

*NOTE: When we pulled the article up for review, almost every link was broken. In some cases we dug and found the new page location. Some pages have been updated over the years and their dates revised. In some cases, information was revised!*

## **CURRENT COOLANT CHOICES FOR DIESEL PICKUPS:** Introducing Evans Coolant and RMI-25 Coolant Additive

Bob Riley - © 2001 *[edited© 2008]*

In any vehicle, diesel or gasoline powered, the negative effects of water in the cooling system are widely known, but they are typically dismissed as normal. Rust, corrosion, and scale are all results of water. Another problem is "hot spots". Hot spots are created by localized boiling of water in the system where heat is raised above the water's boiling point. This localized boiling causes air to be trapped at the hot spot leaving that area void of any coolant. When this happens, heat transfer is reduced or eliminated. The damage to your vehicle is imminent.

Consider this: Without water, you have no source to cause these issues.

I have recently begun to research coolant maintenance for the 1999 Ford 7.3L PSD. My research has led me to two products that I believe may be a substitute for SCA testing and replenishment. What follows is information on several types of coolant and their possible use in our vehicles and the introduction of those two products I have found.

**Ethylene Glycol** has been used in gasoline and diesel engines for years.. They are an accepted choice for coolant, but have many flaws. In gasoline engines, as long as you change it frequently, it performs it's job, but lacks many properties that would make it ideal.

When using EGs (Ethylene Glycols) in our Powerstrokes, the downside is the required testing and replenishment of SCAs (Supplemental Coolant Additives). EG coolants have a standard mix rate of 50%. You must add 50% water to this mix. The coolant - and the required additives in diesel applications – contain water and therefore the associated problems. So, why are we still using it? Why don't we use 100% EG? Because any mix over 70% eliminates the freeze protection. It needs water to lower the freezing point. A 50% EG/water mix has a boiling point of approximately 220, so you must pressurize the system to keep the water from boiling. The boiling point at 16 lbs. of pressure is raised to about 270 degrees. That is as good as it gets with EG coolant.

For coolant maintenance on our 7.3L PSD, we are told to add an SCA additive at every 15,000 mile interval. SCAs are actually a suspended solid that coats the walls to act as a sacrificial liner. I find it hard to believe that the proper maintenance of our trucks is to add an abrasive particle to the coolant system to stop the wear of cavitation when in turn it wears away at the water pumps, seals, and hoses. This seems to be very prehistoric compared to the ELC "Extended Life Coolant" technology that I discuss later and it isn't acceptable as my preferred maintenance routine. No SCAs will ever enter my vehicle cooling system again after I have see what harm they can do to the coolant system components. To eliminate the need for test strips and SCA additives I will try a product called RMI-25.

RMI-25 is a coolant additive that acts as a cleaner and a lubricant for your cooling system and it's components. It actually changes the properties of the water found in your cooling system so that cavitation cannot occur. It is an oxygen scavenger. No free oxygen, no cavitation. I believe it is better for our vehicles than SCAs and have no doubt that it will prove to be an acceptable and preferable solution to adding the harmful SCAs into our cooling system. I will be testing this product for long term results and effects and will certainly have the product available on my website if it proves itself to be a superior choice to SCAs.

**ELC – Extended Life Coolants** There has been much talk and some controversy about whether you can run extended life coolants, also known as ELCs, in the Ford Powerstroke.

While I have yet to see or hear of the problems associated with ELC use, there are warnings published by many engine manufacturers. For instance, in this Hastings Filter Engineering Bulletin they state:

"Cummins Engine Company announced in a memo dated July 16, 1999, that these materials based on Organic Acid Technology (OAT) are not compatible with their engines. Cummins is reporting that these long life antifreezes cause degradation of silicone seals in their engines after 80,000 to 100,000 miles of service. Cummins, therefore, is not recommending the use of long life coolants in their engines."

I also read recently where Navistar stated that they were endorsing the use of Texaco ELCs. The Navistar "helpful hint" can be found [here](#). However, our ***owner's manual states specifically not to use ELCs***. So, bottom line about ELCs for our trucks is that Ford denies it's possible use and still warns against it probably for the same reasons stated by Cummins in the Hastings info above.

It's important to note that the ELCs and conventional SCA based coolants are not to be mixed. The SCAs are not to be added at any time to an ELC. This Baldwin Filter TSB state

"While coolants using current SCA's require the SCA level to be replenished on a routine basis, coolants using extended life antifreeze require inhibitor package replenishment only once during its service life. The inhibitor additive for extended life antifreeze is **not** an SCA style package. Only a special formulation additive package is to be used with extended life antifreezes. Neither the current formulation SCA package or the special extended life package are to be substituted for each other at anytime."

Shell Corp. adds some input by stating "Do not add any supplemental coolant additive in either filter or liquid form" on this Rotella ELC Product Data Sheet. *[NOTE: the Rotella ELC data sheet has been updated at some point with new information. Our article shows the quote as it was in 2001.]*

Because ELCs are relatively inexpensive, readily available, require no maintenance have a long life expectancy (some with several hundred thousand miles), it would seem to be the likely choice. **But**, we should not ignore the fact that ELCs are an acid based coolant and they require that the engine and it's components be built for it's use. The acid based coolants are the Organic Acid Technology (OAT) coolants referred to by Cummins in the Hasting Bulletin link above. Examples of these would be GM Dex-Cool® and Texaco ELC.

