

Dual-Tire Performance on Mine Haulage Equipment

- TIRE PRESSURE MAINTENANCE -

START BY...

CREATING A TIRE CULTURE

WHY CREATE A TIRE CULTURE?

- CURRENT TIRE SHORTAGE
- REDUCE COSTS
- LESS DOWN TIME
- SAFETY
- IMPROVE BUDGETING/FORECASTING
- EFFICIENT INVENTORY MANAGEMENT
- INCREASE PERFORMANCE/PRODUCTION
- MAXIMIZE RETURN ON INVESTMENT

Rule of thumb for large haulage tires:

Over the life of the vehicle, you will spend the initial purchase price of the vehicle in tire related cost.

Given that “TIRE” replacement costs are accepted in the top three categories in terms of operating expenditure, it is important that a comprehensive “**In-service**” pressure maintenance policy be implemented to optimize maximum tread life and tire utilization.

INFLATION PRESSURE

Maintenance of correct inflation pressure is absolutely necessary.

Excessively **HIGH** or **LOW** inflation pressures will often result in premature tire failure.

WHY...?

Pressure Status	Creates...	Causes...	Effect
Under-Inflated	Increased Flexing	Heat build-up	Premature failure – various separations (heat, ply, belt edge)
Over-Inflated	Increased Stiffness	High Cord Tension & Low Enveloping Power	Shock/Cut Impact Break
Correct	Maintained Design Shape of the Tire	Maximum ground contact/Minimum Heat build-up	Optimal Operational Ability

Axle and tire loads are
specified on flat level ground.

On paper, equal tire loads are
assumed across each axle.

Is this true in service?

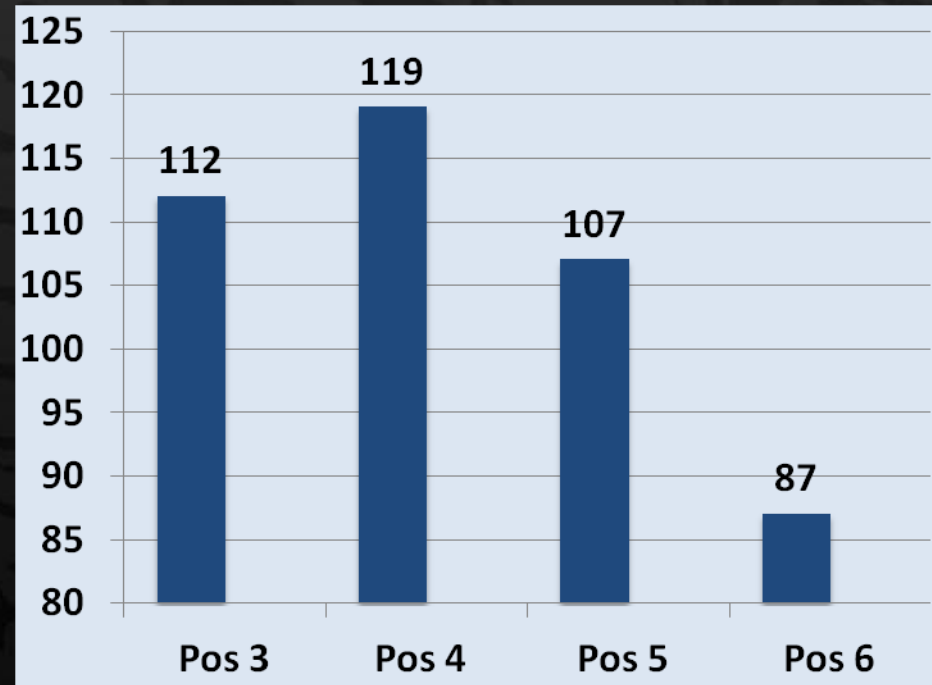
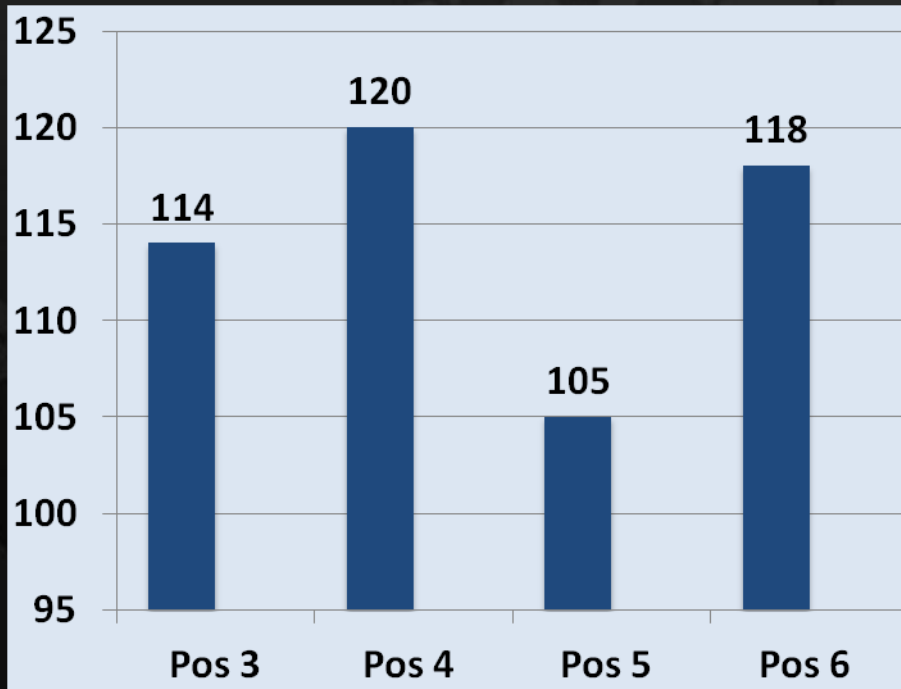


