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Replacing TB/T 1463-2006

Technical Specification for Wheelsets Assembly of Locomotive

机车轮对组装技术条件

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Foreword

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

This standard replaces TB/T 1463-2006 "Technical Specification for Wheelsets Assembly of Railway Locomotive". Compared with TB/T 1463-2006, the main changes of the technical content of this standard are as follows:

- The modification of the definition of pressure test (See 3.4; 3.6 of 2006 edition);
- The deletion of the provision of residual stress of axle (See 4.2.5 of 2006 edition);
- The addition of the "classification and selection of wheelsets assembly methods" (See Chapter 5);
- The modification of solid wheel interference ratio and oiling pressure range (See Table 3; Table 2 of 2006 edition);
- The modification of technical requirements of storage period of components prior to assembly (See 6.1.5; 5.1.6 of 2006 edition);
- The addition of molybdenum disulfide lubricant (See 6.2.2 and 6.4.2);
- The addition of the provision of pressure curve and final press force of 1 press-fitting method of solid wheel to axle (i.e. press-fitting II) (See Annex C and Annex D);
- The addition of the provision of final press force inspection of press-fitting (See 7.1.3 and Table 6);
- The deletion of quality assurance content (See Chapter 9 of 2006 edition).

This standard is proposed and shall be administered by CSR Qishuyan Institute Co., Ltd.

This standard is drafted by: CSR Qishuyan Locomotive Co., Ltd., CSR Zhuzhou Electric Locomotive Co., Ltd., Standards and Metrology Research Institute of China Academy of Railway Sciences, CSR Qishuyan Institute Co., Ltd.

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The previous editions of this standard are as follows:

- TB/T 1463-1983, TB/T 1463-1991, TB/T 1463-2006;
- TB/T 1757-1986, TB/T 1757-1991.

Technical Specification for Wheelsets Assembly of Locomotive

1 Scope

This standard specifies the terms and definitions of the assembly of new wheelsets, the technical requirements of the assembly parts, the classification and selection of the assembly methods of wheelsets as well as the technical requirements, inspection requirements, marking and protection of wheelsets assembly of railway locomotives.

This standard is applicable to the assembly of solid wheel, wheel core, tyred wheel and other components with axle for newly wheelsets of railway locomotives.

2 Normative References

The following documents are essential to the application of this standard. For the dated references, only the dated editions apply to this standard. For the undated references, their latest editions (including all amendments) apply to this standard.

GB/T 5371-2004 Limits and fits - The Calculation and Selection of Interference Fits

TB/T 1400 Technical Specifications for Cast Steel Wheel Core for Railway Locomotive

TB/T 1882-2001 Technical Specifications for Ordering Rough-Rolled Tyres for Railway Locomotive

TB/T 2015-2001 Types and Dimensions of Rough-Rolled Tyres for Railway Locomotive

TB/T 1027.1 Technical Conditions for Locomotive Axle - Part 1: Billets

TB/T 1027.2 Technical Conditions for Locomotive Axle - Part 2: Locomotive Axle

3 Terms and Definitions

For the purpose of this Standard, the following terms and definitions apply.

3.1 Oiling press-fitting

An assembly method in which, during the wheelsets press-fitting process, high pressure oil is injected in between wheel seat and hub bore which exceeds their contact stress, in order to form an oil film, and in which, along with the increase of the

6.2.1 The interference and oiling pressure shall meet the requirements of 6.1.3.

6.2.2 Prior to press-fitting, the surface of the axle wheel seat and the surface of the wheel hub inner bore shall be smeared evenly with pure vegetable oil or molybdenum disulfide.

6.2.3 During press-fitting, the center line of the axle shall be consistent with the center line of the press piston. The pressing speed shall be 0.5 mm/s ~ 5 mm/s.

6.2.4 The acceptable pressure curves shall be that the pressure increases gradually with the increase of the pressing distance when oiling, and that the pressure decreases gradually with the increase of the pressing distance when not oiling. The pressure is minimum when it is finished pressing, and is less than 196 kN. In the process of oiling press-fitting, the oiling pressure is allowed to fluctuate within the range specified. See Annex A for the pressure curve graphs of oiling press-fitting; the pressure curves without oiling are allowed to have spikes as shown in Fig. C.3 of Annex C.

6.2.5 During the oiling press-fitting of wheelsets, the press machine is allowed to stall midway. After press-fitting, the residence time is not limited and it is allowed to adjust the medial distance and phase angle freely.

6.2.6 Each pressure curve graph of wheel oiling press-fitting shall be indicated with: manufacturer name (or manufacturer code), vehicle type (wheelset type), axle number, wheel number, hub bore diameter, side, seat diameter, oiling pressure value and press-fitting date.

