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CENTRAL NEWS[®]

**ANNOUNCING:
CEN-PE-CO
EXTREME DUTY
10W-30**

Reality Check

By Blaine Ballentine

As a natural continuation of Cen-Pe-Co's line of Extreme Duty Oil, Cen-Pe-Co Extreme Duty SAE 10W-30 is now available.

We tend to think of SAE 10W-30 as a winter grade for diesel engines, and most diesel manufacturers recommend it only for cold temperature use. On the other hand, Caterpillar recommends SAE 10W-30 as the preferred grade year around for some of its diesel engines.¹ Cen-Pe-Co Extreme Duty 10W-30 provides easier winter start up for all diesel engines, and exceeds the CAT ECF specifications.

The other area where a significant amount of SAE 10W-30 oil is used is in gasoline engines and Extreme Duty 10W-30 exceeds the requirements for API SM. Due to a quirk in API rates, if the "C" specification proceeds the "S" specification on the label, the product is not subject to the 800 ppm phosphorus limit of a passenger car motor oil. Cen-Pe-Co Extreme Duty Oils exceed the API CJ-4/SM specifications, which include the performance requirements of gasoline engines.

As the number of diesel engines requiring API CJ-4 oils increases, we are prepared with Cen-Pe-Co Extreme Duty SAE 15W-40, 10W-30, and Synthetic 5W-40.

1. "Caterpillar Commercial Diesel Engine Fluids Recommendations." Caterpillar Publication #SEBU6251-12. Jan 2009.

SAE 5W-20 is recommended more and more for passenger cars, and SAE 0W-20 is on the way. Frequently we hear that "tolerances are tighter" and there are severe consequences for using more viscous oils. I think that is half right.

Machining and materials have changed dramatically over the past 20 years. There is less variation between bearings, which is sometimes referred to as "tighter tolerances," but also the average gap between the bearing and journal is somewhat tighter.

Yet we know that a thicker oil film can reduce wear. This is particularly true when the oil becomes contaminated (dirt, wear particles, soot, fuel, water, etc), loads are higher than normal, or temperatures are higher than normal.

Thin oils, such as SAE 5W-20, are about fuel economy. Right now, the CAFE (Corporate Average Fuel Economy) legislation requires an auto manufacturer's average car to achieve 27.5 mpg or more, and tougher requirements are on the way. Failure to meet the requirement results in a \$10 per vehicle fine. It does not sound like much until you consider Ford sold 1.6 million vehicles in the U.S. last year. Thin oils are recommended because they produce slightly better fuel economy in laboratory test engines.

Well last fall I heard that SAE 5W-20 is the only grade that will work with today's tighter tolerances one too many times. I contacted Ford Technical Information Centre, and asked for viscosity grade recommendations. No, "Centre" is not misspelled. That is the way they spell it in England. The CAFE requirements only apply to the United States, so I wanted to know what Ford recom-

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mended for their tighter tolerances somewhere else.

I received a chart showing Ford's engine oil recommendations in England. Some "petrol" and diesel engines call for SAE 5W-30 and some call for 5W-40. One of their petrol engines called for SAE 0W-40. SAE 5W-30, 5W-40, and 0W-40 are the only grades recommended by Ford in England, and SAE 5W-20 is not even an option.

The cars offered in the U.S and British markets vary. We do not have diesel cars in the U.S., and they do not appear to have the Mustang in England. However, some of the cars match up and use the same engine on both sides of the pond. Such is the case with the Ford Focus using the Duratec 25 engine. The oil viscosity requirement for this combination in England is SAE 0W-40, but my local Ford dealer told me the Focus with the Duratec 25 engine requires SAE 5W-20. The tolerances are the same, but thinner oil is recommended in the United States.

When I asked a British motor-head email acquaintance if SAE 5W-20 engine oil is available in England, he responded that "if it is available, it is certainly not widely available. I don't think I've seen 5W-20. In fact, 5W-30 has been fairly hard to get until recently..."

