International Standard 4131

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Road vehicles — Dimensional codes for passenger cars

Véhicules routiers — Code de dimensions pour voitures particulières

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FOREWORD

ISO (the International Organization for Standardization) is a worldwide federation of national standards institutes (ISO member bodies). The work of developing International Standards is carried out through ISO technical committees. Every member body interested in a subject for which a technical committee has been set up 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.

Draft International Standards adopted by the technical committees are circulated to the member bodies for approval before their acceptance as International Standards by the ISO Council.

International Standard ISO 4131 was developed by Technical Committee ISO/TC 22, *Road vehicles*, and was circulated to the member bodies in February 1978.

It has been approved by the member bodies of the following countries :

Austria	Japan	Spain
Belgium	Korea, Dem. P. Rep. of	Sweden
Brazil	Korea, Rep. of	Switzerland
Czechoslovakia	Mexico	United Kingdom
France	Netherlands	USA
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Iran	Romania	
Italy	South Africa, Rep. of	

The member body of the following country expressed disapproval of the document on technical grounds :

Australia

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Road vehicles — Dimensional codes for passenger cars

1 SCOPE AND FIELD OF APPLICATION

This International Standard establishes dimensional codes for passenger cars as defined in ISO 3833 and for commercial vehicles which are derived from passenger cars, to be used for the exchange of vehicle data and their electronic processing.

2 REFERENCES

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

ISO 1176, *Road vehicles — Weights — Vocabulary.*

ISO 2958, *Road vehicles — Exterior protection for passenger cars.*

ISO 3409, *Passenger cars — Lateral spacing of foot controls.*

ISO 3832, *Road vehicles — Luggage compartments of passenger cars — Method of measuring the reference volume.*

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

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

3 CODING SYSTEM

Each dimension considered in this International Standard is assigned a code, which is composed of three parts :

3.1 The prefix "ISO"

This prefix is intended to avoid any confusion with other existing coding systems.

3.2 A capital letter which denotes the type of dimension considered :

L for length

H for height

W for width

D for diameter

V for volume

L, H or **W** for an angle according to whether it is dimensioned with respect to the zero X, Z or Y plane.

3.3 A number,

from 1 up to and including 99 for internal dimensions;

from 100 up to and including 199 for external dimensions.

4 DEFINITIONS

NOTE — Throughout this International Standard, unless otherwise stated, the supporting surface is conventionally horizontal, lengths and widths are measured in a horizontal plane, and heights are measured in a vertical plane.

For the purpose of this International Standard, the following definitions apply :

4.1 complete vehicle kerb weight : As defined in ISO 1176.

4.2 maximum authorized total weight : As defined in ISO 1176.

4.3 design load : As defined in ISO 2958 or by the manufacturer.

4.4 zero X, Y and Z planes : Three dimensional reference system, as defined in ISO 4130.

4.5 x, y and z planes : Planes parallel to their respective zero X, Y and Z planes (4.4).

4.6 fiducial marks : As defined in ISO 4130.

4.7 R-point : Manufacturer's design point which establishes the rearmost normal position of each seat provided by the vehicle manufacturer : it has co-ordinates established relative to the designed vehicle structure and simulates the position of the pivot centre of the human torso and thigh. This point is also called "seating reference point".

5 DIMENSIONING OF THE THREE-DIMENSIONAL REFERENCE SYSTEM AND FIDUCIAL MARKS

5.1 Dimensioning of the three-dimensional reference system

No.	Term	Definition	Loading condition	Code	Figure
5.1.1	Position of zero Z plane with respect to supporting surface at front of vehicle	The distance from the zero Z plane to the supporting surface of the vehicle, measured in a vertical plane passing through the centre of the front wheel.	Design load (4.3)	ISO-H136	1
5.1.2	Position of zero Z plane with respect to supporting surface at rear of vehicle	The distance from the zero Z plane to the supporting surface of the vehicle, measured in a vertical plane passing through the centre of the rear wheel.	Design load (4.3)	ISO-H137	1
5.1.3	X coordinate of rear wheel centreline	The distance from the zero X plane to the rear wheel centreline. NOTE – If the values of left and right wheel centreline coordinates are different, both dimensions are stated, separated by a dash, the first one corresponding to the left wheel.	Design load (4.3)	ISO-L127	1
5.1.4	X coordinate of front wheel centreline	The distance from the zero X plane to the front wheel centreline. NOTE – If the values of left and right wheel centreline coordinates are different, both dimensions are stated, separated by a dash, the first one corresponding to the left wheel.	Design load (4.3)	ISO-L128	1

5.2 Fiducial mark dimensions

NOTE — The following definitions apply to fiducial marks No. 1, No. 2 and No. 3. Similar definitions may be given for other fiducial marks.

