OEM DISCUSSION | ADVANCING TECHNOLOGY

INSPIRING AND PREPARING THE TECHNICIANS OF TOMORROW

Mobilize Summit 2023

AGENDA

- Introduction
- The Future of Vehicle Innovation
- ADAS Calibrations & Scanning
- Resources
- Careers & Training
- Summary

Safety, enhancements in vehicle design, and comfort are the forefront priority of a transformative movement toward Zero Emission Vehicles (ZEVs)

INTRODUCTION

DAVID SOSA

Manager, Rivian Automotive

Collision Research &
Development Workshop

JOEY GRAMMATICO

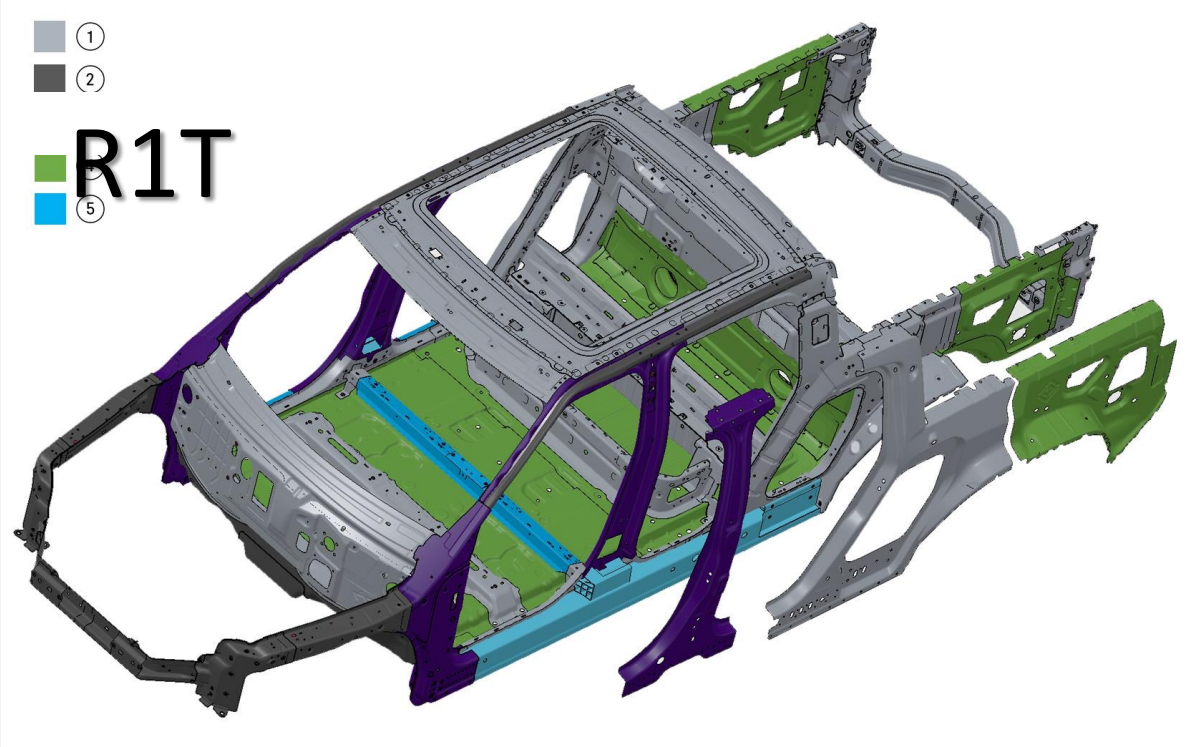
Manager, I-CAR

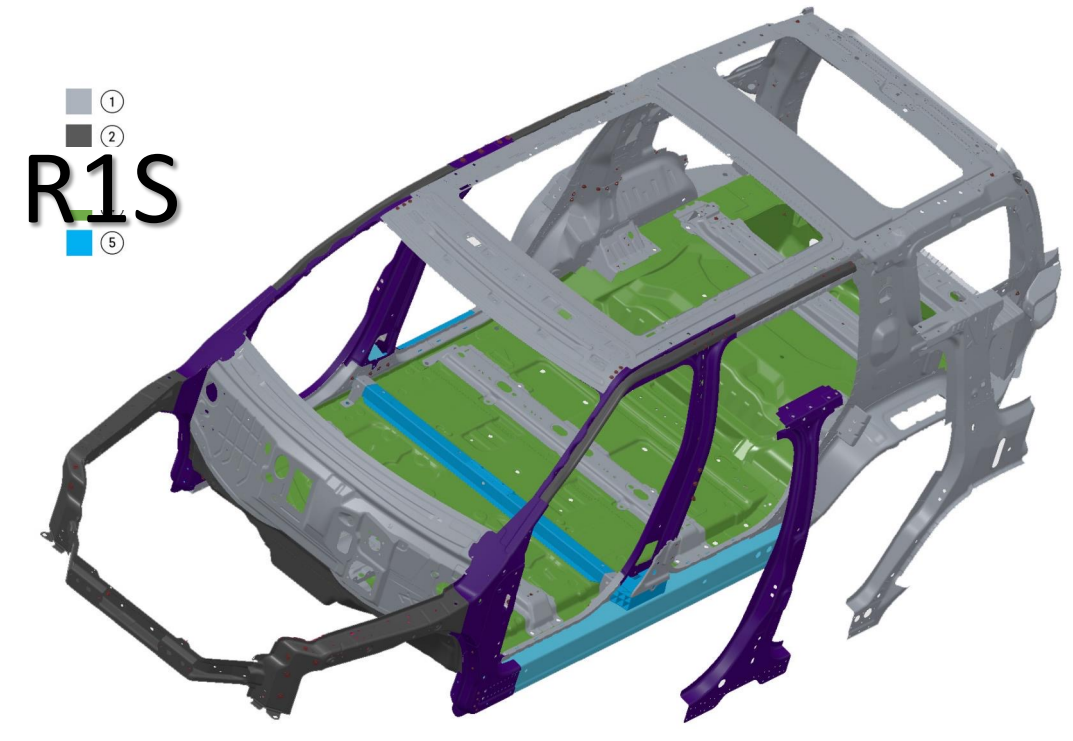
Product

The Future of Vehicle Innovation Is Here

- RIVIAN -

Material Matrix- R1 Tophat (Body)