Case Study #1

Pressure Imbalance Example

Random inspection data – Bad Pressure Maintenance

Hot Inflation Pressure (psi)





As a result...

Dual tire fitments can suffer irregular wear, reducing life...



ALIGNMENT



MATCHING

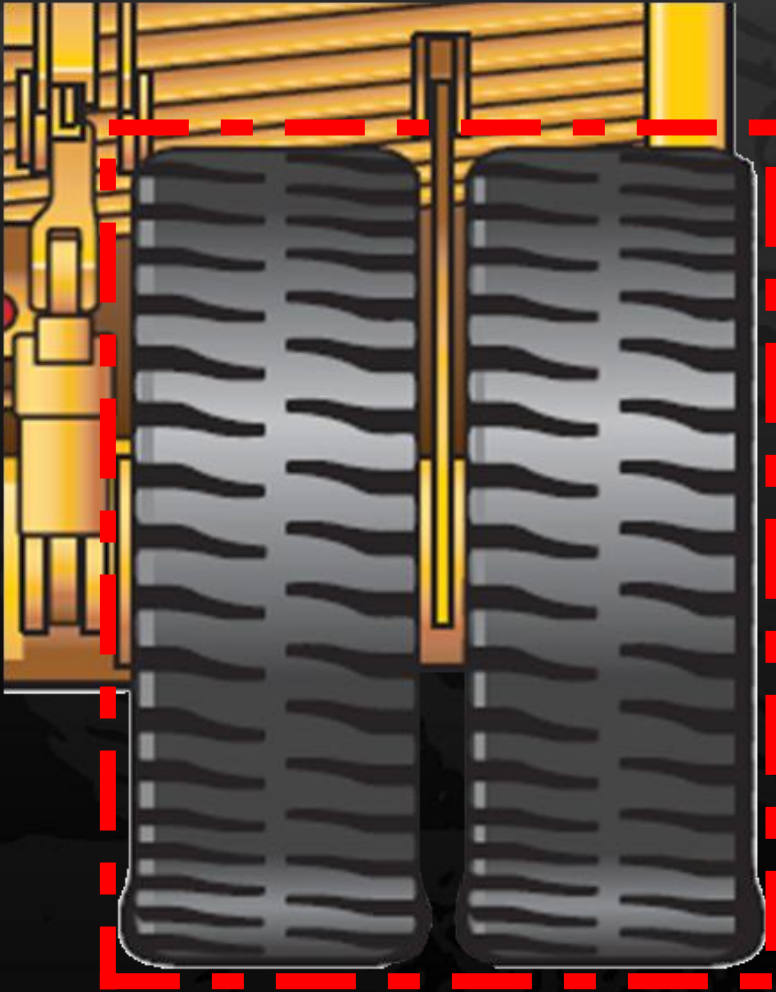


TURN RADIUS



PRESSURE

Dual tires are physically fixed together on a machine



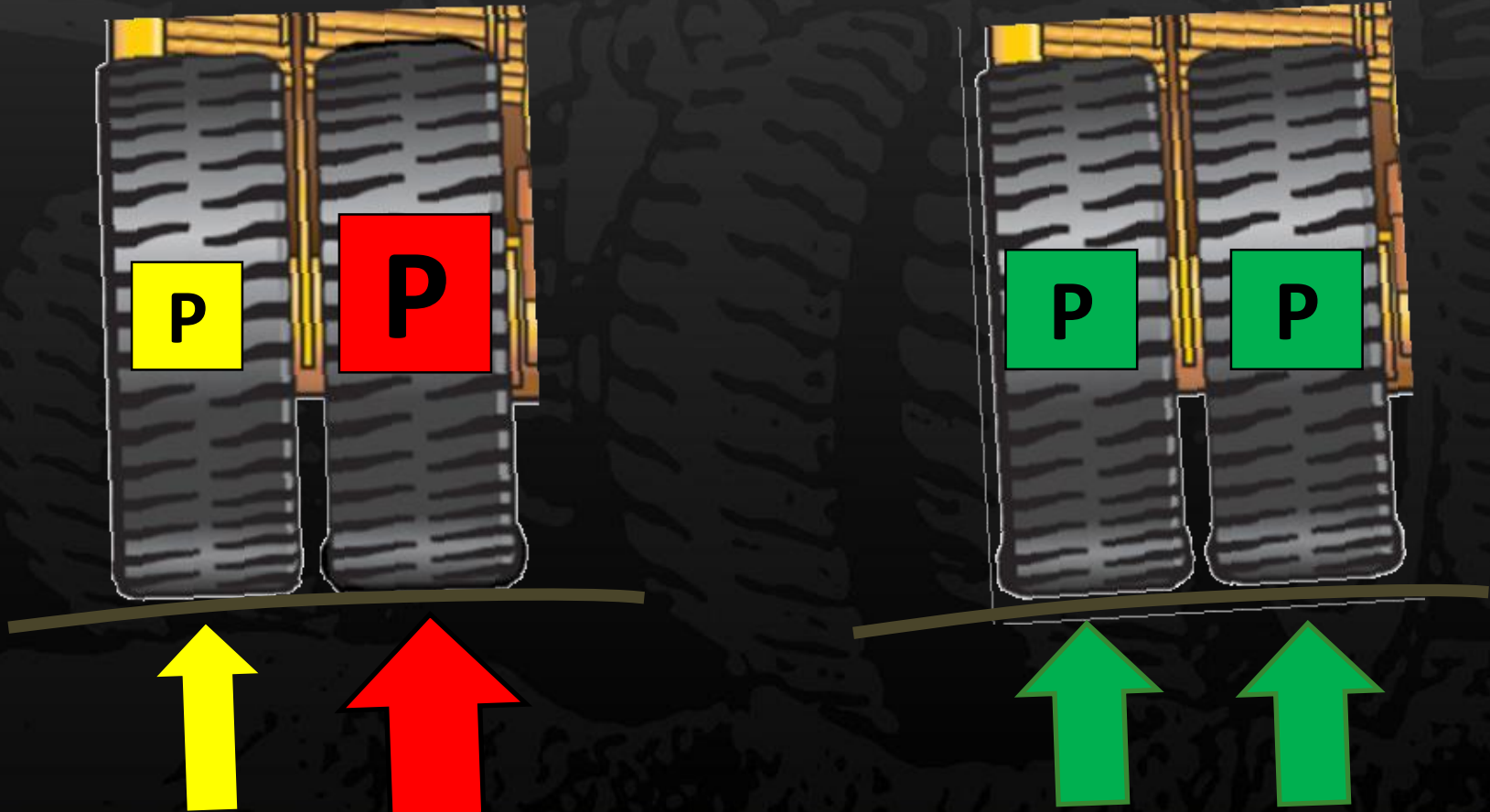
Manufacturers' Advice:
*Dual tires should ideally
behave like one and the same
tire.*

