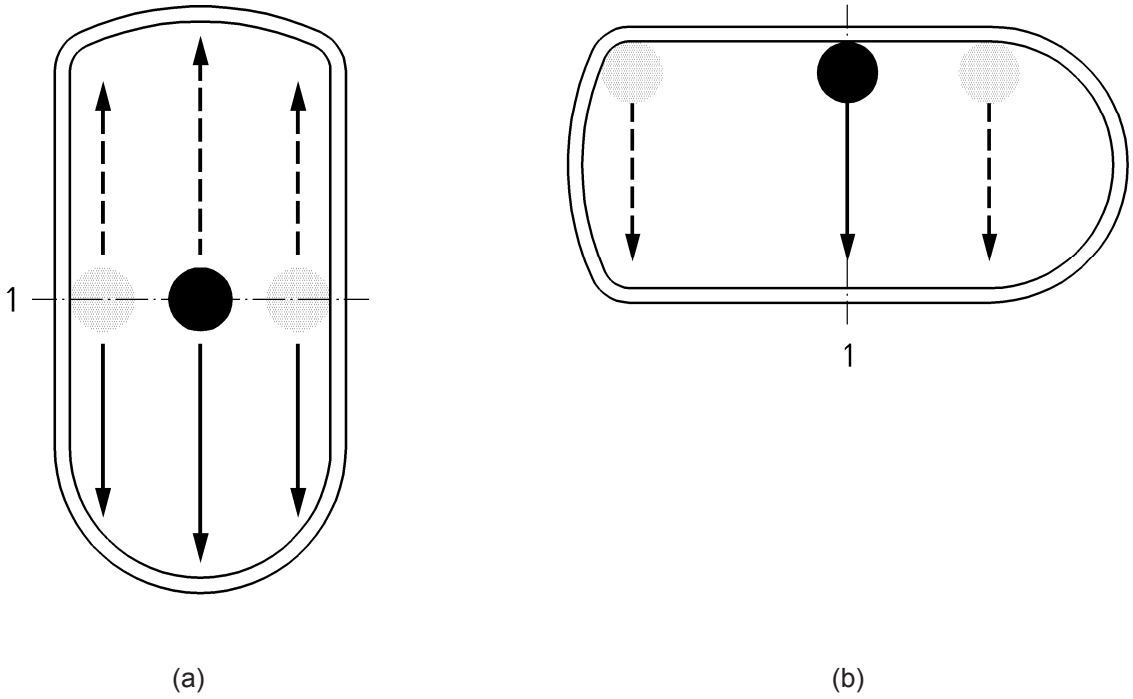
Measure angles 1, 2 and 3 (see Figure 26) on the top surface of the angle measuring device. During measurement, the angle measuring device shall not move from its position.

If applicable, adjust the backrest to its lowest position allowing the angle measuring device to move freely with the *seat unit*. Then measure angles 1, 2 and 3 (see Figure 26) on the top surface of the angle measuring device. The angle measuring device shall not move from its position during the measurement.

Check if the top of the backrest of the *seat unit* is equal to or higher than the top of part 2 (Figure 18) of the angle measuring device

8.1.1.2.2 Ball retention test

Recline the backrest of the *seat unit* to the most reclined position. All parts intended to retain the child including the rear part of hoods and aprons shall be attached in accordance with the manufacturer's instructions.



Key

1 *junction line*

Figure 27 — Retention test

Restrain the vehicle to a plane inclined at 45°, in a direction facing down slope.

Position the test ball (5.4) as shown in Figure 27a) on the centre of the *junction line*. Release the test ball allowing it to roll freely.

Record whether the test ball falls from the *seat unit*.

Repeat the test positioning the test ball on the left and right sides on the *junction line*.

Repeat the entire procedure with the vehicle facing up the slope.

Repeat the entire procedure with the vehicle facing in a direction perpendicular to the slope, with the test ball positioned as shown in Figure 27 b).

8.1.2 Minimum internal height of pram body

8.1.2.1 Requirements

When measured in accordance with 8.1.2.2 the minimum internal height of the pram body side and end upper edges shall be

a) for a *pram body* having an internal length ("D" on Figure 28) of 800 mm or less:

   — internal height ("A" on Figure 28) shall be not less than 150 mm for at least 170 mm in both directions from the centre line of the length ("B" on Figure 28); and

   — at all other points on the sides and ends the internal height ("C" on Figure 28) shall be at least 100 mm;

b) for a *pram body* having an internal length ("D" on Figure 28) greater than 800 mm:

   — internal height ("A" on Figure 28) shall be not less than 180 mm for at least 180 mm in both directions from the centre line of the length ("B" on Figure 28); and

   — at all other points on the sides and ends the internal height ("C" on Figure 28) shall be at least 130 mm.

8.1.2.2 Test method

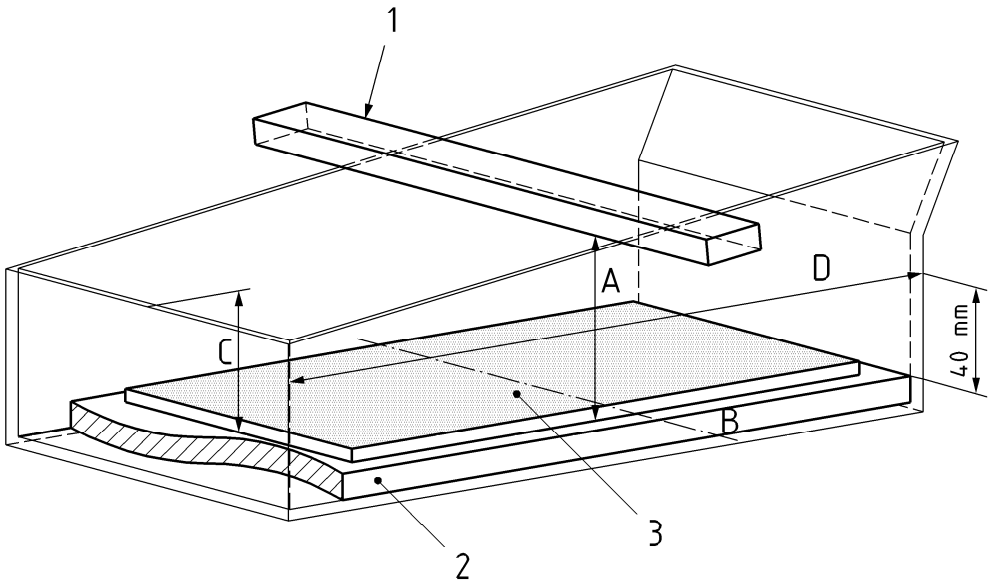
Measure the internal length “D” 40 mm from the top surface of test mass C, on the longitudinal axis of the pram.

The minimum internal heights of the *pram body* shall be measured from the lower edge of the test bar (5.1.9) as shown in Figure 28 placed on the top edge of the *pram body*, to the lower edge of test mass C placed on the mattress supplied or recommended by the manufacturer (see 10.2.7).

The measurement of the minimum height shall be carried out, longitudinally with the test bar placed across the ends of the *pram body* and laterally with the test bar placed across the sides of the *pram body*.

If the *pram body* is fitted with a base which may be inclined the measurement shall be carried out in full lying position.

Dimensions in millimetres



Key

1 test bar
2 mattress
3 test mass C
A internal height from the centre line
B centre line of the length
C internal height for all points
D internal length

Figure 28 — Measurement of the minimum internal heights of the *pram body*

8.1.3 Restraint system and fasteners

8.1.3.1 Requirements

8.1.3.1.1 Restraint system

*Seat unit*s shall be fitted with a *restraint system* incorporating a *crotch restraint* for each position a child can occupy.

The *restraint system* shall be designed so that it cannot be used without the crotch restraint.

The *restraint system* shall be adjustable.

Where straps are included in the *restraint system* they shall have a minimum width of 19 mm.

All *seat unit*s shall be tested in accordance with 8.1.3.2.1 and test mass D (5.1.5) shall not completely fall out of the *restraint system*.

*Seat unit*s designed for children under 6 months of age shall be tested in accordance with 8.1.3.2.1 and test mass D_0 (5.1.6) shall not completely fall out of the *restraint system*

NOTE Any partial movement of test mass D or D_0 is not considered a failure.

When tested in accordance with 8.1.3.2.2 the attachment of the *restraint system* shall not break, deform, work loose or become torn/displaced and the *seat unit* shall remain in place without permanent damage.

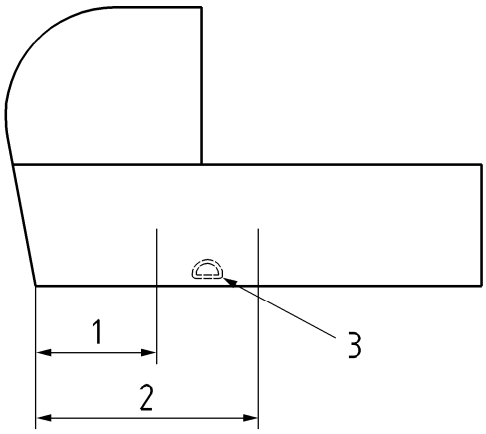
When tested in accordance with 8.1.3.2.3 in any orientation, fasteners shall not be released and shall not have suffered damage which impairs their normal operation and function.

When tested in accordance with 8.1.3.2.4 the maximum slippage of adjusters shall be 20 mm.

The requirements in 8.1.3.1.1 do not apply to the *restraint system* of car seats complying with ECE44.

8.1.3.1.2 Harness anchorage points

Pram bodies with an internal length greater than 800 mm (see 8.1.2.2) shall be fitted with two *harness anchorage point*s for each position that a child can occupy. The *harness anchorage point*s shall be located on each side of the base of a *pram body* within the zone indicated in Figure 29.



Key

1 245 mm from hood end
2 half of internal length (“D”/2) of the *pram body*
3 harness anchorage point

Figure 29 — *Harness anchorage point*s

If provided, anchorage points for an additional harness fitted on pram bodies with an internal length less than 800 mm (see 8.1.2.2) shall be located on each side of the base of the pram body within the zone indicated in Figure 29.

When tested in accordance with 8.1.3.2.5 the *harness anchorage point*s shall continue to function as intended.

8.1.3.2 Tests methods

8.1.3.2.1 Effectiveness of restraint system

For *seat unit* designed for children under 6 months of age, place the hinged board described in 5.5 between the test mass D_0 and the back rest of the *seat unit*. The hinged board shall follow as closely as possible the curvature of the *seat unit* and its base shall be flush with the base of test mass D_0. Attach the *restraint system* in accordance with the manufacturer's instructions with the *seat unit* in the most reclined position. Fasten any waist restraint around the torso section of test mass D_0 so that any slackness is removed and the waist restraint is positioned above the leg stumps. If the *crotch restraint* is adjustable, adjust it so that any slackness is removed. After adjustment of the *restraint system* the hinged board is removed to perform the test. Where the *restraint system* has shoulder straps that can be positioned on the back of the *seat unit* in a range of positions, the shoulder straps shall be placed in the lowest position (to accommodate the youngest child).

For *seat unit*s designed for children over 6 months of age, initially place test mass D against the backrest in the middle of the *seat unit* with the 225 mm axis against the back rest and attach the *restraint system* in accordance with the manufacturer's instructions with the *seat unit* in the most upright position. Fasten any waist restraint around the torso section of test mass D so that any slackness is removed and the waist restraint is positioned above the leg stumps. If the *crotch restraint* is adjustable, adjust it so that any slackness is removed and the waist restraint is still positioned above the leg stumps. Where the *restraint system* has shoulder straps that can be positioned on the back of the *seat unit* in a range of positions, the shoulder straps shall be placed in the highest position (to accommodate the oldest child).

Where shoulder straps are fitted, place a 30 mm cuboid spacer block, made of a hard smooth material, on each shoulder of test mass D. Adjust each shoulder strap in accordance with manufacturer's instructions so that any slackness is removed. Remove the spacers.

A rotating test surface shall be used to rotate the vehicle smoothly through 360° at a speed of (4 ± 0,5) RPM in a forward and reverse direction.

