INTERNATIONAL STANDARD

ISO 3958

Second edition
1996-02-15

Passenger cars — Driver hand-control reach

Voitures particulières — Portée des mains du conducteur

Reference number
ISO 3958:1996(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 3958 was prepared by Technical Committee ISO/TC 22, *Road vehicles*, Subcommittee SC 13, *Ergonomics applicable to road vehicles*.

This second edition cancels and replaces the first edition (ISO 3958:1977), which has been extended to include tables for hand-reach envelope unrestrained.

Annex A of this International Standard is for information only.

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Introduction

The hand-reach envelopes described in this International Standard were developed using data acquired from test subjects performing reach tasks in test fixtures simulating a range of actual vehicle configurations [1], [2]. The test subjects included equal numbers of men and women selected to represent the driving population on the basis of standing height and age. Subjects were tested with upper torso three-point restraint (a type 1 lap strap and a diagonal non-extending shoulder strap independent of the lap strap), and with only a type 1 lap strap. The data were analysed in a manner to account for different proportions of male and female users.

The hand-reach envelopes are three-dimensional surfaces described in tabular form and can be referenced to a particular vehicle seating configuration according to the procedures described in clauses 4 and 5.

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Passenger cars — Driver hand-control reach

1 Scope

1.1 This International Standard defines hand-reach envelopes: the boundaries of passenger car hand-control locations that can be reached by different proportions of male and female driver populations.

This International Standard applies to passenger cars (term 3.1.1 in ISO 3833:1977). It is primarily directed towards the initial design stages of a new vehicle programme. Its application for checking purposes in actual vehicle prototype seat models will take into account the allowable tolerances for the actual H-point and actual torso angle (see ISO/TR 9511).

The hand-reach envelopes apply directly to left-hand-drive passenger cars designed for seated operators in full-width or single-width seats having approximately horizontal fore-and-aft seat adjustment. Application to right-hand-drive vehicles is assumed to be symmetrically opposite.

1.2 The envelopes constructed using the static three-point restraint described in the Introduction are meant to define a restrained reach. The envelopes constructed using lap belt only (type 1) are meant to define an unrestrained reach applicable to all restraint systems with free shoulder movement.

The hand-reach envelopes are directly applicable for a three-finger grasping reach to a forward-mounted control knob of 25 mm diameter manoeuvred horizontally in the fore-and-aft direction. The hand-reach envelopes are also applicable to other types of forward controls by using an appropriate adjustment factor that will account for the mode of operation of the control:

a) extended-finger-operated forward control: an adjustment factor of 50 mm is added to the values of the reach envelope in the appropriate table;

b) full-hand-grasped forward control: an adjustment factor of 50 mm is subtracted from the tabled values of the reach envelope.

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 4130:1978, *Road vehicles — Three-dimensional reference system and fiducial marks — Definitions.*

ISO/TR 9511:1991, *Road vehicles — Driver hand-control reach — In-vehicle checking procedure.*

3 Definitions

For the purposes of this International Standard, the following definitions apply.

3.1 driver hand-reach capability: Maximum reach capability of drivers in a simulated driving situation with the non-reaching hand on the steering-wheel and the right foot on the accelerator pedal.