भारतीय मानक

Indian Standard

IS 18623 (Part 3) : 2024
ISO 29061-1 : 2010

सड़क वाहन — चाइल्ड रिस्ट्रेन सिस्टम की उपयोगिता मूल्यांकन के तरीके और मानदंड तथा वाहन एंकरेज सिस्टम के साथ उनका इंटरफ़ेस

भाग 1 आईएसओएफआईएक्स एंकरेज और संयोजन से सुसज्जित वाहन और चाइल्ड रिस्ट्रेन सिस्टम

Road Vehicles — Methods and Criteria for Usability Evaluation of Child Restraint Systems and Their Interface with Vehicle Anchorage Systems

Part 1 Vehicles and Child Restraint Systems Equipped with ISOFIX Anchorages and Attachments

ICS 43.040.80

भारतीय मानक ब्यूरो

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NATIONAL FOREWORD

This Standard (Part 1) which is identical to ISO 29061-1 : 2010 'Road vehicles — Methods and criteria for usability evaluation of child restraint systems and their interface with vehicle anchorage systems — Part 1: Vehicles and child restraint systems equipped with ISOFIX anchorages and attachments' issued by International Organization for Standardization (ISO), was adopted by the Bureau of Indian Standards on the recommendation of the Passive Safety Crash Protection Systems Sectional Committee and approval of the Transport Engineering Division Council.

This standard is one of the parts on 'Road vehicles — Methods and criteria for usability evaluation of child restraint systems and their interface with vehicle anchorage systems'. Other parts of this standard are:

Part 3 Installation of child restraint systems using vehicle seat belts

Part 4 Securing of child in child restraint system and daily handling aspects

The text of ISO standard has been approved as suitable for publication as an Indian Standard without deviations. Certain terminologies and conventions are, however, not identical to those used in Indian Standards. Attention is particularly drawn to the following:

a) Wherever the words 'International Standard' appear referring to this standard, they should be read as 'Indian Standard'; and

b) Comma (,) has been used as a decimal marker, while in Indian Standards, the current practice is to use a point (.) as the decimal marker.

In this adopted standard, reference appears to certain International Standard for which Indian Standard also exists. The corresponding Indian Standard, which is to be substituted in its respective place, is listed below along with its degree of equivalence for the editions indicated:

International Standard	Corresponding Indian Standard	Degree of Equivalence
ISO 13216-1 Road vehicles — Anchorages in vehicles and attachments to anchorages for child restraint systems — Part 1: Seat bight anchorages and attachments	IS 18635 (Part 1)/ISO 13216-1 : 1999 Road vehicles — Anchorages in vehicles and attachments to anchorages for child restraint systems: Part 1 Seat bight anchorages and attachments	Identical

Attention is drawn to the possibility that some of the elements of this standard may be the subject of patent rights. The Bureau of Indian Standards shall not be held responsible for identifying any or all such patent rights.

Contents

Page

Introduction

The usability of a child restraint system (CRS) in terms of ease of

— installation of child restraint systems in various vehicles, and

— day-to-day use with a child (securing, harnessing, adaption for a growing child, etc.),

is of utmost importance to ensure that a CRS is used properly in accordance with the manufacturer's intentions, and to ensure that it will provide maximum protection in a crash situation. An international agreement on usability criteria and measurements is beneficial for both consumers and manufacturers.

The aim of this part of ISO 29061 is to develop and validate a usability rating system for ISOFIX systems to promote improved ISOFIX design for easy and correct use. It provides child restraint and vehicle manufacturers with a tool for the assessment of the usability of new and current ISOFIX systems. At the same time, it provides consumers (parents and caregivers) with information on the key features related to the proper use of the ISOFIX system, and assists them in selecting CRS and vehicles with ISOFIX systems that are easy to use properly.

The rating system consists of an assessment form and a manual (see ISO/TR 29061-2). In the manual, the content of the assessment form is clarified and guidelines and interpretations are provided. The rating form is also available in Excel (xls) format for download from the ISO standards maintenance site.

The usability of ISOFIX is addressed both in terms of the CRS (attachment system) and in terms of the vehicle (anchorage system) as well as the interaction of the two, emerging when child restraint systems are mounted in cars.

The usability evaluation system in ISO 29061 has been developed with participation from, and based on the experiences from, usability rating systems from Canada (Transport Canada and ICBC), the USA (NHTSA), and the EU (NPACS and consumer rating programmes, such as ICRT, ADAC).

