

INTERNATIONAL STANDARD

ISO
11835

Second edition
2002-11-15

Road vehicles — Motor vehicles with antilock braking systems (ABS) — Measurement of braking performance

*Véhicules routiers — Véhicules à moteur équipés de dispositifs de freinage
à antiblocage (ABS) — Mesurage des performances de freinage*



Reference number
ISO 11835:2002(E)

AVA **Documents**
© ISO 2002
Document Sharing Hub

PDF disclaimer

This PDF file may contain embedded typefaces. In accordance with Adobe's licensing policy, this file may be printed or viewed but shall not be edited unless the typefaces which are embedded are licensed to and installed on the computer performing the editing. In downloading this file, parties accept therein the responsibility of not infringing Adobe's licensing policy. The ISO Central Secretariat accepts no liability in this area.

Adobe is a trademark of Adobe Systems Incorporated.

Details of the software products used to create this PDF file can be found in the General Info relative to the file; the PDF-creation parameters were optimized for printing. Every care has been taken to ensure that the file is suitable for use by ISO member bodies. In the unlikely event that a problem relating to it is found, please inform the Central Secretariat at the address given below.

© ISO 2002

All rights reserved. Unless otherwise specified, no part of this publication may be reproduced or utilized in any form or by any means, electronic or mechanical, including photocopying and microfilm, without permission in writing from either ISO at the address below or ISO's member body in the country of the requester.

ISO copyright office
Case postale 56 • CH-1211 Geneva 20
Tel. + 41 22 749 01 11
Fax + 41 22 749 09 47
E-mail copyright@iso.ch
Web www.iso.ch

Printed in Switzerland

Contents

Page

Foreword	iv
1 Scope	1
2 Normative references	1
3 Terms, definitions and symbols	1
4 General	3
5 Test apparatus	4
6 Test area	4
7 General checks	5
8 Dynamic test of laden vehicle	6
9 Determination of peak coefficient of adhesion — Low-adhesion surface — Laden vehicle	6
10 Determination of adhesion utilization — Low-adhesion surface — Laden vehicle	7
11 Determination of adhesion utilization — High-adhesion surface — Laden vehicle	9
12 Additional checks — Laden vehicle	9
13 Energy consumption — Low-adhesion surface — Laden vehicle	10
14 Tests on unladen vehicle	12
Annex A (informative) Equivalence with UNECE Regulation No. 13	13
Bibliography	14

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 3.

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 International Standard may be the subject of patent rights. ISO shall not be held responsible for identifying any or all such patent rights.

ISO 11835 was prepared by Technical Committee ISO/TC 22, *Road vehicles*, Subcommittee SC 2, *Braking systems and equipment*.

This second edition cancels and replaces the first edition (ISO 11835:1995), which has been technically revised.

Annex A of this International Standard is for information only.

Road vehicles — Motor vehicles with antilock braking systems (ABS) — Measurement of braking performance

1 Scope

This International Standard specifies a method for testing the braking performance of motor vehicles of categories M and N, as defined in UNECE (United Nations Economic Commission for Europe) Regulation No. 13, equipped with antilock braking systems (ABS).

NOTE Pending the harmonization of national and international braking standards, regulations and directives, the test method itself is based on UNECE Regulation No. 13.

2 Normative references

The following normative documents contain provisions which, through reference in this text, constitute provisions of this International Standard. For dated references, subsequent amendments to, or revisions of, any of these publications do not apply. However, parties to agreements based on this International Standard are encouraged to investigate the possibility of applying the most recent editions of the normative documents indicated below. For undated references, the latest edition of the normative document referred to applies. Members of ISO and IEC maintain registers of currently valid International Standards.

ISO 611, *Road vehicles — Braking of automotive vehicles and their trailers — Vocabulary*

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

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

ISO 7638 (all parts) 1997, *Road vehicles — Electrical connectors for braking systems*

UNECE Regulation No. 13:1996¹⁾, *Uniform provisions concerning the approval of vehicles with regard to braking*

3 Terms, definitions and symbols

For the purposes of this International Standard, the terms and definitions given in ISO 611, ISO 1176 and ISO 3833, and the following terms, definitions and symbols (see Table 1) apply.

3.1

category M vehicle

power-driven vehicle having at least four wheels or having three wheels when the maximum mass exceeds 1 t, and used for the carriage of passengers

[UNECE Regulation No. 13]

1) Incorporating the 09 series of amendments, but without the supplements to those amendments.

3.2**category N vehicle**

power-driven vehicle having at least four wheels or having three wheels when the maximum mass exceeds 1 t, and used for the carriage of goods

[UNECE Regulation No. 13]

3.3**directly controlled wheel**

wheel whose braking force is modulated according to data provided at least by its own sensor

NOTE Antilock braking systems with select-high control are deemed to include both directly and indirectly controlled wheels. In devices with select-low control, all sensed wheels are deemed to be directly controlled wheels.

3.4**indirectly controlled wheel**

wheel whose braking force is modulated according to data provided by sensor(s) of other wheel(s)

NOTE Antilock braking systems with select-high control are deemed to include both directly and indirectly controlled wheels. In devices with select-low control, all sensed wheels are deemed to be directly controlled wheels.

Table 1 — Symbols

Symbol	Description	Unit
E	Wheelbase	m
ε	Vehicle adhesion utilized: quotient of the maximum braking rate with the antilock system operative (ε_{AL}) and the coefficient of adhesion (k)	1
ε_i	ε value measured on axle i , in the case of a power-driven vehicle with a category 3 antilock braking system (see clause 4)	1
ε_H	ε value on the high-adhesion surface	1
ε_L	ε value on the low-adhesion surface	1
F	Force	N
F_{dyn}	Normal reaction of road surface under dynamic conditions and with antilock system operative	N
F_{idyn}	F_{dyn} on axle i in case of power-driven vehicles or full trailers	N
F_i	Normal reaction of road surface on axle i under static conditions	N
F_1	Normal reaction of road surface on axle 1 under static conditions	N
F_2	Normal reaction of road surface on axle 2 under static conditions	N
F_M	Total normal static reaction of road surface on all wheels of power-driven (towing) vehicle	N
F_{Mnd}^a	Total normal static reaction of road surface on the unbraked upon and non-driven axles of the power-driven vehicle	N
F_{Md}^a	Total normal static reaction of road surface on the unbraked upon and driven axles of the power-driven vehicle	N
F_{wM}^a	$0,01 F_{Mnd} + 0,015 F_{Md}$	N
g	Acceleration due to gravity (9,81 m/s ²)	m/s ²
h	Height of center of gravity specified by the manufacturer and agreed by the technical service conducting the approval test	m
h_k	Height of fifth wheel coupling (king pin)	m
k	Coefficient of adhesion between tyre and road	1
k_f	k factor of one front axle	1