



CAT S·O·S SERVICES

Like all Cat® Dealer services, the S·O·S Services Program is a mutual commitment to protect the performance and value built into your Cat equipment and non-Cat equipment. Our S·O·S Program will provide you with one of the most sophisticated diagnostic tools available. By giving you a clear picture of what's happening inside your equipment, we will help increase productivity, reduce repair costs, schedule down-time and lower your overall operating costs. Through wear metal, oil condition, oil cleanliness and coolant analysis, abnormal wear and problems are caught before they progress to a complete failure.

SAMPLE TURNAROUND TIME

ALL OIL AND COOLANT SAMPLES ARE COMPLETED AND REPORTED BY THE END OF THE NEXT BUSINESS DAY FOLLOWING THEIR ARRIVAL IN OUR LABORATORY.

- › Diesel Fuel samples are completed in 7 to 10 business days by our contracted independent fuel laboratory.
- › All reports can be provided via e-mail or mailed to your company.
- › You will also have access to view your test results on our company website

For more information about H.O. Penn S·O·SSM Fluids Analysis Laboratory or any of our capabilities, please call Heather Hart at 860-594-4860 or email hhart@hopenn.com.



H.O. PENN MORE THAN THE MACHINE

PROTECT THE PERFORMANCE OF YOUR

S·O·S SERVICES PROVIDE YOU WITH VALUABLE RESOURCES TO CARE FOR YOUR EQUIPMENT.

WEAR METAL ANALYSIS

Inductively Coupled Plasma (ICP) detects wear elements, oil additive package elements and the elemental constituents of some contaminants. These concentrations are listed in parts per million (ppm) and can detect particles up to about 10 microns in size. By looking at wear particles this small, we can catch problems when they're just beginning, allowing you to become proactive rather than reactive to a failure. Different combinations of key elements allow us to pinpoint areas of abnormal wear

OIL CONDITION ANALYSIS

Oil Condition analysis is used to determine if the oil has degraded. The condition of used oil is determined by Infrared Technology. Infrared analysis determines soot, oxidation, nitration and sulfur products. Your S·O·S Analyst uses established guidelines or trend analysis to determine if the oil has reached the end of its useful life.

OIL CLEANLINESS ANALYSIS

Particle Count Technology determines the amount and size of particles in non-engine compartments. Particle count analysis is used to evaluate particles from 4 to 50 microns and counts metallic and non-metallic debris. Particle Count results are listed as an ISO code and a channel count. The Particle Count channel counts are reported in counts per milliliter of sample (counts/mL). The ISO code is a summarization of the channel count results. An increase in ISO code values could indicate an increase in wear or the presence of contaminants.

VISCOSITY ANALYSIS

The viscosity of all oil samples are tested at 100 degrees Celsius and reported in centistokes (cSt). Viscosity is the measure of a fluid's resistance to flow through the viscosity tubes at the calibrated temperature. The higher the value the more viscous the fluid. Water, soot, oxidation and antifreeze

may cause the oil's viscosity to increase or thicken. Fuel causes the oil's viscosity to decrease. Extended oil drains may do either; high soot and oxidation will thicken an oil and extreme temperatures may cause a multigrade oil to shear down to its lowest number.

WATER ANALYSIS

All samples are tested for the presence of water. Water is reported as positive, trace, or negative. Positive is anything over 0.5%. An amount of over 0.5% is considered unacceptable. Water may condense or leak into a compartment. Water can also be a result of pressure washing equipment. Equipment that operates in wet conditions may experience water in final drives and axels. Water can cause corrosive wear and rusting in any compartment. Corrosive wear occurs when the water combines with compounds in the oil to form acids. Rusting can occur in areas above the oil level in sumps, where an oil film does not protect the metal. If large quantities of water enter a compartment, the oil and water mixture could create a thick sludge

COOLANT CONTAMINATION

Engine oil may become contaminated with coolant due to leaks from: oil cooler cores, internal coolant passages and cylinder head gaskets. Hydraulic systems or transmissions, using oil-to-water coolers, may become contaminated with coolant. Coolant contamination will increase wear. High levels of coolant in the oil will produce sludge and total oil deterioration.

GAS CHROMATOGRAPHY (GC) ANALYSIS

Gas Chromatography Technology determines exactly how much fuel is leaking into a compartment. The most significant problem associated with fuel dilution is low viscosity. Low viscosity and high operating temperatures can cause oil films to become dangerously thin. If the oil film does not have adequate thickness, moving parts may experience direct contact. This could result in scuffing or seizure of moving parts and eventually a failure. If fuel dilution exceeds recommended levels, it is generally because of:

- › Internal fuel injectors
- › Worn fuel injectors



OUR EQUIPMENT

- › Failed fuel injector
- › Extended idling
- › Incorrect timing

COOLANT ANALYSIS

Engines, transmissions and hydraulic systems all suffer from poor coolant condition. Nearly half of all engine failures are caused or accelerated by poor cooling system maintenance. If the coolant is not properly conditioned, the oil will overheat resulting in lost lubricity and rapid deterioration. The following tests are performed on all coolant samples sent to our S-O-S Laboratory:

- › Percent Glycol (boil and freeze point protection)
- › pH
- › Conductivity
- › Nitrite
- › Foam
- › Sediment
- › Odor
- › Oil or Fuel presence

DIESEL FUEL ANALYSIS

Our S-O-S Fluids Analysis Laboratory offers a comprehensive collection of diesel fuel testing services to detect storage integrity and classify product by ASTM and industry specifications.

Call the lab to determine which package includes the right testing need for your application.

S-O-S SERVICES WEB

With S-O-S Services Web, it's fast and easy to monitor the effectiveness of your equipment maintenance program. From the opening screen you can view your current sample information by exception or by performing an advanced search by exception, job site, serial number, unit number, status, manufacturer, family, model, or compartment. Once the information is pulled up, a detailed description of the specific sample is available along with the history of previous samples from that engine or piece of equipment. This data can be used to create graphs for easy trend analysis of one compartment or even across models. S-O-S Services Web also allows users to create and print out labels by pulling compartment information directly from the database and provides a built in messaging system and actions taken feature that keeps track of activities associated with each sample.

- › RESULTS BY THE END OF THE NEXT BUSINESS DAY
- › EASY 24 HOUR ACCESS TO VIEW SAMPLES FROM OUR WEBSITE

