



# ASPASA

## Tyre Care for Surface Mining

### SOME OF THE SERVICES WE OFFER



**Legal compliance**

Updates on legislation



**Health and safety**

Audits, training and advice



**Environmental**

Audits, training and advice



**Government liaison**

Meetings with legislator and others



**HR and training  
(Skills development)**

Audits, workshops and training courses



**Transport**

Trackless mobile, PDS and transport



**Technical**

Quality and information



**Engineering**



# ASPASA AT WORK



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## BEST PRACTICE GUIDELINE

### Tyre Care for Surface Mining

#### Introduction:

The issue of Trackless Mobile Machines is covered in the MHSA and **ASPASA** believes tyre care on TMM's are of importance.



Tyres represent a substantial part of the initial cost of a mobile plant. It is, therefore, important to prolong tyre life and avoid down-time for repair and replacement.

The following pointers, based on commonsense operating procedure, are aimed at holding down maintenance costs.

#### Common causes of tyre failure:

Premature tyre failure can be the result of many different things. Among the most common are improper tyre selection, neglect, abuse and carelessness, overloading and damaged rims.

You can save money and downtime by making sure you have the appropriate tyres for the jobs you intend to do. A tyre perfectly suited to a long-haul job in sandy clay may have plenty of tread left when the job is completed, but it will not last much longer if the next job involves travel over rocks. Likewise, heat-resistant tyres build for high-speed hauling will not last long working over sharp rocks. Nor will deep-tread cut-resistant tyres give good service for fast road hauling.

But what if a machine application is faced with a variety of working conditions – long hauls, soft sand or clay, short trips, rocks etc.? Consider an extra set of tyres and wheels; changing wheels may reduce total operating cost per ton-kilometers.

The first step in tyre selection is anticipating possible use areas for the machine. If you are still in doubt over which tyre to buy, always consult the manufacturers. (Vehicle and Tyre Suppliers).

Under-inflation subjects tyres to extra flexing which builds up heat and subsequently causes sidewall damage or failure. It can also result in uneven wear. Over-inflation stresses cords which reduces impact resistance and increases danger of rock cuts. It also provides a rougher ride, which can lead to equipment damage and greater operator fatigue. It can also result in uneven tread wear.

Inflating tyres with dry air overcomes rims rusting inside the tyre. Dry air can be obtained by installing a dryer in-line on the compressor.

Failure to inspect tyres frequently for embedded objects, cuts or other damage can lead to an early end of a tyre's useful life. Check the rims for breaks and bends. Rim damage can cause air leaks, which lead to tyre damage because of under-inflation.

Cracked or bent rims can also damage the tyre bead. Where this condition exists, it is best to discard the damaged part immediately. Never mix rim parts or different sizes or from different manufacturers. They may appear to fit but often do not.

Careless driving over rocks, stumps and other sharp objects can shorten tyre life. Tyre slippage can also cause expensive damage. Wet rubber cuts twice as easily as dry rubber. So, when traction is poorest, tyres are most subject to damage.

Proper ballasting can go a long way toward reducing slippage, and therefore increasing tyre life. Always follow the operator's manual or instructions; when specific instructions are not available, a maximum of 75% fill of ballast is recommended to retain an air cushion in the tyre.

Loose or damaged equipment parts may intermittently or continuously cut tread or sidewalls, ruining the tyre. Overloading tyres can cause severe tread wear and sidewall damage. For instance, a 20% overload can increase tread wear 30%; a 40% overload can increase tread wear 50%.

**The two most common types of overloads are:**

1. Machine too heavy for the tyre size and ply rating
2. Pulling loads greater than the tyre can withstand, resulting in excess slippage or sidewall buckling.



Besides the excessive tread wear, overloading causes cord separation, body break-down and premature failure. Often the effects of overloading are not immediately visible, but continued use will result in early failure.

Overloading can also cause the tyre to slip on the rim. This usually occurs when the operator attempts to pull a load heavier than the tyre can withstand. Such slippage ruins the tyre bead and the tyre must be discarded.

Rims may be damaged or broken by striking solid objects – stones, curbs etc. – and such accidents account for many tyre leaks. Rims and other metal parts should be inspected frequently. If a bent or broken part is found, it is best to discard it immediately.

A good operating environment adds many hours to tyre life. Haul roads should be well-prepared and maintained. Regular removal of stray rocks and other debris reduces the possibility of tyre impact damage and punctures. Filling pot-holes and levelling humps reduces equipment bouncing and consequent overloads and shocks.

Avoid driving tyres through puddles of oil, grease, fuel, acid or other substances that can cause rapid tyre deterioration. Fix all leaks that may develop at hydraulic couplings or hoses. Leaking hydraulic fluid that contacts tyres can reduce tyre life considerably.

If a tube-type tyre slips on the bead, it is likely the valve will be ripped from the tube. This slippage may be caused by under-inflation, improper seating of bead on rim, or excessive use of soap solution when mounting tyres.

After a tyre slips, it must be demounted, and rims and wheels cleaned. Some general tips to avoid other types of damage are:

- avoid spinning the wheels
- watch for objects which could damage fabric

- keep tyres clean and free of rock
- use tyres recommended for the machine, application and operating conditions.

### **Tyre Construction:**

The parts of a tyre are bead, body plies, sidewalls and tread, plus inner liner (for tubeless tyres) or tube. The body consist of layers of rubber-cushioned cord or fabric that give a tyre strength to perform in rugged conditions.

All tyres for industrial use are ply-rated. This rating identifies a given tyre with its recommended load, when used in a specific type of service. The rating tells the strength – not necessarily the number of plies in the tyre.

Two basic types of tyres are available – conventional bias-ply and radial. In the conventional bias-ply tyre, cords that make up the plies run from one tyre bead to the other at an angle. In radial tyres, the body cords run radially, from bead to bead. Bias-ply tyres have the advantages of easier service, lower cost, better lateral stability and greater sidewall strength. Radial tyres have the advantage of better flotation and traction, less rolling resistance, cooler operation and better material for recapping.

Fuel savings, increased productivity, longer tyre life and better flotation and traction are the main advantages of radial tyres. Because radial tyres have less rolling resistance, it takes less effort to start he machine in motion and keep it moving.

In most earthmoving operations, heat generated by high speeds and very heavy loads is the greatest deterrent to long tyre life. Because radial tyres usually have only one body ply, little internal frictional heat is generated to cause tyre failure.

The 'ton-mile-per-hour-rating' is an indicator of a tyre's ability to perform in high speed and load carrying applications.