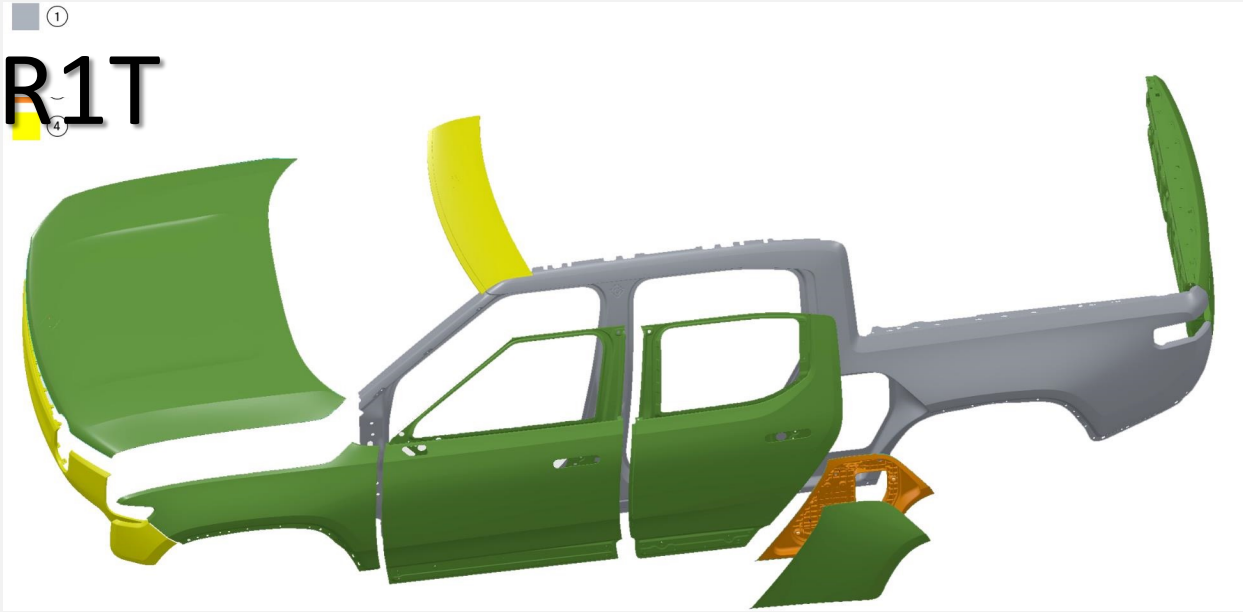


- Conventional Steel
- Advanced High Strength Steel
- Press Hardened (Hot Stamped) Steel
- Aluminum Sheet
- Aluminum Extrusion

RIVIAN

Material Matrix- R1 Closures

R1T

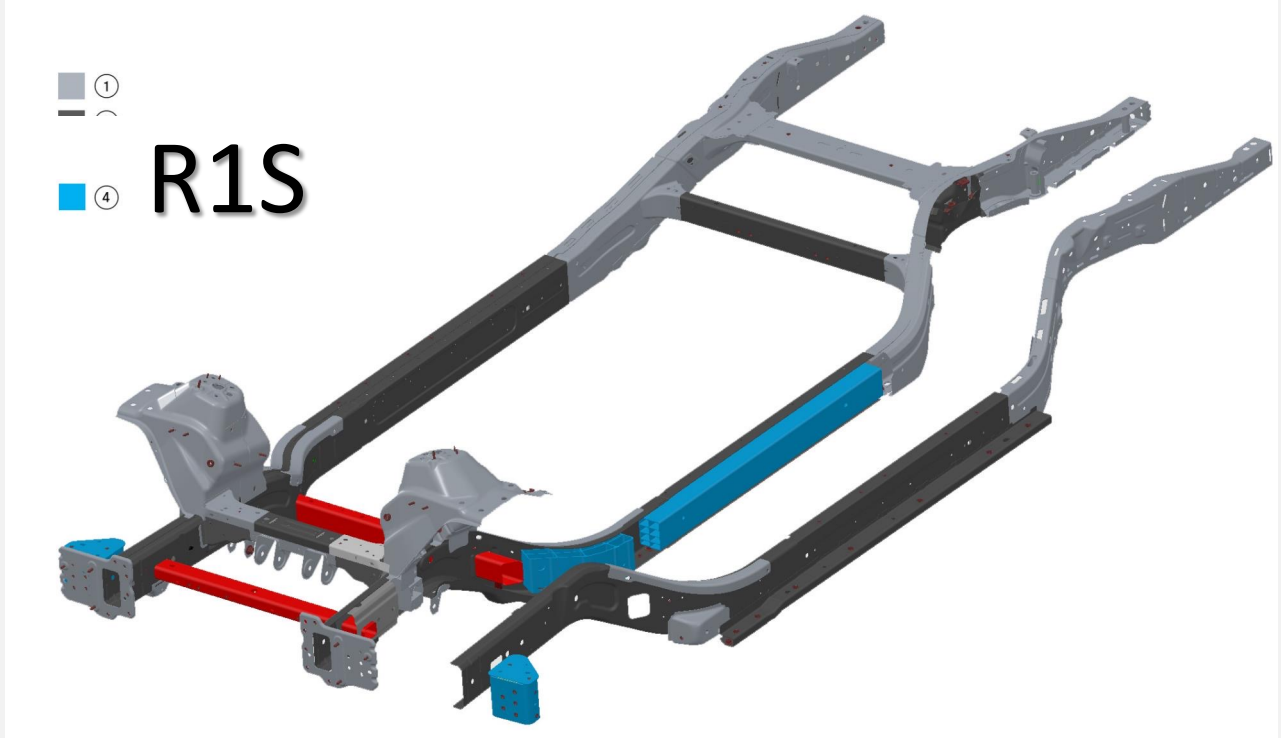


R1S

- Conventional Steel
- Aluminum Sheet
- Magnesium
- Plastic

RIVIAN

Material Matrix- R1 Skateboard (Frame)



