

ICS 43.040

QC

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

QC/T 326-2025

**Numbering rules for automotive standardized parts
(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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Foreword

This Document was drafted as per the rules specified in GB/T 1.1-2020 Directives for Standardization - Part 1.Rules for the Structure and Drafting of Standardizing Documents.

This Document replaced QC/T 502-1999 Metallographic Test for Induction Quenching Parts of Automobile. Compared with QC/T 502-1999, the major technical changes of this Document

are as follows besides the structural adjustments and the editorial modifications.

- a) Add the preparation method of specimen (see 4.1 of this Edition);
- b) Add sampling locations (see 4.2 of this Edition);
- c) Add a hardness test method for measuring the depth of hardened layer (see 5.2 of this Edition);
- d) Change the metallographic photographs for measuring the depth of the hardened layer using metallographic methods (see Figure 4 of this Edition; Figures 11 and 12 of the

1999 Edition).

Please note some contents of this Document may involve patents. The issuing agency of this

Document shall not assume the responsibility to identify these patents.

This Document was proposed by and under the jurisdiction of National Technical Committee

of Auto Standardization (SAC/TC 114).

Drafting organizations of this Document. Dongfeng Commercial Vehicle Co., Ltd.; FAW Jiefang Automotive Co., Ltd.; Luoyang Shining Induction Heating Co., Ltd.; SAIC Motor Corporation Limited; Dongfeng Peugeot Citroen Automobile Company Ltd.; Pan Asia Technical Automotive Center Co., Ltd.

Chief drafting staffs of this Document. Zhao Junping, Niu Enlai, Yan Jing, Wang Weixin, Guo Wenfang, Chu Hongmei, Sun Chao, Huang Zhi, Zhang Yifan, Liu Haitang, Xiong Biyun, and Shi Tianyin.

The historical editions replaced by this Document are as follows.

--- QC/T 502-1999 was first-time published in 1999;

--- It is first-time revised hereby.

Metallographic Examination for Steel Automobile Parts by
Induction Hardened

1 Scope

This Document specifies the specimen preparation, measurement of hardened layer depth, and

inspection and evaluation of metallographic structure for induction hardening of steel automotive parts.

This Document applies to the metallographic inspection of parts made of medium-carbon structural steel and medium-carbon alloy structural steel after induction hardening and low-temperature tempering.

2 Normative References

The provisions in following documents become the essential provisions of this Document through reference in this Document. For the dated documents, only the versions with the dates

indicated are applicable to this Document; for the undated documents, only the latest version

(including all the amendments) is applicable to this Document.

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

GB/T 4340.1 Metallic materials - Vickers hardness test - Part 1. Test method

GB/T 9450 Steels - Determination and verification of the depth of carburized and hardened cases

GB/T 13298 Inspection methods of microstructure for metals

3 Terms and Definitions

For the purposes of this Document, the following terms and definitions apply.

3.1 Effective hardened depth

For induction hardened parts, the vertical distance from the surface of the hardened layer of the

part to the specified limit hardness value, whether in the hardened state or in the low-temperature tempered state after hardening.

4.1 Sampling

Test specimens are generally taken directly from the part. However, provided it does not affect

the results, samples can also be taken from a test piece with the same shape, size, material, and

heat treatment conditions as the part being inspected.

4.2.1 For parts with simple shapes, samples are taken from the center of the hardening zone, as

shown in Figure 1. Any special requirements shall be noted in the product document.

4.2.2 For shaft-type parts with continuous hardened zones and variable cross-sections, samples

can be taken near the point of cross-section change, as shown in Figure 2. Any special requirements shall be noted in the product document.

4.3 Requirements for specimen preparation

During specimen preparation, the test surface (section) of the specimen shall be perpendicular

to the surface of the hardened layer of the part; the edges of the specimen shall not be rounded;

any impact on the hardness or microstructure of the specimen (such as deformation, overheating,

etc.) shall be avoided to prevent changes in hardness and microstructure.

5.1 General

Methods for measuring hardened layer depth include hardness measurement and metallographic measurement. In case of dispute, the Vickers hardness test shall be used as the

arbitration method for hardness measurement.

5.2.1 General requirements

Vickers hardness is recommended, and hardness measurement shall be performed according to

GB/T 4340.1. The load can be 4.9 N~49 N, and 9.8 N is recommended. When the minimum required hardened layer depth is greater than 2.0 mm, Rockwell hardness (HRC) can be used,

and measurement shall be performed according to GB/T 230.1.

5.2.2 Limit hardness

The limit hardness for determining the effective hardened depth is 400 HV or 41 HRC.

Where the technical documents specify otherwise, the limit hardness specified in those documents shall apply. Recommended limit hardnesses are shown in Table 1.

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