
**Road vehicles — Vehicle dynamics test
methods —**

**Part 2:
General conditions for heavy vehicles
and buses**

*Véhicules routiers — Méthodes d'essai de la dynamique des
véhicules —*

Partie 2: Conditions générales pour véhicules lourds et autobus



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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 15037-2 was prepared by Technical Committee ISO/TC 22, *Road vehicles*, Subcommittee SC 9, *Vehicle dynamics and road-holding ability*.

ISO 15037 consists of the following parts, under the general title *Road vehicles — Vehicle dynamics test methods*:

- *Part 1: General conditions for passenger cars*
- *Part 2: General conditions for heavy vehicles and buses*

Introduction

The dynamic behaviour of heavy vehicles is a most important part of active vehicle safety. Any given vehicle, together with its driver and the prevailing environment, constitutes a closed-loop system which is unique. The task of evaluating the dynamic behaviour of the vehicle is therefore very difficult, since there is significant interaction between these driver–vehicle–environment elements. Each of these elements is individually complex in themselves.

Moreover, the knowledge of the relationship between overall vehicle dynamic properties and accident avoidance is insufficient. The number of variants of heavy vehicles is enormous and each vehicle is itself unique. Therefore, the measured results are valid only for the actual vehicle tested, and the application of results to other, apparently similar, vehicles is not permissible.

Test conditions have a strong influence on test results. Only vehicle dynamic properties obtained under virtually identical test conditions are comparable.

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Road vehicles — Vehicle dynamics test methods —

Part 2:

General conditions for heavy vehicles and buses

1 Scope

This part of ISO 15037 specifies the general conditions that apply when vehicle dynamics properties are determined according to ISO test methods carried out on heavy vehicles. These are commercial vehicles, combinations, buses and articulated buses, as defined in ISO 3833 for trucks and trailers above 3,5 t and buses above 5 t maximum weight, and in UNECE (United Nations Economic Commission for Europe) and EC vehicle classification, categories M3, N2, N3, O3 and O4.

In particular, it specifies general conditions for

- variables,
- measuring equipment and data processing,
- environment (test track and wind velocity),
- test vehicle preparation (tuning and loading),
- initial driving, and
- test reporting (general data and test conditions),

which are of general significance, independent of the specific vehicle dynamics test procedure. They apply when vehicle dynamics properties are determined, unless other conditions are required by the standard actually used for the test method.

NOTE The general conditions defined in existing vehicle dynamics standards are valid up until the point when a respective reference to this part of ISO 15037 is included.

2 Normative references

The following referenced documents are indispensable for the application 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 1176:1990, *Road vehicles — Masses — Vocabulary and codes*

ISO 3833:1977, *Road vehicles — Types — Terms and definitions*

ISO 8855:1991, *Road vehicles — Vehicle dynamics and road-holding ability — Vocabulary*

UNECE Regulation No. 13, *Uniform provisions concerning the approval of vehicles of categories M, N and O with regard to braking* (Series 09: 28 August 1996 and supplements 1 to 4: 4 February 1999)

UNECE Regulation No. 30, *Uniform provisions concerning the approval of pneumatic tyres for motor vehicles and their trailers*

3 Terms and definitions

For the purposes of this document, the terms and definitions given in ISO 8855 and the following apply.

3.1

vehicle unit

unit of vehicle combination connected with a yaw-articulation joint

EXAMPLE Tractor, semitrailer or dolly.

NOTE The number of vehicle units is one more than the number of articulation joints.

3.2

offtracking

lateral deviation between the path of the centre-line point of the front axle of the vehicle and the path of the centre-line point of some other part of the vehicle

NOTE 1 If a single number is given, it becomes the maximum offtracking.

NOTE 2 In a single-lane-change manoeuvre where the path of the other part is farther from the projection of the original path of the vehicle than the path of the front axle, the path of the other part is said to “overshoot” the path of the front axle at that point. In the opposite case, the path of the other part is said to “undershoot” the path of the front axle.

3.3

rearward amplification

ratio of the maximum value of the motion variable of interest (e.g. lateral acceleration or yaw velocity) of a following vehicle unit to that of the first vehicle unit during a specified manoeuvre

3.4

zero damping speed

speed at which the damping coefficient of the free oscillatory yaw movements of the vehicle combination equals zero

3.5

reference damping speed

speed at which the damping coefficient of the free oscillatory yaw movements of the vehicle combination equals 0,05

3.6

centre-line point

point at the intersection of the ground plane and the $x-z$ plane of symmetry of the part of interest, which point lies directly below a longitudinal reference position

NOTE For an axle, the longitudinal reference point is the wheel-spin axis. For other parts, the longitudinal reference point needs to be stated.

3.7

yaw articulation angle

yaw angle of the X axis of the intermediate axis system of a more forward vehicle unit in the intermediate axis system of a following vehicle unit, i.e. the angle between the X axes of the two units, with polarity determined by the rotation of the leading unit in the axis system of the following unit

NOTE The units involved are usually adjacent, but not necessarily so.