5.2.1 *In the three-dimensional reference system*

No.	Term	Definition	Loading condition	Code	Figure
5.2.1.1	X coordinate of fiducial mark No. 1	The distance from the zero X plane to fiducial mark No. 1.	Design load (4.3)	**ISO-L54**	1
5.2.1.2	X coordinate of fiducial mark No. 2	The distance from the zero X plane to fiducial mark No. 2.	Design load (4.3)	**ISO-L55**	1
5.2.1.3	X coordinate of fiducial mark No. 3	The distance from the zero X plane to fiducial mark No. 3.	Design load (4.3)	**ISO-L56**	1
5.2.1.4	Y coordinate of fiducial mark No. 1	The distance from the zero Y plane to fiducial mark No. 1.	Design load (4.3)	**ISO-W21**	2
5.2.1.5	Y coordinate of fiducial mark No. 2	The distance from the zero Y plane to fiducial mark No. 2.	Design load (4.3)	**ISO-W22**	2
5.2.1.6	Y coordinate of fiducial mark No. 3	The distance from the zero Y plane to fiducial mark No. 3.	Design load (4.3)	**ISO-W23**	2
5.2.1.7	Z coordinate of fiducial mark No. 1	The distance from the zero Z plane to fiducial mark No. 1.	Design load (4.3)	**ISO-H81**	1
5.2.1.8	Z coordinate of fiducial mark No. 2	The distance from the zero Z plane to fiducial mark No. 2.	Design load (4.3)	**ISO-H82**	1
5.2.1.9	Z coordinate of fiducial mark No. 3	The distance from the zero Z plane to fiducial mark No. 3.	Design load (4.3)	**ISO-H83**	1

5.2.2 *With respect to the supporting surface*

No.	Term	Definition	Loading condition	Code	Figure
5.2.2.1	Height of fiducial mark No. 1 above supporting surface	The distance from fiducial mark No. 1 to the supporting surface for the following loading conditions :			1
			Complete vehicle kerb weight (4.1)	**ISO-H161**	
			Design load (4.3)	**ISO-H163**	
			Maximum authorized total weight (4.2)	**ISO-H165**	
5.2.2.2	Height of fiducial mark No. 2 above supporting surface	The distance from fiducial mark No. 2 to the supporting surface for the following loading conditions :			1
			Complete vehicle kerb weight (4.1)	**ISO-H162**	
			Design load (4.3)	**ISO-H164**	
			Maximum authorized total weight (4.2)	**ISO-H166**	
5.2.2.3	Height of fiducial mark No. 3 above supporting surface	The distance from fiducial mark No. 3 to the supporting surface for the following loading conditions :			1
			Complete vehicle kerb weight (4.1)	**ISO-H167**	
			Design load (4.3)	**ISO-H168**	
			Maximum authorized total weight (4.2)	**ISO-H169**	

6 EXTERNAL DIMENSIONS

No.	Term	Definition	Loading condition	Code	Figure
6.1	Vehicle height, unladen	See ISO 612	Complete vehicle kerb weight (4.1)	**ISO-H100**	3
6.2	Vehicle height	See ISO 612	Design load (4.3)	**ISO-H101**	3
6.3	Approach angle	See ISO 612	Design load (4.3)	**ISO-H106**	3
6.4	Departure angle	See ISO 612	Design load (4.3)	**ISO-H107**	3
6.5	Vehicle height, unladen, hinged lid of luggage compartment open	The distance between the supporting surface and the z-plane touching the uppermost part of the opened hinged lid of the luggage compartment.	Complete vehicle kerb weight (4.1)	**ISO-H110**	3
6.6	Vehicle height, laden	See ISO 612	Maximum authorized total weight (4.2)	**ISO-H113**	3
6.7	Bonnet height above supporting surface	The distance from the supporting surface to the point of intersection, in the zero Y plane, of the bonnet and the windscreen.	Design load (4.3)	**ISO-H114**	3
6.8	Approach angle, laden	See ISO 612	Maximum authorized total weight (4.2)	**ISO-H117**	3
6.9	Departure angle, laden	See ISO 612	Maximum authorized total weight (4.2)	**ISO-H118**	3
6.10	Ramp angle	See ISO 612	Design load (4.3)	**ISO-H119**	3
6.11	Ramp angle, laden	See ISO 612	Maximum authorized total weight (4.2)	**ISO-H147**	3
6.12	Ground clearance, laden	See ISO 612	Maximum authorized total weight (4.2)	**ISO-H157**	3
6.13	Wheel space	See ISO 612 NOTE — If the dimensions of right and left wheel spaces are different, both dimensions are stated, separated by a dash, the first one corresponding to the left wheels.	Design load (4.3)	**ISO-L101**	3
6.14	Vehicle length	See ISO 612	Design load (4.3)	**ISO-L103**	3

