

ICS 45.120

S 23

**TB**

**MINISTRY OF RAILWAYS OF THE PEOPLE'S  
REPUBLIC OF CHINA**

**中华人民共和国铁道行业标准**

TB/T 2340-2012

Replace TB/T 2340 - 2000, TB/T 2340-1995

---

**Ultrasonic testing detector for rail**

**钢轨超声波探伤仪**

**Issued on March 01, 2012**

**Implemented on July 01, 2012**

---

**Issued by Ministry of Railways of the People's Republic of China**

# Contents

Foreword.....	5
1 Scope.....	7
2 Normative references.....	7
3 Terms and definitions.....	8
4 Technical requirements .....	11
4.1 General rules.....	11
4.2 Probe .....	12
4.2.1 General rules for probes.....	12
4.2.2 Probe performance.....	13
4.2.3 Operating ambient temperature .....	14
4.3 Instruments.....	14
4.3.1 Pulse repetition frequency.....	14
4.3.2 Attenuator .....	14
4.3.3 Dynamic range.....	15
4.3.4 Amplifier frequency response .....	15
4.3.5 Error of time base (horizontal) linearity .....	15
4.3.6 Linearity of vertical display error .....	15
4.3.7 Blocking range .....	15
4.3.8 The effects of on measuring results deactivated state.....	15
4.3.9 The effects of operation voltage on the wave height of detector echo and the sensitivity of detection (alarm) .....	15
4.3.10 Digital detector .....	15
4.4 Combination property.....	16
4.4.1 Sensitivity margin .....	16
4.4.2 Distance-amplitude characteristic .....	16
4.4.3 Signal-to-noise ratio .....	16
4.4.4 Defect detection capability .....	17
4.5 Electromagnetic compatibility .....	17

4.6 Operation ambient temperature.....	17
4.7 Temperature stability .....	17
4.8 vibration performance .....	17
4.9 Falling performance.....	17
4.10 Sealing performance.....	17
4.11 Safety Performance.....	18
5 Inspection methods.....	18
5.1 Inspection conditions.....	18
5.2 Probes .....	18
5.2.1 Physical properties.....	18
5.2.2 Echo frequency .....	18
5.2.3 Relative error of echo frequency .....	19
5.2.4 Refraction angle error .....	19
5.2.5 Sound axis offset angle .....	19
5.2.6 Relative deviation of combined probe .....	20
5.2.7 Attenuation value of protective boot (film).....	20
5.2.8 Resolution.....	21
5.2.9 Sensitivity surplus.....	21
5.2.10 Width of acoustic beam N .....	22
5.2.11 Spurious echo amplitude $\Delta S$ .....	22
5.2.12 Temperature applicability of working environment .....	22
5.3 Instrument.....	22
5.3.1 Pulse repetition frequency.....	22
5.3.2 Attenuator .....	23
5.3.3 Dynamic range.....	23
5.3.4 Amplifier frequency response .....	23
5.3.5 Time base (horizontal) linearity error .....	24
5.3.6 Vertical linearity error .....	25
5.3.7 Blocking range .....	25
5.3.8 The influence of inhibitory state on the measurement results .....	25

5.3.9 The influence of working voltage on the echo height of flaw detector and the flaw detection (alarm) sensitivity.....	26
5.3.10 Digital flaw detector.....	26
5.4 Comprehensive performance.....	28
5.4.1 Sensitivity surplus.....	28
5.4.2 Distance amplitude characteristic .....	28
5.4.3 Signal-to-noise ratio .....	28
5.4.4 Defect detection capability .....	29
5.5 Electromagnetic compatibility .....	29
5.6 Ambient temperature test .....	29
5.7 Temperature stability .....	29
5.8 Vibration performance.....	29
5.9 Falling performance.....	30
5.10 Sealing performance.....	30
5.11 Safety performance .....	30
6 Inspection rules .....	30
7 Sign, packaging, transportation, storage and accompanying documents .....	31
7.1 Sign.....	31
7.2 Packaging .....	31
7.3 Transportation .....	31
7.4 Storage .....	31
7.5 Accompanying documents.....	32
Annex A (Informative Annex) WGT-3 test block.....	33
Annex B (Informative Annex) GTS-60C lengthened test block.....	34
Annex C (Informative Annex) GTS-60 test block.....	35
Annex D (Informative Annex) CSK-   A type test block.....	36
Annex E (Informative Annex) Step test block used for measuring distance amplitude characteristic of straight probe .....	37
Bibliography.....	38

## Foreword

This standard is drafted according to rules given by GB/T 1.1-2009 *Technical conditions for type A multi-channel ultrasonic testing detector for rail* and TB/T 2634-1995 *Technical conditions for ultrasonic defect detecting and probe for rails*. This standard is mainly based on TB / T 2340-2000 and brings the content of TB / T 2634-1995 into it. Compared with TB / T 2340-2000, there are the following technical changes in addition to editorial changes:

