

Turning LUBRICATION on it's head!



Lubrication practices will have a massive impact on the life of machinery, productivity and operating costs.

If any CEO is really interested in saving energy, preserving the environment, protecting a truck fleet including all the fleet support machinery, increasing productivity and reducing operating expenses, then it's time to turn lubrication on its head. Make lubrication a strategic and policy-driven issue writes *FleetWatch* technical correspondent Dave Scott.

A recent study by the SA Institute of Tribology (SAIT) – tribology has nothing to do with tribes and everything to do with friction and wear – outlines the alarming state of lubrication practices in South Africa. The problem is that weak lubrication practice has a massive impact on the life of machinery, productivity and operating costs. This problem is compounded by the fact that lubrication costs are such a small part of operating expenses, are perceived to have no strategic value and are applied by the most unskilled labour available ('grease monkeys').

Sponsored by the South African Department of Science and Technology and titled 'SA Tribology Project 2010', the study/report objective was to determine the cost and energy saving potential of tribology to South Africa. The 21-page report is broad-brush stuff but here are findings that relate directly to the SA road transport industry:

Root-cause failure analysis is not typically performed in industry hence the true value of lubrication related failures cannot be determined. There are, however, a number of individual operations that are conducting root cause analyses and have reliability engineers for failures above a certain

value. Most failures and breakdowns that occur are typically due to:

- Contamination, water or dirt ingress
- Alignment
- Poor maintenance
- Lack of greasing/ lubricating
- Policies and control.

The major component failures are gearboxes, pumps and bearings.

Typically up to 35% of the failures are caused by shaft misalignment. Laser alignment equipment is normally available but is not always used by the maintenance personnel - unless the reliability department insists and checks that this occurs.

An example in one plant was fans with double spherical bearings that were failing: 30% were due to misalignment and 70% due to balancing. Bearing life in the 18 fans was two to three months. With correct alignment and balancing this was reduced to approximately one failure per annum. These failures indicate the lack of skills, attitudes and training of artisans and artisan helpers. It is believed that this could be the cause of up to 60 -70% of all failures.

This study has shown that, in general, equipment life has been reduced by a factor of three over the past 15 to 20 years. The loss of equipment life is linked to a lack

of traditional maintenance skills. 'Modern' maintenance has forgotten that dirt does not lubricate, that shafts must be correctly aligned and that oils and greases are not all the same. The report goes on to point out the desperate need to get back-to-basics:

- A need to calculate the correct viscosity grades throughout to minimise energy wastage;
- To understand the difference between grade and type of lubricant.

Education is a priority, from the boardroom to artisan level. Tribology and lubrication are currently not part of any tertiary level course. A lubricator is one of the most important people in the plant and must be trained and recognised accordingly. Here are three items that truck operators can note:

- Total cost of ownership of assets should be a philosophy that is implemented.
- Filters and filter management is critical in improving system cleanliness and improving component life.
- Design of systems from an operation and maintenance perspective is essential to minimise dirt contamination of systems during maintenance. ► 28

Tribology

After gravity, tribology is the second most important property of matter; it is a complex science that impacts every person in almost every situation, and has a tremendous effect on industry at large, from energy consumption and wear in the largest machines to the joints in our bodies. Tribology is the study of friction and wear. Without friction, the world as we know it would not exist: we would all slide around endlessly. On the other hand, friction can only occur when two bodies are in relative rubbing motion - and rubbing means that the bodies are in actual contact. Friction generates wear and heat. Heat developed through friction wastes energy and sometimes requires more energy to dissipate the heat, such as through a cooling system. At the same time, wear takes place on both rubbing surfaces.

◀ **Is unskilled roadside** lubrication on wheel hubs really effective? Not by the looks of this operation. It's a mess. There is a better way.





▲ **Neat and well** organised lubrication stations in workshops giving easy access to different lubricants as well as vehicles is a sure sign of a well kept fleet.

Executive challenge – turn lubrication on its head!

Most lubrication pits and lube stores are not places you would want to visit in office dress. So go on! Instead of whisking yourself off to the executive suite, take a tour of the lubricator's ('grease monkeys') workplace and ask yourself does this match the highest standard? In all honesty, is this operation going to extend vehicle and component life? Do you really need more computers and software over an upgrade for outdated lubrication equipment, storage areas, systems and procedures?

And then how are the lubricators dressed? What hand-cleaning material is available? Is there enough light in the lube-pit? What are their job descriptions and when did they last receive training? Are colour codes employed to simplify lube applications? Do used oil disposal methods match the highest environmental standards? Do lube practices and material match the technology now in use?

Finally, make friction (tribology – your new word) a strategic issue. This elevates the subject to the level of being policy-driven, environmentally-friendly, energy-conservative and concerned with life-cycle costs. □

References & acknowledgement

'Swan PG, Fitton JC; South African Institute of Tribology; SA Tribology Project 2010'

A copy of this paper can be obtained from the SA Institute of Tribology.

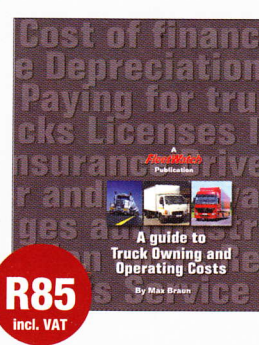
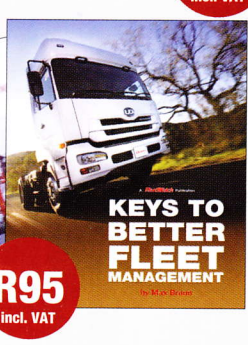
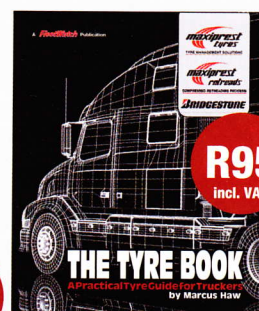
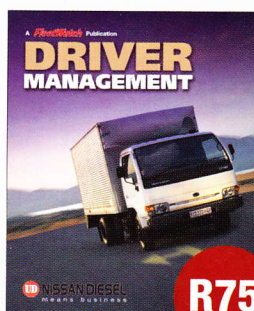
CASE STUDY

Lack of skills ... causes a costly mistake

A RECENT incident occurred when a multi-load bulk lubricant tanker was dispatched to an open cast mine to deliver bulk loads of two different lubricants. The wrong product was pumped into the engine oil tank, and although the driver realised the mistake, he thought that he would "fix" the problem by ensuring that the correct volumes were pumped into the respective tanks. Both mine bulk tanks then contained various mixtures of lubricant, but the driver's paper work balanced.

Unfortunately, due to the significant differences between the lubricants, the mine was brought to a standstill, as all vehicles that had received services or top-ups needed to be drained. Fortunately, however, the error caused a rapid increase in blow-by on some trucks, or the incident would have been significantly more severe.

The cost of this incident in lost production and equipment repair costs was approximately R3-million; this could have been resolved for a few thousand Rand if the driver had had the skill and knowledge to determine the mistake initially. Additional costs are now being incurred to prevent further multi-load deliveries mix-ups, and each lubricant delivery needs to be tested on site. □



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