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

TB/T 1618-2001

**Ultrasonic inspection of rolling stock axles
(English Translation)**

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Table of Contents

Foreword...	3
1 Scope...	5
2 Normative References...	5
3 Type, Composition and Label of Tension Assembly Wheel...	6
4 General Property Requirements of Tension Assembly Wheel...	8
5 Fittings in Tension Assembly Wheel...	9
6 Inspection Rules and Test Methods...	17
7 Mark and Package...	18

1 Scope

This Part specifies the type, composition, label, material, technical requirements, inspection rules, test methods, mark and package of the tension assembly wheel.

This Part is applicable to the tension assembly wheel of fittings for overhead contact system in electrification railway.

2 Normative References

The provisions in following documents become the provisions of this Part through reference in this Part of TB/T 2075. For dated references, the subsequent amendments (excluding corrigendum) 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 31.1-1988 Hexagon Bolts with Split Pin Hole on Shank - Product Grade A and B

GB/T 41-2000 Hexagon Nuts-Product Grade C (eqv ISO 4034.1999)

GB/T 95-2002 Plain Washers - Product Grade C (ISO 7091.2000, EQV)

GB/T 68-2000 Slotted Countersunk Flat Head Screws (eqv ISO 2009.1994)

GB/T 91-2000 Split Pins (eqv ISO 1234.1997)

GB/T 97.1-2002 Plain Washers - Product Grade A (eqv ISO 7089.2000)

GB/T 196-2003 General Purpose Metric Screw Threads - Basic Dimensions (ISO 724.1993, MOD)

GB/T 283-2007 Rolling Bearings - Cylindrical Roller Bearings - Boundary

Dimensions

GB/T 699-1999 Quality Carbon Structural Steels

GB/T 700-2006 Carbon Structural Steels (ISO 630.1995, NEQ)

5.1.3 Label example of ratchet-wheel

Example. Marking for the wheel body of Type-Z tension assembly wheel is as follows.

Type-Z tension assembly wheel body TB/T 2075.13(Z)-10

5.1.4 Ratchet-wheel materials

5.1.4.1

The ratchet-wheel body and end cover shall, according to GB/T 1173-1995, adopt high-quality cast aluminum-magnesium-silicon alloy (ZA1Si7Mg1A) with code of ZL114A; the alloy use T5 (solid solution treatment and incomplete artificial aging) treatment; the tensile strength $\sigma_b \geq 290\text{MPa}$, elongation $\sigma_5 \geq 2\%$.

5.1.4.2

The ratchet-wheel shaft shall, according to GB/T 699-1999, adopt high-quality carbon structural steel with designation of No.45; and shall be quenched and tempered.

5.1.4.3

The bearing shall conform to GB/T 283-2007; adopt the inner ring single rib cylindrical roller bearing with designation of NJ2305E. The connection between ratchet-wheel shaft and the ratchet-wheel body shall be double bearing structure.

5.1.4.4

The wedge and balance wheel body shall, according to GB/T 11352-2009, adopt the cast carbon steel with designation of ZG 270-500.

5.1.4.5

Pin, countersunk head screw, and oil-filling screw are all in accordance with GB/T 1220-2007. Pin adopts austenitic stainless steel with designation of 06Cr19Ni10; the rest all adopts the austenitic stainless steel with designation of 12Cr18Ni9.

5.1.4.6 Fastener (bolt, nut, washer) that adopts austenitic stainless steel, where the

mechanical properties of bolt and nut shall meet the following requirements with tensile strength $\sigma_b \geq 700\text{MPa}$, non-proportional elongation $\sigma_{p0.2} \geq 450\text{MPa}$, elongation

after break $\delta \geq 0.4d$.

5.1.4.7 The ratchet-wheel connecting frame shall, according to GB/T 700-2006, adopt the carbon structural steel with designation of Q235A.

5.1.5 Technical requirements of ratchet-wheel

5.1.5.1

The general technical requirements of ratchet-wheel shall conform to the provisions of TB/T 2073.

5.1.5.2

The requirements for manufacturing process of ratchet-wheel is as follow.

a) The ratchet-wheel body and end cover are manufactured by metal mold low- pressure casting process; its casting state is JB (metal mold casting + modification treatment).

b) The ratchet-wheel body has no casting defects; the grooves of wheel body are

Figure 4 - Schematic Diagram for Appearance Structure of Ratchet-Wheel

Bracket

5.3.2 Reference weight of ratchet-wheel bracket

Type-Z is 16.5kg; Type-F is 14.5kg.

5.3.3 Label example of ratchet-wheel bracket

Example 1.the label of Type-Z forward-brake ratchet-wheel bracket is as follows.

Type-Z ratchet-wheel bracket TB/T 2075.13B(Z)-10

Example 2.the label of Type-F reverse-brake ratchet-wheel bracket is as follows.

Type-F ratchet-wheel bracket TB/T 2075.13B(F)-10

5.3.4 Materials of ratchet-wheel bracket

5.3.4.1

The hook, connection plate, long bolt, washer, and nut in the wheel bracket shall, according to GB/T 700-2006, adopt the carbon structural steel with designation of Q235A. The riser and connecting pipe shall, according to GB/T 699-1999, adopt the high-quality carbon structural steel with designation of No.20.

5.3.4.2

The brake plate shall, according to GB/T 699-1999, adopt the high-quality carbon structural steel with designation of No.45.

5.3.4.3

Bolt, nut, washer and spring washer for fixing brake plate shall be accordance with GB/T 1220-2007; thereof, the bolt adopts the austenitic stainless-steel with designation of 06Cr19Ni10; nut, washer, and spring washer adopt the austenitic stainless-steel with designation of 12Cr18Ni9.

5.3.5 Technical requirements of ratchet-wheel bracket

5.3.5.1

The general technical requirements of ratchet-wheel bracket shall conform to the provisions of TB/T 2073.

5.3.5.2

The manufacturing process requirements of ratchet-wheel bracket are as follows.

- a) The hook shall be manufactured by metal die forging process; the connecting plate shall be manufactured by profile stamping process;
- b) The ratchet-wheel bracket shall use special tools to perform assembly-welding.

After welding, ensure the error between the two sides of the hook opening and the brake plate is less than $\pm 0.25\text{mm}$. After the assembly-welding, the surface shall, according to the provisions of TB/T 2073, perform the Grade-2 hot-dip

5.4.2 Reference weight of balance wheel

The balance wheel is 3.16kg.

5.4.3 Label example of balance wheel

Example. the label of balance wheel for connecting ratchet-wheel is as follows.

Balance wheel TB/T 2075.13C-10

5.4.4 Materials of balance wheel

5.4.4.1

The balance wheel body shall, according to GB/T 11352-1989, adopt the carbon steel with designation of ZG 270-500.

5.4.4.2

The connecting plate, bolt pin, nut and washer of balance wheel, shall according to GB/T 700-2006, adopt carbon structural steel with designation of Q235A.