Conventional Steel

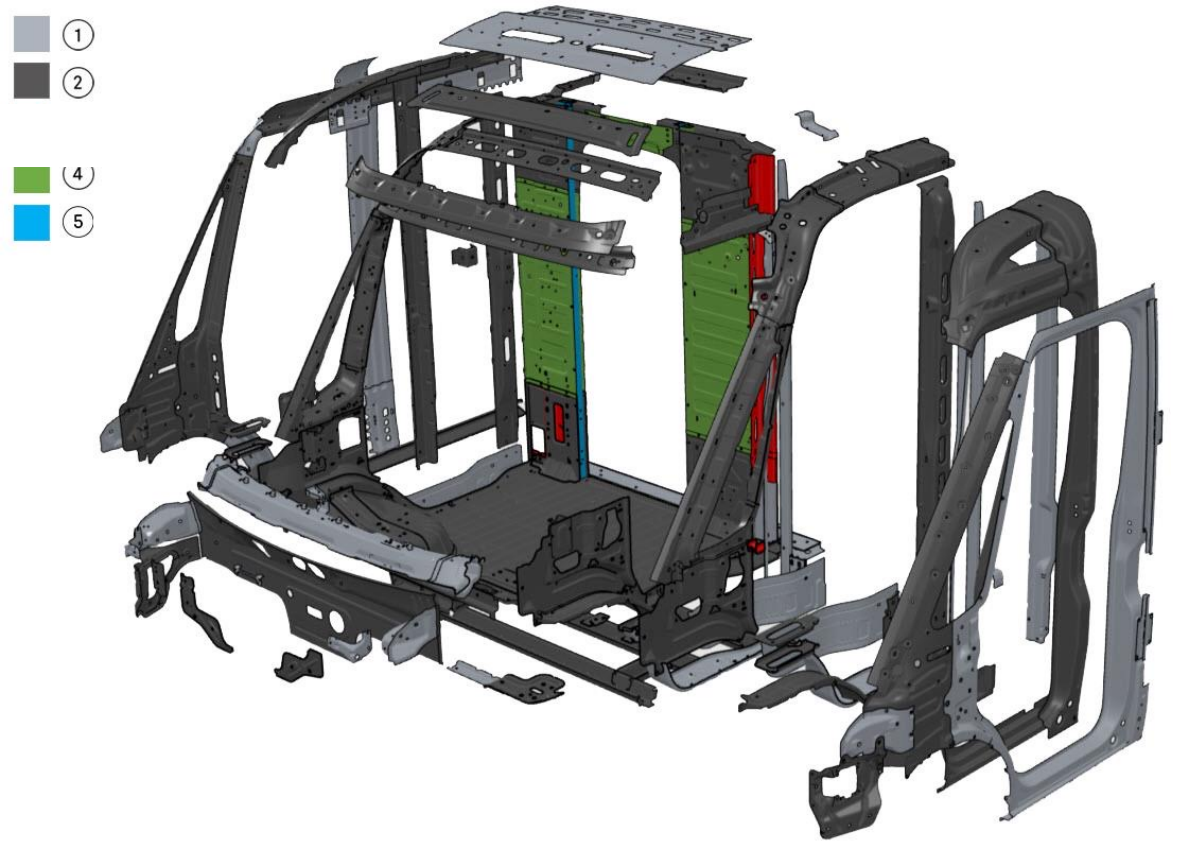
Advanced High Strength Steel

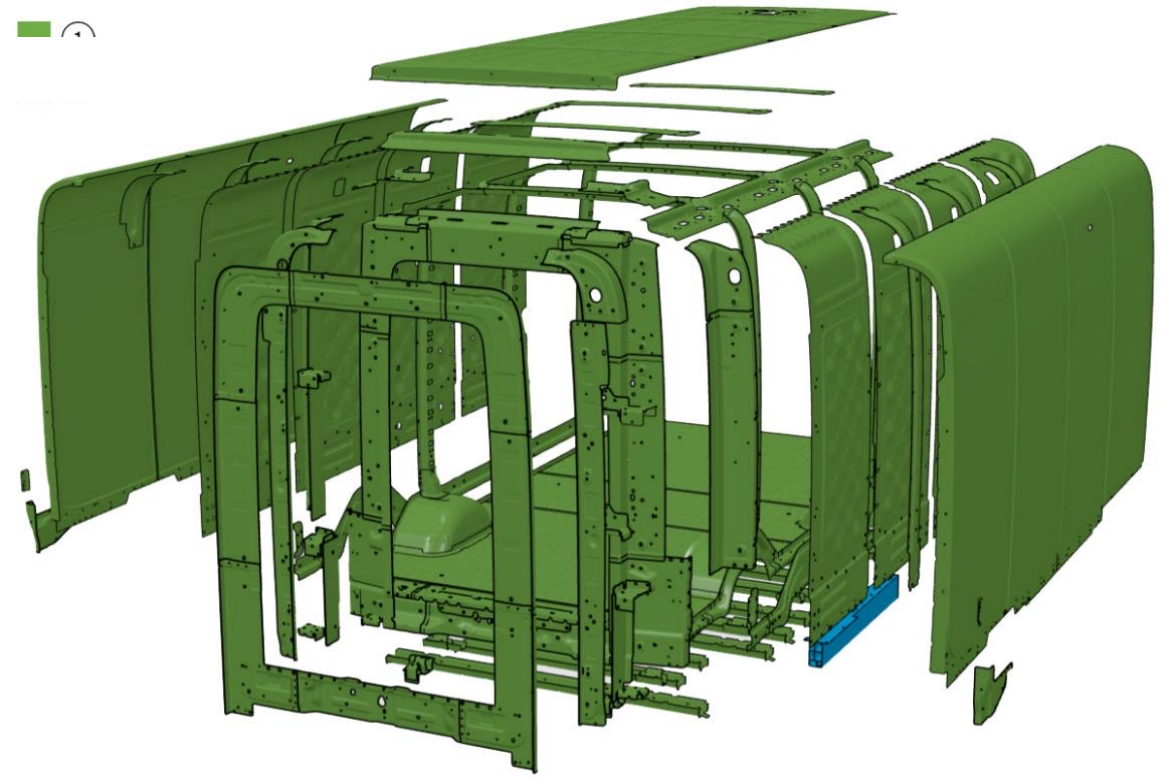
Ultra High Strength Steel

Aluminum Extrusion

RIVIAN

Material Matrix- EDV Tophat (Body)





Conventional Steel

Advanced High Strength Steel

Ultra High Strength Steel

Aluminum Sheet

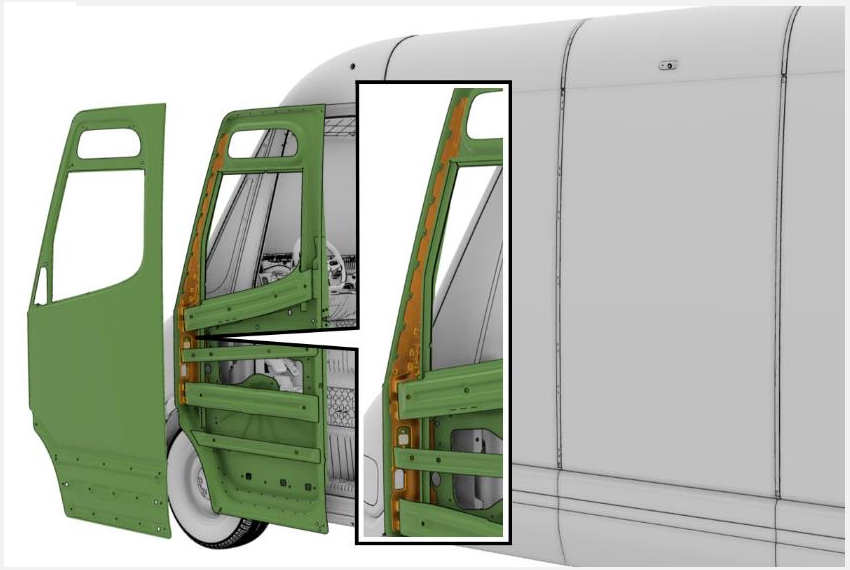
Aluminum Extrusion

RIVIAN

Material Matrix- EDV Closures

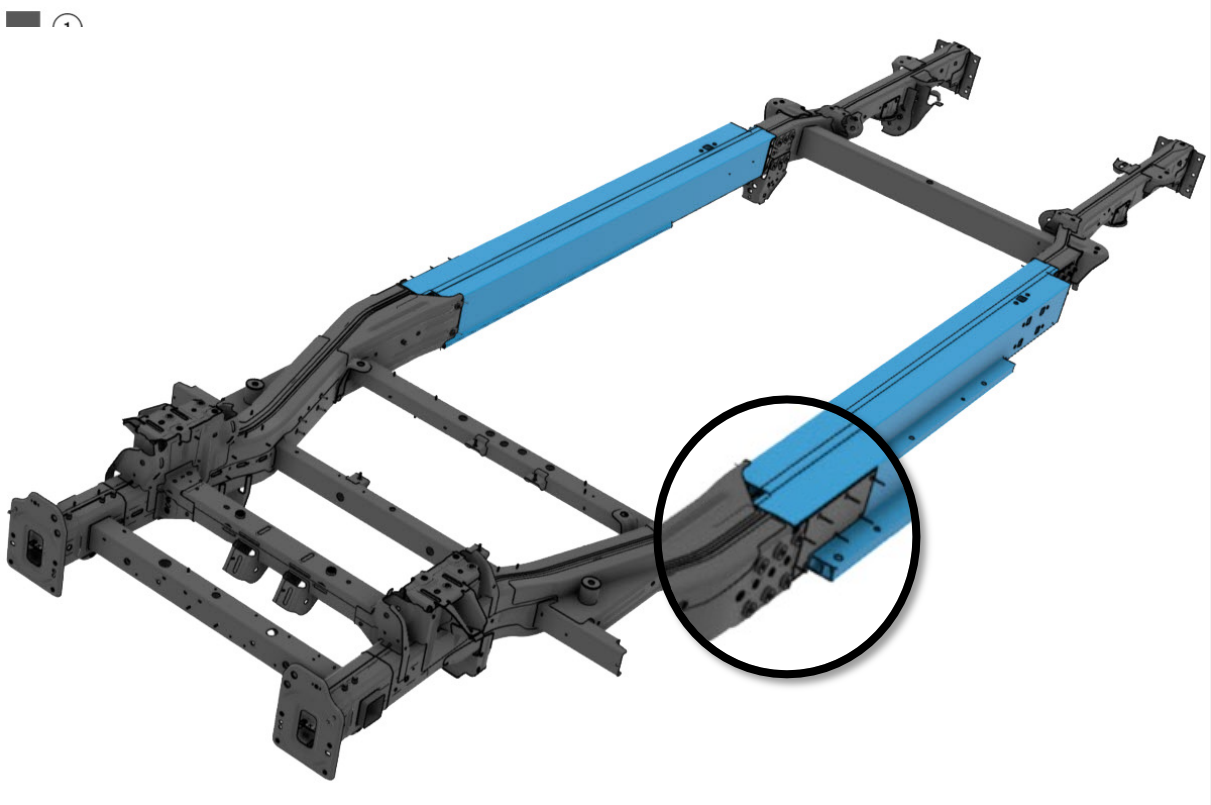
Aluminum Sheet

Plastic



RIVIAN

Material Matrix- EDV Skateboard (Frame)



