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Service Magazine

Extended Life Coolant (ELC) Exhibiting Nitrite Depletion in Machines Equipped with Aluminum Radiators {1352, 1395}

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Extended Life Coolant (ELC) Exhibiting Nitrite Depletion in Machines Equipped with Aluminum Radiators {1352, 1395}

SMCS - 1352; 1395

Caterpillar Products All Machines

A change has been made to Service Magazine, SEPD1903, 16, December 2014, "Extended Life Coolant (ELC) Extender Is No Longer Required". The content of the article has changed. Disregard this article and refer to the following.

Reference: Operation and Maintenance Manual, SEBU6250, Coolant Recommendations

Reference: Operation and Maintenance Manual, SEBU6251, Coolant Recommendations

Nitrites in Extended Life Coolant (ELC) can react with the aluminum cooler to produce elevated pH and low nitrite levels in Schedule Oil Sampling (STMOTMS) samples. An odor of ammonia may also be detected in these samples. The cooler is not damaged during this depletion of nitrite.

As there are multiple issues that can contribute to the depletion of nitrite, Cat STMOTMS Level 2 coolant analysis is crucial to the confirmation of the issue discussed in this publication. Contact your local Cat dealer to request Level 2 coolant analysis if nitrite depletion is experienced.

Cat ELC will continue to be recommended for most Caterpillar diesel engines. Refer to the coolant specifications in SEBU6250 and SEBU6251 and the engine Operation and Maintenance Manual for exceptions.

ELC is formulated to provide cavitation erosion protection of aluminum and cast iron components. Most of this protection is provided by Organic Additive Technology (OAT), which depletes slowly and provides extended life to the coolant.

As a backup to the protection from OAT, Cat ELC formulation also contains nitrites. However, the rate of depletion of nitrite in Cat ELC varies.

Field Follow Observations

During the field follow of machines, nitrite depletion from 500 parts per million (ppm) to 0 ppm was observed. Simultaneously, the pH level of the coolant increased, and the odor of ammonia appeared. Continued operation of the field follow machines at 0 ppm nitrite showed a disappearance of the ammonia smell and the pH level returned to normal levels. The cooling systems continued to function normally throughout the field follow period.

In some cases, Cat ELC Extender was added to boost the nitrite level back to 500 ppm. The situation reoccurred until the nitrite was again depleted back to 0 ppm. Having a high pH and an ammonia smell in the coolant is not desired.

Recommended Actions

- For machines without wet sleeve liners (engines smaller than C8.8), the secondary cavitation protection that nitrite provides is not needed. Therefore, on machines with aluminum radiators and without wet sleeve liners, when nitrite is depleted and pH levels are elevated, it is recommended to dose the cooling system with the appropriate amount of Cat **369-0805** Additive (Cooling Conditioner for Aluminum Components). Do not add any Cat ELC Extender until mid-life of the coolant, and continue to operate the machines with depleted nitrite.
- For machines with wet sleeve liners (engines larger than C8.8), secondary corrosion erosion protection from nitrite is still needed. Therefore, on machines with aluminum radiators and wet sleeve liners, when nitrite is depleted and pH is elevated, dose the cooling system with the appropriate amount of Cat **369-0805** Additive (Cooling Conditioner for Aluminum Components). Also, add an amount of Cat ELC Extender equal to 1% total cooling system capacity to boost the nitrite concentration to within an acceptable range for proper corrosion erosion protection.

Cat SâTMOâTMS Level 2 coolant analysis is recommended within 500 hours after either of the actions listed above. Be sure to note on the sample label if Cat **369-0805** Additive (Cooling Conditioner for Aluminum Components) and/or Cat ELC Extender was added prior to taking the follow-up Level 2 coolant sample.

Note: This article only addresses ELC and not conventional coolants, as in Diesel Engine Antifreeze/Coolant (DEAC). In the case of DEAC and other conventional type coolants, nitrite provides almost all the cavitation erosion corrosion protection. It is necessary to maintain appropriate nitrite levels in these coolants.