



PREPARING FOR ADVANCED MATERIAL REPAIRS

IF YOUR SHOP HASN'T BEGUN THIS PROCESS, YOU ARE ALREADY FAR BEHIND

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OEMs are hard pressed to produce vehicles that are not only stylish, functional and cool-looking, but that are extremely fuel efficient and safe as well. Gasoline engines are only about 30 percent efficient, so that means 70 percent of that energy is wasted. So how can the OEMs get more miles and improve efficiency? Hybrids and electric vehicles have helped, but we still have gasoline and diesel engines. If lighter materials are used, the challenge is keeping build costs down, and in turn selling prices, while also maintaining safety.

Over the past 20 years, we have seen more and more Advanced High Strength Steels (AHSS) trickle down from the high-end luxury vehicles to the mass-produced vehicles. We saw the same with aluminum components on panels for mass-produced vehicles, and now we are seeing aluminum-intensive vehicles in the less than \$50k price range. Over the past few years, we have seen high-end vehicles produced with Carbon Fiber Reinforced Polymer (CFRP). How far off do you think it is before CFRP is found in affordable mass-produced vehicles? Think about it this way: many OEs utilize plas-

tic or plastic composite for radiator core supports. How long will it be before they use CFRP to lighten the vehicle weight? In the near future this material will start to show up as structural components on affordable cars. Repair facilities need to be prepared to be able to repair these advanced-material vehicles.

Understanding the industry

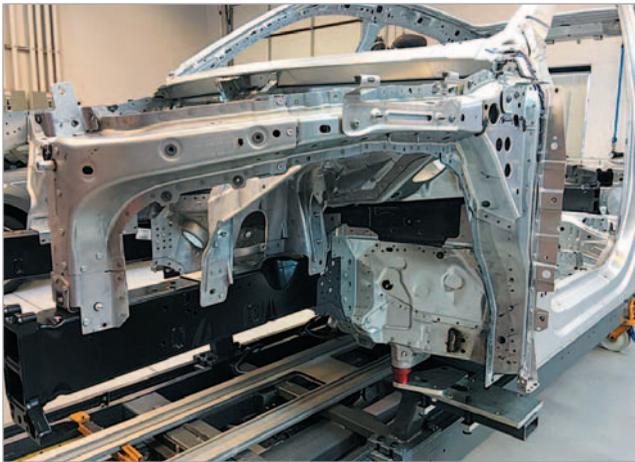
Some of you may be reading this and thinking that what I'm telling you is

nothing new. However, there are many shops across the country that are out of touch and are repairing vehicles in the same ways they were repaired in the '60s and '70s. If you are on any of the industry Facebook pages such as (but not limited to) Collision Repair Technicians United, Auto Body Repair, National Auto Collision Instructor Association or any of the other auto body groups, you will see posts asking for opinions on equipment choices for upgrades, ques-



MERCEDES-BENZ type aluminum T-weld

PHOTOS: LARRY MONTANEZ



AUDI Q7 frontal components — aluminum and steel



AUDI Q7 lower front aluminum rail sectioning bolt bonding



AUDI TT A-pillar sectioning rivet bonding, FDS bonding and bolt bonding



AUDI TT A-pillar sectioning rivet bonding, FDS bonding and bolt bonding

tions about repair procedures that seem to not make sense, material types and even how to handle a particular issue or problem pertaining to a claim. However, more often than many would prefer, you will see posts on clipping, rolling clip or full-body sectioning and how the posting technician feels they did a great job. Then all hell breaks loose. Comments roll in on why these procedures shouldn't be performed, and then egos kick in, and it gets ugly.

You will also see posts with panels that should be replaced, and there is body filler top to bottom, left to right, side to side, and once again an educational conversation turns into an ego measuring contest. Surprisingly, after all the mudslinging and name calling, most of the technicians who at first tried to de-

pend an incorrect repair come away actually understanding what they should have done.

A diagnosis from Dr. Montanez

The main issue is that many people in our industry suffer from one or more of several ailments. These ailments include:

1. A shop owner who will not invest in equipment and/or training
2. Technicians who are not properly trained
3. Technicians focused on completing repairs quickly as it impacts their pay, rather than on proper repairs
4. Shop management and/or estimators who cater to an insurer's preferences either on a direct repair or in an independent shop
5. Lack of knowledge on OEM repair

procedures, materials and/or state laws and rules

6. Lack of training on modern equipment
7. Techs and owners who don't read industry magazines or keep up with industry trends and technology.

Do you suffer from one or more of these? Dr. Montanez is going to help you overcome these ailments with the following prescriptions.

