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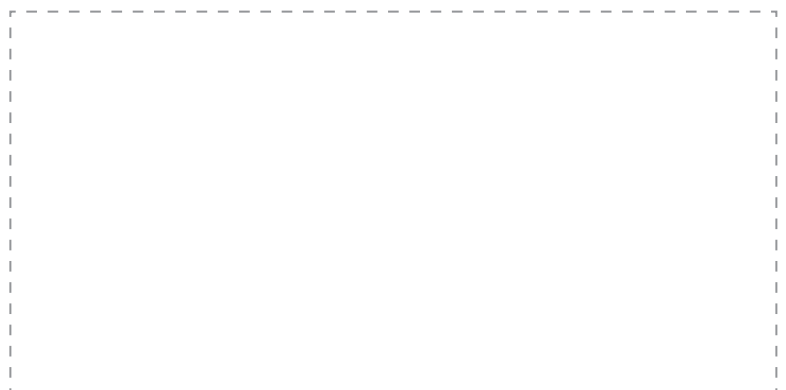
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18 **OVERCOMING COMMON INSURER BATTLES**

Getting properly compensated for repairs begins with communication and understanding

22 **UNSEEN CONCERNS SURROUNDING LATE REPAIRS**

Repair delays can stall cash flow, and that can cripple a shop





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Repair delays can stall cash flow, and that can cripple a shop



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### EDITORIAL

#### MICHAEL WILLIAMS

GROUP CONTENT DIRECTOR  
[michael.williams@ubm.com](mailto:michael.williams@ubm.com)  
(440) 891-2604

#### KRISTA MCNAMARA

CONTENT CHANNEL DIRECTOR  
[krista.mcnamara@ubm.com](mailto:krista.mcnamara@ubm.com)  
(440) 891-2646

#### CHELSEA FREY

SENIOR ASSOCIATE EDITOR  
[chelsea.frey@ubm.com](mailto:chelsea.frey@ubm.com)  
(440) 891-2645

#### STEPH JOHNSON-BENTZ

ART DIRECTOR

#### STALIN ANNADURAI

GRAPHIC DESIGNER

### CONTRIBUTORS

#### BRIAN ALBRIGHT

[b-albright@sbcglobal.net](mailto:b-albright@sbcglobal.net)

#### JOHN ANELLO

[atowscopeit@aol.com](mailto:atowscopeit@aol.com)

#### STEVE FELTOVICH

[sjfeltovich@gmail.com](mailto:sjfeltovich@gmail.com)

#### JAMES E. GUYETTE

[jimguyette2004@yahoo.com](mailto:jimguyette2004@yahoo.com)

#### WILL LATUFF

[wlatuff@latuffbrothers.com](mailto:wlatuff@latuffbrothers.com)

#### MARK OLSON

[mark@vecoexperts.com](mailto:mark@vecoexperts.com)

#### PATRICK PORTER

[patrickporter@gmail.com](mailto:patrickporter@gmail.com)

#### TIM SRAMCIK

[tsramcik@yahoo.com](mailto:tsramcik@yahoo.com)

#### JOHN YOSWICK

[info@crashnetwork.com](mailto:info@crashnetwork.com)

### EDITORIAL ADVISORY BOARD

#### PAUL GAGE

PROCARE

#### JEFF POOLE

I-CAR

#### JAKE RODENROTH

COLLISION DIAGNOSTIC SERVICES

### BUSINESS

#### JIM SAVAS

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GROUP PUBLISHER

#### TSCHANEN BRANDYBERRY

SPECIAL PROJECTS EDITOR

#### JILLENE WILLIAMS

SALES COORDINATOR

### DOMESTIC SALES

MIDWEST & WESTERN STATES/

CLASSIFIED SALES

#### MICHAEL PARRA

[michael.parra@ubm.com](mailto:michael.parra@ubm.com)

(704) 919-1931

ILLINOIS, EASTERN & SOUTHERN STATES

#### PAUL ROPSKI

[paul.ropski@ubm.com](mailto:paul.ropski@ubm.com)

(312) 566-9885

Fax: (312) 566-9884

OHIO, MICHIGAN & CALIFORNIA

#### LISA MEND

[lisa.mend@ubm.com](mailto:lisa.mend@ubm.com)

(773) 866-1514

### PRODUCTION & ADMINISTRATION

#### KAREN LENZEN

SENIOR PRODUCTION MANAGER

#### TRACY SKALLMAN

CIRCULATION MANAGER

#### DAVID PASQUILL

COMMERCIAL FINANCE PARTNER

#### SOFIA RENTERIA

BUSINESS ANALYST

### REPRINT SERVICES

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OEM NEWS

## TESLA MOVES FORWARD WITH COLLISION REPAIR OFFERINGS

**BRIAN ALBRIGHT** // Contributing Editor

➔ Tesla, which last year announced plans to expand its service center footprint and begin performing more collision repairs at those facilities, has begun performing body work at its own branded shops.

In an email sent to Tesla owners at the end of June, the company officially announced the availability of collision repair services at its service centers and

via its mobile service offering.

According to the email, Tesla service centers will now replace bumpers, fenders, doors, side mirrors and a variety of other bolt-on parts, as well as repairing minor dents, paint scuffs and scratches.

“We are excited to announce that Tesla Service is now performing collision repair at our Service Centers and through Mobile Service. Having your vehicle repaired by Tesla ensures quality work,

>>TESLA CONTINUES ON PAGE 6

**BREAKING NEWS**

INDUSTRY EVENTS

## TEXAS AUTO BODY TRADE SHOW TAKES SHAPE

➔ Online pre-registration is now open for the biggest industry event in Texas — the 2019 Texas Auto Body Trade Show, which is set for Sept. 20-21 at the Will Rogers Memorial Center in Fort Worth, hosted by the Auto Body Association of Texas (ABAT).

Attendees can pre-register at <https://ibk.nyc/tab>.

For the first time in the event's history, the association has partnered with Thomas Greco Publishing, Inc. — the team behind Texas Automotive and the Alliance of Automotive Service Providers of New Jersey's (AASP/NJ) annual NORTHEAST<sup>®</sup> Automotive Services Show — to elevate the show's presence in the industry and take it to the next level.

“This year's show will be bigger than ever before, so there will be more people to network with,” says ABAT President Burl Richards. “With technology changing so quickly, you need to get educated and know what's going on in the industry. You're

>>TEXAS CONTINUES ON PAGE 6

**TRENDING**

### SKILLSUSA STUDENTS USE E-SAFETY

The inaugural SkillsUSA Maintenance and Light Repair National competition contestants scored an average 88 percent at the CCAR safety station, among the highest of all MLR Stations.

[ABRN.COM/CCARSAFETY](http://ABRN.COM/CCARSAFETY)

### BEST, WORST METRO CITIES FOR REPAIRS

Jill Trotta with RepairPal talks about which cities are the best and worst for vehicle repairs, based on survey data capturing average repair order, road quality and average labor rate, among others.

[ABRN.COM/METROCITY](http://ABRN.COM/METROCITY)

### A DISCONNECT IN BUSINESS CAN DESTROY YOUR SELF CONFIDENCE

Shop management's No. 1 function in business is to build relationships. And one of the most important relationships is with the staff, says columnist Bob Greenwood.

[ABRN.COM/DISCONNECT](http://ABRN.COM/DISCONNECT)

### I-CAR LAUNCHES BODYSHOPOLOGY.COM

I-CAR launched BodyShopology.com, an industry-neutral locator that connects motorists with trained and credentialed collision repair shops close to home, all by entering a ZIP Code.

[ABRN.COM/SHOPOLOGY](http://ABRN.COM/SHOPOLOGY)

### LATEST “WHO PAYS FOR WHAT?” CONCLUDED

The latest “Who Pays for What?” survey by Collision Advice and CRASH Network shows a growing percentage of shops billing and being paid to match OEM texture of seam sealer.

[ABRN.COM/TEXTURE](http://ABRN.COM/TEXTURE)



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## &gt;&gt; TESLA CONTINUED FROM PAGE 4

quick service and transparent pricing,” the company wrote in the email.

Tesla also certifies third-party body shops to work on its vehicles, but customers have complained for years about long waits for parts. The shops in the current network have blamed Tesla’s supply chain, while Tesla has pointed the finger at the shops themselves as well as parts shortages caused by its efforts to fulfill new vehicle orders. It’s still not clear how Tesla plans to address the long lead times, but it appears the automakers will stock common parts at the service centers.

Tesla’s service footprint in North America is still spread thinly, with most service centers clustered in California and in the Northeast. It’s likely certified body shops will still play an important role in meeting the demand for repairs, and Tesla’s description of the collision services offered indicates that major damage will still require the services of a collision specialist.

Tesla has also focused on having cus-

tomers make service appointments online and through its mobile app, rather than contacting service centers directly.


In the company’s January shareholder’s call, CEO Elon Musk discussed the focus on service including the mobile component:

“I’m actually really excited about our mobile service,” Musk said. “We have mobile service vans that will come fix your car as soon as it breaks down. It actually will immediately send a note to Tesla mobile service, and it will be on its way to fix the car. We trialed it in the Bay Area and now have extended it to the L.A. area and a number of others for tire repair. The van will arrive, give you a new tire in half an hour, and you’re on your way. It makes it a huge difference. We’re adding things like bumper repair and collision repair. If I look at the things that most trouble customers, it’s things like collision repair taking an eternity and a third-party body shop charging an arm and a leg after taking an eternity. We’re moving a lot of the body repair in-

house at Tesla, and then even providing it on mobile service.”

Musk noted that the company had recently completed its first bumper replacement from a mobile service van, and that the repair took less than an hour.

In a Twitter announcement in May, the company also stated that the vehicles themselves will now alert owners if/when parts need to be replaced. The vehicles can also automatically initiate a parts order prior to the service visit.

Other OEMs, meanwhile, are expanding their own collision repair certification programs. General Motors is actively recruiting more shops into its own GM Collision Repair Network. Ford is working to boost the use of its Find-A-Collision-Shop locator on the Collision.Ford.com website. BMW of North American also recently announced the opening of two new service and collision repair technician training centers in South Carolina and Georgia, along with the expansion of training facilities in California and New Jersey. 

## &gt;&gt; TEXAS CONTINUED FROM PAGE 4

going to walk away from this show with information that you can utilize the first day you go back to work.”

Those who have attended the show in the past can expect big and very positive advancements in this year’s education schedule.

“Over the years, we’ve gone through a lot of different evolutions in the balance between the trade show and the educational component,” explains ABAT Executive Director Jill Tuggle. “This started off years ago as an educational event and morphed into a trade show. Now, with our trade show growing with more exhibitors, we’ve made a lot of changes to our education program to keep the number of attendees on the exhibitor floor steady at all times.”

The updated educational format will include shortened course times,

concurrently running classes and caps on the number of people who can attend each offering. Topics discussed will run the gamut from improving customer service to receiving more adequate compensation for performing OEM-required/recommended procedures.


During “How to Get Paid for Your Work: Receiving Proper Compensation for Proper Repairs,” certified auto appraiser and Texas Automotive “Ask the Expert” writer Robert McDorman (Auto Claim Specialists) will lead attendees through techniques and strategies for shops to successfully receive proper compensation for performing repairs to OEM specifications, using real-world examples from his experiences out in the field.

For “Use BillableGenie to Get Paid for More Procedures at Better Rates,”

veteran Texas Auto Body Trade Show presenters Sam and Richard Valenzuela of National AutoBody Research (NABR) will discuss BillableGenie, which Sam describes as “the industry’s first researchable database of actual repair data from actual insurer-written and paid estimates.”

Other Texas Auto Body Trade Show speakers slated to appear include (but are not limited to) Shawn Collins (3M), Ron Reichen (Precision Body & Paint) and Burl Richards.

From exhibitors showcasing the latest in automotive technology to seminars that will guarantee greater success in the field, the 2019 Texas Auto Body Trade Show will provide attendees with an experience they will not find anywhere else in the Lone Star State.

More information is available at [abat.us/events/2019tradeshow](http://abat.us/events/2019tradeshow). 

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~ Dave Olender,  
Olender’s Body Shop  
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~ Jeff Olender, Owner/Partner  
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# MIXED NEWS ON TARIFFS

**BRIAN ALBRIGHT** // Contributing Editor

The Trump Administration has delayed its decision on a proposed 25 percent tariff on imported cars and parts, moving the deadline back another six months. While that provides some relief for the industry (which anticipates large price increases, lost sales and supply chain challenges as a result of the tariffs), additional tariffs on Chinese goods — including auto parts and electronics — could pose a threat.

The U.S. has already increased tariffs from 10 percent to 25 percent on \$200 billion in Chinese imports. There could be another increase of 25 percent on \$325 billion in imports this summer.

The proposed 25 percent automotive tariff was targeted at Japanese and European car and auto parts imports.

“The Auto Care Association urges President Trump not to follow through on his threat to increase tariffs on \$200 billion in imported goods from China as soon as this week,” said Auto Care Association president and CEO Bill Hanvey. “The proposed sudden increase from 10 percent to 25 percent would have an immediate negative impact on not only the U.S. businesses that manufacture and distribute these parts, but the motoring public who will see higher prices on a wide range of products, including important safety-related components. Furthermore, the president’s suggestion that a 25 percent tariff could be levied on an additional \$325 billion in imports from China, without knowing which goods would be impacted, creates even more uncertainty for the business community.”

Automakers and other industry stakeholders have already had to deal with the fallout from Section 232 tariffs on steel and aluminum that have affected domestic operations as well as goods imported from a wide variety of countries, many of them close allies. In May, Treasury Secretary Steven Mnuchin indicated

that there had been progress on rolling back tariffs on steel and aluminum from Mexico and Canada. Those tariffs have been a significant sticking point in negotiations over a new North American free trade agreement.

China is the second-largest supplier of auto parts to the US, with 12 percent of all imports in 2017, according to the Center for Automotive Research (CAR). CAR estimates that current tariffs could lead to job losses in excess of 300,000 in the US, and an average price increase of \$2,750 for light-duty vehicles, accompanied by a reduction in sales of 1,319,700 units per year.

Last year, the Auto Care Association noted that a study by John Dunham and Associates found that the proposed 25 percent tariff on imported auto parts could result in the loss of \$1.4 billion wages, as well as a job loss of 6,800 in the vehicle repair sector and 85,200 jobs in the auto care wholesale and retail segment, in addition to job losses of 17,800 in the auto parts manufacturing sector.

## High cost of tariffs

While the purpose of the tariffs is to, ostensibly, drive trading partners into more favorable trade deals and increase the use of U.S.-made products, the results have been decidedly mixed. Consider the steel tariffs, which according to some estimates, have increased the cost of steel by as much as 41 percent. While that has been good for domestic steel producers, it has greatly increased production costs for other manufacturers. General Motors has already cut its own profit outlook in anticipation of a \$300 million increase in commodity costs.

The American Action Forum, a conservative-leaning economic think tank, estimates that if all of President Trump’s tariffs were enacted, it could increase U.S. consumer costs by \$66 billion annually. While increased steel profits have resulted in more jobs in that industry, the Peterson


Institute estimates that each of those jobs costs nearly \$900,000 to create.

China has already announced retaliatory tariffs that would increase to as much as 25 percent on \$60 billion worth of U.S. imports this summer.

Automotive manufacturers and parts suppliers have opposed most of these tariffs, while agreeing in principle that something needs to be done to curb China’s trade abuses when it comes to steel dumping and intellectual property theft. Other sectors have also urged the administration to reach some sort of agreement and reduce the tariffs.

“We have been encouraged by the President’s optimism and remain deeply concerned about recent suggestions that China is backing away from progress made to date,” said Myron Brilliant, executive vice president and head of international affairs at the U.S. Chamber of Commerce. “The American business community urges the Administration and the Chinese government to move forward expeditiously and in good faith to strike a high-standard, comprehensive, enforceable agreement, and end the tariffs now in place. Prolonging trade tensions and the escalation of tariffs are in neither country’s interest.”

“A trade war will not solve our problems. So we look forward to the United States and China returning to the negotiating table to get this deal done as soon as possible,” said Jay Timmons, president of the National Association of Manufacturers.

Bills currently under consideration in the U.S. Senate would provide more control over the tariffs by Congress, but it’s unlikely that legislation will pass any time soon. One is a bipartisan bill that would give Congress authority to approve future tariff increases under Section 232 of the Trade Expansion Act. Another bill, sponsored by Senator Rob Portman (R-Ohio), would enable Congress to pass “disapproval resolutions” for controversial tariffs. 

