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Low-sulphur fuels cause injection pump dilemmas

Tractor dealers are seeing more problems with pumps where an extra lubricant isn't used

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When Shamus Morris of Chapeau, Quebec took his Massey Ferguson tractor out to cut silage this year, he was amazed that the tractor didn't have the usual power it had to mow through the corn.

He changed the shear bars and knives on his harvester, but the problem was still there.

"When it needs a lot of power, it hangs on, and then drops fast," says Morris.

His local Agco dealer, Elliott Farm Equipment Ltd. in Pembroke, across the Ottawa River into Ontario, didn't take long to diagnose the problem.

They told Morris his injection pump was on the way out.

Dave Leahy, service manager with Elliott Farm Equipment blames Morris's problem and the rash of other pump problems he's seen on the low and ultra-low sulphur diesel now the standard for diesel fuel.

The process by which the environmentally-concerning sulphur is decreased reduces the lubricity of the diesel fuel by removing oxygen and nitrogen. That means more wear on parts, especially seals.

"When a customer calls and complains I can just about guarantee what it is," says Leahy, who adds the problems don't appear to be with one make of tractor.

"They are not getting the power factor they used to. They are used to climbing a

hill in one gear, but now they have to go down two gears to climb the same hill."

Leahy has talked to pump manufacturers, tractor companies and fuel companies about the issue. The tractor companies say it is a wear issue, which it is. Pump manufacturers say it is a fuel issue and fuel companies say they are following the government-set requirements for diesel fuel. Some say they already add an extra lubricant.

Leahy spent the \$600 it cost to send fuel away for testing to an independent lab. His conclusion: the fuel supplied by the fuel companies meets government standards.

"I feel bad for these guys. A lot of them have been customers for years."
- Dave Leahy

Environment Canada, which is responsible for fuel standards, changed its requirements for diesel fuel for on-road vehicles in 2006. The change was needed since beginning with the 2007 model year, some diesel on-road vehicles were being fitted with the latest emissions technology, which cannot tolerate the higher levels of sulphur historically in diesel fuel. The new on-road standard was 15 parts per million of sulphur in the diesel fuel, and was called ultra-low-sulphur diesel.

Off-road vehicles, like tractors are a different story. This summer, a new standard

came into effect, at 500 parts per million, down from 5000 parts per million previously.

The off-road requirement will become equal with the on-road requirement for off-road vehicles in 2010 at 15 parts per million.

However, some of the largest fuel companies have already phased out the 500 parts per million off-road level for sulphur in diesel, and have only one diesel quality. So many off-road vehicles are already running with the ultra-low-sulphur diesel at 15 parts per million.

The reason Petro-Canada moved to one sulphur standard already was to avoid cross contamination, says Michael Southern, a Petro-Canada spokesperson. Petro-Canada says it already puts a lubricant in its fuel, so no other lubricant should be needed.

Elliott Farm Equipment sent a letter to all of its customers advising them to use some sort of lubricant in their diesel fuel.

"We told them they didn't have to buy it from us, but you have use the stuff," says Leahy.

Across the province from Pembroke, in Huron County, Pat DeJong of Huron Fuel Injection says it is difficult to tie a fuel issue to increased wear in a pump. But he has been seeing some increase in problems due to what could be a lack of lubrication. He is seeing more problems with unexplained fuel leaks.

He too recommends adding a lubricant.

Huron Tractor, which operates six John Deere outlets across southern Ontario, has been heavily recommending a diesel fuel lubricant to its clients at its tractor clinics, as a preventative.

Charlie Wise, the service manager at the Exeter Huron Tractor outlet, says he believes that's why they aren't seeing much of an increase in injection pump problems.

"We knew that's what was coming," he said.

The leaks issue is more common on older tractors, says Leahy. Old seals weren't



The process by which sulphur content in diesel fuel is lowered reduces its lubricating ability

made for the new fuel formulations, so more leaks happen. When new seals are installed, that appears to fix the problem, he says.

However, the newer tractors are causing the most problems, says Leahy, as the tolerances are set so tightly to meet emissions standards, that any lack of lubrication causes a problem.

Morris hasn't yet had his injection pump rebuilt, at a cost of \$1200 to \$1600, on his new tractor. His new tractor has not yet reached 2000 hours, and he isn't relishing spending \$1500 to \$2000 every 2000 hours for a pump rebuild.

He has also always used a lubricant, something he carried over from his 16 years as a transport truck driver.

That lubricant costs Morris about six cents per litre, adding to his fuel costs. He says he wishes more companies would add in the lubricant at source, taking advantage of cheaper cost of adding in the lubricant in a bulk form.

"I can see why we need to take out the sulphur to save the environment, but why can't the fuel companies put in the additive at the start?"

"I feel bad for these guys," says Leahy. "A lot of them have been customers for years."

Biodiesel's advantage

The hope for a solution to lubricity concerns with regular diesel fuel could lie in the greater use of biodiesel. Biodiesel, made from oilseeds or leftover fats, is supposed to be a better lubricant than regular diesel fuel, even at very low levels supplemented into regular diesel.

A University of Idaho study found that adding one to two per cent biodiesel to petroleum diesel fuel returned lubricity to more acceptable levels.