

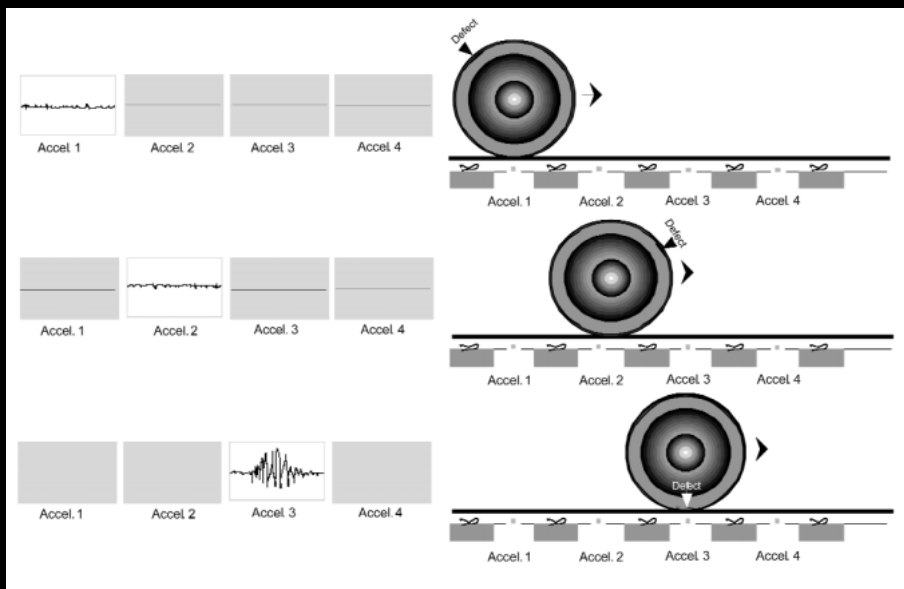
WHEEL IMPACT MONITOR

OVERVIEW

Impact loads caused by tread irregularities on train wheels can increase the deterioration rate of track and rolling stock. In the worst instances, component failure can cause derailment.

The Wheel Impact Monitor (WIM) is a railway installation developed by the BHP Institute of Railway Technology and marketed by Teknis Pty. Ltd.. WIM systems are installed at Cityrail and FreightCorp in New South Wales, Queensland Rail, National Rail in South Australia and BHP Iron Ore in Western Australia.

The WIM comprises 10-12 track-mounted accelerometers and 4-8 wheel sensors, interfaced to a computer via custom signal conditioning media. The system detects, grades, records and reports on the tread condition of all wheels of passing trains



OPERATION

Proximity switches detect the presence of a train with the passage of the first pair of wheels. The speed of the train is calculated each time a pair of wheels traverses the distance to a second set of switches located one metre downtrack.

Accelerometer pairs are then monitored sequentially for the time it takes the wheel to traverse the accelerometer array (3m long), which is designed to monitor the entire wheel circumference.

As a tread defect impacts the rail, vibrations transmitted through the rail section are analysed by computer and recorded against date, time, train identification, wheel number and side (left or right).

Reports are written to a First In – First Out buffer capable of storing data on more than 40,000 wheels.

Reports can be written to a remote "Host" computer that can accept input from two or more WIM installations. The Host manages exception reports, collates data and can also control WIM track installations.

BENEFITS

- Reduced risk of wheel failure and potential derailment.
- Prevention of impact damage to rail (corrugations, fatigue cracks).
- Reduced track structure damage and ballast degradation.
- Reduced potential for exceeding allowable track sub-grade pressure.
- Reduced rolling stock axle bearing and structural damage.
- Reduced track and rolling stock inspection and maintenance requirements.
- Improved maintenance scheduling resulting in operating and capital cost savings.

