SCLEAD 主导科技

LD Wayside Ultrasonic Inspection System for Wheels

1. General Introduction

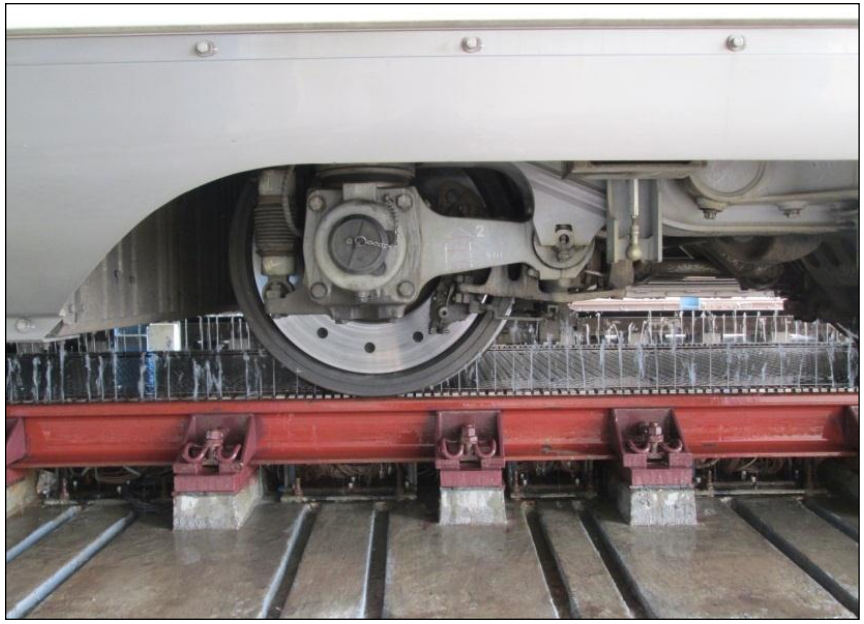
LD Wayside Ultrasonic Inspection System(hereinafter referred to as LD system) is for defects detecting in wheel rim.

LD system is applied at the entrance line where **high-speed train** ,**locomotive** or **rolling stock** pass by, and wheels are daily monitored to ensure running safety.

2. Features

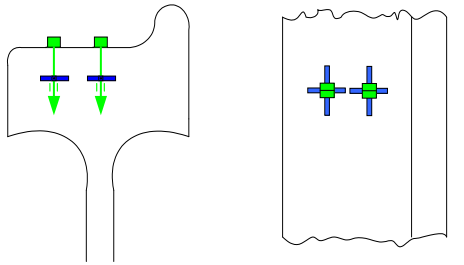
- Wayside wheel automatic monitoring
- Wheel rim and flange defect/crack detection
- Advanced ultrasonic probe array technology
- A/B Scan and wheel side view analyzing
- Automatic alarm of detected defect
- Data inquiry/analyzing/comparison through network

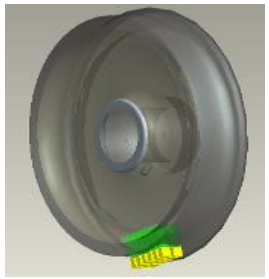
3. Wheel Inspection Method



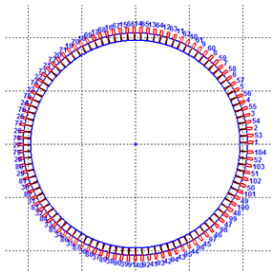
- ✓ Longitudinal wave probe(TR probe) for circumferential defects
- ✓ Transverse wave probe(AP probe) for radial defect in wheel rim and flange

