
**Road vehicles — Determination of centre
of gravity**

Véhicules routiers — Détermination du centre de gravité



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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 10392 was prepared by Technical Committee ISO/TC 22, *Road vehicles*, Subcommittee SC 9, *Vehicle dynamics and road-holding ability*.

This second edition cancels and replaces the first edition (ISO 10392:1992). Clause 7 has been added.

Introduction

Two methods for determining the height of the centre of gravity above the ground are presented. The first method, the axle lift method, was the only method contained in ISO 10392:1992. The second method, a stable pendulum method, was added to this second edition of ISO 10392. The model, assumptions, and measurements used for the stable pendulum method have many analogies to the unstable pendulum method (often referred to as the tilt table method). Clause 7 includes a brief discussion of the unstable pendulum method for determining vehicle centre of gravity (CG) height. Other procedures such as vertical balance methods and vehicle hang methods are also used.

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Road vehicles — Determination of centre of gravity

1 Scope

This International Standard specifies methods for determining the location of the centre of gravity (CG) of a road vehicle, as defined in ISO 3833. A method for determining the coordinates of the CG in the horizontal plane is provided. Two methods for determining the height of the CG above the ground are specified.

The axle lift and the stable pendulum methods are the most common methods for determining vehicle CG height. The axle lift method requires less dedicated equipment and is typically an easier and less expensive method than the stable pendulum method. The axle lift method can generally provide CG height accuracy in the range of a few percent, while the stable pendulum method can provide accuracy in the range of 0,5 %.

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 612, *Road vehicles — Dimensions of motor vehicles and towed vehicles — Terms and definitions*

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

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

3 Terms and definitions

For the purposes of this document, the terms and definitions given in ISO 612, ISO 3833 and ISO 8855 apply.

4 Test conditions and preliminary measurements

4.1 Operating and other liquids

The fuel tank shall be completely full. Fuel motion within an unfilled fuel tank can have an adverse effect on the test results. If the displacement of other liquids (operating and other) due to the inclination of the vehicle during testing is considered significant, this shall be taken into account.

4.2 Preliminary measurements

With the vehicle horizontal, and in accordance with the dimensions given in ISO 612 and ISO 8855, measure and record:

l_{left} , the wheelbase, left, in millimetres;

l_{right} , the wheelbase, right, in millimetres;