

AS 2088:2022



STANDARDS
Australia



Prams and strollers — Safety requirements



AS 2088:2022

This Australian Standard ® was prepared by CS-020, Prams And Strollers. It was approved on behalf of the Council of Standards Australia on 14 June 2022.

This Standard was published on 24 June 2022.

The following are represented on Committee CS-020:

- Australian Chamber of Commerce and Industry
- Australian Competition and Consumer Commission
- Australian Industry Group
- Australian Retailers Association
- Australian Toy Association
- CHOICE
- Consumer Affairs Victoria
- Consumers Federation of Australia
- Infant and Nursery Products Alliance of Australia
- Kidsafe Australia
- National Retail Association Australia
- Royal Institute for Deaf and Blind Children
- Sydney Children's Hospitals Network

This Standard was issued in draft form for comment as DR AS 2088:2022.

Keeping Standards up-to-date

Ensure you have the latest versions of our publications and keep up-to-date about Amendments, Rulings, Withdrawals, and new projects by visiting:

www.standards.org.au

ISBN 978 1 76113 859 1

Prams and strollers — Safety requirements

Originated in Australia as AS 2088—1977.
Originated in New Zealand as NZS 5804:1977.
First joint edition AS/NZS 2088:1993.
Previous edition 2013.
Revised and redesignated as AS 2088:2022.

© Standards Australia Limited 2022

All rights are reserved. No part of this work may be reproduced or copied in any form or by any means, electronic or mechanical, including photocopying, without the written permission of the publisher, unless otherwise permitted under the Copyright Act 1968 (Cth).

Preface

This Standard was prepared by the Australian members of the joint Standards Australia/Standards New Zealand Committee CS-020, Prams and Strollers, to supersede AS/NZS 2088:2013.

After consultation with stakeholders in both countries, Standards Australia and Standards New Zealand decided to develop this document as an Australian Standard rather than an Australian/New Zealand Standard.

The objective of this document is to provide manufacturers, authorities, and others with minimum safety requirements in order to reduce the likelihood of injury to children.

The major changes in this edition are as follows:

- (a) Expansion of the scope to include convertible vehicles and other vehicles designed to transport a child in a seated position and excludes certain products.
- (b) Introduction of definitions for terms associated with frame fold locking.
- (c) Specification of child accessible zones in the vehicle.
- (d) Extension of requirements for finger entrapment hazards to include certain sizes of openings.
- (e) Addition of requirements for parking brake actuators on vehicles with reversible handles.
- (f) Additional testing configurations to the stability test.
- (g) A new method for measuring the angle of the reclined backrest and seat.

The terms “normative” and “informative” are used in Standards to define the application of the appendices to which they apply. A “normative” appendix is an integral part of a Standard, whereas an “informative” appendix is only for information and guidance.

Contents

Preface	ii
Introduction	vi
1 Scope	1
2 Normative references	1
3 Terms and definitions	1
4 Child accessible parts	4
4.1 General	4
4.2 Zone accessible from the seat	4
4.2.1 General	4
4.2.2 Inclusions and exclusions	5
4.3 Zone accessible from the pram body	8
4.3.1 General	8
4.3.2 Inclusions and exclusions	8
5 Dimensions	8
6 Materials	8
6.1 Toxicity	8
6.2 Corrosion	9
7 Accessories	9
7.1 General	9
7.2 Child restraints	9
7.3 Toys	9
8 Construction	9
8.1 Objects which could make contact with a child's head	9
8.2 Finger entrapment hazards	9
8.3 Reversible handles	10
8.4 Footrest	11
8.5 Removable components	11
8.6 Parking brakes	11
8.6.1 General	11
8.6.2 Parking brake actuator	12
8.7 Locking devices	12
8.7.1 Frame fold locking devices	12
8.7.2 Actuators for frame fold locking devices and latching devices	13
8.7.3 Storage latch	13
8.8 Occupant retention	14
8.8.1 Harness configuration	14
8.8.2 Shoulder straps	15
8.8.3 Waist straps	15
8.8.4 Crotch strap	15
8.9 Head barrier	16
8.10 Foot end openings	16
8.11 Seating and reclining surface	16
8.12 Toddler platform	16
8.13 Tether strap	16
8.14 Hazardous gaps and openings that can injure persons other than the occupant	17
9 Performance requirements	17
9.1 Durability	17
9.1.1 Static durability	17
9.1.2 Dynamic durability	17
9.1.3 Kerb mounting durability	17
9.2 Projections	17

9.3	Hazardous sharp edges	17
9.4	Hazardous sharp points	17
9.5	Hazardous gaps and openings that can injure the occupant	18
9.6	Parking brakes	18
9.6.1	General	18
9.6.2	Durability	18
9.6.3	Efficiency	18
9.6.4	Resistance to rolling	18
9.6.5	Automatic parking brake	18
9.7	Occupant retention	18
9.7.1	Harness assembly	18
9.7.2	Head barrier	19
9.7.3	Foot end openings	19
9.8	Stability	20
9.8.1	General stability	20
9.8.2	Vehicles with reclining backrests or seats	20
9.9	Security of wheels	20
9.10	Security of reversible handle engagement	20
9.11	Security of frame fold locking devices	20
9.12	Security of latching devices for accessories	20
9.13	Connection of child restraint	21
9.14	Toddler platform	21
9.15	Other accessories	21
10	Testing	21
11	Packaging and instructions	24
11.1	Plastic packaging	24
11.2	Markings on the packaging	24
11.3	Printed instructions	24
11.3.1	General	24
11.3.2	Content	25
12	Marking	26
12.1	General	26
12.1.1	Identification markings	26
12.1.2	Warning notices	26
12.1.3	Additional warning notices	27
12.1.4	Markings on accessories	27
12.2	Legibility of marking	28
12.3	Adhesive labels and printed-on markings	28
12.4	Fabric warning labels	28
12.5	Durability of marking	28
Appendix A (normative) Loading		29
Appendix B (normative) Test for static durability		32
Appendix C (normative) Test for dynamic durability		34
Appendix D (normative) Test for kerb mounting durability		40
Appendix E (normative) Test for removability of a projection by a torque force		42
Appendix F (normative) Test for removability of a projection by a tensile force		44
Appendix G (normative) Test for hazardous sharp edges		46
Appendix H (normative) Test for hazardous sharp points		48
Appendix I (normative) Test for durability of parking brakes		50
Appendix J (normative) Determination of efficiency of parking brakes		51

Appendix K (normative) Determination of efficiency of harnesses and attachments for harnesses	53
Appendix L (normative) Head barrier probe test	57
Appendix M (normative) Foot end openings probe test	61
Appendix N (normative) Test for stability	64
Appendix O (normative) Test for security of wheels	68
Appendix P (normative) Test for security of reversible handle engagement	69
Appendix Q (normative) Test for security of frame fold locking devices	71
Appendix R (normative) Method of marking the position of wheels on the surface of the tilting platform	75
Appendix S (normative) Test for stability against overbalancing	76
Appendix T (normative) Test for small parts	78
Appendix U (normative) Test for hazardous gaps and openings	80
Appendix V (normative) Test for dynamic strength of locking and latching devices	82
Appendix W (normative) Test for harness configuration	85
Appendix X (normative) Method of measuring the angle of recline of the backrest	89
Bibliography	91

Introduction

In Australia, the Australian Competition and Consumer Commission (ACCC) currently administer the *Competition and Consumer Act 2010* (Cth) (CCA) which mandates the product safety standard for prams and strollers.

