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**BREAK IN OIL**  
CHOOSING THE RIGHT OIL  
FOR FLAT TAPPET CAMS

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**LS ENGINE OVERVIEW**

**RACE BEARING TECH**

**CAMSHAFT BALANCING**

**2007 TECH SOLUTIONS**

**GRAND PRIZE WINNER**

# Oil 101

An industry expert discusses the best oils to use for specific engine applications.

**L**aVerne Schumann has been involved in racing since the 1950s. A senior member of the Society of Manufacturing Engineers, he started his own company, Schumann Sales and Service, in 1970, developing and distributing parts to warehouse distributors and engine builders. Schumann, who's also a member of PERA and AERA, spoke with *Precision Engine* on the best type of oils to use at different phases and for different applications during the life of an engine.

**PE:** In terms of both street performance and racing applications, which type of oil is best, petroleum or synthetic, for which specific applications?

**LS:** For street performance, which is a mild performance, either one would do a very adequate job. The hardcore racing fraternity, circle track or drag strip, particularly in the drag strip, for example, they've all gone to very lightweight oils for horsepower gain.

**PE:** Do you need to use a specific type of oil when breaking-in new flat tappet camshafts and lifters?

My

recommendation would be to use quality, anti-build, anti-weld oil throughout the life of the engine.

**LS:** In my estimation, today there are only three oils out there that work on flat tappets. The break-in is usually accomplished on a flat tappet with reduced valve spring pressure to help aid the break-in and then the full valve spring load is put on after break-in cycle. There are some specialty oils for break-in and they contain a high percentage parts per million of the break-in package, anti-build, anti-weld additive, but I would not recommend going back to a standard oil after break-in, there's a risk involved. You can still have micro welding and damage to the cam and lifters after break-in if you put in an oil that's not up to the job, so my recommendation would be to use the quality anti-build, anti-weld oil throughout the life of the engine.

As far as flat tappet wear problems, half of it's caused by oil lubrication misunderstandings, misapplications, and the other half is caused by geometry, the geometry of the cam shaft load and the geometry of the lifter being mismatched. An oil can't cure a geometry problem, a geometry problem has to be cured by modifying the geometry of the cam or lifter. In other words you can't just take the magic bottle and pour it into a mismatched geometric lifter, cam load situation and fix the problem, it's not that easy.

**PE:** In terms of both high-performance street and racing, what are your viscosity recommendations?

**LS:** The better engine builders with better equipment are all going to thinner-weight oils. The clearances on bearings, pistons anywhere in the engine has been reduced and made more accurate. The drag strip people now use an 05-weight oil to gain horsepower and they also use that same light weight in their small reduction volume pump. The circle track people, the days of 50- and 60-weight heavy-viscosity are over, it's all a 10-40 or a 20-50 scenario these days. Even some of the longer-endurance racing on asphalt are using a 10- or 20-weight oil today.

**PE:** What is the engine oil's role in absorbing and transferring heat?

**LS:** Different parts of the engine on heat transfer are affected by the oil. Any place you have a mist or a spray in the engine, the is able oil to stick to the part for a significant

amount of time to draw the heat out before being transferred into the return cycle of the sump, dry or wet. In the pan, if the part is hit by the oil and immediately discharged, it has very little residual time to draw any heat out. The part of the engine, such as engine bearings and crank shafts and that area where it's under full pressure, you are always ensured of a constant flow of oil and it's a little less critical. Piston skirts, wrist pins, valve guides, valve train purge, push rods, rocker arms, the type of oil, the residual time to draw the heat out and the viscosity index and the modifiers that are putting oil plays a key role.

**PE:** What are some engine lubrication challenges for off-road applications?

**LS:** As far as for oil change intervals, it depends upon the fuel that's used, if it's a gasoline in the fuel mixture is correct, if the cylinders run fairly dry and efficient. The worst scenario would be an alcohol engine improperly tuned where you have a lot of residual fuel getting into the oil and that's a situation where, perhaps, after every circle track race the oil would require changing. If it's in a drag strip situation where we have nitro diluting the oil, it's after every run. If it's a street rod situation where it's actively driven and temperature is up to 220, 240 and the things are being dried out as it should be, it would be another 2,000-3,000 miles, more than normal situations. The oil change interval is really directly proportional to the headache of the racing taking place.

The oil change requirements, asphalt versus dirt, it's more of a lap-to-lap, 100 lap nonstop, 200 lap nonstop versus a Saturday night scenario of 20 or 30 laps. The oil change intervals has to be directly controlled, and the oil filter involved is a big element, whether it's a full-time filter through screen meshing or whether it's a typical paper partial-bypass filter, the oil filter determines a lot of the residual parts that might come loose on an engine due to normal wear, or abnormal, the kind of fuel, gas versus alcohol, is directly something that needs to be addressed and looked at, and the tune up of the engine. But, if in doubt, change it. **EQ**