

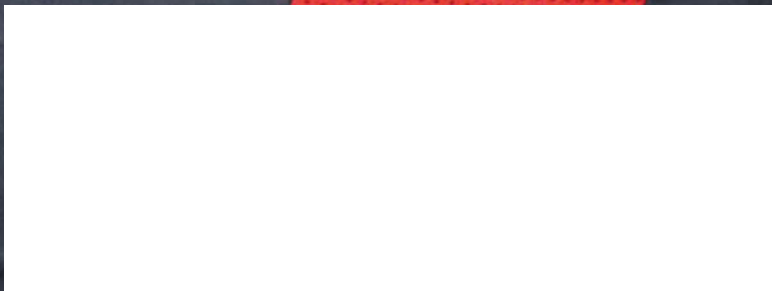
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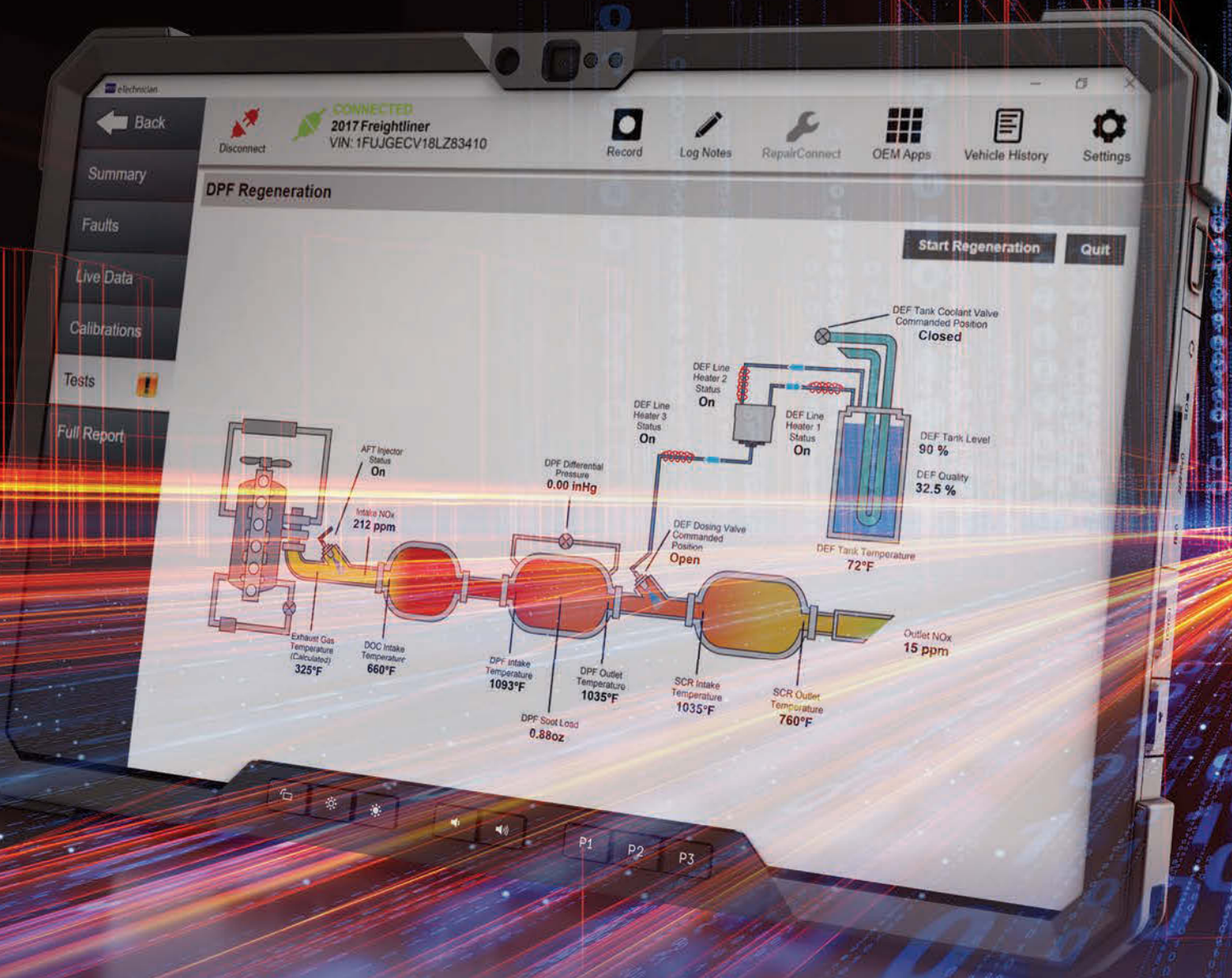
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**HOW GAMIFICATION
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Want to contribute? Contact us at editor@FleetMaintenance.com

→ **Cover photo:** John Hitch

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Instead of trying to find a needle in a haystack, one Colorado shop pushed back on the labor shortage and decided to make their own techs by partnering with a nearby school filled with eager students ready to learn and work in the real world.

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Three strikes and they're out: UAW strikes hit Big Three at three plants

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Trade school vs. college: Experts, students weigh in

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In search of the best techs and leaders around

We want to know the qualities that ensure that nothing's gonna keep your trucks down, so nominate your colleague as one of our Overachievers of the Year.



By John Hitch
Editor-in-chief



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What qualities make a great commercial vehicle technician? What skills do their leaders need to succeed? The answers to both are what we seek to find in every issue of *Fleet Maintenance*.

Typically, we weave them organically into our carefully crafted features. In this issue, for instance, in our so-in-depth-it's-spooky feature on aftertreatment system troubleshooting (Pg. 14), we show why fearlessness and patience are highly sought-after qualities to look for in a diagnostic tech. They shouldn't be afraid to ignore the easy (and often wrong) quick fix, and instead follow the trouble tree to the poisoned branch.

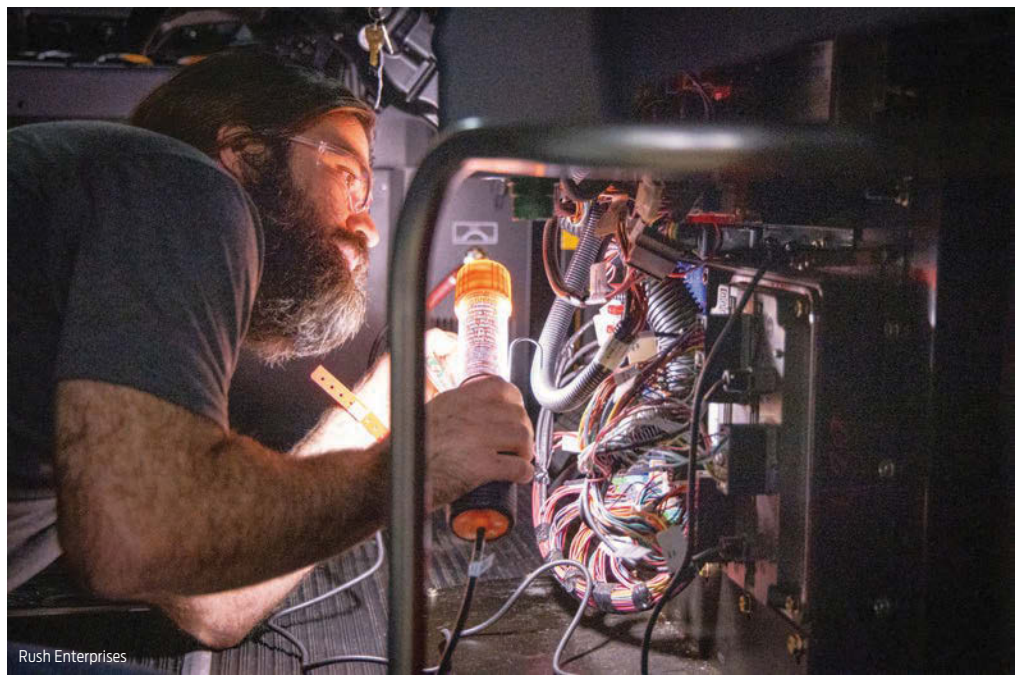
If you haven't done so already, you can pick up the supplement mailed with this issue, Fleet Diagnostics (Pg. 10), to confirm that. In the story on triage bays, Missy Albin, senior lead master technician at Navistar dealer Taylor & Lloyd, Inc., talked to us about how "a good lead technician will follow established diagnostic procedures as well as use their experience to think inside and outside the box."

That amounts to basically knowing when to—and when not to—follow the standard troubleshooting conventions. Time management and the ability to prioritize are also paramount, as triage only works when you can quickly discern which trucks need more care than others and how long that will take.

Two other biggies are a competitive spirit and the tenacity to continuously improve your skills. That's what I distilled from what experts told me while reporting for the feature on gamifying the shop (P. 20), and what I saw firsthand at TMC SuperTech in Cleveland last month (P. 36). A major reason FedEx Freight swept the awards was their shared goal to study hard and push each other harder.

If we're being transparent, another reason is that many rival maintenance providers with their scale to invest in training, such as Penske, Ryder, and Rush, forego TMC's National Skills Competition to put on their own events.

Speaking of transparency, that's one of the things that makes a great manager. I would hardly call myself that (way too modest), but shops deploying gamification are finding that it is a great way to motivate employees to improve efficiency and productivity. Showing them metrics on a leaderboard, such as how



Rush Enterprises

they are performing in real time vs. the standard repair time, helps them understand if they are on track or falling behind. Then, of course, a good supervisor would review and coach them where they were deficient. Just the act of being tracked can help a worker become more productive, noted Jacob Findlay, co-founder and executive chairman of Fullbay, a provider of shop management software.

This could be perceived by shop employees as crossing the Big Brother rubicon. Techs were resistant at first when Rush Truck Centers adopted leaderboards, but Javier Gonzales, director of service at Rush, explained that over time, stronger techs saw which colleagues were falling behind by their real-time standard repair time scores and helped them out.

This helped managers also see what practices needed to be improved as well. As a whole, the entire company got better. "Our build hours per tech per day have increased considerably over the course of five years, and our revenue per tech has increased considerably," said Victor Cummings, Rush VP of service operations.

There are plenty more insights, and we encourage you to read on and decide which insights could benefit you. The profile on Jon Graber (P. 32), a shop owner (and *Fleet Maintenance* reader) I met at the last Heavy Duty Aftermarket Week, has some great ones.

Next issue, we want to come right out and provide as many proven qualities of the industry's best labor (techs, service writers, parts folks, etc.) and leaders (from supervisor to ownership) as possible.

This is where you come in. If you have a great co-worker, colleague, boss, or service partner who really performed above and beyond this year, email us why you think they should be recognized as one of our *Fleet Maintenance* Overachievers of the Year. Just email us at Editor@fleet-maintenance.com and list the nominee's name, title, company, how they overachieved (be specific), and their best qualities.

Remember to put "Overachiever of the Year" in the subject line. We will review the submissions with our advisory board and decide who will be recognized in the December issue. Recognition is its own reward of course, but we might have something else special for them as well. Please note that to be considered, we'll need to interview the overachiever for the piece.

For bosses worried that calling attention to your best techs will entice poachers, in my experience, it's more dangerous not to acknowledge top performers. So, send us your nominees (limit 1 per location, 3 per company) by Nov. 1, and we'll do the rest. Thanks so much! ■

How to submit your nomination!

Email: Editor@fleetmaintenance.com

Subject line: "Overachiever of the Year"

Include:

- Nominee's name
- Title
- Company
- How they overachieved (be specific)
- and their best qualities

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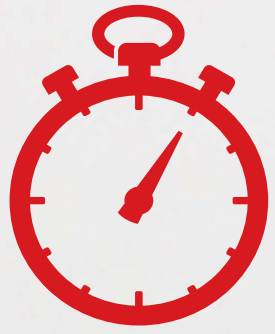
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On your mark, get set, **winterize!**

Cold, ice, and snow can cause serious problems if you're not prepared.

By Seth Skydel

[BEST PRACTICES]



Vibrant, fiery-hued foliage is still lining the roads of the northern U.S. and Canada (at the time this story is published), but soon the trees will be barren and covered in pure white snow, while the roads will be slick with an ashen gray mixture of slush and salt. The good news is you likely have a month or two to brace your fleet before winter kicks into high gear (excluding the Dakotas, Montana, and Canada, of course, where you may have mere hours).

But you should start getting ready ASAP, because winterizing your fleet now will save you money come January.

"Preparation before winter is certainly less expensive than a failure on the road," said Tom Stencil, regional sales representative at Eberspaecher, whose career has also included working as a truck driver and a technician. "Drivers want to deliver their loads and not lose time and money. For fleets, the high cost of repairs impacts efficiency and driver satisfaction and leads to poor ratings from customers."

Luckily, there is still time to prevent weather-related issues from happening by getting equipment ready for winter operation. To help plan, a range of experts weighed in on winterizing best practices for critical systems, what happens if those are not done, and the benefits of being prepared.

Batteries

"A lot is asked of electrical systems in cold weather," said Daniel Mustafa, director of technical service for TravelCenters of America. "Batteries need to crank over cold engines, and they charge slower. Lights are on longer due to reduced daylight hours, and a battery's freezing point changes when cold temperatures cause water and electrolytes to separate."

To prevent problems, Mustafa recommended avoiding unnecessary battery drain by unplugging cab and sleeper items when they're not needed. When a truck is parked, make sure load disconnect switches are deactivated, he advised. That will allow essential items to function while preventing voltage drops from components that draw power even when they're not being used.

"We recommend testing electrical systems before the weather changes," Mustafa added. "Using tools like an AutoMeter, our technicians can evaluate things like battery cable integrity. That not only predicts the life of the components but also presents an opportunity to prevent a breakdown."

The summer ruins batteries, but the winter brings out the problems, noted Larry Rambeaux, sales application engineer at Purkeys. "If you go into winter without having taken care of things, then you have an increase in jump starts,



and if drivers are worried about the truck not starting, idling goes up because they're afraid to shut off the truck," he said. "If you properly maintain batteries before extreme winter cold, you will have improved life and performance for all electrical components."

Rambeaux's advice also included using quality testing equipment for batteries, voltage drop, cranking and charging circuits, and the alternator. Those tests must be done to make sure the entire system is working properly, he noted, and it's important to maintain and properly calibrate the testing equipment.

Alan Kohler, senior marketing manager at Odyssey, said lead acid batteries often lose some of their operational capacity when subjected to an extremely cold environment. "A temperature of 0 degrees F, for example, diminishes power by about 30%," he related. "If it's cold enough for the oil to thicken, the battery must expend more energy to start the engine."

Winterizing a heavy-duty vehicle's battery involves inspecting, cleaning, testing, and charging. Kohler recommended the following:

- ➔ Check conventional, flooded lead acid battery electrolyte levels, and add distilled water to replenished cells if needed.
- ➔ Inspect the case, terminals, cables, and clamps for damage from wear

and corrosion. This would appear as a thin, white powder or a blue-green growth. Apply dielectric grease, anti-corrosion spray, or petroleum jelly to the terminals after cleaning.

