
Road vehicles — Location of hand controls, indicators and tell-tales in motor vehicles

*Véhicules routiers — Emplacement des commandes manuelles, des
indicateurs et des témoins sur les véhicules à moteur*

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Reference number
ISO 4040:2009(E)

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Published in Switzerland

Foreword

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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 4040 was prepared by Technical Committee ISO/TC 22, *Road vehicles*, Subcommittee SC 13, *Ergonomics applicable to road vehicles*.

This fifth edition cancels and replaces the fourth edition (ISO 4040:2001), which has been technically revised.

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Introduction

There is a recognized potential for errors in the selection of controls essential to the safe operation of a vehicle if these controls are not found in similar locations in all vehicles. The standardization of these control locations is therefore considered to be a logical and beneficial design objective, especially in view of the fact that drivers have more and more opportunities to use a variety of vehicles.

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Road vehicles — Location of hand controls, indicators and tell-tales in motor vehicles

1 Scope

This International Standard specifies the location of controls in motor vehicles by subdividing the space within reach of drivers into specific zones, to which certain controls essential to the safe operation of vehicles are assigned. It also specifies certain combinations of functions for multifunction controls and the degree to which certain indicators and tell-tales are to be visible.

This International Standard is applicable to hand-operated controls, to indicators and to tell-tales in all motor vehicles, excluding motorcycles and mopeds, as defined in ISO 3833.

NOTE A specification for a control indicator or tell-tale does not imply that the item needs to be fitted.

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 2575, *Road vehicles — Symbols for controls, indicators and tell-tales*

ISO 3958, *Passenger cars — Driver hand-control reach*

ISO 6549, *Road vehicles — Procedure for H- and R-point determination*

3 Terms and definitions

For the purposes of this document, the following terms and definitions apply.

3.1

reference plane

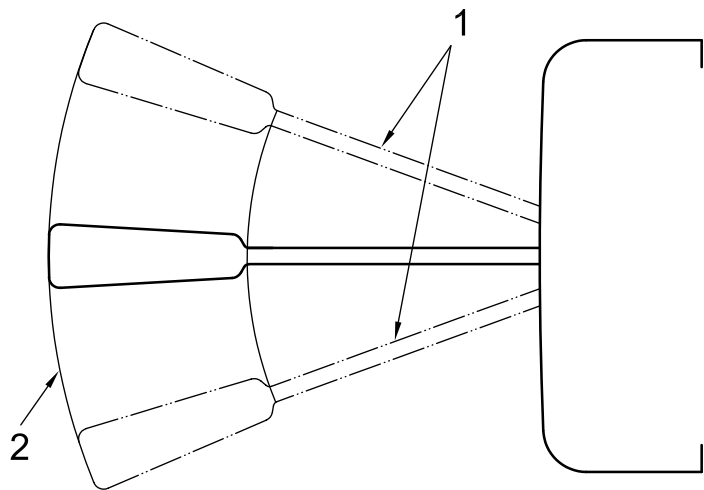
vertical plane parallel to the longitudinal axis of the motor vehicle, passing through the steering wheel axis and within a zone 50 mm to either side of the centre of the designated seating position for the driver at the R-point as defined in ISO 6549

3.2

operational area of control

area swept by those parts of a control activated by the hand while the possible modes or positions are selected in the manner intended by the designer

EXAMPLE See Figure 1.



Key

- 1 extreme location of the control
- 2 operational area of the control

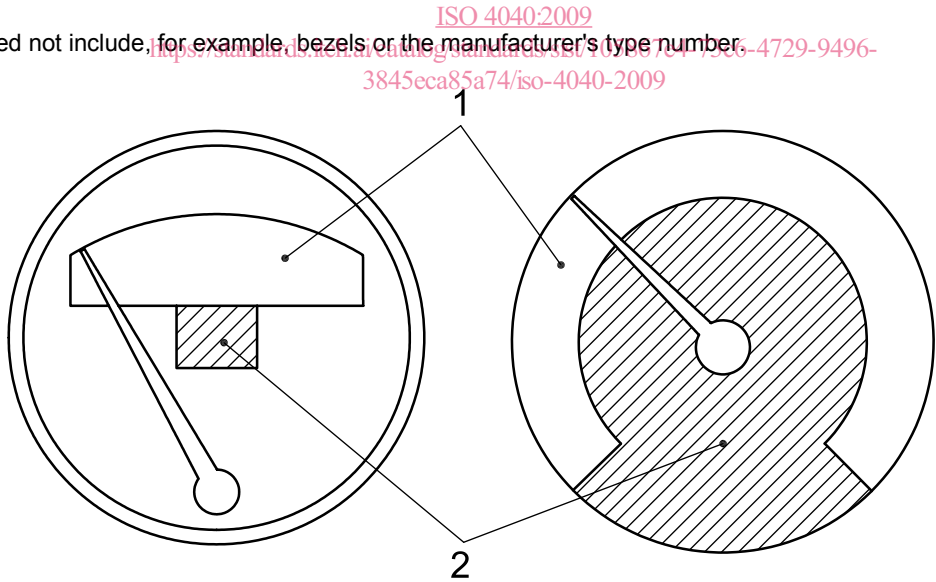
Figure 1 — Example of operational area of a control

