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Press Release

Soot build-up in lubricants can be big issue, warns Techenomics

Techenomics' fluid analysis determines soot levels, which can form a vital part of a predictive maintenance program. Trending the analysis results over time can point to the cause of the soot build-up and the problem can be remedied.

Techenomics CEO Chris Adsett says, "Soot is harmful to engines and at excess levels causes abrasion. It can be attributed to improper air/fuel ratio, poor fuel quality and improper injector adjustment.

"The soot level is a good indicator of engine combustion efficiency and should be monitored on a regular basis. "Excessive amounts of soot can indicate timing issues, over-fuelling or dribbling injectors as well as worn compression rings, among other reasons."



Chris Adsett, CEO of
Techenomics International

Chris Adsett says soot can be particularly harmful if it accumulates into clumps, which leads to valve train, ring and liner wear.

It can also thicken the oil and increase viscosity, which inhibits oil flow, especially in cold weather starts where the soot-laden engine oil can increase the time it takes for the oil to reach critical engine parts, such as the valve train.



Soot samples being analysed by Techenomics staff

As viscosity increases there is a tendency for greater amounts of the thickened oil to accumulate on the engine cylinder wall. As the piston moves upward, the increased accumulation of soot laden oil on the

cylinder wall may result in the excess oil being released into the combustion process, which can increase oil consumption.

Soot particles are very small and generally pass through the filter media until they begin to agglomerate. At this stage the oil condition can cause several problems.



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Techenomics is developing improved analysis and treatment techniques for soot.

“We have found with analysis of soot cakes from certain engines that the content of iron, copper and lead can be hundreds of ppm and may well greatly exceed the iron, copper and lead in the oil analysis, thus masking the actual wear rate in the engine which is monitored by setting warning and critical levels,” Chris Adsett says.

“At this stage we have not completed enough soot cake analysis to fully understand the relationship between the wear metals in the oil and soot cake but they are obviously indicating that the rate of wear of critical components in the engine is higher than indicated by the oil analysis.

“This is critical as failure could occur without wear metals being above the warning levels in the oil as 50% or more of the wear metal is being trapped in the soot cake, thus masking a potential failure.”

He says further research and development work at the company’s laboratories is examining soot in an effort to provide improved preventative maintenance services for clients.

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