No.	Term	Definition	Loading condition	Code	Figure
6.15	Front overhang	See ISO 612 NOTE — If the dimensions of right and left overhangs are different, both dimensions are stated, separated by a dash, the first one corresponding to the left wheel.	Design load (4.3)	**ISO-L104**	3
6.16	Rear overhang			**ISO-L105**	
6.17	Vehicle length with hinged lid of luggage compartment open	The distance between two x-planes, one touching the foremost point of the vehicle and the other touching the rearmost part of the opened hinged lid of the rear luggage compartment.	Design load (4.3)	**ISO-L110**	3
6.18	Windscreen rake angle	The angle, measured in the zero Y plane, between the vertical and a straight line running from the lower daylight opening to the upper daylight opening or, in the case of "wrap over" glass, to a point 457 mm from the lower daylight opening, both ends of the line being on the outer surface of the glass.	Design load (4.3)	**ISO-L122**	3
6.19	Track, front	See ISO 612	Design load (4.3)	**ISO-W101**	3
6.20	Track, rear	See ISO 612	Design load (4.3)	**ISO-W102**	3
6.21	Vehicle width	See ISO 612	Design load (4.3)	**ISO-W103**	3
6.22	Body width at R-point, front	The length of the line parallel to the zero X plane and passing through the R-point, front, between the points where it intersects the body surface on each side.	Design load (4.3)	**ISO-W117**	3
6.23	Vehicle width, front side doors open	See ISO 612	Design load (4.3)	**ISO-W120**	3
6.24	Vehicle width, rear side doors open	See ISO 612	Design load (4.3)	**ISO-W121**	3
6.25	Tumble home	The angle measured in the x-plane passing through the R-point, front, between the vertical and a straight line running from the lower daylight opening to the upper daylight opening or, in the case of "wrap over" glass, to a point 457 mm from the lower daylight opening, both ends of the line being on the outer surface of the glass.	Design load (4.3)	**ISO-W122**	3
6.26	Minimum turning circle	See ISO 612 NOTE — If the turning circles to right and left are different, the greater value is stated.	Maximum authorized total weight (4.2)	**ISO-D101**	8

7 INTERNAL DIMENSIONS

7.1 R-point dimensions

7.1.1 *R-points of the front seats*

No.	Term	Definition	Loading condition	Code	Figure
7.1.1.1	Z coordinate of R-points, front	The distance from the zero Z plane to the R-points of the front seats. NOTE – The values of left and right R-point coordinates are stated, separated by a dash; the first one corresponding to the driver's seat.	–	ISO-H70	4
7.1.1.2	X coordinate of R-points, front	The distance from the zero X plane to the R-points of the front seats. NOTE – The values of left and right R-point coordinates are stated, separated by a dash; the first one corresponding to the driver's seat.	–	ISO-L31	4
7.1.1.3	Y coordinate of R-points, front	The distance from the zero Y plane to the R-points of the front seats. NOTE – The values of left and right R-point coordinates are stated, separated by a dash; the first one corresponding to the driver's seat.	–	ISO-W20	4

7.1.2 *R-points of the rear seats (2nd row of seats)*

NOTE – When a vehicle is fitted with more than two rows of seats, each code is followed by the numerals 2, 3, etc for the second, third, etc rows respectively.

No.	Term	Definition	Loading condition	Code	Figure
7.1.2.1	Z coordinate of R-points, rear	The distance from the zero Z plane to the R-points of the rear seats (2nd row of seats). NOTE – The values of left and right R-point coordinates are stated, separated by a dash, the first one corresponding to the left seat.	–	ISO-H71	4
7.1.2.2	X coordinate of R-points, rear	The distance from the zero X plane to the R-points of the rear seats (2nd row of seats). NOTE – The values of left and right R-point coordinates are stated, separated by a dash, the first one corresponding to the left seat.	–	ISO-L35	4
7.1.2.3	Y coordinate of R-points, rear	The distance from the zero Y plane to the R-points of the rear seats (2nd row of seats). NOTE – The values of left and right R-point coordinates are stated, separated by a dash, the first one corresponding to the left seat.	–	ISO-W25	4

7.2 Internal dimensions of the front compartment

NOTE – Unless otherwise specified, all dimensions measured from the R-point relate to the R-point of the driver's seat.

