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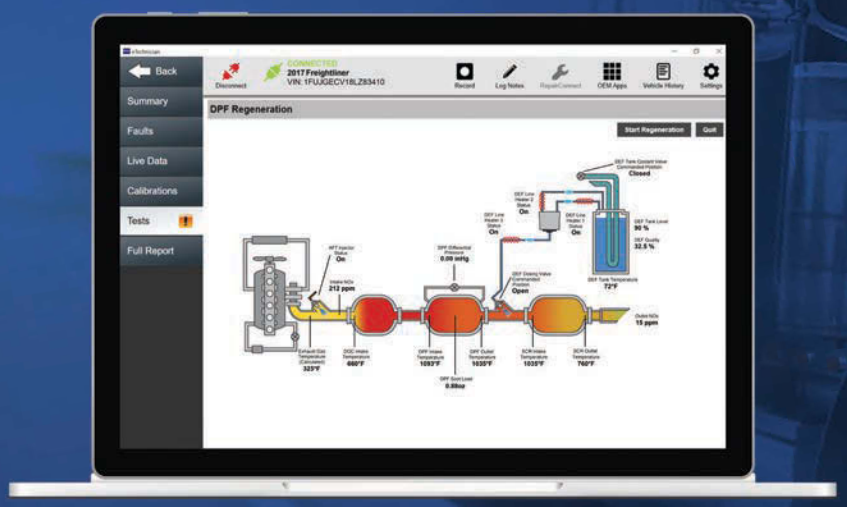

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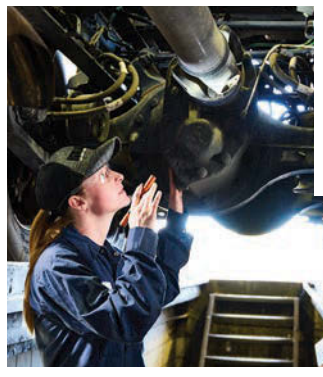

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➔**Cover photo:** Fleet Fast

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The elusive search for more hours in the day

Don't race against the clock; learn to run with the time you're given.

By John Hitch
Editor-in-chief

@Hitched2Trucks

My whole life, time has been my greatest adversary. In school and at dead-end jobs, it held me in place until the bell rang or the workday ended, and on summer breaks or vacations, it dragged me along despite my protest. Then in the military, although I counted down the days to my enlistment's end, my job called for a split-second reaction time, whether it was donning fire response gear or picking up contacts, assessing threats, and triangulating ranges.

Then, when I found a pursuit I wanted to turn into a career—writing—time sped ahead, occasionally looking back with a mocking grin, while I huffed and puffed and barely kept up with various deadlines and life in general. Now, as editor-in-chief, deadlines I thought were insurmountable a few years ago seem laughably quaint. All that running made me stronger, but it took a heck of a lot of time to get there.

And it still does. You see, my hackneyed life hack was to simply divert personal time, mostly the portion for sleeping, over to work time. When you do that, you really do have all the time in the world.

After a year of that, though, this strategy's negative aspects—chief among them backaches and burn out—have caught up with me. Now, it's time to work smarter, not harder, which requires putting into action novel concepts such as delegating overall workload and putting more energy into training staff, as opposed to trying to do everything myself. I need to become a master of time management. And because managers within the transportation industry have their own sprints and marathons with clocks and calendars, let me share a few tips from what little I've gleaned to help you tack on some extra minutes and hours to your day.

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Take time to organize your workstation

Saving time starts with being more efficient, and for that you may want to consider adopting a lean mindset and practicing the 5S pillars: sort, set in order, shine, standardize, and sustain. In the shop, this means keeping tools organized with shadow foam inserts for each tool drawer. This ensures certain sizes of wrenches are always in the same place, and if one is missing, you know you accidentally left it under the hood of your last job.

If most of your time is behind a keyboard, invest in a little preventive maintenance on your desktop and inbox. Think about how often you spend searching for a file or email. Apply the Set in Order pillar to these areas with properly named folders and files that can be searched with a keyword. Bookmarking frequently visited sites, like TMC's online Recommended Practices Manual (or *FleetMaintenance.com*), can also shave some seconds off your searches.

Find a quiet moment and let your brain be inspired.

Find time for training

First thing to note: Technicians will leave a company if they feel they did not get enough training to build new skills. Compare that to how much time and money is spent on finding and training a new hire. Next, ask yourself how productive the shop would be if everyone reached a certain level of diagnostics mastery or could perform alignments. Nearly every OE has some sort of virtual training, and you can always work with vendors to set up on-site training. The subject of this month's cover story (Pg. 24), Fleet Fast, excels here and can take on the biggest jobs despite being a small body shop. For them, speed and productivity are tied to the amount of training provided.

Become a technology early adopter

While being the first to beta test a piece of tech has its disadvantages as the bugs are worked out, keep apprised of as much of the new technology in your sector as possible and make calculated investments. This again helped Fleet Fast when they implemented PPG's AdjustRite estimating system. Similarly, other fleets used tech to monitor wheel ends to catch thermal events or partnered with vendors to analyze used engine oil and extend oil drain intervals.

The next big thing may be augmented reality, as wearable computers are finding a home in the shop for next-level time management. These connected devices fit on a user's head and include a microphone, speaker, display, and camera. Using the RealWear Navigator 500, which can be 100% voice-operated, a MAN dealership in Romania cut diagnosis time by 75% and reduced travel time by 50%. This is because the technician can instantly bring up schematics on the monocular display without leaving the truck and, for trickier troubleshooting, can remotely call up an expert who can share their eyes from a laptop and walk them through the repair.

Prepare for the future

I recently met up with my old boss, Travis Hessman, who warned me about working too long on various stories and pet projects (I never got around to listening, though). He's an acolyte of futurism, lean process, and, of course, is now even more of my boss as a VP. The last thing he said to me may be worth following: You can spend all the time in the world trying to be more efficient and eking out more productivity, but it's not worth much if you don't also step away, find a quiet spot, and just let your mind drift to where your best ideas and innovative practices hide.

"You have to slow down and think," he said. "Otherwise, you spend your whole life firefighting."

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A sense of safety

As ADAS technologies are further adopted, fleets and service providers must focus on best practices for maintaining those systems to ensure they actuate the risk reduction and safety improvements they were spec'd to deliver.

By Seth Skydel

[SAFETY & TECHNOLOGY]

Trucks outfitted with safety systems, such as advanced driver assistance systems (ADAS), which include active braking, steering, warning, and camera monitoring systems, are becoming increasingly common. Safety, after all, is every fleet's top priority. This often means ensuring brakes and tires are in working order and changing them out when they aren't.

It is equally important that fleet maintenance providers are up to the task of making sure each ADAS component, such as the various sensors and cameras, works at all times and their maintenance is a top priority.

» TEXA's ADAS Truck Kit includes a calibration frame and target, along with software, to ensure the correct alignment and calibration of ADAS.

Photo: TEXA USA, 25787622 | Andrey Burmakin, 67907909 | Geerati | Dreamstime

"Fleets and shops must realize this will be a part of standard maintenance; it cannot be overlooked," noted Fabio Mazzon, technical manager at TEXA USA, a provider of ADAS diagnostic and calibration solutions. "Soon most trucks will be equipped with ADAS systems as a standard. This means that technicians in the shop, whether they like it or not, will have to get familiar with the ADAS systems, and how to do calibrations and diagnostics."

Some basic tips Mazzon offered include physically inspecting the systems and making sure the radar is clean and the truck is properly aligned. Spare parts should also be stored away from dust or humidity.

Being unprepared when an ADAS component isn't working properly will lead to "significant downtime," Mazzon warned.

Failure to do so will not only lead to more downtime but possibly accidents as well.

Mazzon noted that a malfunctioning lane departure system can cause the truck to drift into other lanes, while an uncalibrated or improperly installed radar connected to the emergency braking system can prevent it from sensing the vehicle up ahead and may not mitigate a potential collision in time.

It's all connected

One thing to first note is that the more advanced ADAS technologies become, the more interconnected they are with each other. That can create a challenge for maintenance operations, noted Chuck Brodie, field service team leader, Commercial Vehicle Systems, ZF Group.

For example, an issue with an antilock braking system (ABS) wheel speed sensor can affect a collision mitigation system.

"A failed sensor can trigger a fault code, but it may not be an issue with that system," Brodie explained further. "To accurately diagnose a problem, technicians can use software to follow a very logical step-by-step procedure. They can determine the description of the problem and, in our diagnostic software, double-click on fault code readings to see recommendations about what to check and in what order."

While there are not recommended maintenance procedures for many of these systems, Brodie did say that fleets should be asking how they can make sure things are working properly. The answer often has to do with when and where modifications are made. For example, certain procedures could misalign the radar system, and replacing a windshield could move a camera out of position.

Brodie also stressed that while fault codes vary from system to system, drivers should report all codes.

"Drivers are not inclined to report issues if the truck is running correctly, but in the case of things like cruise control not working, it will get their attention," Brodie said. "Drivers may also notice a service need when the issue is simply blocked radar caused by the buildup of sticky snow or ice."

Training up technicians

Brodie added that technicians need to have a strong understanding of the electrical and data link aspects of ADAS technologies. "With that basic training, they are able to use diagnostic software and check simple things like power, ground, and data link connections. Not having that knowledge can lead to higher costs and not fixing the system."

Main ADAS issues that are seen in the shop at Fyda Freightliner Columbus in Ohio are related to wiring, noted Jamie Denton, assistant service manager at the 30-bay shop, one of seven service department locations operated by the Elite Support Certified dealership network.

"Basic electrical is one of the skills we need to work on," Denton said. "Training technicians to load test a wire to make sure it will carry the necessary current or to see if it fails goes a long way. We tell our technicians that a simple voltmeter is their best friend."

"Drivers are not inclined to report issues if the truck is running correctly, but in the case of things like cruise control not working, it will get their attention."

Chuck Brodie, field service team leader, Commercial Vehicle Systems, ZF Group

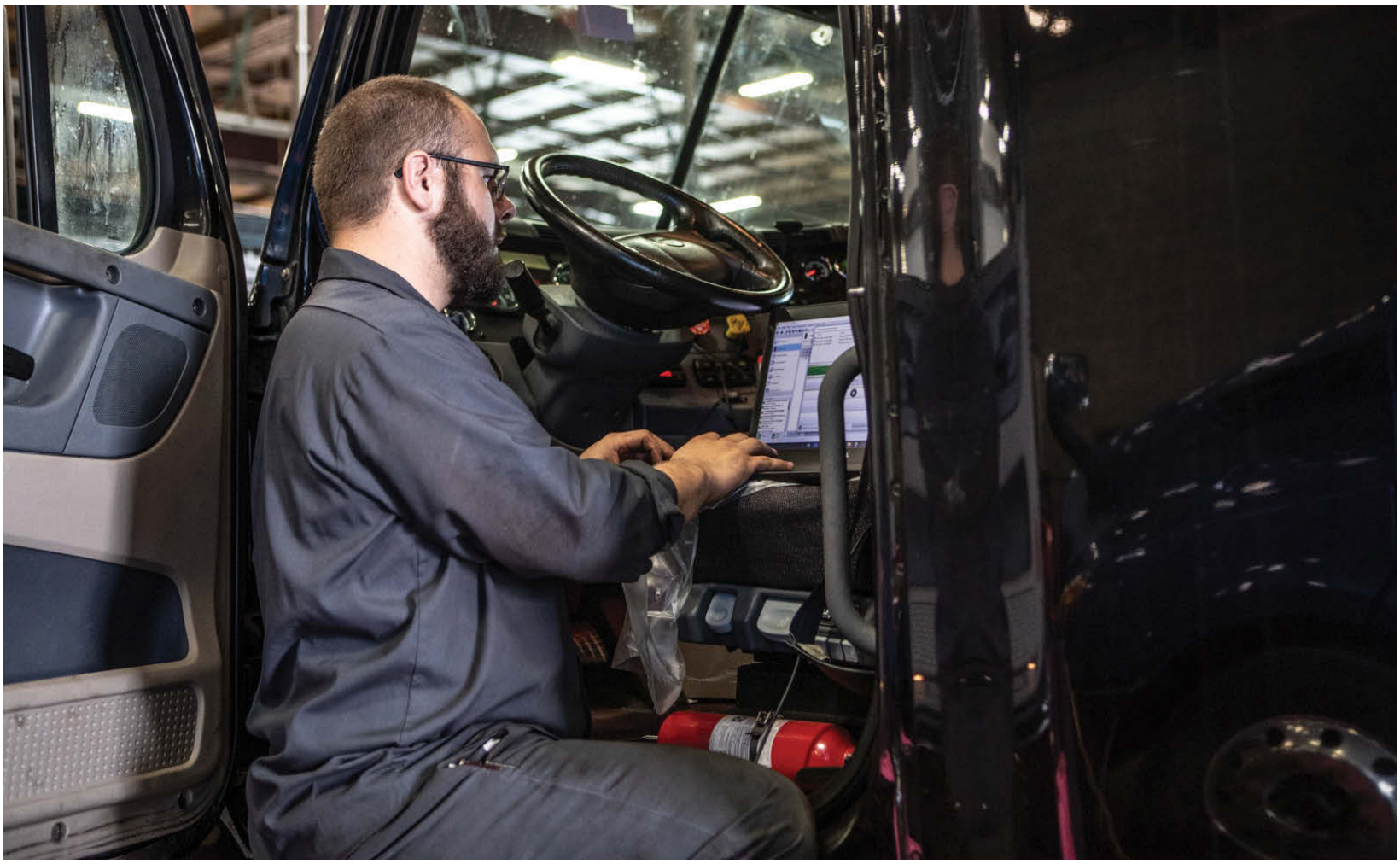
» Interconnected ADAS technologies can create a challenge for maintenance operations.

Photo: ZF

Those issues can arise when aftermarket components are added to vehicles. For example, Denton related that an aftermarket bumper might impact the operation of a forward-facing radar.

"We had a vehicle in with an intermittent problem that was hard to diagnose," Denton continued. "It turned out that when a camera was added to the windshield, the wiring wasn't run through a grommet and the bare metal edge of the hole rubbed through the insulation. In that case, we had to start at the frame and didn't find it until we reached the headliner. It took all that labor time for a problem that could have been avoided with a small, inexpensive part."

For Denton, the biggest obstacle to effective ADAS diagnostics is learning how OEM and



» “Basic electrical is one of the skills we need to work on,” said Jamie Denton at Fyda Freightliner Columbus. “Training technicians to load test a wire to make sure it will carry the necessary current or to see if it fails goes a long way. We tell our technicians that a simple voltmeter is their best friend.”

Photo: FYDA Freightliner

aftermarket systems communicate with the truck. “The use of these technologies is growing fast,” he said. “We started training a few years ago when the systems began to become more popular, and we’re always interested in refresher courses, especially about how the systems interact.”

