

WITH THIS ISSUE:  
SPRING 2018  
KIA QUALITY CONNECTION

# REAR IMPACT OR RODENT?

UNCOVERING THE TRUE FOUR-LEGGED  
CAUSE BEHIND AN ENGINE PROBLEM

## 51 NECESSARY INTEGRATION

How to build OEM repair  
information into the estimating and  
repair process

## 55 ENVISIONING THE FUTURE SHOP

Implement linear remanufacturing  
to improve profitability





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## OPERATIONS

### 12 LEADERSHIP LESSONS

Vendors offer multiple options to train your managers

**TIM SRAMCIK** // Contributing Editor

### 20 GROW YOUR OWN TECHNICIANS

Find a solution for the technician shortage

**JOHN BURKHAUSER** // Contributing Editor

### 26 IMPROVING YOUR EFFECTIVE LABOR RATE

Watch your billed labor categories to help maintain gross profit and stay competitive

**JOHN SHOEMAKER** // Contributing Editor

### 28 THE COLLISION EXECUTIVE FOCUS ON OVERLOOKED PROCEDURES

Simple steps shops can take — in addition to training — to help estimators improve

**STEVE FELTOVICH** // Contributing Editor

### 30 FINDING A FIX QUALITY REPAIRS OR NOT: MANAGEMENT DECIDES

Set the bar high for your team and make sure they know it is a constant priority

**MARK OLSON** // Contributing Editor

### 32 SHOP PROFILE REPAIRS TAKE FLIGHT

Shop soars with successful approach to equipment, innovation and education

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

### 70 THE LAST DETAIL PROPOSITIONAL LOGIC CAN BUILD BETTER ESTIMATORS

Understanding how to construct word equations will lead to better estimates

**WILL LATUFF** // Contributing Editor



## TECHNICAL

### 40 UNDERSTANDING PLASTIC REPAIR WITH ADHESIVES

When considering options for plastic repair, shop management should carefully consider the cost of equipment and necessary training before investing in the next 'cool tool' for the shop

**DOUGLAS CRAIG** // Contributing Editor

### 46 WIRING QUALITY, PROFITS INTO A REPAIR

Today's advanced vehicles need to have wiring repairs done properly

**BOB HEIPP** // Contributing Editor

### 49 REAR IMPACT OR RODENT?

Uncovering the true four-legged cause behind an engine problem

**JOHN ANELLO** // Contributing Editor

### 51 NECESSARY INTEGRATION

How to build OEM repair information into the estimating and repair process

**SEAN GUTHRIE** // Contributing Editor

### 55 ENVISIONING THE FUTURE SHOP

Implement linear remanufacturing to improve profitability

**LEE RUSH** // Contributing Editor

**automechanika**  
Commitment to > **TRAINING**

**NACE**  
**automechanika**  
ATLANTA

### 36 IT'S ALL ABOUT YOU, AND THAT'S NOT A SELFISH WAY TO LIVE

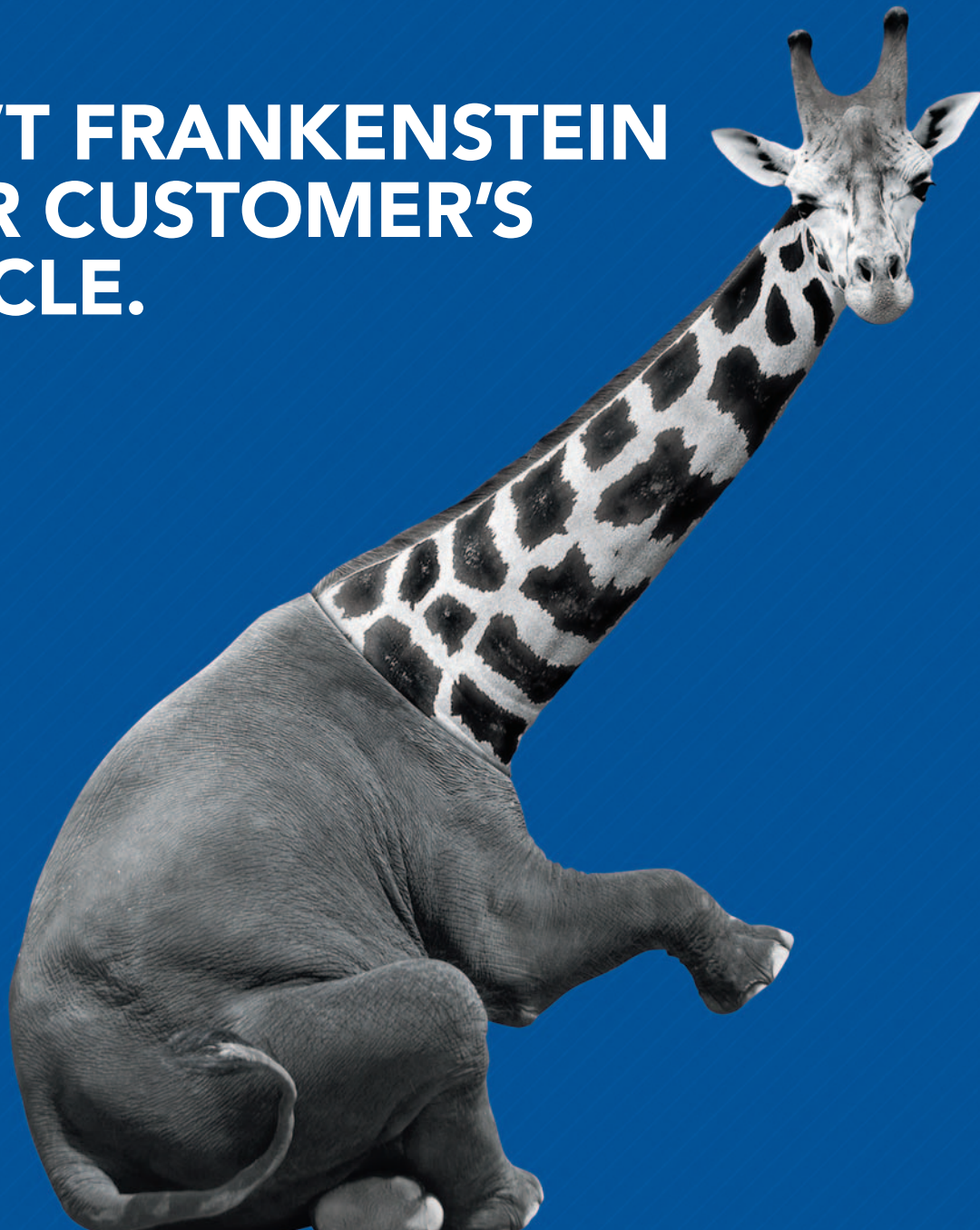
Do not defer blame and responsibility for your actions to the team

**MIKE JONES** // Contributing Editor

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IN EVERY ISSUE



## 8 INDUSTRY NEWS

**AUTO INSURANCE PREMIUMS REACH HISTORIC HIGH**

**BRIAN ALBRIGHT** // Contributing Editor

**SURVEY: INCREASED USE OF MATERIALS INVOICING SYSTEMS**

**EVERY COLLISION SHOP NEEDS AN ACE TECHNICIAN**

## 67 COLLISION PRODUCTS GUIDE

## 68 MARKETPLACE

## 69 AD INDEX



SPECIAL SUPPLEMENT

### KIA QUALITY CONNECTION

The latest issue of the Kia Quality Connection is packaged with this issue of ABRN or online at: [ABRN.com/KQCSpring18](http://ABRN.com/KQCSpring18)



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NACE Automechanika Atlanta also features a host of co-located events, including the Advanced Technology & Diagnostic Repair Forum, the MSO Symposium, I-CAR training, Collision Industry Conference and CREF golf outing. [ABRN.com/NAM2018](http://ABRN.com/NAM2018)



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## AUTO INSURANCE PREMIUMS REACH HISTORIC HIGH

**BRIAN ALBRIGHT //**  
Contributing Editor

➔ Auto insurance rates are increasing at twice the rate of inflation, according to a study by online insurance marketplace The Zebra. Premiums have reached a national average of \$1,427 according to the company's data, which the company says is a record high rate.

Rates have climbed 20 percent since 2011. In some states, rates increased by as much as 60 percent. The Zebra survey is based on an analysis of 52 million

quotes generated by its comparison shopping website.

"Insurance companies leverage thousands of data points to determine car insurance rates — things like your age, driving record and even your credit score. Today, we're also seeing extraordinary forces like overnight tech innovation and devastating natural disasters impacting rates," said Adam Lyons, founder and executive chairman at The Zebra. "Our independent research seeks to uncover

>> **RATE CONTINUES ON PAGE 10**

**BREAKING NEWS**

**RESEARCH**

## SURVEY: INCREASED USE OF MATERIALS INVOICING SYSTEMS

➔ Although the majority of shops are still using a simple calculation of dollars-per-refinish-hour to bill for refinish materials on estimates, the first "Who Pays for What?" survey of 2018 found that the percentage of shops using materials invoicing systems to calculate these charges has increased.

The latest of the four 2018 "Who Pays for What?" surveys, which focuses on not-included body labor operations closed at the end of April. The surveys are conducted by Collision Advice and CRASH Network.

The survey conducted in January found that 23 percent of shops are using some kind of invoicing system to calculate their materials charges; that is up from the previous two years when about 19 percent of shops said they were using an invoicing system.

>> **DATA CONTINUES ON PAGE 10**

### TRENDING

#### CAR-O-LINER PROGRAM EQUIPS, TRAINS NEW TOYOTA HEADQUARTERS

Car-O-Liner's OEM Training Facility Program worked with Toyota to help the OEM pick equipment to install and provided training for employees at the new Plano, Texas facility.

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

#### PPG CUSTOM PAINTING CLASSES SET FOR Q2

PPG announced its custom refinish painting class schedule for April, May and June. The classes are held at PPG Business Development Centers throughout the United States.

[ABRN.COM/CUSTOMQ2](http://ABRN.COM/CUSTOMQ2)

#### ASSURED PERFORMANCE ANNOUNCES BUSINESS SUMMIT

Assured Performance will hold its 2018 Business Development Summit Aug. 8-10 at the NACE Automechanika trade show in the Georgia World Congress Center.

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

#### EVERY COLLISION SHOP NEEDS AN ACE TECH

As the landscape of the automotive industry continues to advance and change, it is more important than ever that every shop employ an Automated and Computerized Electronics (ACE) systems technician.

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

#### ASA REAFFIRMS ENDORSEMENT OF OEM SERVICE PROCEDURES

In response to Senate Bill 164, the ASA's Collision Division Operations Committee reaffirmed its support of always using OEM procedures when available.

[ABRN.COM/SB164](http://ABRN.COM/SB164)





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NOTHING ELSE IS A  
**CHIEF**

## &gt;&gt; RATE CONTINUED FROM PAGE 8

the trends and forces behind these rate hikes and to help the 250 million drivers in the U.S. make informed insurance decisions about their own coverage.”

Consumer credit scores play a large role in insurance rates, and the Zebra survey found that those with lower credit scores can pay as much as \$1,400 more for insurance than someone with a score above 800. Unemployed drivers pay the highest rates.

The least expensive rates were found in Winston-Salem, N.C., which averaged \$774. Detroit had the most expensive rates, a whopping \$5,414. The most expensive states were Michigan, Louisiana and Kentucky; the least expensive states were North Carolina, Virginia and Maine.

Of the most popular cars to insure, the least expensive was the Honda CR-V, with an average rate of \$1,317. Other vehicles with the lowest rates included the Honda Odyssey, Jeep Wrangler and Jeep Renegade.

The most expensive vehicles to insure are the Mercedes-Benz E-Class CLS-Class (\$3,541), Mercedes-Benz GLE-Class M-Class (\$2,737), and Nissan Maxima (\$2,176).

The survey also found that usage-based insurance (UBI) solutions that rely on telematics data to give insurance companies real-time information on driving habits had very little effect on rates. Participants in those programs

reported an average premium of \$1,415, just \$12 less than the national average. Safety and anti-theft technology on the vehicle also make very little difference in insurance rates.

Among the factors that can lower your rates: being married (a savings of \$80); having a PhD (\$44 savings), and owning a home.

While insurance premiums have risen rapidly in the past several years, insurance companies have reported lower profits. In part, that is because the cost of crashes has been rising, there are more distracted drivers on the road, and extreme weather events have occurred over the past several years.

According to the Zebra report: “In the first half of 2017, insured property losses were 23 percent higher than in the first half of 2016 nationwide due to historic hail in Colorado and a number of other storms and tornadoes largely across the Midwestern states. Then, Hurricanes Harvey, Maria and Irma, as well as the California wildfires and other events caused damage exceeding \$300 billion for 2017. In fact, Hurricane Harvey alone cost 2.5 times what all of 2016’s storms did.”

Variations in state regulations can also lead to variable and higher premiums.

However, some states and consumer groups are pushing back on the use of certain demographic data on setting rates, because it penalizes lower-income drivers based on factors that have nothing

to do with their driving records.

New York state, for example, has negotiated agreements with three insurers (GEICO, Liberty Mutual and Allstate) to stop using occupation and education level as factors in setting rates in compliance with new regulations.

The Consumer Federation of America also found that, despite the fact that driving fewer miles reduces your risk of filing a claim, insurance companies generally don’t offer much of a discount to low-mileage drivers. Consumers save only \$30 per year, or 1.6 percent, on average for every 5,000 fewer miles driven annually (excluding California drivers, who save \$81 on average, or 8.7 percent).

“How well you drive and how much you drive should be the primary factors considered when insurance companies set premiums, but we have found that many companies either entirely ignore their customers’ actual mileage or give such a pittance for low-mileage as to have no meaningful impact on rates,” said J. Robert Hunter, CFA’s director of insurance and former Texas Insurance Commissioner. “For people in most parts of the country, with California as the notable exception, you’ll often pay about the same auto insurance premium whether you commute 90 miles round trip every day or if you take public transit to work and only drive on the weekends. If you drive less, you should pay less, because you can’t crash when you’re not driving.” ■

## &gt;&gt; DATA CONTINUED FROM PAGE 8

Mike Anderson of Collision Advice said invoicing systems are becoming more necessary as OEM paint processes become more complex. “I think this is going to become increasingly important as we start to see more 3-stage and 4-stage finishes, as well as more limited-use toners that shops may not stock because they are only infrequently used or have limited shelf-life,” Anderson said. “It’s important

to research the paint code during estimating to find out it’s stage, or if it requires a limited-use toner.”

The survey, with more than 900 shops responding, also showed that among those shops using invoicing systems, well over 50 percent of them are being paid based on those invoices “always” or “most of the time” by seven of the eight major insurers in the survey. Farmers and Nationwide all exceeded 60 percent, and more than 65 percent

of shops reported that USAA pays “always” or “most of the time” based on materials invoices.

The January survey also asked shops about their billing practices — and insurers’ payment practices — regarding more than two dozen not-included refinish labor operations.

The current survey focuses on body labor procedures and includes some all-new questions to offer the industry even more helpful information. ■





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# UNWRAPPED THE ALL NEW



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Where the Pros Go for Genuine Toyota Parts





### ESTIMATING

**TRAINING** isn't just for damage analysis staff members. Managers benefit as well and can help ensure the shop gets all the benefits of their information software.

# LEADERSHIP LESSONS

## Vendors offer multiple options to train your managers

**TIM SRAMCIK** // Contributing Editor

**S**hop management training programs generally can be broken down into three types:

- Informal on the job, shop-led
- Formal on the job, shop-led
- Combination of shop-based lessons and outside sources

The third selection arguably provides the best overall education. As with any type of training, especially from external providers, finding the time and resources can pose a serious challenge. Help is actually just a phone call or visit away from the same folks who provide the products and services you use every day.

Vendors, most notably, your paint and information providers, offer a full range of affordable management training, with most of it packaged so your employees can conveniently take courses. All you

need is a plan to make the most of the training available to your business. Build yours using the following available help.

### Paint vendors

**Axalta:** Axalta offers 11 courses in its Refinish Performance Management (RPM) program, covering estimating, parts management, customer service, production management and other areas. All Axalta courses have been updated for 2018 and are conducted either online or in person, with many qualifying for I-CAR credit hours.

Most recently, Axalta added a Repair Planning Process course that incorporates lessons on 100 percent vehicle disassembly, parts management and auditing supplements prior to upload. Beginning April 1, Axalta says it will be the first company to offer I-CAR Professional Development Program credit hours for completing eLearning courses. Production managers

can earn up to 17 I-CAR credit hours by completing online courses through Axalta's learning portal, the Axalta Learning Campus. Credit hours can be applied to I-CAR's Platinum designation in its Professional Development Program.

For aspiring or new managers, Axalta recommends Delivering Exceptional Customer Service, Refining Selling Skills, Parts Management, Lean Foundations, Production Management and Advanced Production. Each class is tied to a measurable improvement in the shop. Delivering Exceptional Customer Service class teaches managers best practices in customer experience and is designed to boost customer retention, repeat and referral customers, and help grow sales.

For more experienced managers, Axalta offers five General Manager courses covering topics like recruiting, hiring, orienting/training, reinforcing processes, quality control and implementing teams.



AUTEL MAXISYS MS906TS

## PRE-SCAN & POST-SCAN

# COLLISION-REPAIR READY

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FROM TOOL - WIRELESSLY PRINT & EMAIL REPORTS TO SUBMIT FOR INSURANCE CARRIER APPROVAL

SCAN MORE VEHICLES - GET MORE PROFIT OUT OF EVERY ESTIMATE

### PRE-SCAN



TEST ALL MODULES IN ALL VEHICLE SYSTEMS



### Fast & Easy Reports

#### Step 1: AutoSCAN the Vehicle

- AutoVIN instantly identify all vehicle information
- AutoSCAN all available modules in all systems
- Single screen list all DTCs and code details

#### Step 2: Print Pre-SCAN Report

- Take vehicle pictures and attach to SCAN report
- Single button generates dated report file to submit
- Report is customized with shop and vehicle info
- Expedite insurer approved repair estimate
- Avoid additional insurance authorizations

#### Step 3: Repair Vehicle

CREATE EFFICIENT REPAIR PLAN FROM THE START



#### Step 4: AutoSCAN Repaired Vehicle

- Ensure no new faults were created during repair
- Confirm no DTCs are present at completion
- Ensure vehicle is repaired and safe for customer

#### Step 5: Print Post-SCAN Report

- Prove all DTCs on Pre-SCAN report are fixed
- Dated SCAN report to confirm project complete

### POST-SCAN



TEST ALL MODULES IN ALL VEHICLE SYSTEMS



#### CALIBRATION MODULE IDENTIFICATION

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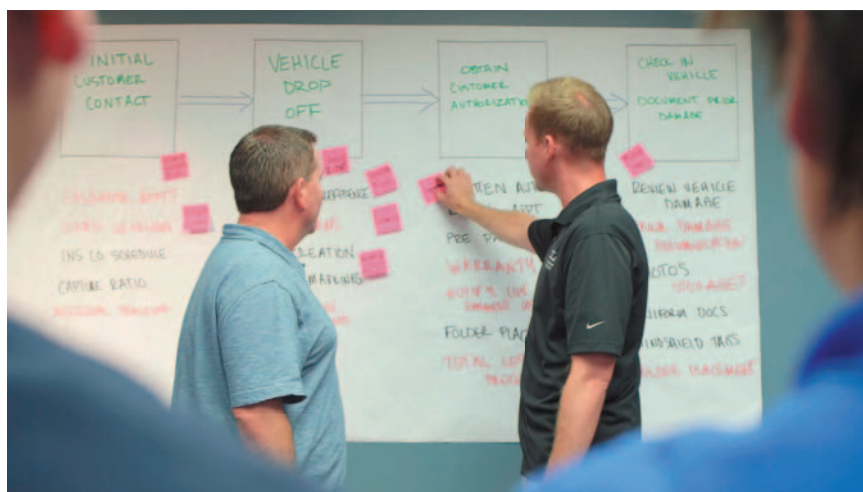
**AkzoNobel:** AkzoNobel offers nearly 20 classes that are applicable to management (though not all are available at any given time). Acoat Selected classes are considered an “in-the-can” service for users of Sikkens brand refinish products, so there is no fee to attend. The majority of classes are scheduled based on customer demand and conducted in a traditional classroom. “We’ve considered online or blended learning, but our customers seem to prefer the personal interaction that comes with traditional classroom learning,” says Rick Fifer, North America Business Services Manager.