3. Wheel Inspection Method

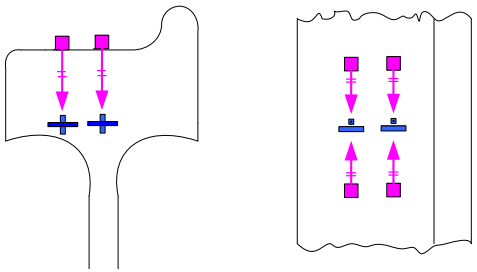


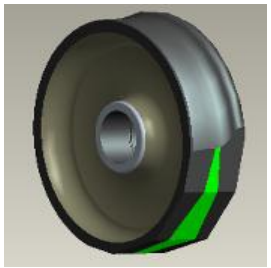


TR probe: Circumferential defect detection in wheel rim

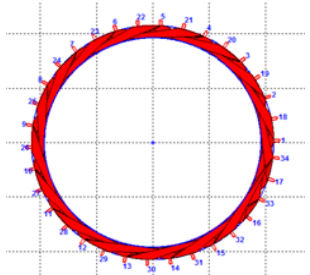


The coverage area by TR probe

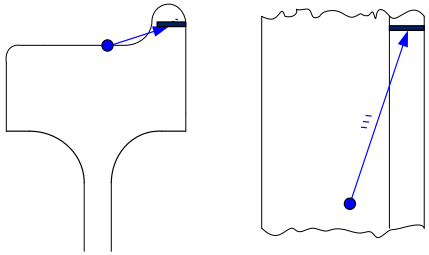




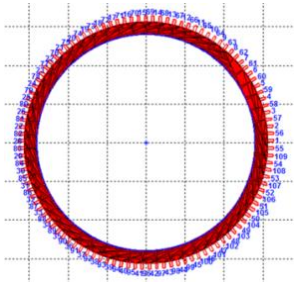
AP probe: Radial defect detection in wheel rim



The coverage area by AP probe



AP probe: Radial defect detection in wheel flange



The full coverage of the wheel

4. Defect Detect Ability (One pass)

Wheel flange:

- 5mm depth radial notch at the top of wheel flange (AP probes)

Wheel rim :

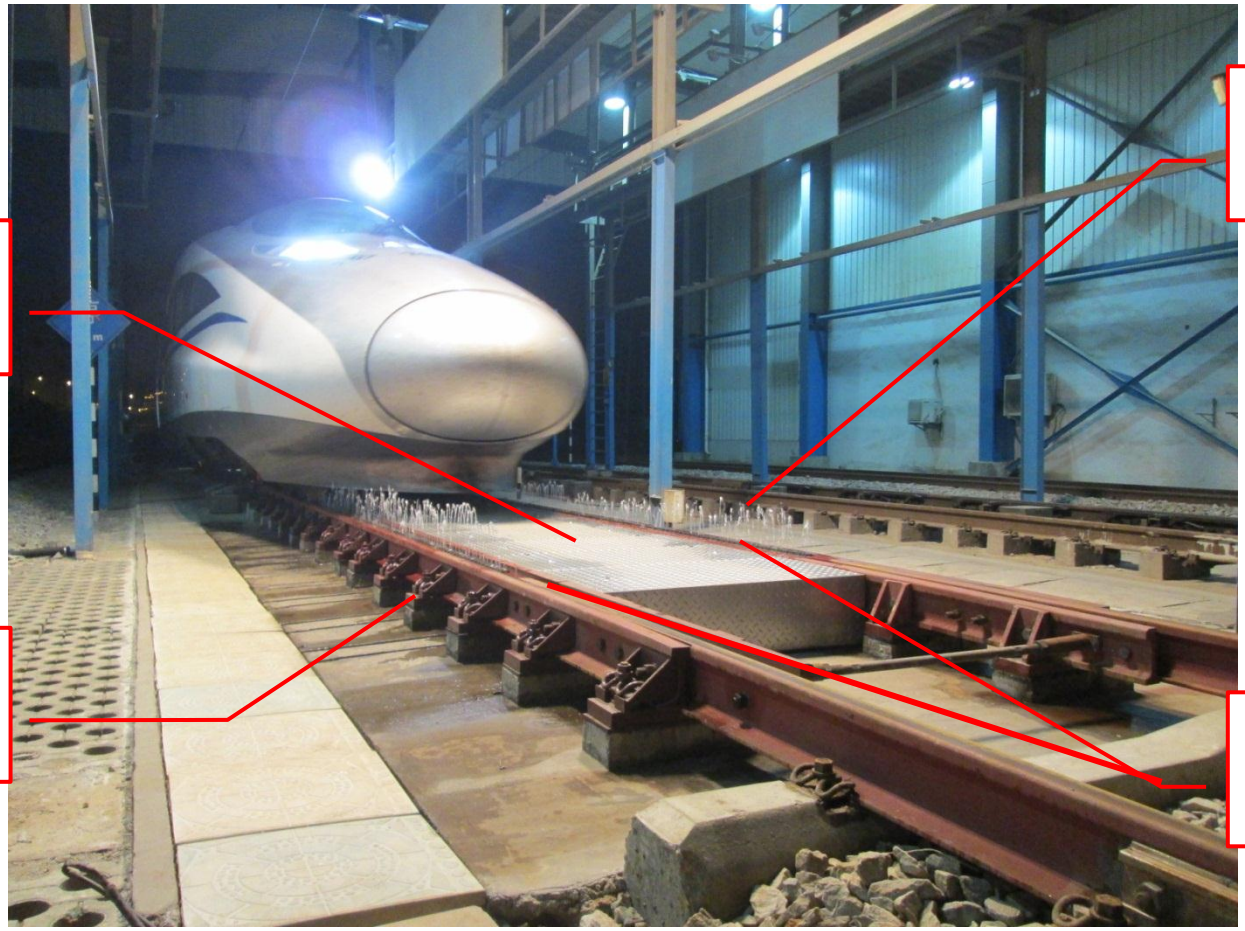
- Φ 3 x 100 mm SDH(side drilled hole) (AP probes)
- Circumferential defect in flat bottom ellipse with 50mm long axis, 30mm minor axis at 60mm ～100mm regions (TR probes)

