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**Automobile Industry Standard
of the People's Republic of China**

QC/T 818-2009

Spoke-wheels of motorcycles and mopeds

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

Announcement

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Ministry of Industry and Information Technology has approved 139 industrial standards (such as "Snow blower vehicle", etc.), including 29 standards for automobile industry, 29 for pharmaceutical equipment industry, 4 for packaging industry, and 77 for textile industry (standard No., name, main contents, and implementation date are shown in Appendix 1). The Ministry of Industry and Information Technology has approved and published the modification sheet for the textile industry standard — FZ/T 73001-2008 "Hosiery" (refer to Appendix 2). The modification sheet shall come into force since issuing date. Automobile industry standards will come into force since April 1, 2010.

The above standards in the areas of automobile, pharmaceutical equipment, and packaging industries are published by China Planning Press. Textile industry standards are published by China Standardization Press.

Appendix: Numbers and Names of 29 Automobile Industry Standards

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

November 17, 2009

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Foreword

This Standard was proposed by National Technical Committee of Auto Standardization.

This Standard shall be under the jurisdiction of National Technical Committee of Auto Standardization.

Responsible drafting organizations of this Standard: Nanchang Motorcycle Quality Supervision Inspection Institute, Jiangsu Yuantong Auto Components Co., Ltd., and Asimco-ST (Sichuan) Components Co., Ltd.

Participating drafting organizations of this Standard: Yongkang Junjian Industrial Co., Ltd., and Shanghai Baiqiang Auto & Motorcycle Components Co., Ltd.

Main drafters of this Standard: Chen Jianfa, Ma Zhenxin, Liu Chengtong, Xu Kangjun, and Wang Youfang.

Spoke-wheels of motorcycles and mopeds

1 Scope

This Standard specifies the terms and definition, requirements, test methods, inspection rules, label, package, transportation, and storage of spoke-wheels of motorcycles and mopeds.

This Standard is applicable to the spoke-wheels of motorcycles and mopeds (hereinafter referred as wheel).

2 Normative references

The provisions in following documents become the provisions of this Standard through reference in this Standard. For dated references, the subsequent amendments (excluding corrections) or revisions do not apply to this Standard, however, parties who reach an agreement based on this Standard are encouraged to study if the latest versions of these documents are applicable. For undated references, the latest edition of the referenced document applies.

GB/T 228 Metallic materials — Tensile testing at ambient temperature (GB/T 228-2002, ISO 6892:1998(E), EQV)

GB/T 1173 Casting aluminium alloys (GB/T 1173-1995, ASTM B26:1992, NEQ)

GB/T 2828.1 Sampling procedures for inspection by attributes — Part 1: Sampling schemes indexed by acceptance quality limit (AQL) for lot-by-lot inspection (GB/T 2828.1-2003, ISO 2859-1:1999, IDT)

GB/T 2933 Wheels/rims for pneumatic tyres — Nomenclature, designation and marking (GB/T 2933-1995, ISO/DIS 3911: 1993, EQV)

GB/T 20975.1~GB/T 20975.24 Methods for chemical analysis of aluminium and aluminium alloys

GB/T 7999 Optical emission spectrometric analysis method of aluminum and aluminum alloys

GB/T 9438 Aluminium alloy castings (GB/T 9438-1999, ASTM B26/B26M:1992, NEQ)

GB/T 13202 Series of motorcycle rims (GB/T 13202-2007, ISO 4249-3:2004, ISO 5995-2:1988, ISO 6054-2:1990, MOD)

GB/T 13822 Test specimens for non ferrous diecasting alloys

GB/T 15115 Die casting aluminum alloys

GB/T 22435-2008 Light-alloy wheels for motorcycles and mopeds

QC/T 725 Test method for calibrated diameter of motorcycles and mopeds rims using sphere-string ruler

QC/T 726 Test method for calibrated diameter of motorcycles and mopeds rims using even strap ruler

HG/T 2443 Test method of static loaded performance for tyres

3 Terms and definitions

The terms and definitions defined in GB/T 2933 AND the following terms and definitions apply to this Standard.

3.1

Wheel hub

Part which is located between bearing and spoke of wheel. It usually has brake drum or can be installed with brake plate and transmission mechanism.

3.2

Spoke

A kind of steel wire used to connect hub and rim.

3.3

Spoke nut

Nut used to fix spoke on rim.

3.4

Wire spoke-wheel

Rotating part located between tire and bearing, which is composed of rim, spoke, spoke nut, and hub.

Figure 1 Measurement Position of Deformation of Back Wheel after Radial Impact

4.7.2 Radial load fatigue performance: After test for more than 5×10^5 rotation in accordance with 5.7.2, wheel shall be free of damage crack, breakage, and the abnormal loosen of joint part. The radial and axial circle run-out of wheel after test shall not be greater than 2.0mm.