3.3 display area of indicator or tell-tale

area including the identification of the quantity displayed and those portions required to determine its level at any point within the usable capacity of the instrumentation

EXAMPLE See Figure 2.

NOTE It need not include, for example, bezels or the manufacturer's type number.



Key

- 1 display area used by pointer
- 2 display area for other information

Figure 2 — Example of display area of indicators

3.4**steering-wheel plane**

plane tangential to the upper surface of the steering-wheel rim in the design condition, as designated by the vehicle manufacturer, and with the vehicle wheels in the straight-ahead position

3.5**steering-wheel axis**

line at right angles to the steering-wheel plane, passing through the centre of rotation of the steering-wheel rim

3.6**zone 1**

volume to the left of the reference plane bounded by the following surfaces:

- a plane parallel to the steering-wheel plane and 20 mm above it;
- a plane parallel to the steering-wheel plane and 170 mm below it;
- a cylinder extending 100 mm beyond the periphery of the steering-wheel rim whose axis is on the steering-wheel axis;
- a cylinder lying 130 mm inside the periphery of the steering-wheel rim whose axis is on the steering-wheel axis;
- two planes intersecting along the steering-wheel axis, at 40° and 130° from the reference plane

NOTE See Figure 3.

3.7**zone 2**

volume bounded by the following surfaces:

- a plane parallel to the steering-wheel plane and 20 mm above it;
- a plane parallel to the steering-wheel plane and 170 mm below it;
- a cylinder of 50 mm radius whose axis is on the steering-wheel axis

NOTE See Figure 3.

