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Road vehicles — Reduction of misuse risk of child restraint systems —

Part 1: Forms for field studies

Véhicules routiers — Réduction du risque de mauvaise utilisation des systèmes de retenue pour enfants —

Partie 1: Formulaires pour les études in situ

Reference number
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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 13215-1 was prepared by Technical Committee ISO/TC 22, *Road vehicles*, Subcommittee SC 12, *Passive safety crash protection systems*.

ISO 13215 consists of the following parts, under the general title *Road vehicles — Reduction of misuse risk of child restraint systems*:

— *Part 1: Forms for field studies*

— *Part 2: Requirements and test procedures for correct installation (panel method)*

— *Part 3: Prediction and assessment of misuse by Misuse Mode and Effect Analysis (MMEA)*

This corrected version of ISO 13215-1:2006 incorporates the following correction:

— the URL in Clause 7 has been updated.

Introduction

Whether or not adequate protection is provided to a child occupant in a vehicle crash depends not only on the inherent capability of the child restraint system to provide protection, but also on its proper installation and subsequent correct use. Today it is known that certain misuse configurations and interface problems can have serious consequences for child occupants in vehicle crashes.

A clear understanding of the kind and frequency of incorrect use has important implications for the design of child restraint systems and instructions for use, the vehicle in which they are used, education and loan programs, and legislation.

Road vehicles — Reduction of misuse risk of child restraint systems —

Part 1: Forms for field studies

1 Scope

This part of ISO 13215 specifies a basic methodology, including sample forms, for collection of data concerning misuse of child restraint systems in field studies. The purpose of using standardized forms is to provide a tool for quantification of misuse related to common misuse parameters, and to facilitate the exchange of data between different parties, thus making the results easily available for analysis. By using the sample forms provided, some main misuse configurations for several different groups of child restraint systems can be determined.

NOTE For further evaluation of the misuse risk of a specific child restraint system, ISO 13215-2 and ISO 13215-3 can be used.

2 Terms and definitions

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

2.1
child restraint system
CRS
any free-standing device intended to provide child vehicle occupants with an approved restraint

NOTE CRS comprise various categories, such as car beds, infant restraints, toddler seats, booster cushions and booster seats. Combination products may cover two or more of these product categories.

2.2
misuse of child restraint systems
any deviation from intended application and use which might reduce the protective performance of the child restraint system

3 Instructions

3.1 General

Annex A consists of two forms for general information, and five forms covering various application examples for common CRS types. The different forms have the same general layout. Typical child mass ranges are given for reference.

NOTE The forms presented are examples for common CRS types. While the forms may not fully cover the needs for a typical CRS, they can serve as a support for development of more specific layouts. In general, the main intention is to provide all variables needed to perform a CRS field study on misuse, and to facilitate the assessment and comparison of incorrect use of child restraint systems for different markets.

3.2 Recommendations regarding accomplishment of the field study

3.2.1 The observations should be performed by experienced persons, with the ability to distinguish between correct and incorrect installations of the respective CRS types and models.

3.2.2 The observations should be carried out at suitable selected areas, such as parking areas, shopping centres, roadside restaurants, zoos.

3.2.3 The observations should preferably be performed both in urban areas (short driving distances) and rural areas (longer driving distances).

NOTE In addition to the above, it is presumed that the observations are performed in a safe and ethical manner according to instructions and guidelines of the performing organization.

4 Instructions for completion of the forms

The forms (see Annex A) shall be filled out as follows:

— Seating position in vehicle: Enter the two-digit seating code for the actual child restraint system in accordance with the figure.

— Installation parameters (forms C to G):

  — If correct use applies: Enter a check mark (e.g. “X”, or “0”) in the first square (marked as bold);

  — If a misuse mode applies: Enter a check mark (not “0”) in the corresponding misuse mode square. In case the misuse mode can be quantified by the observer, an error score between 2 and 10 (see below) can be entered directly in the appropriate square.

Each separate misuse mode should be judged with an individual error score (a weighted value between 2 and 10). The value of each error score should be based on the probability and potential severity of injury caused by incorrect use of that particular aspect. Minor errors are scored “2”; the more serious the error, the higher the score (up to and including “10”). For correct use, the “error” score is always “0”.

