Optimizing Oil Change Intervals

For All Diesel Engines Except On-Highway Truck Engines

Getting the most from your oil and your engine

The recommended oil drain intervals for Caterpillar® engines are determined through extensive testing in the laboratory and at actual job sites. However, these recommended intervals cannot take into account your specific operating conditions or other factors that may require a different oil change interval.

Maintaining your engine oil is a very important factor in maximizing the productive life of Cat® engines. It begins when you demand the higher standard of protection available from Cat engine oil and filters and continues as you work with us to optimize the effective life of the oil.

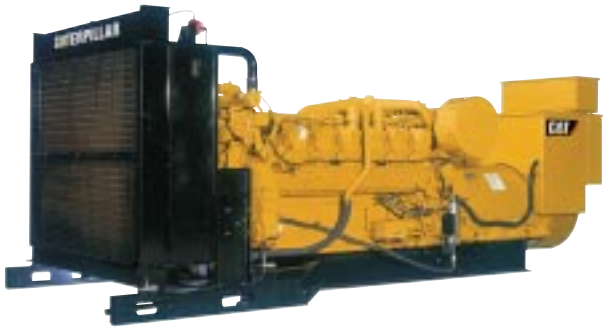
The Caterpillar S•O•S℠ Services program helps you understand the factors affecting your engine oil, so you can better manage the life cycles of your engines and reduce costs. S•O•S Services provide a maintenance management tool that evaluates oil deterioration and detects the early signs of abnormal wear on engine components. S•O•S Services accomplish this through a comprehensive set of tests that are specially designed for evaluating diesel engine oils.

CATERPILLAR®

Determining Optimal Oil Change Intervals

Work with our experts

We will work with you to optimize the oil change intervals for your Cat engines. Keep in mind, the process of determining new oil change intervals is not simple. It requires that you work closely with your dealer over a period of several months. Once new intervals are established, it will be more important than ever to carefully monitor oil performance and engine wear. Use S•O•S Services for both oil and coolant analysis, to make sure there are not any problems.



Proceed with caution

We suggest that when evaluating engines with a 500-hour recommended oil change that you move forward cautiously. Some applications and conditions may allow for oil drain interval extensions, but some extreme applications and conditions may require more frequent oil changes.

Extend oil drain intervals

We suggest you proceed beyond the manufacturer's recommended oil change period cautiously. First, determine that wear rate and oil condition are satisfactory at the recommended interval. Then, extend to the recommended interval plus 50 hours. Stay with the new interval for several changes and closely monitor the S•O•S results. If wear results remain acceptable, proceed again to a plus 100 hour interval.

Four types of oil samples

There are four categories of oil samples involved in evaluating an oil change interval:

• Samples of new oil

A sample of new oil is needed as a test reference to the used oil. The new oil must be the exact same oil as the used oil being tested. Any time a new shipment of oil is received, a best practice is to take a sample to monitor the characteristics and cleanliness.

• Baseline samples

After changing the oil and filter, run the engine until it reaches operating temperature (about 15 minutes) and take a sample. This determines wear metal carryover from any oil left in the pan from the previous interval. It also reveals if any external contaminants were introduced through the oil fill process. During the evaluation period, take a baseline sample after every oil change.

• Samples at shortened intervals

Taking samples at less than the recommended oil change interval is essential to monitoring the oil degradation process. This will allow you to determine a trend line for wear accumulation and any external contamination entry. You must establish these rates for the recommended oil change interval before you begin an extended interval evaluation.

• Samples at oil change

Test results from the samples taken at the time of each oil change will indicate the final levels of oil degradation and wear accumulation. These results, along with the shortened interval sample results will be evaluated to establish the optimal oil change interval for your engine. Once the optimal interval has been established, submit a sample at each oil change.

Consider these factors when evaluating your oil performance:

Everything that could have an impact on oil condition must be held constant during the evaluation period. The following list of parameters must be under control for an effective evaluation:

• Service intervals
Your maintenance system must be capable of maintaining a plus or minus 10% margin on oil changes. Also, additional oil samples must be taken during the evaluation period. Maintenance personnel must be available to take these samples in a timely manner.

• Filters
To minimize risk and provide the best filtration, use genuine Cat oil filters, fuel filters, and air filters. Change the oil and fuel filters at the recommended intervals. Change air filters as required by the air restrictor indicator. Always use Cat filters to guarantee the highest quality filter available.

• Engine oil
Cat DEO™ (Diesel Engine Oil) is recommended for optimized oil drain programs. Cat DEO exceeds the requirements of the latest Caterpillar ECF (Engine Crankcase Fluid) specification and the latest American Petroleum Institute (API) category. Cat DEO contains the best additive package and base oil stock to help you achieve longer oil use and maximum engine life.

• Cooling system maintenance
Inadequate cooling system maintenance can eventually lead to system problems or even engine failure. Initially submit coolant samples for S•O•S Level 2 Coolant Analysis to assure the cooling systems on all test units are optimal. Continue using S•O•S Level 1 Coolant Analysis at each oil change. Verify that radiators are clean of debris both internally and externally. Maintain proper coolant levels and coolant conditioner levels.

• Engine Maintenance
Keep engines running according to specifications. Check boost, fuel settings, air/fuel ratio control and transmission shift points. Poorly tuned engines can lead to malfunctions or adversely affect operating temperatures, fuel consumption or other parameters contributing to premature engine failure.

• Selection of test engines
Include engines with relatively low total operating hours. Engines with higher hours may have different wear rates and oil consumption rates than newer engines. Recently overhauled engines are also good candidates for oil drain interval optimization.

• Operating practices
Operating techniques impact how an oil responds and holds up in your application. Excessive lugging, excessive idling and full throttle on/off will all effect sooting and oxidation of oil. The same load should be applied in the same operating and climatic conditions.

Provide Complete S·O·S Information

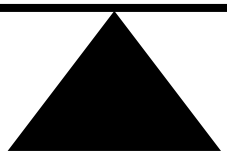
Be sure to correctly and completely fill out the S•O•S sample bottle label. The information is crucial to insure accurate interpretation of the data. It is essential to include the total hours or odometer units on the engine and oil, and the quantity of make up oil added since the last oil change.

Optimizing Oil Change Intervals

The oil change interval balance

As with most business decisions, establishing an engine oil change interval beyond the manufacturer's recommendation has both risks and rewards. Perhaps the biggest potential reward is increased availability due to less maintenance downtime. But this increased availability can be quickly eroded if extended oil drains are causing premature wear and repair downtime. Extending oil change intervals without a carefully planned and executed program is gambling with the life of your engines-and your cost of operations. Call your Cat Dealer today for more information.

Rewards	Risks
Increased Availability and Productivity	Decreased Availability and Productivity
Decreased Oil and Filter Costs	Decreased Engine Life
Decreased Maintenance/Labor Costs	Increased Repair Downtime
Decreased Disposal Costs	Increased Repair Costs



At some oil change interval, there is reasonable balance.

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 entire fleet up and running to maximize your equipment investment.

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