Fifer recommends shops explore financial training courses since a number of managers “don’t understand the basic financials of a successful body shop.” He recommends courses like AkzoNobel’s Paint Material Management, which focuses on measuring and managing paint materials and paint material profitability. His company also offers a Financial Analysis class for a deeper exploration into overall body shop financials.

For more experienced managers and those wanting to better understand the financial and operational KPIs of their business, and to benchmark themselves against their peers, Fifer suggests joining either AkzoNobel’s Regional Performance Groups or one of several groups that meet at its North American Performance Group Conference.

“In addition to elevated financial and operational benchmarking, we always include presentations and training, from both AkzoNobel and external vendors, regarding management and leadership skills,” Fifer explains. “Recent topics have included negotiation skills, understanding and leading different personality styles, emotional intelligence and online marketing.”

**BASF:** With 11 courses in its VisionPLUS division ([www.refinish.basf.us/training/](http://www.refinish.basf.us/training/)), BASF trains managers in everything from Advanced Production Management and Paint Department Pro-



**MOST PAINT VENDORS PROVIDE** a full-range of instructor-led, interactive management training sessions.



**VENDOR TRAINING TENDS** to be conducted in formal classroom settings across the country, but more online lessons are being developed, some of which earn I-CAR credits.

ductivity to Marketing and Insurer Relations and Delivering Complete Customer Satisfaction. Craig Seelinger, VisionPLUS Program Manager, says BASF lets shops build whatever skillsets they require. “If you’re looking to add revenue, there’s Estimating for Profit and Measuring and Improving Performance,” says Seelinger. “If you want to open a new location, a course like Organizational Structure will help.”

Shops with questions on courses or needing help setting up a training program can turn to BASF business development managers for guidance.

BASF courses are formal, instructor-led and held across the country. Costs generally run from \$100-\$300 per student. All courses are I-CAR accredited (as are BASF Performance Groups, which Seelinger calls an industry first).

Seelinger says BASF partners with local distributors familiar with their customers’ needs to determine which courses to offer to best meet shop needs.

Seelinger also notes that BASF continually updates course content to ensure they’re as up-to-date as possible. “The same folks who facilitate our Performance Groups conduct our classes so they’re constantly upgrading our offerings with input from industry leaders,” says Seelinger. “The same course BASF offers one month will have changed when it’s offered again just several weeks later. There’s always something new to learn.”

**PPG:** Looking for a full suite of training options offered around the nation, along with videos available online? PPG’s MVP Business Solutions program ([www.ppgmvp.com](http://www.ppgmvp.com)) includes business courses

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on leadership, such as Have a Nice Conflict!, which explores developing more effective work relationships, and Leading Change, a two-day class that helps repairers assess and strengthen their leadership skills, while learning proven approaches to leading change throughout their organizations.

The MVP program additionally includes coursework on sales and marketing, financial management, operational production and shop administration. In that last category, shops can study job relations, instruction and methods to develop skills needed to make the most of employee talents to optimize business improvement.

PPG also hosts workshops and White and Green Belt training. Many courses allow students to earn I-CAR and Automotive Management Institute (AMI) credits.

**Sherwin-Williams Automotive Finishes:** Lee Rush, Business Consulting

Manager for Sherwin-Williams Automotive Finishes, says his company offers nine courses specifically designed for shop management: Achieving Service Excellence, The Road to Sales Success, Estimating Solutions for Profit, Compensation Solutions for Profit, Improving Performance with KPIs, Performance Management Leading for Results, Principles of 5S, Tactically Lean and the Lean Office.

All are offered in workshop formats, both regionally and by market, with online workshops currently in development. Courses typically run \$295 per student. For repairers looking to enter management, Rush recommends Performance Management Leading for Results, saying it provides “the tools to manage employee performance and behaviors on both the production floor and the office.”

“It is probably the most critical course we offer,” he adds. “The proven methods

featured in the course come from many industries over the last 50 years on how to manage performance in your employees. It isn’t just limited to collision.” He also suggests Tactically Lean, which provides learning tools to transform shops from a traditional repair model to a more progressive one.

Also available are a number of online workshops, including Improving Workshop Efficiency, Cycle Time Reduction, and Damage Analysis and Blueprinting. Rush says the courses are interactive, featuring video and include an option to track performances. “We believe these will be especially useful for onboarding,” he explains. “It will help operators bring new hires up to speed quickly on business processes and rules.”

For more experienced managers, he recommends Compensation Solutions for Profit. Rush notes compensation re-

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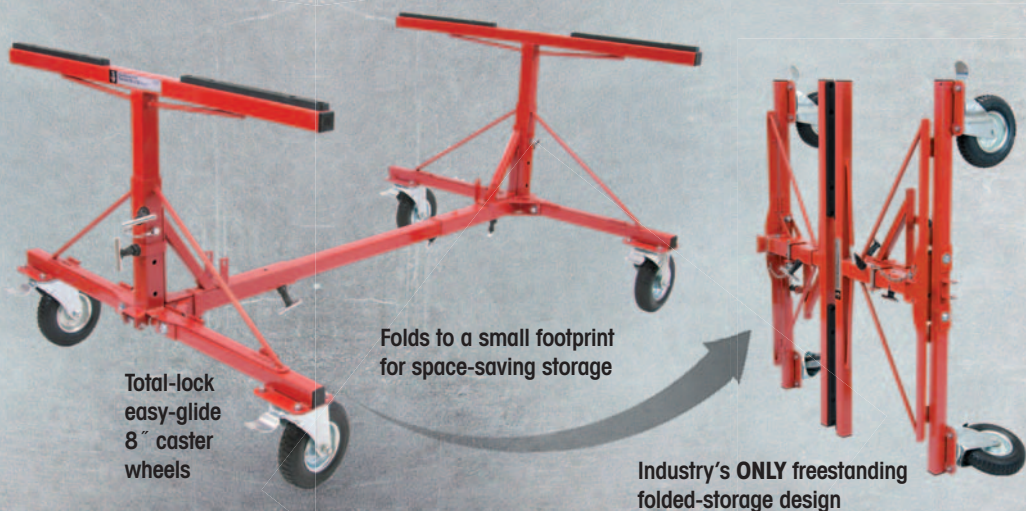


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mains one of the biggest hurdles for shops transitioning to a more progressive model, with many repairers still compensating employees the same way they did 20-30 years ago. In addition, he suggests Estimating Solutions for Profit to help managers stay on top of the latest vehicle technology while gaining a better grasp of estimates.

### Information providers

Both CCC and Mitchell provide classes on using their software. Mark Fincher, Vice President of Market Solutions for CCC, says his company focuses on online learning that can then function as a springboard for formal in-shop training.

"At the shop, we work with shops to develop best practices and show them how they can best apply our software for their processes," Fincher explains. From there, shops can ask for help from CCC's Elevate consultation services to further remake their operations.

What can a manager gain from this training? Fincher says managers need to be on top of estimating and other information services because of their effect on cycle times and multiple shop processes. Considering the hundreds of releases and other updates to repair information, every shop needs someone to manage this part of the business to ensure they're getting the most out of their investment in information services.



PHOTO: SHERWIN-WILLIAMS AUTOMOTIVE FINISHES

**VENDORS REPORT** that their management training has helped transform hundreds of shops that have been able to effectively put their lessons to work.

For example, CCC Direct recently introduced a checklist function to allow shops to create unique SOPs inside a set list of tasks for each repair to ensure every job is performed completely and correctly. "It's something a shop can rally around. But if you didn't know it was available, you couldn't benefit from it," says Fincher.

### Final thoughts: Added benefits

Plenty of successful shops, including large MSOs, don't go in for external management training. Odds are, though, the management training they already have in place offers much the same education they would gain elsewhere. Their success speaks for itself.

But so does the success of shops who go to their vendors for training. Axalta says hundreds of its customers have reported marked improvements, such as better closing ratios, higher net promoter scores, improved paint and material gross profit, reduced cycle times, improved booth throughput and improved overall profitability.

Seelinger points to recent post-course surveys that show 99.5 percent of BASF trainees reporting be able to put lessons to work at their shops and 100 percent recommending the training to others.

Fifer says management training has the power to transform shops into top-tier performers. "The most successful operators weren't born that way, and it didn't happen by accident," he declares. "They looked for opportunities to learn and develop their people. They realized the importance of knowing how to communicate, lead people, benchmark performance, motivate others, etc. We help them do all of this."

That's something to keep in mind as you work on your business and search for new ways to succeed. ■



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# GROW YOUR OWN TECHNICIANS

## Find a solution for the technician shortage

**JOHN BURKHAUSER //**

Contributing Editor

**T**he technician shortage is here and will be for some time. In this article, we are not going to look at the cause of this shortage. Instead, we are going to explore one opportunity to help solve the shortage for your shop, helping you get the technicians you need.

If you want to keep your bays full of good employees, you need to grow your own! What that means is to get involved

with local technical schools — either high school and/or post-secondary levels. Become part of a student program so that you not only can provide input on how it is structured, but you can also discover any talent that comes through and guide those individuals to a successful career at your shop.

I recently spoke with George Stahl, the automotive instructor at Eastern Center for Arts and Technology located in Willow Grove, Penn., to get some insight into the Automotive Technology program at the school. Stahl has been a part of the auto-

motive program at Eastern for nine years. Currently, he has 40 total students, with a waiting list of 22 students.

With a waiting list of students, I asked Stahl if he thought that it was the result of local schools pushing the program.

"I think it is more student-driven. The kids are passing the word that, if you like cars, you should apply to the class," Stahl stated. "I had 20 returning seniors, which is the highest amount in years," he added.

Checking with other local automotive programs, I found that they also have full rosters of students. It seems





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that Stahl isn't alone.

I asked Stahl about what certifications the students will graduate with:

"They will be prepared to take their ASE 1 through 8 certification tests and be prepped to take the [PA] state inspection and emissions licenses. However, most of the students are not 18 years old yet, so they can't take the certifications. We do run them through the state inspection manual, give them quizzes, and provide them with some training and questions for the emissions program also; so, we can test their knowledge of the subjects."

Stahl has found that the current generation of students has difficulty focusing and needs more hands-on time than book time, so he has adjusted his approach to take advantage of that, rather than fight it. Currently, he assigns tablets to his students for them to complete tasks. Having success with this method, Stahl has requested additional tablets for the school.

Stahl added that when students graduate from the program, they have basic knowledge of safety, tools and system functions. Proving the success of the program, Stahl has a 75 percent placement rate for students going to a post-secondary automotive education.

When asked if any local shops are reaching out to the program, Stahl said that the list was mostly dealerships. I had to ask

if there were any independents. He again replied yes, naming only a few when compared to the dealerships.

I asked Stahl what, if anything, he would ask for from the shops around him — independent and dealership.

"More programs for 17-year-old students — getting them in the shops to see what the business is like. Let them shadow techs to get experience," he answered.

Before I started with BOLT ON TECHNOLOGY, I also taught automotive technology in a post-secondary school. I can relate to what Stahl is sharing. I can also tell you that there are students who will make good techs if given a chance. With support from local shops, I feel that any program can, and will, produce more, better-trained, individuals to fill those empty bays.

I've found that taking the students on field trips to different shops, dealerships and independents really made an impression on the students. If I had a student or two who showed real promise, I'd tell them to bring their resumes. Pointing them out to the right people either got the students hired or helped build their confidence so that they would try harder in class. Of course, there were students who realized how dirty and dark a shop can be and reconsidered their decision to be a tech.

What I'm suggesting is not a quick solution to filling your bays with great technicians, but like most things in life, the more time you spend with it, the more you'll get from it. What makes this method unique is that it demands your time, and not your money. You'll get to "try before you buy" which, in and of itself, will save you time and money in the long run.

Across the country, there are hundreds of automotive technical schools, both high school and post-secondary level, that are National Automotive Technicians Education Foundation (NATEF) certified.

The NATEF website states that they have existed since 1983 with the mission to improve the quality level of education in automotive programs across the country. Schools that meet this certification must abide by the required standards set by NATEF. These standards affect every aspect of the school from equipment, student skill sets, instructor training and more. The school certification process is repeated every five years, maintaining the adherence and consistency with the required standards.

A NATEF certified school is where you want to start your search for new technicians. Once you locate a school, I recommend that you go and visit it to see what the program is like. I highly recommend that you reach out to the school before stopping by to avoid any possible issues. Just going and meeting the instructor and seeing what equipment the school has is a great start. This should help determine if this school is a good fit for you.

Some of these programs have top-of-the-line equipment, including the latest tire balancers, scan tools and alignment equipment. Having experience on this equipment will make



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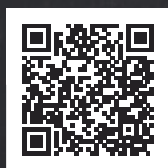


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the transition to tech even easier.

One of the requirements for a school to be NATEF certified is that they maintain an Advisory Committee consisting of individuals that include business owners, technicians, industry representatives, program graduates and more. This committee is responsible for watching over the program and making sure it teaches

everything students need to complete their training.

Sometimes referred to as an OAC (Occupational Advisory Committee), this committee is the perfect way to become part of a training program and see what exactly it is doing. As a committee person, you would have input regarding the direction of the program.

If you want to involve yourself more, volunteer to help at school events, such as an open house or help monitor some testing. Offer to open your shop for class trips. When the students arrive, watch them, challenge them, learn who they are and what they know. With this knowledge, you can make an informed decision of who you would like to give a chance to find success in the industry. You could be the one who helps the 17-year-

old student get the experience they need.

This will not fill your empty bays today. It is simply a way for you to fill empty bays for years to come. This is a win-win situation for all involved. You grow your own techs, molding them to your needs and you help the school deliver more tech-ready candidates by assuring that the automotive program is top notch and stays that way for years. 📧



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# IMPROVING YOUR EFFECTIVE LABOR RATE

Watch your billed labor categories to help maintain gross profit and stay competitive

**JOHN SHOEMAKER //**  
Contributing Editor

**M**anaging your effective labor rate is probably one of the best ways for a shop to increase its labor gross profit. The effective labor rate is calculated by dividing the dollar amount of labor sold by the number of hours charged for a repair. The most common labor rates in a collision repair facility are body, structure, frame, mechanical and paint. The goal is to have a higher effective labor rate than your posted door rate.

Let's use an example of an estimate that had ten body hours, four frame hours and twelve paint hours. For this example, body labor is billed at \$34, frame labor is billed at \$45 and paint labor is billed at \$34. Ten body hours calculates to \$340, four frame hours equal \$180 and twelve paint hours calculate to \$408. The total of those hours is \$928 with an effective labor rate of \$35.69.

To maximize your effective labor rate opportunities, you need to ensure that you utilize all the labor categories correctly. As I review estimates, I see body, frame and paint labor rates used most often but seldom see structural repairs



charged as a separate rate, and, most often, mechanical repairs are identified as body operations. Using the 26-hour repair example previously mentioned, let's identify the different labor operations required in the repair. The ten body hours are now four body, four structural and two mechanical. Adding labor rates for structure at \$40 and mechanical at \$75, we will recalculate the repair. The four body hours calculates to \$136, the four structural hours calculates to \$160, the two mechanical calculates to \$150, the frame remains at \$180 and paint

remains \$408. The total on this repair is now \$1,034, and when it's divided by the number of hours in the repair, the effective labor rate is \$39.77 — a \$4.08 increase in effective labor rate.

Adding a structural labor rate into the equation may be new to some of you. The question often is when to charge a structural labor rate and what to charge. The first part of this question is easy to answer by looking at the way vehicles are constructed. Any repair other than a replacement or repair of a bolt-on part should be considered a structural repair.



Reviewing Motor and Mitchell procedure pages indicates that most welded-on components are to be considered structural. Replacement of inner structures like upper frame rails, aprons, core supports and lower rails are some of the items identified as structural repairs. Calculation of the structural labor rate is similar to other rate calculations. Since structural repairs require a higher skill set than removing and repairing a bolt-on part as well as specific equipment, the rate should be based on the expense involved in training a structural technician and maintaining the equipment required. Inter-Industry Conference on Auto Collision Repair (I-CAR) clearly defines a difference between a non-structural and structural technician in their training profiles, and OEMs are requiring specific equipment in their structural repair processes.

Mechanical repairs follow the same theory. If it takes a mechanical skill set to complete a repair, then a mechanical labor rate should be charged. There is often an argument that repairs accomplished by someone hired as a body technician cannot be billed as mechanical. That might have been a good argument once upon a time, but in today's environment it really does not apply. There are collision centers that have trained their technicians through OEM programs that include specialized mechanical operations as well as enrolling technicians in dual roles within I-CAR and Automotive Service Excellence (ASE). As vehicles become more complex, there are many operations outside of panel replacement and structural repairs that fall into the mechanical category. Most estimating system platforms, while not inclusive, will identify common mechanical operations

with an "m" in the labor margin.

I encourage you to review the estimates you are writing and compare them to the skill sets and equipment you are using during the repair process to see how they line up. I believe you will find you are not being properly reimbursed for the investments you are making in training and equipment to repair today's complex automobiles. The only way you can maintain profitability in a repair environment that requires high technical skills and expensive equipment is through appropriate labor gross profit. 📡



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# Focus on overlooked procedures

Simple steps shops can take — in addition to training — to help estimators improve

In last month's column ("Technical training alone is not enough," April 2018), I wrote about the lack of recent training most estimators have received, and some of the consequences that has for those shops.

It was not a shameless plug for the estimating training I offer. There are plenty of options out there. Toyota University offers training to those with an affiliation with a Toyota/Lexus dealer. Mike Anderson of Collision Advice offers estimating training. I-CAR has courses helpful to those in the estimator role. Check with your paint company about estimating training they may offer.

But one key is the training needs to be RECENT. Vehicles continue to change dramatically. Good estimating training continues to evolve to help estimators meet these new challenges.

Owners, managers and estimators can also take steps to improve a shop's estimating aside from getting new training on a regular basis. One of the approaches I recommend is creating a charge-out guide for items that aren't in the estimating systems. That helps create consistency for an estimator — and across multiple estimators at a business — as to how things are charged on estimates and invoices.

I also challenge estimators to think about repair procedures that are being done regularly as part of a repair but are often left off of estimates. Start with the low-hanging fruit, the items that are the easiest to negotiate. If you're not getting paid to disconnect and reconnect the battery terminal, start with that. If you're not getting paid for removing and reinstalling wheels, start with all those wheels. Even if these items account for only one- or two-tenths of a labor hour, that's a lot of money over the course of a year.

Think about paint labor operations as well that are legitimate charges when they are performed. What about refinishing the backsides of panels or the trunk area? The refinish times in all three estimating platforms are for exterior panels only; those times do not include backsides. This step requires materials as well, so that's a double-whammy if you're not being compensated for it.



**CREATING A CHARGE-OUT GUIDE FOR ITEMS NOT IN THE ESTIMATING SYSTEMS CAN HELP CREATE CONSISTENCY FOR AN ESTIMATOR.**

Moving and set-back of wiring is another labor operation that often isn't charged out. Many estimators (and others not regularly working on vehicles) have little understanding of how fragile wiring is today. At a recent class I taught, no one realized that on late-model vehicles, even a minor kink in the wiring can send a resistance signal that sets a fault code. That's how smart and sensitive wiring is today, so estimators need to understand when movement of wiring will be necessary so they can bill accordingly.

One approach I suggest is choosing a few of these types of items to focus on for the coming two or three months, to get in the habit of including them on estimates when appropriate, and to gain experience negotiating for them successfully when necessary.

But many of these items aren't particularly new. The reason recent training is so critical for estimators is because vehicle electronics, computers, sensors, calibrations and scanning have become such a key component of estimating. In my recent estimating classes, I've been predicting that in the very near

future, 60 percent of collision repair will be related to these types of items. I was taken aback when a representative from Honda who attended one of these classes stood up and interrupted to say that 60 percent was exactly the number the collision group at the automaker had come up with in a recent meeting.

Shops can no longer expect technicians to keep up with all this without help from estimators. The estimator's role now includes doing the research necessary to get the OEM information technicians need. Proper calibrations, resets and road tests all are vital in order to restore a vehicle's crashworthiness, including functionality of all safety systems. The repair standard can't be based on just pre-accident appearance.

Shops need to give their estimators the tools — including recent training — to serve this critical and ever-changing job function. ■

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# Quality repairs or not: management decides

Set the bar high for your team and make sure they know it is a constant priority

In last month's column ("Quality control systems fail without enforcement," April 2018), I argued that quality control issues in this industry are more related to estimators and shop management than technicians. In that column, for example, I argued that most shops today have a quality control system in place; management just isn't ensuring that it's being followed.