Regulations may refer to specific editions of this Standard and may also make variations to the requirements stated in the referenced edition. Therefore, conformance to this document goes only part way to complying with all legal requirements for the sale of prams and strollers.

NOTE Refer to the ACCC website for further information on the mandated product safety standard for prams and strollers.

Australian Standard®

Prams and strollers — Safety requirements

1 Scope

This document specifies materials, construction, performance and labelling requirements, and test methods for prams, strollers, and their accessories.

This document applies to wheeled vehicles, including those that operate in more than one mode, providing one of those modes is designed to transport one or more children in a seated position.

In addition to prams and strollers, this document also applies to —

- (a) convertible vehicles;
- (b) wagon-type vehicles; and
- (c) other vehicles that are able to be pushed by a carer in a stroller mode.

This document does not apply to —

- (i) learner tricycles;
- (ii) wheeled suitcases; and
- (iii) ride-on toys.

NOTE A learner tricycle, unlike a convertible vehicle, has basic features such as —

- (a) a handle for parental assistance;
- (b) a handlebar for use by the child to learn to steer with the pedals disengaged; and
- (c) waist and crotch harness on a seat having a low back support.

2 Normative references

The following documents are referred to in the text in such a way that some or all of their content constitutes requirements of this document.

NOTE Documents referenced for informative purposes are listed in the Bibliography.

AS/NZS ISO 8124.1, *Safety of toys, Part 1: Safety aspects related to mechanical and physical properties*

AS/NZS ISO 8124.3, *Safety of toys, Part 3: Migration of certain elements*

ISO 4287, *Geometrical Product Specifications (GPS) — Surface texture: Profile method — Terms, definitions and surface texture parameters*

ISO 6508-1, *Metallic materials — Rockwell hardness test — Part 1: Test method*

3 Terms and definitions

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

3.1

accessory

non-integral, supplementary component that is approved for use with a vehicle

Note 1 to entry: This includes items sold with, or separately from, the vehicle and nominated in the vehicle instructions.

3.2

actuator

component designed to be operated by the carer through one or several deliberate operations

3.3

automatic**automatically**

without user intervention

3.4

bassinet

accessory designed to transport a fully reclined baby or child weighing up to and including 9 kg and able to be attached or removed from the vehicle

Note 1 to entry: It is usually shaped like a box or a boat.

3.5

child restraint

device used to restrain a child passenger in a motor vehicle

3.6

convertible vehicle

vehicle that may operate in more than one mode

Note 1 to entry: One such mode of operation includes features to support the transportation of a child as though it were a stroller.

EXAMPLE Convertible tricycle or trike, stroller, wagon type vehicle, road vehicle look-alike.

3.7

folding

collapsing or bending

3.8

frame fold locking device

mechanical components that maintain a vehicle in an erected position for use

Note 1 to entry: It includes those parts of the mechanism that enable the vehicle frame to lock and to release (i.e. actuator), to connect to the frame and the means of locking.

3.8.1

combined primary and secondary locking device

device where the secondary locking device prevents the release of the actuator for the primary locking device where the devices are in the same mechanism

3.8.2

separate primary locking device

device that, when released, enables a vehicle to be folded upon release of the separate secondary locking device

3.8.3

separate secondary locking device

supplementary device that, when released, completes the action of releasing the frame fold locking device in conjunction with the primary locking device

3.9

liner

removable or additional seat pad

3.10**main buckle**

<vehicle harness> central device to which the tongued ends of the shoulder straps and waist straps connect with the crotch strap

Note 1 to entry: The buckle enables the straps to be secured and released.

3.11**may**

indicates the existence of an option

3.12**permanently fixed**

attached so that it cannot be removed without the use of a tool

3.13**pram**

wheeled vehicle designed to transport a baby or child weighing up to and including 9 kg, primarily in a fully reclined position

Note 1 to entry: The pram body is usually shaped like a box or a boat.

3.14**securely attached**

attached to prevent casual or inadvertent removal

Note 1 to entry: Securely attached does not mean *permanently fixed* ([3.12](#)).

3.15**shall**

indicates that a statement is mandatory

3.16**should**

indicates a recommendation

3.17**single action release mechanism**

release mechanism that enables a securing device to be released by applying a single force in one direction

3.18**storage container**

feature or accessory used to carry goods

EXAMPLE Basket, tray or bag.

3.19**stroller**

wheeled vehicle to transport one or more children usually in a seated position that may be adjustable to a semi-reclined or fully reclined position

Note 1 to entry: Strollers include wheeled vehicles that may operate in more than one mode, if one of those modes is designed to transport a child in a seated position. This includes *convertible vehicles* ([3.6](#)) and *wagon-type vehicles* ([3.24](#)).

3.20**structural failure**

observed breakage or failure to operate

3.21 toddler platform

device, with or without wheels, that is attached to a vehicle to enable a toddler to stand and stabilize themselves by holding the handle or other designated structure

Note 1 to entry: The platform may be a removable accessory or an integral part of the stroller.

3.22 toddler seat

accessory that provides an additional seating position

3.23 vehicle

pram or stroller

3.24 wagon-type vehicle

wheeled vehicle having a floor and four sides forming a wall, either pulled or pushed by a handle attached to the body, that is used to transport one or more children in a designated seated position

Note 1 to entry: Certain designs of wagon-type vehicles do not have a floor, four sides or designated seated position.

3.25 wheel

circular, rotating/revolving device that provides a means for the vehicle to remain in contact with, and move on, the ground

Note 1 to entry: There may be either a single wheel or a set of adjacent wheels attached to the same mounting point.

4 Child accessible parts

4.1 General

Child accessible parts in zones specified in [Clauses 4.2](#) and [4.3](#) shall be evaluated in all configurations of the seat, pram body, handle and any components that can be adjusted to various positions which alter this zone.

EXAMPLE Forward-facing and rearward-facing seat and pram body, reversible and adjustable handle, various recline positions of the seat and backrest.

4.2 Zone accessible from the seat

Parts of the vehicle within the zone specified in [Clause 4.2.1](#) and illustrated in [Figures 4.2.2\(A\)](#) and [4.2.2\(B\)](#) shall be considered accessible to the child while the child is properly restrained in the seat.