- ➔ Measure Open Circuit Voltage (OCD) and determine the battery's State of Charge (SOC) after the battery sits for at least six hours, and after it has been charged, to ensure chemical reactions reach equilibrium and the surface charge is gone.

Electrical systems

One way to help winterize your wiring is by spec'ing a sealed wire harness, said Andy Summers, director of fleet sales at Phillips Industries. This helps keep out moisture and debris. Failure to do so can result in drops in power, leading to flickering, intermittent, or non-working lights, which are both safety hazards on the road and CSA violations.

Aside from regular cleaning and greasing of lighting connections, Summers stressed that it's vital to keep the 7-way connections clean at the front of the trailer.



EV winterizing

While electric vehicles don't have many of the systems that cause cold weather problems in diesel-powered trucks, issues still exist. For Gina Bonini, VP and GM of Advanced Thermal Systems at Modine, however, that means seasonal temperature-related preparations for EVs will look different.

"Cold weather is known to impact EV battery range and performance, but it is important to know that nearly two-thirds of the range reduction is due to the extra drain on the battery to heat the cab for driver comfort," Bonini said. "Cold temperatures also impact performance as the battery will deplete a charge faster and take longer to recharge."

"EV batteries are susceptible to temperature swings and must be maintained in a much narrower operating temperature window than ICE vehicles," Bonini continued. "In addition to the battery, managing temperature is important for the inverter, converter, and traction motor. Appropriate thermal management is necessary for efficient EV operation all winter long."

"A commercial EV battery thermal management system (BTMS) helps maintain the battery pack at its ideal temperature, regardless of harsh outdoor temperatures," Bonini explained. Additionally, planning for winter months can help optimize efficiency and uptime and extend the battery's life.

"For example, especially during extreme temperatures, a BTMS can maintain battery temperature by heating the coolant that circulates the pack. A BTMS also has the capability to pre-condition an EV by warming up the battery packs to an optimal temperature range before the vehicle is charged or driven."

"While winterizing is not as hands-on for EVs as it is for ICE vehicles, fleets should pay attention to the diagnostic and maintenance software for battery thermal management systems," Bonini said. "Those systems also have tools to help ensure necessary preventive maintenance is done to keep vehicles running smoothly."



» Moisture accumulated in the air systems during the warm months needs to be drained manually at the beginning of the cold weather season.

Bendix

"In regions where deicers are commonly used, more frequent cleaning and the application of dielectric grease on plugs and sockets on both the tractor and trailer are essential to counteract the corrosive effects of these chemicals," Summers said.

Ensuring proper cable support by tightly affixing lights to their pigtail connections and the chassis frame is essential to protect cables from sharp edges or rubbing against the trailer's frame. Summers explained this could compromise the jacketing or cause the cables to become dislodged or damaged.

Regularly maintained mud flaps play a dual role in keeping large road debris like rocks from kicking up and in creating a barrier against moisture and contaminants that can compromise electrical connections, he said.

Summers warned to take extra care when cutting or splicing sealed harnesses or when pressure washing vehicles, emphasizing the importance of keeping moisture away from couplings such as plugs, sockets, lamp pigtails, and harness connections.

"It's vital to ensure wires are properly seated in terminals for a strong connection, and any repairs should be sealed to keep moisture out and maintain the integrity of the harness," he said. "High-pressure water can force moisture into these components, potentially causing electrical issues or corrosion."

Fuel systems

Diesel fuel gels when it's cold. In addition to clogging fuel systems, it won't flow or burn. Hot fuel cools when the truck isn't running, and cool outside temperatures cause moisture to collect in the tank, explained Jamie Hagen, owner of Hell Bent Xpress and a former driver. "We use a quality anti-gel additive all winter long and keep our tanks full at night to prevent condensation from occurring," he explained. "Full tanks gather no moisture."

Fuel gelling can also be prevented by using locally purchased fuel in colder areas because it's blended or treated, TA's Mustafa noted. In any of those cases, he recommended removing the fuel and sweeping the tank to remove excess water. The fuel filter should be changed, and the fuel/water separator should be drained.

"Anti-gel additives can pre-treat fuel as well," Mustafa added, and there are great products like Diesel 911 when you already have a problem."

Air systems

Rick Conklin, Bendix director of engineering, air supply, and drivetrain, noted that winter conditions increase the vulnerability of air systems. In particular, he recommended the following:

- ➔ Drain the air tanks manually at the beginning of the cold weather season to get rid of any moisture from warmer months.
- ➔ Check the air dryer cartridge. If it hasn't been replaced lately, replacement may be wise before the winter season hits because moisture in the air system can condense and freeze, upping the chances of brake and valve malfunctions.
- ➔ Replace the purge valve if you spot corrosion or grit accumulation. Corrosive road chemicals—the kind you'll run into during winter—can damage this valve and cause bigger system issues.

"The largest issue with air systems in winter is water freezing that prevents critical systems from functioning," Mustafa said, "and the easiest way to prevent it is to not let it in. Changing the air dryer filter is a low-cost item that can save a lot of pain. Draining air tanks as part of a pre-trip inspection is also an undervalued procedure."

For Hell Bent Xpress' Hagen, changing air system filters is a standard practice. "We only use high-quality products in this application as cheaper ones have led to issues," he emphasized. "We also purge all of our truck and trailer air tanks."

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Braking systems

The importance of brake performance heightens in winter, noted Mark Holley, Bendix director of marketing and customer solutions, wheel-end, so preventive maintenance is imperative before the systems are put to the test and should include the following:

- Check air brake chamber housings for corrosion or damage and make sure dust plugs are properly installed, which helps prevent corrosive materials from taking hold.
- Regular lubrication on drum-braked wheel ends keeps moisture from building up and enabling corrosion. Also, make sure automatic slack adjusters, clevis pin connections, cam tubes, shafts, and bushings are all greased in preparation for winter.
- Any opening into air disc brake calipers can permit corrosion, so inspect the boots for tears or punctures, and check the integrity of the guide pins. Make sure the shear adapter cover is in place and fully seated. Additionally, make sure the pads move freely in the carrier, and check that the brake moves freely on its guidance system.

Cooling systems

Before winter sets in, testing coolant for proper freeze protection is very important, said Brad Jordan, product application specialist at Shell Lubricants. “For most areas of the country, 50/50 antifreeze coolant concentrate/water is sufficient for a freeze point of -34 degrees F or lower. For northern regions that experience extreme cold in wintertime, a 60/40 coolant for -60 degrees F freeze protection should be considered. In all cases, a freeze point check should be done using a calibrated refractometer to ensure adequate protection in cold weather.

“Before winter, you should also check for signs of contamination,” Jordan continued. “It’s also important to check all hoses, clamps, and connections in the coolant system for cracks or wear, as cold weather can lead to leaks and potential engine overheating. Also, inspect the radiator for blockages, debris, or damage that might hinder proper cooling.”

Tommy Smith, regional sales manager southeast, Webasto Thermo & Comfort North America, offered advice about reducing issues that occur with cold engine starts with engine coolant heaters. “When the temperature drops significantly, the oil inside the engine thickens, making it harder for the engine to turn over and circulate the oil,” he explained. “Preheating the engine warms up the oil, allowing it to flow more easily and protect vital components.”

Starting and idling a cold diesel engine turns it into a soot- and smoke-generating machine that feeds directly into the vehicle’s DPF, Jordan noted as well. A combination of un-combusted fuel and particulate matter create a heavy, wet, and dense coating that forms on the surface of the DPF. The contaminants increase backpressure, resulting in significant reductions in engine and DPF efficiency.

Engine oil

When it comes to cold extremes, high-quality, heavy-duty engine oils offer a world of benefits, stated Darryl Purificati, senior technical advisor, OEM/Automotive for Petro-Canada Lubricants, an HF Sinclair brand.

“Low temperatures affect a lubricant’s viscosity, so it can take longer to warm up, and when temperatures drop into the critical zone of the lubricant’s operating range, it can thicken or become overly viscous,” Purificati explained. “Consequently, if the lubricant flow is severely hindered, it can harm the engine’s components, leading to significant unplanned downtime and costly repairs.”

Opting for a lubricant with a lower Cold Cranking Viscosity (CCS) can mitigate these issues by enabling smoother fluid flow during start-up in cold weather, Purificati said. Fleet owners and operators are advised to transition to lower viscosity oils that maintain flow in low temperatures if they don’t already use them.

“Offering better stability and performance across diverse weather conditions, synthetic and synthetic blend oils are also worth considering for winter preparation,” Purificati continued. “For exceptionally cold climates, oils with improved low-temperature performance facilitate faster flow during start-up.”

Karin Haumann, OEM technical manager, Shell Global Solutions, agreed that low-viscosity engine oil provides several benefits during winter months by flowing more readily at cold temperatures, ensuring faster lubrication, and reducing wear on engine components during cold starts.



» Optimal air pressure is important for good traction on icy roads.

Michelin

“An engine that can start quickly in cold weather will also put less stress on the battery and starter,” Haumann said. “Low-viscosity engine oils can be used in many diesel engines, but always refer to your vehicle or engine manufacturer’s recommendations before switching.”

Tires

“Conducting tire maintenance before and during the winter months can make a world of difference,” said Dustin Lancy, senior commercial product manager at Goodyear. “Tire pressure can fluctuate moving from warmer to cooler climates and drop about 1 PSI for every 10 degrees the temperature drops,” he said. “The ideal time to check tire pressures is during the pre-trip inspection when tires are in the same outdoor temperature you intend to travel in.”

Jim Garrett, product marketing, B2B, long haul and regional, Michelin North America, noted as well that air pressure is important for winter traction. “Getting pressures right will assure that a tire’s footprint on the road is at its best,” he said.

Robby Hamby, director, commercial product strategy, Bridgestone Americas, noted that tires must also have the proper tread depth to ensure sufficient traction. “Worn tires on icy or snow-covered roads can add risk to an already dangerous driving condition,” he related. “Ensuring your vehicle’s tires are at optimal levels during wintry weather can reduce the possibility of unscheduled removals, improve safety, and maximize uptime in challenging conditions.”

Don’t forget FOHs

Webasto’s Tommy Smith provided a winterizing checklist for fuel-operated heaters that includes the following:

- Clean air filters to maintain unobstructed airflow and prevent the accumulation of dust and debris by using compressed air or washing it with water.
- Inspect fuel lines for deterioration, cracks, leaks, or connections that are not secure.
- Assess electrical connections and wiring, looking for signs of wear, corrosion, or connections that are not snug.

Cheaper isn’t better

For Tom Stencil, the adage ‘You get what you pay for’ is wise advice when it comes to preparing trucks, tractors, and trailers for cold weather operation. “There are a lot of not-so-good parts that are not good quality,” he said. “While you might get lucky with a less expensive product, the gamble is usually not worth the savings.

“OEM quality products have been tested to withstand winter operation,” Stencil added. “The last thing you want is to save a dime here and pay a dollar later because you had trouble with a less expensive component, part, or product.”

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THE EMISSIONS SYSTEM EXORCIST

THE POWER OF DIAGNOSTICS
COMPELS YOU.

By Gregg Wartgow

[AFTERTREATMENT]

A

n aftertreatment system failure can be a frightening prospect for a fleet's bottom line. That's because in the long term, the costs related to roadside service, downtime, and repairs can haunt a perfectly normal maintenance budget. In the short term, tracking down and exorcising the root cause can feel like a futile exercise in hunting ghosts. Once you think you've found the phantom problem—poof—it vanishes.

To truly bust the ghosts in the machines, first and foremost, technicians need a disciplined approach to troubleshooting, but it also helps to know when those efforts have reached a dead end. To help reanimate your trucks, *Fleet Maintenance* has communed with leading aftertreatment experts to dig up common diagnosing missteps.

Mistaken identity

One of the biggest missteps a technician can make is to hastily presume—and take action on—upstream leaks that *could be* to blame. And this isn't something that only happens once in a blood moon; it's actually a regular occurrence in the shop.

Steve Hoke, president of Diesel Emissions Service (DES), sees “NOx sensors changed out all the time” to resolve an aftertreatment fault code. “But a day or week later, the truck has the same issue because replacing the sensor didn't repair the root cause.”

The devilish DTC is summoned more often by dosing issues or a bad electrical connector in the harness, he explained.

“This does cause additional stress on both the customer and shop,” Hoke added.

An OEM-label NOx sensor runs more than \$300, which isn't so scary, but then you have to factor in labor and downtime, as well as when the shop, either in-house or external, can service the truck. One phantom problem can end up costing a fleet thousands.

“There are just so many components that have to work perfectly,” Hoke said. “Furthermore, even the best aftertreatment system relies on an engine that is running almost perfectly. There's a lot to think about.”

Aside from the maligned NOx sensor, diesel particulate filters can also be cast in a bad light.

“The DPF always *gets* the blame, but rarely *is* to blame,” said Jeremy Anderson, VP of sales at FSX Equipment, a manufacturer of DPF, DOC, and SCR cleaning equipment.

The hunt for upstream apparitions

What are some upstream apparitions a technician should be on the lookout for?

Don Kirkpatrick, director of reliability and uptime at Penske Truck Leasing, offered some guidance.

“At intake, there can be restricted air filters and intake side leaks that can reduce the oxygen available for the in-cylinder

burn process,” Kirkpatrick said. “Within the engine itself, there are sensors and system controls. Those include wiring issues, faulty sensors and ECM, as well as failed intake components, boost control, or fuel system.”

He added this could also include failed internals, such as excessive oil consumption, an incorrect valve adjustment, compression loss, internal coolant loss, and burning coolant.

“In the seventh injector, there are sensors and system controls, clogged injector posts, and leaking or inefficient injection,” Kirkpatrick said.

You can't forget about the EGR either. “There can be clogged coolers and tubes, and carbon-packed sensors,” he reminded.

According to Hoke, the EGR has gained a ghastly reputation for developing hotspots and cracking. Some of that can be traced to design issues, but other causes include internal leaks and over-fueling.

Ryan Fox, owner of Fox Truck & Tractor in Canton, Ohio, said the EGR cooler is the first place he looks when a customer comes in with a DPF-related problem.

“I have come to look at EGR coolers as a maintenance item,” Fox said. “I would rather just replace one at 500,000 miles as opposed to just letting it go completely out. That coolant can ruin a diesel oxidation catalyst (DOC), which can create even bigger problems.”

Fox provides in-depth maintenance tips on his YouTube channel, *Trucking & Fixing With Ryan*, and other social channels.

As a general rule, technicians should always remember that the job of the aftertreatment system is to clean up what's coming out of the engine.

“When something isn't working properly on that engine, the aftertreatment system just can't keep up,” said Scott Meek, diesel training manager at Diesel Laptops, a provider of diagnostic tools, repair and parts information, and technician training and support. “You end up with an aftertreatment assembly that becomes restricted. The technician troubleshoots the aftertreatment system and resolves that but never addresses the engine. They send the truck on its way, but the same issue comes up again. When it comes to solving the toughest aftertreatment issues, solving the upstream issue is the ticket.”

Night of the living dead DOC

The technician still has to resolve the aftertreatment failure, too. Any upstream failures can wreak havoc on the aftertreatment system, starting with the DOC and creating a domino effect.