I can point to shops that I've worked with where the owners or managers keep a close eye on how vehicles are being repaired. In those shops, it doesn't matter which body technician is assigned to any job; there's a pretty consistent product reaching the paint shop.

Technicians in those shops tell me that in previous shops where they've worked, one technician may be gluing everything, another one is welding, while another is MIG brazing everything — no matter what repair method is actually appropriate for a given job. In those shops, I can almost guarantee the estimators are inexperienced or poorly trained, or the management is focused only on certain numbers — CSI and gross profit, perhaps — and not on quality control.

I've tracked quality levels over time for both individuals and shops as a whole, and I can pretty much assure you what you will experience when you hire a new technician — or acquire a new shop of them. Initially, the quality will be fantastic. You'll be convinced it was a great hire or great acquisition.

But shortly thereafter, quality will drop a bit. Technicians will think, "I wonder if I can cut this small corner to save some time? I'll make more money, and I bet no one will probably notice."

That downward spiral, if not immediately halted, will only continue, until finally someone says, "Whoa, what is going on?" It's not until that moment that the technician (or team) knows the lowest acceptable quality level. They know that all they have to do is keep it one notch above that. That's become your quality standard. It's human nature, folks.

Conversely, if quality gets addressed as soon as it starts to



**IF QUALITY GETS ADDRESSED AS SOON AS IT STARTS TO DECLINE JUST A BIT, IT WILL REBOUND AND STAY MORE CONSISTENTLY HIGH OVER TIME.**

decline just a bit, it will rebound and stay more consistently high over time. That proves it's a management issue, not a technician issue. I can point to example after example of the same crew at the same shop having widely differing quality levels over time based solely on the current management at that shop.

At one shop I worked with, for example, I saw consistently good quality over time, but then a 60-90-day decline. I called the location manager and learned it was her last day there, that she had decided to leave the company. I asked her confidentially when she'd made that decision, and she said about two months ago.

The quality decline wasn't because of any change in the production staff. It was because the location manager had stopped making it a priority. A new manager came in, and the quality rebounded to its previous high level.

In a similar instance when I saw a decline in quality at one MSO shop location, I called and learned the manager, Frank, had been moved to another location. Comparing the graphs of quality over time at the two locations, I could pinpoint right when that personnel change had been made; without any change in the production team, the quality at the shop Frank left declined while the quality at the shop he moved to improved.

Twenty years ago, quality control was a technician issue. But the industry has, out of necessity, increasingly come to rely on estimators and managers who have never fixed a car and who are being told — explicitly or implicitly — what's important and what numbers they need to succeed. If one of those numbers isn't quality, what incentive do they have to focus on it?

I also believe most technicians and production teams can and want to do quality work. Owners and managers just need to set the bar for that — and consistently maintain it. ■

**MARK OLSON** is the founder of Vehicle Collision Experts, LLC (VECO Experts), a consulting firm that takes a holistic approach to working with shops on repair quality and business performance. [mark@vecoexperts.com](mailto:mark@vecoexperts.com)





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## Repairs take flight

Shop soars with successful approach to equipment, innovation and education

JAMES E. GUYETTE // Contributing Editor

**→** Airport Road Auto Body consistently takes flight with the latest in collision repair technologies and techniques. “We are a state-of-the-art facility, providing high quality workmanship,” says owner Tony Cavallaro, Sr.

Having recently relocated to a 34,000 sq-ft. structure that previously housed a manufacturing plant for industrial electrical products, “We built the shop with the recommendations and feedback of some of our employees so that they can work more efficiently and effectively. I also provide continuous training to our employees so that they are provided with the knowledge they need to stay up to date on vehicle repairs and the industry.”

Pointing out that “teamwork begins with a positive and healthy work environment,” the operation is kept clean and organized amid a mindset of constant innovation.

It is the only Connecticut body shop certified to conduct aluminum repairs on Cadillacs, and is one of just two shops in the state carrying OEM certifications from Tesla, Jaguar and Range Rover. Volkswagen and BMW authorizations have been obtained as well.

“It’s been worth it,” Tony Sr. remarks, reflecting on the steady investments in education and equipment that he has been pursuing since establishing the business in 1983.

Starting out at age 23 with a staff of four and a lot of ambition, “It was at this time I began to teach myself how to improve my management skills and how to become more efficient in this business. My wife Rita, who was my girlfriend at the time, was alongside me from day one, and together through trial and error we learned how to make this operation grow and prosper.”

Rita handles the bookkeeping and administrative tasks while son Tony Jr. assists with production as he prepares to eventually assume ownership.

“If he *ever* retires,” muses Tony Jr., noting his dad’s zeal is grounded with an enthusiastic approach to navigating the turbulence and challenges that come with the territory of running a thriving business.

In December, the Cavallaro clan moved into its new facility over on Locust Street in historic Hartford, the Nutmeg State’s capital city, also known as the “Insurance Capital of the World” for its prominent presence of insurer headquarters buildings that dominate the skyline.



### AIRPORT ROAD AUTO BODY

Hartford, Conn. // [www.airportroadautobody.com](http://www.airportroadautobody.com)

**Tony Cavallaro Sr.**  
Owner

**34,000**  
Total square footage of shops

**40**  
No. of customer vehicles per week

**1**  
No. of shops

**26**  
No. of bays

**Axalta**  
Paint supplier

**35**  
Years in business

**5 days**  
Average cycle time

**24**  
No. of employees

**\$5,000**  
Average repair order

At present, Airport Road Auto Body is rebranding itself as Airport Auto, with Tony Jr. explaining that the area’s residents experience little confusion over the new Locust Street address. “Our brand is strong and our customer base is 30-to-34-years deep,” he says. “We’re about a mile from the old location. The exit off the freeway is the same — it’s the Airport Road exit.”

When Tony Jr. joined the company in 2013, according to Tony Sr., “He brought with him new, fresher ideas and the drive needed to move forward towards growth. With that drive and determination, we have grown our business, and we felt we needed to expand.”

What people now find upon entering differs considerably from what one might expect to see at a collision repair facility.





"A lot of thought was put into making our lobby not look like a typical body shop, but more of a hotel reception area feel. We want all of our customers to feel welcome," says Tony Sr.

An industry-leading production array greets visitors venturing back to the shop floor. "This expansion has provided us with the ability to be more efficient and have the capability to handle higher volume. Built with layout and design in mind, our repair process flows through each department smoothly," he says.

Among the highlights is one of the largest installations of a REVO Accelerated Curing System paired with Global Finishing Solutions (GFS) equipment:

- Two 30-foot long Ultra XD down-draft paint booths
- Two Ultra XR dual-bay Closed-Top Open-Front (CTOF) booths that feature two side-load rail and dolly systems, along with a REVO Speed that can run on an integrated rail system through all four bays
- An Ultra XD Paint Mix Room
- A Rapid mobile system on wheels (MC2) that can be used throughout the shop

"GFS did a phenomenal job," Tony Sr. reports, providing engineering, design and technical support throughout the project.

The end result is a specialized, highly productive paint system designed to have A and B paint lines to increase the flow of vehicles and maximize production. It is coupled with integrated "fast

lane" capability in the middle prep areas that utilize state-of-the-art REVO Speed technology.

Troy Vollbrecht, a GFS automotive refinish territory manager, recounts numerous collaborative conference calls among the sales, distribution and engineering personnel, adding that the building's back wall had to be knocked out and an addition constructed to make room for the new paint department.

"Everyone involved worked together to finalize the shop drawings, make sure all the equipment was up to local codes and create custom engineering to ensure that the REVO Speed could travel seamlessly through all four of the CTOF's bays," says Vollbrecht.

GFS distributor Rob Mercier of Collision Center Design was especially instrumental in facilitating the installation. "Rob made many trips to the customer's site. He not only helped to develop the shop drawings, layouts and CAD drawings, but he dealt with any issues that cropped up," said Vollbrecht. "He worked with the customer and GFS to finalize the engineering and make any necessary adjustments."

After the installation was completed, Mercier and Joe Demaske, a technical advisor and trainer with GFS, conducted onsite REVO training sessions with the shop's staffers.

## Moving and growing

The Cavallaros are proud of what they've

accomplished and they endeavor to deliver transparency to patrons who may still be rattled and reeling from being in a crash. "When it comes to servicing customers, we make sure that we walk them through the auto body repair process from beginning to end, handling all aspects of the insurance claim," says Tony Sr.

The company has no Direct Repair Program (DRP) affiliations, nor does it want any. "We repair vehicles to OEM specifications," he declares, "not insurance company specifications."

That said, "Being in the business for so many years, we have maintained good working relationships with many insurance adjusters and companies, from which this relationship is built on trust in how we repair our vehicles and the quality service we provide. We also believe in providing the best in repairing our customers' vehicles by not using any aftermarket parts on any repairs: We restore all vehicles to pre-accident condition."

Honesty with everyone they deal with is a key component throughout the shop.

"I have always been very honest with our customers, and I instill that same honesty in our service writers and our employees. We have been in business for 35 years and this has been a priority for us," Tony Sr. says. "We strive to provide outstanding customer service. We believe in building good relationships with our customers and make them feel comfortable leaving their vehicles with us to repair."

He goes on to emphasize that “the best marketing tool we have is word of mouth. When our customers are satisfied, that is the all the marketing we need to keep business moving and growing.”

Yet Tony Sr. is quick to credit Lucy Cavallaro for what he and his family have achieved. “It was my mother who instilled the value in me that hard work pays off.”

His career in auto repair dates back

to a high school shop class and mentoring provided by the late Clary Rome. “It was then that I realized that I loved the satisfaction I received from taking a damaged vehicle and making it look new again. He encouraged me to continue with my training, and I got a job at a local body shop that I worked for part-time,” he recalls.

“It was during this time, at the age of 20, that I would fix cars in my parents’ garage for friends, neighbors and family. With the drive to succeed, I was able to purchase a small building on Airport Road with the help of family — and that is where this all began.”



#### 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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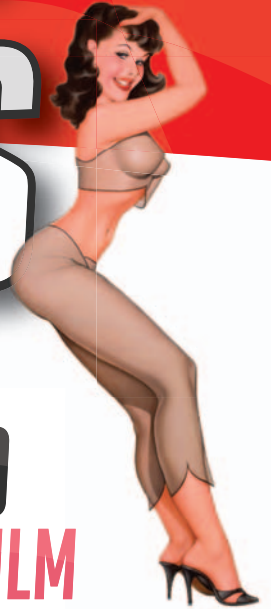
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# It is ALL about you, and that is not a selfish way to live

DO NOT DEFER BLAME AND RESPONSIBILITY FOR YOUR ACTIONS TO THE TEAM

**MIKE JONES** // Contributing Editor

**M**any of us grew up being taught that there is no “I” in team. The message is, “It’s not about you.” This teaching has created a lack of personal responsibility.

We are taught things in one context. That context has a positive or negative frame. There is a positive and a negative context to the lesson about there not being an “I” in team. If the context is an individual who is selfish, only looking out for her or himself at the expense of others, then clearly it is a negative context.

If the context of the “I” in team is an awareness that you, your choices, your attitude, your integrity matters, how much you give to the success of the team or relationship matters. It truly is all about you, because you will affect the team or relationship in a positive or negative way with everything that you do.

It could have taken one person in the repair of the 2010 Honda Fit incorrectly repaired by John Eagle Collision Center’s to step up and do the right thing for them to avoid paying a \$31.5 million lawsuit. That’s right — one person will need to accept personal responsibility to do the right thing. That one person would

need to focus on the right decision for the customer and not a business decision for the financial profit to the shop.

My son Jeremy got a new head football coach at his high school for his senior year. My son grew up learning there is an “I” in team and that lesson was all about teaching him to accept personal responsibility for his choices and the outcomes those choices produced. Many of his past coaches and team members at East Central High School had attended our training. One of the philosophical foundations of our programs is that there is an “I” in team.

One of the changes Coach Hartman, the new head football coach at East Central High School, made was to reintroduce the philosophical belief most of us in North America grew up learning, “There is no ‘I’ in team.” Coach Hartman put a different spin on how he taught this lesson by putting it in an acronym, INAM. Spelled out “It’s Not About Me”. The belief that this philosophy ascribes to is if I say it is about me, then I am being selfish.

There is no question Coach Hartman was taught this lesson as a boy in a negative context. As Hartman came up as an aspiring coach, this lesson was likely reinforced by other coaches who also learned this as boys.

Now, people who have this belief system absolutely have great intentions; however, they have not had the opportunity to conduct or study the homiletical research I have conducted while working with millions of high school students and business professionals over the past 30 years.

The unintended consequence is the proliferation of individuals who refuse to accept personal responsibility for their choices. The inability to accept personal responsibility has now become the norm and the blame game has become a way of life.

I believe that in our attempt to pass on what we have been taught about nobility, humbleness and selflessness, we have missed a few very important points. It is critical that we recognize the severity of our blindness, because it is creating an unintended negative consequence. I have observed many parents, teachers, coaches, managers and leaders struggle with why so many people will not accept personal responsibility for their choices. The truth is, we have taught them not to do so. We have taught them to abdicate personal responsibility for their actions, and quite frankly we have taught them to abdicate personal responsibility for their lives.

Hartman and others teach, “It’s Not About Me.” I completely disagree. I believe it is ALL about me. This is where it may become challenging for you to read on; however, compelling research that is indisputable is about to be shared.

I began challenging “There is no ‘I’ in

>> CONTINUES ON PAGE 38

## SUPPORTERS





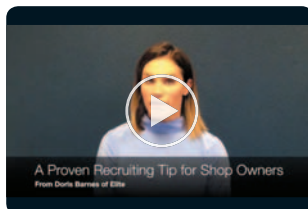


## WATCH + LEARN



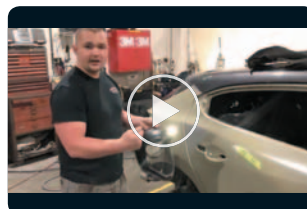
The hidden dangers of improper repairs

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



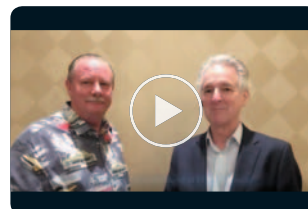
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## MECHANICAL MOMENT

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

### FORD ESCAPE RUNS ROUGH — AND NO DTCS ARE PRESENT

**VEHICLE:** 2012 Ford Escape, 4WD, V6-3.0L, Automatic Transmission

**MILEAGE:** 76,030

**PROBLEM:** This vehicle came in to the shop because the engine ran rough and there was a strange smell coming from the exhaust. The transmission was also shifting harshly into each gear.

**DETAILS:** The tech connected a scan tool to view the parameter identification (PID) data and found the battery power from the ignition switch (VPWR) at 0v.

Next, the tech checked for VPWR from fuse #23 at the PCM connector C175B, pin #21 and found there was battery voltage at the connector. He unplugged the connector and checked the pins for being bent or corroded. They were in good condition. He also tested all the power and grounds at the PCM. They were all good as well.

**CONFIRMED REPAIR:** Since the power and grounds to the PCM were in good condition, the tech installed and programmed a new PCM. With the new PCM in place, the rough running and harsh shifting problem was fixed.

*This tech tip and others come from ALLDATA Tech-Assist, a diagnostic hotline of ASE-Certified Master Technicians.*

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## TRAINING EVENTS

**MAY 7-9**

**Women's Industry Network Educational Conference**  
*Hyatt Regency Indianapolis*  
Indianapolis, Indiana

**MAY 16-18**

**Paint, Body and Equipment (PBES) Conference**  
*Fairmont Austin*  
Austin, Texas

**JUNE 11-13**

**IBIS 2018**  
*Hilton Munich Park Hotel*  
Munich, Germany

**AUGUST 7**

**SCRS Board of Directors meeting**  
*Georgia World Conference Center*  
Atlanta, Georgia

**AUGUST 7-8**

**Collision Industry Conference**  
*Georgia World Conference Center*  
Atlanta, Georgia

**AUGUST 8-10**

**NACE Automechanika 2018**  
*Georgia World Congress Center*  
Atlanta, Georgia

**OCTOBER 30**

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

**OCTOBER 30-NOVEMBER 2**

**SEMA 2018**  
*Las Vegas Convention Center*  
Las Vegas, Nevada



&gt;&gt; CONTINUES FROM PAGE 36

team” when I played high school football. I was far from being a selfish person; however, I recognized that every position has an individual “area of responsibility” and our success on every play would be the sum total of each individual accepting 100 percent personal responsibility to do his job. When we were all focused on the same singular positive outcome, and we did our job, the team succeeded.


Every time just one of us was unfocused, undisciplined or allowed our fears to dominate us, the entire team suffered a negative consequence. So you see, there is an “I” in team, and it is ALL about me, because every choice I make will positively or negatively affect my team, my

relationships, my business unit.

New York football Giants motto is “Do it for your brother,” and I absolutely agree with their motto with the understanding that you cannot give away something you do not have. If I do not possess self-confidence, drive, courage, empathy, generosity, selflessness, positive attitude, great work ethic, pride, personal responsibility, enthusiasm, self-motivation, integrity or commitment, I cannot give them to you. I can tell you about them. I can reference people in history that have demonstrated these gifts. I might even be able to share some modern-day examples of people who possess these gifts.

I am crystal clear that it is ALL about me. I am crystal clear there is an “I” in team.

When we accept that level of personal responsibility in our relationships and when performing the jobs we do every day, then the positive possibilities available in our relationships and on our professional teams have not yet been realized.

What will you do today to take your relationships to the next level? And when will you recognize that it is ALL about you? 



**MIKE JONES** is the founder and president of Discover Leadership Training, a next-level leadership development solutions company in Houston, Texas. He encourages others to create a better version of themselves by realizing their untapped potential.

[mikej@discoverleadership.com](mailto:mikej@discoverleadership.com)

## 4 interview tips to hire star techs

**BOB COOPER** // Contributing Editor

It's getting harder and harder to find the superstar techs, but finding those stars is just the beginning. Once found, you need to interview them like a seasoned pro. Here are some interviewing tips that we share with our Elite Coaching clients:


**No. 1. Impress the applicant with your professionalism.** When you are interviewing a real superstar, they will be interviewing you at the same time, so you need to really wow them. One way is by being well prepared, and ensuring you have a well-thought-out list of questions that you will ask. In compiling your list, ensure you ask questions about their goals, their interests, and what they feel the hallmarks of a good employer are. The more they realize that you are interested in them, their family, their success and their opinions, the more interest they will have in working with you.

**No. 2. The superstars look for opportunities, not jobs.** There is no question that the superstars can easily find

jobs. As a matter of fact, with rare exception they already have one and have little interest in moving from one to another. On the other hand, the superstars are always looking to advance their lives and careers. This is why you need to not only offer them an opportunity, but you will need to spell it out in very clear terms. Let them know that they'll not only have some wonderful growth and income opportunities, but they will be a part of a vibrant, growing company that will be good for the industry, and community, for years to come.

**No. 3. Have a key employee participate in your second or third interview.** This will allow you to obtain a number of insights from your employee, will send a powerful message to the applicant that you value the opinion of your employees, and will let the applicant know that you want to ensure they are a great fit; not only for the position, but as a part of your entire team.

**No. 4. At the conclusion of the second or third interview, ask if you**

**can meet with them again, along with any spouse (partner, better half, etc.) they may have.** By asking to meet the applicant's spouse you are sending a powerful message that you care about the family members of all of your employees. Not only will this meeting allow you to learn a lot more about the applicant (and their family), but you will have the opportunity to make a positive impact on someone that will have a strong influence on the applicant's decision. You should also have a package ready to provide them that contains general information on your compensation and incentive program, your Mission Statement, your team and your company's accomplishments. This way they will have something concrete to review at home, rather than trying to recall what they may remember from your conversations. If you do your job correctly, you can rest assured that on their drive home the spouse will more than likely be selling the applicant on two things: You, and the opportunity you are offering. 



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# UNDERSTANDING PLASTIC REPAIR WITH ADHESIVES

WHEN CONSIDERING OPTIONS FOR PLASTIC REPAIR, SHOP MANAGEMENT SHOULD CAREFULLY CONSIDER THE COST OF EQUIPMENT AND NECESSARY TRAINING BEFORE INVESTING IN THE NEXT 'COOL TOOL' FOR THE SHOP.

### DOUGLAS CRAIG //

Contributing Editor

**N**ow that the collision repair industry has moved past the stigma of repairing plastic automotive parts rather than just replacing them, adhesives provide an economical and uncomplicated solution for technicians to make successful repairs.

