# FleetMaintenance

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## THE SEARCH FOR TRUCKING'S FOUNTAIN OF YOUTH

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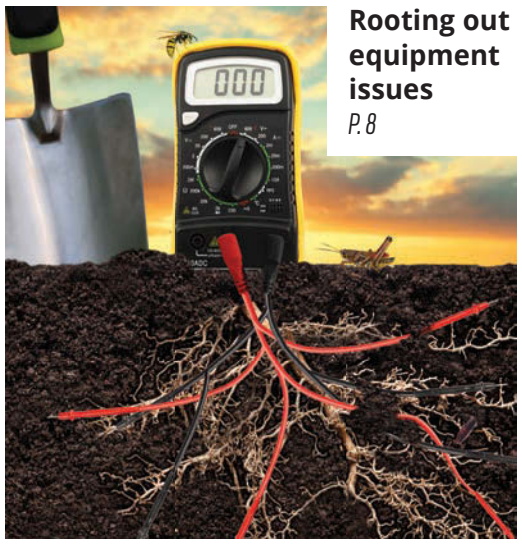





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## OPINION

### Are hydrogen engines the answer?

Along with being used in fuel cells, hydrogen can also fuel internal combustion engines. And while not always being the most efficient, fleets may find they are the most proficient for now.
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## ARTICLE

### Importance of detecting EV battery leaks

Leaks or contaminants can compromise an electric vehicle battery and endanger drivers and technicians, which is why battery detection solutions will be crucial, Redline Detection President Alex Parker explains.
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SCAN CODE

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# A fresh approach to maintenance

The industry's exhausted workers need a recharge, and a holistic approach to managing maintenance could provide a much needed boost.

By John Hitch
Editor-in-chief

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**Even in the worst of times, the trucking** sector is asked to be at its best: maximum uptime and minimal delays. No excuses; just results. Because you know how it is. Low margins. Competition. Customer expectations. Economy hangs in balance. The usual.

I imagine in an alien invasion when the rest of the world would be in hiding, over-the-road trucks will probably still be braving the nation's highways to resupply the resistance (or to offer tribute to our wonderful new alien overlords, who I for one, welcome). Meanwhile, work trucks will be out in force clearing the streets of rubble and patching up laser-scorched infrastructure.

Sure, that may seem improbable, but during the chaos of the last three COVID-tainted years, order—and you could argue society itself—was maintained by the commercial vehicle operations who delivered vital goods and ensured the power stayed on. These few worked overtime while many were subsidized by the government to work less or not at all.

It was exhausting, especially considering the majority of drivers are far from spring chickens. The average age of drivers has hovered around the high 40s for many years. According to Lindsey Trent, co-founder and president of NextGen Trucking, it's now 54 years old, while new entrants are 35.

Meanwhile, in the shop, it's hard to keep young technicians. George Arrants, VP of ASE Education Foundation, is always quick to remind whoever will listen that two out of five automotive/diesel technicians leave the trade within two years. (He explains the problem in-depth on pg. 35.) That means the exhaustive search to replenish the shop workforce never ends, a tiresome effort for all involved, from the managers in charge of onboarding to the experienced techs expected to train and mentor them.

A healthy society needs these two sides of the commercial vehicle sector lively and strong to function. So what happens if the grim forecasts are true? Aliens don't seem so bad compared to barren grocery stores and routine power outages, which is what is at stake.

The American Trucking Associations estimated the driver shortage—at about 80,000 or so now—will increase to 160,000 by 2030. The maintenance side is assumed to have an equal current deficit of techs, and the U.S. Bureau of Labor Statistics calculated the industry will add 28,100 "diesel service technicians and mechanics" each year over the decade.

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It's worth noting that the world changes so fast and the moving parts are so complex that these specific numbers are likely off. (Remember, we have been told several times in the last 50 years that we had 12 years to change our behavior or Mother Nature would spank us back to the Stone Age.) But even if you don't look at the data, put your ear to the shop floor and listen. You'll hear the clamor of managers shouting in unison: "We can't find good people to work for us!"

That's what I hear on the regular, anyhow. And it's a not-so-subtle warning sign of a systemic problem.

This issue may become exacerbated as fleets hold on to trucks longer. A recent Noregon Research report, "Unpacking the Commercial Vehicle Diagnostics Market: 2023" indicated in the U.S. and Canada, around a quarter of Class 8 trucks are under seven years old, one-third are between 8 and 15, and 40% are 15 or older. The total population in 2023 is expected to be 2.3 million. That's a lot of trucks to maintain, and if the industry is short on technicians, fleets will wait longer to get trucks back on the road again.

As we mention on pg. 12, the average truck age is 8.7 years, and after 500,000 miles, more maintenance issue crop up requiring more attention. There are some excellent tips in that piece from several very capable sources to provide guidance in that department.

The good news is troubleshooting broken systems—and fixing systemic problems in general—is kind of maintenance professionals' thing, and root cause analysis is gaining traction industry-wide, which we dig into on pg. 8. I advise fleets and their service partners to extend that holistic approach of maintaining individual systems to the overall maintenance ecosystem. In the longterm, this would require more training and determination expended from both shops and fleets, but less energy over time. This is all the more crucial as the industry may have less bodies available.

A fresh approach should also recharge workers' batteries and rejuvenate the entire operation. To get there, first you'll need to examine what your biggest pain points are.

If the shop is always getting maintenance surprises when trucks get to the terminal, encourage drivers to get more thorough on pre-trips and driver vehicle inspection reports (DVIRs). They are the first and best line of defense to catch small problems before they grow into time-consuming ones. Maybe derates have become an epidemic, so kick the tires on one of the myriad remote diagnostic and telematic solutions out there. These can give maintenance teams advance warning on serious issues. And if you uncover the root cause of one truck's infection, you could apply that to similar models across your fleet.

And if certain parts are always on backorder, requiring shifting of assets or turning down loads or jobs, it's high time to find a backup supplier or new distributor partner. All it might take is a detailed chat with your current parts distributors so they know what you need and how they can serve you better. Read our feature on pg. 18 for more ideas.

Just look at this moment as the perfect opportuity to perform some managerial spring cleaning with one goal in mind: How you can stop treating the symptoms of shop inefficiencies and seek out the true cause.

# PROVEN RELIABILITY AND TOUGHNESS


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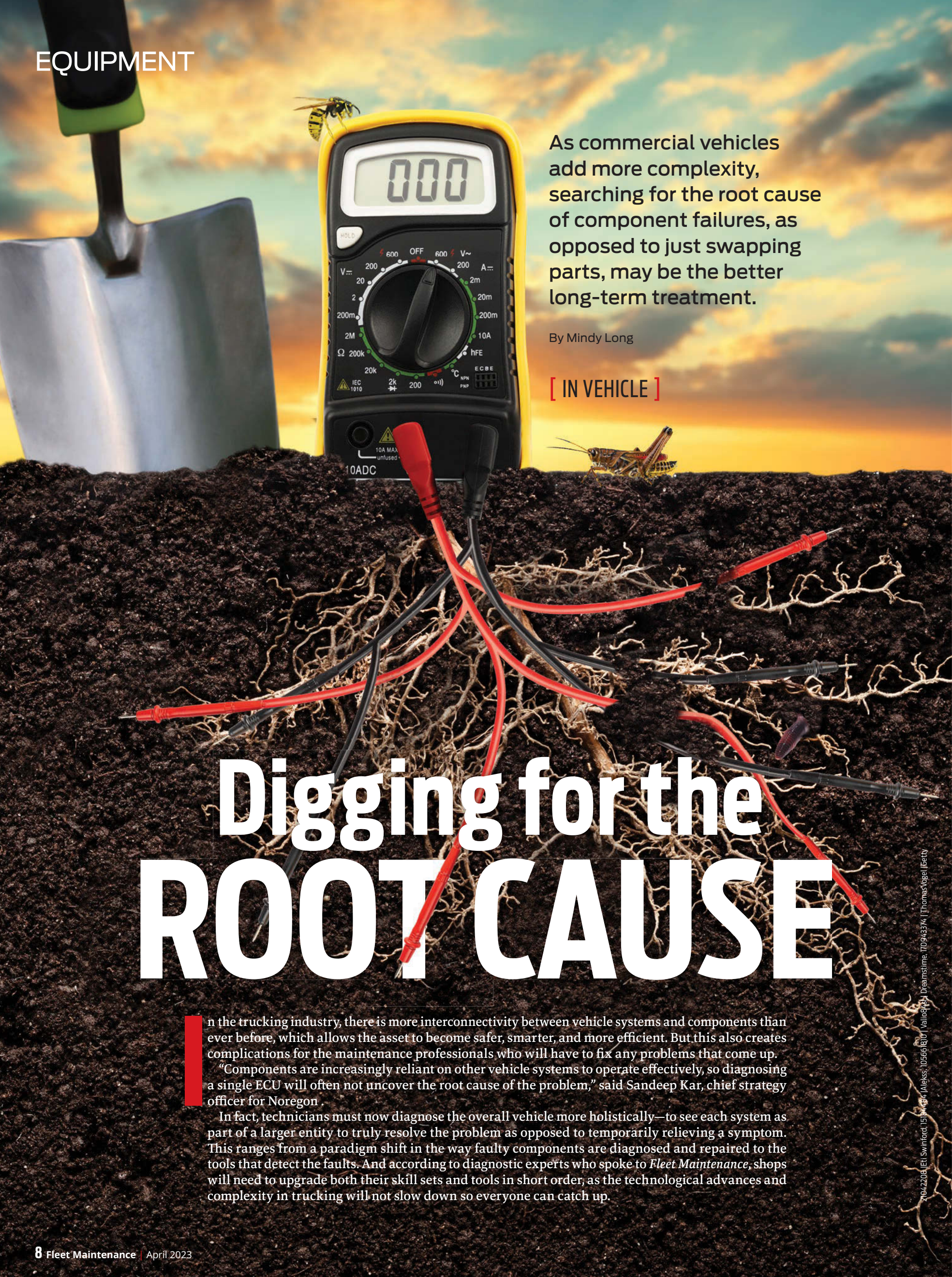



As commercial vehicles add more complexity, searching for the root cause of component failures, as opposed to just swapping parts, may be the better long-term treatment.

By Mindy Long

[ IN VEHICLE ]

# Digging for the ROOT CAUSE

In the trucking industry, there is more interconnectivity between vehicle systems and components than ever before, which allows the asset to become safer, smarter, and more efficient. But this also creates complications for the maintenance professionals who will have to fix any problems that come up.

"Components are increasingly reliant on other vehicle systems to operate effectively, so diagnosing a single ECU will often not uncover the root cause of the problem," said Sandeep Kar, chief strategy officer for Noregon .

In fact, technicians must now diagnose the overall vehicle more holistically—to see each system as part of a larger entity to truly resolve the problem as opposed to temporarily relieving a symptom. This ranges from a paradigm shift in the way faulty components are diagnosed and repaired to the tools that detect the faults. And according to diagnostic experts who spoke to *Fleet Maintenance*, shops will need to upgrade both their skill sets and tools in short order, as the technological advances and complexity in trucking will not slow down so everyone can catch up.

## The root of the matter

When trying to uncover a vehicle's issue, some are easy fixes, such as topping off the coolant or diesel exhaust fluid. Others may take deeper digging with a diagnostic tool, some trial-and-error, and parts swapping. Even all that may not be deep enough to reach the real root of the problem.

"There is a very clear difference between making a repair that was created by a problem—or root cause— and solving the problem that created the need for a repair," explained Randy Obermeyer, VP of safety and maintenance at OnLine Transport.

It's a noble pursuit. Fix one DEF sensor and improve one truck's uptime; help the OEM identify why the sensor failed and avoid future downtime for all similar trucks.

It's the reason that Obermeyer chose "Root Cause Analysis/Problem Solving" as the major theme of his recently concluded tenure as general chairman and treasurer of the American Trucking Associations' Technology & Maintenance Council.

He presented the following common method of resolving a check engine light:

First, the tech uses various troubleshooting steps, such as using a scan tool to find fault codes. Once the faulty component is identified, the quote is written and submitted for approval. Then the faulty component is repaired or replaced, and the invoice is sent and settled.

If another truck comes in with the same issue, the process repeats.

"Nowhere in this example is anything suggested as to what caused the component to fail," Obermeyer noted. "It is not suggested that the component's typical life expectancy was passed or if it failed prematurely."

Obermeyer imagines an industry-wide workflow where repair facilities emphasize root cause analysis and problem-solving as part of the diagnosis and repair process.

In this scenario, when dealing with a check engine light, the tech still goes through the troubleshooting steps to find the faulty component. Then the shop determines if the part failed early. Obermeyer noted this would take industry standardization and the customer's repair history.

If the part failed early, the shop looks for obvious reasons, like a shorted wire, to understand why the component failed.

"If no, the repair facility digs deeper into the root cause, such as an internal component issue, an electrical voltage spike, internal wire or connection faults, etc.," Obermeyer explained.

The quote would now include the cost to repair the current issue and list potential causes, and the tech then repairs or replaces the faulty component, and fixes the root cause if applicable. The invoice would also state the root cause and any potential countermeasures.

"The problem that created the need for the repair was solved, and the countermeasure is then put into place by the fleet which slows down and then potentially eliminates that particular issue from occurring on similar trucks," Obermeyer explained.

It's a comprehensive solution to problems that nag the industry, but it's not without critics.

"I have had people push back saying that fleets will not want to pay extra for that service," he said. "My answer: They cannot afford not to. Inflation has caused the price of my average component to go up 25%. There will be more expensive electronic control features added as ADAS and EV technology advance. Add that to skyrocketing labor prices at dealers and service providers. Why wouldn't they?"

The former TMC chairman believes strongly that this is the best way forward and will continue to push the industry to shift from temporary to permanent fixes. His plans include helping develop a guide for teaching root cause analysis and making it a part of the curriculum at technician trade schools, adding a root cause track to TMCSuperTech and state skills competitions, as well as developing new root cause repair order and invoice standards for dealers, service providers, and fleets.

He also hopes to create a certified Root Cause Analysis Specialist Program similar to that of the VMRS Specialist Program currently offered by TMC.

## Troubleshooting tool trends

Not only do technicians need to be better trained and acclimated to a problem-solving workflow, but they have to have a more capable array of diagnostic tools at their disposal.

"With technology advancing at an accelerated pace in Class 8 trucks, proper diagnostic equipment is a requirement for getting customers back on the road quickly," explained Eric Daniels, VP of truck care for Love's. "And proper triage with diagnostic equipment helps drive throughput and technician efficiency."

For Winston Minchew, maintenance training manager for Old Dominion Freight Lines, diagnostic software for fault code diagnostics is essential.

"You definitely need that with today's engines, today's aftertreatment systems, and all of the modules on the vehicle," he said.

Diagnostic tool providers have responded by developing more complex tools to avoid becoming obsolete, ensuring users have accurate information and increased efficiency.

"Overall, the evolution of comprehensive scanning tools for commercial vehicles has been marked by a steady increase in sophistication and functionality, driven by advancements in software, algorithms, and wireless technology," said Marcos Obispo, sales director for Cojali.

More advanced diagnostic tools don't have to complicate the user experience, and sophistication on the back end amplifies the need for a user-friendly experience on the front end.

"While scans are getting more sophisticated, the analysis from the scans is getting more predictive and prescriptive in nature," Noregon's Kar noted.

He added that tools can't just present information to the technician but must guide them through the process. Without simultaneously scanning all components, technicians may find a temporary fix and clear the fault. Still, if the problem originates from another component, it will soon reoccur, causing unnecessary downtime and additional service expenses, Kar explained.

Duane Watson, a technical trainer for Bosch, said techs need a scan tool that can simultaneously communicate on different levels of protocols to speak to the various modules and protocol speeds. "Doing that will give me the information to drive to that root cause failure," Watson said.

John Forro, a technical trainer specialist for Autel, added that a system that isn't sending a signal to a module that needs it could cause a technician to spend a lot of time troubleshooting. "That is where a feature like the topology tool from Autel comes in," he said.

Obispo said having bi-directional control allows technicians to communicate with a vehicle's onboard computer system and perform tests and calibrations. "They also include features such as predictive maintenance, allowing us to anticipate and prevent problems before they occur," he said.

**"With technology advancing at an accelerated pace in Class 8 trucks, proper diagnostic equipment is a requirement for getting customers back on the road quickly."**

Eric Daniels, vice president of truck care, Love's

## Keeping up

In addition to increased connectivity, today's equipment uses much faster processors. "You have to have a tool that is faster than the equipment you're testing," said George Arrants, VP of ASE Education Foundation.

TMC recently submitted the first recommended practice for using lab scopes, which use live data, to diagnose an intermittent problem.

"Its sampling speed is faster than the truck's computer. It can measure a billion samples a second and see things your multimeter and scan tool can't see," Arrants said.

Typically, scan tools use interpretive data. "That means there is a pretty good chance it is the correct data, but if there is a fault with the module itself, it can share anything, and we don't know if it is correct or not," Forro said. "If I pull up the MaxiSys tool, I can split the screen and put the scan tool data on one side of the screen and pull the lab scope data on the other side, so I can test what we see in the data is what the scan tool is seeing. If there is variance in the data, that gives you good insight that you're looking at an actual module problem."

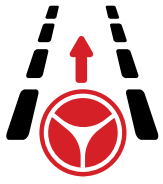
» Technicians must engage in routine training to keep up to speed on new truck systems and how to diagnose problems.