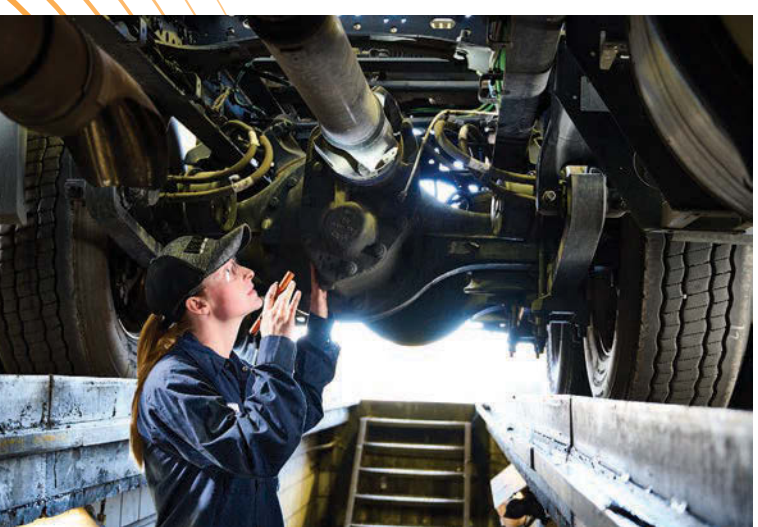
Sensing sensor issues

It’s important to think of an indication that there’s a problem with a safety system as a chassis issue, noted Brian Screeton, supervisor, technical service training at Bendix Commercial Vehicle Systems: “Sensors are where we see the most issues with these solutions, and it’s generally related to moisture.”

Screeton provided two examples. In one case, you might try to calibrate a system without any luck, but taking the connector apart, cleaning it out with contact cleaner, and then putting compatible grease in might resolve the problem simply. Another issue might be with wiring pins that get corroded, even if they’re in the cab. “We did one where there was actually ice in the cab that had melted once it warmed up,” he said.

Voltage issues can be the culprit as well. With the key on, for instance, the ECU will send voltage to the sensor but if there is an open circuit or short in the wiring, it will shut off. There is a tendency, Screeton noted, to confuse that with a bad ECU when it’s actually a harness going from the ECU to the central bank. In reality, it didn’t see the sensors, so it cut the power.

“When it comes to voltage issues, typically, what you’ll see is a timeout fault,” Screeton added. “What you really have is a circuit issue in a chassis wiring, which means it’s not getting any data from the sensors. Most of the time with sensors, we haven’t seen any systemic issues with the components. Other than calibration issues, it’s mostly chassis wiring issues, not sensor issues.”



» One of the biggest challenges Werner is currently facing is the need to have inventory on hand for repairs and to have it in the right locations. To address supply chain issues, the fleet is working ahead with its providers to understand its needs and have parts available.

Photo: Werner Enterprises

Listening to drivers

Daryl Bear, lead engineer and COO of MVT Solutions (MVTS), a subsidiary of Mesilla Valley Transportation that provides technology testing services for fleets and manufacturers, has seen an increasing number of issues with malfunctioning ADAS technologies. He raised his concerns at a recent TMC meeting and was not surprised to hear other fleets were having the same issues.

“We have seen a variety of problems with forward-facing radar that have to do with reliability and interference,” Bear explained. “The least extreme consequence is inoperative cruise control; the worst case is brake lock-up.

“We’ve also seen issues with steering-assist systems designed to keep vehicles in the lane,” Bear continued. “Drivers complained they were fighting the system, and during one of our fuel economy evaluations involving trucks from three different OEMs, we saw it firsthand. It was a windy day and the next day the driver in the truck equipped with that technology was exceptionally tired and had very sore shoulders, and this was someone who was used to hard work.”

For its part, MVTS is using its advanced data acquisition equipment to provide OEMs with information they can use to make these systems more reliable and eliminate issues that lead to costly time in the shop. “We understand that many of these systems are still relatively new and are getting better every year,” Bear added. “But we also believe that driver complaints and issues are worth listening to.”

With nearly 9,000 tractors equipped with some of the latest ADAS technologies, Werner Enterprises finds that keeping the devices calibrated is one of its biggest service challenges.

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"Many of these systems have radar-based sensors in the bumper and cameras in the cab," said Ben Murphy, associate VP of equipment resources at Werner. "They need to be rugged and rigid to withstand the stress associated with rolling down the highway.

"Understanding how to react if one of the systems is out of sync is essential," Murphy continued. "Buy-in from drivers and including them during the testing and validation processes is important when you decide to start using ADAS technologies. At the same time, they need to understand the importance, from a service perspective, to provide feedback about notifications they receive in the cab."

A key part of the service process for Werner is an alert system that is based on exceptions. "It is unrealistic to scroll through data for all these trucks daily to find unique examples of notifications, so we look to manufacturers to provide exception-based reports," Murphy said.

» **Maintenance management software also plays a role in preventive and predictive service practices for ADAS and other safety technologies.**

Photo: Trimble Transportation

Stocking up on parts

One of the biggest challenges Werner currently faces is the need to have inventory on hand, and in the right locations, for repairs. To address supply chain issues, the fleet works ahead with its providers to understand their needs and have the necessary parts available. This mutually beneficial partnership with manufacturers also allows the ability to make regular upgrades to diagnostic software over the life of the technology.

A solid vendor network is important as well. "We can't solely rely on our network of company shops because some of our trucks may not reach one of those facilities when a service event or repair

Stability technology and the need for maintenance, training

Along with ADAS, modern tractor-trailers are also often equipped with stability technology to prevent a disastrous roll-over event by adjusting when each set of brakes activate. Stability systems have been mandated since 2017 on new heavy-duty tractors, and the technology is prevalent on trailers as well. Several components must work in concert to keep a fully-loaded tanker from tipping on an icy road, so technicians must be fully aware of how those interactions play out and how to diagnose issues.

In May, Brian Screeton, Bendix technical service training supervisor, held an in-depth session at the company headquarters in Avon, Ohio, to help techs understand what each component of the Bendix ESP (Electronic Stability Program) full stability system does and how to troubleshoot some common issues.

"There is not much maintenance required unless there have been adjustments or repairs done to the chassis, such as chassis alignment or any steering or suspension system repair," Screeton noted. "In these cases, calibration of the steering angle sensor would be required."

One area he discussed that could confound troubleshooters is the yaw rate/lateral acceleration sensors (YRS). These sensors help detect an oversteering event that could cause a rollover. They work in conjunction with the ABS system, wheel speed sensors, and steering angle sensors, all of which are processed by the ECU. The system will then intervene if corrective action is required.

Some steps to diagnose an issue include: verifying proper installation and the correct YRS model is used, checking the wiring from the sensor to ECU, and ensuring that the sensor is securely mounted and not moved from its original location.

Techs must also be trained on how to correctly use the system's diagnostic tools. Bendix safety systems all require the Bendix ACom Pro diagnostic software. In general, Screeton recommended drivers are well-versed in operation as well.

"With any safety system, the shops and fleets need to make the proper training of their drivers and technicians a priority," Screeton said. "This will help the drivers explain any issues to the technicians accurately, and they will also know what to expect when the system may intervene. The technicians need a good understanding of how the system works and also of the correct diagnostic tools to be able to effectively maintain and diagnose any issues that may arise."

-John Hitch

» **An example of when Bendix' ESP is turned off...**

and when it is working.

Photos: Bendix Commercial Vehicle Systems

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is needed," Murphy pointed out. "A partnership between our shops, third-party service providers, and manufacturers enables the accurate diagnosis and repair of technology issues in the least amount of time and with fewer obstacles."

Simplification and consistency also play a significant role. "We are focused on step-by-step troubleshooting that starts with basic electrical and communication issues," Murphy said. "We also take a cradle-to-grave approach in order to effectively maintain these technologies over their life span and strive for uniformity by not specifying many variations.

"As ADAS and other safety technologies become increasingly integrated, we are continually laying the groundwork for upcoming enhancements," he added.

There's a general underestimation about the level of activity necessary to maintain technology, according to Deryk Powell, president and COO of Velociti. "If you ask most fleets, they'd think the numbers are low but in 2021, among the more than 700,000 systems we monitor through our VeloCare technology health monitoring and repair service, 19.4% required some level of support."

In 2021, 24.4% of the service calls for onboard cameras made by Velociti were due to accidental damage or tampering. Among those, broken windshields accounted for a significant percentage of the repairs. Another 20% resulted from needing to remove the devices from retired or wrecked trucks. Next on the list were the rapidly growing number of user devices and driver apps, which accounted for 9.6% of service needs. That number, Powell noted, doubled from 2020.

Most important is a proactive system that monitors connected devices on vehicles and uses that information to maximize uptime of technology solutions. Introduced in 2012, Velociti's VeloCare Program combines technology health monitoring, field repair services, a tech support call center, and inventory management services for electronic logging devices, vehicle telematics systems, and in-cab video safety solutions.

"Fleets invest in ADAS and other technologies to improve productivity, efficiency, safety, fuel economy, driver satisfaction, and customer service," Powell stated. "When you have a reactive approach, there's an undetermined amount of time between a failure, its discovery, and then repair. When a technology is offline, it negatively impacts your return on investment, which can also be compounded if your in-house service operation doesn't have the resources it needs to work on those systems, especially when the market for technicians is tight and keeping up with core maintenance needs is a big challenge."

Another thing that can erode the value of a technology and extend an ROI is the current uncertainty with the supply chain for parts, especially electronic items. Centralizing that effort with a service provider can eliminate the need to purchase and store more inventory than in the past, Powell noted. That maintenance partner can also supply repair kits.

Setting up a PM schedule

Measurable value can also be realized when you address speed of service.

"It starts with proactive monitoring, which leads to more effective troubleshooting, but also includes

» Velociti found that in 2021, nearly one in four service calls related to onboard cameras were due to due to accidental damage or tampering.

Photo: Altom Transport

the need to take a look at bringing the repair to the vehicle when it comes to onboard technology," Powell said. "The cost of waiting until the driver reaches a shop can be ridiculously expensive. Taking advantage of opportunities to have the technician go to the truck can lead to the lowest cost."

A preventive approach to onboard safety technology works well for getting the most out of an investment and for getting the output you need, noted Adam Kahn, president of Netradyne, a provider of vision-based safety camera solutions.

"In some cases, it can be as simple as putting camera lens cleaning on a set schedule," Kahn said. "Most people routinely make sure their cell phone camera is clean, but fleets don't always stop to think that their in-cab devices aren't always operating in a clean environment."

Kahn also points to the value of over-the-air software upgrades that can keep electronics-based systems functioning properly. Unlike the traditional practice of finding vehicles and installing updates when they can be accessed, often during other service intervals, connectivity through 4G and now 5G modems can speed up the process significantly.

"There is also a need for training in basic electrical, data, and communications systems," Kahn added.

Maintenance management software can play a role in preventive and predictive service practices for ADAS and other safety technologies.

"You can use asset management systems like our TMT Fleet Maintenance and TMT Service Center software to track repetitive repairs and find causes and solutions," said Dave Walters, senior solutions engineer at Trimble. "Analyzing data by component, system, and even location can be considered a part of normal maintenance today.

"You can eliminate issues with these technologies by adding to DVIR and inspection checklists to validate their proper function," Walters continued. "Especially when it comes to components like sensors and cameras that live outside the cab and need to operate in severe conditions, you need to be sure they are properly protected and positioned."

Walters went on to say that if onboard technologies are connected to a vehicle's electronics and telematics systems, there are mobility products that can be configured to send alerts with early notifications. From there, diagnostic steps in a maintenance management system are a logical source for identifying problems.

"Effective technology maintenance begins with not being reactionary," Walters stated. "The goal is to not have issues occur by catching things that could have been prevented, especially if they cause a breakdown. In those cases, you have unnecessary downtime and lost revenue that you can't recover."

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Putting the brakes on HOT WHEELS

Wheel-end monitoring technology can help put a stop to costly thermal events.

By Scott Achelpohl, Tyler Fussner

[TIRE & WHEEL]

Wheel ends are complicated systems and are among the highest friction points on any tractor-trailer, so trucking fleets hear a lot about thermal events at both the wheel and tire. These events are expensive in terms of extra maintenance and downtime, and can cause great harm to equipment, cargo, and even people.

The good news is that in the heavy-duty space, several manufacturers have come to market with wheel-end monitoring technologies—connected via onboard digital hubs to the cloud—that help head off incidents, avoid costly downtime, and identify maintenance errors that can cause wheel- and tire-related problems and failures.

At their most basic level, wheel-end monitoring technologies are "another set of eyes in the maintenance arena to catch things that are [preventable]," said Bryan Lewis, an ASE master truck technician and former instructor who retired from wrench-turning five years ago but now works as a consultant. "We have to up our preventive maintenance game. The more eyes and ears you have on that vehicle, the better, to catch something possibly catastrophic."

Safety, money, and equipment security motivate fleets to invest in any number of wheel-end monitoring systems. There are several wheel-end monitoring units on the market and others that exist as part of tire-pressure monitoring systems (TPMS). They all can provide data to the fleets that could catch a wheel-end issue before it impacts uptime and safety.

Stop your ignition

Rubber compounds begin to break down when tire temperatures exceed 250 degrees F, warned Phil Arnold, a former product engineer with Michelin North America, at the 2018 American Trucking Associations' Technology and Maintenance Council Fall Meeting. That's when a blowout might occur that results from the deterioration of a tire.

The most extreme thermal event—fire—can begin when rubber reaches temperatures of 500 to 550 degrees F and flammable vapors are emitted from the tire. If an ignition source is present, the tire rubber will start burning at 650 to 700 degrees F. Spontaneous combustion won't occur until 850 to 900 degrees F. The normal operating temperature range for tires is between 100 and 150 degrees F.

"Tires contain a great deal of potential energy," Arnold explained. "They are like high-grade coal when they start to burn, and they are very difficult to extinguish."

When a tire comes apart while driving, it's usually the result of underinflation, Arnold added. Heat generated within the sidewalls as the tire flexes weakens the steel belts in the casing while softening the rubber to the point it eventually breaks down and the tire blows apart.

With tire fires, the heat source is the wheel end. Heat travels through the metal of the hub and through the wheel, where it meets the tire bead. Since the bead is built differently from the upper sidewall, the rubber there gets hotter and hotter until it begins burning, rather than exploding as the casing might because of underinflation.

The source of that heat is friction from either a deteriorating wheel bearing or a dragging brake. In the bearing's case, failure usually stems from lack of lubrication. Brakes can drag due to multiple causes.

What do these "connected" wheel-end technologies monitor to help avoid the most extreme or the most minor maintenance problems? Generally, anything that causes excess heating and vibration in the wheel system—anything that could cause a thermal event—even in the tire itself.

A typical wheel-end system comprises a seal, an inboard and outboard tapered bearing, and a hubcap. Additional wheel-end components include a spindle nut and wheel nuts, and some wheel-end systems may also contain a spacer that is meant to provide preset torquing.

Each of these components plays a vital role in protecting the wheel end as well as the operator.

Where wheel-end monitoring comes into play is when the trailer or tractor is in motion—detecting and flagging problems before or after the time when wheel ends are inspected to ensure safety and maximize performance.

Scheduled inspections help determine if a wheel-end repair is necessary, but monitoring systems give fleets and technicians clues about what might be amiss even before the trailer or tractor makes it to the shop for examination.

Sensing danger

Monitoring systems are all about the data, according to Paul Washicko, VP and general manager of ConMet's digital business unit. He detailed at length the PreSet Plus SmartHub, which is ConMet's connected wheel health monitoring system integrated into a hub assembly that "generates actionable intelligence on wheel-end health," according to the manufacturer.

