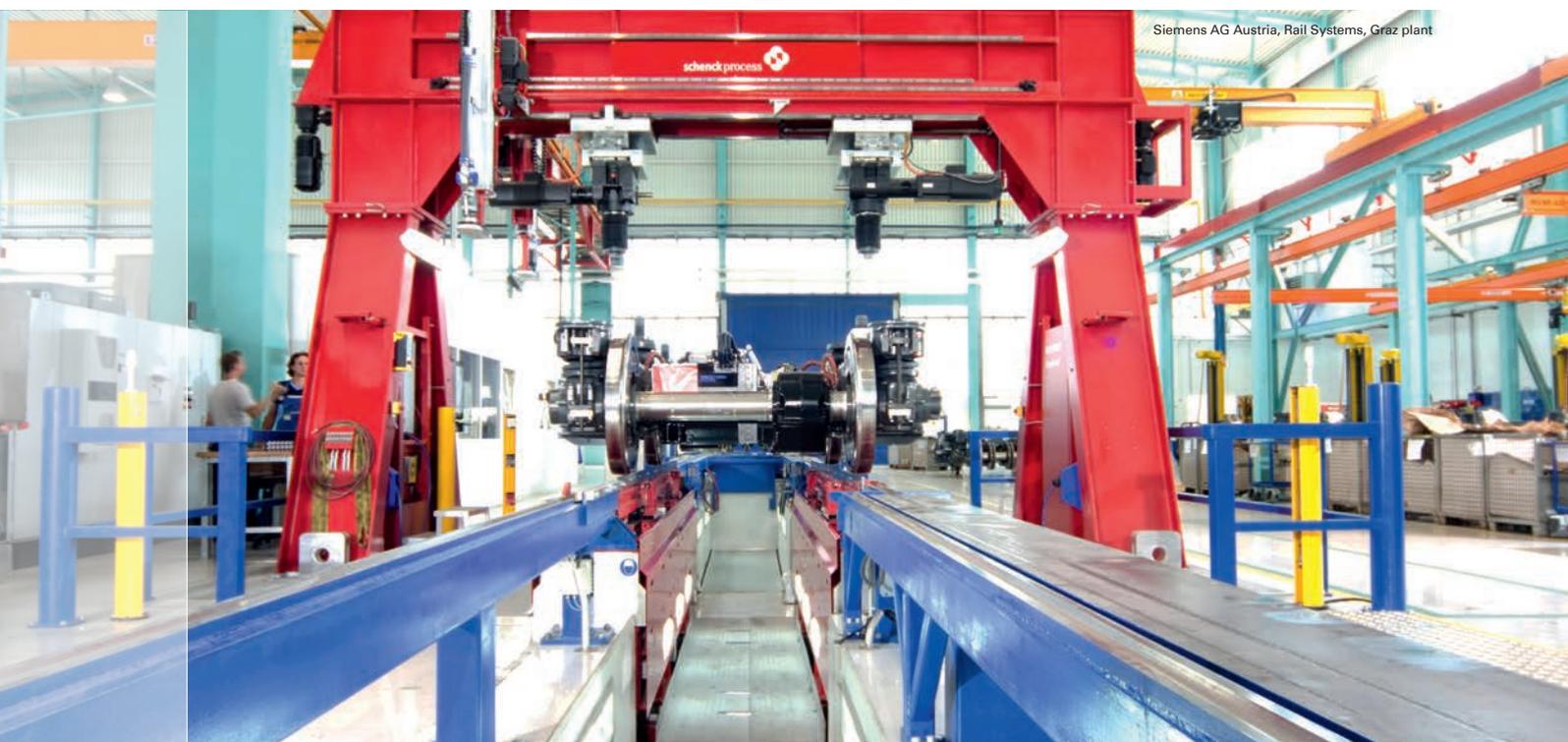


# One system. Three versions. Many applications.



Siemens AG Austria, Rail Systems, Graz plant

## The new generation of bogie adjustment.

MULTIRAIL® Bogie Test Bench pro, MULTIRAIL® Bogie Test Bench plus  
and MULTIRAIL® Bogie Test Bench eco