Love's

Lab scopes help diagnose electrical issues, which often require additional tools. Autel utilizes a VCMI box, which has a reprogramming tool, four-channel lab scope, graphing meter, and a signal generator, all included with that scan tool.

Minchew said diagnosing electrical issues is more challenging today than it was ten years ago. "There are a lot more sensors, a lot more wires, and a lot more electrical modules," he said. "When we test the wiring, the most important tool in the shop is the digital multimeter to ensure the wire is good."

## Troubleshooting ADAS



More and more vehicles support some level of advanced driver assistance systems (ADAS), which introduces new diagnostic hurdles. "Many quick and relatively simple jobs, such as replacing a windshield, have become more complicated due to the requirement to ensure ADAS systems are properly aligned and functioning correctly during the replacement," Kar said.

For example, if a collision avoidance system is not functioning properly, a diagnostic tool can help identify the specific component or sensor causing the issue. "This allows for the quick and accurate repair of the system, reducing downtime and preventing potential safety issues on the road," Obispo said.

Diagnostic tools can also calibrate ADAS systems after repairs or component replacement. "Calibration is critical to ensuring that these systems function properly and provide accurate information to the driver," Obispo said. "Failure to properly calibrate ADAS systems can lead to inaccurate readings or false alarms, putting the driver and other road users at risk."

ADAS sensors are mounted to the vehicle and assume the vehicle's alignment is correct. Forro said that Autel's IA900 has a built-in wheel alignment system to ensure a successful calibration.

## Diagnosing engines

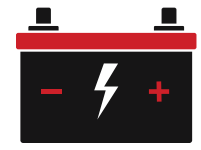
There have been changes to engines which can require an advanced scan tool to diagnose, Forro said. "A lot of vehicles are going to secured gateway modules, which basically require that various manufacturers authorize that it is a legitimate scan tool," he explained.

The growing use of hybrid and electric powertrains in commercial vehicles has created a need for diagnostic equipment that can diagnose and repair issues with the systems, which rely heavily on electrical components such as batteries, motors, and inverters.

"Additionally, these systems often include advanced engine technology, such as regenerative braking and energy management systems, which require diagnostic equipment that can accurately diagnose and repair issues," Obispo said.

Obispo said that direct fuel injection systems often rely on advanced electrical components, such as high-pressure fuel pumps and injectors, to deliver fuel to the engine.

## Testing batteries



The right tools can help technicians diagnose battery issues and prevent battery-related problems from occurring in the first place. "By regularly monitoring battery performance and health, technicians can identify potential issues early on and take preventive measures, such as replacing a battery before it fails, to avoid more serious problems down the line," Obispo said.

Autel can perform tests on low-voltage batteries inside or outside of the vehicle. "If we do the test outside of the vehicle, I can measure the available voltage of the battery and then apply the load to make sure it is going to be good under dynamic conditions," Forro said. "If I do it inside the vehicle, I can do that testing and add the other starter and charging tests."

Autel's scan tool can also be connected to high-voltage batteries to recalibrate the battery range of health. "We refer to it as the modern-day tune-up," Forro said.

## Making the investment

Each tool has its place, and Arrants said it comes down to knowing what you need and what you're trying to accomplish.

Minchew said he looks for tools that will save time, which creates value. "You can decide whether or not the tool will pay for itself with that saved time," he said, adding that he also factors in whether or not a tool will allow technicians to do more work in-house. "If you send trucks out because you don't have a tool, the tool would end up paying for itself over time."

The Old Dominion technician offered as an example changing from an analog to digital drum micrometer.

"Another tool that can save time is the dial indicator," he added. "Maybe 20 years ago there was a dial indicator we purchased and used where you put articulating arms together. Now, there is a tool that you lock in an arm. It is easier to use and saves time."

In this way, swapping out tools—not parts—could help foster a more holistic approach.

Forro said the ability to share the screen could allow shops to tap into other experts without physically bringing in a mobile diagnostics person, which can also save money. "With Remote Expert, we can keep the money in-house and search out the vetted industry experts to contract them," he said.

Quality and flexibility are essential for the diagnostic tools used at Love's Truck Care and Speedco locations. "We look for a product that is well supported by the vendor and flexible enough to service all makes and models," Daniels said.

In addition to using OEM software, Love's uses Noregon JPRO heavy-duty diagnostics in all shops. "This tool, along with their NextStep Repair, gives our technicians interactive instructions for troubleshooting and repairs," Daniels said.

JPRO has a Repair Mentor feature that guides users down the optimal diagnostic and troubleshooting path. "Features like Repair Mentor help newer technicians diagnose complicated issues with less assistance and empowers them to perform at the level of a technician who can manage the same process without that guided aspect," Kar said.

Watson said scan tools are simply necessary to treat today's equipment. "The bottom line is the importance of electronics and software has grown, so this has to be part of the complexity technicians think about. It is more than opening the hood. It starts with the connector under the dash," Watson said.

Techs should also check tools regularly. "One thing we like to tell technicians is to test your test equipment and have it in working order before you need it," Kar said. "This means ensuring the leads on your multimeter work and the device is calibrated before diagnosing an electrical issue. It also means ensuring your diagnostic software is up to date before it's time to connect to a vehicle."

> **"The location where you store [a diagnostic tool] is critical... You're not going to store it in a drawer other than one with sensitive tools."**
>
> Duane Watson, technical trainer, Bosch

Once shops invest in diagnostic tools, they must properly care for them. "The location where you store it is critical," Watson said. "You're not going to store it in a drawer other than one with sensitive tools. Be mindful of where you keep it. You don't want to have it propped up on a plastic box next to your air compressor that vibrates all day long."

Daniels noted that it is important to keep tools clean and organized. "Having a well-organized shop not only helps with safety but also allows tools to be properly stored and easily accessible for all technicians," he said.

## Training technicians

Even the best tools can't eliminate the need for training. Without training, technicians may struggle to diagnose and repair issues, leading to longer repair times, higher costs, and increased frustration for customers. "Training is your best asset when it comes to repairing complex vehicle problems, no matter what system the problem is in," Forro said.

Minchew likes to know when upcoming changes to equipment will require a new tool so he can plan in advance. He added that technicians and the location's leadership have to buy in to any new tool. "A lot of times, training helps you get the buy-in," he said.

Love's utilizes both hands-on and computer-based training for new technicians and the continuing education of technicians across the Love's and Speedco networks. Daniels said technicians and mechanics can't overlook the basics.

And in this way, a shop's best tool to root out problems is, of course, the technician.

"No piece of diagnostic equipment will replace a quality visual inspection of components," Daniels concluded.

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**» Old Dominion relies on OEM engine software and diagnostic devices to troubleshoot engine issues, but the most valuable tool is still a well-trained tech.**

Old Dominion

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# TRUCKING'S FOUNTAIN OF YOUTH FOUND

How fleets can keep their assets on the asphalt several years longer than they've grown accustomed to.

By Gregg Wartgow

[ REPAIR & DIAGNOSTICS ]

According to its director of service operations, J. Ellis, the dealership Kenworth Northeast has seen an increase in vehicles coming in for major repairs like engine rebuilds and transmission replacements, especially from the vocational side.

"We've been seeing quite a few invoices well over $50,000 lately," Ellis revealed.

This isn't just happening at Kenworth Northeast, which is an independently-owned truck dealership with eight locations providing service in New York, Massachusetts, and Rhode Island. Fleets trying to hold on to aging assets seems to be a nationwide trend, according to the data.

An August 2022 study published by the American Transportation Research Institute (ATRI) found the average trade cycle on a tractor-tractor has increased to 8.7 years.

"There appear to be a couple of reasons for this," ATRI's SVP Dan Murray said. "First, equipment costs have gone through the roof in the past couple of years. Secondly, supply chain issues have made trucks and many components not only really expensive but oftentimes quite rare."

The high costs can still be preferable to current higher interest rates. These add to the ownership cost equation, particularly with smaller to mid-size fleets that typically don't purchase new equipment with cash.

"It's really a perfect storm right now," Murray said of the financial situation.

There's no telling when the economics will get easier, so for now, fleets have scrambled to turn back the clock, or odometer (hypothetically speaking), trying to squeeze out a few more years of reliable service. That's easier said than done, as there's no quick fix, no literal Fountain of Youth to douse your assets in. (Sorry for the misdirect.) But with plenty of sweat, a team of dedicated maintenance folks, a solid strategy, and proper execution, at least some of those hard miles will wash away. And you'll have a reliable asset until you're ready to sell.

## Time to ramp up the PMs

When developing a maintenance strategy for an older truck, the first thing to do is assess how well the vehicle has been taken care of earlier in its life.

"If the truck has been getting good preventative maintenance that's up to manufacturer recommendations, there might not be a whole lot that has to change," said Dan Nynas, COO of Diesel Laptops, a provider of diagnostic tools, repair information, and technician training.

That's a big if, though. Nynas said many fleets have grown accustomed to a four-year trade cycle before the pandemic. Given that, although it's never recommended, preventive maintenance often wasn't up to OEM recommendations because a fleet knew it would be getting rid of a truck before it started to show its wear and tear. If a fleet is now hanging on to trucks more than five years, it could all come back to bite them.

"It's quite possible things like overhead valve adjustments were skipped," Nynas said. "Sometimes fleets try to extend out drain intervals a bit too far, or maybe skimp on fuel filters. If a fleet now decides to stretch that trade cycle, these are the types of things they need to focus on

## Service hitlist for older trucks

Here's a quick hitlist of key service items a fleet will want to start looking at once a truck-tractor cruises past the 500,000-mile threshold.

- Inspect rubber seals on aftertreatment system composite connectors for water and corrosion intrusion
- Consider proactively replacing the DOC if the frequency of active regens increases dramatically
- Replace transmission fluid and filter per OEM recommendation
- Perform teardown inspection of rear axle wheel ends, paying close attention to bearing wear pattern and replacing wheel seals
- Replace oil on steer and rear axles
- Change power steering fluid and filter, paying close attention for signs of metal in the filter pleats which would necessitate further inspection
- Flush, drain, and refill extended-life coolant
- Inspect wiring harnesses and harness connectors for chafing
- Inspect drum brake cams and bushings for wear or damage. Look for signs of oil, transmission fluid, and coolant leaks
- Consider proactively replacing O-rings and seals in lubrication syste
- Consider starting an oil analysis program
- Inspect braking system hoses for cracks and damage, especially where plastic connectors are being used; simply replace when in doubt
- Inspect the entire air dryer and consider proactively replacing
- Consider replacing leaf springs, air bags, and rear suspension; first inspect mounting points and suspension spring components for cracks or missing spring stacks, inspect air bags for cracking rubber and chafing, and look for leaking airline connections and level valve binding
- Start planning for an engine rebuild around 750,000 miles or sooner if the vehicle has been operated in a harsh environment
- Inspect all clutch parts, paying attention to clutch free play and grab height to gauge lining wear

*Editor's Note: Always refer to your vehicle's owner's manual for specific maintenance interval recommendations based on age, hours, mileage, duty cycle, average idle time, fuel economy, etc.*


**» When developing a maintenance strategy for vehicles that are well past their normal trade cycle, the first step is to assess how well maintenance has been performed up until that point.**

Kenworth Northeast

getting right. These types of simple actions could help extend the life of things like fuel injectors and fuel pumps. But if these steps have been ignored for the first four years of service, the damage may have already been done."

So, then what?

Drivers and technicians should be on the lookout for even the smallest of oil leaks.

"Even something like a front cover that's starting to get wet must be reported," said Jeff Celantano, technical data manager at Diesel Laptops. "It might not create a problem right then and there, but it will likely turn into a problem when you least expect it. The same can be said for hydraulic oils and engine coolant."

Discoloration in the oil is another indication of real trouble.

"If they aren't doing it already, we always encourage our customers to start doing oil analysis once a vehicle is over 500,000 miles," Kenworth Northeast's Ellis said. "Even just doing it every other oil change or even once a year can be beneficial."

Tech training is also key. Oil samples must be captured midstream and properly labeled. The fleet also needs to partner with a good lab so analysis is reliable and consistent. "Oil sampling can be a great tool, but only if it is done correctly," Nynas said.

In addition to engine oil, it can be beneficial to take samples from the transmission and drive axles. "This can give fleets a good look at the health of the assembly, as well as what's going on in places that are not visible," said Anthony Balkonis, VP of services and warranty at Navistar.

More thorough electrical inspections also become essential as a vehicle ages, particularly vehicles that were somewhat neglected during their earlier years. Technicians should take a good look at wiring harnesses and harness connectors for things like chafing.

Paying special attention to the electrical system is even more important if the vehicle has been operated in a more punishing environment.

"If the unit was operated in Rust Belt areas, it is common to begin seeing the effects of climate and road conditions on the electrical system, primarily grounds," said Andrew Plant, manager of powertrain service engineering at Daimler Truck North America. "Maintaining a good electrical system, including batteries, cables, and grounds is critical to proper electronic engine controls."

## The half-million-mile hurdle

In addition to ramping up PMs, there's a good chance fleets will also start running into a new


batch of service items at half a million miles.

"Most OEMs have maintenance guidelines well beyond when the first owner normally keeps the truck," Balkonis said. "If a fleet has developed its own maintenance checklist based on a shorter lifecycle, it is important to update the inspection form to include the OEM's recommendations out to their extended lifecycle. Components they would not have needed to inspect when trading a truck at their prior lifecycle may now need to be serviced or replaced."

For instance, Balkonis said it's important to look at things like suspension bushings, A-cams, harnesses, and cable routing. S-cams and tubes are another overlooked area. "S-cams are rarely removed unless they are frozen. But as a vehicle ages, bushings can wear out. Catching that quickly helps keep the unit on the road and prevents a major brake assembly overhaul," Balkonis said.

Braking system inspections should also include a couple of additional steps.

"I'd be looking at brake hoses," Celentano said. "The plastic ones tend to dry out and sometimes split at the crimp."

O-rings are also at the top of the list, according to Nynas.

"Over time, after exposure to detergents in the oil, O-rings start to get hard and brittle and shrink," Nynas said. "You might start experiencing some leakage. But the bigger issues are inside the engine—things like oil pickup tubes and suction manifolds."

As Nynas explained, degraded O-rings start to allow air contamination in the lubrication system. That becomes a ticking time bomb in a vehicle with more than half a million miles on it. "This is what can lead to things like bearing failure," Nynas pointed out. "It's a good idea to simply replace the O-rings and seals in a lubrication system at this point."

Air dryers should also be thoroughly examined, and we're not just talking about the desiccant cartridge. The entire module should be inspected. An air dryer also has a valve and most have heaters. "These things are typically about shot by this point," Nynas said. "Simply getting them replaced is probably a good idea."

Turbocharger issues also tend to plague heavier-duty trucks—especially the ones that have quite a bit of time under their belts.

"Oil breaks down," said Josh Steinmetz, brand manager at Lubrication Specialties, a provider of oil, lubricants, and additives whose brand names include Hot Shot's Secret. "At the end of a long day, that oil is really hot. The bearings on a turbo are extremely hot. If you don't let that oil cool down and cycle through, it actually burns right onto the turbo bearings. That can cause a lot of issues over time. You might even see bearing failure."

In a case like this, a technician may need to rely on driver input because visual indicators

**"If a fleet has developed its own maintenance checklist based on a shorter lifecycle, it is important to update the inspection form to include the OEM's recommendations out to their extended lifecycle."**

Anthony Balkonis, VP of services and warranty at Navistar


**» It's important to make sure technicians have the training they need to perform the services necessary after 500,000 miles. Diesel Laptops provides both online and hands-on classroom training.**

Diesel Laptops


## Extended warranties for longer lifecycles

As the average lifecycle of truck-tractors has extended out to 8.7 years, truck suppliers have begun seeing more interest in an extra layer of protection and peace of mind.

"We are definitely seeing many more requests for information on extended warranties coming through our website these days," said Melinda McAuliff, director of marketing for Kenworth Northeast, a multi-location dealership serving New York, Massachusetts and Rhode Island.

"As the age of vehicles in the field extends beyond historic levels, there is risk that they will experience incrementally higher failure rates, including potentially more catastrophic failures," said Anthony Balkonis, vice president of services and warranty at Navistar. "Extended warranties eliminate spend risk and can provide predictable cash flows for the business, something that is important to both large and small fleets."

To address the issue of longer wait times for new vehicles over the past couple of years, Navistar has introduced a warranty bridge program to provide extended coverage for older vehicles awaiting replacement. "The program has been strongly embraced by our customers and is providing them with improved cash flow, security, and predictability," Balkonis said.

"In my opinion, if a fleet isn't purchasing an extended warranty these days, they aren't spending their money right," added J. Ellis, director of service operations for Kenworth Northeast. "If you don't have an extended warranty on the engine, but have a turbo failure, the turbo itself is $7,000. Then it's probably going to take out the aftertreatment, too, which will cost another $10,000 or so."

Ellis said a base vehicle extended warranty is a great investment because it covers essentially everything that might go wrong later in the truck's life.

won't be noticed, short of tearing down the entire turbo. "Ask drivers if they are experiencing any kind of loss of power or other issues," Steinmetz said. "If they are, that's a good time to start using some additives before the issues get any worse."