Each year, the collision repair industry is presented with thousands of plastic automotive parts that can be restored to original equipment manufacturer (OEM) standards — and done so simply and

often profitably — rather than being replaced after they have been damaged. New simplified procedures of using repair adhesives for plastic repair provide an alternative to more cumbersome procedures — both past and current — that require intensive training and sometimes costly equipment.

Repair adhesive products specifically formulated to be used on plastic for more than cosmetic repairs are offering straightforward solutions. For example, torn bumper tabs can be created with the plastic repair adhesive, enabling technicians to make a new tab, bond it to the assembly and continue

with the repair job. Emblems, headlamp modules, grilles, cladding, door trims, among other vehicle parts can also be restored

to “like-new” condition with repair adhesives when they are used properly, according to Kevin Creegan, Sales Manager for LORD Fusor Aftermarket Repair Adhesives in the U.S. and Canada for LORD Corporation.

Although it can be helpful, there is no need for the vehicle repair technician to



Kevin Creegan



identify the type of plastic material — i.e. determine if the plastic material is flexible, semi-flexible, rigid or semi-rigid — just that the part is plastic. (It is generally required to determine if you are working with an olefin plastic to determine if adhesion promoter/surface modifier is required). As long as the technician selects the appropriate repair adhesive, while also following proper OEM recommendations, almost any plastic part can be effectively repaired with a repair adhesive, Creegan explains. Conversely, he adds, identification of plastics required for repairs made with a plastic welding can be both confusing and time consuming. (See diagrams, “Composite and Plastic Repair Process Using Adhesives” (left) and “Composite and Plastic Repair Process Using Plastic Welder” (page 42).

“Repairing a damaged plastic car part is as simple as identifying the damaged part and choosing the right repair adhesive,” he says. “With the right adhesive product, you don’t need to understand the type of plastic with which you are working. This really simplifies the repair process and saves time involved searching for mold marks, or in the case of plastic ‘welding,’ conducting multiple rod adhesion tests to match the substrate.”

This is significant, especially as the use of plastic in vehicles continues to grow. Not only are automotive manufacturers staying focused on reducing vehicle weights — a.k.a. lightweighting — to comply with government regulations on fuel efficiency, but plastics and polymer composites continue to remain an integral part of vehicle safety and performance breakthroughs.

The 14.65 million light vehicles assembled in the United States and Canada in 2016, the latest available data, required nearly 4.9 billion pounds of plastics and polymer composites valued at \$5.7 billion, which is \$390 in every vehicle, according to the American Chemistry Council’s November 2017 report “Plastics and Polymer Composites in Light Vehicles.”

By 2020, the average car will incorporate close to 770 pounds of plastics, up from more than 400 pounds in 2014, predicts analyst IHS Chemical in the report, “Weight Reduction in Automotive Design & Manufacture.”

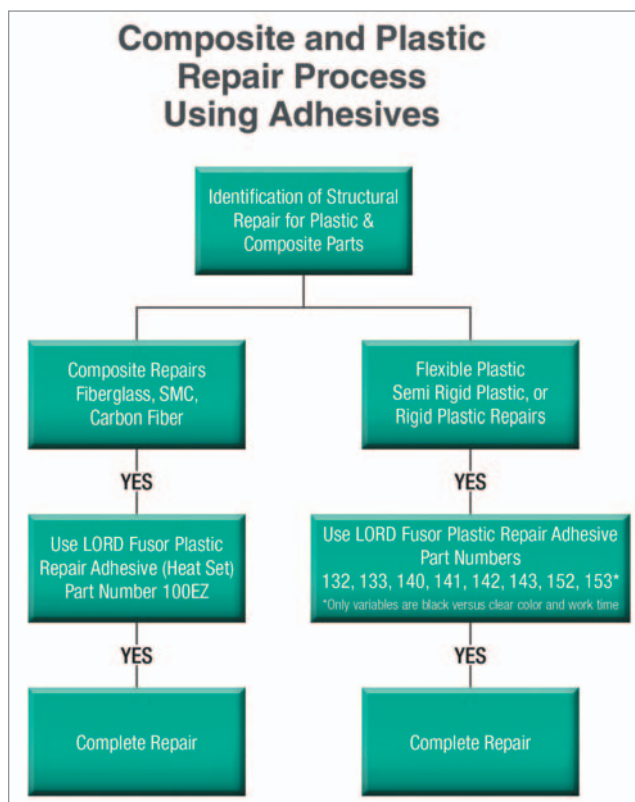
## Staying on top of training

Since plastic used in vehicle manufacturing is obviously here to stay, training is crucial regardless of the process used to repair it. Although it may seem obvious, it’s worth continually reiterating its importance as well as emphasizing that procedure- and product-specific training is a must.

“Any reservations about the use of plastic repair adhesives can be addressed with this phrase: Training and Standard Operating Procedures (SOPs),” Creegan states. “If technicians experience problems with using plastic repair adhesives, it is usually because a technician is not properly trained and is not using the product correctly.”



BUMPER CLEANING WITH FUSOR 703



Making plastic repairs with adhesives is relatively simple, but it is important to understand the product being used and to carefully follow instructions to guarantee the best results. “It’s more than just pumping in a product to glue parts together,” Creegan emphasizes. “If the repair procedure is done properly the first time, the repair will last for the life of the vehicle.”

Basic training is required to understand how to use adhesive plastic repair products, but body shop technicians can make repairs fairly quickly by following SOPs provided by the product’s supplier. At the same time, repairers need to ensure they are also adhering to OEM specifications. Skill and precision are also important points to remember when using ad-

hesive repair product.

When dealing with plastic parts, urethane chemistry represents the best choice because it is flexible, strong and sands to a feather edge. "This doesn't mean other adhesives such as acrylics and epoxies aren't strong, but urethane adheres better to plastics including fiberglass, Kevlar and carbon fiber," Creegan points out.

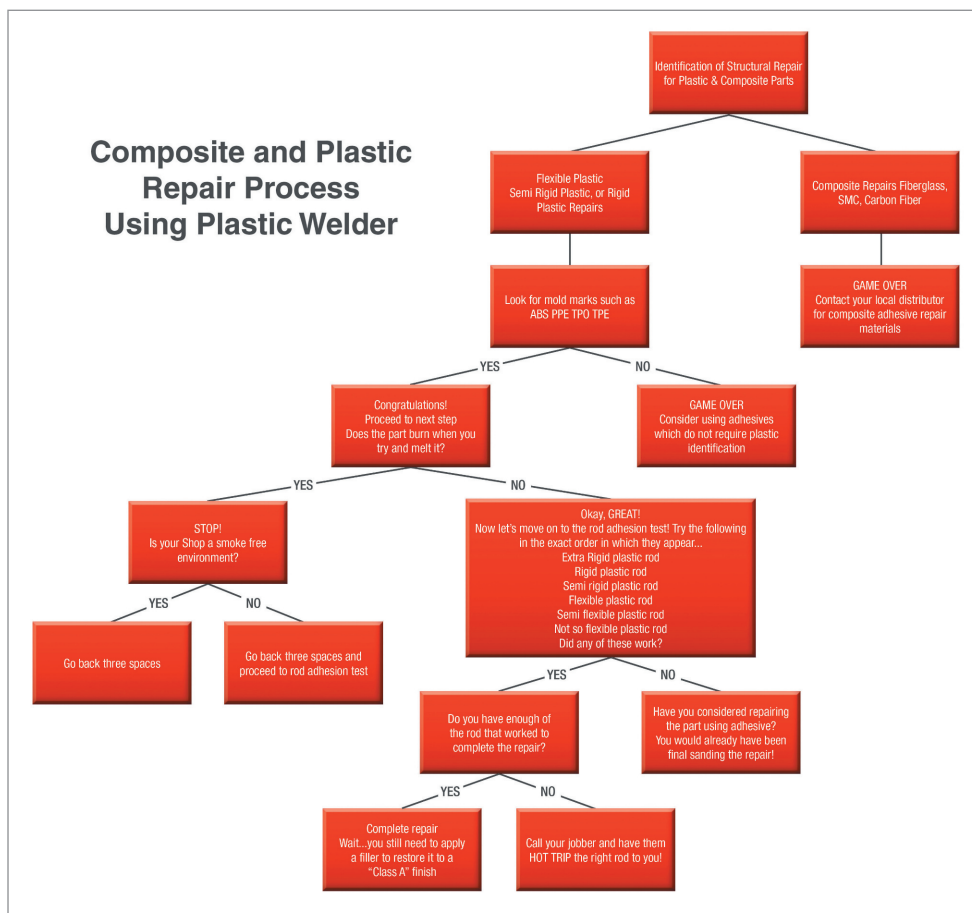
## Consider equipment costs

When considering a new process or technique for repairing plastic parts, all components involved in that solution should be considered. This includes taking equipment costs into account as well as examining the cost of consumables such as cost of adhesive, costs for nitrogen gas tanks and the high cost of replacing a membrane in a nitrogen "generator" contaminated by "dirty shop air." (Dirty shop air can also cause plastic repair failures, adhesive or welded.)

Plastic welders require regular maintenance and many types of rods to fix all the different types of plastic, which regularly need to be updated and restocked. It's also worth noting that welding is highly dependent on material compatibility; only like materials can be welded. "

Equipment costs of plastic welders vary by manufacturer, but high-end models with a lot of bells and whistles can exceed \$5,000 or more," said Creegan. "The same amount of money invested in adhesive repair products would provide for enough material to last five or six years and allow for hundreds and hundreds of repairs to be made. It's also worth noting that adhesives require no capital investment and can be ordered just in time or as needed from the shop's local paint distributor."

## Composite and Plastic Repair Process Using Plastic Welder



Polypropylene (PP), Thermoplastic Polyolefin (TPE) and Thermoplastic Elastomeric Olefin (TEO), the most common plastics used in vehicle construction, all vary in their characteristics as well as the temperature at which the plastic reaches a molten state for welding to occur. If the temperature is too cold during welding, the material will not adequately flow together. If it's too hot, it can cause material degradation. Most welding processes also require joint designs, which may be complex and difficult to mold. None of these concerns apply to repairs made with adhesives.

Circling back again to training, there is also necessary instruction that must be conducted on both the equipment and process for plastic welding. Training is very important for proper use of collision repair adhesives, but requires several fewer steps than a plastic repair

procedure that requires equipment such as a plastic welder.

"In the case of a major equipment purchase, you get a shop demo and an instructor will be brought in for a day of training," Creegan observes. "But where does the follow-up training come from? If a trained technician leaves a shop, who is responsible for training new technicians?"

To that end, it makes good business and economic sense to broaden shop offerings by using an adhesive solution for plastic repair. "Why not explore adhesive solutions offered by the local distributor instead of spending a few thousand dollars or more on a new piece of equipment that may end up eventually just collecting dust?" Creegan says, comparing the latest "shiny, new equipment" to a treadmill or other piece of equipment that ends up just collecting dust.





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**-Shane Lester**



*Shane Lester star of "Street Outlaws: New Orleans"  
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## Don't skimp on surface and application prep

One of the most important steps in the repair process is cleanliness. Technicians need to ensure the surfaces of the plastic parts to be repaired are thoroughly cleaned front and back using adhesion prep/cleaner specified by the adhesive manufacturer before starting the process.

"Cutting corners on proper surface preparation can cause the adhesive to fail. Cleaning can be done with prep/cleaner products specially formulated to remove all waxes, silicones, dirt, and road oils. Dust and debris can be removed with compressed air. (Dirty shop air can also cause plastic repair failures, adhesive or welded.)

Here are some tips to help collision repair technicians with proper surface prep:

- Thoroughly clean the surface, preferably first with a surfactant (soap) and water then followed up with a cleaner specifically designed to remove waxes, silicones and road "grease." Do not allow cleaners to soak into the plastic, especially composite panels such as SMC or other FRPs.
- Make sure that all surfaces are dry before proceeding to the next preparation step.
- Backing patch: A backing patch is needed if the damage penetrates through the part, such as a bumper cover.
- Sanding and abrasion: Abrade the surface and apply a surface modifier, if needed. Scuffing the substrate with a scratch-pad, sanding with a variety of grit ranges or grinding are all techniques that can create more surface area. An abraded surface typically has double or triple the surface area compared to the original flat, smooth surface but always be cautious to sand "slow" so the plastic does not "burn" or the bond will actually be weaker.
- Surface modifier or adhesion promoter: Use the recommended surface modifier or adhesion promoter before applying the adhesive. Surface modifiers

## AT A GLANCE: PROPER PREPARATION FOR PLASTIC REPAIRS WITH ADHESIVES

- **Surface preparation** – clean the front and back of the surface using the recommended cleaner
- **Backing patch** – a backing patch is required if the damage penetrates through the part, such as a bumper cover
- **Sanding** – for certain repairs use a sander or sandpaper to prepare the surface for proper adhesion

and adhesion promoters must be fully flashed or cured.

After completing thorough surface preparation of the part to be repaired, technicians need to make sure the adhesive itself is properly prepped. The ratio in a two-component adhesive cartridge is critical because it will otherwise be off ratio.

If the plungers are not leveled first, the mixture will be off ratio, likely resulting in a failure. You also need to purge a few inches of material from the mixer nozzle before beginning the application.

## Warranty considerations

When deciding which process or combination of processes to use for plastic repair, warranty issues need to be considered. Adhesive repair manufacturers have their own product warranties. A plastic welder manufacturer also may warrant their repairs against failure, but typically their process requires adhesive to prepare the repair for the next step – refinishing.

"This poses the question: 'Who will warranty the complete repair when the process is a combination plastic weld and adhesive use?'" Creegan asks. "Adhesive manufacturers (using LORD as an example) will typically warranty repairs made using their material and process for the life of the vehicle. Does the manufacturer of a plastic welder provide the same across the broad spectrum of adhesives that can be used to make the repair ready for refinish?"

## Removing the guesswork

The best way to really understand and learn how to use plastic repair products — in addition to training, of course — is to work with a reputable supplier/distributor.

Selecting an adhesive takes the guesswork out of plastic substrate identification and repair process decisions. There are products on the market that can be used on all plastic parts whether they are flexible, semi-rigid or rigid.

Having to use just one product for all types of plastics reduces the complexity of a repair and reduces inventory. Repair adhesives give technicians the advantage of making repairs from beginning to end, and they know the upfront cost from a consumable asset.

To learn more about plastic repair and to sign up for training, visit [www.fusor.com](http://www.fusor.com) and [www.i-car.com](http://www.i-car.com).

*Look for the continuation of this topic in an upcoming issue for an analysis of repair adhesives vs. other repair methods and what technicians need to know about using composite repair with adhesives.* 📖



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# WIRING QUALITY, PROFITS INTO A REPAIR

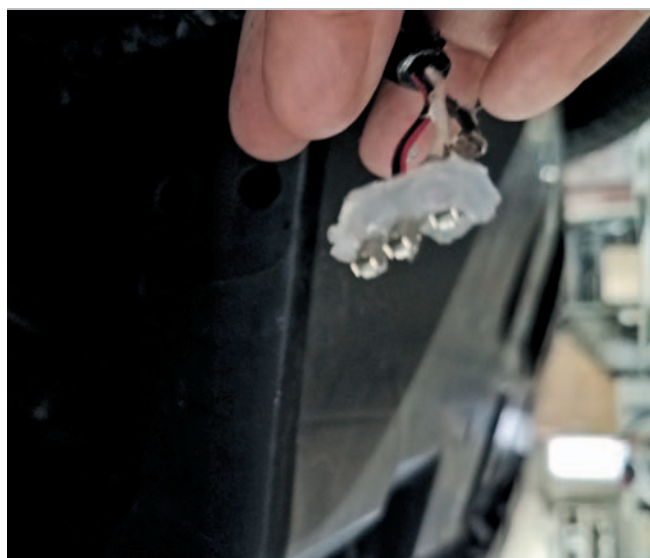
**TODAY'S ADVANCED VEHICLES NEED TO HAVE WIRING REPAIRS DONE PROPERLY**

**BOB HEIPP** // Contributing Editor

**H**aving worked in the automotive field for 30-plus years, I've seen a considerable amount of change. The biggest changes have come in the form of electronic advancement. When I started working on cars, there was nothing to protect connections from the elements. Today the majority of connectors have some form of protection from moisture. Those that don't are interior to the vehicle and are only subject to moisture from spills or leaks. I'd like to discuss proper wiring repair and connector replacement. To understand this better requires an understanding of what has gotten us to this point.

Why the big change? In the early days, large connectors and wires were used; this helped with current flow. When resistance increased and you had a voltage drop that caused half an amp of current loss in a headlight, the change in light output was not really noticeable. As electronic ignition and fuel injection came on, the need for more sensors and wires was established. As features were added to vehicles, wires, switches, relays and modules needed to be added to allow the features to function. At the same time cars were getting smaller, so space also became a concern. To combat the added weight from wires, vehicle emissions gave us communication networks. With these networks, modules could send and receive information and

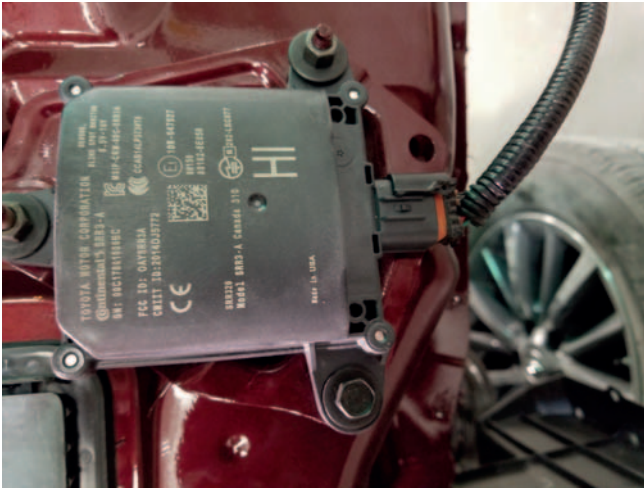
command signals between each other using a minimal amount of wire. As an example, a driver window switch may have needed multiple wires to operate relays and motors for windows; however, a door module could now have a single wire that split and went to all the other doors. Now each door module talking on a single wire network could send requests for the windows to be raised or lowered, the locks to be actuated or the mirrors adjusted. Today, we can have 30-plus electronic control units (ECUs) on a vehicle. All the computers talk to each other via some form of network such as controller area network (CAN), local interconnect network (LIN) or Ethernet. When you start your car, you push a button or turn a key. This action is a request



**A CONNECTOR REPAIRED WITH RTV** instead of using a new connector.

PHOTO: SHAUN O'NEIL - MOBILE AUTO SOLUTIONS





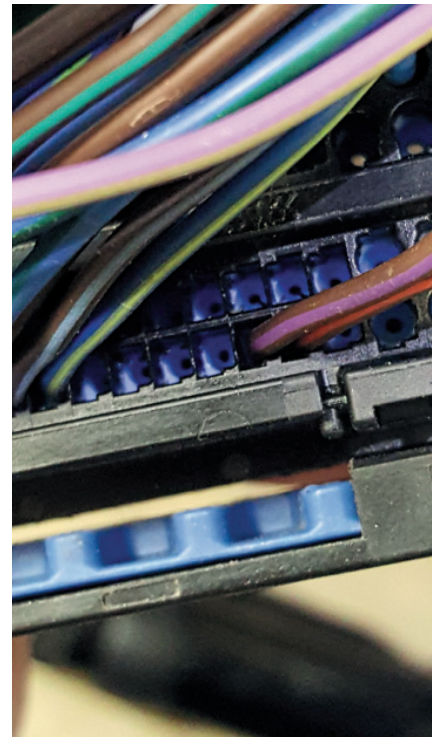
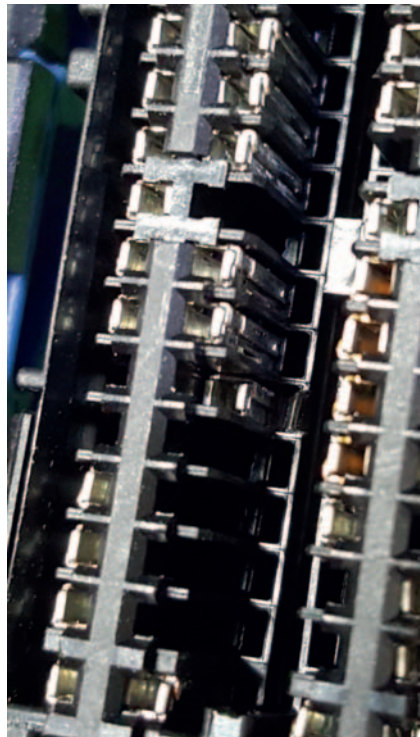
PHOTOS: KEVIN DIVITO - MOBILE AUTO SOLUTIONS

**A CONNECTOR A SHOP** was going to let go.

to a module. That module in turn looks at data to see if that request should be ignored or sent to the other modules. Seems fairly simple, right?