## Enhanced safety

The MULTIRAIL® Bogie Test Bench product family

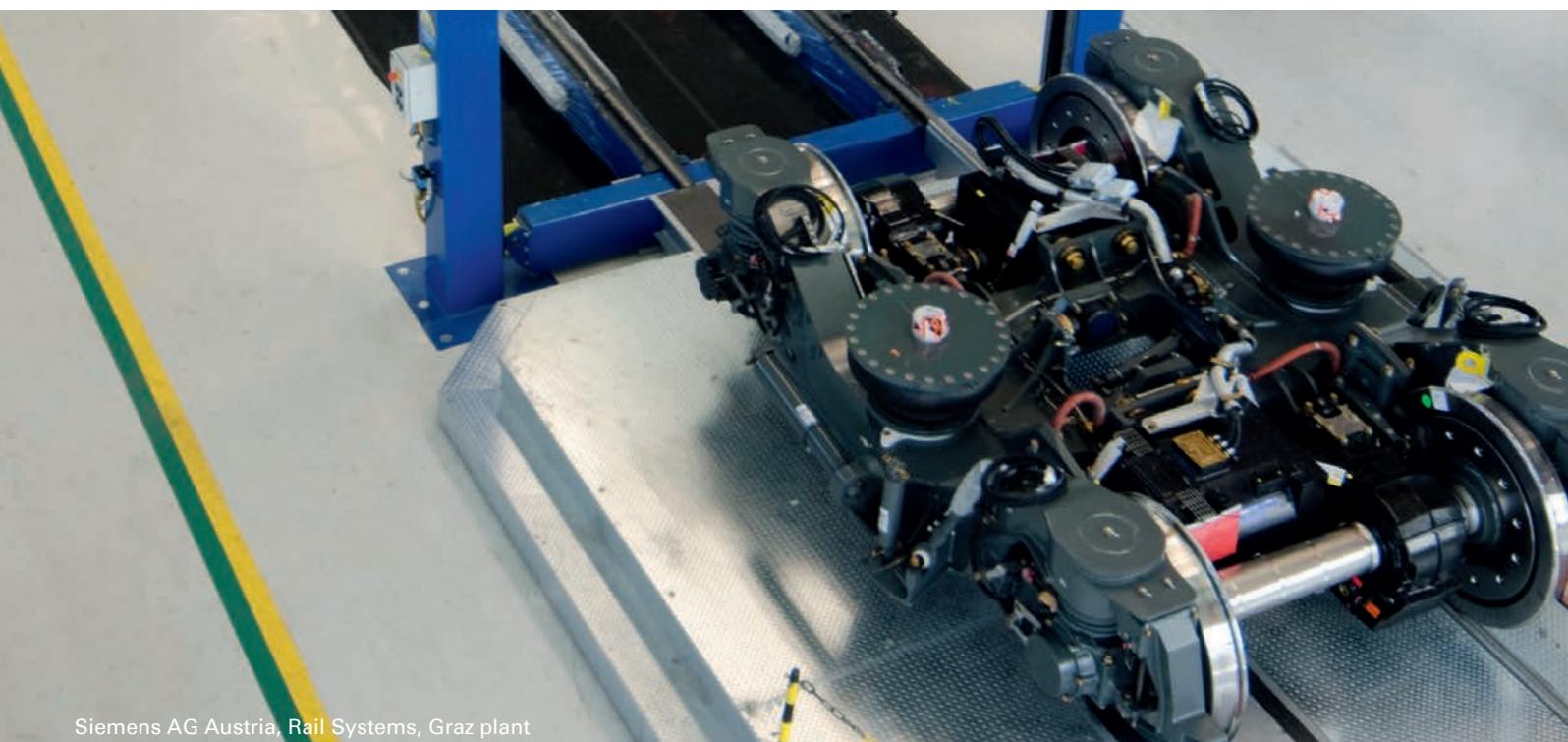


Siemens AG Austria, Rail Systems, Graz plant

### **Bogie testing for new rail vehicles and servicing**

Perfectly set bogies deliver improved safety and result in less wear. To provide the optimum bogie test rig for every application, Schenck Process is now providing the MULTIRAIL® Bogie Test Bench in three different designs. Whether it be new vehicle construction or maintenance, locomotive or high-speed bogies, MULTIRAIL® Bogie Test Bench pro, MULTIRAIL® Bogie Test Bench plus and MULTIRAIL® Bogie Test Bench eco will make your production and test process more accurate for improved safety.

MULTIRAIL® Bogie Test Bench pro  
MULTIRAIL® Bogie Test Bench plus  
MULTIRAIL® Bogie Test Bench eco



Siemens AG Austria, Rail Systems, Graz plant

Today the bogies used in all areas of rail transport are highly developed and complex. To achieve cost-effective as well as smooth rail operations, the bogies have to be adjusted perfectly and fulfil a large number of important functions:

- Derailment protection
- Minimisation of wear
- Reduction in noise development
- Reduction in dynamic forces
- Safeguarding of smooth running and comfort
- Optimisation of maintenance intervals
- Free replaceability of the bogies

## The principle of modern bogie testing



A bogie test rig produces static test forces which simulate the weight of the rail car body. These test forces are introduced through the bogie via the wheels to the measurement equipment. Under load, the test rig calculates the static vertical wheel forces, a major input measurement parameter for optimum bogie adjustment using shims. Nowadays, they occupy a central position in production as well as the test process and are therefore often used for geometric monitoring measurement and adjustment tasks.

## **More safety. Less wear.**

Whether it be new vehicle construction or maintenance, for underground trains and trams or regional and high-speed trains, the new Schenck Process MULTIRAIL® Bogie Test Bench product family offers the ideal bogie test rig for every application. For improved safety and less wear.