6.3 Shrink fitting of solid wheel and core to axle

6.3.1 The magnitude of interference shall meet the requirements of 6.1.3.

6.3.2 The shrink fitting shall be conducted after the heating of solid wheel or core; the wheel installed with tyre is not suitable for shrink fitting. The heating temperature shall not exceed 250°C. The surface of the hub bore shall be prevented from oxidation during heating.

6.3.3 The solid wheel or core shall be wiped clean after they are taken out from the heating place. After they are assembled to the correct position of the axle, they shall be cooled indoors under normal temperature until the solid wheel or core are fastened on the axle seat; they shall not be cooled by forced cooling.

6.4 Press-fitting I of solid wheel, tyred wheel and core to axle

6.4.1 The magnitude of interference shall meet the requirements of 6.1.3.

6.4.2 Prior to press-fitting, the surface of the wheel axle seat and the surface of the wheel hub inner bore shall be smeared evenly with pure vegetable oil or molybdenum disulfide.

6.4.3 During press-fitting, the center line of the axle shall be consistent with the center

bore diameter, side, seat diameter, oiling pressure value and press-fitting date.

6.4.9 If the wheel is to be unloaded, it shall be done by oiling according to the oiling pressure range specified in Table 3.

6.5 Press-fitting II of solid wheel to axle

6.5.1 The interference shall meet the requirements of 6.1.3.

6.5.2 Prior to press-fitting, the surface of the axle wheel seat and the inner surface of the wheel hub bore shall be evenly smeared with WM-10 or LB-0749 assembly lubricant.

6.5.3 During press-fitting, the center line of the axle shall be consistent with the center line of the press piston, and they shall be pressed in parallel. The pressing speed is preferably 0.5 mm/s ~ 5 mm/s and shall be maintained constant.

6.5.4 The pressure curve graphs shall rise steadily; the pressure during the whole assembly process nearly increase linearly; and there is slight decrease in speed (a slight pressure drop is allowed in oiling groove area when there is an oiling groove). The pressure curve projection length shall not be less than 80% of the theoretical length. See Annex C for the pressure curve graphs of press-fitting II.

6.5.5 The final pressing force of the press-fitting of solid wheel to axle shall meet the requirements of Annex D.

6.5.6 Each wheel pressure curve graph shall be indicated with: manufacturer name (or manufacturer code), vehicle type (wheelset type), axle number, wheel number, hub bore diameter, side, seat diameter, oiling pressure value and press-fitting date.

6.5.7 If the wheel is to be unloaded, it shall be done by oiling according to the oiling pressure range specified in Table 3.

6.6 Tyre assembly

6.6.1 Prior to assembling, the surface of the hub inner bore and the rim outer circle shall be cleaned to prevent damage.

6.6.2 The tyre shall be heated evenly and the heating temperature shall not exceed 350°C. The unevenness of heating shall not be more than 15°C.

6.6.3 After the tyres are assembled, they shall be cooled indoors under normal temperature and they shall not be cooled by forced cooling.

6.6.4 When the retaining ring needs butt welding after the tyre is assembled with an retaining ring, the tyre and core shall not be damaged by welding.

6.7 Assembly of other accessories

The components, including driven gear and brake disc, shall be assembled according

7.2.3.1.4 During the press-fitting of solid wheel, tyred wheel or core, if pressure test is required, the minimum pressure P_p of pressure test shall be determined as follows unless otherwise specified:

- a) The minimum pressure P_p on each wheel shall be 1.2 times of the actual final pressing force;
- b) When the minimum pressure P_p is reached, the solid wheel, tyred wheel or core shall not move.

7.2.3.2 Resistance test

Use a resistance tester to measure the resistance value between two wheel flanges in a state of insulation of the wheelset.

7.2.3.3 Wheelsets unbalance test

The dynamic unbalance and static unbalance of wheelsets shall be tested with a satisfactory instrument.

7.2.3.4 Dimensional inspection

After the assembly of wheelsets, use a measuring instrument meeting the accuracy requirements for inspection, and meet the requirements of Fig. 2 and Table 5.

7.3 Certificate of quality

The manufacturer shall provide a certificate of quality in accordance with the requirements of this standard.

8 Marking

8.1 After the assembly of each wheelset is qualified, it shall be marked at the axle gear end for unilateral drive and the axle anticlockwise-rotation gear end as follows:

- a) Wheelset manufacturer and axle manufacturer code (one code for the same manufacturer);
- b) Vehicle type;
- c) Forging year-axle number;
- d) Material code;
- e) Smelting furnace number.

The following traceable marks shall be printed at least on both sides of the axle:

- a) Assembly year;