RAILWAY SYSTEMS
by voestalpine

AMS ACOUSTIC MONITORING SENSOR

Continuous Monitoring of Bearing Health

Description

Monitoring the wheel bearing condition during operation provides valuable information for optimizing wheelset maintenance as well as maintenance intervals. The Acoustic Monitoring function (PHOENIX^{MDS} AMS) is a state-of-the-art and robust measuring system that records the acoustic signals of each bearing of a moving train. Damage to individual bearing components, both tapered roller bearings and cylindrical roller bearings, is detected early and trends are provided for each monitored bearing. Alarms are generated after thresholds are exceeded, which can be set individually by the user for each bearing type. This supports more efficient maintenance planning for wheelsets. Future phases of development also include the detection of additional defects, such as wheel-rail contact.

System advantages

- Early detection of defects on inner and outer raceway as well as on rollers and optimization of wheelset maintenance management
- Optimization of the maintenance intervals of wheelset bearings
- Safety management of the railroad operation
- Long-term monitoring with trend tracking of the components
- Condition-based maintenance
- Low maintenance due to no moving parts
- High reliability and availability due to measurement of several bearing rotation even in bad weather conditions.
- Wide range of supported bearing types

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ACOUSTIC MONITORING

Microphones record the sound of passing trains. The microphones are located next to and in the track to detect both inside and outside bearings. The two microphone rows ensure high reliability by measuring multiple bearing rotations, even in poor weather conditions. In addition, the sensor is able to distinguish between sound emanating from the train and ambient noise through the algorithms used. The bearing assignment to the respective vehicle is realized by the combination with the Automatic Vehicle Identification System PHOENIX^{MDS} AVI or with transmission of the train ID in the track section. Detected damages are assigned to the bearing components, such as inner/outer ring or rolling element. For each vehicle, bearing damage is tracked, classified according to customer-specific thresholds, and trends are provided using PHOENIX^{CMS} based on the recorded data. The algorithms cover a wide range of bearing types and can be easily adapted to new types.

Technical Specification	
Train speed	30 to 160 km/h
Defects reported	Cup, Cone, Rollers, Multiple Railway Defects, Large Area Spalling
Double Track Installations	Yes
Reporting	PHOENIX^{CMS} (Fleet Condition Monitoring)
Trending	Yes
Environment	-20 to +60 °C
IP class microphones	IP67

Options and variants

Arctic

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