MAINTENANCE MATTERS

WITH James Menzies

SPRING 2014

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To say the last few years have been challenging for maintenance managers is a gross understatement. The arrival of emissions control technologies such as EGR, DPFs and SCR has brought with it some reliability issues technicians have had to learn about in a hurry.

Just staying abreast of all the mandates handed down by the Obama Administration has been difficult. Learning how these regulations affect equipment where the rubber meets the road has been an ongoing education for technicians.

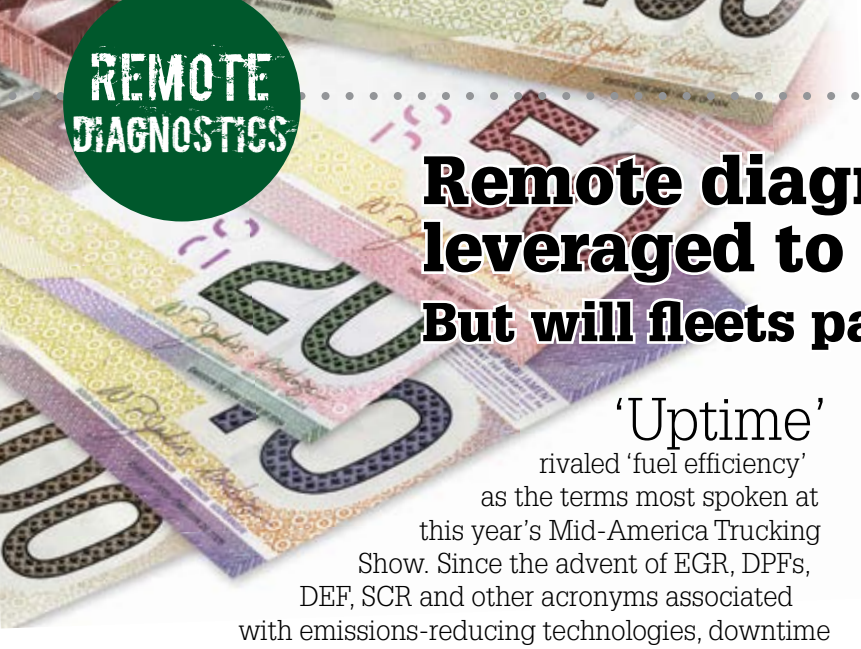
The systems aboard new trucks have become more sophisticated, the interaction between components more complex and the impact of unscheduled downtime much more costly. Meanwhile, technicians are being pressured to become more productive as fleets try to do more with less and a technician shortage makes help hard to come by.

We at Transportation Media have produced our second edition of Maintenance Matters with all this in mind, with the hope of providing easily digestible information you'll find to be of value. In this edition, we explore:

- How remote diagnostics is being leveraged to reduce downtime;
- What the development of a new engine oil category means to fleets;
- How power requirements on heavy-duty vehicles are evolving;
- And why a coolant maintenance program can reduce repair costs.

And as in our debut issue, released last year, you'll find the Toolbox, which contains information about new products and services shop managers and technicians will want to know about.

I'd like to personally welcome Petro-Canada Lubricants Inc. on-board as the exclusive sponsor of Maintenance Matters, which will be published four times in 2014. And as always, I invite your feedback, suggestions, comments and criticisms. Reach me at jmenzies@trucknews.com or 416-510-6896. MM



REMOTE DIAGNOSTICS

Remote diagnostics being leveraged to increase uptime

But will fleets pay for the service?

'Uptime' rivaled 'fuel efficiency' as the terms most spoken at this year's Mid-America Trucking Show. Since the advent of EGR, DPFs, DEF, SCR and other acronyms associated with emissions-reducing technologies, downtime has been on the increase and so have the frustration levels of fleet owners and maintenance managers.

One maintenance manager, speaking at this year's Technology & Maintenance Council Fleet Talk forum, estimated 70% of the company's repairs are aftertreatment-related. "When is a break coming?" he openly wondered.

While equipment reliability, anecdotally at least, appears to be improving, the harsh winter we just suffered through didn't provide a reprieve. There have been reports of DEF lines freezing, reservoirs cracking and heater elements burning out.

