



CHAMPION BRANDS
1001 GOLDEN DRIVE
CLINTON, MO 64735
1-800-821-5693

www.championbrands.com
www.championsusechampion.com

TECHNICAL BULLETIN: KD102720
SUBJECT: Used Oil Analysis

DATE: 10-27-20

Used Oil Sampling for Analysis

Oil provides the cooling, cleaning, lubrication and fluid power for equipment such as motors, engines, transmissions, shock absorbers and differentials. In essence, oil is the lifeblood of your vehicle and just like a doctor samples your blood to determine your health, oil analysis can determine the health of the equipment and the health of the oil itself.

Your race car, muscle car, tractor, classic car, diesel pick-up, or diesel big rig can all benefit from an oil analysis regimen to know when to change the oil or to prevent catastrophic failure down the road.

In the same way that an engine dyno measures horsepower, oil analysis measures engine wear without having to disassemble the engine. Utilizing atomic emission spectroscopy, oil analysis reveals the amount of wear occurring within an engine and reports it in parts per million for each element. For example, increasing levels of tin and lead indicate bearing wear.

Oil analysis also reveals contaminants such as water, coolant, fuel dilution and airborne dirt/sand. Contamination levels provide insight into the effectiveness of both oil and air filters as well as the tune up of the engine. High levels of fuel dilution indicate possible injector or carburetor problems.

Finally, used oil analysis provides trend analysis which reveals the "health trend" of the engine. When should the engine be rebuilt? Can the engine run another race? Go another 10,000 miles over-the-road?

Oil analysis is an economical and highly effective method of monitoring your vehicles condition and detecting early warning signs of problems and failures. However, oil analysis results and diagnoses are only as good as the quality of the oil sample. To maximize the effectiveness of your oil sampling, it must be performed with some important goals in mind.

- The oil sample must be representative of the condition of the lubricant at the time of sampling.
- Sampling should be done carefully to minimize contamination.
- Consistent sampling procedures provide more representative samples as well as accurate data and trending.
- Samples should be submitted immediately to ensure results are as relevant as possible.

The system should not be idle or "cold". To maximize data accuracy, the oil sample needs to be representative of the oil as it flows through your equipment during normal operation. The equipment should be running under normal working conditions and operating temperature, so the sample can be taken under conditions that would cause normal wear. Ideally, the equipment should have been running about one hour prior to sampling.

Oil samples should be extracted as quickly as possible after the equipment has stopped to minimize loss of data from the effects of settling. Have your sampling equipment--hoses, pumps, etc.--ready prior to shut-down, so sampling can be done as soon as possible. Ideally, oil sampling should be done within 10-15 minutes of shut-down.

Samples should be taken on the fluid return or drain line; basically downstream. The collection point should also be upstream of your filter. Try to avoid sampling from the drain plug. Sumps and reservoirs will hold historical sediment and contaminants not representative of the current state of the lubricant.

Better to pull from the oil dip stick with a vacuum type pump. Insert tube through the fill port or dip stick port. Take sample about midway into the oil level. You should try to draw your samples at the same level each time. A quick-connect sampling valve can be installed on high pressure ports to improve sampling.

Establish consistent oil sampling procedures to ensure repeatability and accuracy of oil analysis results. This also ensures accurate historical trending. All maintenance personnel should follow the same procedure for sampling. Sample from the same location, and sample at the set frequency.