INTERNATIONAL STANDARD

ISO 13215-3

Second edition
2022-10

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

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

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

Partie 3: Prédiction et évaluation des mauvaises utilisations par MMEA (analyse des modes de mauvaise utilisation et de leurs effets)

Reference number
ISO 13215-3:2022(E)

© ISO 2022



COPYRIGHT PROTECTED DOCUMENT

© ISO 2022

All rights reserved. Unless otherwise specified, or required in the context of its implementation, no part of this publication may be reproduced or utilized otherwise in any form or by any means, electronic or mechanical, including photocopying, or posting on the internet or an intranet, without prior written permission. Permission can be requested from either ISO at the address below or ISO's member body in the country of the requester.

ISO copyright office
CP 401 • Ch. de Blandonnet 8
CH-1214 Vernier, Geneva
Phone: +41 22 749 01 11
Email: copyright@iso.org
Website: www.iso.org

Published in Switzerland

© ISO 2022 – All rights reserved

Contents

Page

Foreword ..... **iv**
Introduction ..... **v**
1 Scope **1**
2 Normative references **1**
3 Terms and definitions **1**
4 General **2**
4.1 Conformance with this document 2
4.2 Assessment panels 2
5 Assessment **2**
5.1 Assessment form 2
5.2 Preliminary steps 2
5.3 Assessment procedure 2
5.3.1 General 2
5.3.2 Potential misuse modes 3
5.3.3 Assessment of misuse modes 3
5.3.4 Corrective actions 4
6 Requirements **4**
6.1 Acceptance criteria of a single misuse mode 4
6.2 Acceptance criteria of more than one misuse mode 4
7 Coding of typical misuse modes **4**
8 Final steps **6**
Annex A (normative) **Misuse Mode and Effect Analysis (MMEA) — Assessment sheet** **7**
Annex B (informative) **Guideline for examiners using the MMEA method** **8**
Bibliography **11**

© ISO 2022 – All rights reserved

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.

The procedures used to develop this document and those intended for its further maintenance are described in the ISO/IEC Directives, Part 1. In particular, the different approval criteria needed for the different types of ISO documents should be noted. This document was drafted in accordance with the editorial rules of the ISO/IEC Directives, Part 2 (see www.iso.org/directives).

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. Details of any patent rights identified during the development of the document will be in the Introduction and/or on the ISO list of patent declarations received (see www.iso.org/patents).

Any trade name used in this document is information given for the convenience of users and does not constitute an endorsement.

For an explanation of the voluntary nature of standards, the meaning of ISO specific terms and expressions related to conformity assessment, as well as information about ISO's adherence to the World Trade Organization (WTO) principles in the Technical Barriers to Trade (TBT), see www.iso.org/iso/foreword.html.

This document was prepared by Technical Committee ISO/TC 22, *Road vehicles*, Subcommittee SC 36, *Safety and impact testing*.

This second edition cancels and replaces the first edition (ISO 13215-3:1999) which has been technically revised.

The main changes are as follows:

— added introduction;

— added references to ISO 13215-1 and ISO 13215-2;

— added coding of misuse modes;

— added references to scientific papers and other literature supporting the use of MMEA;

— revised MMEA use case;

— editorial improvements.

A list of all parts in the ISO 13215 series can be found on the ISO website.

Any feedback or questions on this document should be directed to the user’s national standards body. A complete listing of these bodies can be found at www.iso.org/members.html.

© ISO 2022 – All rights reserved

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. 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.

Reduction of misuse risk can be achieved in several ways. One effective way is to work in a systematic manner in the design phase of child restraint systems; to predict and evaluate possible misuse of the intended design, and to address possible misuse modes by an improved design. The MMEA method presented in this document has been developed to support this approach.

© ISO 2022 – All rights reserved

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

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

1 Scope

This document specifies a method to predict and quantify misuse of child restraint systems (CRS) called Misuse Mode and Effect Analysis (MMEA). Such misuse can degrade the performance of CRSs.

As a predictive method it is intended to be applied by CRS manufacturers at an early stage, before the CRS is put into use by consumers.

Being predictive implies the possibility of incompleteness and errors. Such errors can be reduced if the proposed method is supported by field studies (for example, according to ISO 13215-1) and panel method evaluation (for example, according to ISO 13215-2).

2 Normative references

There are no normative references in this document.

3 Terms and definitions

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

ISO and IEC maintain terminology databases for use in standardization at the following addresses:

— ISO Online browsing platform: available at https://www.iso.org/obp

— IEC Electropedia: available at https://www.electropedia.org/

3.1
child restraint system
CRS
free-standing device intended to provide child vehicle occupants with an approved restraint

Note 1 to entry: Child restraint systems comprise various categories, such as infant restraints, toddler seats, booster cushions and booster seats.

3.2
misuse
any deviation from intended application and use which might reduce the protective performance of the *child restraint system* (3.1)

3.3
ISOFIX
system for the connection of a *child restraint systems (CRS)* (3.1) 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 to entry: In this document, the term ISOFIX includes flexible CRS attachments (LATCH, UAS).

© ISO 2022 – All rights reserved

[SOURCE: ISO 13216-1:1999, 3.6, modified — Note 1 to entry has been added.]

3.4
vehicle seatbelt
approved webbing used to restrain vehicle occupants

3.5
buckle
quick release device which enables the child to be held by the *child restraint system* (3.1), or the child restraint system by the structure of the car, and can be quickly opened

3.6
harness
internal webbing, in relevant cases, intended to restrain the child within the *child restraint system* (3.1)

3.7
adjuster
device through which a *strap* (3.8) passes and which, by means of moving, enables the effective length of the straps to be controlled to suit the circumstances

3.8
strap
flexible component designed to transmit forces

4 General

4.1 Conformance with this document

A CRS tested in accordance with the requirements of this document is considered correctly designed if, when any predicted misuse modes are assessed, it meets the acceptance criteria. Manufacturers of CRSs are advised to apply the MMEA method before type approval or self certification.

4.2 Assessment panels

The prediction and assessment of potential misuse modes are carried out by persons experienced in using and testing CRSs. Ideally, such persons should also be involved in panel testing and field studies of CRSs. See ISO 13215-1 and ISO 13215-2 for more details.

5 Assessment

5.1 Assessment form

The assessment shall be performed by using the form given in Annex A. Guidance is given in Annex B.

5.2 Preliminary steps

Prior to assessment, the examiner shall inspect the CRS for completeness and shall carefully read any attached information provided for the consumer such as instructions for installation and use. Particular attention shall be paid to warning instructions.

5.3 Assessment procedure

5.3.1 General

The product name/number and the name of the manufacturer shall be entered into the head of the form (see Annex A).

© ISO 2022 – All rights reserved