Washicko said the low-power electronic sensor of the PreSet Plus SmartHub installs to the barrel of the wheel hub and transmits data to a "gateway" (installed on the bogey underneath a trailer or under the dash on a tractor), sending data from that "vehicle area network" to the SmartHub's interface dashboard or to common trucking industry telematics products such as Geotab, Lytx, Samsara, Solera (Omnitracs), and others about wheel end, brake, bearing, and tire health.

"We have all this data, and we understand when a component gets to a temperature where it's failing," Washicko said. "We've taken advantage of the low-power electronics where we can actually put this out in the real world with fleets, monitoring temperature and vibration to see the health of the wheel end. We can separate out the frequencies of bearings and tires.

"It's interesting how we're able to separate out those tire issues from bearing problems," Washicko continued. "We've been able to pick up a bearing failure so early that a mechanic is not able to detect it." He also said ConMet's system picks up on flat spots in tires, misalignments, and even objects lodged in tires based on their different frequencies detected by the sensor.

Alerts from the SmartHub most often pertain to tires, steer tires especially, he explained. ConMet partners with more than 60 fleets to use the SmartHub system, Washicko said.

"We find out remarkable things about this system every day," he said. "Fleets don't expect the alerts. We're giving them visibility that we've never had before. We've picked up three different

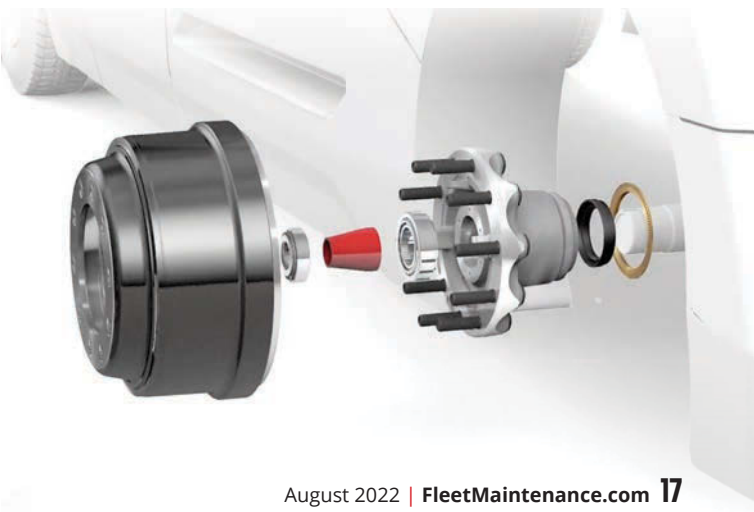
Burning money

ConMet, maker of the PreSet Plus SmartHub, studied the cost of key downtime events, which can sometimes be astronomical, and found the following:

- **Roadside repairs:** $1,150 per event.
- **Unplanned maintenance:** $3,750, or four times the cost of each planned maintenance event.
- **Catastrophic thermal events:** More than $400,000 per event.
- **Catastrophic wheel-offs:** Up to—or more than—$1.5 million per event, which can include significant trailer and cargo damage and even fatalities.

Furthermore, SKF reported its TraX wheel-end monitoring system for trucks, trailers, and buses may slash unplanned maintenance and downtime costs by as much as $3.6 million yearly, based on a fleet of 5,000 trailers, and can also help avoid thermal events.

» **A breakdown of ConMet's wheel-hub assembly.**
Photo: ConMet



hub issues that would have been catastrophic, two were from damaged seals in the bearings. They had been in periodic maintenance [in fleet shops] and hadn't been detected."

The TraX from SKF looks different but functions very similarly to the ConMet PreSet Plus SmartHub. The assembly mounts to any wheel of a heavy-duty vehicle and wirelessly transmits data to an onboard transponder. The wheel-bearing vibration and temperature data are then relayed to a maintenance location or the driver's smartphone app, which alerts fleet technicians and the driver long before a failure in the wheel end or tire occurs. If a thermal event is detected, the truck's driver is notified immediately to pull over to avoid a failure that could be catastrophic.

TraX also can integrate with Drōv Technologies' AirBoxOne Smart Trailer solution, which includes a telematics and pneumatics ECU and on-vehicle computer system that can read multiple sensors—from wireless to wired sensors. It has Bluetooth, CAN, Ethernet, Wi-Fi, cellular connectivity, seven radios, and GPS capabilities.

"AirBoxOne does a lot of connecting to safety points on the vehicle," said Pete Jankowski, CTO of Drōv Technologies.

The AirBoxOne sits on the bogey near the axles, tires, and wheel. It is connected to the air system as well, which allows it to regulate tire pressure through automated inflation and deflation according to determined parameters set by either the fleet or in conjunction with Drōv and the tire OEMs' recommended psi.

» SKF's TraX wheel-end monitoring solution integrated with Drōv's AirBoxOne Smart Trailer solution.

Photo: Drōv Technologies

"It also has the ability to read the sensors at the wheel end, TPMS sensors for the tire pressures for each individual tire and the temperature of the air inside the tire," Jankowski explained.

The integrated solution includes three monitoring points at the wheel end. These include the temperature sensor and pressure sensor for the tire; the TraX system for the bearings and the hub health, and to make sure there's no vibration or wheel wobble; and a sensor to detect heat near the brakes.

To further differentiate problems from causes, the AirBoxOne also monitors the air pressure of the braking system, understanding when brakes are being applied or if a brake is dragging.

"That can be a problem with a wheel fire or fuel economy, too," Jankowski said of dragging brakes. "If you're dragging a brake just a little bit, it's a problem. So, we are monitoring both the service and parking brake pressure lines."

The AirBoxOne has those sensors on it to preemptively determine thermal events that could occur at the wheel end; notifications of any arising issues are delivered to both the fleet and the driver immediately.

Drōv also has an iOS and Android application that the driver can use to see the health of the vehicle. This includes the alerting system from any of the wheel ends. The fleet itself is able to leverage an interface from the office to monitor the health across all assets.

"If they have an alert, they'll see it immediately and then can schedule maintenance or get the trailer off the road if it's an emergency alert," Jankowski stated. "The idea is to get information to the fleet and the driver well before an event happens. It isn't that you get an alert, and the wheel end is already in trouble; it's kind of preemptive maintenance, so that you have time to get the vehicle off the road so that you don't have an on-road event."

The system's notification alerts are tiered as 'Warning,' 'Critical,' and 'Emergency.' Warning and Critical alerts allow plenty of time to get the vehicle off the road or even to the nearest service center, whereas Emergency alerts are intended to notify the driver to get the vehicle off the road immediately.

Hendrickson's trailer wheel-end monitoring product—WATCHMAN, powered by the Sensata Vehicle Area Network—pays attention to tires and the brakes of a wheel assembly, explained Steve Hampson, director of electronic controls for the aftermarket manufacturer.

As for WATCHMAN, it relays trailer tire pressure and wheel-end temperature data to a fleet via the product's trailer telematics system, according to a Hendrickson fact sheet.

WATCHMAN integrates with TIREMAXX, which is Hendrickson's tire-pressure monitoring system that helps minimize tire wear and maximize fuel economy by managing trailer tire pressures. TIREMAXX has tire-inflating and pressure-relieving, and equalizing capabilities, according to the fact sheet. The manufacturer worked with the Society of Automotive Engineers on industry standards for the communication of data and fault codes for trailer wheel-end information.

"This common platform allows Hendrickson's WATCHMAN wheel-end sensor to be used by OEMs to provide crucial trailer data to their customers," explained Omar Fernandez, director of marketing at Hendrickson Trailer Commercial Vehicle Systems.

Hampson added additional perspective on thermal events, what causes these events, and what WATCHMAN does for fleet maintenance managers and drivers.

"Brakes are the heat generator," he said, adding that numerous wheel-end components generate excess temperatures, hubs and bearings among them. "By the very nature of it, the wheel end gets hot by use of brakes. There are normal operations of brakes, controlled, [but] it's when it exceeds those thresholds.

"It's about wheel-end health," Hampson continued. "That can equate to a lot of things. It's predominantly focused on the tire, looking at the pressure in the tire system, and making sure that it's level."

WATCHMAN also warns drivers if they are navigating the road with deflated tires.

"That's what leads, in some cases, to what they call 'thermal events,'" Hampson noted. "You're trying to prevent that thermal event from occurring. We also feel the WATCHMAN product [will identify] slow leaks. Small leaks become bigger leaks, which become even bigger leaks. The inflation system is keeping up with it, but it's something you should have looked at soon. Address thermal events before they happen."

WATCHMAN has temperature sensors mounted in the hubcap at the wheel end. "We do get indications if that area starts heating up beyond normal operation," Hampson said. "Another indicator of problems."

Early warnings of low tire pressure, leakage, and/or elevated temperatures can help minimize the cost of repairs and maintenance of crucial wheel-end components. WATCHMAN's hubcap-mounted, battery-powered wheel-end sensors transmit wireless signals to the gateway module, collecting the data and acting as the trailer's communication hub. The information is then transmitted from the gateway module to the trailer telematics device for transmission to the fleet's back office.

ConMet, SKF, Hendrickson, and Drōv Technologies are all working with telematics providers to integrate data from their systems into telematics solutions to provide timely and actionable data presentation for enhanced fleet efficiency and uptime.

Data driven maintenance decisions

The master tech Lewis said wheel-end monitoring technology data can be used to ease drivability complaints, such as "the shakes and shimmies." Vibration detectors, for instance, will point drivers and maintenance providers to "which wheel is potentially creating this problem," he added.

"I'm an advocate for telematics and data," Lewis continued. The technology, however, "doesn't replace the basics," he said. "We still have to install the wheel seal properly, adjust the wheel bearing properly, and so forth. I can't echo enough the basics, but this technology is another set of eyes. It's just another tool for the toolbox."

With monitoring systems in place, fleets have the opportunity to learn from and leverage the data generated off their assets in order to execute more efficient operations.

"Once you start correlating all of the data, particularly around the wheel end, fleets are going to

better understand how those different components are performing versus other components or other manufacturers," Drōv CEO Lisa Mullen said. "This gives fleets a real insight into spec'ing their trailers in different ways or running different components, maybe by area, maybe by type of asset."

As the AirBoxOne monitors and records more than just wheel-end related information, it also captures insights into fleet operations and can reveal granular nuances that can lead to higher efficiency and asset life.

"That's eventually where you really want to get to, because we are recording the GPS location of the vehicle, the weight of the vehicle, how much load is on it, [et cetera]," Drōv's Jankowski said. "When you start correlating those type of things—how fast the vehicle is going, what road it's on, if the roads are rough—eventually, a lot of this data is going to be for learning insights into the stuff that we don't know yet. Things like on this road with this load it seems that we're heating up our bearings and the wheel ends are running hotter than normal. So specifically, you could start looking at heat reduction."

Furthermore, Jankowski explained how monitoring technologies can point maintenance personnel in the exact direction of the root cause for performance issues. "If you start seeing events on a specific wheel end, it may be something like the alignment is off on the trailer," he said. "The AirBoxOne can help the maintenance people identify specifically where there is a problem instead of the driver coming back and saying the trailer seems to be pulling to the right a little bit. With the AirBox One, they can see the data is showing that one of the wheels is getting hot and it may be dragging a brake. They can get to a specific point of looking exactly where it is at without having to look at the whole trailer and figuring out what the problem is."

Another benefit of wheel-end monitoring technology is the real-time insight into asset lifespan.

"You don't bring anything to a failure if you have monitoring on those systems," Jankowski said. "If you bring it to failure, you have to replace a lot. If you have to replace one little component, it's a lot easier to do."

Monitoring technologies do more than record data; they can provide the opportunity for fleets to shift from a reactionary to preemptive mindset in asset management and maintenance.

"It changes the mindset of the fleet away from 'It's been X many years or X many miles, it's time to do a change out.' Now, with solutions like ours and like SKF's, you have data to know if it is in need of replacement or repair," Mullen concluded. "And that's what I think is exciting for fleets is that now they have data-driven decisions instead of just time- or mileage-based decisions."

Technology is the key to addressing wheel-end and tire problems before they become failures or emergencies. Monitoring the tire and wheel area of trailers and tractors has come a long way in the last

10 to 15 years. Using that technology can reduce downtime in the shop and help avoid expensive repairs for fleets by catching problems early.

The role of other systems

Other tire- and brake-monitoring systems can also assist in mitigating thermal events while enhancing maintenance strategies.

Jim Sharkey, VP of global sales and marketing for P.S.I., explained the company's TPMS system, TireView, pairs with another P.S.I. product, ATIS with ThermAlert tire-inflation system, to sense excess wheel-end temperatures and alert fleet headquarters and drivers. If the temperature of the wheel end elevates into a dangerous operating zone, a eutectic screw installed in the press plug melts, causing pressurized air to vent through the hubcap tee vent.

A warning light becomes visible in the driver's rearview mirror, allowing him or her to pull over to avoid a catastrophic event. Air escaping through the hubcap vent will audibly identify the problem wheel end.

The TireView "gateway" can be mounted inside or outside the cab of a truck, can be located inside a trailer, and can port with certain manufacturers' electronic logging devices, depending on the vehicle configuration.

"Right now, everybody wants smart trailers, so they want all the data going to one location," Sharkey said. "We'd rather integrate with somebody else's platform. The important stuff is the data. We don't care how it gets there. We're going to help you learn when there's a problem."

According to Mike Jeffress, VP of maintenance at Maverick Transportation, PSI's ThermAlert can positively impact maintenance operations.

> **"The important stuff is the data. We don't care how it gets there. We're going to help you learn when there's a problem."**
>
> Jim Sharkey, P.S.I. VP of global sales and marketing

"ThermAlert provides additional peace of mind to our drivers that they can operate the assets knowing if an issue were to arise, they can and will receive advanced notice," he said. "That notice aids in limiting lost productivity of our drivers, [as well as] provides advanced notification of where we may need to send parts—and that has proven critical in today's supply chain challenge that all fleets are facing."

Maverick also uses TireView on both tractors and trailers. " [Our] trend analysis reporting has assisted us on not only maintaining tire pressures, but also provided us with additional data for proper tire selections," Jeffress said of the benefits of TireView. "Tire selection for specific applications has been the biggest enhancement thus far.

"Our road assist department has the ability to schedule potential tire repairs prior to the driver being dispatched on a load and aids in notification to the driver of potential issues that are about to occur," he continued.

The portal that provides tire data to fleets via their telematics provider is called TireView LIVE. P.S.I. stores the data and users can generate reports to track issues.

According to Sharkey, reports can indicate when a tire was punctured, when temperatures rose, identify brake issues versus tire issues, indicate when brakes are dragging, and more. Users can also catch component issues before parts need to be replaced, he added.

Bendix Commercial Vehicle Systems added sensing technology on its SmarTire TPMS to detect elevated temperatures within the air disc brakes (ADB), providing early warning for when pads are nearing their replacement interval. Fleets can receive this data and use it to schedule maintenance. The system helps lower maintenance costs by reducing the need for technicians to measure friction and by optimizing friction replacement schedules. Because the system provides alerts when pads are reaching the point of replacement, it protects costly ADB components, such as rotors, from being damaged by worn-out pads. Both systems are also linked to Bendix's ACom PRO diagnostic software.