Rotate the vehicle through 360° in a forward direction. If necessary reposition test mass D or D_0 to its initial position without altering the adjusters on the *restraint system*. Rotate the vehicle through 360° in the reverse direction. If necessary, reposition test mass D or D_0 to its initial position without altering the adjusters on the *restraint system*.

Repeat the forward and reverse rotation cycles for two more sequences, giving a total of 3 forward and 3 reverse rotations. If necessary, after each rotation, reposition test mass D or D_0 to its initial position without altering the adjusters on the *restraint system*.

8.1.3.2.2 Attachment of the restraint system to the seat unit

Gradually apply a tensile force of 150 N to each point of attachment of the *restraint system* in the most onerous direction. Maintain this force for 1 min.

If more than one strap is attached at the same position or within a 20 mm radius, the force 150 N shall be applied to each strap simultaneously.

8.1.3.2.3 Strength of fastener

A tensile force of 200 N shall be gradually applied to the straps either side of the fastener. Maintain this force for 1 min.

8.1.3.2.4 Effectiveness of the adjustment system

This test shall be conducted at the end of the whole test procedure given in this standard.

Use approximately 125 mm of the *restraint system* on either side of the adjustment system.

Fix one end of the test piece into one jaw of a dynamometer and the other end into another jaw. The distance between the jaws shall be 200 mm.

Draw a line across the width of the test piece flush with each jaw.

Set the jaw movement speed to (500 ± 10) mm/min. Reduce the distance between the jaws to 150 mm. Subject the test piece to a tensile force until the latter reaches (100 ± 10) N. When this strain has been reached, return the distance between the jaws to 150 mm.

Conduct the test for a total of 10 times.

Measure the distance between the lines drawn flush with the jaws. The difference between this dimension and original dimension of 200 mm is the amount of slippage.

8.1.3.2.5 Strength of the harness anchorage points

Secure the pram body or seat unit to prevent any movement and gradually apply a force of 150 N to each *harness anchorage point* in the most onerous direction. Maintain this force for 1 min.

If more than one *harness anchorage point* is attached at the same position or within a 20 mm radius, the force 150 N shall be applied to each *harness anchorage point* simultaneously.

8.2 Entrapment hazards (see A.4.3)

8.2.1 Holes and openings

8.2.1.1 Requirements

There shall be no open ended tubes and completely bounded circular openings within the protected volume of the vehicle between 7 mm and 12 mm when measured in accordance with 8.2.1.2, unless the depth is less than 10 mm. This requirement is not applicable to the restraint system.

The size of the holes in mesh within the protected volume shall be less than 7 mm when measured in accordance with 8.2.1.2.

There shall be no accessible holes or openings in the footrest having a width greater than 25 mm and smaller than 45 mm, when measured in accordance with 8.2.1.2.

8.2.1.2 Test methods

Check whether the 7 mm finger probe (5.2.1.1) with an applied force of up to 30 N, enters 10 mm or more into any open ended tubes and completely bounded circular openings within the protected volume in any possible orientation. If the 7 mm finger probe enters 10 mm or more then the 12 mm finger probe (5.2.1.1) shall also enter 10 mm or more with an applied force of up to 5 N.

Check whether the conical probe (5.2.1.2), penetrates holes in the mesh to the 7 mm diameter section with an applied force of up to 30 N.

Check whether the 25 mm conical probe (5.2.1.3), enters into any opening in the footrest with an applied force of up to 30 N. If the 25 mm conical probe enters then the 45 mm conical probe (5.2.1.3) shall also enter with an applied force of up to 5 N.

8.2.2 Entrapment between the handle and the pram body

8.2.2.1 Requirement

This requirement is only applicable to *pram bodies* where the internal length is greater than 800 mm when measured in accordance with 8.1.2.2.

When tested in accordance with 8.2.2.2 if the hip probe (5.2.2) passes through the gap between the handle and the *pram body*, the large head probe (5.2.3) shall also pass through.

8.2.2.2 Test method

Check whether the hip probe can pass through the gap between the handle and the end of the *pram body* with a force of up to 90 N.

Check if the large head probe passes through the opening when pushed along the axis of the handgrip, with a force not exceeding 5 N.

8.3 Hazards from moving parts (see A.4.4)

8.3.1 Requirements

The requirements shall be checked before and after the irregular surface test (8.10.3). These requirements do not apply to the *restraint system*.

Within the protected volume there shall be no potentially hazardous shear and compression points between rigid parts moving relative to each other that can close to less than 12 mm, except while the vehicle is being erected for use or being folded or during adjustments of parts that are locked when in position for use.

Contact edges between parts moving relative to each other shall be rounded or chamfered in accordance with 8.7, unless the clearance is always less than 5 mm.

When the product is in use there shall be no accessible compression points which can close to less than 12 mm unless the clearance is always less than 5 mm, as the result of:

a) the mass or movement of the product; or

b) the movement of body weight by the child using the product; or

c) the application of an external force either by another child, or unintentionally by the carer, or by a powered mechanism.

8.3.2 Wheels

Any gaps in wheels within the protected volume shall be covered so that the 7 mm finger probe (5.2.1.1) does not enter.

The point of contact between a wheel and the ground shall not be within the protected volume.

8.3.3 Locking mechanism(s)

8.3.3.1 Folding system for storage or transportation

8.3.3.1.1 Requirements

####### 8.3.3.1.1.1 General requirements

Vehicles that can be folded for storage or transportation where the *chassis* can fold with the *pram body* or *seat unit* attached, shall be fitted with one or more *locking mechanism*(s). The *locking mechanism*(s) shall comply with the requirements in clauses 8.3.3.1.1.2 and 8.3.3.1.1.3.

Vehicles that can be folded for storage or transportation where the *chassis* can only fold when the *pram body* or *seat unit* has been removed, or vehicles that can only be folded after putting them in a position that clearly does not allow transportation of a child (e.g. overturn the vehicle) shall be fitted with a *locking mechanism*(s)

The function of any *operating device* shall not be impaired after being tested in accordance with 8.3.3.1.2.1.

####### 8.3.3.1.1.2 Incomplete deployment

To avoid the hazard due to incomplete deployment, there shall be at least two *locking device*s and at least one *locking device* shall engage automatically when the product is fully deployed for use.

NOTE If the *locking device* is not visible without damaging the vehicle a second sample may be used.

####### 8.3.3.1.1.3 Unintentional release of locking mechanism(s)

NOTE A guideline is given for the application of this subclause in Annex C.

To avoid the hazards due to unintentional release one of the following conditions shall be fulfilled:

a) there shall be at least one *operating device* which fulfils the following:

   i) the *operating device* shall require at least two consecutive actions, the second being dependent on the first having been carried out and maintained; and

   ii) the *operating device* shall not be activated or damaged in one single action during testing in accordance with 8.3.3.1.2.2;

or

b) there shall be two separate and independent *operating devices* which fulfil one of the following:

   i) where one *operating device* is intended to be operated by foot (e.g. for its position, shape, according to the manufacturer's instructions for use, etc.) it shall automatically return to its original status and the locking device shall reengage when tested in accordance with 8.3.3.1.2.3; or

   ii) where both *operating devices* are intended to be operated by hand(s) (e.g. for their position, shape, according to the manufacturer's instructions for use, etc.) they shall both automatically return to their original status and the locking devices shall reengage when tested in accordance with 8.3.3.1.2.3.

or

c) there shall be three or more separate and independent *operating devices*, at least one of which shall be located out of the protected volume or shall require a force of more than 50 N to be operated.

During testing in accordance with 8.3.3.1.2.4 the vehicle shall not fold. After testing in accordance with 8.3.3.1.2.4 the vehicle and the *locking mechanism*s shall not be damaged and the vehicle shall still comply with the requirements of 8.2 and 8.7.

When tested in accordance with:

— irregular surface test (8.10.3); and

— dynamic strength test (8.10.4); and

— handle strength test (8.10.6.);

the vehicle shall not fold and the *locking device*(s) shall not be released.

8.3.3.1.2 Test methods

8.3.3.1.2.1 General

Operate the *operating devices* 200 times.

8.3.3.1.2.2 Unintentional release of the locking mechanism by one single action

Place the vehicle fully deployed and ready for use on a horizontal flat surface.

Apply a force of 150N or a torque of 2,2 Nm to the *operating device*. This force or torque shall be applied to the *operating device* in the direction most likely to operate the *operating device* in one single action. The force or torque shall be applied for a period of 5 s.

8.3.3.1.2.3 Automatically returning *operating device*

Place the vehicle on a horizontal flat surface.

Without any test mass in the vehicle operate the *operating device*. Check whether the *operating device* automatically returns to its original position and whether the locking device re-engages.

Place test mass A in the *pram body* having a length less than 800 mm or group 0 *car seat*, test mass B in the *seat unit* or in a *pram body* having a length greater than 800 mm or test mass F in the group 0+ *car seat* as described in 8.8.2.1 with the backrest and/or *seat unit* adjusted to the most onerous position. Disengage the automatic *operating device*. Check whether the automatic *operating device* automatically returns to its original position and whether the locking device re-engages.

8.3.3.1.2.4 Effectiveness of locking mechanism(s) on vehicles where the chassis can fold with the pram body or seat unit or car seat installed

Place test mass A in the *pram body* having a length less than 800 mm or group 0 *car seat*, test mass B in the *seat unit* or in a *pram body* having a length greater than 800 mm or test mass F in the group 0+ *car seat* as described in 8.8.2.1. If the vehicle is designed for more than one child use any number of appropriate test masses, up to one in each place intended to be occupied by a child.

Engage all the *locking mechanism*s.

Restrain the wheels to prevent forward or rearward movement by means of fixed floor stops with a height greater than the radius of the wheels as shown in Figure 30.

Apply a force F for a period of 5 s, to the handle bar (or to each handle in turn in the case of separate handles), in each of the following directions:

a) forward horizontal;

b) rearward horizontal.

The test shall be performed with the stops between the wheels or outside them (see Figure 30).

Force F shall be either the force to raise the front or rear wheels or 200 N, whichever is the lesser force.

For vehicles with 2 or more separate and independent *operating device*s operate each *operating devices* such as to disengage each *locking devices* in turn and apply force F in the same manner as in (a) and (b) above.

The test is not conducted on vehicles whose test mass causes all *locking device*s to automatically re-engage.

The test is not conducted on vehicles that can only be folded after the *pram body* or *seat unit* or *car seat* has been removed.

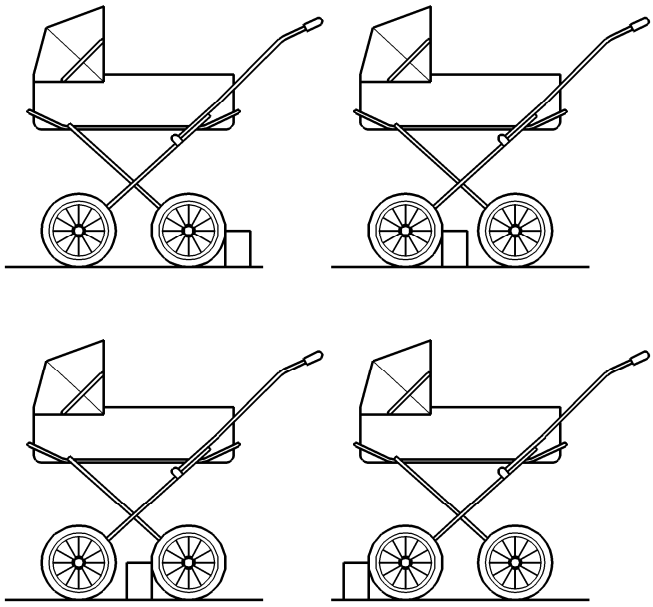


Figure 30 — Positioning of the stop

8.3.3.2 Pushchairs with rotating seat units

Pushchairs with rotating *seat units* on any axis shall be fitted with at least one automatic *locking device* to prevent inadvertent rotation.

8.3.3.3 Handle movement

8.3.3.3.1 Requirements for reversible handles

Any *locking device*(s) for the *reversible handle* shall be positioned so that it is not possible to operate more than one device in a single action.

To avoid the hazards due to inadvertent operation by the adult or operations by a child there shall be at least two *locking mechanisms*, which require:

a) two separate operations acting on two separate parts of the vehicle; or

b) two consecutive actions, the first being maintained while the second is carried out.

