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Security and resilience — Vehicle security barriers — Part 1: Performance requirement, vehicle impact test method and performance rating

Sécurité et résilience — Barrières de sécurité de véhicule — Partie 1: Exigence de performance, méthode d'essai d'impact du véhicule et taux de performance

ISO Copyright Office
CP 401 • CH-1214 Vernier, Geneva
Phone: + 41 22 749 01 11
Email: copyright@iso.org
Website: www.iso.org
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Contents

Foreword

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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~~document 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).

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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 292, *Security and resilience*.

This first edition cancels and replaces IWA 14-1:2013, which has been technically revised.

The main changes are as follows:

— this document has been brought into line with modern technology and practices;

— all figures have been reviewed and surface-placed barriers have been explicitly identified;

— additional reporting of furthest part of vehicle beyond ~~VSB~~vehicle security barrier datum;

— there has been a general review of all text and structure to provide clarification to test houses and other interested parties.

A list of all parts in the ISO 22343 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.

Security and resilience — Vehicle security barriers — Part 1: Performance requirement, vehicle impact test method and performance rating

1 Scope

This document specifies impact performance requirements for a vehicle security barrier (VSB) and a test method for rating its performance when subjected to a single impact by a test vehicle not driven by a human being. It is applicable to test methods for vehicle penetration distances not exceeding 25 m.

This document is applicable to all manufacturers and procurers of VSBs, where they are used to protect people in any public or private location from the impact of vehicle attacks.

This document does not apply to the performance of a VSB or its control apparatus when subjected to:

— slow speed encroachment;

— slow speed nudging and ramming;

— blast explosion;

— ballistic impact;

— manual attack, with the aid of the vehicle (multiple impacts at slow speed);

— manual attack, with the aid of tools (excluding vehicles);

— electrical manipulation;

— attack on the control systems by any means.

NOTE 1 For manual attack, a variety of test methods exist. For assessing intruder resistance of building components, see LPS 1175[6].

NOTE 2 The VSB is designed and tested on the basis of:

a) vehicle type, mass and speed of the assessed vehicle-borne threat;

b) its geographical application (e.g. climate conditions);

c) intended site location (e.g. rigid or non-rigid soil/finished surface).

It does not apply to guidance on design, the operational suitability of a VSB or other impact test methods.

NOTE 3 Guidance on the selection and specification of a VSB by type and operational suitability is given in ISO 22343-2.

2 Normative references

The following documents are referred to in the text in such a way that some or all of their content constitutes requirements 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 22300, *Security and resilience — Vocabulary*

ASTM C31/C31M, *Standard practice for making and curing concrete test specimens in the field*

ASTM C39/C39M–18, *Standard test method for compressive strength of cylindrical concrete specimens*

EN 12390-2, *Testing hardened concrete — Part 2: Making and curing specimens for strength tests*

EN 12390-3, *Testing hardened concrete — Part 3: Compressive strength of test specimens*

SAE J211/2, *Instrumentation for Impact Test — Part 2: Photographic Instrumentation*

3 Terms and definitions

For the purposes of this document, the terms and definitions given in ISO 22300 and the following 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

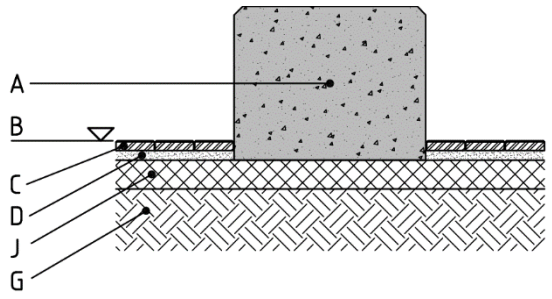
— IEC Electropedia: available at https://www.electropedia.org/

3.1
vehicle security barrier
VSB
passive, active, portable or linear barrier used to prevent potentially hostile vehicular access to a site

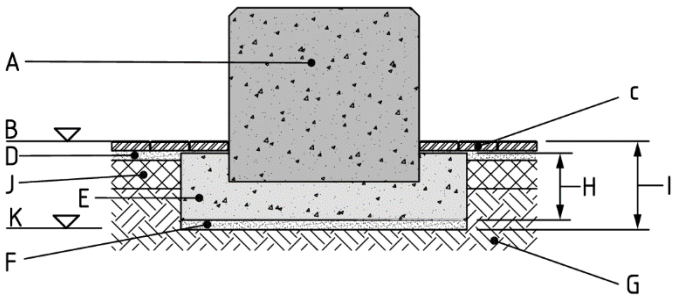
Note 1 to entry: Types of VSB and their application are discussed in ISO 22343-2.