Wheel flange

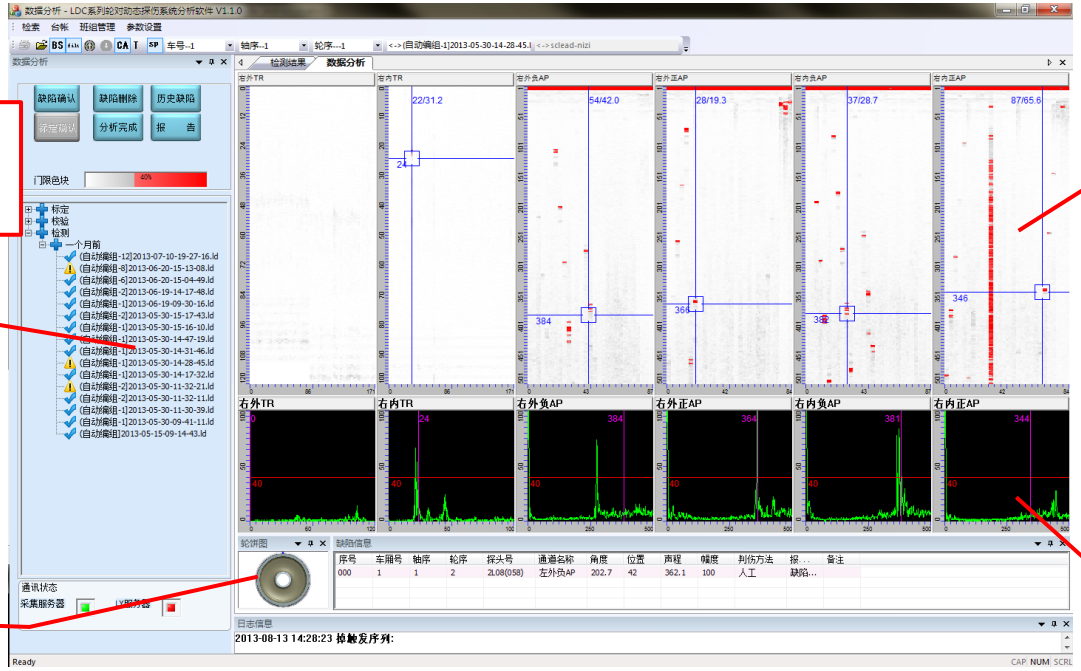
Radial defects of wheel rim

Circumference defects of wheel rim

5. System Composition-System Hardware