To avoid the hazards due to an unlocked handle at least one of the *locking mechanisms* shall engage automatically when the handle is in position of use.

When tested in accordance with:

— irregular surface test (8.10.3); and

— dynamic strength test (8.10.4); and

— handle strength test (8.10.6),

the *locking mechanism*(s) of the handle shall not be released.

8.3.3.3.2 Requirements for telescopic handles

Telescopic handles shall be fitted with devices to avoid inadvertent separation or detachment during use.

8.3.3.4 Requirements for the attachment *of* pram body and seat unit and car seats to the chassis

When the *pram body* or *seat unit* or *car seat* is attached to the *chassis* in accordance with the manufacturer's instructions, it shall be obvious to the carer that the *pram body, seat unit* or *car seat* is correctly placed and locked in position.

To avoid the hazards due to unintentional release of the *pram body* or *seat unit or car seat*, the weight of the child shall act against the detachment of the *pram body* or *seat unit* or *car seat* and one of the following requirements shall be fulfilled:

a) a minimum force of 50 N or a minimum torque of 0,34 Nm is required to release the attachment device attaching the *pram body* or *seat unit* or *car seat* to the *chassis*; or

b) at least 2 consecutive actions are required to release the *pram body* or *seat unit* or *car seat* or to release the attachment device, the first of which shall be maintained while the second is carried out; or

c) at least 2 independent simultaneous actions are required to release the *pram body* or *seat unit* or *car seat* or the attachment device; or

d) more than two independent actions are required to release the *pram body* or *seat unit* or *car seat.*

This shall be assessed with and without the test mass in the product. The pram body, the seat unit or the car seat shall not fall under their own weight when all the attachment devices are disengaged.

8.4 Entanglement hazards (see A.5)

Cords, strings and other narrow fabrics located inside the *pram body* or *seat unit* shall have a free length not exceeding 220 mm when a 25 N tensile force is applied. This requirement does not apply to the free lengths of the *restraint system*.

The maximum peripheral dimension of loops shall not exceed 360 mm when a 25 N tensile force is applied. This requirement does not apply to the *restraint system* and carrying handles.

8.5 Choking and ingestion hazards (see A.6)

8.5.1 Requirements

When tested in accordance with 8.5.2.1 and 8.5.2.2 any component or part of a component within the protected volume that is removed, whether intended to be removed without the use of a tool or not, shall not fit entirely within the small parts cylinder (5.6) in any orientation without compression.

Self-adhesive plastic labels shall not be used on the inside surfaces of a *pram body* or *seat unit*.

When tested in accordance with 8.5.2.3 no filling (rubber, plastic, foam, etc.) shall be detached from the bumper bar. If components indicate signs of detachment carry out tests in accordance with 8.5.2.1 and 8.5.2.2 at the position where the components show signs of detachment.

8.5.2 Test methods

8.5.2.1 Torque test

Apply a torque gradually to the component within a period of 5 s in a clockwise direction until either:

— a rotation of 180° from the original position has been attained; or

— a torque of 0,34 Nm is reached.

The maximum rotation or required torque shall be applied for 10 s.

The component shall then be allowed to return to a relaxed condition and the procedure repeated in an anticlockwise direction.

Where projections, components or assemblies are rigidly mounted on an accessible rod or shaft designed to rotate together with the projections, components or assemblies, during the test, the rod or shaft shall be clamped to prevent rotation.

If a component which is attached by a screw thread becomes loosened during application of the required torque, the torque shall continue to be applied until the required torque is exceeded or the component disassembles or it becomes apparent that the component will not disassemble.

When using clamps and test equipment care shall be taken not to damage the attachment mechanism or body of the component.

Check whether any component or part of a component that is removed during the test fits wholly within the small parts cylinder.

8.5.2.2 Tensile test

The tensile test shall be carried out on the same components as the torque test.

Attach a suitable clamp to the component, taking care not to damage the component or any part of the product.

Apply a tensile force of up to 90 N to the component to be tested. Apply the force gradually within a period of 5 s and maintain it for 10 s.

Check whether the component or any part of a component that is removed during the test fits wholly within the small parts cylinder.

8.5.2.3 Bite test

If the padding material of a bumper bar is encased by a cover that can be opened or removed by the child, the test procedure shall be performed on the padding material after the cover has been removed.

The test procedure comprises two stages:

Stage 1) pinch the materials of the bumper bar between finger and thumb and attach the bite tester, specified in 5.7 so as to "bite" the smallest amount of materials possible to allow contact with all four teeth and apply a pulling force of 50 N, maintaining it for 10 s, to the bite tester; then

Stage 2) open the jaws of the bite tester as far as possible and push it horizontally onto the bumper bar as far as the guide, allow the teeth to close on the bumper bar and apply a pulling force of 50 N, maintaining it for 10 s to the bite tester.

If, during the test procedure, the outer material of the bumper bar is punctured by the teeth, remove the outer material to expose the layer below or the filling and repeat stages 1 and 2 until the filling cannot be reached or no filling, (rubber, plastic or foam) becomes detached. As soon as any filling, (rubber, plastic or foam) becomes detached the test is terminated.

A puncture is defined as occurring when at least one tooth of the bite tester has broken the textile or plastic material to which it is being applied, the tooth passing through the entire thickness of the material, so that the 7 mm test probe can enter by more than 6 mm. Where the bite tester is applied to materials of a loose weave or open mesh, a puncture is defined as occurring when part of the weave or mesh is broken by at least one of the teeth of the bite tester. Should the teeth of the bite tester pass through materials of a loose weave or open mesh without damaging the material, a puncture has not occurred.

If the bumper bar is made of any soft material (e.g. foam) the test shall be directly applied to the material. Record if pieces of material are detached.

8.6 Suffocation hazards (see A.7)

8.6.1 Internal lining of the pram body and seat unit

Where the internal lining of a *pram body* or *seat unit* is made of plastic or of a plastic coated material it shall have a minimum thickness of 0,2 mm.

Where the internal lining of a *pram body* or *seat unit* is made of a fabric not coated with plastic it shall be tensioned so as not to present any suffocation hazard to the child.

8.6.2 Plastic packaging

Plastic bags and plastic sheeting used for packaging shall conform to one of the following requirements:

a) Bags made of flexible plastics with an opening perimeter greater than 360 mm used for external or internal packaging or plastic sheeting used for packaging, shall have an average sheet thickness of 0,038 mm or more when measured in accordance with EN 71-1 and shall not have a drawstring or cord as a means of closing; or

b) Bags made of perforated sheets or perforated plastic sheeting with an average thickness of less than 0,038 mm when measured in accordance with EN 71-1 and of an area greater than 100 mm $\times$ 100 mm shall be perforated with defined holes so that a minimum of 1 % of the area has been removed over any area of 30 mm $\times$ 30 mm; or

c) Any plastic covering used as packaging that does not fulfil the previous requirements shall be conspicuously marked in the official language (s) of the country where the vehicle is sold with a statement to indicate that any plastic cover should be removed, destroyed or kept away from children to avoid suffocation hazard.

8.7 Hazardous edges and protrusions (see A.8)

All exposed edges, surfaces and protrusions within the vehicle's protected volume shall be rounded or chamfered and free from burrs and sharp edges.

All other surfaces shall be free from burrs and sharp edges.

8.8 Parking and braking devices (see A.9)

8.8.1 Requirements

The vehicle shall be fitted with a *parking device*, the mechanism of which can be operated by the carer standing adjacent to the handle.

If the *parking device* or its operating mechanism is within the protected volume it shall be designed so that it cannot be operated by the child sitting within the vehicle. This requirement is met if:

a) a minimum force of 50 N or a minimum torque of 0,34 Nm is required to release the *parking device*; or

b) at least 2 consecutive actions are required to release the *parking device*, the first of which shall be maintained while the second is carried out; or

c) at least 2 independent simultaneous actions are required to release the *parking device*; or

d) at least 3 independent actions are required to release the *parking device*.

*Parking device*s on vehicles with swivelling or steering front wheel(s) shall be engaged simultaneously on all rear or front wheels or sets of wheels with a single action.

When tested in accordance with 8.8.2.2, 8.8.2.3 and 8.8.2.4 the vehicle shall remain static on the slope for a minimum of 1 min.

The maximum movement of any one wheel or set of wheels shall be 90 mm when tested in accordance with 8.8.2.5. This requirement does not apply to vehicles where the *parking device* acts directly on the tyre(s) and *parking device*s where there is no gap between different positions.

The *parking device* shall be tested in accordance with 8.8.2.2 to 8.8.2.5 both before and after undergoing the irregular surface test (8.10.3). The abrasion conditioning (8.8.2.6), if applicable, shall be performed after irregular surface test (8.10.3).

If the vehicle has a *braking device* the carer shall be able to activate the *braking device* when walking.

When *braking* and *parking device*s are combined in one mechanism, the action to activate the *braking device* shall be different from the action to activate the *parking device*. Braking action shall not activate the *parking device*.

Any platform shall not impede accessibility to the operating mechanism of the *parking device* or the braking device.

8.8.2 Test methods

8.8.2.1 General test conditions

Operate the *parking device* 200 times before carrying out the tests.

Position relevant test mass (es) as follows:

— in a *pram body* the test mass A or test mass B for *pram bodies* having an internal length greater than 800 mm when measured in accordance with 8.1.2.2 shall be placed centrally and in a horizontal position;

— in a group 0 *car seat* the test mass A and in a group 0+ *car seat* the test mass F shall be placed centrally against the backrest in such a way that its bottom edge is in contact with the seat/back *junction line*;

— in a *seat unit* the test mass B shall be placed centrally against the backrest in such a way that its bottom edge is in contact with the seat/back rest *junction line*;

— for vehicles fitted with a *platform*, the test shall be performed with test mass G uniformly positioned and secured so that the middle point of the base of the test mass G is on the centre line of the *platform* in the most perpendicular position with respect to the ground when the vehicle is positioned on the slope. If necessary wedges of negligible mass shall be used to maintain the position defined for the test mass G.

For positions in which the angle between the backrest and the seat is equal to or greater than 150°, test mass B shall be positioned such that the seat backrest *junction line* and transverse plane through the centre of the test mass coincide.

If the vehicle is designed for more than one child, use any number of appropriate masses, up to one in each position to be occupied by a child. Additional test load(s) shall be positioned centrally within any receptacle designed for carrying additional load(s). Any test mass and additional load shall be secured to prevent movement by using packing of negligible mass.

NOTE 1 The most onerous conditions for *parking device* tests may be obtained when the number of test masses placed in the vehicle is less that the number of children the vehicle is designed for.

If a vehicle is designed for more than one child and the *chassis* can accommodate *pram bodies*, *seat unit*s and/or *car seats*, combinations of these as described in the manufacturer's instructions for use and by product markings shall be loaded with appropriate test mass. The most onerous conditions for the test shall be established with regard to the combination of *pram* body, *seat unit* or *car seat.*

Any initial movement of the wheels on the slope shall be disregarded for test purposes.

NOTE 2 This movement may result from the interaction of the *parking device* and the vehicle and from the suspension and structural settlement.

8.8.2.2 Vehicle facing up the slope

Place the vehicle on the test surface (5.8) inclined at 9° facing up the slope. Engage the *parking device*.

If the vehicle is fitted with swivelling or steering wheels then:

— the swivelling or steering wheels opposite the handle shall be unlocked and placed in the position they would normally assume when the vehicle travels in the direction it is facing; and

— any lockable swivelling or steering wheels on the handle end shall be locked.

8.8.2.3 Vehicle facing down the slope

Repeat 8.8.2.2 with the vehicle facing down the slope.

8.8.2.4 Vehicle perpendicular to the slope

Place the vehicle at 90° to the direction of the slope on the test surface (5.8) inclined at 9°. Engage the *parking device*.

If the vehicle is fitted with swivel wheels, then:

— any swivel wheels on the handle end shall be locked;

— the swivel wheels opposite to the handle shall be unlocked and placed in the position they would normally assume when the vehicle travels in the direction it is facing.

8.8.2.5 Test for available wheel movement

Place the vehicle to be tested on the test surface (5.8) inclined at 9° facing up the slope and engage the *parking device*. Allow the vehicle to reach a state of equilibrium.