4.2.1 General

The point and boundaries of the zone [see [Figure 4.2.2\(A\)](#)] are as follows:

- (a) A point of origin on the uncompressed surface at the midpoint of the junction of the seating surface and the backrest.
- (b) A horizontal plane 150 mm below the point of origin.
- (c) A circular arc plane 550 mm in radius from the point of origin, at the front of the seat and parallel to the lateral centre-line of the seat.
- (d) A plane behind the backrest (taking into account the various recline positions), 150 mm from the point of origin and parallel to the plane of the backrest.

- (e) A vertical plane on the left and right of the seat, each one 550 mm from the point of origin and parallel to the longitudinal centre-line of the seat.

4.2.2 Inclusions and exclusions

All parts directly behind the backrest and all parts directly under the seat and leg rest shall not be considered as child accessible parts.

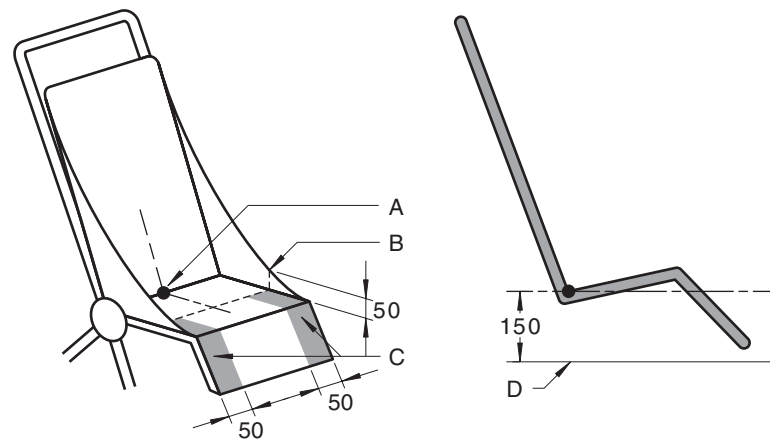
For seats where the height of the side protections (whether soft or rigid) are 50 mm or less, parts that are directly under the seat and leg rest within a 50 mm wide band measured from the outermost edge of the sides of the seat or leg rest shall be considered child accessible parts, see [Figure 4.2.2\(B\)](#). The assessment shall be made with the backrest at the most upright position.

For vehicles designed for multiple occupants where one seat is at the front of another seat, parts located behind the backrest of the seat at the front and parts under the seat and leg rest of the seat at the front shall be considered as child accessible parts, provided those parts fall within the zone specified for the seat behind, see [Figure 4.2.2\(C\)](#).

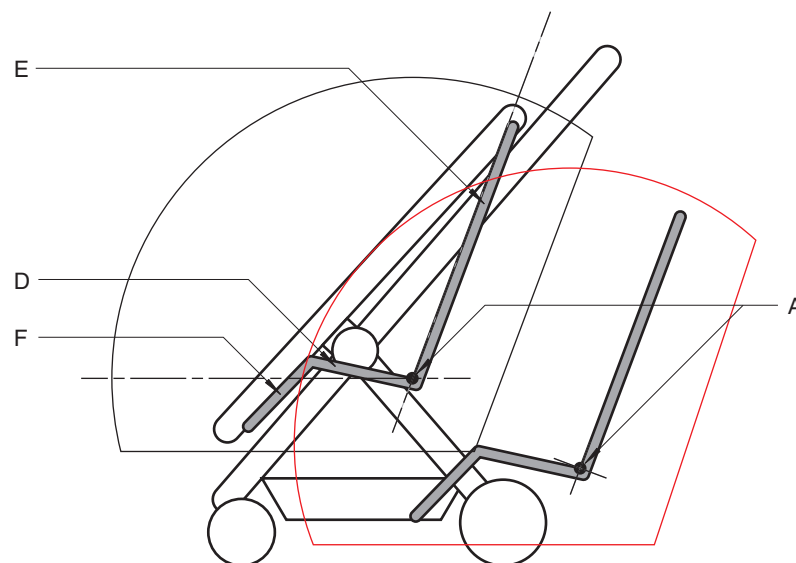
For vehicles designed for multiple occupants where a pram body is at the front of a seat, parts of the pram shall be considered as child accessible parts, provided those parts fall within the zone specified for the seat behind, see [Figure 4.2.2\(D\)](#).

Wheels within the zone shall be provided with an access preventing barrier.

Dimensions in millimetres

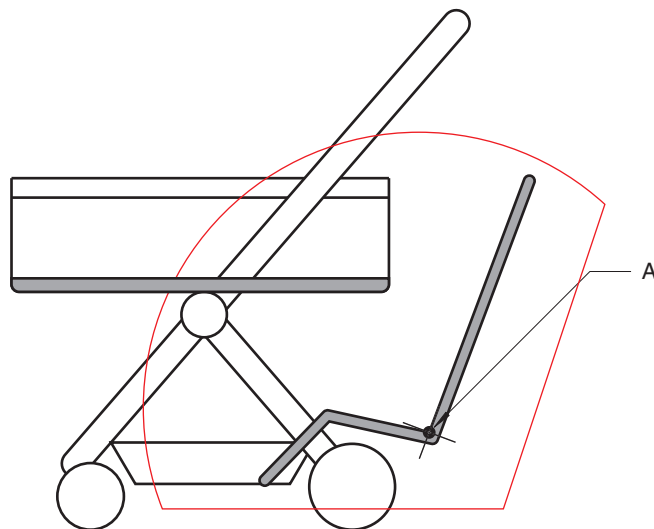
**Key**

- A Point of origin
- B Starting point where the height of the side protection is 50 mm or less
- C Surfaces beneath which are to be checked
- D Lower boundary of space to be checked, see [Clause 4.2.1\(b\)](#)

Figure 4.2.2(B) — Additional zone accessible from the seat**Key**

- A Point of origin
- D Lower boundary of space to be checked, see [Clause 4.2.1\(b\)](#)
- E Backrest
- F Leg rest

Figure 4.2.2(C) — Example of tandem seating



Key

A Point of origin

Figure 4.2.2(D) — Seating position behind pram body

4.3 Zone accessible from the pram body

4.3.1 General

All parts above the plane of the top or highest edge of the pram body shall not be considered child accessible parts.

4.3.2 Inclusions and exclusions

For vehicles designed for multiple occupants, parts located under the pram body shall be considered child accessible parts on the seat behind or another pram body behind if those parts fall within the zone specified for the seat behind or pram body behind.

5 Dimensions

The minimum depth of the body of a pram at, or at any position within 300 mm from, the harness attachment points shall be 140 mm when measured from the top edge of the top surface of the mattress or the next horizontal plane (the seat if there is one). If there are no harness attachment points, use points which are halfway along the length of the pram body at each side of the pram. The minimum depth at any other point on the sides or ends of the body shall be 100 mm.

6 Materials

6.1 Toxicity

All materials and all coatings that are capable of being sucked, licked, mouthed, or swallowed while the child is properly restrained in the vehicle shall conform to the maximum acceptable levels of element migration when tested in accordance with AS/NZS ISO 8124.3.

