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**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**

*Véhicules routiers — Méthodes et critères pour l'évaluation de la facilité  
d'utilisation des systèmes de retenue pour enfants, et leurs interfaces  
avec les systèmes d'ancrage dans le véhicule —*

*Partie 1: Véhicules et systèmes de retenue pour enfants équipés  
d'ancrages et d'attaches ISOFIX*



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Case postale 56 • CH-1211 Geneva 20  
Tel. + 41 22 749 01 11  
Fax + 41 22 749 09 47  
E-mail [copyright@iso.org](mailto:copyright@iso.org)  
Web [www.iso.org](http://www.iso.org)

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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 2.

The main task of technical committees is to prepare International Standards. 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 document may be the subject of patent rights. ISO shall not be held responsible for identifying any or all such patent rights.

ISO 29061-1 was prepared by Technical Committee ISO/TC 22, *Road vehicles*, Subcommittee SC 12, *Passive safety crash protection systems*.

ISO 29061 consists of the following parts, under the general title *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*
- *Part 2: Manual to assist the usability assessments of ISO 29061-1* (Technical Report)

## 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.



# 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.



**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. ....	
ISOFIX child restraint system	<input type="checkbox"/> Rigid attachments	<input type="checkbox"/> Flexible attachments	<input type="checkbox"/> Top tether <input type="checkbox"/> Support leg <input type="checkbox"/> 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		
Type (Infant, Group 1, etc.)	CRS inclination tested		
		<input type="checkbox"/> Forward-Facing <input type="checkbox"/> Rearward-Facing	<input type="checkbox"/> Upright/Normal <input type="checkbox"/> Reclined

Form 1.1: CRS ISOFIX instructions and labels<sup>1)</sup>

	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	<input type="checkbox"/>	<input type="checkbox"/>	A	<input type="checkbox"/>	
	Manual	<input type="checkbox"/>	<input type="checkbox"/>	C	<input type="checkbox"/>	
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	<input type="checkbox"/>	<input type="checkbox"/>	A	<input type="checkbox"/>	
	Manual	<input type="checkbox"/>	<input type="checkbox"/>	C	<input type="checkbox"/>	
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	<input type="checkbox"/>	<input type="checkbox"/>	C	<input type="checkbox"/>	
	Manual	<input type="checkbox"/>	<input type="checkbox"/>	C	<input type="checkbox"/>	
1.1.4	Do the instructions on labels on CRS or base and in manual convey the same meaning?	<input type="checkbox"/> Yes	<input type="checkbox"/>	B	<input type="checkbox"/>	

---

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?	<input type="checkbox"/> Yes All parts are assembled when unpacking the CRS.	<input type="checkbox"/> Some parts must be assembled, but in a self-explanatory way and without the need of tools.	<input type="checkbox"/> No CRS delivered as a kit. Parts must be assembled with the use of tools.	B	<input type="checkbox"/>	
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.		<input type="checkbox"/>	
Rigid attachments	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	B	<input type="checkbox"/>	
Flexible attachments	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	B	<input type="checkbox"/>	
Top tether	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	B	<input type="checkbox"/>	
Support leg or other anti-rotational device	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	B	<input type="checkbox"/>	
<b>Flexible attachments</b>						
1.2.3 Can lower flexible attachments be correctly routed through CRS, without risk of misrouting or interference with CRS harness?	<input type="checkbox"/> Yes	<input type="checkbox"/>	<input type="checkbox"/> No	A	<input type="checkbox"/>	
<b>Top tether attachment</b>						
1.2.4 Can tether be adjusted with a one-hand operation?	<input type="checkbox"/> Yes	<input type="checkbox"/>	<input type="checkbox"/> No	A	<input type="checkbox"/>	

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		
Seating positions with top tether anchorages		
Seating position(s) evaluated		
Interior seating system		
	(According to seating position codes graph at end of form)	Top tether anchorages
	(According to seating position codes graph at end of form)	<input type="checkbox"/> Present and evaluated
	(According to seating position codes graph at end of form)	<input type="checkbox"/> Not available
	(E.g. 3 seat bench, row with 2 seats)	