OEM certified repair programs

The European OEMs have set a high bar of standards for their Certified Collision Repair Facility (CCRF) programs. These OEMs have established requirements for CCRFs of ASE certification, I-CAR training, I-CAR welding certification and specific tool and equipment purchases to start on the program, followed up

with specific OEM training and welding certifications under strict ISO welding testing. Additionally, these OEMs monitor OEM parts and materials purchases and OEM repair information access and perform surprise in-shop inspections. Annual training must be met; welding certifications expire and require retesting to stay on the program. An added bonus is the restriction of certain components that are only sold to CCRFs. Generally, the component restrictions are for aluminum- or carbon-intensive vehicles. This is for two main reasons: first, the OEM ensures the vehicle is being repaired properly and second, the restriction of these components protects the investment the CCRFs have put in to the program.

A shop interested in these type programs must not only meet facility size and tooling, training, uniforms, office appearance, insurance coverage and distance to the sponsoring dealer, but must be sponsored by a dealer and have a relationship with that dealer. Investment costs in a European or Tesla CCRF program generally requires \$175,000-\$300,000 initial investment and an additional \$15,000-\$175,000 for each additional program.

So why invest? Easy — it is a great program if you are in the right demographic area. Many other OEMs have followed suit with similar programs but are not as strict. Most require all the facility insurance coverages, location to dealer(s), I-CAR train-

ing or even Gold Class Recognition or Platinum Individual Recognition*, ASE certifications (B2-B5 and B6), access to the OEM repair procedures (through the OEM or a third-party provider) and periodic in-shop inspections from VeriFacts or Assured Performance. (*Note: I-CAR does not certify technicians or repair facilities; they train. I-CAR does certify technicians for their welding tests.)

Almost all of these programs have a wide range of required equipment choices for structural, welding and tools. There are no parts restrictions (except Cadillac for the CT6). All OEM programs have collision repair websites for vehicle owners to find the closest CCRF, with a search by zip code and OEM CCRF signage and plaques identifying the facility as being on the program, generally requiring a yearly re-certification.

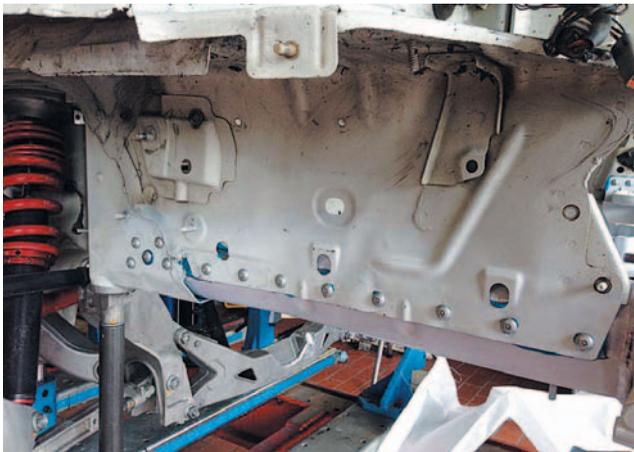
Why?

So why are the OEMs developing and supporting these programs? They want to ensure brand recognition, customer satisfaction for service and quality and



LAMBORGHINI carbon fiber and aluminum floor.

proper repairs; to keep the OEM warranties in force; and to have eligible trade-ins and lease returns meet requirements for Certified Pre-Owned (CPO) Programs. Additionally, many of the programs require the CCRF to only use new OEM replacement components, so they sell more parts. OEMs look at numbers and trends, and if a vehicle is deemed a total loss, or there are issues about a repair (come back or bring back), the consumer statistically blames the vehicle maker. In approximately 60 percent of these cases, the consumer will purchase or lease a different vehicle from another OEM. The goal for OEMs is to prevent this from happening by making the traumatic experience of having a consumer's second most expensive purchase less stressful when they are



PORSCHE 911 (996) lower rear rail FDS bonded



PORSCHE 911 (996) rear structure repair on a Celette.

involved in a collision event and have to deal with the insurance company and the repair facility. OEMs cannot manage or control insurance companies, but through CCRF programs they can control, audit, manage and keep checks and balances over participating facilities.