5. System Composition-System Software

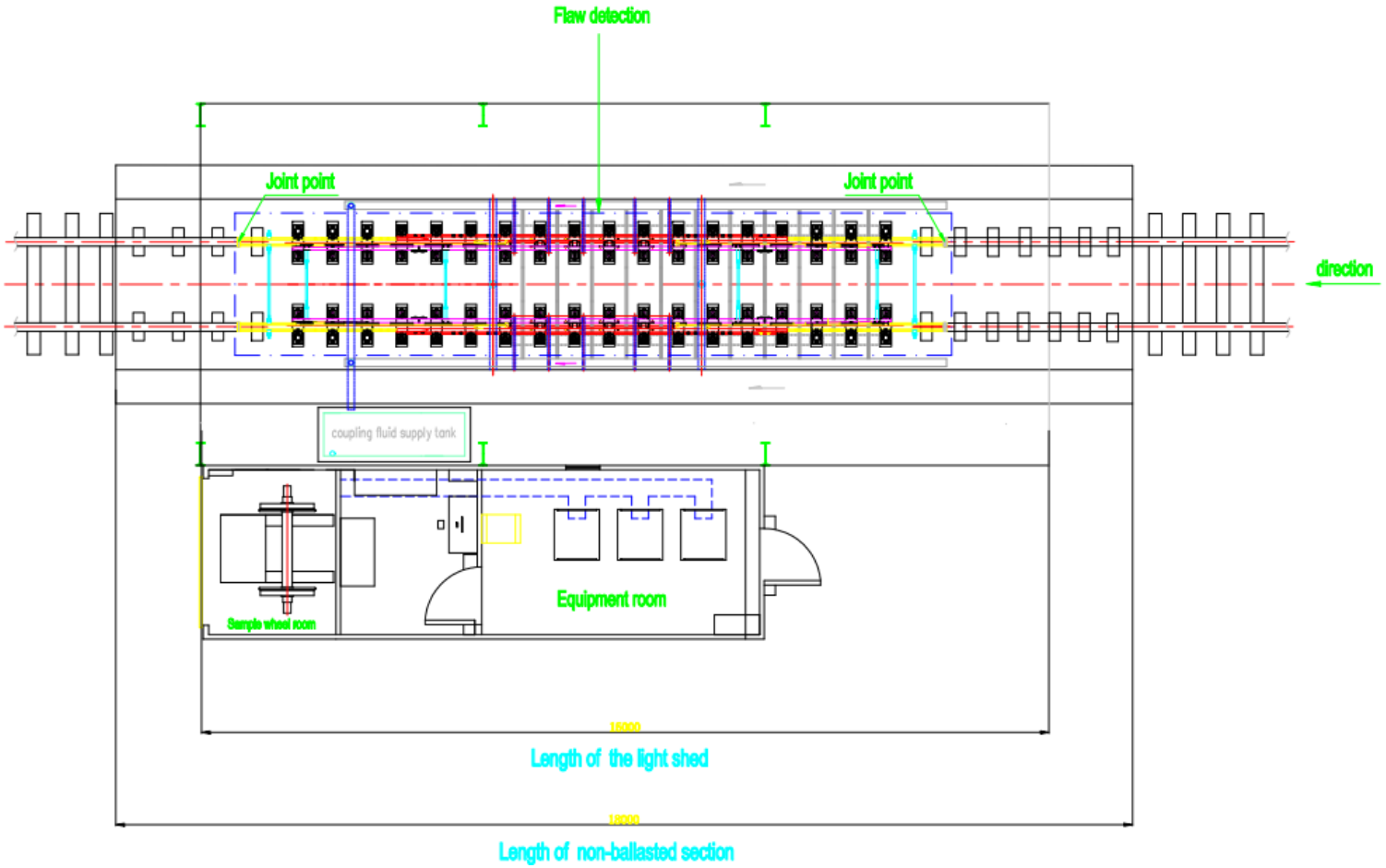


- Defects diagnosis automatically
- Efficient data analyzing
- Easy data management