3.2
vehicle security barrier foundation
VSB foundation
foundation and surrounding test location ground into which the *VSB* (3.1) is installed

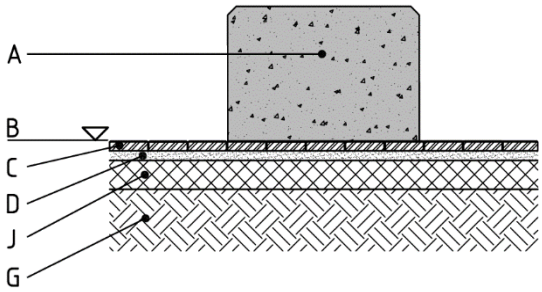
Note 1 to entry: Typical foundations that can be presented for test are illustrated in Figure 1.



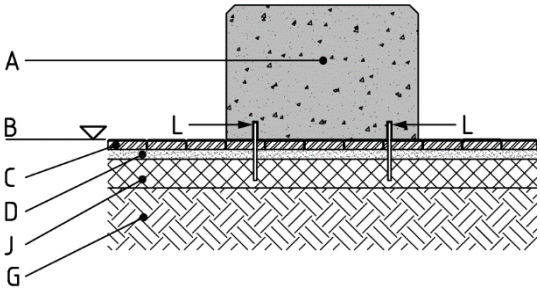
a) VSB rebated



b) VSB integral/proprietary



c) VSB on test site ground (surface placed)



d) VSB anchored/pinned/bolted to test site ground

Key

A	VSB	G	natural ground
B	existing finishing level	H	foundation thickness
C	paviors	I	depth of foundation excavation
D	pavior bedding	J	base construction
E	foundation	K	formation level
F	blinding concrete	L	connections

Figure 1 — Examples of VSB installations — Section view

3.2.1
integral vehicle security barrier foundation
integral VSB foundation
VSB foundation (3.2) that is a structural component of the *VSB* (3.1)

3.2.2
proprietary vehicle security barrier foundation
proprietary VSB foundation
VSB foundation (3.2) designed and sized solely for use with a specific *VSB* (3.1)

Note 1 to entry: A surface pinned VSB can need a concrete plinth into which fixings can be installed, this plinth should be recorded as part of the VSB foundation.

3.2.3
test site ground
surrounding land, in which the vehicle security barrier (VSB) foundation is situated or placed on which the VSB is installed for testing

3.3
test vehicle
commercially available vehicle and load bed

Note 1 to entry: The vehicle having an unmodified chassis and unmodified frontal structure, used in an impact test to evaluate the performance of a VSB (see Table 2).

Note 2 to entry: Modifications that are permissible include the addition of a load bed (in accordance with the vehicle manufacturer's instructions) and methods to restrain movement of ballast.

Note 3 to entry: See Table 2 for test vehicle type and test mass

3.3.2

ballast
mass added to the test vehicle to bring the test vehicle mass within tolerance

Note 1 to entry: Table 1 specifies the permissible quantities of secured and unsecured ballast.

3.3.3
crew cab
four-door compartment of an N1G vehicle for driver and passengers

3.3.4
day cab
driver compartment of an N1 vehicle that does not include overnight facilities

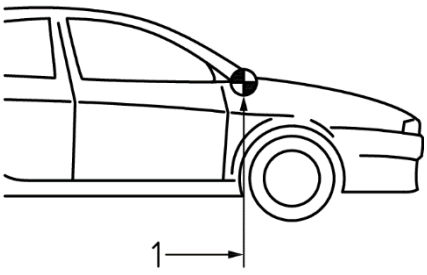
3.3.5
unladen mass
mass of test vehicle, excluding *ballast* (3.3.2) but with manufacturer's equipment, quantities of engine oil and coolant, and minimum amount of fuel

Note 1 to entry: A minimum amount of fuel is required to ensure engine operation during the test which in turn facilitates power steering and braking systems.