It is envisaged that this methodology could be useful for current vehicle rating systems such as US NCAP and Euro NCAP.

Indian Standard

ROAD VEHICLES — METHODS AND CRITERIA FOR USABILITY EVALUATION OF CHILD RESTRAINT SYSTEMS AND THEIR INTERFACE WITH VEHICLE ANCHORAGE SYSTEMS

PART 1 VEHICLES AND CHILD RESTRAINT SYSTEMS EQUIPPED WITH ISOFIX ANCHORAGES AND ATTACHMENTS

1 Scope

This part of ISO 29061 provides criteria for the judgement of usability of child restraint systems (CRS) with ISOFIX attachments and their corresponding anchorages in the vehicle.

This part of ISO 29061 provides criteria for a separate evaluation of the child restraint ISOFIX attachments, of the ISOFIX anchorage installation in the vehicle, and an evaluation of the interface issues when installing a child restraint system in a certain vehicle.

This part of ISO 29061 covers both rigid and flexible attachment systems of the CRS.

NOTE   Although ISOFIX is defined in the original "ISOFIX" standard (ISO 13216-1) to be a rigid system, the term "ISOFIX" in this part of ISO 29061 is extended to include flexible CRS attachments (LATCH, UAS).

2 Normative references

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

ISO 13216-1:1999, *Road vehicles — Anchorages in vehicles and attachments to anchorages for child restraint systems —– Part 1: Seat bight anchorages and attachments*

3 Terms and definitions

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

3.1
anchorage
part of the universal interface provided in a vehicle

NOTE   See also ISOFIX anchorages and top tether anchorage.

3.2
anti-rotational device
device intended to restrict forward or rearward rotation of a child restraint system (3.6)

3.2.1
primary anti-rotational device
device intended to restrict forward rotation of a child restraint system

EXAMPLE   Top tether or support leg.

3.2.2
secondary anti-rotational device
device intended to restrict rearward rotation of a rearward-facing child restraint system

EXAMPLE   Rebound bar or rebound tether.

3.3
attachment
part of the universal interface provided with the child restraint system

NOTE   See also ISOFIX attachments (3.9.3) and non-rigid (flexible) attachment (3.11).

3.4
audible
capable of being heard in normal environmental conditions

3.5
base
part of the CRS (3.6) equipped with ISOFIX attachments (3.9.3) which can be attached to the ISOFIX anchorages (3.9.2) separately from the CRS shell

NOTE   The CRS shell is attached on the CRS base in the normal use.

3.6
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.

[ISO 13216-1:1999, definition 3.3]

3.7
connector
connecting and locking device to the universal interface, provided with the child restraint system, and part of the attachment

3.8
hidden slack
unintended looseness of a strap that is likely to adversely affect the performance of the CRS, and that cannot be easily detected or can only be detected by handling the CRS attachments in a non-standard way

3.9
ISOFIX
system for the connection of CRS to vehicles, which has two rigid anchorages in a vehicle seating position located near the seat bight, corresponding rigid attachments on the CRS, and a means to limit the pitch rotation of the CRS

NOTE 1   In this part of ISO 29061, the term ISOFIX is extended to include flexible CRS attachments (LATCH, UAS).

NOTE 2   Adapted from ISO 13216-1:1999.

3.9.1
ISOFIX accessibility tester
device used to check the accessibility of an ISOFIX anchorage

NOTE   The dimensions are defined in Figure 3, ISO 13216-1:1999.

2

3.9.2
ISOFIX anchorages
two horizontal rigid bars, 6 mm in diameter and at least 25 mm long, as specified in ISO 13216-1, installed in vehicles in or near the seat bight, and to which two ISOFIX attachments are connected to secure the lower part of the CRS

NOTE   Anchorages may be rigid or semi-rigid according to Annex A of ISO 13216-1:1999.

3.9.3
ISOFIX attachments
two hardware assemblies, built into the CRS base at 280 mm apart, that meet the requirements of ISO 13216-1 and are used to connect a CRS to ISOFIX anchorages

NOTE   Attachments may be rigid or non-rigid according to Annex B of ISO 13216-1:1999.

3.10
misuse
any deviation from the intended application and use of a CRS that might reduce its protective performance

3.11
non-rigid attachment
flexible attachment
one of two (2) prescribed connections, in accordance with ISO 13216-1:1999, Annex B, flexibly supported from the child restraint system structure, between a CRS and an anchorage

NOTE 1   A non-rigid (flexible) attachment may consist of a CRS connector or hook supported by webbing or the equivalent. A CRS connector is an attachment with certain specified dimensions designed to be rigidly supported, described in ISO 13216-1:1999, Figure 8. When designed according to ISO 13216-1:1999, Annex B, a CRS connector may be flexibly supported.

