YOU ALREADY ARE SEEING THE FUTURE

RIVET and bolt bond procedure

A LOOK AT ADVANCED MATERIALS, METALLURGY AND ESTIMATING

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Welcome to the future and what the future holds for the collision repair industry. Today's vehicles are constructed out of materials found on the space shuttle and more computers and electronics than the spacecraft used in the first 30 years of space exploration. Today's collision repair damage assessors (estimators) need to lead by example and set the bar higher.

Too many times we see that many are just data entry people with no real knowledge of vehicle construction, design, technology or repair protocols. I cannot tell you how many times I have spoken to a group and asked, "How many estimators are here by a show of hands?" and most of the class raised their hands. I then ask, "How many of you have I-CAR training?" and still most of the hands stay up. But when I ask how many are ASE certified, I wind up with only a few hands left.

Then I ask how many are on a certified OEM program from a European OE or Tesla, and that is when I realize why the hands of those few are still up. The European OEMs and Tesla are forcing their program shops to excel and train. Cadillac seems to be doing the same thing with the CT-6 program. But this is not the masses; it is the minority that is excelling and making the effort. The masses need to change their way of thinking and get on board with training and education or be left behind.

Metallurgy and advanced substrates

Metallurgy is the study of the structure and properties of metals; their extraction from the ground; the procedures for refining, alloying and the forming of components from them, such as full frames, monocoque stampings, structural parts and body panels for automotive use. This includes both steel and aluminum of various grades of strength. Damage assessors (estimators) need

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to understand these scientific principles and vehicle design to better determine the full extent of sustained damage. Additionally, damage assessors will also need to understand what the strengths of these materials are to determine repair vs. replace decisions, what may or may not be sectionable and what requires full component replacement.

Classifications for steel are different between the USA/Asian and the European vehicle makers for the same materials. Let's look at the comparison:

USA and Asia/Europe

• Low Strength (Mild Steel)/Standard Steel

• High-Strength Steel/High-Strength Steel, Higher-Strength Steel, Ultra-High-Strength Steel

• Ultra-High-Strength Steel/Highest-Strength Steel, Maximum-Strength Steel, Ultimate-Strength Steel

Although the classification names might differ, if we look at the material strengths, pounds per square inch (psi) of MegaPascal (MPa) we have a better understanding of the material we are working with.

• Low Strength/Standard Steels are steels that are 270MPa/39,160psi

• High-Strength Steel are steels that are between 271MPa/39,305psi to 700MPa/101,526psi for the USA and Asia.

The Europeans also use the 271MPa to 700MPa range, but split this classification into three different sub-categories. The low grade is called High-Strength and ranges from 271MPa to 400MPa/58,015psi; the next is the medium grade High-Strength called Higher-Strength, which ranges from 401MPa/58,160psi to 550MPa/79,770psi; and the top level in this category is the Ulta-High-Strength Steel, which ranges from 551MPa/79,915psi to 700MPa.

USA and Asia	Europe
Low Strength (Mild Steel)	Standard Steel
High-Strength Steel	High-Strength Steel, Higher-Strength Steel, Ultra-High-Strength Steel
Ultra-High-Strength Steel	Highest-Strength Steel, Maximum-Strength Steel, Ultimate-Strength Steel

Ultra-High-Strength Steel in the USA, Asia and Europe is any material stronger in strength then 700MPa. Once again, this category is broken into three sub-categories. The lower grade Ultra-High Strength Steel, Highest Strength Steel ranges from 701MPa/101,671psi to 900MPa/130,534psi; the medium range Maximum-Strength Steel ranges from 901MPa/130,679psi to 1500MPa/217,556psi; and the highest category is the Ultimate-Strength Steel, which is 1501MPa/217,701 and higher. This category is also referred to as Advanced-High-Strength Steels.

