
**Road vehicles — Anchorages in vehicles
and attachments to anchorages for child
restraint systems —**

**Part 1:
Seat bight anchorages and attachments**

iTeh STANDARD PREVIEW

*Véhicules routiers — Ancrages dans les véhicules et attaches
aux anchorages pour systèmes de retenue pour enfants —*

Partie 1: Ancrages près de la jonction dossier-coussin d'assise et attaches

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ISO copyright office
Case postale 56 • CH-1211 Geneva 20
Tel. + 41 22 749 01 11
Fax + 41 22 734 10 79
E-mail copyright@iso.ch
Web www.iso.ch

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Foreword

ISO (the International Organization for Standardization) is a worldwide federation of national standards bodies (ISO member bodies). The work of preparing International Standards is normally carried out through ISO technical committees. Each member body interested in a subject for which a technical committee has been established has the right to be represented on that committee. International organizations, governmental and non-governmental, in liaison with ISO, also take part in the work. ISO collaborates closely with the International Electrotechnical Commission (IEC) on all matters of electrotechnical standardization.

International Standards are drafted in accordance with the rules given in the ISO/IEC Directives, Part 3.

Draft International Standards adopted by the technical committees are circulated to the member bodies for voting. Publication as an International Standard requires approval by at least 75 % of the member bodies casting a vote.

Attention is drawn to the possibility that some of the elements of this part of ISO 13216 may be the subject of patent rights. ISO shall not be held responsible for identifying any or all such patent rights.

International Standard ISO 13216-1 was prepared by Technical Committee ISO/TC 22, *Road vehicles*, Subcommittee SC 12, *Restraint systems*.

ISO 13216 consists of the following parts, under the general title *Road vehicles — Anchorages in vehicles and attachments to anchorages for child restraint systems*:

— *Part 1: Seat bight anchorages and attachments*

— *Part 2: Top tether anchorages and attachments*

— *Part 3: Classification of child restraint dimensions and vehicle space*

Annexes A and B form a normative part of this part of ISO 13216.

Introduction

This part of ISO 13216 describes a universal system for anchoring child restraint systems to vehicles.

The purpose of this system is to improve the overall safety performance of child restraints, particularly by improving the convenience of installation and reducing the risk of misuse.

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Road vehicles — Anchorages in vehicles and attachments to anchorages for child restraint systems —

Part 1: Seat bight anchorages and attachments

1 Scope

This part of ISO 13216 specifies the dimensions, general requirements and static strength requirements of rigid anchorages for anchoring child restraint systems (CRS) in vehicles. It is applicable to fittings for the installation of CRSs for children with a mass of up to 22 kg, by means of two rigid anchorages positioned in the seat bight area, in passenger carrying vehicles.

NOTE 1 This mass limit applies to CRSs where the inertia forces of the child and CRS are transferred via the anchorage system for the CRS. The anchorages may be used for systems for larger children, such as seats where the main forces are transferred through the adult seat belt, provided that the forces applied to the anchorages and the resulting excursions (see 4.2) do not exceed the limits in this part of ISO 13216.

To assure compatibility with the anchorages, this part of ISO 13216 also specifies important features of CRSs equipped with rigid attachments, such as critical dimensions of the attachments and general requirements for handling. Supplementary devices, such as tether straps and reaction bars, which may be necessary for specific vehicle configurations or to fulfil performance criteria included in national and international standards and regulations, are not specified in this part of ISO 13216.

An interim anchorage system that employs semi-rigid anchorages in the vehicle is described in annex A. Requirements for optional non-rigid attachments on the CRS are given in annex B.

NOTE 2 Performance and strength requirements for the homologation of CRSs using attachments according to this part of ISO 13216 are presumed to be specified in other standards and regulations.

2 Normative references

The following normative documents contain provisions which, through reference in this text, constitute provisions of this part of ISO 13216. For dated references, subsequent amendments to, or revisions of, any of these publications do not apply. However, parties to agreements based on this part of ISO 13216 are encouraged to investigate the possibility of applying the most recent editions of the normative documents indicated below. For undated references, the latest edition of the normative document referred to applies. Members of ISO and IEC maintain registers of currently valid International Standards.

ISO 4130, *Road vehicles — Three-dimensional reference system and fiducial marks — Definitions.*

ISO 6487, *Road vehicles — Measurement techniques in impact tests — Instrumentation.*

ISO 6549, *Road vehicles — Procedure for H- and R-point determination.*

ISO 13215-2¹⁾, *Road vehicles — Reduction of misuse risk of child restraint systems — Part 2: Requirements and test procedures for correct installation (panel method)*.

3 Terms and definitions

For the purposes of this part of ISO 13216, the following terms and definitions apply.

