

CAT® S·O·S™ SERVICES

WE SEE WHAT OPERATORS CAN'T

WARNING:
COOLANT LEAK DETECTED

REPAIR BEFORE FAILURE SAVINGS: **Rs.10Lacs**



A SMALL SAMPLE REVEALS A LOT ABOUT YOUR EQUIPMENT HEALTH



Your equipment is an investment. You expect it to work whenever and wherever it's needed. And just as you depend on these assets, they rely on quality fluids to perform under pressure.

Fluid analysis is the process of sampling, testing and diagnosing the operating condition of those fluids. The chemicals, metals and other elemental constituents found within a sample can "tip off" the health of major mechanical systems and/or components, including:



ENGINES
TRANSMISSIONS
PUMPS, VALVES & SEALS
HYDRAULICS
DIFFERENTIALS

POWERTRAINS
GEARBOXES
RADIATORS
FINAL DRIVES

WHAT DOES "S•O•S" STAND FOR?

When it comes to durable, reliable equipment, Caterpillar has continuously set the standard for our industry. Back in the 1960s, we rolled out "Scheduled Oil Sampling" to help our customers extend the life of their equipment even further. Since then, your needs have evolved and so have our capabilities. Today, S•O•S Services includes expert analysis for:

OIL

Checking for wear and wear rate, condition, contamination, proper lubricant usage

COOLANT

Checking for correct fluid usage, condition, adequate freeze/boil protection, contamination

4 THINGS TO FIND IN EQUIPMENT FLUIDS

During S·O·SSM Services analysis, multiple tests are performed on engine, hydraulic and drive train oils—plus coolants, too. They can reveal a lot.

1

COMPONENT WEAR RATE

Why we do it: Each oil-washed system has a particular concentration of wear metals produced during normal operation. By evaluating wear inside the lubricated compartment, we can see if rates are normal or not. (For example, high levels of iron and chrome can stem from problems with your engine's cylinder liners and/or piston rings.)

What are we looking for?

- Wear metals — including iron, lead, copper, aluminum & chrome
- Silicon — can indicate dirt entry depending on local soil conditions
- Sodium — potential indicator of water or coolant entry

2

OIL CONDITION

Why we do it: Wear occurs when oil depletes its additives and begins to deteriorate. This can damage components in oil-washed compartments. So it's important to know if the oil has reached the end of its useful life.

What are we looking for?

- Viscosity (how the oil flows) — too low & wear can occur; too high & oil won't do its job
- Oxidation (oxygen molecules joining with lubricant molecules) — in diesel engines, oxidation can trigger sticking piston rings; in hydraulics, oxidized lubricants will increase pump wear & damage valves
- Sulfation (sulfur combining with water during diesel fuel combustion) — can corrode valves, cylinder liners & more
- Nitration (generally a problem in natural gas engines) — may result in oil filter plugging, crankcase deposits & other issues

3

OIL CONTAMINATION

Why we do it: This robust analysis involving several tests can determine if anything harmful has entered the oil.

What are we looking for?

- Soot (from partially burned fuel) — can plug oil filters & cause engine wear
- Fuel — can come from the combustion process & cause low viscosity
- Water (such as from condensation, leaks, wet conditions) - can cause wear, rust & sludge
- Coolant — can contaminate engine oil

4

OIL IDENTIFICATION

Why we do it: The wrong fluid in the wrong compartment can affect performance and lube protection or even severely damage major components. To tell if it's the right fluid, it's important to take an accurate sample with the right labeling.

What are we looking for?

- Viscosity — is it optimal for the geared compartment & your application?
- Additive chemistry — is the oil appropriate based on its unique chemical makeup?

NOW,
THAT'S
SMALL!

When you're testing fluids, you've got to see what operators can't.

Concentration of elements is shown in parts per million (ppm).

For comparison:

1 PPM IS LIKE
ONE DROP
OF MILK IN...



40
GALLONS
OF COFFEE

Gainwell™ Commosales Private Limited
(Formerly Tractors India Private Limited)

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GAINWELL



6 REASONS TO CHOOSE CAT[®] S•O•SSM SERVICES

If you don't have a strong fluid analysis program or you're sampling with another lab, here are six compelling reasons why Cat[®] S•O•SSM Services beats the rest:

1 GET RESULTS YOU CAN TRUST

The S•O•S Services process is built by Caterpillar scientists and backed by product engineers. Our worldwide testing standards ensure consistent quality so you receive accurate, detailed results every time.

2 SEE SOPHISTICATED TREND ANALYSIS

We evaluate your sample based upon complete product knowledge, fluid properties and analysis of millions of data points—with more than 7 million samples tested each year.

3 OUR EXPERTS CARE ABOUT YOUR BOTTOM LINE

Your Cat dealer can set a sampling schedule tailored to your needs, and integrate it into a robust equipment management program. Not only will you save by fixing issues before failure, you can optimize operations to control costs.

4 ENJOY COMPLETE CONDITION KNOWLEDGE

Your fluid data is integrated with other vital condition monitoring information—giving you insights into health, performance, location and more. (And with global software, you can seamlessly sample with any Caterpillar lab and get a complete history.)

5 MIXED FLEET? WE HAVE YOU COVERED

Our team knows engines and components better than anyone, whether made by us or another manufacturer. In fact, about 25% of all samples come from equipment other than Cat. We're your total solution for mixed fleets.

6 WE'RE BUILT FOR EVERY TYPE OF FLUID & APPLICATION

Caterpillar handles oil, coolant and diesel fuel sampling for all kinds of equipment ... from power generation to pipeline, mining to marine and more.



**A FEW OUNCES
TELL THE STORY**

S•O•S SERVICES VS. THE COMPETITION*

Some equipment manufacturers offer fluid sampling services, but they're often outsourced to third parties. No other OEM offers the in-house capabilities we do.

	S•O•S SERVICES	THIRD-PARTY LABS
IN-HOUSE ANALYSIS	✓	Farmed out by OEMs
DEALER SAMPLING SERVICES	✓	Some OEMs
ASSET-SPECIFIC RECOMMENDATIONS	✓	No knowledge of Cat equipment or components
KNOWLEDGE OF CAT METALLURGY	✓	N/A
COMPONENT WEAR TABLES	✓	Lack historical data based on tens of millions of samples
GLOBAL NETWORK OF IN-HOUSE EXPERTS	✓	Not able to leverage Caterpillar's enterprise resources and knowledge

* Comparison of fluid sampling services offered by third-party labs and OEMs, as described in their available marketing materials.

CONNECT WITH THE EXPERTS

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