Needs In Service:
For maximum life, dual tires
must be inflated equally,
share load equally and work
together!

Otherwise, both tires suffer!

Unequal pressure. Unequal load.
Outside position is dragged!

Equal pressure. Equal load.
Less fatigue. Longer life.

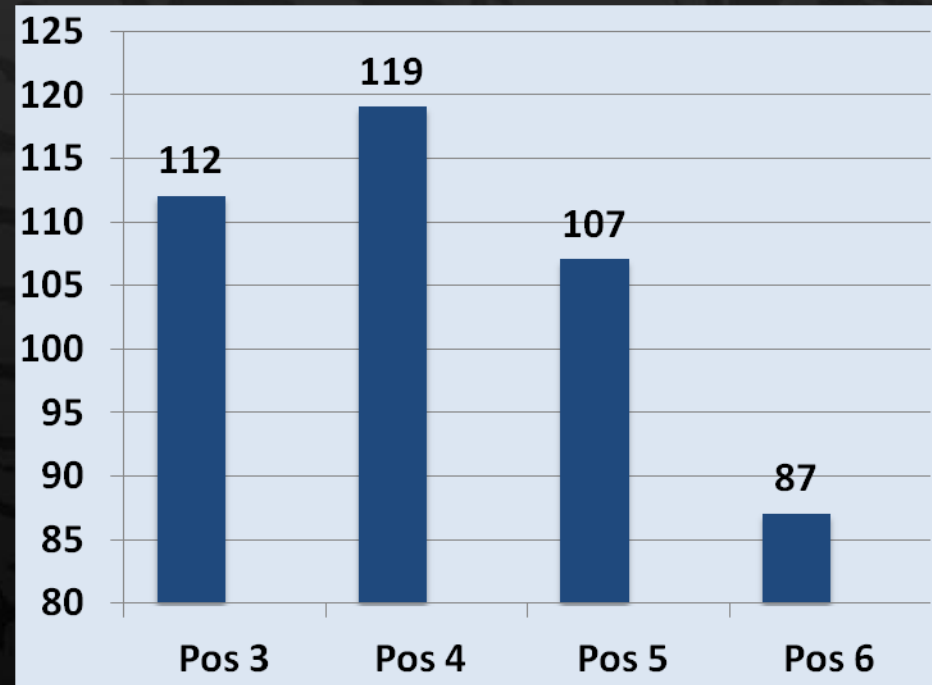
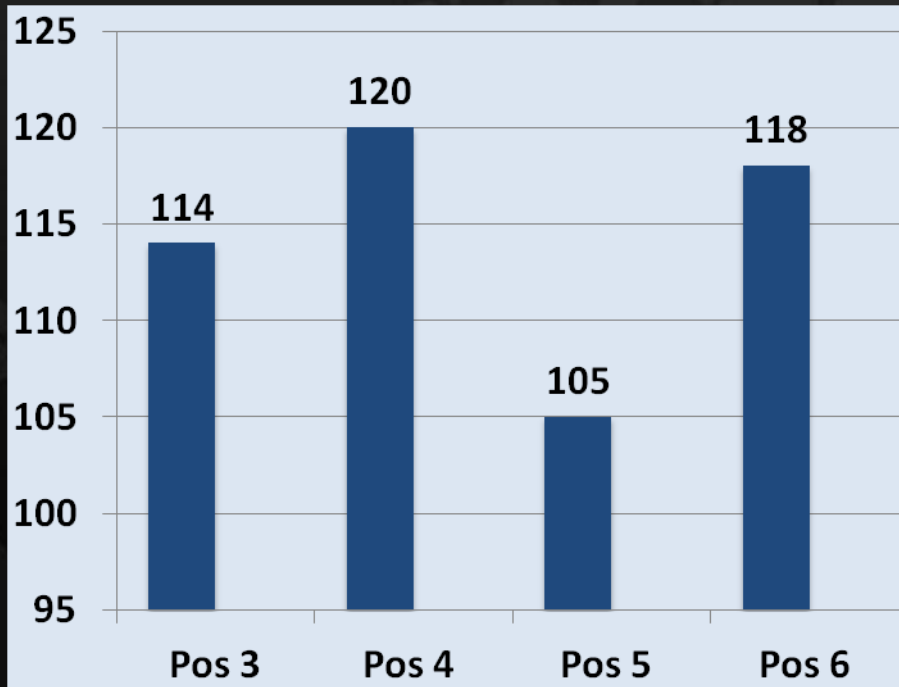