But while emissions systems are the source of much of the downtime fleets are experiencing, the use of remote diagnostics promises to help streamline repairs and eliminate unnecessary trips to the shop. At Mid-America, Cummins was the latest engine OEM to announce telematics support, in the form of Cummins Connected Diagnostics. That leaves only the Paccar products without remote diagnostics, and one has to assume they have something in the works.

In short, remote diagnostics allows the engine OEM to transmit information about a fault code to a call centre, where the code is analyzed and the operator then advised on the proper course of action. Many times, a trip to the dealer can be avoided and the item can be taken care of during the next scheduled service interval. But not all remote diagnostics programs are created equal; they each have their strengths. Here's a quick overview of what's out there:

Detroit's Virtual Technician is the only one to create a log file for each fault code, capturing what happened immediately before and after a fault code was generated.

Volvo's Remote Diagnostics has excellent integration with the dealer network, allowing the company to book appointments at the closest location that has the required parts.

Mack's GuardDog Connect boasts dealership geofencing, so the OEM can intervene when it notices a truck has been in the shop for too long and assist by expediting the delivery of parts or diverting the truck to a less busy location.

Navistar's OnCommand Connection is an open architecture platform, which can be integrated into the telematics systems fleets are already using (ie. PeopleNet).

Cummins will make its Connected Diagnostics available with no hardware required and it too will integrate with the telematics platforms already in use today.

During a discussion at the Technology & Maintenance Council meetings in March, maintenance managers agreed remote diagnostics provides a useful education on what causes fault codes to appear. However, some griped the volume of e-mails received is unmanageable and others said the benefits go out the window when the nearest dealer says it'll be a week before they can see the truck.

Asked who is using remote diagnostics today, nearly every hand in the room went up. Asked then, who would pay for the service, most went down just as quickly. It was an interesting question posed by maintenance guru Darry Stuart, because after a free trial period, fleets are expected to subscribe to the ongoing service.

Volvo is now in the process of signing up paying subscribers to its Remote Diagnostics service, which was launched in 2012 and comes free for the first two years. Conal Deedy, product marketing manager, electronics and communications with Volvo, told me the company has installed the program in 25,000 trucks. The very first such truck went to Purolator Courier here in Canada. He dismissed concerns that few fleets will pay for the service, noting users are seeing an up to 70% reduction in diagnostic time and a 20% decrease in repair time.

"We've already started selling years three, four and five," Deedy said. "We started selling that last year and we're already seeing a take rate on that. We're hitting what we thought, maybe more." MM

PC-11 ENGINE OIL CATEGORY PROMISES FUEL ECONOMY BENEFITS

New category also expected to drive more widespread use of lower-viscosity engine oils

By James Menzies

By early 2016, fleets will see a new category of heavy-duty engine oils on the shelves. Currently dubbed PC-11 (but likely to eventually be named CK-4), the category will be required by new engines built in 2016 and beyond to manage some of the technologies being used by engine manufacturers to comply with greenhouse gas (GHG) reduction requirements laid out by the Obama Administration.

PC-11 represents the first new HDEO category since CJ-4 was introduced in 2007, and while fleets may cringe at the prospect of managing two separate oil inventories (CJ-4 for existing engines and PC-11 for newer ones), the new oil is expected to yield some welcomed benefits.

"What fleets and owner/operators should be excited about, is the potential for fuel economy savings," said Barnaby Ngai, category portfolio manager, transportation oils, Petro-Canada Lubricants Inc.

Unlike previous oil categories, PC-11 will be divided into two subcategories, reflecting the more widespread use of low-viscosity engine oils. One category will apply to traditional 15W-40 oils while the other will focus on low-viscosity oils, such as 10W-30s.

Maintenance managers can expect to see OEMs continue pushing the lighter-weight oils, as they provide some fuel savings and help manufacturers meet the new fuel economy standards required by the EPA and NHTSA. But concerns persist about the ability of low-viscosity engine oils to offer protection on par with trusted and widely used 15W-40 products. These worries should be set aside, Ngai claims.