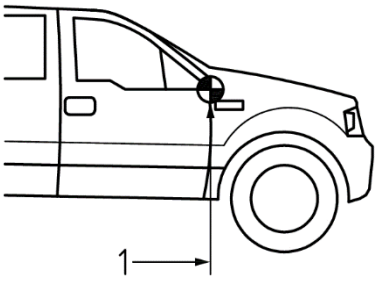
3.4
datum
fixed point or line to where all measurements pre- and post-impact are taken

3.4.1
vehicle datum point
fixed point on a vehicle to where all measurements pre and post impact are taken

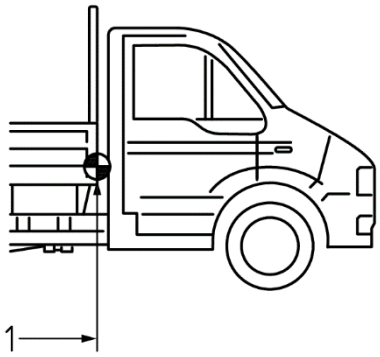
Note 1 to entry: For a car (M1) or 4x4 crew cab pick-up (N1G) vehicle [see Figure 2 a) and Figure 2 b)], a reference line passing through the centre of the A-pillars, at the lowest point of the windscreen. For ~~a~~ N1, N2 or N3 vehicles [see Figure 2 c) and Figure 2 d)], a reference line intersecting the lower load bed leading edge and the vehicle chassis rail.



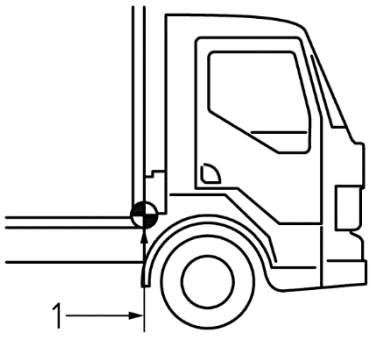
a) Car (M1)



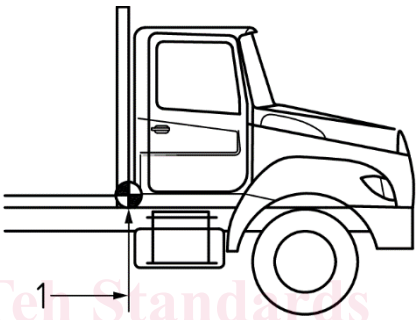
b) 4x4 crew cab pick-up (N1G)



c) Day cab vehicle (N1)



d) Large ~~Goods Vehicle~~goods vehicle (LGV) N2A, N3C, N3D, N3F and N3G



e) Large ~~Goods Vehicle~~goods vehicle (LGV) N2B and N3E

Key

1 vehicle datum point

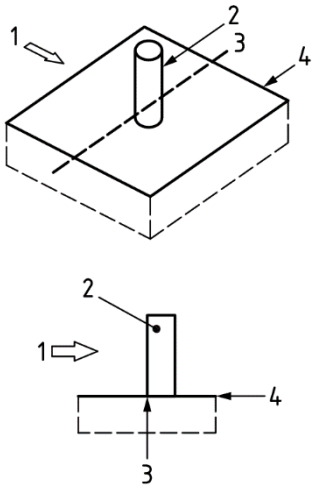
Figure 2 — Vehicle datum point — Side view

3.4.2
vehicle security barrier datum line
VSB datum line
horizontal line marked on the ground pre-impact, vertically aligned with the foremost point of the *vehicle security barrier (VSB)* (3.1) structure designed to withstand the impact

