

ICS 21.100.20

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

GB/T 25763-2024

Replacing GB/T 25763-2010

**Rolling bearings - Needle roller bearings for automotive
transmissions**

滚动轴承 汽车变速箱用滚针轴承

Issued on: September 29, 2024

Implemented on: January 1, 2025

**Issued by: State Administration for Market Regulation;
Standardization Administration of the PRC**

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1 Scope

GB/T 25763-2024 is the Chinese standard for the needle roller bearings used in automotive transmissions, the companion to GB/T 25764 on the roller bearings. Needle bearings are chosen in a gearbox for one reason, radial space: a needle bearing carries a heavy radial load in a section a ball bearing could not fit into, which is what allows a modern transmission to package the number of ratios it does. The trade-off is sensitivity, to misalignment, to the surface finish and hardness of the shaft and housing that often serve as the raceways, and to lubrication. The standard sets the types and boundary dimensions of the needle roller bearings used in transmissions, with and without inner rings, the drawn cup types and the cage and full complement variants, the tolerances on dimensions and running accuracy, the internal clearance, the requirements on the materials and the heat treatment, the requirements on the shaft and housing raceways where these are used directly, the load ratings, and the test methods, inspection rules, marking and packaging. The 2024 edition replaces GB/T 25763-2010.

This document specifies the identification code, structure type, overall dimensions, technical requirements, detection methods, inspection rules, markings and anti-rust packaging of needle roller bearings for automotive transmissions. This document applies to the manufacture of needle roller bearings for automotive transmissions (hereinafter referred to as "bearings").

2 Normative references

The contents of the following documents constitute essential clauses of this document through normative references in the text. Among them, for dated references, only the version corresponding to that date applies to this document; for undated references, the latest version (including all amendments) applies to this document.

GB/T 272-2017 Rolling bearings - Identification code

GB/T 307.1-2017 Rolling bearings - Radial bearings - Geometrical product specifications (GPS) and tolerance values

GB/T 307.2-2005 Rolling bearings - Measuring and gauging principles and methods

GB/T 307.3-2017 Rolling bearings - General technical regulations

GB/T 2828.1-2012 Sampling procedures for inspection by attributes - Part 1: Sampling schemes indexed by acceptance quality limit (AQL) for lot-by-lot inspection

GB/T 4199-2003 Rolling bearings - Tolerances - Definitions

GB/T 4604.1-2012 Rolling bearings - Internal clearance - Part 1: Radial internal clearance for radial bearings

GB/T 4605-2003 Rolling bearings - Thrust needle roller and cage assemblies, thrust washers

GB/T 6930-2024 Rolling bearings - Vocabulary

GB/T 7811-2015 Rolling bearings - Symbols for physical quantities

GB/T 8597-2013 Rolling bearings - Rust proof packaging

GB/T 20056-2015 Rolling bearings - Radial needle roller and cage assemblies - Boundary dimensions and tolerances

GB/T 24605-2009 Rolling bearings - Marking for products

3 Terms and definitions

The terms and definitions defined in GB/T 4199-2003 and GB/T 6930-2024 apply to this document.

4 Symbols

The symbols given in GB/T 4199-2003 and GB/T 7811-2015, as well as the following symbols, apply to this document. B1: Distance from the inner side of the rib to the small end face di: Inner ring raceway diameter T: Height of thrust needle roller bearing assembly

5 Classification of needle roller bearings for transmission

5.1 Classification by use conditions:

- a) Radial needle roller bearings for shaft end support - When subjected to radial load, the bearing rotates relative to the shaft or hole;
- b) Radial needle roller bearings for idler gears and planetary gears - When subjected to radial load, the bearing rotates relative to the shaft or hole;
- c) Radial needle roller bearings for gears - When subjected to radial load, the bearing does not rotate relative to the shaft or hole;
- d) Thrust needle roller bearings for gear end faces and other end faces - Subjected to axial loads.

5.2 Classification by structural type is as follows:

- a) Solid ring needle roller bearing;
- b) Drawn outer ring needle roller bearing;
- c) Radial needle roller and cage assembly;
- d) Radial needle roller and cage assembly and inner ring;

e) Thrust needle roller and cage assembly, thrust needle roller bearing assembly and thrust washer.

8 Dimensions

The dimensions of the bearings shall comply with the product drawings.

9.1.1 Bearing rings and needle rollers

9.1.1.1 Solid rings and needle rollers should be made of high carbon chromium bearing steel in accordance with GB/T 18254-2016; their heat treatment quality shall comply with GB/T 34891-2017; the surface of needle rollers and rings may also be treated by other processes such as nitriding and carbonitriding; their heat treatment quality shall comply with JB/T 7363-2023 or product drawings.

9.1.1.2 The solid ring can also be made of low carbon alloy steel such as 15CrMo, 20CrMo, etc. in accordance with GB/T 3077-2015. After carburizing heat treatment, its heat treatment quality shall comply with the provisions of JB/T 8881-2020.

9.1.1.3 The drawn outer ring is generally made of low carbon steel plate (or steel strip) in accordance with GB/T 13237-2013; it can also be made of low carbon alloy steel plate (or steel strip) such as 15CrMo, 20CrMo, etc. in accordance with GB/T 3077-2015. After carburizing and carbonitriding heat treatment, its heat treatment quality shall comply with the provisions of JB/T 7363-2023.

9.1.1.4 The thrust washer is made of 65Mn, T7A, T8A and other steel strips in accordance with YB/T 5058-2005 or other materials with equivalent performance. The surface hardness of the raceway after heat treatment is 670 HV10 ~ 810 HV10.

9.1.2 Cage The cage can be made of engineering plastics or metal. When the cage is made of engineering plastics, its material shall comply with the provisions of JB/T 7048-2011; when the cage is made of low carbon steel, its material shall comply with the provisions of GB/T 28268-2012; its heat treatment quality shall comply with the provisions of JB/T 7363-2023.

9.1.3 Sealing ring The sealing ring is made of nitrile rubber in accordance with JB/T 6639-2015; it can also be made of other materials with equivalent or better performance. shall comply with the provisions of GB/T 307.2-2005; the rest shall comply with the provisions of JB/T 8878-2011.

10.1.3 The measurement method of the tolerance of the radial needle roller and cage assembly shall comply with the provisions of GB/T 20056-2015.

10.1.4 The measurement method of the tolerance of the thrust needle roller bearing assembly shall comply with the provisions of GB/T 4605-2003.