

**BS ISO 11096:2011**



**BSI Standards Publication**

# **Road vehicles — Pedestrian protection — Impact test method for pedestrian thigh, leg and knee**

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**National foreword**

This British Standard is the UK implementation of ISO 11096:2011. It supersedes BS ISO 11096:2002 which is withdrawn.

The UK participation in its preparation was entrusted to Technical Committee AUE/15, Safety related to vehicles.

A list of organizations represented on this committee can be obtained on request to its secretary.

This publication does not purport to include all the necessary provisions of a contract. Users are responsible for its correct application.

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# INTERNATIONAL STANDARD

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## Road vehicles — Pedestrian protection — Impact test method for pedestrian thigh, leg and knee

*Véhicules routiers — Protection des piétons — Méthode d'essai de  
choc pour la cuisse, la jambe inférieure et le genou des piétons*



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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 11096 was prepared by Technical Committee ISO/TC 22, *Road vehicles*, Subcommittee SC 10, *Impact test procedures*.

This second edition cancels and replaces the first edition (ISO 11096:2002), which has been technically revised.

## Introduction

The intent of this International Standard is to help standardize the pedestrian leg impactor test method that will allow a test organization to use the results from pedestrian impact tests conducted by other test organizations.

The method is based on the simulated impact of a motor vehicle on an adult pedestrian. It is anticipated that biomechanical data for children will later be studied in order to determine the potential for child pedestrian protection. Research suggests that safety improvements in vehicles derived from such pedestrian impact tests would also be beneficial to motorcyclists and bicyclists (see Annex D).



# Road vehicles — Pedestrian protection — Impact test method for pedestrian thigh, leg and knee

## 1 Scope

This International Standard specifies a test method for simulating the lateral impact between the front of a passenger vehicle or light truck vehicle derived from passenger cars (as defined in ISO 3833) and an adult pedestrian.

The test method addresses the reduction of pedestrian thigh, leg and knee injuries. It is not applicable to testing for, or the evaluation of, injuries to other pedestrian body regions, nor does it directly cover the potential risk of injury to children or human soft tissue. It is not applicable to vehicles with deployable devices designed for activation in the event of impact with a pedestrian.

## 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 1176, *Road vehicles — Masses — Vocabulary and codes*

ISO 3784, *Road vehicles — Measurement of impact velocity in collision tests*

ISO 3833, *Road vehicles — Types — Terms and definitions*

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

ISO/TR 15766, *Road vehicles — Pedestrian protection — Targets for the assessment of the biofidelity of pedestrian-leg test devices*

## 3 Terms and definitions

For the purposes of this document, the terms and definitions given in ISO 1176 and ISO 3833, and the following apply.

### 3.1 Legform impactor

#### 3.1.1

##### **knee joint**

mechanical joint of a legform impactor with deformable elements simulating a human knee in lateral impact only

#### 3.1.2

##### **thigh**

mechanical components above the legform impactor knee joint

### 3.1.3

#### **leg**

mechanical components below the legform impactor knee joint

### 3.1.4

#### **knee joint centre**

centre of the bending part of a knee joint's deformable element before deformation

### 3.1.5

#### **valgus angle**

angle of the knee joint in abduction

## 3.2 Vehicle

### 3.2.1

#### **impact point**

point on the vehicle at which initial contact occurs

### 3.2.2

#### **front face**

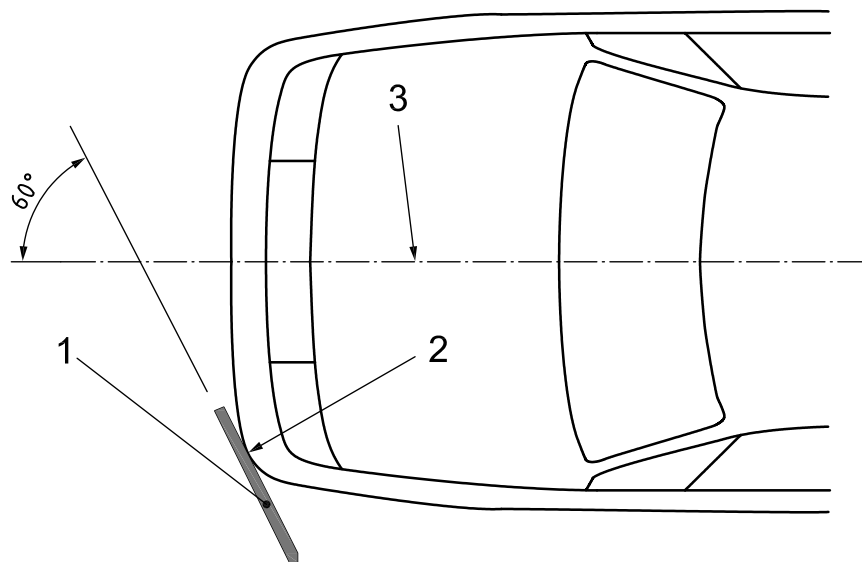
foremost part of the front of the vehicle, and that most likely to strike the pedestrian's leg

### 3.2.3

#### **corner**

extremity on either side of the front face located at the point at which a vertical plane, set at  $60^\circ$  to the centreline of the vehicle, comes in contact with, and is tangential to, the outer surface of the front face

NOTE See Figure 1.



#### **Key**

- 1 straight edge
- 2 corner of front face
- 3 vehicle centreline

**Figure 1 — Corner of front face**