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## FRANCHISING

# ENTREPRENEUR REALIZES AMERICAN DREAM OF BUSINESS OWNERSHIP

ABRN WIRE REPORTS //

Robert Reid always aspired to owning his own business.

Reid moved to the U.S. from Jamaica when he was 18 years old to attend college. Passionate about cars from a very young age, he worked as a helper in a body shop while earning his degree in Mechanical Engineering.

Reid spent 14 years in corporate America developing skills in managing manufacturing operations and driving continuous improvement — first in the automotive industry and then in consumer products. He held various roles of increasing responsibility, including production manager, plant manager, and manufacturing and performance director.

But entrepreneurship was always on his mind — and in his blood. Both his mother and father were small business owners — with his mother being hands-on while his father spent most of his career in corporate roles. At the age of 36, Reid found himself in the perfect position to start a business. He put his corporate career behind him and followed his dream of being a business

owner and his passion for all things automotive.

“When I looked at franchise opportunities in the automotive space, I found that Maaco fit my criteria for the type of business I wanted to own and the financial potential I wanted to achieve” said Reid, owner of the Maaco location in Mansfield, TX, which opened in February 2017.

In his second year in business, Reid nearly doubled his output in 2018. He’s well on his way


to another significant increase in 2019. Reid cites Maaco University, the company’s training program, and tons of support from many of the existing franchisees as instrumental to his success.

“Maaco U is a solid training program,” said Reid. “From the pre-opening training you receive in Charlotte to the ongoing training for technicians, you can really learn a great deal.”

As part of his growth strategy, Reid wants to be sure that his shop is known for more than just economical paint jobs. Last year, his shop participated in a project with a famous Japanese car tuner Akira Nakai, who specializes in design and modification of Porsche 911 models. A close friend of Reid chose him and his Maaco team to paint the RWB and facilitate the project in Dallas.

“Painting the RWB Porsche was a great opportunity, and it fits with my strategy of proving we are capable of performing the highest levels of work. It is not our core business but we don’t ever want to be discredited for a lack of capability,” noted Reid. “The Maaco economics and national position with fleet business have also helped to fuel our rapid growth.”

Reid also stresses the importance of hiring good people. Two key members of his team are individuals with not only decades of experience working in collision shops but were also body shop owners in other states. These two gentlemen support the business in any area needed and help mentor the newer employees. One of these individuals is the painter that Reid worked for as a helper while attending college.

Reid is a great example of someone who has turned his passion for cars and his years of experience in corporate America into the perfect blend for entrepreneurial success. 

## ROBERT REID'S TIPS FOR NEW FRANCHISEES

- Begin with the end in mind
- Know how large you want to grow and plan accordingly
- Know what kind of work you want to attract
- Be sure you are comfortable managing a fast-paced business and technical workforce
- Find and hire good people



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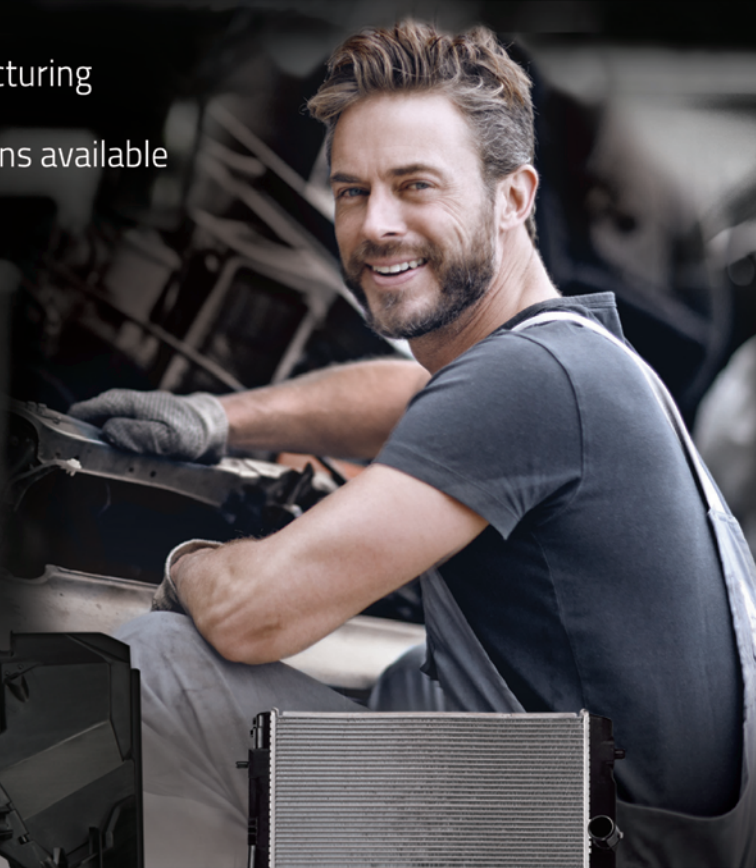
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# ASA, ALLIANCE TO HOST TECHNOLOGY & TELEMATICS FORUM

The Automotive Service Association (ASA) is partnering with the Alliance of Automobile Manufacturers to host the 6th Annual Technology and Telematics Forum Sept. 12, in Troy, Mich.

The half-day “What’s Now, What’s New & What’s Next” forum will consist of a number of discussions focusing on new vehicle technologies.

“We are excited about this year’s Technology and Telematics Forum,” said Bob Redding, ASA’s Washington, D.C. representative. “It’s an opportunity for independent repairers to hear first-hand the latest vehicle technology advances, discussions about data access and dialogue with colleagues.”

Attendees will have the opportunity to listen to and interact with industry experts regarding new and developing vehicle technologies, the impact this technology will have on the automotive industry, and data access and

cybersecurity solutions.

## What is TTF?

Now in its sixth year, the Technology & Telematics Forum (TTF) provides the opportunity to discuss next-level issues facing mechanical and collision repairers and shop owners. This year, it is being held over one comprehensive day designed to bring attendees face-to-face with industry leaders and innovators.

## Who should go to TTF?

Shop owners and staff of independent repair facilities who are interested in coming away from cutting-edge information on new vehicle technologies.

## Why should I care?

Vehicle technology is becoming increasingly sophisticated, and it is critical that independent repairers are aware of the latest technological advances in the in-


dustry and how these innovations will impact shop owners.

## When & where is TTF?

Thursday, Sept. 12, 2019 at the Hilton Garden — Ballroom — in Troy, Michigan. Troy is a suburb located a short distance north of Detroit.

## What will happen?

The forum will include five panels providing a multitude of information over a four-hour period (from 1-5 p.m.). Then, following the last panel discussion, there will be a time for attendees to interact, get connected and discuss key takeaways.

Past forums have included representatives from the National Highway Transportation Safety Administration (NHTSA), automakers, consumer groups, cybersecurity professionals and other stakeholders. 

# HD REPAIR FORUM SECURES PLANS FOR THIRD ANNUAL EVENT IN 2020

## ABRN WIRE REPORTS //

Plans for the third annual HD Repair Forum have been confirmed. The 2020 event is scheduled for March 24-25 at The Worthington Renaissance Fort Worth Hotel. Registration will open in the fall of 2019. To keep up to date with the HD Repair Forum’s agenda, speakers, and current news in the commercial vehicle collision repair industry, sign up for the monthly HD Repair Forum newsletter.

“The HD Repair Forum brings together all stakeholders from the heavy-duty collision repair industry. The event provides attendees an op-


portunity to discuss trends, address industry challenges, and evaluate key business strategies,” explains Jennie Lenk, Communications Manager for the HD Repair Forum.

The 2019 event saw significant growth from its inaugural meeting, proving the HD Repair Forum, with the guidance of its advisory board members, is addressing the needs of the industry.

A few of the highlights from the 2019 event included presentations from Daimler, Navistar, Peterbilt, Volvo, Heavy Duty Manufacturers Association (HDMA) and I-CAR. Session topics focused on a myriad of industry issues such as advanced driver assistance sys-

tems (ADAS), electric and hybrid vehicles, liquified and compressed natural gas vehicles, and a panel of insurance executives discussing claims handling and industry collaboration.

“Attendees also witnessed a historic announcement and well-earned recognition, as I-CAR acknowledged Penske Truck Collision of Norcross, Georgia, as the first-ever commercial vehicle collision repair facility with an I-CAR Gold Class certification,” states Lenk.

In addition to presentations, attendees gathered valuable knowledge for business sustainability and growth in a series of breakout sessions designed around process improvement and profitability. 





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# AN EVOLVING REPAIR MIX



## Sedan fixes taking a backseat to heftier repairs for pickups, SUVs and CUVs

**JAMES E. GUYETTE** // Contributing Editor

**W**ith pickups and sport utility vehicles — plus the related category of crossover utility vehicles — now overtaking sedans as the dominant choice as a daily driver pur-

chase, shop managers and parts purveyors are seeing a larger brand of repair job. Individual parts tend to be bigger, the refinements and features are more sophisticated and the training requires higher levels of rigor.

“You take an emblem off and there’s a camera underneath it,” remarks Darren Huggins, head of collision services for Berkshire Hathaway Automotive, which has more than 85 car dealerships and associated repair centers across 10 states.

An SUV can be rolling down the road equipped with more than a dozen cameras and a multitude of sensors while enveloped within the latest situational awareness technology.

"You have all these whistles blowing at you," activating a vast array of various alerts, and the costs accelerate accordingly when work is needed, according to Huggins, who also serves as chairman of the National Auto Body Council (NABC).

"With the severity of the repair the price goes up," he says. "Cycle time is increased; it takes a lot of time, a lot of skill and a lot of parts." A mechanical rate that previously ran at \$129 per hour is now up to \$159, and a bill of \$25,000 to \$30,000 is not unheard of when a drastic fix is involved.

"And don't think that ADAS (Advanced Driver-Assistance Systems) isn't having and impact on the industry be-

cause of the cost of the materials," says Huggins.

"Pickup trucks are now considered daily drivers," notes Tony Molla, vice president of the Automotive Service Association (ASA), further propelling a pattern of vehicle heftiness shifting into heavier metal, including special materials such as high-strength steels and aluminum, plus assorted composites necessitating a uniqueness of shaping and forming techniques.

"That means more training and more equipment in the shop," says Huggins. Repairing aluminum, for instance, requires a clean room-type setup separated from other operations. "If you can't work on aluminum you shouldn't be working on these vehicles."

"You may need some special tools, such as a locking tool to replace a special sensor," Molla points out. "Even though



the SUVs have gotten bigger, most lifts will handle anything up to a mid-sized truck. Most shops are designed with larger vehicles in mind."

A structure's height could become an issue, however, when extra-tall vehicles are coming through the bay doors. "If you're going to service buses and motor homes you'll want a larger facility," he says.

An old-time rural or inner-city shop that's yet to be updated may place some constraints on your ability to adequately

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move about in the bays and circle the car. “The 12-foot-wide stall is too narrow,” says Huggins. “I like 14 to 15 feet if I can get it.”

### Setting up shop

In gearing up to accommodate the newer vehicle preferences, “The main difference is more service for all-wheel-drive systems,” reports Bernard Swiecki, senior analyst at the Center for Automotive Research (CAR) in Michigan.

“The bigger the vehicle, the more it costs — the panels are bigger, there’s heavy-duty frames, etc., and fancy metals,” says Huggins. “You’re going to see more replacement parts” for panels rather than pounding dents into submission with a hammer. “Most of them are full-frame now — you can’t heat them up” to straighten out kinks.

“We try to keep just-in-time inventory. We don’t want to tie our dollars up in a bunch of parts that sit on a shelf,” explains Huggins, yet even this strategy results in an inventory cost approaching \$300,000. “Our margins are shrinking. We’re paying our technicians more than ever, and we still can’t find enough of them.”

“One of the biggest challenges besides finding talent is having a high enough volume to be able to afford the new tools and equipment that are needed,” says Molla. “This is an example of the market responding to consumer demand, and training is an even more important issue.”

Some shops are opting to focus on a particular OEM nameplate, such as Fords, Chevrolets or whatever, due to the high cost of coping with the specialization requirements, according to Molla. “You’ll pick and choose which models to work on because of the diagnostic equipment. There’s a lot to the equation,” he says.

And part of this equation, according to Swiecki, is knowing whether the task at hand is indeed an SUV — or is it actually a CUV? A crossover utility vehicle usually sits upon a unibody chassis, with the body and frame being one unit like a sta-

tion wagon. An SUV has a body-on-frame construction, as with a pickup.

Over time, the terms have become blurred and are often used interchangeably, even by automakers and their marketing teams. “The vast majority of what people think of as an SUV is not an SUV — it’s a CUV,” Swiecki declares. “You’ll even have different definitions by different government agencies” as to what constitutes an SUV versus a CUV.

“It all comes back to the good ol’ station wagon,” Molla muses. With CUVs, “a lot of components are shared with sedans — it’s just a car in a different package,” Swiecki elaborates. When designated as a CUV, “they’re seen as cooler and more rugged than a traditional sedan.”

He goes on to observe that these types of vehicles “are very much a real trend” among motorist favorability. “They’re now more than 40 percent of the total U.S. market, and it’s starting to take hold around the world. It’s not just a shift in preferences,” says Swiecki, “it’s been going on for a couple of years, and it’s expected to be the new market norm.”

Referring to a beefier SUV-like footprint, “In the U.S. we’ve always had a preference for large vehicles, especially when gas is affordable,” he says.

In addition to being more accommodating for senior citizens and others with mobility issues who might have trouble bending themselves into a low-to-the-ground car, “you get more room and more utility — and people like to sit up high to see over traffic,” according to Swiecki. “And it’s also an image thing.”

There are plenty of parts to purchase and plenty of service needs to be met. “You look at the average vehicle today, and it’s \$38,000. People are driving and repairing their older cars longer because of the cost of a new one,” says Huggins.

“People don’t care how much the price of gas is,” he continues. “It’s all about convenience and comfort. You want the protection of a full-size vehicle — a pickup or an SUV.”

Although larger vehicles bring in better OEM profit margins, smaller mainstream cars remain viable within the pre-owned segment, particularly among millennials and other budget-minded buyers. “The spring market trend continues with affordable used sedans rising the most in values,” says Dr. Anil Goyal, executive vice president of operations for the Black Book sales guide. “The crossovers are showing an uptrend as well, but not as strong as the sedans.”

Some empty-nester retirees and first-time drivers are deeming deluxe SUVs as too expensive, plus there is a brewing backlash by the younger set against being seen behind the wheel of a vehicle more closely associated with soccer moms.

According to J.D. Power research, in 2018 the average price of a subcompact SUV ran about \$22,400 — more than \$6,000 higher than a similarly sized car model. (It’s possible, too, that subcompact pickups may be picking up increased sales down the pike.)

“Looking ahead to 2019, a record number of truck and SUV launches will help manufacturers better align portfolios with overall demand,” reports Thomas King, senior vice president of J.D. Power’s Data and Analytics Division. Nearly 45 all-new or major redesigned vehicles are expected to rollout this year, with 28 being a truck or SUV.

“It’s an example of need-based growth” as drivers in the 25- to 34-age range move from urban areas and settle down to buy a home in the suburbs, according to Ford U.S. sales analyst Erich Merkle. “Millennials have begun forming families, and those families are growing — in terms of the number of children as well as the size of those children.” ■



#### JAMES E. GUYETTE

is a long-time contributing editor to *ABRN*, *Aftermarket Business World* and *Motor Age* magazines.  
[JimGuyette2004@yahoo.com](mailto:JimGuyette2004@yahoo.com)

# Scale the KPI concept up for larger success stories

KPIs helped this owner build — and successfully sell — a multi-location business

In some previous columns, I shared how a shop owner in Idaho is using a basic set of key performance indicators (KPIs) to improve his two-location collision repair business.

Now I'd like to scale the concept up by introducing (or re-introducing) you to John Gagliano. Like the shop owner in Idaho, John started using KPIs when he opened his second Collex Collision Experts location in Michigan back in 1985. He wanted a way to see how each location was doing.

"It was a manual system, but until we had that tool in place, I did not feel comfortable. I always had to be there, running between the shops," John told me as we reconnected by phone earlier this year.

When I decided to write about KPIs, I knew I needed to call John. He developed and implemented a premier system to track and improve KPIs of any business in this industry.

"I get excited about talking about this because I think this was one of the key tools for the success of our business," John told me.

And by any measure, it was a very successful business. Collex grew to 16 locations in two states — with another five in various stages of coming under the brand — when John sold it all to The Boyd Group in 2014 for about \$45 million.