## **Innovative. Fully automatic. Precise. DIN compliant.**

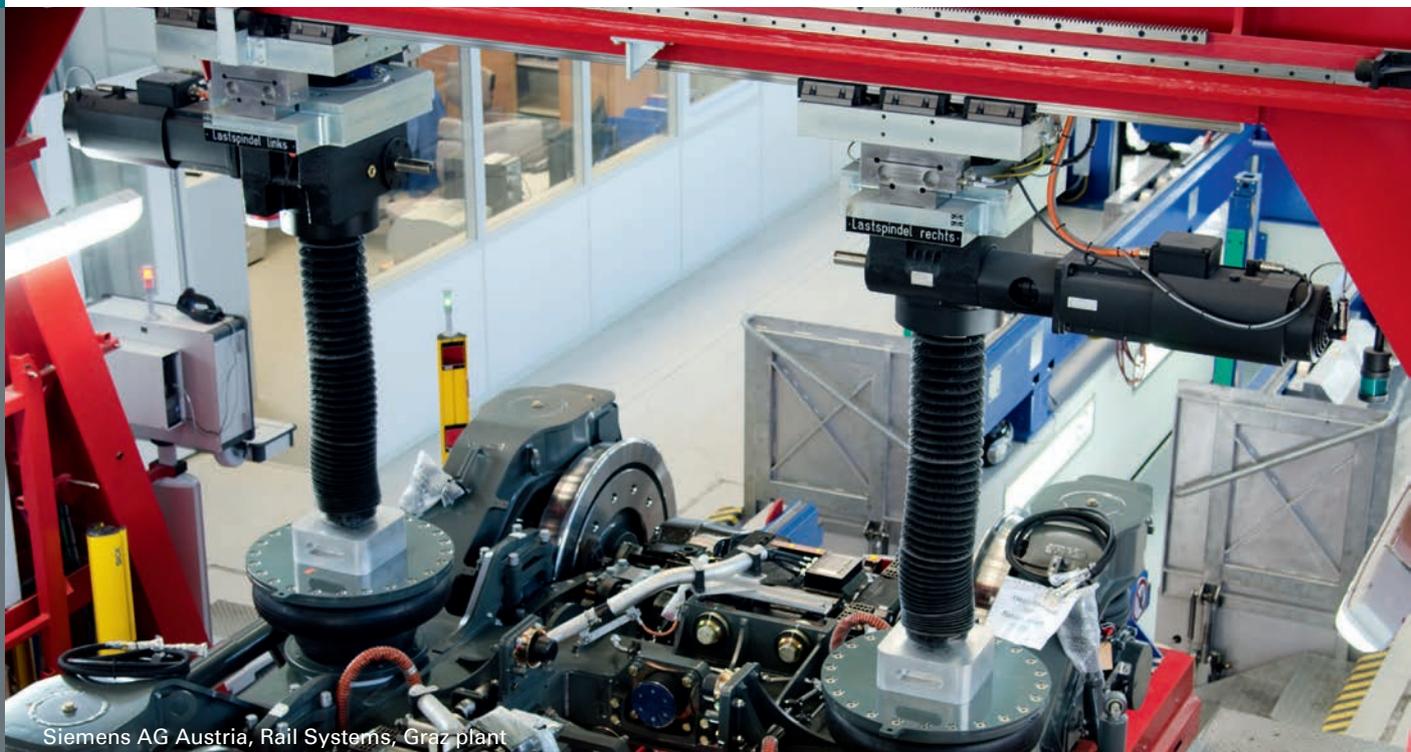
MULTIRAIL® Bogie Test Bench combine the very latest technology, maximum automation and outstanding quality. The high-tech version MULTIRAIL® Bogie Test Bench pro also enables complete bogie testing in accordance with DIN 25043-7. This is a standard for testing new bogies in which the Schenck Process experts played a key role. MULTIRAIL® Bogie Test Bench ensures not only highly accurate, but also highly reproducible results because each bogie can be automatically positioned in exactly the same way as the previous one.

## **Always fully up-to-date**

As well as supplying and installing MULTIRAIL® Bogie Test Bench, Schenck Process also modernises existing systems. For safe, smooth and cost-effective rail operation.

# MULTIRAIL® Bogie Test Bench

The optimum bogie test rig for any application

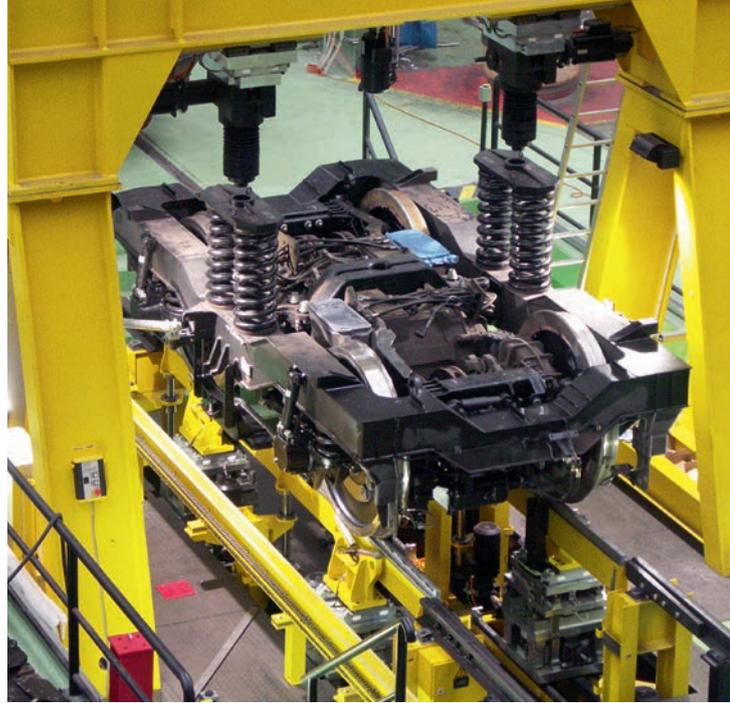


Siemens AG Austria, Rail Systems, Graz plant

## Versions for bogie testing

Modern test rigs for bogie testing need to be designed to allow all required test arrangements and processes to be carried out with simple resources and in high measuring technology quality. MULTIRAIL® Bogie Test Bench pro and MULTIRAIL® Bogie Test Bench plus reliably and flexibly satisfy these requirements thanks to their modular structure. The basic bogie test configuration does not involve secondary suspension. Other tests, e.g. with secondary suspension fitted, with air suspension via adapter crossbeams or the testing of bogies with tilting technology or Jacobs bogies via adapter crossbeams, can be easily undertaken at speed.