Advanced High Strength Steel

Aluminum Extrusion

RIVIAN

Material Repairability Guide

Use of Heat When Straightening?

Heat Application Frequency?

Damage Severity?

Color Key	Material Type	Welding		Heat Straightening	Cold Straightening
		MAG	STRSW		
	Conventional Steel	Yes	Yes	60 sec. @ 600° C	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	60° C	Yes
	Aluminum Extrusion	No	No	No	No
	Magnesium	No	No	No	No
	Plastic	N/A	N/A	N/A	N/A

Aluminum sheet tears?

Sectioning?

GMA Welding

High Voltage Battery Pack- Inspection and Support

RCI-30-23-001-1: High Voltage (HV) Battery Storage and Handling Guidelines

Rivian Automotive, LLC - Service Guideline

Document Type	Collision Repair Information Document
Date	February 6, 2023
Affected Region(s)	USA
Affected Model(s)	All Models
Model Year(s)	2022+
Vehicle System	30 - High Voltage Battery

Important:
- This procedure requires RiDE. Review the RiDE instructions specific to this procedure before starting work.
- Some RiDE routines are restricted and will need to be performed by a Rivian service center.

Attention:
- Always refer to the Rivian service manual for up-to-date information regarding the disablement of the High Voltage (HV) system and safety precautions/steps to follow prior to performing any work on the HV system.
- Rivian recommends that only Factory Certified Service Technicians inspect and repair the HV System in Rivian vehicles. Please contact your regional Rivian Collision/Service Team to request more information or for assistance with repairs

General Information

To promote and maintain its rigorous standards of quality and safety, Rivian Automotive provides the collision industry with important information, and safety precautions, to use when storing and handling HV battery packs.

Warning:
To lower the risk of possible electrocution, always assume the HV battery pack, and associated components, are energized and fully charged until their status can be verified by following the HV disabling guidelines in the service manual.

Warning:
Exposed HV electrical components, cables, and batteries present potential HV shock hazards that could result in bodily injury or death.

Warning:
Any venting/off-gassing HV battery vapors may be toxic and/or flammable and could result in bodily injury or death.

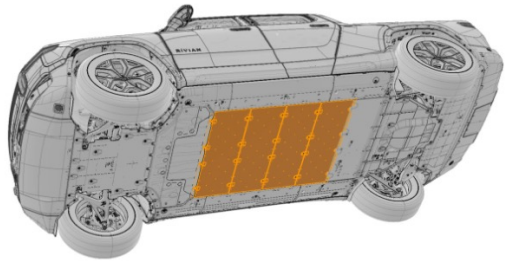
Warning:
Physical damage to the HV battery may result in a fire or in immediate, or delayed, release of toxic and/or flammable gases which could result in bodily injury or death.

Battery Damage Inspection

Warning:
A HV battery, pack as well as all related HV components, pose a significant electrocution risk if the enclosure or the built-in safety components have experienced significant damage during a collision event. Rivian strongly recommends that you contact your regional Rivian Collision/Service team for assistance with repairs.

If possible, prior to allowing the vehicle to enter the shop area, perform the steps in the table below to ensure the vehicle is safe to work on. Make sure there is adequate ventilation prior to performing the inspection and always maintain clear access to the vehicle for proper monitoring and emergency response access, if needed.

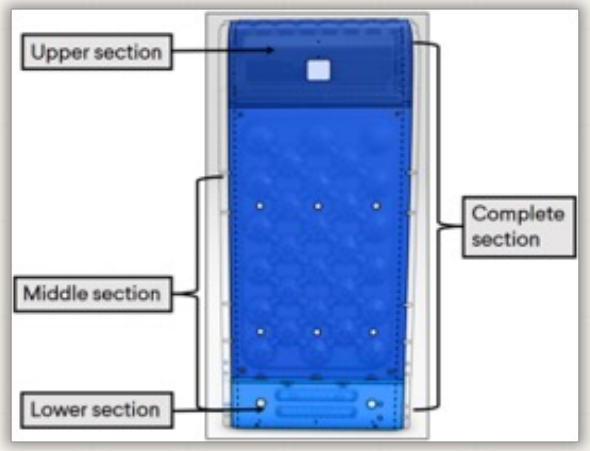
Areas of Inspection



No.	Inspection Point	Inspect For	Action
1	Battery Enclosure	Sparks, smoke or flames	Call Emergency Services
		Electrical odors and fumes	
		Gurgling or bubbling noises	
2		Any external leak(s) of battery cooling fluid (check coolant level)	Contact your regional Rivian Collision/Service Team to request more information or assistance with repair.
		Signs of moisture accumulation and possible corrosion	
		Any deformations, cracks, dents, or tears that compromise the battery internals	
		Damaged HV Connectors	
		Damaged Enclosure Seals	
		Evidence of electrical arc event resulting in welding or spatter marks	