In reality, when you are driving down the road and a tire loses traction, for example, the antilock brake system (ABS) module talks to the powertrain control module (PCM), electronic power steering (EPS) and supplemental restraint system (SRS) to determine a course of action to keep the vehicle driving down the road and not spinning out. Now, I'd like you to think about what could be involved in an advanced driver assistance system (ADAS) event. To avoid steering out of a lane when someone is tired or texting, sensor data that is gathered by multiple computers is shared via network so that a decision can be made in a fraction of a second. Or, like in the commercials, a child runs into the street, and the vehicle stops before hitting them.

The reason for the quick lesson on the advancement of automotive technology brings us back to protecting connections from the elements. With space being a commodity, engineers have designed smaller modules. While the modules may have shrunk, the amount of electronics could have increased. This required the terminal size to shrink, adding new challenges to connector replacement or terminal repair. When a 5-volt supply is



PHOTOS: MIKE VAN WAZER - MOBILE AUTO SOLUTIONS

**THE TERMINAL IS NOT SEATED**, causing 5-volt reference to be missing from the CKP. Cavities of the same connector are left open to the elements.

used to operate sensors, resistance is extremely critical. Think back to that ADAS event; if the resistance changed for one or more sensors, the data to make decisions has changed. Proper repair of connectors or broken wires has never been more important than it is today. How repairs were made in the past is no longer acceptable.

What does an acceptable repair consist of? That depends on what is being re-

paired. Who makes the repair rules, and who is performing the repair? Who performs the wiring repairs in the shop you work at? What is their background? Are they a mechanical technician or a body technician? Do they have resources for performing the repairs? Efficiency and quality repair involve letting people do what they do best. Having a body man repair a connector for .2 hours and spend



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## IN THIS ISSUE

### COVER ALL BASES

Replace the E-CVVT Cover and motor plug subdues DTC and oil leak

### AGAINST THE WIND

Front door glass run channel replacement can eliminate noise

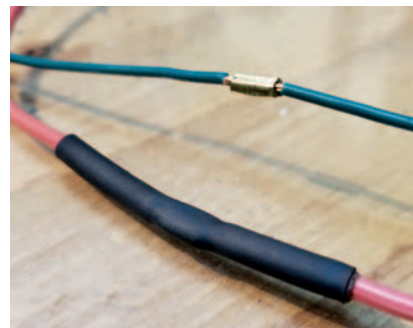
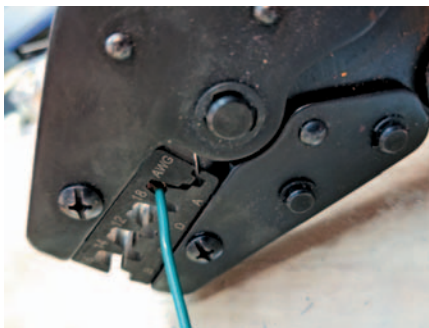
### QUESTION OF THE DAY

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TECHNICAL

ELECTRICAL



PHOTOS: PAUL SUITOR - MOBILE DIAGNOSTICS

**THIS IS AN EXAMPLE OF THE CRIMPER,** crimp and finished splice FCA suggests.

30 minutes is not good business. That means the shop has the choice of having an in-house mechanical tech or subletting the mechanical repairs. How does the tech or shop keep up on technology and repair procedures? Do they attend regular classes or read trade magazines? How do they verify the information they are receiving is correct? Do they have access to OEM service information?

I was recently at a shop to perform a diagnosis; the in-house mechanical tech replaced a connector. The seals had not been properly crimped so that when the terminals were installed, the seal did not stay seated in the housing. That repair is going to cost someone down the line. The other thing I noticed is that the splices that had been made looked to have been soldered and taped. I see many splice repairs performed this way. While solder has been considered the proper way to make a splice, just taping the repair is not a quality finish. The repaired splice needs to also be protected from the elements. This requires using heat-shrink tubing. Not just any heat shrink will do. To seal the repair from the weather, adhesive lined tubing should be used.

Another piece of the puzzle is when not to repair. Does the shop or tech have the information or knowledge to know when not to make a repair? I've been to many a shop that has made repairs to SRS harnesses that should never have been made. I've also seen outside vendors that specialize in wiring repairs who perform connector replacement

or splices on harnesses where the OEM states the harness should be replaced. Most of the time I hear the shop say that it's because the insurance company makes them perform the repair or denies a harness replacement. The OEM has the final say as to how repairs are to be performed. Everyone is learning and becoming more aware of this after the John Eagle lawsuit in Texas. Having access to OEM repair procedures in the form of a subscription or a vendor that provides repairs is the most reliable way to know what can or can't be repaired.

In the litigious society we are living in, shops need to be guarded. This means eliminating liability to every possible extent. Start by finding a company that can service your wiring needs in a timely fashion. Providing quality photos and descriptions to the vendor will help speed up the process. Get a company that can source and install the proper connector. Make splices that are weather sealed. Read service information to determine that the terminals are in the correct location. With the right relationships, a shop's wiring repair needs can result in better cycle time, higher profits and less chance of the repair returning down the road. 📶



**BOB HEIPP** is the Chicago Area Technician Manager for Mobile Auto Service, which services nearly 1,295 shops in Illinois, Indiana, Michigan and Wisconsin. He is

also an industry trainer and contributor to the Remarkable Results podcast.

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# REAR IMPACT OR RODENT?

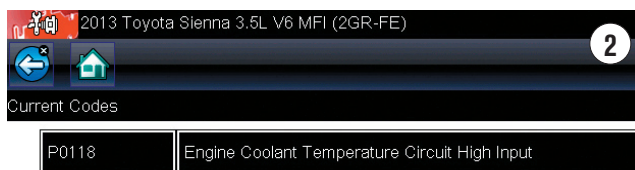
## UNCOVERING THE TRUE FOUR-LEGGED CAUSE BEHIND AN ENGINE PROBLEM

JOHN ANELLO // Contributing Editor

I was called to a body shop with a hard start and CEL lamp illumination on a 2013 Toyota Sienna with a 3.5 Liter engine (Figure 1) that was recently involved in a rear-end collision. The vehicle had been in the shop for quite a while due to extensive repairs. The car was finally finished but it was hard for the shop to know for sure if this issue was caused by the impact or whether it was a preexisting problem. It is not uncommon for a vehicle to be involved in an accident and have multiple post-repair problems that may be unrelated to a claim. It is up to the shop and the insurance company to have a discussion with the vehicle owner to see who is actually liable for problems that may seem unrelated.

It is so important prior to working on a vehicle to take many pictures of the vehicle damage to build a case for a claim. What is also important, if the vehicle runs, is to take a picture of any warning lights on the dash. These indicator lights will usually illuminate if there are any underlying problems that you may not be able to see. It is also a good idea to perform a full vehicle scan using a scan tool to get a better evaluation of unforeseen issues with a vehicle. Most of the scan tools out there today can actually print out a report that you can place in a folder, which can help build your claim.

Keep in mind that there may be error codes stored on that report that could have been set prior to the accident and may not be related to the claim. It is up to a good body technician who has some scan tool experience to evaluate each and every code to see which ones hold value and if they are related. There are usually present or past codes stored in a vehicle. The past codes could have been in memory for quite a while and even before the accident took place. The present codes are the ones you need to address. These are the codes that will keep warning lights on and will only come back once they are cleared, so they need to be addressed in order to complete the vehicle for delivery back to the owner. Remember that it's all about



customer satisfaction and shop ratings.

I proceeded to hook up my scan tool and performed a vehicle scan. There was only one code stored in the engine computer, but there were no codes stored in any of the other controllers. This was because the shop tried to clear all vehicle codes by disconnecting the vehicle battery cables. This is usually not a good practice; if you disconnect a battery rather than clear the entire vehicle with a proper scan tool, you will run the chance of losing vehicle-learned procedures of many system components on board. This could include learned calibrations for Steering Angle Sensor Positioning, Occupant Seat Weight, Headlight Positioning, Camera Positioning, Power Window Pinch Limits and much more.

When I cleared the engine controller, the Check Engine light kept returning with a present code P0118 for a coolant sensor circuit high input (Figure 2). The coolant sensor was a two-wire

sensor screwed into the engine coolant passage that was feeding a 5 Volt reference and a ground reference. The sensor itself was a negative coefficient thermistor whose resistance lowers as engine temperature rises. This code indicated either an open circuit in either of the feed wires or a bad coolant sensor with abnormally high resistance.

At this point it was easy enough to go into the scanner data PIDs to verify the fault by looking at the coolant sensor reading. Keep in mind that in OBDII factory-enhanced mode, some manufacturers may mislead you by putting a substitute value in the data stream to run the vehicle in a failsafe mode, but that was not the case here. When viewing the coolant sensor PID you could see the -40 degree reading indicating a definite open coolant sensor circuit (Figure 3). Now it was time to go do some visual inspections that included poking and probing within the engine compartment.

It was hard to believe that the shop was at fault, because the problem was engine-compartment related and the vehicle was hit in the rear, but at this point the garage needed to get to the bottom of this dilemma and worry about who was going to pay later. While looking in the engine compartment everything seemed intact, but I had yet to dig deeper (Figure 4). As I removed the engine cover to gain access to the coolant sensor, I was taken aback by what I discovered. There were bits and pieces of blue plastic lying all over the top of the engine (Figure 5).

The body shop worker who was near me starting laughing at my findings and told me that the blue plastic was material

from the shop that was used to wrap their cars during paint prep. This was signs of a rodent at work, and it was time for me to grab some gloves to protect my hands from the unknown. Keep in mind that rodents and rodent feces can be dangerous to human health, and I wasn't going to be taken down by rodent intrusion. As I dug even deeper and removed the plastic particles, I discovered that this rodent had severed both wires of the coolant sensor and this was the cause of the hard start and check engine light (Figure 6). With the wires severed, the sensor wiring falsified a coolant temp reading of -40 degrees and created a hard-start condition because the engine computer was over-fueling the engine and fouling the spark plugs with excessive fuel. This problem was no longer the vehicle owner's problem. It was now in the lap of the shop owner who has a rodent problem.

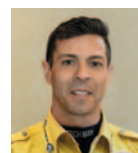
What has always amazed me in this business is that you can never predict the outcome of a problem with a vehicle. There are so many variables that play a role, and I have seen many rodent issues in my career where mice or squirrels would climb into warm engine compartments during the cold months. They would even stockpile food or use whatever is available to build a nice nesting spot. What I don't understand is the chewing of wires. I'm am sure that by chewing on the wires it helps them to sharpen their teeth, but what draws them to the wires in the first place is a mystery. There are many theories out there as to why mice do this and some include the fact that certain manufacturers have moved to soy-based wire coatings or manufacturers may use peanut oil as a releasing agent when the insulation gets applied to the

copper stranding. The mouse is the only one who knows the definite answer for this one.

Cars that sit for a long period of time for repairs or simply for storage purposes are prone to exposure to rodent intrusion. You have to make sure that you



check your garage and the vehicles for food lying around that may draw them into your building or into a vehicle. You also need to be careful when storing the vehicles outside, especially near wooded areas. It's a good idea to put moth balls, cedar wood or even peppermint oil in the vehicle to ward them off. The other method would be to keep some pet cats around and put them on payroll. I'm just hoping that this story has hit home with you and that the next time you encounter an unexplained problem, you keep an open mind before you start pointing fingers in the wrong direction. 🐭



**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)

Engine Data 1 - Engine Speed(RPM)		102
Engine Speed(RPM)		3
Calculate Load(%)		0.0
Vehicle Load(%)		0.0
MAF(gm/s)		0.37
Atmosphere Pressure (psi)		14.6
COOLANT TEMP (°F)		-40
INTAKE AIR (°F)		50





# NECESSARY INTEGRATION

**ESTIMATOR JUSTIN WEBER** reviews the repair procedures with technician Kristopher Barker. The two have mapped the vehicle and are discussing exactly how the work will be performed.

## HOW TO BUILD OEM REPAIR INFORMATION INTO THE ESTIMATING AND REPAIR PROCESS

**SEAN GUTHRIE** // Contributing Editor

**H**ave you ever tried to build a puzzle without looking at the picture to see what it is supposed to look like? It's a simple project with a simple set of instructions: "You must insert correctly-sized pieces into their corresponding location." Such a simple process and yet we all look at the "manual" to see what we are supposed to assemble. Even after

building the same puzzle multiple times, you still utilize the box lid to assist in the assembly process. We should treat every vehicle repair exactly the same.

Most vehicles have repair procedures, or manuals, for safe and proper repair. These manuals have been designed to ensure that once performed, a vehicle — if wrecked again — will wreck as well as it did the first time. These manuals, which are so much more important than the box lid of a puzzle,

don't come with the vehicle. They don't even come with the parts to the puzzle. They must be researched to obtain.

Vehicle manufacturers build cars with unique characteristics. One make will not be the same as another make, which is obvious, but even from one model of the same make to another model, they can be built differently. Manufacturers change models and their production methods regularly. Some manufacturers even change the production methods

during the same model run. This means a vehicle can look exactly the same as a year prior and yet contain completely different metals, attachment methods and have completely different collision characteristics. Therefore, different repair processes for each make, each model and each year are required. Many times, a repair method will evolve on the exact same vehicle; for example, a repair process on one model changed four times in just a year's time!

Why is it so important to perform an operation as the OEM has designed? By now everyone has heard of the accident and subsequent judgement that happened in Texas. This was a glaring diversion from the OEM repair procedures, but even a small deviation can have huge implications. Fixing vehicles how they were fixed even a few short years ago can cause massive degradation to the crashworthiness of a vehicle, resulting in increased likelihood of injury or death. A quick Google search of "crash test on incorrectly repaired vehicle" will show you many videos on crash test comparisons from grossly incorrect repairs to repairs that seem perfectly logical, all showing eye-opening results.

Why is it so important now, more than ever?

Construction of vehicles has changed substantially over the past few years. Cars have to be both lighter and safer. The increase in features has increased the weight, yet the mandate for better fuel mileage from the government requires a lighter car. Simply making a car lighter could create issues with safety. Safety requirements have increased as well as the demand from consumers for safer cars. This has created a need for new car design strategies, new materials and radical changes to how vehicles are built.

A typical vehicle will now have over five different substrates of steel, not including vehicles that are a mix of materials like aluminum, magnesium, carbon fiber and steel. They have different

strengths, different thicknesses, all designed to serve a different purpose. The high-strength steels (HSS, UHSS, HSLA, AHSS, etc.) all will be altered when heat is applied to them. Those metals are also stronger than the standard MIG welding wire. This means that any weld, spot or seam, performed with a MIG steel welder WILL affect the strength of those metals. This has created the need for specific replacement or sectioning locations and for the use of brazing, squeeze type resistance spot welding, riveting and bonding.

Consumers have demanded advanced driver systems, advanced comfort features; therefore, the computer systems and sensors have exponentially grown. Modern vehicles have an electrical system that looks like a human's central nervous system. More than ten computer modules, miles of wiring, countless sensors, tens of millions of lines of computer code, all of which are integrated into every piece of a vehicle. Simply disconnecting a battery or unplugging a window switch may require reprogramming, calibrating or codes to be cleared. A simple alignment will now affect a vast array of electrical systems, far outweighing the four wheels that are being aligned. There are arguably no repairs that can be performed on a modern car that do not, in some way, affect the electrical system of the vehicle.

No matter if it's structural pieces, cosmetic parts or electrical components, you must know the proper way to handle each situation. What and how are the correct ways to perform the respective repair? What items can be re-used, which parts have to be replaced and are there additional operations required outside of the immediately obvious? What, then, is the best way to discover the full repair manual, when should you make the dis-



#### ESTIMATOR JUSTIN WEBER WRITES THE ESTIMATE

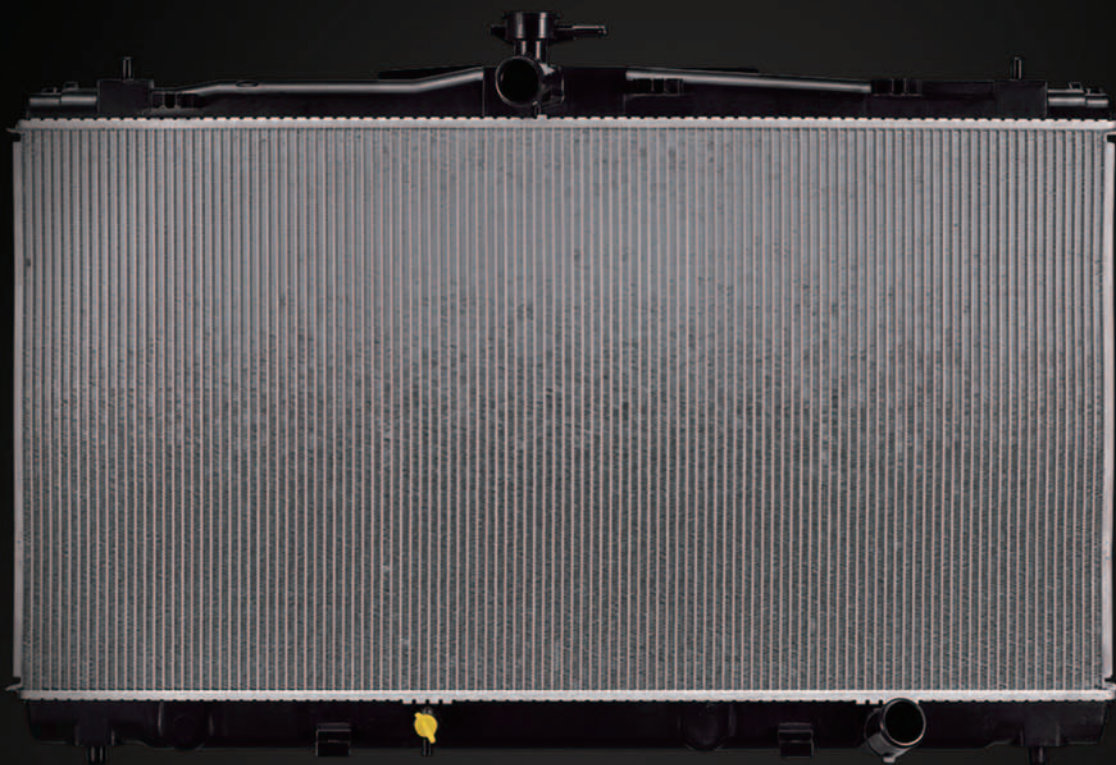
on a Dodge truck with the repair procedures close by. Utilizing repair procedures is essential to ensuring the estimate includes all that is necessary to perform proper repairs.

covery and how do you implement that into your shop?

The first step to a proper repair is a proper estimate. A repair cannot be performed correctly if the components needed to perform the repair are not received. A step further is nobody wants to perform steps that aren't being properly compensated. Lastly, no one has the ability to know what they don't know. If the only way to fix a car properly is to have the parts required, be fairly compensated and know exactly how the work is to be performed, this means we must research the repairs before and during the estimating process.

Obtaining repair procedures can be done multiple ways. All OEMs, short of two, (owned by the same company) have their own website with their full line of procedures. Some of these sites require a daily, monthly or yearly fee, while others are free. There are also independent companies who compile the OEMs' data. Those sites are much easier to use, but can contain outdated material. The OEMs don't push their data out to these companies; instead, it must be retrieved. The best place to start for OEM data is OEMonestop.com. It's a webpage that links to all the manufacturer sites. The outside sources are RTS.ICar.com, ALLDATA, Mitchell and CCC. CCC and





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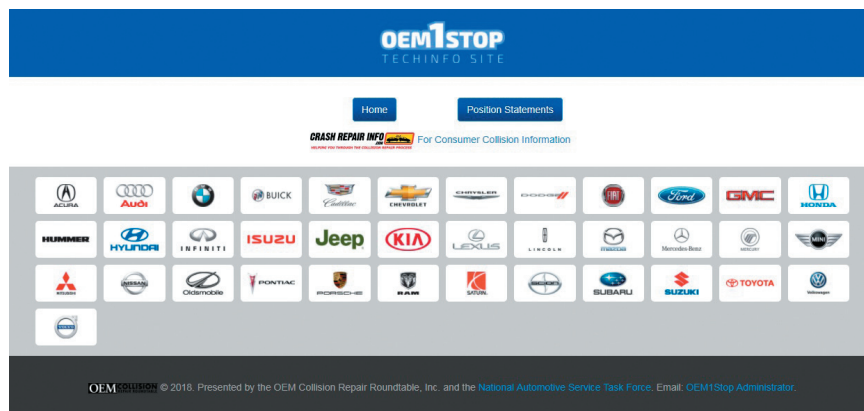


Mitchell are both working on integrated solutions that, when finished, could revolutionize the future of collision repair estimating. ALLDATA also has a great integration piece.

