

## **Teepiirdesüsteemid. Osa 1: Terminoloogia ja katsemeetodite üldtingimused**

Road restraint systems - Part 1: Terminology and general criteria for test methods

## EESTI STANDARDI EESSÕNA

## NATIONAL FOREWORD

Käesolev Eesti standard EVS-EN 1317-1:2010 sisaldab Euroopa standardi EN 1317-1:2010 ingliskeelset teksti.

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Võtmesõnad: kaitserinnatised, kaitsevahendid, kõnniteed, löögiteimid, määratlused, teed, teedehutus, tehnilised andmed, testid,

Inglisekeelsed võtmesõnad: crash barriers, definitions, impact tests, pavements, road safety, roads, safety devices, specifications, tests,

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English Version

## Road restraint systems - Part 1: Terminology and general criteria for test methods

Dispositifs de retenue routiers - Partie 1 : Terminologie et dispositions générales pour les méthodes d'essai

Rückhaltesysteme an Straßen - Teil 1: Terminologie und allgemeine Kriterien für Prüfverfahren

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# Contents

Page

Foreword.....	3
Introduction .....	5
1 Scope .....	6
2 Normative references .....	6
3 Abbreviations .....	6
4 Terms and definitions .....	7
5 Test methods.....	10
5.1 Test site .....	10
5.2 Test vehicles .....	11
5.2.1 General.....	11
5.2.2 Loading conditions.....	11
6 Vehicle Instrumentation .....	13
6.1 Vehicle Instrumentation required for the calculation of ASI and THIV .....	13
6.2 Frequency requirements .....	13
6.3 Compensation for instrumentation displaced from the vehicle centre of mass.....	13
7 Data Processing and Analysis .....	15
8 Test Results and Calculations.....	17
8.1 Severity Indices.....	17
8.1.1 General.....	17
8.1.2 Summary of the procedure to compute ASI .....	17
8.1.3 Procedure to compute THIV .....	18
8.2 Vehicle cockpit deformation index (VCDI) .....	24
8.2.1 Deformation .....	24
8.2.2 Location of the deformation .....	24
8.2.3 Extent of the deformation .....	25
8.2.4 Examples (informative) .....	27
Annex A (informative) Calculation of the acceleration severity index (ASI) .....	28
Annex B (informative) Vehicle acceleration - Measurement and calculation methods .....	29
B.1 Introduction .....	29
B.2 Acceleration in a rigid body.....	29
B.3 Methods of measuring rigid body motion .....	30
B.4 Measurement by six linear and three angular transducers.....	31
B.5 Remarks .....	35
Bibliography .....	36

## Foreword

This document (EN 1317-1:2010) has been prepared by Technical Committee CEN/TC 226 "Road equipment", the secretariat of which is held by AFNOR.

This European Standard shall be given the status of a national standard, either by publication of an identical text or by endorsement, at the latest by January 2011, and conflicting national standards shall be withdrawn at the latest by January 2011.

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. CEN [and/or CENELEC] shall not be held responsible for identifying any or all such patent rights.

This document supersedes EN 1317-1:1998.

This document has been prepared under a mandate given to CEN by the European Commission and the European Free Trade Association, and supports essential requirements of EU Directive(s).

EN 1317 consists of the following parts:

- EN 1317-1, *Road restraint systems — Part 1: Terminology and general criteria for test methods*;
- EN 1317-2, *Road restraint systems — Part 2: Performance classes, impact test acceptance criteria and test methods for safety barriers including vehicle parapets*;
- EN 1317-3, *Road restraint systems — Part 3: Performance classes, impact test acceptance criteria and test methods for crash cushions*;
- ENV 1317-4, *Road restraint systems — Part 4: Performance classes, impact test acceptance criteria and test methods for terminals and transitions of safety barriers*;
- prEN 1317-4, *Road restraint systems — Part 4: Performance classes, impact test acceptance criteria and test methods for transitions of safety barriers* (under preparation: this document will supersede ENV 1317-4:2001 for the clauses concerning transitions);
- EN 1317-5, *Road restraint systems — Part 5: Product requirements and evaluation of conformity for vehicle restraint systems*;
- prEN 1317-6, *Road restraint systems — Pedestrian restraint systems — Part 6: Pedestrian Parapet* (under preparation);
- prEN 1317-7, *Road restraint systems — Part 7: Performance classes, impact test acceptance criteria and test methods for terminals of safety barriers* (under preparation: this document will supersede ENV 1317-4:2001 for the clauses concerning terminals);
- prEN 1317-8, *Road restraint systems — Part 8: Motorcycle road restraint systems which reduce the impact severity of motorcyclist collisions with safety barriers* (under preparation).

