



# M Y T H B U S T E R S —



## Aluminum Style

Separating fact from fiction when it comes to the metal that's taking the collision repair industry by storm.

**By Larry Montanez**

**S**ince Ford announced their 2015 Ford F-150 body was going to be constructed of aluminum, the collision repair industry has been in an uproar over aluminum repair. I was asked by *BodyShop Business* to offer some facts about aluminum and dispel some of the myths.

### Not New

First and foremost, I'm here to tell you the truth: aluminum is not new. There-

fore, aluminum repair is not new. I myself have been involved with the Audi aluminum program since 1996 and have been through all the trials and tribulations about aluminum repair.

We know this will be the first time a mass-produced vehicle from an American car company will be constructed from aluminum, but back in 1979, the collision repair industry was in an uproar over the monocoque design (a.k.a. unibody) coming to an American mass-produced vehicle, the 1980 Chevrolet Citation. As we all know, the monocoque design wasn't new in 1980; it

was just something that the U.S. wasn't all that familiar with. We know better now, don't we?

In 1917, Nash Motors utilized the monocoque design. Through the '30s, other companies used this design as well. In the '50s, Mercedes-Benz introduced their first monocoque, the W120 body or the 180, and started mass producing it in Germany. In the '60s, Ford produced the Lincoln Continental (at the time, the largest and heaviest monocoque) and, of course, the late '60s saw the Japanese monocoque design invade the U.S. The proliferation of the monocoque design was the main reason I-CAR was formed – to teach us about them and how to repair them properly.



History is now repeating itself with aluminum. After Ford made headlines with the F-150, GM is now stating that the 2018 Chevrolet Silverado and GMC Sierra will feature aluminum-intensive bodies with HSS steel full frames.

### True or False?

Since Ford's announcement, we've seen a lot of information about aluminum, some of it true but much of it incorrect. Additionally, we've seen multiple equipment manufacturers produce aluminum repair equipment for the first time and many "so-called experts" attempt to tell the masses what the procedures are, lots of whom are downplaying these procedures and protocols. I'll hopefully clear the air and set things straight in this article. Remember, I do not sell equipment, nor do I represent any of the OEMs. What I do is educate people on the proper procedures, protocols, materials and equipment to properly repair

aluminum- and steel-intensive vehicles.

Let's look at some of the statements we've all heard and separate fact from fiction.

### **Aluminum is new to the automotive industry and is something we've never seen before.**

**FALSE**

The Berlin Motor Show in 1899 showcased two aluminum-constructed show cars. From the '20s through the '90s, many foreign OEMs produced aluminum-intensive sports cars. But that all changed in 1994 with the Audi A8. The Audi Space Frame (ASF) is considered the first mass-produced aluminum intensive vehicle, but even the A8 was a rarity in a U.S. collision repair facility.

In the following years, more and more European and German OEMs produced luxury, high-end, aluminum-intensive vehicles such as the Acura NSX, Jaguar XJ and XK, and Audi R8 and TT. Even

Land Rover jumped into the aluminum-intensive design in 2014. We saw a hybrid construction vehicle (aluminum and steel monocoque) in the mid-2000s from BMW (2004-2010 5 and 6 Series), and 2008 in the Audi TT and Porsche Panamera. Since 2008, many OEMs have adopted aluminum strut towers affixed with rivet-bonding, including Audi, BMW and even Cadillac with its ATS. And I believe we'll see more and more of this type of hybrid construction from OEMs. How long do you think it will be before Ford offers the Taurus or GM offers the Impala as an aluminum-intensive vehicle?

### **Repairing aluminum is a lot harder than repairing steel.**

**TRUE & FALSE**

Aluminum can be very difficult if not downright impossible to work with, but it

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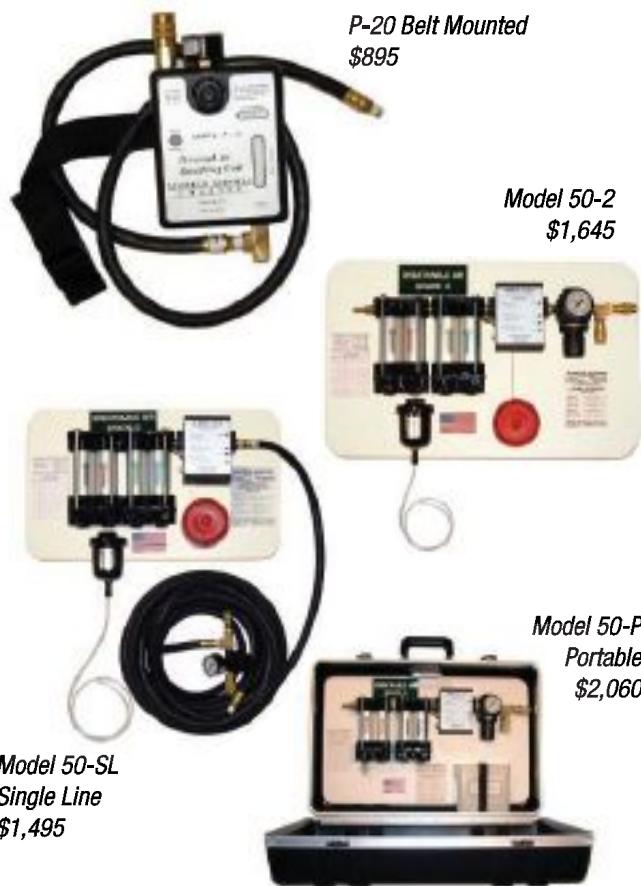
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is NOT hard to repair or work with if you know what to do.

Aluminum is very different from steel, and we must think differently. And different means change, and we all mostly hate change.