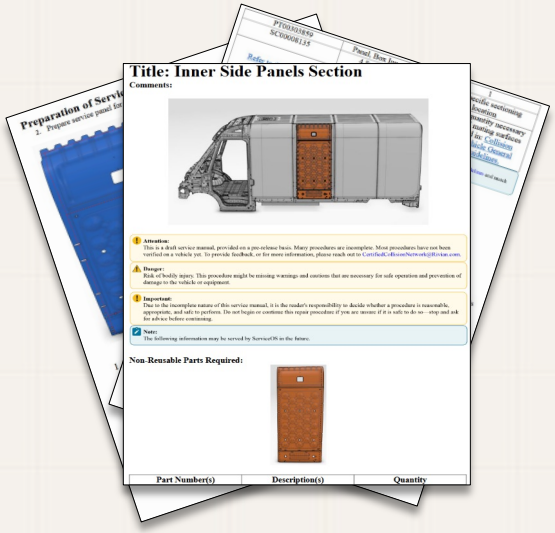
RIVIAN

Repair Procedure Research- Unique Repair Sectioning

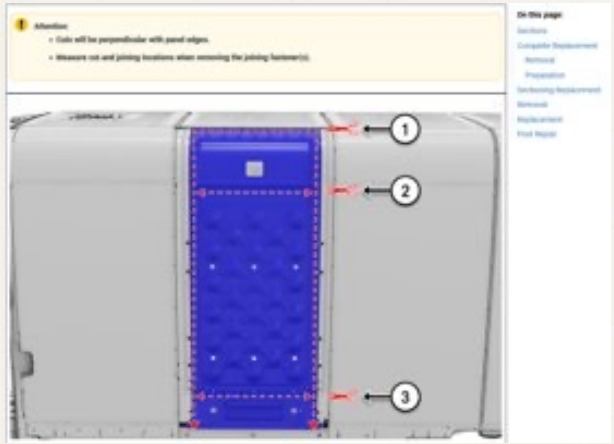


1. Investigate Alternate Repair Options

2. Design the Repair



3. Daft the Procedure



4. Design Final Procedure

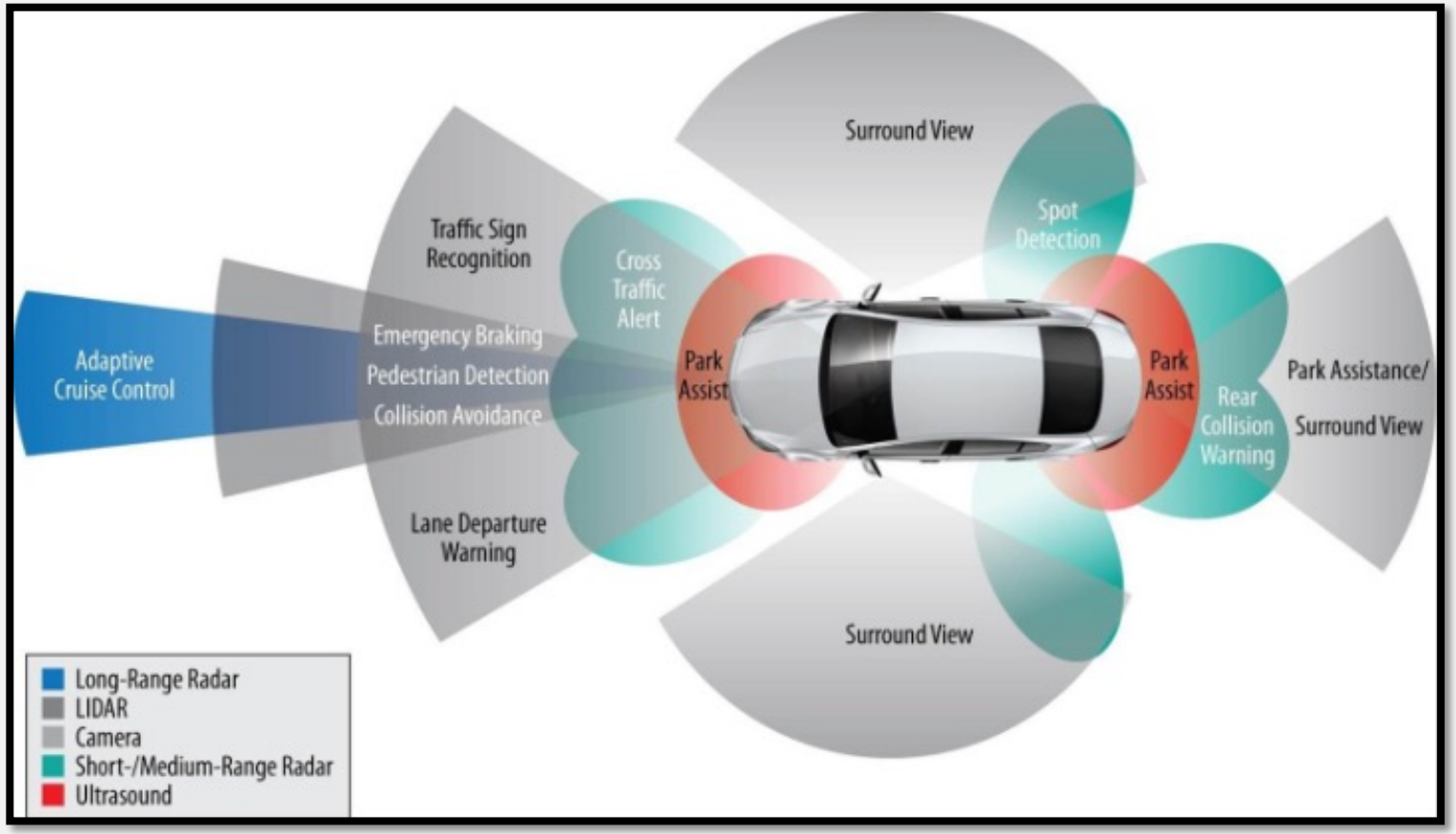
5. Physical Validation

RIVIAN

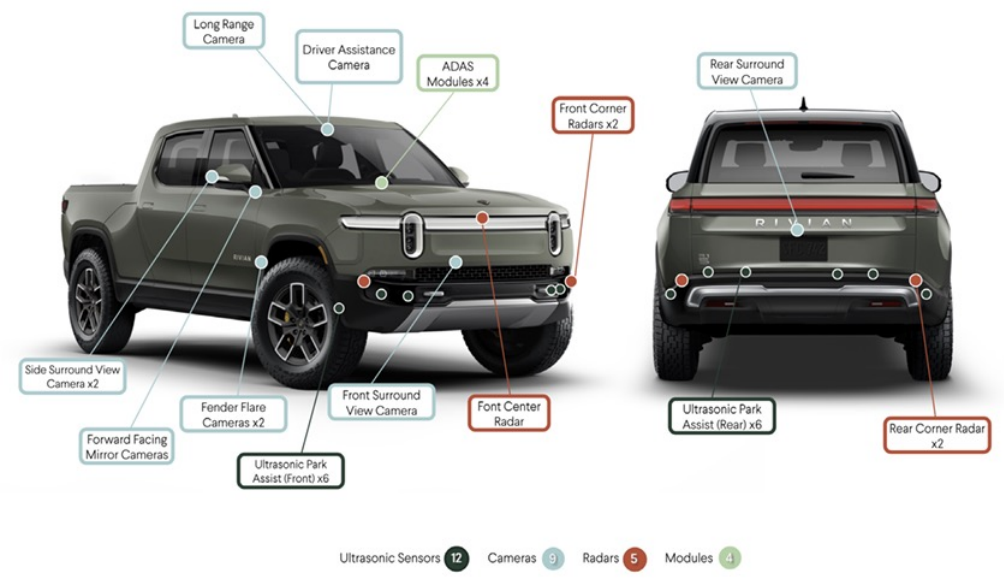
Let’s Talk ADAS Calibrations and Scanning

Advanced driver-assistance systems (ADAS)

ADAS features in the vehicle are primarily focused on collision avoidance technologies (for example, lane departure warning and blind-spot applications) and driver aids, such as night vision, driver alertness and adaptive cruise control



Scanning and Calibration



RIVIAN

RCI-86-22-001-3: Driver+ Calibration Requirements and Best Practices, R1T and R1S

Rivian Automotive, LLC Position Statement

Document Type	Collision Repair Information Document
Date	February 3, 2023
Affected Region(s)	USA
Affected Model(s)	R1T, R1S
Model Year(s)	2022-Present
Vehicle System	86 - Driver Assistance

Rivian has established important guidelines regarding collision repair and interaction with parts on Rivian vehicles to help ensure the vehicle is repaired to Rivian standards. Certified Collision Centers and the collision industry must follow these guidelines to uphold Rivian's standards of safety and quality.

Repair guidelines, position statements, and repair procedures published by Rivian are engineered and tested to help ensure Rivian vehicles are repaired to provide quality, performance, safety, and durability. To meet Rivian Repair standards, repairs should be performed by Rivian Certified Technicians using Rivian approved repair procedures, tools, and Rivian Original Equipment Parts.