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.	Manual has written instructions only or shows only some or no anchorages, in an unclear way.			
	ISOFIX anchorages	<input type="checkbox"/>	<input type="checkbox"/>	C	<input type="checkbox"/>	
	Top tether anchorages	<input type="checkbox"/>	<input type="checkbox"/>	C	<input type="checkbox"/>	
2.1.2	Does the vehicle owner's manual clearly identify the top tether routing instructions <sup>2)</sup> ?	<input type="checkbox"/> Yes	<input type="checkbox"/> No	C	<input type="checkbox"/>	
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.	Anchorage hidden or not visibly marked.			
	ISOFIX anchorages	<input type="checkbox"/>	<input type="checkbox"/>	A	<input type="checkbox"/>	
	Top tether anchorages	<input type="checkbox"/>	<input type="checkbox"/>	A	<input type="checkbox"/>	
2.1.4	Can the top tether anchorages be unambiguously identified, with no risk of confusion with other similar hardware?	<input type="checkbox"/> Yes There is no risk of confusion with other hardware.	<input type="checkbox"/> No There is some risk of confusion, but top tether anchorages are clearly and permanently marked to avoid mistake (e.g. with top tether symbol).	A	<input type="checkbox"/>	

---

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

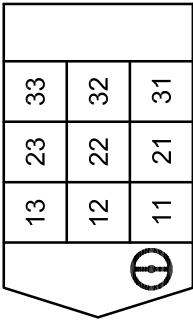
	Good	Average	Poor	Importance	N/A	Notes
2.2.1	Actions required to prepare anchorages for use (applies to vehicle-provided equipment)	None, or need to lift attached cover or guide (must have ISO ISOFIX / Top Tether symbol).	Multiple actions or tools needed to install guides or deploy anchorages.			
	ISOFIX anchorages	<input type="checkbox"/>	<input type="checkbox"/>	A	<input type="checkbox"/>	
	Top tether anchorages	<input type="checkbox"/>	<input type="checkbox"/>	A	<input type="checkbox"/>	
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.	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	<input type="checkbox"/>	<input type="checkbox"/>	A	<input type="checkbox"/>	
	Top tether anchorages	<input type="checkbox"/>	<input type="checkbox"/>	A	<input type="checkbox"/>	
2.2.3	Can ISOFIX anchorages be accessed without any interference with seat belt or seat belt buckle?	<input type="checkbox"/> Yes Physically separate.	<input type="checkbox"/> No Difficult to access anchorages because of interference.	A	<input type="checkbox"/>	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.

Seating position codes

If right-hand drive — mirror image

Score (points)

Score (% of achievable)



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

Vehicle – Make, model and model year	.....	Evaluation includes assessment of the following interfaces and modes  <input type="checkbox"/> Rigid attachments <input type="checkbox"/> Top tether anchorages/attachments  <input type="checkbox"/> Flexible attachments <input type="checkbox"/> Support leg  <input type="checkbox"/> Adjustable attachments <input type="checkbox"/> Secondary anti-rotational device  <input type="checkbox"/> Separate base <input type="checkbox"/> CRS upright/normal <input type="checkbox"/> CRS reclined
Child seat – Make and model	.....	
Seating position(s) evaluated (see graph)	.....	
Vehicle seat position (fore/mid/aft)	.....	