One final thing to note is that whatever the wheel-end monitoring solution a fleet chooses, they should factor in training for drivers and technicians to help them understand how the technology should operate and be maintained. With all those parts in place, the industry will finally reach a point where thermal events are no longer a hot topic.

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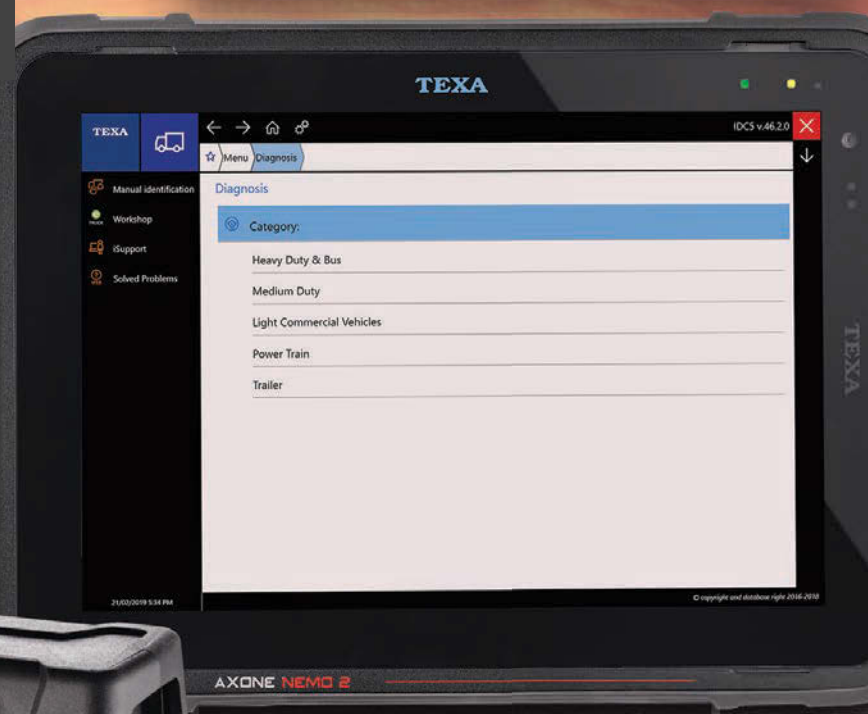

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» The Basran family (From left to right: Ravinder, Raj, Kiran, and Mukhtar) during construction of their auto body shop in the 1970s.

Photo: Raj Basran

HOME BODY

» Raj Basran, who took over the family business 20 over years ago, stands in front of the new box truck repair building, with his wife Tami, son Kamran, daughter Saranya, and mother Mukhtar.

Photos: Fleet Fast

By transforming his mom and pop's auto body shop into a flourishing commercial vehicle collision repair business, Raj Basran found you don't always have to leave the nest to spread your wings.

By John Hitch

Photo: John Hitch | Fleet Maintenance

Raj Basran, president and owner of Fleet Fast, never intended to follow in the family business, running a small auto and truck body shop in Akron, Ohio, but life is unpredictable that way.

Basran knows that better than most, as the shop's success is driven by unpredictable events, like a reckless deer bounding in front of a van's grille, or a truck driver misjudging a bridge clearance, or those times the side of a building comes out of nowhere to hit the back of a box truck. If life wasn't messy, Fleet Fast's parking lot wouldn't be full of battered box trucks and dented delivery vans.

» Raj Basran now runs the shop his late father started, but at one time he just swept the floors.

Photos: Raj Basran

And just as successful fleets will use these events as teachable moments that help those involved grow and mature, Basran and Fleet Fast have found flexibility in handling the unexpected—whether that's flipping the customer base, handling planned expansions and an unplanned pandemic, or procuring hard-to-find parts and retaining in-demand technicians—leads to long-term growth.

Basran, 51, certainly knew about the business from a young age, as he quite literally grew up where Fleet Fast stands. His childhood home was right next to the corner collision shop, which his father, Ravinder, started up in the '70s shortly after emigrating from Punjab, India, with his wife, Mukhtar.

"He started the business with very little experience, but a lot of drive," Basran said of his father, who had previously done some welding in the nearby city of Kent.

Back then, the shop only fixed up cars. Their customers were locals, with likely plenty of Goodyear employees mixed in, as the tire maker's headquarters is a little over a mile away.

Things changed in the '80s when the shop landed an account with Wonder Bread, which had a bakery nearby. The house was demolished to make way for three more bays to do commercial vehicle work, and business was good, even as the Rubber City was turning into another Rust Belt casualty.

His parents—worried about their retirement plans—asked their son one question: "Can you make a go of this?"

"This business that my mom and dad had built up for their entire lives was hanging in the balance," Basran said. "How do you refuse?"

There wasn't much deliberation before he accepted the offer.

Cut to the present, and Basran's office is about 10 yards from where his nursery room was. But while his geographical location has not changed much since the start of his life, the business is in a far better place than when he took over. The first-generation entrepreneur inherited his father's drive and has transformed the modest body shop into an oasis for broken trucks and vans, and as the boss, he's found that by treating vendors, partners, and employees like family, that success will continue.

Going commercial

Over the first several years, which included the Great Recession of the late 2000s, All Around Body Shop (the shop's former name) had a tough time building customers, as the neighborhood's perceived decline made people hesitant to patronize the business.

"I wasn't getting the volume, and after a few years, I realized nobody even wanted to come here for an estimate, let alone drop their cars off," the former psychology major said. "It's not nearly as bad as the perception, but that perception is real—and that perception is what I was fighting."

Ten years ago, Basran decided to stop fighting for customers who would never come and face reality: the shop would have to adapt or all hope for growth, and the ability to provide security for his family, would be lost.

"Failure was not an option," Basran asserted.

This meant going all in and catering solely to commercial customers.

"Fleets don't care where your physical location is," Raj noted.

Fleet Fast offers a complimentary concierge service where shop drivers retrieve the vehicle for repairs and then drop them back off when complete. Now the only perception that matters is if the truck looks like new and was repaired promptly. And what Basran expects from his team on every job—"quality work with a sense of urgency"—is exactly what fleets would expect to become a repeat customer.

It wasn't easy and everything had to be executed perfectly at the small shop, which had three unusable auto bays and three for trucks.

"In the early days, we were extremely conscious of the workflow; we did not have the luxury of keeping trucks in bays while waiting for parts," Basran said. "We were fanatical about choosing the right jobs to pull in at the right time. We also would ask for overnight delivery of all parts back then. I would pay the extra charge out of our pocket. This made a huge impact on lowering cycle times."

And by sticking with the core tenets of speed and efficiency, the business turned around. With the growth of the last-mile segment and drivers' propensity to hit things they shouldn't, the business started to see real growth in 2016. Basran bought the lot on the northwest corner of the block and added a building for high-roof vans, and then in 2019, he built a 6,000-sq.-ft. building to rebuild box trucks.

"Low bridges and low branches built this building," Basran quipped during a tour of the site.

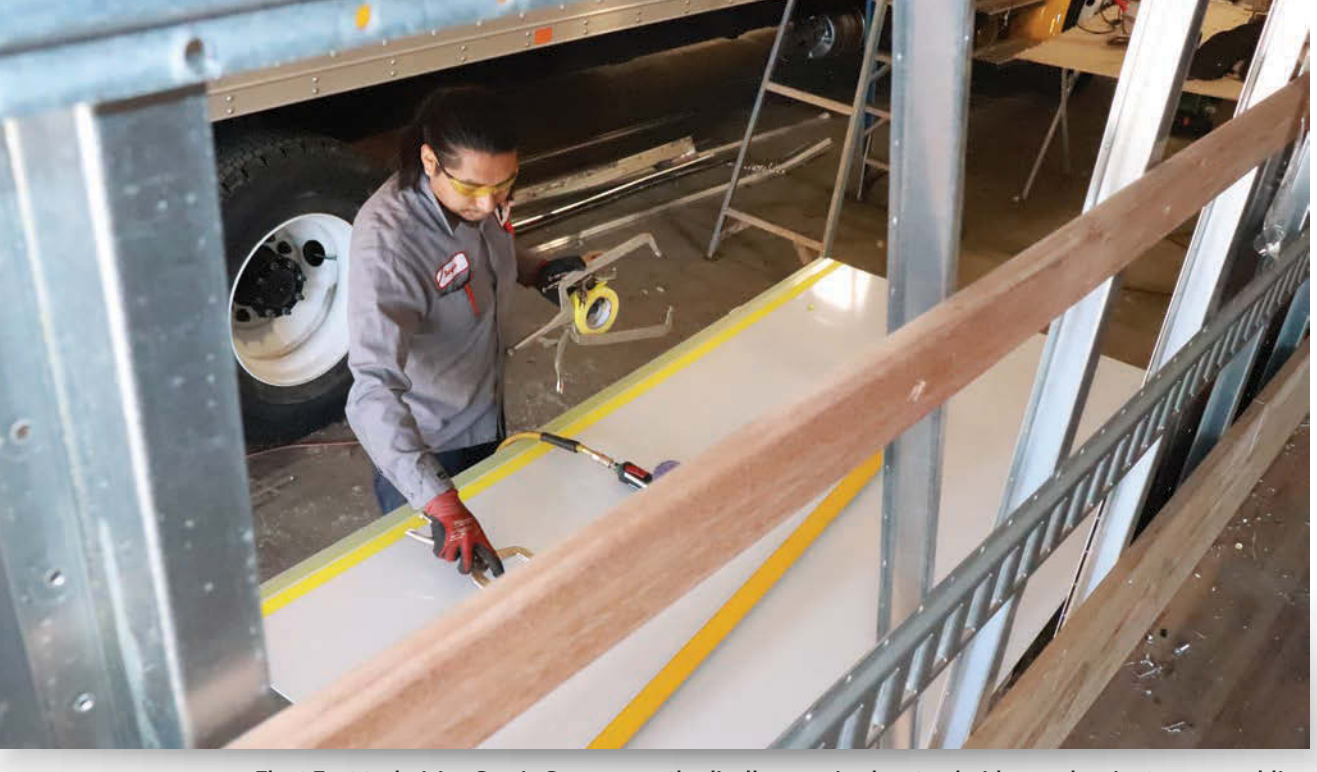
The more serious reason is that companies such as Amazon and Penske want trucks that bear their name to look professional and not like they moonlight at demolition derbies. And it's very difficult to get new trucks, due to backlogs driven up by chip shortages and COVID-related plant shutdowns.

"In the early days, we were extremely conscious of the workflow; we did not have the luxury of keeping trucks in bays while waiting for parts."

Raj Basran, president and owner of Fleet Fast

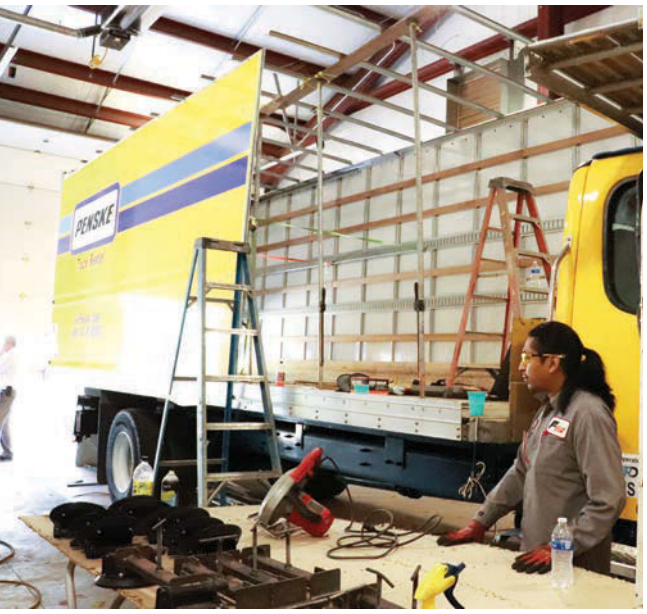
"We're seeing a bigger volume from the customers who actually take a lot of pride in their fleets because it's a lot harder to find new trucks right now," noted Fleet Fast office manager Ben Cole. "Trucks that have been hit—that normally would have been totaled out—or older trucks they would be retiring, they're fixing instead. And they're still making them look top notch for their drivers."

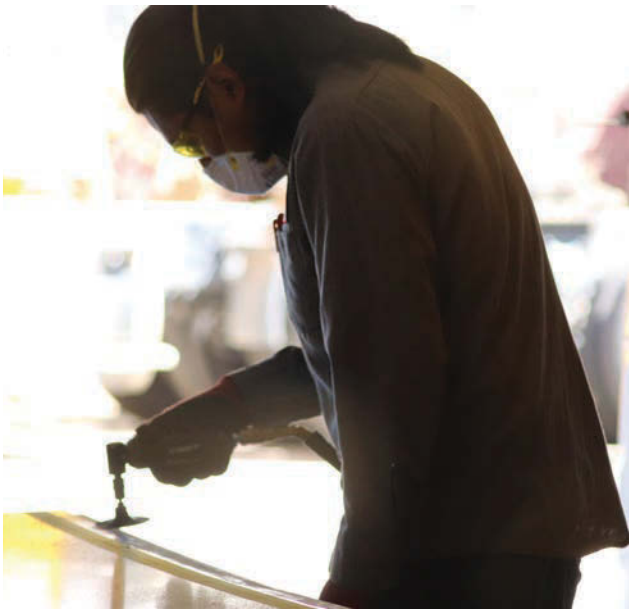
At any one time, up to 70 commercial vehicles could be in the bays, queued up in one of the shop's secure parking lots, or in the overflow lot across the street. And Basran noted business revenue has grown eight-fold over when the shop worked on both passenger and commercial vehicles.



» Fleet Fast technician Sergio Soreque methodically prepping box truck side panels prior to reassembling the body. This repair process can take one to two weeks, and costs one-third of a full replacement.

Photos: John Hitch | Fleet Maintenance





"Down equipment means longer downtime for repairs, so we have strong relationships with our tool vendors in servicing and maintaining. They also provide loaners when necessary."

Raj Basran, president and owner of Fleet Fast

» Usbaldo "Uzzy" Hernandez, who has been a technician at Fleet Fast for seven years, has been cross-trained to perform several jobs at the shop, including box repairs, body and paint, welding, and decal installation.

"Pre-pandemic, we were probably looking at around 40 to 50 trucks that are works in progress or pulling in at any given time," Basran said. "Now we're renting more space just to park them, so that's an added cost of doing business."

Basran admitted he was naïve about expansion: "I didn't realize with every step, we're going to need more parking."

Parts are also a major challenge. Extruded aluminum and corner caps for the bodies, as well as certain hoods and other pieces, have pushed back certain repairs by weeks to months. COVID-related shocks to the global supply chain resonate even deeper for smaller shops with little bargaining power, but Basran said larger fleet customers, such as Penske, can help move things along faster.

And while overflow parking has become a struggle, the unused automotive bays allow for ample parts and paint storage.

"A big advantage to our business versus some others is that we hold around $100,000 in parts onsite," operations coordinator Brian Joseph relayed. "A lot of that is box parts that we can then put on the truck and have a turnaround time much lower than other shops in the area."

