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

GB 146.1-2020

Replacing GB 146.1-1983

Gauge for standard gauge railways - Part 1: Rolling stock gauge

标准轨距铁路限界 第1部分：机车车辆限界

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Foreword

GB 146, Gauge for standard gauge railways, is divided into two parts. -- Part

1 Scope

Part 1 of China's mandatory railway gauge standard, defining the rolling stock gauge - the envelope inside which every locomotive, carriage and wagon on the standard gauge network must fit. Together with Part 2, which defines the structure gauge, it is the pair of outlines that guarantees a train can pass anything on the line it is cleared for. Nothing else in railway engineering is quite like it: a vehicle that infringes this envelope by a few centimetres will run for years and then strike a platform edge or a tunnel lining on the one route where the clearance was already at the minimum. The standard specifies the rolling stock gauge for standard gauge railways, the way it is applied and the conditions under which a vehicle is verified against it. It applies to the design, the manufacture, the acceptance and the operation of rolling stock on standard gauge railways. What the document actually contains is the outline itself, given as coordinates and drawings, together with the rules for using it: the difference between the static gauge measured on a stationary vehicle and the kinematic envelope that includes the movements of the body on its suspension, the lateral throw of the vehicle on a curve, and the allowances for wear, for tolerances of construction and for the settlement of the track. The distinction between rolling stock gauge and structure gauge is what makes a railway a system: neither figure means anything on its own, and the space between the two is the safety margin the whole network depends on. Issued on 11 October 2020 and in force since 1 May 2021, it replaces GB 146.1-1983.

This Part of GB 146 specifies the rolling stock gauge of 1 435 mm standard gauge railways. This Part applies to standard gauge rolling stock.

2 Normative references

The following documents are indispensable for the application of this document. For dated references, only the dated version applies to this document. For undated references, the latest edition (including all amendments) applies to this document.

GB 146.2-2020, Gauge for standard gauge railways - Part

3 Terms and definitions

The following terms and definitions are applicable to this document.

3.1 Rolling stock gauge The limit cross-sectional contour that is perpendicular to the center line of the track and restricts the outer dimensions of the rolling stock.

4 General

4.1 The center line of the rolling stock gauge is the vertical line that passes through the center of the straight line. The horizontal dimension of the rolling stock is calculated from its centerline and expressed in half-width of the gauge. The vertical dimension is calculated from the rail surface.

4.3 The rolling stock, whether it is empty or loaded, whether it is a new vehicle with the largest standard tolerance, or an old vehicle with the largest standard tolerance and wear limit, is parked on a horizontal straight line, without lateral tilt and offset; the part that needs to be protruded only when parking shall be retracted;

4.4 When the rolling stock is designed and manufactured, neither the basic size nor the tolerance size shall exceed the limit cross-sectional contour line that is specified by the gauge.

5 Vertical contour dimensions of rolling stock

5.1 The maximum dimension in the vertical plane of the upper part of a newly- built (not used after production) rolling stock under light condition can be designed and manufactured according to the maximum dimension of the vehicle gauge-1A.

5.4 For shunting engines that pass automated and mechanized hump vehicle reducers, the designed and manufactured vertical dimension of the lower part, after taking into account the spring static deflection and maximum wear under heavy condition, shall not be less than the vertical dimension that is specified by the vehicle gauge-3 of the lower gauge of the shunting engine when the vehicle reducer is in the relief position.

5.5 When the designed and manufactured vertical dimensions of the lower part of the new car are determined according to 5.2 ~ 5.4, the spring dynamic deflection under dynamic

load does not need to be included.

6 Maximum allowable width of rolling stock

6.1 When determining the maximum allowable width of the rolling stock, the lateral offset (limit value) that is caused by the maximum wear of the traveling part when it enters the curve is not considered.

6.2 For rolling stocks that run on the railway track of standard gauge that meets GB 146.2-2020, the body length of the basic car is 26 m; the bogie center distance is 18 m; the maximum allowable width is 3 400 mm.

6.3 For rolling stocks that run on railway track that does not meet the standard gauge of GB 146.2-2020, the body length of the basic car is

13.22 m; the bogie center distance is

9.35 m; the maximum allowable width is 3 400 mm.

7 Railway rolling stock gauge diagram

7.1 Diagram of the upper gauge of rolling stock The upper gauge of rolling stock is the vehicle gauge-1A, as shown in Figure 1.

7.2 Diagram of the lower gauge of rolling stock

7.2.1 The lower gauge of rolling stock that enters the structure gauge-1 and structure gauge-3 of GB 146.2-2020 is the vehicle gauge-1B, as shown in Figure

2. For the rolling stock whose running speed is less than or equal to 160 km/h, in Figure 2, a is 70 mm and b is 90 mm; for the rolling stock whose running speed is greater than 160 km/h, in Figure 2, a is 80 mm and b is 110 mm.