6.2 Corrosion

All metal parts, including springs, nuts, bolts and washers shall either be made of corrosion-resistant material or be protected against corrosion.

NOTE Corrosion is assessed by visual inspection.

7 Accessories

7.1 General

All combinations of vehicle and accessories shall conform to this document.

7.2 Child restraints

For vehicles that can be fitted with child restraints as an accessory, the child restraint shall be secured to the vehicle such that the occupant would be positioned as specified by the manufacturer's instructions. The combination of the vehicle and the child restraint shall meet the requirements of [Clauses 8.7.2, 9.8.1 and 9.13](#) and be subject to tests specified in [Clause 10](#) and in the order given in [Table 10.1](#).

NOTE Refer to relevant federal, state and territory regulations to determine applicable legislative requirements related to child restraints used in cars.

7.3 Toys

Toys sold as an accessory of the vehicle and accessories embodying toys sold as part of the vehicle should conform to AS/NZS ISO 8124.1 and AS/NZS ISO 8124.3.

NOTE Refer to relevant federal, state and territory regulations to determine applicable legislative requirements related to toys.

8 Construction

8.1 Objects which could make contact with a child's head

A vehicle in any configuration shall not have any protruding objects that are not padded or otherwise protected and that could make contact with a child's head and cause injury while the child is properly restrained in the vehicle.

NOTE Examples of projections include —

- (a) a discontinuity of surfaces that creates a step with a height of more than 5 mm with an edge radius of 5 mm or less or a chamfer of 45° or less;
- (b) a protrusion with a height of more than 5 mm with a diameter or width of 10 mm or more and with an edge radius of 2 mm or less; or
- (c) a protrusion of more than 10 mm in height with an edge radius of 5 mm or less.

8.2 Finger entrapment hazards

The following requirements shall apply:

- (a) All open-ended tubes that allow the passage of a 5 mm diameter rod to a depth of 10 mm or more shall also allow the passage of a 12 mm diameter rod. Where a tube is not circular, the opening shall be tested at the centre of the largest dimension of the aperture.

- (b) Any apertures in rigid material that allow the passage of a 5 mm diameter rod to a depth of 10 mm or more shall also allow the passage of a 12 mm diameter rod.

8.3 Reversible handles

A three-wheeled vehicle shall not have a reversible handle.

If a vehicle has a reversible handle, one of the following shall apply:

- (a) Where a reversible handle is operated by a single release actuator, a clearance shall be provided between the handle parts and the armrest or side of the vehicle for a downwards distance of not less than 50 mm throughout the arc of movement of the handle as it passes the armrest or side of the vehicle, see [Figure 4.2.2\(B\)](#). It shall be possible for a rod with a diameter of 12 mm and a length of 50 mm to enter and to be pulled out through the clearance [see gap shown in [Figure 8.3\(A\)](#)] with a force of not more than 20 N.
- (b) Where more than one release mechanism is provided, at least one of the release mechanisms shall be situated on a side arm of the handle, not more than 300 mm above the plane of the armrest or top of the side of the vehicle at forward or reverse locked handle position, see [Figure 8.3\(B\)](#).

NOTE The requirements in Items (a) and (b) are intended to reduce the likelihood of a child's fingers being in the path of a reversing handle. Either the gap is sufficient to clear the fingers if a child's hands are on the armrest or side of the vehicle, or at least one operating mechanism for the handle is situated so that the operator is forced to be within close proximity to the child while operating the handle, and thus may be likely to observe whether the child's hands are in the path of the handle as it moves.

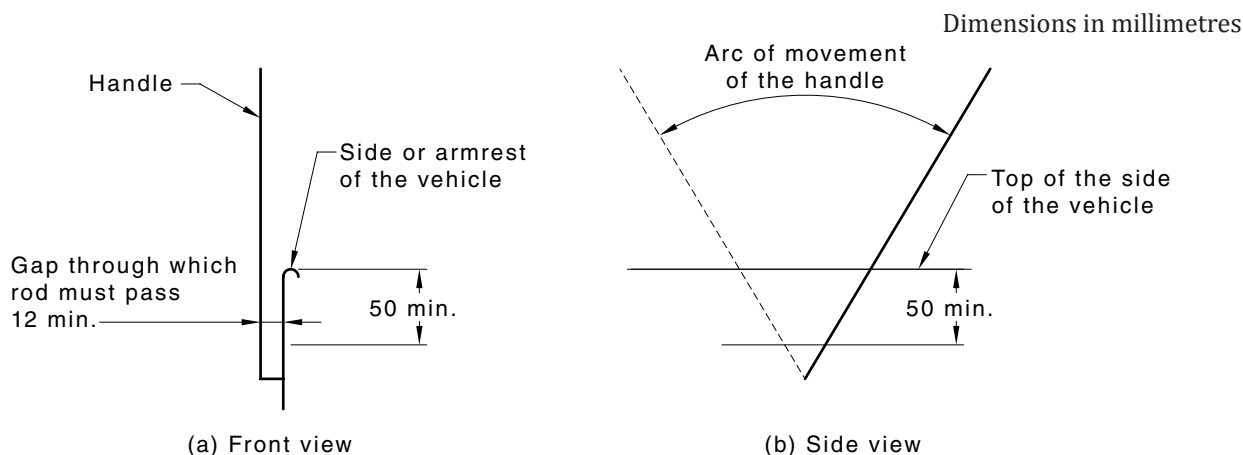


Figure 8.3(A) — Clearance for reversible handles operated by a single release mechanism

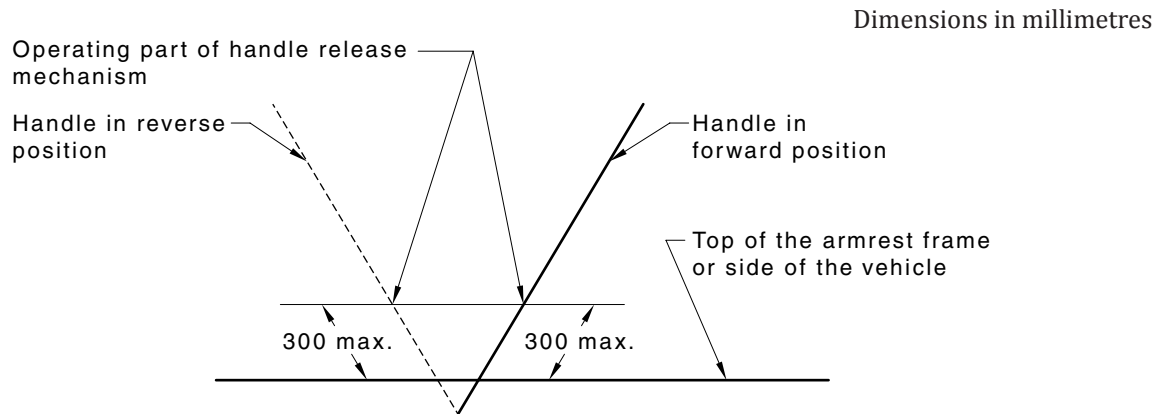


Figure 8.3(B) — Position for reversible handles having at least one release mechanism

8.4 Footrest

Strollers shall be fitted with a footrest. Where a stroller is designed for more than one child, provision shall be made for each child to have a footrest. Toddler seats shall have a footrest if the distance between the front edge of the seat and the ground or any wheel is 30 cm or less.

