RCI-52-22-010-3: Model Year 2022-2024 R1S Material Matrix and Repair Guide

Rivian Automotive, LLC Service Document

Document Type	Collision Repair Information Document
Date	October 31, 2024
Affected Region(s)	USA
Affected Model(s)	R1S
Model Year(s)	2022-2024 Vehicles
Vehicle System	52 - Body

Rivian body and frame structures have been assembled from different grades of a variety of materials. These materials include, but are not limited to, stamped steel, aluminum sheet, aluminum extrusions, and molded plastics. Before starting a repair, refer to the tables and diagrams in this document to identify the type of material being worked on and the allowed operations for each type of material.

Table of Allowed Operations

Color Key	Material Type	Welding		Heat Straightening	Cold Straightening
		GMA	STRSW		
	Conventional Steel	Yes	Yes	Max of 600°C up to 60 seconds (limit 2 times**)	Yes
	Advanced High Strength Steel	Yes	Yes	No	Yes
	Ultra High Strength Steel	No*	Yes	No	Yes
	Press-Hardened Steel	No	Yes	No	No
	Aluminum Sheet	Yes**	No	Max of 60° C**	Yes
	Aluminum Extrusion	No*	No	No	No
	Plastic	N/A	N/A	Yes***	Yes***
*Except as directed in vehicle specific repair procedures.					
**Refer to Material Repairability Method Guidance for additional limits.					
***Following industry standard procedures.					

Material Repairability Method Guidance

Straightening:

- Allowed for repairs on damaged panels depending on material type, provided the base material is not compromised after the repairs, as defined below:
  - Metal is NOT over stretched from original condition (typically observed as “oil-canning”).
  - Metal is NOT thinned down from original condition.
  - Metal is NOT cracked. If cracks exist, GMA weld repair is acceptable depending on material type, as defined in the table of allowed operations.
- When appropriate, Paintless Dent Repair (PDR) and/or glue-pulling are preferred.
- Structural pulling is NOT allowed, except as defined in the Structural Pulling section of this document.
- Heating of panels during straightening operations is acceptable depending on material type, as defined in the Table of Allowed Operations..

CAUTION: Do NOT heat adhesive bonded joints above 100° C unless the adhered component is being replaced.

GMA Welding:

- May only be performed with approved welding wires.
- Allowed for repairs of minor tears or punctures in conventional steels as well as aluminum sheets of less than, or equal to, 1.2mm in thickness.
- Allowed as specified in the vehicle specific repair procedure(s).
- Refer to the General Repair Guidelines for additional information.

Resistance Welding:

- Recommended when replacing factory spot welds.
- Refer to the General Repair Guidelines for additional information.

Sectioning:

- In some cases, may be allowed for partial replacement.
- Refer to the vehicle specific repair procedure(s) for additional information.

Repair Limitations

Aluminum Repairs:

- Only use aluminum-specific tools and equipment when repairing bare aluminum.

Plastic Repairs:

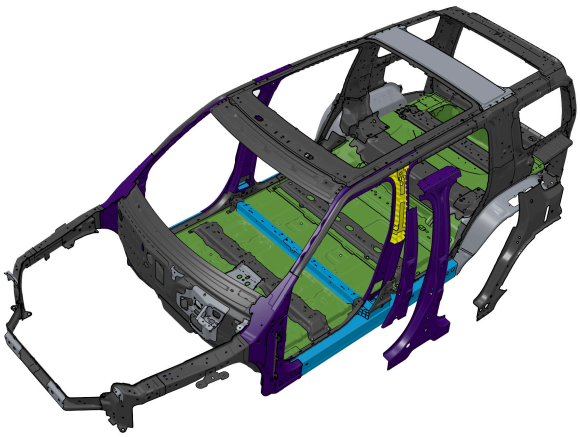
- Most plastic components can be repaired with special tooling, adhesives, and proper training.
- Direct repair of minor broken tabs is preferred as compared to full component replacement, whenever possible.
- Fascia repairs for vehicles equipped with radar sensors behind the plastic fascia are limited. Refer to the No-Repair Zone for vehicle specific requirements.

