

# What Parts Are Actually Considered Structural?

By Larry Montanez III, CDA and Jeff Lange, PE

Classifying which vehicle components are “structural” has been an ongoing debate in the collision repair industry. With the help of this article, you should be able to determine for yourself which parts are (or can be) considered “structural” by understanding the various definitions and position statements of the suppliers, manufacturers and repair “authorities.”

Let’s look at what some recognized authorities in the collision repair field have to say about structural parts:

**I-CAR:** I-CAR defines a **Structural Part** as: “Any of several parts that support vehicle weight and absorb collision energy and road shock.” (*UPCR’s Glossary 01 GL01, page 14*)

**IIHS** (*Insurance Institute for Highway Safety*): David Zuby, chief research officer for the IIHS, was quoted in *Consumer Reports* as saying, “The vehicle structure is part of a complex system designed to protect people in crashes, as well as hold up the engine. There’s a lot of engineering that goes into making a crash protection system.”

**SAE** (*Society of Automotive Engineers*): The SAE defines structural parts as follows in Standard J2376: Surface Vehicle Recommended Practice New-Vehicle Collision Repair Information:

**“3.2 Structural Parts:** Parts that support vehicle weight and absorb road shock, while maintaining the vehicle shape. Structural parts also absorb and manage collision energy.”

Based on the above statements, there are a few common denominators, including supporting vehicle weight and absorbing collision energy and road shock. Which components contribute to this? The statements are ambiguous at best with regard to specific components or systems. Many OEMs - including VW, Audi, BMW, Mercedes Benz and Toyota, among others - have position statements as to which parts are structural. Always check with the OEM website or [www.ALLDATACollision.com](http://www.ALLDATACollision.com). What we are hoping to do is give you some guidance as to which component should be considered structural if the OEM does not have a position statement.

The following components are considered structural due to their contribution to absorption of collision energy (CE), road shock (RS), supporting vehicle weight (SVW) and airbag timing (AT):

- Front and Rear Bumper Reinforcements, Stays, Mounts and Crush Caps/Rail Extensions (CE, AT)
  - Steel, Aluminum or Composite
  - Generally, repairs are limited to sanding and refinishing. Most OEMs require replacement if there is any deformity.
- Radiator Core Support (CE, AT, SVW)
  - Steel, Aluminum or Composite
  - Bolted, Welded or Combination attachment
  - Generally, cosmetic damage can be repaired on steel supports (except VW, Audi, Porsche vehicles). Aluminum and composite supports generally require replacement if there is any damage or deformity.
- Front Structure
  - Upper Uni-Rail and Lower (Side Member) Uni-Rails (Frame) (CE, RS, SVW, AT)
  - Strut Tower (SVW)
  - On steel components: Must be replaced if “kinked” and if “bent.” Some require replacement due to the type of substrate. If any deformities, cracks or tears are present in the crush zones/convolutions, the component must be replaced or sectioned (if allowed by the OEM).
  - Aluminum and composite components generally require replacement or sectioning (if allowed by the OEM) if any deformities, cracks, tears or misalignment are present. Generally, structural realignment is prohibited (some limited OEMs allow structural realignment).
- Firewall/Dash Panel (CE, SVW)
  - Steel components: Generally, repairs are allowed. If the panel is laminated (“Quiet Steel”), some repairs may be allowed by the OEM.
  - Aluminum or composites generally require replacement, although the cost of repairs and the structural integrity and liability issues would make the vehicle a total loss.



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■ A, B, C, D Pillars (CE, RS, SVW, AT)

- On steel components: Generally, outer panel repairs are allowed. Reinforcement and inner components generally require replacement or sectioning (if allowed by the OEM).
- Aluminum and composite components generally require replacement or sectioning (if allowed by the OEM) if deformed.

■ Floor Pan Crossmembers (CE, RS, SVW, AT)

- Generally require replacement if deformed, regardless of the substrate construction.

■ Front Seat Frames (CE) and Rear Seat Lower Frame (CE)

- Generally require replacement if deformed.

■ Rocker Panel, Inner and Outer (CE, RS, SVW)

- Steel components: Generally, outer panel repairs are allowed. Reinforcement and inner components generally require replacement or sectioning (if allowed by the OEM).
- Aluminum and composite components generally require replacement or sectioning (if allowed by the OEM) if deformed.

■ Front and Rear Door Intrusion Beams (CE, RS, SVW, AT)

- Generally require replacement if deformed, regardless of the substrate construction.

■ Most Quarter Panels (depending on the OEM's classification) (CE, RS, SVW)

- Generally repairable, but may require replacement depending on the amount, location and backside access of the damage.

■ Rear Wheelhouse Inner and Outer (CE, RS, SVW)

- Generally repairable, but may require replacement depending on the amount, location and backside access of the damage.

■ Rear Body Panel (CE, RS, SVW)

- Generally repairable, but may require replacement depending on the extent, location and backside access of the damage.

■ Rear Uni-Rail (Side Member/Frame) (CE, RS, SVW, AT)

- On steel components: Must be replaced if "kinked" and if "bent." Some require replacement due to the type of substrate. If any deformities, cracks or tears are present in the crush zones/convolutions, the component must be replaced or sectioned (if allowed by the OEM).
- Aluminum and composite components generally

require replacement or sectioning (if allowed by the OEM) if any deformities, cracks, tears or misalignment is present.

- Generally, structural realignment is prohibited. (Some limited OEMs allow some structural realignment.)

■ Roof Bows and Upper Inner Roof Rails (CE, RS, SVW)

- Generally require replacement if deformed, regardless of the substrate construction.

■ Full Frames (CE, RS, SVW, AT)

- Generally repairable, but may require replacement depending on the extent, location and backside access of the damage. Most OEMs prohibit the use of heat and only a select few allow the use of heat for stress relieving, but limit the amount of heat and the length of time for application.
- Some OEMs have specific sectioning procedures for the front frame rail crush zone and rear rail.

The following components are considered "secondary structural" due to the fact that they play a role in support of the vehicle weight and "assist" the structural components:

- Front Apron Panels
- Passenger Floor Pan
- Trunk Floor Pan
- Roof Panel
- Some Quarter Panels (depending on the OEM's classification)

Generally, secondary structural components are repairable, but may require replacement depending on the extent and location of the damage and OEM requirements.

You should always adhere to all OEM repair procedures and requirements. If none exist, use the recommendations above as a guideline. However, many OEMs have published their procedures, position statements and requirements. Please keep in mind that your decisions regarding the guidelines associated with structural part replacement affect your customer's safety. Wrong choices or "business decisions" may put your customer at risk of injury and expose you to liability if improper repair procedures result in reduced occupant safety. When in doubt, please ask someone who can help you make an educated decision. The OEM, the I-CAR Tech Centre and ALLDATA are good sources of information. As always, you can contact us at any time. If you are considering deviating from an OEM or other authoritative recommendation, you can always consult your lawyer regarding your responsibility should that choice prove to be a mistake. Hopefully, this article has brought to your attention the importance of understanding which components are considered structural, the processes required to replace or

repair them and what needs to be done to restore the vehicle to pre-loss condition.

Feel free to contact us at any time if you have any questions that we could help with.



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