The judgement of error scores can either be made by the time of checking the restraint installations, or afterwards.

5 Assessment of results

The total score of a CRS in a field study is obtained by adding the error scores of the different aspects. Total scores far in excess of “10” are possible.

The scale used to translate this total score into a final assessment can be divided in four categories:

0 points: Correct use;

2 to 4 points: Acceptable slight misuse;

5 to 9 points: Serious misuse;

$\geqslant$ 10 points: Very serious misuse.

6 Assessment cases

6.1 All aspects are correct, the total score is “0”. Assessment: Correct use.

6.2 Only one or two aspects of minor severity (value “2”) is incorrect, the total score is “2” or “4”. Assessment: Acceptable slight misuse.

6.3 Three or more minor errors are detected, the total score is more than “4” but less than “10”. Assessment: Serious misuse.

6.4 One or more very serious errors are found, the total score is “10” or more. Assessment: Very serious misuse.

7 Related electronic documents

To enhance the value and applicability of this part of ISO 13215, the forms found in Annex A are provided in a revisable (MS Excel) format.

These forms are posted on the ISO Standards maintenance web site, and can be found at the following URL: http://standards.iso.org/iso/13215/-1.

Annex A
(informative)

Sample collection and report forms

The forms below are presented on the following pages.

General information forms:

Form A: General information

Form B: General information — Questions for all occupants

Specific child restraint evaluation forms:

Form C: Carry-cots/car-beds (up to 10 kg)

Form D: Infant restraints (up to 13 kg)

Form E: Rearward or forward facing infant/child seats (up to 25 kg)

Form F: Child safety seats with harnesses or harness/shield combinations (9 kg to 25 kg)

Form G: Booster cushions/seats, backless shield boosters (15 kg to 36 kg)

FORM A

General Information

ID: _____

Observer: _____

General interview data:

Date: _____

Day: Su M Tu W Th F Sa

Road conditions: Dry Wet Snow Ice

Start time: _____ am/pm

End time: _____ am/pm

Vehicle and occupant data:

Model: _____

Type: _____

Model year: ☐☐☐☐

Number of doors (2 or 4): ☐

Number of occupants: ☐☐

General area data:

Area type: _____ (Shopping centre, roadside restaurant, zoo, etc.)

Location: _____

Place: _____

Country: _____

If possible, describe details of the travel (shopping, weekend trip, holiday):

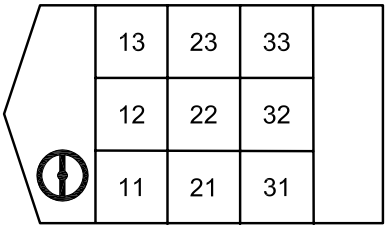
General remarks:

Begin a new general observation sheet for each study.
If a vehicle has more than one CRS, use the applicable evaluation form (C to G) for each CRS.

FORM B

General Information

Child occupants
Safety-related features
CRS use and non-use



ID: _____

Observer: _____

Positions to be mirror-imaged for right-hand drive

	Driver	1st child	2nd child	3rd child	4th child
Seating position:	1 1				
Driving distance, this trip (km):					
Sex: 1=male 2=female **Age:** AA=0 to 9 months BB=9 to 12 months CC=12 to18 months 01 = 1 year, etc.					
Height (cm): **Mass (kg):**					
Safety-related features Coding below: 1=yes 2=no					
Seat equipped with airbag	8				
Airbag type: 1=Front 2=Side 3=Curtain					
Airbag switch-off (auto or manual)	8				
Airbag status: 1=on 2=off	8				
ISOFIX/LATCH anchorages	8				
Switchable retractor, ELR/ALR	8				
Built-in (integrated) CRS	8				
Other (specify):					

Child seat use	Driver	1st child	2nd child	3rd child	4th child
Child seat is: **1=bought new** **2=bought second-hand** **3=other:** _____	8				
By whom installed: **1=private** **2=professional**	8				
Instructions: **1=permanently attached** **2=separate, loose** **3=not available**	8				
Child seat non-use (loose, in adult belt, in lap of adult, etc.)					