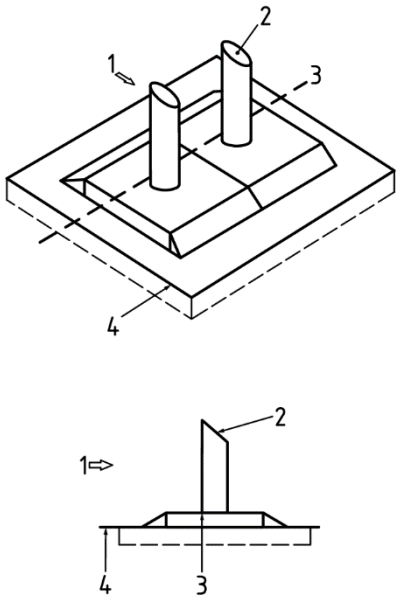
Note 1 to entry: The VSB front face can be flat and perpendicular to the ground. In this case, the whole VSB front face is in line with the VSB datum line. In the case of a blocker, it is the furthest protrusion of the VSB structure designed to withstand the impact [see Figure 3 c)].

Note 2 to entry: The front face of the VSB is not the same as the front face of the VSB foundation or any supporting structure. In the case of a ditch, it is the point where the front face of the ditch meets the ground level.

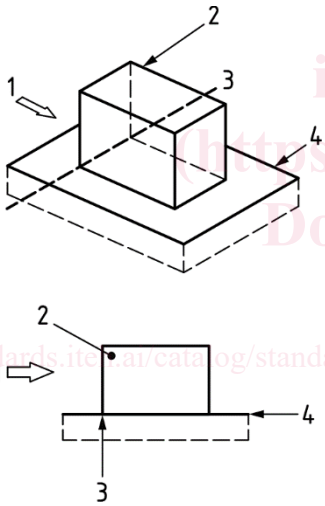
Note 3 to entry: The VSB datum line is illustrated in Figure 3.