One option, Stiction Eliminator from Hot Shot's Secret, is a blend of synthetic cleaner and proprietary lubricant that can be used in oil systems. "Stiction Eliminator can help clean up that burnt varnish that tends to accumulate on a turbo bearing," Steinmetz explained. "It doesn't just clean it up, either. It also has our FR3 technology that helps fortify the oil, helping prevent it from burning so easily in the first place."

## Aftertreatment is not an afterthought

Turning our attention to the aftertreatment system, a fleet must remember that upstream issues have a downstream effect. If the DPF ever fails, the technician must determine the true cause.

"With older trucks, look closely at the service histories," said Dave Jerman, sales director for Roadwarrior Inc., a provider of aftermarket DPFs and other aftertreatment parts. "Has the turbo ever been replaced? Was there ever oil contamination? Have there been any EGR or coolant leaks? Have you had a bad seventh injector, which can cause hydrocarbon poisoning? Knowing the cause and effect is important in order to get a proper diagnosis and avoid throwing good money at a bad investment."

For instance, one of Jerman's fleet customers had replaced a failed DPF. They also cleaned the diesel oxidation catalyst (DOC), which is considered best practice. But with older vehicles, the DOC's coating may have deteriorated over time. The fleet performed a forced regen to test the temperature rise. Everything checked out OK. But according to Jerman, that gave a false sense of security because the test only shows if the DOC is dead on arrival.

"This truck continued seeing active regens far too often," Jerman said. "We found out the truck had a failed turbo in the past. That's a big red flag because a failed turbo creates a strong possibility of DOC contamination. The 20x increase in active regens the fleet was still experiencing was an indicator that the DOC needed to be replaced. Sure enough, the fleet replaced the DOC and the active regen cycle normalized, to a large degree."

One of the best and easiest things a fleet can do with older vehicles is to begin paying attention to regen cycles.

"When active regens start to take over, you might have a problem," Jerman said. "Look at the service history and establish a baseline for what is normal. The good thing is that the ECU will provide data on active regen events so you can establish an accurate baseline."

Fuel additives can be another useful tool from a preventative standpoint. Products like Hot Shot's Secret Everyday Diesel Treatment and Diesel Extreme include a cetane booster that helps burn fuel more completely.

» Example of a failed DPF caused by excessive soot buildup over time. When servicing older vehicles in particular, a technician should look for obvious signs of soot bypass (as shown) to know the DPF has failed and should be replaced. This is also a good time to consider replacing the DOC.

Roadwarrior

> **"When active regens start to take over, you might have a problem... Look at the service history and establish a baseline for what is normal. The good thing is that the ECU will provide data on active regen events so you can establish an accurate baseline."**
>
> Dave Jerman, sales director for Roadwarrior Inc.

"You end up with a lot less soot going through the system," Steinmetz said. "We have data that shows regens can be reduced by 50%, all while helping extend the life of the aftertreatment system."

## Stay ahead of the problem

After five years or 500,000 miles, fleets can also start thinking about the proactive replacement of certain components—before their eventual failure leads to more serious problems. Diesel Laptops' Nynas already touched on O-rings and air dryers. But there are other elements consider.

For instance, Kenworth Northeast's Ellis said technicians should inspect for bushings that appear dry-rotted or cracked. "You always want

to replace worn bushings before the damage gets through the bushing," Ellis said. "If that happens, then you're having to replace hard parts, which sometimes you can't even get these days."

Leaf springs, airbags, and rear suspension could also be replaced proactively. "You know these things aren't going to last forever anyway," Ellis said. "By replacing these types of components that help absorb shocks on the road, you'll allow your chassis and cab to last longer."

Fleets can also start thinking about predictive maintenance. Consider the year, make, and model of the vehicle. Determine which components have a history of failure at a certain point, perhaps a NOx or particulate sensor. It might be a good idea to begin replacing some of those items before they result in a breakdown.

Celantano is a big fan of predictive maintenance software that can identify patterns by looking across a vast population of similar vehicles. Short of that, a fleet can simply look at its own assets, taking note of when certain components needed to be replaced on other like vehicles.

Whatever the approach, predictive maintenance can also help fleets alleviate any potential parts availability issues when a component is unexpectedly needed. By planning ahead, a fleet could assemble its own inventory of needed items.

» In an era where fleets are hanging on to trucks longer, good maintenance technicians are as important as ever. Setting technicians up for success is key to keeping them happy, and that's key to keeping operating costs in check.

Navistar

## Rebuild your peace of mind

For fleets pushing their linehaul trucks beyond the five-year mark, another good preventative measure to consider is an engine rebuild.

"It is definitely a good idea to do an in-frame rebuild by around 750,000 miles, or maybe even do an out-of-frame and replace *all* the gaskets," Ellis said. "If you just wait to see if you'll have a failure, and then you have a failure, it's going to be far more expensive. You may end up causing damage to the block, crank, or camshaft."

Keep in mind that a rebuild may be necessary much sooner than 750,000 miles. Daimler's Plant said the need for an overhaul is dependent on the vehicle's application, as well as the level of preventive maintenance that has been adhered to throughout the vehicle's life. For a fleet that is past the 500,000-mile mark, it's time to start looking for clues that an overhaul could be needed.

"Indications can include oil consumption increases, fuel economy decreases, low power, and difficulty starting in colder weather," Plant said. "The decision for an overhaul shouldn't be based on a single factor."

The motivation for an overhaul, however, is based on one factor: getting reliable performance out of that truck. To that end, Plant said a fleet should thoroughly evaluate the vehicle's overall condition before investing in a rebuild. He's talking about things like the transmission, clutch, axles, suspension, and any specialized equipment.

If the decision is made to rebuild the engine, Plant offered one more piece of advice. "When an engine is rebuilt by a trained and qualified technician with OEM parts, the owner can expect an exceptional second life."

A fleet may also want to start thinking about proactive transmission and clutch service. Ellis said rebuilds are generally out of the question due to cost. But replacement could be a good investment if the fleet must continue relying on that truck.

» Once a truck-tractor blows past the 500,000-mile mark, brake system and wheel-end maintenance needs to intensify. Techs should start closely looking at things like air hoses, bushings, and seals that often succumb to wear and tear over time.

TravelCenters of America

"I would strongly consider going to an OEM replacement," Ellis said. "If you made it 750,000 miles with the same clutch, I wouldn't skimp on the replacement. Plus, replacing with new gives you another three- or four-year warranty."

Speaking of warranties, extended warranties can be another useful tool for fleets looking to get more life out of their linehaul trucks.

Of course, basic wear items like bushings aren't covered, which is why a big part of an older truck's "fountain of youth" strategy must always include thorough inspections and proactive, predictive, and preventative maintenance.

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# The post-pandemic parts plan

Even as the pandemic shrinks in the rear-view mirror, supply issues still plague the vehicle maintenance industry. Here are the parts lessons gleaned from the tough times to help stakeholders move forward.

By John Hitch

FleetPride

## [ SUPPLY & DEMAND ]

The last few years have been rough on the global supply chain, and there's no telling when the scars left by the COVID-19 pandemic will fully heal. But for the transportation sector, it doesn't really matter. Like a pack of great white sharks, if a fleet ceases movement, it risks death, or at least profitability. It's sink or swim, and even when necessary repair and replacement parts were not available, fleets' maintenance providers have to adapt or die.

This was all too common during the pandemic's peak and can still be an impediment today. There might not be a global shortage of semiconductor chips, but certain specialty items, such as add-on systems, are "not readily available, causing some downtime, but not as broad a scale," noted Rodney Gamble, GM and VP of parts sales and operations at FleetPride, an independent distributor of heavy-duty truck and trailer aftermarket parts.

Anything seems like an improvement over the the parts issues in 2021, when diesel particulate filters were marked up 100% or more on eBay. These components are still difficult to come by.

"Of course, the aftertreatment system continues to be the biggest challenge," Gamble said.

And it looks like the industry will have to collectively swim against the current for a while longer.

"I don't think it's completely eased; it's just slightly better for all of us," asserted Kent Jones, president of SAF-Holland (Americas), during the Heavy Duty Aftermarket Dialogue event in January. "At this point versus maybe a year ago, there are not 50 supply chain constraints causing problems, but there's still five—and those five were different a month ago, and they change and evolve into the next five. So there still are shortages and, in many cases, they are still very significant. But they're rotating and becoming a bit less."

Because of the lingering issues, and the ever-present potential of some new disruption (wars, natural disasters, social unrest, alien invasion), everyone will have to learn quickly what has worked and what hasn't as far as parts manufacturing and distribution during the pandemic, as well as how each link of the supply chain can make the others stronger. This will make the tough times easier to bear, and the easy times incredibly efficient and yes, more profitable.

### Shop lessons learned: 'Just keep trucking'

Because many of those deep cuts to the supply chain have taken longer to heal, a wider, more creative approach to parts procurement has become standard practice at plenty of shops.

This is the case across the industry, and in use every day at Kenworth of Richfield in Ohio, which stayed open throughout the pandemic and continues to operate 80 hours a week.

The dealership, part of the Hissong Group, also has a 22-bay all-makes shop that's always full of overflow from various fleets, such as the neighboring FedEx Freight terminal, as well as owner-operator business. The company runs six dealerships and three TRP Parts locations.

*Fleet Maintenance* visited the dealership in March to speak with the leadership team and the parts situation was top of mind. Management spoke specifically about their parts team's resourcefulness and fleets' willingness to compromise to get trucks back on the road.

When a radiator goes down and the warranty replacement would be eight months out, they would work to find an aftermarket replacement so the vehicle would generate revenue again. They also could turn to their FSX Equipment DPF cleaning machine as opposed to dealing with exploitative eBaymarkups.

Still, the Hissong team all concurred the supply chain interruptions remain one of—if not the most—critical issues.

"It has been very challenging," professed Denise Vargo, service director at Hissong's northern locations. "We still have parts issues these days."

For example, Bob Wilson, VP of northern operations, explained that getting DEF quality sensors has caused "a year's worth of problems," before Vargo chimed in: "It still is."

Currently, the big headache is right-hand stalk shifters for certain MY 2021-2022 transmissions.

"There's really no idea, no end in sight," Wilson said regarding the stalk shortage. "We don't know what's going on. It would be nice to have an idea of [the reason for] the shortage."

Yet the dealership knows, like the rest of the industry, slowing down is not an option.

"We're still waiting on parts, but the biggest thing is to just keep trucking," Vargo offered.

One of the tricks is to be a good neighbor to nearby logistics companies that dot the west side of where Interstates 77 and 271 collide.

"We've definitely had times where we called [our contact] at FedEx Freight for some parts—and he's definitely helped us out," Wilson noted. "So, if we were short on something, we call him up."

"Expand your personal network." That's a pro tip from the Kenworth dealer's shop service manager Joel Turenne.

"The biggest thing is networking with everybody, because they may be the most important person you've ever called," Turenne said. "Always keep their [phone] number. They may be your best friend next week. You just don't know."

Networking at events and tradeshows has paid off through COVID-19 and now.

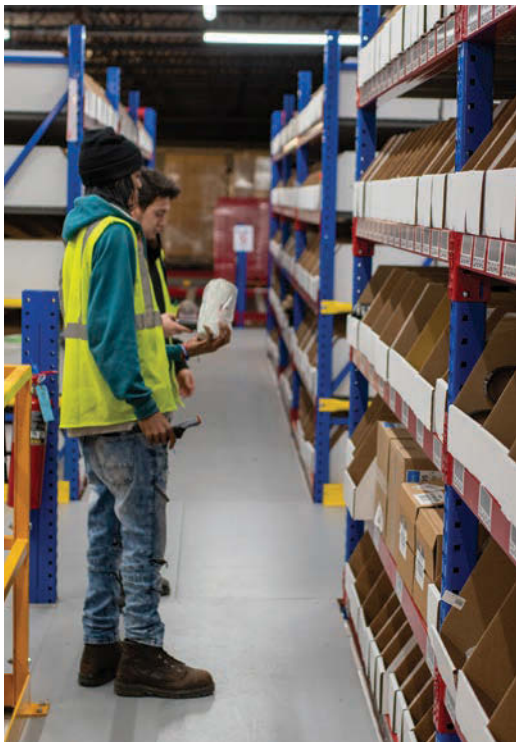
"We have repair facilities now that can fix some of these things that we're having problems getting," he said.

At Pitt Ohio, a carrier operating out of Pennsylvania and Ohio, sometimes turning to past strategies can also work.

"We went back to our old model from several years ago and started holding more parts in stock at our warehouse," said Jason Dolence, Pitt Ohio's manager of parts and warranty.

The fleet also buys up hard-to-source parts from vendor partners when they are in stock, he added. He noted cast parts and mirrors are still hard to come by.

"It has changed," Dolence pointed out. "We not only lean on our local vendors that supply our warehouse operations, but we have been sourcing parts from vendors outside shop locals and moving them throughout the network."



» Communication between suppliers, distributors, and fleets is crucial to ensuring parts distribution centers are well stocked and can replenish fleets' inventory.

FleetPride

» DPF cleaning machines alleviated Kenworth of Richmond's worries about finding replacement DPFs, which skyrocketed in price during the pandemic. The shop can also generate revenue by cleaning DPFs as a service.

FSX Equipment

## Parts hell: A retrospective

Before going further, let's recall how truly tumultuous the supply chain was just a few years ago.

Semiconductor shortages left newly built trucks dormant near their plants of origin, while a lack of raw materials due to widespread plant shutdowns in China (where the SARS-CoV-2 virus was first reported) kept relatively cheap parts from being made, and thus sidelined fleet assets. Furthermore, even when parts were manufactured and shipped across the Pacific, the port backlogs of 2021 kept containers from getting to shore.

"What we saw was just sporadic supply chain disruptions across a number of categories and raw materials," said FleetPride's Ken Clinchy, VP of digital e-commerce. "At times, it felt a little bit like whack-a-mole: As we fixed our supply chain on brake drums, now we've got plastic shortages—and you can't get filters. It was sort of one thing after another.

"Nobody was safe from that," he added. "And for fleets, it could mean missing a seal for a turbocharger, and they could have a truck down for six weeks. You're probably talking about a $40 to $50 piece that's holding a $125,000 truck in a shop, costing thousands of dollars a day to not be running."

Service managers became battlefield commanders, deciding how to get at least a few wounded trucks back in the fight. That often meant cannibalizing parts.

"They rob Peter to pay Paul to keep that truck going," Clinchy explained. "They would take a part from two or three trucks to keep one on the road. That happened quite frequently, and honestly, it even happened in some of our own shops."

While that was the extreme survival method, more often fleets and shops would just simply need to expand their network and use their smartphone to order parts via ecommerce sites, as opposed to calling their usual representative.

"We definitely saw an uptick in digital usage from our customers, and not just in traditional channels—they were using non-traditional vendors," FleetPride's Gamble said. "Just anybody who could get them the part."

This all ended up benefiting FleetPride, which launched its e-commerce site in October 2021, upgrading from a catalog format. The distributor now has more than 1 million parts and over 10 million cross-references. This is a 33% increase in parts and more than double the cross-references from July 2022. The site also recommends associated and alternative parts.

Overall, Clinchy said the company is "more agile" in helping fleets than before, "because we had to move so quickly during the pandemic to help our customers, and so it's a muscle we really built out as an organization."

Cummins-Meritor was already bulky in this department, with the Meritor Parts Xpress ecommerce site maturing since its 2017 inception and the Uptime Services Group ready to offer emergency parts assistance to fleets. This positioned the OEM and aftermarket supplier to mitigate various issues, such as labor availability.

"MeritorPartsXpress is transactionally agnostic to labor disruptions as customers may place orders, schedule returns, and manage their core eligibility electronically," explained Jason Soika, Cummins-Meritor GM of sales, N.A. aftermarket. "This provides a quick and effective solution for customers to order parts."

Soika added fleets also learned that inexpensive parts from non-traditional suppliers would pass muster for secondary-cyle trucks, but not when prices ballooned to compensate for shipping costs.

"The direct sourcing competitive advantage offered by these suppliers evaporated when logistical expenses accelerated to never-before-seen levels," Soika explained. "In many scenarios, buyers not only had to burden the inflated cost to import the products, but then had to navigate the domestic quagmire of port and transportation delays created by labor shortages."

## Distributor and supplier lessons learned: Growing and sharing

Some believe a crisis is a terrible thing to waste, and that's true if you fail to learn from it. And that's what the CV supply chain has been trying to do since the pandemic.

FleetPride learned that size matters, and has gobbled up parts businesses like a great white shark does chum, acquiring 27 smaller distributors since 2020. These locations widen FleetPride's parts distribution network, which includes 300 locations nationwide and five distribution centers, and are "another place for us to store some extra inventory," Gamble noted.

And according to Jim Pennig, VP of Business Development, VIPAR Heavy Duty, a healthy inventory from a mix of multiple suppliers for similar products was key to success during the pandemic.

"Those with proper inventory levels rode out the pandemic with record sales," he said.

He attributed this to an "increased level and detail of communication with our distributors, as well as with our supplier community supporting the VIPAR Heavy Duty network."

The e-commerce functionality has also expanded to include more administrative and user options for shop management, which aids in reporting, compliance, quotes, and reducing rogue spend, the company said.

In custom cases, FleetPride can even offer a form of predictive ordering.

"We also connect digitally with many of our customers who are able to let us know ahead of time that they're going to need this part on this date," Clinchy said. "And they've got the part on their shelf before the truck ever breaks down."