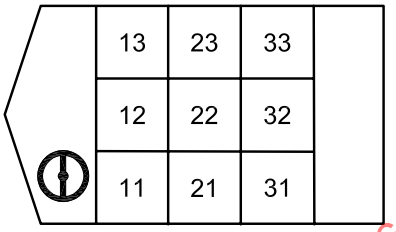
8=not applicable

FORM C

ID: _____ **Observer:** _____

Carry-cots/car beds (up to 10 kg) ECE Group 0 or similar

If right-hand drive, mirror image



Seating position codes

A. Seating position code (see figure)
If CRS is also occupying the nearby seat:

B. Installation configuration
B1=*as intended*
B2=*other than intended (e.g. forward facing)*
B3=*child seat incompatible with child*

C. Attachment with vehicle seatbelt ← OR →
C1=*correctly used*
C2=*not used*
C3=*wrong routing of vehicle seatbelt*
C4=*excessive slack in vehicle seatbelt*
C5=*belt clip/guide applicable but not used*
C6=*wrong positioning of seatbelt buckle*
C7=*top tether applicable but not used*
C8=*lower tether applicable but not used*
C9=*support leg applicable but not used*
C10=*child seat not locked in base*

D. Attachment with ISOFIX/LATCH/UAS
D1=*correctly used*
D2=*not used*
D3=*partially used (one of two)*
D4=*top tether applicable but not used*
D5=*lower tether applicable but not used*
D6=*support leg applicable but not used*
D7=*brace arm not tightened* — N/A
D8=*adjustment mechanism not adjusted*
D9=*child seat not locked in base*

E. Specific belts
E1=*correctly used*
E2=*not used*
E3=*wrong routing of specific belts*
E4=*used with excessive slack*

F. Safety net
F1=*completely closed*
F2=*partially closed*
F3=*not closed*

G. Child support
G1=*newborn supported on sides*
G2=*newborn not supported on sides*

H. Misuse possible to correct (y/n)
If no, please state: _____

Assessment of misuse	
For each misuse configuration, apply an individual error score (es) from 2 (minor) to 10 (severe). **Example:** C3(es6)+E3(es4)+G2(es3) Total error score = 13 (⩾10) **Assessment:** ***Very serious misuse***	
Misuse configuration code	**Error score**
Total error score:	
Assessment (see below):	

Assessment scale	
0 points:	**correct use**
1 to 4 points:	**acceptable/slight misuse**
5 to 9 points:	**serious misuse**
⩾ 10 points:	**very serious misuse**

I. Additional information (*Examples: Shell cracked, frame bent or damaged? Padding or lining missing?)*

Manufacturer:	**Approval number:**
Type:	**Type approval/compliance label: Yes/No**

ID: **Observer:** **FORM D**

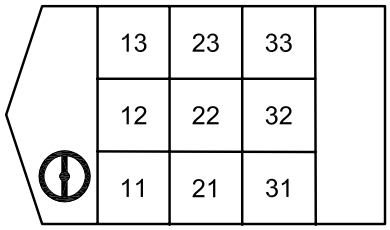
Infant restraints (up to 13 kg) (reclined / upright position) ECE Group 0/0+ or similar

A. Seating position code (see figure)

B. Installation configuration

B1=*as intended (in most cases rearfacing)*
B2=*other than intended (e.g. forward facing)*
B3=*child seat incompatible with child*

If right-hand drive, mirror image



Seating position codes

C. Attachment with vehicle seatbelt ← OR →

C1=*correctly used*
C2=*not used*
C3=*wrong routing of vehicle seatbelt*
C4=*excessive slack in vehicle seatbelt*
C5=*belt clip/guide applicable but not used*
C6=*wrong positioning of seatbelt buckle*
C7=*top tether applicable but not used*
C8=*lower tether applicable but not used*
C9=*support leg applicable but not used*
C10=*child seat not locked in base*

D. Attachment with ISOFIX/LATCH/UAS

D1=*correctly used*
D2=*not used*
D3=*partially used (one of two)*
D4=*top tether applicable but not used*
D5=*lower tether applicable but not used*
D6=*support leg applicable but not used*
D7=*brace arm not tightened*
D8=*adjustment mechanism not adjusted*
D9=*child seat not locked in base*