Driver+ Overview

Driver+ is Rivian's suite of Advanced Driver-Assistance Systems (ADAS). The system is comprised of cameras, radar sensors, antennas, and ultrasonic sensors that aid with vehicle operation. To meet Rivian Standards, all repairs involving Driver+ components should be performed by a Rivian Certified Technician at either a Rivian Service Center or Rivian Certified Collision Center. After repair, the Driver+ system will need to be calibrated before the vehicle can be returned to the customer. Refer to the appropriate service procedure(s) for detailed and vehicle-specific calibration instructions.

Always refer to the appropriate Rivian Service Manual for information on removal, installation, fault tracing, and calibration.

RIVIAN

RCI-86-22-002-1: Driver+ Calibration Requirements and Best Practices, EDV

Rivian Automotive, LLC Position Statement

Document Type	Collision Repair Information Document
Date	February 3, 2023
Affected Region(s)	USA
Affected Model(s)	EDV
Model Year(s)	2022-Present
Vehicle System	86 - Driver Assistance

Rivian has established important guidelines regarding collision repair and interaction with parts on Rivian vehicles to help ensure the vehicle is repaired to Rivian standards. Certified Collision Centers and the collision industry must follow these guidelines to uphold Rivian's standards of safety and quality.

Repair guidelines, position statements, and repair procedures published by Rivian are engineered and tested to help ensure Rivian vehicles are repaired to provide quality, performance, safety, and durability. To meet Rivian Repair standards, repairs should be performed by Rivian Certified Technicians using Rivian approved repair procedures, tools, and Rivian Original Equipment Parts.

Driver+ Overview

Driver+ is Rivian's suite of Advanced Driver-Assistance Systems (ADAS). The EDV uses cameras, radar sensors, antennas, and ultrasonic sensors to aide with driver assistance, parking, obstacle maneuvering, and delivery navigation. Proper cleaning and maintenance of the components are critical to vehicle operation and driver safety. The components are located on the vehicle in areas that may sustain damage. If any Driver+ component needs to be replaced due to damage, only new, Rivian components should be used to make sure Driver + functions and operations meet Rivian standards. Failure to replace a damaged component with a new, Rivian Driver+ component may result in the Driver+ system not working as intended, risking the safety of the

- Long Range Camera
- Driver Assistance Camera
- Stereo Vision Camera
- Lane Change Camera
- Front Radars
- Corner Radar
- Ultrasonic Sensors

RIVIAN

Training & Resources

https://thewomensindustrynetwork.site-ym.com/page/Resources

WIN Women's Industry Network®
Driving the Future for Women in Collision Repair

WIN Wear | Contact Us | Sign In | Join WIN

About | Membership | Sponsorship | Industry & Events | Programs

Technical Courses

The Importance of Weld Testing

The Evolution of ADAS

Understanding Dynamic Calibrations

Understanding Static Calibrations

Let’s Talk Resources for Researching Repair Procedures

The Why's

Fascia Repair Guidelines

RIVIAN

RCI-52-23-001-1: Fascia, Front, Upper Repair

Rivian Automotive, LLC Position Statement

Document Type	Collision Repair Information Document
Date	May 17, 2023
Affected Region(s)	All
Affected Model(s)	R1T, R1S
Model Year(s)	2022+
Vehicle System	52 - Body

Rivian has established important guidelines regarding collision repair and interaction with parts on Rivian vehicles to help ensure the vehicle is repaired to Rivian standards. Certified Collision Centers and the collision industry must follow these guidelines to uphold Rivian's standards of safety and quality.

Repair guidelines, position statements, and repair procedures published by Rivian are engineered and tested to help ensure Rivian vehicles are repaired to provide quality, performance, safety, and durability. To meet Rivian Repair standards, repairs should be performed by Rivian Certified Technicians using Rivian approved repair procedures, tools, and Rivian Original Equipment Parts.

Fascia, Front, Upper Repair Guidelines

Rivian passenger vehicles are equipped with radar sensors located behind the front bumper fascia. To avoid interference with the Sensor, Radar, Front, Center and the integrated safety systems, repair is not allowed to the Fascia, Front, Upper in front of the component.

In addition to repairs, repainting (primers, sealers, and base coats) is not allowed in the No-Repair Zone. Only clearcoat can be applied in the No-Repair Zone. If any repair beyond clearcoat application is required in the radar transmission area, the bumper must be replaced. Repairs outside the No-Repair Zone area are allowed.

To locate the Sensor, Radar, Front, Center under the Fascia, Front, Upper, measure up from the Camera, Bumper, Front. Then, measure left and right to create a rectangle; the rectangle represents the radar transmission area and No-Repair Zone.

Figure 1. No-Repair Zone

XPEL Paint Protection Film
- ULTIMATE PLUS™ Gloss Finish
- STEALTH™ Satin Finish

Clearcoat Blending

RIVIAN

RCI-52-22-001-2: Clearcoat Blending

Rivian Automotive, LLC Position Statement

Document Type	Collision Repair Information Document
Date	July 27, 2023
Affected Region(s)	USA
Affected Model(s)	R1T, R1S
Model Year(s)	2022+
Vehicle System	52 - Body

Rivian has established important guidelines regarding collision repair and interaction with parts on Rivian vehicles to help ensure the vehicle is repaired to Rivian standards. Certified Collision Centers and the collision industry must follow these guidelines to uphold Rivian's standards of safety and quality.

Repair guidelines, position statements, and repair procedures published by Rivian are engineered and tested to help ensure Rivian vehicles are repaired to provide quality, performance, safety, and durability. To meet Rivian Repair standards, repairs should be performed by Rivian Certified Technicians using Rivian approved repair procedures, tools, and Rivian Original Equipment Parts.

⚠ **Warning:** The use of clearcoat blending procedures may void the paint manufacturer's warranties.

Rivian does not recommend the use of any clearcoat blending procedures in warranty or collision refinishing repair work.

Technicians should not perform clearcoat blending due to the following:

- Clearcoat blending does not allow material to properly adhere to the refinished surface.
- Clearcoat blending does not provide sufficient ultraviolet (UV) protection to the refinished area.
- Clearcoat blending can degrade the durability of the material, exposing it to the elements. This can result in discoloration, delamination, hazing, fading, peeling, and a noticeable blend edge.

Rivian advises technicians to perform the following clearcoat procedures:

- To restore the factory finish, the final clear coat should be applied to the panel's edge or natural breaking point.
- It may be necessary to remove exterior trim, moldings, weather stripping, handles, emblems, decals, or glass for clearcoat application. The removal of certain components can cause fault codes and may require recalibration or reinitialization to ensure all systems are functioning properly.

Rivian's position applies to all approved paint systems. Please refer to the paint manufacturer's guidelines for additional information on recommended processes and warranty restrictions.

Always refer to the appropriate Rivian Repair procedure for the most up to date information regarding specifications as well as location, position, operation sensitivity, part numbers and any revisions listed.