Case Study #2

Pressure vs. Load Distribution

Random inspection data – Bad Pressure Maintenance

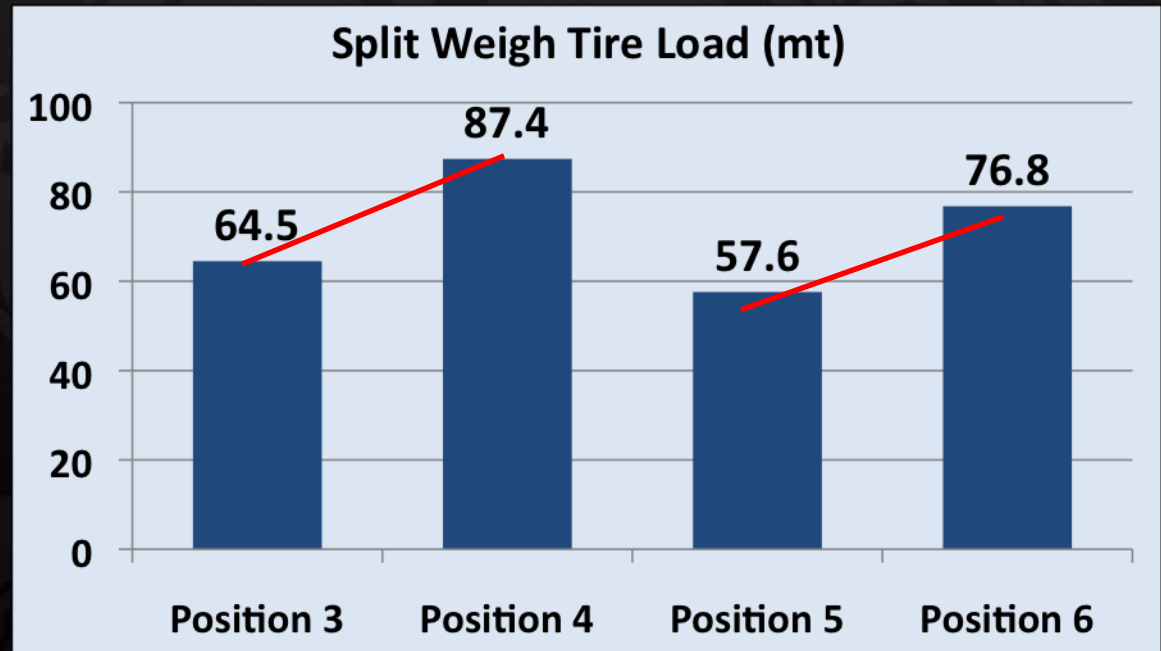
Hot Inflation Pressure (psi)