Information analysis

The OEM repair information is paramount to writing a proper and accurate damage report (estimate). The damage assessor must check in the construction materials section of the OEM repair information to know what type of substrate it is and the strength of the component. Additionally, the assessor must check the repair procedures to know if sectioning or full components replacement is required, along with the required materials and additional labor. Today's damage assessor needs to know how to properly repair vehicles and have the documentation to prove it; assuming is not the answer.

In the coming years, OEMs will be producing not only hybrid construction vehicles, such as the Mercedes-Benz C and S-Classes, Audi TT and Q7, Cadillac CT-6, Porsche Panamera and 911 to name a few, but mixed-material vehicles (steel, aluminum, composites) such as the Audi R8 and BMW 7 Series, which a constructed from various grades of steel, aluminum and carbon fiber reinforced plastic (CFRP). Training for the technicians, the damage assessors and insurance personnel will be required. For Model Year (MY) 2016, Honda released a newer version of their Advanced Compatibility Engineering (ACE) body structure, which has specific areas that will crumple intelligently in a collision event and direct the collision impact forces away from the occupants. Additionally, Honda introduced their 3-Bone Platform Structure, which improves impact load management around the passenger compartment while reducing overall weight. The floor pans contain additional reinforcements strategically placed to direct the collision pulse through the floor pan. After a collision, these reinforcements will require inspection, and if damaged, must be replaced. The new 3-Bone floor pans are Advanced

MERCEDES-BENZ quarter panel replacement

High-Strength Steel (590MPa-780MPa).

BMW introduced the new redesigned 7 Series for MY2016, and it is constructed with Advanced High-Strength Steels, aluminum and carbon fiber. Carbon fiber is used for inner structural reinforcements. BMW has stated that this design will be utilized on the 5/6 Series and X5/X6 SAVs in MY2017. Repairing aluminum has been a major issue for most of the shops that are not involved in the European aluminum OEM programs, and carbon fiber will be just as difficult for the masses as we see mixed-material vehicles on the economical vehicles.

Estimating

A big misconception in the industry is the reparability of some of the materials, such as the Advanced HSS and aluminum. Structural aluminum for the most part cannot be repaired. Some OEMs allow movement of only +/- 3mm to be repaired on aluminum structural components. Fractures (rips/tears), cracks, stress markings, significant bends or kinks to aluminum cannot be repaired and must be replaced. Aluminum outer cosmetic panels in some cases may be repaired, but the technician must be proficient with metal shaping and not sculpting with body filler. B-Pillars on almost every vehicle made in the past five years have a reinforcement that is constructed from Martinsite (Hot-Stamped) or Boron alloyed steel. Any displacement and/or deformation of the reinforcement requires replacement of the reinforcement. Always check with the OEM procedures prior to attempting any repair.

Adding to this issue of advanced material is all of the electronics and safety features in vehicles. Today's electronically advanced vehicles are driven by multiple computers all communicating with each other. For years OEMs have required scanning to relearn or reset systems, but this information was buried in the mechanical information, and too many collision repairers were too lazy or uneducated to look at the mechanical procedures. For this reason we are seeing OE after OE issue position statements about pre- and post-scanning.

Another thing this industry needs to understand — both repairs and insurers — is that many of the outside-view mirrors are now equipped with not only blind-spot warning sensors and LEDs, and lane departure radar/sensors, but now many OEMs are installing the side-view camera for the all-around camera system. Thus, replacing a side-view mirror assembly on the door will now require the alignment and re-initializing of the camera to the system and the aiming of the camera if necessary. Because of the back-up cameras, this procedure many times will require a four-wheel align-

ment. Additionally, vehicles with autonomous features also require four-wheel alignments when cameras are moved or replaced.

Any shop's SOPs must include the following:

• Complete description of the event, who was in the car, weather conditions, road conditions, what was impacted, any issues observed now, day or night, etc…

• Pre-wash vehicle to better view the damage and to ensure all dirt, grime, grease, debris and waxes are removed prior to repairs.

• Walk around the vehicle and start your analysis in the opposite corner of the impact.

• Take photos overall and drill in close-ups.

