



Nencki Bogie test stand NBT

Bogie test stand NBT Modular test stands for individual requirements

Nencki is the world leading manufacturer of bogie test stands, some with complex functions, such as the testing of tilting and radial steering bogies. Our customers are rolling stock manufacturers, railway maintenance companies and metros. With the modular range, each bogie test stand NBT can be equipped to customer- and bogie-specific requirements.





Bogies on the test stand High-speed requires control

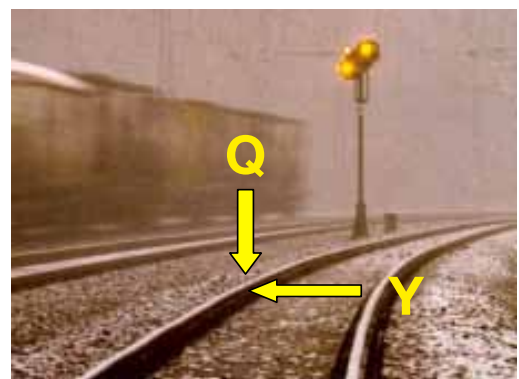
More comfort, less risk

A detailed examination and adjustment of the load and the bogie geometry optimizes the comfort and minimizes the wear and operating costs of rail and rolling stock. This accurate test is essential to avoid derailings. These two factors are considered: The lateral force Y is increased, especially in curves or during heavy side-winds. The wheel load Q must be high enough to withstand them. With the bogie test stand, the weight of the vehicle or the vehicle body is simulated to examine the behavior of the bogie under load before it is dismantled or re-mounted.

Function of the bogie test facility

The Nencki bogie test stand was developed for the final inspection and quality control of new, overhauled and repaired bogies. Hydraulic cylinders simulate different vehicle weights and forces for fully automated inspection of wheel loads, axle distance and parallelism, wheel

run-out and diameter, suspension stroke and other parameters. Due to the rigid, closed frame structure the force is distributed evenly on the hall floor and ensures high stability for an accurate measurement of geometry. The data is logged and can be traced permanently.



Versions

Modular for individual requirements

The “pit-version“

- The rails of the test stand and the workshop are on the same level
- Bogies can be moved to the test stand without any additional equipment: efficient bogie testing

The “over-floor version”

- This solution is recommended if the architecture of the building does not allow a pit or if the bogie test stand will be moved to another location later



Bogie test stand NBT Basic

- The suitable machine for small workshops, freight wagon bogies
- Testing of wheel load, stiffness of the primary springs, leakage test of the springs, pneumatic suspensions, wheel shoulder distance



Bogie test stand NBT Coach

- The optimum solution for manufacturers and operators of EMU-, DMU-, high-speed, metro and light rail bogies
- The axle geometry and other functions allow a comprehensive check
- On this test stand 2-axle bogies can be tested
- Arrangements for tests of tilting mechanisms and navigator systems are already successfully used

