
**Road vehicles — Side impact test
procedures for the evaluation of
occupant interactions with side
airbags by pole impact simulation**

*Véhicules routiers — Modes opératoires d'essai de choc latéral pour
l'évaluation des interactions des occupants avec les sacs gonflables
latéraux par simulation d'une collision contre un poteau*

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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 15829 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 15829:2004), which has been technically revised.

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Introduction

Side airbags/curtains (SAB) are deployable devices intended to help reduce the risk of injury to the head or the chest or the pelvis of vehicle occupants in side impact collisions. Side impact accident data indicate that the vehicle side is most likely to contact a passenger car, a truck or a fixed object, such as a pole or a tree. Accident data also indicate that serious to fatal injury in side impact is most likely to occur to the head and chest regions.

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Road vehicles — Side impact test procedures for the evaluation of occupant interactions with side airbags by pole impact simulation

1 Scope

This International Standard specifies dynamic side impact test procedures with poles for evaluating the effects of the interaction between side airbags and occupants of road vehicles.

2 Normative references

The following documents, in whole or in part, are normatively referenced in this document and are indispensable for its application. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies..

ISO 1176:1990, *Road vehicles — Masses — Vocabulary and codes*

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

ISO 8721, *Road vehicles — Measurement techniques in impact tests — Optical instrumentation*

ISO/TR 27957, *Road vehicles — Temperature measurement in anthropomorphic test devices — Definition of the temperature sensor locations*

ISO 15830-4¹⁾, *Road vehicles — Design and performance specifications for the WorldSID 50th percentile male side impact dummy — Part 4: User's manual*

ISO 17949, *Impact test procedures for road vehicles — Seating and positioning procedures for anthropomorphic test devices — Procedure for the WorldSID 50th percentile male side-impact dummy in front outboard seating positions*

3 Terms and definitions

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

3.1

side airbag

SAB

airbag designed primarily to help reduce occupant injury potential where the significant collision force vector is lateral

3.1.1

head airbag

curtain airbag

airbag that deploys between the occupants' head and the vehicle side structure or an external object that could contact the head

3.1.2

chest airbag

thorax airbag

airbag that deploys between the occupant's upper torso and the vehicle side structure

1) To be published.

3.1.3

pelvic airbag

airbag that deploys between an occupant's pelvis/thigh area and the vehicle side structure

3.1.4

combination airbag

airbag that deploys to help protect two or more body areas of an occupant

EXAMPLE Head and chest combination airbag.

3.2

rigid pole

vertically-oriented, cylindrical, rigid structure, extending beyond the anticipated lower and upper boundary of the deformed test vehicle, in the region of impact

4 Test facility and equipment

4.1 Impact test site

The impact test track shall be a horizontal, smooth and hard surface, which is of sufficient length and area to allow for a monotonic acceleration of the test vehicle to the specified impact speed and to permit post impact deceleration and displacement of the test vehicle without secondary impacts.

4.2 Pole

The pole shall be 254 mm \pm 3 mm in diameter. The supporting structure of the pole shall not interfere with the test vehicle during the collision and shall be designed to reduce the risk of a secondary impact

5 Test configurations

5.1 Angle of impact

- a) Oblique tests shall be performed with an impact angle of 75° \pm 3°.
- b) Perpendicular tests shall be performed with an impact angle of 90° \pm 3°.

