

ICS 43.040.50

QC

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

QC/T 1218-2025

**Automatic dump semi-trailer
(English Translation)**

Issued on: May 9, 2025

Implemented on: November 1, 2025

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

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1 Scope

This document specifies the technical requirements, test methods, inspection rules, marks, packaging, transportation and storage for wheel side drive axle of electric bus.

This document applies to wheel side drive axle of M3 electric bus. Other vehicles may refer to this document for implementation.

2 Normative references

The following referenced documents are indispensable for the application of this document. For dated references, only the edition cited applies. For undated references, the latest

edition of the referenced document (including any amendments) applies.

GB/T 191, Graphical symbols marking for handling and storage of packages

GB/T 4208-2017, Degrees of protection provided by enclosure (IP code)

GB/T 10125, Corrosion tests in artificial atmospheres -- Salt spray tests

GB/T 13306, Plates

GB/T 15089, Classification of power-driven vehicles and trailers

GB/T 18386.2, Test methods for energy consumption and range of electric vehicles

-- Part 2. Heavy-duty commercial vehicles

GB/T 18488, Drive motor system for electric vehicles

GB/T 19596, Terminology of electric vehicles

GB/T 38146.2, China automotive test cycle -- Part 2. Heavy-duty commercial vehicles

JT/T 1359-2020, Technical requirements for passenger car air suspension

QC/T 533, Commercial Vehicle Drive Axles Assembly

QC/T 983, Measuring method of cleanliness of automobile transmission assembly

QC/T 1022, Technical specification for reduction gearbox of battery electric passenger cars

3 Terms and definitions

For the purposes of this document, the terms and definitions defined in GB/T 15089, GB/T 18488, GB/T 19596, QC/T 533 and QC/T 1022 as well as the followings apply.

3.1

wheel side drive axle

A drive unit consisting of a drive motor and a reducer is integrated on the wheel rim.

The drive motor is located outside the wheel hub. The drive units on both sides are connected to the vehicle body through a rigid support axle or independent suspension to transmit power to the wheels.

3.1.1

integral wheel side drive axle

A wheel side drive axle of which the two drive units are connected by a rigid support bridge.

3.1.2

disconnected wheel side drive axle

A wheel side drive axle of which the two drive units are connected to the vehicle body via independent suspension.

3.2

wheel side reducer assembly

A device located at both ends of the wheel side drive axle, connected to the motor output end, to reduce speed and increase torque.

4.1 General requirements

4.1.1

The outer surface of the wheel side drive axle shall be clean, free from rust and oxidation, and free from defects such as cracks and burrs that affect performance and appearance.

4.1.2

There shall be no oil leakage at any mating surfaces, oil seals, bolt holes, etc. of the wheel side drive axle.

4.1.3 All electrical components, connecting wires and connectors on the wheel side

drive axle shall be securely fixed and well protected.

4.1.4 The wheel side drive axle shall rotate freely without any abnormal noises (such as friction between the stator and rotor, periodic abnormal noises, abnormal noises after damage to gear bearings, etc.) or jamming.

4.1.5 The wheel side drive axle shall function normally under the following conditions.

a) Operating temperature. $-40^{\circ}\text{C}\sim 55^{\circ}\text{C}$;

b) Operating humidity. 5%~95%.

4.2.1.1 Vertical bending stiffness

The test shall be conducted according to the method specified in 5.3.1. The maximum deformation per meter of wheel track of the integral wheel side drive axle shall not exceed 1.4 mm.

4.2.1.2 Vertical bending static strength

The test shall be conducted according to the method specified in 5.3.2. The reserve factor for the vertical bending static strength of the integral wheel side drive axle shall be greater

than 6.

4.2.1.3 Bridge fatigue

The test shall be conducted according to the method specified in 5.3.3. The fatigue life shall meet the following requirements.

- a) Integral wheel side drive axle.
 - 1) Vertical bending fatigue life shall not be less than 8×10^5 cycles;
 - 2) Braking fatigue life shall not be less than 8.8×10^4 cycles;
 - 3) Transverse bending fatigue life shall not be less than 2×10^5 cycles.
- b) Disconnected wheel side drive axle
 - 1) The fatigue life of the bridge body shall not be less than 8×10^5 cycles;
 - 2) The suspension system shall meet the requirements of 5.7 in JT/T 1359-2020.

4.2.2 Static torsional strength

The test shall be conducted according to the method specified in 5.3.4. The static torsional strength reserve factor shall not be less than 3.

4.2.3 Air tightness

The test shall be conducted according to the method specified in 5.3.5. The change in gas pressure shall not exceed 20 Pa.

4.2.4 Dynamic sealing

The test shall be conducted according to the method specified in 5.3.6. There shall be no oil leakage at any mating surfaces, oil seals, bolt holes, etc.

4.2.5 High-speed performance

The test shall be conducted according to the method specified in 5.3.7. There shall be no oil leakage during or after the test. Furthermore, bearings, gears, oil seals, and other parts shall not show signs of burning or damage that would affect the normal operation of the wheel side drive axle.

4.2.6 Overspeed performance

The test shall be conducted according to the method specified in 5.3.8. There shall be no oil leakage or abnormal noise during or after the test. Furthermore, bearings, gears, oil seals, and other parts shall not show signs of burning or damage that would affect the normal