Gamble said fleets could help "forward deploy inventory" by informing their distributor of duty cycle, region, and where exactly the trucks will be domiciled.

The pandemic "forced" FleetPride to work closer with vendors, Gamble said. This includes sharing forecasts and data "with [FleetPride's] best and most strategic vendor partners that allowed them to ramp up production and helped them balance their cost better."

This has paid off, said OE partner Delco Remy.

"The resources being committed to providing holistic customer solutions in this digital environment is really incredible," said Nick Chelman, national accounts manager for Delco Remy. "We are doing our part to provide all Delco Remy product information to support our customers in the field through the FleetPride efforts."

In VIPAR's sphere, sharing info allowed for "a consistent and accurate gauge of product availability and other forces impacting the supply chain," so the network could respond appropriately, Pennig explained.

He stressed fleets should also develop a "B2B transactional relationship with a distributor [which] helps significantly with expediting parts availability and the order and delivery process."

True success all comes down to transparency, according to Brad Williamson, director of parts marketing and stratgey at Daimler Truck North America. He noted in a panel at HDAD that suppliers did end up sharing more information with the OEM during the pandemic, and were "more human with each" and "more transparent" about production issues. This included updating DTNA when too many workers were out sick to meet production goals.

"A lot of times before the pandemic, there was a little bit of keeping your guard up, and I really feel like a lot of our suppliers stepped up in being open," he said.

Williamson said sharing data and information is "a two-way street," and the OEM also has to communicate with suppliers.

He added the pandemic proved "ecommerce is here to stay." DTNA launched the Excelerator platform in 2020, succeeding Pinnacle Truck Parts. The site can search via VMRS codes, VIN, product name, or part number, and loops in inventory info from the entire Dealer Management System, including Alliance Parts DCs.

"We've got to get our dealers parts, so we can get our customers parts, so we can get trucks back on the road, and literally keep the world moving," Williamson said.

## Manufacturer lesson learned: Destination Mexico

America, and the rest of the world, found out the hard way that relying so much on exports from one country can lead to ruin when the steady flow of Chinese products simply stopped when the country locked down.

In December 2022, China ended its "zero COVID" policy. This relaxed stance led to 250 million COVID-19 infections in China during the first 20 days of that month, according to figures allegedly leaked from China's National Health Commission. The world's largest production base has roared back in manufacturing activity, but manufacturers' confidence in China has been shaken.

"China has been a difficult place to do business in the last three years or so, since COVID really changed some of the assumptions that we had about the globalization that was taking place in the previous decade or so," SAF's Jones said at HDAD. "We're reevaluating many supply positions that were single-sourced in China, coming to us in the U.S. and into our company in Europe. It was highly disruptive to the supply chain."

His co-panelist, Jeffery Porter, president and CEO of Velvac Inc., a maker of medium- and heavy-duty truck, bus, and RV parts, concurred.

"In the last four or five years we've been trying to move as much of our component supply back to North America as possible," Porter said, noting that geopolitical events have also added to the urgency.

Instead of looking east across the Pacific, the heavy-duty chassis component manufacturer has turned south of the border to Mexico.

Mexico already makes a substantial portion of North America's commercial trucks —half, according to SAF's Jones. This includes Freightliner, Kenworth, Navistar, and Peterbilt models. Nearshoring is also attractive as the United States-Mexico-Canada Agreement (USMCA) dictates that at least 75% of auto and truck parts automobiles be made in North America.

In March, SAF-Holland broke ground in Piedras Negras, located in Coahuila, Mexico, on a 158,000-sq.-ft. facility plant to manufacture fifth wheels and other components. That factory is expected to open in August.

"This investment allows us to better meet customer demand, delivering our fifth wheels more quickly to tractor manufacturers, dealers, and customers," Jones stated after the groundbreaking. "The additional manufacturing space not only enables us to serve our customers better but provides for future growth."

Nearshoring to Mexico has many benefits.

"When we're looking at key factors that influence where to put your production capacity—like availability and cost of labor, proximity to customers, proximity to supply base—I think all of those arrows point to Mexico as being a really good choice," Porter said.

Velvac's main plant is in Reynosa, Mexico, a border town due south of San Antonio, Texas.

"That's all allowed us to be more cost competitive; we're more responsive to our customers and have better control over quality at the same time," Porter said.

Rob Phillips, CEO of Phillips Industries and CEO and founder of Phillips Connect, the third panelist at that HDAD discussion, is one of the industry's biggest proponents of Mexican manufacturing.

"We're very bullish on Mexico: I'm a huge fan of the workers, the level of experience from the industry perspective," he said. "The college system is spectacular. So, we don't have labor issues—we have people that line up [for work]."

Phillips Industries already had been producing wire harnesses in Saltillo, Mexico, for over 15 years, and in March celebrated the grand opening of a new 500,000-sq.-ft. facility. In Q2 2023, Phillips expects to make about 20,000 truck parts—cables, air hoses, harnesses, lighting, and coils—per week for OEMs, up from 11,000. For the aftermarket, production will increase from 28,000 to 40,000 parts per week.

Some production lines moved from Santa Fe Springs, California, where finding workers has become a more difficult.

"It is very hard to get any employees to show up to work," noted Phillips at the grand opening in March. "If we lose anyone in California now, we can't get anyone back. The workforce challenges in California are real. We are not having those same issues in Mexico."

Phillips Connect is relocating its lines for trailer sensors and gateway devices to the company's original plant on the same campus.

Phillips also shifted manufacturing from China to Southeast Asia and Australia. "We set up in Vietnam to avoid some of the tariffs that are plaguing us from the China side," Phillips said. "But the reality is we're looking at nearshoring. Everything is about moving closer, reducing inventories, improving quality levels and cycle times."

With the supply chain moving in the right direction, the next time a global crisis happens, fleets should be able to focus more on trucks getting from Point A to B, and not out of the bay. Let's just hope that's not for a very long time.

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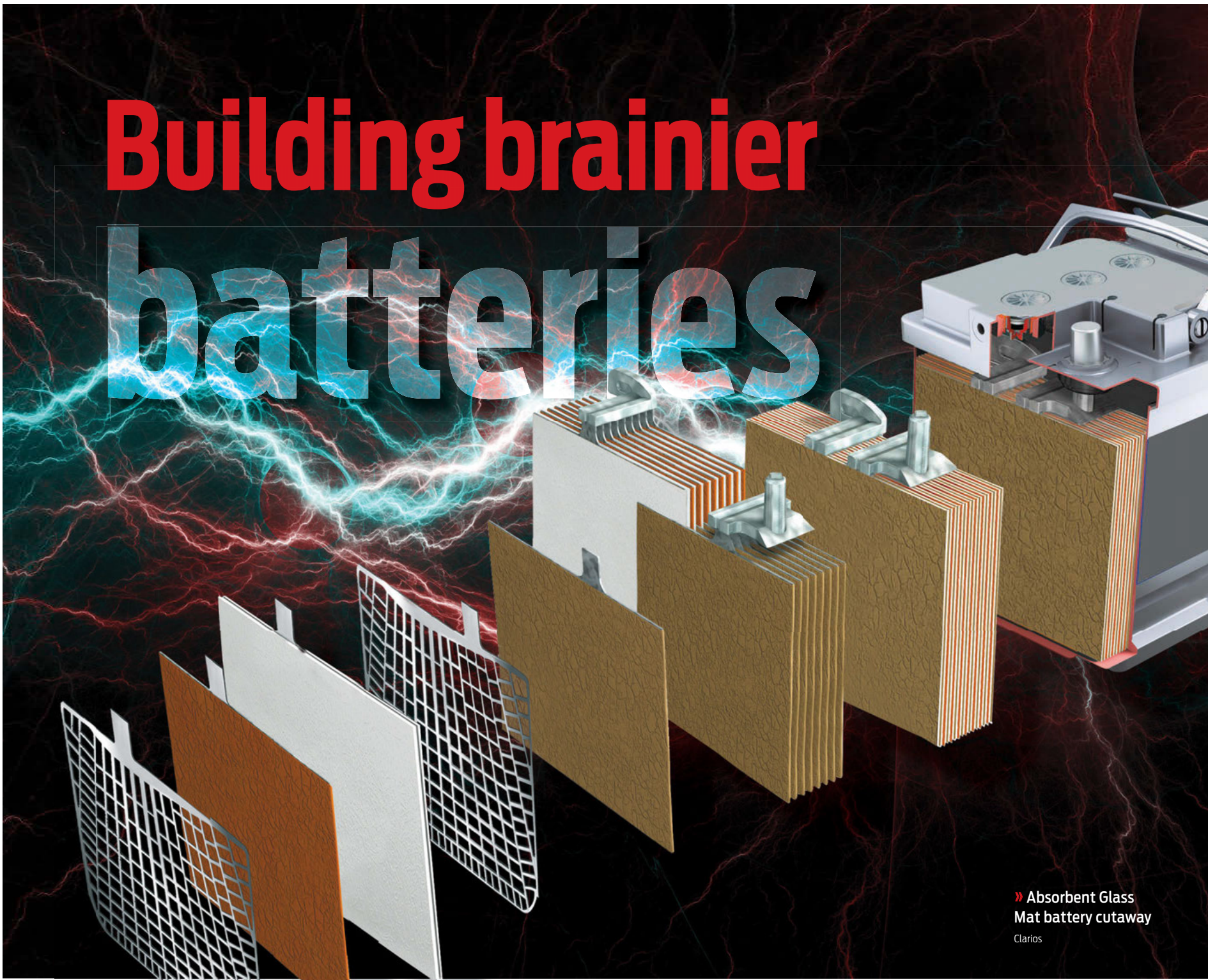
# Building brainier batteries



» Absorbent Glass Mat battery cutaway
Clarios

Battery systems have had to advance as commercial vehicles get smarter and rely more on electrical systems.

By Seth Skydel

Even for new technicians—or even amateur mechanics—the vehicle battery has been one of the easier components to troubleshoot and replace. Working with electrical systems should never be taken lightly, but if you follow the right steps, it's all pretty straightforward. But over the last several years the rest of the vehicle—particularly the systems that feed off the battery—have become more complex and smarter, with electric trucks here and autonomous ones not far off.

And because of this, batteries too must increase their IQ, and that effort is well underway at several leading battery manufacturers.

According to Craig Rigby, Clarios VP of technology, improving battery intelligence "is one of the next frontiers" and will enable more autonomy and optimize vehicles' electrical architecture "for the sake of reliability, performance, and cost."

And as vehicle safety evolves, Rigby noted the level and quality of power supplied by the battery is just as critical. Clarios is making its batteries more intelligent by improving internal sensing and how that is communicated to the vehicle.

This has been enabled by using Absorbent Glass Mat (AGM) technology as opposed to a standard lead-acid batteries. AGM batteries are more costly, but have several benefits, including lighter weight, more robustness, faster charging time, and the ability to better withstand lower temperatures. They do need to be completely charged or they will lose capacity over time.

"Truck AGM batteries are designed to deliver high cranking power, ensuring reliable starting in even the coldest of temperatures, and high capacity to support the increasing hotel requirements of today's trucks," explained John

Bania, Clarios managing director for heavy duty/non-automotive global CBU. "Clarios has also developed batteries with technology that enables them to recover quickly from deep discharges, providing uninterrupted power to the vehicle's electrical system."

Bania noted that Clarios has leveraged these benefits within the Smart AGM solution, which "allows fleet managers, technicians, and drivers to monitor battery health in real time."

As an active, real-time monitoring system, Smart AGM technology identifies weak cells that eventually drain battery life, provides a predictive assessment, and sends performance alerts to fleet management systems so fleets can proactively plan for replacement. Smart AGM batteries will enter limited production in 2023 and are currently being tested by fleets. They will be in full production in 2024.

The technology might also mean the end of dead batteries, as the new communication gives the system "the ability to predict when a replacement needs to be made before a roadside failure reduces downtime," Bania explained.

Clarios is one of many battery OEs boosting batteries' brain power.

"Battery intelligence is something we are working hard on integrating," said Bryce Gregory, systems product manager for transportation and specialty at EnerSys, which produces Odyssey batteries. "Our Odyssey Connect solution helps identify problems with batteries and battery packs on trucks to help solve problems before the vehicle goes back out on the road. We're also working on making this solution more dynamic, predictive, and easier to use to help reduce the opportunity for field failures."

This is exactly what fleets have been asking for.

"We're seeing customers expect more than just plain batteries; they expect smart batteries that can operate in a system and provide optimum performance and reliability," said Landon Self, director, of administration, ZeroRPM at Mission Critical Electronics.

MCE owns power solutions provider Xantrex, a company which produces the Freedom eGEN lithium-ion battery-based power system, and has focused on new ways to optimize electrical system controls.

"Xantrex / ZeroRPM APU batteries are intelligent systems that can control other components on a vehicle like the alternator for optimum charging; an inverter, for powering tools and equipment; a solar controller for charging without shore power or the engine running, and vehicle interfacing for safety and performance."

## Advanced solutions for more complex trucks

"As commercial trucks become more advanced and the shift toward electric and autonomous vehicles accelerates, we are continuing the development of advanced low voltage energy storage solutions to support those changes," Bania said. "And for non-Smart AGM batteries, we are working on sensor-based solutions to identity battery-related issues in the field and assist technicians in their assessments."

Non-spillable AGM batteries, manufactured with Thin Plate Pure Lead (TPPL) technology, are purpose-built for fleet use, noted Bryce Gregory.

"Odyssey batteries provide great cranking power, even on the coldest of days, and the ability to recover from deep discharges and cycle many hundreds of times," he said. "These batteries also feature refined application battery chemistry for fleet applications, as well as work in new applications like auxiliary energy storage for safety-critical applications in autonomous and electric vehicles."

Interstate Batteries, a provider of commercial batteries, offers products for several vehicle applications. The manufacturer's AGM batteries provide high cranking and extreme deep-cycle power needed in modern heavy-duty trucks. The 2-in-1 pure lead AGM technology, according to the company, delivers a service life three times longer than conventional flooded batteries and twice as long as alloyed lead AGM batteries.

Interstate also offers starting batteries with a range of low to high cranking power such as the company's Group 31 batteries, which can produce more than 300 medium-duty cycles. Additionally, the company makes high-cycling batteries for moderate cranking needs and power for liftgates, lights, APUs, and other cab and sleeper accessories, including 520-cycle Group 31 models.

MCE's Self pointed out that moving from lead-acid or AGM to lithium-ion batteries offers an immediate upgrade in energy density and provides for reduced size and weight.

"Our Xantrex LiFeMnPO4, which is what we call our lithium-iron battery chemistry, is inherently safe and offers electromechanical protection by automatically disconnecting if a cell voltage or temperature exceeds specified operating limits," he related. "Each battery also has a valve to help prevent an explosion in case of puncture."

Lithium-ion batteries offer nearly double the usable energy capacity of other battery technologies like lead-acid and AGM as they have a deeper depth of discharge, Self said. For example, AGM and flooded lead-acid batteries offer a 50% depth of discharge and Li-Ion batteries offer an 80% depth of discharge. These batteries can also be completely discharged without damage, so a 600-amp hour lithium battery provides a full 600-amp hours of usable power.

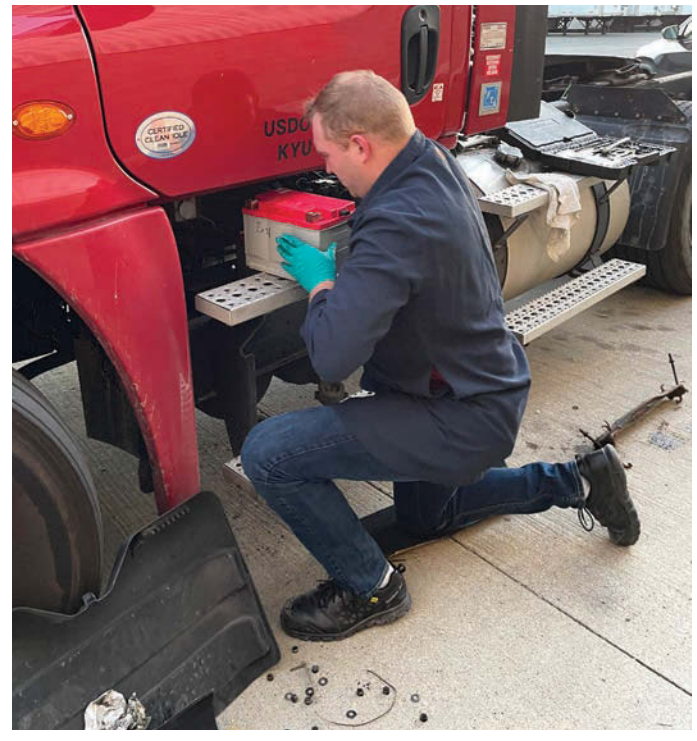
You might assume more capacity means more bulk, Self also noted, but the opposite is true. As one of the world's lightest metal, lithium boasts a 60% to 80% weight advantage over lead. A typical Group 31 battery weighs about 75 lbs. while a similar Li-Ion battery only weighs 28 lbs.


» Xantrex 12V 410Ah Lithium-Ion Battery

Xantrex


» ODYSSEY Battery's ODX-AGM31, formerly 31-PC2150

Odyssey Battery



» Clarios is improving its batteries' internal sensing and communication, increasing reliability.