4.7.3 Torsion fatigue performance: After test with more than 1×10^5 rotation in accordance with 5.7.3, wheel shall be free of damage crack, breakage, and the abnormal loosen of joint part. The radial and axial circle run-out of wheel after test shall not be greater than 2.0mm.

4.7.4 Air tightness (only applicable to wheel without inner tire): CONDUCT test in accordance with 5.7.4. The pressure of tire and rim shall be kept for at least 30s and there shall have no air leakage.

5 Test methods

5.1 Measurement of the calibrated perimeter of and width of rim

5.1.1 Measurement method of the calibrated perimeter of rim

- a) The diameter (perimeter) of WM-type column-type bead seat rim and slopping-bottom-style (straight) bead seat rim shall be measured by using the flat-tape used for the measurement of the calibrated diameter of rim in accordance with the methods specified in QC/T 726.
- b) The diameter (perimeter) of MT-type slopping-bottom-style bead seat rim, DT-type open-style bead seat rim, and DC-type deep-groove-style bead seat rim shall be measured by using the ball tape used for the measurement of the calibrated diameter of rim in accordance with the methods specified in QC/T 725.

5.1.2 Measurement method of the width of rim: USE the vernier caliper to measure the width.

5.2 Inspection of the materials used to forge hub

5.2.1 The internal quality of forged part shall be inspected in accordance with the test methods specified in GB/T 9438.

5.2.2 The mechanical performance of materials is inspected in accordance with the test methods specified in GB/T 228.

5.2.3 The chemical components of the materials of forged part shall be inspected in

Figure 7 Diagram of Radial Load Fatigue Test Machine

5.7.2.2 Test conditions:

a) Radial load:

Radial load Q is determined by formula (5):

$$Q = S_r \times F_v \dots\dots\dots (5)$$

Where:

Q — Radial load, N;

S_r — Intensified test coefficient, 2.25;

F_v — Refer to the definition in 5.7.1.2 c).

b) Tire pressure: the pressure of tire used in test is the pressure corresponding to the maximum design load, kPa; deviation is ± 10 kPa;

c) Radial load fluctuation tolerance: the load fluctuation tolerance during test is $\pm 5\%$;

d) Tire breakdown: In case of tire breakdown, test shall be continued after tire is replaced.

5.7.2.3 Test method: Tire shall be installed on the test machine in the same way as it is installed on the vehicle (refer to Figure 7). Tire is inflated in accordance with the method in 5.7.2.2 b). Then APPLY the radial load Q according to the calculated value of Formula (5); at the same time, DRIVE the drum to rotate and then conduct test. All the loads shall be on the connecting line between the center of wheel and the center of drum.

5.7.2.4 CHECK cracks after test is done: For the inspection of cracks, ADOPT visual inspection method, dye penetration method, penetration flaw detector, or X-ray fault detector to inspect cracks.

5.7.3 Torsion fatigue test:

5.7.3.1 Test machine: Test machine shall be able to apply reciprocating torque between hub and rim, as shown in Figure 8.

6.1.2 Exit-factory inspection shall be conducted in accordance with the double sampling plan as specified in GB/T 2828.1. Acceptable quality level (AQL) is 4.0 and inspection level (IL) is Class I.

6.1.3 The test items of exit-factory inspection are:

- a) Dimension of rim;
- b) General requirements on hub (except the tension to destroy hub spoke hole);
- c) Tightening torque of spoke nut;
- d) Assembly quality examined in accordance with Article 4.5;
- e) Appearance quality;
- f) Air tightness.

6.2 Type inspection

6.2.1 In case of one of the following circumstances, type inspection shall be conducted.

- a) Trial identification of new product or the product is transferred to new plant;
- b) If the structure, materials, or process is changed significantly, during official production, which might influence the property of product;
- c) Production resumes after shutting down for more than 18 months;
- d) Periodic quality inspection of batch of products;
- e) Upon the requirements of superior quality supervision department or national quality supervision agency.

6.2.2 Wheel which is delivered for type inspection must be the qualified products that are verified by exit-factory inspection.

6.2.3 The test items of type inspection are:

- a) Ultimate tension of hub spoke hole;
- b) Ultimate tension of spoke and spoke nut;
- c) Radial direction impact;
- d) Radial load fatigue;
- e) Torsion fatigue.

packed wheels shall not be rubbed each other or easily loosened.

7.4 The total weight for each packing box of wheel shall not exceed 30kg.

7.5 The packing box of wheel shall be handled with care during transportation. Do not throw it violently. The packing box shall be avoided from being rubbed each other or collided during transportation. Protect them from sunlight, rain or snow. It is strictly forbidden to mix them with acid or alkali products during transportation.

7.6 Wheel shall be placed in the dry well-ventilated warehouse which can protect them from rain or snow. It is strictly forbidden to mix them with acid or alkali products during storage. They shall be placed at the place which is at least 0.2m above the ground. The height of piled products shall not exceed 3m.

7.7 Under normal storage and transportation conditions, the protective layer shall not be ineffective within 1 year since delivery date.

_____ **END** _____