3.1

anchorage

one of two (2) prescribed 6 mm diameter round horizontal bars, in accordance with this part of ISO 13216, provided at a vehicle seating position and extending from vehicle or seat structure to accept and restrain a **child restraint system** (3.3) with prescribed **attachments** (3.2)

NOTE Anchorages may be rigid, or semi-rigid according to annex A.

3.2

attachment

one of two (2) prescribed connections, in accordance with this part of ISO 13216, extending from the **child restraint system** (3.3) structure, and compatible with an **anchorage** (3.1)

NOTE Attachments may be rigid, or non-rigid according to annex B.

3.3

child restraint system CRS

free-standing device intended to provide child vehicle occupants with an approved restraint

NOTE CRSs comprise various categories such as car beds, infant restraints, toddler seats (forward and rearward facing), booster cushions, and booster seats. Combination products may cover two or more of these product categories.

3.4

child restraint fixture CRF

fixture which simulates the maximum external dimensions of the child restraint, and which is used to determine the space required by the **child restraint system** (3.3) and the location and access to the **anchorages** (3.1), but not the space required for ingress to the vehicle

See Figures 1 and 2.

NOTE Forward and upward limitations are not specified in this part of ISO 13216.

3.5

CRS connector

attachment (3.2) with certain specified dimensions designed to be rigidly supported

See Figure 8.

NOTE When designed according to annex B, a CRS connector may be flexibly supported.

3.6

ISOFIX

system for the connection of **child restraint systems** (3.3) to vehicles which has two rigid **anchorages** (3.1) in a vehicle seating position located near the seat bight, corresponding rigid **attachments** (3.2) on the child restraint system, and a means to limit the pitch rotation of the CRS

1) To be published.

3.7**non-rigid attachment**

one of two (2) prescribed connections, in accordance with annex B, flexibly supported from the **child restraint system** (3.3) structure, between a CRS and an **anchorage** (3.1)

NOTE A non-rigid attachment may consist of a CRS connector or hook supported by webbing or the equivalent.

3.8**seat bight**

area close to the intersection of the surfaces of the vehicle seat cushion and the seat back or squab

3.9**semi-rigid anchorage**

anchorage (3.1) fulfilling the requirements in annex A

3.10**static force application device****S-FAD**

test fixture that engages the vehicle **anchorages** (3.1) and that is used to confirm their strength and stiffness, as well as the CRS interaction with the vehicle seat, in a static test

See Figures 4 and 5.

3.11**vehicle seat fixture****VSF**

fixture which simulates the minimum dimensions of the available space provided by the vehicle seat and the location of the **anchorages** (3.1), and which is used by the child restraint manufacturer to determine the appropriate dimensions of the child restraint and the location of and access to the anchorages

See Figures 6 and 7.

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NOTE Forward and upward limitations are not specified in this part of ISO 13216.

4 Vehicle anchorage specifications**4.1 Dimensions and installation requirements****4.1.1 General**

The vehicle anchorages are positioned near the seat bight. The location of the anchorages is defined with respect to the CRF as described in Figures 1, 2 and 3. The purpose of the CRF is to ensure that a child restraint system will fit in the designated seating position with regard to the anchorage positioning and the surrounding vehicle interior.²⁾

The anchorages shall be positioned so that no parts of the vehicle interior are in conflict with the boundary surfaces given by the CRF. If the vehicle seat is adjustable, it shall be adjusted as recommended by the vehicle manufacturer for use with child restraint systems.

2) An amendment specifying the tolerances in order to use the CRF as a checking tool for homologation purposes is in preparation.

4.1.2 Anchorage dimensions and location

The anchorages shall be 6 mm \pm 0,1 mm diameter transverse horizontal round bars with a minimum effective length of 25 mm. The transverse spacing of the bars shall be 280 mm, centre-to-centre. They shall be supported so as to extend from the adjacent vehicle or seat structure such that the anchorages are readily accessible (when deployed for use, if storable, or if and when equipped with removable physical guidance features such as those described in 4.4).

NOTE 1 The actual length of the anchorages is given by the CRF, considering the manufacturing tolerances for the 280 mm anchorage spacing in the vehicle.

The anchorage bars are located at the vehicle seating position with the aid of and with respect to the CRF rearward extensions as shown in Figures 1, 2 and 3, with the CRF placed against or near the vehicle seat back.

With the CRF attached to the anchorages and resting on the seat cushion, the bottom surface shall have attitude angles within the following limits, angles measured relative to the vehicle reference planes according to ISO 4130:

- pitch: 15° \pm 10°
- roll: 0° \pm 5°
- yaw: 0° \pm 10°

NOTE 2 An explanation of the above angles is given in Figure 1.

