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**QC**

AUTOMOBILE INDUSTRY STANDARD  
OF THE PEOPLE'S REPUBLIC OF CHINA

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**QC/T 717-2015**

Replacing QC/T 717-2004

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**Road vehicles - Wheels - Requirements and  
measuring methods of radial and lateral run-out**

汽车车轮跳动要求和检测方法

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**Annex:**

**Numbers, standard names and initial implementation dates of 17 automotive industry standards**

S/N	Standard number	Standard name	Standard number being substituted	Initial implementation date (YYYY-MM-DD)
287	QC/T 991-2015	Passenger cars - Light alloy wheels - 90° impact test procedure		2015-10-01
288	QC/T 717-2015	Road vehicle – Wheels - Requirements and Measuring methods of radial and lateral run-out	QC/T 717-2004 ISO 16833:2006, MOD	2015-10-01
289	QC/T 52-2015	Refuse collection vehicle	QC/T 52-2000	2015-10-01
290	QC/T 652-2015	Suction-type sewer scavenger	QC/T 652-2000	2015-10-01
291	QC/T 992-2015	Municipal emergency service vehicle		2015-10-01
292	QC/T 993-2015	Explosive transport vehicle		2015-10-01
293	QC/T 994-2015	Demountable tanker carrier		2015-10-01
294	QC/T 995-2015	Hydrostatic drive modular transporter		2015-10-01
295	QC/T 764-2015	Road vehicles - Hydraulic braking system - Simple flare pipes, tube tapped holes male fittings and hose end fittings	QC/T 764-2006	2015-10-01
296	QC/T 239-2015	Specifications and bench test methods for commercial vehicle service brake	QC/T 239-1997 QC/T 479-1999	2015-10-01
297	QC/T 996-2015	Specifications and bench test methods of automobile air dryer		2015-10-01
298	QC/T 997-2015	Passenger car full load overall frame body structure requirements		2015-10-01
299	QC/T 998-2015	The Technical Specification of		2015-10-01

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## Foreword

This standard was drafted in accordance with the rules given in GB/T 1.1-2009 “Directives for standardization - Part 1: Structure and drafting of standards”.

This standard replaces QC/T 717-2004 “Run out requirements and measuring methods of automotive wheels”.

As compared with QC/T 717-2004, in addition to editorial changes, the main technical differences of this standard are as follows:

- CHANGE the standard name into “Road vehicles - Wheels - Requirements and measuring methods of radial and lateral run-out”;
- MODIFY the requirements for the peak-to-peak value of the runout of vehicle’s wheel (see clause 3 of the 2004 version; clause 6 of this version);
- ADD definitions of terms such as radial runout, lateral runout, uniformity, first harmonic, and so on (see clause 3 of this version);
- ADD the principles of measurement (see clause 4 of this version);
- ADD the calculation method for runout (see clause 5 of this version);
- MODIFY the system’s error requirements of the measuring equipment in the testing method (see clause 4 of the 2004 version; Appendix A of this version);
- MODIFY the datum of measurement in the testing method (see clause 4 of the 2004 version; Appendix A of this version);
- DELETE the measurement method for the 15°DC wheels in the testing method (see clause 4 of the 2004 version; Appendix A of this version);
- MODIFY the Figure A.1, Figure A.2, Figure A.3, Figure A.4 of the testing method; CHANGE the datum of measurement to the wheel’s mounting surface (see clause 4 of the 2004 version; Appendix A of this version);
- DELETE the requirement for first harmonics in Appendix A (see Appendix A of the 2004 version).

This standard uses the redrafting method to modify and adopt ISO 16833:2006 “Road vehicles - Wheels - Requirements and measuring methods of radial and lateral run-out”.

The technical differences between this standard and ISO 16833:2006 are as follows:

# Road vehicles - Wheels - Requirements and measuring methods of radial and lateral run-out

## 1 Scope

This standard defines parameters that characterize the geometric uniformity of the wheel and describes the principles of measurement of these parameters.

This standard specifies the requirements for the peak-to-peak value of the radial runout, the peak-to-peak value of the lateral runout, the first harmonic of the average of radial runout, the first harmonic of the average of lateral runout of the vehicle wheel.