Finding the right tools and partners

The shop has nine technicians, two office employees who handle logistics and estimates, and a few drivers to pick up and drop off the vehicles to fleets. The shop's technicians constantly buzz around, sanding panels, wrapping a whole chassis in plastic, and replacing corner caps. The team can rebuild an entire straight truck's box in a week or two. It's clear from walking around the premises that this small team has fabricated an efficient workflow. However, twenty years ago, the blueprints were fuzzy outlines in Basran's mind.

"Not having the background of being a tech, or even training in the industry, I knew that I needed to partner up with somebody who could teach me," Basran said.

After looking around and reasoning a paint company would provide the best support, Basran settled on PPG Refinish, which had recently launched its MVP Business Solutions program. This offering comprises training, consulting, tool help, and more. The MVP operations manual would become Basran's "bible."

"When I first started, this gave me all of the key insights into running the facility," he recalled.

He also connected with a vendor called Autobody Products Inc. (API) out of Butler, Pennsylvania, which provides PPG paints and coatings, tools, and training and service. They remain Fleet Fast's primary vendor.

Other partners include Morgan Corp., Wabash, Mickey Truck Bodies, Maxon, Waltco, and 3M. Certification partners include I-CAR and ASE.

Having established partnerships and getting the right shop equipment made the transition smoother, Basran said. This included riveters and plasma cutters, DuraPlate application/installation kits, and even truck diagnostic tools.

Basran credits the purchase of eight scissor lifts as making the biggest impact on technician

productivity and comfort. The shop previously used stationary and rolling ladders.

"We invested in the best equipment available to ensure that we could be as efficient and fast as possible," Basran explained. "Down equipment means longer downtime for repairs, so we have strong relationships with our tool vendors in servicing and maintaining. They also provide loaners when necessary."

Implementing PPG's AdjustRite automatic estimating software eight years ago also has allowed Fleet Fast to get work orders created and approved.

"AdjustRite is such a robust estimating system that we don't have to do anything," said Basran.

The system, accessed from a computer or smart device's web browser, takes the user step by step and provides populated lists of options to click on. The program draws from a vast cloud-based database, taking into account the truck model, parts pricing, labor, and even smaller costs such as hazmat disposal, to instantly provide an accurate estimate to the customer so work can get started.

"If an estimating system does not have a logic-based function, it's possible to overlook a certain percentage of costs attributed to parts and/or labor," noted Doug Orr, manager for AdjustRite. "Even if this number is just 5%, a job estimated at $20,000 could be missing up to $1,000 in costs for these items."

Before using AdjustRite, Basran said he was writing in everything manually and using automotive estimating templates for the commercial trucks, which proved difficult. That was anything but fast.

"The big thing is speed for us—it's in the name," Basran said. And at Fleet Fast, the estimating system also proved to be highly accurate.

Office manager Cole, who performs about 1,000 estimates a year, said the estimates match final cost over 95% of the time. While the estimator can walk around the truck and fill in the fields at the vehicle, Cole prefers to jot information down on a pad using a shorthand he devised. He then plugs the numbers in at his desk, because he also has to man the phones in the office.

Growing up and out

It's a small crew, so everyone has many jobs. Basran is especially proud of Francisco "Frank" Esquivel, his master technician and right-hand man. Esquivel was an entry-level worker 12 years ago and is now entrusted with the most difficult jobs, such as fixing Freightliner front ends. He benefited from learning from an older technician, Alan Grace, who had worked for truck body manufacturer Supreme Industries, which merged with Wabash in 2017.

Having someone with OE experience who was willing to train others allowed the shop to now expand from basic bodywork to rebuilding boxes, which Basran credited as the major driver of the shop's current success.

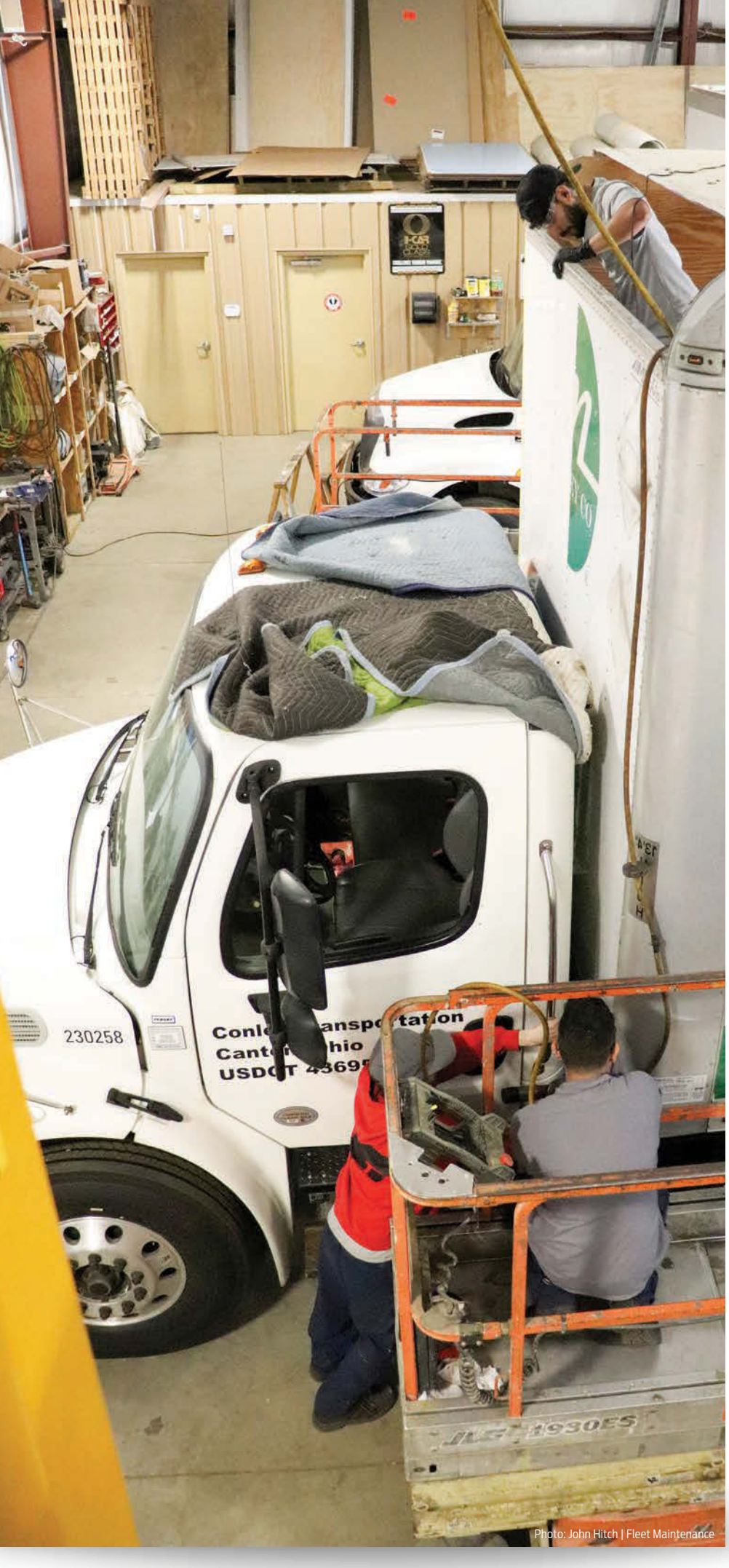


Photo: John Hitch | Fleet Maintenance


Photo: John Hitch | Fleet Maintenance

"We want to hire people who have a good work ethic, are kind, open-minded, and reliable; everything else we feel like we can train."

Raj Basran, president and owner of Fleet Fast

Photo: Fleet Fast


Photo: Fleet Fast

Loyalty obviously matters to Basran, as this shop is more than just a business; it's his family's legacy. And because Esquivel has taken advantage of every training opportunity to expand his skillset, Basran has entrusted him with a larger managerial role, including employee hiring and day-to-day performance.

Esquivel had a big role in rooting out the "bad apples," what he called technicians who would hide in a corner and play on their phones instead of working. But the shop manager realized even when techs are hard to come by, the wrong hires can create more of a workload.

"We threw bodies at the problem just to help us out—and we ended up babysitting," Esquivel said.

The culture issues stopped around the time the pandemic started, with a new strategy emerging.

"Our philosophy is bringing in entry-level guys with little or no experience and training," Basran said. "We want to hire people who have a good work ethic, are kind, open-minded, and reliable; everything else we feel like we can train."

That method had already paid off with Esquivel and his brother, Cristian Fonseca, who started as an apprentice nine years ago. Fonseca received his welding certificate about five years ago and is now a master tech in fabricating and welding.

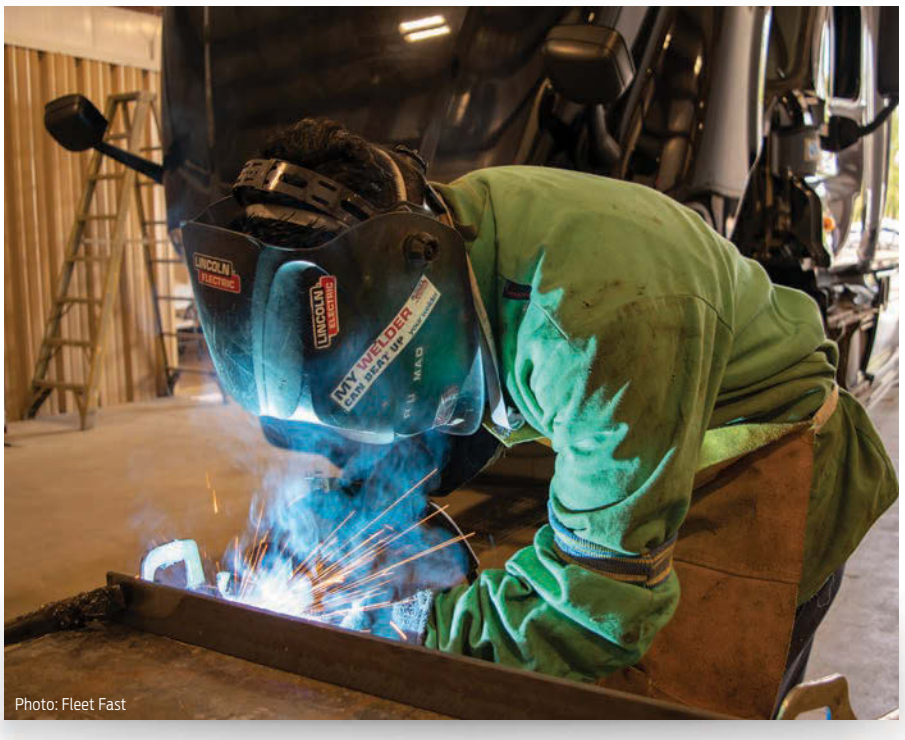


Photo: Fleet Fast

» **Top left:** Fleet Fast uses scissor lifts to keep techs at the most ergonomic and safest height for repairs.

» **Top right:** Francisco Esquivel dons his painting suit to apply a clear coat.

» **Bottom right:** Cristian Fonseca welds a liftgate.

» **Middle:** Office manager Ben Cole (left) and technician Dwayne Lowe (right) jot down notes and take photos for an estimate.

» **Bottom middle:** Using the space and tools to modify and tune up personal vehicles, likeTy Hayward's yellow Lexus, is one of the most commonly used work perks Fleet Fast.

"The welding teachers come to me and say, 'Okay, this guy can now teach the course because he's that good,'" Basran proclaimed. "[Fonseca] basically had mostly on-the-job training, and he learned from the box guys who used to work here full time."

Basran reasoned anyone who Fonseca trains will gain at least some of the institutional knowledge from those technicians who haven't worked there in several years. He has already taught another fellow technician, Ty Hayward, a former plant worker at Waltco Liftgates.

"He taught me a little bit about it; I feel comfortable doing it, though I wouldn't say I'm *really* good at it," Hayward offered. Basran took exception to that assessment, saying Hayward is perfectly capable of many tasks.

The Fleet Fast employee of three years does plan to continue training and get even better at welding, which will certainly help the shop. Those skills are always needed to precisely repair door frames and ramp components after being severely damaged. Basran also takes great pride in returning trucks back to OEM standards, even when they come into the shop looking like they went a few rounds with Optimus Prime.

Fleet Fast takes a "homeschooling" approach to its continuous education in all areas, often inviting vendors and OE experts to hold hands-on clinics onsite. Van experts may come in to show where to apply adhesives on side paneling, while an I-CAR trainer may go through welding procedures. This show-don't-tell method is crucial, as going off written instructions alone can become burdensome. Ford's procedure for replacing roof panels is around 30 pages, Basran noted.

"Training is a problem in the commercial body shop industry—there's a big void," Basran said. "There's I-CAR and ASE, but we have struggled as an industry."

One thing Fleet Fast does not struggle with is retention. This starts with all that training and is fortified by competitive wages. Due to the pandemic and now rampant inflation, Basran said he handed out cash bonuses and "brought up our hourly wages accordingly and aggressively with the team."

It's also about recognizing who his employees are at heart and allowing them ample time and resources to fix up and modify their personal vehicles. They pay the wholesale cost for supplies like paint.

"If you look at their cars, they build them, they don't buy them—it's the old hot rod mentality," Basran said. "Back in the '60s and '70s, everybody would go in their garage and get dirty. You don't see that anymore. But with our culture, we emphasize that. It's who we are."

To attract more of those gearheads to Fleet Fast, Basran has his techs do some soft recruiting of friends with similar interests and at car shows.

"These guys are so resourceful by nature, and they like working on things and with tools," Basran explained. "So I told them, 'When you go to the car shows, recruit. When you talk to any like-minded friends, recruit.' And actually, we got a lot of these guys working here now from the network of people that my guys knew."

Esquivel recently found three new technicians through his social media network. And while Basran admitted the shop could use more technicians to grow even more, it won't come at the cost of ruining the family dynamic.

"I'm not going to disrupt my culture just to add more bodies," Basran concluded. "I feel like we're better off now post-COVID, strengthening the guys we have now, empowering the guys we have now, and continuing to train them up."

Even though Basran still works where he learned to walk, he appears miles ahead of where he started.

Last-mile tires made to last

Last-mile deliveries are booming, but these routes add significant stress to commercial vehicle equipment, particularly tires. Designs for today's LMD tires are a mix of complex materials and evolving technology.

By Cristina Commendatore

[TIRE & WHEEL]

The pandemic has launched e-commerce and consumers' digital buying behaviors into overdrive. Data from the U.S. Department of Commerce shows that e-commerce sales have been growing steadily for over a decade, with the most significant growth in the last two years.

In 2021, total U.S. e-commerce sales reached $960.1 billion, an 18.3% year-over-year increase from $811.6 billion in 2020. E-commerce sales in 2021 marked the highest on record and are up from a decade ago, when online sales in 2011 totaled $199.3 billion.

As of late, for the first quarter of 2022, the Census Bureau of the Department of Commerce estimated that U.S. retail e-commerce sales were $250 billion, an increase of 2.4% from the fourth quarter of 2021. E-commerce sales in the first quarter of 2022 accounted for 14.3% of total sales, according to federal data.

» Yokohama tires keep this Southern Tire Mart delivery truck rolling.