Regarding the DOC itself, it's difficult to know if it has failed unless there is face plugging or other visible damage. Cleaning a DOC won't help if the catalytic coating has been compromised, which is nearly impossible to detect without sending the DOC to a lab for analysis.

“The best thing to do is think about the relationship between components and how the aftertreatment system works,” said Dave Jerman, sales director for Roadwarrior Inc., a provider of aftermarket DPFs and other aftertreatment parts.

If a vehicle is having regen issues, Jerman advises that technicians use the truck's history as a guide.

“The vehicle's ECM records every active regen event,” Jerman said. “Download that history and look for trends. As an average, maybe the vehicle was regenerating every 200 hours or so. Then the frequency started to increase. The technician cleaned the DOC, but the frequency didn't change. Then it's important to look at vehicle service history to see if any upstream issues may have poisoned the DOC. If the vehicle had a blown turbo, EGR coolant leak, or bad in-cylinder injector within the 12 months preceding the DPF failure, you know the DOC has been compromised to some degree. It's possible that the DOC isn't dead on arrival, but it could be getting weak in the knees.”

For this very reason, Hoke said it's important for a technician to perform a DOC efficiency test. A poisoned DOC may continue to limp along for a while. But the DPF will continue to prematurely overload with soot because the DOC isn't doing its job

“The DPF always gets the blame, but rarely is to blame.”

Jeremy Anderson,
VP of sales, FSX Equipment

» Visible soot on the outlet side of a DPF is an indication of internal cracking. When this is the case, the DPF should be replaced.

Roadwarrior





» Before cleaning the DPF, check for damage such as cracking or pitting.

FSX

correctly. DES service facilities use a diagnostic tool to perform a DOC efficiency test as well as DPF and SCR efficiency tests on every truck that comes in with an aftertreatment issue. “It only takes about 15 minutes and gives us a quick baseline of what is going on,” Hoke said.

Although cleaning a DOC will not restore a poisoned catalyst, there could be instances when cleaning is definitely a worthwhile measure. In fact, FSX Equipment’s Anderson said some fleets are making it standard practice.

“When you pull the DPF off, you may as well inspect the DOC for any damage, like cracking or pitting,” Anderson said. “If there is any face plugging, you should pull the DOC and clean it. We’re seeing a lot of fleets that are just cleaning the DOC right along with the DPF. It’s one of those things where you might as well do it while it’s accessible. Plus, it only adds a few more minutes to the process.”

Edgar Velazquez, co-owner of Brothers DPF Cleaning in Bakersfield, California, agrees. He’s a user of FSX cleaning equipment, and always encourages his customers to have their DOC cleaned. “We charge the same price to clean both the DPF and DOC,” Velazquez said. “With the DOC, we always bake it and blow it out. We bake and blow 90% of the DPFs we clean, too.”

Downstream demons

There are also some debilitating aftertreatment issues that can arise after the DPF. Sometimes it’s something relatively simple.

For example, there could be instances when the aftertreatment components all check out fine, but the vehicle is still throwing a fault code for backpressure. Roadwarrior’s Jerman said the technician should stop and think about how the system works.

“A backpressure tube runs from the DPF port to the backpressure transducer,” Jerman explained. “Sometimes that tube springs a leak or just becomes crimped. These are the types of aftertreatment issues a diagnostic tool won’t solve for you. Diagnostic codes will help point you in the right direction, but then you have to do some work to find out what’s really causing the issue.”

That’s good advice when it comes to DEF-related issues as well. “With the DEF system, we have seen issues with sensors and system controls, as well as contamination due to the wrong fluid or non-approved mixtures being used, or just a general failure of the DEF delivery system,” Penske’s Kirkpatrick said.

Fox has run into several instances where SCR efficiency didn’t test high enough. On many of those occasions, the SCR had become face plugged with crystallized DEF due to a leaky DEF injector. “Since we have equipment that can clean an entire Detroit 1-box, we’ll get that SCR clean and help the customer save up to 75% by not having to buy a replacement,” Fox said.

Sometimes, however, the SCR has a bigger problem than crystallized DEF.

“In my mind, the toughest aftertreatment issue is low NOx conversion,” said Josh Barstow, dealer technical product and services training supervisor at Daimler Truck North America, whose brands

Regenerating your DPF cleaning strategy



» James Wendt of DPF Guys in Atlanta stands next to an EvacuBlast DPF cleaning cabinet in his shop.

DPF Guys

In many instances, a DPF failure is the result of an upstream failure. In some cases, however, the blame rests squarely on the DPF—or perhaps those who failed to properly maintain it.

What’s a good maintenance schedule?

“It really has a lot to do with duty cycle,” said Jim Sutherland, director of equipment sales at Enviromotive, manufacturer of EvacuBlast DPF cleaning and testing equipment.

“We like to throw out 100,000 miles as a starting point,” added Jake Litell, an Enviromotive sales representative. “If you’re idling a lot, it could be sooner. If you’re always on the highway, it could be longer.”

The point is that you want to stay ahead of any issues. You also want to make sure the DPF is cleaned really well.

James Wendt, managing partner at DPF Guys in Atlanta, uses EvacuBlast DPF cleaning equipment. He has a compressed air/vacuum machine and an aqueous flush system. Wendt often uses both methods to ensure a cleaner DPF that’s ready to resume service.

“Of the 300 or so DPFs we clean a month, maybe two or three actually have to be condemned,” Wendt said. “But 99% can be cleaned. You just need to have the right cleaning equipment and cleaning process. The goal is to get that DPF as close to new as possible before it goes back on the truck.”

Another goal is to keep downtime to a minimum while still ensuring that your DPFs are properly maintained.

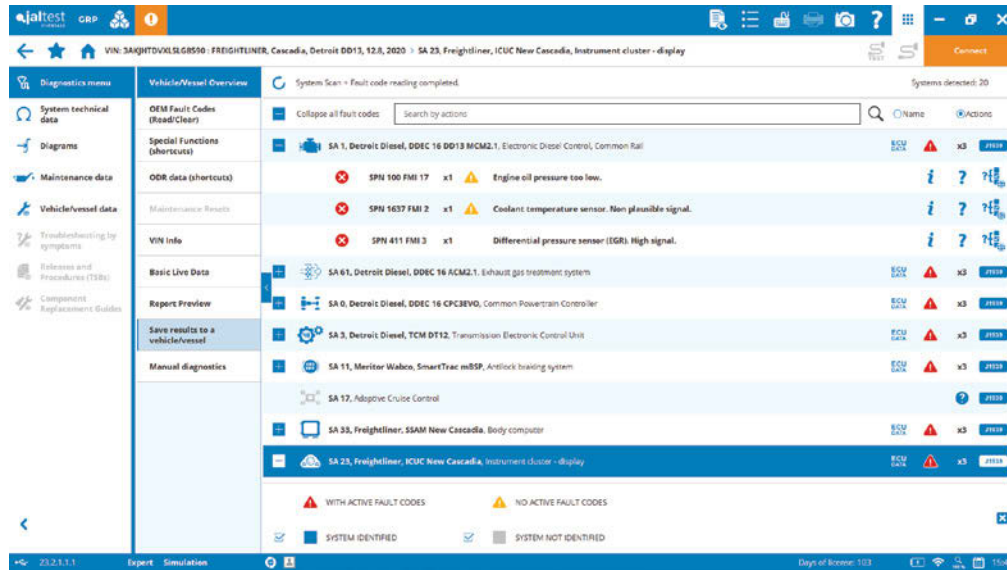
MIXED FLEETS: Managing Maintenance Challenges

In today's complex fleet management landscape, numerous factors influence a fleet's composition. Variables like cargo types, travel distances, and maintenance considerations play a key role in determining the vehicle quantity, choice of manufacturers, and associated costs. However, what are the primary maintenance challenges that mixed fleets face, and how do these challenges relate to diagnostic tools?

Fundamentally, the diversity in manufacturers relates to electronic systems. Modern vehicles incorporate an increasing array of onboard systems, including engines, brakes, and transmissions, often manufactured by different OEMs. This results in a single vehicle typically featuring components from 3 to 6 different system manufacturers. When performing maintenance and repair tasks, mechanics must communicate with these Electronic Control Units (ECUs), requiring the use of OEM-specific diagnostic tools. Using a different tool for each system is not only impractical but also expensive, and in some cases, it's not even feasible.

Addressing this challenge becomes particularly crucial when fleets opt for in-house maintenance and repair actions. Fleet owners must carefully consider the specific needs of their fleet when deciding on the most suitable diagnostic tools. For a fleet of vehicles from a single manufacturer, it might make sense to work with fewer OEM tools, but is this the optimal approach? In the case of mixed fleets, opting for an all-makes tool could prove to be a more convenient option, simplifying the mechanic's workflow, reducing the learning curve, and saving time and costs.

Varieties of All-Makes Tools: In the world of diagnostic tools, options abound. They range from basic, cost-effective handheld devices that merely read fault codes to mid-level



Jaltest Software Preview of a System Display for a Freightliner Cascadia

tools that offer limited bidirectional actions alongside code reading. At the top end of the spectrum, there are advanced tools, that integrate proprietary diagnostic actions and comprehensive dealer-level bidirectional controls.

Advantages of Using Advanced All-Makes Diagnostic Tools Versus OEM/Dealer Tools: The benefits are clear – more efficient repairs translate to time and cost savings. Why? Because the technicians would be dealing with just one tool, things become more manageable: a single learning curve, just one license renewal process, a unified mechanic support, and one environment for everything diagnostics.

Introducing Jaltest Diagnostics: Positioned as a “Dealer-Level” All-Makes tool, Jaltest Diagnostics by Cojali distinguishes itself from competitors with its extensive coverage and unique integration of technical and repair information within a single diagnostics platform. Imagine receiving a fault code and instantly accessing a troubleshooting guide. Better yet, it directs you to the replacement guide for the affected component. You identify the issue and learn how to replace it,

with the electrical diagram guiding you on ECM connections. This seamless logic extends until the repair is 100% complete. With everything integrated, mechanics no longer need to hunt for manufacturer specs in other tools, make calls to dealerships, or search endlessly on the internet. Jaltest is an intuitive and user-friendly tool designed to guide technicians through the repair process, boosting their productivity while saving significant time and money in the long run. Cojali has over two decades of experience in diagnostics and operates in over 100 countries. We use our understanding of various markets, along with insights from Jaltest users, to consistently create competitive diagnostic solutions.



Jaltest Commercial Vehicle Kit



» Fox Truck & Tractor promotes the fact that it cleans not only the DPF but also the DOC and SCR. The shop's Filtertherm DPF thermal oven is capable of cleaning an entire 1-box aftertreatment unit.

Fox Truck & Tractor



» DPF Guys can restore "99%" of the DPFs they clean, the shop says.

DPF Guys



» Filtertherm's aqueous DPF cleaning machine is a computer-controlled system that flushes debris with 600 gallons of low-pressure, recirculated water.

Filtertherm

Bringing cleaning in-house

When fleets begin moving toward a more frequent DPF cleaning interval, the idea of bringing cleaning in-house becomes more intriguing. This is especially true if the fleet is also looking to get more proactive with cleaning the DOC and SCR.

Steve Hoke, president of Diesel Emissions Service, said their most successful fleet customers adhere to a regular maintenance regimen on all stages of the aftertreatment system. "These fleets start crunching the numbers on what it would cost and how much downtime they could save," Hoke said. "When cleaning in-house, it's possible to pull, wash, dry, and reinstall a DPF in a couple of hours. That's a same-day procedure, and the vehicle is back on the road."

According to Jeremy Anderson, VP of sales at FSX Equipment, if a fleet wants to see a positive ROI on its aftertreatment cleaning equipment within a year or so, it's going to need around 100 vehicles. That said, a smaller fleet of even 10 to 15 trucks could still see a quick ROI. The trick is creating additional income by offering cleaning services to other truck owners.

Daniel Barandalla, owner of D&I Farms in Fresno, California, is one such fleet owner. He purchased Filtertherm cleaning equipment to take care of his own 35-truck fleet after becoming frustrated with long wait times during COVID. He has since developed a standard practice of cleaning a truck's DPF once a year during its annual inspection. A truck has generally accumulated 120,000 miles at that time.

Now Barandalla has a second company, D&I DPF Cleaning, that services other fleets. "I started out cleaning for my inner circle of truck-owner friends," Barandalla said. "Word got out pretty quickly and the business has grown. I have my own team of technicians who also handle the DPF cleaning for our customers. It has worked out very well."

include Detroit engines, transmissions, and after-treatment systems. "Sometimes a DPF becomes too clogged. The system wants to regen and get to its light-off temperature, but there's too much hydrocarbon built up in the DPF. That can cause an overtemperature code. When that happens, the SCR will likely end up failing because it has been compromised by whatever has been causing the excessive hydrocarbon buildup in the DPF."

According to Barstow, the technician's first step is to test the sensors. If the sensors test OK but the DPF continues plugging up, the root problem is likely upstream of the aftertreatment system. Barstow stressed the importance of following a troubleshooting guide like the one Detroit developed.

"We've captured every possible avenue that could result in low NOx conversion," Barstow said. "It could be something simple like a bad sensor or something more serious like a failed SCR. The thing is, an SCR may continue working for six months to a year after an upstream problem caused DPF over-temperatures. But the SCR continues to degrade over time until it won't convert NOx efficiently anymore and typically needs to be replaced."

But the technician's work isn't done. The root cause of the excessive DPF hydrocarbon build-

up and ensuing overtemperature needs to be resolved. Tools like Detroit's Virtual Technician can help analyze fault codes to paint a historic picture of what happened.

Let's say everything checks out with the engine. But the technician notices a long stretch of low-boost codes and DPF overtemperature codes from about six months ago. Now they can look into the vehicle's repair history.

"If a plugged air filter was found and replaced a while back, and then the low-boost codes went away, that could pinpoint why the SCR is now starting to fail," Barstow said. "The technician should now confirm that the current air filter is in good shape, along with making sure any other engine health issues are found and addressed to avoid a repeat problem."

Turning techs into ghostbusters

As an independent shop owner, Fox said he needs to ensure as much diagnostics coverage as possible. That's why he uses two diagnostic tools, Snap-on Pro-Link and Cojali Jaltest.

"I really like Jaltest for its ability to not only diagnose difficult aftertreatment issues but also provide further repair assistance," Fox said. "When you open up a specific fault, you get a built-in troubleshooting tree. You even see actual photos of what you're working on, not just some drawing. That helps us locate where things like sensors are and makes the repair go smoother."

In most instances, good diagnostic technology must be supported by manual detective work. Case in point, Fox had a customer bring in a 2012 truck with the first generation of the 1-box. That unit was a pneumatic system. After cleaning the entire 1-box, which was packed full of crystallized DEF, Fox started the regen process.

"I had to keep trying because it wouldn't pass," Fox said. "The odd thing was that the NOx level on the outlet side was double the inlet side. That's impossible because you can't create more NOx than is already in the system. So I pulled the compressed air line off the metering unit and

found oil inside. Working backwards, I found that the air dryer had failed a while ago. The truck owner purchased a lower-quality replacement that wasn't providing the clean air this older 1-box needed. All of that contaminated air ended up poisoning the SCR."