Safety Components:

- Deformation damage in the vicinity of impact sensors, seat belts, airbags, and other safety components may NOT be repaired. Damaged structures in these areas must only be replaced. Refer to RCI-72-24-001-1: R1S Supplemental Restraint System (SRS) Overview and Servicing Guidelines for component locations.

Material Identification

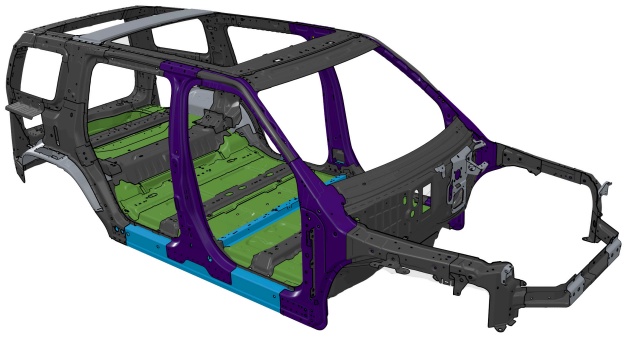
Body Structures



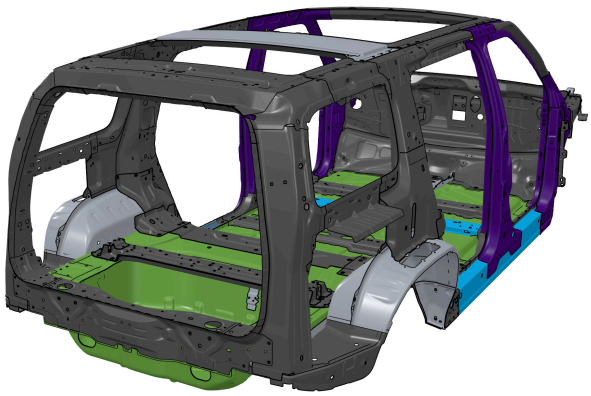
Color Key	Material Type
	Conventional Steel
	Advanced High-Strength Steel
	Ultra High-Strength Steel
	Press Hardened Steel
	Aluminum Extrusion
	Plastic