NOTE 2   Adapted from ISO 13216-1:1999.

3.12
pictogram
illustration or photo used to represent a concept or an operation

NOTE   It may be supplemented by text.

3.13
rebound bar
type of anti-rotational device intended to restrict the rearward rotation of a rearward-facing CRS

NOTE   It usually comprises a rigid device that, when in its operational position, rests against the car seatback.

3.14
rebound tether
lower tether
type of anti-rotational device intended to restrict the rearward rotation of a rearward-facing CRS

NOTE   It usually comprises a tether strap or other hardware attached near the back or base of the CRS that connects to a rebound tether (lower tether) anchorage. It incorporates a device to enable it to be connected to such an anchorage.

3.15
rebound tether anchorage
lower tether anchorage
anchorage on the vehicle seat track or on or close to the vehicle floor to which a rebound tether (lower tether) can be attached

3.16
seat bight
area close to the intersection of the surfaces of the vehicle seat cushion and the seatback or squab

3.17
single action
operation that can be completed without the need to undertake a secondary action

NOTE   Examples include tightening a strap by pulling it without the need to release a locking system, or attaching to an anchorage without the need to depress the seat cushion.

3.18
support leg
type of anti-rotational device comprising a permanent attachment to a child restraint system, or a base of a child restraint system, creating a compressive load path between the child restraint and a vehicle structure (for example, the vehicle floor) to prevent or reduce forward rotation of the child restraint

NOTE   A support leg may be adjustable.

3.19
top tether
tether strap attached at or near the top of a CRS, incorporating a device to enable it to be connected to a top tether anchorage

3.19.1
top tether anchorage
device, such as a ring, bar, bracket, or webbing loop, and its underlying structure, either user-ready or aftermarket-installed, to which a top tether can be attached

3.19.2
top tether strap
webbing strap which extends from the top of a CRS to the top tether anchorage and which is equipped with an adjustment device, a tension-relieving device and a top tether connector

3.20
usability
extent to which a product can be used by specified users to achieve specified goals with effectiveness, efficiency and satisfaction in a specified context of use

NOTE 1   This is a generic definition taken from ISO 9241-11.

NOTE 2   Interpretation of the generic definition for the purpose of this part of ISO 29061: the extent to which an ISOFIX-equipped vehicle or CRS is capable of being used and is convenient and practical in use (separately or combined).

3.21
visible
capable of being seen without tools (other than spectacles) in normal environmental conditions

4   ISOFIX usability evaluation procedure and scoring principles

4.1   Evaluation procedure

This part of ISO 29061 provides a procedure to evaluate the usability of ISOFIX attachments on child restraints, ISOFIX hardware in vehicle seating positions, and the interface between ISOFIX systems for specific combinations of child restraints and vehicle seating positions. The rating system takes into consideration child restraint systems that are equipped with either flexible or rigid ISOFIX attachments including those that include a top tether or other anti-rotation device(s). The usability rating protocol, aided by the manual in ISO/TR 29061-2, is intended to be objective and repeatable.

The rating is most easily accomplished using a team of two people having basic knowledge of child restraints and being familiar with the technical terms used. The rating procedure for all three aspects of the process — the child restraint, the vehicle seating position, and the resulting interface — takes about 45 min.

The materials necessary include

— the usability evaluation rating form (in either paper or electronic format),

— the usability rating manual (see ISO/TR 29061-2),

— the vehicle owner's manual,

— the child restraint manual, and

— a screwdriver, or a simple prying/turning tool.

A copy of the terms and definitions from this part of ISO 29061 may also be helpful.

For the independent assessment of CRS ISOFIX connector function, the use of an ISOFIX bar dummy is recommended. In its simplest form, this can be a straight 6 mm wide bar of at least 280 mm length. It could consist of two aligned ISOFIX anchorages connected to a rigid supporting material, or a demo seat equipped with ISOFIX anchorages.

For the independent assessment of vehicle ISOFIX anchorages and the available space around them, the use of an ISOFIX accessibility tester or a standard ISOFIX connector is recommended, in accordance with the requirements of ISO 13216-1:1999, Figure 3.