Photo: Yokohama Tires

These shifts to e-commerce from traditional brick-and-mortar buying behaviors are prompting a booming evolution in fleets' last-mile delivery (LMD) and regional-haul operations. With that growth comes high commercial equipment utilization rates and demands for new equipment, which have been juxtaposed by lingering OEM backlogs.

It makes sense that commercial fleets in the LMD segment today are looking to get the most from their current assets. Part of that means adequate spec'ing up front and procuring equipment that can keep fleets' unique, high-demand LMD operations rolling. Tires are a key piece of this efficient-operations equation.

"Last-mile delivery and regionalized business has seen continual rise throughout the last decade, with no signs of slowing down, especially as companies meet the demand of their customers for free, fast delivery," said Tom Fanning, Continental Tire's VP of sales and marketing for truck tires in North America.

Because of this explosive growth in the segment, LMD equipment and light commercial vehicles are evolving hand in hand, added Helmut Lang, head of product management, Truck Tires the Americas, Continental Tire.

For the most part, last-mile pickup-and-delivery fleets are spec'ing their tires for cost per mile, overall mileage, durability, and low-rolling resistance, with many fleets moving toward more sustainable tire solutions and practices in today's world of growing environmental, social, and governance standards.

Durable treads

Tire fitments for LMD fleets typically range from 16" to 19.5", depending on application. Durability and tread design are among the most important features for tires to withstand LMD, regional, and urban delivery challenges on the road.

"Especially when reaching the last mile, tires need durability and management to handle changing environments and varying levels of stress," explained Dustin Lancy, commercial product manager for Goodyear North America. "LMD vehicles are typically driven by inexperienced drivers who abuse the tires, especially from curbing, which causes sidewall damage."

Today's tires have become a mix of complex materials and evolving technology, with tread design playing a major role in functionality. According to Jason Miller, national fleet channel sales manager for Cooper Tire & Rubber Co., last-mile fleets have a blend of consumer and commercial challenges that could be troublesome for tire engineers.

Cooper Tire, which is relatively new to the commercial tire space, was recently acquired by Goodyear. Together, the companies are providing various tire options to the LMD market.

"The tires for final-mile need to have the handling, low road noise, and mileage of consumer tires and the toughness, load flexibility, and casing durability of a commercial truck tire," Miller said. "All of that comes into play where the rubber literally hits the road—in your tread. Picking the right tire and right tread design will help deliver on the unique needs of final-mile fleets."

Continental's LAR3 16" tire featuring an all-steel casing has been built for commercial van applications. The all-steel radial was designed for durability and retreadability. According to the company, the tire's specialized compounding delivers enhanced mileage while providing fuel efficiency. In addition, the 10-ply light truck all-steel casing provides increased load-carrying capacity, durability, and puncture resistance.

In essence, fleets need tread designs with adequate traction to handle all delivery situations—city streets, gravel roads, even steep muddy driveways in some areas—explained Jon Wilkins, Michelin's senior operational marketing manager.

LMD operations introduce additional stress with the frequency of stops, causing brakes to heat; curbing, or bumping/grinding into curbs, at the delivery point; and the constant twisting and turning to navigate side streets and neighborhood delivery routes.

Spec'ing the right tire and tread design from the start can help fleets get the most from their tires. According to a blog post from tire industry veteran Tim Phillips, VP of marketing and operations for CMA/Double Coin, tire companies and testing agencies are placing considerable resources into testing tires for endurance, curb impact resistance, heat aging, and other factors to determine which tire products can deliver in LMD applications.

Within fleets' operating areas, tread selection should be based on surface and weather conditions along the routes their equipment and drivers frequent, Tom Clauer, Yokohama Tire's senior manager of commercial product planning, pointed out.

Fuel economy

Similar to more conventional long-haul operations, last-mile tire tread designs need to address specific operating conditions, Yokohama's Clauer advised. Typically, shallow rib-type tread designs are the most fuel efficient, he explained.

"Interestingly, many last-mile deliveries include on-highway and high speeds," Clauer added. "That alone makes added fuel efficiencies an important factor. Many fleets recognize this and are adding fuel economy components to their equipment as well."

When possible, operating efficiently also means saving time and money at the pump. That's where low-rolling-resistance (LRR) features come into play. Overcoming rolling resistance can end up saving up to 33% of a truck's overall fuel consumption. So, it makes sense that some 80% of new trucks and trailers are spec'ing LRR tires, according to data from the North American Council for Freight Efficiency (NACFE).

Tire makers like Goodyear, for example, are developing new tires to help fleets meet evolving last-mile expectations. Earlier this year at the American Trucking Associations' Technology & Maintenance Council meeting, Goodyear launched its Fuel Max RSA ULT for regional-haul applications.

Goodyear developed its Fuel Max Technology to deliver longer wear, lower cost per mile, and lower rolling resistance for better fuel efficiency. The tire technologies embedded in the Endurance RSA ULT also include IntelliMax Rib Technology to stiffen tire tread; better rolling resistance; new tread geometry applied to the bottom of the grooves to reduce stress and casing damage; a deep, open zig-zag tread pattern with stone-penetration protectors to help enhance traction and resist stone retention on urban streets; and durable casings for retreadability.

"By the time a package reaches your door, the tires have been through a lot," Goodyear's Lancy emphasized. "We've seen that there is no one-size-fits-all solution. Different tread designs will perform differently in different environments, so it's important to work closely with a trusted partner to plan and execute the life cycle of your tires."

When considering the way geography and climate can impact fleet assets, like tires, Keith Iwinski, director of fleet marketing for commercial, Bandag, Bridgestone Americas

» Continental's LAR3 16" tire features an all-steel casing.

Photo: Continental

» The Goodyear Wrangler Workhorse AT is an all-terrain tire that delivers strong traction on and off road, enabling drivers to access remote job sites.

Photo: Goodyear

» The Cooper Work Series All-Steel All-Position tire is engineered for regional pickup-and-delivery applications and optimized for final-mile delivery. The Cooper ASA tire contains stone protectors to help resist the hazards associated with urban applications.

Photos: Cooper Tire

Tires for last-mile EVs

After evaluating data from its Run on Less—Electric program, the North American Council for Freight Efficiency (NACFE) determined that half of Class 8 regional-haul tractors are electrifiable today. This is even more apparent in the last-mile delivery (LMD) market segment, which is typically served by commercial vans and step vans that make it back to their home base each day. In fact, NACFE has reported that LMD vehicles are 100% electrifiable today.

As the LMD sector continues to adopt electric vehicles (EVs), there will be a need for more EV-ready tires.

"Heavier EVs require special consideration to keep them rolling efficiently," pointed out Dustin Lancy, commercial product manager for Goodyear North America. "Goodyear is seeing a variety of tire sizes being used on these future EVs.

"It's important that if your fleet is transitioning to EVs that you don't assume you can use the same tire on ICE and EVs," Lancy continued. "The conditions, environment, and needs of a fleet are all unique and need a tailored approach."

Goodyear's first tire developed for commercial EVs is the Endurance RSA ULT and is available in 16", 17.5", and 19.5". The 17.5" option has the first Goodyear tire with the company's Electric Drive Ready badge on the casing wall.

In addition to weight consideration for EV-ready tires, Keith Iwinski, director of fleet marketing for commercial, Bandag, Bridgestone Americas Tire Operations, explained that the high start-stop frequency for last-mile fleets is impactful as well.

"Your moment of inertia is immediate [for EVs] compared to other vehicles," he said. "You have to think about how that tire immediately starts up."

LMD EVs need both the durability and longevity in their tire performance as well as low rolling resistance, added Jon Wilkins, Michelin's senior operational marketing manager. And rather than fleets seeking out an EV-specific tire, he believes they should pursue tires with the lowest rolling resistance and longer wear for their electric LMD vehicles.

"There is a trend for some manufacturers to quickly label their tires as 'EV' to capitalize on the current EV change in the industry," Wilkins advised. "Fleets need real information to understand the components and not be swayed by slick marketing to label a tire EV."

Helmut Lang, head of product management, Truck Tires the Americas, Continental Tire, added that in the end, EV-ready tires will have the best rolling resistance to maximize range as well as a higher load index to maximize payload.

» **Michelin's Agilis CrossClimate is an all-weather truck tire for high-stress commercial applications.**

Photo: Michelin

Tire Operations, explained that fleets running routes in the south would typically seek a straight tread, or ribbed design, for better rolling resistance, longer wear, lateral traction in the rain, and optimal startup traction.

Furthermore, LMD fleets in the northern states may prefer drive tire designs for enhanced traction in the rear axle where LMD fleets in the southern states may only need all-position designs around the whole vehicle, Goodyear's Lancy added.

Maintain to retread

Although LMD urban pickup-and-delivery trucks operate mainly in local areas and run short miles compared to long-haul applications, last-mile tires don't last all that long compared to their over-the-road counterparts. From what Bridgestone's Iwinski has seen, tires for LMD applications last only about three months. That's why many fleets are doing what they can to salvage their initial tire casings and capitalize on retreading.

"For a vehicle that has a 17.5" tire or is a decent size steel tire, you are going to look into retreading because the retread tire will last as long as the new tire, and you're able to use your asset another time," Iwinski said.

Implementing a maintenance program specifically for last-mile tires that considers the frequent start-stop nature of delivery trucks and vans also can help maximize uptime.

Part of that preventive maintenance means ensuring LMD tires are correctly inflated and regularly rotated. That includes monitoring tire pressure and following manufacturers' pull-point recommendations.

Typically, the federal commercial tire pull point is 2/32nds. Bridgestone tells its LMD fleet customers that pull points for their operations should be in the 3/32nds and 4/32nds range, so they have the capacity to retread, Iwinski explained.

"A lot of times you get punctures on rainy days because water acts as a lubricant, so things that cut tires cut them easier on rainy days."

Keith Iwinski, director of fleet marketing for commercial, Bandag, Bridgestone Americas Tire Operations

The key is not allowing the tire casing to become too far worn or for the belt package to become injured beyond repair, otherwise the casing likely won't be salvageable for retreading, Iwinski advised. Equally important is education on driving conditions—where the vehicle is being operated, how it is being operated, start-and-stop frequency, and debris.

"A lot of times you get punctures on rainy days because water acts as a lubricant, so things that cut tires cut them easier on rainy days," Iwinski explained. "Curbing affects casing integrity. So, if you're pulling up to a house, stay a little bit away from the curb so you can save your tire. When you are backing up, make sure you are not backing up over curbs because of pin shock.

"It's okay to walk another 100 feet to deliver the package if you see you are in a construction area," he added. "That will save your casings in the long run."

Overall, if the LMD vehicle has a balance or alignment issue, tires are going to wear out much faster.

"When people don't do pre-trips or post-trips, what ends up happening is that tire injury is an injury on the road," Iwinski emphasized. "As an LMD fleet, when that happens, packages have to be loaded onto another vehicle. Now, the fleet is one truck down because the driver didn't do a pre-trip or a post-trip."

Monitoring tread life

Technology also has a role to play when it comes to keeping track of tire health. Bridgestone's IntelliTire solution, for example, automatically measures and monitors tire pressure and tread depth when vehicles drive over a sensor mat. When vehicles pull into the yard, the onboard system will inform fleets and service dealers when a unit has a flat so the tire can be changed before its next scheduled delivery.

Similarly, Continental's ContiConnect Yard Reader is a digital tire monitoring solution that can be mounted at a distribution center or fleet terminal to identify any tires with low air pressure or high temperature before they leave. Optimal for vehicles that return to the fleet yard at least once a week, ContiConnect's web portal displays tire data such as pressure, casing temperature, and valve damage and air leaks to fleet personnel if a problem is detected.

On commercial tires, such as the Cooper PRO Series Long Haul Steer 2, the company implements a Wear Square, a visual indicator on the shoulder ribs that starts as an "A," and becomes an "L" at half tread life, and an exclamation mark when it needs to be replaced. The difference between the markings on either side of the tire also indicate alignment issues. Misalignments can exacerbate wear.

Goodyear Tire & Rubber Co. also has a handheld digital tire tool called Tire Optix, with one end to measure tread depth while the other attaches to the valve stem to check pressure. The data is sent via Bluetooth to a mobile app, which tracks what trucks have problem tires.

"We inspect about 2 million tires a year with Tire Optix, and it's all about creating efficiencies and accuracies during this tire inspection process," said Jamie Redmond, Goodyear customer engagement specialist.

Goodyear's CheckPoint drive-over-reader uses micro-transducers, lasers, and cameras to detect tread depth and pressure, and it can be used for vehicles ranging from passenger vehicles to Class 8 tractor-trailers, with options for in-ground installation or 2-3" ramp style above ground option.

Hunter Engineering Company's Quick Tread Heavy-Duty automated tire inspection system provides fleets the ability to "get a quick glimpse of the state of that vehicle within a matter of seconds as it passes through, and there is no human involvement at all," said Tommy Maitz, director of marketing at Hunter. The camera system takes images every time a vehicle passes through; in the ground, lasers read tire tread depth, and multiple angles capture the inboard side as well to provide wide inspection coverage. Quick Tread Heavy-Duty can read single tires at the front of the vehicle as well as duals or super singles.

Ultimately, LMD fleets should evaluate tires based on treadwear longevity, operational durability, and what fits best for their specific operations. Establishing a robust tire program that emphasizes tread depth monitoring can ensure that tires achieve the longest life possible and are ready for retread as well as being ready for the frenetic environment of urban delivery.

—Additional reporting by Tyler Fussner.

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Optimizing engine oil drain intervals

Hitting the sweet spot of oil change scheduling takes planning and data.

By John Hitch

Images: 67082121 | Igor Zakharevich and 55756008 | Okea | Dreamstime

There's not much the maintenance department can do to help fleets on fuel prices and inflation right now, but a renewed focus on engine oil management can help improve fuel efficiency and engine life to defray all the pesky issues biting into fleets' profit margins.

At the top of the list, of course, is making sure the engine oil is suitable for the engine. You should also factor in the overall benefits an oil marketer's formulation provides, not just the cost.

"Minor changes to get a better performing product translates into a lot of other much more tangible benefits," noted Tom Gaurke, a commercial business consultant for Chevron. "When we went from 15w-40 to 10w-30, we got about a 1% increase in fuel economy, and that was at $4 per gallon of diesel. That's $900 in savings per truck per year."

How much ash content is created in the aftertreatment system is another factor to consider. Chevron formulated its Delo 600 ADF heavy-duty engine oil to 0.4% sulfated ash, which can save fuel and prevent drivers from taking time out of the day to perform a regeneration.

"Over time, as the diesel particulate filter has greater and greater ash accumulation, the number of regens that you have increases and each one of those regens costs you fuel," Gaurke added. "Not only does Delo 600 generate a much smaller amount of ash, but that ash is packed in the DPF more densely, so for the same amount of ash getting put into the DPF, you're actually able to hold more of it and prolong the DPF."

Oil drain intervals

Next, ensure the oil drain interval (ODI) schedule matches reality. Going too long between oil changes will make the engine work harder and reduce fuel efficiency, and the properties that reduce friction among moving parts also degrade, exacerbating wear and tear. On the other hand, premature oil changes can drain resources, labor, and asset uptime.

Paul Cigala, commercial vehicle lubricants applications engineer at ExxonMobil, noted that small fleets and owner-operators may take this precautionary approach to drain intervals based on, perhaps, what their dad might have done. These users are "throwing good oil away" that Cigala said larger fleets would gladly put in their own engines because "there's still life left in there."