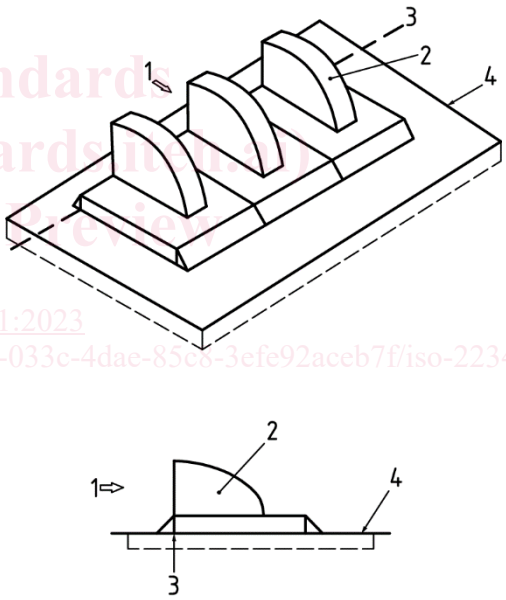
a) Bollard



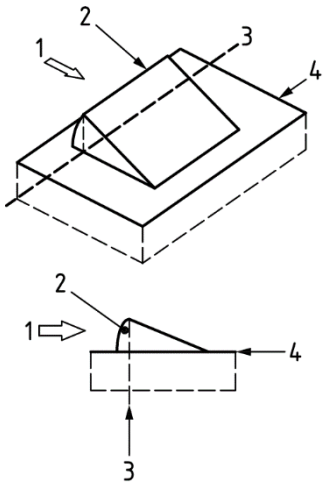
b) Surface-placed bollard



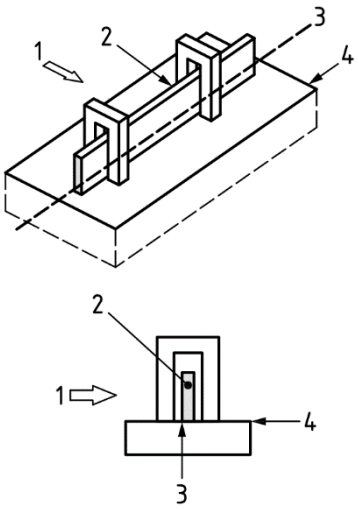
c) Planter, wall, balustrade



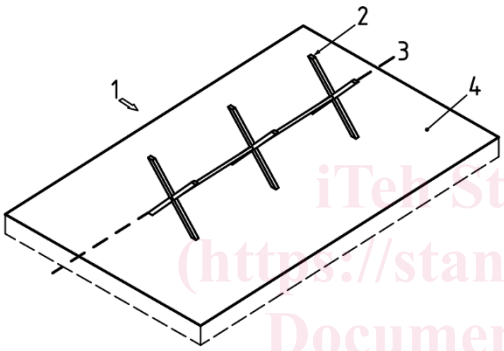
d) Surface-placed barrier

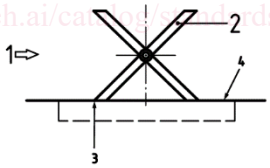


e) Blocker

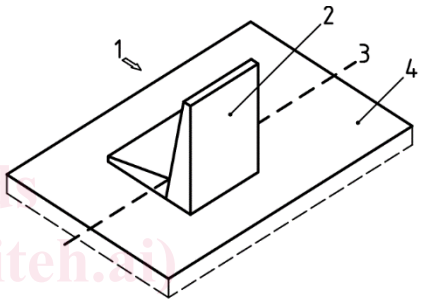


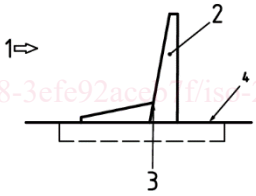
f) Gate barrier, rising/swing arm barrier



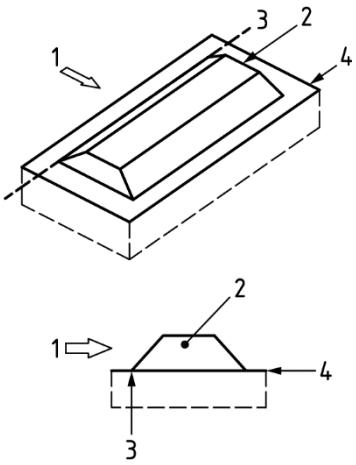


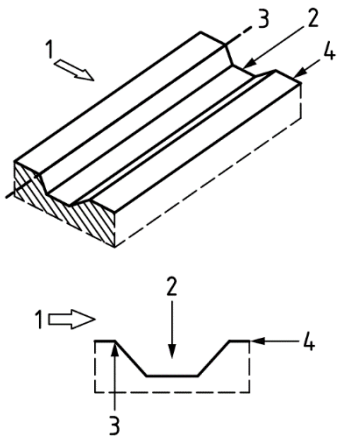
g) Surface-placed barrier





h) Surface-placed barrier





i) Bund/berm **j) ditch**

Key

1	direction of impact	3	VSB datum line
2	VSB	4	ground level

NOTE 1 ISO 22343-2 provides information on the different types of VSB available.

NOTE 2 For c), refer to Note 1 in 3.4.2.

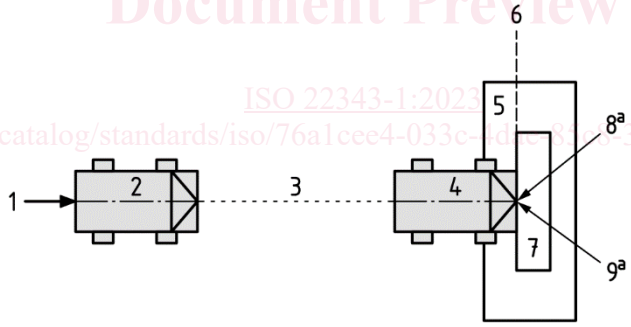
Figure 3 — Examples of VSB datum line — Isometric and side view

3.5
impact
sequence of events between a moving vehicle engaging with a *vehicle security barrier (VSB)* (3.1)

3.5.1
impact speed
velocity of the freely moving test vehicle before reaching the initial contact point

3.5.2
impact angle
angle >0° and ≤ 90° in the horizontal plane between the ~~VSB~~*vehicle security barrier (VSB) datum line* (3.4.2) and the vehicle approach path into the *VSB* (3.1)

Note 1 to entry: The impact angle is illustrated for clarity in Figure 4.



a) Impact angle = 90°