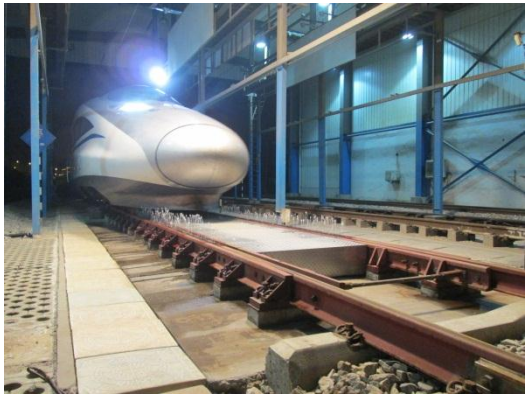
6. Technical Specification

- Probe frequency: 2.5MHz
- Inspection speed: ≤20km/h;
- constant speed is recommended.
- Axle loading: ≤30t

6. Technical Specification-System Layout



7. Application-High-speed Train


Wuhan


Qingdao


Tianjin


Changsha


Chongqing


Urumqi

7. Application-Locomotive


Handan


Jiangan

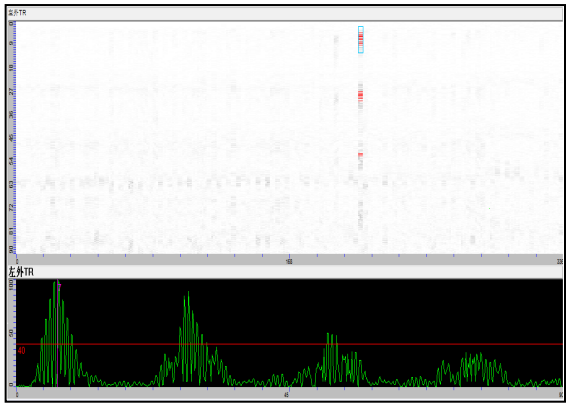

Lanzhou


Houma

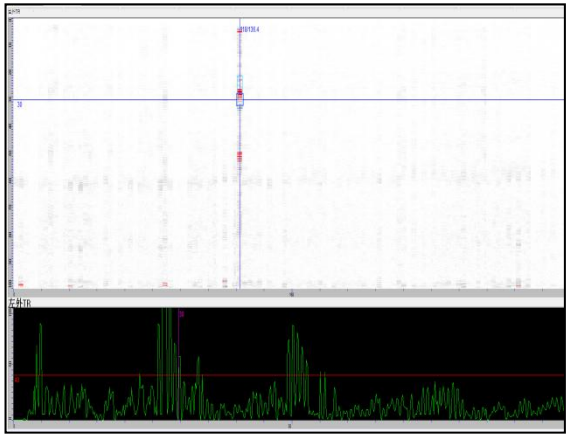

