

ICS 43.060.01

QC

**AUTOMOTIVE INDUSTRY STANDARD OF THE
PEOPLE'S REPUBLIC OF CHINA**

QC/T 346-2023

**Plastic Plug
(English Translation)**

Issued on: May 9, 2025

Implemented on: November 1, 2025

**Issued by: Ministry of Industry and Information Technology of the
People's Republic of China**

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1 Scope

This document specifies the classification and structural types, technical requirements, test methods, inspection rules, marking, packaging, transportation and storage of camshafts of automotive engine.

This document is applicable to integral camshafts and mechanically interference-fit assembled camshafts (hereinafter referred to as the "camshafts") for automotive engines.

2 Normative References

The contents of the following documents constitute indispensable clauses of this document through normative references in the text. In terms of references with a specified date, only versions with a specified date are applicable to this document. In terms of references without a specified date, the latest version (including all the modifications) is applicable to this document.

GB/T 223.58 Methods for chemical analysis of iron, steel and alloy - The sodium arsenite-sodium nitrite titrimetric method for the determination of manganese content

GB/T 223.60 Iron, steel and alloy - Determination of silicon content - Gravimetric method

GB/T 223.61 Methods for chemical analysis of iron, steel and alloy - The ammonium phosphomolybdate volumetric method for the determination of phosphorus content

GB/T 223.83 Steel and iron - Determination of high sulfur content - Infrared absorption method after combustion in an induction furnace

GB/T 223.85 Steel and iron - Determination of sulfur content - Infrared absorption method after combustion in an induction furnace

GB/T 223.86 Steel and iron - Determination of total carbon content - Infrared absorption method after combustion in an induction furnace

GB/T 224 Determination of the depth of decarburization of steels

GB/T 226 Test method for macrostructure and defect of steel by etching

GB/T 228.1 Metallic materials - Tensile testing - Part 1.Method of test at room temperature

GB/T 230.1 Metallic materials - Rockwell hardness test - Part 1.Test method

GB/T 231.1 Metallic materials - Brinell hardness test - Part 1.Test method

GB/T 699 Quality carbon structure steels

GB/T 10128 Metallic materials - Torsion test at ambient temperature

GB/T 10561 Determination of content of nonmetallic inclusions in steel - Micrographic method using standard diagrams

GB/T 12443 Metallic materials - Torque-controlled fatigue testing

GB/T 13320 Metallographic grading atlas and assessing method for steel die forgings

GB/T 18254 High-carbon chromium bearing steel

GB/T 19055 Reliability test methods for motor vehicle engines

GB/T 19076 Specifications for sintered metal materials

GB/T 31315 Cold drawn or cold rolled precision weld steel tubes for mechanical structures

GB/T 34891 Rolling bearings - Parts made from high-carbon chromium bearing steels - Specifications for heat treatment

JB/T 6729 Internal combustion engines - Magnetic particle inspection for crankshafts and camshafts

JB/T 9204 Metallographic examination of induction hardened steel parts

JB/T 9205 Metallographic examination of pearlitic graphite cast iron parts induction hardened

ISO 683-17 Heat-treatable steels, alloy steels and free-cutting steels - Part 17.Ball and roller bearing steels

3 Terms and Definitions

The following terms and definitions are applicable to this document.

3.1 Integral Camshaft

A camshaft made entirely of the same material, with the cam and shaft formed as a single unit.

NOTE: Integral camshafts include alloy cast iron camshafts, ductile iron camshafts, steel camshafts, etc.

3.2 Assembled Camshaft

A camshaft in which various sub-components, such as cams, etc., are mechanically interference-fitted onto an assembled camshaft steel tube.

NOTE: The sub-components of assembled camshafts generally include steel tubes, end pieces, valve cams, fuel pump cams, brake cams, vacuum pump drive components, target wheels, cup-shaped plugs, steel balls, etc.

3.3 Assembled Camshaft Steel Tube

The carrier used to connect other sub-components of the assembled camshaft.

3.4 Assembled Camshaft End Piece

The sub-component used to connect timing gears, sprockets, etc.

3.5 Assembled Camshaft Cam Lobe

The sub-component used to drive valves, etc.

3.6 Vacuum Pump Drive Components

The sub-component used to drive the vacuum pump.

3.7 Target Wheel

The sub-component used to provide the camshaft position signal.

3.8 Eccentric Wheel

The sub-component that is a circular body eccentric to the camshaft axis, used to drive the fuel pump.

4.1 Classification

Camshafts are classified according to manufacturing process into. integral camshafts and assembled camshafts.

4.2 Structural Types

Figures 1 and 2 show structural diagrams of the integral camshaft and assembled camshaft, respectively.

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