Using a rectangular stop, mark the position(s) of the down slope wheel(s) with a line perpendicular to the direction of the slope. Remove the stop.

Maintain the position of the vehicle by hand at the same time release the *parking device*(s). Allow the vehicle to move down the slope so that the *parking device* is engaged in the next position for use. Using the rectangular stop, mark the position(s) of the down slope wheel(s) with a line perpendicular to the slope.

Measure the distance between the two lines.

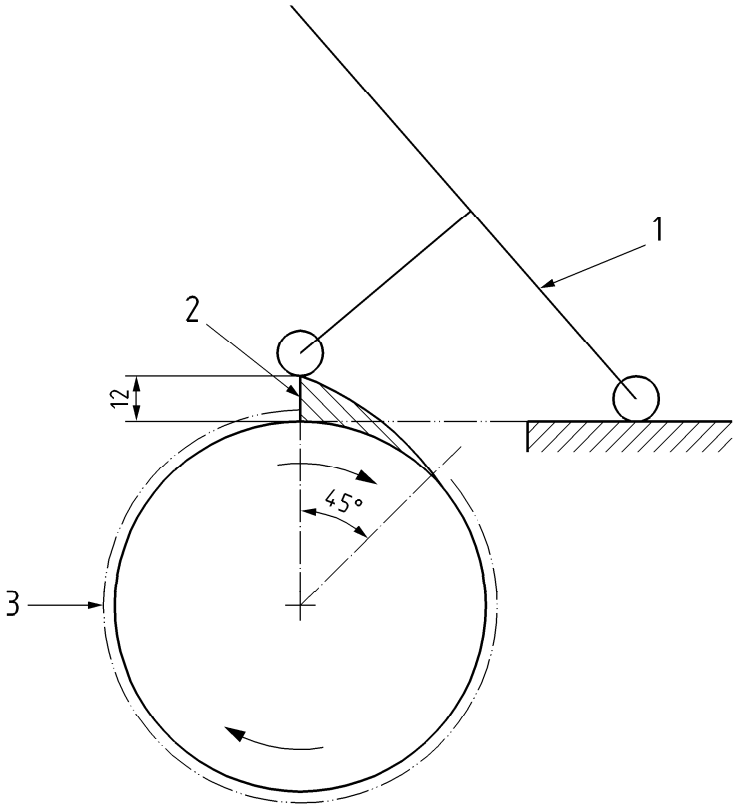
8.8.2.6 Abrasion conditioning

The abrasion conditioning shall be performed if the vehicle is fitted with a *parking device* which operates on the tyre(s) of the wheel(s) and it shall be carried out on the wheel(s) on which the *parking device* operates.

The abrasion conditioning shall be performed after the irregular surface test (8.10.3).

The abrasion conditioning shall be performed on a drum, the surface of which is capable of being run at a speed of $(5 \pm 0{,}1)$ km/h. The drum shall be covered with aluminium oxide paper of grade 80 with cam obstacles of 12 mm in height, as shown in Figure 31. New aluminium oxide paper shall be used for each test.

Dimensions in millimetres



Key

1 vehicle
2 cam obstacles
3 aluminium oxide paper of grade 80

Figure 31 — Abrasion conditioning

Place and secure:

— test mass A at the bottom of *pram bodies* having an internal length of 800 mm or less when measured in accordance with 8.1.2.2, or in group 0 *car seats*,

— test mass B for *pram bodies* having an internal length greater than 800 mm when measured in accordance with 8.1.2.2,

— test mass F on group 0+ *car seats* or

— test mass B on *seat unit*s.

The abrasion conditioning shall comprise 100 000 cam obstacles. The distance between obstacles shall be (400 0/+40) mm.

For vehicles having alternative arrangements the test shall be carried out for a total of 100 000 times with a minimum of 50 000 cycles in the *seat unit* arrangement, and for the remaining 50 000 cycles, with an equal number of cycles for each arrangement.

8.9 Stability (see A.10)

8.9.1 Stability of vehicle

8.9.1.1 Requirements

The vehicle shall not tip over when tested in accordance with 8.9.1.2. Any *pram* body or *seat unit* or *car seat* attachment device shall not become detached during the test.

8.9.1.2 Test procedure

8.9.1.2.1 Positioning of the vehicle

Place the vehicle loaded with the appropriate test mass(es) on the test surface inclined at an angle of 12° with the *parking device*(s) applied, firstly facing forward, then backward and then at right angles to the slope facing the opposite direction with the wheel(s) in the lower position on the slope resting against the 25 mm stop(s) (5.9).

NOTE If the vehicle passes over the 25 mm stop, use a stop with a minimum height that retains the vehicle on the test surface without affecting the test conditions.

Where the vehicle has swivelling or steering wheels they shall be placed in the most onerous position.

8.9.1.2.2 Stability of *prams* (for one child)

8.9.1.2.2.1 *Prams* (for one child) having an internal length of 800 mm or less

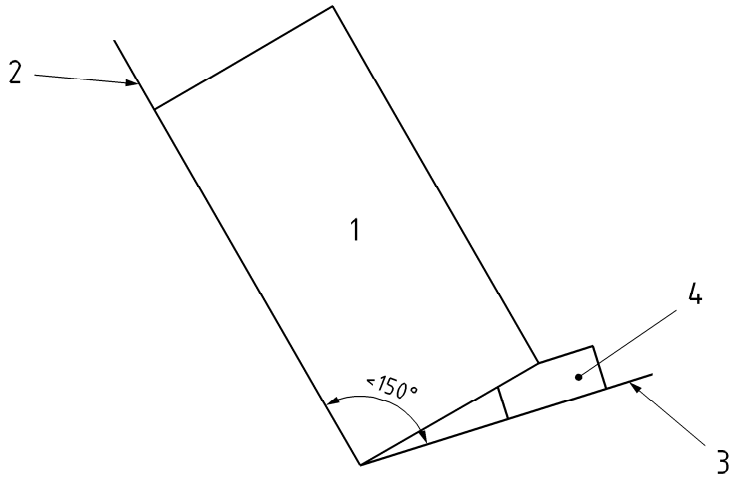
Load the *pram* with an internal length of 800 mm or less with test mass A, placed centrally in the *pram* body, within a tolerance of ± 10 mm so that the longitudinal and transverse axes of the *pram* body and test mass are aligned.

8.9.1.2.2.2 *Prams* (for one child) having an internal length greater than 800 mm

Load the *pram* with an internal length greater than 800 mm with test mass B placed centrally in the *pram* body, within a tolerance of ± 10 mm so that the longitudinal and transverse axes of the *pram* body and test mass are aligned.

8.9.1.2.3 Stability of pushchairs (for one child)

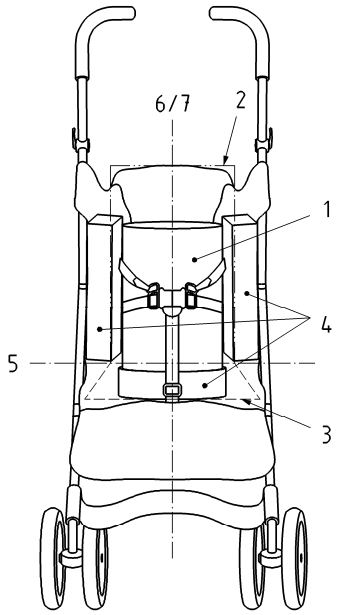
For positions in which the angle between the backrest and the seat is less than 150° when measured in accordance with 8.1.1.2.1, test mass B shall be placed against the backrest, the bottom edge of the test mass resting against the seat/back junction line. Where necessary in order to maintain the position of the test mass against the backrest use wedges of negligible mass to support the test mass (Figure 32a). The test mass is positioned centrally on the backrest such that the longitudinal axes of the test mass and backrest are aligned (Figure 32b).



Key

1 test mass B
2 back rest
3 seat unit
4 wedges of negligible mass

a) side view



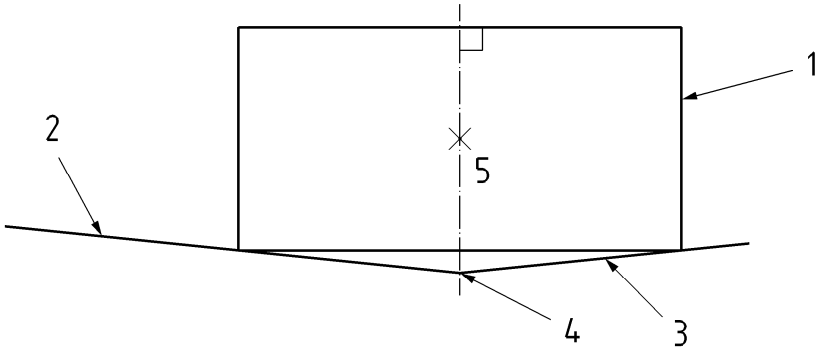
b) front view

Key

1 test mass B
2 backrest
3 seat
4 wedges of negligible mass
5 *junction line* of the seat and backrest
6 longitudinal axis of test mass
7 longitudinal axis of seat unit (centreline of seat)

Figure 32 — Positioning of test mass B in the seat unit for stability tests

For positions in which the angle between the backrest and the seat is equal or greater than 150°, test mass B shall be positioned such that the seat backrest *junction line* and transverse plane through the centre of the test mass coincide (see Figure 33).



Key

1 test mass B
2 reclined backrest
3 seat
4 junction of the seat base and the backrest
5 centre of gravity

Figure 33 — Positioning of test mass B for stability test of *pushchair*s in which the angle between the backrest and the seat is equal or greater than 150°

8.9.1.2.4 Stability of vehicles fitted with a car seat

Place test mass A in group 0 car seats and test mass F in group 0+ car seat positioned centrally on the backrest so that the bottom edge of the test mass is in contact with the lowest point inside the car seat. Where necessary in order to maintain the position of the test mass use wedges of negligible mass to support the test mass.

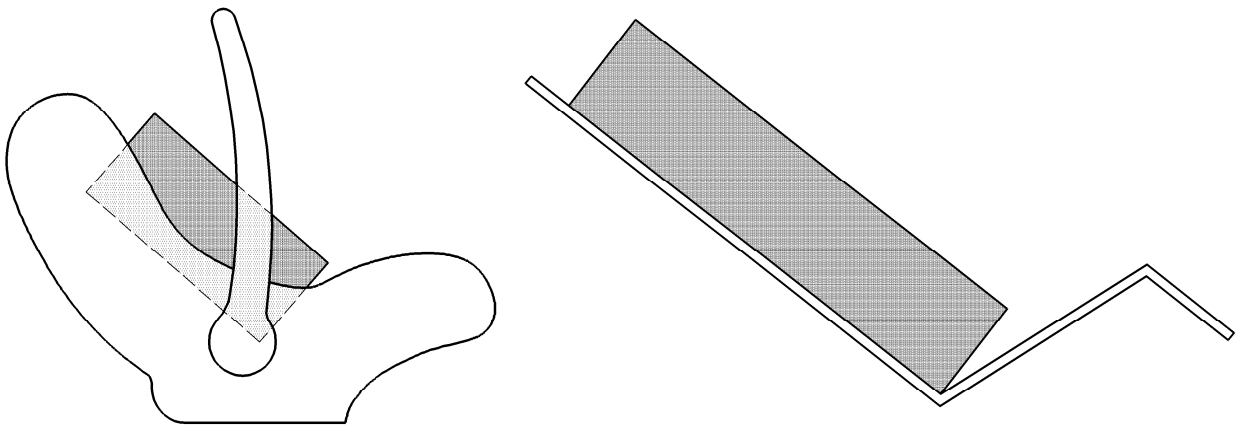


Figure 34 — Positioning of test mass A or test mass F for stability test of vehicles fitted with a car seat

8.9.1.2.5 Stability of vehicles for more than one child

If a *pram* is designed for more than one child, use any number of test masses, up to one in each place intended to be occupied by a child as described in 8.9.1.2.2.1 or 8.9.1.2.2.2.

If a *pushchair* is designed for more than one child, use any number of test masses, up to one in each place intended to be occupied by a child as described in 8.9.1.2.3.