No matter how the data is retrieved, it's important that you research everything you are doing to every car. The obvious items are welded-on parts, SRS components and mechanical items. The scary items are those that you wouldn't think to research — such as the interior pieces that once removed must be replaced or the airbags may not deploy as intended. A component as simple as a mirror, once disconnected, requires a multitude of processes performed. Some painted parts can only be painted once or it will affect the sensors behind it. There is no way to know what you don't know. There is no way to know what is required on each make, each year, each model and at each trim level without research.

When a vehicle is brought in for repairs, the first decision has to be if the damaged components can be repaired or must be replaced. If the components appear repairable, then a few questions have to be asked: Does the manufacturer allow this component to be repaired? By repairing this component, will I jeopardize the integrity of the vehicle? Will the repairs create a cosmetic problem? Is it cost effective to repair? If the answer to each of those questions is yes, then you can move on to what other parts must be removed to perform the repairs. If the answer to any of those questions is no, then the component must be replaced. The next step is to go to the repair methods. Look up each part starting with the replacement items, moving to the remove-and-install items and ultimately the refinish items. As you look at each, it may increase the number of items that must be removed, components to be replaced, or calibration/programming required.

Armed with the repair procedure for each item being worked on, a complete



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estimate can be written. The estimate should include the necessary materials, hardware and labor to perform every required step on the repair procedures. If the procedure calls for a specific bonding adhesive, then that adhesive must be on the estimate. If the repairs need rivets, one-time-use fasteners, etc. they have to be on the estimate. I-CAR, along with most manufacturers, requires a test weld process on any welded-on part. This process is not included in the replacement or repair of any components and therefore should also be included on the estimate.

The estimate should mirror the repair procedures, and the estimator should know everything he didn't know before he started the process. Now a manual for the repairs has been produced. The first step to building the puzzle has been completed. Now the person who is going to build the puzzle needs the "manual," and they must understand the "manual."

When all parts arrive and the job is assigned, it is imperative that the work order AND the repair procedures are given to each technician. The technicians must read that manual and understand it completely. They need to understand each step they are to perform. There may be a language barrier, as unfortunately repair procedures are not being written in multiple languages, yet. This may require the estimator or

manager to review the procedures and work order with the technicians. Reading through the documents with the technicians is a good idea to ensure that everyone understands what is expected and what will be accepted.

Once the technicians know what is required to bring the vehicle to pre-loss condition based on the manufacturer, only then can work commence. Throughout the repair process it is imperative that the repairs are verified to be correct. This verification must come from individuals who have read and understand the repair procedures. Trust but verify is the key to ensuring a mistake isn't made. Not following the repair manual could end in the vehicle not performing correctly in another accident. If the vehicle doesn't perform as designed, increased chance of injury or death could occur. The result of the vehicle not performing correctly can then become a financial burden on the shop and result in criminal charges against the technician who performed the repairs. 📧



**SEAN GUTHRIE** is the director of operations for Car Crafters Collision Centers in Albuquerque, NM. Sean oversees the seven locations handling their

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# ENVISIONING THE FUTURE SHOP

## IMPLEMENT LINEAR REMANUFACTURING TO IMPROVE PROFITABILITY

LEE RUSH // Contributing Editor

**A** new standard for how collision shops operate is quickly taking over the industry. For a number of highly performing larger shops, it's already here. It's a new standard dictated by market demands, insurance company requirements and — most importantly — evolving consumer expectations.

Consumers today are increasingly used to personalized experiences in which they get what they want, when they want it. That means a customer walking into a collision center is expecting a consumer-focused experience, not a collision-centered experience. This expectation is tricky within the collision industry, but it's one we must contend with.

Within this context, let's take a look at what the future shop looks like and how it operates.

### The front office experience

Facility design is a critical component of customer experience. The actual analysis of a damaged vehicle is performed on the production floor, not in the front office. That means front offices should be designed to function as a sales and service center with the same feel that a consumer is used to elsewhere in their life.

Instead of comparing the experience of walking into a collision shop to other collision shops, compare the experience



**THE FUTURE SHOP TECHNICIAN** who disassembles and analyzes damage hands the vehicle off to the frame and unibody technician, who completes repairs for structural components, then hands the vehicle off to a metal tech for the next repair step.

to walking into spaces designed to immediately help visitors feel at ease, such as the relaxing setting of a doctor's office or the atmosphere of a bank. The reality is that this is how consumers today judge the first impression of a shop. They most likely have not visited other collision centers, and most likely will not be shopping around to other collision centers.

Customers of the future shop walk into a beautiful, thoughtfully designed showroom. The facility doesn't look like a stereotypical body shop. It's modern, open and organized — free from stacks of paper and clutter. They've set their appointment up online in advance and submitted digital images of their damaged vehicle. They

are greeted warmly by a service representative ready with a tablet — not a clipboard — loaded with their information. The representative immediately begins to set expectations by effectively and transparently initiating the process of sharing information and obtaining authorizations. The customer is transitioned to a rental vehicle and sent on their way with none of the discomfort of sitting and waiting for an estimate and every assurance that they are in good hands.

### Damage analysis

In production, the shop of the future fully embraces the 5S lean principles of organizing for maximum productivity. These

principles provide the foundation for a repair cycle built to exceed customer expectation.

The first step of the repair process is damage analysis and blueprinting. It's a deliberate process to determine all the needs of the vehicle through complete disassembly and analysis. Each component in need of repair or replacement is analyzed carefully. Additional operations — especially OEM requirements — are identified in advance, not halfway through the repair cycle. The needs of the vehicle are documented within a repair order to ensure 100 percent accuracy. This work is done by a dedicated, experienced analyst.

This is a complete 180-degree shift from the old “tear down” process in which an incoming vehicle would be assigned to a tech, who then disassembles the vehicle, rattles off to someone with a clipboard what he thinks is needed (without technical data, OEM requirements or I-CAR data), snaps a couple pictures and walks around his pile of parts up front to a cubicle to bang out a guesstimate. Inevitably, this process would result in unforeseen issues delaying completion. Customers are no longer settling for this standard, and forward-thinking shops have created a new environment in which they no longer have to.

Damage analysis is a dedicated department in the future shop. Meticulously assessing the damage of vehicles is their single focus. It is driven by an exacting process utilizing a mobile estimating database workstation with the vehicle, with a technician identifying and documenting each need of the vehicle in detail. This is crucial, as the complexity of vehicles today call for extensive requirements with regard to specific sectioning, electronic pre- and post-scanning and other manufacturer requirements. Capturing this data at each step of the cycle alongside the vehicle is ideal for ensuring accuracy.

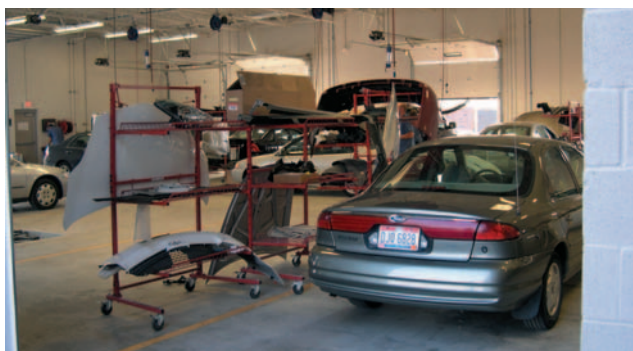
The shop of the future incorporates color identification into the damage analysis process, long before the vehicle enters the spray booth. By utilizing the best available technology, such as a color spectrometer integrated with smart scales, accuracy approaches 100 percent. The color captured in the spectrometer feeds info to the smart scales, while the estimating system captures refinish labor hours.

Part carts are utilized during the disassembly process with a schematic outlining an exacting process for kits. This method is similar to the way a manufacturer operates. Manufacturers do not operate with stacks of parts in the middle of a shop floor. Parts kits are designed to best accommodate the reassembly process. Damaged parts are placed on the parts cart, and new parts are mirror matched to the damaged parts as they are received. The mobile parts cart allows technicians to inventory in and off the production floor as needed.

The future shop does not cut corners on parts correctness. As new parts come in, they are unboxed and checked for correctness against the damaged part and are only added to the kit once verified as the correct part.



**DAMAGED PARTS ARE PLACED** on the parts cart, and new parts are mirror matched to the damaged parts as they are received.



**THE MOBILE PARTS CART ALLOWS** technicians to inventory in and off the production floor as needed. This keeps the active work area clean and more productive.



**THE FUTURE SHOP FULLY EMBRACES THE “5S” LEAN PRINCIPLES** of organizing for maximum productivity: Sort, Set, Shine, Standardize and Sustain.

Nothing is random in the future shop, including the parking lot, which is staged according to the needs of production. Vehicles waiting for a critical part are staged in a defined section of spaces. Other dedicated spaces are for vehicles that have just arrived and are waiting for the damage analysis and blueprinting process. This method allows a high level of visual management for operators. It also ensures that anything on the production floor is guaranteed



to be ready for repair with correct parts and an accurate estimate.

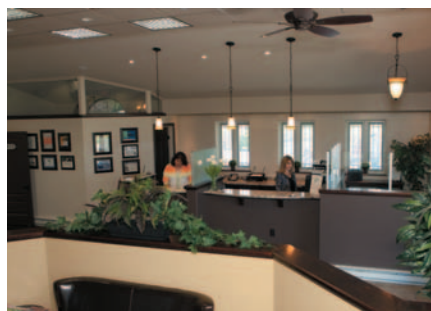
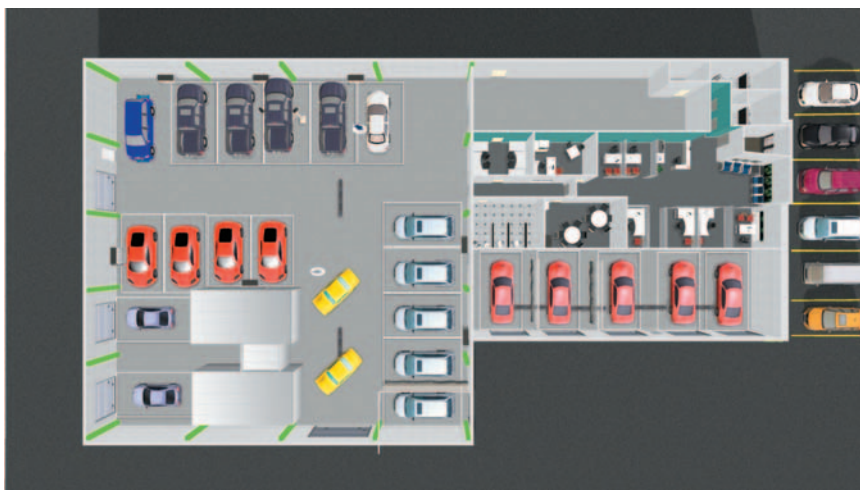
## Linear remanufacturing

The shop of the future has adopted a linear remanufacturing model in which labor is segmented so that specific technicians are deliberately tasked with the most efficient part of the repair process. It's rare that today's large collision centers a painter preps and paints his work. In the future shop, it is just as rare for a metal tech to disassemble a vehicle, repair the frame and unibody, and reassemble their own work.

The future shop technician who disassembles and analyzes damage with an analyst hands the vehicle off to the frame and unibody technician, who completes repairs, corrections and replacements for structural components. After post measurement of the frame and unibody is complete, the tech hands the vehicle off to a metal tech who repairs additional panels, finishes any remaining structural repairs or finish work necessary and hangs doors and fenders. Finally, the vehicle is handed off to the refinish department, where a prep technician conducts preparation work and a refinish technician executes the refinish process.

Linear remanufacturing is a production line concept, straight out of the most efficient manufacturing operations. A major advantage of the linear model is that shops can identify any delays, stops or slowdowns before they arise. Quality assurance can be managed "in-process" at each stage of the repair process. Each handoff includes built-in quality assurance component. It's a far more efficient practice compared to our old quality control process, which often resulted in a vehicle re-entering the repair process for corrections, at a significant cost for cycle time and delay for the customer.

There's a well-known reason why this model is more necessary today than ever before: The average age of collision industry technicians is rising. Boomers are retiring. And, the number of qualified, skilled



**FRONT OFFICE AND WAITING AREAS** should be designed as sales and service centers similar to what a consumer is used to elsewhere in their life — the bank, the doctor's office or any other type of professional service firm lobby.

technicians is declining. In this environment, the model of handing eight cars to one tech and expecting them to efficiently execute every piece of the repair cycle is a dying model. It's flawed from the beginning because it does not address skill set. The skill set required to take apart a damaged bumper, damaged fender or broken headlight is different than that of a frame and unibody technician. Linear remanufacturing aligns skill set to labor operations.

## The future is now

One of the strongest advantages of linear remanufacturing is better productivity. The future shop, with an efficiently implemented linear remanufacturing model, will achieve touch time approaching 100 percent, as someone is always on a vehicle, as opposed to one technician having to dance around several cars at a time. It simply makes more sense from a productivity standpoint to task lower-skilled technicians with dismantling cars, higher

skilled technicians with structural repair, and mid-tier technicians with reassembly, with each supported by the guidance of a highly-skilled certified technician.

A linear-oriented segmentation of labor is the future. It is inevitable that profitability and survivability are going to force us into segmenting labor more aggressively. The old model cannot sustain the evolving demands of the market, insurance companies or consumers. The truth is, what we call the shop of the future is already out there. They are led by capable and competent forward-thinking managers who have found that the biggest hurdle to adopting these practices is not cost, but culture. 📡



**LEE RUSH** is the manager of business consulting services for Sherwin-Williams Automotive Finishes. He is a proven leader in recruiting, training, technical, sales and

management in the industry.



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In 1976 the Jorgensen family immigrated to the USA from Denmark for a new adventure. They worked to grow their family business, which took off at a much faster pace in 1981. That year, in the small town of Spring Valley, Minn., the Jorgensen family, who had been restoring and painting cars, began to import SATA Spray Equipment, a polyester putty and many other items into the United States. A few years into importing SATA and other products they stopped the restoration business, and it led them to the point where they are today — the exclusive independent importer of SATA for the USA and Puerto Rico.

SATA and Dan-Am Company products are the most-used products in the collision repair industry today. Dan-Am

Company has jobber distributors, warehouses and 47 independent representatives across the USA, making it simple to buy SATA and DanAm Air components for spraying paint, filtered compressed air, aluminum airlines, breathing protection and single use RPS disposable cups for any automotive professional, industrial or home-use shop.

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## Sherwin-Williams Automotive Finishes

Providing high-performance automotive, fleet and aerospace coatings and associated products, Sherwin-Williams Automotive Finishes serves a variety of customers including automotive collision repair facilities, dealerships, fleet owners/refinishers, jobber distributors and original equipment manufacturers.

A total commitment to excellence in technology, products and process-driven solutions provides a competitive advantage for Sherwin-Williams Automotive Finishes' results-based customers. Some of the brand's leading products and services include:

- **Ultra 7000® Refinish System:** Recognized as one of the fastest solvent-based refinishing systems.
- **CC200 Dynamic Clearcoat:** A premium clearcoat that delivers a glamorous finish in half the amount of time compared to others in its category.

- **ATX™ Refinish System:** A complete system consisting of undercoats, basecoats and spot and overall clearcoats suitable for use in both regulated and National Rule areas.

In addition to providing revolutionary products to the field, Sherwin-Williams Automotive Finishes continues to score with its Lean Stock™ inventory management system. Through Lean Stock™, body shop customers have a strong solution to the challenges they face in producing repairs, streamlining in-house processes, improving cycle time and ensuring consistency across the entire refinishing and repair process.

One of Sherwin-Williams Automotive Finishes' most popular programs, the A-Plus™ Network, offers a wide variety of solutions such as membership in Sherwin-Williams vision groups, customer service, employee growth, insurance re-

lationships, management training, marketing, process refinement, productivity and profitability. A-Plus™ Network members receive discounted pricing and priority services from approved contributors including: American Honda, Fleet Response, Instant Estimator, Safelite Solutions, CSI Complete, Customer Research Inc., GMG EnviroSafe, GRC-Pirk, Automotive Disciplines Inc., The Fristoe Group, VeriFacts, ALLDATA Collision, AutoWatch, iContact, OEConnection, Web Ready Solutions, DELL, OfficeMax and HERTZ.

Sherwin-Williams Automotive Finishes is the solution for industry excellence and great paint.

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## Valspar Automotive

Valspar Automotive is a market leader in premium quality refinish and custom coatings, as well as collision repair products with such brands in its portfolio as Matrix® Automotive Finishes, Prospray® Finishes, DeBeer Refinish®, Valspar® Refinish, House of Kolor® and U.S. Chemical & Plastics® (USC®).

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- **Matrix Automotive Finishes:** The new C2C Coast 2 Coast® Intermix Color System offers a complete bank of products that are within VOC standards no matter where a shop is located in the U.S. and Canada.

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- **DeBeer Refinish:** The WaterBase 900+ Series continues to be a driving force in waterborne technology giving shops a compact system with color match every time and a premium finish.

- **House of Kolor:** Basecoat solutions, Shimrin® and Shimrin2® provide eye-popping vibrancy and mind-bending depth.

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Chemical & Plastics (USC) continues to set the standard in the formulation and manufacturing of high performance repair, refinish, appearance and accessory products. Professionals like you depend on USC for quality and value in aftermarket products such as fillers, putties, fiberglass repair, masking, paints, coatings, adhesives, truck bed liners, abrasives, and accessory products.

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Creating tools and equipment would prove to be Orazio's life's passion.



### Continuous innovation

Orazio took his passion, intuition and experience to the equipment manufacturing industry in 1989, creating his namesake business, Spanesi,

and releasing his first frame straightening bench in 1989. In 1992, Spanesi followed up with the first Touch electronic measuring system. Today, Spanesi has become a global leader through the creation of the highest quality collision repair tools and equipment available.

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**AUTOMOTIVE  
ELECTRICAL**

**73**



**ENGINE  
PERFORMANCE**

**118**



**ENGINE  
MECHANICAL**

**16**



**DRIVELINE  
SYSTEMS**

**10**



**STEERING &  
SUSPENSION**

**16**



**BRAKES & VEHICLE  
DYNAMICS**

**15**



**HVAC  
SYSTEMS**

**12**



**VEHICLE  
SERVICING**

**6**



**TOOLS &  
EQUIPMENT**

**57**



**TECHNICAL  
INFORMATION**

**29**





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## AD INDEX

ADVERTISER	PAGE #	ADVERTISER	PAGE #	ADVERTISER	PAGE #
AKZONOBEL COATINGS INC.....	58, CV4	GOFFS ENTERPRISES INC.....	27, 61	SOUTHERN POLYURETHANES INC.....	39, 65
AMERICAN HONDA MOTOR INC.....	19	IBIS .....	69	SPANESI.....	43, 65
AUTEL.....	13	INNOVATIVE TOOLS & TECH.....	16, 61	TOYOTA MOTOR SALES USA .....	11
AUTOMOTIVE MGMT INSTITUTE.....	22	INSTA FINISH.....	17, 35, 62	TYC GENERA.....	31, 53
AXALTA COATINGS SYSTEMS.....	7, 58	KIA MOTORS AMERICA.....	21, 48, OTS		
CCC INFORMATION SERVICES .....	15, 59	LAUNCH TECH .....	29, 62		
CHIEF AUTOMOTIVE SYSTEMS INC .....	9, 59	MOTOR GUARD CORP .....	18		
CJ INC .....	67	PPG INDUSTRIES .....	CV2-03, 63		
EAGLE ABRASIVES .....	34, 60	PRO SPOT INTL INC.....	CV3		
GENERAL MOTORS.....	5	SATA SPRAY EQUIPMENT.....	23, 63		
GLOBAL FINISHING SOLUTIONS.....	24, 60	SHERWIN-WILLIAMS .....	25, 45, 64		

## PRODUCTS

MARTECH SERVICES COMPANY.....	67
SAINT-GOBAIN.....	67
SNAP-ON.....	67
WALMEC NORTH AMERICA .....	67

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# Propositional logic can build better estimators

Understanding how to construct word equations will lead to better estimates

**W**ords evoke thoughts and emotions. They are the reason we feel happy, agreeable, uncomfortable, confused or upset. But, why is that? This is because words create statements. Statements contain evidence that helps form a premise and make a conclusion. The premise and conclusion together form an argument, and we analyze the argument to see if it makes sense. The idea of making sense is a function of the argument's logical structure. Well-formed arguments fill in all the blanks and lead right to the conclusion while not-so-well-constructed arguments leave you feeling seemingly unconvinced or confused.

