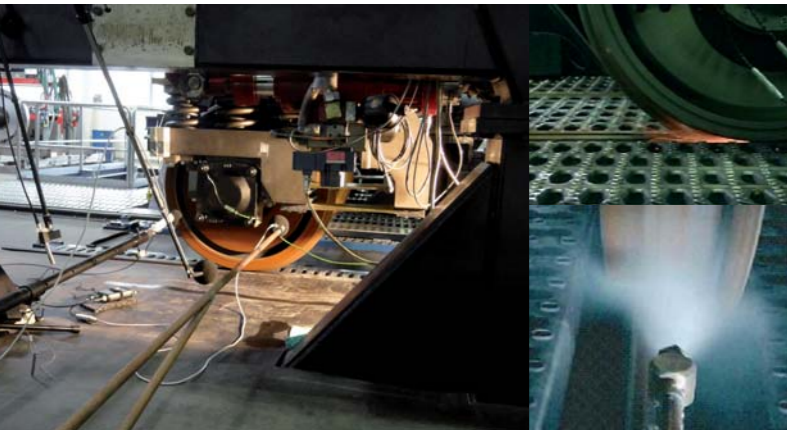




**Application examples:**

- Materials for wheels, rails, switches and crossings, joints and repair welding technologies for the track
- Endurance testing of wheelset constructions
- Fatigue crack growth of wheelset axles
- Rolling noise, curve squeal, sound absorber
- Brakes, lubricants, friction modifier, moistening
- Rolling over foreign objects, derailment
- Vibration analysis on bogies
- Wheelset diagnosis, early detection of damage



**Selected references for the large-scale test rigs:**

- **DB Fernverkehr:** fatigue crack growth tests on wheelset axles, testing of wheel materials (e.g. wheels of Sumitomo Corp.), wheelset diagnosis systems
- **DB Netz:** product qualification of rails, switches and crossings, insulated rail joints, welding joints, qualification of welding materials, influence of friction modifiers
- **Bochumer Verein Verkehrstechnik:** fatigue crack growth tests, wheel constructions for tram vehicles, use of high-strength wheel materials
- **voestalpine:** design optimization of crossings, product qualification of rails, use of higher-strength track materials
- **Bombardier Transportation:** vibration analysis on a high speed bogie
- **Knorr-Bremse Sfs:** longitudinal force measurement at a brake
- **Participation in projects on noise reduction:** curve squeal, wheel sound absorber (Quiet Train on Real Track), use of lubricants

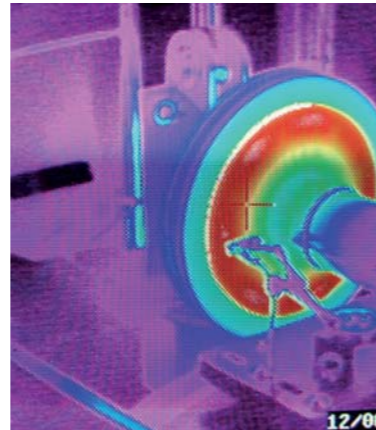
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**Wheel/rail testing**  
 with real forces and  
 up to a speed of 300 km/h!

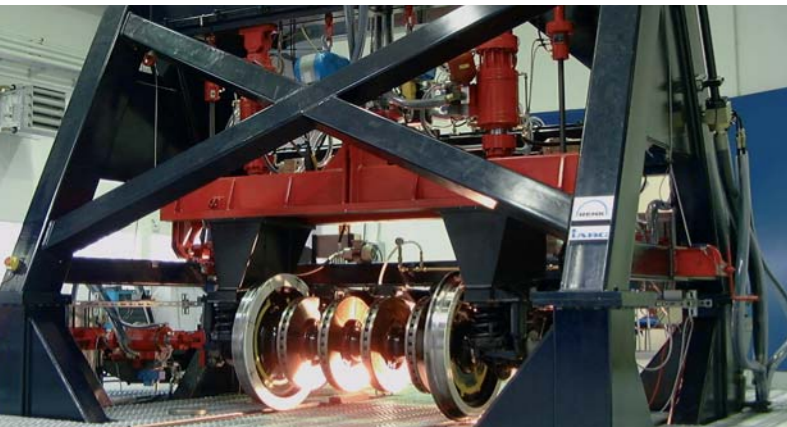
The wheel/rail large-scale  
 test rigs of  
**DB Systemtechnik**

In the area of wheel/rail contact, DB Systemtechnik not only has the system expertise for the wheel but also for the rail. We offer competent engineering, consulting and testing services in all areas of wheel/rail contact for railway and local transport companies as well as the railway industry.

On our wheel/rail test rigs, we test proven and innovative structures for wheels, rails, switches and their components using real forces and speeds of up to 300 km/h:

- During this testing procedure, you receive cost-effective insights and measurement data for **optimising your components**.
- At the test rigs, we generate the **interaction of wheel and rail** according to your requirements – quickly and hazard-free. We demonstrate, which **forces or damage can occur at the components**.
- If required, we also create **environmental influences** such as lubrication, and acoustic noise and vibration emissions at the test rig.
- Supported by our specialized experts, you can conceptualise and **test your solution methods**.