Fastener Re-use

RIVIAN

RCI-52-22-006-2: Threaded Fastener Re-use (Threadlocker)

Rivian Automotive, LLC Position Statement and Technical Notes

Document Type	Collision Repair Information Document
Date	5/24/2022
Affected Region(s)	USA
Affected Model(s)	R1T, R1S, EDV
Model Year(s)	2022 +
Vehicle System	52 - Body

Table 1

Factory Material	Purpose	Location	Visual Identifier (Color)	Approved Service Alternative
ND Microspheres Blue	Medium Strength Thread Locker	Fastener Threads (General assembly and mild stressed fasteners	Blue low viscosity liquid or anaerobic gel	Loctite 243/290 Permatex 24835 Vibra-Tite VT121/VT125
ND Patch Yellow	Thread sealant and thread locker	Wheel liners and under shields	Yellow viscosity liquid or anaerobic gel	Re-usable 3X. If in doubt replace with NEW fastener with factory applied Yellow Patch
ND Epoxy-Lock ND TA 800 Orange or Red	High Strength Thread Locker	Fastener Threads (structural, heavy mechanical assembly, high stressed fasteners)	Red low viscosity liquid or anaerobic gel	Loctite 263/277 Permatex 26210 Vibra-Tite 140/135
ND ST-3 White	Thread Sealant	Fastener Threads (connection points with liquids present)	White paste	Loctite 5452 Permatex 57535 Vibra-Tite VT420
ND Plastisol Black	Fastener Seal	Fastener mating flange surface (Areas that require moisture protection)	Black sealant	Loctite SI 593 Permatex 80060 Vibra-Tite VT998

Fastener re-use is not possible if:

- The fasteners are torque-to-yield

Note: Some bolts may have the same visual appearance, but the function and placement may affect the operation purpose. Always replace with a new fastener and observe the installation torque values and applicable repair procedure.

- The fasteners are prevailing torque types.
- The fasteners have plastic that is deformed during installation.

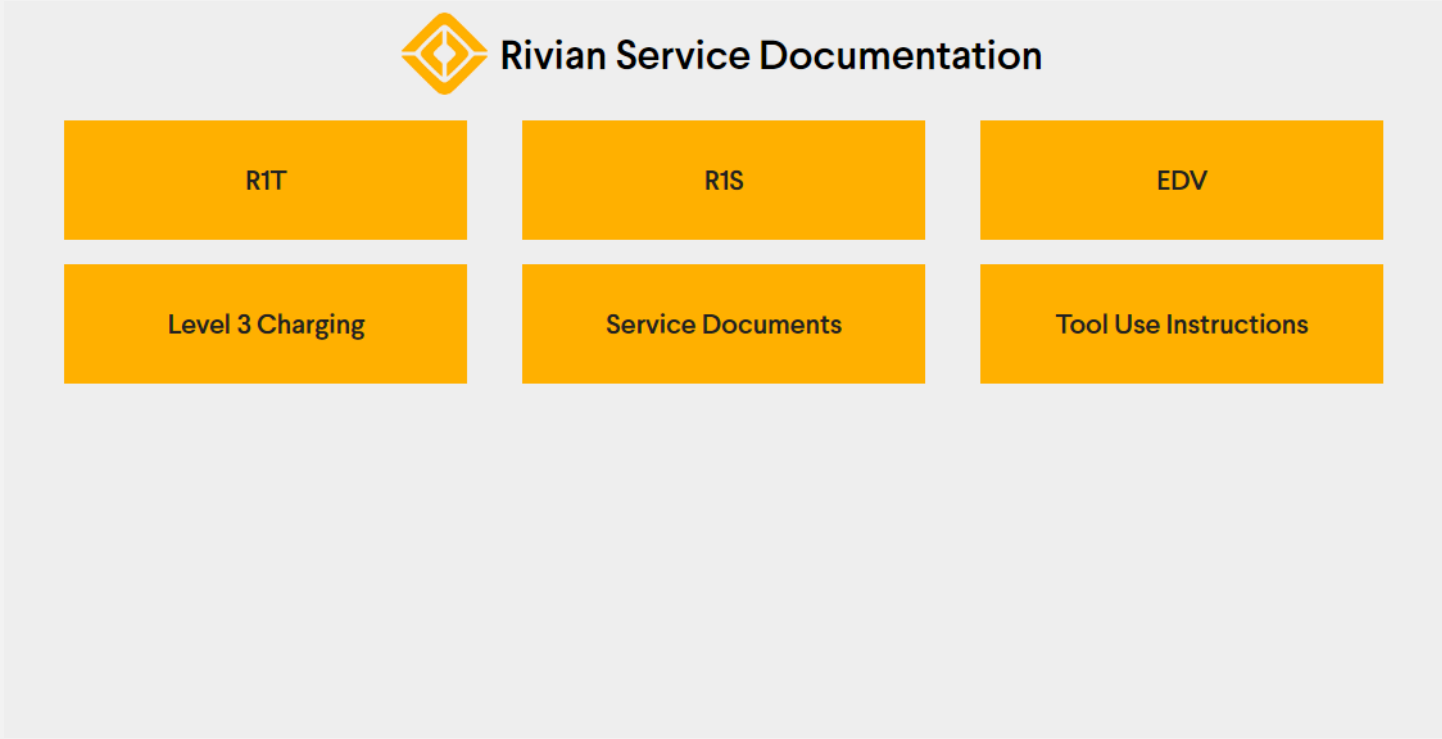
Note: The re-use of these types of fasteners can cause failure of the bolted connection.

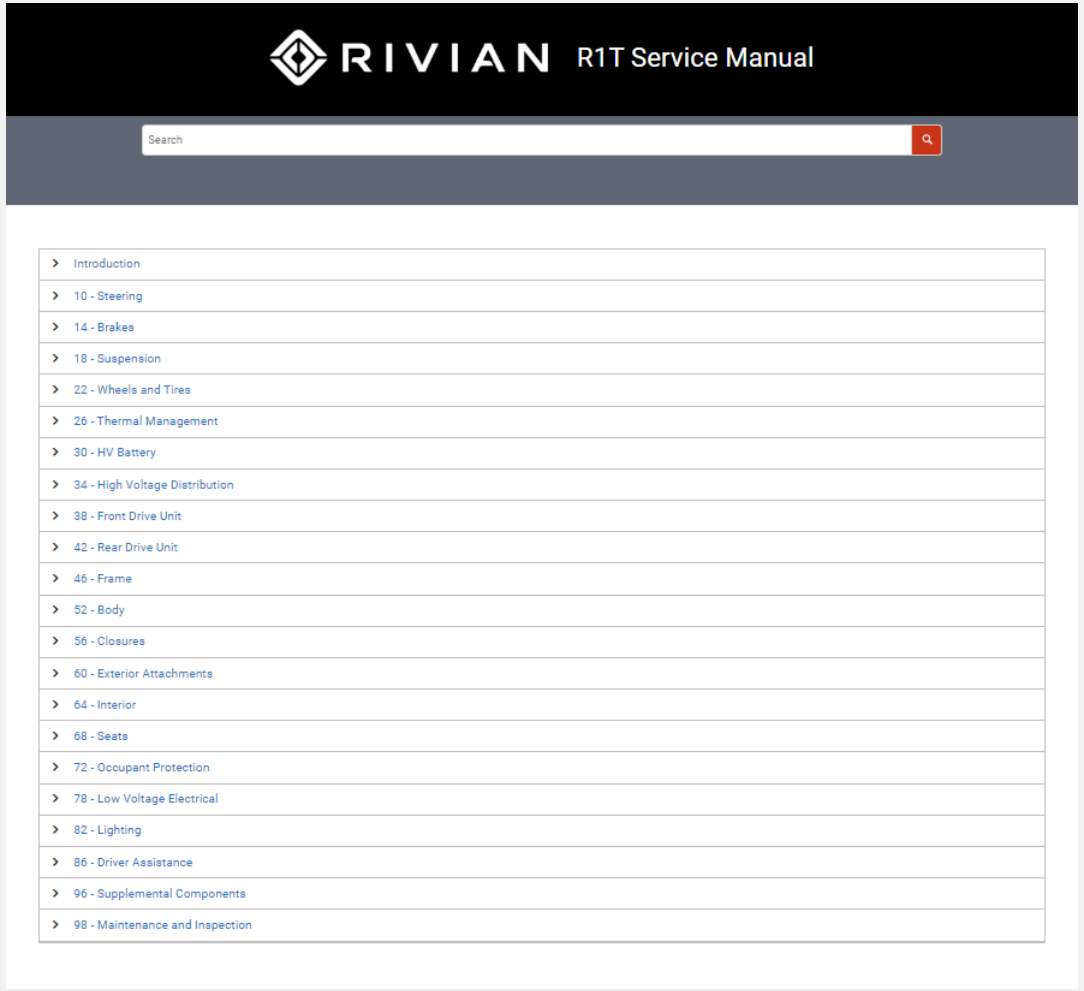
- The fastener Nuts have Teflon lining.
- The fastener has any damage.
- The parent fastener material has any damage.