"There has definitely been talk about, are lower-viscosity oils robust enough? Definitely those conversations come up. In our experience with our existing CJ-4 line-up, we've experienced real-world results that have proven the strength of our DURON-E 10W-30 engine oil product to be as robust as our 15W-40 when talking about protection, all with the potential of fuel economy (improvements)," Ngai says.

Thinner oils with lower high temperature high shear (HTHS) properties provide fuel economy benefits because they provide less resistance to moving parts within the engine. Ngai explains the difference between low-viscosity oils and conventional 15W-40 oils as being akin to swimming in a pool filled with water as opposed to molasses.

"You're going to expend a lot less energy getting from Point A to Point B," he said. "The nature of its composition is going to give you the fuel economy (benefits)."

Fuel savings are available today by moving from a 15W-40 to a 10W-30, but the gap is expected to increase with the new PC-11 category, which will bring higher-performing engine oils. And the benefits won't end at fuel economy, Ngai says.

"When you move towards a lower-viscosity, higher-performing product, you're going to get additional performance benefits from protection, cold temperature properties and fuel economy," he says.

The new category is currently scheduled to be released by April 2016 and will be required on all new engines at that time. MM

TECH TIPS

A TWO-PRONGED APPROACH TO FUEL SAVINGS

When looking to improve fuel economy, don't count on technology to provide all the answers. Speaking at the Technology & Maintenance Council meetings in March, Scott Webb of Mesilla Valley Transportation said driver behaviour modifications are equally effective, and often less costly to implement.

"About half of our fuel economy comes from technological improvements and half from how drivers drive the truck," Webb said.

He outlined Mesilla Valley's journey towards improved fuel economy from its beginning in 1981, when the fleet averaged a paltry 4 mpg. One of its earliest efforts involved installing fan clutches to disengage the fan when it wasn't required. The company began monitoring driver behaviour in 1986.

Other fuel-saving spec's used by the company include: wide-base single tires; trailer tails; trailer side skirts; wheel covers; narrower mud flaps; roof cap extenders and tire inflation systems. This was combined with driver-focused initiatives such as cash prizes for the most fuel-efficient drivers.

By 2009, Webb said, Mesilla had more than 15 drivers averaging 12 mpg. In February 2014, the fleet averaged 8.5 mpg thanks to its combination of technology and driver behaviour initiatives

POWER HUNGRY

By John G. Smith

Vehicle charging systems face growing challenges

A modern truck's thirst for power involves more than the need to turn wheels.

Inverters are now being called upon to deliver the battery power for a growing list of driver amenities including computers and the CPAP devices used to fight sleep apnea, while lift gates and walking floors present power demands of their own, says Keith Doorenbos of Kenworth's engineering team.

"We've got to get a lot smarter about how we make systems work," he told an audience during the recent annual meeting of the Technology & Maintenance Council of the American Trucking Associations. "We've got to use the energy when it is available and try not to use it when it is scarce."

There is no mistaking that some energy savings have been realized through advances such as LED lighting and improvements to motors and controls alike. Low-voltage detection systems can help to ensure that batteries retain enough power to start a truck, and cut-off switches can be used to preserve valuable battery juice if a truck will be shut down for extended periods of time.

But Doorenbos refers to most gains as "fairly incremental."

To compound matters, the demand for power is also increasing. Safety systems from lane departure systems to anti-lock brakes all draw voltage. Tightening limits on vehicle emissions also introduce new sensors, actuators and turbos. "In order to meet the very, very accurate needs of on-board diagnostics, you need system voltages that are stable," Doorenbos adds.

The biggest emissions-related demand of all will likely come in the form of engines that have to stop and start whenever they arrive at an intersection. "Those will drive another increase in storage capacity and rapid recovery," he says. "They will also drive a significant change in the starter."

It isn't the only way that tightening emission standards will play a role in electrical systems. Aerodynamic changes made in the name of better fuel economy are limiting the air flow and spaces traditionally used to cool components. To compound matters, a truck's aerodynamic gains are realized by rolling up windows, and this increases the demand on ventilation and air-conditioning in the cab.

