



SCRS OEM Technology Event Includes Plenty of Focus on Aluminum Repair

Aluminum was front and center throughout much of the collision repair portion of the 2014 SEMA tradeshow, including at one of the new features of this year's event: the "OEM Collision Repair Technology Summit," hosted by the Society of Collision Repair Specialists (SCRS).

The day-long summit brought together shops, automakers and equipment manufacturers to discuss what SCRS Executive Director Aaron Schulenburg called a "topic that affects every segment of the industry."

"There is no bigger conversation right now than the changing landscape of automotive design and how that influences the repair of a vehicle," Schulenburg said as the summit began.

Sessions during the event covered OEM shop certification programs, changing vehicle designs impacting repairs, and the increasing use of steel alternatives, including aluminum.

Doug Richman, vice president of engineering and technology for Kaiser Aluminum, said Ford's introduction of the all-aluminum 2015 F-150 pickup is just part of a 4-decade-long expansion in the use of aluminum by automakers. Over that time, the average vehicle has come to have about 400 pounds of aluminum, including such parts as wheels and cylinder heads and blocks. That's about 10 percent of the curb weight of the average vehicle. It's gone up by about 7 pounds per year since the mid-1970s, but has risen by 14 pounds per year for the last three years.

While Richman is quick to note that steel is not going away, the rate of growth in aluminum use is expected to be maintained over the next decade, according to a recent study commissioned by the aluminum manufacturers association. The study, Richman said, is conducted every three years and relies not on projections but on actual vehicle programs committed to by automakers. It forecasts that by 2025, seven out of 10 pick-ups will be all-aluminum, and 547 pounds (or 16 percent) of the average vehicle weight will consist of aluminum, including an increasing percentage of crash parts and body structures.

"Our experience has been [the

study has] been conservative for 21 years," he said. "For seven consecutive reports, [it has] been very close but conservative."

The most obvious reason for the shift is the weight savings aluminum offers as automakers work to meet increasing federal fuel efficiency requirements. The new F-150 is about 700 pounds lighter than its predecessor, and 400 pounds of that savings is accounted for by the switch to aluminum, Richman said.

"Your industry has a great deal of know-how in managing – at least technically what needs to be done – the aluminum side of the business," he said. "But I've heard repeatedly in conversation on the [SEMA tradeshow] floor that the skillsets to do that work properly may not be on the shop floors yet. In the case of aluminum body structure repair in particular, the skillsets are really critical, because it's not like welding and repairing steels body structures."

Separate area, dust extraction crucial for aluminum repair safety, not just quality

Most European automakers call for a separate "clean room" – set off from the rest of the shop by brick-and-mortar – for repair of aluminum. Though its requirements for Ford F-150 certification are somewhat less stringent, Ford requires the repair area be curtained off. A separate dust extraction system for these repair areas is also required.

Most shops recognize the need to prevent steel or aluminum dust from contaminating vehicle parts made of the other type of metal. But the dust extraction is also critical to prevent a potentially hazardous build-up of aluminum dust which can be explosive. Sixty-eight people were killed this past August in such an explosion in a factory in China that polishes aluminum wheel rims.

During a session at the Society of Collision Repair Specialists' "OEM Collision Repair Technology Summit," in Las Vegas in November, "Mark Allen of Audi of America noted that aluminum oxide was a key ingredient in the "bunker buster bombs" that the U.S. military used in Afghanistan.

"For a shop to say they can't afford to designate a certain amount of square footage in a shop for aluminum is not a good statement to make," agreed General Motors' Leo Gruzgas, who said his company has new aluminum-intensive vehicles in the pipeline. "Everybody needs to have an area where they can do that specialized work and to make sure the materials are separated and that everybody stays safe."

But the change also improves how the truck rides and maneuvers, he said. There are also safety advantages.

"Every single vehicle that has been converted to aluminum has had higher safety ratings than the steel version it replaced," Richman said. "A lot of that is design, but also the energy absorption capability of aluminum."

Richman focused much of his presentation on "repair considerations" related to aluminum.

Richman offered several key pieces of advice for shops as they prepare to work on more aluminum vehicles. First, he said, automaker recommended procedures are going to be more crucial than ever. Car companies can choose from a wide variety of aluminum materials, each with its own tempers and characteristics, he said. Even knowing the "number" designating a type of aluminum isn't enough.

"When you see a number like '6061,' what you need to understand is every manufacturer of 6061 has a different formulation – or in fact multiple formulations – that are 6061 materials," he said. "Just because it says '6061' doesn't mean it acts like the '6061' on the next vehicle you see. They are very different. Be certain that you consult the OEM recommended repair practices for the specific model, because even within a manufacturer, they have varying practices depending on the specific design or model."

Dust management is another crucial element of aluminum repair, Richman said, even aside from the risk of galvanic corrosion if aluminum or steels 'contaminate' the other (see sidebar).

"I want to make sure you understand that aluminum dust is potentially an explosion hazard," he said. "I personally don't ever want to hear about a shop having a fire or explosion with aluminum dust. I know this isn't news to you, but I want to reinforce it. There's lots of stories about businesses that burned to the ground because they didn't manage this."

Using the automaker-specified joining process is also critical, Richman said, given the impact to aluminum's strength in the heat-affected zones around welds. That's why use of self-piercing rivets and bonding are often the process-of-choice in the manufacture and repair of aluminum vehicles. Again, following manufacturer guidelines for rivets and adhesives are critical, he said. Use of the incorrect adhesive, for example, may not ensure the necessary gap for the adhesive is maintained between the pieces being joined, he said.

Schulenburg said the response SCRS received to its inaugural OEM Collision Repair Technology Summit convinced him it is an event that will continue.

"This does not end here today. This is the beginning of a very long conversation," Schulenburg said. "It will be ongoing. As technology continues to evolve so should the discussion. This is the first of many 'OEM Collision Repair Technology Summits,' and we're excited to launch this program."