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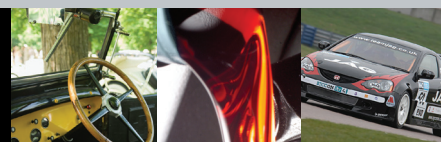
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ENGINE OILS, TRANSMISSION OILS AND FUEL TREATMENTS



Motorsport



ZDDP CAMSHAFT WEAR PROBLEMS

IMPORTANT INFORMATION FOR RACE PREPARATION TEAMS AND CLASSIC CAR AND BIKE OWNERS.

Changes to the anti wear additives in modern engine oil formulations can have a serious effect on older engine designs. Accelerated camshaft/cam follower wear can be a sign of this problem

Engine builders are reporting frequent cases involving serious wear on camshafts and followers during the running in process, and / or within a relatively short period of time after an engine rebuild.

Inevitably, the problem will be attributed to the surface hardness or the quality of the lubricant.

However the situation is not as simple as it appears, and this paper sets out to explain the changes that are occurring in current additive technology and how they will affect older designs of engine component.

Historically, the anti wear additive used in the majority of formulations was a zinc / phosphorous based compound known as ZDDP. (Zincdialkyldithiophosphate)

The bad guy in this story is the phosphorous content of ZDDP and its associated ash content that has a detrimental effect on sensitive exhaust emission systems.

As the car manufacturers demand long drain intervals (combined with low viscosities, e.g. 0w30, 5w30) there has been a need to replace the zinc / phosphorous additive with other additives.

Hence many new formulations developed to meet the OE specifications from Ford, BMW, VAG, Mercedes etc have reduced levels of ZDDP.

However the anti wear characteristics of these new additives are different to ZDDP in certain circumstances and therefore require different specifications for the surface hardening on camshafts, followers, gears etc.

These oils will not present a problem in your new Ford Focus, but will cause serious problems in your Cosworth Ford DFV or Lotus TwinCam Ford, where the surface hardness has not been developed in conjunction with the additive pack.

All Millers Oils Motorsport and Classic formulations will continue to contain the optimum amount of ZDDP to give maximum possible protection against wear in highly loaded engine components.

The Premium Automotive range is formulated to meet or exceed the current OE specifications of car manufacturers.

ZDDP