That's a great example of how upstream issues could be lurking just about anywhere.

It's also a reminder that solving the scariest aftertreatment issues often means finding the resolve to resist the easy way out and exorcise those accursed faults once and for all. ▀

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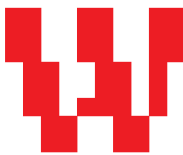
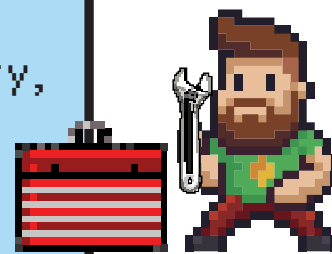
SHOP OPERATIONS

GAME ON!



Gamification can be the powerup shops need to reach higher scores in efficiency and productivity, while making work a little more fun, too.

By John Hitch



With most maintenance shops offering comparable pay, shop owners and managers must distinguish themselves in other ways to attract and retain labor, while at the same time motivating them to be as safe, productive, and efficient as possible.

Money alone can't buy consistent productivity or loyalty—all you get are maintenance mercenaries who will leave when the job gets too hard or boring. There's also the threat that another shop gives them a better offer. You can differentiate your operation, though, by making it a place where technicians, service writers, and parts personnel look forward to working 40+ hours a week, 50+ weeks a year.

"Work doesn't have to suck—you should have fun," offered Chris O'Brien, COO at Fullbay, which provides shop management software and regularly hosts virtual discussions on how shop owners can better connect with their workers.

"Going to work day in and day out where it actually feels fun and engaging can make a huge difference," added Jacob Findlay, Fullbay's founder and executive chairman.

There is a science to fun, though. Fullbay's platform collects and measures data to help maintenance operations increase productivity and revenue. Findlay advises that fleets and shops ought to combine their data with some friendly competition and rewards. This will in turn help the whole shop reach a winning strategy for uptime and efficiency.

In short, turn work into a game.

This is something we all knew intuitively as children, but the stresses and responsibilities that come with age have a way of shoving such notions into the recesses of our minds. The grown-up word for it is gamification. This is basically leveraging techs' competitive nature, along with incentives such as cash bonuses, trophies, trips, and intrinsic rewards, to help achieve a company goal, whether that's completing a project on time, boosting revenue, or improving quality. Let's call it what it is: a way to make work suck less.

And this strategy, which has been formally around for more than a decade, is growing in popularity among fleets.

"Gamification is being used more and more among commercial fleets," said Belinda Rueffer, Fleetio VP of marketing, based on customer conversations.

"What started as a fun way to get drivers engaged in building a culture of safety—by

creating safe driver leaderboards and tying financial and recognition-based rewards to drivers who exhibit safe driving habits—has now extended beyond safety to driver engagement in general, and even into in-house and outsourced maintenance shops."

Rueffer believes gamification is more than "a passing trend" and sees it "as a gradual shift that helps fleets recruit, engage, and retain top talent."

One of Fullbay's customers, Iron Buffalo Truck and Trailer Repair (formerly JE-CO Truck & Trailer), has found that gamifying the shop does that and more. The shop's business model is to provide premium service that costs less than a dealership, so happy, focused, and productive technicians are essential.

"We try to come up with creative ways to inspire them," said co-owner Mike Schwarz at the 2023 TMCSuperTech competition in Cleveland. He and the shop's other owner, Austin White, were there to support their director of training and technician development, Ian Matje, who won the Automated Manual Transmission, EV, and cybersecurity stations in the heavy-duty track.

The Denver-based shop offers weekly, quarterly, and annual contests based on billable hours. The weekly and quarterly winners get some extra cash, with the quarterly winner earning a coveted trophy depicting the Hulk ripping his shirt off. Techs keep them on their toolboxes as a symbol of pride, or perhaps dominance.

The top biller of the year gets a trip for themselves and their significant other. The first winner chose Hawaii. That choice somehow took Schwarz and White by surprise. They hadn't planned on such an extravagant locale, but did find a way in the budget to honor the request, and the other techs were more motivated than ever to win. Iron Buffalo also brings on apprentices from local schools, and in the program's three years, all have chosen to stay on at the shop.

"And they're billing consistently—50 to 70 hours a week—as 19- or 20-year-olds," offered White, who added they "are extremely loyal." Matje, a former diesel school instructor, was hired six months ago to run the apprenticeship and overall training.

"They are worth every penny that we've invested in the program and extremely loyal," White continued.

The gamification is enabled by the standardized training Matje provides. Together

they serve as a major shop powerup.

"What we see is that there is a return in terms of the productivity of the staff and the quality of their work and a reduction in comebacks, and in turn the amount of revenue that we can generate with the same space," Schwarz said.

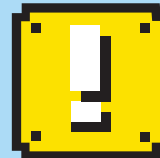
Getting started isn't all fun and games, though. There's a science to gamifying a shop, and the strategy can take many forms and fail in many ways. Here's a guide that should help get you started.

Ground rules



Before you decide on fun stuff, like how the game will be played and what the rewards will be, you have to establish some basic rules, such as what company goal you want to achieve or metrics you want to improve.

"As far as driving operational betterness or improvement, you've got to have alignment between whatever you're measuring with this gamification and what you want to achieve as an organization," Findlay explained. "It can't just be going around and shooting each other with Nerf guns and calling it 'gamification.'"



Hint #1 Decide on metrics and KPIs game will improve

An easy target is technician efficiency. For this, take a technician's total hours worked and divide by hours billed.

"If they bill 30 hours in a week, and they're on the clock for 40 hours, that would be 75% efficiency," he said.

Gamifying utilization can also unearth some hidden inefficiencies.

"You might have a hotshot tech who can get 40 hours worth of work done in 20 hours, and then sits around for another 20 hours," Findlay said. "What if we could get them to work the other 20 hours?"

A tech being utilized only half of the time should signal to leadership they need to find a way to keep them more engaged. This could also help a shop identify really efficient techs who need help billing more hours.

MAINTENANCE KOMBAT

In a competitive market for technicians, internal competitions have proven a great tool for recruiting, training, and retention.

By John Hitch

There's a battle for resources going on in the vehicle repair space, and for some fleets and shops, it could be to the death (of their business). According to TechForce Foundation's 2022 Transportation Technician Supply & Demand Report, post-secondary graduates declined across the board in 2021: automotive (-11.8%); diesel (-2.6%), and collision (-0.4%). The COVID-19 shutdown likely played a large role, but overall, diesel and collision were down a combined 17% over the last five years, the report found.

Combined with demand increasing from Baby Boomers and even some Gen Xer's aging out, this lack in supply will create even more competition. TechForce estimates that demand for new-vehicle repair techs will hit 900,000 through 2026. Several other trades are also in high demand. The American Welding Society said between 2023 and 2027, the U.S. will have a shortage of 360,000 welders, while TechForce predicted the aviation industry will need 78,000 entry-level techs between last year and 2026.

This all means competition for good young technicians could get ugly—and soon.

Rush Enterprises employs more than 3,000 technicians at its 200+ locations, and a while back realized they had to prepare “for the exodus of the older generations,” noted Victor Cummings, Rush VP of service operations. They found a balance by hiring more lower-level techs and training them to reach the highest tier, Level 5.

Now, 70% of its technicians are Millennials or Gen Z (born in 1981 or later), with a fairly even distribution across the five levels. “Those are pretty overwhelming numbers, if you go back to where we were several years ago,” Cummings said.



» A Rush technician trying to diagnose his way to the top spot in the 2022 Rush Rodeo.

Rush Enterprises | Fossum Studios

Boomers only comprise 28% of its top-level techs, he noted.

To remain competitive in the field, Rush has also devoted a great deal of training resources to its annual internal skills contest, the Rush Rodeo. Leadership identifies what areas the maintenance teams need to work on, and those are the focus of that year's event.

The top 10% of the 2,000 leasing, parts, sales, and service employees ventured to San Antonio last year for the 17th Rodeo, where Rush gave away \$300,000 in cash and prizes.

“The rush rodeo has been a motivator for years,” said Javier Gonzales, director of service at Rush, who added it's a great tool to attract new hires as well. “It allows our employees to showcase their talent but also earn prizes and money.”

With so much on the line, technicians spend a lot of time studying up to earn the right to compete. And they learn even more from other top techs there.

“They go back to their home dealers with knowledge that they didn't have prior to the rodeo,” Gonzales said, adding that those who didn't win double down on

deficiencies and “come in with more hunger the following year.”

Penske Truck Leasing, which has nearly 11,000 techs, also puts on a skills competition called the National Tech Showdown every other year with the same intent. Sixteen finalists, out of the company's 1,623 who tried out in district and regional contests, were invited to Team Penske Race Shop in Mooresville, North Carolina, all vying for the top prize of \$25,000. Each finalist took home at least \$2,000, and all were invited to the Indianapolis 500 in 2024.

“I think that people want to be like [the finalists], and that then enables our training to kick into an even higher gear,” explained Art Vallely, Penske Leasing president. “Once they see this, there's a momentum created, and [other Penske technicians] aspire to get involved.”

While a high-stakes competition, the Showdown 2023 winner, Tommy Bass, said it's teamwork that helped him win.

“I wouldn't be here without the basics, and I wouldn't be here without people that took the time to teach me what I know,” Bass said.

One of those mentors was Sal

Boemia, who is Bass's area maintenance manager in the South Central Area.

“When I came into the industry, there were far more technicians than there were jobs,” said Boemia, who started in the 1980s. “Now, it's the opposite. There are no techs out there, so you really need to build your own.”

Penske's rival, Ryder, has hosted a Top Tech Skills Competition since 2002. This summer in Detroit, Cody Morris, a T4 technician in charge from Kentucky, won the top spot and \$50,000 prize. He beat out nine other finalists and about 2,500 Ryder techs overall.

Chris Barnett, a two-time Ryder Top Tech and TMC SuperTech Grand Champion, helped mentor him.

“Working with those smarter guys like that, it just rubs off,” Morris said. “It's their questions on some of the stuff I don't see every day that helps to keep me on top of different things.”

Not every fleet and repair shop has the resources to put on internal competitions, but they can enter state-level contests provided by their trucking associations or the national skills competition held by TMC.

Then talk to the would-be players, the technicians or other employees involved, about what type of game would keep them engaged. Without willing participants, a game is not much fun, after all.

Make sure the game is winnable, (so don't set unachievable goals), O'Brien explained. Playing the game must also drive positive employee behavior. He added that it is important to encourage overachieving on the goal, so don't cap incentives once players reach 100%. Even a gamer who considers themselves a 'completionist' will likely stop at that point. Video games may have an end screen, but profitability does not.

Do no harm

Unlike video games, there are no extra lives in the real world, so like with anything in the transportation industry, safety should not be sacrificed, no matter what. If your goal is to increase mean time to repair, and your shop mostly does brakes and wheel-end service, incentivizing your techs to speedrun through service is a dangerous proposition.

Even if it doesn't result in game over for someone on the road, sloppy work will kill repeat business.

"There is a difference between a speedy, quality repair that should be rewarded compared to a fast (shortcut) repair that increases revenue for the shop, but may lead to a return or unhappy customer because something was overlooked due to trying to increase sales numbers," warned Duane "Doc" Watson, a technical trainer at Bosch.

This doesn't mean it can't be done; it just can't be done carelessly.

"Auto repair shops can use gamification techniques to improve their mean time to repair/replace while maintaining safety by simply prioritizing safety alongside speed," Watson noted. "However, applying game-like elements to automotive repair, including brake jobs, such as rewards or challenges, takes a thoughtful approach. Shop owners must consider how they implement it before proceeding."

Watson advised that shops implement mandatory quality "checkpoints" to ensure the repairs go smoothly.

Iron Buffalo does track the comebacks, and the foremen and the general manager have their own



Hint #2 Never sacrifice safety for speed; create quality check points.

game going on: Who wants to lose their bonus?

"If the comebacks are too high, it lowers their bonus anywhere from 10 to 40%," explained Schwarz, a certified Agile coach. Cleanliness is scored on a 40-point inspection twice a week for each shift. Both serve as a "checks-and-balances" system to ensure quality.

Breeding resentment can be another pitfall. There is a fine line between friendly competition and "toxic competitiveness," Findlay noted. Any incentive or prize cannot come at the cost of overall shop productivity or morale.

"You don't want the employees competing against each other; you want them competing against a benchmark so that everybody can hit it," he said.

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Big Lifts for Big Vans

One of the lasting effects of the pandemic is the proliferation of full-size vans. While big vans have been popular with plumbers and other service providers for many years, the growth of home delivery of, well, everything, combined with the popular #vanlife movement, have driven van sales to levels unheard of since the 1970s.

Many of the hot “European style” vans — Ford Transit, Mercedes-Benz Sprinter, Ram ProMaster, and new EV models — that dominate fleets are available with high roof heights. These roofs, which can be more than 9 feet high, enable the vans to carry more cargo and equipment while also allowing drivers to stand up and walk around inside, making the vans useful as mobile offices or shops.

If your fleet includes full-size, high-roof vans, having the right lifts to service them can help maximize technician productivity and vehicle uptime.

In the U.K., where the Transit van is as common as a pickup truck is in the U.S., many workshops have installed two-post baseplate lift models instead of the clear-floor models that are more popular here. That’s because clear-floor models have a top beam that can get in the way when lifting tall vans.

So, does that mean servicing vans requires buying baseplate lifts? No.

Baseplate lifts have some drawbacks. The steel cover plate that mounts on the floor spanning the two columns in a baseplate model sits about two inches off the ground. Its primary purpose is to protect the lift hydraulic lines and equalizer cables running between columns. And while it’s fairly easy to drive over, it can be a hindrance when trying to push a non-powered vehicle into the bay. It also gets in the way when moving oil drains or transmission jacks under the raised vehicle. A clear floor model, on the other hand, has an unobstructed floor between the columns.

While it may appear that the cover plate provides support for the columns when the lift is loaded, it does not.



Without the bolstering advantage of a top beam, the anchor bolts holding the columns are always under extreme load as the columns tend to lean inward toward each other. That’s why two-post baseplate lifts require a very solid concrete foundation.

Fortunately, it is possible to get all the advantages of a clear-floor design in a two-post lift designed to accommodate taller vehicles. A traditional two-post lift has a top beam positioned around 12 feet high, which limits a technician’s ability to raise a high-roof van to around 55 inches. That’s less than ideal for anyone over four feet tall! But a two-post model with an extended height top beam that’s 13 to 14 feet high will provide more working room.

There are plenty of options. Many commercial vans weigh less than 9,500 lbs., so a lift with 10,000 lbs. rated

capacity and extended height top beam could be a good choice, if it can reach the manufacturer-recommended lifting points and the van isn’t carrying a heavy load. The triple-telescoping nested swing arms on the new BendPak 10APX, for example, reach more pickup points than ever. Plus, it offers the versatility of both symmetrical and asymmetrical lifting with a 13-foot-high top beam.

For the biggest vans and those with heavier upfits, consider moving to a lift with at least 12,000 pounds rated capacity. Lifts like the BendPak XPR-12CL let you handle full-size vans and trucks, as well as smaller passenger vehicles.