• Take notes.

• Pre-scan the vehicle.

• Check with the OEM repair information for procedures and inspections required after a collision.

• Pre-measure the vehicle mechanically with quicks checks. If any deviations are discovered, pre-measure the vehicle with 3D electronic measuring equipment and also measure the suspension components (EME 54® Theory).

• Write the damage report, and check with the repair procedures for operations and required materials (foams, rivets, adhesives, FDS, etc). While you are doing this, have the vehicle disassembled for more analysis.

• Review the damage report after the vehicle is disassembled and make any additions or corrections.

• Check all parts prices from the OEM.

• Print a final copy and work order, and conduct a meeting with the foreman, technician and parts manager.

• Place the vehicle in the waiting area for all parts to arrive.

• Wrap and store all reusable components.

By adhering to these SOPs you will ensure the following:

1. Damaged components and procedures were all addressed and no hidden or unknown damage will be discovered (supplement).

2. This is basically your final invoice, except for the dealer services (wheel alignment, scanning, resets, etc.). Changes in judgement labor times are either additions or subtractions.

3. There will be little to no delays in the repair, as the vehicle was fully examined and diagnosed, and there wil be no surprises.

4. There will be no wasted time on supplements, because all the damage was viewed up front.

5. There will be better utilization of equipment and man power, as vehicles will move smoothly through each department and not be delayed waiting for parts due to unseen damage.

Due to the complexity of today's vehicle designs and substrates, damage assessors need to understand what it takes to structurally repair a vehicle and how it must be affixed to the structural realignment apparatus or bench (frame machine). Two hours has never been a standard, and it has never been a body labor operation. There are some vehicles that will take 2.0 hrs and others can be 7.0 hrs for the set up and removal and storage of anchors. Damage assessors must be fully educated in what the operations and tasks are and how to calculate them. The amount of time required to affix the vehicle to the bench would be dependent on what type bench system you are using. Some examples would be:

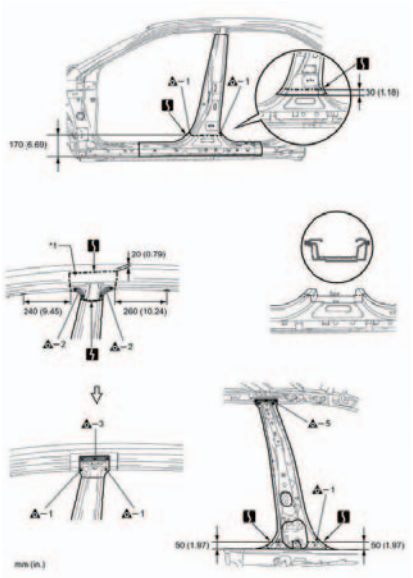
• Affixing the vehicle to a Celette Bench, which requires renting dedicated fixture jigs

• Affixing it to a CarBench/Global Jig, which would require building the universal jigs for the specific vehicle.

• Affixing it to a Car-O-Liner, which would require building the EVO jigs for each vehicle application

• Or does the vehicle maker allow standard pinch weld anchoring to a standard bench, like Chief or another universal machine like Spanesi?

Damage assessors need to acquire the knowledge of the required operations and tasks, as the times for the procedures for these different apparatuses vary greatly. Today's vehicles require very little structural realignment time (pull time) and much more time to anchor them to the bench. You must also consider the additional — not included, but required — operations that damage assessors must address, calculate and charge for.



2015 TOYOTA CAMRY sectioning center body pillar

To sum it up, today's damage assessors, technicians and insurance adjusters must think differently and make attempts to go to training and learn more about the industry. People's lives are at stake and many seem concerned with profits and loss statements and alphabet acronyms like KPI, GP, NP, CSI, DRP, etc., but not with proper repairs following the OEM procedures. Today's vehicles are so far advanced that we can no longer assume and make business decisions, as doing so could expose not only the shop to a lawsuit but the damage assessor and technician, too.

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