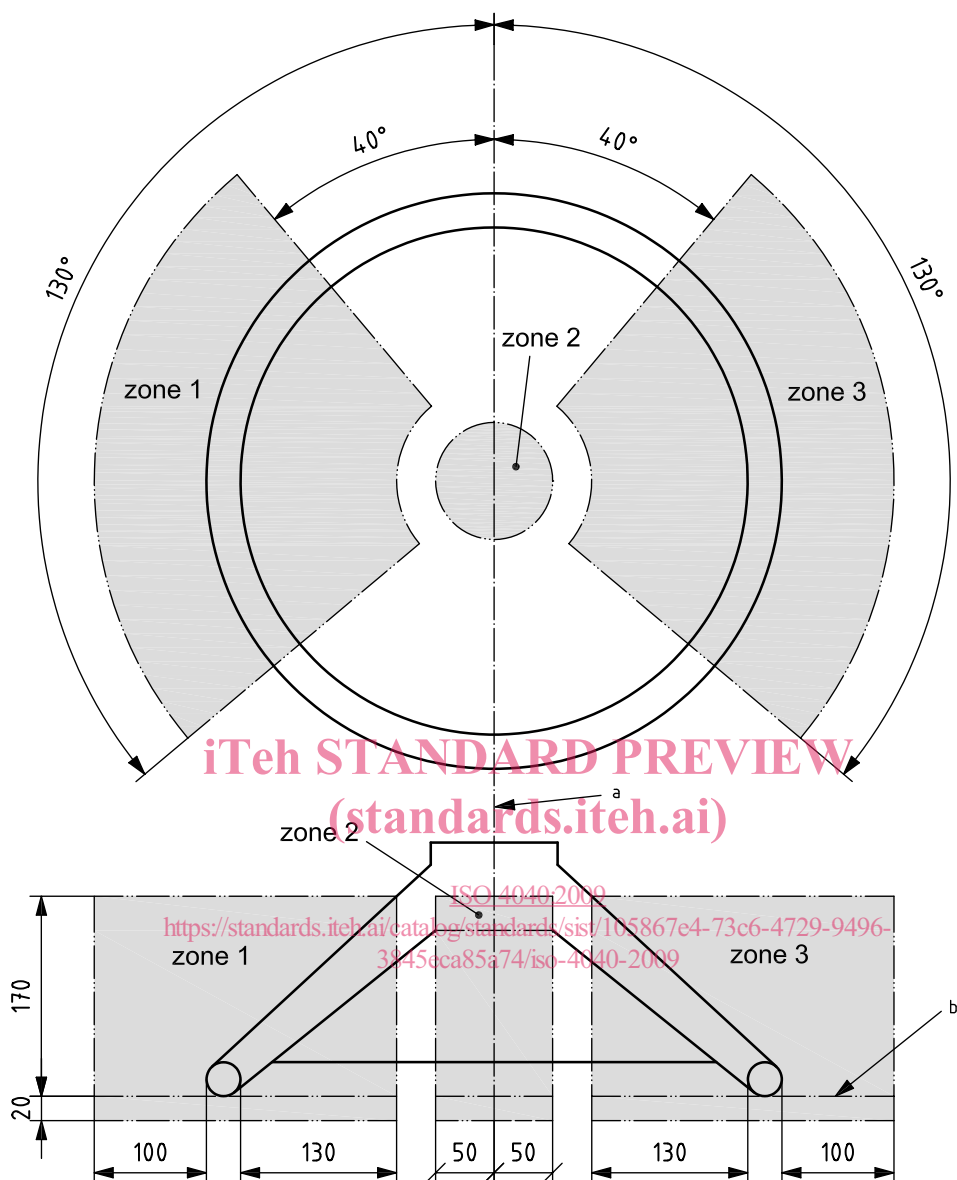
3.8**zone 3**

volume to the right of the reference plane bounded by the following surfaces:

- a plane parallel to the steering-wheel plane and 20 mm above it;
- a plane parallel to the steering-wheel plane and 170 mm below it;
- a cylinder extending 100 mm beyond the periphery of the steering-wheel rim whose axis is on the steering-wheel axis;
- a cylinder lying 130 mm inside the periphery of the steering-wheel rim whose axis is on the steering-wheel axis;
- two planes intersecting along the steering-wheel axis at 40° and 130° from the reference plane

NOTE See Figure 3.

Dimensions in millimetres



- a Steering-wheel axis.
b Steering-wheel plane.

Figure 3 — Location of zones

3.9 visible

seen with either eye, not necessarily with both eyes simultaneously, from all positions within the 95th percentile eyellipses, with the gear selector in top gear or drive position and the steering wheel in the straight-ahead position adjusted in accordance with the manufacturer's specification

NOTE See ISO 4513.

3.10 head movement

movement required to overcome a geometric obstruction

NOTE For the purposes of this International Standard, this does not include movement when the target is more than 30° from the line of sight.

3.11**identification**

symbol in accordance with ISO 2575, written label or some portion of the pointer and scale by which a driver can distinguish the characteristic displayed by the control, indicator or tell-tale

3.12**passive restraint readiness indicator**

tell-tale or indicator indicating a malfunction that will prevent or impede the operation of a passive restraint in the designed manner, or indicating that the passive restraint is disabled

3.13**stalk control**

rigid, elongated control device with a visible length at least five times as great as the smallest cross-sectional dimension

NOTE This device can be fixed or movable and located on the steering column or instrument panel. The operational area is located within reach of the driver (see 4.1 and ISO 3958).

3.14**operational surface**

area on the control surface for the user to grasp or touch in order to activate the controlled function

3.15**secondary operational surface**

operational surface mounted on, and external to, another operational surface

NOTE This does not include buttons on the end of a stalk control (see Figure 4).

4 Requirements for location of controls

4.1 For passenger cars, the controls listed in 4.2 to 4.9 shall be located within the restrained reach of drivers as defined in ISO 3958.

For commercial vehicles and buses, these controls shall be located within reach of drivers wearing a lap belt, with unrestrained reach as defined in ISO 3958.

4.2 The operational areas of the following controls shall be located in zone 1:

- head lamp beam switching (high beam, main beam to low beam, dipped beam);
- head lamp optical warning (momentary high beam warning);
- turn signals (see 4.7).

4.3 The operational area of the master lighting control shall be located:

- to the left of the reference plane for left-hand drive vehicles, or
- to the right of the reference plane, if panel mounted, for right-hand drive vehicles.

4.4 A portion of the operational area of a control for the audible warning (horn) shall be located either in zone 1 or zone 2.

Additional audible warning controls may be located elsewhere, or may have operational areas extending beyond these zones.