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Motorcycle and motorcycle-rider kinematics — Vocabulary

Cinématique relative au motocycle et à son conducteur — Vocabulaire



Reference number
ISO 11838:1997(E)

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.

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.

International Standard ISO 11838 was prepared by Technical Committee ISO/TC 22, *Road vehicles*, Subcommittee SC 22, *Motorcycles*.

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Motorcycle and motorcycle-rider kinematics — Vocabulary

1 Scope

1.1 This International Standard specifies symbols, definitions and conventions related to motorcycle and motorcycle-rider motions and kinematics and to the modelling thereof.

1.2 It does not deal with methods of measurement, nor with the units used in reporting the results, nor with accuracy.

1.3 The provisions of this International Standard apply to two-wheeled motorcycles as defined in ISO 3833.

1.4 This International Standard does not cover road motorcycles which are controlled by a pedestrian or which are used for the carriage of goods to the exclusion of persons.

1.5 This International Standard specifies terms, definitions and symbols for the following systems, parts and aspects:

steering system (clause 3)

suspension system (clause 4)

tyres and wheels (clause 5)

basic principles of axis systems and kinematics (clause 6)

directional dynamics (clause 7)

motorcycle motion characteristics (clause 8)

aerodynamic characteristics of the motorcycle-rider combination (clause 9)

riding postures and behaviours (clause 10)

tests (clause 11).

2 Normative references

The following standards contain provisions which, through reference in this text, constitute provisions of this International Standard. At the time of publication, the editions indicated were valid. All standards are subject to revision, and parties to agreements based on this International Standard are encouraged to investigate the

possibility of applying the most recent editions of the standards indicated below. Members of IEC and ISO maintain registers of currently valid International Standards.

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

ISO 6725:1981, *Road vehicles — Dimensions of two-wheeled mopeds and motorcycles — Terms and definitions*.

ISO 6726:1988, *Mopeds and motorcycles with two wheels — Masses — Vocabulary*.

3 Steering system

3.1 Axis and angles of the steering assembly

3.1.1

steer axis

z_H
rotational axis of the steering assembly for steering control which coincides with the axis of the steering stem and with the axis of the steering head pipe

3.1.2

steer angle

δ_H
angle of motion of the steering assembly about the **steer axis** (3.1.1) which is zero when the front wheel plane is parallel to the motorcycle longitudinal plane

3.1.3

wheel steer angle

δ_W
angle formed by the intersection with the road surface plane of the motorcycle longitudinal plane and the front wheel plane

3.2 Dynamic quantities of the steering assembly

3.2.1

steering velocity

$\dot{\delta}$
angular velocity of the sprung part of the steering assembly about the z_f -axis

3.2.2

steering velocity of the handlebars

$\dot{\delta}_H$
angular velocity of the handlebars about the z_H -axis

3.2.3

steer torque

torque about the **steer axis** (3.1.1)

3.2.4

steer force

value obtained from dividing the **steer torque** (3.2.3) and the effective rotational radius of the steering handle

NOTE — The effective rotational radius of the steering handle is the distance between the **steer axis** (3.1.1) and the centre point of the steering handlegrip projected on the plane perpendicular to the steer axis.