Komatsu 730E Weight Study Results Analysis

BEFORE
Pressure
Equalisation

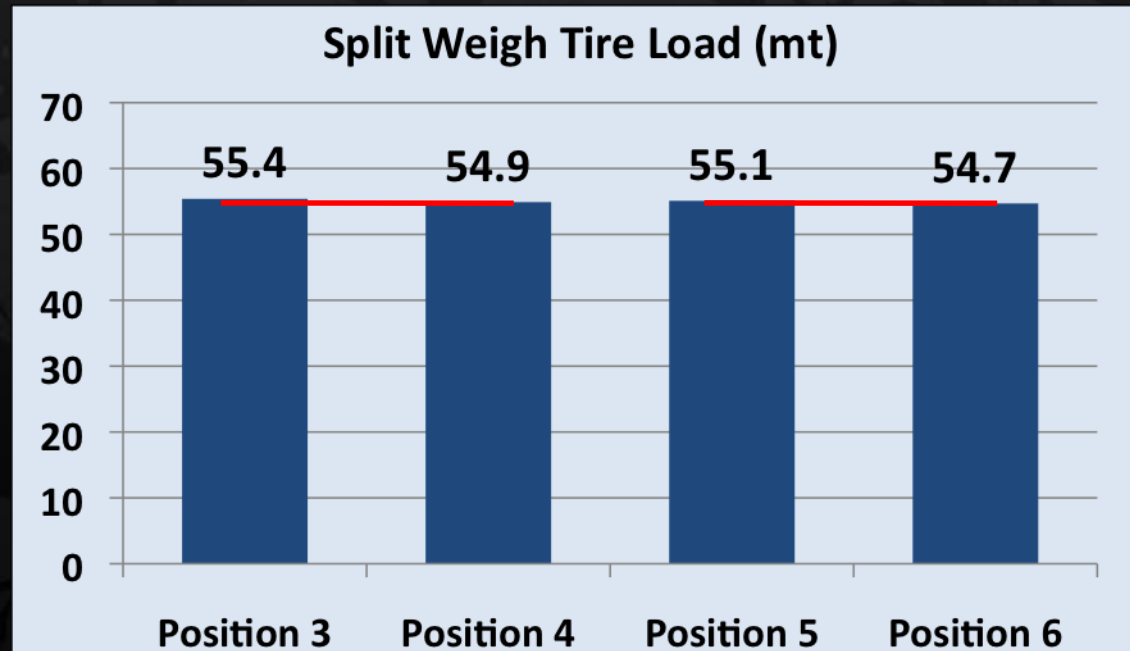
Date: 18-Nov-09	Time: 1:51 pm	Material: WASTE	
Left Front: 61.6	14.9%		
Right Front: 65.2	15.8%	Front Axle: 126.8	30.69%
Left Rear: 151.9	36.8%		
Right Rear: 134.4	32.5%	Rear Axle: 286.3	69.31%
GVW: 413.1	Tare: 146.6	Payload: 266.5	