Clarios

"For common applications and use there is more traction for AGM batteries among fleets, and there are more options on the market," said Larry Rambeaux, sales application engineer at Purkeys, a Mission Critical Electronics Brand. "At the same time, lithium chemistry batteries are gaining interest in the heavy-duty market. The technology is used in everything from rechargeable hand tools to electric vehicles, so it's only natural that interest is growing. However, lithium-ion batteries are not a drop-in solution. Many things will have to change with the vehicle to make the technology work."


» A Vanair technician addresses battery issues in cold weather.

Vanair

## Dead and drained batteries

A growing number of fleets are now utilizing supercapacitors. The modules can replace starting batteries or be used alongside existing batteries for powering hotel loads. Now available to fleets in the U.S. and Canada through C8 Energy is the SkelStart Engine Start Module from Skeleton Technologies.

"The supercapacitor is designed to take on the duties of engine starting and is engineered to fit in a similar dimensional envelope as a standard commercial vehicle battery," said Jean Labrie, CEO of C8 Energy. "Replacing starter batteries with supercapacitors makes sense because it cuts down on roadside service calls, cold start problems, improves driver comfort, and with a lifespan of up to one million cycles they can theoretically outlast the vehicles."


» Clarios is constantly reevaluating their products for improvement and monitoring real-time use.

Clarios

The SkelStart Engine Start Module is designed to crank a 27-liter engine with supercapacitor technology that delivers 2,000 cold-cranking amps. It also delivers that same starting power whether the ambient temperature is as low as -40 degrees F (-40 degrees C) or as high as 149 degrees F (65 degrees C).

"A supercapacitor is not hindered by temperature, nor is its performance impacted by extremes of cold or heat," said Labrie. "One SkelStart can put out three times the amperage of an average lead-acid battery, and the high amperage means less system-wide exposure to the low voltage associated with depleted lead-acid batteries. Low voltage delivered by a struggling lead-acid battery can also cause higher resistance on the battery cables, which can result in starter burnouts."

Also using supercapacitors for starting and charging 12- and 24-volt batteries on heavy-duty vehicles and a range of equipment during service calls is the Cap•Start line from Vanair featuring VSC (Vanair Super Capacitor) technology. Included in the product line are the Vanair Cap•Start 3000-Light Plus Air Compressor and Cap•Start 3000 Hydraulic Driven machines.

Cap•Start models, in conjunction with a 250-amp alternator, provide 3,000 amps of engine-starting capability. The fast-recharging VSC system can be ready to jumpstart another vehicle or piece of equipment in seconds. The units also feature user-friendly controls and a digital display for reading diagnostics, as well as a weather-protected enclosure, reverse polarity protection, and open, closed, or low circuit safety.

## The need for good data and skilled techs

Regardless of the technology being used to start and power vehicles, the battery manufacturers said that good data and skilled technicians can be some of the best facilitators of fleet and industry-wide improvements.

"Correctly identified root causes and the documentation of them can lead to improved battery designs, as well as better checklists and procedures," Gregory said. "At Odyssey we work with OEMs and fleets to provide critical on-site investigations for understanding root causes of common issues and turning those findings into training and improvements with a strong emphasis on corrective action."

Bania noted Clarios has an extensive benchmarking and analysis program that helps understand areas needing improvement for next-generation products. "On a regular basis we bring in and tear down our products, as well as competitive products," he explained further. "We also couple this with our data collection activities where we monitor various vehicles in real-time to better understand application drive and duty profiles. Fleets partner with us on these activities and help with access to both batteries for teardown and data collection."

"Failure analysis is key for developing new protections and features in battery packs to respond to market demands and improve product reliability," MCE's Self said. "We welcome feedback from customers as a part of our product development process. To have the most intelligent batteries, we must consider many use cases across many applications and how our batteries will perform, and often our customers provide insights that are impossible to identify in a lab."

Like anything else, Purkey's Rambeaux noted, you can learn a lot from failed products and batteries are no different. "Tests can very easily tell if batteries have been over cycled, subjected to higher heat environments, have seen high vibration during their service life, or extended periods of time in a discharged condition," he said. "All of these can help battery manufacturers improve their batteries for an application or recommend a different product.

"As new technology comes into the industry there will also be a lot of opportunities for shop equipment to be developed to be able to properly charge and test these new types of batteries and high voltage battery packs," Rambeaux added. "Across the industry, basic training is still required and management needs to make sure shop policies and procedures are followed.

"Batteries have changed in many ways and have become better, but in the heavy-duty market no battery is truly maintenance-free," Rambeaux added. "Technicians still need to know how to properly inspect, clean and test batteries."

Battery service technicians will need basic and advanced tools as well, Self pointed out. Included are computers with CAN (Controller Area Network) connectivity, diagnostic tools, standard multi-meters for checking voltage and current on a vehicle, and common hand tools. "Technicians will also need specialized training on low-voltage, high-capacity DC circuits and an understanding of safety parameters used by battery management systems from various manufacturers," he added.

For EnerSys' Gregory, equipment designed for higher voltage and technicians who understand higher voltage, electric motors, energy conversion, safety, and all related PPE and tools will be important in the years and decades ahead.

Examples he noted include improved electrical training for a better understanding of voltage drop and how to correct it, the signs of bad connections, how a variety of sensors work, and how to identify problems with repair connectors for communications and sensor systems.

In addition, fleets must learn how to get and use the data collected on or by these systems. And once the data is available, it's important to identify the environmental effects that the information is communicating may have on the batteries, like low or high voltage, low or high current, temperatures, and daily drive cycles.

"These tools and this understanding will be important to fleets and technicians as we move into the future," Gregory stated. "Batteries are chemistry-driven devices and respond to environmental and duty cycle changes. What can be started on today is gaining knowledge of what is good for batteries and what isn't."

# DECODING the disc vs. drum brake debate

» Disc brake

Bendix

» Drum brake

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Brake experts discuss the maintenance differences between drums and ADBs and lifecycle advantages of each. Plus, how to visually identify wear and damage.

By Gregg Wartgow

Though a decade ago it was far from the case, nowadays, the likelihood for a technician to work on a newer truck with air disc brakes (ADBs) is about the same as one with drum brakes.

"Almost half of the builds for new equipment are for disc brakes today," noted Mark Holley, director of marketing and customer solutions for wheel ends at Bendix Commercial Vehicle Systems. "With new trailers, it's about 20%."

Both types can provide some value to fleets, and when evaluating whether a drum or disc brake is the better overall fit, fleets should consider the benefits relative to the application they will be placed in. The total cost of ownership, including the maintenance and service, also factors into a brake's longer-term ROI.

To help you calculate which is more suitable for your duty cycles and assets, we talked to leading brake experts about how service is done on each and what to look out for.

## Service time is money

ADBs and drums have a few things in common, of course. Primarily, they both arrest vehicle movement, which takes a toll each time it happens.

"Friction and rotors will wear, as will friction and drums," said Kevin Pfost, wheel end product specialist at Bendix.

But to discern the amount of wear, technicians must go about this in different ways.

"Visually and with a tool, a technician can measure friction and drum thickness," Pfost said. "With a disc brake, we have a tool to measure rotor thickness. A technician can also measure the percentage of friction. So comparatively, disc brakes and drum brakes are the same in terms of visual inspections."

The difference presents itself when the time comes to actually service the brakes.

Changing ADB pads takes roughly half the time of drum brakes, according to Joe Kay, director of engineering for Cummins-Meritor, a global power technology company whose products include disc and s-cam drum brakes.

Drum brakes not only require additional time, but oftentimes more effort.

"With disc brakes, you don't have to pull off a heavy drum in order to change the friction," Pfost explained. "With disc brakes, you're only pulling wheels off."

Furthermore, with a drum brake system, the technician is nowhere near done after removing the drum. There are brake shoes to deal with, which Pfost said can be a challenge in their own right. After that, the cam head should be cleaned up and inspected for wear or damage.

"You should really use a dial indicator to measure bushing wear on the cam head," Pfost

**"If a drum brake job isn't done properly, you can run into issues like adjustment issues and hang-ups later in the brake's life."**

Kevin Pfost, wheel end product specialist, Bendix

» Thin friction in the middle of the shoe indicates uneven pad wear, which could be caused by a variety of factors, including debris buildup or damage on the drum's surface. Replace the shoes and examine the drum for any damage.

Bendix

added. "If it's out of spec, there is even more to do. You might have to pull the slack adjuster off, pull the cams and bushings out and put new bushings back in. You might find that the clevis pin is seized into the slack adjuster. Now you have to spend time working that out. You don't have to do any of this on a disc brake because everything is internal."

To service a disc brake, the friction removal process simply involves a spring clip, pin, and pad-retaining bar. Then you just pull out the worn pads. Next, push the caliper all the way inward, inspect the guide pin boots to make sure they aren't torn, ensure that the caliper can slide freely, and inspect the boots on the tappets (pistons) in the caliper. If everything checks out OK, clean the carrier, measure rotor thickness to ensure it is within spec, and drop the new pads in.

"A technician can typically do all of that within 15 minutes per wheel end," Pfost said, adding that a thorough drum brake inspection can push upwards of an hour.

"There will always be a technician who says they can change out brake shoes in 10 minutes," Pfost continued. "They probably can, but they haven't done any measuring. If a drum brake job isn't done properly, you can run into problems like adjustment issues and hang-ups later in the brake's life."

There are also more moving parts with a drum brake. Plus, those parts are exposed to the elements, which increases the opportunities for contamination and damage.

"With a disc brake, you just have a caliper, rotor, and hub," Pfost said.

One potential issue with a disc brake is if the rotor becomes damaged. Pfost said replacing a rotor is more time-consuming than replacing a drum. The caliper carrier assembly must be removed, followed by the hub and rotor. The standard repair time is around 100 minutes.

"Premature failures will always have an adverse impact to any ROI," Pfost said. "But over the long-term, a rotor's life expectancy is longer than that of a drum, helping reduce the total cost of ownership. Fleets could use our Bendix ADB Value Calculator (valuebybendix.com) to see the directional difference."

## Tips to maximize lifecycle ROI

The best thing a fleet can do to maximize lifecycle ROI on their brakes is to stay on top of wear. This is especially the case with disc brakes where the ROI proposition hinges a lot on preserving the rotor.

According to Pfost, rotors are designed to last at least several hundred thousand miles in on-highway applications with properly scheduled maintenance.

"Inspection for premature pad and rotor wear and early detection of conditions such as cracking or discoloring are vital to ensuring the life of the rotor," Pfost said. "Drums get changed with every friction/shoe replacement."

He added genuine Bendix pads and rotors can provide "at least two or three pad lives per rotor."

When inspecting the rotor, a technician should look for rust or corrosion which may indicate that the brake isn't functioning properly. "Damage such as a rough surface or gouge on the rotor braking surface may indicate that the pad is fully worn and the metal back plate is contacting the rotor," Cummins-Meritor's Kay said.

With respect to pad wear, brake manufacturers are giving technicians some assistance. For instance, Cummins-Meritor's EX+ air disc brakes feature a visual wear indicator that allows for easy wheels-on pad wear inspection.

Bendix offers pad-wear sensing technology for their disc brakes. End-of-life alerts are issued at 3.5mm, helping technicians schedule service before the friction wears out and the backing plates destroy the rotor. "Now we're improving this technology through continuous-wear sensing that identifies the percentage of friction left, communicating in real-time through the vehicle's telematics system," Holley said.

When maintaining disc brakes, technicians should also keep an eye on the caliper. The caliper should move freely, about 1mm, when braking occurs.

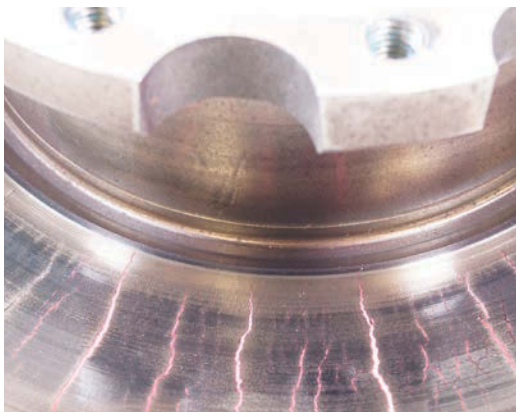
"A technician can check this by grasping the caliper and moving it axially with the parking brake off," Kay explained. "No movement may indicate that the caliper may have an issue and should be inspected further. Excessive movement in the axial direction may indicate that the internal adjuster is not keeping up with pad wear and should be inspected further. Excessive up and down movement may indicate slide pin or bushing wear."

Another thing fleets can do is consider the environment a given vehicle is operating in.

"Working in wet, corrosive, or dirty environments will wear brakes faster," Kay said. "A fleet maintenance department must keep good records and adjust to any changes as they happen."

Adjusting to changes is really what maximizing brake lifecycle ROI is all about. Staying ahead of friction wear helps preserve other vital components. So, one of the questions a fleet must ask itself is, how much time and money will it cost to stay ahead?

» Guide pin and tappet (piston) boots are a simple and inexpensive, yet crucial component to protecting a disc brake. Boots help keep dirt, moisture, and other contaminants from reaching other vital components. Shown here are torn tappet boots that should be replaced.
Bendix



» Cracks extending from one edge of the rotor to the other are not acceptable. Rotor must be replaced.
Bendix

» "Hot spotting" or "leopard spotting" on the drum is an indicator of friction that's improperly rated for the vehicle. Replace with a properly rated friction.
Bendix

» Very minor damage at a brake pad's edge may be acceptable, but major damage to the pad's surface (as shown here) requires the pad to be replaced.
Bendix

# TMC 2023 looks ahead

## 2023's theme focused on root-cause analysis and sustainability

By Jason McDaniel

The Technology and Maintenance Council's 2023 Annual Meeting at the Orange County Convention Center in Orlando focused on advancing reliability through root-cause analysis, something outgoing TMC general chairman Randy Obermeyer, VP of safety and maintenance at Online Transport, said he's obsessed with using as a problem-solving tool. By better understanding an issue, he can develop countermeasures on the safety side of the business, reducing breakdowns and helping eliminate waste on the vehicle-maintenance side, he said. That's why he was excited about TMC's four technical sessions and eight study groups, designed to help fleets deep dive into a range of maintenance topics, from future powertrains and electric vehicle battery safety to recruiting and retainin technicians. And he wasn't the only passionate transportation professional in the Sunshine State. Incoming TMC general chairman Todd Cotier, director of maintenance at Bison Transport, reported 4,433 people in attendance on Day 1. More than 700 fleets were represented, and the meeting included 1,783 associates, 20 educators, 119 service providers, 44 staff members, and 1,733 exhibitor-only attendees. TMC members spent more than 12,000 hours in 110 task force meetings on the first day of the four-day meeting. TMC 2023 also featured addresses by American Trucking Associations' Chris Spear , president and CEO, and Dan Horvath, VP of safety policy; numerous award presentations, Fleet Talk and Shop Talk, and a Ride & Drive.

# Fullbay releases 2023 State of Heavy-Duty Repair Report

## Fullbay's third annual State of Heavy-Duty Repair report includes trends in technician compensation and the ongoing parts shortage.

By Alex Keenan

Heavy-duty shop revenue is climbing back to pre-pandemic levels, according to Fullbay's third annual State of Heavy-Duty Repair Report. And for Fullbay CEO Patrick McKittrick, that means shops should also be increasing their technician pay.

McKittrick unveiled the key findings of Fullbay's third annual State of Heavy-Duty Repair report to representatives of the press the day before TMC's Annual Meeting officially began, giving him time to dive into the full depth of the data the study utilized. Fullbay collected data from 1,600 respondents and 500 participating Fullbay shops who used the platform over a 12-month period.

According to the report, a 19% revenue increase reported by shops created an average of $12,150 more monthly revenue in 2022 than the year before. In addition, 25% of shops surveyed were pulling in between $1 to $2 million each year, while 17% reported revenue between $250,001 and $500,000. One possible revenue driver for shops is that fleets have had to hold on to older equipment longer, driving up their maintenance costs, McKittrick noted.

"While the year-over-year growth looks to have slowed down, the reality is that 2021's rebound from the pandemic likely inflated those figures. Overall, growth continues to look strong," said Jacob Findlay, Fullbay co-founder and executive chairman, in the report.

Fullbay's report found that 75% of shops increased their labor rates in 2022, which, in turn, trickled down to an average hourly labor rate of $118 in North America and a corresponding increase in average invoice rates, which were roughly $965 across the country.

This increase in business could partially be due to the increased digital presence of shops. Overall, Fullbay reported that 89% of shops have a website, and 25% of shops with websites receive 11 to 15 leads from their digital efforts monthly.

"I was personally a little surprised that only 89% of the shops that we talked to indicated that they have a website," McKittrick admitted. "We're going to continue to see that number go up to eventually reach 100%."

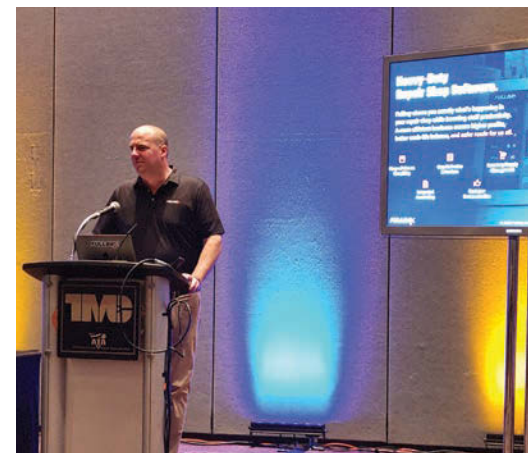
With shops beginning to reach pre-pandemic levels of profitability again with the help of their online presence, Fullbay reported that technicians at large have begun to see a shift in the way they're paid and how much they receive.