Another example of viscosity grades that do not match is with the Lotus Elise. The Elise uses the same Toyota engine as the Toyota Celica. The intake, exhaust, and programming are changed in the Lotus, but the entire rotating assembly is the same. Obviously, the tolerances are the same, but SAE 5W-30 is required for the Toyota, and SAE 5W-40 is required for the Lotus.

Yes, today's tolerances are tighter, but in the compromise between fuel economy and wear, it appears that fuel economy is winning in the United States.

BIOFUEL WOES

The \$1.00 per gallon tax credit on biodiesel expired at the end of last year, and as of mid-April, has not been reinstated. Biodiesel production has plummeted 80 percent.

National fuel quality specifications were scheduled to become effective in Illinois the first day of this year, then it was delayed until May 1, and now it has been delayed another year. The regulation would make ethanol-blended gasoline subject to the same quality standards as gasoline.

Ethanol raises the fuel's vapor pressure and boiling point. Refiners can counterbalance the effect in contracted fuel. However, non-contracted fuel that meets the specification can be taken out of compliance when ethanol is added.



By Blaine Ballentine

Whether they are called bacteria, algae, microbes, or bugs, filter plugging is the result. Now that warm weather is returning, the risk of microbial growth is back. Also, microbial problems have become more prevalent in recent years because of ultra low sulfur diesel and biodiesel blends. If you suspect a microbial problem:

1. Check the filter
2. Remove the water
3. Clean or filter the fuel
4. Maintain the tank

Check the Filter

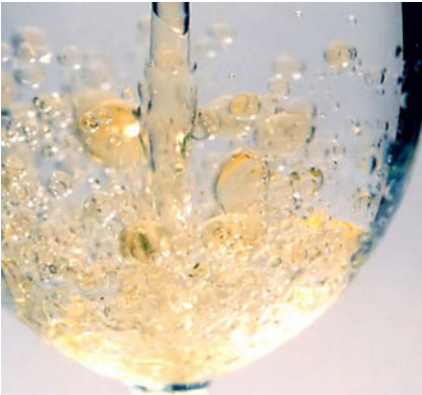
If you are constantly plugging fuel filters, there is a good chance the problem is microbes growing in the fuel. The first step in solving any filter plugging problem is to identify the contaminant in the filter. This usually involves cutting the can off of the filter and examining the material between the pleats.

Bacteria can be green or brown, or black, or any shade of color between them. It usually has a stringy, gooey consistency that is similar to egg whites. A laboratory can confirm that it is bacteria if you send them a sample, but if there is a nasty dark snot in your fuel filter, you can bet it is bacteria.



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Remove the Water



Bacteria are present in all diesel fuel, but at a sub-micron level that you cannot see, and they easily pass through filters. They lie dormant in the fuel until they come in contact with water. Then

they can really take off and grow, plugging filters, degrading the fuel, creating acids, corroding tanks, and sucking the joy out of operating machinery.

If you have bacteria plugging your filters, it is because your fuel came in contact with water at some point in the fuel distribution system, but most likely it is because water is in your tank. So, after you confirm your problem is bacteria, the next step is to check your fuel tanks for water. This includes vehicle tanks, storage tanks, and transfer tanks (like in the back of a pickup). Finding water in a tank is usually accomplished by putting a water finding paste on a clean stick and lowering it to the lowest point of the tank.

Assuming water is found, and it nearly always is, it needs to be removed. Depending on the tank, the water and, hopefully, most of the bacteria can be drained or pumped out.

Since water is the source of the problem, and other action only treats the symptom. The water must be removed.

Cleaning

After the water has been removed, the fuel and/or tank need to be cleaned. Tank cleaning services are available for very large tanks. Fuel



distributors can often pump out and re-fill intermediate sized storage tanks.

For storage tanks up to 2000 gallons or larger, depending on configuration, an economical approach is to use a dispersant-type diesel fuel additive. Every storage tank should have a filter, preferably with a water separator. A good dispersant additive will tend to break up and suspend the solids and help move them to the filter. So simply putting the fuel nozzle into the tank's fill opening and circulating will clean the tank.