If your shop has ceilings that are at least 14 feet high, don’t limit yourself. When you’re in the market for a new lift, consider those with higher-positioned top beams.

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“Because the whole goal is to get revenue and profit as high as possible, obviously, while you’re taking care of the fleets,” Findlay continued.

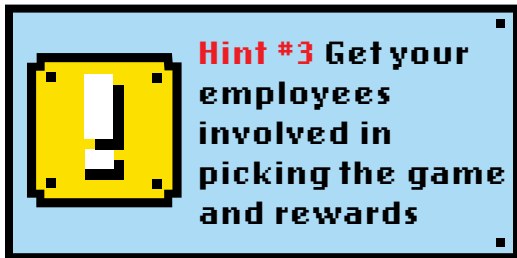
O’Brien also recommended that the game should have collective goals as well as individual rewards to encourage that one outperforming tech to help the slower techs get better.

“We all can independently win, but we can’t win big unless the team wins,” O’Brien said.

At Iron Buffalo, the owners learned another good rule: include all departments, not just the techs. Seeing the techs get bonuses and trips to Hawaii resulted in some division among other departments, Schwarz recalled.

“We had to figure out how to incent the rest of these guys to really care about this stuff and feel like we’re rewarding them like we’re rewarding the technicians,” he acknowledged.

The owners implemented a prize structure and visits to a Top Golf driving range. Service writer rewards are based on average price per ticket and cycle times.



Keeping score

Once the game is underway, data should be provided in real time and on a leaderboard.

Rush Enterprises, which operates 150 Rush Truck Care Centers, has a performance dashboard visible at every shop. It was an internally created system that displays relevant metrics from multiple sources, such as its SAP enterprise resource planning software.

“We have dwell analytics and all kinds of information on tech performance,” said Victor Cummings, Rush’s VP of service operations. “We measure productivity, efficiency proficiency, and what their effective rate is versus the door rate.”

According to Cummings, the monitor displays the job each technician is working on and their hours on the job. Each entry is color-coded based on progress compared to standard repair time (SRT). The job starts green, then morphs to yellow when approaching going over the expected time. It turns red when the tech is running behind.

Rush hosts an annual technician skills competition called Rush Rodeo and is “a pretty competitive company,” Cummings said, but fixing trucks is always a team sport.

Javier Gonzales, director of service at Rush, explained that the foreman’s dashboard, which was not initially accepted by techs, ended up making the whole unit stronger. “It actually allowed our technicians to help each other out,” he recalled. “They’d see another technician struggling—going over SRT time—and ask, ‘Hey, is there anything I can help with?’”

In addition, it helps management with performance reviews and helps locations discover what they do well and what needs to be

improved. This type of transparency is key to a gamification project’s success and a shop’s success in general.

“We’ve seen by exposing metrics and stuff that efficiency tends to go up,” said Findlay.

Findlay likened it to keeping score in a pickup game of basketball, where not keeping score leads to people just nonchalantly lobbing the ball up and not caring if it goes in.

“As soon as you start keeping score, suddenly everybody becomes engaged—and there’s no money involved in that,” he said.

According to a 2017 Gallup study, business units that reported high employee engagement rates were 21% more profitable. Highly engaged businesses also enjoyed a 17% increase in productivity and a 24% turnover reduction.

Intrinsic rewards


An important thing to keep in mind when deciding which employees should win is that it’s not all about the money.

Findlay referenced the Hawthorne effect, a sociological belief that a worker’s productivity increases when being observed due to intrinsic, or intangible, benefits. Once a worker has enough money to meet their needs, motivation should include—but also must extend beyond—cold, hard cash, he argued.

An independent shop, for example, can track each technician’s actual hours worked compared to hours billed, and put it on a leaderboard for all to see. When they see that they may have billed 38 hours while a co-worker has billed 46, Findlay said that “gets the competitive juices flowing.”

Jenny Baker-Ford, manager of fleet maintenance at Mike Albert Fleet Solutions, a leasing and maintenance provider, said this is even more true with younger generations.



 » Iron Buffalo (formerly JE-CO) gives these Hulk trophies to the top biller of the quarter.
Iron Buffalo Truck and Trailer



“When you’re talking about millennials, they think differently, and they need to be rewarded differently,” she said. “It’s not always about the money with them.”

Findlay agreed.

“You don’t motivate this generation by throwing chairs,” he said. “Do it in other ways, like gamification.”

Whether tied to a gamified reward or not, they might accept more time off as opposed to money or even recognition.

Rush’s Gonzales noted even recognition from leadership at a shop goes a long way.

“They recognize those technicians who go above and beyond to better serve our customers and get their asset back on the road,” the former tech said.

When team goals are met, the shop may even spring for morning tacos or even a food truck visit.

Fullbay’s O’Brien recalled during his time at Shamrock Foods, rudimentary gamified tactics worked like a charm. They boosted morale for a Six Sigma project by moving a paper goat up a mountain at the weekly meeting when goals were met and shifted cardboard football players down a fabricated field when revenue targets were hit.


“It changed the dynamics of walking into work every day because people wanted to see where we were at playing the game,” he noted.

As mentioned earlier, Iron Buffalo’s Hulk trophies are a physical sign of a job well done, though even digital badges can work. On the Fullbay app, bosses can award badges for mastery of preventive maintenance or earning a new certification.

Findlay noted shops can create a point system for various accomplishments and provide physical patches, such as a long stretch without comebacks or for solving an unusually tough diagnostic issue. Fullbay gives these to its own employees as intrinsic rewards when their actions reflect the company’s core values.

The “running into the fire” patch has a flame on it and signifies the employee is “the kind of person who runs in and helps somebody and resolves the issue,” O’Brien said. There’s also a work-life balance badge to discourage employees from getting burned out.

None of this should be considered a replacement for giving workers the wages they deserve, Findlay reminded.

“Obviously, you’re going to pay your employees—and you want to pay them well, but if you’re missing that intrinsic component, you’re missing out big time in terms of keeping your employees engaged, getting the absolute best efficiencies out of them, and probably retaining them as employees,” he concluded. 

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Six tips for smoother suspension inspections

With no end of the truck driver shortage in sight, providing a comfy ride might give your company a leg up on keeping drivers in the seats of your trucks versus finding employment elsewhere.

By Cris Beaulieu

Suspensions have the vital role of not only protecting the cab from bumps along the road but also cushioning the driver as well. Ensuring that heavy-duty trucks have a smooth ride makes for a happy driver, supporting employee retention and overall well-being.

But when components of air ride or leaf spring suspensions are worn or damaged, it can put drivers in an unsafe situation and cause poor ride quality, excess tire wear, and driver fatigue from inconsistent alignment due to suspension component wear or failure, according to Mike Adams, general manager at Blaine Brothers TruckAline.

Daily inspections can reduce downtime, and progressive damage can be avoided by identifying problems early. Components should be inspected by a reputable suspension repair shop if you believe there are signs of wear or failure, Adams emphasized.

Here are the top six areas of focus in suspensions, including how to identify problem areas and how to fix them, helping to smooth out the inspection process and ultimately creating a more comfortable ride.



» Look for signs of scraping around a bolt to determine if it's under-torqued.

Under-torqued bolts

The most typical damage happens because of loose fasteners that were not torqued properly at the initial install, said Mark Molitor, sr. product manager of chassis suspensions at Link Mfg. "Maybe it's only hit 75% of what it should have been torqued to," he noted.

Before you can tell for sure if a fastener is under-torqued, a shakeout test should be performed. "You want to drive around for 500 to 1,000 miles to shake things loose," Molitor explained. "Then the technician can go around and start looking for signs of movement."

The most apparent sign that sliding has occurred is if the area around the washer or bracket appears different than the surrounding area, typically because the loose brackets scrape off dirt.

A visual inspection is the preferred method over listening for clanking, Molitor said, because the suspension systems on a work truck, like a dump truck or cement mixer, are too far from the driver to hear. Plus, the symphony of other rattling equipment doesn't help. So stick with the eye test.



» Misting is a sign that the seals are lubricated, but oil runs show evidence of a leak.

Shock absorber leaks

Shock absorbers should be inspected for damage to the shock body or the rubber mounting component, advised Melanie Elliott, marketing manager at Hendrickson. A leaking shock is not an out-of-service issue, but Elliott warned it can lead to reduced service life, increased tire wear, and ride quality issues.

A warm shock still provides some level of damping, so take the truck out on a short trip and then feel the shock, Link's Molitor explained. Touch the frame rail to get a reference temperature, and if the shock is not warmer, it no longer provides the necessary damping, adding that a little bit of oil coming out is acceptable.

"That just means that it's keeping the seals lubricated. So misting is good, but runs are bad," Molitor said. "Shine is fine."



» Cracked edges on a bushing is evidence it's nearing the end of its useful life.

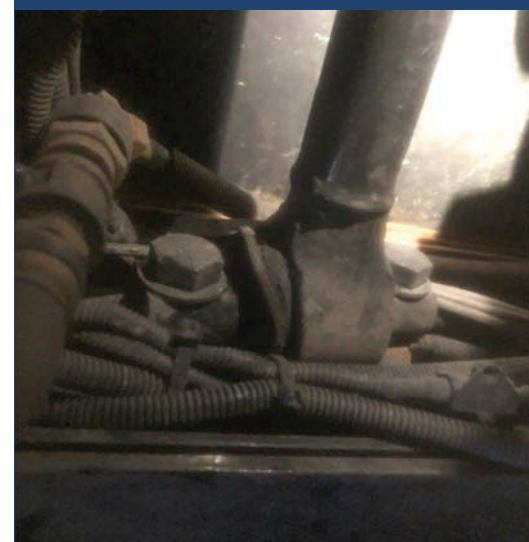
Link Mfg.

Worn rubber bushings

Molitor said worn bushings are likely the hardest to identify, since many bushings are not in easily seen places. However, if the bushings can be seen, then a visual inspection of the edges can help to determine if they are getting close to the end of their life. He said to look for tears, bulging rubber, or a bent spacer. If seen on a lateral control rod, for example, it may no longer be fully controlling the lateral position of the axle.

"You're going to start wearing out other suspension parts, and you'll start having excessive tire wear—at \$1,000 each," Molitor said. "You don't want a \$200 control rod having a set of (four \$1,000 tires) being worn out prematurely because of a faulty bushing."

Worn or damaged bushings can cause axles to track erratically, increasing tire wear and possibly reducing fuel mileage, Blaine Brothers' Adams said, adding that misaligned air springs may likely be an indication of worn bushings, alignment issues, or fatigued U-bolts.



» A bent spacer is likely the result of a worn rubber bushing.

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» Broken leaf springs can lead to complete failure and a road safety hazard.

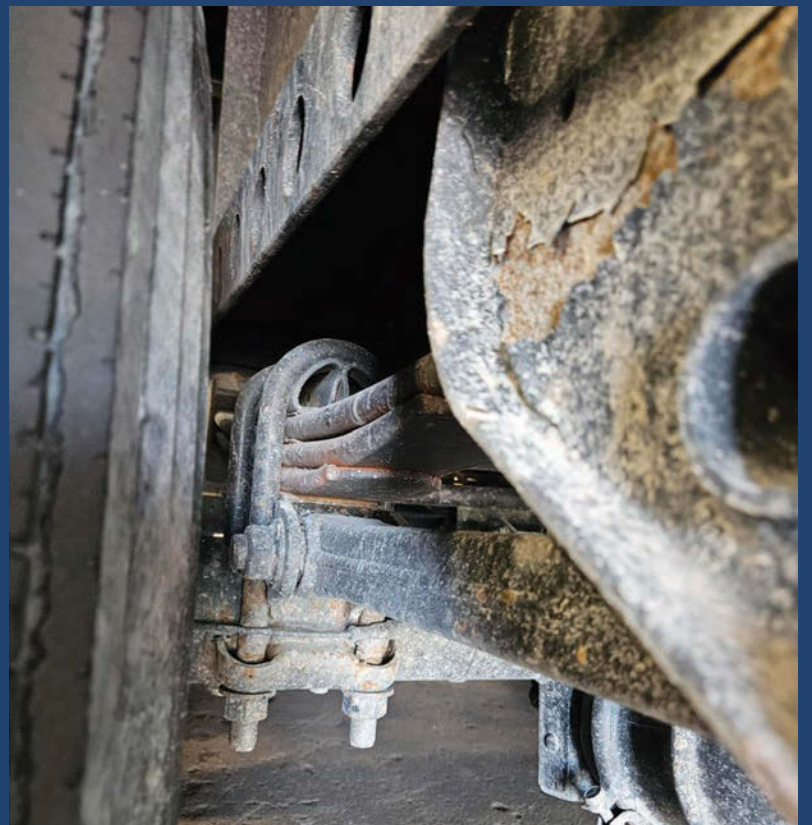
Mike Adams | Blaine Brothers TruckAline

Broken or damaged leaf springs

Broken or damaged leaf springs can cause reduced load capacity and misalignment, as well as becoming a road safety hazard if complete failure occurs, Adams said.

Rick Roy, project manager at EMCO, believes that under normal operating conditions, seeing general rust at the end of spring leaves is okay. But if it has a shiny, rubbing condition, something is loose and there's another problem at play, such as a compromised spring or failing bushings. Another possibility is that the spring is at the end of its useful life.

Tony Beninsky, quality continuous improvement manager at EMCO, added that he looks for any rubbing on either side of the radius to the left or right, which is cause for concern, but a wear mark is evidence the leaf spring is doing its job on the roads.



» Rust on the edges of leaf springs is typically not cause for concern.

EMCO

Scheduling suspension maintenance

Melanie Elliott, marketing manager at Hendrickson, encourages a routine maintenance schedule to maintain a long life and ensure safe operation, adding that no suspension system is maintenance-free.

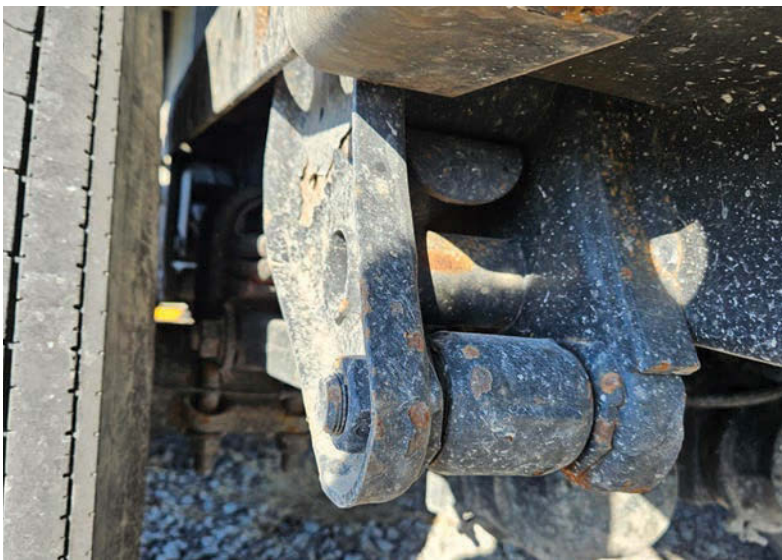
Elliot shared that the major inspection points for air suspensions include the following:

- Ensure that the ride height setting is correct.
- Inspect the air springs for damage or wear.
- Inspect pivot bushings for signs of excessive wear.
- Look for movement around bolted connections that can suggest loosening.
- Check control valves for damage or abnormal leakage.