Bogie test stand NBT Loco

- designed for 2-and/or 3-axle bogies

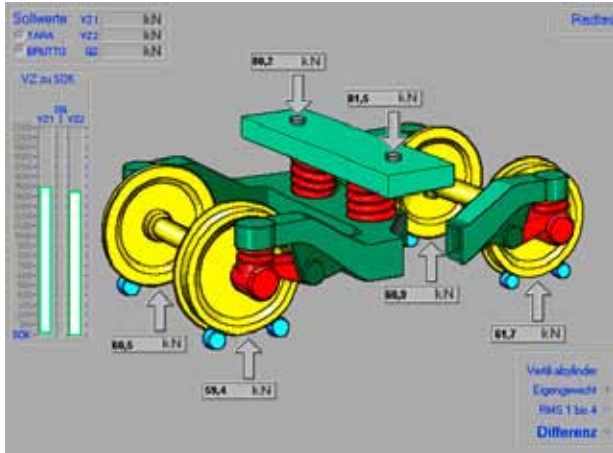


Test functions

Reliable measuring results

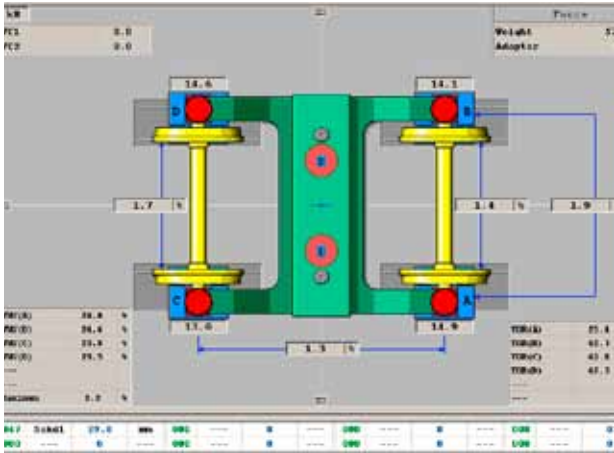
Wheel load

- Applied load
- Wheel load
- Axle distance, wheel shoulder distance, etc.



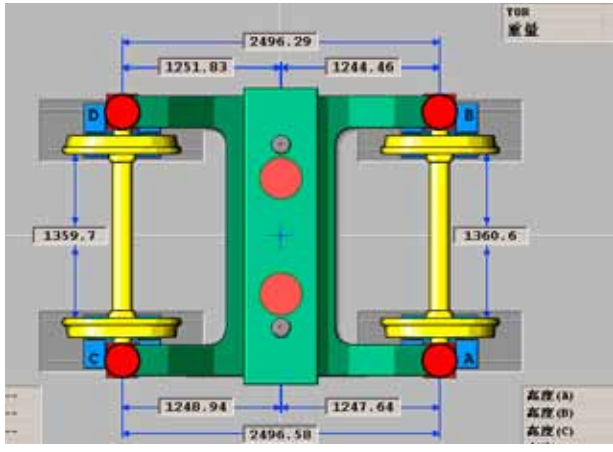
Wheel load %

- Calculation of wheel load in %
- Comparison left wheel to right wheel
- Comparison front axle to rear axle



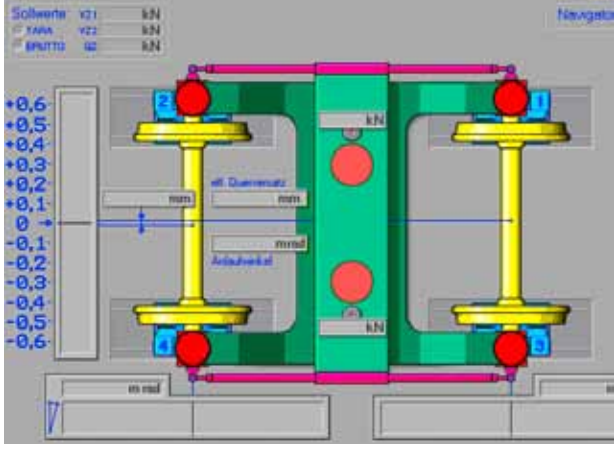
Axle distance and parallelism

- Position of each wheel to the bogie center
- Check the change in axle distance under various loads
- Comparison of left and right axle distance
- Option axle angle



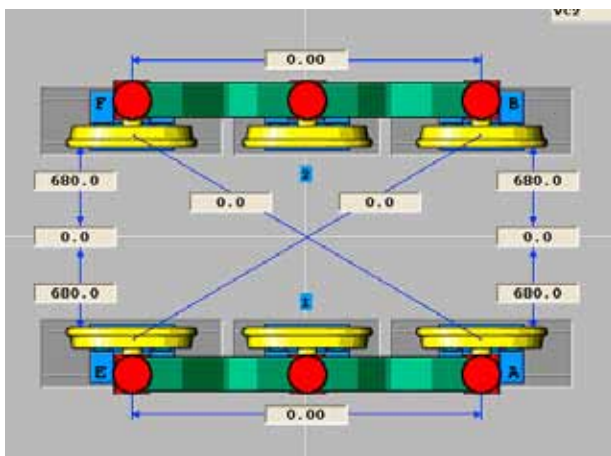
Lateral movement of the bogie under load

- This can occur due to incorrectly assembled springs



Axle diagonal

- Between front and rear axle
- Particularly suitable in the maintenance
- Thanks to this function, in running direction twisted bogies or frames can be recognized