Initially, the child restraint should be as delivered new and separate from the vehicle. The rating process includes all of the steps necessary, including assembly, to complete the installation. The process should preferably be carried out by a person unfamiliar with the CRS and vehicle.

Unpacking the CRS, removing the box and plastic protections, detaching the handbook, etc., should be disregarded for rating purposes, but other initial one-time preparations are considered and assessed in the forms.

The mode of use for the child restraint (i.e. forward-facing/rearward-facing, upright/reclined, with base/without base) and the seating position in the vehicle should be determined in advance and documented in the rating form.

The rating process first addresses the labels and instructions, and finally the ease of installation and removal of the child restraint system.

4.2 Scoring system

The scoring system consists of a Good/Average/Poor rating (scored with 3/1/0 points) of each item assessed, and an importance rating A/B/C (scored with 3/2/1 points) for each item. For each assessment, the scores of the above are multiplied. A maximum score for a "Good" solution on an item with "A" importance is 9 points.

The maximum possible score will depend on the features and usage of the restraint and vehicle. Different products may have different possible maximum scores and therefore comparisons of the raw number of total points would not be appropriate. The final rating consists of a total number of points that should be expressed as a percentage of the maximum possible score for the particular conditions. See also further recommendations given in Annex A.

In addition, the rating will result in a total poor rating (or fail) if the product evaluated does not meet the most crucial questions of this rating. These are questions 2.2.2 and 2.2.3 for the vehicle (poor rating meaning that it is not possible to use the ISOFIX anchorages), and questions 3.1.1, 3.1.3 and 3.4.3 for the assessed combination of a CRS and a vehicle (poor rating meaning that it is not possible to attach the CRS to the ISOFIX anchorages, or that the CRS/base interface fails).

The manual (see ISO/TR 29061-2) provides more detailed instructions, illustrations, and examples to aid the user in the scoring.

5 Usability evaluation forms

The following are the usability evaluation forms:

Form 1: ISOFIX child restraint system.

Form 2: Vehicle ISOFIX and top tether anchorages.

Form 3: Interface — Installing the CRS, or base with seat, in the vehicle.

To enhance the value and applicability of this part of ISO 29061, the forms are also provided in a revisable (MS Excel) format. These forms are posted on the ISO Standards maintenance website, and can be found at the following URL: http://standards.iso.org/iso/29061.

Form 1: ISOFIX child restraint system

NOTE — For the independent assessment of CRS ISOFIX connector function, the use of an ISOFIX bar dummy is recommended (see 4.1).

Date of evaluation	Evaluated by	Test no. ....

Field	Value
ISOFIX child restraint system	☐ Rigid attachments ☐ Flexible attachments ☐ Top tether ☐ Support leg ☐ Secondary anti-rotational device
Manufacturer	....
Child seat make & model	.... Base make & model (if applicable)
Country/Area of use	.... Country/Area of use
Certification/Type Approval no.	.... Certification/Type Approval no.
Production no. (ECE seq. no./US no.)	.... Production no. (ECE seq. no./US no.)
Manufacture Date (yyyy-mm-dd)	.... Manufacture Date (yyyy-mm-dd)
If removable base, model no. on base	.... Mode tested ☐ Forward-Facing ☐ Rearward-Facing
Type (Infant, Group 1, etc.)	.... CRS inclination tested ☐ Upright/Normal ☐ Reclined

Form 1.1: CRS ISOFIX instructions and labels[1]

		Good	Average	Poor	Importance	N/A	Notes
1.1.1	Do CRS or base instructions clearly show how to prepare and use/attach the ISOFIX attachments?	Visually obvious, able to use with pictures only. Labels on CRS self-explanatory, or not necessary.	Pictures plus written instructions provided. Labels on CRS non self-explanatory, or viewable from one direction only.	Only written instructions provided (may also be non self-explanatory pictures) or nothing shown.			
	Labels on CRS	☐	☐	☐	A	☐	
	Manual	☐	☐	☐	C	☐	
1.1.2	Do CRS or base instructions clearly show how to prepare and use/attach the anti-rotational devices?	Visually obvious, able to use with pictures only. Labels on CRS self-explanatory, or not necessary.	Pictures plus written instructions provided. Labels on CRS non self-explanatory, or viewable from one direction only.	Only written instructions provided (may also be non self-explanatory pictures) or nothing shown.			
	Labels on CRS	☐	☐	☐	A	☐	
	Manual	☐	☐	☐	C	☐	
1.1.3	Do CRS or base instructions show how to detach or release ISOFIX attachments, base and anti-rotational devices?	Visually obvious, able to use with pictures only. Labels on CRS self-explanatory.	Pictures plus written instructions provided. Labels on CRS non self-explanatory, or viewable from one direction only.	Only written instructions provided (may also be non self-explanatory pictures) or nothing shown.			
	Labels on CRS	☐	☐	☐	C	☐	
	Manual	☐	☐	☐	C	☐	
1.1.4	Do the instructions on labels on CRS or base and in manual convey the same meaning?	☐ Yes		☐ No	B	☐	

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1) If ISOFIX attachments are on a removable base, the following questions apply to the CRS base.

