



OTR Tyre Management Overview

OTR (off-the-road) / EM (earthmover) tyre management covers everything related to the selection, purchase, maintenance, operation and disposal of tyres and associated components (wheels/rims, tyre chains, etc.) running on earthmoving or mining equipment. It is a cradle-to-grave management concept.

The five pillars of an effective EM tyre management system are:

- Risk control
 - Risk management of all aspects of the site tyre operation.
- Selection
 - Determining best brand(s) & specification(s) for each application.
 - Supply allocation system that maximises manufacturer competition.
 - Recording, analysis & reporting.
 - Test program to finetune.
- Maintenance
 - Work-procedures, training & compliance.
 - Workshop efficiency & effectiveness.
 - Tyre service quality.
 - Reconditioning program.
 - Disposal / recycling.
- Operation
 - Mine road / working-area design, construction & maintenance.
 - Haul truck payload & speed management.
 - Operator practices, tyre awareness, training & compliance.
- Global learnings
 - Innovations related to all aspects of EM tyre management.

For most mines the tyre bill is typically 20%+ higher than it should be because of inattention to various aspects of the above tyre management fundamentals; the total losses to the mine are usually substantially higher when indirect costs related to safety, downtime and productivity are considered.

Common reasons for excessive cost include suboptimal tyre selection and allocation by brand; poor mine operating conditions, policies and practices; inadequate tyre inflation pressure, matching or abnormal-wear control; over servicing in regard to tyre reconditioning; and incomplete tyre risk management, serviceperson training, work procedures and compliance.

Mines often 'reinvent the wheel' – due a to a lack of global perspective – when attempting to solve tyre related problems that have been satisfactorily addressed on other operations.

The objective of many mines is to maximise tyre life and minimise tyre direct operating cost; however, it should be a much more holistic approach. The ultimate goal should be to minimise the total cost of ownership (TCO) of the

mine haulage process that is related to tyres – i.e. the direct cost of tyres and allied components plus all indirect costs connected with the operation of tyres: notably safety, haulage productivity and machine downtime.

Basic elements that are crucial to a successful tyre management program include:

- Comprehensive tyre management system (TMS) to record and analyse data.
- Correct tyre life key measurement – distance (km/mi) for haul and water trucks; time (hr) for loaders, dozers and graders.
- Proper tyre life analysis methodology – scrap period based to highlight overall trends; fitment period based to compare performance by brand and specification (refer tyre management paper referenced below).
- Effective reporting system – not just statistical (graphical/tabular) – that includes a written section covering key aspects of the tyre operation with recommended actions for improvement.
- Close mine oversight – whether tyre servicing is conducted in-house or contracted out – to keep the program on track with clear lines of accountability and responsibility.
- Monthly tyre meeting, including a representative from each of production, maintenance, purchasing and safety, to discuss the monthly tyre report, its recommendations and required actions.

Tyres are the limiting factor in the development of larger haul trucks and loaders. They are also the most critical component in regard to maximising haul truck productivity – based on tyre load, speed, workload (TKPH/TMPH) and lateral acceleration ratings. The growth of autonomous haulage – which is pushing the bounds of haul truck productivity – means that having a good tyre management program has become even more important.

Tyre workshop management is also crucial to reducing maintenance related equipment downtime and incidents that lead to damage, injury or death (tyre maintenance is ten times more likely to result in a workshop fatality than all other aspects of mine site vehicle maintenance).

Mines should constantly be on the lookout for innovations of systems, procedures, components and equipment to improve tyre related outcomes. Recent examples include TPMS (tyre pressure monitoring systems), fast tyre change wheel/rim componentry, and fast lift, whole axle jack/support systems.

There is much more to EM tyre management than first meets the eye.

Keywords: *Tyre Management, Selection, Maintenance, Operation, Disposal*

References: Gordon DM & Cutler AT: *Proper Tyre Management Reduces Tyre Costs* (published by the Australian Institute of Mining and Metallurgy, Proceedings No. 286, June 1983)

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