Estimators are tasked every day with using sound logic and forming valid arguments to advise customers and negotiate repair costs. There is an opportunity for employers to enhance their training regimens and benefit their employees by looking outside the industry for solutions. One of the toughest positions in a shop to train for, from scratch, is estimating. Estimating does require knowledge of cars, and there is training available from I-CAR, paint companies, tool companies and more. The curriculum supplied in these courses is excellent and beneficial to the estimator.

However, there is a component that is missing that in its absence will spell almost certain failure for a new estimator. The missing component is logic. Logic is required for writing an estimate, negotiating a supplement, researching OEM repair procedures and many more job-related activities. You have used a form of logic if you have written any formulas in Microsoft Excel. Propositional logic, however, is the study of words — more specifically, the logical connectives of words and the statements they create. Propositional logic teaches how to take words and turn them into equations. It teaches good reasoning skills and allows the student to make valid assumptions and inferences based upon a specific set of rules.

Propositional logic will aid estimators not only in estimating, but also in problem solving. It is with these math equations that an argument's validity can be judged and the truth or falsehood of



**PROPOSITIONAL LOGIC WILL AID ESTIMATORS IN PROBLEM SOLVING, DRAWING INFERENCES AND CONCLUSIONS AND WILL EASE OEM RESEARCH.**

a statement can be determined. The tools learned in the study of propositional logic will aid estimators in writing thorough estimates using conditional statements. It will enable them to draw inferences and conclusions from the database reference manuals and construct valid arguments for use while negotiating for non-included items. It will enable them to overcome poorly-formed objections during negotiations and will make researching, interpreting and applying OEM research easier.

Propositional logic has five main symbols called logical connectives. Propositional logic uses sentential letters when creating equations to represent statements. Statements create premises and conclusions, which form arguments. Arguments have two parts: the antecedent and the consequent. The antecedent is the premise of the argument and the consequent is the conclusion.

To view a table that shows the connectives and describes their connection to words and their function and to see a real-world example of how an argument of an OEM position statement is constructed

with propositional logic, go to [ABRN.com/logic](http://ABRN.com/logic).

The real application of propositional logic begins when estimators learn about proofs and how to solve them. Proofs in propositional logic consist of a series of formulas such that each formula is derived either from a previous formula's premise or created from an inference rule that is taught in propositional logic.

Training on propositional logic is readily available. Courses can be found at local colleges, through apps such as Coursera, and even on YouTube. The best part about the online options is that they are driving down the cost of education and delivered at a pace convenient to the student. I would encourage you to investigate propositional logic and how it can benefit your businesses training regimen and improve your results. After all, it's only logical. ■

---

**WILL LATUFF** is a manager of Latuff Brothers Auto Body in St. Paul, Minn. He is an active member of AASP-MN, participating on the board of directors as well as serving as AASP-MN Collision Division director. [wlatuff@latuffbrothers.com](mailto:wlatuff@latuffbrothers.com)

## TECH TIP: PEEL TEST

### HOW TO PERFORM A DESTRUCTIVE WELD TEST

STEP

1



**Before Welding:**  
Your test welds should be on the same material or as close as possible to the material you will be repairing.

- Clamp the welded test material into the vice.

STEP

2



- Bend material back in the vice to create a section to grip and peel.
- Use a pair of channel lock pliers to help roll the material back.

STEP

3



- With the pliers, start peeling the material back.
- You will see the weld nugget start tear from bottom or top of the material.

STEP

4



- If welds are good, the weld nugget will stay in tact while tearing around weld nugget.

**NOTE:** This test may be harder to complete on HSS and UHSS.

1

2

3

4

## FIND MORE TECH TIPS ON OUR YOUTUBE PAGE



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SPRING 2018 VOL. 13 | NO. 1

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### COVER ALL BASES

Replacing the E-CVVT cover and motor plug can subdue DTC and oil leak

### AGAINST THE WIND

Front door glass run channel replacement can eliminate noise

### QUESTION OF THE DAY...

Why not replace the cabin filters for your customers?



Genuine Part



# Breaking the compact car mold

All-new Forte offers excellent combination of comfort, fuel efficiency and advanced tech

**E**ntering its third generation as one of Kia's best selling vehicles, the all-new Forte breaks the mold of what compact cars have been. Introduced at the recent North American International Auto Show, the 2019 Forte offers drivers a higher level of comfort and advanced driver assistance technologies that are aimed to make the journey — whether a short commute or long haul — a more rewarding and decidedly upscale experience.

The Forte has evolved with a number of visual and feature enhancements, inside and out. The cabin is a “class above” by offering more comfort and integrating new driver assistance technology. Moreover, space has been expanded in several key areas so passengers are treated to a comfortable space no matter how long the journey. Outside, the Forte enhances its sporty and youthful image by taking design cues from the Kia Stinger.

And, of course, communication technology abounds featuring an 8-inch color touchscreen with support for Android Auto™ and Apple CarPlay® that's integrated neatly on the dash and within the driver's



Label the 2019 Forte a “class above.”

line of sight. With select smartphone devices, the system also has the capability to read SMS texts aloud through Bluetooth®. Eliminating the need for a charging cord is an available wireless charging tray perched on the center stack for compatible Android devices, as well as Apple iPhone 8 and iPhone X.

Housed underneath the Forte's longer hood is a second-generation 2.0-liter Nu four-cylinder engine that benefits from Atkinson Cycle technology and a cooled EGR system. Typically applied to hybrid and electric vehicles, the Atkinson Cycle and cooled EGR technologies are designed to help boost fuel efficiency. The new powerplant can be paired with either a six-

speed manual or Kia's all-new Intelligent Variable Transmission (IVT). The engine and in-house-built IVT are the first of a new line of highly efficient “Smart Stream” powertrains that will make their way into the Kia lineup in the future.

“The compact sedan segment is highly competitive, but with all the improvements the new Forte brings to market for the 2019 model year, it is more than prepared to take on the toughest the segment has to offer,” said Orth Hedrick, Vice President, Product Planning, Kia Motors America.

Standard features and desirable amenities in the compact sedan segment continue to be available across three trims – LX, S and EX – with the model line continuing to expand throughout its lifecycle.

With your service expertise, we are confident that you will help keep the new Forte on the road for many years to come.

## Kia Motors America, Inc.

*All trademarks and tradenames are the property of their respective owners. 2019 Forte EX prototype shown with optional features. Not all optional features available on all trims. Some features may vary. Expected availability fall 2018.*

## IN THIS ISSUE

VOL. 13 | NO. 1 | SPRING 2018 | *Quality Connection* is published by Kia Motors America



4

### Cover all bases

Replacing the E-CVT cover and motor plug can subdue DTC and oil leak



8

### Against the wind

Front door glass run channel replacement can eliminate noise



12

### Question of the day...

Why not replace the cabin filters for your customers?

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When your customers are behind the wheel,  
Kia is more than just the sum of its parts.

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Genuine Parts

\* Kia Genuine replacement parts (except battery) sold by an Authorized Kia Dealer under warranty are covered for the greater of (1) the duration of the New Vehicle Limited Warranty or (2) the first 12 months from the date of installation of the Kia Genuine replacement parts or 12,000 miles. Labor charges not included when not installed by an Authorized Kia Dealer. Warranty is limited. See Kia's Replacement Parts and Accessories Limited Warranty for further details.



# Cover all bases

Replacing the E-CVVT cover and motor plug can subdue DTC and oil leak



You may encounter some 2016-2017MY Optima (JF, JFa), 2016-2017 Sorento (UMa), and 2017 Sportage (QL) vehicles, equipped with 2.4L GDI or 2.0T-GDI that may exhibit a malfunction indicator light (MIL) ON with DTC P001000 and/or oil leakage in the E-CVVT motor cover. If you do, we recommend inspecting and/or replacing the E-CVVT cover or O-ring and replacing the motor plug as outlined in this article.

*Notice: A video clip is available to aid technicians in completing this repair. Access the Tech Videos in the Publication section of Kia Global Information System (KGIS) and look under Engine Mechanical System for "[VID012]2016 Sorento (UMa), Optima (JFa), Sportage (QL) - E-CVVT Cover & Motor Plug Installer."*



## AFFECTED VEHICLE RANGE:

Model	Production Date Range
Optima (JF)	From October 27, 2014 to June 14, 2016
Optima (JFa)	September 4, 2015 through March 6, 2017
Sportage (QL)	December 10, 2015 through September 12, 2016
Sorento (UMa)	October 29, 2014 through October 11, 2016

» This and other technical information is available at [www.Kiatechinfo.com](http://www.Kiatechinfo.com).

» All images are for illustration purposes only.

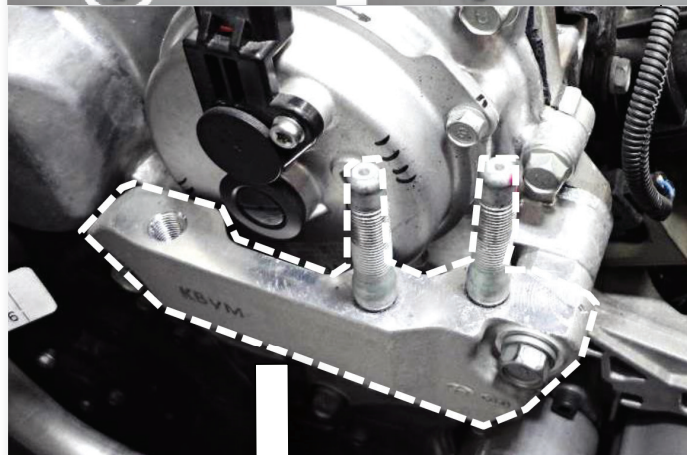
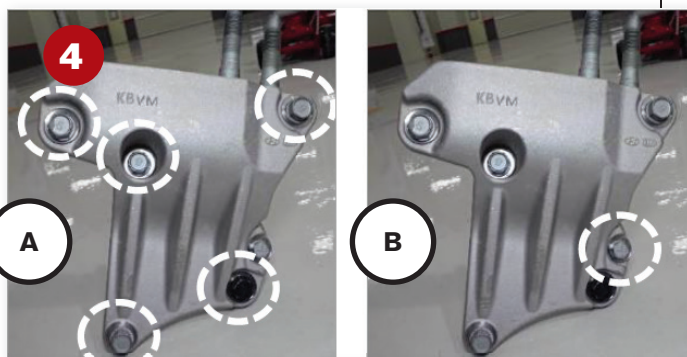
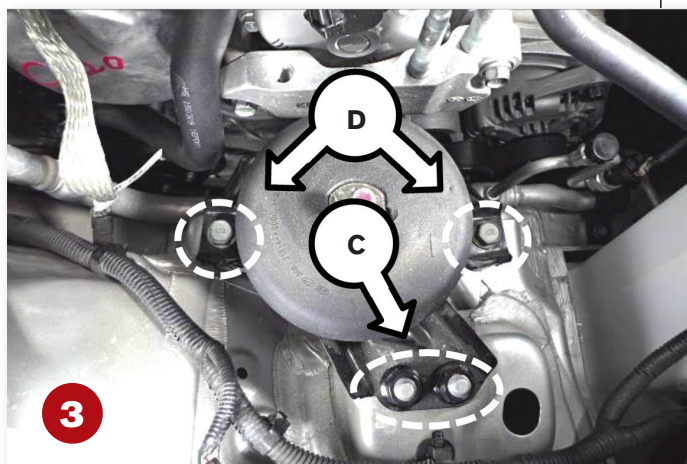
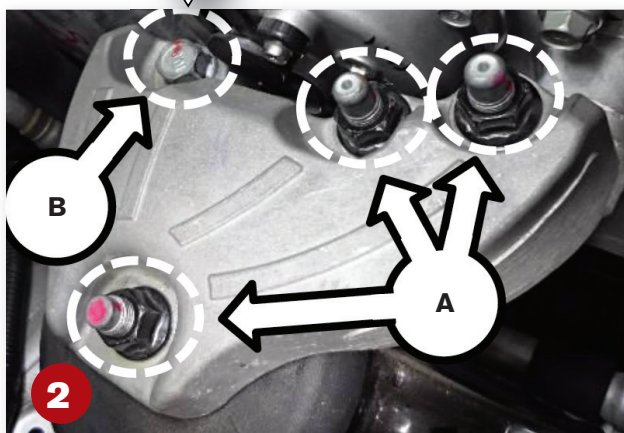
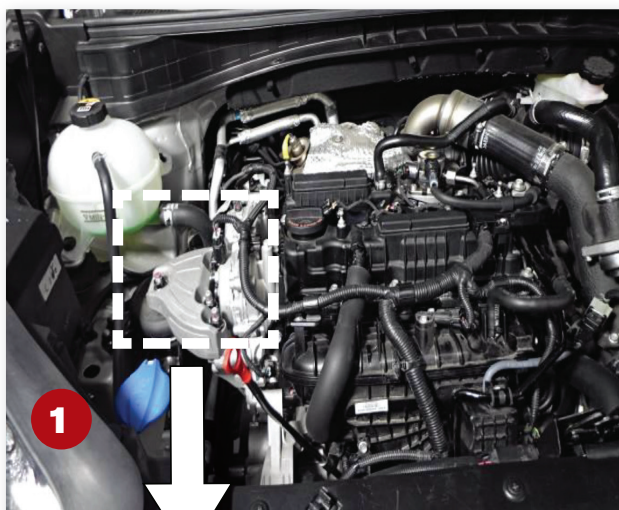
## REQUIRED TOOLS

Part Name	Part Number	Figure			Remarks
		A	B	C	
SST	09243 C1000			N/A	A. E-CVVT Plug Installer B. E-CVVT Plug Cover Installer
SST	09243 C2000				A. E-CVVT Plug Installer B. E-CVVT Plug Cover Installer C. Handle
Brake Cleaner	UM040 CH018				Order through Kia Chemicals

## REQUIRED PARTS

Part Name	Part Number	Figure	Remarks
Motor Plug	24351 2GGA1QQk		Brown → Black
E-CVVT Cover	24360 2GGD0QQK		Center boss height tolerance changed Replace if necessary
O-Ring	24365 2GGA0QQK		—





## Service Procedure

**1.** Carefully place a jack at the bottom edge of the oil pan and support the engine for removal of the engine mounts.

*Notice: Place a wooden or rubber block between the edge of the oil pan and the jack to prevent damaging the oil pan. Do not place block at the center of oil pan as damage can result.*

*Notice: Allow sufficient time for the oil to drain from behind the motor plug before removal of the plug in step 8.*

**2.** Loosen three engine mounting support bracket retaining nuts (A) and one retaining bolt (B).

Tightening torque: 65.1–79.6 lb.ft (88.3–107.9 N.m)

*Notice: Some engine support brackets may be different depending on vehicle configuration. Always refer to the “Engine Mechanical System → Engine and Transaxle Assembly → Engine Mounting → Repair procedures” chapter in the applicable Shop Manual on KGIS ([www.Kiatechinfo.com](http://www.Kiatechinfo.com)) for proper removal and installation instructions.*

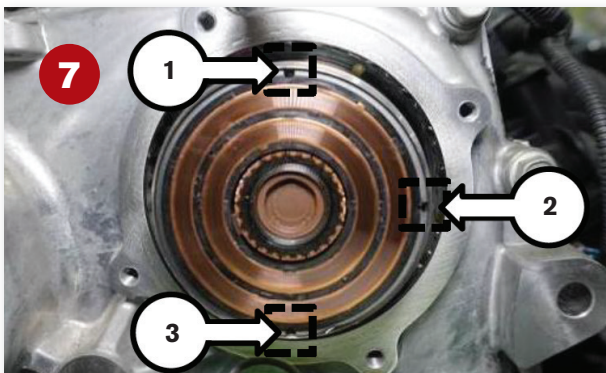
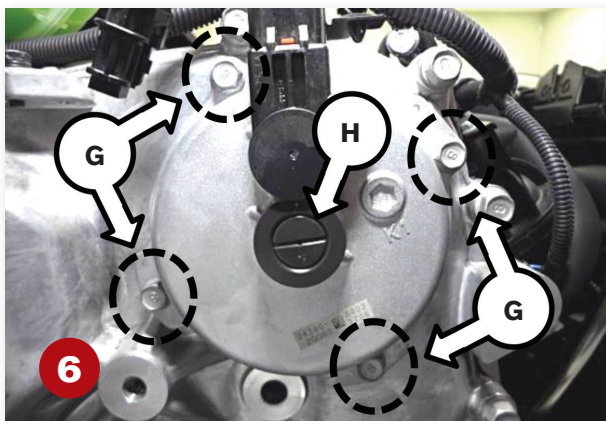
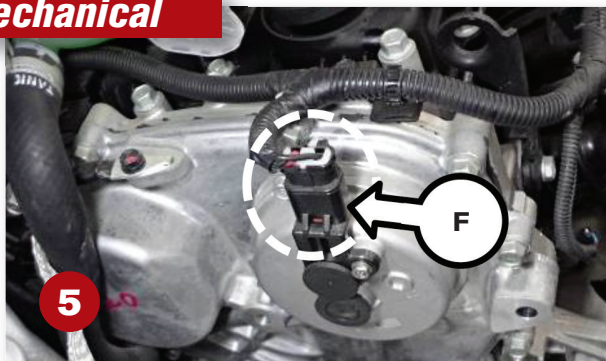
**3.** Loosen two engine mounting bracket retaining nuts (C) and two retaining bolts (D).

Tightening torque: 47.0–61.5 lb.ft (63.7–83.3 N.m)

**4.** Loosen six engine support bracket retaining bolts (E).

Tightening torque: (A): 28.9–32.5 lb.ft (39.2–44.1 N.m) (B): 14.5–18.1 lb.ft (19.6–24.5 N.m)





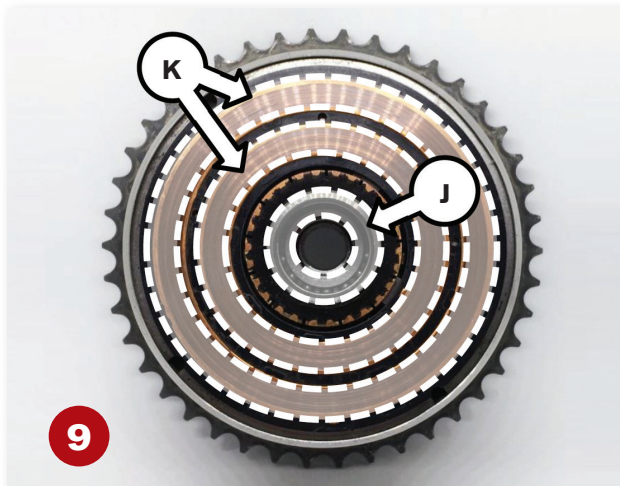
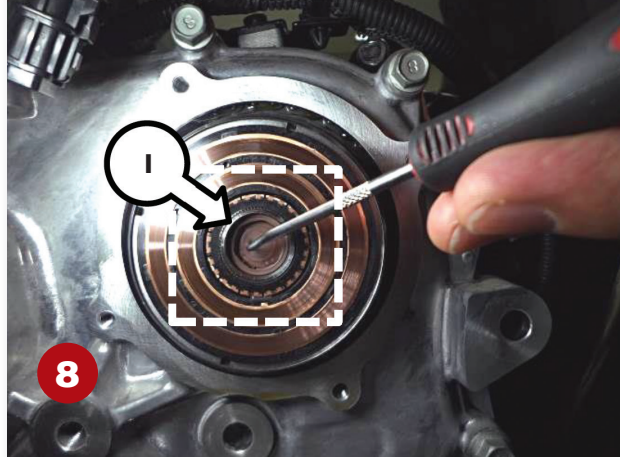
**5.** Disconnect the E-CVVT cover connector (F).