NOTE The requirement for a footrest is to reduce the likelihood of the child's feet reaching the ground or wheel while the child is properly restrained in the stroller or toddler seat.

8.5 Removable components

Where the removal of any removable component is potentially hazardous to the child, the removable component shall be attached to the vehicle in such a manner that the means of attachment is either —

- (a) not accessible to the child while the child is properly restrained in the vehicle; or
- (b) resistant to being operated by the child. The release mechanism shall not be a single action release mechanism unless the force required to operate the mechanism is at least 40 N.

NOTE It is difficult to specify a location for release mechanisms which will ensure that a child cannot come into contact with them under all conditions of use.

Any removable component shall not fit entirely into the small parts cylinder when tested in accordance with [Appendix T](#), see [Clause 9.2](#).

8.6 Parking brakes

8.6.1 General

Vehicles shall be fitted with either —

- (a) a manual parking brake or an automatic parking brake that meets the requirements of [Clause 9.6.3](#); or
- (b) a manual parking brake that meets the requirements of [Clause 9.6.3](#) and an automatic parking brake that meets the requirements of [Clauses 9.6.4](#) and [9.6.5](#).

Manual and automatic parking brakes shall meet the requirements of [Clause 9.6.2](#).

8.6.2 Parking brake actuator

Each parking brake actuator shall —

- (a) be located so that it is not accessible to the child while the child is properly restrained in the vehicle, see [Clause 8.5](#) Note;
- (b) be red in colour, and the surrounding components such as the framework and mouldings shall be a contrasting colour;
- (c) be able to be applied and released using one hand or one foot; and
- (d) for vehicles with a reversible handle, be within immediate reach of the user regardless of the position of the reversible handle.

EXAMPLE Foot-operated parking brake actuators at the front and rear sets of wheels on a vehicle that has a reversible handle, and hand-operated actuators on the handle.

8.7 Locking devices

8.7.1 Frame fold locking devices

8.7.1.1 General

Frame fold locking devices shall have a distinct locked position. They shall not appear locked when they are unlocked.

Folding vehicles shall have, at least, either —

- (a) a separate primary locking device and a separate secondary locking device as specified in [Clauses 8.7.1.2](#) and [8.7.1.3](#); or
- (b) a combined primary and secondary locking device as specified in [Clause 8.7.1.4](#).

8.7.1.2 Separate primary locking device

The following requirements shall apply for a separate primary locking device:

- (a) The device shall lock the folding mechanism in the normal operating position of the vehicle.
- (b) The device shall require deliberate operation by the user to release the device.

NOTE The separate primary locking device may be locked manually.

8.7.1.3 Separate secondary locking device

The following requirements shall apply for a separate secondary locking device:

- (a) The device shall be separate from, and act independently of, the separate primary locking device.
- (b) The device shall automatically lock the folding mechanism when the vehicle is erected for use but require deliberate operation by the user to release the device.
- (c) Release of the device shall not release or impair the efficiency of the separate primary locking device.
- (d) Where the chassis and pram body, or chassis and seat, can be separated the device shall operate on the chassis.

- (e) When the separate primary locking device is released, the separate secondary locking device shall not permit any folding action in any plane above the seating surface of the vehicle greater than one-third of its total movement range between the normal operating and fully folded positions.

The separate secondary locking device may be identical to the separate primary locking device in design and operation provided it meets the requirements of this clause.

8.7.1.4 Combined primary and secondary locking device

The following requirements shall apply for a combined primary and secondary locking device:

- (a) The primary locking device shall act on and lock the frame at least at one point. It shall meet the requirements of [Clause 8.7.1.2](#). It is recommended, however, that the primary locking device acts on and locks the frame at least at two separate points for greater security.
- (b) Both the primary and secondary locking devices shall automatically lock when the vehicle is erected for use.
- (c) The secondary locking device shall —
 - (i) require deliberate operation by the user to release it;
 - (ii) require an operating principle that is different from that of the primary locking device;
 - (iii) automatically return to its engaged position after use;
 - (iv) require an operating force of not less than 20 N or 0.5 N m if the actuator is at a location where it can be inadvertently operated, e.g. on or near the handle. The operating force shall be determined at the instant that the frame becomes unlocked and folding can begin; and
 - (v) require an operating force of not less than 10 N or 0.25 N m if the actuator is at a location where it cannot be inadvertently operated, e.g. on the frame under the seat. The operating force shall be determined at the instant that the frame becomes unlocked and folding can begin.
- (d) Release of the secondary locking device shall not release or impair the efficiency of the primary locking device.

8.7.2 Actuators for frame fold locking devices and latching devices

The actuators for frame fold locking devices and the actuators for latching devices that retain a seating unit, bassinet, child restraint, toddler seat, toddler platform or other accessory that supports the occupant shall not be capable of becoming inadvertently released.

The actuator for any primary locking device or latching device shall not be accessible to the child while the child is properly restrained in the vehicle. The actuator for any primary locking device or latching device shall require a force of at least 40 N or 1 N m to operate if it is accessible to the child.

The actuators for latching devices for the removable seat are exempt from this requirement if the presence of the seated occupant precludes further release of the seat after the actuators are operated.

8.7.3 Storage latch

Vehicles shall have a storage latch to secure the vehicle in its folded form.

The storage latch should engage automatically when the vehicle is folded.

NOTE The storage latch enables the vehicle to be carried without the frame opening and possibly causing injury

8.8 Occupant retention

8.8.1 Harness configuration

The following requirements shall apply:

- (a) Vehicle seats and toddler seats shall have integral, permanently fixed waist and crotch straps and securely attached shoulder straps for each seating position. Harnesses shall meet the requirements of [Clauses 8.8.2, 8.8.3, 8.8.4](#) and [9.7.1](#).
- (b) The adjustable range of the harness shall be such that the harness can be adjusted to fit the range of occupants for whom the vehicle is designed as stated in the instructions.

NOTE 1 The method for determining conformance with the requirement in Item (b) has not been specified because there is no standardized range of occupants for whom the vehicle is designed. The apparatus specified in [Clause W.3\(a\)](#) (graduated test cylinder) and [Clause A.3\(a\)](#) (test dummy) may be used to determine if the harness can be adjusted to securely fit on both apparatus.

