

TURBO

Railway Monitoring System

Wheel Force Diagnostics & Evaluation (Flat spot)



TURBO is an innovative force diagnostics system designed to assess wheel-rail forces and evaluate tread damages under operational conditions through wayside monitoring.

The system is installed in a position to monitor each wheel fully automatically via the wheel force diagnostic software during operational use. This allows the "condition-based maintenance" of your vehicles. TURBO is LGA/TUV certified and can replace manual measurements currently done in the workshop.

By utilising wayside monitoring and advanced graphical data handling, TURBO functions as a self-calibrating monitoring system. This convenient tool supports integrated quality management by enabling:

- **Statistical data collection**
- **Immediate notifications for limit breaches (e.g., flat spots)**
- **In-depth investigations of abnormal wear on wheels and bogies based on the dynamic running behaviour of vehicles.**

Moreover, TURBO provides precise measurements of wheel flat lengths and allows for the assessment of polygonisation severity (out of round) once the installation site is accurately set.

The TURBO can detect:

Flat tyre
Shelled tread
Shattered rim
Spread rim

- Fully automated, mobile, long term stability.
- All track types no modifications.
- 40km/h - 400km/h.
- Self calibrating, self updating software.
- Graphical data presentation.
- Limit value based on vehicle type (Identify vehicle types autonomously & selects all limits & values correspondingly).
- Centralised evaluation & trend observation - all data collected at a data processing centre. User define statistics supply encyclopedic information and facilitate investigations & analysis.



TECHNICAL DATA

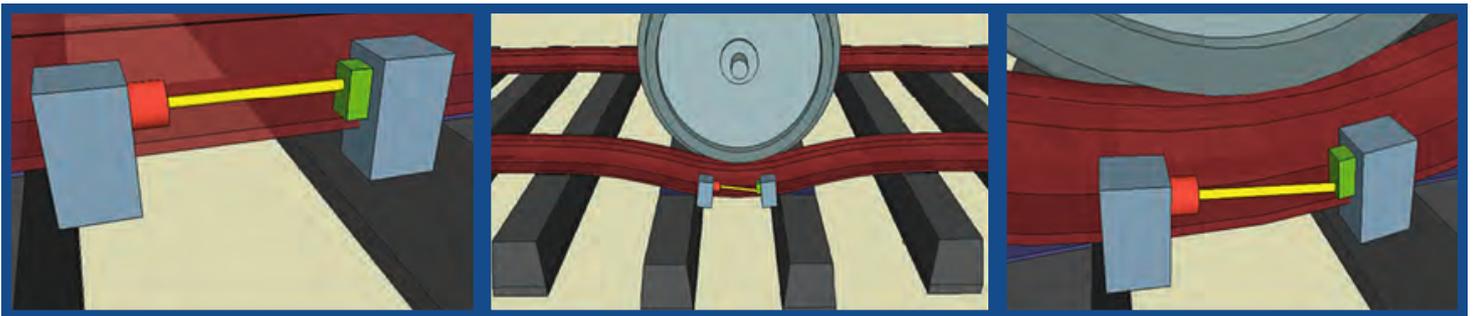
Measuring Sensor:	Laser based deformation measurement of the track
Number of measuring points:	2 x 6 clamped in sleeper compartments
Measuring distance:	ca. 4000 mm = Wheel dia. 250 mm up to 1273 mm
Range Sensor:	10kg until 100 tonne
Resolution/ division step:	10kg
Speed:	10 km/h up to 380 km/h
Temperature range track:	- 45°C up to + 70°C
Electrical connection:	230 V (AC) / 50-60 Hz, track 5 V, 12 V, 24 V (DC)
Input interfaces:	ZLV Bus, Transponder, Rail Switch, Temperature
Output interfaces:	DSL, LAN, Intranet, Internet, E-Mail, FTP, BKU, ISDN, Funk

Note: Images are for illustration purposes only. Accuracies may vary based on site conditions.

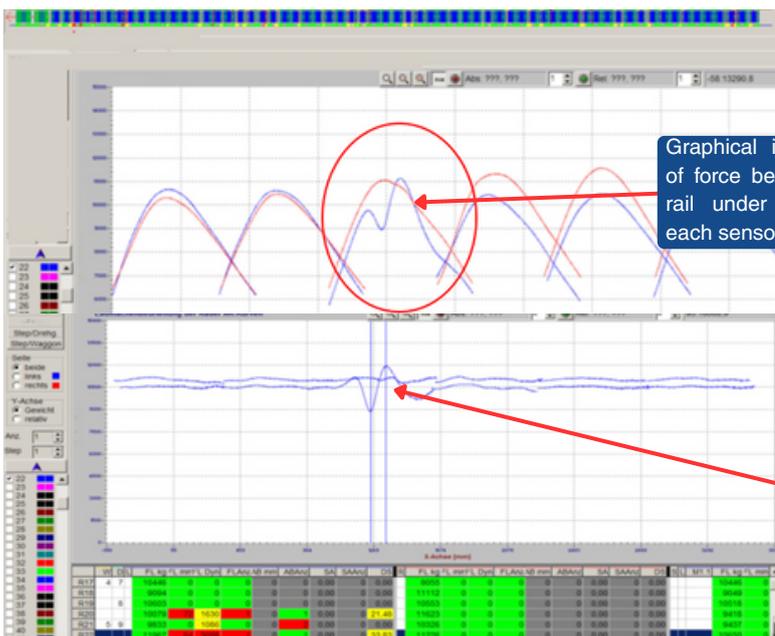
How it works?

One fixture contains a laser emitting laser ray. The ray is shielded by a flexible supported iron tube & a light spot will appear on the target contained in the second fixture.

BELOW: A passing wheel will bend the rail and displace the laser light spot downwards proportionally to the bending moment, thus the bending moment is detected with unmatched accuracy.



Flat Detection:



Graphical illustration of the tread unrolling over the circumference, normalised to the static wheel load, in force and length for the evaluation of the dynamic forces per axle.