Body Structures - Additional Views

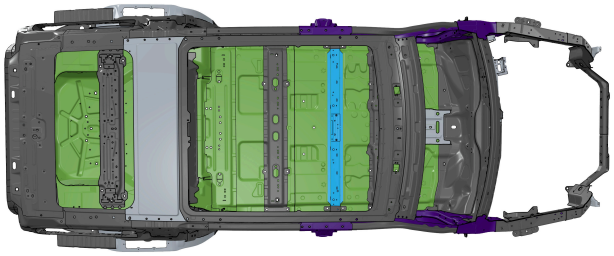
Quarter View - Front Right



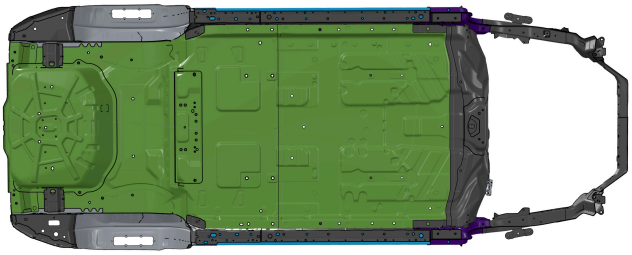
Quarter View - Rear Right



Top View



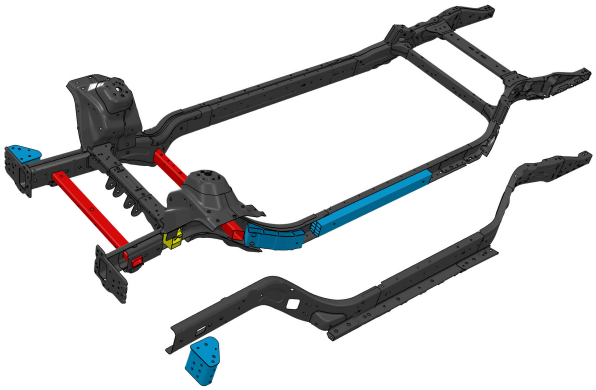
Bottom View



Closures & Exterior Trim

Color Key	Material Type
	Conventional Steel
	Aluminum Sheet
	Plastic

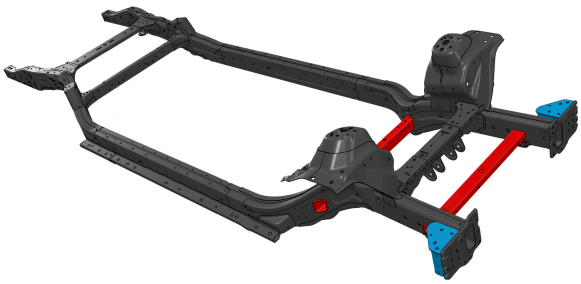
Frame Structure



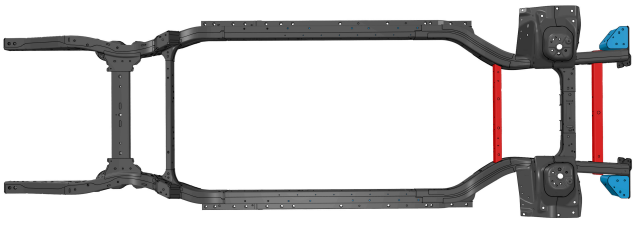
Color Key	Material Type
	Advanced High-Strength Steel
	Ultra High-Strength Steel
	Aluminum Extrusion
	Plastic

Frame - Additional Views

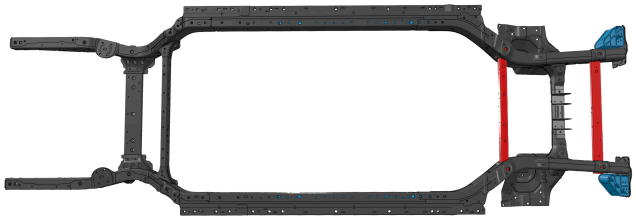
Quarter View - Right Side



Top View



Bottom View



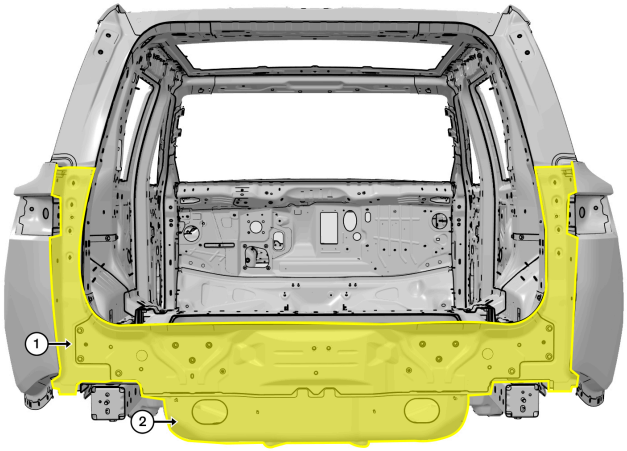
Repair Guide

Cosmetic Sheetmetal Repairs

Rivian recommends glue-pulling for light dent repair, especially when the paint finish is not broken and there is a possibility of completing the repair without refinishing. When dents are beyond the capacity of glue-pulling, welded pin pulling of the damage is preferred over component replacement, as long as the repair adheres to the guidelines for the specific material type.

Areas of Concern

The rear body panel section between the tailgate mounts, as well as the spare tire wheel well, may experience denting in minor rear end impacts. Cosmetic repair of this damage within the material repair guidelines is recommended instead of full component replacement, provided there are no indications of more damage to the underlying structure, or other concerns that would require replacement of the entire panel.