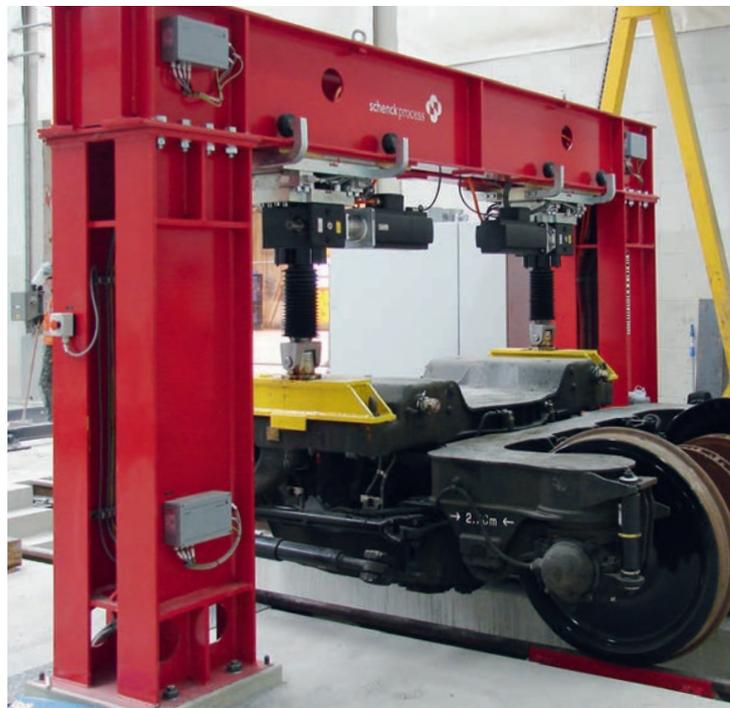
Test with  
secondary  
suspension fitted



Testing with air  
suspension via  
adapter crossbeams



Testing bogies  
with tilting  
technology



# MULTIRAIL® Bogie Test Bench

## Installation versions



DB vehicle maintenance, Dessau plant

An important criterion for test rig installation is a variable concept that can be ideally adapted to the workshop surroundings and production requirements.

The Schenck Process MULTIRAIL® Bogie Test Bench pro and MULTIRAIL® Bogie Test Bench plus solutions minimise the forces that need to be absorbed by the foundations thanks to their closed frame design. Three versions are available for vertical arrangement of the test rig with respect to the zero level of the track in the shop floor.



Alstom Transport, Salzgitter plant

### **Above-ground version**

The entire test rig is assembled on a suitable shop floor, which minimises the costs of foundations and preparatory time. This version is used mainly in workshops with crane feeding and average production throughput in highly automatic mode.

### **Pit version**

The test rig is lowered fully into a special concrete foundation, making the bogies very accessible for inspection and maintenance work. This version is used mainly in volume production/testing with a high throughput and extensive additional measurement tasks.



Siemens AG Austria, Rail Systems, Graz plant

### **Semi-recessed**

The test rig is lowered some way into the foundations. The upper surface of the rails is around 650 mm above the shop floor. This solution is therefore an interesting compromise between the cost of foundations and access to the bogie.

# MULTIRAIL® Bogie Test Bench pro

The bogie test rig that can do everything



Siemens AG Austria, Rail Systems, Graz plant

Whether maximum product variety, high throughput, ultra-flexible testing facilities, minimal setup times and precision accuracy are required, MULTIRAIL® Bogie Test Bench pro is the right choice. The high-tech device for testing bogies in high-speed trains is also suited to vehicle development and for special tests. Outstanding features include the fully electro-mechanical design with spindle technology and fully automatic positioning of the bogie in the centre of the test rig. The best way to ensure improved safety, less wear and minimum maintenance and servicing costs. Precise, fast and flexible for a wide range of bogie types and sizes, the solution is important to optimise production processes in new bogie construction.