I asked John to talk about the role he saw KPIs having in the growth and successful sale of his business. Here are some of the fundamental take-aways for any shop owner looking to implement or improve the use of KPIs in their business.

**Start at the end — and then work backwards.** John said the most effective KPIs are essentially an "upside down" financial statement. Choose the number you want at the end of that statement, then work back step by step to determine what has to happen to hit that number. Keep breaking it down into smaller and smaller chunks until you are down to monthly, weekly and daily goals. Production hours are a good place to start.

"We're in the business of buying hours from technicians at one rate and then selling them for another, hopefully with something left over in between," John said.



**ANYTHING YOU CAN MEASURE CAN — AND LIKELY WILL — IMPROVE. THERE'S THAT COMPETITIVE NATURE IN US, THAT IF WE SEE A NUMBER, WE TRY TO BEAT IT.**

If you know you need \$110,000 in monthly labor sales to hit your goals, you need \$5,000 in labor sales per day in a month with 22 business days. At \$50 an hour, you need 100 labor hours per day. If you have seven technicians, they each need to produce 14-15 labor hours per day. Boom. You've just created some powerful KPIs to track.

**Measuring spurs improvement.** John firmly believes that anything you can measure can — and likely will — improve.

"There's that competitive nature in us, that if we see a number, we are going to try to beat it," he said.

Ask anyone in your front office responsible for sales what his or her closing ratio is, he cited as an example. If it's not something that's being measured, they will likely guess around 80 percent. Start tracking it, and in reality, it's probably half that, he said.

"People closing even in the 70-percent range are superstars," John said.

But start tracking it and show them their numbers, John suggests, and it likely will improve. Combine it with some sales training in closing techniques, and they may over time reach that

80 percent they presumed they were at from the start. But measurement is a key to any such improvement.

**KPIs offer a roadmap to consistency.** Too often in this industry, John said, we hire managers and give them a big picture, but expect them to bring their own formula and processes to hitting the goal.

"But if they don't do it, we just get someone else, and that person brings their own systems," John said. "You end up with inconsistencies, and no one really knows what's right or wrong. Instead, the organization needs to build a process that those managers can use to hit the KPIs you've given them."

I'll share more of John's insights into effective use of KPIs in my next column. 📧

**STEVE FELTOVICH** of SJF Business Consulting, LLC, works with dealers, MSOs and independent collision repair businesses to make improvements and achieve performance goals. [sjfeltovich@gmail.com](mailto:sjfeltovich@gmail.com)

# OVERCOMING COMMON INSURER BATTLES

Getting properly compensated for repairs begins with communication and understanding

**SEAN GUTHRIE //** Contributing Editor

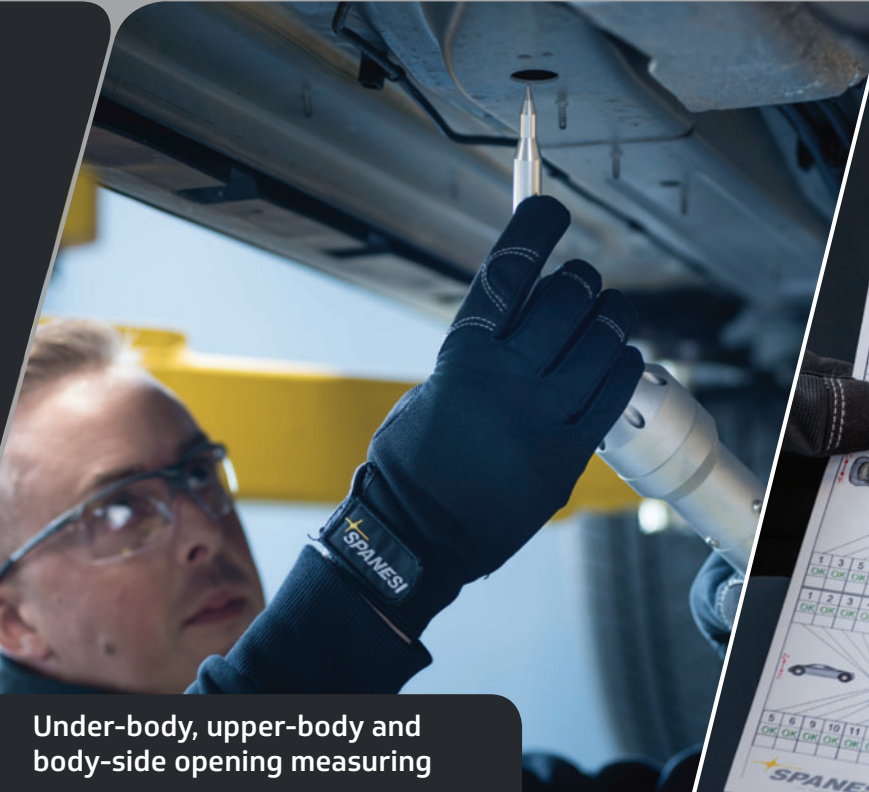
**A**s vehicles continue to advance with electrical components, safety features and new metal substrates, repair procedures will continue to become even more complex. These complexities create new and unique reimbursement needs, which can be difficult to be fully compensated for. It is easy for repairers to feel that we cannot receive fair compensation for what a repair requires. Many times, these items are things repairers would prefer not to do, as they add complexity, difficulty and liability to our already complex, difficult and litigation-prone jobs. Other times, simple and well-known items struggle to be reimbursed either partially or in some cases, entirely. In all cases, I have found the reason for improper reimbursement to usually be the same.

Payers seeking to control costs is normal for any individual or business. As collision center owners and managers, we want to control costs on materials, parts, labor, facilities and more. If you have ever reviewed a profit and loss statement and tried to figure out how to reduce loss, then you have tried to control costs. If you have ever negotiated price on a car or home, then you have tried to control costs. In all of these negotiations, data has to be shared in order to understand

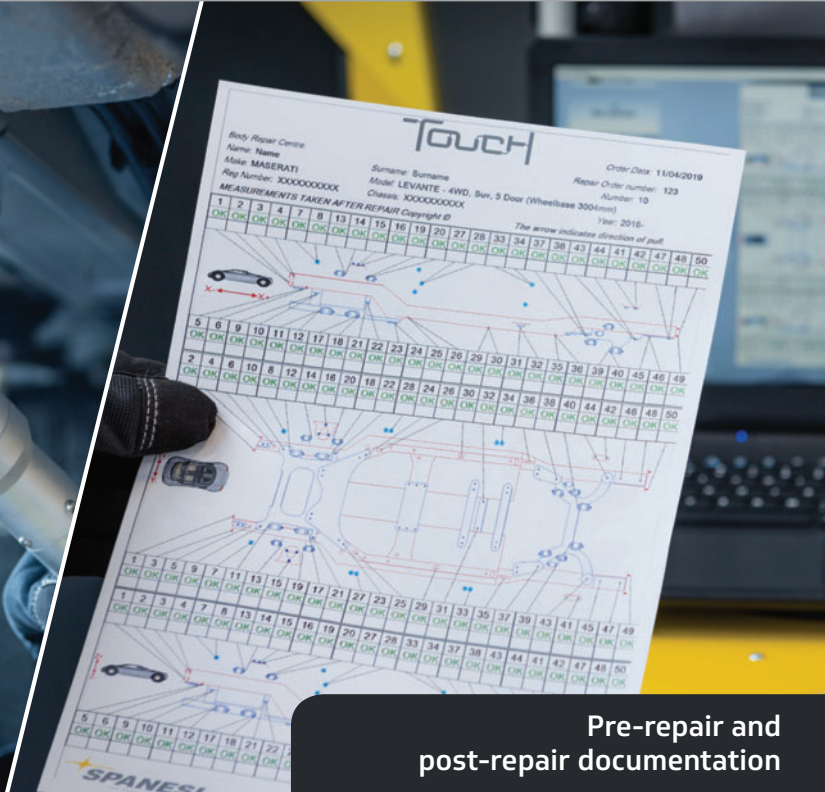


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what is being asked, the value in what's being asked for, and then to determine a fair price for both parties. The reason one house or car is worth more than the one right next to it are the features, quality, condition, etc. If these reasons are not well represented and understood, then the difference in price will not be accepted.

It is crucial for all successful collision repair centers to include everything that will be required to repair the vehicle during the estimating process. Parts that require replacement, labor required for repairs and materials necessary to bring the vehicle to pre-loss condition should all be included on the estimate. The cost of doing business is paying for insurance, lease payments, training, etc. The cost of doing business does not include any item or material that goes on a vehicle or any labor required to fix that vehicle. Non-included labor may include researching or purchasing subscriptions for repair procedures, scanning, diagnosis, etc. Paint materials should cover the liquids applied, as well as basic filler, sand paper and tape. The paint material calculation is out of convenience for all parties, not out of any type of requirement. Paint materials do not include adhesives, foams, seam sealers, undercoatings, etc.

A proper estimate does not mean the negotiation is over. Proper estimating simply sets the asking price. You should not set the asking price for more than the value of the repairs. Setting an exorbitant price upfront will create distrust and lead to difficult negotiations. It is always easier to negotiate when the asking price can be reinforced with data and obvious value. Once the asking price is set, the next step is to present why the estimate delivers that value. What items make this repair more difficult than the vehicle being repaired next to it? How is the vehicle going to be fixed differently than the shop next door who quoted half the price? Why is the price being asked worth the amount asked? If these questions cannot be answered, then the asking price is too high.

## SHOPS MUST FIND A PARTNER – NOT A BULLY – IN THEIR INSURER PARTNERS

**DARRELL AMBERSON //**

Contributing Editor

We as repairers know better than anyone that our industry is unique in that almost every repair job comes with a variation of two customers: the vehicle owner and an insurer. Each wants a quality repair, but they often have a different perspective of what that is. Since the insurer is typically paying most of the cost they are far more concerned over the price.

This dynamic has had more influence on our repair operations over the years than arguably any other single factor. The introduction of Direct Repair Programs (DRPs) in the 1980s had a monumental effect on the repair industry. The insurers leveraged their ability to refer customers to get cost concessions and additional administrative services provided from repairers. As the number of programs has grown, as well as the insurers' use of their influence, many repairers have built their businesses through DRP relationships. Over

the years, insurers have used their increased influence over shops by continually adding more responsibilities and requirements to their programs. For the most part, repairers have accepted these, even sometimes to the surprise of insurers, in the interest of perpetuating and increasing their referral dependence. Fast forward to today and we see that many insurers have dramatically cut their claim handling staff and passed many responsibilities to repairers.

Some years ago, there was an insurer expert presenting at NACE. At the time, more and more shops were referring to insurers as their "partners," meaning through their DRP relationships. Talking to repairers in the room, this speaker said, "Insurers are NOT your partners! They need you and you need them. But they are NOT your partners." That has always stuck with me. I believe that insurer/repairer relationships can have some of the attributes of a partnership. Keep reading at [ABRN.com/bully](http://ABRN.com/bully).

Justifying the price and showing the worth is a critical step in the estimating process. It is crucial to notate, document and illustrate everything you are asking for. Again, this helps to add value and reinforce the asking price. One way to do that is with multiple photos from different angles and distances. Great photos are of paramount importance for proper compensation when the person reviewing the claim is not present. A good exercise is to review a fellow co-worker's photos and attempt to write an estimate from them. Then, have them do the same

with photos you have taken. The repair hours and parts that you do not see in their photos may shock you. Doing this simple exercise demonstrates how difficult it is for insurers who aren't in front of the car to fairly reimburse a claim.

Complex repairs require a multitude of materials for proper completion. These may include rivets, glues, unique welding wires and much more. Ten years ago, these types of repairs were quite easy. As metal substrates have advanced, so too have the required repair methods. It can no longer be assumed how to properly



replace something even if you have just done so on a similar model. With these complex repairs, the compensation is just as complex. Items that have never been included on an estimate now have to be. These items may not be common knowledge, especially to customers and insurance adjusters. It is not fair to expect anyone to accept a bill with items that they do not recognize. It is also not fair to expect people to pay for things they do not understand.

With new or rare items, it is critical to properly document and communicate why they have to be done and why they must be paid for. This documentation can be as simple as referring to repair procedures. It can also be something as time-consuming as photographing each individual step. In any of these instances, education is supremely important for compensation. At one time, shops did not know there was a need to write for these additional steps or that they even had to be done at all. Until these new items become commonplace, do not alienate yourself by refusing to educate others. Always be willing to demonstrate, explain and mentor those who are unaware in order to receive complete payment.

Basecoat reduction is one battle that simply will not go away and is slightly different than those previously discussed because of the tendency to be extremely biased. That being said, utilizing a similar approach of educating can help overcome the battle. There are three sets of opinion on this. The first argues that it doesn't take any less time to paint an edge than it does to paint the whole panel and thus, no reduction should be taken. The second argues that blend time is 50 percent of the basecoat time, which includes full clear, so therefore repairing an edge is not much different. The third is that of data and understanding. The first two are from a point of view from a seller who doesn't want to explain why it's worth more and the second is that of a purchaser who doesn't want to pay

any more than they have to. In order to understand the true value, it is crucial to know the difference between blending and painting a repaired panel.

The first difference is the preparation required for a blend is less than that for a repaired panel. Light DA sanding or scuffing provides the necessary preparation for proper adhesion. With a repaired panel, additional feathering of the damaged area is required (this does not include the application and blocking of primer as this is not included in refinishing). The repaired panel may require more time before it gets into the paint booth. The second and major difference occurs inside the booth, where a blend panel is substantially easier than a repaired panel. Blend panels already have the proper ground color and simply need a light application of the new mixed base coat to give the appearance of a perfect match. Depending on the color and paint manufacturer, the number of coats on a blend panel is around half or less than half that of a repaired area. A repaired area requires the application of sealer once it is ready for the paint booth. Sealer is not required at all on a blend panel. There is additional work to mix the sealer, spray the sealer and then clean the spray gun. Once the application of the basecoat begins, additional coats of paint are required to get full coverage over the non-color matched sealer. These additional coats take additional time and material, both of which are covered with an increased base coat time. Once the panel is based, the clear coat time is similar, and that time is understood and calculated. In essence, there are more steps to a repaired panel than a blend panel; thus, blending and refinishing after repairs cannot be compared and cannot be used in negotiating times.

What should definitely be negotiated in basecoat reduction is the difference in labor of a full area refinish and that of a partial area refinish. In refinish time, there are basically three items that make up the

total basecoat time. First is the preparation required for cleaning, sanding, masking (first 36 inches). The second step is the sealer and the final step is the basecoat. The first step takes the same amount of time no matter how big or small the refinished area. The second step, or sealer, makes up 7 percent of the basecoat book time. Finally, the basecoat time, which makes up 19 percent of the database basecoat time. These percentages are from MOTOR's database. The combined time for base and sealer is 26 percent. An estimator should never eliminate 26 percent or more from the basecoat refinish time, as anything more than 26 percent does not account for any application of paint on the panel at all. Tacking the panel between coats is also included in that 26 percent, as well as a few smaller steps. As a fair guide, 20 percent of the basecoat time should be the beginning of all basecoat reduction negotiations. If half of the panel is being painted, then 50 percent of the 20 percent would be a fair deduction. For example, if the panel has 2 hours of basecoat time, 20 percent would be 0.4 hours, and 50 percent of 0.4 is 0.2. Therefore, 0.2 hours would be a fair deduction on a 2-hour basecoat time, plus full clear.

There are numerous other battles between repairers and payers and there are additional agreements that can be made. Agreements both verbal and written should be considered whenever negotiating. Some items are conceded for the benefit of the relationship and these cannot be covered in an article. Nothing is a guarantee, but proper data, patience and an attitude of educate not alienate, will be beneficial for any collision repair facility. 📧



**SEAN GUTHRIE** is the director of operations for Car Crafters Collision Centers in Albuquerque, NM. Sean oversees the seven locations handling their DRP and OEM relationships. Sean is I-CAR platinum, ASE certified, multiple OEM trained and sits on two advisory boards.

[sean@carcrafters.com](mailto:sean@carcrafters.com)



# UNSEEN CONCERNS SURROUNDING LATE REPAIRS



## Repair delays can stall cash flow, and that can cripple a shop

**JOHN SHOEMAKER** // Contributing Editor

**S**ome of the concerns surrounding late repairs are very visible while others are only noticed by a few. We can see

the grimaced face of the customer service representative as they are discussing a late repair with a customer. We can hear the reasons for the delayed repair

from the production manager during progress and release meetings. We can see the red on the management system screen when a vehicle has not pro-

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Once inside "myAMI" search for "The Unseen Concerns Surrounding Late Repairs," or go to [ABRN.com/unseenconcern](http://ABRN.com/unseenconcern) and successfully complete the quiz.

gressed to the next repair phase on time — but what about the issues that aren't quite as evident?