Form 1.2: CRS attachment hardware evaluation

		Good	Average	Poor	Importance	N/A	Notes
1.2.1	Can CRS be used without initial assembling when taken out of the transport package?	☐ Yes All parts are assembled when unpacking the CRS.	☐ Some parts must be assembled, but in a self-explanatory way and without the need of tools.	☐ No CRS delivered as a kit. Parts must be assembled with the use of tools.	B	☐	
1.2.2	Are CRS or base ISOFIX attachments ready to use?	Yes, or if stored, clear single action with pictures or markings on CRS.	Steps necessary, described with pictures, or a single action without pictures or markings.	No, or if stored, steps not defined with pictures or markings on CRS.		☐	
	Rigid attachments	☐	☐	☐	B	☐	
	Flexible attachments	☐	☐	☐	B	☐	
	Top tether	☐	☐	☐	B	☐	
	Support leg or other anti-rotational device	☐	☐	☐	B	☐	
Flexible attachments							
1.2.3	Can lower flexible attachments be correctly routed through CRS, without risk of misrouting or interference with CRS harness?	☐ Yes		☐ No	A	☐	
Top tether attachment							
1.2.4	Can tether be adjusted with a one-hand operation?	☐ Yes		☐ No	A	☐	

Form 2: Vehicle ISOFIX and top tether anchorages

NOTE   To aid the evaluation of accessibility to ISOFIX anchorages, the use of an ISOFIX accessibility tester or a standard ISOFIX connector is recommended.

Vehicle category

(2-door or 4-door sedan, 5-door family combi/station wagon, van, SUV, pick-up truck, etc.)

Vehicle – Make, model and model year   ....

Vehicle – VIN and date of manufacture   ....

Seating positions with ISOFIX anchorages   ....   (According to seating position codes graph at end of form)

Seating positions with top tether anchorages   ....   (According to seating position codes graph at end of form)

Seating position(s) evaluated   ....   (According to seating position codes graph at end of form)

Interior seating system   ....   (E.g. 3 seat bench, row with 2 seats)

Top tether anchorages

☐ Present and evaluated

☐ Not available

Form 2.1: Vehicle ISOFIX and top tether instructions and labelling

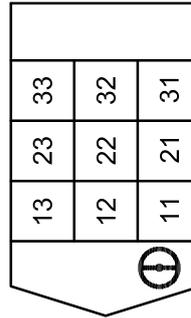|		Good	Average	Poor	Importance	N/A	Notes
2.1.1	Does the vehicle owner's manual clearly identify locations and number of positions fitted with:	Can identify all anchorage positions using ISOFIX pictograms.	Can identify all anchorage positions using some pictograms and written instructions.	Manual has written instructions only or shows only some or no anchorages, in an unclear way.			
	ISOFIX anchorages	☐	☐	☐	C	☐	
	Top tether anchorages	☐	☐	☐	C	☐	
2.1.2	Does the vehicle owner's manual clearly identify the top tether routing instructions[2])?	☐ Yes	☐	☐ No	C	☐	
2.1.3	Are all anchorage positions visible and visibly marked in vehicle itself (i.e. from point of installation)?	Yes, clear and visible markings close to the anchorages.	Not all anchorage positions visible or visibly marked, but still easily identified.	Anchorages hidden or not visibly marked.			
	ISOFIX anchorages	☐	☐	☐	A	☐	
	Top tether anchorages	☐	☐	☐	A	☐	
2.1.4	Can the top tether anchorages be unambiguously identified, with no risk of confusion with other similar hardware?	☐ Yes There is no risk of confusion with other hardware.	☐ There is some risk of confusion, but top tether anchorages are clearly and permanently marked to avoid mistake (e.g. with top tether symbol).	☐ No There is risk of confusion and countermeasures have not been taken to avoid this.	A	☐	

2) Instructions should preferably take into account both "V" shape and "I" shape top tether strap routing.