Vehicle tanks can be cleaned the same way.

Treat the fuel with a dispersant additive and operate. Modern diesel engines circulate far more fuel past the injectors than what the injectors use. So, filtered fuel is returned to the tank. As you get toward the bottom of the tank, that fuel has been filtered several times.

Of course, as the solids of the microbes and the debris they create move to the filter, the filter will plug. In fact, several may plug before the system is clean.

Biocides

You will notice that biocides have not been mentioned as part of the solution. Although biocides (bacteria killers) and bio-stats (stoppers of bacterial growth) are useful, particularly in large tanks or tanks with a chronic problem, they are usually not necessary.

Keep in mind that biocides do not immediately solve the problem, because dead bacteria still plug filters. However, dead bacteria do not grow. Of course, it will not grow in the absence of water either,



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which is why biocides are usually unnecessary. So, if the tank is large and you are unsure that all the water was completely removed, add a fuel biocide or a bio-stat.

Biocides should never be used on a continuous basis. First, they are generally hazardous to humans and you really do not want to handle them more than necessary. Second, they have usually been tested extensively for killing bugs, but have absolutely not testing for compatibility with diesel injection systems. Finally, constant exposure will eventually lead to bacteria developing immunity to the biocide.

Maintenance

Once the fuel tanks are clean and free of water, good tank hygiene will prevent microbes from returning. Keeping tanks topped up during temperature swings and other precautions to prevent moisture will stop bacterial growth. No water in the fuel, no bugs. And a good fuel additive will help.

ULSD and Biodiesel

Now that you know water's role in bacterial growth, it is easy to see why bacteria problems are more prevalent today with ultra low sulfur diesel (ULSD) and biodiesel.

Ultra low sulfur diesel became mandatory for the 2007 on-road vehicles, and truckers began complaining about the need to drain their water separators more frequently. ULSD holds less water, and more free water means more microbial problems.

One of the advantages of biodiesel is that if it spills, it biodegrades. In other words, bacteria break down biodiesel. With this propensity to produce bacteria it is easy to understand how biodiesel blends can be problematic when contaminated with water.

Cen-Pe-Co Diesel Fuel Additives

Cen-Pe-Co diesel fuel additives inhibit bacterial growth in two different ways. One is by controlling water. The other is by making it less comfortable for the bacteria to reproduce. Bacteria prefer a slightly acidic environment and Cen-Pe-Co diesel

fuel additives are alkaline.

When water contamination is at a very low level, the dispersants in Cen-Pe-Co fuel additive disperse or dissolve the water, preventing bacterial growth. However, when water contamination is excessive, the demulifiers in Cen-Pe-Co fuel additives drive the excess water to the bottom of the tank.

Here is the thing. Bacteria grow on the interface between fuel and water. If droplets are suspended in the fuel, consider how much more fuel to water surface is available for bacterial growth. When a biodiesel blend is contaminated with water, the fuel becomes hazy with suspended water, and it is an ideal environment for microbial growth.

Some fuel additives claim to "remove" water. This is a bogus term used for marketing. Additives can suspend, dissolve, or disperse water, but obviously water stays in the fuel tank. What, are we supposed to believe an additive can take water from the fuel tank and put it in a jar for us? Such additives can increase the water to fuel surface area and increase the rate of bacterial growth.

The biggest problem with fuel additives that suspend significant amounts of water is they can defeat the water separator and damage the injection system. A secondary problem occurs when the fuel is contaminated with excessive amounts of water; a thick, nasty, cottony or curdled emulsion can form between the layer between the fuel later and the water layer. This is an ideal environment for bacterial growth.

Cen-Pe-Co fuel additives will de-haze biodiesel blends contaminated with water. In all fuels, they drive water to the bottom and leave a crisp line between the fuel and water interface, limiting microbial breeding ground to a minimum.

If you experience microbial problems, check the filter, remove the water and double-treat them with Cen-Pe-Co diesel fuel additive to clean the tank. Maintain the system with Cen-Pe-Co diesel fuel additives