Xinxiang

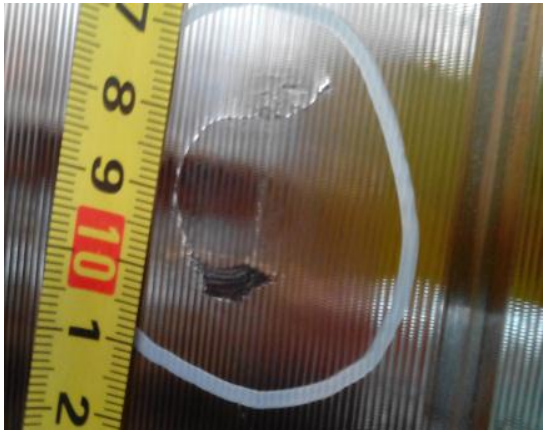

Chongqing

8.Typical Defect Cases



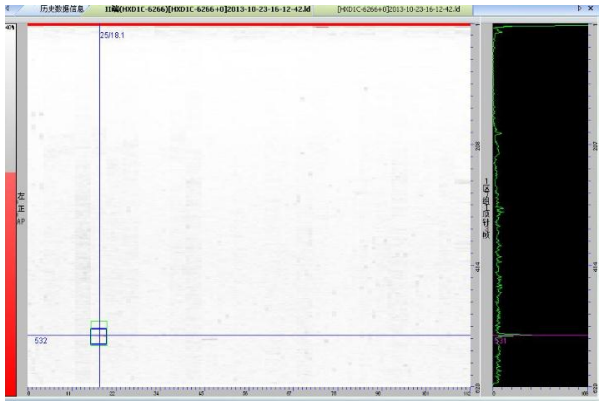
Crack with 70mm length and 17mm width, 10mm below the wheel rim tread



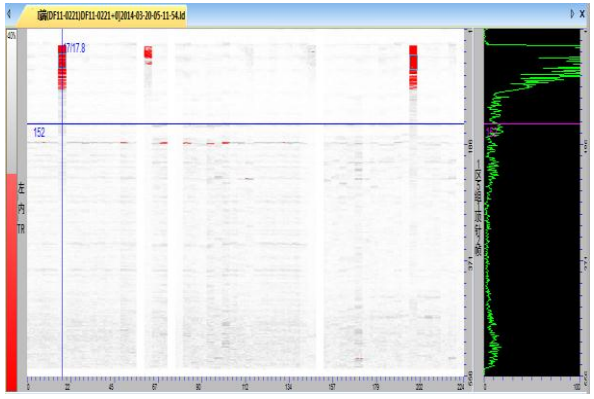


Crack with 25mm length and 30mm width, 5mm below the wheel rim tread

8.Typical Defect Cases

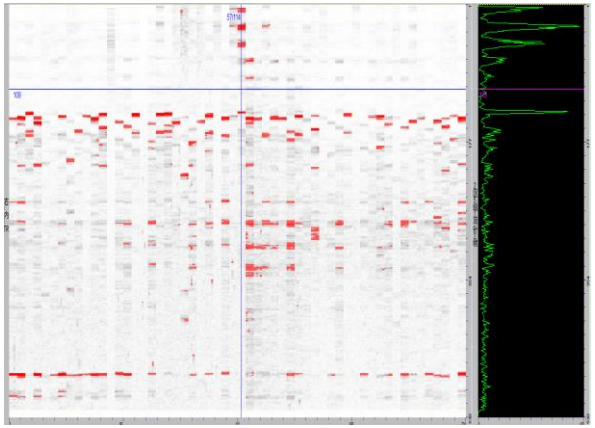
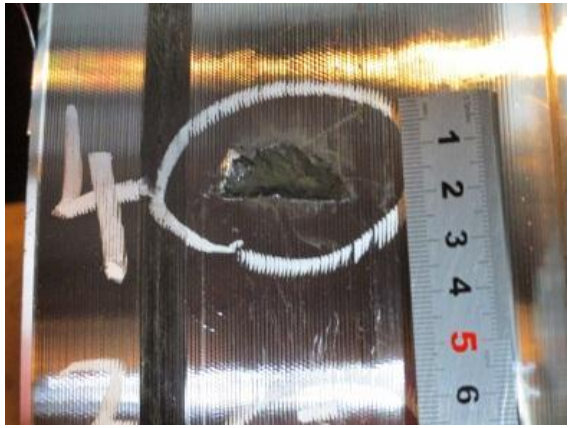