Form 2.2: Vehicle ISOFIX and top tether anchorage evaluation

		Good	Average	Poor	Importance	N/A	Notes
2.2.1	Actions required to prepare anchorages for use (applies to vehicle-provided equipment)	None, or need to lift attached cover or guide (must have ISO ISOFIX / Top Tether symbol).	Anchorages must be deployed with single operation (no tools required) or guide must be installed (no tools).	Multiple actions or tools needed to install guides or deploy anchorages.			
	ISOFIX anchorages	☐	☐	☐	A	☐	
	Top tether anchorages	☐	☐	☐	A	☐	
2.2.2	Are the prepared anchorages accessible (i.e. is it possible to use them)?	Yes, can get positive attachment on each anchorage, sufficient clear space around the anchorages.	Yes, after single action, e.g. one-handed depression of seat cushion, or moving seat belt buckle, or other feature out of the way (including the head rest of the car seat).	No or not accessible without tools, or physically modifying seat, or extreme effort.			The use of a standard ISOFIX connector is recommended for this evaluation. NOTE A poor rating on this question will result in an overall poor rating result.
	ISOFIX anchorages	☐	☐	☐	A	☐	
	Top tether anchorages	☐	☐	☐	A	☐	
2.2.3	Can ISOFIX anchorages be accessed without any interference with seat belt or seat belt buckle?	☐ Yes Physically separate.	☐ No But can be moved out of the way.	☐ No Difficult to access anchorages because of interference.	A	☐	The use of a standard ISOFIX connector is recommended for this evaluation. NOTE A poor rating on this question will result in an overall poor rating result.

Score (points)

Score (% of achievable)

Seating position codes

If right-hand drive — mirror image

13	23	33
12	22	32
11	21	31

Form 3: Interface – Installing the CRS, or base with seat, in the vehicle

Vehicle – Make, model and model year	....
Child seat – Make and model	....
Seating position(s) evaluated (see graph)	....
Vehicle seat position (fore/mid/aft)	....

Evaluation includes assessment of the following interfaces and modes

☐ Rigid attachments   ☐ Top tether anchorages/attachments

☐ Flexible attachments   ☐ Support leg

☐ Adjustable attachments   ☐ Secondary anti-rotational device

☐ Separate base   ☐ CRS upright/normal   ☐ CRS reclined

Form 3.1: Attaching CRS or base to ISOFIX anchorages

	Question	Good	Average	Poor	Importance	N/A	Notes
3.1.1	Using the CRS, are the prepared vehicle ISOFIX anchorages accessible during the connecting process (i.e. is it possible to use them)?	☐ Yes Can get positive attachment with both ISOFIX attachments, and sufficient clear space around the anchorage.	☐ Yes After single action, e.g. one-handed depression of seat cushion or moving seat belt buckle out of the way.	☐ Not accessible or ready to use. Not possible to attach CRS without tools or physically modifying seat, or using extreme effort.	A	☐	NOTE A poor rating on this question will result in an overall poor rating result for this CRS-Vehicle combination.
3.1.2	Do the CRS ISOFIX attachments remain accessible during the process of connecting until they are secured to the vehicle anchorages?	☐ Yes	☐	☐ No	A	☐	
3.1.3	Is there clear feedback that the child restraint system is correctly attached to the ISOFIX anchorages?	☐ Yes Visual plus tactile and/or audible indication that both CRS ISOFIX attachments are correctly attached.	☐ Tactile and/or audible indication that both CRS ISOFIX attachments are correctly attached.	☐ None, or false (false means indicating correct attachment without actually being attached to anchorage).	A	☐	NOTE A poor rating on this question will result in an overall poor rating result for this CRS-Vehicle combination.
3.1.4	Can the ISOFIX attachments be tightened after the initial connection to the lower anchorages?	☐ Yes With clearly defined steps with pictures or markings on CRS, or no need to tighten.	☐ Yes With non self-explanatory pictures or markings or nothing on CRS.	☐ No Unable to tighten or extreme efforts required.	A	☐	
3.1.5	Flexible Attachments only: When properly installed, no hidden slack can exist in lower attachments (includes possible fouling)	☐ Yes Hidden slack cannot exist.	☐ Hidden slack may appear.	☐ No Major risk of hidden slack.	A	☐	
3.1.6	Is the child harness fully operable when ISOFIX is installed properly?	☐ Yes	☐	☐ No	A	☐	

