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Third edition
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Road vehicles — Design and performance specifications for the WorldSID 50th percentile male side-impact dummy —

Part 1: Vocabulary and rationale

Véhicules routiers — Conception et spécifications de performance pour le mannequin mondial (WorldSID), 50e percentile homme, de choc latéral —

Partie 1: Vocabulaire et raisonnement

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.

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 third edition cancels and replaces the second edition (ISO 15830-1:2013), which has been technically revised.

The main changes are as follows:

— in B.3.3.3 and Table B.4, corrected biofidelity rating of neck test 2;

— in B.3.6.3 and Table B.7, corrected biofidelity rating of abdomen test 3;

— in Table B.9, corrected biofidelity ratings;

— in Table B.10, replaced “rotation accelerometer” with “angular accelerometer or ARS”;

— in Table B.10, replaced “IR-TRACC” with “deflection sensors”;

— in Table B.10, removed ankle rotation sensors;

— replaced “WorldSID production dummy” with “WorldSID (May 2005 version)”;

— in Figure C.15, corrected zero offset;

— in Table C.3, corrected biofidelity rating of neck test 2;

— in Table C.13, corrected biofidelity ratings of abdomen test 3;

— in Table C.20, corrected biofidelity ratings.

A list of all parts in the ISO 15830 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.

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Introduction

The purpose of the ISO 15830 series is to document the design and specifications of this side-impact dummy in a form suitable and intended for worldwide use.

In 1997, the WorldSID 50th percentile adult male dummy development was initiated, with the aims of defining a global-consensus side-impact dummy, with more human-like anthropometry, improved biofidelity, and increased injury-monitoring capabilities, suitable, for example, for regulatory use. Participating in the development were research institutes, dummy and instrumentation manufacturers, governments, and vehicle manufacturers from around the world.

This document is intended to document information and design changes which have become available since the publication of the second edition of the ISO 15830 series (2013-05-15).

In order to apply the ISO 15830 series properly, it is important that all four parts be used together.

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Road vehicles — Design and performance specifications for the WorldSID 50th percentile male side-impact dummy —

Part 1: Vocabulary and rationale

1 Scope

This document provides the vocabulary, symbols, and rationale used in all parts of the ISO 15830 series for the WorldSID 50th percentile side-impact dummy, a standardized anthropomorphic dummy for near-side-impact tests of road vehicles.

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
1-to-2-*g*-setting
joint friction setting which will support the weight of a horizontally extended limb segment but will not support twice the limb segment weight

3.2
abdomen rib
lowest two ribs of the six mechanical ribs in the WorldSID dummy

3.3
aluminium honeycomb
manufactured material comprising multi-layered bonded sheets of aluminium bent or corrugated in a rib pattern, in which there is an internal pattern of hexagonal cylindrical spaces

3.4
angular rate sensor
ARS
sensor which records angular velocity

3.5
arm
assembly of the WorldSID dummy comprising dedicated upper arm components which are different from the components of the *full arm* (3.12)

Note 1 to entry: Unless otherwise specified, arm refers to the half arm for the ISO 15830 series.

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3.6
C7
location corresponding to the seventh cervical vertebra in a human

3.7
capacity
maximum designed range for force or moment measurements

3.8
cheese screw
slotted button head screw

Note 1 to entry: This concept is also referred to as a slotted cheese head screw as defined by ISO 1207.

3.9
data acquisition system
DAS
system that includes sensors, recorders, cables and other associated hardware

3.10
docking station
data recorder connection point inside the dummy which allows the recorder to be conveniently disconnected from the sensors

3.11
frontal
forward-facing or anterior surfaces of the dummy, when it is in a standing posture

3.12
full arm
optional assembly of the WorldSID dummy comprising the articulated upper arm and forearm, including the hand

3.13
H-point
point on the outer surface of the dummy on an imaginary line which passes through the left and right hip ball centres

3.14
H-point tool
device which can be inserted into index holes in the dummy pelvis to provide an external surface for indicating the orientation of the pelvis and an imaginary line connecting the left and right hip ball joint centres

3.15
head form
mechanical device with the same mass and I_{xx} inertia as the WorldSID head, used for lateral neck *validation* (3.33) tests

3.16
infrared telescoping rod for assessment of chest compression
IR-TRACC
sensor for deflection measurements

3.17
L1
location corresponding to the first lumbar vertebra in a human

3.18
L5
location corresponding to the fifth lumbar vertebra in a human

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3.19
lower leg
portion of the lower extremity between the knee and the ankle

3.20
mass replacement
non-electronic component which is substituted for a given dummy electronic component, which has the same mass as the given electronic component, and which does not act as a structural component of the dummy (e.g. an accelerometer)

3.21
rib deflection
change in distance between the accelerometer mount on the rib and the spine box

3.22
S1
location corresponding to the first sacral vertebra in a human

3.23
shoulder rib
upper-most rib of the six mechanical ribs in the WorldSID dummy

3.24
side impact dummy
dummy used to evaluate performance of impacts lateral to the dummy

3.25
structural replacement
non-electronic component which is substituted for a given dummy electronic component (e.g. a load cell), which has the same mass as the given component, and which also acts as a structural component of the dummy

3.26
thorax rib
second, third, and fourth upper-most ribs of the six mechanical ribs in the WorldSID dummy

3.27
T1
location corresponding to the first thoracic vertebra in a human

3.28
T4
location corresponding to the fourth thoracic vertebra in a human

3.29
T12
location corresponding to the twelfth thoracic vertebra in a human

3.30
tilt sensor
sensor that measures angle relative to gravity

3.31
universal
capable of being mounted at several different locations on the dummy

3.32
upper leg
portion of the lower extremity between the knee and the hip ball

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3.33
validation
process by which the relevant dummy component or whole dummy is verified and documented to meet the specifications

3.34
validation bench
specialized seat with defined seat bottom and seat back angles used to position the dummy for *validation* (3.33) tests

3.35
W50-
prefix denoting WorldSID 50th percentile adult male dummy part or drawing number

4 Symbols, subscripts and abbreviated terms

4.1 Symbols

See Table 1.

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