Form 3.1: Attaching CRS or base to ISOFIX anchorages

	Good	Average	Poor	Importance	N/A	Notes
3.1.1	<input type="checkbox"/> Yes Can get positive attachment with both ISOFIX attachments, and sufficient clear space around the anchorage.	<input type="checkbox"/> Yes After single action, e.g. one-handed depression of seat cushion or moving seat belt buckle out of the way.	<input type="checkbox"/> Not accessible or ready to use. Not possible to attach CRS without tools or physically modifying seat, or using extreme effort.	A	<input type="checkbox"/>	NOTE A poor rating on this question will result in an overall poor rating result for this CRS-Vehicle combination.
3.1.2	<input type="checkbox"/> Yes Do the CRS ISOFIX attachments remain accessible during the process of connecting until they are secured to the vehicle anchorages?	<input type="checkbox"/>	<input type="checkbox"/> No	A	<input type="checkbox"/>	
3.1.3	<input type="checkbox"/> Yes Visual <u>plus</u> tactile and/or audible indication that both CRS ISOFIX attachments are correctly attached.	<input type="checkbox"/> Tactile and/or audible indication that both CRS ISOFIX attachments are correctly attached.	<input type="checkbox"/> None, or false (false means indicating correct attachment without actually being attached to anchorage).	A	<input type="checkbox"/>	NOTE A poor rating on this question will result in an overall poor rating result for this CRS-Vehicle combination.
3.1.4	<input type="checkbox"/> Yes Can the ISOFIX attachments be tightened after <u>the initial connection</u> to the lower anchorages?	<input type="checkbox"/> Yes With clearly defined steps with pictures or markings on CRS, or no need to tighten.	<input type="checkbox"/> No Unable to tighten or extreme efforts required.	A	<input type="checkbox"/>	
3.1.5	<input type="checkbox"/> Yes Flexible Attachments only: When properly installed, no hidden slack can exist in lower attachments (includes possible fouling)	<input type="checkbox"/> Hidden slack may appear.	<input type="checkbox"/> No Major risk of hidden slack.	A	<input type="checkbox"/>	
3.1.6	<input type="checkbox"/> Yes Is the child harness fully operable when ISOFIX is installed properly?	<input type="checkbox"/>	<input type="checkbox"/> No	A	<input type="checkbox"/>	

**Form 3.2: Attaching a top tether (if applicable)**

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

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

	Good	Average	Poor	Importance	N/A	Notes
3.3.1	<input type="checkbox"/> One hand operation from position of installation or no operation at all.	<input type="checkbox"/> One hand operation from other position or two hands.	<input type="checkbox"/> Other, more complicated adjustment procedure.	B	<input type="checkbox"/>	
3.3.2	<input type="checkbox"/> One hand operation from position of installation or no operation at all.	<input type="checkbox"/> One hand operation from other position or two hands single operation from position of installation.	<input type="checkbox"/> Other, more complicated adjustment procedure.	B	<input type="checkbox"/>	

Form 3.4: CRS/base interface evaluation

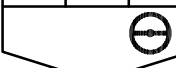
	Good	Average	Poor	Importance	N/A	Notes
3.4.1 CRS and base preparation: CRS base and CRS shell ready for installation?	<input type="checkbox"/> Yes No further action necessary.	<input type="checkbox"/> No Single action needed.	<input type="checkbox"/> No Multiple actions needed, or additional or specific parts or actions are required.	B	<input type="checkbox"/>	
3.4.2 Actions required to attach the CRS shell to base?	<input type="checkbox"/> Single operation from position of installation.	<input type="checkbox"/>	<input type="checkbox"/> Multiple operations necessary.	B	<input type="checkbox"/>	
3.4.3 Is there a clear feedback of correct locking of the CRS to the base?	<input type="checkbox"/> Tactile plus visual and/or audible indication that CRS is correctly locked to base.	<input type="checkbox"/> Tactile and/or audible indication that CRS is correctly locked to base.	<input type="checkbox"/> None, or false (false means indicating correct locking without actually being locked to base).	A	<input type="checkbox"/>	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?	<input type="checkbox"/> Dual action (e.g. lifting and releasing button).	<input type="checkbox"/> Triple or more.	<input type="checkbox"/> Not possible or requiring considerable effort.	C	<input type="checkbox"/>	

