

機械與機電系統研究所

MECHANICAL AND MECHATRONICS SYSTEMS
RESEARCH LABORATORIES, MMSL.

Railway Systems





Intelligent Track Inspection Vehicle

This intelligent, electric, and lightweight rail inspection vehicle is designed for track maintenance. Integrated with the Permanent Way Information System (PWIS), it enables automated inspection and data reporting, reducing labor requirements and enhancing efficiency.



Technical Advantages and Features

Electrification- Net Zero Emissions

- Electric-powered with low noise and zero emissions, significantly improving working conditions.

Intelligent Status Detection and Alerts

- Supports recording on-site inspection status via text, photos, video, and audio.
- Inspection data is transmitted in real time to central management system, keeping the control center updated simultaneously.

Lightweight and Fast Assembly Design

- Lightweight aluminum frame with a front and rear modular design enables easy transport and assembly.
- The steering seat, equipped with a patented rotation and reversing mechanism, enables vehicle direction changes in under 30 seconds.



Industrial Benefits and Business Opportunities

Industry Applications:

Railway Industry (e.g., trams, high-speed rail)

Application Examples:

Used for rapid track inspection to enhance inspection efficiency.



Lightweight vehicle body
for easy carrying and assembly



Intelligent track inspection vehicle



Direction reversal
of track vehicles within 30 seconds



Bogie Running Tester (BRT)

Jointly developed by Industrial Technology Research Institute (ITRI) and Taiwan High Speed Rail Corporation (THSRC), The Bogie Running Tester (BRT) serves as an additional checkpoint in the bogie maintenance process. By simulating high-speed operation in the depot before mainline testing, it identifies potential issues in advance, enhancing maintenance quality and reducing time and labor costs.



Technical Advantages and Features



- The first domestically developed train bogie running tester delivers performance comparable to international counterparts and surpasses Japanese and German alternatives in cost-efficiency.



- Integrates Industry 4.0 technologies, including predictive diagnostics, AI, and big data analytics to monitor equipment aging and ensure motor and bearing health under full-range operation.



- Localization of equipment installation and maintenance parts, enabling faster, more efficient inspection and maintenance services for steering gear.



Industrial Benefits and Business Opportunities

Industry Applications:

Railway Industry (e.g., trams, high-speed rail)

Application Examples:

High-speed, medium-speed, and low-speed railway operators in domestic and international markets.



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