- Check shock absorbers for leaking or mounting issues.

She also listed preventive maintenance points for leaf-spring suspensions:

- **Fasteners** – Loose, missing, or damaged fasteners
- **U-bolts** – Annual retorque, signs of movement
- **Springs** – Broken or shifted
- **Shocks** – Leaking, misting, broken, missing/loose fasteners
- **Control rods** – Split, torn, or shredded bushings; missing fasteners
- **Hangers/hanger pins** – Cracking, movement, or wear
- **Spring seats** – Cracking or signs of looseness indicating insufficient U-bolt torque



» Proper ride height starts with installation and should be checked regularly.
EMCO

Improper ride height

In terms of air suspensions, Hendrickson's Elliot recommends that ride height should be inspected during the pre-delivery inspection phase and then quarterly thereafter. The driver should also visually verify that the ride height is correct during his daily vehicle pre-trip inspection. Damage to the air springs or air control components may appear as a problem if the suspension ride height is set incorrectly, she explained.

"The designed ride height helps optimize suspension performance and helps maintain load equalization among the axles," Elliot said. "Operating an air suspension outside its specified ride height range can reduce ride quality, damage cargo, and increase suspension wear. To take full advantage of the benefits an air-ride suspension has to offer, each suspension on the trailer should be operated at its designed ride height."

The same goes for leaf spring suspensions. EMCO's Beninsky suggests that a ride height problem could've started in the bay during installation and not on the road.

"If there was no space under there, maybe they have the wrong hanger, maybe it's wrong spacing, or the arch on the spring is compromised," Beninsky said. "So it could be an installation or a modification somebody did, and they didn't have the proper parts to create that clearance." ▀



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» Graber finds it exhilarating to look back on his excitement at earning his first \$10,000 from his business. “Now, I can do \$10,000 by noon.”

Photos by Alex Keenan, Fleet Maintenance

Building and maintaining a LEGACY

Wyoming shop owner Jon Graber has grown his business from a single mobile service truck to two locations by focusing on his customers and employees.

By Alex Keenan

For Jon Graber, owner of Grabers Diesel Repair, turning wrenches isn't so much a job as it is a calling, and one that he's fostered since childhood. “This is all I know,” said Graber, who drew his first shop logo at nine. “My entire life has been working toward building a truck repair shop.”

And Graber, 45, who now owns two locations in Cheyenne, has put in the work to make that dream a reality. But Graber's dream has grown beyond shop ownership and into upholding a local trucking tradition that began in 1969. By doing so, he's ensuring any truck with maintenance issues rolling through the intersection of Interstates 25 and 80 will get their needs met.

Starting out

Of course, the first and most critical part of Graber's plan was to learn *how* to repair diesel trucks. The southeast Iowa native attended WyoTech, an automotive, diesel, and collision trade school in Laramie, Wyoming. He graduated in 2001, then headed about 50 miles west to Cheyenne. His first venture was modest—running a mobile repair business to service over-the-road vehicles.

“I took a camper trailer, gutted it, and made a mobile shop out of it,” Graber recalled.

But after about a year and a half, Graber outgrew the camper and bought his first service truck. A

year later, Graber hired his first employee. Then he hired another technician and purchased a third truck. After that, he would soon need to come up with a more permanent blueprint for his childhood goal, as his wife “got completely annoyed with all the trucks,” he laughed.

To stay in his wife’s good graces, Graber rented out a single bay at an industrial lot east of Interstate 25 that he shared with several other businesses. As demand increased, Graber rented two more bays in the same location. In 2017, Graber made his biggest expansion yet.

Opportunity knocks

Things really kicked into high gear when Graber acquired Art’s Truck Terminal, a one-stop-shop smack dab at the intersection of I-25 and I-80, started in 1969 by Arthur Grout. It included a service center, restaurant, fuel station, convenience store, showers, and even some sleeping areas. The Grout family, who previously sold the truck stop, offered Graber the service portion in 2017. Graber readily accepted, bringing his total bay count up to five.

The most striking thing about it is the view. The building stands on the outskirts of town, overlooking I-25. Looking out of the service bay, you can see a sweeping view of the vast western sky and empty green fields.

For Graber, a self-professed history buff, it was a chance not only to expand his business but also to own a small piece of local trucking history. He said he was drawn to the story behind this scenic shop—and thinking about how many truckers have come through this location over the decades.

“We still get guys that come through that remember riding in the truck with their grandfather and stopping off at our truck terminal to get a service and dinner at the diner,” Graber said. “Call me sentimental, but I like the story behind something.”

Art retired in 1989 and passed the business on to his children, and the family legacy lives on even with Graber as the new owner. Art’s grandson, Daniel Ruiz, stayed on as lead technician.

“It was the only truck stop up on top of the hill here before Flying J moved in years later,” Ruiz recalled. Art hired his son (and Ruiz’ uncle) Cliff Grout, to run the service side when he returned from a tour of duty in Vietnam.

Meanwhile, Ruiz’s father, who married Cliff’s twin sister, served as the general manager of the truck stop portion. Ruiz worked on that side for a while too, until his uncle recruited him for the shop when he was 17.

“I was just one of those punk kids,” the 48-year-old Ruiz said. “He came up to me and said, ‘Hey, do you want to learn how to work for a living? I’ll show you how to do that.’”

Ruiz isn’t the only of Art’s progeny to stay on. His son, Joseph, also works in the shop.

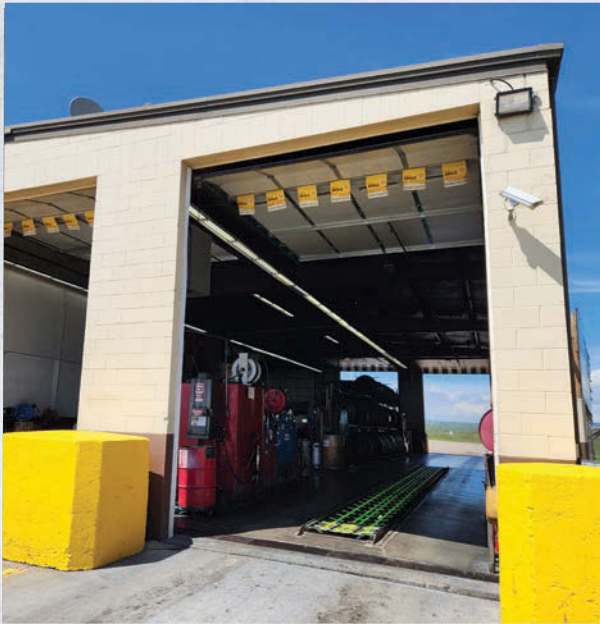
“They grew up in the industry and are still here on the same property doing the same job,” Graber said.

Becoming a mentor

Maintenance is in the blood for Ruiz and his son, but Graber had to put more effort into training



» The view to the west of Grabers Diesel Repair overlooking I-25.



» Grabers Diesel Repair’s second location features two bays that open to the east and west.

the shops’ 13 other techs, many of whom had no formal diesel education.

“I’ve got a fair amount of guys who actually never went to school, that either we trained from the ground up or started in another shop. And they learned and grew from there,” the shop owner said.

When these seedling techs start, it’s hard to predict how they will turn out. Graber has found that through mentorship, the investment can be quite fruitful. This was the case with Andrew Grantz, Graber’s longest-tenured employee. After assisting his dad with some work on their family vehicle, Grantz was hooked on vehicle repair and wanted to learn more. But he only had time to take one auto program class during his freshman year of high school before his family moved from Colorado Springs to Cheyenne. Luckily, Graber and Grantz crossed paths at church, where he agreed to let Grantz shadow at his shop.

After shadowing through high school, Grantz took diesel technology classes at Laramie Community College in Cheyenne while working for Graber a few hours each morning.

“It wasn’t much,” Grantz said. “But it still allowed me to be in the shop and go to school, and then the next morning, I’d come in and see how



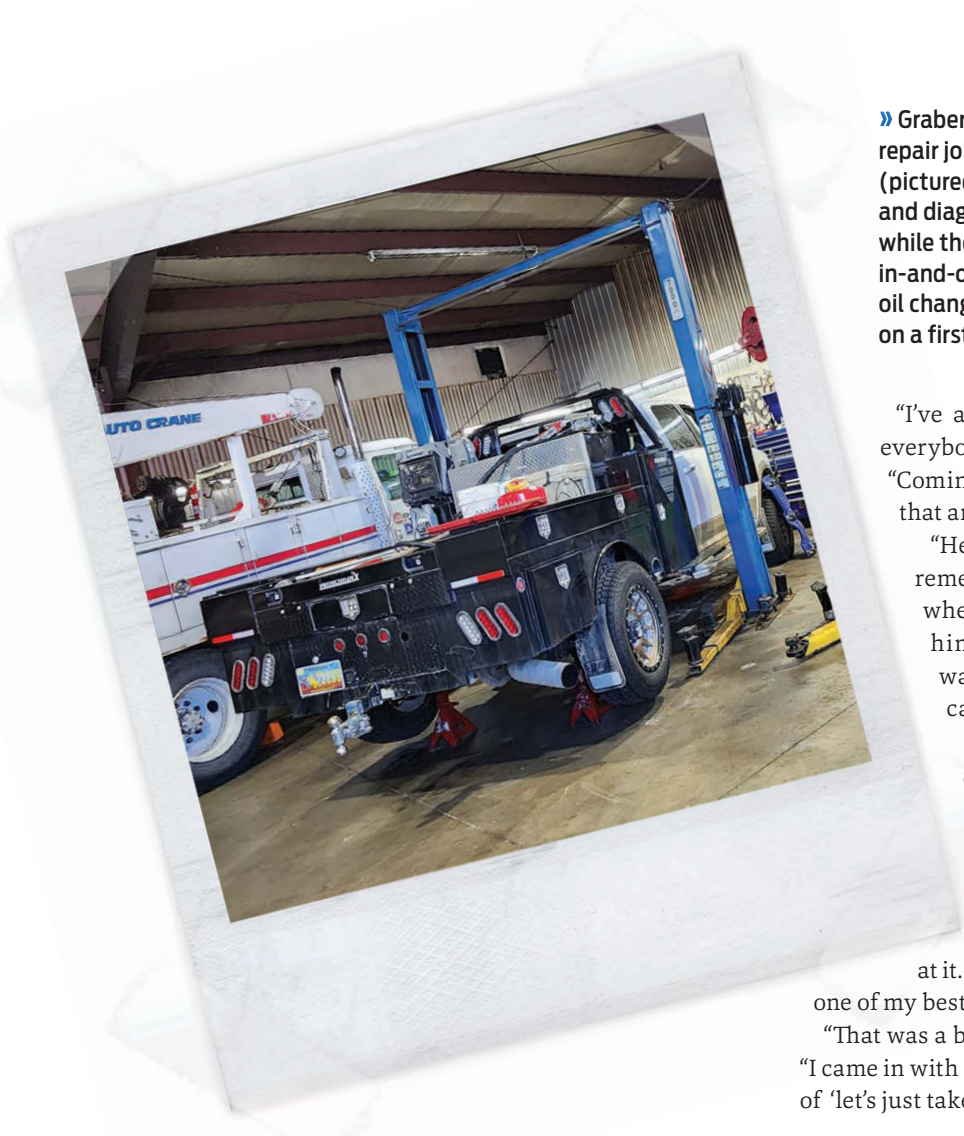
» Graber rented out his first shop location when his service truck fleet outgrew his home.

my schoolwork might apply or not to whatever we’re actually doing in the shop.”

Once he graduated, Grantz returned to Grabers Diesel Repair full-time. But even with his schooling, the learning curve was steep.

“The transition period really hit me hard,” the 29-year-old related. “That first year was a huge struggle for me, and it’s only by Jon’s good graces and the grace of the Lord that I still have a job here.”

Grantz’s situation wasn’t helped by the physical demands of diesel work.



» Grabers Diesel Repair sorts its repair jobs by location; the first shop (pictured left) handles engine work and diagnostics by appointment, while the second location manages in-and-out jobs such as minor repairs, oil changes, wheel seals, and brakes on a first-come, first-serve basis.

"I've always been smaller than most everybody," said the 5'9, 140-lb. Grantz. "Coming into it, I'm working with guys that are bigger or stronger than I am."

"He started green as ever," Graber remembered. "He's one of those kids where I even had a sit-down with him one day. He's not big, and I was like, 'I don't know if this is the career for you.'"

But according to Graber, that single conversation changed everything for Grantz.

"It lit a fire under him," Graber said. "And he started learning ways of overcoming his size, and he started working harder at it. As young as he is, he has become one of my best and longest-term employees."

"That was a big turning point," Grantz agreed. "I came in with a better attitude and the mindset of 'let's just take one job at a time, don't be afraid



» Graber and one of his technicians check out a livestock carrier in need of a filter change.

to ask questions, and show them that I actually want to keep my job."

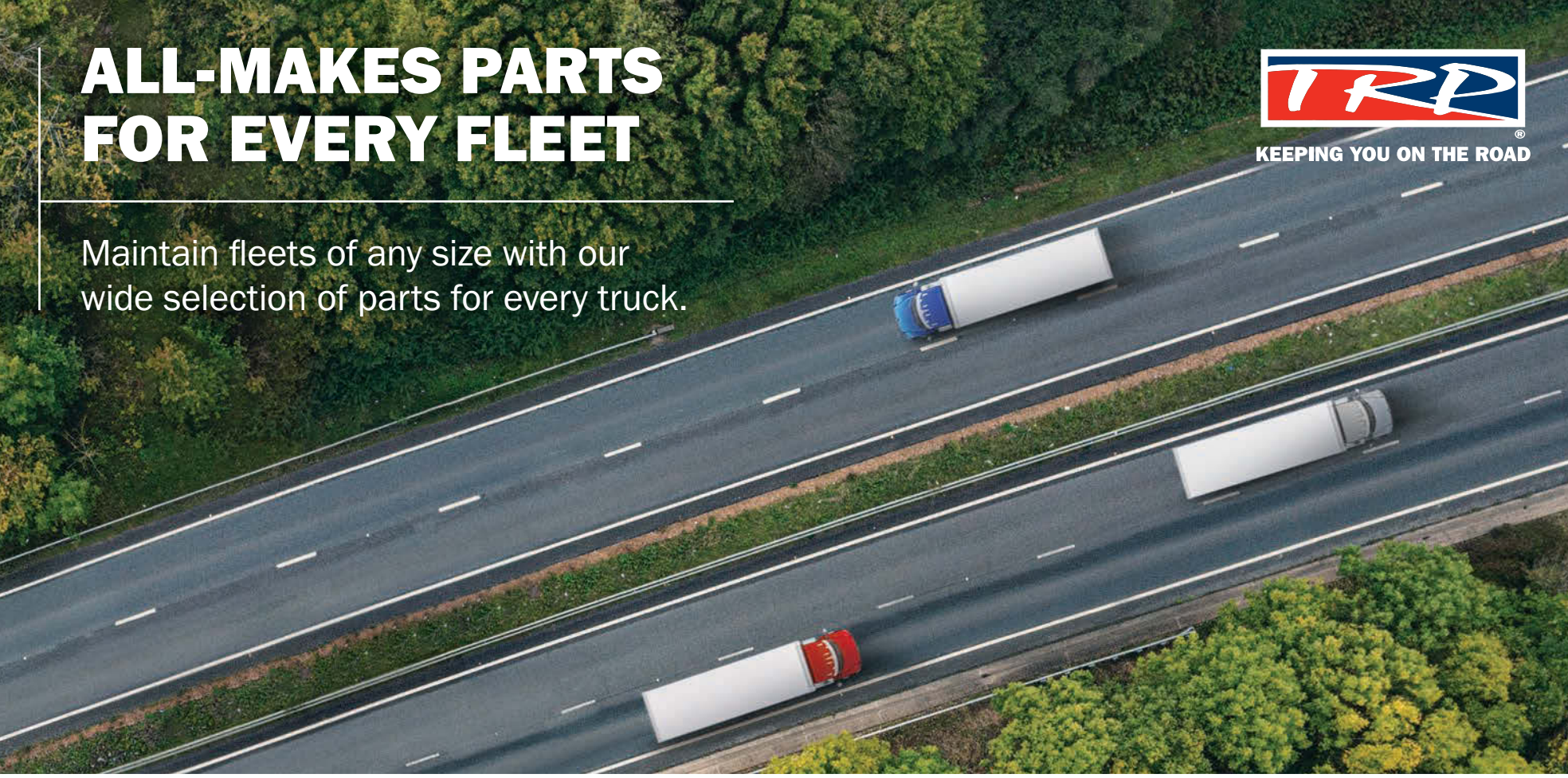
For Graber, this kind of individual attention is key to his leadership.