Crack with 5mm length and 30mm width, 8mm below the wheel rim tread

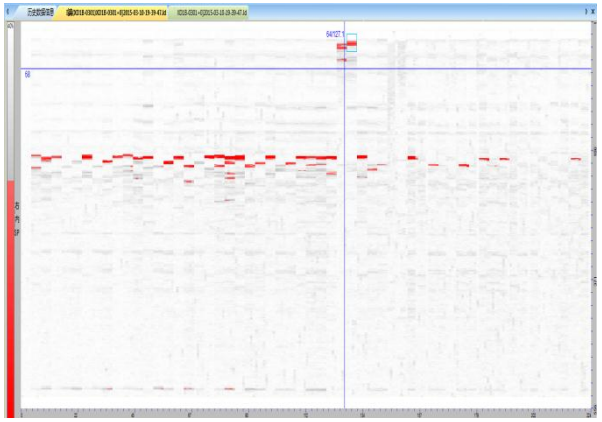


Crack with 77mm length and 2mm width, 11mm below the wheel rim tread

8.Typical Defect Cases

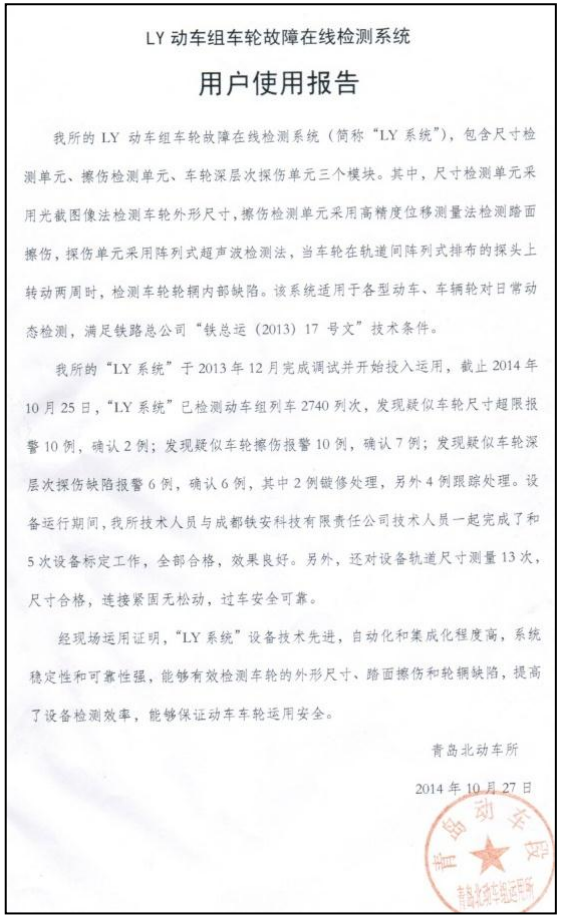




Crack with 10mm length and 30mm width, 10mm below the wheel rim tread


Crack with 80mm length and 25mm width, 11mm below the wheel rim tread

9.Recommendation Letters from Customers



LY 动车组车轮故障在线检测系统

用户使用报告

我所的 LY 动车组车轮故障在线检测系统（简称“LY 系统”），包含尺寸检测单元、擦伤检测单元、车轮深层次探伤单元三个模块。其中，尺寸检测单元采用光截图像法检测车轮外形尺寸，擦伤检测单元采用高精度位移测量法检测踏面擦伤，探伤单元采用阵列式超声波检测法，当车轮在轨道间阵列式排布的探头上转动两周时，检测车轮轮辋内部缺陷。该系统适用于各型动车、车辆轮对日常动态检测，满足铁路总公司“铁总运（2013）17 号文”技术条件。

我所的“LY 系统”于 2013 年 12 月完成调试并开始投入运用，截止 2014 年 10 月 25 日，“LY 系统”已检测动车组列车 2740 列次，发现疑似车轮尺寸超限报警 10 例，确认 2 例；发现疑似车轮擦伤报警 10 例，确认 7 例；发现疑似车轮深层次探伤缺陷报警 6 例，确认 6 例，其中 2 例镟修处理，另外 4 例跟踪处理。设备运行期间，我所技术人员与成都铁安科技有限责任公司技术人员一起完成了和 5 次设备标定工作，全部合格，效果良好。另外，还对设备轨道尺寸测量 13 次，尺寸合格，连接紧固无松动，过车安全可靠。