E. Child seat harness

E1=*buckle closed and visible*
E2=*not used*
E3=*buckle partially used*

F. Harness adjustment

F1=*straps comfortably tight, no slack*
F2=*wrong shoulder height adjustment*
F3=*straps incorrectly routed in back*
F4=*adjuster(s) wrongly threaded*
F5=*fittings/hardware into contact with skin*
F6=*Y-harness clip not used*

G. Child support

G1=*newborn supported on sides*
G2=*newborn not supported on sides*

H. Recline angle

H1=*comfortable angle*
H2=*too reclined, infant lies too flat*
H3=*too upright, infant's head falls forward*

Assessment of misuse	
For each misuse configuration, apply an individual error score (es) from 2 (minor) to 10 (severe). **Example:** C3(es6)+E4(es4)+H3(es3) Total error score = 13 (⩾10) **Assessment:** ***Very serious misuse***	
Misuse configuration code	**Error score**
Total error score:	
Assessment (see below):	

Assessment scale	
0 points:	**correct use**
1 to 4 points:	**acceptable/slight misuse**
5 to 9 points:	**serious misuse**
⩾ 10 points:	**very serious misuse**

I. Misuse possible to correct (y/n)

If no, please state: _____

J. Additional information (*Examples: Shell cracked, frame bent or damaged? Padding or lining missing?*)

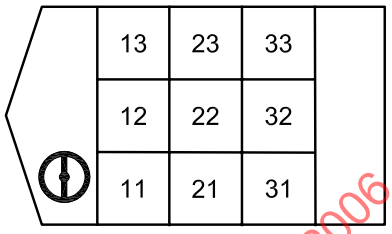
Manufacturer:	**Approval number:**
Type:	**Type approval/compliance label: Yes/No**

FORM E

ID: _____ **Observer:** _____

Rearward facing or forward facing infant/child seats (up to 25 kg)
Combination/convertible infant/child seats
ECE Group 0+/I/II or similar

If right-hand drive, mirror image



Seating position codes

A. Seating position code (see figure) | | |

B. Installation configuration

B1=*as intended, direction* ……..	
B2=*other than intended, direction* ……	
B3=*child seat incompatible with child*	

C. Attachment with vehicle seatbelt ← OR →

C1=*correctly used*	
C2=*not used*	
C3=*wrong routing of vehicle seatbelt*	
C4=*excessive slack in vehicle seatbelt*	
C5=*belt clip/guide applicable but not used*	
C6=*wrong positioning of seatbelt buckle*	
C7=*top tether applicable but not used*	
C8=*lower tether applicable but not used*	
C9=*support leg applicable but not used*	
C10=*child seat not locked in base*	

D. Attachment with ISOFIX/LATCH/UAS

D1=*correctly used*	
D2=*not used*	
D3=*partially used (one of two)*	
D4=*top tether applicable but not used*	
D5=*lower tether applicable but not used*	
D6=*support leg applicable but not used*	
D7=*brace arm not tightened (rear facing CRS)*	
D8=*adjustment mechanism not adjusted*	
D9=*child seat not locked in base*	

E. Additional strap(s) (if required other than lower and top tether ISOFIX/LATCH/UAS)

E1=*correctly used/not applicable*	
E2=*not used*	
E3=*extra strap(s) attached to wrong detail*	
E4=*belt adjusters wrongly threaded*	
E5=*used with excessive slack*	

F. Child seat harness

F1=*buckle closed and visible*	
F2=*buckle partially closed*	
F3=*buckle riding up*	
F4=*harness clip applicable but not used*	

G. Harness adjustment

G1=*straps comfortably tight, no slack*	
G2=*wrong shoulder height adjustment*	
G3=*straps incorrectly routed in back*	
G4=*adjuster(s) wrongly threaded*	
G5=*fittings/hardware into contact with skin*	

Assessment of misuse	
For each misuse configuration, apply an individual error score (es) from 2 (minor) to 10 (severe).	
Example: C3(es6)+E4(es4)+G2(es3) Total error score = 13 (⩾10)	
Assessment: ***Very serious misuse***	
Misuse configuration code	**Error score**
Total error score:	
Assessment (see below):	

