



# alphabearing

## Axle bearing monitoring via analysis of the speed signal

Rolling stock axle bearings are critical to railway operations and require extremely high levels of performance, durability and reliability. They are subject to radial impact loads caused by rail joints and switches, as well as to radial loads of vehicle weight. To minimize downtime or potential damage it is useful to monitor the bearings and to properly plan maintenance and replacement activities.

**alphabearing** is a specific module to assess the status of axle bearings in order to help engineers in planning their activities. It uses the torsional vibration measured by non-intrusive speed sensors to diagnose axle bearings during normal operation.





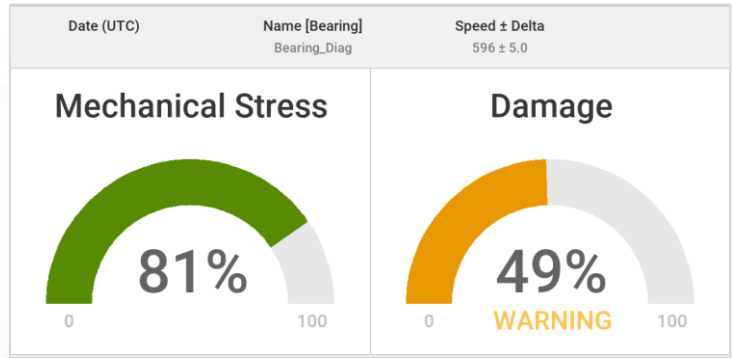
# Axle Bearing

## Bearing Defect

During train operation a failure of an axle bearing can lead to unnecessary costs, delays, and loss of confidence in rail transport by passengers. First symptoms of an upcoming bearing damage are small defects resulting in an impact on axle movement. Each time the rotating axle meets a defect the torsional vibration of the axle is affected. This change of the torsional vibration is repeated periodically.

## Solution

By using **alphabearing** for bearing health condition monitoring, a fault can be detected during its initial stage. The bearing diagnosis is based on torsional vibration measured by non-intrusive speed sensors. This allows sufficient time for repairs before significant failures occur and to avoid unscheduled maintenance of the vehicle, reduced bearing lifetime and increased operating costs.



Example of an axle bearing diagnostic report

## Diagnostic Results

Faults in axle bearings can be classified into two separate categories:

- Mechanical Stress identifies local defects, such as cracks, pits, spalls, etc. which can generate stress pulses in the rotating axle twist.
- Damage identifies defects such as surface roughness, waviness, etc. resulting in a speed variation due to high vibrations of the axle movement.

## Fleet Management



- ✓ Fast return of investment
- ✓ Savings in maintenance and operation costs
- ✓ Extended life time of axle bearings
- ✓ Early indication of any bearing anomalies
- ✓ Increased vehicle reliability
- ✓ Capability to keep your fleet on track while business grows

## Benefits