If a vehicle is designed for more than one child and the *chassis* can accommodate *pram bodies*, *seat unit*s and/or car seats, combinations of these as described in the manufacturer's instructions for use and by product markings shall be loaded with appropriate test mass in accordance with 8.9.1.2.2. to 8.9.1.2.4. The most onerous conditions for the test shall be established with regard to the combination of *pram* body, *seat unit* or car seat.

NOTE The most onerous stability condition can occur when less than the total number of test masses is in the vehicle.

8.9.1.2.6 Stability of vehicles fitted with a platform

The test shall be carried out on a vehicle fitted with a platform with and without test masses A or B or F on the seat unit or pram body or car seat.

The vehicle is placed on a horizontal surface.

The backrest shall be placed in the most upright position.

Place and secure test mass G and fix it uniformly putting the middle point of the base of test mass G on the centre line of the platform. The test mass G shall be maintained along the platform with a rigid bar and both parts shall be maintained apart from each other by any connecting means of negligible mass.

Test mass G shall be positioned and fixed in such a way it is perpendicular to the test surface. Where the geometry of the vehicle does not allow test mass G to be in a vertical position it shall be placed in the most vertical position.

Apply a force of 50N vertically downwards in the middle of the handle. For separate handles connect handles with a rigid bar and apply the force in the middle of the bar.

8.9.2 Longitudinal stability of a pram body with carrying handles

8.9.2.1 Requirement

When tested in accordance with 8.9.2.2 the maximum angle of inclination of the pram body towards the head or foot shall be 10°.

8.9.2.2 Test procedure

Place test mass A in the geometric centre of the pram body. If the vehicle is designed for more than one child use any number of test masses, up to one in each place intended to be occupied by a child. Movement of the test mass (es) may be limited, if necessary, using any convenient means of negligible mass.

If the pram body has a hood, this shall be in the down position.

If the pram body has rigid handles take two equal lengths of 20 mm wide webbing and attach each length to the rigid handles to form webbing loops.

Suspend the pram body by either the handles or the webbing loops from a metal bar having a cross section of 40 mm $\times$ 40 mm with an external radius of approximately 5 mm.

If the pram body has a transverse handle suspend it by the handle from the metal bar previously described in such a way that the handle is perpendicular to the metal bar.

8.10 Structural integrity (see A.11)

8.10.1 Carrying handles and handle anchorage points of pram bodies and detachable seat units

8.10.1.1 Requirements

The attachment points or the top of the handles' maintaining device shall be located in a position which is at least three quarters of the height of the pram body, measured on the outside from the base.

When tested in accordance with 8.10.1.2 the anchorage points of the carrying handles of the pram body or of the detachable seat unit shall not break or be pulled out.

The integrity of the anchorage points shall have been maintained.

There shall be no permanent distortion or damage to any part of the pram body or of the detachable seat unit, or of the handles or points of attachment when these are tested in accordance with 8.10.1.2.

8.10.1.2 Test method

Place test mass C in the geometric centre of the pram body and load uniformly the pram body to a total mass of 38 kg, or to a total mass of 38 kg per child if designed for more than one child.

Load uniformly the detachable seat unit to a total mass of 38 kg, or to a total mass of 38 kg per child if designed for more than one child.

Suspend the pram body or seat unit by its handle(s) as described in 8.9.2.2 for 30 min.

8.10.2 Strength and durability of attachment devices for pram bodies or seat units or car seats

8.10.2.1 Requirements

After testing in accordance with 8.10.2.2 the devices used to connect the *pram* body or the *seat unit* or *car seat* to the *chassis* shall not become disconnected, loosened or show signs of damage during or after test and the *pram* body or *seat unit* or *car seat* shall not become detached from the *chassis*.

After testing in accordance with 8.10.2.2 any carrycot attached to a *seat unit* shall not become detached from the *seat unit*.

8.10.2.2 Test method

With the *pram* body or the *seat unit* or *car seat* mounted on the *chassis* operate the attachment devices securing the *pram* body or the *seat unit* or *car seat* to the *chassis* 200 times.

When a carrycot is attached to the *seat unit* operate the attachment device 200 times.

Place test mass A at the bottom of a *pram* body or group 0 car seat or test mass B in a *seat unit* or test mass F in a group 0+ car seat and secure it in a central position.

If the vehicle is designed for more than one child use any number of test masses, up to one in each position intended to be occupied by a child.

Attach the vehicle by its wheels or axles to a rigid platform which can be orientated in an axis parallel to the ground.

Slowly rotate the vehicle with the test mass through an angle of 100° to the horizontal both in a clockwise and anticlockwise direction such that the attachment devices alone transmit the test load to the *chassis* or *seat unit* (see Figure 35).

Maintain this position for 5 minutes in each direction.

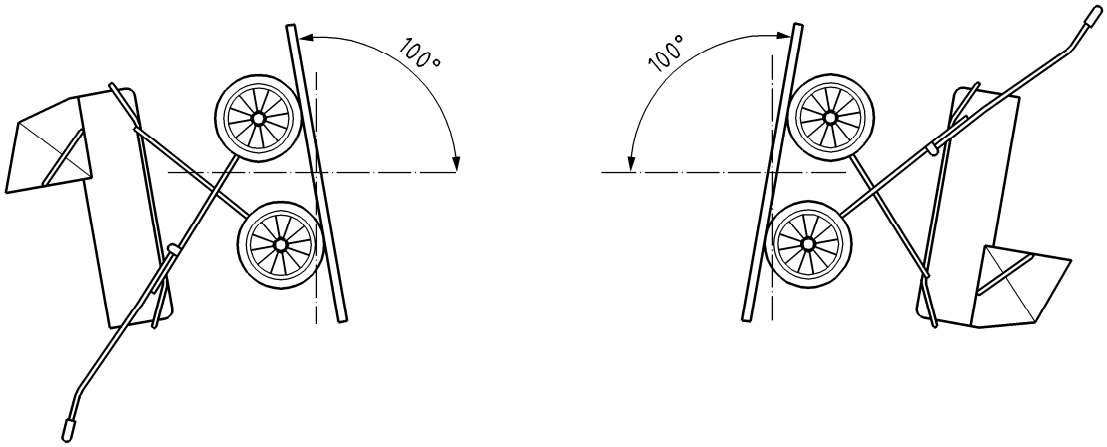


Figure 35 — Test for strength and durability of attachment devices for *pram bodies* and *seat unit*s and *car seats*

8.10.3 Irregular surface test

8.10.3.1 Requirements

When tested in accordance with 8.10.3.2 there shall be no break or deformation of any part of the product that can impair the safety of the vehicle. Signs of wear shall not be regarded as a failure.

The vehicle shall not collapse; the *locking mechanism*s and attachment devices shall still function as intended.

The devices used to connect the *pram* body or the *seat unit* or *car seat* to the *chassis* shall not become disconnected, loosened or damaged during or after testing.

After testing in accordance with 8.10.3.2 the vehicle shall still comply with the requirements of:

8.2 – entrapment hazards;

8.3 – hazards from moving parts;

8.8 – parking and braking device; and

8.9 – stability.

8.10.3.2 Test method

The vehicle shall be placed on the irregular surface test equipment (5.10) in a position so that the vehicle handle(s) can be attached to the independent articulating arms (5.10.2). The handle(s) shall be attached to the articulating arms initially positioned horizontally so that the free movement of the handle(s) is not restricted or controlled by the articulating arms. Where there are more than two handles the articulating arms shall be attached to the outer pair of handles.

Position relevant test mass (es) as follows:

— in a *pram body* the test mass A or test mass B for *pram bodies* having an internal length greater than 800 mm when measured in accordance with 8.1.2.2 shall be placed centrally and in a horizontal position;

— in a group 0 *car seat* the test mass A and in a group 0+ *car seat* the test mass F shall be placed centrally against the backrest in such a way that its bottom edge is in contact with the seat/back *junction line*;

— in a *seat unit* the test mass B shall be placed centrally against the backrest in such a way that its bottom edge is in contact with the seat/back rest *junction line,* Restrain the test mass with the *restraint system* and any appropriate strap if needed.

Place any adjustable backrest of seat units in the most upright position.

If the vehicle is designed for more than one child use any number of appropriate test masses, up to one in each place intended to be occupied by a child.

Swivelling or steering wheels shall be unlocked.

The maximum movement of the test mass during set up shall be limited to 50 mm in any direction by the use of straps linking the anchorage points on the test mass to the attachment points on the vehicle.

NOTE To enable the vehicle to remain central on the irregular surface test equipment during the test, side straps may be used to guide the vehicle with a minimum of tension applied to the vehicle. The straps should be attached horizontally to the front legs of the vehicle and the side and/or the front of the irregular surface test equipment.

The vehicle shall pass over the configuration shown in Figure 25 a total of 72 000 times at a speed of 5 km/h ± 0,1 km/h.

For vehicles having alternative arrangements, the test shall be carried out for a total of 72 000 times, with a minimum of 48 000 cycles in the *seat unit* arrangement, and for the remaining 24 000 cycles, with an equal number of cycles for each arrangement.

For vehicles fitted with a *platform*, half of the total number of cycles: i.e. 36.000 shall be performed placing and securing two masses of 10 kg each, fixed uniformly about the centre line on the *platform.* The test masses used shall not break the platform due to their shape or material.

8.10.4 Dynamic strength

8.10.4.1 Requirements

When tested in accordance with 8.10.4.2 there shall be no visible damage to the vehicle. The vehicle shall not collapse; the *locking mechanism*s and attachment devices shall still function as intended.

The devices used to attach the *pram* body or the *seat unit* or the *car seat* to the *chassis* shall not become detached, loosened or damaged during or after testing.

After testing in accordance with 8.10.4.2 any carry cot attached to the *seat unit* shall not become detached from the *seat unit*.

The *pram* body or the *seat unit* or the *car seat* shall not be displaced by more than 10 mm on the *chassis* after testing in each direction in accordance with 8.10.4.2. This requirement does not apply to soft carry cots attached to a *seat unit* or in a *pram* body.

8.10.4.2 Test method

Position relevant test mass (es) as follows:

— in a *pram body* the test mass A or test mass B for *pram bodies* having an internal length greater than 800 mm when measured in accordance with 8.1.2.2 shall be placed centrally and in a horizontal position;

— in a group 0 *car seat* the test mass A and in a group 0+ *car seat* the test mass F shall be placed centrally against the backrest in such a way that its bottom edge is in contact with the seat/backrest *junction line*;

— in a *seat unit* the test mass B shall be placed centrally against the backrest in such a way that its bottom edge is in contact with the seat/backrest *junction line,* Restrain the test mass with the *restraint system* and any appropriate strap if needed.

Place any *seat unit(s)* adjustable backrest(s) in the most upright position.

If the vehicle is designed for more than one child use any number of appropriate test masses, up to one in each place intended to be occupied by a child.

Position the vehicle as shown in Figure 36. Release the vehicle and allow it to run freely down the slope, against a rigid stop made of steel and which is at least equal to the height of the axle of the wheels of the vehicle.

