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Oil Analysis and testing

Soot, when is it a problem

9/10/2009

Soot, when is it a problem for an engine?

How often have you heard something along the lines, “soot is abrasive” or “soot is damaging to the engine”. However, it’s a regular misconception that soot particles of the type generated by internal combustion diesel engines and commonly found in diesel engine oil, are abrasive.

That said we’ve all seen the build up of soot on piston top lands and jamming rings, stuck up with hard baked on soot and carbonaceous deposits and all the ensuing problems associated with it. So what’s going on?

Basically soot in an internal combustion engine is produced in a very fine, sub micron form. It’s a normal process when distillate fuels are burnt in a compression ignition engine, despite advances in all modern engines, primarily driven by emission regulations. These advances mean that less soot is produced per ignition stroke.

Another major advance in the past 20 years has been the continual improvement of engine oils, in particular the way they are able to control and handle soot.

One of the ways quality engine oils deal with soot is to hold the soot particles in suspension, preventing them from agglomerating or flocculating and depositing themselves on engine parts, which would lead to the build up of undesirable deposits. Special chemicals, of the type detergents and dispersants, generically known as surface active agents, associate themselves with the soot particles, keeping them in a safe condition.

Poorer quality oils will not have the same capacity to carryout this function, meaning the oil will have to be changed sooner or risk harmful deposits occurring. Also oils that have been used beyond there useful life, will similarly lose their ability to control soot particles. Other factors like coolants leaks and poor ignition process will greatly affect an oils ability to control soot by shortening the useful life of the oil.

So back to the question of “is soot abrasive?” the answer is; intrinsically soot is not abrasive, but left to get out of control it may become so, as its form is changed due to flocculation and other processes.

The best way to avoid problems with soot is to use good quality oil and ensure the engine is running at optimum tune. That done, the situation is best monitored through oil analysis by enrolment into a Regular [oil analysis](#) programme.

By monitoring the oil in this way, maximum life (and therefore reduced costs) can be obtained from the oil, along with all the other associated benefits of being on a scheduled oil analysis programme.

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