The solutions will likely involve some form of hybrid system, perhaps capturing some of the kinetic energy created as a truck drives downhill and then storing the power until it is needed most, Doorenbos says. Under the hood, there could be more electric-powered power steering pumps, air-conditioning compressors, pneumatic system compressors, and water pump fans, all running only

when needed. "We're going to have to put smarter controls on alternators," he says, adding that available energy might be used to top up batteries or even compressed air.

There is certainly room to improve a charging system.

A typical alternator is now 60% efficient, says Bob Jeffries, Delco Remy's manager, fleet operations and services. This means a typical truck will burn $3,000 in fuel per year just to operate the component. Improving that efficiency to 70% would save about $330 per year.

Ideally, an alternator should be oversized so it can run at about 35-50% of its rated current, extending the life of bearings and other related components, he adds. "When we do need that higher output it's available."

Doorenbos muses about how high the vehicle voltages might climb in the face of rising demands. Passenger vehicles can be equipped with 48 volts, he says. "We could see multiple-voltage systems." Starting needs and hotel loads could be addressed separately, while flywheel-mounted electrical devices could be used to support the multiple starts and stops during a trip.

There will be plenty of challenges to address along the way. MM

DID YOU KNOW

The North American Class 8 truck fleet is getting older. Estimates are that the average age of a heavy-duty tractor is now between six-and-a-half and eight years. Speaking at the Technology & Maintenance Council meetings, Dwayne Haug of Werner Enterprises noted a linehaul truck that's 5.5 years old will typically have 550,000 miles on the odometer. The cost of maintaining a truck with 550,000 miles is 15 cents per mile. The cost of maintaining a truck with 175,000 miles on it is just three cents per mile.

COOLANTS

Don't lose your cool over coolant-related engine damage

A proactive coolant maintenance program can reduce repairs

By James Menzies

If 'fill it and forget it' is the extent of your coolant maintenance strategy, then there'll inevitably come a time where a driver will takes things into his own hands somewhere along the highway.

And that's when some potentially costly problems can begin to take hold.

An attentive driver may have the best intentions when he notices coolant levels are low and decides to top it off at a truck stop. But how do you know he'll put the right stuff in? And will he even tell you if he doesn't? Often, fleet maintenance managers don't realize their coolant has been thrown off-spec' until problems arise or they test the quality of their coolant. And too few do the latter.

"Often, what we have found is the maintenance people are surprised when they find a mixed bag of coolant chemistries all in one truck," said Colin Dilley, PhD director of technology for Prestone Command. He recommends keeping pre-mixed coolant solutions in each truck to eliminate the guesswork for drivers.

"The driver often doesn't have a full knowledge of what coolant can do and how important it is to the engine," Dilley said. "Really, it's a matter of being proactive, thinking ahead and making sure you have the right things on hand."

Drivers who top off the coolant with an incompatible product invite many potential problems. They may not understand the glycol/water mixture is carefully formulated to best protect the engine.

"Once you have the right coolant mixture, it's maintaining the engine at the correct heat and

keeping the oil at the correct viscosity and that's leading to a longer service life for that vehicle," Dilley explained.

What happens when the glycol mixture becomes too high, say in the 80% concentrate range? "It loses its ability to transfer heat," Dilley explained. "In the water/glycol mix, it's the water itself that has the best heat transfer properties. Take away the water and you have less ability to transfer heat. When that cooling system sits idle and cools down, with a high glycol mix it becomes very slushy and that becomes difficult to pump around. The water pump is not designed to push through slush. And with some chemistries, when you get that very high (glycol) concentration with very little water, it can start precipitating out some of the inhibitors – and the inhibitors are what protect the engine system from corrosion."

And what if the glycol levels are too low? "One, you start losing the freeze point protection and freezing equals expansion which equals damage. Secondly, you reduce the concentration of the inhibitor package so that it will become ineffective more quickly, or you may not have enough (inhibitor) to fully protect the system from corrosion."

If you're not regularly testing the quality of your coolant, these problems can go unnoticed until catastrophic damage occurs. A ruined water pump is one potential outcome. Worse, wet sleeve liners can be damaged beyond repair.