"When I can see that a guy's growing and doing better, then I sit down and go, 'Hey, you're doing awesome. I'd like to see you start doing this or take on these responsibilities. I want to send you out to this training so you can learn more on this and become more proficient,'" Graber explained. "It's an individual basis; that's really how I've dealt with most of my guys."

This approach helps Graber assign each of his nine technicians at the scenic site, and four at the

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original location, to the jobs that best suit their skills. With the help on hand at each location, Graber said he's often able to process 25 walk-in invoices per day and 6 to 10 by appointment.

"We split it up with [the second location] being more for minor repairs, oil changes, wheel seals, and brakes—in-and-out jobs," Graber noted. "Get them in, get them out as fast as possible." Meanwhile, the first location handles larger jobs, such as engine work, diagnostics, and differentials.

Parts management

With each of the two shops handling different types of jobs, this makes inventory management critical, especially when the first shop may need more specialty parts, but the second also needs to be consistently stocked with day-to-day pieces.

"A large part of what we do is service or inventory," Graber said. "It's hard within our industry to know what to stock, so of the inventory I do stock, the parts are common to many vehicles. Over time, you learn what you do and don't sell. So, stuff that's not selling you get rid of; the stuff that you are selling, you bring more in or update newer filters and newer parts."

To keep track of two sets of inventory, assignments, and techs, Graber uses Mitchell's ManagerEnterprise Pro, which allows him to manage invoicing, inventory, accounting and reports, and scheduling.

"It is an all-in-one suite, which is really nice," Graber related. "It's all web-based, so I can access it from a phone or laptop, no matter where I'm at any given time, and see what's happening live, what jobs are being done, who's clocked into what."

This is especially helpful to Graber as he balances his managerial duties with his love for the craft. This is partially why Graber is most often stationed at the more scenic location, so that he can bring his diagnostic knowledge to bear while also managing the more active shop.

With Graber and his technicians almost constantly in motion between the bays, their inventory storage upstairs, and their work area, this sometimes means customers have to actively catch Graber when they arrive

for a walk-in service. But while the small shop is busy, it pays off in personal attention to the drivers who use their services. The same technician who hears a complaint will likely be the one who fixes the truck, bills the customer, and sends them on their way.

From his workflow to his personalized approach to both customers and employees, Graber has

ensured that he'll carry on the Grout legacy for years to come and fulfill his childhood dream. Now, little gives him more pleasure than watching trucks return to Grabers Diesel Repair for the same reason they did 50 years ago.

"It's amazing to see how you grow, and you get to that point where you're moving work through," Graber said. "It's been fun." ■



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» Doug Nickles, a FedEx Freight technician from East Moline, Illinois, was crowned TMC SuperTech 2023 Grand Champion.

John Hitch | Fleet Maintenance

FedEx Freight delivers a TMC SuperTech sweep, with Doug Nickles crowned as '23 Grand Champion

FedEx Freight took the top five spots at the latest national skills competition's HD track, with FedEx Freight techs also nabbing top honors in LMV and Trailer tracks.

By Cris Beaulieu

CLEVELAND—The winner's podium popped in purple all night at the 2023 TMC SuperTech awards dinner on Sept. 19, as FedEx Freight dominated the American Trucking Associations' Technology & Maintenance Council's National Technicians Skills Competition. Doug Nickles, a FedEx Freight technician from East Moline, Illinois, was named TMC SuperTech 2023 Grand Champion for the first time, with four other FedEx Freight techs also finishing in the Top 5 of the Heavy Duty track. Wesley Salley of Round Rock, Texas, placed second and Kelby Bentley, the 2019 Grand Champion, placed third.

FedEx Freight colleagues Cory Westfall and Phillip Barlow repeated as winners of the Trailer and Light and Medium Vehicles tracks, respectively. Cox Automotive's Michael Kerfoot Jr. finished right behind Westfall for the second straight year. Zachary Nikorak and Alan Snyder of Cox Automotive were the runners-up in the LMV track.

TMC SuperTech was held Sept. 17-18 at the Huntington Convention Center in Cleveland in conjunction with TMC's Fall Meeting.

The two-day competition pushed 93 professional techs to their limits, testing their knowledge and hands-on skills in heavy-duty truck, light/medium vehicle, and trailer tracks. New skills stations also tested techs' ability to troubleshoot cybersecurity, CNG, and electric vehicle issues.

Nickles and Bentley also won the team title at this year's competition. Overall, Nickles, a graduate of Universal Technical Institute's diesel program, attributed his win to teamwork.

"My teammates—we push each other to work on our weaknesses," he said, adding that he relied on a great deal of studying to give him the upper hand in the competition.

For his efforts, Nickles won a cache of prizes, including a "dream shop" from Reliance Supply, which included tools, fittings, connectors, and a \$2,000 store credit.

"Winning TMC SuperTech is a tremendous achievement and clearly demonstrates Doug's dedication to service and professionalism," said TMC Executive Director Robert Braswell. "As always, this competition brings out the best in our industry and Doug, and the rest of his FedEx Freight teammates, rose to the occasion, providing real examples of the knowledge and skills needed to keep this industry moving. On behalf of ATA and TMC, I want to congratulate Doug and thank all our competitors who make this such a special event."

Twenty-five students' skills were also put to the test to compete for the top spot of TMC FutureTech 2023. Timothy Rose, a student at Ferris State University, won the National Student Technician Skills Competition. He finished in second place last year. Fellow Ferris student Maxwell Chatman finished second. Northwest Technical Institute's Joshua Waldrep placed third.

Last year, FedEx's Freight's Bonnie Greenwood made female tech history by finishing second overall in the HD track, though she was unavailable to attend in 2023. There were fewer female techs overall this year. Only one female, April Hill from TravelCenters of America, competed in the professional competition, but TMC FutureTech had two: Aysia Williams from Francis Tuttle Technology Center and Jillian Proell from WyoTech. The student competition had only 17 challengers last year, but four were women. Experts estimate the U.S. repair sector is about 2% female.

TMC SuperTech 2023 Skills Station Winners:

Heavy-Duty Track:

- **CNG Fuel System Essentials:** Jamie Smith, FedEx Freight
- **Brakes:** Kelby Bentley, FedEx Freight
- **Wheel End:** Brian Peters, Salem Leasing Corp.
- **Fifth Wheel:** Doug Nickles, FedEx Freight
- **Liftgates:** Jamie Smith, FedEx Freight
- **Automated Manual Transmission:** Ian Matje, Iron Buffalo Truck and Trailer
- **Tire & Wheel:** Kevin DaCosta, Publix Supermarkets, Inc.
- **Tractor PMI:** Wesley Salley, FedEx Freight
- **Starting & Charging:** Doug Nickles, FedEx Freight
- **Steering & Suspension:** Doug Nickles, FedEx Freight
- **Aftertreatment Mechanical:** Lucas Coyle, TravelCenters of America

Top 3 Heavy Duty Track Order of Finish

- 3rd:** Kelby Bentley, FedEx Freight
- 2nd:** Wesley Salley, FedEx Freight
- Team Champion:** Doug Nickles and Kelby Bentley
- Grand Champion:** Doug Nickles, FedEx Freight

Trailer Track:

- **Written Test:** Michael Kerfoot, Cox Automotive Mobility
- **Hydraulics & Drivebelts:** Michael Kerfoot, Cox Automotive Mobility
- **Trailer Wheel End:** Cory Westfall, FedEx Freight
- **Electrical Vehicle Safety:** Cory Westfall, FedEx Freight
- **Trailer Fasteners:** Cory Westfall, FedEx Freight
- **Trailer PMI:** Cory Westfall, FedEx Freight
- **Trailer Alignment:** Adam Burton, Great Dane
- **Roll-Up Doors:** Cory Westfall, FedEx Freight
- **Trailer Lighting:** Cory Westfall, FedEx Freight

- **Trailer Liftgates:** Adam Burton, Great Dane
- **Central Tire Inflation:** Michael Kerfoot, Cox Automotive Mobility
- **Trailer Electrical Corrosion:** Michael Kerfoot, Cox Automotive Mobility
- **Trailer ABS:** Cory Westfall, FedEx Freight

3rd place: Issac Perez, FedEx Freight
2nd place: Michael Kerfoot, Jr.
1st place: Cory Westfall, FedEx Freight

Light and Medium Vehicles Track:

- **Written Test:** Alan Snyder, Cox Automotive Mobility
- **Fasteners:** Philip Barlow, FedEx Freight
- **Wiring Diagrams:** Zachary Nikorak, Cox Automotive Mobility
- **RP Manuals:** Philip Barlow, FedEx Freight
- **Coolants & DEF:** Philip Barlow, FedEx Freight
- **Electric Vehicle Safety:** Alan Snyder, Cox Automotive Mobility
- **Electrical Circuits:** Zachary Nikorak, Cox Automotive Mobility
- **Lubricants & Fuels:** Philip Barlow, FedEx Freight
- **Wheel End:** Zachary Nikorak, Cox Automotive Mobility
- **EVAP Systems:** Alan Snyder, Cox Automotive Mobility
- **Preventive Maintenance:** Andrew Hansen, United Parcel Service, Inc.
- **Liftgates:** Zachary Nikorak, Cox Automotive Mobility
- **CNG Fuel System Essentials:** Philip Barlow, FedEx Freight

3rd Place: Alan Snyder, Cox Automotive Mobility
2nd Place: Zachary Nikorak, Cox Automotive Mobility
1st Place: Philip Barlow, FedEx Freight

TMC FutureTech Station Winners

- **Written Test:** Joshua Waldrep, Northwest Technical Institute
- **Fasteners:** Maxwell Chatman, Ferris State University
- **RP Manuals:** Erik Barishman, Madison Area Technical College
- **Wiring Diagrams:** Zachary Davis, Forsyth Technical C.C.
- **Preventative Maintenance:** David Johnson, Mid-America Technology Center
- **Electrical Circuits:** John Lowe, Des Moines Area C.C.
- **Lubricants & Fuels:** Joshua Waldrep, Northwest Technical Institute

- **Cybersecurity:** Cole Plaster, Forsyth Technical C.C.
- **Coolants & DEF:** Timothy Rose, Ferris State University
- **Electrical Vehicle Safety:** Lane Archer, Francis Tuttle Technology Center
- **Trailer Wheel End:** Maxwell Chatman, Ferris State University

- **CNG Fuel System Essentials:** Timothy Rose, Ferris State University
- **Hydraulics & Drivebelts:** Timothy Rose, Ferris State University

3rd place: Joshua Waldrep, Northwest Technical Institute
2nd place: Maxwell Chatman, Ferris State University

1st place: Timothy Rose, Ferris State University

The TMC Fall Meeting and TMC SuperTech will return to Raleigh, North Carolina in 2024, and will be held at the Raleigh Convention Center Sept. 14-21. ▀

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FLEET PARTS & COMPONENTS

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

» Features a dual-chamber design

The **Oni Tools Fuel System Priming Pump** for the Detroit Diesel S60, MBE 900, MBE 40000, DD13, DD15 features a dual-chamber design, an ergonomic handle, a built-in temperature gauge, and a pressure gauge to provide an ideal user experience. Users can also pressurize the tank manually with the handle or with a compressor via the Schrader valve. This feature enables faster and more accurate pressurization to reach the exact psi levels required. Additionally, the priming pump has a specific fitment for priming, ensuring a tight and secure connection between the pump and the fluid source, as well as a pressure release valve for added safety.

➔ For more information visit FleetMaintenance.com/53042259



» A turn-key integrated camera solution

Isaac Instruments' InView camera system is a fully integrated video camera and data recording system that simplifies driver coaching while protecting drivers during road events. The AI-capable system includes both road-facing and optional side and driver-facing cameras which can capture footage alongside the truck. Managers can review these videos on the company's fleet management platform, including video segments triggered by hard driving maneuvers accompanied with telematics data from the truck. All external cameras are ruggedly designed to withstand harsh environments, while footage is preserved in a built-for-trucking, four-channel digital video recorder DVR behind the dash. The system also includes an optional inward-facing camera that can track a driver's eyes for distraction, and a camera health portal to stay on top of issues.

➔ For more information visit FleetMaintenance.com/53071905



» Features unique fluted lens pattern

The **MCL16T Series LED Marker/Clearance Lights** from **Optronics International** is a single-diode series that has a diameter of 1.25" and a 1.31" profile. The round light has a fluted lens pattern and comes hard-wired and available in bulk and polypack packaging. Useful for work trucks, dry vans, reefers, box trucks, and more, the MCL16T series comes in yellow and red and is sonically welded to be resistant to dust and moisture. The lights also feature a surface-mount device that protects it from moisture, shock, and vibration.

➔ For more information visit FleetMaintenance.com/53069326



» Has no wet seal to wear out or replace

The **ROTRON Transportation Sealless Pumps and Brushless DC Motors** by **Bison AMETEK** is SAE J1939 CAN enabled and incorporates a brushless DC motor with a 40,000-hour operational life and quiet-running, wet-rotor design. The electromagnetically coupled design has no wet seal to wear out or replace, and by eliminating brush maintenance and associated motor failures, the company says the product is maintenance free. Other features include a CAN interface, protection from over temperature, current overload, locked rotor, reverse polarity, and transient voltage spikes.