## Our test rigs



### Roller rig A

The roller rig for speeds of up to 300 km/h offers testing opportunities at running and powered wheelsets of any structure for:

- Wear and rolling contact fatigue
- Rolling tests with lubrication and brake slip
- Acoustic inspections, curve squeal, rolling noise and wheel sound absorber
- Vibration analyses
- Tests with wheelset and bearing diagnosis systems

<b>Operation</b>	Wheel materials, brakes, influence of friction coefficient, wheel sound absorbers, bogies, wheelset bearings, diagnostic systems	
<b>Wheelset</b>	Diameter Brakes	400 – 1,250 mm e.g. disc brake
<b>Rail rollers</b>	Material Diameter Profile track gauge	R260 2.10 m 60E2 1:40 inclined, or similar 1,435 mm
<b>Forces, operating conditions</b>	Axle load Lateral force Speed	up to 340 kN 30 kN, skew up to 300 km/h
<b>Control</b>	Dynamic, freely programmable	

## Our test rigs



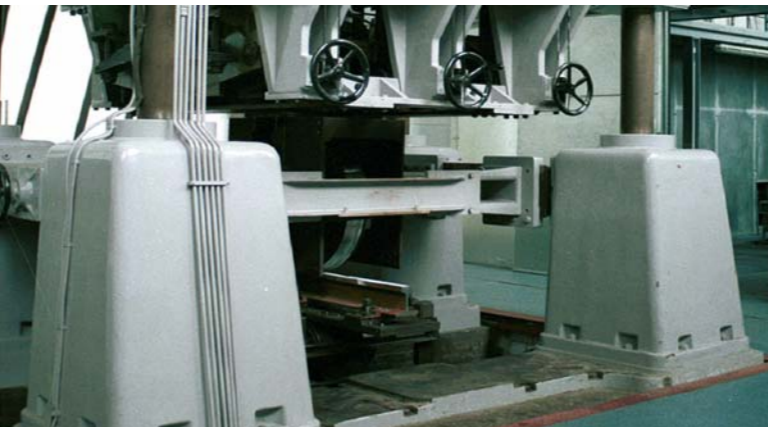
### Linear test rig A

The roller rig A can be converted into a linear test rig within a few hours. In this configuration, wear and rolling contact fatigue of rail components can be tested:

- Rail segments
- Repair weldings and welding joints
- Insulated rail joints
- All parts of switches and crossings

<b>Operation</b>	Rails, weld joints, switch constructions, wear and crack development, wheel/rail interaction, rolling over foreign objects	
<b>Single wheel</b>	Diameter Wheel profile according to customer preferences	800 – 920 mm
<b>Rail, turnout frog or similar</b>	Total length Usable distance Max. speed	2.8 m to 3.6 m 2.0 m to 2.1 m 7 km/h
<b>Forces, operating conditions</b>	Contact force Lateral force	up to 200 kN up to 20 kN, skew
<b>Load</b>	1,000 load cycles/h; approx. 1 MGT/d	

## Our test rigs



### Linear test rig B

Another linear test rig for superstructure components, suitable for cost-efficient inspection of smaller rail segments. On a distance of 0.7 m, a single wheel rolls over the rail segment. The following is inspected:

- Materials for switches and crossings
- Re-forced section of switch blades
- Insulated rail joints
- Filler materials

<b>Operation</b>	Rails, turnout frog with scale reduction, Insulated rail joints, weld joints	
<b>Single wheel</b>	Diameter	up to 920 mm
<b>Rail segment</b>	Length Usable distance Max. speed	1 m 0.7 m 12 km/h
<b>Forces</b>	Contact force Lateral force	200 kN wheel flange offset, skew
<b>Load</b>	5,000 load cycles/h; approx. 5 MGT/d	

## Our test rigs



### Heavy duty rig C

Investigation of the dynamic load of wheels and wheelsets with high contact forces and bending moments. In order to allow continuous operation for several 100,000 km, the profiles of the rail rollers and wheels are cylindrical, which avoids wear and deformation in the rolling contact.

- Wheel constructions with elastic springs, e.g. tram wheels
- Wheelset constructions, e.g. adjustable gauge wheelsets
- Fatigue crack growth of wheelset axles

<b>Operation</b>	Adjustable gauge wheelsets, shaft-hub connection, Fatigue crack growth of wheelset axles	
<b>Wheelset</b>	Diameter Wheel profile	600 – 1,200 mm cylindrical
<b>Rail rollers</b>	Diameter Rail profile Speed	2.10 m cylindrical up to 160 km/h
<b>Forces, operating conditions</b>	Axle loads Lateral force Control	up to 340 kN 80 kN programmable
<b>Load</b>	e.g. 10 million load cycles (continuous load) in 12 days	