An unseen concern that most don't pay attention to is cash flow. Cash flow is generated by sales, and the timeliness of those sales is what keeps a business fluid. While front office and production staff concentrate on moving a repair through the shop, accounting is working to keep the business in the black.

I'll use a simple four-day repair that gets delayed for three days to illustrate some concerns.

The first unseen concern is in labor expense paid out without a sale completed. Payroll is one of the largest expenses in a shop, and it requires stable cash flow to ensure employees are paid on time. This repair was originally due out on Thursday, with Friday being a scheduled payday. Even though the repair is delayed, a portion of the repair has probably been accomplished with a technician expecting to see the labor posted in their paycheck. One repair might not stress cash flow; however, multiple late repairs could quickly take things in the wrong direction.

A second unseen expense is related to parts purchases. Some shops pay for parts as they arrive, others are billed with payment that is due by the 10th of each month. Let's look at how that delay will affect parts and follow that same four-day repair schedule. In this instance, the repair was scheduled to be delivered by the end of the month, but the delay pushed it into the following month. If those parts were paid in advance, there is a purchase without a sale recorded; if they were invoiced, a bill has now arrived with payment due by the 10th without a completed repair sale posted. In an accountant's world, a purchase and the related sale should happen in the same month of business. Delays disrupt this process, requiring adjustments to keep a business's books in balance and cash fluid.

When a customer talks to me about low paint gross profit, one of the first things I look at is cycle time. It seems odd to the customer at first, but once I explain it, they see how it relates. As with labor and parts, paint products consumed must be balanced by a sale. When a repair is late, it is reflected in cycle

time. With cycle time out of balance, paint consumption can occur in one month with the sale in another. This creates a roller coaster effect in paint material gross profit levels, which is echoed in a decrease in cash flow because of payments posted without a sale.

Some believe that cash flow issues balance out over a couple of months and don't give them much concern. Other businesses operate month to month and see it as a problem, but do not make the connection between delayed repairs and their poor cash flow. Knowing how late repairs affect the stability of a business's cash flow is key to sustainability. I think a lot like an accountant and believe that each month should stand on its own with balanced debits and credits and stable cash flow.

It is said that knowing about a problem is the first step in resolving the concern. I encourage all shop owners to look at their repair delays, how many are started in one month and completed in the next. Your cash flow could be affected by these delays and taking steps to correct them could make great improvements for your business. 📧



**JOHN SHOEMAKER** is a business development manager for BASF North America Automotive Refinish Division and the former owner of JSE Consulting.

[john.a.shoemaker@basf.com](mailto:john.a.shoemaker@basf.com)

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**Body Shop Requirements**

FROM PULLING TO PAINTING

# Pennsylvania Senate fast tracks anti-emissions I/M bills

No stakeholder process for consumers and shops

Legislation was recently introduced in the Pennsylvania State Senate that strikes at the core of the Pennsylvania emissions inspection and maintenance program (I/M). Republican State Senators Judith Ward, Elder Vogel, Patrick Stephano and Wayne Langenholtz introduced five bills aimed at modifying the current Pennsylvania emissions I/M program. These bills were quickly moved through the Senate Committee on Transportation. One of the most egregious of the policy proposals is that “a subject vehicle shall be exempt from the requirements for emission inspection for eight years after the vehicle is manufactured.” According to PennDot, there are 5.9 million vehicles tested annually, of which 3.2 million are eight years old or newer.

Vehicle inspection and maintenance programs help improve air quality by identifying cars and trucks with high emissions that may need repairs. Owners or operators of vehicles with high emissions are notified to make any repairs so that emissions are within legal limits. The 1990 Amendments to the Clean Air Act (CAA) made I/M mandatory for several areas across the country. The Pennsylvania Department of Environmental Quality describes the value of the Pennsylvania I/M program: “Cars and light trucks are a major source of air pollution in Pennsylvania. Vehicle emissions contribute to health and environmental problems such as urban smog, air toxics, global warming and haze. All cars emit some pollution, but poorly maintained cars emit more. Not maintaining your car or ignoring your dashboard check engine light can cost you in future repair costs as well as pollute the air.”

In a memorandum to all Pennsylvania state senators, bill sponsors offered: “Vehicle emissions testing has become less effective at reducing air pollution, particularly due to newer, more fuel-efficient vehicles entering the fleet. There is also compelling evidence that vehicles are continuously passing the annual vehicle emissions testing. In Pennsylvania, between 2011-17, an average of 5.7 million vehicles were tested each year and an



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average of 96 percent of vehicles passed the test. Although we are meeting or exceeding federal air quality standards and fewer vehicles are failing the emissions testing, there has not been any action to modernize the onerous, costly regulations of the I/M program.”

Since the implementation of the U.S. Environmental Protection Agency’s Clean Air Act Amendments of 1990, vehicle emissions inspection and maintenance programs have faced adversity. Programs have struggled with whether to be centralized or decentralized, training issues, consumer inconvenience and being seen as a financial burden on consumers.

On its face, the Pennsylvania legislation’s exemptions and other proposed policies do harm to both consumers and small businesses. Most importantly, for this discussion, is the lack of stakeholder input. Legislative or administrative bodies opt, at the beginning of the process, to make important decisions with limited information when stakeholders are not involved. This is high risk for positive outcomes. In the Pennsylvania case, a quick hearing, speedy legislative mark up and fast-tracked legislation to the Senate floor proves harmful for Pennsylvania consumers and the automotive repair community.

Vehicle inspections are no different than a medical or dental check up, not always convenient but important for maintenance. In the case of I/M, this issue is important for air quality and public health, not just in the state of Pennsylvania, but for those communities outside Pennsylvania’s borders that inherit poorer air quality due to these types of proposed I/M program modifications.

The Pennsylvania I/M reform legislation should be stopped by House members. 🚫

**ROBERT REDDING** is the Automotive Service Association’s Washington, D.C. representative. He has served as a member of several federal and state advisory committees involved in the automotive industry. [rredding@reddingfirm.com](mailto:rredding@reddingfirm.com)



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# TECH AND THE CITY

## University of Michigan's 'mock city' serves as real-life proving ground for automotive innovations

**JAMES E. GUYETTE** // Contributing Editor

**M**um's the word at Mcity. Engineers, designers and manufacturers are assured of complete confidentiality as they develop the latest technologies for connected and automated vehicles at the University of Michigan's 32-acre educational testing site.

While expert automotive consultations are readily available to assist the clientele if desired, "We don't ask users to disclose their testing plans," says Susan Carney, Mcity's director of marketing and communications.

And even if such information were to become available, you wouldn't be reading about it on this page. "It is a closed facility, and the work done here is private," she emphasizes.

"We don't disclose specific information about who is using Mcity because, like most automotive proving grounds, it is a closed facility and any work done there is confidential," adds Dr. Huei Peng, the center's director who is also U-M's Roger L. McCarthy Professor of Mechanical Engineering. "But since its opening in 2015, Mcity has been in demand for testing and research as well as for informational visits by government officials and media."

"The Mcity Test Facility is essentially a mock city," Carney says, "with an urban area, a stretch of highway, roundabouts, traffic lights and crosswalks, a tunnel and more. It was designed to support safe, repeatable testing of connected and au-



**AN AERIAL VIEW OF THE MCITY TEST FACILITY**, which sits on a 32-acre site and features about 16 acres of roads and traffic infrastructure.

tomated vehicles and technologies in a real-world, controlled environment before trying them out on public roads."

As a public-private R&D partnership, more than 100 undergrad and graduate students under the direction of 50 faculty members at the school's College of Engineering work on an assortment of projects in collaboration with OEMs and parts suppliers who consequently conduct testing at the course on a sliding fee scale.

"More 'traditional' automotive proving grounds generally are much larger," according to Carney, often dominated by an oval high-speed track. At Mcity's realistically focused environment, building facades of up to two stories high can be efficiently repositioned and the locations of faux pedestrians, bicyclists and other obstacles can be altered for different

types of tests.

The tunnel that comprises a simulated highway overpass is accompanied by a steel bridge to create special challenges by blocking vehicle reception of signals from sensors, satellites and other wireless sources.

Included in the 16 acres of roads and traffic infrastructure are 4.25 lane-miles of varied driving surfaces such as gravel and differing pavement types. A 1,000-foot stretch of highway mimics a limited-access freeway, complete with entrance and exit ramps, overhead road signs, guardrails and other features. There are street lights, crosswalks, lane delineators, curb cuts, bike lanes, trees, fire hydrants, sidewalks, signs, traffic control devices — even construction barriers.

"The goal of Mcity is that we get a

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Full vehicle systems AI inspection report		Report No. AG000014193
<b>LAUNCH ROXIE</b>		
<b>Vehicle Information</b>		
VIN: 1FTWW31P86B01636 Vehicle manufacturer/model: Ford/F-350 Year of manufacture: 2005 Mileage: 235871 KM		
<b>Inspection organization</b>		
Name: LaunchTechUSA Address: 1820 S Milliken Ave Ontario CA Contact Number: 5624831880 SN: 98876020223 Time and date of inspection: 10/09/2018 11:58:57 Inspection Location: 2495 Aransimo Dr, Corona, CA 92678, USA		
<b>Inspection result</b>		
There are 2 issues for Power system: 1 On-Board Diagnostic (OBD) Systems Readiness Test Incomplete 2 Too Low RPM - Engine Cranking		
There are 2 issues for Safety and Security system: 1 CAN Communication Bus Error - Reception Error 2 FR Wheel Speed Sensor Input Circuit Fault		
There are 7 issues for Vehicle body system: 1 Brake On/Off Switch Circuit Fault 2 Transfer Case (2WD Two Wheel Drive) Solenoid Circuit Open Or Short To Ground 3 Ignition Run/Accessory Circuit Fault 4 Transmission Transfer Case (4WD Four Wheel Drive) Solenoid Circuit Fault 5 Ignition Key In Circuit Error 6 CAN Communication Bus Error - Reception Error 7 Ignition Switch Circuit Open		
Inspections are normal for Power system 1.TCM (Transmission Control Module)		
Inspections are normal for Safety and Security system 1.PAM (Parking Aid Module) 2.TBC (Trailer Brake Control Module) 3.PCM (Restraint Control Module) 4.VSM (Vehicle Security Module)		
<b>Professional Report</b>		
GEM (Generic Electronic Module)	Abnormal	🔴
ABS (Anti-Lock Braking System)	Abnormal	🔴
IC (Instrument Cluster)	Abnormal	🔴
PAM (Parking Aid Module)	Normal	🟢
PCM (Powertrain Control Module)	Abnormal	🔴
TBC (Trailer Brake Control Module)	Normal	🟢
TCM (Transmission Control Module)	Normal	🟢
RCM (Restraint Control Module)	Normal	🟢
VSM (Vehicle Security Module)	Normal	🟢

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scaling factor. Every mile driven there can represent 10, 100 or 1,000 miles of on-road driving in terms of our ability to pack in the occurrences of difficult events,” explains Dr. Ryan Eustice, a U-M associate professor who additionally serves as director of the Toyota Research Institute (TRI) and director of the Perceptual Robotics Laboratory (PeRL) along with contributing to collaborative programs with Ford.

### A grand experiment

At present, some 60 industry entities have been involved with more than 20 research projects amounting to \$26.5 million in investments, logging 4,400 hours-plus of on-the-road testing since January 2017. Development and deployment activities are expected to top \$100 million by 2020, with funding from U-M, government agencies and auto industry patrons.

“Launching Mcity was in itself a grand experiment,” says Peng, the facility’s director. “How might companies representing such a broad range of industries, including many who compete with each other, be able to effectively work together? The experiment has proven to be a very successful model where these companies have been able to work collaboratively and productively to explore questions about connected and automated vehicles that no single company or industry can address alone.”

Beginning a second funding phase in 2017, 11 firms belonging to the Mcity Leadership Circle have committed to invest a total of \$11 million over a three-year period for further upgrades.

The Leadership Circle’s roster includes Delphi, DENSO, LG Electronics, Verizon, State Farm Insurance, Ford, General Motors, Honda, Toyota and State Farm Insurance.

“Our leadership position with Mcity gives us early access to the latest data and research findings as the connected and automated ecosystem evolves, so that we can better understand the poten-

tial benefits and risks of connected and automated vehicles,” explains Chris Mullen, State Farm’s director of technology research. “We are also able to encourage research direction that will be most useful to our customers and our business.”

“The breadth and depth of membership in the Leadership Circle speaks volumes about Mcity’s important work,” notes LG Senior Vice President of Technology Dr. Jong G. Kim. “From LG’s perspective, Mcity represents the epicenter of innovation and public policy defining the future of connected transportation.”

“Mcity is a great opportunity to combine engineering, urban planning and energy and information technologies to accelerate progress and help drive the industry forward with automated vehicles,” reports Doug Patton, DENSO’s executive vice president of engineering, providing “the ability to collect data on our dedicated short-range communication modules, data communication modules, driver status monitoring and more to make the necessary changes before putting these technologies on the road.”

An on-campus DENSO R&D laboratory has a dozen standout U-M students researching the intricacies of machine learning, Advanced Driver-Assistance Systems (ADAS) and Automated Drive (AD). “As a member of the Mobility Transformation Center’s Leadership Circle and a sponsor of multiple research projects across campus, DENSO has been one of the University’s key industrial partners,” says U-M Vice President for Research Dr. S. Jack Hu.

Hu, who also holds numerous professorship positions, points out that the DENSO lab’s ongoing academic contributions “allow us to work even more closely to create further opportunities for innovation and education.”

### Rebuilding public trust

In January, Mcity rolled out a new “ABC Test” concept to deliver independent

safety assessments for highly automated vehicles (HAVs), covering “Accelerated Evaluation, Behavior Competence and Corner Cases” related to performance issues. Recent polls have found that more than half of American respondents are concerned about the safety of autonomous technologies.

“Highly automated vehicles must be developed in a responsible way to fully realize their promise as a useful tool that will benefit society,” according to Peng, describing a three-pronged approach to HAV testing that includes simulated driving and HAV on-road evaluation in the aftermath of two pedestrian and motorist deaths elsewhere attributed to driverless car technological failures.

“The Mcity ABC Test is an approach that can help rebuild public trust and accelerate the development of these potentially life-changing vehicles,” Peng points out.

Drawing from a variety of sources, Mcity has compiled a list of 50 dicey situations, of which 35 were chosen for a near-term study focus, including 16 scenarios for low-speed, path-following vehicles. Corner-case testing concentrates on situations that test the limits of automated vehicle performance and technology, as with 16 behavior competence scenarios for lower-speed applications pertaining to experimental driverless vehicles.

A specially equipped Lincoln MKZ, based at Mcity, is an open-source connected and automated research vehicle available to U-M faculty and students, startups and others to help accelerate innovation. The Arma, a 15-passenger driverless electric shuttle manufactured by French firm NAVYA, is also part of the on-campus test fleet. ■



**JAMES E. GUYETTE**

is a long-time contributing editor to *ABRN*, *Aftermarket Business World* and *Motor Age* magazines.  
[JimGuyette2004@yahoo.com](mailto:JimGuyette2004@yahoo.com)



# Faith-based service

Integrity, community service attract loyal customers to duo of Georgia shops

**JAMES E. GUYETTE** // Contributing Editor

➔ Jamie White's religious faith is strong, enduring and ever-present — put into practice throughout every aspect of his life. And when he speaks about being of service to his friends, neighbors and community by providing honest and competent collision repairs, he really means it.

"People know us from our beliefs and our honesty. All of our decisions are based on quality and service," says White, who owns the Ken's CARSTAR and CARSTAR Dalton franchises situated 13 miles apart in Dalton, Ga. He additionally supports a daunting array of Dalton's civic and charitable causes.

"I am a firm believer in putting money into our local community, from Little League ball teams, high school sports and local organizations." Although attracting patrons seeking vehicle repairs is decidedly not White's main mission, "When you take care of your customers in and out of the business, they will continue to come," he explains.

White prefers to back endeavors that encourage the participants to be relaxed and reflective of the experience. "We make sure that we are concentrated in the areas that customers are made to sit and slow down, such as sporting events, school classrooms and local charities. I have a huge soft spot in my heart for my community and for special needs athletes."