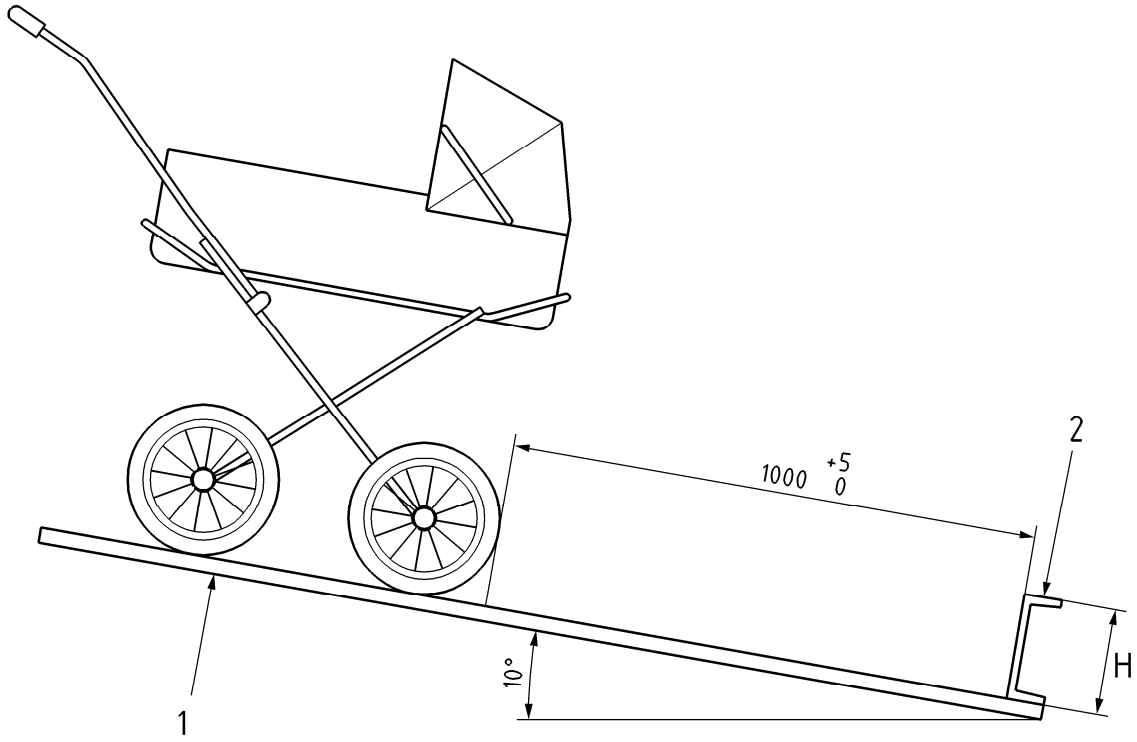
Carry out the test for a total of 10 times and check the displacement of the *pram* body or *seat unit* or *car seat*.

During test the vehicle shall be prevented from tipping over.

If the *pram* body or *seat unit* or *car seat* has moved, reposition the *pram* body or *seat unit* or *car seat* to its original position before testing in the backwards direction.

Repeat the test with the vehicle facing in the reverse direction and check the displacement of the *pram* body or *seat unit* or *car seat*.

Dimensions in millimetres



Key

1 rigid and flat surface
2 stop made of steel
H at least the height of the axle of the wheels

Figure 36 — Dynamic strength test

8.10.5 Wheel strength

8.10.5.1 Requirements

After testing in accordance with 8.10.5.2 removable or fixed wheels shall remain attached to the axle and shall show no distortion that impairs the safety of the vehicle and the wheel assembly shall function as intended.

8.10.5.2 Test method

Removable wheels shall be fitted and removed 200 times. Each type of removable wheel assembly shall be tested.

Place the wheel and the axle in a holding device. Gradually apply a force of 200 N in a direction that would remove the wheel or wheel assembly and maintain it for (120 ± 1) s.

8.10.6 Handle strength

8.10.6.1 Requirements

After testing in accordance with 8.10.6.2.2 there shall be no structural failure of the handle or any part of the vehicle that impairs its safety and the vehicle shall still conform to the requirements of 8.3.1.

After testing in accordance with 8.10.6.2.3 adjustable or reversible handles or part of handles shall not be detached, any attachment point of the reversible handle shall not be released or broken.

During testing in accordance with 8.10.6.2.4 the end stops shall prevent the release of telescopic handles or part of the handle.

8.10.6.2 Test methods

8.10.6.2.1 General test conditions

Before testing in accordance with 8.10.6.2.2 and 8.10.6.2.3 reversible handles shall be reversed 200 times, each time engaging the *locking mechanism*.

8.10.6.2.2 Durability test

Position the vehicle on a horizontal surface without the *parking device* applied.

Position relevant test mass (es) as follows:

— in a *pram body* the test mass A or test mass B for *pram bodies* having an internal length greater than 800 mm when measured in accordance with 8.1.2.2 shall be placed centrally and in a horizontal position;

— in a group 0 *car seat* the test mass A and in a group 0+ *car seat* the test mass F shall be placed centrally against the backrest in such a way that its bottom edge is in contact with the seat/back *junction line*;

— in a *seat unit* the test mass B shall be placed centrally against the backrest in such a way that its bottom edge is in contact with the seat/back rest *junction line,* Restrain the test mass with the *restraint system* and any appropriate strap if needed.

Place any seat unit(s) adjustable backrest(s) in the most upright position.

If the vehicle is designed for more than one child use any number of appropriate test masses, up to one in each place intended to be occupied by a child.

Alternately raise and lower the handle(s) by applying a vertical force to the handle so that the rear wheels and front wheels in turn are raised (120 ± 10) mm, measured at the start of the test from the floor and then lowered in a controlled manner without pause (see Figure 37).

Carry out the test for a total of 10 000 cycles at a frequency of (15 ± 2) cycles/min.

Where the downwards force necessary to lift the front wheels exceeds 450 N, carry out the test by applying alternately a downwards 450 N force and an upwards force necessary to raise the rear wheels for 3 000 cycles at a frequency of (15 ± 2) cycles/min, then continue the test by only raising the rear wheels (120 ± 10) mm for additional 7 000 cycles at a frequency of (15 ± 2) cycles/min.

For vehicles having alternative arrangements the test shall be carried out a total of 10 000 cycles, with an equal number of cycles for each arrangement.

For vehicles fitted with a *platform*, place and secure uniformly 2 masses of each 10 kg about the centre line on the *platform*.

Dimensions in millimetres

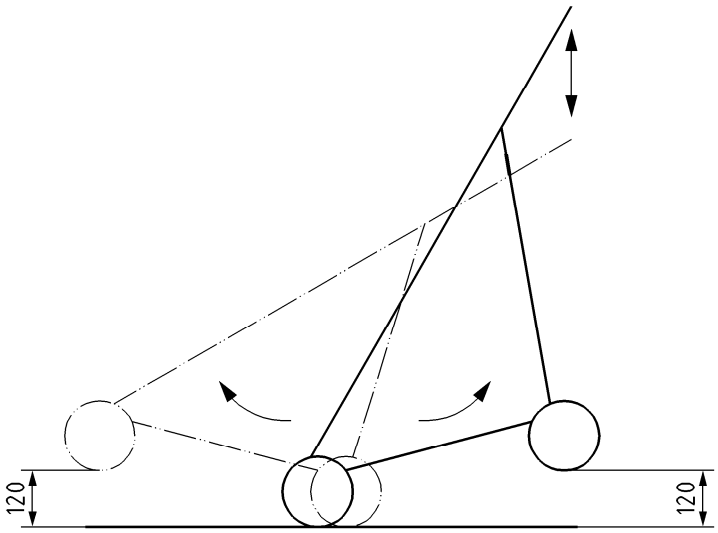


Figure 37 — Motion of the vehicle during handle test

8.10.6.2.3 Dynamic resistance of reversible and/or adjustable handles

Restrain the vehicle in such a way that any existing suspension does not absorb any movement and force when moving the handle.

All automatic handle *locking device*s shall be locked.

If a vehicle is equipped with any extra *locking device*s that need to be activated manually to secure the reversible handle the handle test shall be performed without the extra *locking device* attached.

Attach a steel cable at the handle, 200 mm off centre or, in the case of individual handles, to one handle, or, if the measurement is not possible, in the most onerous position.

Lead the cable via pulleys in such a way that a force at an angle of 90° in the direction of the movement of the handle can be applied. Attach test mass B to the other end of the cable and allow it to hang down freely (see Figure 38).

Allow the mass to reach a state of equilibrium.

Lift the mass vertically 100 mm and release.

Repeat the test with the cable attached at the other side of the handle or on the other single handle.

Reverse the handle(s) and repeat the above procedure.

Dimensions in millimetres

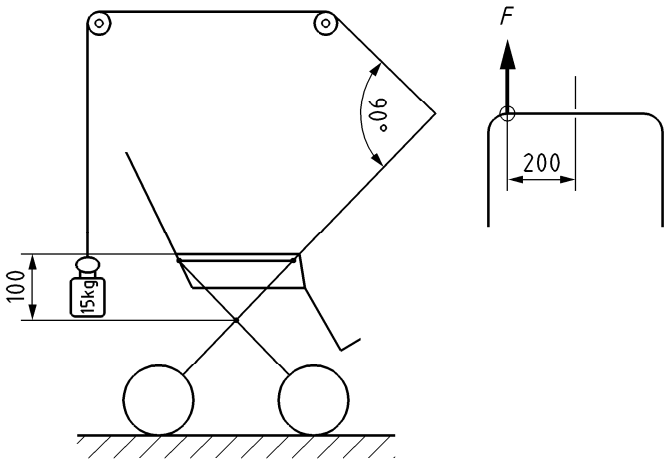


Figure 38 — Test for dynamic resistance for the handle

8.10.6.2.4 Dynamic resistance of telescopic handles

Restrain the vehicle in such a way that any existing suspension does not absorb any movement and force when moving the handle.

All handle *locking device*s shall be locked.

Adjust the handle to its maximum length. If a vehicle is equipped with any extra *locking device*s that need to be activated manually to secure the handle the handle test shall be performed without the extra *locking device* attached.

Attach a steel cable at the handle, 200 mm off centre or, in the case of individual handles, to one handle, or, if the measurement is not possible, in the most onerous position.

Lead the cable via pulleys in such a way that a force can be applied in the direction of the longitudinal axis of the handle. Attach test mass B to the other end of the cable and allow it to hang down freely (see Figure 39).

Allow the mass to reach a state of equilibrium.

Lift the mass vertically 100 mm and release.

Repeat the test with the cable attached at the other side of the handle or on the other single handle.

Dimensions in millimetres

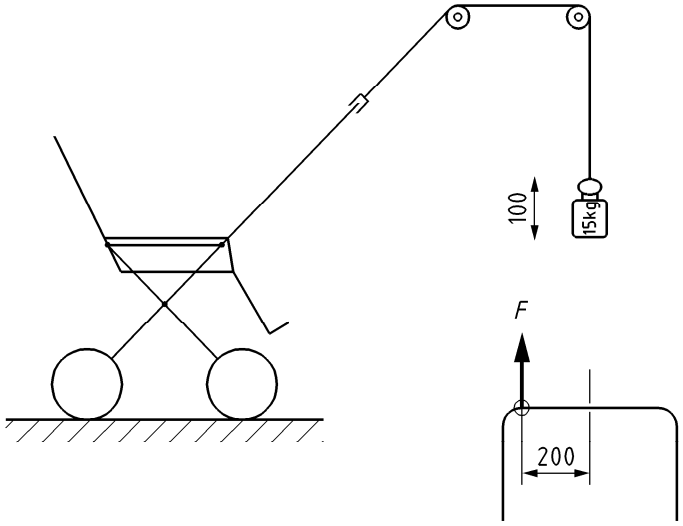


Figure 39 — Test for dynamic resistance for telescopic handle(s)

9 Durability of marking

Any permanent labels shall be rubbed with a cotton cloth moistened with water for 20 s.

After rubbing the text shall still be clearly legible.

10 Product information

10.1 General

All product information as required in this standard shall be provided in the official language(s) of the country of sale.

Warning sentences shall be written in letters whose upper case shall be at least 2,5 mm in height. The word "WARNING" shall be written in upper case.

For inflatable tyres the maximum pressure shall be marked on the tyre or in the instructions for use.

10.2 Marking of product

The vehicle shall be legibly, visibly and permanently marked with at least the following:

The word WARNING! can be given at the top of a list of warnings:

10.2.1 Name or trademark of the manufacturer, importer or organisation responsible for its sale. Where a vehicle can be sold in separate parts such as *chassis* and/or *pram* body and/or *seat unit*, each part shall be marked.

10.2.2 Means to identify the model. Where a vehicle can be sold in separate parts such as *chassis* and/or *pram* body and/or *seat unit*, each part shall be marked.

10.2.3 The warning:

"WARNING Never leave your child unattended."

This warning shall be visible when using the product.

10.2.4 *Pram bodies* having an internal length greater than 800 mm, as defined in 8.1.2.2, shall have a label stating:

"WARNING Use a harness as soon as your child can sit unaided."

10.2.5 Vehicles that are not suitable for children under 6 month in accordance with 8.1.1.1.1, shall have a label visible during folding, unfolding or adjustment of the vehicle stating:

"WARNING This *seat unit* is not suitable for children under 6 months."

10.2.6 *Seat unit*s shall be marked with the following warning:

"WARNING Always use the restraint system"

For seat units complying with 8.1.1.1.1 b) the warning shall be visible only when the vehicle is used as a pushchair.