- (c) The buckling device, associated tongues and other components of the harness assembly shall be constructed to prevent their removal from the straps.
- (d) The main buckle shall not be capable of becoming inadvertently released. It shall either —
 - (i) require two separate actions to release it; or
 - (ii) if the harness uses a single action release mechanism, a force of at least 40 N shall be required to release the buckle tongues. This force shall be applied to the actuator in the normal manner of actuation but shall not be applied within 3 mm of the edge of the actuator surface.

Each individually releasable connection to the main buckle shall meet the requirements of Item (d).

NOTE 2 A tongued buckle which is released by pressing a part of the buckle using at least one finger on one side and at least one finger on an identical but directly opposite side of the buckle is considered to meet the requirement in Item (i).

NOTE 3 The force specified in Item (ii) should be applied through a probe with conical tip that tapers down to a point of not more than 0.1 mm in diameter. A probe with a diameter of 5 mm and a flat tip may also be used.

- (e) When all straps are adjusted to their longest setting and the tongues of the main buckle are released by the actuation of the main buckle, there shall be no straps or combination of straps that create a loop with an internal perimeter greater than 360 mm.
- (f) When all straps are adjusted to their shortest setting and to any intermediate setting, and the tongues of the main buckle are released by the actuation of the main buckle, there shall be no straps or combination of straps that create a loop with an internal perimeter greater than 360 mm.
- (g) If the main buckle is designed to prevent loops being formed by the harness straps, the ends of the shoulder and the waist straps shall become disconnected from each other and from the buckle after actuation of the buckle. Where the waist and shoulder straps remain connected to each other following their release from the buckle, then they shall separate when a force of not more than 20 N is applied to the main buckle in various possible forward and sideways directions, but not upward or downward.
- (h) Prams do not require a harness.

8.8.2 Shoulder straps

Shoulder straps shall —

- (a) have a minimum width of 15 mm;
- (b) have provision for adjustment to fit the occupant;
- (c) not form loops, as specified in [Clause 8.8.1\(e\) and \(f\)](#); and
- (d) have one of the following connections:
 - (i) Provisions for adjustment such that the shoulder straps meet the seat backrest at the following heights when the backrest is in the fully upright position —
 - (A) 265 mm ± 25 mm;
 - (B) 320 mm ± 25 mm;
 - (C) 380 mm ± 25 mm if the stroller is claimed by the manufacturer to be suitable for a child 18 kg or greater; and
 - (D) 265 mm ± 25 mm for a toddler seat.

NOTE This requirement does not preclude having additional heights.

Shoulder straps shall meet the seat back with a maximum distance of 150 mm between their inside edges at the point of attachment or transition through the seat back.

- (ii) Attached to the rear portion of the waist strap such that the distance between the inside edges of the shoulder straps is no greater than 100 mm when measured at the upper edge of the waist strap where it meets the shoulder straps.

8.8.3 Waist straps

Waist straps shall meet the following requirements:

- (a) Waist straps shall have a minimum width of 20 mm.
- (b) Waist straps and fittings for waist straps shall be secured to the frame of a stroller or toddler seat either directly or indirectly by their securement to the seat.

If the waist straps are secured indirectly by their securement to the seat —

- (i) the seat shall be secured to the frame of the stroller or toddler seat at a point where the seat cannot be pulled away substantially from its normal seated position; and
 - (ii) when a force of 50 N is applied to the waist straps in an attempt to pull it from the intersection of the seating surface and the backrest in a manner shown in [Figure K.3](#), the intersection shall not displace by more than 100 mm. Where there is no defined intersection, the displacement shall be measured from where the lowest edge of the waist strap is attached to the backrest.
- (c) Waist straps shall not form loops, as specified in [Clause 8.8.1\(e\) and \(f\)](#).

8.8.4 Crotch strap

The crotch strap shall —

- (a) have a minimum width of 20 mm;
- (b) be permanently fixed to the main buckle; and

- (c) be attached to the seating surface so that it prevents the occupant sliding forward, see [Clause 9.7.1\(b\)\(iii\)](#).

NOTE The length of the crotch strap may be adjustable.

8.9 Head barrier

Vehicle seats and toddler seats in which the backrest or seat reclines to an angle greater than 150° to the horizontal when in the fully reclined position shall —

- (a) have a barrier that is securely attached that prevents the occupant sliding out the head end of the seat; and
- (b) not create a head entrapment hazard.

Where the vehicle has multiple occupant positions in a tandem configuration, the requirements for the head barrier shall apply to the rearmost occupant position of the vehicle only.

8.10 Foot end openings

Vehicle seats and toddler seats in which the backrest or seat reclines to an angle greater than 150° to the horizontal shall —

- (a) be designed so that the openings at the foot end shall be of such a size as to prevent head entrapment of children; or
- (b) provide a means of closing the openings at the foot end so that small children do not become entrapped.

Other openings around the seating area and under toddler seats shall be of such a size as to prevent entrapment of small children.

8.11 Seating and reclining surface

With the exception of a liner, any component that forms the seating and reclining surface shall not be removable except with the use of a tool or with complete removal of the vehicle trim assembly including the seating and reclining surface.

Any fabric structure within 100 mm above and including the seating and reclining surface should not form a pocket which will trap a child's head when fully reclined.

8.12 Toddler platform

Toddler platforms shall be attached to the stroller so that a child can stand upright unimpeded by the seat, canopy, or other accessory. A structure on the vehicle such as the handle tubing shall be provided so that a child is able to grasp it with each hand.

The platform shall have a non-slippery surface.

8.13 Tether strap

The following requirements shall apply:

- (a) Vehicles shall be provided with a tether strap to allow the vehicle to be tethered to the operator while in use.
- (b) The tether strap shall be permanently fixed to the vehicle frame so as to be always available to the vehicle operator.

- (c) The tether strap shall be designed to minimize the possibility of it being a strangulation hazard for a child inside or outside the vehicle such that —
 - (i) the free length of the strap when attached to the intended part of the vehicle shall not be greater than 400 mm; and
 - (ii) any loop in the strap shall have a perimeter not greater than 360 mm.

8.14 Hazardous gaps and openings that can injure persons other than the occupant

The vehicle shall be designed so that the potential hazard of scissoring, shearing, pinching, or crushing is minimized for the user and other persons or children other than the occupant when the vehicle is in use and particularly during folding or unfolding, see [Clause 9.5](#).

9 Performance requirements

9.1 Durability

9.1.1 Static durability

When tested in accordance with [Appendix B](#), the vehicle shall not incur structural failure.

9.1.2 Dynamic durability

When the vehicle is tested in accordance with [Appendix C](#), the following requirements shall be met:

- (a) The amount of angular displacement of each wheel shall not increase by more than 0.1 radians (5.7°).
- (b) The vehicle shall not incur structural failure.
- (c) No accessory shall become dislodged or detached.

9.1.3 Kerb mounting durability

When tested in accordance with [Appendix D](#), the vehicle shall not incur structural failure.

9.2 Projections

Any component, except those which are designed to be removable, that is able to be grasped with the thumb and forefinger or teeth of a child while the child is properly restrained in the vehicle, shall be tested in accordance with [Appendices E](#) and [F](#). Components include projections such as zip tabs, fabric and plastic labels, and any other similar attachments.