Shim plates

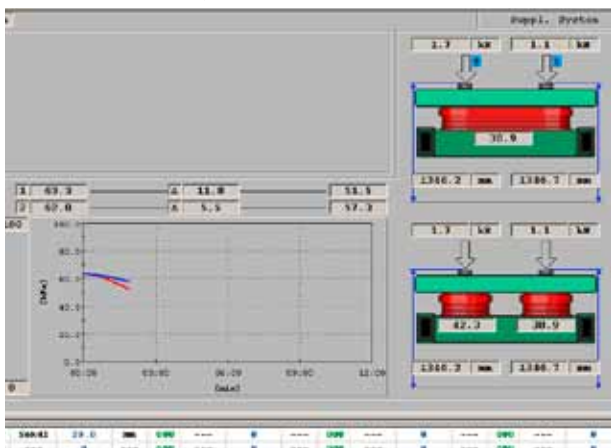
- Fully automatic calculation and display for each wheel
- Calculation based on the values of wheel load and suspension stroke or based on bogie supplier's formula

| D | | WU | B |
|-------|-------|---------|-------|
| 27.50 | kN | Δ Force | 29.00 |
| 24.60 | mm | Δ High | 24.40 |
| 1.524 | kN/mm | Spring | 1.598 |
| 0.98 | mm | Shim | 0.00 |

| C | | WU | A |
|-------|-------|---------|-------|
| 36.90 | kN | Δ Force | 37.20 |
| 25.90 | mm | Δ High | 25.60 |
| 1.502 | kN/mm | Spring | 1.452 |
| 0.07 | mm | Shim | 1.24 |

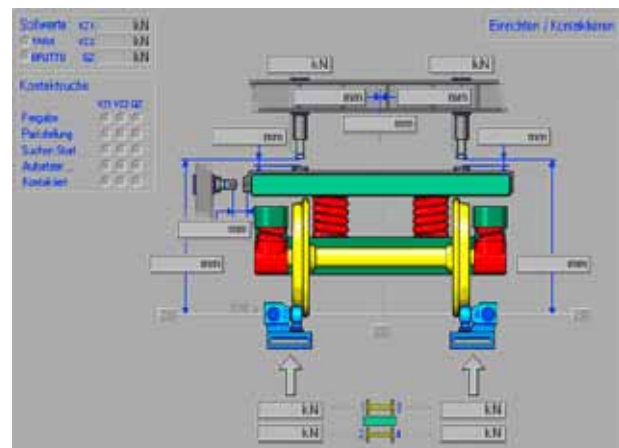
Testing of air suspension and brakes

- The l.h. and r.h. air bolsters can be checked individually for leakage
- The height from T.O.R. can be calculated and adjusted
- Option air leakage test of the brake system



Many other functions

- Application of lateral force
- Adjusting the tilting angle
- Function control of the radial steering bogies



Control and traceability Transparent and clear

Calibration

- Calibration tools are part of the scope of supply
- Training: comprehensive instruction of the maintenance staff for independent calibration

Measuring results

- Measuring results can be traced at any time
- Storage and printout of test parameters and results
- The test report can be created by the end users
- Tolerance range can be programmed by the end user



State of the art hydraulic equipment ensures highest reliability

- over 60 years experience in hydraulics
- Top quality components such as hard-chrome-plated pistons with heavy duty seals, micro filters as well as electronic controlled proportional valves are used



Technical data

Possible test features

NBT Basic

- Load applied, synchronous or independent
- Wheel load on each wheel
- Wheel load compared between wheel, axles, average
- Heights to the top of the bogie frame from T.O.R.
- Height of secondary suspension from T.O.R.
- Wheel diameter manually measured
- Stiffness of each primary suspension
- Calculation of shim plates for primary suspension
- Calculation of shim plates for secondary suspension
- Secondary air suspension leakage test
- Air brake system leakage test
- Axle impedance measuring
- Wheel shoulder distance

NBT Loco

- Same functions as Basic, additional:
- Axle distance (left and right side)
- Axle parallelism (calculated from left and right dist.)
- Axle distance diagonal

NBT Coach

- Same functions as Basic and Loco, additional:
- Wheel diameter automatic
- Wheel run-out in X direction
- Wheel run-out in Y direction
- Wheel profile
- Axle sensor function test
- Axle angle
- Application of side force



