Europe's Rail

Co-funded by the European Union

Optimising running gear

Railway vehicles are complex machines, meaning their running gear require regular maintenance. Addressing this need is EU-Rail, which delivered technical demonstrators covering three key areas.

CONDITION-BASED MAINTENANCE (CBM)

CBM is a maintenance strategy that monitors the condition of an asset to determine when maintenance is needed.

Solutions delivered

- Hardware architecture and main components
- Hardware and software architecture, components and algorithms
- Bogie component diagnostic system
- Health monitoring of high-speed trains
- Train-borne ultrasonic detection system

Key Finding

CBM can reduce maintenance costs for running gear by up to **12%** and increase reliability by up to **15%**.

Fast Fact

The expected impact of implementing CBM solutions includes a **2%** increase in reliability and **5%** decrease in running gear maintenance costs.

Did You Know?

Some of the CBM solutions delivered could detect up to **90%** of insufficiently lubricated gauge faces.

RADIAL STEERING ON THE BOGIE

Work focused on reducing the wear of wheels and rails, as well as avoiding noise in curves.

Solutions delivered

- Active hydraulic actuator
- Hydro elastic bushing
- Electromechanical actuators
- Active steering system

Key Finding

Radial steering can reduce maintenance costs by up to **10%**.

Fast Fact

The solutions delivered have the potential to reduce running gear maintenance costs by between **3% - 10%**.

SUSPENSION

Assessing the benefits of active or semi-active suspension systems to boost passenger comfort.

Solutions delivered

- Computer model (virtual twin) of two-axle metro car
- Design of experiment to select most suitable active dampers

Key Finding

Two-axle metro car can meet the recommendations for passenger comfort at speeds up to **100 km/h** or more.

Did You Know?

Suspension with active vertical dampers is the best choice for passenger comfort.

CONCLUSION

1. CBM has the potential to reduce rail wear and track settlement and to enable the early detection of potential failures in running gear.
2. Promising new radial steering solutions include the use of active hydraulic actuators, hydro-elastic bushing, electromechanical actuators, and a system to actively steer single-axle running gear.
3. Future trains will run faster, and virtual tests and simulations show that active suspension will likely be the best way to ensure passenger comfort.

Who Benefits

Infrastructure managers

Railway operators

Suppliers

Final users

WANT TO LEARN MORE?

Solutions developed by Shift2Rail, Europe's Rail's predecessor programme

rail-research.europa.eu