Advanced material and system repair

Steel — Vehicles are being produced with a wide range of multiple strength steels, aluminum, composites and computer-controlled electronic systems. Many repair facilities are not trained or equipped to repair these vehicles and diagnose and reset or relearn these systems. The CCRF programs help to alleviate these issues. Because of Advanced High-Strength Steels (ADHSS) such as Boron alloyed, Martensite, Dual-Phase, TRIP, TWIP and others, resistance welding is now the main requirement for

welding replacement panels back onto the vehicle structure. Silicon Bronze/MIG brazing has been adopted by a few OEMs for outer panel sectioning and/or panel attachment in specific areas. **Please note:** MIG brazing IS NOT an alternative to steel MAG welding and is only used on steel components. MIG brazing is only approved by a few OEMs for specific repairs in specific areas. Honda, VW and Jaguar/Land Rover utilize MIG brazing more than any other OEM. These OEMs have procedures for MIG brazing at not only sectioning joints, but in specific areas, such as panel attachment to structural AHSS components like the B-Pillar outer to reinforcement. Generally, this is performed through slotted holes with MIG brazing, using specific type electrode wire. Honda, Toyota and Mercedes-Benz utilize MIG brazing in specific sectioning areas on outer panels. No OEM has any procedures to uni-rail (frame) sectioning



MIG BRAZING-SILICON bronze weld training.

or uni-rail replacement using MIG brazing. Remember MIG brazing is not a fusion weld. Only use MIG brazing when and where the OEM specifically says to in their repair procedures.

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Conversely, some OEMs have some very different procedures for their steel vehicles. For example, BMW uses rivet bonding to affix replacement panels to the vehicle on mating flanges, some MAG plug welding on specific areas and an OEM insert/sleeve in sectioning areas on outer panels that is bonded only with a specific BMW adhesive and heating lamp required. Additionally, BMW requires two to four EMC (Electro Mechanical

Compatibility) screws to be installed on the replaced panel to ensure there is an electrical connection. And in the bonded sectioning areas, a special metal putty is required to smooth out the area. Ford and Chrysler/Dodge/Jeep require weld bonding for replacement of their outer panels and some inner reinforcements. On outer panels, Ford requires sectioning locations to be MAG seam welded, while Chrysler requires a bonded sleeve in the sectioning locations. These are just a few examples of why you must read the OEM procedures.

Aluminum — As most have learned by the Ford F-150 program, and some have known for years by being involved in the European, Tesla and Cadillac CT6 CCRF programs, aluminum repairs require rivet bonding for outer panel attachment to the structure of the vehicle. Some aluminum outer panel replacement procedures will require MIG welding (seam sectioning and plug welds). Some aluminum structural repair sectioning procedures will require bolts and adhesives. There are approximately 15 different rivets and 8 different adhesives used for replacement of aluminum components. You must follow the OEM repair procedures and protocols for the type of rivet and adhesive to use. Never mix or match materials between OEMs. Additionally, some of the adhesives require special applicator guns, and rivets have specific tensile strength and



PRE-MEASURING with electronic 3-dimensional equipment.

require specific guns, gun heads and even adapters to install the different rivets. Unfortunately, there is no one tool that can do it all.

For aluminum welding, you must first take a welding training class, such as I-CAR. Once you pass that training and testing you will need to practice 3 to 5 hours a week to become proficient at aluminum welding and to maintain your technique. With some newer vehicles, the OEM is mixing aluminum and steel together, like the Cadillac CT6 and Audi Q7. These hybrid construction-type vehicles will generally require bolt or rivet bonding on aluminum-to-steel mating flanges and STRSW on steel-to-steel mating flanges.

Composite and plastics — Plastic Composites, Fiber Reinforced Plastics (FRP), Sheet Molding Compounds (SMC), Reinforced Reaction Injection Molding (RRIM) and Reaction Injection Molding (RIM) — although still utilized for components on vehicles — will soon be replaced with Nano-Plastics, CFRP and Nano-Carbon Fiber. Repairs to these newer plastics are very similar to the repairs for plastic that we have been utilizing for the past 15 years, but with only a few changes, such as adhesive and heat curing. Conversely, if the damage extends to the edge of the component, then in many cases it will require replacement. BMW was the first company to introduce a multiple

or mixed-material construction vehicle, with the all-new 7 Series (G12) in MY2016. The G12 body is an AHSS, aluminum and CFRP mixed construction, and BMW claims the new 5 Series, X5 and X6 models will all be built similarly. Once again, it is imperative that the repair facility employees (estimator, manager, technician and even painter) review and understand the OEM repair procedures and protocols and adhere to them. Many OEMs will require their branded

adhesive material while others will allow choices from multiple adhesive brands.

The future

Expect more:

- Advanced steels that are thinner, lighter and stronger than what is available now.
- Aluminum outer panel components, both bolt-on and affixed
- Carbon fiber components and mixed material constructed vehicles.

Repair facilities will need to invest in equipment and training, and we predict more OEMs will restrict replacement components to those shops who are certified by the OEM.

One other procedure to mention is the pre- and post-repair scanning of collision-damaged vehicles. Review the OEM policies, which have been around for the past 20 years. After almost every collision event, the vehicle will require a pre-scan.

Our recommendation is that you keep up this technology by reading *ABRN* and taking training classes. Remember, no one knows what they don't know. 📞



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He is also a certified technician for multiple OEM collision repair programs.

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