Form 3.2: Attaching a top tether (if applicable)

	Good	Average	Poor	Importance	N/A	Notes
3.2.1 Actions required to attach the top tether to the tether anchorage?	☐ One hand to attach from position of installing.	☐ One hand to attach, must be routed from other position.	☐ Other, e.g. must move something out of the way, not foreseen in the vehicle manual.	B	☐	
3.2.2 Can top tether be tightened properly?	☐ Yes — Single action and one hand to tighten tether.	☐ Yes — With two hands and/or multiple steps.	☐ No — E.g. catches on seat or slips off fixed head restraint or too short distance between CRS and top tether hook.	A	☐	
3.2.3 Is there clear feedback that the child restraint system is correctly attached to the top tether anchorage?	☐ Visual plus tactile and/or audible indication that top tether attachment is correctly attached.	☐ Tactile and/or audible indication that top tether attachment is correctly attached.	☐ None, or false (false means indicating correct attachment without actually being attached to anchorage).	A	☐	

Form 3.3: Using anti-rotational device(s) other than top tether (if applicable)

	Good	Average	Poor	Importance	N/A	Notes
3.3.1 Actions required to adjust the primary anti-rotational device to the correct position (e.g. a support leg in a rearward installation)?	☐ One hand operation from position of installation or no operation at all.	☐ One hand operation from other position or two hands.	☐ Other, more complicated adjustment procedure.	B	☐	
3.3.2 Actions required to operate any secondary anti-rotational device(s) [e.g. a rebound bar, or rebound tether(s), in a rearward installation]?	☐ One hand operation from position of installation or no operation at all.	☐ One hand operation from other position or two hands single operation from position of installation.	☐ Other, more complicated adjustment procedure.	B	☐	

Form 3.4: CRS/base interface evaluation

	Good	Average	Poor	Importance	N/A	Notes
3.4.1	CRS and base preparation: CRS base and CRS shell ready for installation? ☐ Yes No further action necessary.	☐ No Single action needed.	☐ No Multiple actions needed, or additional or specific parts or actions are required.	B	☐	
3.4.2	Actions required to attach the CRS shell to base? ☐ Single operation from position of installation.	☐	☐ Multiple operations necessary.	B	☐	
3.4.3	Is there a clear feedback of correct locking of the CRS to the base? ☐ Tactile plus visual and/or audible indication that CRS is correctly locked to base.	☐ Tactile and/or audible indication that CRS is correctly locked to base.	☐ None, or false (false means indicating correct locking without actually being locked to base).	A	☐	A poor rating will result in an overall poor rating of the CRS/base interface in this CRS-Vehicle combination.
3.4.4	Actions required to detach CRS from base? ☐ Dual action (e.g. lifting and releasing button).	☐ Triple or more.	☐ Not possible or requiring considerable effort.	C	☐	

Form 3.5: Detachment and removal of CRS from vehicle ISOFIX anchorages

		Good	Average	Poor	Importance	N/A	Notes
3.5.1	Ease of releasing tension of top tether?	☐ One hand/action to release tension of top tether, or not necessary.	☐ Two hands, e.g. one hand to loosen strap, one hand to push button.	☐ Not possible or requiring considerable effort.	C	☐	
3.5.2	Actions required to detach and store the top tether strap after tension has been released?	☐ One hand/action to undo top tether from anchorage. Simple storage.	☐ Two-hand action or multiple steps. Actions needed for storage.	☐ Not possible or requiring considerable effort. No storage facilities.	C	☐	
3.5.3	Ease of releasing tension of flexible CRS attachments?	☐ One hand/action to release tension of attachments, or not necessary.	☐ Two hands, e.g. one hand to loosen strap, one hand to push button.	☐ Not possible or requiring considerable effort.	C	☐	
3.5.4	Actions required to remove and store the primary anti-rotational device?	☐ Single quick release action. Simple storage or autostorage.	☐ Two-hand action or multiple steps. Actions needed for storage.	☐ Not possible or requiring considerable effort. No storage facilities.	C	☐	
3.5.5	Actions required to remove and store any secondary anti-rotational device(s)?	☐ Single quick release action. Simple storage or autostorage.	☐ Two-hand action or multiple steps. Actions needed for storage.	☐ Not possible or requiring considerable effort. No storage facilities.	C	☐	
3.5.6	Actions required to detach the attachments from the ISOFIX anchorages?	☐ Easy to detach (single action once tension is released, if applicable). Prevention of unintentional release is considered in design.	☐ Detachment requires multiple steps or actions.	☐ Not possible or requiring considerable effort or risk of unintentional release.	C	☐	

Score (points)

Score (% of achievable)

Seating position codes

If right-hand drive — mirror image

13	23	33
12	22	32
11	21	31

Summary

Date of evaluation ....