And with oil in general becoming more scarce across the globe, the transportation industry must rethink this conservative strategy and work to conserve more oil. By finding the perfect time to perform ODIs, fleets will ensure the engine oil does not hinder fuel efficiency and, at the same time, does not take up technicians' time by performing oil changes too early.

That's why Cigala advises fleets with whom he works to implement a used-oil analysis program.

"If your OEM allows a 40,000-mile oil drain interval, and you're doing it at 15,000 miles, I'll say, 'Let's take a look at the data,'" he explained.

A used-oil analysis involves taking samples from oil while in the engine and testing for contaminants and lubricant chemical integrity.

This data has been enlightening for customers using Mobil Delvac's used-oil analysis program. Stewart-Haas Racing's trucks that haul NASCAR vehicles and parts across the country extended ODIs from 20,000 miles to 70,000.

"There's less downtime for us and a lot more time to chase the checkered flag," noted Gary Geissman, Stewart-Haas Racing's fleet manager.

Texas Transportation Company pushed the ODIs on their Detroit Diesel engines from 50,000 to 70,000 miles, saving $734,000 annually and cutting labor by 475 hours annually.

Cigala said fleets that regularly sample used oil can also detect EGR cooler leaks, fuel dilution, and excessive wear metals inside of the engine.

According to Darryl Purificati, sr. technical advisor, OEM/Automotive for Petro-Canada Lubricants, some important pieces of the engine efficiency puzzle include "keeping the overall performance at an optimal level for the longest amount of time, extending drain intervals with proper oil maintenance, and ensuring that the critical components within an engine are being protected with an oil analysis program."

"If your OEM allows a 40,000-mile oil drain interval, and you're doing it 15,000 miles, I'll say, 'Let's take a look at the data."

Paul Cigala, commercial vehicle lubricants applications engineer, ExxonMobil

This can be tracked digitally with a solution like Petro-Canada's LUBE 360 Oil Diagnostics solution, Purificati said. Fleet managers can input samples and access results from a PC or mobile device via a customizable dashboard, which he said "prioritizes critical results and detects abnormal conditions before they cause costly repairs."

"Fleet managers can benefit from expert analysis and recommended maintenance activities based on their oil sample results," Purificati added. "They can track maintenance events, manage sampling schedules, and receive email reports sent directly to them and their team for one site or across multiple sites."

For example, sampling can alert a fleet to glycol or coolant in the engine oil, which could indicate

a failing EGR cooler seal; or iron and aluminum, which could signal a failing camshaft, coolant leak, or that the engine needs a mechanical adjustment.

The sampling process

"Optimally, you should have a sample of used oil analyzed after every oil change for every truck," explained Karin Haumann, OEM technical services manager for Shell Lubricant Solutions.

This, she said, is the first step to getting to that target ODI. But you have to first know how to take that sample properly.

"If you take your sample when the oil is being drained, catch it midstream by waiting at least five seconds," Haumann said. "That way, you won't be collecting heavy metals or other deposits lying at the bottom of the pan.

"Withdrawing oil through the dip-stick opening is another good way to take the sample," she added. "This can reduce the chance of outside dirt or contaminants getting into the sample and will keep the oil from splattering when you stick the bottle into the stream. Whichever way you take the sample, do it in the same manner each time to help keep your results consistent."

Cigala also asserted where the oil is sampled from makes a big difference in getting accurate results.

"When you go to the doctor and they pull a blood sample, they're not just making you bleed and then picking it up off of the floor," he said. "They're taking it out of a vein in a flow, and taking a representative sample of your blood and they're looking at everything that they look at on the panel—it's the same thing with used oil analysis."

He said the sample should be taken from an engine that's up to temperature, and either live under pressure out of the oil gallery or out of the middle of the oil pan through the dipstick tube.

ExxonMobil advises taking a sample via vacuum extraction with a vampire pump or from the in-line sample valve are both good options, though collecting oil from the sump drain after removing the drain plug is not. A few other best practices include keeping the oil sampling vacuum pump in a clean and controlled environment, as well as using new lengths of plastic suction tubing for each sample, which prevents cross-contamination. And always promptly send the sample to a lab.

Accurate reporting is crucial to help the lab do its jobs. The mileage on the engine determines if certain contaminants are normal or not. Until about 200,000 miles, engines will still have copper from when the manufacturer braised the oil coolers at the factory, and aluminum and potassium can come from the charge air cooler until an oxidative layer forms, Cigala said.

"What happens is as the hot air from the turbocharger goes across the charge air cooler, it picks up the aluminum and potassium, brings it into the combustion chamber, and then after combustion it finds its way into the engine oil," he explained.

It's also important to note that ODIs depend not only on the engine and engine oil, but the duty cycle.

"We always say 'optimize,' we never say extend your oil drain, because in a lot of cases, depending on where the fleets are operating and the drivers, there's a lot of variability and [maintenance providers] need to really have a good picture of what's happening there," said Rebecca Zwetzig, Chevron, ISO clean project manager for the Americas.

She said three factors will ensure optimized oil: "Start clean, monitor that fluid health with a fluid analysis program, and then keep it clean."

This year Chevron rolled out its Keep Clean Preferred Vendor Program to provide shops a network to find the right tools and partners, which ensures oil does not get contaminated before being poured into the engine and while in service through oil monitoring. Vendors include fluid management company Des Case and oil and fluid sampling provider Checkfluid.

"We don't have tools or an offering in that category, and many times our sales representatives are getting asked questions about that," Zwetzig said. "We felt there was a gap here that we could help fill for those who are seeking a solution in this area with quality vendors who provide top-notch service and have the expertise to deliver upon that."

According to Jason Bendon, chief commercial officer of Des Case, "80% of failures on the mobile side are directly related to contamination."

"You just have to have enough data to be able to measure it, which is why taking that sample is so critical," Zwetzig concluded. "This leads to more uptime, higher equipment availability—and components that last longer means a significant reduction in expenditures to a fleet's capex budget."

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What freight & fuel have to do with inflation

The Consumer Price Index is how we measure inflation, but a look at trucking-related indicators like freight and fuel also can help predict where the economy is heading.

The rebound from -3.8% in May 2020 to +23.4% in June of this year is the result of extraordinary levels of demand, constrained supply, and robust pricing power.

The Consumer Price Index (CPI), the most widely followed measure of inflation, has experienced a relentless rise in its rate of change over the past two years—so much so that the subject now dominates discussions of current and prospective economic conditions. Here's a quick timeline of the past few years:

- **February 2020:** At the start of the COVID-19 pandemic, the inflation rate stands at 2.3%, a level around which it fluctuates from the previous five years.
- **May 2020:** As the country endures the lockdowns that disrupt every facet of daily life, the CPI drops to 0.2%.
- **March 2021:** The economy reopens and the inflation rate climbs higher, reaching 2.6%.
- **July 2021:** The CPI jumps to 5.3%.
- **January 2022:** The CPI reaches 7.5%.
- **July 2022:** Inflation hits 9.1%.

While it has become quite fashionable among the punditocracy to compare the current rate of inflation to the rates of the 1970s and 1980s—with headlines noting the recent CPI is the highest in 40 years—those comparisons are about as valid as saying a heart attack is the same as a broken leg because both patients are in the ICU.

The circumstances that brought about the waves (yes, there was more than one) of double-digit inflation in the 1970s and 1980s are completely different from the circumstances that brought the CPI from 0.2% to 9.1% over the past two years.

So, rather than dwell on the past, let's focus on the signals we are getting now from several prices that are important to you.

The most important prices are those associated with hauling freight. Why? Because how much maintenance a truck needs depends largely on how much it is used. How much maintenance that truck actually receives depends largely on the ability of the truck user to afford the repair. And both of those elements are reflected in the revenue collected by hauling freight.

According to the U.S. Bureau of Labor Statistics (BLS), truck transportation prices have risen 23.4% over the past year. In May 2020, they had fallen 3.8% from where they had been in 2019. The price measured by the BLS includes all the costs associated with moving the freight, so special handling charges, fuel surcharges, and any other fees are in the BLS number. By the way, these price indexes can be accessed at no charge from the BLS website.

The rebound from -3.8% in May 2020 to +23.4% in June of this year is the result of extraordinary levels of demand, constrained supply, and robust pricing power.

Much of what happens next to freight rates also will depend on what happens to fuel costs. In February 2020, as the COVID event was getting under way, diesel fuel stood at $2.956. By May, the price was down to $2.437 per gallon. In early June of this year, we reached $5.783 per gallon.

Over the next several months, we will be looking at the level and trend of freight rates to see just how much of the tensions that have driven those prices higher over the past two years are unwinding.

On the demand side, we expect to see the seasonal patterns of freight movement begin to reassert themselves. We will be looking most closely at the freight volumes associated with the retail sector where there are reports of inventories still being out of balance. Also of interest will be what happens in the agricultural sector as the crop year progresses.

Recent news from the supply side has employment in truck transportation rising steadily as training, recruitment, and retention programs appear to be having some success.

The pricing dynamic, which has lately favored the truckers, seems likely to revert to a more balanced situation where shippers regain some element of control.

Structural changes are underway in the economy that are affecting every aspect of the trucking industry. The rapid rise in the prices associated with trucking activity are the proof of that. The structural changes are far from complete, so the pricing environment will remain volatile. Our task will be to make the best use of the information being signaled by those prices.

By Robert Dieli
ECONOMIST, MACKAY & COMPANY
AND PRESIDENT, RDLB INC.
MacKay & Company specializes in market research for commercial trucking, construction equipment, and agricultural machinery. The company provides strategic research and analysis to vehicle and component manufacturers, distribution and service channels, industry associations, and private equity firms. With a long career managing portfolios and coordinating domestic economic forecasting programs, Dieli began RDLB, Inc. in 2001. In this role, Dieli serves as an advisor to many firms in the trucking, consulting, and financial services sectors. He is also an economist with MacKay & Company.

FLEET PARTS & COMPONENTS

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

Maintains optimal fluid temperatures

The **EVantage Electronics Cooling Package** (ECP) from **Modine Manufacturing Company** keeps the traction motor and power electronics cool for all loads. This complete solution is designed to maintain optimal fluid temperatures for the traction motor and power electronics circuits utilizing multi-zone cooling. EVantage ECPs are designed to specification with small to large fan arrays that operate only when required to minimize power draw. The EVantage Thermal Management Systems are designed to operate as complete, plug-and-play systems controlled through Controller Area Network (CAN) bus communications. They also include a pre-programmed master controller for automated operation. Modine thermal management products are especially suited for zero-emission transit, coach and school buses, specialty vehicles and trucks, including vans.

For more information visit **FleetMaintenance.com/21270679**

Separates solid contaminants from main oil supply

Dieselcraft Fluid Engineering developed the **OC-25 Cyclone Series Centrifuge** for internal combustion gas and diesel engines. Engine oil pressure spins the centrifuge rotor at a rate of up to 6,000 rpms, generating a centrifugal force 2,000 times greater than gravity. That force separates the solid contaminants from the main oil supply. Contaminant particles less than 2 microns are removed, eliminating the wear and tear on close tolerance metal parts. The solids/soot is stuck to the inside of the rotor, which is easily cleaned at over 15,000 miles. The OC-25 requires only a 1/4 NPT tapped hole to return oil to the engine. It has a universal mounting plate and comes with all the needed hoses and fittings. Minimum requirements are any engine with a sump of at least 5 quarts (no maximum) and 12V.

For more information visit **FleetMaintenance.com/21274779**

BLE radio enables two-way communication

The **Bluetooth Low Energy** (BLE) **Tire Pressure Monitoring System** (TPMS) from **Sensata Technologies** was developed for vehicle OEMs to help improve vehicle safety and performance. Sensata's BLE TPMS replaces the ultra-high frequency (UHF) radio with BLE radio to enable two-way communication. The BLE TPMS solution is available in both clamp-in and snap-in configurations, optimized for long battery life, and delivers the same pressure, temperature, and auto-location capabilities as Sensata's existing UHF TPMS. With over-the-air updates, drivers can download tire-related features and software updates, avoiding a trip to the shop for service. BLE two-way communication also enables cyber security authentication and adds a layer of protection from being hacked. Sensata will be launching production in the first half of 2023.

For more information visit **FleetMaintenance.com/21274780**

Real-time live streaming capabilities

The **Ranger Hybrid DVR** from **Pro-Vision** expands the number of high-definition cameras supported compared to the 900 Series DVR. It is backward-compatible with all existing Pro-Vision cameras, supports up to eight AHD (analog high definition) cameras and an additional DHD (digital high definition) camera, up from four AHD cameras and two DHD cameras on the previous model. The AHD inputs feature zero latency, meaning there is no lag between what the camera captures and what the in-cab video monitor displays. Additional benefits include enhanced real-time live streaming capabilities, HDMI HD video output, a timelapse recording feature, and the ability to support up to one terabyte SD card options.

For more information visit **FleetMaintenance.com/21274781**

Provides audible alarms and object detection

The **Ultrasonic Back-Up Sensor Kit** from **Continental** is easy to set up and simple to configure as a retrofit or original equipment installation for virtually any vehicle, including commercial vehicles, RVs, and off-highway agricultural and material handling equipment. It provides an audible alarm to the operator when the vehicle comes within 10' of an object and beeps faster as the driver gets closer to the obstacle. The kit can also be customized for specific distance intervals to meet OEM specifications. The system delivers a voice announcement of object distance at specific intervals and integrates with on-board camera/monitor systems. When paired with a back-up camera system, a monitor will display an overlay, revealing the active sensor(s) and the object distance from that sensor. The kit includes four sensors, a central control unit, and a speaker.

For more information visit **FleetMaintenance.com/21274783**

Comes with a sensor, new bung, weld-on plate, and zip tie.

This **Dorman Products** OE FIX **Exhaust Gas Temperature** (EGT) **Sensor**, No. 904-7134, directly replaces the sensor (OE Number 4984179) and comes with a bung repair kit in case the bung is damaged during removal. The bung repair kit allows direct repair of a damaged bung instead of replacing the entire exhaust pipe. The kit comes with a sensor, new bung, weld-on plate, and zip tie.

For more information visit **FleetMaintenance.com/21274831**

Utilize Super Chrome Piston Rods

Marathon Brake Systems developed a line of **Heavy Duty Shock Absorbers** for a range of truck, trailer, and severe service applications. The shocks have perimeter welding for the closing system, reinforced projection welded zones (8,000 lbs. maximum tensile strength of mounting), and endcap/outer tube welding that delivers 12,000 lbs. maximum tensile strength. The shocks also utilize Super Chrome Piston Rods for durability and corrosion protection. These piston rods have temper hardness of 30-55 Rc, chrome plated surface hardness 67 Rc min., 0.0004" min. thickness, are dehydrogenized at 218°C for 70 minutes, a surface finish of Ra:6µ" and Rz:45µ", and are salt spray tested for 24 hours minimum.

