

## SOOT HANDLING

Soot is generated as a byproduct during the internal combustion process. With the advent of EGR emissions controls, soot that used to go out as exhaust is now returned to the crankcase to be added to the engine oil. Fortunately, the engine oil is designed to handle this additional amount of soot. The most recent upgrade, API CJ-4, has greater dispersancy and soot handling ability than any previous category.

It is critical that the oil be able to handle the soot being introduced into the crankcase since soot is comprised of 98% carbon, a very hard compound. If soot were allowed to move around uncontrolled, it would cause wear to the engine. Additionally, soot particles tend to grow through agglomeration and the particles will continue to increase in size if unchecked, causing the engine oil to greatly increase in viscosity. The dispersants present in the engine oil will "surround" the soot particles and prevent them from agglomerating and causing wear.

With the new CJ-4 category there are specific engine tests designed to determine the oils ability to disperse soot. The Mack T-11 test requires the oil to maintain its original viscosity with an allowable increase at certain percentages of soot loading. In the past, OEMs have established condemning limits for soot levels because it was believed it was time to change the oil after a certain level of soot was reached. The current approach is that the soot needs to be absorbed by the oil and held in suspension since soot that is dispersed in this manner is not present to cause wear. Therefore, it becomes critical that the dispersant keep the soot suspended and that the viscosity, which is now a more critical determinant, does not elevate above the limits assigned by the API category.

In summary, soot is a normal occurring component of combustion, soot absorbed in the oil is a desirable function, and API CJ-4 oils are designed to disperse the soot and remain in viscosity grade. Universal Lubricants, Inc. has three engine oils with API CJ-4 approval which have demonstrated superior soot handling capabilities:

Universal Dezol  
Dyna-Plex 21C SHPD  
Dyna-Plex 21C Durazol

For more information, please contact your Sales Representative or our Technical Services Department at 800-444-OILS.

Technical Services  
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