

KEEP EQUIPMENT OPERATING AT PEAK PERFORMANCE.

With TIPL S•O•SSM Services

BUILT FOR IT.™

S•O•S Services from TIPL, your Cat® dealer provide valuable information to help you make correct maintenance decisions, reduce owning and operating costs, and maximize component life.

Check out S•O•S Services from TIPL and see how the difference counts.



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TIPL Tractors India

CAT



S•O•S SERVICES CAN HELP YOU PROTECT THE VALUE

- S•O•S Services help you maintain performance through your equipment's life cycle.
- S•O•S Services, a vital part of Condition Monitoring, are designed to identify problems before they become major repairs. Early detection is the key to reducing downtime and increasing productivity.
- Performance losses and major repairs of lubricated compartments can often be avoided by monitoring fluid samples. Overall, you'll get more work done at a lower cost with benefits such as:
 - Accurate analysis using tests designed for Cat products.
 - Knowledgeable interpretation by experts.
 - Quick turnaround. Most S•O•S Services test results are available usually within 48 to 72 hours after receipt of the sample.

What's more, our S•O•S services help you make well-informed service decisions with:

- In-depth fluid analysis.
- Clear, understandable reports.
- Timely information about the inside of your machine.

S•O•S OIL ANALYSIS

The S•O•S oil analysis tests have been developed in order to evaluate the condition of your engines and machines, rather than the condition of the oil alone. Following is a brief description of the standard tests offered in the S•O•S program. Additional tests, such as Viscosity, TBN or TAN, may be performed, if needed.

COMPONENT WEAR RATE & ELEMENTAL ANALYSIS

Our S•O•S analysts use the results of elemental analysis and particle count tests to evaluate wear. Trend analysis and proprietary wear tables are then used to determine if wear rates are normal or abnormal. Elemental Analysis detects wear elements, oil additive package elements and the elemental constituents of some contaminants.

OIL CONDITION ANALYSIS

Oil condition analysis is used to determine if the oil has degraded or reached end of its life. Tests are done to look at the viscosity, oxidation, sulfation and nitration of the oil. All lubricated systems risk oxidation damage of the oil. Therefore, it is recommended that oil samples from all compartments be analyzed for oil condition.

Soot, oxidation, water contamination etc can be precisely detected by oil condition analysis.



GET RESULTS FAST

S•O•S Services allow you to test all oils and have results and recommendations available usually within 48 to 72 hours of receipt. Coolant results and recommendations are available within 72 hours of receipt.

Receive different reports for different alert levels and view last 3 reports along with current result that come with color coded alert levels. Receive results by:

- E-mail • Fax • Postal Mail.

PUT RESULTS INTO ACTION

Results are presented in a clear, concise, easy-to-understand report. Our trained personnel provides recommendations or specific immediate actions on each report. If a critical situation is identified, immediate notification is sent to customers. Recommendations with alert levels allow you to quickly review the most critical components and prioritize your work. This in turn allows you to optimize maintenance schedule and component life.

TIPL's S•O•S LAB is state-of-the-art with most modern instruments that deliver enhanced capabilities in areas of analysis and reporting to provide not only optimized machine performance, but also improved cost control. The data is analyzed and interpreted by experienced personnel using LIMS (Laboratory Information Management System) software. Our Laboratory Information Management System (The S•O•S Services Manager) manages fluid analysis data effectively and accurately. Its unique reporting system enables us to send report through e-mail as well as by using S•O•S services web.

S•O•S Services Tests - the five analyses

- 1 Elemental Analysis: Wear Metal Analysis (Iron, Chromium, Lead, Copper, Tin, Aluminum, Nickel, Molybdenum), Contaminants (Sodium, Potassium, Silicon, Aluminum), Oil Formulation (Calcium, Phosphorous, Zinc, Magnesium)
- 2 Oil Contamination Analysis (Fuel Dilution Detection, Water Detection, Glycol Detection)
- 3 Oil Condition Analysis (FT-IR: Soot, Sulfur Compounds, Oxidation, Nitration)
- 4 Fluid Cleanliness Analysis (Particle counting-ISO Code)
- 5 Data Analysis (Evaluation and Recommendation)



LAB AT A GLANCE

ICP-OES FOR WEAR ANALYSIS AND TRENDING

This is the most advanced inductively coupled Optical Emission Spectrometer (ICP-OES) installed at TIPL S.O.S Lab for elemental analysis up to 15 elements that includes the detection of wear, contaminants and additive metals of the oil. Truly sophisticated, this instrument is calibrated with international standards to achieve highest degree of accuracy, with throughput of about 300 samples per day.



OIL CONDITION ANALYSIS BY FTIR

This instrument uses most advanced software and can measure the oil parameters by JOAP method, ASTM E2412 direct trending method, ASTM E2412 spectral subtraction method. As much as 150 samples can be processed in a day with high accuracy.



FERROUS DEBRIS MONITOR

It detects the total quantity of ferromagnetic particles in the oil samples irrespective of size limitations. The readings are analyzed in conjunction with iron readings of ICP-OES and the severity of the wear is interpreted. This method is extremely useful for the differential, final drives, gear systems: where chances of large sized particle generation are more. This method is particularly suitable for analysis of gear oil and planetary oil.



PARTICLE COUNTER FOR OIL / FUEL CLEANLINESS

This high technology instrument determines the contamination in the oil and fuel samples and gives the total number of particles irrespective of its nature (metallic or non metallic). A three digit cleanliness ISO code ($4\mu/6\mu/14\mu$) is used for fuels and two digits ISO code ($6\mu/14\mu$) is used for oils in accordance to the standard ISO 4406:99. It uses technology that is very useful to monitor the filtration efficiencies.



PATCH TEST & MICROSCOPIC EVALUATION

Patch test followed by microscopic evaluation helps to figure out the contaminants in the oil or fuel samples and gives the pictorial view of the fluid condition.

The sample is passed through a membrane filter and the particles retained over the membrane are analyzed using a high resolution microscope to determine the nature and size of the particles.



OIL FORMULATION PROPERTIES

An automatic viscometer is used to check the kinematic viscosity at 40°C and 100°C to notice the change in oil viscosity due to oxidation, internal or external contamination in the oil. Throughput is 10 samples per hour. TAN and TBN are measured using potentiometric titration method as a special test.



COOLANT ANALYSIS

Our advanced Coolant Analysis program ensures your cooling systems protect machine's vital components from failure. Coolant samples are checked for pH, conductivity, glycol percentage, freeze point protection, nitrite level and other physical properties in line with the Caterpillar level 1 coolant analysis program.



WHY USE S•O•S SERVICES FROM TIPL?

- **AVOID** complete failures. Often an adjustment or replacement of a single part, based on S•O•S Services findings, can prevent a small problem from growing into a major repair.
- **TRACK** what is going on inside the equipment. S•O•S Services tracks the wear of components, oil performance and condition, allowing greater flexibility in repair scheduling and downtime control.
- **MAINTAIN** repair time and availability. Using the S•O•S Services Report as a guide, troubleshooting time is often reduced, enabling a serviceman to go directly to the core of the problem. You can be assured that parts and workshop time are readily available.
- **OPTIMIZE** oil change intervals.
- **MANAGE** component life and equipment availability, thus reduce downtime and increase productivity and profitability.



Working together towards the same goal -
We have the same goal as you : Preventive Maintenance: Keeping your equipment operating at maximum efficiency, at the lowest operating cost. By monitoring your equipment throughout the life cycle, you are able to optimize performance, maximize productivity and save money. We provide information about the problem and then help you decide the best course of action.

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