

February, March, April 2015



cen·pe·co[®]
LUBRICANTS

CENTRAL PETROLEUM COMPANY
Cleveland, OH Walcott, IA

CENTRAL NEWS[®]

Issue 850

THANK YOU!
Randa and Dale



On May 1st Randa and Dale Burkhead will be leaving Central Petroleum Co. to begin their retirement together. Randa started working for Central in September of 1977 and is celebrating her 38th year in the sales department. Dale more recently started with Central in April of 2004, working most of that time in the traffic department.

We all wish Randa and Dale much happiness during their retirement and hope that they have great success in working on their "bucket list".

**ALL THE BEST TO YOU,
FROM THE CEN-PE-CO FAMILY!**

Tractor Hydraulic Oil Shear Update By Blaine Ballentine

We had another shear test run on a competitor's tractor hydraulic oil. This time it was on Brad Penn Universal Tractor Transmission Hydraulic Oil, with which our Pennsylvania and New York sales reps compete. The Brad Penn product lost 9.55% of its viscosity compared to Cen-Pe-Co Multi-Purpose Hydraulic & Wet Brake Oil's 2.4%.

Why it is Important

The reason manufacturers limit the amount of viscosity loss with their specifications is wear. Most tractor fluids are SAE 10W-30. If it were made with a really cheap polymer, the drive gears in a tractor would shear it down to near its starting point of 10W.

Oil that is too thin does not provide adequate protection to

the drive gears, pumps become less efficient, and temperatures increase. Maintaining viscosity relates to wear, and how efficiently the system operates.

Details

Polymers are plastic, also known as viscosity index improvers, that are dissolved into oils to give them multi-grade

capabilities. They allow tractor hydraulic oil to behave like an SAE 10W oil in the cold and like an SAE 30 when hot.

One of their weaknesses is that during use, these polymer molecules can rip apart and the viscosity of the oil drops. Just like there are many types of plastic with some being harder, more pliable, or more durable than others, many polymers are available with each having different characteristics. Due to these differences, some oils shear a lot more than others.

The industry has a few variations on the same theme to test shear stability. Oil is blasted through a diesel injector nozzle to shear the polymer, and the loss in viscosity is measured.

The procedure used in our test was a Kurt Orbahn test, ASTM D7109. Viscosity was measured at the beginning of the test, the oil was sprayed through an injector 90 cycles, and then viscosity was measured again. The beginning and ending viscosities were compared, and the amount of loss expressed as a percentage.

Although these injector shear tests are good screening tests and good for comparison purposes, they were designed to correlate with shear loss in engines, not tractor hydraulic systems. Needless to say, the pressures and tearing action

between drive gears in tractors produce more shear loss than engines.

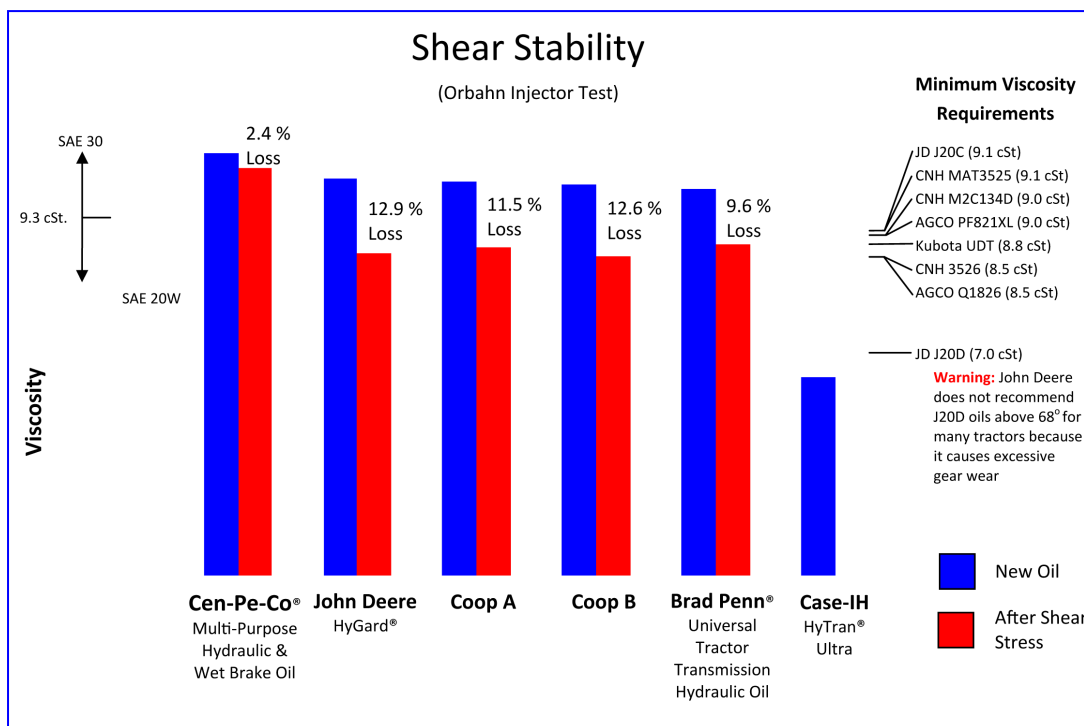
Injector shear tests are still good indicators of relative performance. The shear loss in the back of a tractor is more than the shear loss in an injector test. But the oil that loses more viscosity in a test rig also loses more viscosity in the real world. In fact, tractor manufacturer specifications require shear stability, with some specifying no more than a 10% loss in an injector shear test.