10.2.7 *Pram bodies* shall have an indication of the maximum height of the mattress, to ensure compliance with the minimum internal height requirements (8.1.2.1) unless a mattress is provided. In that case, the manufacturer shall clearly indicate that no additional mattress shall be added.

10.2.8 The number and date of this European Standard.

10.3 Purchase information

The manufacturer, importer or organization responsible for the sale of the vehicle shall provide the following information to be clearly visible at the point of sale.

10.3.1 Information concerning the weight, age and/or ability of the child for which the vehicle is suitable (up to 15 kg).

10.3.2 The warning

"WARNING This product is not suitable for running or skating."

10.3.3 For *pram bodies* with a length of 800 mm or less, provide a statement that the product shall not be used, as soon as the child is able to sit by himself:

"This product is suitable for a child who cannot sit up unaided, roll over and cannot push itself up on its hands and knees. Maximum weight of the child: 9 kg"

This requirement does not apply to pram bodies complying with ECE44.

10.4 Instructions for use

Instructions concerning safe use of the vehicle shall be provided in the form of instruction sheet, instruction manual, leaflet or other similar physical support. These instructions shall include at least the following and shall be headed as follows:

"Important – Keep these instructions for future reference"

10.4.1 The following warnings shall be provided, in the form given.

— **"WARNING Never leave your child unattended."**

— **"WARNING Ensure that all the locking devices are engaged before use."**

— **"WARNING To avoid injury ensure that your child is kept away when unfolding and folding this product."**

— **"WARNING Do not let your child play with this product"**

— For *pram bodies* having a length greater than 800 mm: **"WARNING Use a harness as soon as your child can sit unaided."**

— If applicable, **"WARNING This seat unit is not suitable for children under 6 months"**

— If applicable, **"WARNING Always use the restraint system"**

— **"WARNING Check that the pram body or seat unit or car seat attachment devices are correctly engaged before use."**

— **"WARNING This product is not suitable for running or skating."**

The word WARNING! can be given at the top of a list of warnings:

10.4.2 The following information shall be given.

— The name or trade mark of the manufacturer, importer or organization responsible for its sale.

— Means to identify the product.

— Information concerning the weight, age and/or ability of the child for which the vehicle is suitable (up to 15 kg).

— Pushchair designed to be used from birth shall recommend the use of the most reclined position for new born babies.

— Instructions for initial assembly, folding and erection, if applicable.

— A statement of compatibility between *chassis* and *pram* body and/or *seat unit* and/or *car seat*, if applicable.

— Instructions for *pram bodies* shall indicate the maximum height of the mattress, to ensure compliance with the minimum internal height requirements (see 8.1.2.1) unless a mattress is provided. In that case, the manufacturer shall clearly indicate that no additional mattress shall be added unless recommended by the manufacturer.

— Instructions covering all functions of the vehicle.

— Instructions for operating parking and/or *braking device*(s).

— An instruction that the *parking device* shall be engaged when placing and removing the children.

— For vehicles fitted with load carrying accessory (ies), details of the maximum permissible load.

— A statement that any load attached to the handle and/or on the back of the backrest and/or on the sides of the vehicle will affect the stability of the *vehicle.*

— Instructions for routine inspection, maintenance, cleaning and/or washing.

— A statement that the vehicle shall be used only for up to the number of children for which it has been designed.

— Any additional seat shall clearly indicate its compatibility to a specific vehicle.

— A statement that accessories which are not approved by the manufacturer shall not be used.

— If fasteners and adjustment devices of a *restraint system* are removable information on how to re assemble them.

— Instructions for the use or not of the restraint system if the seat unit is suitable for use from birth, including how to remove, to cover or to hide the restraint system for vehicles complying with 8.1.1.1.1 b)

— Instructions for use of the harness attachment points and any integral harness.

— Any other information for safe usage if relevant.

— Instruction concerning safe use of a platform together with an indication of weight of the child (up to 20 kg)

— For *pram bodies* with a length less than 800 mm, a statement that the product shall not be used, as soon as the child is able to sit by himself**: "This product is suitable for a child who cannot sit up by itself, roll over and cannot push itself up on its hands and knees. Maximum weight of the child: 9 kg"**

  This requirement does not apply to pram bodies complying with ECE44.

— For *pram bodies*, a statement that carrying handles shall be left out of the *pram body* during use.

— For car seats used in conjunction with a chassis, this vehicle does not replace a cot or a bed. Should your child need to sleep, then it should be placed in a suitable pram body, cot or bed.

— Only replacement parts supplied or recommended by the manufacturer/distributor shall be used.

Annex A
(informative)

Rationales

A.1 General

This informative annex has been included with the purpose of providing the rationales for the inclusion of some of the requirements given in this standard.

Where appropriate, relevant clause numbers in the standard are given in this annex and the relevant reference for the annex is given in the normative part of the standard.

A.2 Chemical hazards (see Clause 6)

Children up to the age of 24 months spend a considerable amount of time both mouthing and chewing. It is important that quantities of certain elements, which may have a harmful effect if a child has access for mouthing and chewing, should be limited.

A.3 Thermal hazards (see Clause 7)

In the case of *wheeled child conveyances*, the probability that the child will come close to or be in contact with a source of ignition is low. However, if the vehicle should come close to, or be in contact with an ignition source, the carer shall be able to remove the child before injury occurs. Therefore, it was considered that flash effect needs to be addressed.

A.4 Mechanical hazards (see Clause 8)

A.4.1 General

Linked to the following concerns, the age and ability of the child have been considered as well.

A.4.2 Protective function (see 8.1)

As children are at risk from falling out of the vehicle, this has been addressed within this clause of the standard. Therefore, requirements for *pram bodies* defined in 3.2, effective *restraint system*s and harness attachment points have been included in the body of the standard.

A.4.3 Entrapment hazards (see 8.2)

Entrapment hazards occur when a child becomes trapped in a static gap and the child does not have the ability to extract itself. These hazards should not be confused with those gaps between moving parts where a child's finger or flesh could become crushed or severed.

Entrapment of a child's fingers in static openings may cause loss of blood supply to the tips of the fingers.

Requirements for the size of the gap between the handle and a *pram* body has been specified to reduce the risk of a child's torso slipping into the gap and the child becoming trapped by its neck with potential risk of strangulation.

A.4.4 Hazards from moving parts (see 8.3)

Hazards from moving parts are related to products and rigid parts of products that move in use. The hazard relates to either the whole of the child's body or parts of the body. A child's body may be crushed if a product collapses around the child. A child's finger may be crushed, cut or even severed if the fingers become trapped between parts of a product that move. Scissoring effects have been considered as well.

Compression points may exist if one component can move relative to another part reducing the separation between the components. This risk is most severe if parts move under loads such as body weight, component weight or the application of powered mechanisms.

Requirements for the *folding system* of the *chassis* to be locked in the position of use and to be protected against accidental release by the child or the adult have been specified. The force of 150 N or the torque of 2,2 Nm are applied to the *locking mechanism* (8.3.3.1.1.3) to check if it can be released by an unintentional single action (e.g. pull in a diagonal direction instead of pulling on one side and the upwards or rotate the *locking mechanism* without pressing its locking button).

Locking mechanisms are required to prevent a reversible handle from releasing when pulling the vehicle over a step whilst a child is in the vehicle.

Requirements for removable *pram bodies* and seats to be locked against accidental release by the child or the adult and for adjustable handles to be locked against accidental release by the child or the adult have been specified.

A.5 Entanglement hazards (see 8.4)

If cords, ribbons and narrow fabrics are sufficiently long to encircle a child's neck there is a risk of strangulation. Loops which can pass over a child's head also present a risk of strangulation.

A.6 Choking and ingestion hazards (see 8.5)

Choking is a serious hazard which can occur when a child's internal airways are blocked and its breathing is impeded so that air cannot pass into the lungs, which can lead to brain damage.

Ingestion hazards result from small components passing into the child's digestive system, which may cause toxic contamination or an internal blockage or lacerations.

The requirements given limit the size of components on the *wheeled child conveyance* that are either detachable or could be pulled off by the child.

A.7 Suffocation hazards (see 8.6)

If a child's external airways, mouth and nose are blocked simultaneously, air cannot pass into the child's lungs and brain damage can occur.

Requirements are given for the internal lining of a *pram* body or *seat unit* either plastic or coated with plastic to ensure it is sufficiently thick so that it cannot mould over the child's face and to ensure that any fabric lining is not so loose that it covers the child's face.

A.8 Hazardous edges and protrusions (see 8.7)

Sharp edges and protrusions on the *wheeled child conveyance* could cause cuts, lacerations or abrasions to a child's skin. Sharp points could puncture a child's skin or eye.

A.9 Parking and braking devices (see 8.8)

*Parking device*s are to maintain the vehicle in a stationery position whereas *braking device*s are to slow the vehicle when being pushed by the carer.

Requirements have been given to ensure *parking device*s are accessible to the carer during use and are designed so that they cannot be operated by the child within the vehicle.

A.10 Stability (see 8.9)

Hazards associated with a vehicle tipping over and injuring a child in the vehicle are addressed by specific requirements for the vehicle stability.

It has been considered that the stability of the vehicle may be affected by adding additional loads and using accessories or features mounted on the product.

A.11 Structural integrity (see 8.10)

If the *locking mechanism* of a reversible, adjustable or telescopic handle releases unintentionally when pulled or pushed over a step or a curb, the vehicle may tip over and the child could fall out of the vehicle.

If a handle breaks off when the vehicle is pulled or pushed over a step or a curb, the vehicle may tip over or roll away and the child could fall out of the vehicle.

Requirements have been given to ensure any *pram* body and *seat unit* is securely attached to the *chassis*.

The irregular surface test has been included to replicate the overall use of the vehicle on both even and uneven surfaces.

The dynamic strength test is to replicate situations where the vehicle hits stationary objects.

Annex B
(informative)

Examples of articulated arms to maintain the vehicle on the rig for the irregular surface test

Some examples of articulated arms are given in Figure B.1.

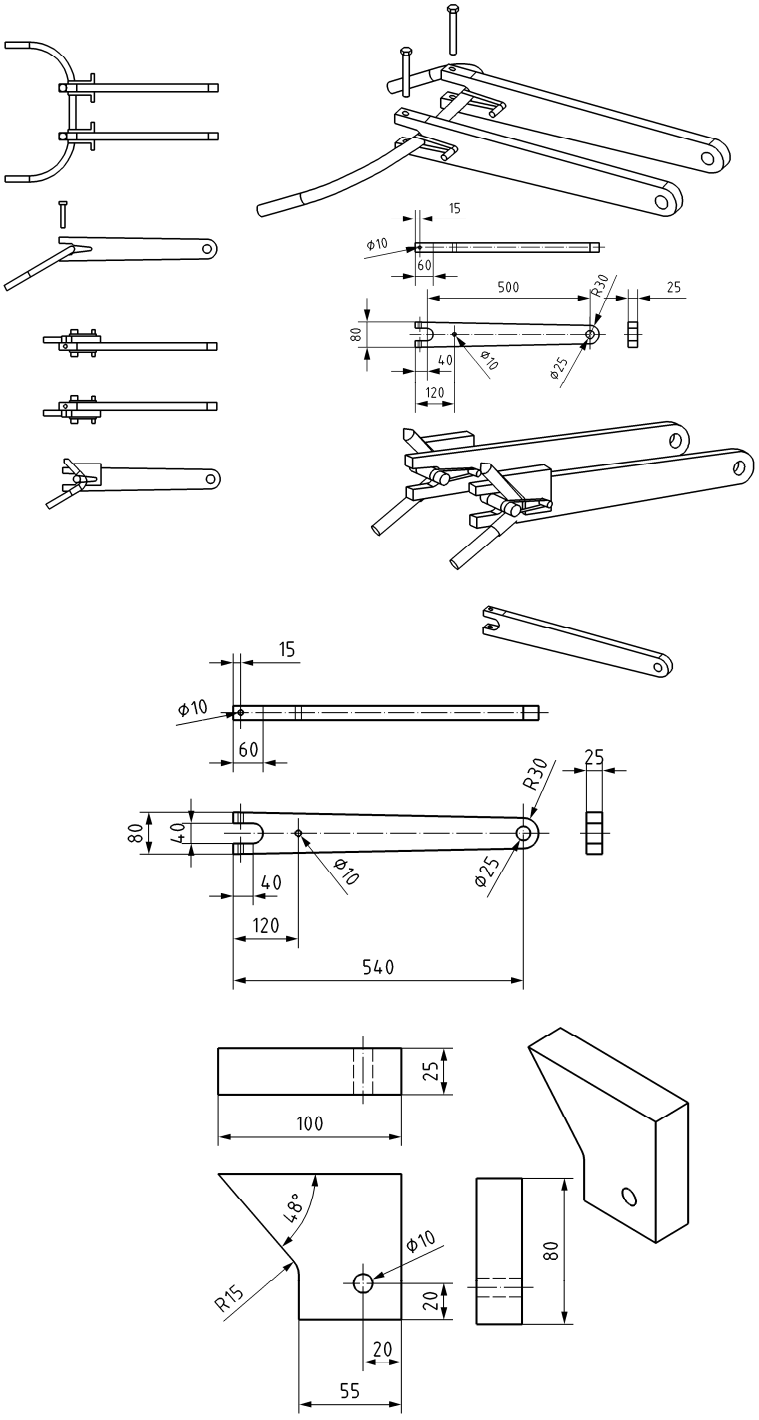


Figure B.1 — Examples of articulated arms to maintain the vehicle on the rig for the irregular surface test

Annex C
(informative)

Guideline for the application of 8.3.3.1.1.3 "Unintentional release of locking mechanism(s)"

C.1 Relevant definitions

Relevant definitions are given in Clause 3.