"If the wet sleeves get cavitation corrosion, which leads to penetration, you can basically kiss that engine goodbye," Dilley warned.

If a driver does misfill the coolant while out on the road, it doesn't have to be a costly problem – as long as you find out about it early. Verifying the quality of the coolant using a test kit allows maintenance managers to determine whether or not they need to flush and fill the system.

"Usually, with the amount a driver will put in, it's fairly easy to correct without flushing and filling what you have in that vehicle," Dilley said.

Coolant test kits can provide inexpensive

insurance. Prestone recommends testing the coolant every time a truck comes in for service.

"When it's time to do maintenance, test," Dilley advised. "If it's in excellent shape, don't change it."

Aside from on-road top-ups, there are other factors that can affect the quality of your coolant. One of them is the quality of the water used in the mixture. Bottled water is safe to use and usually, so is tap water – but not always.

"Excessively hard water can form deposits in the cooling system," Dilley said. "When they get into the radiator, they'll precipitate out onto the radiator and those deposits make it harder for the rad to do its job because now the heat has to pass through not just the aluminum, which conducts heat very well, but also through the calcium-type deposit, which does not conduct heat very well."

Fleets that are using well water should test its quality monthly, Dilley suggested, noting some wells produce excellent water for most of the year but then it becomes salty in the spring due to the road salts contained in run-off. As with coolant test kits, water test strips provide inexpensive insurance.

Another way to ensure you won't lose your cool over coolant-related engine breakdowns, is to choose a decent product in the first place. Avoid the ultra-cheap coolants, which in some cases are recycled.

"As coolant ages, it breaks down and becomes more acidic due to the breakdown of the glycol," Dilley warned. "Poorly recycled glycol retains breakdown products and they acidify the coolant and that makes it more corrosive."

Also stay away from the green silicate coolants, which don't offer enough protection in heavy-duty applications, Dilley suggested. However, a silicate coolant containing a supplemental coolant additive (SCA) is acceptable, even though it offers limited longevity – about 25,000 miles of protection – before more SCA must be added.

"People tend to get into more trouble when they have a coolant with a shorter life," Dilley said. "It may cost less, but if it's only good for 25,000 miles, that gets eaten up very, very quickly. It's a lot easier for your cooling system to become neglected and to have damage with a coolant that lasts a shorter amount of time than one that does 300,000 or 600,000 miles."

Among the longer-lasting coolants are those in the organic acid technology (OAT) category. These can be bought with nitrite (NOAT), lasting up to 600,000 miles, provided an additive is put in at 300,000 miles. Then there are OATs, which can last, with good maintenance, 600,000 miles without an additive.

Another option are hybrid OATS (HOATS), a cross between the silicated coolants and OATs.

"In my opinion, they have pretty much the same lifetime as conventional silicates, so there's not a great deal of advantage to using those," Dilley said. MM

TECH TIPS

TRAVELLING BETWEEN THE EXTREMES

So, what do you do if you're picking up oranges in Florida for delivery to Winnipeg? In February. How should you mix your coolant to offer protection when you could see temperatures of -30 C in Manitoba and 20 C in Florida all on a single trip?

It's a challenge Prestone's Dilley admits. However, he says the rule of thumb is to mix your coolant to levels that will provide the best protection in the colder end of the spectrum.

"For those trucks that are all over the place, north and south, high and low elevations, usually close to a 50-55% concentrate-to-water ratio works," he said. "Know the route that's going to be taken and make sure you have enough cold weather protection."

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THE TOOLB

TMC benchmarking service offered

Ever wonder how your shop compares to others of the same size in the US and Canada? The Technology & Maintenance Council and Decisiv have teamed up to provide the industry's first TMC Scorecard Service.

Fleet maintenance managers are asked to take a 15-minute survey, providing insight into their fleet maintenance practices. Once completed, participants receive a benchmark report. They can also log in and create customized reports, comparing their own performance against their peers.

All that's required to participate is a US DOT number. Fleets that take part will be asked to update their data every four to eight weeks throughout the year.