### Technician pay

McKittrick reported 46% of shops still pay their technicians an hourly rate, with the highest-paid techs typically residing in the Southwest at $46 per hour and the lowest-paid in the Midwest at $35 per hour. But that statistic is set to change as per-job pay is on the rise for technicians.

"There's very definitive time guidelines for how long a specific job should take," McKittrick explained. "And more and more shops are willing to bill that exact amount of time, regardless of the exact amount of time it takes a technician to do that job.... That kind of flat-rate, per-job compensation is going to continue to grow, in our opinion."

When it comes to figuring out how labor rates impact technician pay, Fullbay found that for the shops that did not raise their labor rates, more than half of them also did not raise the hourly rates of their technicians. Of the shops that did raise their rates, 8% of them reported they did not bump the hourly rates of their technicians. The good news is that a majority did: 92% of shops that increased their labor rates increased tech pay, and 40% of those who did not increase their labor rates increased tech pay as well.



» Fullbay CEO Patrick McKittrick released the company's latest State of Heavy-Duty Repair report at TMC's 2022 Annual Meeting.

Alex Keenan | Fleet Maintenance

"You would think that if I'm going to pay my technicians more, I need to raise my hourly rate," McKittrick said. "But I think you still have shop owners who feel bad about [raising labor rates and] just don't feel like you're in a position to be able to raise their labor rates to their customers. It certainly needs to be done, every single thing is getting more expensive. And it's okay for shop owners to raise their labor."

Speaking of items getting more expensive, while Fullbay's report showed that the parts shortage is starting to ebb, an increasing number of shops have been seeking alternate vendors. 14% of respondents described the parts shortage as causing large-scale disruptions for their operations, down 3% from 2021.

"People started getting more and more creative at seeking alternatives, whether it be online alternatives or local alternatives [so] they can actually get that part," McKittrick explained.

# Yokohama targets application-specific design with regional-haul trailer tire

The tire manufacturer unveiled a new trailer tire that highlights ultra wide-base retreadability and emerging trends.

By Jason McDaniel

Yokohama Tire isn't trying to fit round pegs into square holes.

Instead, the manufacturer is expanding its range of application-specific commercial tires designed to maximize fleet performance, rolling out the 114R regional-haul trailer tire during TMC's spring meeting.

The new wear-resistant trailer tire features cut- and chip-resistant compounds, rounded shoulder ribs, and funnel-shaped step grooves that eject debris, helping protect retreadability—a key value proposition for all Yokohama's tires.

"Coming off the success we had with the 114 ultra wide-base (UWB) regional tire, we wanted to create a regional tire for standard-size customers," said Tom Clauer, Yokohama's commercial product planning manager. "So, we designed this tire with a rounded outside shoulder rib that's bolstered by the compound we use in it, so it can take that lateral slide."

Yokohama also highlighted two recently introduced tires during TMC's meeting, the 716U UWB and 121T—both launched in 2022—and the retreadability of its tires, and discussed recent trends impacting tire maintenance.

The 716U UWB drive tire is tailored for waste-hauling operations. "Bulk haulers are one of our biggest customer bases, especially fuel haulers," Clauer said. "They've been into ultra wide-base tires from the beginning, because they can load extra fuel on their trailers—and more payload means extra money."

Fleets can save up to 800 lb. by replacing eight duals with four 716Us, Clauer said, increasing payload capacity and helping them compensate for heavier battery-electric vehicles. The new 121T trailer tire, also launched last year, is targeted at drop-deck and heavy-haul trailer applications. The regional-haul tire features an increased speed rating, up to 68 mph, rigid shoulders, and severe-snow traction.

In addition to their weight-saving potential, Clauer credits the success of Yokohama's ultra wide-base tires to their superior retreadability.

"These tires all have four steel belts, along with our zero-degree belt, so basically, we've got five steel belts on these tires," Clauer said. "Do our tires weigh a little bit more? Yes, they do. But we can retread them over and over, and over again because durability is built in."

» Groendyke Transport specs Yokohama's 902L ultra wide-base tires in the drive position on new Kenworth tractors.

Jason McDaniel | Bulk Transporter

Instead of buying a new tire for $500, fleets can retread them for $200, and further extend tire life by moving them after each retread, from steer to drive, and drive to trailer.

All Yokohama's UWBs come with six-year, three-retread warranties.

The growth of automatic tire inflation systems (ATIS) further promote retreadability, and last-mile delivery tires are on the rise. But the key trend now is the proliferation of electric vehicles.

"That's the major issue right now," Clauer concluded. "These trucks are very heavy."

# Goodyear rolls out EV-compatible ultra-low rolling resistance drive tire

The RangeMax RSD EV provides fleets an efficient option for electric or conventional regional vehicles.

By Fleet Maintenance staff

Even as fleets transition to electric vehicles, they will still have plenty of traditional vehicles, which is why Goodyear Tire & Rubber's newly released RangeMax RSD EV drive tire is compatible with electric and gas- and diesel-powered regional trucks. The tire, available now in size 295/75R22.5, was revealed during TMC 2023's press conference junket and was later displayed on the exhibit hall floor alongside Goodyear's other offerings.

According to the company, the versatile, ultra-low rolling resistance tire is the company's "best regional drive tire for energy efficiency" and "equipped to handle the higher load capacities of EVs." During testing, the tire demonstrated better rolling resistance versus two comparable competitors.

By utilizing Goodyear's TreadLock Technology, the tire will wear more evenly during that time. The RangeMax's enhanced tread pattern can also handle the high torque an EV motor can generate while also helping promote more even wear, which is a benefit for any regional truck, as their duty cycles typically make more turns and stops than long-haul trucks.


» Goodyear RangeMax ESD EV tire for electric-, diesel-, and gas-powered vehicles in the regional segment.

Alex Keenan | Fleet Maintenance

The casing construction provides more toughness and durability. The casing can be retread, according to Goodyear, but there is no matching retread for the RangeMAX as of yet.

"The new RangeMax RSDEV strives to live up to its name and deliver the superior range and confidence that comes with ultra-low rolling resistance," said Tom Lippello, senior director, Commercial Marketing, Goodyear North America. "With the continued growth we're observing in the regional EV segment, changing power trains and fleets' cost-savings and sustainability priorities, Goodyear recognized an opportunity to provide fleets and original equipment manufacturers with a tire designed for the unique needs of these vehicles."

The tire is also the first regional drive tire embossed with Goodyear's "Electric Drive Ready" designation.

» Mitchell 1 updated TruckSeries' Advanced Interactive Wiring Diagrams to follow a wire throughout a system.
Mitchell 1

# Mitchell 1 TruckSeries gets TMC RPs and more user-friendly wiring diagrams

Technicians can now access the industry's recommended practices via the software tool, which also got an upgrade to how users access wiring diagrams.

By John Hitch

Members of the American Trucking Associations' Technology & Maintenance Council (TMC) have spent countless hours over more than six decades deciding what guidance and instructions should make it into TMC's 500+ Recommended Practices, and now, that trove of maintenance knowledge is at any Mitchell 1 TruckSeries' user's fingertips.

TruckSeries is a web-based diagnostic and repair program that allows technicians to access information while working on commercial vehicles, and through Mitchell 1's licensing agreement with TMC, the entire 2022-2023 Recommended Practices Manual, which includes instructions on every facet of commercial vehicle maintenance, is now accessible via the software.

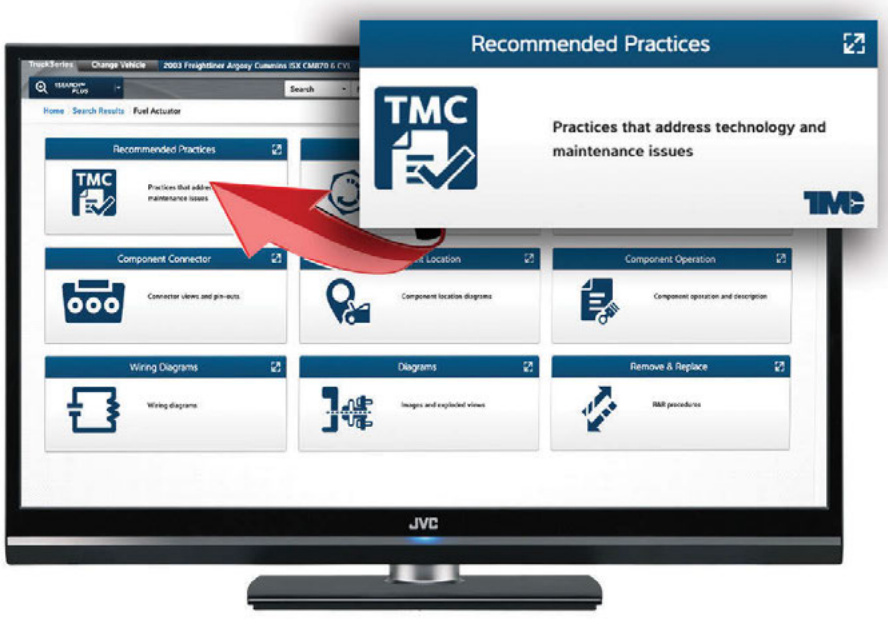
The RPs are already available via a webviewer, but Mitchell 1 has made finding the right technical information easier now that the RPs are on the TruckSeries browser, via the program's 1Search Plus card-based format or through the Service Manual view.

"When you click on there, you're not going to get 500+ recommended practices to choose from; you're going to get the recommended practices that we have mapped to that subject that we believe are most appropriate," explained Ben Johnson, Mitchell 1 director of product management, who revealed the new feature at TMC's Annual Meeting in Orlando.

After the technician selects the appropriate medium- or heavy-duty vehicle and component in question, such as brake assembly or diesel particulate filter, the 1Search Plus view provides an index card listing RP's associated with that vehicle and component.

Johnson noted getting the right RP info in front of the right person has been a challenge TMC leaders have been trying to solve.

"Including the RPs in TruckSeries makes it easier than ever for technicians to find specific information with a single search, improving efficiency and productivity in the shop," Johnson added.




» TMC's Recommned Practices are now easier to access via Mitchell 1's TruckSeries.
Mitchell 1

TMC Executive Director Robert Braswell said making the RPs available in TruckSeries will help increase the number of maintenance professionals adopting the industry-recommended practices, improving the industry.

"We are all working toward one common goal—to increase equipment maintenance efficiencies for the commercial truck industry," Braswell said. "And merging the content into TruckSeries will help us disseminate this valuable information throughout the industry."

TruckSeries is updated monthly, so if any RPs are added or updated after the annual meeting, the software will have that new guidance in short order.

**"We are all working toward one common goal—to increase equipment maintenance efficiencies for the commercial truck industry."**

TMC Executive Director Robert Braswell

## New wire-to-wire navigation feature

Mitchell 1 also updated TruckSeries' Advanced Interactive Wiring Diagrams. The feature allows a technician to lock in on one wire and follow it throughout a system from one diagram to another. This does not exit the technician from the initial view opened in TruckSeries to complete the diagnostics task. Having to backtrack and reopen windows slows the diagnosis down, and over the course of the day can add up to a lot of lost productivity.

"With electronically distributed wiring diagrams, there has always been this challenge when one diagram ends and another needs to be accessed," Johnson noted. "Even with old-style book manuals, we used to bookmark one diagram when we needed to research another. Now, we can seamlessly navigate between them, following the circuit we're interested in without sacrificing efficiency."

As electric vehicles, which have even more complex wiring than modern trucks, appear in the shops, speeding up the troubleshooting process will be even more valuable. This was a primary reason Mitchell 1 made the investment to upgrade the application, Johnson sad.

Advanced Interactive Wiring Diagrams also includes a history section of the last 10 diagrams.

The new features create "a lot more likelihood the technician is going to stay on the circuit that they really need to be on for the whatever diagnosis that they're doing," Johnson surmised.

# Mack Trucks gets digital upgrade, adds new maintenance contracts

The new Mack Premium Service Contracts aim to help increase uptime for small- and medium-size fleets.

By Cristina Commendatore


Mack Trucks

Mack Trucks is expanding the number of electronic control units (ECUs) enabled for Mack Over the Air (OTA) updates in the Mack Anthem, Pinnacle, and Granite models.

To simplify and offer a more comprehensive bundled suite of services, Mack Trucks also announced during TMC that it will offer Mack Premium Service Contracts to help increase uptime for small- and medium-sized fleets.

Prior to this, key powertrain ECUs could connect remotely to allow diagnostics and receive over-the-air parameter changes and updates.

With the new configuration, the instrument cluster, vehicle ECU, and body-builder modules join the engine, transmission, and aftertreatment control modules in connecting via Mack OTA technology.

The additional control modules available for remote updates enhance fleets' ability to maximize uptime, the OEM noted. What once required an in-person visit can now be done remotely and to more ECUs.

"This gives fleets unparalleled control," Stu Russoli, Mack Trucks highway product manager, pointed out during a TMC press conference. "If I'm running down the highway and I want the best fuel economy, I can have it set up that way. If I want to change a route, I can ask for a parameter that gives me better performance instead of better fuel economy."

Mack OTA updates are free for the first two years of ownership and can be extended by subscription after that period. OTA connectivity is a feature of Mack's fully integrated telematics platform, Mack GuardDog Connect. Customers also have access to Mack OneCall, Mack's 24/7 customer support, and Mack ASIST, Mack's web-based service management program.

Mack began offering driver-activated OTA updates in 2020, and more than 57,000 trucks are enrolled to date, the company noted.

## Mack aims to simplify fleet maintenance management

Premium Service Contracts offer maintenance management with a single point of contact at local dealers to manage maintenance scheduling; parts and labor costs for cost consistency; adaptive maintenance based on each customer's unique operations, allowing for improved vehicle health; and consistent repair and maintenance through Mack Certified Uptime Dealers.

Mack Premium Service Contracts aim to prevent unplanned downtime due to a 74-point inspection, noted Patrick Brown, Mack Trucks services and solutions strategy manager.

"The adaptive maintenance model takes vehicle operations data like fuel consumption, idle time, miles driven, and hours, and feeds it into a proprietary regression model," Brown explained. "The output of the regression model allows us to help forecast when the next service event should be based on when the truck is being run."

Information is then sent to a fleet manager at the dealership who will schedule maintenance directly with the fleet. Fleets will also have variable payment options.

"This boils down to two things: ensuring uptime is maximized and ensuring we are supporting the customer bottom line," Brown said. "All parts and labor will be pre-indexed upfront so the customer has complete visibility of what they will be paying throughout the contract."

Eligible vehicles for the Premium Service Contract are those that are powered by Mack engines with fewer than 150,000 miles. Preventive maintenance, adaptive maintenance, and fleet management by the dealer are included.

The Mack Premium Service Contract is available for normal-duty applications in 100,000-mile increments, while the Mack heavy-duty Premium Service Contracts are available to customers in 50,000-mile increments.

# Volvo Trucks launches adaptive preventive maintenance contract

With VTNA's new Blue service contract, dealers can schedule PMs 30 days in advance to help mitigate unplanned downtime.

By Cristina Commendatore

Volvo Trucks North America's new preventive maintenance contract bundles connected services to run an adaptive, service plan.

Under the Volvo Blue service contract, work is performed by Volvo technicians and includes monitoring, software management, and recall updates.

This will simplify PM scheduling, said Mike Furst, director of contract services and leasing technology solutions for Volvo Trucks North America. Through the contract, dealers can schedule PMs 30 days out for more predictive maintenance.

Each PM interval includes an oil analysis and a 74-point inspection to identify any additional repairs that can be performed while the truck is in the shop.

The Volvo Blue service contract leverages real-time over-the-air truck data to tailor service based on the actual usage of an individual truck, sending the vehicle's diagnostic data to the dealership or repair center before the truck arrives for service.

Traditionally, the onus was on the fleet to schedule their own PMs with their dealers.

"We felt that was driving some of the downtime," Furst said. "The other issue was they didn't have payment options. They had to prepay, so you're looking at $10,000 or more for these contracts sometimes. That was a big obstacle."

Now, Volvo hopes to prevent fleets from waiting for parts, as dealers know 30 days in advance what trucks are coming in and why. Armed with that knowledge, dealers can order needed parts.

"Worst case scenario, if [fleets] have a confirmed appointment three weeks out and the part is still not there, the dealer can contact the fleet and push the appointment out until the part is in," Furst added.

Fixed service fees from the Volvo Blue contract can be spread throughout the chosen contract period duration of 12 to 60 months. Customers may elect to be billed via bank draft to their preferred account or bundle with their loan or lease from Volvo Financial Services.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# Are you willing to invest in techs?

## Finding qualified technicians is not the same as keeping them, though their strategies often coincide.

**Is there really a technician shortage? Or is** there a shortage of qualified applicants? Those are two different things.

Right now, there are over 2,000 ASE accredited auto, truck, and collision repair training programs at the high school and college levels with over 125,000 students enrolled in the current school year. We have plenty of "hand-raisers" to work with, but what are we doing to get them into the industry and keep them there?

