RailCheck

Complete check of the rail bed structure at more than 200 km/h

RailCheck enables the automatic detection of the following types of faults:
• Rail anomalies
  - chunking in the rail surface
  - breaks on the running edge
  - periodical imprints
  - wheel slip points
  - insulated joints
  - broken rails
  - corrugation
  - HeadChecks in the final stage
    (with the extension module Head-
    Check, the system is also able to detect
    HeadCheck in the early stage)
• Fasteners
  - type-independent detection of missing
    fasteners
• Sleepers (concrete sleepers)
  - safety-relevant spallings
  - safety-relevant crack formations
  - with the extension module
    CrackCheck cracks of up to 0.5mm in
    width can be detected automatically
    or can be visualized up to 0.3mm in
    width.
• Ballast
  - overfilling
  - underfilling
• Turnout detector
  - automatic detection of the cross frog
  - storage of the area of the turnout in a
    separate file

RailCheck is an automatic inspection system, which inspects the entire area of the rail bed structure for safety-relevant defects at high speeds of more than 200 km/h and produces a rail condition protocol as a result, which generates an objective status of the inspected rail for the user with high quality and safety in the shortest time. Using the latest image processing technologies RailCheck ensures that the rail bed structure inspection is faster, safer and more reliable.

Recording

The picture recording system is integrated in device modules suitable for railway vehicles, which are installed in a carrier frame on the bogie frame or vehicle frame of the carrier vehicle.
The camera system arranged vertically above the rails consists of monochrome digital line scan cameras and a highly coated lens with a fixed focal length.
The photograph is taken controlled along the optical path length by means of an incremental position encoder linked to the wheels and is independent of the speed. The fault pattern assignment to the current rail position is controlled by means of a central chainage system.
The inspection area is illuminated by powerful LED lights. The illumination of the entire inspection area is arranged as a vertically inclined reflected-light illuminator for forming optimal contrast in dry and wet weather conditions.
Additional sensors enable continuous measurement of the ballast profile and the online comparison with a predefined reference profile.
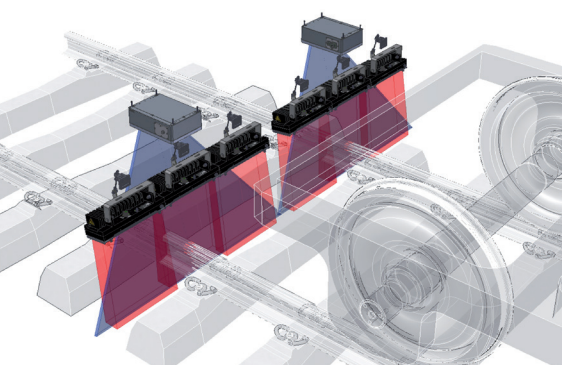
Evaluation / Documentation

The resulting pictures are evaluated online by means of ultra-modern image processing algorithms. The fault patterns are classified automatically and the results are provided in a fault protocol immediately after inspecting the rails, archived in a database or forwarded to superordinated systems.

Résumé

The system includes the following features:
• Scalable speed of up to 400 km/h.
• High detection performance.
• Low incorrect detection rate.
• Easy operation; intuitively controllable user interface.
• Modular concept.
• Low maintenance costs.
• Proven suitability for railway vehicles.
• Easy integration thanks to small space requirements both under and in the vehicle.
• Open system; thereby easy adaption to country-specific database systems
  or central data acquisition on the vehicles.

RailCheck System