

## **Bulletin 4**

### **CAMSHAFT – TAPPET LUBRICATION PROBLEMS**

Elsewhere in this issue you will see a Notice about a proposed Supplemental Preparation Rule regarding camshafts and cam followers. Although the proposed change is directed at Race Group 6, the problem it addresses concerns engines in cars in other race groups, perhaps even all race engines. If you are running any type of race engine using a flat mechanical tappet camshaft, the use of standard API oils could result in damage, particularly during break-in.

As stated in the proposed rule, the allowance of any type of camshaft and roller cam followers in Group 6 is being allowed because of changes to engine oil formulations. In its efforts to reduce pollution, the EPA has required API engine oil producers to drastically reduce the zinc, manganese or phosphate content of their oils to reduce damage to catalytic converters. The result of the reduction or elimination of these chemicals, primarily ZDDP (Zinc Dialkyl DithioPhosphate) in API oils results in reduced lubricity, or in other words, the oils do not have as much resistance to the pressure one engine part may place on another. The camshaft to tappet pressure area is the primary example.

Although this issue originally arose regarding freshly rebuilt engines during the initial run-in, the lack of ZDDP chemicals in API oil may cause increased wear after break-in. So there are two areas of concern, initial break-in and long term operation.

There are a number of ways to avoid the increased wear. As always, it is important to adequately lubricate the camshaft and tappets when assembling an engine. Every good engine builder knows to do this, using molydisulfide assembly lube or similar products.

Next it is important to make certain that whatever break-in oil is used, that it either contains the appropriate chemicals or that the necessary chemicals are added to the oil. A number of companies make products containing the necessary additives. These include Comp Cams Camshaft Break-In Oil Additive, Valvoline SynPower, Chevron Delo 400 or GM EOS. Also, pure racing oils, such as Red Line, Royal Purple, Amzoil Synthetic Racing Oil or similar products are not API approved and should contain the necessary chemicals.

Originally, when this problem was discovered, the use of Rotella, or other diesel oil was recommended, but the machine shop operator I use said that the EPA had recently required that these products also reduce their ZDDP content. Keith Ansell, president of Foreign Parts Positively Inc. has written several articles on the subject. You can find one of them on the MiniMania website, [www.minimania.com](http://www.minimania.com), or go to Mr. Ansell's company website, [www.ForeignPartsPositively.com](http://www.ForeignPartsPositively.com).

Mr. Ansell's article confirmed what my machinist said about Rotella and similar products, stating that diesel oils may be suspect after the middle of 2007.

If you have been using what might be referred to as a standard street oil, including synthetics, you should check to verify that the necessary ZDDP is included. It would seem that any oil intended for modern street cars, will not contain the necessary ZDDP, although Mr. Ansell's article lists a number that currently could be used. Among the oils listed, Castrol Syntec 5W-40 and 20W50, Grand Prix 4-Stroke Motorcycle oil 10W40 and 20W-a50, TWS Motorsport 10W-60 and BMW Long life 5W30, Red Line 10W-30 and 10W-40, Valvoline VR-1 20W-50, Amzoil 20W50(TRO), 10W40(AMO), 15W40(AME), 20W-50 (ARO), Mobil 1 5W-30 and 20W-50.

In reviewing the recommendations, I noted that my machinist had mentioned that the high viscosity grades, 5W-30 and 10W-30 will have virtually no ZDDP in them.

It is also apparent that the oil companies are working on new products to take care of the problem. Red Line is supposed to be bringing out a new break-in oil this spring. If you have a race car with the type of engine which could be affected, it is necessary that you investigate and choose your oil carefully.

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