C.2 Guidelines for the application of 8.3.3.1.1.3 "Unintentional release of locking mechanism(s)"

C.2.1 General

Vehicles have locking mechanism(s) with different numbers of *operating device*(s) intended to be operated by the carer.

Requirements for unintentional release of locking mechanism(s) have been defined taking into account the number of the *operating device*s provided to release the locking mechanism(s). This therefore reduces the probability of releasing the locking mechanisms unintentionally.

There may be products for which, due to the number and features of the *operating device*s, there may be doubts on the suitable requirements apply – e.g. (a) or (b), (b) or (c), …. C.2.4 provides guidance on such cases.

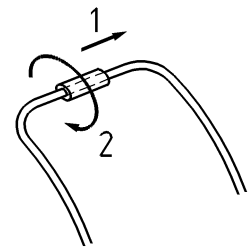
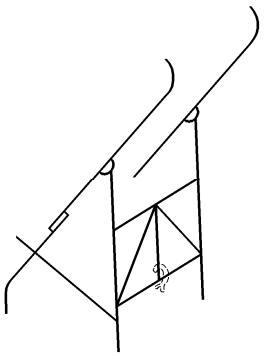
C.2.2 Products fitted with one single *operating device* (products that may be fold using only one hand)

Products having a single *operating device* (see Table C.1) are considered to prevent the unintentional release of locking mechanism(s) if they meet specific condition 8.3.3.1.1.3 (a), that means they satisfy both the following conditions:

— the *operating device* requires two consecutive actions, the first of which is maintained while the second is carried out; and

— it is not possible to skip one or both required actions by applying a certain force or torque on the device (e.g. to pull a lever without the need to push the interlocking button; to rotate a knob without sliding the interlocking button; to pull a lever in a diagonal direction even if it is designed to be pulled and then pushed sideways).

Table C.1 — Examples of locking mechanisms with one operating device

	How to release Slide button (1) and then rotate knob (2). Meets condition 8.3.3.1.1.3 (a) only if the knob cannot be rotated with the specified torque without sliding the button.
	How to release Double operation on cross bar linkage (slide the lever and lift the cross bar). Meets condition 8.3.3.1.1.3 (a) only if the cross bar linkage cannot be lifted with the specified force without sliding the lever (e.g. by applying that force directly to the lever in a diagonal direction).

C.2.3 Products fitted with two operating devices

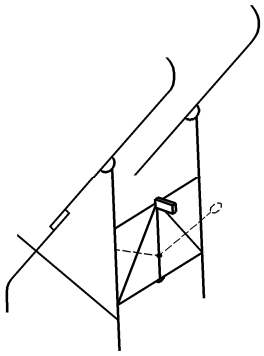
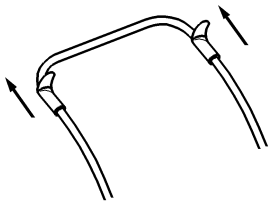
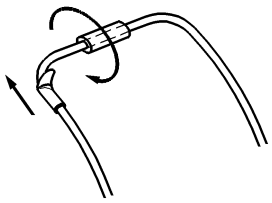
Two separate and independent *operating device*s (see Table C.2) are considered as enough to prevent unintentional release of locking mechanism(s) if they meet conditions 8.3.3.1.1.3 (b), which means that at least one of the conditions (i) or (ii).

Condition (i) applies to products for which at least one of the *operating device*s is intended to be operated by foot.

It is foreseeable that the carer unintentionally activates the *operating device*. Therefore it was considered the probability of having at any time at least one *locking device* engaged that prevents unintentional folding of the vehicle is very high if at least the *operating device* activated by the foot automatically returns to its original status and the locking device re-engages.

Condition (ii) applies to products for which both *operating device*s are intended to be operated by hand. It is foreseeable that the carer unintentionally activates one of both *operating device*s (e.g. by playing with them while using the product); for this reason it is required that both *locking device*s should automatically reengage when tested in accordance with 8.3.3.1.2.3.

Table C.2 — Examples of locking mechanisms with two operating devices

	How to release Lift the rear cross and then push the pedal by foot. Meets condition 8.3.3.1.1.3 (b) (i) if the pedal intended to be operated by foot automatically returns to its original status when tested in accordance with 8.3.3.1.2.3.
	How to release Pull both the triggers on the handle. Complies with 8.3.3.1.1.3 (b) (ii) only if both the *operating device*s automatically reengage when tested in accordance with 8.3.3.1.2.3.
	How to release Pull the trigger on the handle and simultaneously rotate the knob. Meets condition 8.3.3.1.1.3 (b) (ii) only if both the *operating device*s automatically reengage when tested in accordance with 8.3.3.1.2.3.

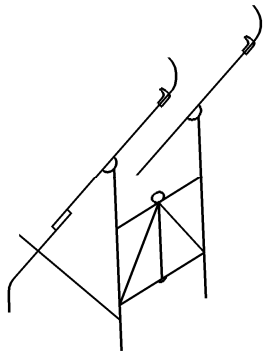
C.2.4 Products having three or more *operating device*s

Three or more separate and independent *operating device*s (see Table C.3) are considered enough to prevent unintentional release of locking mechanism(s) if at least one of them cannot be operated by the child sitting in the vehicle. For this reason, it is required that at least one of the following conditions is met:

— at least one of the *operating device*s should be outside the protected volume; or

— if all the *operating device*s are inside the protected volume, at least one of them requires a force greater than 50 N to be operated.

Table C.3 — Examples of locking mechanisms with three or more operating devices

	How to release Pull both the triggers on the handle and lift the rear cross. Meets condition 8.3.3.1.1.3 (c) if at least one of the three *operating device*s (one of the triggers or the rear cross) is outside the protected volume or requires at least 50N to be operated.

C.2.5 Products covered by different requirements

There are cases in which a doubt may arise on which suitable condition is to be applied is (e.g. a vehicle fitted with two *operating device*s one of which requires a double action to be operated; a vehicle with 3 *operating device*s two of which automatically return in their original status when operated, …).

In these cases, it is enough when the vehicle meets at least one of the set of conditions (a), (b), or (c).

EXAMPLE Consider a product fitted with two *operating device*s: one trigger on the handle and one knob with a button that has to be pushed to rotate the knob.

If the knob meets the conditions defined in 8.3.3.1.1.3 (a) – i.e. it cannot be rotated without pushing the button – the vehicle is considered to meet condition 8.3.3.1.1.3 even if the locking mechanisms do not meet condition 8.3.3.1.1.3 (b) (e.g. the trigger may not automatically return in its original status when tested in accordance with 8.3.3.1.2.2).

If the locking mechanisms meet condition 8.3.3.1.1.3 (b) – i.e. both the knob and the trigger automatically return in their original status and the *locking devices* reengage when tested in accordance with 8.3.3.1.2.2 – the vehicle is considered to meet condition 8.3.3.1.1.3 even if the knob does not meet condition 8.3.3.1.1.3 (a) (e.g. the knob may be rotated without pushing the button).

Annex D
(informative)

A-deviation

A- deviation: National deviation due to regulations, the alteration of which is for the time being outside the competence of the CEN/CENELEC member. This European Standard does not fall under any Directive of the EU. In the relevant CEN/CENELEC countries these A- deviations are valid instead of the provisions of the European Standard until they have been removed.

FRANCE:

The French decree N° 91-1292 of 20 December 1991 relating to the prevention of hazards resulting from the use of child care articles, as published in the *Official Journal* of the French Republic of 24 December 1991, provides under article 2 of title II of its annex that : "child care articles must be made of materials which either do not burn under direct action of a flame, a spark or any other potential seat of fire, or are hardly flammable (the flame extinguishes as soon as the fire cause disappears), or, when flammable, burn slowly with a low flame propagation rate".

Consequently, the requirements in 7 of this European Standard will have to be supplemented, in France, by the following : "The flame propagation rate of textiles, coated textile supports and plastic coverings should not exceed 30 mm/s when tested in accordance with 5.7 of EN 71-2:1993".

Bibliography

[1] ECE 44 regulation, United Nations – Agreement concerning the adoption of uniform technical prescriptions for wheeled vehicles, equipment and parts which can be fitted and/or be used on wheeled vehicles and the conditions for reciprocal recognition of approvals granted on the basis of these prescriptions. Addendum 43: Regulation no. 44 — Uniform provisions concerning the approval of restraining devices for child occupants of power-driven vehicles ("child *restraint system*").

[2] EN 1466, *Child use and care articles — Carry Cots and stands — Safety requirements and test methods.*

This page deliberately left blank

This page deliberately left blank

British Standards Institution (BSI)

BSI is the independent national body responsible for preparing British Standards and other standards-related publications, information and services. It presents the UK view on standards in Europe and at the international level.

BSI is incorporated by Royal Charter. British Standards and other standardisation products are published by BSI Standards Limited.

Revisions

British Standards and PASs are periodically updated by amendment or revision. Users of British Standards and PASs 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 British Standards would inform the Secretary of the technical committee responsible, the identity of which can be found on the inside front cover. Similary for PASs, please notify BSI Customer Services.

Tel: +44 (0)20 8996 9001 Fax: +44 (0)20 8996 7001

BSI offers BSI Subscribing Members an individual updating service called PLUS which ensures that subscribers automatically receive the latest editions of British Standards and PASs.

Tel: +44 (0)20 8996 7669 Fax: +44 (0)20 8996 7001
Email: plus@bsigroup.com

Buying standards

You may buy PDF and hard copy versions of standards directly using a credit card from the BSI Shop on the website **www.bsigroup.com/shop.** In addition all orders for BSI, international and foreign standards publications can be addressed to BSI Customer Services.

Tel: +44 (0)20 8996 9001 Fax: +44 (0)20 8996 7001
Email: orders@bsigroup.com

In response to orders for international standards, BSI will supply the British Standard implementation of the relevant international standard, unless otherwise requested.

Information on standards

BSI provides a wide range of information on national, European and international standards through its Knowledge Centre.

Tel: +44 (0)20 8996 7004 Fax: +44 (0)20 8996 7005
Email: knowledgecentre@bsigroup.com

BSI Subscribing Members 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: +44 (0)20 8996 7002 Fax: +44 (0)20 8996 7001
Email: membership@bsigroup.com

Information regarding online access to British Standards and PASs via British Standards Online can be found at **www.bsigroup.com/BSOL**

Further information about British Standards is available on the BSI website at **www.bsi-group.com/standards**

Copyright

BSI

389 Chiswick High Road London W4 4AL UK

Tel +44 (0)20 8996 9001
Fax +44 (0)20 8996 7001
www.bsigroup.com/standards

raising standards worldwide™