He coached a special needs softball team for seven years, and "that was a turning point in my life," White reveals. "It opened my eyes — we tend to lose sight of what we're doing" during the more mundane challenges of everyday life, not paying attention to the plight of those who are less fortunate.

Self-questioning and self-awareness are important qualities to always keep in mind, according to White. "Am I making an impact now? We need to do everything today to make sure we're presenting ourselves correctly."

Maintaining high ethics at his two body shops is a longstanding practice dating back to when Jamie's uncle, Ken White, established the business in 1997. "My uncle knew to go beyond just repairing the vehicle," he recounts.

"We are well known in the community because we've been here to serve them for years. We've worked hard to give back and support local charities and schools where our customers go; we've literally grown up with them!"

Emphasizing a sense of gratitude and observing how "we



**KEN'S CARSTAR & CARSTAR DALTON**  
Dalton, Ga. // [www.carstar.com](http://www.carstar.com)



**Jamie White**  
Owner

**10**  
No. of DRPs

**2.8 days**  
Average cycle time

**\$3,200**  
Average repair order

**2**  
No. of shops

**55**  
No. of customer vehicles per week

**22**  
Years in business

**\$6.2 million**  
Annual gross revenue

**40**  
No. of employees

**Axalta**  
Paint supplier

are blessed with more than we deserve," White points out that "we give full credit to Christ, and we have Bibles on the waiting room tables" to assist in spreading the good word.

Service is a constant. A collection of miscellaneous light bulbs is kept on hand to offer free on-the-spot replacements as a courtesy. Recently a driver came in seeking aid in identifying an annoying squeak. "We rode around with him for about 15 minutes and we fixed it — no charge. People keep coming in because they've heard of us."

White describes the entire 40-person staff as "a big family committed to delivering the highest-quality vehicle repairs and customer service — both literally and figuratively. We believe

in honesty, integrity and community service as the hallmarks of our business.”

Since 2011, just three people have left the company, evidence of White’s consistent efforts to instill employee loyalty. Financial details are shared along with expectations and results. “We’re a team. We’re open and we’re honest,” he reports, “and we’re very clear — this is how it is.”

It should probably come as no surprise that “we’re also open with our suppliers and vendors. We have open, honest communication and we pay a lot of CODs (cash on delivery). They know that when they drop the part off they’re going to get paid.”

In return, “Our expectations are ‘as quick as we can get it and honesty’” throughout the process. “If they say ‘we’ll get your parts tomorrow morning’ and we don’t get them until tomorrow afternoon, that car isn’t going home on time,” thus disappointing the customer. “Communicate with us,” White stresses. “Tell us if you can’t make it on time.”

A full packet of documentation and photographs are presented to insurance carriers to justify each and every procedure. “The adjusters know that they’re going to have everything they need” to present to their supervisors.

### Taking care of others

Wherever you happen to live, chances are you’ve walked all over the main driver of Dalton’s economy: The city of 33,000 residents 100 miles north of Atlanta is known as “The Carpet Capital of the World.” At one time there were more than 320 carpet mills in the area. Currently there are about 150 rug-making facilities still in operation, producing an astounding 90 percent of the world’s supply of carpeting.

Essentially Dalton’s entire population — men, women and children — began gaining acclaim in the 1900s as the globe’s top “tufters,” a type of specialized yarn-crafting skill that became key to mechanized carpet production. This

“cottage and porch” industry saved Dalton’s residents from financial ruin as the Great Depression loomed, and flooring continues to support robust regional revenues.

“When the economy collapsed in 2008 (and a lot of carpet production moved overseas) they made transitions into ceramic tile and hardwoods,” White recalls, adding that since that dire period “we’ve seen huge increases with the local economy because of the construction industry. We’re making the carpet that goes into all the hotels” and just about every other commercial and residential structure being erected across the globe.

Located just off Interstate 75 in the foothills of the Blue Ridge Mountains, tourism is another large industry bringing in drivers in need of vehicle repairs. Not only is spectacular scenery in abundance, but the federal government identifies Dalton as the nation’s largest repository of Civil War artifacts, as lead fired between the Blue and Gray once flew with great abandon.

In conjunction with the spiking spending levels on vehicles, related services and everything else that accompanies a robust regional economic uptick comes a burgeoning demand for labor in the mills that has resulted in a large influx of Latin American immigrants, now amounting to nearly half of Dalton’s population.

White employs seven Hispanic technicians along with bilingual estimators to accommodate an expanding international customer base that continues to steadily achieve higher levels of affluence.

An aggressive employee recruiting program includes outreach into other occupations in search of potential job candidates with admirable personal



character traits. “We’ve hired a lot of our employees from outside of our industry; we run across people and notice how well they take care of others,” says White.

“We recruit great employees from grocery stores, fast food restaurants, other retail positions, and we also work with local schools,” he explains.

“We offer an apprentice program allowing young, talented individuals to work their way up from zero experience to qualified trained technicians. We specialize in partnering young, inexperienced technicians with senior technicians who are willing to help and provide training with hands-on experience,” according to White, noting that the innovative three-year instructional effort “produces some phenomenal service technicians” who are highly motivated to provide standout customer service. Patrons are also attracted through “a ton” of advertising on local radio stations.

“We have great team members at every step of the repair process, from the first time a customer visits us to their estimate to the disassembly, repair and painting to when we return their keys,” White reports. “We are constantly evaluating our performance to ensure we meet the highest standards throughout the repair.”



**JAMES E. GUYETTE** is a long-time contributing editor to *ABRN*, *Aftermarket Business World* and *Motor Age* magazines.  
[JimGuyette2004@yahoo.com](mailto:JimGuyette2004@yahoo.com)

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## Three talent groups are the key to the industry's longevity

WE MUST BRING IN NEW TALENT IF THE AFTERMARKET IS GOING TO SURVIVE

CHRIS CHESNEY // Contributing Editor

In a previous article (“Recruiting up the wrong mountain,” April 2019), I discussed the idea that our industry is not attractive to the talent pool we so desperately need.

As this industry faces the largest challenges in its history with respect to the advancements in vehicle technology, I don't want you to miss the reality that our industry is being left behind as an attractive option for young people to consider as a profession.

Here we outline three groups with currently critical stances that our industry needs to impact. These groups are the young people looking for a career, the talent already in our industry but always seeking something better, and the skilled workforce leaving our industry for others.


Let's start with the first group: youth who are looking for a career. There are many in vocational schools giving our industry a try while their friends enter other segments of vocational trades. However, we are seeing that many students in automotive programs are beginning to look at other industries for several reasons. First, other industries such as engineering, wind industry, etc., are more attractive because the cost of entry is low, and the benefits are on par with other industries. Entry-level professionals don't have to buy their own tools, and they receive a benefits package that includes health care, retirement, life insurance, vacations, bonuses and a career path that illustrates to them the oppor-

tunity for growth and advancement. The second reason is that other industries are actively talking to young people; these industries act like they want them. In the meantime, the majority of our industry waits for graduates to show up and ask if we have an opening. Think about how you can offer a comparable compensation and benefit package that rewards talent for working in a production environment that provides the tools needed to be successful and engages them in a career path that is planned and encouraged.

The second group consist of the journeyman techs who we consider to be the norm. What makes them move every year or two? These journeymen come in two types: skilled but without direction and unskilled with inflated confidence and value. The former is worthy of investment, placing them on a career path and helping them organize their skills while training them to keep abreast of the technology. The latter evolved out of the typical flat-rate model and lack of process in handling technology problems. Over the years, lack of skill could be hidden by speed of the wrench. This inflated the confidence of many techs who became known as the Master Tech in their shop, but who have not been given the foundational skills needed to solve problems on the technologies in today's bay. This tech is salvageable in the same way as the former, but it requires humility on their part. Both of these journeymen need process and support to thrive and gain satisfaction in their career.

The final group are those who are

leaving our industry. If you follow any of the blogs and forums common in our world such as those found on Diagnostic Network, iATN, Facebook and others, you've read posts about a shop's best tech leaving the industry for something they find more attractive. In the past, many shop owners have looked at this as being OK because the tech may have put themselves through higher education with the goal of becoming an engineer. However, with our industry facing many professionals departing after spending years crafting their skills, one has to wonder: what made the tech take this route? Is it because they don't see a future in our industry? Is it related to taking care of their family? Or has a different industry always been their dream or goal? I want to help them reach their dream, but with my company or as a partner in business. Ultimately, if they are the type of person I wanted when I hired them, and they aren't satisfied with what they have with my company, then I need to find a way to challenge them in a way that allows them to stay.

Talent doesn't grow on trees. Attitude doesn't either. It is far more profitable to invest in and keep talent by stretching your business model to leverage that talent than it is to let them ride off into the sunset and hope an able replacement is picking up the phone to call. 



**CHRIS CHESNEY** is the Senior Director of Customer Training for Carquest Technical Institute (CTI) and Advance Professional.

[chris.chesney@carquest.com](mailto:chris.chesney@carquest.com)

## WATCH + LEARN



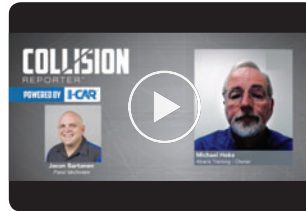
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## MECHANICAL MOMENT

SERVICE REPAIR PROBLEMS AND SOLUTIONS THAT JUST MIGHT BENEFIT YOUR SHOP TECHNICIANS

### GRAND CHEROKEE – DTC P20EE, SCR NOX CATALYST EFFICIENCY BELOW THRESHOLD BANK 1

**VEHICLE:** 2015 Jeep Grand Cherokee, 4WD, 3.0L Turbo Diesel, Automatic Transmission

**MILEAGE:** 32,158

**PROBLEM:** The vehicle came to the shop with the MIL on. The engine seemed to run normally.

**DETAILS:** The bulletin stated to connect a scan tool and pull codes from all modules. If any of the following DTCs are present, check for signs of DFE contamination: P20EE, P2BA9, P20E8 or P20E9.

The technician connected a scan tool and pulled DTC P20EE. He inspected the Diesel Emission Fluid (DEF) and it looked good, but he replaced the fluid anyway, using new DEF in from a sealed bottle. There was still no difference.

An ALLDATA Tech-Assist consultant suggested that the technician check the DEF injector for signs of contamination

based on a factory TSB he found in ALLDATA (TSB #25-003-15). It appears that the DEF system on Grand Cherokees with a 3.0L Turbo Diesel engine, built on July 10, 2015 to July 11, 2015 and vehicles built on August 24, 2015 to August 25, 2015, may have been contaminated during manufacturing.

**NOTE:** Based on the vehicle's VIN, additional replacement parts are suggested. Please review the full TSB in ALLDATA Repair.

**CONFIRMED REPAIR:** The technician checked the DEF injector, and it was full of limestone deposits. He was able to clean the injector and reinstall it. After clearing the DTC and test driving the vehicle, the MIL remained off and did not return.

*This tech tip and others come from ALLDATA Tech-Assist, a diagnostics hotline of ASE-certified Master Technicians. Learn more at [ALLDATA.com](http://ALLDATA.com).*

## TRAINING EVENTS

**SEPTEMBER 5-7**  
**Mobile Tech Expo**  
*South Point Hotel & Casino*  
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**SEPTEMBER 16-18**  
**CIECA CONNEX**  
*Omni Charlottesville*  
Charlottesville, Virginia

**SEPTEMBER 27-29**  
**DRIVE EXPO WEST**  
*Sheraton Fairplex Hotel*  
Pomona, California

**NOVEMBER 4-8**  
**Society of Collision Repair Specialists**  
**Repairer Driven Education**  
*Renaissance Las Vegas Hotel*  
Las Vegas, Nevada

**NOVEMBER 5**  
**Collision Industry Conference**  
*Renaissance Las Vegas Hotel*  
Las Vegas, Nevada

**NOVEMBER 5-8**  
**SEMA 2019**  
*Las Vegas Convention Center*  
Las Vegas, Nevada

**JANUARY 15-16**  
**Collision Industry Conference**  
*Hilton Palm Springs*  
Palm Springs, California

# DOING A 360

NEW CAMERA TECHNOLOGY CAN GIVE DRIVERS A FULL BIRD'S EYE VIEW OF THEIR SURROUNDINGS, BUT CAN ALSO COMPLICATE REPAIRS WHEN OTHER SENSORS ARE INVOLVED

JOHN ANELLO // Contributing Editor

**G**rowing up I always knew about the phrase “doing a 360,” and what it meant to me was that someone was doing a total change in their life or simply doing a full circle on a skateboard. Times are changing so fast in the automotive arena, and now we’re applying this terminology to working on advanced camera technology in cars today that incorporate front, rear and side cameras.

These new systems give a driver a full bird’s eye view of the conditions around the vehicle from the convenience of an onboard screen in the center dash panel. This is accomplished in most systems by an onboard controller that is wired to each camera with a video or Ethernet cable. The controller then sends the images by use of Ethernet technology to a main gateway controller that will transfer these images to a display panel wired by a MOST or Ethernet connection. The goal is to have the images display close to real time, and this can only be possible by having faster networks on board.

I recently had a call on a 2018 Mercedes GLE 350 (**Figure 1**) that was involved in a front-end collision. The grille was damaged, along with the front camera housed below the emblem (**Figure 2**). This front camera is used for the 360-camera system onboard and should not be confused with the forward-facing camera up in the windshield, which is used for the Lane Departure Systems on most vehicles. Onboard cameras are not always plug and play and must be ini-



tialized to pair with the camera control module. There is no software needed, but a scan tool that supports camera functions should have the ability to start the camera initialization process. After the initialization process, a calibration of the replaced camera must be followed to finish the procedure.

When I arrived at the shop, I noticed the onboard screen displayed the message “Camera not calibrated” (**Figure 3**). I went ahead and performed a full scan on the vehicle just to make sure there were no other underlying issues I could not see. It is vitally important to let my shop be aware if there is anything else that

would need to be addressed while I was still there. Sure enough, I came across a Code B127B14 for a problem with the Center Left Rear Parking Aid Sensor, but this would have to be addressed with the insurance company, because this vehicle was a front-hit only and this code was unrelated to the accident. I was more concerned with the Code B1FBD54 that read “Control Module for 360 is faulty/ Calibration is absent” (**Figure 4**). This code was related to the accident, but was a little deceiving because it was pointing me in a direction of a faulty camera control module, and the code was not specific to which camera had the calibration



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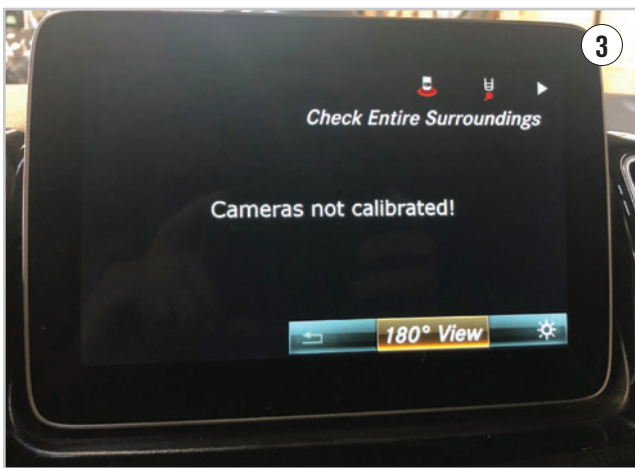
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issue. I basically knew one new camera was changed, and that was the front one, so my next move was to start the initialization process and see if this code would be gone.

Scan tools basically are laid out with the same main menu features such as Codes & Data, Bi-Directional Controls, System Tests and Functional Procedures/Adaptations. When you go into the Adaptations menu, you should see a selection for the 360 Camera. You need to choose the correct camera you are servicing. Don't choose to do all the cameras at the same time because that would take you a longer period of time, and it is not necessary since only one camera was replaced. Some manu-

MaxiSys Vehicle Diagnostic Report		AUTEL 4
<b>1. ESP-Electronic Stability Program — (4)</b>		
1.1. C076600	No CAN message was received from control module 'Control module 'Collision Prevention Assist''.	Stored Event
1.2. C076700	No CAN message was received from control module 'Control module 'Collision Prevention Assist''.	Stored Event
1.3. C07F200	No CAN message was received from control module 'Control module 'Collision Prevention Assist''.	Stored Event
1.4. C333400	The software version for the control module 'A89 (DTR electric controller unit)' is too old.	Stored Event
<b>2. PTS-Parking system — (1)</b>		
2.1. B127B14	The center left rear distance sensor is faulty. There is a short circuit to ground or an open circuit.	Current and Stored
<b>3. SVS-360° camera — (1)</b>		
3.1. B1FBD54	Control module for 360° camera is faulty. Calibration is absent.	Current and Stored



facturers will give you the option to perform the calibration “dynamically” on the road by viewing the real world or “statically” with targets laid around the entire perimeter of the vehicle. In my experience, the high cost of camera targets can lead to a never-ending expense to cover all manufacturers, and different





models within the same manufacturer may not always use the same targets.