After testing to [Appendices E](#) and [F](#), any component that becomes detached shall not fit entirely into the small parts cylinder when tested in accordance with [Appendix T](#), see [Clause 8.5](#).

9.3 Hazardous sharp edges

There shall be no hazardous sharp edge on the vehicle when the vehicle is tested in accordance with [Appendix G](#).

9.4 Hazardous sharp points

There shall be no hazardous sharp point on the vehicle when the vehicle is tested in accordance with [Appendix H](#).

9.5 Hazardous gaps and openings that can injure the occupant

When tested in accordance with [Appendix U](#), the vehicle shall not pose an injury hazard while the child is properly restrained in the vehicle/toddler seat, as a result of —

- (a) scissoring, shearing, pinching, or crushing when adjoining or adjacent components pivot, fold up, open up or close in; or
- (b) gaps that are created when force is applied to the handlebar unit of a connected handlebar or, if the vehicle has separate handles, to each separate handle.

NOTE An example of a scissoring action may be found at the hood of a vehicle when it is being folded. A scissoring action at or near the hinge or pivot where the adjacent components are more rigid poses a greater risk of injury than two bows making contact farther away from the hinge or pivot where the adjacent components are more flexible.

9.6 Parking brakes

9.6.1 General

See [Clause 8.6](#) for information on the construction of parking brakes.

9.6.2 Durability

When tested in accordance with [Appendix I](#), manual and automatic parking brakes shall not incur structural failure.

9.6.3 Efficiency

When determined in accordance with [Appendix J](#), any distance between the two points marking the position of each braked wheel shall be —

- (a) not more than 50 mm for wheels up to 200 mm in diameter; or
- (b) not more than 90 mm for wheels greater than 200 mm in diameter.

9.6.4 Resistance to rolling

Where an automatic parking brake is provided, the vehicle shall not roll more than 300 mm when tested in accordance with [Appendix J](#).

9.6.5 Automatic parking brake

The release actuator for the automatic parking brake shall operate with a force of 40 N or less.

9.7 Occupant retention

9.7.1 Harness assembly

The harness assembly shall meet the following requirements:

- (a) *Efficiency* — When determined in accordance with [Appendix K](#) —
 - (i) all components of the harness assembly shall not show any signs of damage;
 - (ii) the waist and shoulder straps shall not become unfastened; and

- (iii) any slippage of adjustable straps shall not be more than 6 mm for each application of the test load.
- (b) *Configuration* — When tested in accordance with [Appendix W](#), the harness assembly shall meet the requirements of [Clause 8.8](#) and the following:
 - (i) The waist straps shall lie between the 50 mm and 125 mm graduations on the test cylinder.
 - (ii) Any gap between the test cylinder and the waist strap and between the test cylinder and the backrest shall not allow the 25 mm diameter probe to enter.
 - (iii) The crotch strap attachment point or transition point to the seating surface shall not be more than 136 mm from the backrest, i.e. underneath or on the edge of the test cylinder.
 - (iv) The range of heights of the waist straps for the range of lengths of the crotch strap shall lie between the 100 mm and 200 mm graduations.
 - (v) The shoulder straps shall meet the backrest or transition through the backrest at heights specified in [Clause 8.8.2\(d\)\(i\)](#).

9.7.2 Head barrier

Strollers or toddler seats with backrests or seats that recline to an angle greater than 150° to the horizontal when measured in accordance with [Appendix X](#) shall meet the following requirements:

- (a) *Efficacy* — When tested in accordance with [Appendix L](#), the probe shall not break through the barrier or go completely over the sides or head end of the seat, or go over the barrier. The barrier shall not collapse.
- (b) *Entrapment* — When tested in accordance with [Appendix L](#), the head end of strollers or toddler seats which have fabric trims or upholstery that can be removed or partially removed without the use of tools or necessitating the removal of the fabric from the seating and reclining surface of the stroller or toddler seat, shall not have any gap that allows the passage of the probe, unless the distance between the reclining surface and the structure above it is 250 mm or greater.

Any fabric structure within 100 mm above and including the seating and reclining surface should not form a pocket which will trap a child's head when the stroller's backrest or seat is in the fully reclined position.

9.7.3 Foot end openings

Strollers or toddler seats with backrests or seats that recline to an angle greater than 150° to the horizontal when measured in accordance with [Appendix X](#) shall meet the requirements of either Item (a) or (b):

- (a) When tested in accordance with [Appendix M](#), the foot end openings shall be fitted with a device to enclose the foot opening area that prevents a 95 mm probe passing through any gaps.
- (b) When tested in accordance with [Appendix M](#), the foot end openings shall accept the passage of a 160 mm probe.

Strollers with a back recline angle greater than 150° to the horizontal for use with babies should include a foot end enclosing device to prevent babies slipping out.

NOTE A foot muff, leg cover or boot cover is considered as a foot end enclosing device.

9.8 Stability

9.8.1 General stability

When tested in accordance with [Appendix N](#), vehicles shall not tip over, see [Clause 9.15](#).

9.8.2 Vehicles with reclining backrests or seats

When tested in accordance with [Appendix S](#), strollers with backrests or seats that recline to an angle greater than 150° to the horizontal shall not tip over.

9.9 Security of wheels

When tested in accordance with [Appendix O](#), wheels and wheel-locking devices shall neither become detached from the vehicle nor incur structural failure.

9.10 Security of reversible handle engagement

When tested in accordance with [Appendix P](#), the reversible handle shall not disengage from its locking positions.

9.11 Security of frame fold locking devices

When tested in accordance with [Appendix Q](#), the following requirements shall apply:

- (a) For frame fold locking devices that are located on the sides of the vehicle and accessible to the child while the child is properly restrained in the vehicle, all locking devices shall remain fully engaged.
- (b) For frame fold locking devices that are not covered in Item (a), at least one of the locking devices on the vehicle shall remain fully engaged.
- (c) For a vehicle with a combined primary and secondary locking device, the secondary locking device shall remain operational after the required force is applied to the primary locking device actuator.
- (d) After testing, all locking devices shall remain operational.

When tested in accordance with [Appendix V](#) —

- (i) all locking devices shall remain engaged and not incur structural failure; and
- (ii) no locking device shall fail and thereby result in the angle between the seating surface and the backrest decreasing by more than a quarter of its normal angle.

9.12 Security of latching devices for accessories

When tested in accordance with [Appendix V](#) —

- (a) all latching devices shall remain engaged and not incur structural failure;
- (b) the accessory shall not become detached from the vehicle; and
- (c) if the accessory became dislodged from the vehicle during testing, then neither the vehicle nor the accessory shall tip over when tested in accordance with [Appendix N](#).

Where latching devices can be manually released and if the accessory became dislodged from the vehicle when tested in accordance with [Appendix V](#), then neither the vehicle nor the accessory shall tip over when tested in accordance with [Appendix N](#).