For more information visit **FleetMaintenance.com/21274805**

Matches fit, function, and appearance of OE handle

The **Exterior Door Handle**, Nos. 760-5112 and 760-5113, from **Dorman Products** matches the fit, function, and appearance of the original equipment handles, OE Numbers R561158 and R561159R, on specified heavy-duty truck years, makes, and models—Kenworth T680 2020-15, Kenworth T800 2020-15, Kenworth T880 2020-15, Peterbilt 567 2020-12, and Peterbilt 579 2020-13.

For more information visit **FleetMaintenance.com/21274811**

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Features a convenient tilt-down custom design

Lippert Components, Inc. and **Fontaine Modification** jointly developed the **LUVERNE 2" Tubular Grille Guard** for the Chevrolet Silverado 4500 HD, 5500 HD, and 6500 HD Chassis Cabs. The LUVERNE 2" Tubular Grille Guard features a convenient, heavy-duty tilt-down custom design that maximizes front-end protection. The guard is constructed from a high-strength, 2" diameter tubular steel ring assembly that mounts to solid 1/4" steel plate uprights. The guard is also frame-mounted, providing a solid structural base and promoting dependable front-end protection. The grille guard features tilting brackets that allow it to be folded down whenever needed, so technicians can do under-hood work without removing the guard.

For more information visit **FleetMaintenance.com/21274801**

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- 22mm Low Profile Shockit™ Socket for delivering maximum rotational force and minimum side loading for extremely stuck NOx sensors
- 22mm Thin Wall Deep Shockit™ Socket removes NOx sensors on Jeep® & RAM® ECO Diesel
- 24mm Shockit™ Socket removes Particulate Sensors (Soot Sensors) on Chevy® Duramax, Dodge® Cummins and Ford® Power Stroke
- 24mm Low Profile Shockit™ Socket for delivering maximum rotational force and minimum side loading for extremely stuck particulate sensors
- 30mm Shockit™ Socket removes the NOx sensor lock nuts on Jeep® and Ram® ECO Diesel
- Includes 20mm, 22mm & 27mm bottoming tap and dies for sensor and mounting hole threads
- Must be used with Shockit™ Punches for maximum performance and warranty coverage
- Additional Shockit™ Punches sold separately - LT1910PS 5.5" Short Punch, LT1910PL 22" Long Punch
- Patent #7,677,143

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TOOLS & EQUIPMENT

A roundup of the latest tool and equipment offerings.

Able to measure, record, and playback compression readings

The **OTC Deluxe Digital Compression Tester Kit**, No. 5605-DG, is designed to help determine the mechanical condition of the engine's cylinders. The digital gauge is easy to read and can display pressures in psi, kPA, bar, and kg/c. It can also measure, record, and playback compression readings on up to 12 cylinders for quicker testing and diagnosis. Specialized adapters work on both flat and tapered seat plugs. A convenient push-button side release valve relieves pressure for repeat testing. The kit includes standard and specialty adapters, including the deep well connector used on recessed plug well style heads and the Ford Triton engine adapter using 16mm thread plugs.

For more information visit **FleetMaintenance.com/21246001**

Available in three disk sizes

The **Durofix 60V Cordless Brushless Angle Grinders**, No. RG6020, is available in three disk sizes: 6" (No. RG6020-150), 7" (No. RG6020-180), and 9" (No. RG6020-230). All three deliver power performance equivalent to a 15A corded grinder. They also feature a three-position side handle, spindle lock button design, dual action trigger to eliminate accidental trigger actions, and a tool-free blade change and guard adjustment. The 6" and 7" offer three speed options with a maximum of 8,000 rpm. The tools are IP56 dust and water resistance.

For more information visit **FleetMaintenance.com/21249582**

Repairs inside and outside threads

The **Rotary Thread 15-pc Thread Restoration Master Kit**, No. RTK2.1, is designed to repair and restore all threads, grooves, glands, keyways, gears, and more. The kit repairs inside or outside threads, no matter the size, length, or diameter, without having to measure thread pitch, the company said. Each piece can be attached to a drill, die grinder, or Dremel tool. It features an embedded diamond abrasive, tuned for smooth control and easy thread repair. The kit is lightweight and can fix most hard-to-reach areas.

For more information visit **FleetMaintenance.com/21249588**

Lightweight and compact

The **ESAB Rogue ET 200iP Pro** is a high-frequency start TIG machine. The easy-to-use welder is designed with a durable housing that is IP23S rated. Weighing only 21.2 lbs., the welder features an ergonomic handle, carrying strap, and long extension cables for portability. In addition to offering ideal arc characteristics in TIG and stick mode, it provides several TIG parameters that can be easily adjusted, including gas pre flow, start current, ramp up time, ramp down time, finish current, and post flow. It also offers a pulse feature with background current control and frequency adjustments up to 500 Hz for better heat input control.

For more information visit **FleetMaintenance.com/21250495**

Has an onboard air pressure gauge

The **Ingersoll Rand 3/4" Impact Wrench**, No. 2146Q1MAX, features an air gauge that indicates whether it is operating at, below, or above the tool's maximum rated air pressure of 90 psi. The onboard air pressure gauge is situated on the back and monitors the air pressure ranging from 60 psi to 120 psi. The tool delivers up to 2,000 ft.-lbs. of nut busting torque, has the ability to quickly dial-in optimal power settings, has a six-vane motor to remove stubborn bolts reliably, and is built to withstand tough use. Also available with a 1" drive (No. 2146Q2MAX).

For more information visit **FleetMaintenance.com/21249594**

Soft-touch and hammer-resistant handles

The **Mueller-Kueps Heavy Duty Duo Handle Pry Bar**, No. 276 342V2, features two ergonomic, soft-touch and hammer-resistant handles, allowing for two-handed use. Made with special steel that has been hardened and tempered, the pry bar is ideal for heavy-duty jobs such as truck and offshore work. The pry bar has a large striking cap and a 45-degree pry tip.

For more information visit **FleetMaintenance.com/21252700**

Tungsten carbide tip is brazed to the steel blade

The **Lisle Corporation 1-1/4" Carbide 8" Scraper**, No. 81990, is designed to remove gasket residue from steel and aluminum heads and manifolds, along with carbon build-up and even rust. The carbide scraper features a double-dip grip handle for comfort. It can also be used to clean disc brake caliper slides. The Tungsten carbide tip is brazed to the steel blade. The tip remains very sharp and is precision ground. Use caution when using the scraper on aluminum to avoid scratching the surface, the company noted.

For more information visit **FleetMaintenance.com/21250500**

Automatically shuts off to prevent overinflation

The **Milwaukee Tool M18 Inflator** is an 18V cordless tire inflator designed to meet the needs for transportation maintenance professionals by providing ideal performance, versatility, and durability to survive demanding jobsites. With the 150 psi max capability, users can fill tires quickly. Additionally, the inflator is equipped with TrueFill auto shut-off technology that has the accuracy to be set at a specific psi which will automatically shut off the tool to prevent overinflation. The M18 Inflator is also resistant to auto shop chemicals.

For more information visit **FleetMaintenance.com/21254539**

Delivers up to 70 lb.-ft. of torque

The **DeWalt ATOMIC Compact Series 20V Max Cordless 3/8" and 1/4" Ratchets**, Nos. DCF513B and DCF512B, deliver up to 70 lb.-ft. of maximum torque. The ratchets feature a variable speed trigger to help users optimize speed based on the application at hand and a glass-filled nylon housing to help combat damage caused by oil spills and solvents. With an integrated LED and compact build, the ratchets keep the workspace well-lit and enable access to difficult-to-reach fasteners. Battery and charger not included.

For more information visit **FleetMaintenance.com/21269032**

Offers quick and easy chisel changes

The **Air Hammer**, No. SP-1410, from **SP Air** uses a hard steel cylinder and offers a free speed of 3,000 rpm. It features a quick change coil spring retainer for fast and easy chisel changes. Simply attach each chisel to remove rust from mufflers and pipes, cut body panels, and peel off spot welds. The air hammer has a 0.4" shank size, measures 8.5" in overall length, weighs 3.6 lbs., and has a sound level of 96 dB. Also available in a kit (No. SP-1410K) that includes a sheet metal chisel, flat chisel, tapered punch chisel, and a spot welder chisel.

For more information visit **FleetMaintenance.com/21271569**

Features dual hot-swappable batteries

The **ZX10 Android Tablet** from **Getac** is a fully rugged tablet and versatile 10" device built around the Android 11 operating system. It features dual hot-swappable batteries, glove touch capability, and is MIL-STD-810H and IP66 certified to withstand drops up to 6', shock, vibration, dust, and liquid spillages. An 8mp front camera and 16mp rear camera deliver high-quality photo and video capture, while dual integrated microphones help filter out loud background noise for enhanced audio quality.

For more information visit **FleetMaintenance.com/21252693**

Flexible head bends up to 180 degrees

The **STKR FLEXIT Pocket Light** performs as a traditional flashlight yet features a head that bends up to 180 degrees, allowing the user to point the light exactly where it's needed. It offers hands-free lighting by being able to stand upright, hang from its built-in hook, attach to metal surfaces via a built-in magnet, or clip onto a pocket or belt. The aluminum LED housing contains a center CREE spotlight and a ring of floodlights for wide-angle lighting. The LEDs can be used independently or at the same time. The pocket light is rechargeable and includes a charging cable. Available in 400 lm or 650 lm.

For more information visit **FleetMaintenance.com/21252695**

Includes 11 magnetic tip bits

The **Vessel Low-Profile Flat Plate Ratchet Screwdriver Sets**, Nos. TX-76U and TX-79U, are ideal for use in very limited spaces. Both sets include a ratchet, a 2-pc internal bit storage, and an 8-pc external storage. The ratchet measures 4" in length and has a total height of 0.7" after attaching a 0.7"-long insert bit (13/32" height without bit insertion). The TX-76U uses a straight ratchet, whereas the TX-79U offers a 15-degree angle. The magnetic tip bits include: slotted 4mm and 6mm; Phillips PH1, PH2, and PH3; Torx T20, T25, T27, and T30; and Metric hex 3mm, 4mm, and 5mm.

For more information visit **FleetMaintenance.com/21271572**

Converts 1/4" drive ratchets into a high-torque hex screwdriver

The **ProMAXX PowerDrive Hex Adapter** is designed to convert any type of 1/4" drive ratchet, including electric, air, and hand, into a powerful, high-torque hex screwdriver. With a compact design, its 1/2" tall profile allows users to reach limited access areas with an included straight-head or Phillips-head hardened-steel bit. Additionally, the PowerDrive Hex accepts any 1/4" security hex shank specialty bit, enabling technicians to use their ratchet for any repair even in the tight sections of the engine compartment. Made in the U.S.

For more information visit **FleetMaintenance.com/21255607**

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» Fleets inundated with data may prefer simpler tire pressure monitoring solutions like Link MFG.'s Cat's Eye fixed tire pressure gauge.

Photo: Link Mfg.

Searching for simplicity in tire pressure management

Fleets may be getting more than they bargain for when they opt for complicated systems to maintain proper vehicle tire inflation.

It's clear that proper tire inflation is critical to the safe and efficient operation of commercial vehicles everywhere. Underinflation causes unnecessary tire wear, lower fuel efficiency, and can even cause a fire. Overinflation also causes tire wear but adds an uncomfortable ride, reduced braking distance, and increased risk of blowout to the list. It's truly an issue of safety.

So, there's really no debating that whether you're the VP of maintenance for a large fleet or an owner-operator managing your own rig, getting and keeping tires at their manufacturer's prescribed pressures is important. The age-old question is, what's the best way to maintain proper tire pressure?

I'm old enough to remember the ubiquitous tire-thumping method, which unfortunately still persists today, though it certainly wouldn't pass for a "best practice." Fortunately, technology has helped most of us evolve from tire thumpers to a more enlightened state. However, like many advancements within the technology realm, too much tech might just be a little too much for the majority of folks to handle. In fact, some of the technology might even be causing and propagating the very thing it was meant to prevent.

First, do no harm

Even the best intentions may result in negative consequences. I submit that for all but the most advanced fleets, and often even for them, automatic tire inflation systems (ATIS) may often do more harm than good.

There are competing ATIS technologies on the market, and no matter which technology you examine, they all have a few things in common. Add an ATIS to any vehicle and you add complexity and increased compressor runtime. And with the increased air connections and electronics required to run the system, you're adding more opportunities for problems down the road.

A self-fulfilling prophecy

Let's start with the complexity of the ATIS-related air systems. These systems require additional air lines and a lot of connection points. Each connection point presents an additional opportunity for an air leak. Then there are the seals required for the system. Most have rotating seals and, over time, these seals have the potential to wear or "oblong," which can undermine their integrity and create their own leaks in the system.

There is a trend that I've noticed with trailer OEMs I've visited over the years. One of the last checks they do on a trailer is an air pressure check, and they're allowed to have only so much air loss in a given amount of time. Otherwise, they have to go and first find and then fix leaks. I've found that the first place that they look is the ATIS tire inflation ports, especially the hubcap ports.

Let's say you're a driver picking up a trailer that has been parked overnight or over a weekend, and you're ready to start your shift. You could find trailer tires that have bled down, but because you get paid by the mile, you're highly motivated to get on the road. Or maybe you think that because the vehicle has ATIS, you don't need to worry about the air in the tires. Proper training aside, some folks are likely to drive those initial miles with underinflated tires.

Essentially, an ATIS may end up creating a lot of its own weak points and thus a parasitic loss of air. That air loss can only be compensated for by additional compressor run time.

Compressor time is money

With diesel prices soaring, running a compressor for any reason has to be part of the ROI calculation when it comes to considering an ATIS. More compressor load means higher fuel costs and a higher rate of maintenance and replacement for the compressors and other air circuit components.

With the advent of electric vehicles ever encroaching on the Class 8 vehicle space, compressor loads and run times will play an even larger role in the power usage equation. It will be interesting to see how ATIS will fare once OEMs and fleets start ordering BEVs at scale and once they see the impact these systems have on vehicle range.

A simple fix

I don't think I'm alone in my observation that technology is progressing a bit faster than fleets and maintenance folks would prefer. Actually, I think we all marvel at the technology, but the way the data is uniformly presented—not so much.

I'll leave it at this. ATIS often is just another part of the stream of telematics data, apps, and dashboards that have to be contended with. Even with the simple light-on/light-off systems, I had one user tell me that the light is virtually always on, indicating that the system is constantly engaged in keeping the air pressure stable.

Personally, I'm for the most simple and unencumbered approaches to tire pressure monitoring. Link Mfg. developed a simple, inexpensive solution called Cat's Eye. Customers choose the tire pressure they want to maintain, and it comes ready to install for both dual and super single tire configurations. The yellow, easy-to-read "cat's eye" pupil-like gauge constricts to a thin black line, and if the system loses pressure for any reason, the pupil dilates.

The industry is getting more complicated and demanding by the day, so we should all look for things that make life a little simpler for drivers, fleets, and maintenance professionals.

By Mark Molitor
SENIOR PRODUCT MANAGER, LINK MFG.
Mark Molitor brings more than 25 years of experience with engineering in the heavy-duty trucking industry to his position as senior product manager – chassis suspensions for Link Mfg. Prior to his appointment at Link, Molitor held several roles with SAF-Holland including: Vice President Product Engineering, Americas and Vice President Product Engineering, Powered Vehicle Systems Business Unit. His educational credentials include a Bachelor of Science degree in mechanical engineering from Western Michigan University.

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