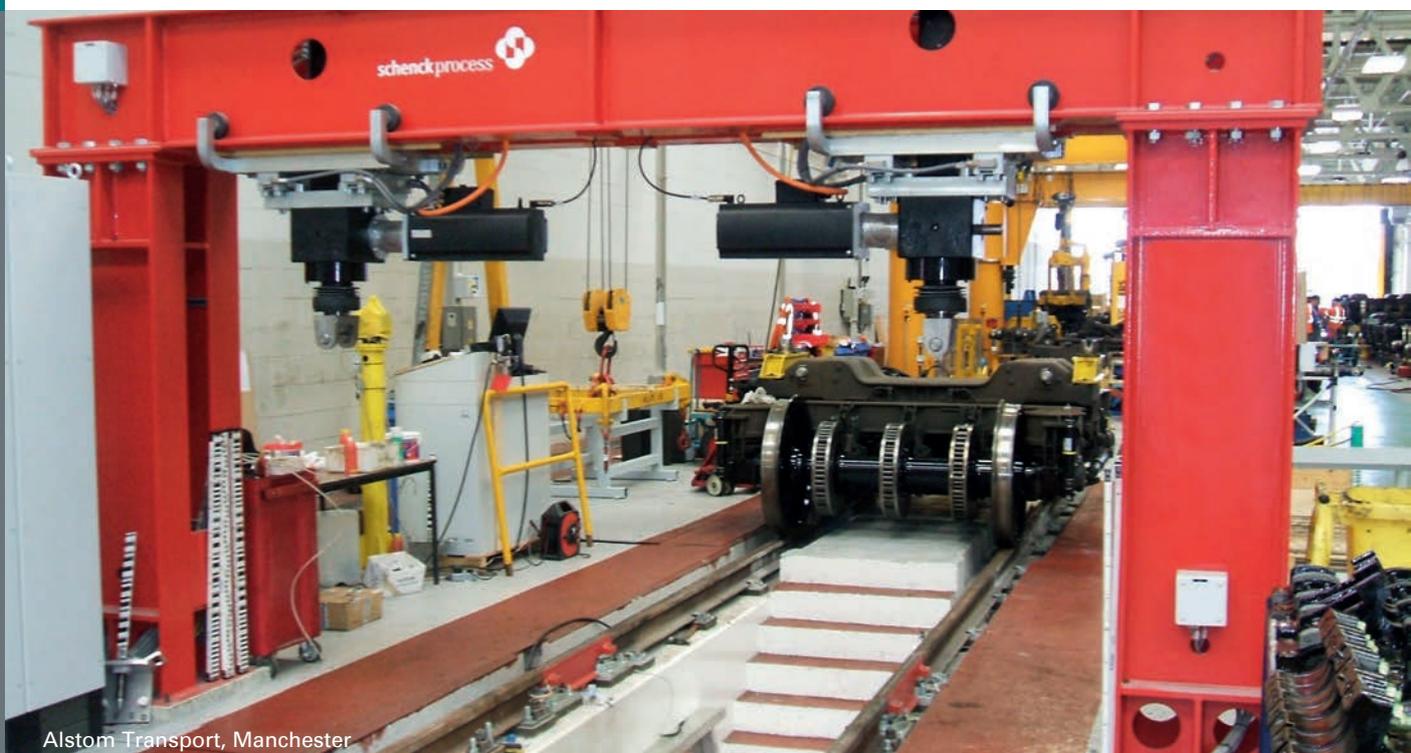
Automatic positioning of bogie in test rig on measuring circle plane of the wheels  
Siemens AG Austria, Rail Systems, Graz plant

#### **Function features**

- Improvement in process reliability
- Precise force measurement: typically  $\pm 0.1\%$
- Precise geometric measurements: typically less than 0.2 mm
- Fully automatic test process
- Complete bogie testing in accordance with DIN 25043-7
- PLC-controlled force and positioning control
- Automatic wheel set geometry measurement
- Automatic shim calculation for adjusting bogies
- Individually adaptable communication with ERP system
- Extensive safety and ergonomics concept for operators
- Reproducible bogie settings including calculation of all force and geometry references
- Demonstrated process capability

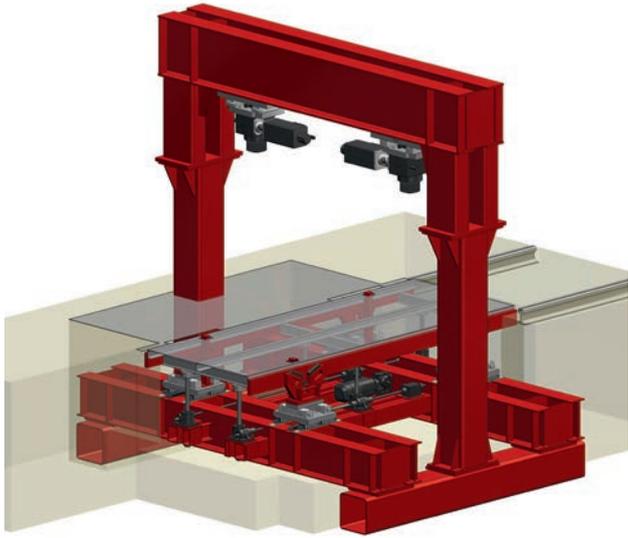
# MULTIRAIL® Bogie Test Bench plus

Day in, day out: the perfect solution for ongoing maintenance work



Alstom Transport, Manchester

Regular maintenance and repairs are indispensable for smooth operations. If a device is required to efficiently service regional trains, underground trains or trams, the MULTIRAIL® Bogie Test Bench plus offers value for money perfectly suited to this job. A further benefit is that negligible inherent errors increase process reliability, resulting in reliable compliance with threshold limits for the permissible wheel load differences prescribed by the manufacturers of the rolling stock.

