The S•O•S℠ program is one element of a condition monitoring philosophy that you can put into place with your equipment to monitor the impact of your maintenance program. The S•O•S program combined with regular inspections, analysis of your equipment's site conditions, electronic data, and service history will enable you to evaluate your equipment's health. You can perform a maintenance program on your own, or you can enlist the assistance of your Caterpillar Dealer to perform any level of preventive maintenance that will keep your equipment running at peak performance.

Sampling Valve Method

This sampling method requires a Brass Probe and approximately 15 cm (6 in) of tubing. If you are sampling several compartments, begin with cleaner systems like hydraulics. Then sample the transmission or steering system. Sample engines and gear compartments last. Use a new piece of tubing for each sample. Re-using the tubing will contaminate other samples.

The steps below outline the process of sampling engine oil. Use the same process for other pressurized compartments.

Step A
Before sampling, exercise the machine and implements to ensure the oil reaches operating temperature. This provides a S•O•S sample that is representative of the oil in the compartment. Set the engine at low idle. Remove the dust cap from the valve and wipe the valve with a clean cloth.

Step B
Insert the probe into the valve and collect about 100 ml (4 fl oz) of oil into a waste container. If the oil flow is slow at low idle, have someone accelerate the engine to high idle while extracting the sample. Dispose of the waste oil properly. This process cleans the valve.

Step C
Insert the probe into the valve again. Collect about 100 ml (4 fl oz) of oil or fill the sample bottle three-quarters full. Do not fill to the top. Do not allow any dirt to enter the bottle or bottle cap.

Step D
Withdraw the probe from the valve and secure the bottle cap. Place the bottle with the completed label into the shipping cylinder.

To avoid contamination, do not take samples from the drain stream, a waste oil container, or a used filter.

Fill out sample labels completely

To receive the most value from S•O•S℠ Services, supply all of the requested information. Model, serial number, and service meter units on both equipment and fluid are very important. Obtain fluid and maintenance information from shop records, Product Link, or EquipmentManager. Indicating fluid changes and top off fluid is also important. All of this information is critical to turn data into useful component health information and recommendations. **Tip:** fill out the sample label information before you begin taking samples to keep the label clean and easy to read.

Vacuum Extraction Method

This sampling method uses a Vacuum Extraction pump to sample non-pressurized systems. In general, use this method for geared compartments. It is important to use a new piece of tubing for each sample. Re-using tubing will contaminate other samples.

It is recommended that pressurized systems without sampling ports be fitted with sampling port kits. For pressurized systems, this provides the most reliable sample. If a pressurized system does not have a sampling valve, follow the vacuum extraction method described below.

The steps below outline the process of sampling a final drive. Use the same process for other non-pressurized compartments.

Step A
Before sampling, exercise the machine and implements to ensure the oil reaches operating temperature. This provides a S•O•S sample that is representative of the oil in the compartment. Turn the engine off. Measure and cut new tubing to the length of the dipstick. If the compartment you are sampling does not have a dipstick, cut the tubing so that it reaches about halfway into the fluid depth.

Step B
Insert the tubing through the head of the vacuum pump. Tighten the retaining nut. Tubing should extend about 4 cm (1 in) beyond the base of the vacuum pump head.

Vacuum Extraction Method

Step C
Install a new sampling bottle onto the vacuum pump. Insert the end of the tubing into the fluid sump. Do not allow the tubing to touch the bottom of the compartment.

Step D
Pull the vacuum pump handle to create a vacuum. Hold the pump upright. If the pump is tilted or turned over, oil may contaminate the pump. If oil enters the pump, disassemble and clean it before taking the sample. Fill the sample bottle three-quarters full. Do not fill to the top. Do not allow any dirt to enter the bottle or bottle cap.

Step E
Withdraw the tubing from the compartment. Remove the bottle from the vacuum pump and secure the cap on the bottle. Then place the bottle with the completed label into the shipping cylinder.

Step F
To prevent contamination of the vacuum, loosen the nut and extend the tubing farther than 4cm (1in) past the base of the vacuum pump head. Extend the tubing far enough that tubing with no oil on the outside is showing. Use the tubing cutter to cut the tubing. The cut should be made where the outside of the tubing is oil free below the base of the vacuum pump head. The remaining tubing may be pulled through the pump without leaving any oil on the inside of the pump. Pulling the tubing through the top of the vacuum pump, without completing this step, will leave oil residue that will contaminate future samples.

Commitment of Service and Support

CAT® DEALERS DEFINE WORLD-CLASS PRODUCT SUPPORT.

We offer you the right parts and service solutions, when and where you need them.

The Cat® Dealer network of highly trained experts keeps your equipment up and running to maximize your equipment investment.

For more information, contact your local Cat Dealer or visit **www.cat.com**

How To Take A Good Coolant Sample

Sampling Valve Method

Coolant compartments with sampling valves can be sampled using the same steps as the oil sampling valve method described earlier.

Vacuum Extraction Method

If the cooling system is not equipped with sampling valves, coolant samples should be drawn from the radiator. While taking coolant samples from a radiator, please observe safety precautions. The sample should be taken after the coolant has been well circulated. However, do not remove the radiator cap if the coolant is hot. The best time to take samples is after the engine has been shut down for an hour or two after a normal workday.

Carefully remove the radiator cap to take the sample. Use the same steps as the vacuum extraction oil sample method described earlier.

Caution, samples drawn from the overflow tank or the system drain valve will not be representative of the fluid in the cooling system.

Always use a separate vacuum extraction pump for coolant samples. Although the fluid does not enter the barrel of the pump, samples may indicate compartment contamination. Vacuum pumps that contain residue from coolant samples may indicate coolant contamination in oil samples. Vacuum pumps that contain oil residue may indicate oil entry into the cooling system. Designate a separate pump for coolant samples.

Making S·O·S℠ Sampling Easier

Install Sampling Valves

Most current Cat® engines and machine models are equipped with sample valves for pressurized compartments. Valves may be easily and inexpensively added if needed. It is important to install valves in the correct location in each system. Avoid contaminating the system during installation. We can help you with specific installation procedures.

Use A Tube Cutting Device

Cutting tubing with a pocketknife is difficult. Particles from the knife can contaminate the tubing and the S·O·S℠ sample. To avoid these problems, use a Tube Cutter. A quick, clean cut can be obtained using just one hand.

Keep Sampling Supplies Clean

Store bottles and tubing in dust free plastic bags. Keep new, empty bottles capped. The vacuum pump and brass valve probe should also be protected from dust. If a sample becomes contaminated during sampling, it should be discarded. Take a new sample that is not contaminated.

How To Take A Good S·O·S℠ Sample

Cat S·O·S℠ Services