Annexes A and B are informative.

The significant technical changes incorporated in this revision are:

## 5 Test methods

The specifications for the test site and test vehicles have been moved from Parts 2 and 3 to Part 1.

### **6.1 Vehicle instrumentation required for the calculation of ASI and THIV**

The requirement of the 1998 text:

*Vehicle acceleration shall be measured at a single point (P) within the vehicle body close to the vehicle centre of gravity.*

is replaced by:

*The accelerometers shall be mounted at a single point (P) on the tunnel close to the vertical projection of vehicle centre of mass of the undeformed vehicle, but no further than 70 mm longitudinally and 40 mm laterally. Measurements made before the publication of the present standard, with accelerometers fixed to an installation close to the centre of mass are accepted.*

### **6.2 Frequency requirements**

The following new requirement has been introduced:

*Since the data will be filtered by recursive (Butterworth) filters, more data should be collected than is specifically required by the analysis. A recursive filter always produces "starting transients" at the beginning and end of the data, and requires time to "settle down". An additional 500 ms of data shall be collected at the beginning and end of the data; this extra data can then be discarded after filtering.*

### **6.3 Compensation for instrumentation displaced from the vehicle centre of mass**

The procedure has been extended also to the cases of non-null roll angle and roll velocity and when the three points Q<sub>1</sub>, Q<sub>2</sub>, P (P<sub>1</sub>, P<sub>2</sub>, P in the 1998 text) are aligned along any straight line.

## **8.1 Severity Indices**

The requirement for the index PHD (Post impact Head Deceleration) has been removed. ASI and THIV are required.

### **8.1.1 Summary of the procedure to compute ASI**

In the procedure to compute ASI, averaging of the three components of the acceleration over a moving window of 50 ms has been replaced by filtering with a four-pole phaseless Butterworth digital filter.

### **8.2 Vehicle cockpit deformation index (VCDI)**

#### **8.2.2 Location of the deformation**

The prefix 'ND' has been added for impacts where there is no deformation of the vehicle cockpit.

#### **8.2.3 Extent of the deformation**

"The sub-index 3 has been added for reductions greater than 20 %, or measurements which cannot be taken due to the deformation of the vehicle."

According to the CEN/CENELEC Internal Regulations, the national standards organizations of the following countries are bound to implement this European Standard: Austria, Belgium, Bulgaria, Croatia, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Romania, Slovakia, Slovenia, Spain, Sweden, Switzerland and the United Kingdom.

## Introduction

In order to improve and maintain highway safety, the design of safer roads requires, on certain sections of road and at particular locations, the installation of road restraint systems. These road systems are designated to redirect errant vehicles with a specified performance level and can provide guidance for pedestrians or other road users.

This European Standard is a revision of EN 1317-1:1998. The standard identifies test methods and impact test acceptance criteria that the products for road restraint systems need to meet to demonstrate compliance with the requirements, given in EN 1317-5 and/or prEN 1317-6. The design specification, for road restraint systems entered in the test report, identify important functional site conditions in respect of the test installation.

The performance range of the products for road restraint systems, designated in this standard, enables national and local authorities to recognize and specify the performance class to be deployed.

Annexes A and B give informative explanation of the measurement of the severity index ASI and vehicle acceleration.

## 1 Scope

This European Standard contains provisions for the measurement of performance of products for the road restraint systems, under impact and impact severity levels, and includes:

- Test site data;
- Definitions for road restraint systems;
- Vehicle specification (including loading requirements) for vehicles used in the impact tests;
- Instrumentation for the vehicles;
- Calculation procedures and methods of recording crash impact data including impact severity levels;
- VCDI.

The modifications included in this standard are not a change of test criteria, in the sense of EN 1317-5:2007+A1:2008, ZA.3.

## 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.

EN 1317-2, *Road restraint systems — Part 2: Performance classes, impact test acceptance criteria and test methods for safety barriers including vehicle parapets*

EN 1317-3, *Road restraint systems — Part 3: Performance classes, impact test acceptance criteria and test methods for crash cushions*

ENV 1317-4, *Road restraint systems — Part 4: Performance classes, impact test acceptance criteria and test methods for terminals and transitions of safety barriers*

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

ISO 10392, *Road vehicles with two axles — Determination of centre of gravity*

## 3 Abbreviations

ASI:	Acceleration Severity Index
ATD:	Anthropomorphic Test Device
CAC:	Channel Amplitude Class
CFC:	Channel Frequency Class
COG:	Centre of mass
HGV:	Heavy Goods Vehicle
PRS:	Pedestrian Restraint System