No.	Term	Definition	Loading condition	Code	Figure
7.2.1	Entrance height, front	The distance between the R-point, front, and the upper trimmed body opening, in the x-plane passing through the R-point, front.	–	ISO-H11	5
7.2.2	Belt height, front	The distance between the R-point, front, and the bottom of the side window daylight opening, in the x-plane passing through the R-point, front.	–	ISO-H25	5
7.2.3	Vertical distance from R-point, front, to heel point, front	The distance from the R-point, front, to the z-plane passing through the heel point, front, B[1]. NOTE – The heel point, front, B, is defined by the manufacturer.	–	ISO-H30	5
7.2.4	Thickness of head lining to roof panel, front	The distance between the internal surface of the roof and the head lining, measured normal to the roof sheet metal, at the intersection of the plane passing through the R-point, front, and forming a rearward angle of 8° with the zero X plane.	–	ISO-H37	5
7.2.5	Vertical distance from R-point, front, to steering wheel centre	The distance from the R-point, front, to the z-plane passing through the steering wheel centre, located on the upper surface of the steering wheel rim. NOTE – If the steering wheel is adjustable in angle and/or in the axial direction, the values for the extreme positions are stated, separated by a dash, the first one being the minimum value.	–	ISO-H93	5
7.2.6	Head room, front	The distance from the R-point, front, to the head lining, measured along a line in a y-plane and at a rearward angle of 8° to the zero X plane.	–	ISO-H95	5
7.2.7	Cushion depth, front	The distance from the R-point, front, to the front edge of the undeflected front seat cushion.	–	ISO-L10	6
7.2.8	Distance between service braking control and steering wheel	The distance between the projections, onto the zero Y plane, of the centre of the undepressed service braking control and the lowest point of the steering wheel rim. NOTE – If the steering wheel is adjustable, the measurement is made in the mid-position.	–	ISO-L13	6
7.2.9	Normal driving and riding seat track travel	The distance between two x-planes, one passing through the R-point, front, the other passing through the reference point of the driver's seat moved to the foremost driving and riding position. These two points are defined by the manufacturer.	–	ISO-L23	6
7.2.10	Steering wheel angle	The angle between the upper surface of the steering wheel rim and the vertical. NOTE – If the steering wheel is adjustable in angle and/or in the axial direction, the values for the extreme positions are stated, separated by a dash, the first one being the minimum value.	–	ISO-L25	6

1) See ISO 3409.

No.	Term	Definition	Loading condition	Code	Figure
7.2.11	Back angle, front	The angle between the vertical and the torso line passing through the R point, front. NOTE – The torso line is defined by the manufacturer.	–	ISO-L40	6
7.2.12	Displacement between service braking control and accelerator pedal	The distance between two planes, perpendicular to the zero Y plane, parallel to the segment AB[1], and lying respectively on the centre of the service braking control face and on the centre of the accelerator pedal face with the control and pedal in the free position. NOTE – When the service braking control is lower than the accelerator pedal, the measured dimension is shown as a minus value.	–	ISO-L52	6
7.2.13	Horizontal distance from R-point, front, to heel point, front	The distance from the R-point, front, to the x-plane passing through the heel point, front, B[1]. NOTE – The heel point, front, B is defined by the manufacturer.	–	ISO-L53	6
7.2.14	Horizontal distance from R-point, front, to accelerator pedal	The distance from the R-point, front, to the x-plane passing through the accelerator pedal point A[1].	–	ISO-L61	6
7.2.15	Horizontal distance from R-point, front, to steering wheel centre	The distance from the R-point, front, to the x-plane passing through the steering wheel centre and located on the upper surface of the steering wheel rim. NOTE – If the steering wheel is adjustable in angle and/or in the axial direction, the values of the extreme positions are stated, separated by a dash, the first one being the minimum value.	–	ISO-L63	6
7.2.16	Shoulder room, front	The minimum distance between the trimmed surfaces, measured in the x-plane passing through the R-point, front, and at not less than 254 mm above that point. NOTE – If arm-rests interfere within this zone, they are ignored.	–	ISO-W3	7
7.2.17	Hip room, front	The minimum distance between the trimmed surfaces, measured in the x-plane passing through the R-point, front, in the zone located 25 mm below and 75 mm above the R-point, front, and 75 mm forward and rearward of that point.	–	ISO-W5	7
7.2.18	Position of steering wheel centre with respect to zero Y plane	The distance from the steering wheel centre, located on the upper surface of the steering wheel rim, to the zero Y plane.	–	ISO-W7	7
7.2.19	Cushion width, front	The distance between two y-planes touching the trimmed width of the undeflected front seat cushion at the outermost point on each side.	–	ISO-W16	7

1) See ISO 3409.