The bulk of those students are in automotive training programs, but don't let that hold you back. Surveys show that 18% of students taking auto tech want to work on trucks or heavy equipment. There just isn't a truck program in their community. For example, Cypress Fairbanks is the third-largest school district in Texas, with 12 high school programs and 1,300 students taking auto tech right now. A local heavy equipment dealer has been growing their workforce from these programs for nearly two decades, even though they don't work on cars. We need to take the blinders off. Instead of going to a diesel school to look for diesel students, we should be looking at students in all the different transportation training programs.

In the meantime, the industry can do more than merely widen their hiring scope at vocational schools. Whether you're a large or small fleet, truck dealership, or independent shop, many of these students are not aware of the career opportunities in your company or the truck market in general. It is your responsibility to engage with the programs and students in your community on an ongoing basis. Growing your workforce from the communities you serve is a better long-term strategy than recruiting techs from other shops who may bring their bad habits with them and leave for a dollar an hour more.

Doing this by getting involved with schools is key to growing your future workforce. Having someone from your company serve on the advisory committee of the local program is a great start. If you employ someone who went to that school, ask them to volunteer as a guest speaker or have the students and instructors tour your company. These are just a few ideas; the ASE Education Foundation can provide numerous options for getting involved through their free Adopt-A-School program as well.

Once we recruit students to come work for us, the second challenge is keeping them. Past surveys have shown that on average, we lose 41% of these students early on: 20% at graduation and another 21% in the next two years. How can we improve our retention?

Start by asking yourself some hard questions about the work environment in your business. Would you want your children or grandchildren to work in your shop? If not, why would anyone else? What is your turnover rate? Is it higher than you want it to be? If so, what are you doing to fix it? Do you really know why people are leaving your organization or do you believe it is just about money? (Hint: It's not.)

When someone leaves your organization, they are saying "The unknown is better than staying with you." Like the maintenance and diagnostics of the vehicles you service, you need to determine and fix the root cause, and stop just replacing people a.k.a. "eating our young."

**By George Arrants**
VICE PRESIDENT FOR ASE EDUCATION FOUNDATION
George Arrants works with instructors and administrators to develop partnerships with local businesses and industries through program advisory committees. He is the past chair of the Technology and Maintenance Council's TMCSuperTech, the National Technician Skills Competition, and TMCFutureTech, the National Student Technician Competition. His entire career has been in the automotive service and education industries.

**2,000**
ASE accredited auto, truck, and collision repair training programs

**125,000+**
students enrolled in the current school year

**20%**
of students leave the industry at graduation

**21%**
of students leave the industry two years after graduation

You should also check your expectations of newly graduated entry-level techs. Have you ever heard someone say, "I hired this kid out of that high-power tech school and he/she rolled in their new red toolbox, and I put him/her on a job first thing, and they messed it up"? Did the student mess it up, or were they taught a different procedure in school? Or do you shortcut the procedure to get the job finished sooner? Was there someone to mentor him/her on how you do things in your shop, or were they left to figure it out on their own? Many of those new hires have never spent time in a real production environment. They need patience and guidance to grow into the technicians they want to be. The best tool for achieving that is having a seasoned tech serve as a mentor to those young technicians.

A formal mentoring program assists in developing entry-level talent, and even those starting at your company with previous experience. Invest the time and resources to grow your workforce the right way and avoid wasting all the time and energy it took to create the hire.

However, be aware that not every great technician makes a great mentor. Careful selection and training of your mentors is important to on-boarding new hires and integrating them into the culture of your shop. When selecting technicians to be mentors, we suggest that you look for those already involved with youth activities (church/temple or youth sports, etc.), have been in the industry about four to six years, and have worked for you at least one year. Then ask them these two key questions: 1) Do you like working in this industry? and 2) Do you like working for our company? Don't pair new hires with techs that aren't enthusiastic about both their career and thier work with your business.

Finally, treat those mentor technicians like the assets they are. Develop a pay plan that ensures that mentors aren't negatively impacted for helping grow your workforce and be sure to recognize them among their peers.

By extension, simply showing your employees a little appreciation can go a long way. Whether that means celebrating their accomplishements or making yourself available to them when they need tools or are experiencing difficulties in their personal lives, you need to ask yourself a critical question about your working relationship between yourself and your techs: Do you survey your employees to understand what's important to them and what they think about you? Do you then honor those results?

Growing your workforce isn't easy, but you need to recognize it as an investment and not an expense. And remember that the business repairs vehicles, but it runs on people. Treat them right and ensure that your shop is a positive and encouraging environment where people *want* to come to work.

**"Growing your workforce from the communities you serve is a better long-term strategy than recruiting techs from other shops who may bring their bad habits with them and leave for a dollar an hour more."**

George Arrants, VP, ASE Education Foundation


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# Five questions to ask your lubricant technical expert

Optimizing oil drain intervals and reducing risk start with asking lubrication experts the right questions.

**Industry-leading technical support can** provide significant benefits for any fleet regardless of whether they are a long-haul heavy-duty truck or delivery van making multiple stops around a city. Lubricant experts can help you make decisions on your engine oil outside of the initial lubricant selection to identify efficiencies and contribute to a reduced total cost of ownership.

And to make that process more efficient and smooth, here are five questions to consider asking your lubricant technical expert to help optimize the assets in your fleet.

## 1. Should I consolidate my lubricants?

If you're operating a large mixed fleet, it's likely that you have a variety of lubricants in your workshop. This means your oil storage area will take up more space, but it also increases the potential for human error in selecting the right lubricant for an application. If the wrong lubricant is used for the wrong application, the impact can be significant and result in improper lubrication, increased wear, and in extreme cases, engine failure.

By seeking the advice of a technical expert, you may be able to safely consolidate your lubricants while maintaining proper lubrication of vital components.

Getting help is crucial, as consolidation can be an extremely complex process where each OEM recommendation needs to be taken into consideration. This is particularly true for mixed fleets where there are multiple OEM manuals that need to be reviewed and analyzed alongside each other to produce a lubricant recommendation to meet all requirements.

This process can be very beneficial, too, by simplifying your processes and, in some cases, reducing costs. Collaborating with a lubricant expert will make sure that any decisions you make do not compromise the protection of your engine hardware.

## 2. How can I optimize oil drain intervals?

By optimizing oil drain intervals fleets can reap a range of benefits including longer time on the road between scheduled maintenance and directly reduced maintenance costs. Added to these clear maintenance benefits, extending ODIs can also help reduce the volume of lubricant used and waste product produced to support your fleet's sustainability efforts.

To extend these intervals without negatively impacting the condition and efficiency of your vehicles' engines, it is important to have a regular oil analysis schedule and work alongside a lubricant expert who can first monitor and interpret your used oil data analysis. Once this key stage is complete, your expert will be able to work with you to extend out your drain intervals while closely monitoring for early signs that lubrication is maintained and not compromised.

Only by performing used oil analysis checks and working together with a technical service advisor can oil drain intervals be safely optimized and time in the shop—and off the road—be minimized.

## 3. How can I get the most out of my used oil analysis data?

Reading used oil analysis reports can be difficult, as various data points and influencing factors need to be considered holistically to provide meaningful insight into a vehicle's condition. Lubricant experts and technical service advisors can offer their detailed knowledge and experience to help turn laboratory data into actionable insight.

The first factor to consider is that not all OEM thresholds are the same for specific properties, so while one level could be deemed acceptable, the same level in a different vehicle could be a cause for concern.

Furthermore, technical experts can quickly identify where immediate maintenance might be required. For example, the presence of coolant or glycol could suggest a failing EGR cooler

**By Darryl Purificati**
PETRO-CANADA LUBRICANTS
Darryl Purificati has 27 years of experience working in the oil and energy sector as a technical advisor. He joined Petro-Canada in 1994 to support its lubricants business and continues to provide technical expertise to the company's Lubricants and Specialities segment. Darryl is also involved within the industry as an active member of the American Petroleum Institute (API), ASTM International, and the Society of Automobile Engineers (SAE).


» Technicians must be sure to select the right lubricant for the job or risk engine failure.
Petro-Canada Lubricants

seal, while an increase in iron and aluminium can indicate a failing camshaft, coolant attacking the liners, or the engine requiring mechanical adjustment.

Working with a lubricant expert allows these issues to be identified quickly and efficiently, allowing for maintenance schedules to be adjusted accordingly before an issue becomes too expensive or serious to resolve.

Additionally, technical experts can provide insight and training sessions for you and your technicians on how to spot warning signs and potential anomalies in your used oil analysis data. This will both increase your confidence in interpreting the data in the future and allow you to independently make informed maintenance adjustments.

## 4. What should I do if I have a problem on site?

Lubricant experts can provide in-the-moment advice to help problem solve. For example, Petro-Canada Lubricants technical service advisors often provide guidance on how to take a good-quality oil sample as well as offer insight into evolving specifications such as the change from the Eaton PS-164 to the current PS-386.

Other commonly asked questions focus on drain intervals and what the OEM recommended interval is. This is key for maintaining warranties and should be an important consideration for all fleets—and how customers can reduce cleaning of their diesel particulate filters (DPFs). With a wealth of knowledge, insight, and experience just a call away, technical service advisors can give in-the-moment advice and help you overcome any lubricant queries.

## 5. How can I reduce risk of error in my workshop?

Organization and storage of lubricants can have a significant impact on a workshop, with the ability to reduce the risk of using the wrong engine oil and maximizing space.

Through visiting your site and facilities, a lubricant technical advisor will be able to provide guidance on the practicalities of workshop organization, optimizing your lubricant storage, decanting lubricants, and correct labeling. This will allow you to continue to evolve and increase the efficiency of your engine oil practices as well as discuss key questions and acquire valuable insight for you and your team. Lubricant experts can play a key role in optimizing numerous areas of your fleet's maintenance and performance. Whether in person, or over the phone, collaboration with a technical service advisor can provide practical guidance and advice to maximize performance while reducing costs and downtime, helping your business to be more sustainable and reducing your fleet's total cost of ownership.

# FLEET PARTS & COMPONENTS

What's new in products for more efficient fleet operation.

## For Dodge 2012-07, Ram 2018-11

The original equipment variable geometry turbocharger actuator on certain Dodge and Ram diesel-powered trucks is prone to failure from soot and carbon buildup and electronic component failure. The **Variable-Geometry Turbocharger Actuator**, No. 904-530, from **Dorman Products** is a precision-engineered replacement designed to match the fit and function of the factory actuator on specified vehicle makes, years, and models. The solution is designed to help restore proper variable boost levels and throttle response when the original actuator has failed from soot and carbon buildup or component failure. The 904-530 comes complete with mounting hardware, cable ties, and an adapter wiring harness to enable compatibility with certain model years. This actuator must be calibrated after installation using a capable scan tool.

For more information visit **FleetMaintenance.com/21295124**

## A self-leveling, multi-beam decking system

The **ConnectedDeck System** from **Doleco USA** provides a more efficient, integrated cargo platform for dry van and reefer applications, although the system has the potential to work in a variety of other situations as well. Based on the company's Level Deck Self-Leveling Decking Beam and LayerLock XP Track, the ConnectedDeck comprises two or three adjustable, self-leveling decking beams with a formed composite panel that locks at ceiling height when not in use. The platform can be accessed from ceiling height with a common dock hook or fifth wheel pin puller, after which it can be manipulated by hand, resulting in less wear and tear on a trailer and in greater safety for workers.

For more information visit **FleetMaintenance.com/53029185**

## Compatible with electric and gas- and diesel-powered regional trucks

The **RangeMax RSD EV drive tire** from **Goodyear Tire & Rubber** is compatible with a range of regional vehicles and is available in size 295/75R22.5. The versatile, ultra-low rolling resistance tire utilizes Goodyear's TreadLock Technology to provide more even wear on the tire's surface while also increasing the mileage of electric vehicles (EVs), and the unique tread pattern is designed to handle the increased torque from an EV engine. Each of these factors contribute to a longer service life of the RangeMax RSD despite the additional demands of an electric vehicles (EV). Additionally, the tough, durable casing can be retread for additional service miles.

For more information visit **FleetMaintenance.com/53029186**

## Fits most manual transmissions

The **Chelsea 489 Series Power Take-Off Unit (PTO)** from **Parker Chelsea** is applicable for a variety of vehicles, including utility and dump trucks and trailers. The PTO reduces mounting time and potential leak paths, and suits most manual transmissions, including Eaton Endurant, Mack, Tremec, and more. The component's housing bolts directly to the 8-Bolt transmission opening for easy installation and includes a two-year warranty. Created from a singular piece of cast iron, the 489 Series provides 250 ft.-lb. of torque and includes 27 output options, and 11 internal speed ratios and shift options.

For more information visit **FleetMaintenance.com/53029321**


## Provides a long-lasting protective barrier

**RUSTGARD Rust and Corrosion Preventive Oil** from **LUBEGARD** is a commercial-grade rust and corrosion preventive oil designed to provide a long-lasting protective barrier for all metal surfaces on parts, tools, machinery, and equipment. According to the company, RUSTGARD's wax-free formula will not clog filters. RUSTGARD is available in an 8 oz. and 16 oz. non-aerosol spray bottle. Bulk sizes are also available.

For more information visit **FleetMaintenance.com/21282875**


## Advanced wireless video transmitter

**Air Vue** from **Safe Fleet** is an advanced wireless video transmitter meant to provide a line of sight for the rear of semi-trailers. With a wireless signal that can reach up to 300 ft., Air Vue can connect with a monitor via a vehicle's electrical system, making installation and pairing easy between trailers. Additionally, the camera is housed in durable metal with IP69K rating, making it able to withstand the rigors of long-haul trucking while installed on a trailer's exterior.

For more information visit **FleetMaintenance.com/53029317**

## Resists temperatures up to 650 degrees F


The **Permatex The Right Stuff Red 1 Minute Gasket Marker** is a leak-proof, elastomeric "formed-in-place" material that is designed to last longer than pre-cut gaskets. It's blowout resistant and protects against leaks caused by vibration and thermal expansion. The Right Stuff Red 1 Minute resists high temperatures up to 650 degrees F, ideal for applications such as exhaust manifolds, headers, turbochargers, and slip-fit exhaust parts. It is also formulated to meet or exceed performance standards for long-term sealability, durability, and handling.

For more information visit **FleetMaintenance.com/21285257**

## Applicable to select Ford 2019-11 model year vehicles

The **Diesel Exhaust Fluid (DEF) Pump**, No. 904-609, from **Dorman Products** is designed to match the fit and function of the original part. Designed as a plug-and-play replacement, this DEF pump has undergone extensive testing and is made of quality components for reliable service. It is applicable to select Ford 2019-11 model year vehicles.

For more information visit **FleetMaintenance.com/21247663**

## Features low-rolling resistance

**Michelin's X Line Energy Z+ tire** is the latest entry in the company's X Line Energy Z long-haul product line and features enhanced durability and traction. Utilizing both Infinicoil and Regenion sculpture technology, the tire has a quarter-mile-long continuous steel wire wrapped around the its circumference and an evolving tread design that correlates to its wear. The tread design itself is 18/32" deep and the tire will be offered in 295/75R22.5 LRH, with the X Line Energy Z+ launching in the third quarter of 2023.

For more information visit **FleetMaintenance.com/53029327**

# TOOLS & EQUIPMENT

A roundup of the latest tool and equipment offerings.

## For select Navistar bodies

The **OTC Cab Mount Bushing Kit**, No. 5867, is designed to remove and/or install cab-mounting bushings on select Navistar bodies. The kit includes the OTC C-frame and proprietary heat-treated and coated forcing screw to generate the necessary force to remove and install cab-mounting bushings. The tool is similar to Navistar OE tool number ZTSE4928. Vehicle applications includes 9000i series, DuraStar, HV, HX, LoneStar, LT, MV, PayStar, ProStar, RH, TerraStar, TranStar, and WorkStar. Made in U.S. from global materials.

For more information visit **FleetMaintenance.com/21289837**

## Large backlit LCD display

The **Mastercool Black Series Compact 2-Way Digital Manifold Gauge Set** performs pressure and temperature calculations for up to 91 different refrigerants, including R-134a and R-1234yf refrigerants. The compact manifold provides an automatic shut-off, offers units conversions, and displays alarm indications (over range, Celsius or Fahrenheit designation, and low battery warnings) directly on its large backlit LCD screen. It also features easy-to-grip knobs, a large sight glass for quick visual refrigerant checks, an accuracy of +/- 0.5 percent FS, and a resolution of 0.5 psi.

For more information visit **FleetMaintenance.com/21294600**

## Includes ID match functionality

The **ATEQ TPMS Tools VT67 TPMS and Tire Management Diagnostic Tablet** is Android-based and has a large screen, expansive memory, and a built-in camera, making it easy for users to store and manage essential customer data. The VT67 is equipped to handle features such as compatibility with the company's upcoming TPMS Cloud platform, BLE sensor scanning, and secure gateway. Similar to all ATEQ tools, the VT67 offers 100% OE sensor coverage as well as coverage for 20+ aftermarket sensor brands. It also includes ID match functionality, built-in email, Wi-Fi/real-time updating, and more.

For more information visit **FleetMaintenance.com/53027969**

## Ideal for brakes, exhaust, and more

The **Mueller-Kueps Multi-Cleaner**, No. 460 300, is a universal cleaning tool ideal for brakes, exhaust, and more. Kit includes one handle, one 40 by 110mm cleaning pad, and one 50 by 110mm cleaning pad.