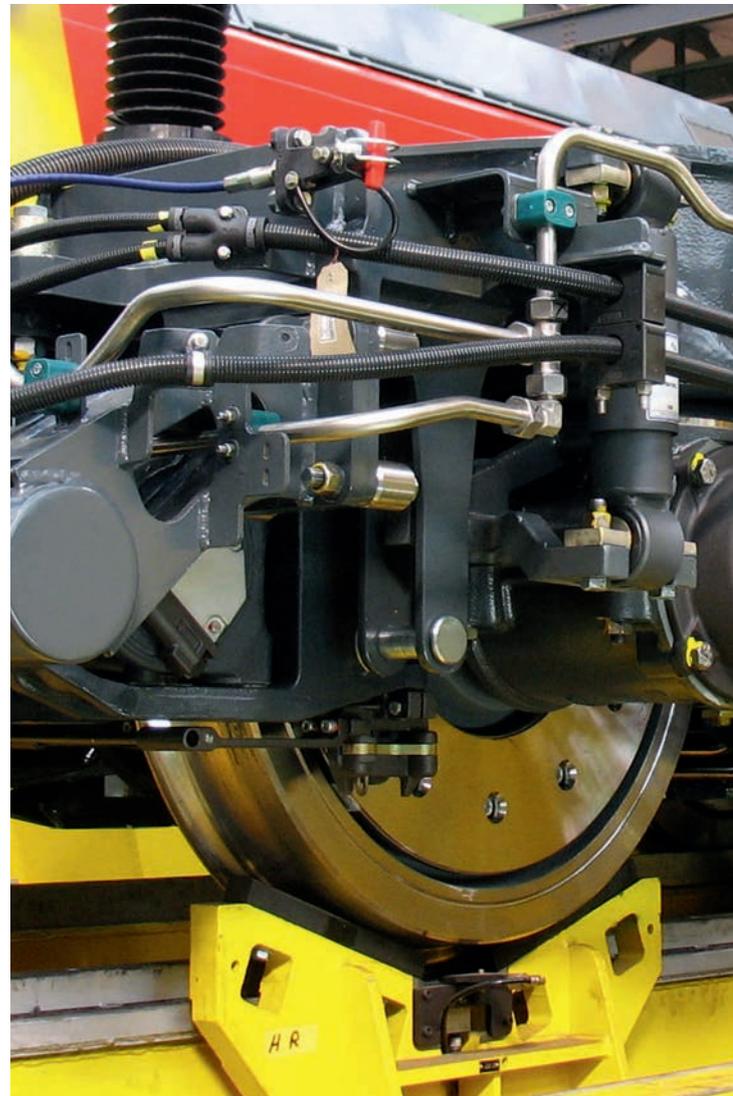


Fully closed force frame,  
fastened to the floor



### Function features

- Optimised design for similar bogie types
- Automated testing sequence after manual basic setting
- PLC-controlled force and positioning control
- Automatic shim calculation for adjusting bogies
- Ease of use and data evaluation
- Contribution towards documentation and quality assurance in accordance with DIN ISO 9001
- Also suitable for new constructions at vehicle manufacturers`
- Low cost for foundations



# MULTIRAIL® Bogie Test Bench eco

Two in one: the innovative solution for maintenance and assembly



DB vehicle maintenance, Dessau plant

Integration stand and load testing in one go.

When assembling and disassembling bogies with a combined load check, the individual vertical wheel forces in the bogie have to be quickly checked with sufficient accuracy.

MULTIRAIL® Bogie Test Bench eco combines the two functions of „load“ and „wheel load measurement“ in a bogie test rig on a shared workstation. The integrated wheel load scales in the track for process monitoring ensure improved process reliability as they provide information about the wheel load distribution at an early stage.



DB vehicle maintenance, Dessau plant



DB intercity plant, Frankfurt/Griesheim

### Function features

- Assembly stand for the rapid and secure integration and removal of bogies
- Avoidance of follow-on costs resulting from incorrect assembly
- Forced positioning of the bogie in the track
- Manual testing sequence for low throughput
- Manual force control and adjustment via buttons without regulation
- Simple operation with a few, easy to operate control elements
- No calibration required
- Simple integration into an existing workshop rail

## **Innovative technology. Intelligently combined.**



Force generation and force measuring technology are two deciding factors in the reliable function of a modern, efficient and high-precision bogie test rig. In the past, Schenck Process has developed solutions with unique performance features for both technologies which when combined are rated highly the world over.

**Spindle technology. Fully electro-mechanical. Efficient. Precise.**

Spindle technology is used in all MULTIRAIL® Bogie Test Bench versions for optimum regulation of test forces. The rotational movement of the servo motor is converted with high precision into a linear movement. Compared with hydraulic systems, this purely electro-mechanical drive offers numerous benefits. In addition to exact implementation of force and positioning control, spindle technology delivers high reproducibility and efficiency in excess of 98 %. It also displays a high lift of up to 1500 mm with a high testing force of up to 300 kN. Since it doesn't use hydraulic oil, this technology is also more environmentally-friendly and quieter and cuts maintenance costs. And the system is ready – with no run-in phase.



**Extensions for geometric measuring technology**

Geometric measuring technology is gaining in importance. As well as load tests, it allows geometric monitoring under load. In new constructions, for example, this may reveal production tolerances or during maintenance can flag up any deformation of the bogie frame that has occurred while in service. To suit the complexity of the requirements, Schenck Process can integrate the following geometric measuring technologies in the MULTIRAIL® Bogie Test Bench system:

- Digital, wireless, hand-held measuring devices with data interface
- Levelling device or guided sleds for height dimensions above and below the bogie
- Two- or three-dimensional measuring arm for the convenient contacting of complex measurement points in all three spatial directions