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

	Good	Average	Poor	Importance	N/A	Notes
3.5.1	<input type="checkbox"/> One hand/action to release tension of top tether, or not necessary.	<input type="checkbox"/> Two hands, e.g. one hand to loosen strap, one hand to push button.	<input type="checkbox"/> Not possible or requiring considerable effort.	C	<input type="checkbox"/>	
3.5.2	<input type="checkbox"/> One hand/action to undo top tether from anchorage. Simple storage.	<input type="checkbox"/> Two-hand action or multiple steps. Actions needed for storage.	<input type="checkbox"/> Not possible or requiring considerable effort. No storage facilities.	C	<input type="checkbox"/>	
3.5.3	<input type="checkbox"/> One hand/action to release tension of attachments, or not necessary.	<input type="checkbox"/> Two hands, e.g. one hand to loosen strap, one hand to push button.	<input type="checkbox"/> Not possible or requiring considerable effort.	C	<input type="checkbox"/>	
3.5.4	<input type="checkbox"/> Single quick release action. Simple storage or autostorage.	<input type="checkbox"/> Two-hand action or multiple steps. Actions needed for storage.	<input type="checkbox"/> Not possible or requiring considerable effort. No storage facilities.	C	<input type="checkbox"/>	
3.5.5	<input type="checkbox"/> Single quick release action. Simple storage or autostorage.	<input type="checkbox"/> Two-hand action or multiple steps. Actions needed for storage.	<input type="checkbox"/> Not possible or requiring considerable effort. No storage facilities.	C	<input type="checkbox"/>	
3.5.6	<input type="checkbox"/> Easy to detach (single action once tension is released, if applicable). Prevention of unintentional release is considered in design.	<input type="checkbox"/> Detachment requires multiple steps or actions.	<input type="checkbox"/> Not possible or requiring considerable effort or risk of unintentional release.	C	<input type="checkbox"/>	

## Seating position codes

If right-hand drive — mirror image

	13	23	33
	12	22	32
	11	21	31

Score (points)

Score (% of achievable)

Summary

Date of evaluation.....

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

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

Child seat – Make & Model.....

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

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

Evaluated by.....

Test no.....

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.

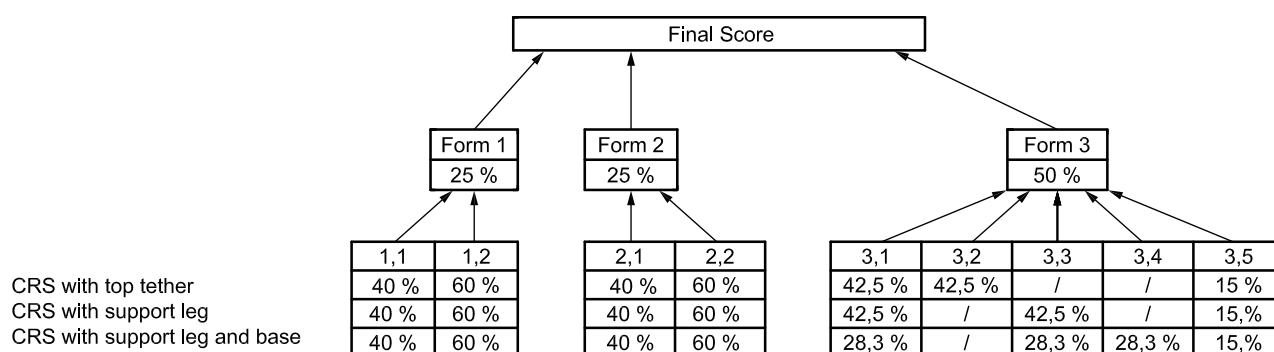
The balance of the scoring is affected by the number of questions applicable to a certain solution. This means that the usability scoring cannot provide a completely “fair” comparison between different CRS types and designs.

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.



**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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- [5] ISO 13216-2:2004, *Road vehicles — Anchorages in vehicles and attachments to anchorages for child restraint systems — Part 2: Top tether anchorages and attachments*
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- [9] ECE R14-06, *Uniform provisions concerning the approval of vehicles with regard to safety-belt anchorages, ISOFIX anchorages systems and ISOFIX top tether anchorages*
- [10] ECE R44-04, *Uniform provisions concerning the approval of restraining devices for child occupants of power-driven vehicles ("Child Restraint System")*
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3) To be published.