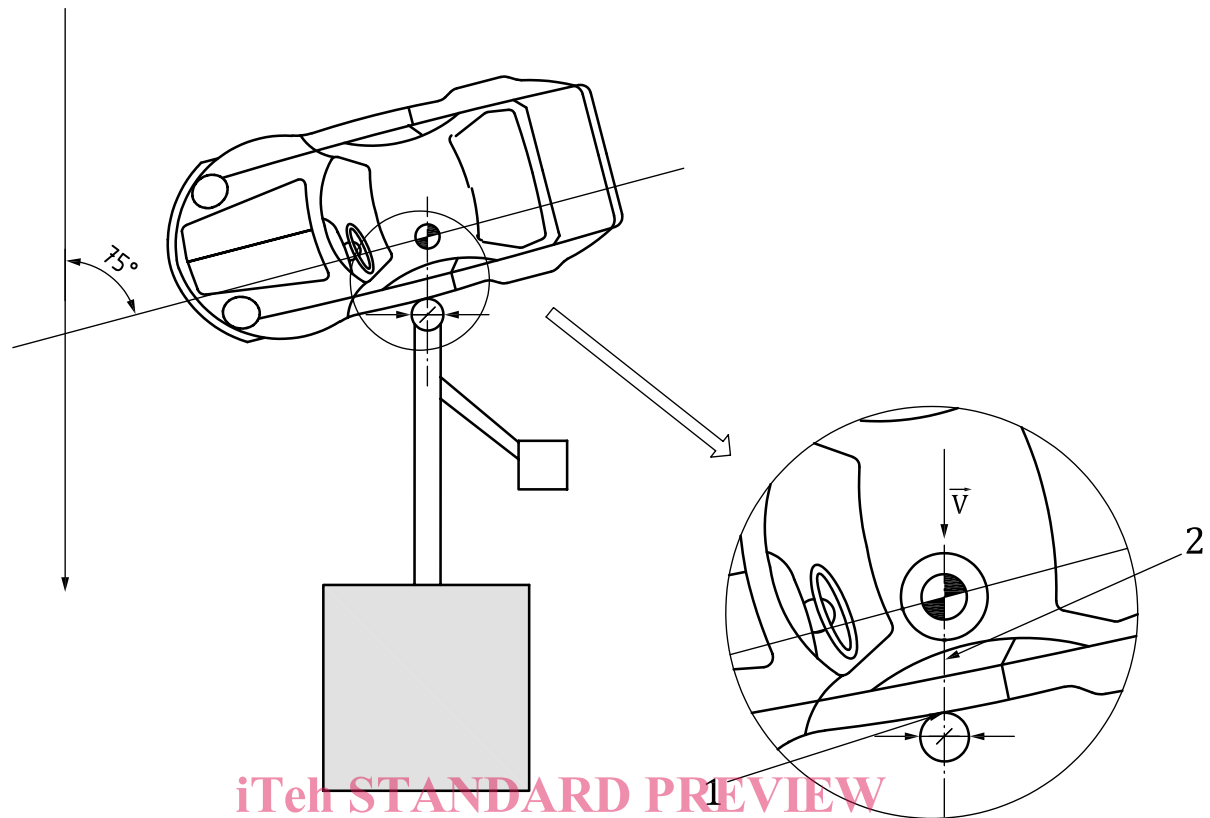
5.2 Locus of the impact on the test vehicle

The test vehicle may be impacted from either side.

The vehicle should be positioned so that the CG of the head is aligned with the centre of the pole, along the direction of impact (75° or 90° from the longitudinal axis of the vehicle).

5.2.1 Impact reference line for oblique test

A vertical impact reference line shall be established on the test vehicle at the intersection of a vertical plane drawn through the dummy head CG of the front outboard designated dummy. The plane should be oriented at 75° with respect to the front, longitudinal axis of the vehicle (front outboard designated seating position) and the exterior door surface (See [Figure 1](#)).



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Key

- 1 First contact with vehicle
- 2 Alignment of CG with pole

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NOTE 1 The impact reference line is established after the dummy is in its final position.

NOTE 2 The vertical impact reference line should be aligned with the centreline of the rigid pole.

NOTE 3 The maximum offset optimal value is set to ± 10 mm.

NOTE 4 The offset value should be kept within ± 25 mm for the test to be considered acceptable. However if the offset value is over ± 10 mm, some care should be taken in the interpretation of the results.

Figure 1 — Test configuration for 75° angle impact

5.2.2 Impact Reference Line for perpendicular test

A vertical impact reference line shall be established on the test vehicle at the intersection of the vertical transverse plane through the dummy head CG (front outboard designated seating position) and the exterior door surface (See [Figure 2](#)).