Evaluated by ....

Vehicle – Make, model and model year ....

Test no. ....

Seating position(s) evaluated (see seating position codes graph) ....

Child seat – Make & Model ....

Type (Infant, Group 1, etc.) ....

Mode tested (Forward/Rearward Facing) ....

Scoring results	Score	Out of	%
CRS			
Vehicle			
Interface			

Comments/observations

Annex A
(informative)

Recommendations regarding scoring and assessment

Various use cases and purposes of the usability assessment according to this part of ISO 29061 can be assumed. The purpose can for example be

— to assess the strengths and weaknesses of a certain child restraint system in different car models,

— to assess a vehicle interface in combination with different child restraint systems,

— to assess the usability of a number of child restraint systems for consumer information purposes.

Depending on the purpose, one form, two forms in combination, or all three forms may be used.

It should be observed that the number of questions related to certain features of the CRS or the vehicle may affect the scoring results.

EXAMPLE   Availability of adjustment provisions means additional questions would be answered. This could add points to the result, in the case of good scoring, but it could also result in a lower score.

The balance of the scoring is affected by the number of questions applicable to a certain solution. This means that the usability scoring cannot provide a completely "fair" comparison between different CRS types and designs.

To some extent, however, the imbalance can be compensated when the final assessment is done (shown in Figure A.1).

Weighting factors are applied to each part and each subpart of the questionnaire

— to compensate for the numbers of the questions in each subpart,

— to ensure the permanence of the scoring in the future,

— to provide a possibility to compare the scoring between different CRS and vehicle solutions.

Figure A.1 shows possible weighting factors to be applied in achieving a total score when all forms are used.

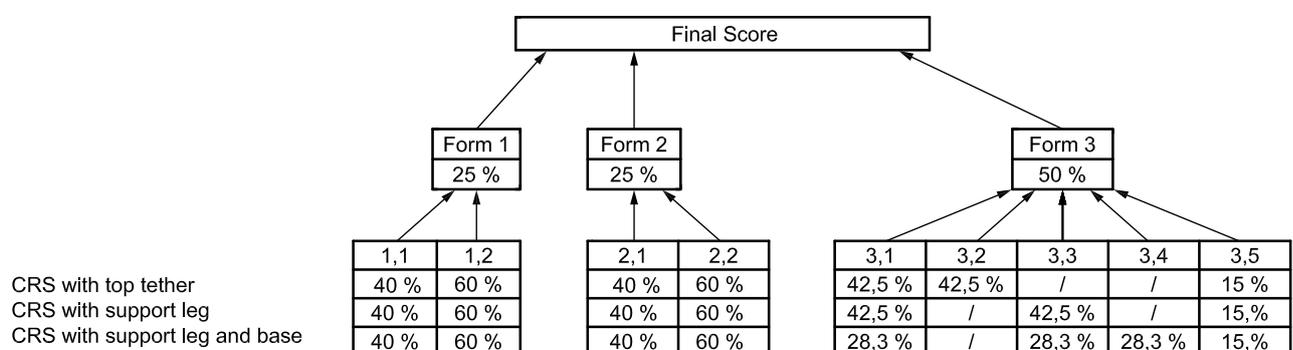|	Form 1 25 %		Form 2 25 %		Form 3 50 %				
	1,1	1,2	2,1	2,2	3,1	3,2	3,3	3,4	3,5
CRS with top tether	40 %	60 %	40 %	60 %	42,5 %	42,5 %	/	/	15 %
CRS with support leg	40 %	60 %	40 %	60 %	42,5 %	/	42,5 %	/	15,%
CRS with support leg and base	40 %	60 %	40 %	60 %	28,3 %	/	28,3 %	28,3 %	15,%

Figure A.1 — Possible weighting factors applicable to the forms and their subparts

Annex B
(informative)

Example usability rating classes

Based on the percentage outcome of the assessment procedure of this part of ISO 29061, usability rating classes according to the following example can be considered:

From 89 % to 100 %   Excellent

From 76 % to 88 %   Good

From 63 % to 75 %   Average

From 50 % to 62 %   Marginal

Less than 50 %   Poor

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3)   To be published.

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