I've been using the analogy of the change from lacquer to urethane and urethane to waterborne refinishing processes as a comparison to what we're going through with aluminum. These changes weren't difficult, just different. We had to change our old procedures for slightly different ones.

### **Aluminum particles mixing with steel can cause an explosion.**

**TRUE** Although many of the so-called experts say it isn't a big deal, it is – and you should heed the warnings. Not keeping aluminum and steel separated from each other can cause an explosion when the particles are mixed in the correct ratio and an ignition is introduced. Many of the OEMs have required a curtained off area, commonly referred to as a "clean area," but others are now requiring a clean room constructed from three walls and a curtain or roll-up gate in the front with an explosion-proof exhaust fan system.

### **I have to have an aluminum isolation station or clean room to repair aluminum vehicles.**

**TRUE**

As I mentioned already, you'll need a "clean area" or "clean room" due to cross-contamination issues between steel and aluminum. Galvanic corrosion forms when the particles from steel and aluminum come in contact with one another in the presence of the elements. Corrosion is defined as "the degradation of materials by chemical reaction with the environment in which the material resides." This is because of metal oxidation. As metals have a tendency to return to their natural state, it's a natural process which produces either salt or oxides. It requires four elements: anode, cathode, an electrolyte and a metallic path. For this reason, you'll need a portable vacuum system for grinding, welding and sanding.

### **You have to be certified to repair the Ford F-150.**

**FALSE**

Ford has a certification program that requires dealership sponsorship, but it is not restricting parts and is providing repair procedures with their service parts. Conversely, OEMs such as Audi (A8, TT, R8), Jaguar (XJ, XK), Land Rover (Range Rover), Mercedes-

Benz (S Class, SL Class, SLS Class) and Porsche (911, Panamera) are restricting structural service parts to certified collision centers only. I predict you'll see more OEMs restricting structural service parts.

### **You have to spend \$100,000 to get all the proper equipment to repair aluminum.**

**TRUE**

To an extent, the investment will require new tools, equipment and training, which could cost \$70,000 to \$100,000 as an initial investment. Almost every OEM is requiring aluminum welding certification where the cost can be \$1,000 to \$15,500 with an every-sixth-month, two-year or five-year recertification test. If you're on multiple OEM programs, you may have to purchase multiple aluminum welders, rivet guns and other hand tools, where the cost can climb to \$500,000 to \$700,000. Structural realignment equipment is required. Many of the OEMs have developed certified aluminum collision repair programs that outline the equipment required to be certified to repair their aluminum vehicles. Check with the vehicle manufacturer(s) for their specific requirements. Additionally, there is construction costs for the clean room, electric and exhaust.

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## I have to buy a new welder to weld aluminum.

**TRUE**

One of the big lies being told is that you can convert your steel MAG welder into an aluminum MIG welder with a spool gun. This setup is nice for hobbyists, but it's not for professionals repairing vehicles. The welders required for automotive-grade aluminum welding are computer-controlled machines that are pre-programmed for the specific parameters needed to perform the proper welds in all positions. In most cases, you'll need to set the material thickness and make practice welds. Generally, you'll need to adjust the stickout (-3 to +3 range), material thickness (+/- 0.2), gun angle and/or speed up or slow down your movement to obtain the proper weld.

## You have to use separate, dedicated tools for aluminum.

**TRUE**

For the most part, you'll need to purchase a lot of new tools. Some are very common, such as reciprocating saws and locking pliers, while others are specialty tools such as rivet guns and adhesive guns. Most of the OEM certified repair programs will require that a shop purchase specific tools to be on the program. Generally, hand tools such as ratchets, sockets and screwdrivers can be used

on both steel and aluminum vehicles; you just need to wipe them off. Conversely, sanders, cutting saws, sandpaper, cutting blades, drill bits, hammers and dollies will need to be purchased to use exclusively on aluminum.

## My techs have 20-plus years of experience, so they don't need training to be able to repair aluminum.

**FALSE**

This is the biggest misconception I've seen in the collision repair industry, for steel and now for aluminum. There are as many individuals in the collision repair industry as there are in the insurance industry who don't understand how to properly repair steel cars. And there is even a larger percentage in both fields who know nothing about aluminum. There are so many people who live and work in such a small area that they continuously only work on the same vehicles and therefore feel they don't need any training. Ask yourself this question: If everyone knows so much about collision repair, why are there so many posts and articles about improper repairs? And I'm not talking about mismatched color or parts issues but subpar welding, sectioning and structural misalignment. Training and new equipment is needed more now than ever before.

## Aluminum will mostly be replace versus repair.

**TRUE**

When compared to steel, yes. There is almost no repair to aluminum structural components except full component replacement or sectioning. As far as outer panels are concerned, generally they're replaced. What I've seen in my aluminum outer body panel repair workshop is that damage you think is repairable is generally not, and damage that appears unrepairable is sometimes repairable. But that's for a different article.

## Conclusion

I hope this article has cleared up some of the myths about aluminum. Obviously, we can't answer every question in one article, but feel free to contact me or *BodyShop Business* with any questions you might have.

The bottom line is that you'll need to invest time and money into training and equipment purchases to be successful at aluminum repair. The future is here now. **BSB**

Larry Montanez, CDA, is co-owner of P&L Consultants with Peter Pratti Jr. P&L Consultants works with collision repair shops on estimating, production and proper repair procedures. They conduct repair workshops on MIG and resistance welding, measuring for estimating and advanced estimating skills. P&L also conducts investigations for insurers and repair shops for improper repairs, collision repairability and estimating issues. Larry is ISO 9606-2 Certified for Audi and Mercedes-Benz and is a certified technician for multiple OEM collision repair programs. He can be reached at his office at (718) 891-4018, cell (917) 860-3588 or info@PnLEstimology.com.

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