➔ For more information visit FleetMaintenance.com/53072963



» Specifically tailored for hydrogen, natural gas, diesel, and biofuels

Cummins' fuel-agnostic 15L engine platform, designed for the next level of emissions, has an increase in power density with a more compact installation envelope. The fuel-agnostic architecture uses a common base engine with cylinder heads and fuel systems specifically tailored for hydrogen, natural gas, diesel, and biofuels, including HVO, and will align with Tier 5. Running on zero-carbon hydrogen, it can use a 700-bar pressure high-capacity fuel storage system for maximum operating hours between refueling.

➔ For more information visit FleetMaintenance.com/53070233



» Provides greater energy cycling performance and weight savings

Eaton's Stamped Battery Terminals are offered for electrified and internal combustion on- and off-highway commercial vehicles. Each stamped battery terminal is customizable and compatible to SAE, DIN, IEC, and JIS battery post configurations and is ideal for the large-gauge cables found in commercial vehicles. Able to be tightened from the top with the right or left hand, the terminals include a primary positive and negative connection on a 12-volt battery. They also come in various shapes and orientations and feature M5/M6 nut and bolt side tightening and a center drive top-down feature.

➔ For more information visit FleetMaintenance.com/53073306



» Measures inclination with MEMS sensors

TWK's Inclination sensor NBT/S3 uses micro-electro-mechanical-system (MEMS) sensors to measure the inclination of a vehicle. The sensor features a stable aluminum housing, which is also offered in stainless steel, making it highly resistant to vibration and shock, and has a protection class of IP 69K, and includes a redundant MEMS sensor system for plausibility checks. If the deviation of the two systems is higher than a set value, the sensor enters a failsafe state. The NBT/S3 has the safety certifications SIL2/PLd and works with the PROFIsafe over PROFINET interface.

➔ For more information visit FleetMaintenance.com/53070971



» Vegetable-based formula that replaces mineral oil

The **Bio-Ultimax 1000 Hydraulic Fluid** from **Renewable Lubricants** is a biodegradable, vegetable-based formula that can perform in hydraulic systems and offers anti-wear, anti-rust, anti-oxidation, anti-foam, and demulsibility properties. The Bio-Ultimax 1000 passes both A and B Sequences of the ASTM D-665 Turbine Oil Rust Test and features a high viscosity index that the company claims goes beyond synthetic levels. Coming in one-gallon jugs or five-gallon pails, the hydraulic fluid comes in ISO 32, 46, 68, and 100.



➔ For more information visit FleetMaintenance.com/53073313



» Install in almost any application

Dana Incorporated's Ultimate Dana 80 Bracketless Crate Axles can be installed in virtually any application and feature 4" tubes with 5/8" wall thickness with Spicer 40 spline SAE-4340 nickel chromoly steel axle shafts. The axles also include a Spicer performance ring and pinion gears in ratios 3.73-5.38. Built for strength and durability for larger tires, Ultimate Dana 80 offers a full-float design and a heavy-duty 8" by 6.5" wheel bolt pattern and a Spicer 1410 strap-style/half-round end yoke.

➔ For more information visit FleetMaintenance.com/53073326

» Offers extreme lubricity protection

Hot Shot's Secret Adrenaline R82+ Diesel Racing Fuel Additive is a competition diesel performance additive, the company stated, and is verified by ASTM D613 and D6079 testing to raise cetane by up to 34 points and offer lubricity protection. R82+ also acts as an upper cylinder lubricant and is suitable for both mechanical injected diesel engines and common rail applications, but is intended for off-road use only. The additive meets the requirements of NTPA, PPL, NHRDA, and ODSS when used with a ratio of one quart of R82+ to every four gallons of diesel fuel.



➔ For more information visit FleetMaintenance.com/53073318



» A modular, rack-based storage solution

The **Active Cargo System Forged** from **Leitner Designs** is a modular, rack-based storage solution that doesn't block the truck bed. With a twist of the quick-release knob, the rear crossbar can slide forward to fit tall items without removing the rack, while the side-mounted GearPODs offer eye-level storage. The ACS Forged is suitable for 2019 or newer Ford Ranger pickup trucks with a 5' short bed and is constructed with an aluminum alloy. Weighing 85 lbs., the 23" tall storage unit features dual-stage, powder-coated steel brackets and a rubber wind diffuser/load pad to keep items from shifting.

➔ For more information visit FleetMaintenance.com/53069329



» Features grips, plug sleeves, and flexibility

The **3-in-One ABS AirPower Lines** from **Tectran Manufacturing** is a tractor-to-trailer hook-up line with WeatherSeal plug sleeves and a thick, beveled-edge spiral wrap. Available in the ArticFlex grade, the 3-in-One features two 3/8" ID SAE J1402 rubber air lines in black, red, or blue and an ABS performance power line that meets SAE J2394 requirements. The line also includes a spoon cut end on a spiral wrap and a FLEXGrip-HD gladhand grip on the trailer leads. The line's all-brass fittings resist corrosion and the thermo-elastomeric reinforcement guard on the tractor leads restricts bending.

➔ For more information visit FleetMaintenance.com/53073339

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TOOLS & EQUIPMENT

A roundup of the latest tool and equipment offerings.

» Lightweight and powerful

The **IQV20 Compact 3/8" Impact Wrench** from **Ingersoll Rand** has breakaway torque up to 400 lb.-ft., a maximum speed of 2,800 RPM, and 4,200 blows per minute (BPM) for rapid removal of fasteners. The 1/2" or 3/8" square drive is for use with impact-rated sockets. As the lightest in its class at 2.3 lbs., the company says it reduces fatigue and improves tool control while allowing technicians to access tight spaces. It's 5.3" long from tip-to-tail with an overmolded ergonomic grip that provides comfort for extended periods of use. The patented 360-degree LED shadowless light ring illuminates the fastener from all sides, and the tool's three speed options with a variable speed trigger cover a wide range of applications. A 3-year limited warranty is included. The W3131-K22 or W3151-K22 kits are available and include one impact wrench, one BL2023 battery, one BL2012 battery, and one battery charger.

➔ For more information visit FleetMaintenance.com/53058865



» Uses high frequency magnetic fields, not open flame

The **Inductor Max** by **Induction Innovations** and its attachments give fleet technicians next-level technology without having to worry about collateral damage from a torch. The different attachments allow for quick, safe, precise heat that can quickly and easily remove vinyl graphics, moldings, windshields, mechanical and suspension parts, and more. The Inductor Max is made in the U.S. and sets the bar for induction heat standards for heavy-duty and fleet mechanics.

➔ For more information visit FleetMaintenance.com/53068876



» Removes stubborn oil and grease stains

The **Oil Eater Overnight Stain Remover** uses oil-eating microbes to penetrate surfaces, seeking out oil and grease carbons. The company says it only takes three steps to use: apply, let it dry for 12 hours, then brush away to help restore concrete, brick, asphalt and more. The stain remover is available in a 32-oz. bottle or a 5-gallon pail.

➔ For more information visit FleetMaintenance.com/53068573



» Works for chemicals, biohazards, and hydrocarbons

The **FlashDry Coir Absorbent** from **EarthSafe** is a sustainable and versatile absorbent that is classified as both universal and hazmat-absorbent. The FlashDry works for all types of spills, including chemicals, biohazards, and hydrocarbons and can absorb up to four times its weight on contact while leaving no residual residue. Coming in both 50L and 5L amounts, the FlashDry uses all-natural, organic coco coir and is 5-7 times faster than traditional clay, molten, or oil-dri absorbents, the company stated. Additionally, FlashDry is OSHA compliant and approved for non-hazardous landfill disposal.

➔ For more information visit FleetMaintenance.com/53069601



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» Removes fumes and dust

The **Exento HighVac** by **Fronius** provides mobile and compact extraction, and when used in combination with the fume extraction torch, removes both fumes and dust. The integrated side-channel compressor allows an extraction capacity of up to 170 m³ per hour, and the vertically mounted filter cartridge ensures particularly effective cleaning.

➔ For more information visit FleetMaintenance.com/53069306

» Enables precise automatic adjustment

The **Lucas EDR 700** calibration robot enables precise automatic adjustment of any Bosch, VDO, Denso, and CAT common rail injector. Due to new configuration records for all of the systems and the generation of new accessories, the EDR 700 can meet any market requirement. The calibration tool's body is made of granite for maximum stability and measures 48" by 42" by 24".

➔ For more information visit FleetMaintenance.com/53070526



» Includes replaceable filter elements

The **Climate Control Stationary Air Compressor**, No. K1C-30C, from **Jenny Products** is a heavy-duty, cast-iron compressor pump made in the U.S. Splash-lubricated and offering a large flywheel for extra cooling, the K1C-30C is filled with Jenny Synthetic Blue Compressor Pump Oil and has a directional air shroud for reduced pump temperatures. The tank is powder coated and ASME certified and has unloading valves to assist in motor starting, and includes an auto start and stop control when the pressure unloader is set at 75-100 psi. the compressor has a 30-gallon tank and a pump RPM of 520.

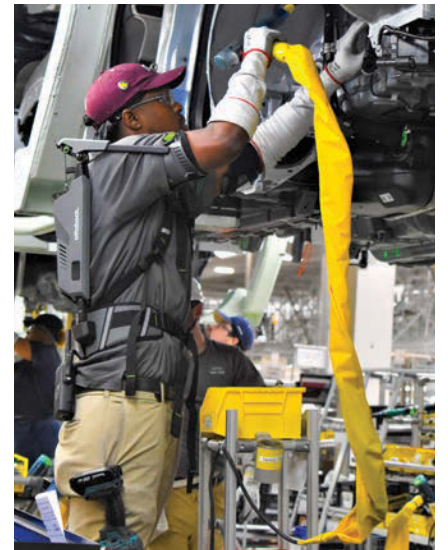
➔ For more information visit FleetMaintenance.com/53069697



» Feels like a natural extension of the body

The **Ottobock Shoulder** passive exoskeleton supports a technician's arms during overhead work. The worn-on-the-body system is structured like a backpack and provides full freedom of movement while transferring the weight of one body part to another. With no electrical components, the fully mechanical system includes easily adjustable straps so that it can be put on in less than 20 seconds and features removable, washable textiles for easy maintenance.

➔ For more information visit FleetMaintenance.com/53070256



» Features low-profile head design

The **M12 Fuel Insider Extended Reach Box Ratchet**, No. 3050-20, from **Milwaukee Tool** is a new-to-world solution with a low-profile head design that offers an over 3/4" shorter head profile size than previous tools. The tool offers 60 lb.-ft. of max torque and 350 RPMs to remove stubborn fasteners and comes with Insider Box Ratchet Sockets (8-19, & 21mm), a 1/4" Hex Bit, 1/4" anvil adapter, and 3/8" anvil adapter. Part of the M12 System, the ratchet offers 350 RPM from a Powerstate brushless motor and dual LED lights to illuminate work areas, as well as an on-board battery fuel gauge and an extended paddle switch for multiple grip positions.

➔ For more information visit FleetMaintenance.com/53069716



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TPMS and ATIS

»» Bridgestone America's Fleet Care

Bridgestone America's Fleet Care includes tire monitoring services for commercial trucks and buses; mining, quarry, and aggregate tires; and tire and rim management; among other services. Bridgestone's IntelliTire provides tire monitoring for tires smaller than 49", while iTrackII covers those larger than 51". Both offer pressure and temperature monitoring with sensors attached to the tire valve stem. These sensors then provide warning emails or texts to a desktop, tablet, or smartphone.

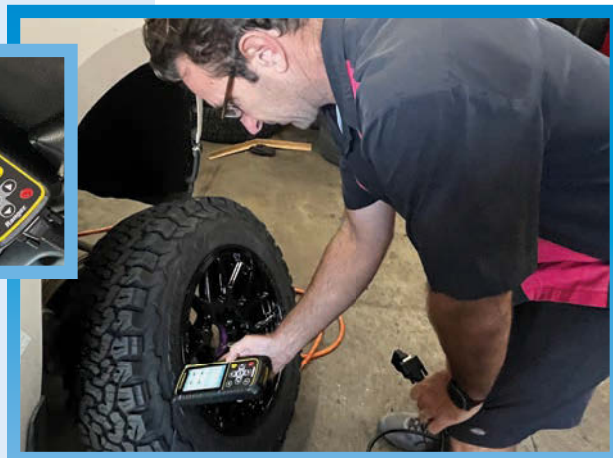
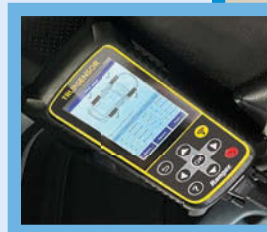
"When our drivers fuel up at Pilot Flying J travel centers, the Watsonstown Trucking maintenance team instantly receives real-time tire air pressure data," said Mike Kemock, fleet manager at the Watsonstown Trucking Company. "The resulting insights our team have received from Bridgestone over the past year have proven invaluable and reduced our incident rate by 10%, eliminating nearly 1,300 hours of downtime."



»» Ranger TruSensor TS58R TPMS kit

The **TS58R TPMS kit** by **Ranger** has everything needed to program and diagnose TPMS on vans and trucks. The kit includes a portable diagnostic and programming tool, metal stem sensors, snap-in rubber sensors, a USB interface cable, OBDII cable, and a power cord in a padded carrying case. The kit can test tire pressure, temperature, and sensor battery life and features a 4.3" touchscreen that can control all operations, including clearing TPMS DTCs and resetting warning lights.

"A nice touch screen too, like [the TS58R has], is very efficient and quick, and it reads fast, which is really nice," said John Heeber, owner of Tire Pros - Thousand Oaks in California. He also noted that the kit has a clear display, straightforward controls, and normal size. "I like the fact that it has that OBD II plug versus wireless, because I've had so many problems with my Bluetooth connect," he said.



»» Pressure Systems International's Meritor Tire Inflation System (MTIS)

The **Meritor Tire Inflation System (MTIS)** from **Pressure Systems International** can be installed on all major trailer axle models and is available for retrofitting. The system sends pressurized air from the tanker air supply through a filter and control box, where it is regulated to preset tire pressures. The regulated air then moves through hollow axle tubes to a rotary union and into the tires via tire hoses.

"It's a good system," said Patrick Cooksey, fleet maintenance manager, Merchants Distributors. "With these new hoses, you can use a tire pressure gauge while the trailer still is sitting in the lot. Now we don't have to take anything apart, and you can put the gauge on there and check all the tires in 15 seconds."



»» Hendrickson's TIREMAAX systems

Hendrickson's TIREMAAX automatic tire inflation systems include the TIREMAAX CP, PRO, and PRO-LB products, all of which are available for Hendrickson integrated air suspension systems and non-integrated axles. Each system includes check valves, a ventless hubcap, axle filter, and axle vent to continuously check a vehicle's tire pressure. A filter at the supply port helps keep both the lines and seals clean, and a mechanical controller maintains the desired tire pressure.

"The fact that it both inflates and deflates to the set pressure is the most attractive feature," said Dave Saunders, Interstate Utility Trailer VP. "Our customers also like the fact that the axle itself is not pressurized and that internal lines are used. It's a very user-friendly system."





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