Lucky for me, this Mercedes had the dynamic feature available to calibrate the camera because I don't have all the available targets yet. The scan tool was merely used to initialize the front camera system and command the onboard camera system to default into a learn procedure using the vehicle onboard screen (**Figure 5**). This screen displays a speedometer icon that will be red when the vehicle is not moving or if you are going above the desired speed necessary for the calibration process. The right side of the screen has a steering wheel icon that will display red if the steering wheel is not kept straight while driving. There is also a four-arrow cursor on the left side of the screen to display which camera you are calibrating by lighting up the proper arrow in green. Lastly, there is a green progress bar on the bottom of the screen that will move as the camera is learning and reflects not time but conditions met.

The conditions for a Dynamic Camera Calibration have to meet certain criteria. The first thing is safety, so you need to make sure you keep your eyes on the road and momentarily glance at the onboard screen to view the drive calibration progress. You also need to know that this particular drive is for low-speed driving and not for highway driving. It's best to drive during a non-rush hour condition and with straight pathways because the calibration process will not continue if you are stopped or the steering wheel is off center. You will have either side of



the screen turn red once these issues are present (**Figure 6**) and the progress bar will stop moving. The total drive around town took about 15 minutes, and it was quicker than I thought. Once the system was done learning the environment in front of the vehicle, the progress bar was completed and a green check mark was present to alert me that the calibration was successful (**Figure 7**). I next cycled the key to come out of the Calibration process; the vehicle now had the 360 cameras up and running. By putting the screen into a dual-view mode you are able to see the front of the vehicle, along with a virtual bird's eye view created by images from each camera.

This was the first Mercedes I have tackled, and it wasn't as bad as I thought it would be. I actually prefer manufacturers allowing the option for every car to have a choice between dynamic and static calibrations. There are pros and cons for each method. Dynamic calibrations are more real-world and use the environment to perform the task giving a better learn process, but if weather or road conditions don't permit you will not be able to perform the task. Static cali-

brations are more precise in their own way and obviously weather conditions and road access are eliminated, but you still need a very large area to work in, good lighting and the added expense of collecting many targets and your time is increased because setting up the targets is a huge task. I can tell you that since this article I have done two more Mercedes camera calibrations, and I find that with each camera system it will be a very long learning curve, but in the end the time you have invested will pay off because you are only putting yourself ahead of the curve. Keeping yourself on the cutting edge is what it is all about, so just embrace the technology as it arrives in your bay. My only hope is that this article has inspired you to keep in the game of automotive technology, because it is only going to get more interesting. 📡



**JOHN ANELLO** owns Auto Tech on Wheels in northern New Jersey, which is a mobile diagnostic service for 1,700 shops, providing technical assistance and

remote programming. He is also a nationally known trainer.

[atowscopeit@aol.com](mailto:atowscopeit@aol.com)

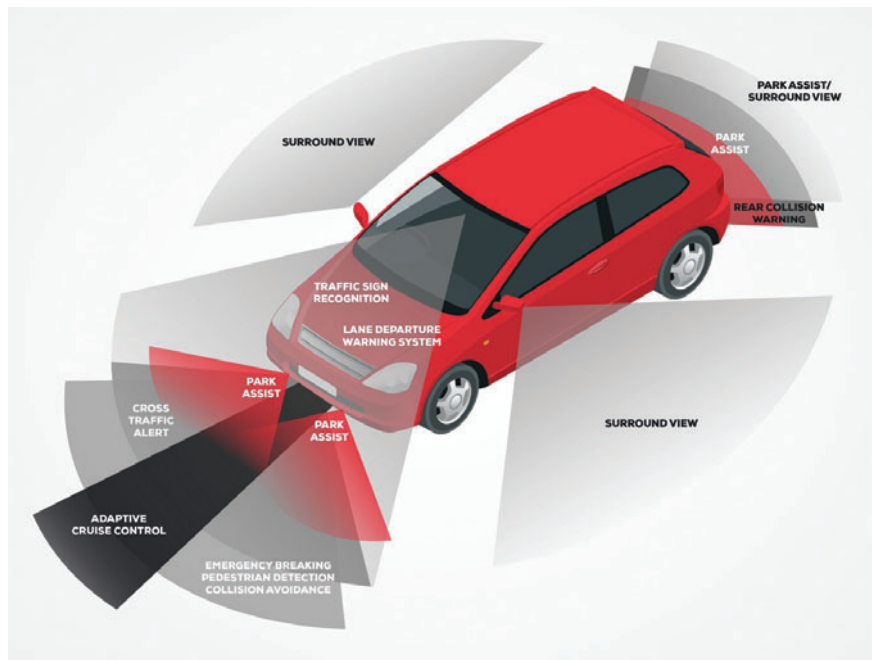
# A CLOSER LOOK AT ADVANCED DRIVER ASSIST SYSTEMS

## IS DRIVER ASSIST REALLY NEW?

**TRACY MARTIN** // Contributing Editor

**A**DAS, or Advanced Driver-Assistance Systems, is front and center in today's automotive technology and is the precursor to fully autonomous driving vehicles. Featured in futuristic automotive advertising, ADAS is touted as cutting-edge technology; however, the concept has been around longer than most people realize.

One of the oldest driver-assistance systems is automatic braking systems (ABS) that were developed for 1920s era aircraft. Having an airplane skidding uncontrollably after touching down on a runway was to be avoided and ABS braking systems helped prevent accidents during landing of heavy airplanes and eventually jet aircraft. It wasn't until the 1970s that Robert Bosch patents, in joint development with Mercedes-Benz, that ABS was widely used on automobiles. Chrysler and the Bendix Corporation developed an ABS system called "Sure Brake" for the 1971 Chrysler Imperial. Ford had "Sure-Track" on Lincoln Continentals and General Motors marketed "Trackmaster," a rear-wheel-only system on Cadillac and the Oldsmobile Toronado. Nissan had an early electronic



**THIS ILLUSTRATION SHOWS** the extent of sensors used on a generic ADAS system. Even a windshield replacement affects the camera alignment for multiple systems.

ABS system developed by Denso fitted to their Nissan President sedan in the 1970s. BMW even applied ABS technology to the K100 motorcycle in the 1980s.

Another driver assist technology was the load sensing proportioning valve used in the mid-1960s. Proportioning valves were installed on pickup trucks to minimize vehicle spin (swapping ends) during hard braking on wet roads. The

load-sensing valve was located in the hydraulic system for the rear brakes. A metal rod attached to the pickup bed and the valve provided a rough indication of how much weight the truck is carrying during braking. It functions to control the brake fluid pressure from the master cylinder in response to vehicle load and prevents early locking of the rear wheels.

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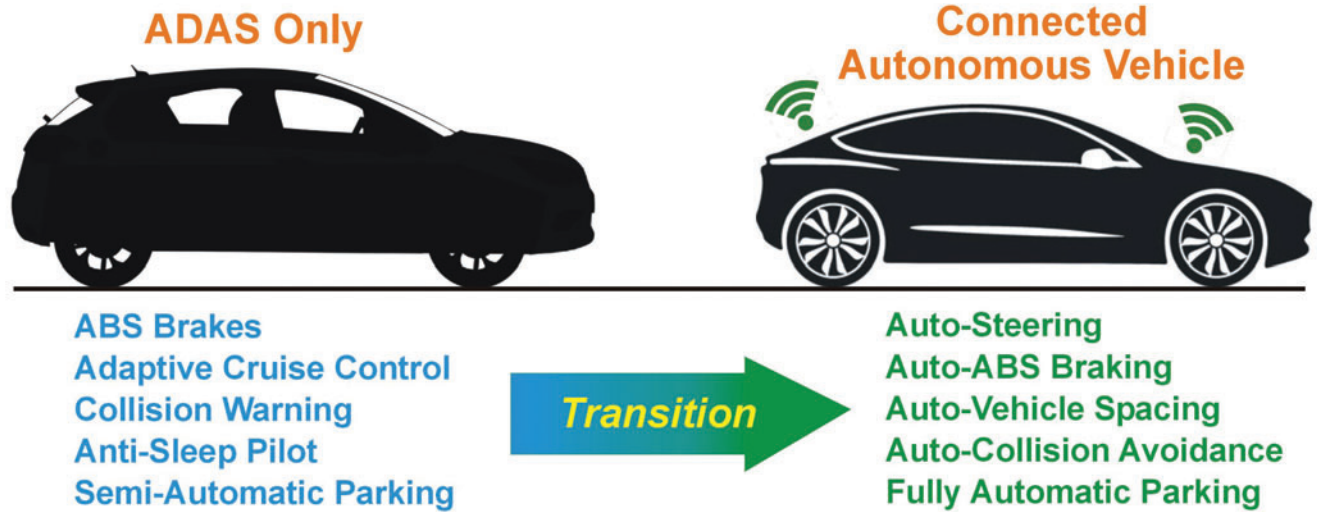
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**THE ADAS CARS OF TODAY** will eventually make the transition to fully autonomous vehicles. With autonomous cars digitally connected to each other, the roadway and driving hazards, ADAS systems will operate in the background with little or no driver interaction.

Since the 1950s, speed warning systems have helped drivers to ease off the gas pedal to reduce speed. The 1962 Buick Wildcat's speedometer had a speed indicator that could be set by the driver. When that speed was exceeded, a buzzer sounded as a warning to slow down. Other driver assist innovations include automotive cruise control that was new in 1947, but is common on vehicles today and the neutral safety switch (or inhibitor switch) for both automatic and manual transmissions — a form of driver assist that prevents drivers from starting the engine with the transmission in gear. Even some vintage radios had an automatic volume control that would increase volume with vehicle speed allowing the driver to pay attention to driving. All of these systems, while not labeled as true ADAS technology, provided early forms of driver assist functionality.

### Current ADAS systems

Not everyone in the automotive industry uses the term “automatic assist,” precisely resulting in accidents caused by a misinformed driving public. This has happened with Tesla and other luxury cars when salespeople tout the benefits of their brand's offerings and overstate

ADAS capabilities. For example, a salesperson might say to a customer, “Just press this button and the car almost drives itself.” After purchasing the car, the new owner gets on the interstate, engages the ADAS system and starts playing a game on their phone. This lack of understanding of ADAS limitations has resulted in accidents with some fatalities.

Because OEMs, software companies and the aftermarket are all developing autonomous cars and the components that support them, a common language is necessary to describe the technology to avoid confusion. In 2016, the National Highway Traffic Safety Administration (NHTSA) adopted descriptions of automated driving functionality, developed by the Society of Automotive Engineers (SAE) International, of five levels of ADAS technology. It's based on “Who Does What, When.”

- **Level 0** - The human driver does everything.
- **Level 1** - Automated system(s) on the vehicle can sometimes assist the human driver to conduct some parts of driving tasks.
- **Level 2** - Automated system(s) on the vehicle can actually conduct some parts of the driving task, while the

human continues to monitor the driving environment and performs the rest of the driving tasks.

- **Level 3** - Automated system(s) can both conduct some parts of the driving task and monitor the driving environment in some instances, but the human driver must be ready to take back control when the automated system requests.
- **Level 4** - Automated system(s) can conduct the driving task and monitor the driving environment, and the human need not take back control, but the automated system can operate only in certain environments and under certain conditions.
- **Level 5** - The automated system can perform all driving tasks, under all conditions.

The use of ADAS that help drivers with steering, braking, monitoring and warning tasks is expected to increase over the next 10 years. In part, this usage will be driven by consumer and government interest in safety applications that protect drivers and reduce accidents. For example, the United States and European Union are mandating that all vehicles be equipped with autonomous emergency braking systems and forward-collision warning

systems by 2022. The increased usage of ADAS will have a significant impact on the auto repair industry as well. Even a simple job like replacing a windshield is complicated by the presence of ADAS sensors that need to be calibrated. Businesses like The Windscreen Company ([www.thewindscreenco.co.uk](http://www.thewindscreenco.co.uk)), located in the United Kingdom are having to educate consumers regarding increased costs for windshield replacement. Consumer surveys show that the car-buying public is increasingly becoming more interested in ADAS applications that offer driver comfort and convenience, like blind spot monitoring and parking assist. The following are some highlights of ADAS in current use.

Adaptive cruise control (ACC), also known as dynamic cruise control, is considered a Level 1 ADAS technology. ACC systems can use radar, LIDAR (like those made by Ainstein ([www.ainstein.ai](http://www.ainstein.ai)) laser- or camera-based sensors to assist drivers in maintaining spacing between vehicles. Sensor input from ACC systems can use the vehicle's engine management system to control braking and acceleration at speed. Radar systems can be long or short range and some vehicles use both. The black-box sensor on a laser-based system must be exposed to the area that it is tracking and because the laser reflects off other cars, it does not work well (or at all) in heavy rain or snow. Some camera-based systems use two forward-facing cameras placed on either side of the rear-view mirror, providing binocular vision to the system's computer. Through digital processing, the ACC system can calculate distance of vehicles ahead.

On some vehicles, collision avoidance is another feature of ACC systems and uses the same sensors to warn drivers of a potential fender bender, or worse. In addition to sensors, GPS information can be used to alert the system of fixed objects like stop signs, intersections, exit and entrance freeway ramps

## AFTERMARKET ADAS ADAPTION HEADING TOWARD INCREASED CATEGORY GROWTH

As OEM-installed and retrofitted Advanced Driver-Assistance Systems (ADAS) continue to gain popularity, the aftermarket is well-positioned to provide much-needed education and training for installers, repairers and motorists along with benefitting by selling the numerous ad-on products that are becoming available within the category.

"ADAS is among the fastest growing automotive segments today, and it presents a significant opportunity for aftermarket retrofitting and new vehicle upgrades," says Chris Kersting, president of the Specialty Equipment Market Association.

In 2017 the segment was valued at just under \$1 billion, and it is expected to grow to more than \$1.5 billion by 2021, according to a SEMA-commissioned study conducted by Ducker Worldwide and the Center for Automotive Research (CAR).

Establishing just what this category actually entails needs clarification, as industry groups are calling on the market to precisely define universal nomenclature along with detailing the product lines, properties and capabilities of the equipment.

Continue reading at [ABRN.com/ADASgrowth](http://ABRN.com/ADASgrowth).

and other hazardous driving areas. Future ACC systems will have an impact on increasing the capacity of roads by maintaining optimal separation distances between vehicles and provide a safer driving environment.

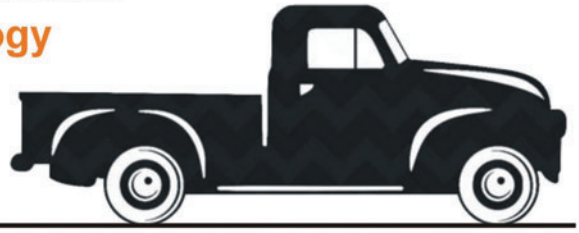
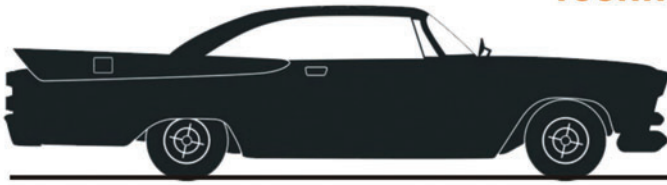
Wake up! Anti-sleep pilot, driver condition monitor, fatigue detection or tiredness detection warning are some of the names of systems that warn a driver that they are not paying attention to the road ahead — time to get some coffee or pull over and take a nap. Studies have shown that 20 percent or higher of road accidents are driver fatigue-related. Driver drowsiness detection and lane departure warning systems are similar, if not identical. They can use road lane monitoring via a camera, steering pattern monitoring or driver eye and face monitoring to determine when to sound a warning. Future systems could use body sensors to measure things like heart rate, brain and muscle activity and skin conductance as a measure of how

awake a driver really is.

