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Performance requirements and bench test methods for automobile steering knuckle assembly (English Translation)

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Foreword

This standard was drafted in accordance with the rules given in GB/T 1.1-2009.

1 Scope

This standard specifies the performance requirements and bench test methods for automotive steering knuckle assemblies.

This standard applies to all types of automotive steering knuckle assemblies.

2 Normative references

The following documents are indispensable for the application of this document. For dated references, only the dated version applies to this article.

Pieces. For undated references, the latest edition (including all amendments) applies to this document.

GB/T 1.1-2009 Standardization work guide Part 1. Standard structure and preparation

(ISO/IEC Directives-Part 2:2004, NEQ) GB/T 5179 automobile steering terminology and its definition GB/T 2828.1-2012. Sampling and sampling procedures - Part 1 . Batch-to-batch sampling plan searched by AQL GB/T 10125 artificial atmosphere corrosion test salt spray test General technical conditions for GB/T 13384 mechanical and electrical product packaging JB/T 4730-2005 Non-destructive testing of pressure equipment QC/T 238 Storage and storage of auto parts QC/T 413 Basic technical conditions for automotive electrical equipment QC/T 484-1999 Automotive paint coating

3 Terms and definitions

The terms and definitions defined in GB/T 5179 and below apply to this standard.

Steering knuckle basic parameter essential parameter According to the product drawing requirements, mainly including the materials, processing and inspection requirements of the steering knuckle.

Vertical force (FZ) vertical force the force exerted on the steering knuckle by the wheel grounding point from the height of the vehicle, pointing to the center of the wheel in the positive direction (FZ), and vice versa Negative direction (FZ-).

Longitudinal force (FX) longitudinal force the force exerted on the steering knuckle by the wheel grounding point from the length of the vehicle, pointing to the forward direction of the vehicle (FX), and vice versa Negative direction (FX-).

Lateral force (FY) lateral force T/CSAE XX-2016 the force exerted on the steering knuckle by the wheel grounding point from the width direction of the vehicle, pointing to the direction of the center axis of the vehicle is the positive direction (FY), and vice versa.

It is the negative direction (FY-).

4.1.1 Steering knuckle

The steering knuckle shall comply with the drawings and technical documentation requirements approved in accordance with the prescribed procedures. The sample should be clean and free of rust, burrs, cracks and its surface and internal defects.

4.1.2 Product Classification

4.1.2.1

Products are divided into cast knuckles and forged knuckles according to the type of production.

4.1.2.2

The products are divided into commercial vehicle steering knuckles and passenger car steering knuckles by model.

4.2.1 Positive impact

According to the requirements of 5.2.1, the impact test shall be carried out, and the sample shall reach the specified impact energy without cracking,, damage, and the ball pin shall be disengaged.

Impacts such as knuckles affect the performance of the steering knuckle, or 100% flaw detection without cracks.

4.2.2 Energy absorption shock

According to the requirements of 5.2.2, the impact test shall be carried out, and the sample shall not break, crack, break or break the ball.

Impacts such as knuckles affect the performance of the steering knuckle, or 100% flaw detection without cracks. Calculated from the bending part of the shock absorber, the bending angle should be greater than 5°.

4.2.3 Main pin hole impact

According to the requirements of 5.2.3, the impact test shall be carried out, and the sample shall not break, crack, break, and the ball pin shall be disengaged.

Impacts such as knuckles affect the performance of the steering knuckle, or 100% flaw detection without cracks.

4.2.4 Knuckle arm impact

According to the requirements of 5.2.4, the impact test shall be carried out, and the sample shall not break, crack, break or break the ball.

Impacts such as knuckles affect the performance of the steering knuckle, or 100% flaw detection without cracks.

4.3.1 Corrosion resistance

After the corrosion resistance test according to the requirements of 5.3.1, the rust spread under one side of the sample cutting line paint film shall not exceed 2 mm.

4.4.1 Assembly durability

After the assembly durability test according to the requirements of 5.4.1, the sample shall not be damaged, cracked or damaged, which may affect the performance of the steering knuckle.

Injury, or 100% flaw detection without cracks.

4.4.2 Knuckle arm durability

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After the knuckle arm durability test is carried out according to the requirements of 5.4.2, the ball joint at the ball joint pin joint is not loose, and the sample shall not be broken after the test.

Cracks, breakage, etc. affect the knuckle performance damage, or 100% flaw detection without cracks.

5.1.1 Temperature deviation

This standard specifies that the temperature deviation in the test method is ± 2 °C, unless otherwise specified.

5.1.2 Installation and connection of steering knuckle

The installation of the steering knuckle on the test bench must be rigidly and reliably connected. The strength of the test fixture must be greater than the strength of the test specimen. The bolt must Tighten according to the specified values of the drawings. If there is no regulation, follow the requirements in Table 1.

Table 1 Torque table for threaded joints

Thread type	pitch/mm	Standard torque value/Nm	Torque allowable range/Nm
M10	1.25	60	
52-68 M12	1.25	110	100~120
M14	1.5	180	160~200

5.1.3.1 Automobile steering knuckle assembly impact performance test device

- a) The test equipment is a device that can apply an impact load to the knuckle at the impact position. The diameter of the impact surface of the punch is not less than $\Phi 40$ mm;
- b) Instruments and instruments that instruct and record the parameters of the test, the accuracy is not less than 2.5;
- c) The test fixture and threaded joints are made of 40Cr or SCM435 with a hardness of HRC 39 to 43 and a thread mechanical performance rating of 12.9.

5.1.3.2 Automobile steering knuckle assembly durability test device

- a) The power output device of the test equipment shall meet the test requirements;
- b) The test rig shall have a device that applies a symmetrical cyclic load of a sinusoidal waveform with an error of no more than 5% applied;
- c) Instruments and instruments that instruct and record the parameters of the test, the accuracy is not less than 2.5;