The anchorage bars shall be located within the following limits:

- most rearward (determined by the CRF) shall be not more than 70 mm behind the rearmost lower corner of the CRF (point Z), measured parallel to the bottom surface and to the centre of the bar, with the CRF rear surface against the seat back;
- most forward: shall be not less than 120 mm behind the vehicle seating reference point (R-point according to ISO 6549), measured horizontally, and to the centre of the bar.

NOTE 3 In case of storable supports, the requirements of this part of ISO 13216 apply to the deployed position.

NOTE 4 For reasons of safety and comfort for the adult seat occupant, it is desirable to locate the anchorage bars as far rearward as possible, but for anchorage bar accessibility, it is desirable to have the anchorage bars as far forward as possible. Adjustable rearward extensions can be used to find the most appropriate position of the anchorage bars within the limits given above.

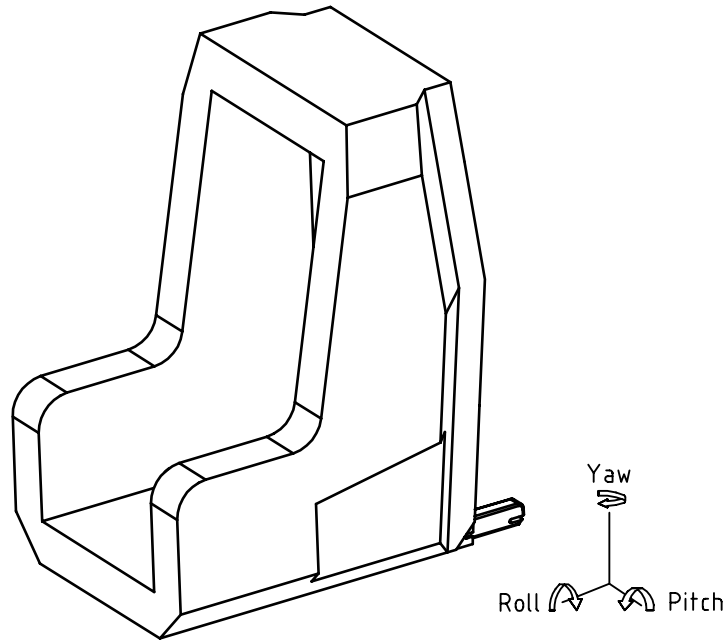
NOTE 5 The positioning of the anchorage bars is dependent on the vehicle seat cushion and seat back characteristics, and should be determined considering the mass range for typical CRSs (approximately 5 kg to 8 kg). Handling of the CRF, the intended use of physical guidance features, etc., should be taken into account for the final positioning of the bars.

NOTE 6 To facilitate installation of the CRF in a vehicle seat, the CRF may be constructed of smaller separable parts and assembled in the vehicle seat. Alternatively, vehicle components may be removed to allow access.

The minimum dimensions for the opening or soft area surrounding an anchorage bar for access by the attachment are determined by using the checking device shown in Figure 3. The checking device may be designed as a detachable part of the CRF for checking angular tolerance. A pitch tolerance of not less than 5° (relative to the pitch angle chosen) is recommended to facilitate mounting of a CRS.

4.1.3 CRS dimensions and space in the vehicle

A classification according to the space needed in the forward and upward direction to accommodate forward-facing and rearward-facing child restraint systems relating to different age groups is given in ISO 13216-3.



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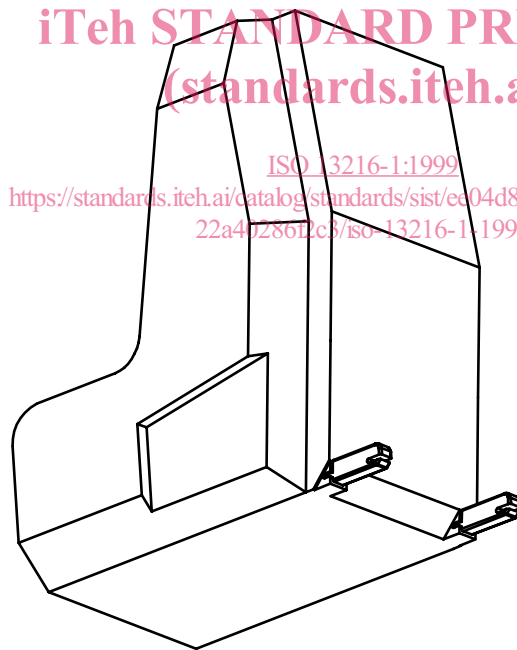


Figure 1 — Child restraint fixture (CRF), isometric views