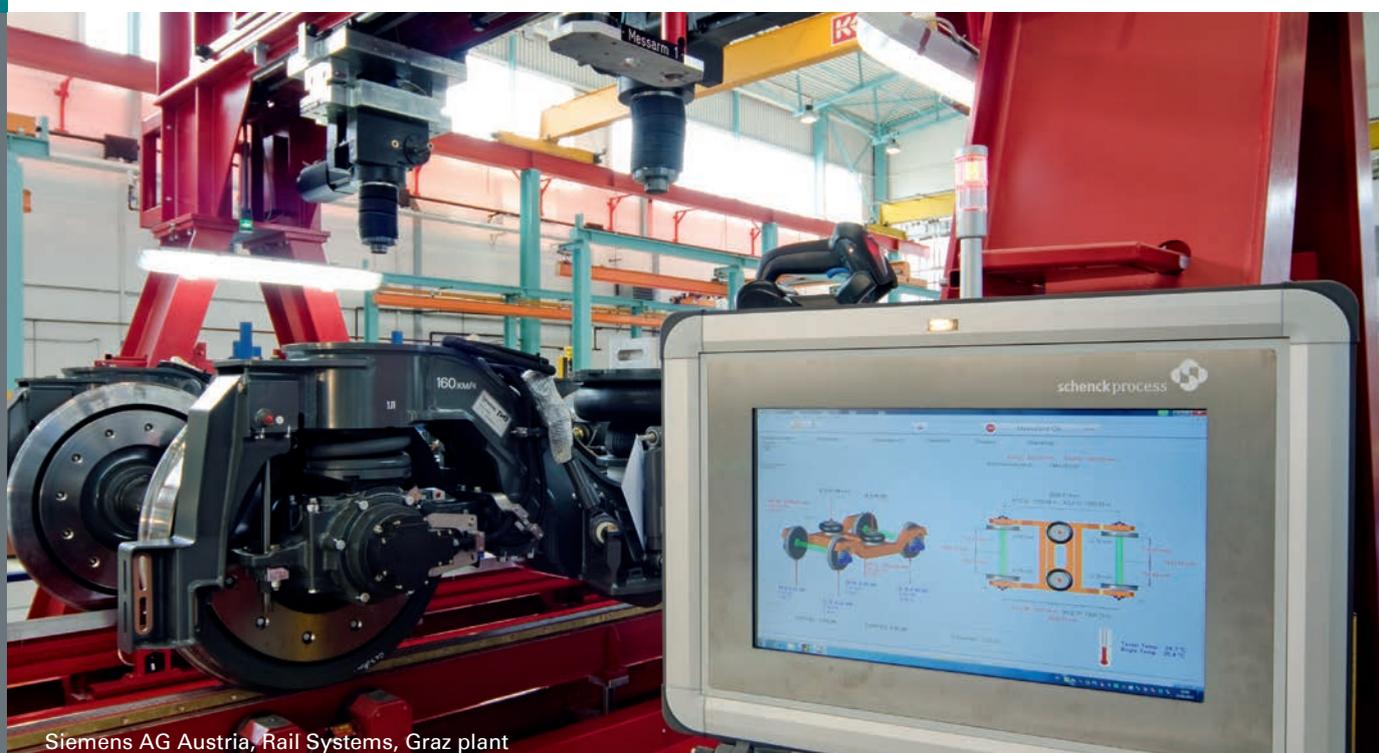
**Direct weighing technology for force measurement  
MULTIRAIL® Wheel Load Test Bench scales in the track**

As a long-established manufacturer of force sensors for a wide variety of industrial applications, Schenck Process possesses unique expertise in the domain of industrial force measuring technology. The zero-clearance installation and slight distortion of these direct weighing sensors enable accurate as well as reproducible measurement of the axle geometry under load. This Schenck Process force measurement solution is also virtually free of maintenance.



# Measurement data conveniently prepared and perfectly communicated

## Outstanding quality assurance



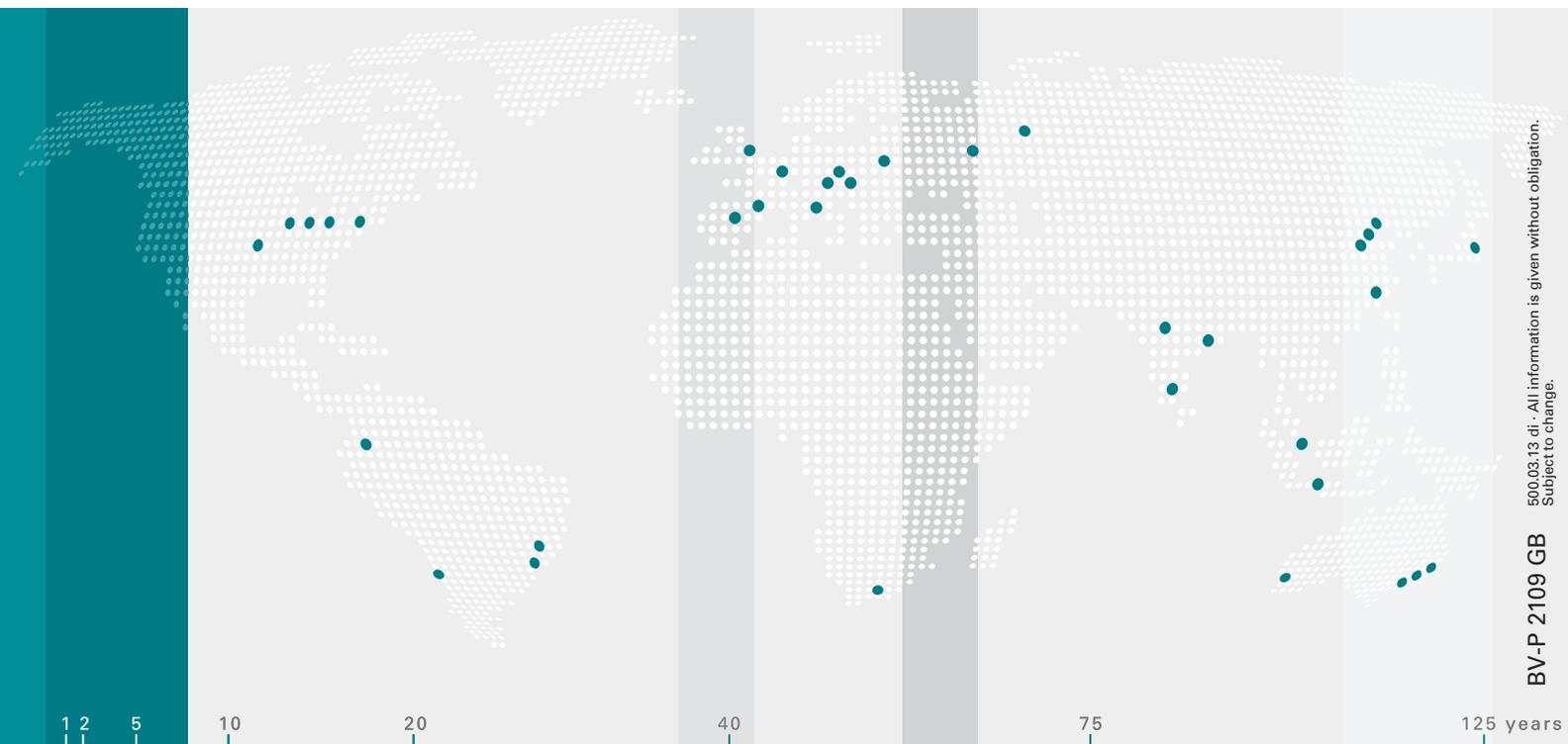
Siemens AG Austria, Rail Systems, Graz plant