9.13 Connection of child restraint

When tested in accordance with [Appendix V](#), the child restraint shall not become dislodged from the vehicle.

9.14 Toddler platform

When tested in accordance with [Appendices B](#) and [C](#), the toddler platform shall not incur structural failure or become detached from the vehicle.

When tested in accordance with [Appendix N](#), the vehicle shall not tip over.

9.15 Other accessories

When tested in accordance with [Appendices B](#), [C](#) and [D](#), any other accessory shall not incur structural failure or become dislodged or detached from the vehicle.

When tested in accordance with [Appendix N](#), the vehicle shall not tip over and any accessory shall not become dislodged or detached from the vehicle.

10 Testing

Testing shall be conducted as follows:

- (a) Unless specified otherwise, tests shall be carried out in the sequence specified in [Table 10.1](#) with the vehicle in the most onerous configuration, including the carrying of an additional child, goods, or accessories if supplied by the manufacturer. Unless otherwise specified in a particular test, the most onerous configuration shall include swivel wheels in their unlocked condition and swivelled in the most unfavourable direction.
- (b) Unless otherwise specified in a particular test, testing shall be conducted with the maximum load specified in the manufacturer's instructions. The masses of the test loads used for every test where a load was used shall be indicated on the test report.
- (c) Where a vehicle has the option for a bassinet, child restraint, toddler seat, toddler platform or other accessory that the child will sit or lie in or stand on, the relevant test procedure shall be performed using the combination of occupant positions loaded at the same time which will result in the greatest total loading if it is possible to use the vehicle and accessories in such a manner.
- (d) Where vehicles are designed to be used with a number of accessories, testing shall be conducted in each mode. It is permissible to use more than one vehicle to complete the evaluation and test sequences in [Table 10.1](#). More than one accessory may be tested at the same time on the one vehicle, but each accessory shall only be subjected to the tests that are applicable to it. For example, a toddler platform may be tested at the same time with a toddler seat, but the toddler platform does not need to be subjected to the test for kerb mounting durability.
- (e) Accessories shall be tested either —
 - (i) on a vehicle, still in satisfactory condition following previous testing; or
 - (ii) on a new vehicle.
- (f) Unless otherwise specified, convertible vehicles shall be tested in all configurations of its stroller mode in accordance with this document.

Table 10.1 — Sequence of design evaluation and testing

Test sequence	Description of test	Reference clause	Test method (Appendix)	Pram or stroller with bassinet	Stroller or vehicle with removable seat	Vehicle with toddler seat	Vehicle with child restraint	Vehicle with toddler platform	Convertible vehicle	Vehicle with other accessories ^a
A Preconditioning testing										
1	Static durability	9.1.1	B	Y	Y	Y	Y	Y	Y	Y
2	Dynamic durability	9.1.2	C	Y	Y	Y	Y	Y	Y	Y
3	Kerb mounting durability	9.1.3	D	Y	Y	Y	Y	—	Y	Y
4	Toddler platform	8.12 and 9.14	B and C	—	—	—	—	Y	—	—
5	Other accessories	9.15	B, C and D	—	—	—	Y	—	Y	Y
B Design and performance										
6	Pram dimensions	5	—	Y	—	—	—	—	—	—
7	Objects that could come into contact with a child's head	8.1	—	Y	Y	Y	—	—	Y	Y
8	Open-ended tubes	8.2	—	Y	Y	Y	—	—	Y	Y
9	Footrest	8.4	—	Y	Y	Y	—	—	Y	Y
10	Removable components	8.5	T	Y	Y	Y	—	Y	Y	Y
11	Removability of a projection by a torque force	9.2	E and T	Y	Y	Y	—	—	Y	Y
12	Removability of a projection by a tensile force	9.2	F and T	Y	Y	Y	—	—	Y	Y
13	Hazardous sharp edges	9.3	G	Y	Y	Y	—	Y	Y	Y
14	Hazardous sharp points	9.4	H	Y	Y	Y	—	Y	Y	Y
15	Hazardous gaps and openings	9.5	U	Y	Y	Y	—	Y	Y	Y
16	Durability of parking brakes	8.6 and 9.6.1	I	Y	Y	Y	—	—	Y	—
17	Efficiency of parking brakes	8.6 and 9.6.2	J and R	Y	Y	Y	—	—	Y	—
18	Resistance of automatic parking brake to rolling	8.6 and 9.6.3	J and R	Y	Y	Y	—	—	Y	—
19	Release actuator of automatic parking brake	8.6 and 9.6.4	—	Y	Y	Y	—	—	Y	—
20	Stability	9.8.1	N	Y	Y	Y	Y	Y	Y	Y
21	Stability against overbalancing	9.8.2	S	Y	Y	Y	—	—	Y	Y
22	Occupant retention	8.8	—	Y	Y	Y	—	—	Y	—
23	Determination of efficiency of harnesses and harness attachments	9.7.1(a)	K	Y	Y	Y	—	—	Y	—
24	Harness configuration	9.7.1(b)	W	Y	Y	Y	—	—	Y	—
25	Head barrier	8.9	—	Y	Y	Y	—	—	Y	Y
26	Head barrier probe test	9.7.2	L and X	Y	Y	Y	—	—	Y	Y
27	Foot end openings	8.10	—	Y	Y	Y	—	—	Y	Y
28	Foot end openings probe test	9.7.3	M and X	Y	Y	Y	—	—	Y	Y

Table 10.1 (continued)

Test sequence	Description of test	Reference clause	Test method (Appendix)	Pram or stroller with bassinet	Stroller or vehicle with removable seat	Vehicle with toddler seat	Vehicle with child restraint	Vehicle with toddler platform	Convertible vehicle	Vehicle with other accessories ^a
29	Seating and reclining surface	8.11	—	Y	Y	Y	—	—	Y	Y
30	Security of wheels	9.9	O	Y	Y	—	—	Y ^a	Y	Y
31	Reversible handles	8.3	—	Y	Y	Y	—	—	—	—
32	Security of reversible handle engagement	9.10	P	—	Y	—	—	—	—	—
33	Locking devices	8.7	—	Y	Y	Y	Y	—	Y	—
34	Security of locking devices	9.11	N, Q and V	Y	Y	Y	Y	—	Y	—
35	Security of latching devices	9.12	N and V	Y	Y	Y	Y	—	Y	Y
36	Connection of child restraint	9.13	V	—	—	—	Y	—	—	—
37	Backrests not adjustable to an angle greater than 130°	12.1.2(b)	X	Y	Y	Y	—	—	Y	—
38	Toys ^c	7.3	—	b	b	b	—	—	b	c
39	Toxicity ^c	6.1	—	Y	Y	Y	Y	Y	Y	Y

^a The requirement of test must be applied if relevant to the accessory.

^b Y, if a toy is supplied.

^c The sequence of testing is not specified and is left to the tester to decide.