Please do not jump to the conclusion that some of the oils shown in the accompanying graph do not meet manufacturers' specs. Although there are a lot of fluids available that do not meet specs, we chose to compare our product with only reputable products. As mentioned earlier, there are variations

on these injector tests. Most tests are run 30 cycles through the nozzle, where we chose a more severe 90-cycle variation that produces greater losses.

Decoding

The Brad Penn product dropped 9.6% from roughly 9.4 to 8.5 cSt at 100° C. The Cen-Pe-Co sample fell only 2.4%



from 10.0 to 9.86 cSt.

Most people are unfamiliar with centistokes (cSt), so we can relate it to SAE grades. For perspective, SAE 30 is defined by fluids between 9.3 and 12.5 cSt at 100° C.

If our samples were engine oils, they both start in the lower part of the SAE 30 range. After shear stress, Cen-Pe-Co's Multi-Purpose Hydraulic & Wet Brake Oil remained in the SAE 30 range. The Brad Penn tractor fluid lost four times the amount of viscosity due to shear, falling into the SAE 20 range. The other fluids that we tested earlier, all with good reputations, sheared even more.

Superior Products

At Central Petroleum, we endeavor to produce the best lubricants available, which includes our tractor hydraulic fluid. Last year we announced Cen-Pe-Co Multi-Purpose Hydraulic & Wet Brake Oil's approval by TractorLife.com as evidence our fluid met leading tractor fluid specifications.

The test discussed here demonstrates one of the ways we go above and beyond the specifications to build a superior product.

Diesel Engines and Soot

Cen-Pe-Co sales rep and former diesel mechanic, Mark Bosma, posits that Ultra Low Sulfur Diesel creates more soot in engines that were built prior to 2007. He suggests looking at their exhaust during acceleration, or looking at the long soot mark down the side of the trailers attached to older trucks at a truck stop as evidence. Higher soot levels seem to be a trend in used oil analysis. You can also ask drivers of older trucks if they noticed a difference in fuel economy after the change to ULSD in 2007.

“The old engines were not designed around today’s Ultra Low Sulfur Diesel, and they do not put out near the injection pressure of today’s common rails.” The old engines cannot break up the new fuel as well as the old fuel, creating more soot.

There is a theoretical basis for Mark’s observation. When diesel fuel is hydro-processed to remove the sulfur, it raises the fuel’s surface tension. Think of hydro-processing like a water softener that works in reverse, causing the fuel to bead up like water on a freshly waxed car.

This higher surface tension makes it harder to bust the fuel into little droplets when sprayed. Today’s diesel engines use much higher pressures to blast the fuel through the injector, so they can deal with the higher surface tension. The fuel systems on older engines do not hit the fuel as hard.

But even after it is sprayed, the droplets coalesce into larger droplets. During injection, fuel mist is hurled into the air of the cylinder. The droplets on the leading edge slow down quickly from the resistance of the air, and other droplets slam into them from behind, causing larger droplets to form.

Again, modern fuel systems are designed to deal with it. Injectors fire up to 10 times per combustion stroke, which greatly reduces the number of collisions between fuel droplets. The droplets stay small.

On older fuel systems, the injectors fire once. There are many many more collisions that cause larger droplets to form which are harder to burn and create more soot.

As you know, soot is unburned fuel. More smoke from the exhaust means you are not burning the fuel as efficiently. Some of the soot finds its way into the oil where it causes viscosity increase, increases wear by interfering with anti-wear additives, and contributes to deposits. In fact, soot accumulation is what ends the useful life of engine oil for the majority of diesel engines.

The good news is that you can reduce the amount of soot produced with the right fuel additives, and you can control soot with a properly formulated engine oil.

Cen-Pe-Co fuel additives have earned two U.S. patents for their ability to lower the surface tension of diesel fuel. They behave like surfactant for diesel fuel, so fuel breaks into droplets more easily and is less likely to coalesce from droplet collisions. The result is fuel droplets that are smaller, light more readily and burn more completely. Cen-Pe-Co Super Diesel Klenz, Power Flo Klenz, and DieselMax also contain cetane improver which enhances this already improved combustion.

Cen-Pe-Co Extreme Duty Oil is loaded with dispersant--over 10 percent more than necessary to meet the CJ-4 specification. These dispersants surround soot particles to prevent them from agglomerating to form larger soot particles. By keeping the soot particles sub-micron in size, oil viscosity does not increase and anti-wear additives function properly. So, Extreme Duty provides an additional level of protection from soot, and allows longer drain intervals.

Whenever possible, start a new customer on Extreme Duty Oil and Cen-Pe-Co fuel additive at the same time. The problem with selling fuel additive to a customer that is not using our oil is that it reduces the amount of soot his engine produces, making his oil look better. He will see a bigger difference in the appearance of his used oil if he starts using fuel additive at the same time he switches to our oil.

Cen-Pe-Co fuel additives and oils provide benefits in every era of diesel engine, but Mark Bosma suggests that particularly pre-2007 on-road engines and pre-2011 off-road engines need our fuel additives and oil to help them deal with a fuel that changed significantly after those engines were designed.



Mark Bosma, IA



Thad King, far left, was a guest speaker at Denny Fleer's district meeting in Eastern Iowa. Thad is a Condition Monitoring Specialist and a Fluid Analysis Manager for Caterpillar in the Midwest. Since he has reviewed thousands and thousands of oil analyses, we asked his opinion of extended drain intervals. Although he acknowledged that some oils provide longer service life than others, he does not recommend running oils to the end of their useful life. "The risk is not worth the reward. Do you really want to risk at least \$12,000 to put off a \$100 oil change?" What oil does Thad use in his own diesel pickup? Cen-Pe-Co Extreme Duty 15W-40, and he also uses Cen-Pe-Co DieselMax.