This standard applies to road vehicle's wheels of 5°DC, 5°SDC, 5°FB, 15°DC.

## 2 Normative references

The following documents are essential to the application of 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) are applicable to this standard.

GB/T 2933 Wheels and rims for pneumatic tires - Vocabulary, designation and marking (GB/T 2933-2009, ISO 3911:2004, IDT)

GB/T 3487 Rim contours for motor vehicles (GB/T 3487-2005, ISO 4000-2:2001, ISO 4209-2:2001, MOD)

GB/T 18506 Uniformity test method for motor vehicle tires (GB/T 18506-2001, ISO 13326:1998, MOD)

## 3 Terms and definitions

### 3.1

#### Radial run-out (RRO)

Over one revolution of the wheel, the amount of change of the distance X of the rim bead' seat as relative to the rotation axis of the wheel, in millimeters (mm), as shown in Figure 1(a).

rim flange as relative to a fixed reference plane perpendicular to the wheel's rotation axis

### Figure 1 -- Radial runout and lateral runout

#### 3.5

##### First harmonic

The peak-to-peak value of the fundamental wave of Fourier series.

Note: The frequency of the first harmonic is equal to the frequency of rotation.

#### 3.6

##### Second (and higher order) harmonic

The peak-to-peak value of the second (or higher order) waveform of the Fourier series.

## 4 Principles of measurement

### 4.1 Datum

#### 4.1.1 Rotation of axis of center-hole-piloted wheel

For the center-hole-piloted wheel, the rotation axis is the center hole's axis, which is determined by the axis of the largest inscribed circle and the plane of the wheel.

#### 4.1.2 Wheel mounting plane

The wheel mounting plane is the plane P (see Figure 2) that supports the hub's surface on the wheel plane (the bearing surface of the wheel on the vehicle hub).

#### 4.1.3 Rotation axis of nut-seat-piloted wheel

For the nut-seat-piloted wheel, the rotation axis is the pitch circle's axis, which is determined by the embedded nut seat (see Figure 2).

### 4.2 Determination of measured values

For each rim bead's seat, during (one) revolution of the wheel, use a ball which has a radius of R to be against the rim flange and in constant contact with the bead's seat. Through measuring these contact points, determine the measured values. Unless otherwise stated on the drawing, the radius R of the ball shall be  $8 \pm 0.2$  mm.

## Appendix A

### (Informative)

#### Testing methods of radial and lateral runout of wheel

##### A.1 Testing equipment

The testing equipment shall have a rotating part equivalent to the positioning of actual installation of the wheel and a measuring device which facilitate the runout testing. Equipment's accuracy meets the following requirements:

- a) The system error of the rotating joint component shall meet the requirements: the radial and lateral runout is less than 0.05 mm.
- b) The measuring device is a dial indicator or sensor which has an accuracy of less than 0.02 mm.

##### A.2 Datum of measurement

**A.2.1** Center-hole-piloted wheel: The datum of measurement is the wheel's mounting plane and the center hole.

**A.2.2** Bolt-hole-piloted wheel: The datum of measurement is the wheel's mounting plane and the nut seat.

##### A.3 Location of measurement

Principles for selecting the location of measurement: Measure the radial runout on a straight-line segment at the width of the bead's seat. Measure the lateral runout on a straight-line segment at the height of the rim flange. If there is no straight-line segment, follow the requirements below to select the measuring points:

- a) For the 5°DC wheel, at about 10 mm from the bead's seat, measure the radial runout; at about 7 mm from the rim flange, measure the lateral runout, as shown in Figure A.1.
- b) For the 5°SDC wheel, at about 10 mm from the bead's seat, measure the radial runout; at about 10 mm from the rim flange, measure the lateral runout, as shown in Figure A.2.
- c) For the 5°FB-I wheel, at about 12 mm from the bead's seat, measure the radial runout; at about 10 mm from the rim flange, measure the lateral runout, as shown in Figure A.3.
- d) For the 5°FB-II wheel, at about 12 mm from the bead's seat, measure the

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Contact: Wayne Zheng, [Sales@ChineseStandard.net](mailto:Sales@ChineseStandard.net)

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