WEAR CHECK® AFRICA
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TECHNICAL BULLETIN

ISSUE 10

Your questions answered

We believe that all of our tests are a necessity, and not a luxury.

Wearcheck technical staff are always happy to answer queries from customers to help them get the most from their oil analysis programme. For the benefit of all Wearcheck customers, we have put together the most commonly asked questions and feature them, along with the answers, in this technical bulletin.

Sampling

Q1. How should I take a correct sample?

All samples should be taken at operating temperature (hot) and the oil should be well mixed.

Q2. How often should I sample?

In general engines are sampled every 10 000 km while transmissions, drive trains and gearboxes are sampled every 20 000 km. In hours, this translates to every 250 hours for engines and every 500 hours for transmissions, final drives and hydraulics.

For industrial applications the oil sample interval is decided during the consultation period by Wearcheck and the engineers involved.

Q3. What are the main reasons for incorrect diagnosis?

A badly taken sample and insufficient information supplied to Wearcheck with the sample.

Testing

Q4. Why does Wearcheck perform so many tests on the oil? Are they all necessary?

We believe that all of our tests are a necessity, and not a luxury. Some oil analysis companies offer a reduced service at a reduced cost, offering customers a choice of the level of service desired. This is not Wearcheck's philosophy. From a data base of over half a million samples we have formulated test profiles for every type of equipment found in industry covering every eventuality, and all samples are subject to the complete range of tests. Even if only three per cent

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of all engines analysed show a dangerous level of water contamination, it is not worth bypassing this test and risking equipment worth hundreds of thousands of rand to save a few rand on oil analysis. It is this philosophy that enables us to offer customers true peace of mind.

Q5. What is the PQ?

The PQ (Particle Quantifier) gives a bulk iron reading irrespective of the particle size. It is able to detect particles that are too large for the spectrometer to pick up.

The higher the PQ index, the more serious the problem. A high PQ would automatically indicate that a microscopic particle examination must be carried out as an in-depth test to evaluate the severity of the wear problem. In serious cases a high PQ could also initiate a ferrogram to determine whether a component needs to be dismantled.

Q6. What is normal?

The definition of normal varies from machine to machine depending on its workload and the environment in which it operates. Oil analysis interpretations are based on trends rather than specific limits.

Q7. Why doesn't Wearcheck use wear limits?

Again, because the same component behaves differently under varying conditions. For example a truck engine operating on long hauls between major cities will have a different wear profile from the same engine which is being overloaded in a stop-start off-road operation like a quarry. Trend analysis is a far more effective measure of abnormalities than wear limits.

Q8. Why doesn't Wearcheck use wear rates?

There are too many variables to be able to determine wear rates accurately.

For example, you need to have precise oil consumption figures to be able to apply the relevant mathematical formulae, and these are seldom available.

Feedback

Q9. Why is it necessary to supply feedback to Wearcheck?

A diagnostician is only as good as the information supplied to him or her. The better the quality of information the diagnostician has to work with, the more accurate the diagnosis will be. Feedback on one sample is essential for diagnosis of the next sample.

Reports

Q10. How should I react to the Wearcheck report?

Read the diagnosis carefully and phone the Wearcheck diagnostician if:

a) you are in any doubt about what action to take, or
b) if you find abnormalities after carrying out the recommended action and are not sure what to do next.

Never dismantle a component

without first consulting a Wearcheck diagnostician.

Q11. I don't have time to figure out all the numbers on the Wearcheck report. I'm a professional in maintenance not chemistry.

We know that most of our customers don't want to interpret their own data.

These customers need only read the interpretation of the chemical and physical results provided in the diagnosis. The readings are included on the reverse of the report for those customers who are interested in seeing them.

Many major manufacturers insist that oil analysis is conducted during the warranty period.

Uses

Q12. Do I need Wearcheck if my equipment is still covered under warranty?

Yes, because a problem could develop towards the end of the warranty period which could cause a failure outside the warranty. Oil analysis can provide solid evidence for warranty claims. Many major manufacturers such as Caterpillar and Komatsu realise the value of oil analysis and insist that it is conducted during the warranty period.

Q13. Can Wearcheck be used to evaluate a second-hand vehicle?

Yes, although trend analysis cannot be applied if this is a one-off test, oil analysis will detect excessive wear and major contaminants such as fuel dilution and dust entry. A ferrogram or a filter examination will help pinpoint specific problems on all components.

Q14. If vibration analysis is carried out on industrial gearboxes, do I still need to do oil analysis?

Yes, the two forms of analysis complement each other. Oil analysis will detect contamination before vibration monitoring detects contamination-related wear, and analytical ferrography can detect abnormal bearing and gear wear in the very early stages.

Q15. What is the importance of in-depth testing, for example filter or ferrographic analysis?

Ferrography accurately pinpoints problems that have been highlighted by oil analysis. Because it is an in-depth examination of particles generated from the problem area, it enables diagnosticians to identify the wear mechanism and its severity and make the decision whether to dismantle or not. Oil filter analysis can also highlight any abnormal wear.

Q16. If I do field tests on diesel engine oils, do I still need to send the sample to Wearcheck?

Yes. Ideally, field screening tests that indicate the presence of fuel dilution or sludging should be done on all samples. The samples still need to be sent on to Wearcheck for complete analysis to measure the levels of other contaminants and wear metals.

If the wear particle is visible to the naked eye, it has already caused substantial damage.

Oils

Q17. Can one oil cater for all the different engines manufactured?

No. Engine manufacturers in Europe, Japan and the USA design engines for specific purposes. They are all high powered and they all need different types of lubricants. You might have been able to use one oil in the past, but this is no longer the case.

Q18. Do high price synthetic oils work?

Yes. However, because of their high cost, the benefits of using them should be balanced against the expense, taking into account the cost of the lubricated component, the application and the working environment. Synthetic oils generally protect components from high temperature operation but cannot protect them against contaminants like dirt or water.

Filters

Q19. Does additional filtration affect the oil analysis result?

Yes. Good bypass filters do remove more debris than standard flow filtration. This can result in lower wear metal readings and emphasises the need for trend analysis.

Q20. Do filters need to be analysed every time they are discarded?

Yes. All filters should be examined before they are thrown away. If the indications are unclear, the filter should be sent to Wearcheck for analysis.

Services

Q21. I've been studying wear metal for years. I can tell if there is abnormal wear by cutting open the filter. Why do I need Wearcheck to measure the metal in oil?

Oil analysis can predict abnormalities before they become a major problem.

Metal you can see and feel is the result of progressive damage in the well advanced stages. When you consider that active wear particles are as small as 15 microns while the average human hair is 40 microns thick, it is clear that if the wear particle is visible to the naked eye, substantial damage has already been caused.

Q22. What tests does Wearcheck perform?

Wearcheck performs oil analysis, filter analysis and ferrographic analysis. Kits are available for all three tests.

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