From the inception of the automobile, the ability of a driver to "park" the car has been a challenge. The parallel parking test for licensing is one of the most difficult skills that drivers have to demonstrate — so difficult that 16 states have dropped the requirement. The lack of parking skills has led to a vicarious form of entertainment — watching drivers trying to parallel park. No matter how many times they back-and-fill, and/or bump other cars, they can't seem to get any closer to the curb. Automatic parking is an ADAS system that bridges the gap between driver assist and fully automatic driving in that the system takes over steering during parking maneuvers.

In general, Automatic Parking Systems (APS) use ultrasonic sensors located at the four corners of a vehicle to determine its position relative to other parked cars. In operation, APS is turned on and the car is driven past

## Early Driver Assist Technology



**Speed Warning  
Cruise Control**

**Neutral Safety Switch  
Auto Radio Volume**

**Load Sensing –  
Proportioning Valve**

**NONE OF THIS EARLY ADAS TECHNOLOGY** required a computer to operate. Everything was analogue using mechanical switches and actuators. While these vintage driver-assist aids were low tech, they did provide benefits to drivers.

the desired parking spot to determine if there is enough room to park. During parking, the system instructs the driver to put the car in reverse or drive and apply the brakes until the car is parked. Perpendicular parking is a similar process. After driving past an empty parking space and measuring it, the vehicle self-steers, backing into the space while the driver controls the gas and brake pedals. With driver angst over parking, it's no surprise that automakers want to offer customers a way to circumvent their lack of parking skills.

Future ADAS systems will be a real factor in differentiating automotive brands from one another. OEMs and their suppliers know that they will also be a significant revenue source for selling consumers various levels of trim and add-on packages. As costs for ADAS tech comes down, it will be found on less expensive cars and become commonplace.

### ADAS and autonomous cars

As evidenced by current ADAS systems, driver assist technology of the future is only going to become a larger part of consumers' automotive experience. The use of ultrasonic, radar and optical sensors will provide a more complete picture of a vehicle's surroundings and shift more driving responsibility away from human drivers and towards computers with the goal of a safer and more

relaxed driving experience. An important part of the transition to fully automatic driving is connecting vehicles to one another and their environment. The combination of sensor technology and connected vehicles will play an increasingly important role in the transition from ADAS systems to fully autonomous vehicles.

While ADAS systems are effective for line-of-sight driving situations, they can't offer the situational awareness of vehicles that are connected to one another and the environment. Vehicles that are connected to each other can use their respective sensors to create a network of awareness that will extend far beyond the range of a single vehicle using ADAS alone. Connected vehicles will receive alerts of dangerous situations, providing drivers and autonomous vehicles more time to react. For example, an oncoming car in the wrong lane in a blind curve, vehicles swerving to avoid a road obstruction, and a driver about to run a red light as they are nearing an intersection could all be detected by connected cars that would transmit this information to other vehicles.

Connected vehicle technology will ultimately be less expensive to install per vehicle than ADAS systems and perform many, if not all, the same functions. Connected cars will receive data from surrounding vehicles and infrastructure, display driver



PHOTO: AINSTEIN

**THE AINSTEIN AUTOMOTIVE SAFETY RADAR**, Kanza-77, enables ADAS features like forward collision warning, automatic emergency braking, pedestrian and cyclist collision warning and adaptive cruise control.

alerts and interact with onboard braking, steering and engine management systems. OEM, and high-tech players like Google and Microsoft are spending huge sums of money on research and development to create self-driving cars, but they can't get there without ADAS systems that will bridge the gap between current driver assist features and fully autonomous cars. Within 10 to 20 years, drivers will be able to get into their car and say "Take me home," read a book or take a nap during the drive, but this will only happen in part because of ADAS systems that are used in today's vehicles. 📶



**TRACY MARTIN** has covered the powersports industries since 1998. He is also the author of six Motorbooks Workshop

Series books published by the Quarto Publishing Group and is a regular contributor for *Motor Age*.

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# PONY CAR PROCEDURES

**THE LONG, SLOPING FRONT-ENDS** of sportscars might be beautiful, but they create a number of collision repair issues.



## STEPS TO PUT SPORTSCARS BACK ON THE ROAD AND TRACK

**TIM SRAMCIK** // Contributing Editor

**P**ity the poor sportscar. That's the shared opinion of many in the automotive sales and repair industries, which shouldn't come as much of a surprise to anyone familiar with this vehicle segment. Even with respectable sales, these hot-running coupes always seem to be on the chopping blocks of auto manufacturers looking to shelve these vehicles to concentrate on far more popular SUVs, trucks and crossovers. For their part, repairers have grown used to seeing their mangled shapes towed to their doors, often because owners are eager to test their limits or are too willing to put safety in the back seat when an aggressive road-

way comes calling.

More than a few shop owners refer to sportscars as the kings of front-end damage. "We don't see a lot of Mustangs, Camaros or anything like that with rear impact damage," says Joe DeClaro, owner of Atlantic Collision and Restoration in Jacksonville, Fla. "You see some side impacts, but most of the time it's severe front-end damage going right up to the driver's compartment."

With so many sportscars utilizing long, sloping front-ends engineered with a host of lightweight materials and bonds to compensate for heavy engines and suspensions, these vehicles can offer significant repair challenges. The final

weeks of summer are a great time to brush up on your knowledge of front-end work as sportscar owners take advantage of their waning driving season (especially in northern parts of the country).

Refer to the following repair steps supplied by General Motors for the 2019 Chevrolet Camaro. As you work your way through them, note the level of detail in this work and the need to strictly adhere to OEM instructions to return a sportscar to form.

### **Front End Upper Tie Bar Replacement Removal Procedure**

**Warning:** Before starting, refer to the



following GM documents.

- Approved Equipment for Collision Repair Warning
  - Glass and Sheet Metal Handling Warning
1. Disable the supplemental inflatable restraint (SIR) system. Refer to GM's SIR Disabling and Enabling instructions.
  2. Disconnect the negative battery cable. Refer to GM's Battery Negative Cable Disconnection and Connection instructions.
  3. Remove all related panels and components.
  4. Repair as much of the damage as possible to factory specifications. Refer to GM's Dimensions – Body instructions.
  5. Locate and remove upper tie bar rear fasteners.
  6. Locate and remove upper tie bar lower fasteners.
  7. Remove the damaged tie bar assembly.

#### Installation Procedure

**Note:** Verify that all mounting points for the upper tie bar are within dimensional specifications prior to installing the replacement tie bar.

1. Remove the rear attachment brackets that are bolted to the tie bar ends on the replacement part.
2. Install the replacement tie bar upper fasteners to the vehicle.
3. Install lower attachment bolts.
4. Apply the sealers and anti-corrosion materials to the repair area, as necessary. Refer to GM's Anti-Corrosion Treatment and Repair instructions.
5. Paint the repair area. Refer to GM's Basecoat/Clearcoat Paint Systems instructions.
6. Install all related panels and components.
7. Connect the negative battery cable. Refer to GM's Battery Negative Cable Disconnection and Connection instructions.
8. Enable the SIR system. Refer to GM's SIR Disabling and Enabling instructions.

## Windshield Frame Header Front Panel Replacement

### Removal Procedure

**Warning:** Before beginning, refer to the following GM instructions:

- Approved Equipment for Collision Repair Warning
- Foam Sound Deadeners Warning instructions
- Battery Disconnect Warning.
- Glass and Sheet Metal Handling Warning.

1. Disable the SIR system and then disconnect the negative battery cable. See GM's SIR Disabling and Enabling instructions.
2. Remove windshield and all related panels and components.
3. Visually inspect the damage. Repair as much of the damage as possible. See GM's Dimensions – Body instructions.
4. Remove the sealers and anti-corrosion materials from the repair area as necessary. See GM's Anti-Corrosion Treatment and Repair instructions.

**Note:** Record the number and location of the original welds for installation of the service assembly.

5. Remove factory welds as required from the windshield frame header front panel.
6. Heat the outer edges of the windshield frame header front panel to release the factory impact-resistant adhesive.

7. Remove the damaged windshield frame header front panel.

### Installation Procedure

1. Prepare all mating surfaces as necessary using 80 grit abrasive.
2. Clean and prepare the attaching surfaces for welding/bonding.
3. Position the windshield frame header front panel on the vehicle. Verify the fit of the windshield frame header front panel and apply impact resistant adhesive to all mating surfaces where factory impact-resistant adhesive was applied. See GM's Metal Panel Bonding instructions.

4. Weld/weld-bond the windshield frame header front panel accordingly at the original weld locations.
5. Clean and prepare all welded surfaces.
6. Apply the sealers and anti-corrosion materials to the repair area as necessary. See GM's Anti-Corrosion Treatment and Repair instructions.
7. Paint the repaired area. See GM's Basecoat/Clearcoat Paint Systems instructions.
8. Install the windshield and all related panels and components.
9. Enable the SIR system and then connect the negative battery cable. See GM's SIR Disabling and Enabling instructions.

## Front Wheelhouse Panel Replacement (Complete)

### Removal Procedure

**Warning:** Before beginning, refer to the following GM instructions.

- Approved Equipment for Collision Repair Warning
- Foam Sound Deadeners Warning
- Battery Disconnect Warning.

**Note:** The front wheelhouse panel is cast aluminum and is rivet-bonded to the front lower frame rail (Ultra High Strength Steel) and hinge pillar upper extensions (Dual Phase Steel). The front wheelhouse is serviced as a complete assembly that includes the hinge pillar upper extension, which is rivet-bonded to the front wheelhouse panel.

**Note:** This procedure describes how to replace the complete front wheelhouse assembly, using recommended adhesive and rivets to attach the assembly to the front lower frame rail. The assembly requires welding at the cowl on the upper hinge pillar extension.

**Note:** Partial replacement of the front wheelhouse assembly can be done by replacing only the front wheelhouse panel (cast aluminum). The front wheelhouse panel will need to be separated from the complete wheelhouse service assembly



PHOTO:GM MEDIA

**OEMs HAVE GOTTEN MUCH BETTER ENGINEERING SPORTSCARS** with lighter, powerful engines. Still, manufacturers continually offset their weight (along with special suspensions) with a variety of weight-reducing materials and bonds.

and replaced using adhesive and rivets.

1. Disable the SIR system and then disconnect the negative battery cable. Refer to GM's SIR Disabling and Enabling instructions.
2. Remove all related panels and components.  
**Note:** Inspect the front of the cowl for damage. If the metal surface is damaged, the cowl panel must be repaired to restore the structural integrity of the vehicle.
3. Repair as much of the damage as possible. Refer to GM's Dimensions - Body instructions.
4. Remove the sealers and anti-corrosion materials from the repair area, as necessary. Refer to GM's Anti-Corrosion Treatment and Repair instructions.

**Note:** Record the number and location of welds for installation of the service assembly.

5. Remove all necessary factory welds. Next, remove the front upper outer rail and the front tie bar attachment bracket to access rivets and hinge pillar upper extension welds.  
**Note:** Record the number and location of welds for installation of the service assembly.
6. Remove all necessary factory welds for the upper outer rail reinforcement bracket and then remove the upper outer rail reinforcement bracket. Next, remove the welds from the hinge pillar upper extensions from the cowl area.  
**Note:** Record the number and location of the rivets for installation of the service assembly.

**Note:** The rivets can be removed using a chisel and hammer to remove the head of the rivet and then driving out the remainder of the rivet with a punch and hammer, or drilled out with a suitable

drill bit and drill.

7. Locate, mark and remove the factory rivets that attach the front wheelhouse assembly to the structure.  
**Note:** The adhesive material will release from the structure by applying heat to approximately 400 degrees Fahrenheit (200 degrees Celsius). A noticeable popping sound can normally be heard when the adhesive releases.
8. To complete the removal of the front wheelhouse panel, apply heat to the adhesive material to cause the adhesive to release and then remove the wheelhouse assembly from the vehicle.

#### **Installation Procedure**

**Note:** Note: Proper alignment of the wheelhouse assembly is important. The use of 3-dimensional measuring equipment is recommended when installing the part.

**I NEED  
A KIA STARTER,  
BUICK FILTER,  
RAM SENSOR,  
HONDA ROTOR.  
AND  
SOMETHING  
FOR MY  
HEADACHE.**



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**SPORTSCARS LIKE THE VENERABLE FORD MUSTANG** often are on the extinction list of manufacturers eyeing other vehicle segments, but still have legions of fans. That's one more reason to keep your repair skills sharp.

1. Prior to applying adhesive or welding, fit the wheelhouse assembly to the structure and check for proper alignment.

2. With the part properly located and aligned, mark the locations for the rivets and welds recorded from the original part and drill the holes for the rivets.

3. Remove the part from the vehicle to clean and prepare the surfaces for bonding and welding.

**Note:** Leave the Elpo-coating on the adhesive bonding surfaces of the service part to allow additional protection of the aluminum from galvanic corrosion.

4. Scuff sand the bonding surfaces on the service part to remove the gloss from the Elpo-coating.

5. Using a grinding disk or equivalent, prepare a bare steel surface on the bonding areas of the vehicle structure.

6. Clean and prepare all welding surfaces.  
**Note:** Refer to adhesive manufacturer's recommendation for specific application and curing recommendations.

7. Apply a bead of adhesive to all bonding surfaces on the vehicle structure and service part, per the adhesive manufacturer's recommendations.

Refer to GM's Aluminum Panel Bonding instructions.

**Note:** Completely cover all bare surfaces with the adhesive.

8. Using a small brush, spread a coat of the adhesive to cover the entire adhesive bonding surface to ensure proper corrosion protection.

**Note:** Do not allow the adhesive to cure off the vehicle prior to installing and aligning the part. Refer to adhesive manufacturer's recommendations for specific cure times.

9. Apply a bead of adhesive to the mating surface of the service part, per the adhesive manufacturer's recommendations.

**Note:** Do not pull the panels apart after they've been joined together. Slide the panels against each other to realign the panels or proper joint strength may be affected.

**Note:** Proper alignment of the wheelhouse assembly is important. The use of three-dimensional measuring equipment again is recommended when installing this part.

10. Install the service part to the vehicle structure and check for proper alignment.

11. Install the rivets along the bonding joint, at the original locations. Refer to the electronic parts catalog for the recommended rivets.

12. Weld the service part at the original weld locations, as necessary.


13. Install front tie bar attachment bracket, front outer upper rail and upper outer rail reinforcement bracket.

14. Clean all welded surfaces.

15. Apply the sealers and anti-corrosion materials to the repair area, as necessary. Refer to GM's Anti-Corrosion Treatment and Repair instructions.

16. Paint the repaired area. Refer to GM's Basecoat/Clearcoat Paint Systems instructions.

17. Install all related panels and components.

18. Enable the SIR system and then connect the negative battery cable. Refer to GM's SIR Disabling and Enabling instructions. 



**TIM SRAMCIK** has written for *ABRN* and sister publications *Motor Age* and *Aftermarket Business World* for more than a decade.  
[tsramcik@yahoo.com](mailto:tsramcik@yahoo.com)



# MAKING SENSE OF TOYOTA'S "SAFETY SENSE"

**TOYOTA SAFETY SENSE** is  
Toyota's advanced driving assist system.

## HERE'S AN OVERVIEW OF TSS — FOUND ON EVERY NEW MODEL TOYOTA VEHICLE — AND INFORMATION ON ITS DIAGNOSIS AND REPAIR

**DAVE MACHOLZ** // Contributing Editor

**T**he push toward autonomous vehicles is driving vehicle manufacturers to create and implement integrated technology packages that are aimed at assisting the driver. These safety packages are commonly referred to as Advanced Driver-Assistance Systems, or ADAS. Toyota Safety Sense (TSS) and Lexus Safety System (LSS) are the proprietary names Toyota is using for their ADAS systems. While these systems are currently designed to support the driver, the foreshadowing towards autonomy is evident. The challenge for today's repair and collision facilities in diagnosing, repairing and calibrating these vehicles will include the need for proper training, service information, scan tools and related tooling.

The complication to this technology on Toyota and Lexus vehicles comes down to the differences in system butnology and display technology found on each varying vehicle. It has been rumored that Toyota and Lexus are on their fifth generation of this technology, adding to the complexity of diagnosis and repair. For example, Toyota Safety Sense has gone under the name TSS-C, TSS-P and the Current TSS 2.0. These formal TSS classifications come after years of utilization of millimeter wave radar systems found on Lexus vehicles and Toyota nameplates such as Sequoia and Prius.

### The push toward autonomy

While most manufacturers are forging toward a driverless future, most are still sure to tell their customers that this is an assist feature and not a replacement for

the vehicle's driver. The Society of Automotive Engineers recently published a chart that outlines the six classification from fully driver-operated vehicles to fully autonomous vehicles. Level "0" representing the former while level "5" the latter. Most manufacturers, including Toyota, find themselves in the level 1-2 range with still quite a few complications and hurdles to overcome before moving up in level.

