



# Axlebox Bearing Detector

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Non-destructive testing of the condition of axlebox bearings in the maintenance depot



 **TÜVRheinland®**  
Genau. Richtig.

**DB Systemtechnik**

## Axlebox bearing detector (AD)

Maintenance personnel face major challenges when conspicuous noises during operation lead to a suspicion of damaged axlebox bearings. Acoustic abnormalities on running trains do indeed provide important information about possible damage to the vehicle. But in practice it is difficult to assign noise to the correct component, which leads to the risk of misinterpretation and unnecessary maintenance measures.

This is where the AD comes in, as it enables the condition of axlebox bearings to be checked on stationary vehicles. It combines engineering expertise with AI-based analysis methods, thus enabling precise damage detection. The system was developed in partnership with TÜV Rheinland and validated for use in rail operations.



### Our expertise

- **Technical expertise** relating to components, function and wear of wheelsets and axlebox bearings
- **Condition analysis** based on airborne noise and vibration
- **Development** of rail-compliant measuring instruments
- **Requirements management**
- **Creation of a measuring concept**
- Bespoke **software applications** and customised **data connection**
- **Creation of validation concepts** and functional support during the validation phase
- Support in **integration into the maintenance process** and preparation of the necessary documents
- **User training** in the workshop
- Technical **support** and user assistance



### How you benefit

- **Fast test result** (measurement time including fully automated analysis approx. 30 s/wheelset)
- **Easy to handle**
- **Very high diagnostic quality**
- Objective and valid **test results**
- **No need** for time-consuming test runs
- **Low investment** costs (compared to alternative measuring applications)
- Suspected cases of **axlebox bearing damage** are reliably confirmed or dismissed
- Damage can be **precisely localised** on the bogie in question
- **Reduction in the replacement rate** of undamaged wheelsets by up to 90%

### DB Fernverkehr AG

At DB Fernverkehr AG (DB FV), train crews and passengers report more than 1,000 cases of acoustic abnormalities every year. Even though the majority of these reports are unfounded or not due to safety-related functions, every single case is taken seriously as the noise could be caused by damage to the axlebox bearing.

In the axlebox bearing detector, DB FV is deploying an innovative measuring system that allows it to analyse the condition of axlebox bearings in the maintenance depot without having to remove the wheelset in question.

On the one hand, this allows DB FV to verify or dismiss suspected cases of damage and, on the other hand, it also enables the exact localisation of a defective axlebox bearing within a bogie, thereby noticeably reducing the amount maintenance work and the costs involved.



### Combination of railway expertise

Working together, the experts from DB Systemtechnik and TÜV Rheinland Intertraffic were able to adapt the measuring system and algorithms to the various vehicle classes at DB FV and successfully validate the test method for operational use.



The portable system is adapted to the depot environment and is reliable in its application. Adapters for various vehicle classes speed up simple, reproducible attachment to the wheelset casings. The measurement data is recorded and processed by the AD. Fully automated analysis allows immediate, clear visualisation on the laptop used to control the process.

DB FV itself performs the entire measurement process. The signals are evaluated in a fully automated process on the device. After just 30 seconds, the depot staff has a clear indication as to whether the axlebox bearings in question can continue to be used safely. The valid test result supports the maintenance process and reduces the replacement rate of undamaged wheelsets by over 90%.

## Contact person



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