Dex-cool® is a GM trademarked term for the GM branded ELC (Extended Life Coolant) product made by Texaco and used in GM vehicles. It is an ethylene glycol based coolant with combination of sebacic acid and 2-ethylhexanoic acid supplemented with tolyltriazole. See Penray FAQ for more

technical information on Dex-Cool®. *[The 1999 article in the original article was revised in 2001 and can be found [HERE](#)]*

There have been many discussions on the forums about the negative aspects of Dex-Cool®. While gathering information for this article I spoke to several techs that steer clear of using it. A typical complaint seems to be the blockage of water passageways and radiators. In my opinion Dex-Cool® IS NOT an option for our trucks. There are compatibility and corrosion issues in addition to blockages.

See "[Bare All](#)" about DEX-COOL® to find more explanations on the problems with using Dex-Cool®. Evidently, Dexcool does not like air in the system or getting topped off with standard coolant, which happens frequently at lube shops. So, if you use Dex-Cool®, best results are had if you carry a gallon of coolant with you to give to the lube mechanic to top off correctly. Check your coolant caps frequently for corrosion, and keep it full, some say even fill it to the hot line when cold. *[This was the original article, but now that site has many antifreeze related links.] [We have edited out many paragraphs of GM Dex-Cool® complaints and information as it is readily available on the internet if you do a search. The original article had none of the links, only text from the discussions. It was removed to reduce the size of this article.]*

For the sake of giving you as much information on the different types of coolant as I can, here is a link by [Caterpillar](#) to an FAQ on CAT Extended Life Coolant.

*[At the time the original article was written, the link below went to the Bulletin titled as shown. We could not recover or trace that link to any other page, but provide the following link which has many links for your reference. [http://www.penray.com/managex/tech\\_bulletins.asp](http://www.penray.com/managex/tech_bulletins.asp). This is from Penray's Supplemental Coolant Additive (SCA) for Fully-Formulated Coolant Bulletin: "Fully formulated coolants do not require, and should not receive, an initial charge of SCA. Plain water systems do need to be treated. The proper dosage for plain water coolant is 5.0 percent by volume. Check the nitrite concentration at regular intervals (3 months, 20,000 miles or 300 hours, whichever comes first) with a Penray test strip. Additional SCA must be added to the coolant if it becomes diluted, as indicated by a nitrite concentration less than or equal to 1,200 PPM. If the nitrite concentration is greater than 1,200 PPM, and the system is equipped with a Penray Need-Release filter, do not add additional Penco SCA."*

**ON EDIT BY BOB RILEY JUNE, 2008:** Fully formulated coolants are not ELCs. They are standard coolants that are precharged with SCA additives. They still require SCA maintenance, but they do not need an initial charge.

**Propylene Glycol** is another type of coolant that is commonly misunderstood and thrown into the category of ELCs. ***It is not an "Extended Life Coolant"***. As I stated earlier, ELCs are actually EG based coolants with organic acid compounds mixed in. PGs are totally different.

PGs were initially touted as non toxic. Propylene Glycol is actually used in coffee beans as a preservative, in some make-ups, etc. In pure form, it is very safe and biodegradable. Propylene Glycol is actually safe enough to drink in pure form but the additives that make it a coolant can be toxic. Because of this the EPA and FDA ruled they now must say "essentially non-toxic".

There are several manufacturers of PG coolants. Only one of those appears to be suitable for use in a diesel engine. One made by Sierra was not a low-silicate based product and did not list diesels as

an application. Another by Amsoil didn't have any test data or information about the use of their coolant in a diesel. Evans Coolant was the only product that stated it was tested and acceptable for use in diesel engines. They provided results and recommendations for maintenance as well. The others give no real info as to the benefits other than environmental impact and they were a water based coolant. Evans explained the many benefits of their product and they are the only non-aqueous coolant in the world. Evans Cooling owns a patent on this fluid and it's magic is a "waterless" solution. This coolant is to be mixed with no water at all. That eliminates all cavitation issues. Their recommendations for fill and drains are 500,000 miles for a diesel, and lifetime for gasoline engines, regardless of use. Best of all the addition of SCAs is not necessary.

Because there is no water in the Evans Coolant, rust, cavitation, scale, overheating – all caused by water- are eliminated. The Evans PG product is mixed at a rate of 100%. It has a boiling point of over 400 degrees at 7psi (compared to 270 degrees at 16psi from a 50/50 EG mix). You can actually run the Evans at full temp with no cap and it won't boil out! I believe this will be the very best protection for my Powerstroke cooling system. Now I won't have to play chemist every couple of months to make sure everything is still in balance.

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**SUMMARY:** Cavitation in our 7.3L Powerstroke is a known issue. EGs are an accepted coolant for our truck but they require the use of SCAs. While SCAs address the symptoms of cavitation, they do not address the cause. SCAs attempt to stop the erosion from cavitation, instead of dealing with the cavitation itself. The harmful wear to your coolant system and it's components by the abrasive SCAs is not worth the band-aid it provides.

PG type coolants and the ELCs seem to have accomplished the task of eliminating cavitation and do not require the use of SCAs. However ELCs are an organic based coolant and introduce new problems. Therefore they are not an acceptable choice.

Evans Waterless Coolant claims to be a lifetime coolant even though it is not an ELC(acid based). It is a PG based coolant designed to be run at 100%, no mix. Evans claims there is no need for any type of SCAs. There is also no maintenance of any kind required. Their literature claims a Detroit diesel truck went 500,000 miles with no SCAs or maintenance of any kind to the coolant system. This was done for a magazine When they tore down the engine, there was no sign of cavitation present. We'll see.....

The advantages? No water to rust, less pressure on the system, no maintenance, and with a 500,000 mile interval recommendation it is essentially a lifetime coolant for your truck.

The disadvantages? More expensive, less available, widely misunderstood. Availability could be a problem. If we prove that this product is acceptable for use in our trucks, we'll make it available to the light duty diesel owners on our website. [\[Evans NPG+ for diesels can be found here on our website\]](#)