- Delete the Type A multi-channel in the name of the standard;
- Adjusted the structure of the standard. The standard is mainly divided into probe performance indicator of the ultrasonic testing detector for rail, instrument performance of it and combined performance indicator;
- Added relevant terms and definitions of the ultrasonic testing detector for rail (see Chapter 3)
- Modified the number of the carried probes of ultrasonic testing detector for rail (see 4.1.3 and 4.1.3 in version 2000);
- Added the angle adjustment range of 70 ° probe of ultrasonic testing detector for rail (see 4.1.3 and 4.1.7 in version 2000);
- Added the technical requirements and inspection method to probes of ultrasonic testing detector for rail (see 4.2 and 5.2);
- Added the pulse repetition frequency of ultrasonic testing detector for rail, relevant technical requirements for signal to noise ratio and inspection methods (see 4.3.1, 4.4.3 and 5.3.1 and 5.4.3);
- Added relevant requirements and inspection method to digital ultrasonic testing detector for rail (see 4.1.12, 4.3.10 and 5.3.10);
- Added the environment (high temperature, low temperature, constant damp heat, vibration, tilt down and water test) to ultrasonic testing detector for rail and requirements for electromagnetic compatibility and safety (see 4.5 to 4.11 and 5.5 to 5.11);
- Added inspection items to ultrasonic testing detector for rail of manufacturer (see 6.2).

This standard is proposed by and is under the jurisdiction of ministry of railways institute of legal metrology.

Drafting units of this standard: ministry of railways institute of legal metrology and metal and chemistry institute of the Chinese academy of railway sciences.

Drafters of this standard: Gao Junli, Huang Yongwei, Zuo Rongsen, Li Lianxiu, Tu Zankuan, Zhang Dingcheng and Zhan Junsheng,

Previous versions that this standard replaces are as follows:

-TB/T 2340—1993 and TB/T 2340—2000;

TB/T 2634—1995.

# Ultrasonic testing detector for rail

## 1 Scope

This standard specifies the terms and definitions, technical requirements, inspection methods, inspection rules and marks, package, transportation, storage and so on of the multi-channel ultrasonic testing detector for rail (hereinafter referred to as the detector)

This standard applies to multi-channel ultrasonic testing detector for rail.

## 2 Normative references

Following documents are indispensable for application of this document. For the dated documents so quoted, only dated versions apply to this document. For the undated documents so quoted, the latest versions (including all modification sheets) apply to this document.

GB/T 2423.1 Environmental testing for electric and electronic and electronic products - Part 2: Test methods - Tests A: Cold (GB/T 2423.1 - 2008, IEC 60068 - 2 - 1: 2007, Environmental Testing - Part 2 - 1: Tests A: Cold, IDT)

GB/T 2423.2 Environmental testing for electric and electronic and electronic products - Part 2: Test methods - Tests A: Heat (GB/T 2423.2 - 2008, IEC 60068 - 2 - 2: 2007, Environmental Testing - Part 2 - 2: Tests B: Dry heat, IDT)

GB/T 2423.3 Environmental testing for electric and electronic products - Part 2: Testing method test Cab: Damp heat Steady state (GB/T 2423.3 - 2006, IEC 60068 - 2 - 78: 2001, Environmental Testing - Part 2 - 78: Tests Cab: Damp heat, steady state, IDT)

GB/T 2423.7 Environmental testing for electric and electronic products Part 2: Test methods Test Ec and guidance: Drop and topple Primarily for equipment-type specimens (GB/T 2423.7 - 1995, IEC 60068 - 2 - 31: 1982, IDT)

GB/T 2423.10 Environmental testing for electric and electronic products - Part 2: Test methods - Test Fc: Vibration (sinusoidal) (GB/T 2423.10 - 2008, IEC 60068 - 2 - 6: 1995, IDT)

GB/T 2423.38 Environmental testing for electric and electronic products - Part 2: Test methods - Test R: Water test method and guidance (GB/T 2423.38 - 2008, IEC 60068 - 2

---

---

**完整版本请在线下单/Order Checks Online for Full version**

**联系我们/or Contact:**

TEL: 400-678-1309

QQ: 19315219 | Skype: Lancarver

Email : [info@lancarver.com](mailto:info@lancarver.com)

<http://www.lancarver.com>

---

---

**线下付款方式 :**

**I. 对公账户 :**

**单位名称 :** 北京文心雕语翻译有限公司

**开户行 :** 中国工商银行北京学清路支行

**账 号 :** 0200 1486 0900 0006 131

---

---

**II. 支付宝账户 : [info@lancarver.com](mailto:info@lancarver.com)**

**III. Paypal: [info@lancarver.com](mailto:info@lancarver.com)**

---

---

注: 付款成功后, 请预留电邮, 完整版本将在一个工作日内通过电子 PDF 或 Word 形式发送至您的预留邮箱, 如需索取发票, 下单成功后的三个工作日内安排开具并寄出, 预祝合作愉快!

**NOTE** All documents on the store are in electronic Adobe Acrobat PDF format, there is not sell or ship documents in hard copy. Mail the order and payment information to [info@lancarver.com](mailto:info@lancarver.com), you will shortly receive an e-mail confirming your order.

---