A look at the current Toyota Safety Sense reveals the current level of technology as well as some of the obstacles to full autonomy.

### Pre-collision system with pedestrian detection

The pre-collision system with pedestrian detection utilizes a forward facing, windshield mounted camera as well as a mil-

limeter wave radar sensor typically mounted in the Toyota or Lexus emblem in the vehicles grille. This technology is designed to detect hazards and/or pedestrians between speeds of 7-110 mph for the pre-collision and 7-55 mph for pedestrian detection and will alert the driver to hazards both audibly and visually with a series of beeps and a flashing warning to brake. If the driver brakes in response to this warning, the system will often provide additional brake force to bring the vehicle to a stop more quickly. If the driver does not brake at all, the system may apply the brakes for the driver automatically.

While the idea of this system is very well intended, Toyota specifically points out that there are multiple scenarios in which this technology is unreliable. Specifically, the system relies on straight roadways and clear visibility. If visibility is poor, such as in bad weather, the system may be unreliable. Additionally, the sudden appearance of a vehicle or other object, uneven roadways or sharp curves, something on the sensor, strong sunlight or the ability to see motorcycles or bicycles all provide complications to system reliability.

Toyota is sure to issue the disclaimer that drivers are responsible for operating their own vehicles.

### Lane departure alert

Tired or distracted driving that causes a driver to swerve out of their lane is mitigated through the use of lane departure alert. LDA typically activates when the system observes the driver veering out of a visibly marked lane. This system utilizes a forward-facing camera to detect the lines on the road. Above a speed of 32 mph with the system enabled and on a reasonably straight road, the system will provide an audible and visual warning to the driver. Some vehicles are also equipped with steering assist that will provide slight adjustments in an attempt to keep the vehicle in the lane. Many of these functions are adjustable and, in some cases, can be turned off entirely.

This system, as well as its pre-collision relative, is highly dependent on the windshield-mounted camera. It works best on straight roads and when lane markers are clearly visible.

Toyota warns to not overly rely on this technology, as it will not work in every situation. Poor visibility of the camera in bad weather or due to bugs, dirt, ice, frequent or sharp curves, oncoming headlights, bright sunlight and poorly marked lanes will all affect operation.

### Automatic high beams

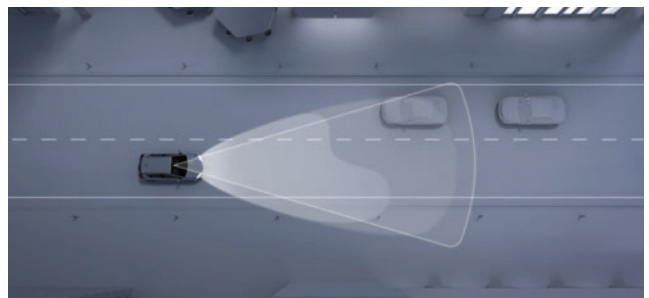
The automatic high beam system utilizes the forward-facing camera to automatically switch between high and low beam operation to maximize visibility for the driver while limiting the interference of high-beam lighting on other drivers. This system utilizes the camera to detect light levels and can sense oncoming headlights and tail lights from vehicles.



TOYOTA'S TSS 2.0 features upgrades such as pedestrian detection.



TOYOTA'S TSS-C AND TSS-P were the predecessors to TSS 2.0.



**AUTOMATIC HIGH BEAMS** add a layer of safety through improved visibility.

### Dynamic radar cruise control

TSS vehicles come with dynamic radar cruise control. This system operates like traditional cruise control, but adds a feature of distance control from the vehicle in front of you by adjusting speed to maintain distance. This system has an overall operating range from 25-110 mph. A speed above 28 mph is required to initiate. There are also full-speed range on some models that will allow the vehicle to come to a complete stop if the vehicle in front of it stops. This system is operated through the use of the millimeter wave radar sensor located in the emblem.

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## Road sign assist

Road sign assist is a new feature for TSS 2.0 and is designed to read certain traffic signs and display them on the vehicle multi-function display. The signs it is capable of recognizing and displaying include speed limit, stop, yield and do not enter signs.

## Lane tracing assist

New with the 2019 Corolla hatchback, lane trace assist combines LDA and DRCC technologies to enhance the vehicle's ability to remain centered in a lane and at a safe distance. This system requires the driver to be an active participant and requires the driver's hands to be on the steering wheel. Failure to do so will result in a visual warning.

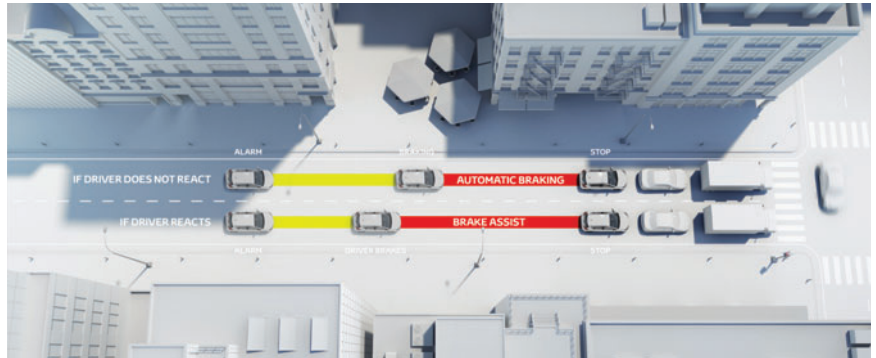
## Blind spot monitoring

While not a formal part of the Toyota Safety Sense suite of technologies, blind spot monitoring is another technology that alerts the driver to vehicles not visible in mirrors. Not all vehicles are equipped with this technology, but a button with "BSM" to the left of the steering wheel is the way of determining if this system is present.

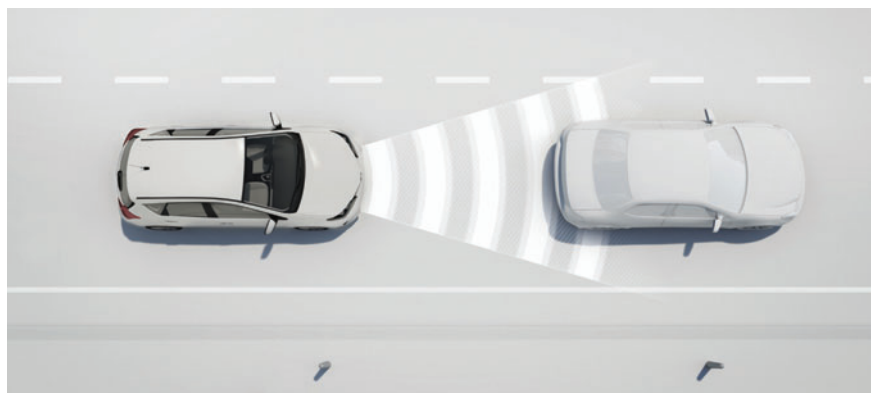
In summary, the TSS suite of safety systems provides a wealth of technologies to support the driver. However, the technology has a way to go. For instance, how will an autonomous vehicle handle the complexity of America's roadways with complex geography and various nuances in state-to-state infrastructure? New Jersey's right-hand turn to make a left comes to mind. On an even more basic level, how will weather and Mother Nature be compensated for?

## Service information

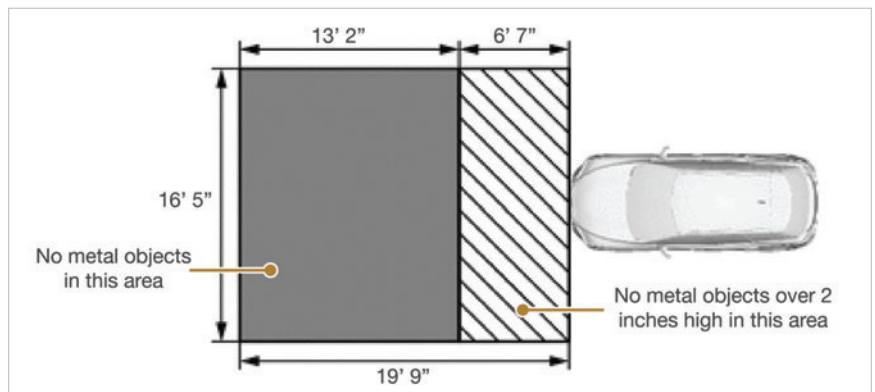
Factory service information is critical in the diagnosis, service and repair of Toyota/Lexus ADAS systems. Many of the vehicles that independent shops will encounter will still be under warranty, adding an extra layer of consideration before



**PRE-COLLISION SYSTEMS** detect closing targets, provide warning and ultimately brake.



**RADAR CRUISE UTILIZES** millimeter wave radar located in the front emblem.



**QUICK TRAINING GUIDES** found in TIS provide critical service information, such as space requirements for calibration.

proceeding with service procedures of any kind. As with any technology, ADAS is constantly evolving, and there are now several generations of ADAS-related equipment found across the Toyota and Lexus product line. As mentioned previously, there are multiple generations and various nuances even within the same model year. With these considerations, accessing Toyota Service Information will be critical.

Toyota makes their service information readily available to the independent repair market via a paid subscription at [www.techinfo.toyota.com](http://www.techinfo.toyota.com). Twenty dollars for a two-day subscription will provide you with the full suite of Toyota and Lexus service information, wiring diagrams, service bulletins and supporting materials such as technical training guides and Quick Training Guides. Monthly and yearly subscriptions are also available.



These resources provide a wealth of information for the independent repair facility and will ensure that any work related to ADAS will be done by the book.

Before proceeding with any service related to ADAS, be sure to consult Technical Service Bulletins, as there are many related to the ADAS system that will be relevant to basic ADAS procedures such as calibration. For example, there are several Lexus models that have TSBs related to the angle of the shop floor and how to compensate for this phenomenon when calibrating the system.


Toyota and Lexus Quick Training Guides also provide valuable insight into the calibration of Toyota and Lexus ADAS systems. Think of these Quick Training Guides as a “greatest hits” document that includes snippets of information from the repair manual, New Car Features Guide, Electronic Wiring Diagrams and more. As such, they are a massive time saver and a go-to guide for technicians.

### When is service required?

The service of the TSS system typically relates to scenarios in which either the camera, millimeter wave radar, sonar or alignment may have been altered due to collision, replacement of parts or regular service. When in doubt, consult the service information.

### Required tools

At a recent instructor training event for the national Toyota T-TEN program, many of us were surprised to see a plumb bob and laser level among the special tools required when performing calibration functions of the TSS system. The plumb bob is utilized to find the center line by locating the center of the emblem in the front and rear of the vehicle and marking center on the floor at the location of the plumb bob. Then the center line of the vehicle can be projected with the laser level to the specified distance in the service information. While low-tech, it works well.



## 2016-2017 RX 350 and RX 450h Millimeter Wave Radar Sensor Service

### Quick Training Guide – QL616A

This Quick Training Guide demonstrates key procedures for adjusting the millimeter wave radar sensor. Because this guide does not describe every step in the entire procedure, be sure to follow Repair Manual instructions when performing radar sensor adjustment.

ENTER

Click the ENTER button to view the Quick Training Guide.

**QUICK TRAINING GUIDES** provide a wealth of information on TSS system functions.

In addition to these easy-to-find tools, calibrations will require an appropriate scan tool and targets for both the camera and millimeter wave radar. The targets can be printed through the service information and some related TSBs, meaning the only piece that will have to be truly sourced is the diamond-shaped reflector for the millimeter wave radar calibration.

There are quite a few companies out there that are beginning to design ADAS calibration systems to work with multiple manufacturer vehicles. Currently in production are systems by Autel, Bosch and Hunter Engineering, while many others are rumored to be working on their own solutions.

### Other considerations

Performing TSS calibration functions may sound like a new line of income for your business, but proceed with caution. Most Toyota dealerships in the metropolitan New York region are charging 2.5-3 hours labor for this service. The complication is that some dealers are unable to perform these functions. Why, you might ask? Because some of the service functions require a flat, level surface with a significant distance of up to 20 feet in front of the vehicle. Add to this the need for good lighting and limited objects in the background during the aiming process and you have eliminated every small, dark service facility in the country.



PHOTOS: TIS MACHOLZ

**INCLUDED IN QUICK TRAINING GUIDES** are the service tools required.

Toyota Safety Sense 2.0 captures the present-day safety features found on Toyota vehicles in 2019. As the saying goes, the only constant is change. You can expect that by this time next year there will be more to write about. In the meantime, consult service information, educate and prepare yourself for the present and future. 📶



**DAVE MACHOLZ** is an instructor for the Toyota T-TEN, Honda PACT and general automotive programs at Suffolk County Community College in Selden, N.Y. He is an ASE CMAT and L1 technician and holds a New York State teaching certification in vehicle repair. [liautotraining@gmail.com](mailto:liautotraining@gmail.com)

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# Change your mind to change your results

Having an abundance mindset in business and life can change your outcomes

Several years ago, I read Dr. Stephen Covey's book, *The 7 Habits of Highly Effective People*, and learned about the concept of mindset and how my mindset affects every area of my life. Mindset affects my relationships, performance, influence with others, cultures, outcomes and results.

Not long after reading Dr. Covey's book, I attended leadership training with Discover Leadership, and I was awakened to my current mindset. It was one that Dr. Covey described as a scarcity mindset. I began to connect the dots from the frustrating thoughts that filled my mind to the frustrating results in every area of my life. I am a perfectionist. I walk into a room and immediately see what is wrong. I realized most of my conversations in life — at work, with family, friends and even my kids, revolved around what was wrong. I was determined to make a change.

I did not want to leave a wake of negativity with people in my life. Every time I walked into the shop and immediately addressed everything wrong. I left a wake of negativity. What is wrong does need to be addressed; however, if all I ever do is point out what is wrong, how will that be received?

I set a goal to be intentional to find what was right and make that the topic of my conversations. When you focus on what is right and celebrate it, it produces more of what is right. I have been on the journey to train my mind and transition from a scarcity mindset to a mindset of abundance for almost four years. This journey starts with first being aware of your current mindset. Are you currently receiving the results you desire in every area of your life? If not, look at your mindset, your thoughts, your paradigm in life. The cultures we create at work and home start with the thoughts in our minds. We either approach our leadership and relationships with a scarcity mindset or an abundance mindset. The abundant mindset leader pours their knowledge and experience into the people around them, believing everyone will benefit and grow. They want others to succeed; they want to empower others to grow and succeed. The scarcity mindset leader is stingy



**THE ABUNDANT MINDSET LEADER BELIEVES THERE IS ENOUGH IN THE UNIVERSE FOR US ALL TO WIN; THE SCARCITY MINDSET THINKS FOR ME TO WIN, YOU MUST LOSE.**

with their knowledge, believing it will give them an edge over others. They withhold knowledge and experience from the people around them, usually stemming from insecurity. The abundant mindset leader believes there is enough in the universe for us all to win; but the scarcity mindset person believes for me to win, you must lose.

The abundant leader operates from what Dr. Covey calls a win-win paradigm. It means we are constantly seeking mutual benefits in all our interactions. Most people are deeply ingrained in the paradigm of win-lose. In other words, I want to win, and I don't care how it affects you. Conversely, there are others who prefer to keep the peace; therefore, they are willing to live in a lose-win paradigm. This paradigm will eventually cause resentment, and there will be no long-term benefit or a healthy relationship in this situation. A win-win paradigm requires both courage and consideration. You must be willing to invest time, deep thought and effective communication, including listening to understand the other perspective. There also must be a decision if we cannot arrive at a solution that is a win-win for all parties, then we opt for no deal. That might be

with a vendor, team member or customer. The abundant leader who operates from a win-win paradigm will develop a culture of synergy, trust and collaboration.

Study after study has shown culture has a direct impact on the bottom line, retention and the overall health of an organization and relationships. Take a few moments and reflect on how you are approaching your relationships, your personal and professional interactions. How might your mindset transition from scarcity to abundance? Write out your goals, then connect the dots starting with the thoughts you think, to the words you speak, to the actions you take. Are your thoughts guiding you to your desired results or are they limiting your actions and in turn your results? 📧

---

**SHERYL DRIGGERS** is the owner of Universal Collision Center in Tallahassee, Fla. Through her career, she has gained specialized experience in marketing, management, public speaking, teaching and fiscal oversight. [sheryld@universalcollision.com](mailto:sheryld@universalcollision.com)



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