**6.** Loosen and remove the four E-CVVT cover retaining bolts (G) and then remove the E-CVVT cover. Remove the cover plug (H) using a non-marring trim removal tool (such as Snap-on® Part Number PBN5 or equivalent) to avoid damaging trim pieces. Note: This cover plug will be reused. Tightening torque: 7.2–8.7 lb.ft (9.8–11.8 N.m)

**7.** Rotate the E-CVVT assembly by hand until the three holes are aligned as shown.

- Hole 1 at the top (12 o'clock)
- Hole 2 at 45 degrees of Hole 1
- Hole 3 at 90 degrees Hole 1

Place a clean shop towel at the bottom of Hole 3. Then using brake cleaner with a straw attachment, insert the straw into Hole 1 and carefully spray for approximately 30 seconds.



**8.** Remove the motor plug (I) by carefully breaking the center with a straight pick.

*Notice: Wipe off any oil leakage when removing the motor plug. Cover the motor shaft inlet with a clean shop towel.*

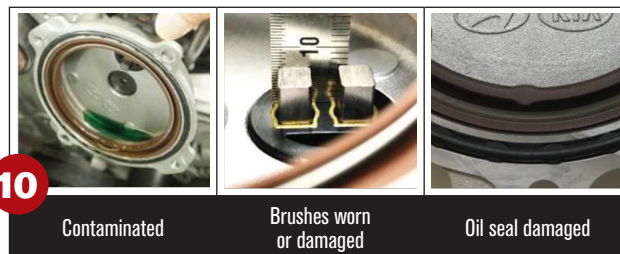
**9.** Using brake cleaner, spray directly on the motor plug assembly seat (J) inside the motor shaft and clean. Spray brake cleaner on a shop towel to wipe and clean the commutators (K).

*Notice: Remove any residual oil or fluid in the motor shaft to prevent plug from becoming displaced.*

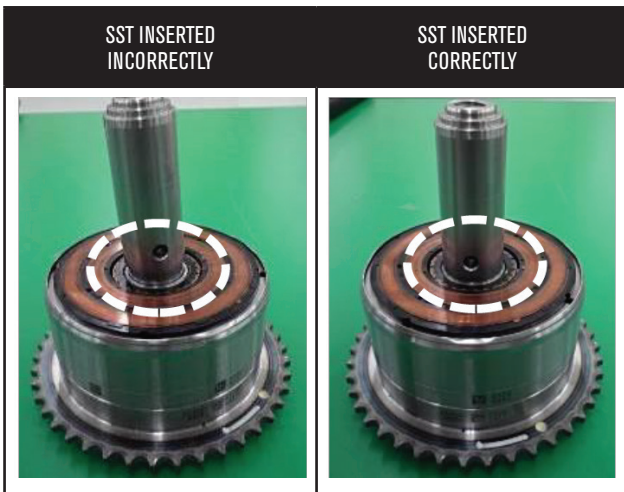
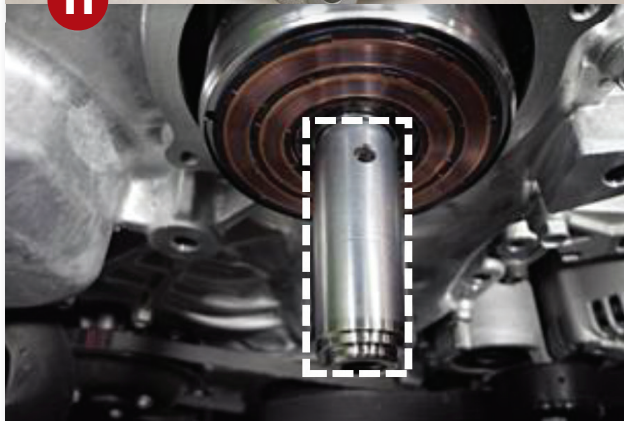
*Notice: Protect the E-CVVT as necessary to prevent oil contamination when spraying brake cleaner.*

**10.** Inspect the E-CVVT cover.

- If there is no sign of oil leakage, contamination, and/or damage, replace only the cover O-ring.
- If there is an oil leak, contamination, and/or damage, replace the cover.







E-CVVT removed from vehicle for demonstration only purposes.

**11.** Apply oil to the oil seal lip (L) of the E-CVVT cover and install the SST “B” to the E-CVVT motor as shown.

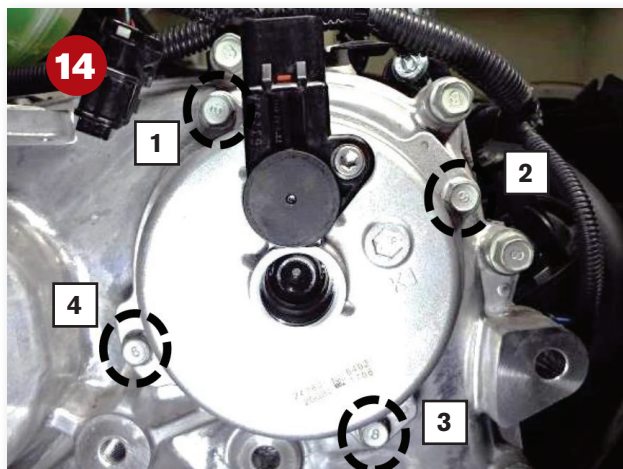
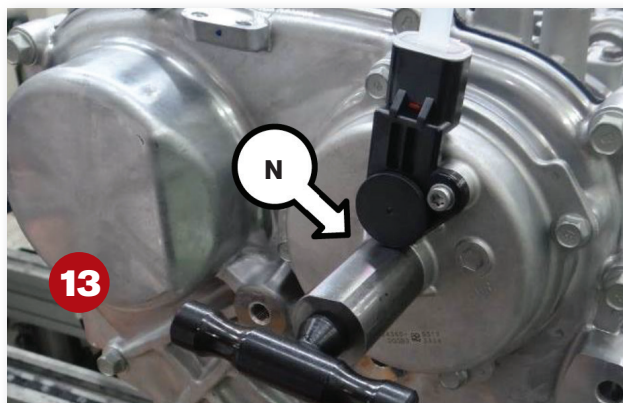
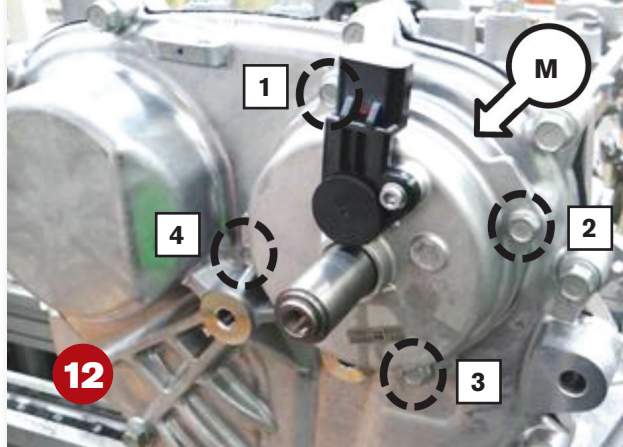
**Notice:** When installing the cover, correctly insert the end of the SST to the motor shaft as shown below. Ensure that the SST hole faces towards the motor shaft.

**Notice:** Use caution not to fold the oil seal when installing the cover.

**12.** Install the E-CVVT cover (M) and perform initial tightening sequence of the E-CVVT cover to the specified torque in the sequence below.

Tightening torque: 8.4–16.8 lb.in (1.0–2.0 N.m)

**Notice:** Tighten the retaining bolts in this sequence: 1 → 3 → 4 → 2



**13.** Install the new motor plug (N) by using the SST “A” of Required Tools.

**Notice:** Insert the plug onto the SST and then insert the SST into the E-CVVT cover opening.

**Notice:** Do not apply impurities (oil, cleaners) on the motor plug.

**14.** Remove the SST and perform final tightening sequence of the E-CVVT cover retaining bolts to the specified torque in the sequence below. Reinstall the cover plug (H) removed in step 6. Tightening torque: 7.2–8.7 lb.ft (9.8–11.8 N.m)

**Notice:** Tighten the retaining bolts in this sequence: 1 → 3 → 4 → 2

Reinstall all removed components by reversing the order of removal. Start and run the engine to confirm proper operation, no oil leakage, and clear any related DTC(s). **KIA**





# Against the wind

Front door glass run channel replacement can eliminate noise



Some Sedona (VQ) vehicles, produced from June 15, 2005 through May 6, 2013, may experience some highway wind noise caused by front door glass channel deformation. To correct this concern, follow the procedure outlined in this article to replace the left and right side front door glass run channels.

## REQUIRED PART

Part Name	Part Number	Quantity
Run Assembly Front Door Window Glass	82530 4D001QQK (LH)	1
	82540 4D001QQK (RH)	1

## AFFECTED VEHICLE PRODUCTION RANGE

Model	Production Date Range
SEDONA (VQ)	From June 15, 2005 - May 6, 2013

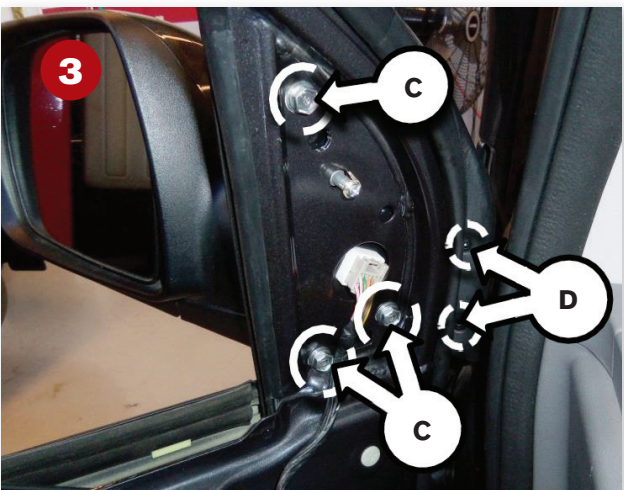
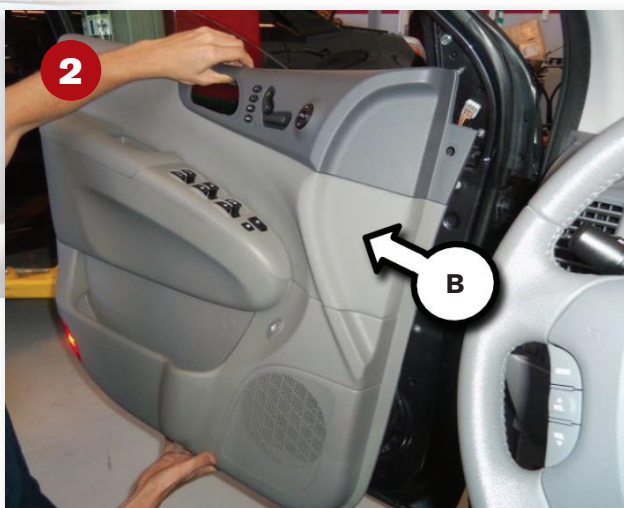
## Service Procedure

**1.** Lower the driver's side window. Remove the quadrant inner cover (A) from the driver's door.

**Caution:** Exercise caution when removing the quadrant inner cover as it can be easily damaged.

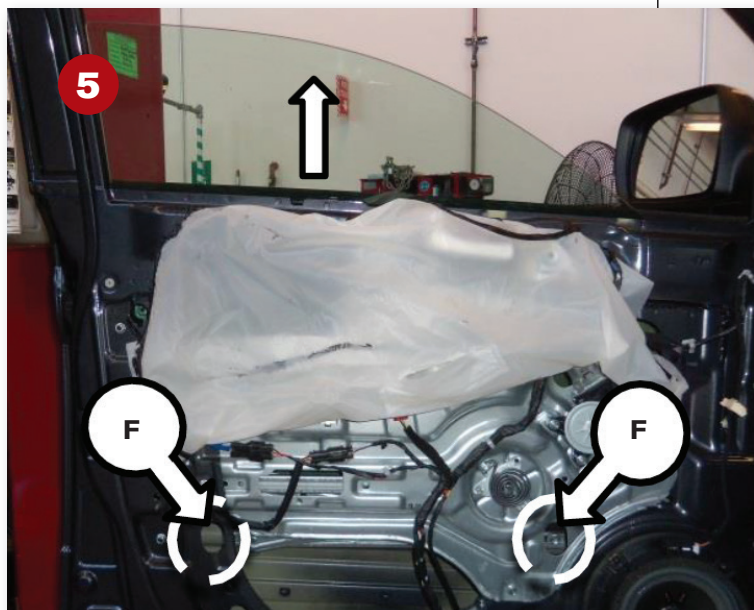
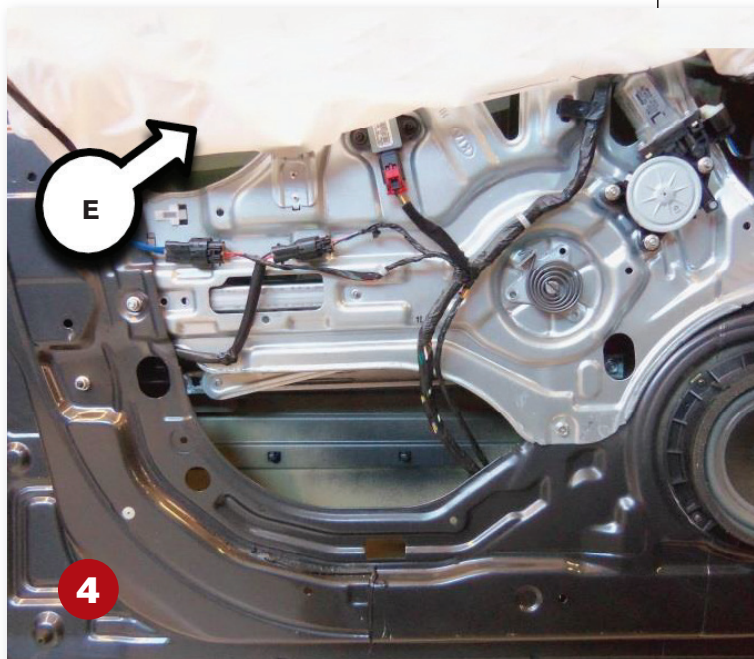
**2.** Remove the door panel (B) by referring to the Service Information on Kia Global Information System ([www.Kiatechinfo.com](http://www.Kiatechinfo.com)).





**3.** Remove three bolts (C) securing the side view mirror. Also, make sure to remove two screws (D) securing the weather strip to the door frame and to disconnect the side view mirror connector.

Remove the run channel from the vehicle.



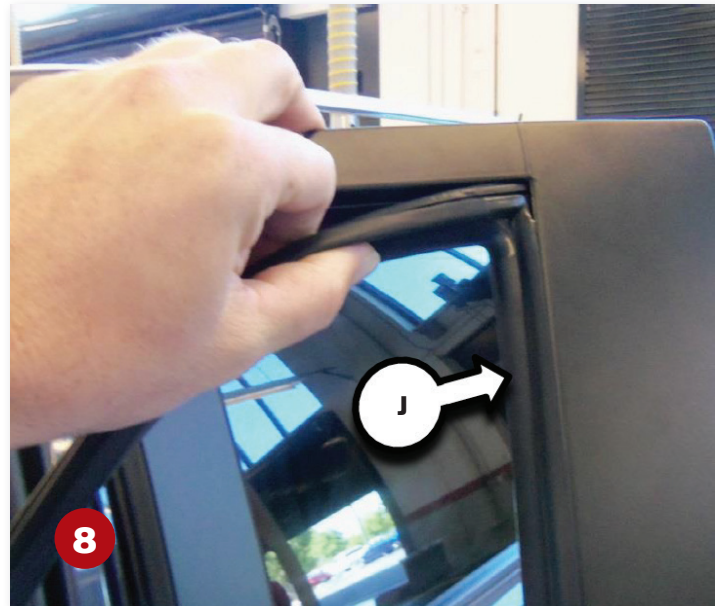
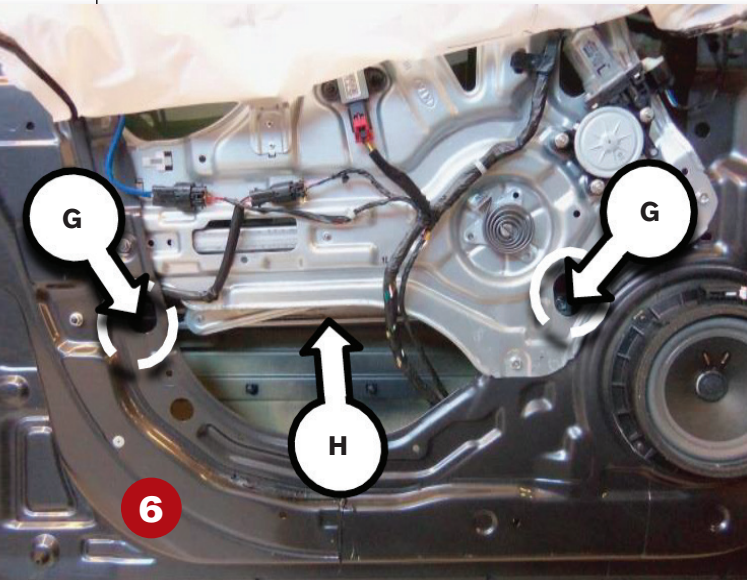
**4.** Partially remove the moisture barrier (E) from the door skin.

**5.** Temporarily reattach the window switch connector to the door panel. Then, raise the glass until the bolts securing the glass are visible through the mounting holes (F).

» This and other technical information is available at [www.Kiatechinfo.com](http://www.Kiatechinfo.com).

» All images are for illustration purposes only.





**6.** Remove two bolts (G) securing the glass to the window mechanism (H) and remove the glass from the door. Tightening torque: 3.98 lb-ft (1.8 Nm)

**7.** Before installing the new run channel, make sure to cut off the projection (I) with a sharp blade, as shown.

**Caution:** Be careful not to damage the run channel when cutting off the projection (I).

**8.** Carefully install the run channel (J) around the window frame.

**Notice:** Check the run channel for proper installation in order to prevent possible water intrusion into the vehicle.

**9.** Install all other removed components by reversing the order of removal.

**Caution:** When reinserting the glass (K) into the door, avoid dropping the glass or scratching the glass surface.

Operate the window to verify proper operation.

Repeat the steps above to install the glass run channel on the opposite side of the vehicle. **KIA**





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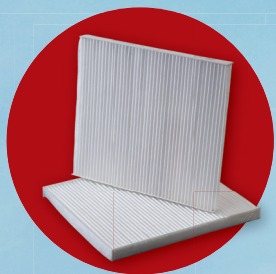


Genuine Parts

\* Kia Genuine collision parts sold by an Authorized Kia Dealer under warranty are covered for the greater of (1) the duration of the New Vehicle Limited Warranty or (2) the first 12 months from the date of installation of the Kia Genuine replacement parts or 12,000 miles. Labor charges not included when not installed by an Authorized Kia Dealer. Warranty is limited. See Kia's Replacement Parts and Accessories Limited Warranty for further details.

# Question of the day...

Your customers will replace their vehicle's air filter so the engine can breathe better, so why not replace a cabin filter so they can breathe better?



The answer to that question might be that replacing a cabin filter is not top of mind for all customers. Cabin filters, which clean the air that comes into a vehicle's interior through the HVAC system, are tucked away so it's easy to overlook them.

But overlooking their replacement is not ideal, since cabin filters can catch a variety of airborne particles that customers could otherwise breathe.

An added bonus to cabin filter replacement is assuring a smoother running, more efficient HVAC system. In other words, attention to these filters may help prevent expensive repairs down the road.

And when you recommend Genuine Kia cabin filter replacements, don't forget to mention the "normal" Genuine Kia filter replacements, namely the fuel filter, air filter and oil filter. With this kind of car care, both your customers' vehicles and your customers can breathe easier.



## Genuine Parts

Contact your local  
Kia dealer today for  
assistance and delivery  
of your parts.



\*Contact your local Kia dealer today for assistance and delivery of your parts.

\*\* Kia Genuine replacement parts (except battery) sold by an Authorized Kia Dealer under warranty are covered for the greater of (1) the duration of the New Vehicle Limited Warranty or (2) the first 12 months from the date of installation of the Kia Genuine replacement parts or 12,000 miles, whichever comes first. Labor charges not included when not installed by an Authorized Kia Dealer. Warranty is limited. See Kia's Replacement Parts and Accessories Limited Warranty for further details.