

## A Sample of Products Developed by Railway Technical Research Institute

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Railway Technical Research Institute (RTRI) conducts tests and research for companies and other organizations, using know-how that it has accumulated through its extensive R&D activities. In this way, RTRI responds to diverse needs of the railway industry and the traveling public, both at home and abroad.

The many and varied R&D projects commissioned to RTRI include testing, studies, design and engineering. We also offer lectures and advice on a wide range of rail technology issues.

Ten major products developed by RTRI are outlined below.

### 1. Products for vehicles

- Cerajet (an adhesion improvement material jetting device): This device is used to improve the adhesion coefficient by jetting ceramic or silica sand particles between the wheel and the rail. Because of the high jet speed and good response, the device can be interlocked with slide/slip signals and emergency brake commands. It can be used during both low and high speed operations (Fig. 1).
- Servo-cylinder for tilting car: This compact device combines a cylinder, servo-valve and displacement sensor. It controls the tilt of a tilting car.
- Semi-active suspension system for railway vehicles: This system significantly reduces lateral vibrations of a carbody above the bogie springs, making it possible to increase running speed and improve riding comfort.
- Simple vibration and riding comfort measurement device: This compact, low-cost system measures vehicle vibrations

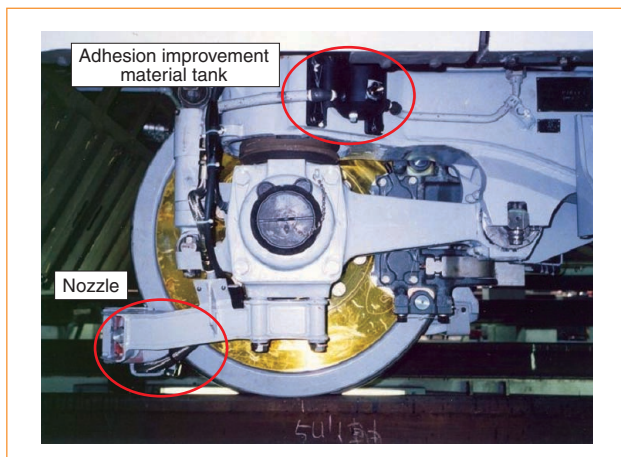


Figure 1. Installation of Cerajet

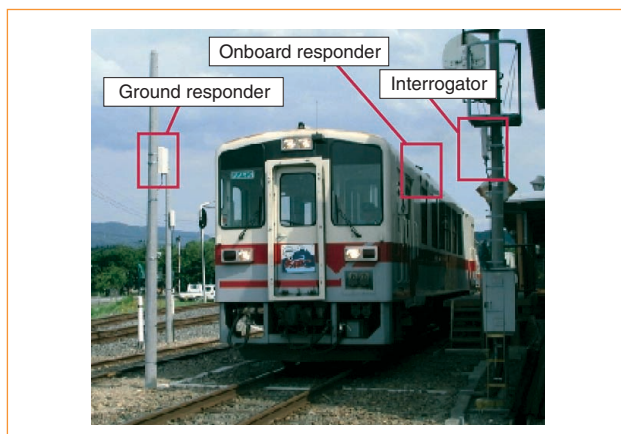


Figure 2. COMBAT

easily, even during commercial runs. Simple software for analyzing vehicle vibration and riding comfort levels has also been developed for the device.



### 2. Products for signal, communication and electric systems

- Computer and Microwave Balise-Aided Train control system (COMBAT): This system detects a train with a non-contact, point-detection method using microwaves. It is equal or superior to conventional track circuitry in terms of safety and detection performance (Fig. 2).
- Catenaries/pantograph system motion simulator: This simulator facilitates complicated calculations to accurately analyze the design and deformation of overhead contact wire structure, the motion of catenary/pantograph systems, etc., using a personal computer.
- POWER DIAGRAM: This simulator permits ascertaining the ever-changing load factors of each train in an operating schedule within an entire track section. It can be used to calculate suitable substation capacity, pantograph point voltage, etc.

### 3. Products for infrastructure

- Ladder track: This ladder-shaped track system is composed of a pair of rails on longitudinal pretension concrete beams that are fastened together with lateral steel pipes. We have developed two types of ladder tracks: a ballasted ladder track for track laid on ballast, and a floating ladder track for track not laid on ballast (Fig. 3).
- Micro LABOCS (track maintenance and management database system): The database contains track inspection data, measurement data obtained during train operations, track diagrams, etc. The data can be analyzed and processed as needed.
- IMPACT-III (bridge substructure soundness evaluation system): RTRI has established an impact and vibration test method to accurately determine the soundness of bridge substructures and elevated bridges. Our bridge substructure soundness evaluation system "IMPACT" effectively supports test functions. IMPACT-III is the latest IMPACT edition.

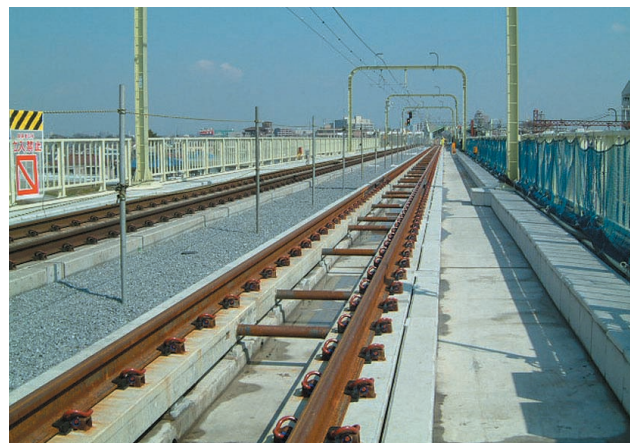


Figure 3. Floating ladder track