Assessment scale	
0 points:	**correct use**
1 to 4 points:	**acceptable/slight misuse**
5 to 9 points:	**serious misuse**
⩾ 10 points:	**very serious misuse**

H. Misuse possible to correct (y/n) | |

If no, please state: _____

I. Additional information (*Examples: Shell cracked, frame bent or damaged? Padding or lining missing?)*

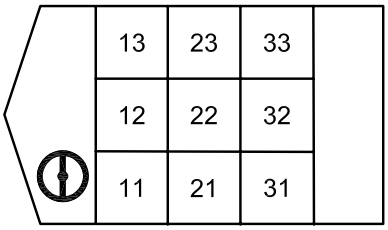
Manufacturer:	**Approval number:**
Type:	**Type approval/compliance label: Yes/No**

FORM F

ID: _____ **Observer:** _____

Child safety seats with harness or harness/shield combinations (9 kg to 25 kg, reclined/upright position) ECE Group I/II or similar

If right-hand drive, mirror image



Seating position codes

A. Seating position code (see figure) [ ][ ]

B. Installation configuration

- ***B1***=*as intended* [ ]
- ***B2***=*other than intended* [ ]
- ***B3***=*child seat incompatible with child* [ ]

C. Attachment with vehicle seatbelt ← OR →

- ***C1***=*correctly used* [ ]
- ***C2***=*not used* [ ]
- ***C3***=*wrong routing of vehicle seatbelt* [ ]
- ***C4***=*excessive slack in vehicle seatbelt* [ ]
- ***C5***=*belt clip/guide applicable but not used* [ ]
- ***C6***=*wrong positioning of seatbelt buckle* [ ]
- ***C7***=*top tether applicable but not used* [ ]
- ***C8***=*lower tether applicable but not used* [ ]
- ***C9***=*support leg applicable but not used* [ ]
- ***C10***=*child seat not locked in base* [ ]

D. Attachment with ISOFIX/LATCH/UAS

- ***D1***=*correctly used* [ ]
- ***D2***=*not used* [ ]
- ***D3***=*partially used (one of two)* [ ]
- ***D4***=*top tether applicable but not used* [ ]
- ***D5***=*lower tether applicable but not used* [ ]
- ***D6***=*support leg applicable but not used* [ ]
- ***D7***=*brace arm not tightened* [N/A]
- ***D8***=*adjustment mechanism not adjusted* [ ]
- ***D9***=*child seat not locked in base* [ ]

E. Additional strap(s) (if required other than lower and top tether ISOFIX/LATCH/UAS)

- ***E1***=*correctly used/not applicable* [ ]
- ***E2***=*not used* [ ]
- ***E3***=*extra strap(s) attached to wrong detail* [ ]
- ***E4***=*belt adjusters wrongly threaded* [ ]
- ***E5***=*used with excessive slack* [ ]

F. Child seat harness or harness/shield combination

- ***F1***=*buckle closed and visible* [ ]
- ***F2***=*buckle partially closed* [ ]
- ***F3***=*buckle riding up* [ ]
- ***F4***=*harness clip applicable but not used* [ ]
- ***F5***=*shield applicable but not used, or misused* [ ]

G. Harness adjustment

- ***G1***=*straps comfortably tight, no slack* [ ]
- ***G2***=*wrong shoulder height adjustment* [ ]
- ***G3***=*straps incorrectly routed in back* [ ]
- ***G4***=*adjuster(s) wrongly threaded* [ ]
- ***G5***=*fittings/hardware into contact with skin* [ ]

Assessment of misuse	
For each misuse configuration, apply an individual error score (es) from 2 (minor) to 10 (severe). **Example:** C3(es6)+E4(es4)+G2(es3) Total error score = 13 (⩾10) **Assessment:** ***Very serious misuse***	
Misuse configuration code	**Error score**
Total error score:	
Assessment (see below):	

Assessment scale
0 points: correct use
1 to 4 points: acceptable/slight misuse
5 to 9 points: serious misuse
⩾ 10 points: very serious misuse

H. Misuse possible to correct (y/n) [ ]

If no, please state: _____

I. Additional information (*Examples: Shell cracked, frame bent or damaged? Padding or lining missing?*)

Manufacturer:	**Approval number:**
Type:	**Type approval/compliance label: Yes/No**