Komatsu 730E Weight Study Results Analysis

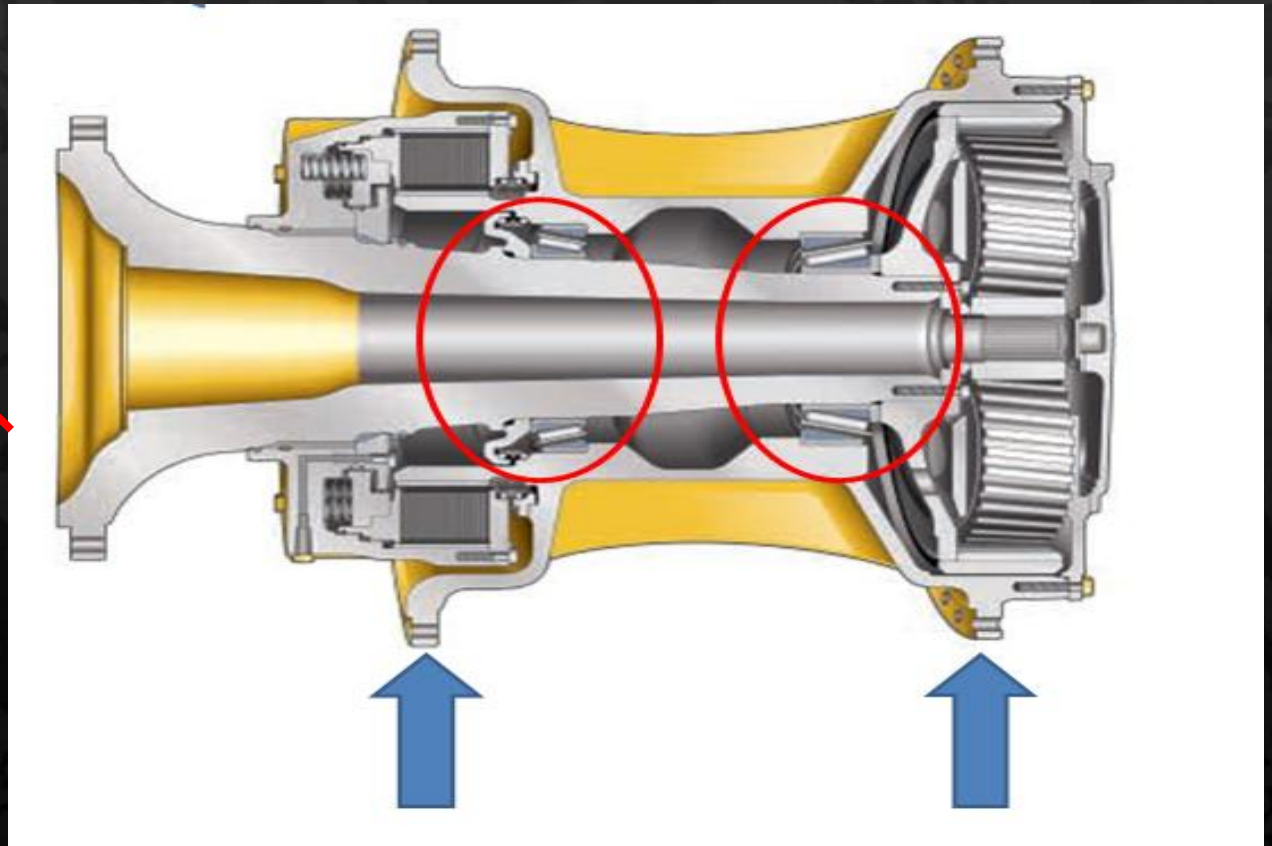
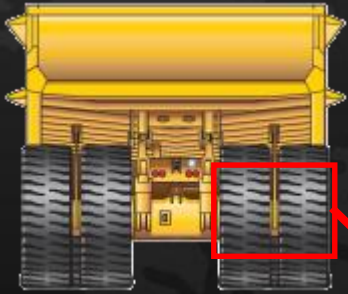
AFTER
Pressure
Equalisation

Date: 20-Nov-09		Time: 7:46 am		Material: WASTE	
Left Front:	58.4	17.3%			
Right Front:	59.4	17.6%	Front Axle:	117.8	34.86%
Left Rear:	110.3	32.6%			
Right Rear:	109.8	32.5%	Rear Axle:	220.1	65.14%
GVW: 337.9		Tare: 151.2		Payload: 186.7	



Potential Benefit

Equal pressure in dual tires provides equal load on wheel bearings & seals



TIRE PRESSURE EQUALIZATION SYSTEM

A dual tire pressure equalization device for retro-fitment on large to ultra class mining dump trucks and haulers





Tire Pressure
Equalization System

THANK YOU