"We have recently piloted a new TMC Scorecard Service that will allow participants to see how their service and maintenance data compares to similar companies based on type and size of fleet, industry/SIC code, cargo type, and other parameters," said Carl Kirk, vice-president of maintenance, information technology and logistics at American Trucking Associations.

"The new TMC Scorecard Service goes beyond simple yardsticks, which show only generic industry data based on surveys," added David H. Tobey, Ph.D. of Decisiv. "The scorecards can be used measure specific aspects of a fleet's operation against its own performance and that of other companies or groups, as well as industry averages. This type of service, which has been used successfully in other industries, will deliver value beyond typical surveys for truck fleets in many market segments."

Fleets can take the survey here.

Tire cage protects technicians from tire explosions

Relative Manufacturing has released the Tire Cage Leek-Seeker, which contains a tire while it's being inspected for air leaks, keeping the technician out of harm's way should an explosion occur.

The Calgary company calls its Tire Cage Leek-Seeker the ultimate in safety for tire service work. It also reduces the risk of injury, since technicians can roll the tire into the cage without having to lift it. The system retails for about $840. More information on the Tire Cage Leek-Seeker can be found at www.leekseeker.com or by calling 403-330-6347.

Bendix says tests prove Versajust slack adjusters extend brake life

Bendix announced at the Mid-America Trucking Show that its Versajust LS slack adjuster can significantly extend brake drum and lining life. Fleet testing has revealed the slack adjuster with WearMax clutch can extend lining life by up to 16% and brake drum life by up to 30%, the company claims.

The WearMax clutch allows for a gradual, continuous and more precise adjustment, contributing to the savings.

"Versajust's unique adjustment rate enables a tighter running clearance, which provides the maximum brake chamber reserve stroke and creates a quicker response time for brake application," said Gary Ganaway, director of marketing and global customer solutions with Bendix Spicer Foundation Brake.

The slack adjuster also protects against brake dragging, which can reduce fuel economy and increase maintenance costs. More info can be found at www.foundationbrakes.com.

Michelin offering mechanical services through new Truck Care network

Michelin is rolling out a new service that will provide mechanical repairs and scheduled maintenance through a network of service locations across the US and Canada. But it could be some time before Canadian locations are welcomed into the program.

Speaking of its new Truck Care service, launched at the Technology & Maintenance Council meetings in Nashville, Michelin's Ted Becker told us the service already consists of 50 locations, and will expand to include 100 by the end of this year before being ramped up in Canada.

Still, Canadian fleets can enroll to use the service when their trucks are in the US. There's no cost to join. The benefits include consistent pricing across the service network, consolidated billing through Michelin, and the ability to get scheduled maintenance performed wherever the truck happens to be. For example, a driver who must take a 36-hour reset in the US could drop the truck off to have some preventive maintenance performed away from home.

"Fleet customers today, their operations are more complex than ever, their ability to control costs are more complex than ever and they need new solutions and new partners to supplement some of their maintenance activities," Becker said.

Services provided include: brake jobs; lighting repairs; oil changes; electrical repairs; DOT inspections; wheel-end and bearing repair and replacement, etc.

DID YOU KNOW

More fleets are spec'ing engines that utilize downspeeding to improve fuel economy. But have you considered the effect downspeeding has on the driveshaft and axles? Spec'ing the engine to cruise at lower rpms saves fuel (about 1.5% for every 100 rpm reduced) but to achieve this, faster rear axle ratios are also typically spec'd.

This places additional strain on the driveshaft and axles. Steve Slesinksi, director product planning at Dana, noted that moving from a 3.55 to a 2.26 rear axle ratio increases the torque load on the driveshaft and axle by 57%. Even going from a 2.64 to a 2.26 ratio increases torque by 14%. Joe ElBehairy, v.p. engineering and quality with Meritor told me in a recent interview, that, more than ever, "It's really critical to make sure that as (rear axle ratios) get faster, you're not overloading the rest of the system."

When spec'ing new trucks, be sure to take a holistic approach and consider the increased interconnectivity between today's engine, transmission and axles. "They have to understand the technologies and how things interact more than they used to; there's just a lot more interaction between the engine, transmission and the axle than their used to be," ElBehairy said.