Number	Component
1	Back Panel, Outer
2	Panel Box, Spare Tire

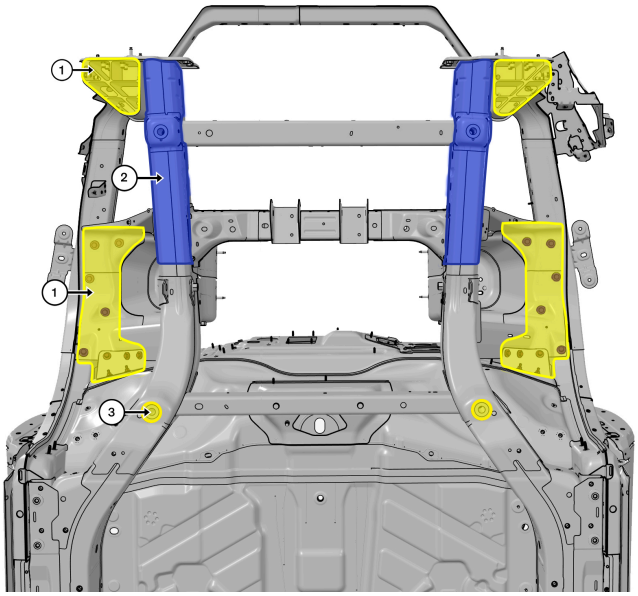
Structural Pulling

Rivian defines “structural pulling” as electrically or hydraulically assisted pulling of collision damage. Rivian recognizes structural pulling has been a historically accepted practice in the collision industry. However, given that Rivian uses a mixture of conventional and advanced designs, materials, and joining methods in its body structures that can be compromised when subjected to such forces, Rivian does not recommend usage of structural pulling outside of the strict guidelines in specific scenarios defined below.

Front Frame Rails

The front rails can be pulled back into alignment only for deflection of less than or equal to 6mm from nominal as measured at the end of the rail, provided there are no signs of damage to the frame in other sections. When performing a structural pull on the front rails, the rest of the vehicle must be secured with the minimum required number of fixturing points, as specified in RCI-98-23-002-3: Rivian Repair Guidelines. Additionally, bolted connections between the frame and upper body should also be removed, temporarily, to prevent damage to the upper body structures, as shown below.

Important: Rails that show compression damage must be replaced to ensure proper performance in any future collision event.

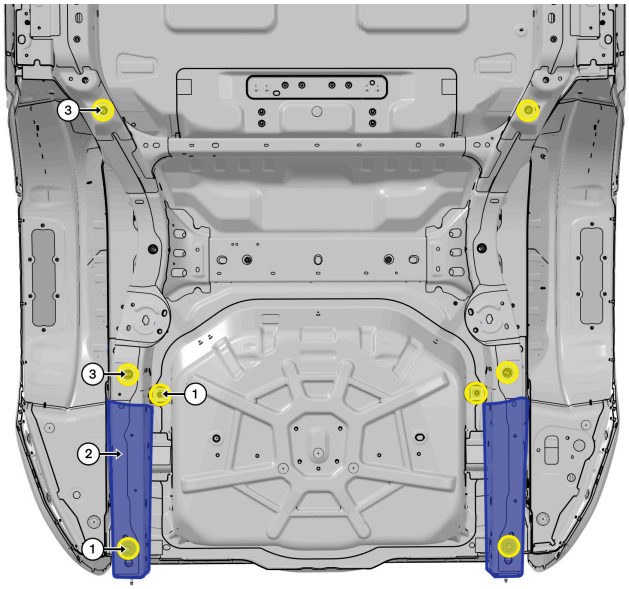


Number	Component
1	Bolted Connections
2	Front Rail
3	Fixturing Points

Rear Frame Rails

The rear rails can be pulled back into alignment only for deflection of less than, or equal to, 6mm from nominal as measured at the end of the rail, provided there are no signs of damage to the frame in other sections. When performing a structural pull on the rear rails, the rest of the vehicle must be secured with the minimum required number of fixturing points, as specified in RCI-98-23-002-3: Rivian Repair Guidelines, including the points identified in yellow below. Additionally, bolted connections between the frame and upper body should also be removed, temporarily, to prevent damage to the upper body structures, as shown below.

Important: Rails that show compression damage must be replaced to ensure proper performance in any future collision event.



Number	Component	Notes
1	Bolted Connections	Some fasteners are only accessible from above (cabin-side).
2	Rear Rail	N/A
3	Fixturing Points	N/A