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**Passenger cars — Stopping distance  
at straight-line braking with ABS —  
Open-loop test method**

*Voitures particulières — Distance d'arrêt de freinage en ligne droite  
avec ABS — Méthode d'essai en boucle ouverte*



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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](http://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](http://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](http://www.iso.org/iso/foreword.html).

This document was prepared by Technical Committee ISO/TC 22, *Road vehicles*, Subcommittee SC 33, *Vehicle dynamics and chassis components*.

This second edition cancels and replaces the first edition (ISO 21994:2007), which has been technically revised.

The main changes are as follows:

— variables in formulae have been corrected.

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](http://www.iso.org/members.html).

## Introduction

The stopping distance of a road vehicle is an important part of vehicle performance and active vehicle safety. Any given vehicle, together with its driver and the prevailing environment, constitutes a unique closed-loop system. The task of determining the stopping distance is therefore, very difficult, since there is a significant interaction between these driver-vehicle-environment elements, each of which is complex in itself.

Test conditions and tyres have a strong influence on test results. Therefore, only vehicle stopping distances obtained under comparable test and tyre conditions are comparable to one another.

# Passenger cars — Stopping distance at straight-line braking with ABS — Open-loop test method

## 1 Scope

This document specifies an open-loop test method to determine the stopping distance of a vehicle during a straight-line braking manoeuvre, with the anti-lock braking system (ABS) fully engaged. This document applies to passenger cars as defined in ISO 3833 and light trucks.

This document specifies a reference method and is especially designed to ensure high repeatability.

## 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 8855, *Road vehicles — Vehicle dynamics and road-holding ability — Vocabulary*

ISO 15037-1:2019, *Road vehicles — Vehicle dynamics test methods — Part 1: General conditions for passenger cars*

## 3 Terms and definitions

For the purposes of this document, the terms and definitions given in ISO 8855, ISO 15037-1 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

$F_{\text{ABS}}$   
pedal force required for ABS activation

## 4 Principle

This document specifies a method to determine the braking distances characterizing the deceleration build-up phase at the beginning of a braking manoeuvre and at full braking until the vehicle comes to a standstill.

The driving situation represents an emergency or panic braking phase (pushing the brake pedal with a very high activation speed) during straight-ahead driving on an even and dry road surface with a high coefficient of friction.

Using this document, three results become available:

- stopping distance from initial brake pedal contact until the vehicle comes to a standstill ( $s_{\text{A100}}$ );
- ABS-braking distance describing the distance travelled under full ABS-controlled braking from 90 km/h until the vehicle comes to a standstill ( $s_{\text{L90}}$ ); and