

ICS 45.080
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**RAILWAY INDUSTRY STANDARD OF THE
PEOPLE'S REPUBLIC OF CHINA**

TB/T 3189-2007

Specification of railway signal axle counter application system

铁路信号计轴应用系统技术条件

(English Translation)

Issued on: July 15, 2015

Implemented on: February 1, 2016

**Issued by: National Railway Administration of the People's Republic of
China**

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Foreword

TB/T 3396 Test Methods for Fastening Systems of High-Speed Railway consists of the following 7 parts:

- Part 1: Determination of Longitudinal Rail Restraint;
- Part 2: Determination for Clamping Force;
- Part 3: Determination of Static Stiffness for Fastening Assembly;
- Part 4: Test of Fatigue Performance of Fastening Assembly;
- Part 5: Determination of Electrical Resistance;
- Part 6: Effect of Severe Environmental Conditions;
- Part 7: Vertical Load Test for Cast-in Fastening Components.

This Part is Part 5 of TB/T 3396.

This Part was drafted as per the rules specified in GB/T 1.1-2009.

This Part shall be under the jurisdiction of Institute of Standards and Metrology, China Academy of Railway Sciences.

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Test Methods for Fastening Systems of High-Speed
Railway - Part 5: Determination of Electrical Resistance

1 Scope

This Part specifies the indoor test method for the insulation electric resistance of fastener assembly.

This Part applies to fastening systems for high-speed railway.

2 Normative Reference

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) is applicable to this

Document.

GB/T 6908 Analysis of water used in boil and cooling system - Determination of electrical conductivity

3 Sign

The following signs are applicable to this Document.

Kgamma: correction factor for conductivity of test water;

Rgamma: the measured electric resistance, in ohm;

R33: the value of electric resistance when the conductivity of water is corrected into 33mS/m,

in ohm;

gamma: conductivity of the used water at 25°C, in mS/m.

4 Principle

Measure the value of electric resistance between two short rails fixed on the sleeper with fasteners under the water spraying condition of the specified water spraying rate. The conductivity of water is corrected by the coefficient K_{γ} .

5.1 Rail

Two short rails with a length of about 0.5 m have the same cross-section as the rails used for assembling the tested fasteners. There should be no floating rust on the surface of the rail.

5.2 Water

The test water was potable water of known conductivity (range 20 mS/m ~ 80 mS/m).

5.3 Spraying device

As shown in Figure 1, a shelf that can move parallel to the rail is equipped with four nozzles with a diameter of 3.6 mm and a spray taper of $100^{\circ}\sim 125^{\circ}$. It shall also be equipped with equipment capable of controlling and measuring the nozzle flow.

5.4 Power supply

The alternating current with voltage of $30V\pm 3V$, and frequency of $50Hz\pm 15Hz$.

5.5 Testing instrument

The testing instrument shall be able to measure the voltage and current between the two rails

with a measurement accuracy of 1%; and can calculate the electric resistance of 1×10^2 ohm ~ 1

$\times 10^6$ ohm. The test equipment shall be able to print out and calculate the recorded resistance-time

curve.

6.1 Sleeper

Sleepers with built-in parts for fasteners or reserved holes.

6.2 Fastener

The complete set of fasteners including all parts.

7 Test Procedure

Test the conductivity and temperature of the test water according to the provisions of GB/T 6908 for testing and calculation; and correct the conductivity of the test water to the value gamma at

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