经现场运用证明，“LY 系统”设备技术先进，自动化和集成化程度高，系统稳定性和可靠性强，能够有效检测车轮的外形尺寸、踏面擦伤和轮辋缺陷，提高了设备检测效率，能够保证动车车轮运用安全。

青岛北动车所

2014 年 10 月 27 日

Qingdao

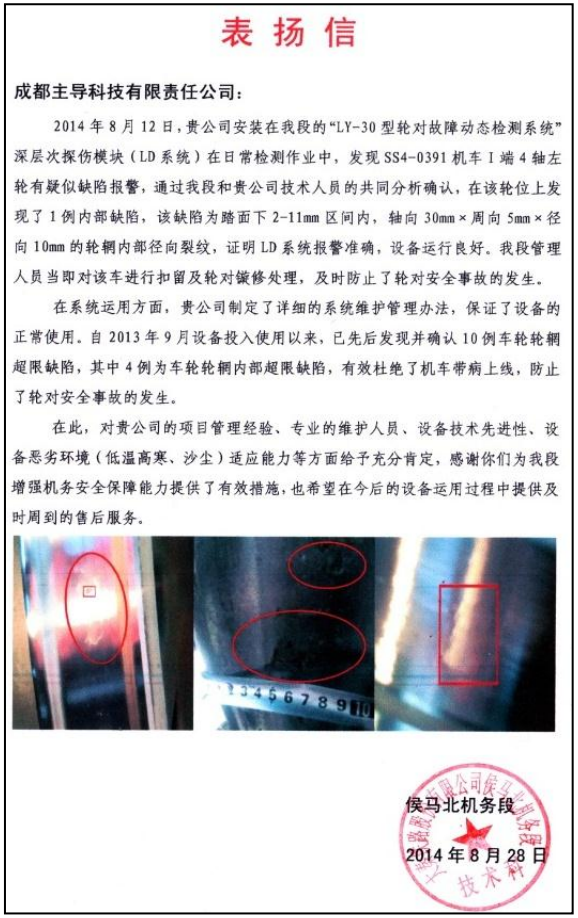


表 扬 信

成都主导科技有限责任公司：

2014 年 8 月 12 日，贵公司安装在我段的“LY-30 型轮对故障动态检测系统”深层次探伤模块（LD 系统）在日常检测作业中，发现 SS4-0391 机车 I 端 4 轴左轮有疑似缺陷报警，通过我段和贵公司技术人员的共同分析确认，在该轮位上发现了 1 例内部缺陷，该缺陷为踏面下 2-11mm 区间内，轴向 30mm × 周向 5mm × 径向 10mm 的轮辋内部径向裂纹，证明 LD 系统报警准确，设备运行良好。我段管理人员当即对该车进行扣留及轮对镟修处理，及时防止了轮对安全事故的发生。

在系统运用方面，贵公司制定了详细的系统维护管理办法，保证了设备的正常使用。自 2013 年 9 月设备投入使用以来，已先后发现并确认 10 例车轮轮辋超限缺陷，其中 4 例为车轮轮辋内部超限缺陷，有效杜绝了机车带病上线，防止了轮对安全事故的发生。

在此，对贵公司的项目管理经验、专业的维护人员、设备技术先进性、设备恶劣环境（低温高寒、沙尘）适应能力等方面给予充分肯定，感谢你们为我段增强机务安全保障能力提供了有效措施，也希望在今后的设备运用过程中提供及时周到的售后服务。

侯马北机务段

2014 年 8 月 28 日

Houma

10.Video Introduction

SCLEAD 主导科技

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Website: http://www.sclead.com
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