For more information visit **FleetMaintenance.com/21292751**


## Includes four hot-swappable batteries

The **X600 Pro-PCI Fully Rugged Notebook** from **Getac Technology Corporation** builds on the company's X600 Fully Rugged Mobile Workstation to give users more functionality in a single, compact device. Notable features include dual PCI/PCIe expansion slots for add-on card functionality (such as video capture, data acquisition, and SATA expansion), a standard DVD (or optional Blu-ray) super-multi drive, as well as Express Card 54 and PCMCIA Type II card readers as standard. The X600 Pro-PCI also includes two additional hot-swappable batteries, bringing the total that come with the device to four, for all-day functionality.

For more information visit **FleetMaintenance.com/21296058**



## Tool reviewers wanted!

If you are interested in sharing your thoughts on tools you've used, or would be open to trying out new ones, or represent a company that wants to provide tools or shop equipment for reviews, please email: editor@fleetmaintenance.com.

## Extra-wide drive-through clearance

The **Challenger Lifts EW1020 Wide Inground Lift** features a lifting capacity of 10,000 lb. and an extra-wide drive-through clearance for servicing wide-bodied and electric vehicles. The hydraulic inground lift comes standard with True three-stage front and rear arms and double-telescoping screw pads. Bench-mounted controls are optional. Each arm has a capacity of 2,500 lb. and each screw pad adjusts from 4" to 6.125". The EW1020 has a rise height of 78", an overall width of 118", and a drive-through clearance of 88".

For more information visit **FleetMaintenance.com/21294592**

## For high-torque applications

The **Martins Industries Impulse 1" Impact Socket Set**, No. MX-S2, is designed for high-torque applications. Made for use with impact wrenches, these chrome molybdenum sockets deliver ideal performance and are able to withstand more torque with durability and strength. Suited for light and heavy duty trucks, the 1" drive impact set includes eight socket sizes, ranging from 21mm to 41mm. Comes in a sturdy case to keep everything organized for neat, efficient storage.

For more information visit **FleetMaintenance.com/53027975**

## Offers handsfree operation

The **Snap-on 400 lm Mini Inspection Light**, No. ECPRI042, features both a 400 lm main light and a 175 lm spotlight. The rechargeable light has approximately three hours of run-time on high for main light and eight hours of run-time on high for the spotlight. Additionally, it's IP65 rated and has magnets on the bottom and on the clip for handsfree operation. The clip rotates 240 degrees.

For more information visit **FleetMaintenance.com/21293306**

## Built-in human body sensor

The **SABER 2,000 Lumen LED Corded/Cordless Underhood Light**, No. ATD-80365, features a human body sensor (HBS), a 360 degree microwave radar sensor that automatically activates the light when a human body is within 10' to 15' and turns off when out of range. The sensor saves on both battery power and lifecycle. The 40" light bar emits up to 2,000 lm, offers two modes (high and low), and has large, padded covered hooks that extend from 55" to 83", capable of fitting new SUVs and light trucks. The light comes with a 25' removeable cord that remains flexible in cold weather and is oil and grease resistant.

For more information visit **FleetMaintenance.com/53026754**

## Pulling force of 3,579 lbs

The **Marson BT-8 Battery-Powered Rivet Nut Installation Tool** from **Howmet Fastening Systems** is designed to deliver reliable pull-force for high-volume assembly applications. Engineered for versatility and extensive use, the tool is lightweight, has an ergonomic grip and built-in LED, offers ideal balance, and has a recharge time of approximately 45 minutes. The tool has a stroke length of 0.25" and a pulling force of 3,579 lbs. The BT-8 kit includes one tool with battery, battery charger, and carrying case.

For more information visit **FleetMaintenance.com/21295532**

## Backed by an auto-engage clutch

The **JET Tools JLA Compact Lever Hoist Series** include three models: 0.75-ton, 1.5-ton, and 3-ton. All feature a compact design, allowing users to get into tight areas. With safety at the forefront, the hoists are backed by an auto-engage clutch that allows for easy load chain adjustment while protecting against accidental freewheeling under load. Each model also offers a fused brake for low maintenance safety, Zinc-plated Grade 100 load chain, cast steel latches, a western-style double pawl system for added safety, and a short handle to get into tight areas.

For more information visit **FleetMaintenance.com/21293313**

## Oil-and-slip-resistant rubber outsole

The **KEEN Utility Reno Work Boot** is designed for the demands of the modern job site. The versatile boot features KEEN.BELLOWS FLEX technology to offer multidirectional flexion, making knee-down work easier, the company says. Other highlights include a KEEN.ReGEN midsole, a KEEN.KonnectFit heel capture system to lock the heel down for sure-footed stability, and an ankle-height engineered mesh upper and KEEN.DRY waterproof, breathable membrane. The Reno also offers asymmetrical carbon-fiber toes and an EH-rated, oil-and-slip-resistant rubber outsole. Available in both men and women.

**For more information visit FleetMaintenance.com/21295523**

# ADVERTISER INDEX



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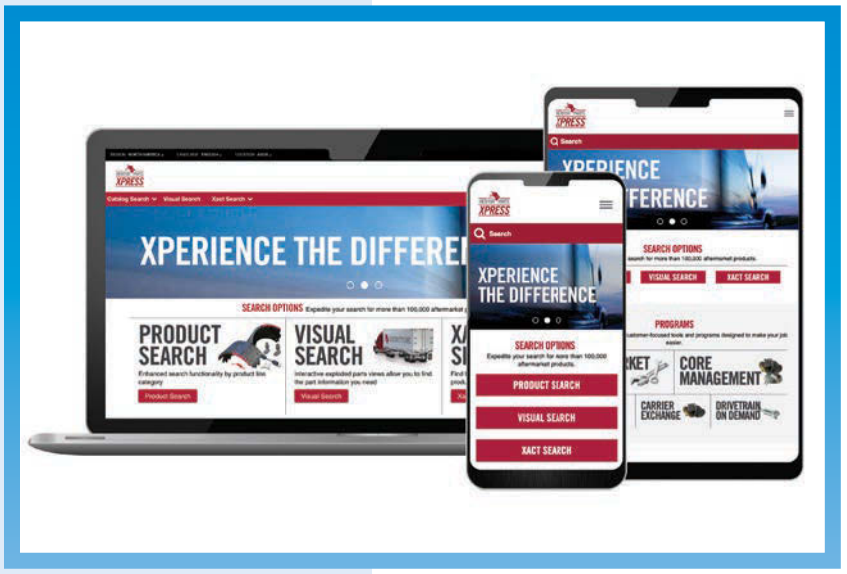
**WSCHLAGHECK@ENDEAVORB2B.COM**

# eCommerce sites

## Cummins-Meritor MeritorPartsXpress.com

**MeritorPartsXpress.com** expedites searches of more than 100,000 aftermarket products—from brake shoe and king pin kits to calipers and rotors—with powerful self-service tools to help boost parts operations. Features include instant notifications for in-process orders and shipping and calculated delivery dates, as well as enhanced Xact Search and Visual Search tools, competitive cross-references, product details, catalogs and more. The Xpress Facts product pages also provide access to product tools and resources including sales and technical publications, maintenance manuals, catalogs, calculators, videos, lists of on-demand training courses, and more.

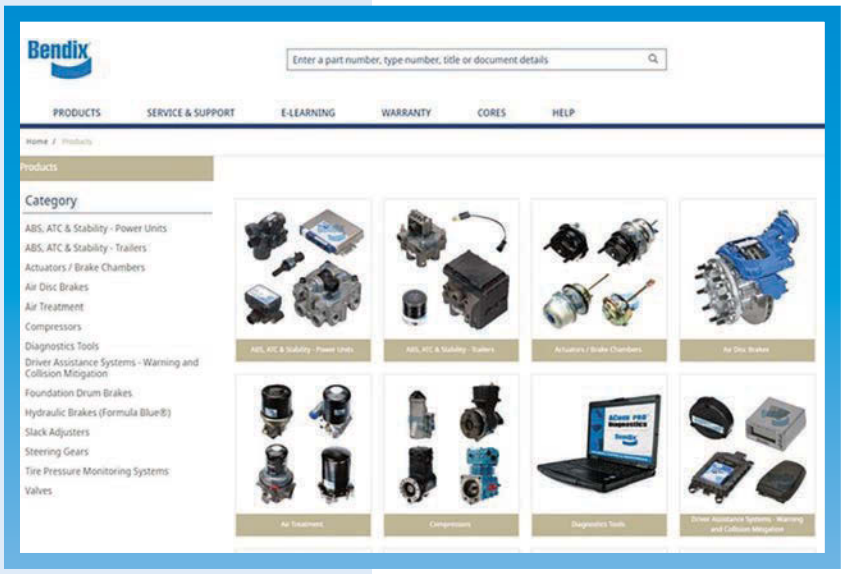
"The product details are in depth down to the VMRS code and the ordering couldn't be much easier," explained Trevor Walker, service specialist at Northwest Drivetrain. "The Visual Search tools are an awesome way to guide those of us who don't have decades of experience in identifying the correct parts and assemblies."




## Bendix Commercial Vehicle Systems B2Bendix.com

**B2Bendix.com** offers access to more than 210,000 of the OE's wide assortment of parts numbers, with orders commonly completed in under 2 minutes. Customers can also import orders from Excel spreadsheets and check availability and price through the site. Components are presented in a high-resolution 360-degree view. Users can also search diagnostic trouble codes and critical documents, access e-learning, and submit and search for warranty claims and core returns on the site, which was upgraded in 2022.

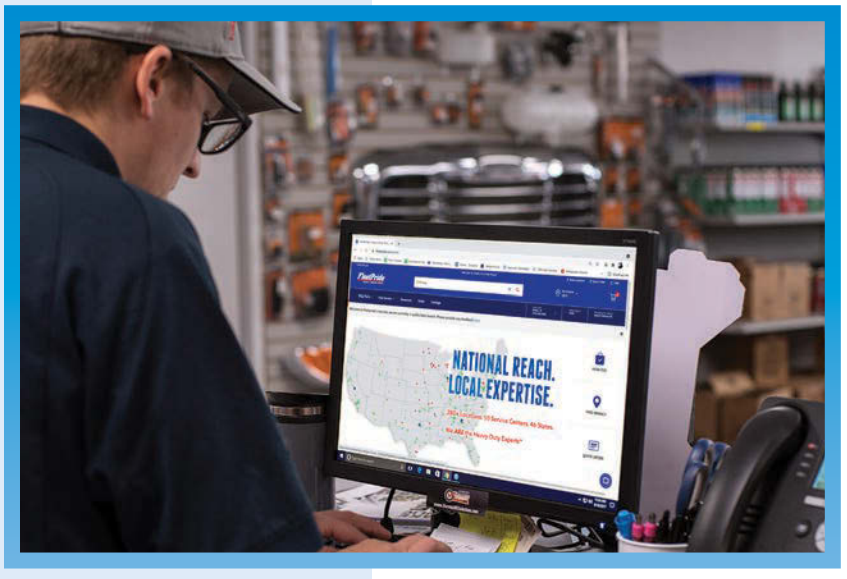
"I use the B2Bendix website to place orders, cross part numbers and check order status," said Chris Folsom, who works in inventory control at Betts Truck Parts & Service. "It's extremely convenient and the fact that I can upload purchase orders in their entirety makes order processing very efficient. It also allows me to check the pricing on my orders before any issues reach my accounting department. It's worked out very well for Betts."




## FleetPride FleetPride.com

**FleetPride.com** offers access to more than 1 million parts related to Classes 6-8 commercial vehicles. Upgraded features include more administrative and user options to ease reporting, compliance, and quotes. Qualified customers also receive eCash Rewards for online purchases (baseline 3%) and for orders in excess of $200, they receive free parcel ground shipping

"It's easy to identify parts using pictures, and we can get quick support either with the live chat or by calling our local team if we need help," said Chris Ouellette, owner of Liberty Oil Equipment Co. "We use saved lists to make ordering for our frequent customers even easier, and because we are eCash members, the annual rebate also allows us to keep our on-hand inventory slightly higher so we're better positioned to take care of our customers."



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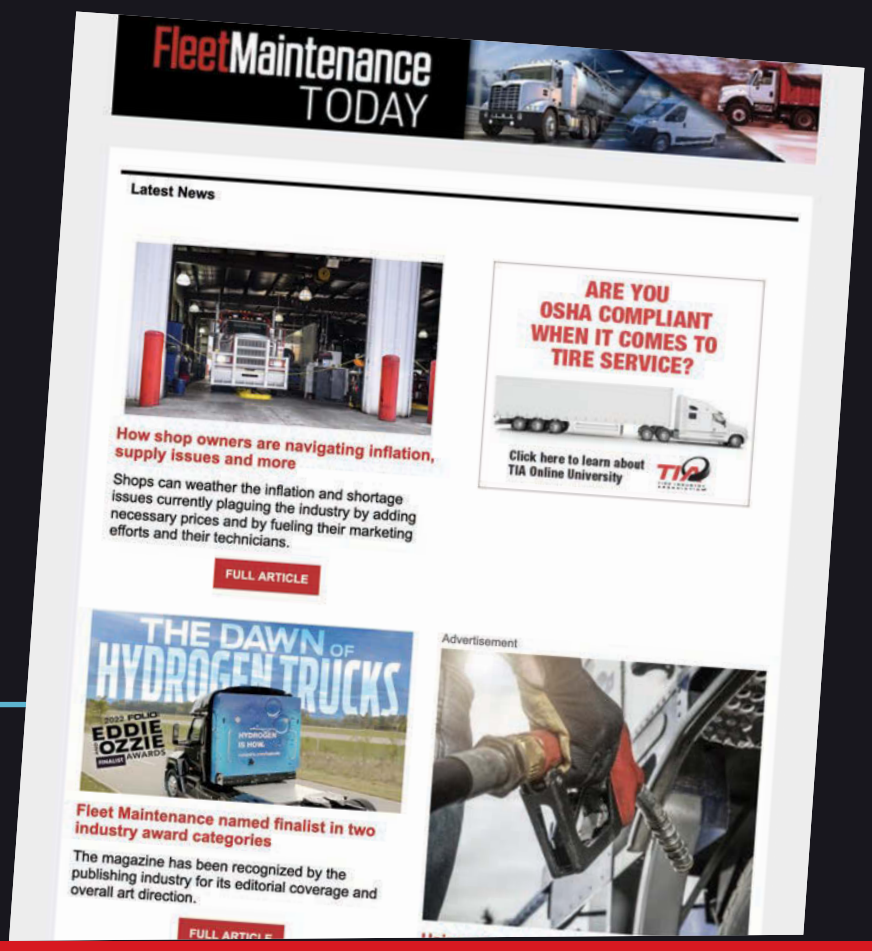


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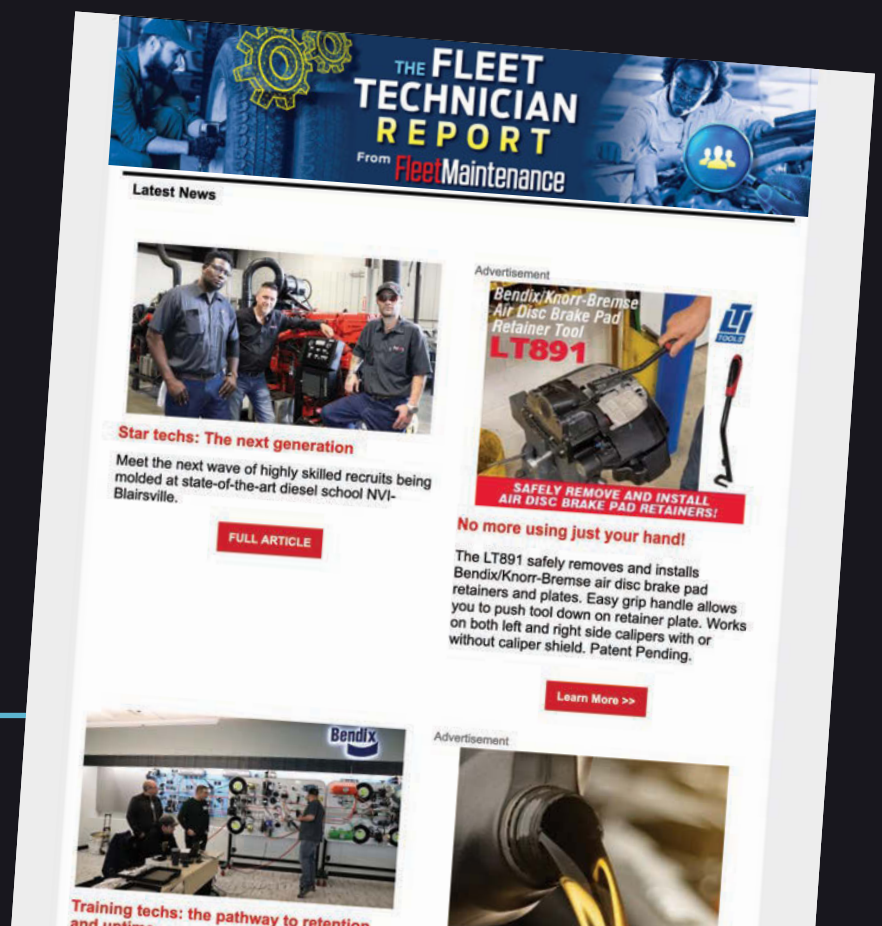


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