Movement of wheels under load in Y direction

Axle distance diagonal

Wheel load under dQ/Q

Measuring of tilting angles

Testing wheel steering mechanism

Bogies

No. of axles : 2 or 3

Wheel width: 90 – 145 mm

Height of wheel flange: 19 – 30 mm

Bogie width: up to 3300 mm

Bogie height: up to 1900 mm

Bogie length: up to 7500 mm

Bogie weight: up to 30 tonnes

Rail gauge: 850 – 1676 mm

Axle distance: 1500 – 4500 mm

Load application

No. of cylinders: 2

Test force: 2 x 150 kN, 2 x 250 kN, 2 x 300 kN,

2 x 600 kN, others on request

Accuracy of load application: 0,5 % of the applied load

min. + / - 100 N

Stroke of load cylinders: 500 mm

Distance between load application points:

600 – 3150 mm

Measuring accuracy

Wheel load measuring: 0,5% of the applied load,
min. ± 100 N

Axle distance measuring: ± 0.1 mm

Axle parallelism measuring: ± 0.2 mm

Wheel shoulder measuring: ± 0.2 mm

Z-Height measuring: ± 0.15 mm

Consumption, space, etc.

Electric supply: 3 x 400 V, 1 x 230 V, $\pm 5\%$, 50 Hz,
(others on request)

Machine weight:

Basic approx. 12 t,

Coach approx. 17 t,

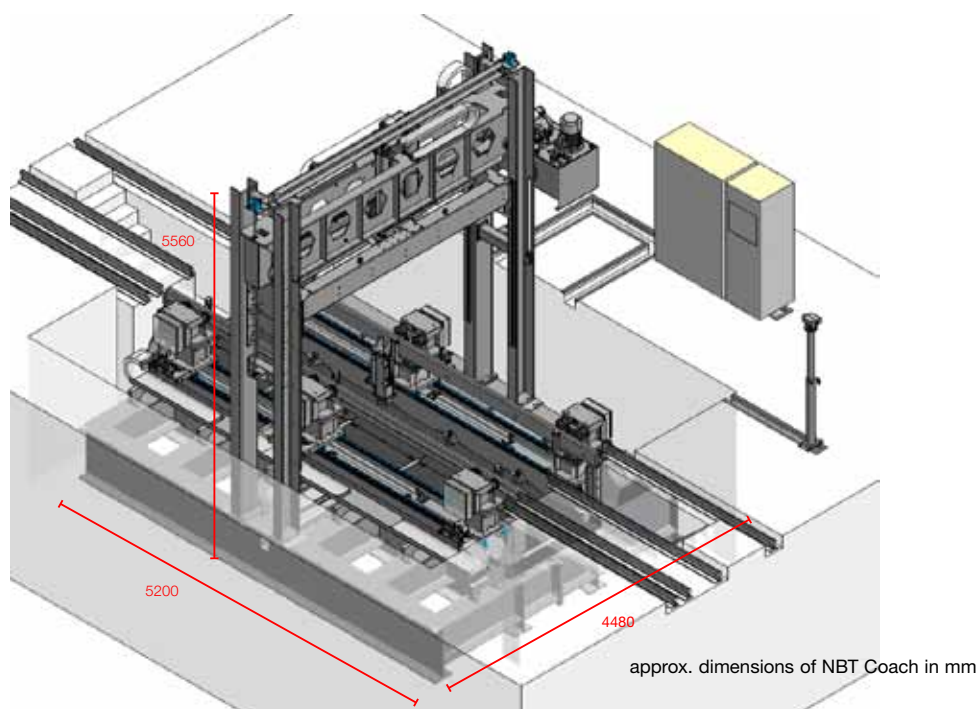
Loco approx. 26 t

Required space max.. L x W x H:

Basic 4500 x 4500 x 5000 mm,

Coach 5200 x 4500 x 5600 mm,

Loco 6500 x 4500 x 6500 mm





Railway technology Plant technology Vehicle technology Manufacturing Service

Nencki Ltd. offers a comprehensive customer and spare parts service in Switzerland but also through international representatives.

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