

ICS 43.040.60



**NATIONAL STANDARD OF THE
PEOPLE'S REPUBLIC OF CHINA**

GB/T 47316-2026

**Road vehicles - Visibility - Method for establishment of
eyellipses for driver eye location
(English Translation)**

Issued on: March 31, 2026

Implemented on: October 1, 2026

Issued by: State Administration for Market Regulation

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Foreword

This document was drafted in accordance with the rules given in GB/T 1.1-2020, Directives for standardization - Part 1.Rules for the structure and drafting of standardizing documents.

This document adopts ISO 4513.2022 Road vehicles - Visibility - Method for establishment of eyellipses for driver's eye location by modification.

Compared with ISO 4513.2022, this document makes the following structural adjustments.

- Delete the theoretical explanation of the definition, background, and determination method of the neck pivot point P in 6.1 of ISO 4513.2022;
- 6.1 corresponds to 6.2 of ISO 4513.2022;
- 6.2 corresponds to 6.3 of ISO 4513.2022;
- Chapter 7 corresponds to Appendix E of ISO 4513.2022, where 7.2.1 corresponds to E.2 of ISO 4513.2022, 7.2.2 corresponds to E.2.1.1 of ISO 4513.2022, 7.2.3 corresponds to E.2.1.2 of ISO 4513.2022, 7.2.4 corresponds to E.2.1.3 of ISO 4513.2022, 7.2.5 corresponds to E.2.1.4 of ISO 4513.2022, and 7.2.6 corresponds to E.2.1.5 of ISO 4513.2022;
- A.6.1 corresponds to the first paragraph of A.6 of ISO 4513.2022;
- A.6.2 corresponds to A.6.1 of ISO 4513.2022;
- Delete the first and second paragraphs of A.6.2 of ISO 4513.2022;
- A.6.3 corresponds to the remaining paragraphs of A.6.2 of ISO 4513.2022;

- Delete E.1, the first paragraph of E.2, and E.3 of ISO 4513.2022;
- Delete Appendix F of ISO 4513.2022;
- Delete the references of ISO 4513.2022.

The technical differences between this document and ISO 4513.2022, and the reasons therefor, are as follows.

- Revise the description of the scope of the standard (see Chapter 1; Chapter 1 of ISO 4513.2022) to align with the requirements for drafting national standards;
- Use the normatively referenced GB/T 12673-2019 to replace ISO 6549 (see Chapter 3), add the normatively referenced GB/T 29120-2012 (see Chapter 3), Road vehicles - Visibility - Method for establishment of eyellipses for driver's eye location

1 Scope

This document describes a method for establishment of eyellipses for driver's eye location inside a vehicle.

This document applies to passenger cars (M1 category) and goods vehicles (N category); other types of vehicles shall refer to this document for implementation.

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.

GB/T 12673-2019, Motor vehicle main dimensions measurement method
GB/T 29120-2012, Procedure for H-point and R-point determination (ISO 6549.1999, ISO 20176.2006, MOD)

3 Terms and definitions

For the purposes of this document, the following terms and definitions, as well as those given in GB/T 12673-2019 and GB/T 29120-2012, apply.

3.1

H-point

In HPM, H-point is the rotation center of torso and thigh, which simulates the hinge center of the human torso and thigh; it is used to determine the actual H-point of the seat. In HPM-II, H-point is the hinge center point of the seat plate assembly and the back plate assembly, which is located on the lateral center line of HPM-II or HPD.

Note 1: In HPM, H-point is located on the center plane of HPM, at the midpoint of the line that connects the H-point marking buttons on both sides of the device.

Note 2: In HPM-II, H-point is also the intersection of the seat line and the torso line.

When HPM-II is properly placed on the vehicle, whether it is a CAD or an actual physical device, the location of the H-point relative to the vehicle is Key.

4 - SgRP line;

LX - the horizontal distance behind the accelerator heel point (AHP);

LZ - the vertical distance between H-point and the accelerator heel point (AHP).

Figure 6 - Accommodation tool reference point, ATRP (when the design H-point travel path is inclined)

3.23

design H-point travel path

The forward and backward travel path of H point when the seat height is in the middle of the vertical adjustable range.

3.24

accommodation tool reference point; ATRP

The intersection of the accommodation tool reference line for the selected proportion of the driver population and the design H-point travel path.

Note: See Figure 5 and Figure 6.

4 95th and 99th percentile tangent cut-off eyellipse for Class A vehicles, equal-proportion mixed male/female driver

population, and adjustable seats

4.1 Characteristic parameters of the reference population

The 95th and 99th percentile tangent cut-off eyellipse for equal-proportion mixed male/female driver population, and adjustable seats are constructed based on the user populations given in Table 2, according to the tables and formulas given in 4.2 and 4.3, and are applicable to the driver and front outer passenger locations for visibility design of Class A vehicles.

beta - angle in the side view;

4 - H-point travel path.

Figure 8 - Positioning parameters, side view axial angle, and centroid location of the eyellipse

4.4.3 Left-eye, right-eye, and mid-eye centroid

The distance between the left-eye centroid (Y_{cL}) and the right-eye centroid (Y_{cR}) shall be 65 mm. The mid-eye centroid (Y_{cycl}) shall be located on the center line of occupant at W20.

5 Method for determining the eyellipse of class A vehicles

The method for determining the eyellipse of a Class A vehicle is as follows.

- a) Determine the seat characteristic parameters A19, W20, H30, TL23.
- b) Determine H8, L1, and L6.
- c) The value of t is determined based on the proportion of vehicles with clutch pedals in production. If the production of vehicles with clutch pedals accounts for 50% or more of the expected production, then set $t=1$. Otherwise, set $t=0$.
- d) Construct identical left and right eyellipses based on the axis lengths given in Table 3.
- e) Determine the centroid location according to Formulas (2) ~ (5).
- f) According to Formula (1), tilt the front end of the eyellipse X-axis downward in the side view.