From the simple MULTIRAIL® Bogie Test Bench eco version in manual mode to the high-tech MULTIRAIL® Bogie Test Bench pro device in fully automatic mode in accordance with DIN 25043: all Schenck Process modern bogie test rigs enable optimum, flexibly adjustable data processing and transfer to the customer. With DISOWARE Bogie Test Bench software from Schenck Process.

### Function features of user interface

- Clear visualisation and user guidance
- Centralisation of force and geometry measurement results in common data processing
- Logging of all results in a dedicated database
- automated data export to customer ERP system
- Simple modification of master data and process data, e.g. where new bogie types are added to the test program
- Variable printing pattern formatting
- Backup, restore and remote maintenance
- Logging compliant with DIN 25043-7

	MULTIRAIL® Bogie Test Bench pro	MULTIRAIL® Bogie Test Bench plus	MULTIRAIL® Bogie Test Bench eco	
<b>Mechanical structure</b>				
Closed force frame	✦	✦		
Open force frame (with foundation anchoring)			✦	
A-pillars	✦			
Vertical pillars		✦	✦	
<b>Bogie holder</b>				
Wheel support	optional	optional		
Prism mounting	✦	✦		
Positioning in Y-direction (automatic) in accordance with DIN 25043	✦	optional		
Positioning in X-direction (automatic) in accordance with DIN 25043	✦	✦		
Y-sleds	optional	optional		
Track width adjustment	optional			
3-axle bogie testing	optional		optional	
Automatic adjustment of wheel mounts	✦			
Wheel set adjustment range ≤ ± 400 mm	✦	✦	✦	
Bogie wheel base range 1500 mm to 3500 mm	✦		✦	
Bogie wheel base range <500 mm; >3500 mm	✦		✦	
<b>Technical measurement analyses – force</b>				
Shim simulation/twist test	optional			
Lifting track (end positions) reference to top of rail	✦	optional		
Design with up to 4 force generators	optional			
Apply the test force with positioning and force control	✦	✦	optional	
Apply the test force in inching mode			✦	
Automatic adjustment of force generator	✦	optional	optional	
Manual adjustment of force generator		✦	✦	
Shim calculation	✦	✦	optional	
Pressure drop test/seal integrity test	optional	optional	optional	
Torque and lateral force measurement via the force generators	optional	optional	optional	
<b>Technical measurement analyses – geometry</b>				
Engraved reference line on the lifting track	✦	optional		
Bogie height measurement (automatic)	✦	✦	optional	
Wheelbase, axle parallelism measurement (automatic)	✦	✦		
Wheel back distance measurement (automatic)	✦	✦		
Position recognition of bogie via wheel support	✦	optional	optional	
Levelling device for calculating Z heights at various points on the bogie	optional	optional	optional	
3D measuring arm for geometric measurements on the bogie for complex measuring technology	optional			
Digital slide gauge	optional	optional	optional	
Photogrammetry for measuring the bogie	optional			
<b>Operation</b>				
Access under the bogie (pit)	✦		✦	
Free access to side of bogie	✦		✦	
Measurements under bogie	optional		optional	
<b>Periphery</b>				
Safety light barriers	✦	optional	optional	
Preliminary track with or without lifting track	optional	optional		
Warping equipment for guiding heavy bogies	optional	optional	optional	
Platform around the test rig	optional			



500.03.13 dt. All information is given without obligation.  
Subject to change.

BV-P 2109 GB

Schenck Process is the global market leader of solutions in measuring and process technologies in industrial weighing, feeding, conveying, screening, automation and air filtration technology.

Schenck Process develops, manufactures and markets a full range of solutions, products and turnkey systems on the basis of combining process engineering expertise, reliable components and field-proven technology.

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we make processes work