If accessible, use chemical cleaner to ensure the area is clean and ready for application. Be sure to remove all debris and residual chemical cleaner prior to application of threadlocker or sealant.

Always refer to the appropriate Rivian Repair procedure for the most up to date information regarding specifications as well as location, position, operation sensitivity, part numbers and any revisions listed.

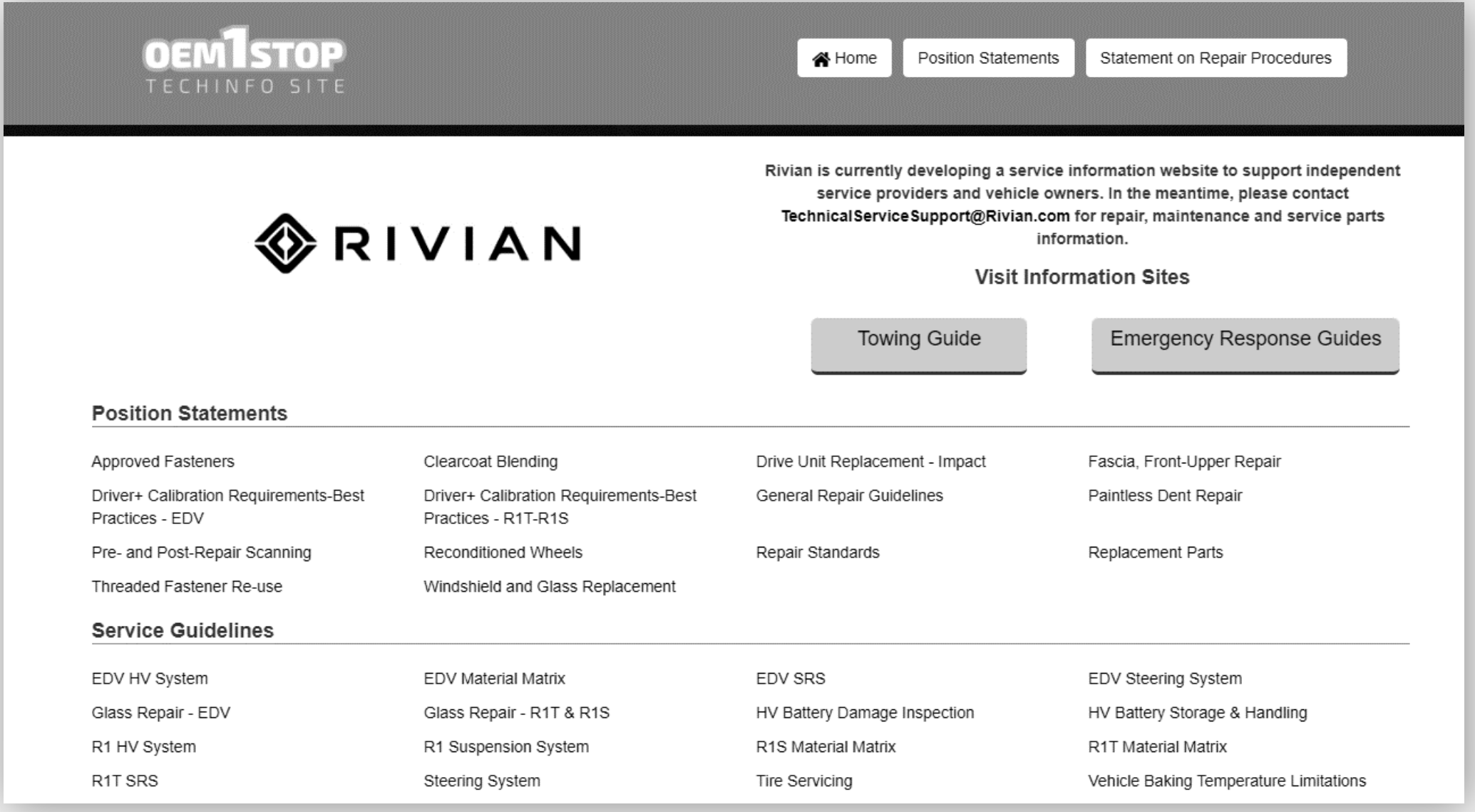
Service Documentation





Position Statements & Guidelines

https://www.oem1stop.com/content/rivian



Technical Support

I-CAR Repairability Technical Support (RTS)

2021 Toyota Camry Hybrid

Print

Click the links below for directions; definitions; articles; and additional RTS portal information such as OEM position statements and publications.

How To Use The OEM Calibration Requirements Search

ADAS, Calibration, And Scanning Article Hotspot

Vehicle System Definitions

Additional RTS OEM Information

Camera Near Rearview Mirror

OEM Name: Forward Recognition Camera

Calibration/Initialization Requirement Events:

- If camera is removed/installed or replaced
- If DTC indicates
- If windshield is removed/installed or replaced

Camera Near Rearview Mirror	Yes	No	Not Identified
DTC Set	X		
Scan Tool Required	X		
Special Tools Required	X		

Systems Affected:

Adaptive Cruise Control | Collision Warning | Collision Braking | Lane Departure Warning | Lane Keep Assist | Adaptive Lighting 1

Technical Support

OEM1STOP
TECHINFO SITE

Home | Position Statements | Statement on Repair Procedures

What is OEM1Stop?

OEM1Stop is intended to provide vehicle repair technicians with easy access to the most up-to-date repair information made available by each of its participating automakers.

There is no registration required for OEM1Stop itself, however, on each participating automaker's page you'll find buttons directing you to that manufacturer's repair information websites. Each of those sites is operated independently by the respective automaker, and each requires its own registration/login process. These sites may also require the purchase of daily/weekly/monthly/annual subscriptions to access repair information.

Recently Added

Ford - On Target 2023 Vol. 3 Added
Tesla Service Repair Information Added
Ford - On Target 2023 Vol. 2 Added
Rivian - Updated Clearcoat Blending Position Added
Rivian - Updated EDV Material Matrix Added
Rivian - Position Statements Added

ACURA | Audi | BMW | BUICK | Cadillac | CHEVROLET | CHRYSLER | DODGE | FIAT | Ford | GENESIS
GMC | HONDA | HUMMER | HYUNDAI | INFINITI | ISUZU | JAGUAR | Jeep | KIA | LAND ROVER | LEXUS
LINCOLN | MAZDA | Mercedes-Benz | MERCURY | MINI | MITSUBISHI | NISSAN | Oldsmobile | PONTIAC | PORSCHE | RAM
RIVIAN | SATURN | SCION | SUBARU | SUZUKI | TESLA | TOYOTA | VW | VOLVO

ADDITIONAL SOURCES TO ACCESS REPAIR INFORMATION

- OEM Websites
- AllData
- I-CAR
- Sun Systems
- OEC RepairLogic
- CCC Repair Methods

“BUSINESS OPPORTUNITIES ARE LIKE BUSES. THERE'S ALWAYS ANOTHER ONE COMING”

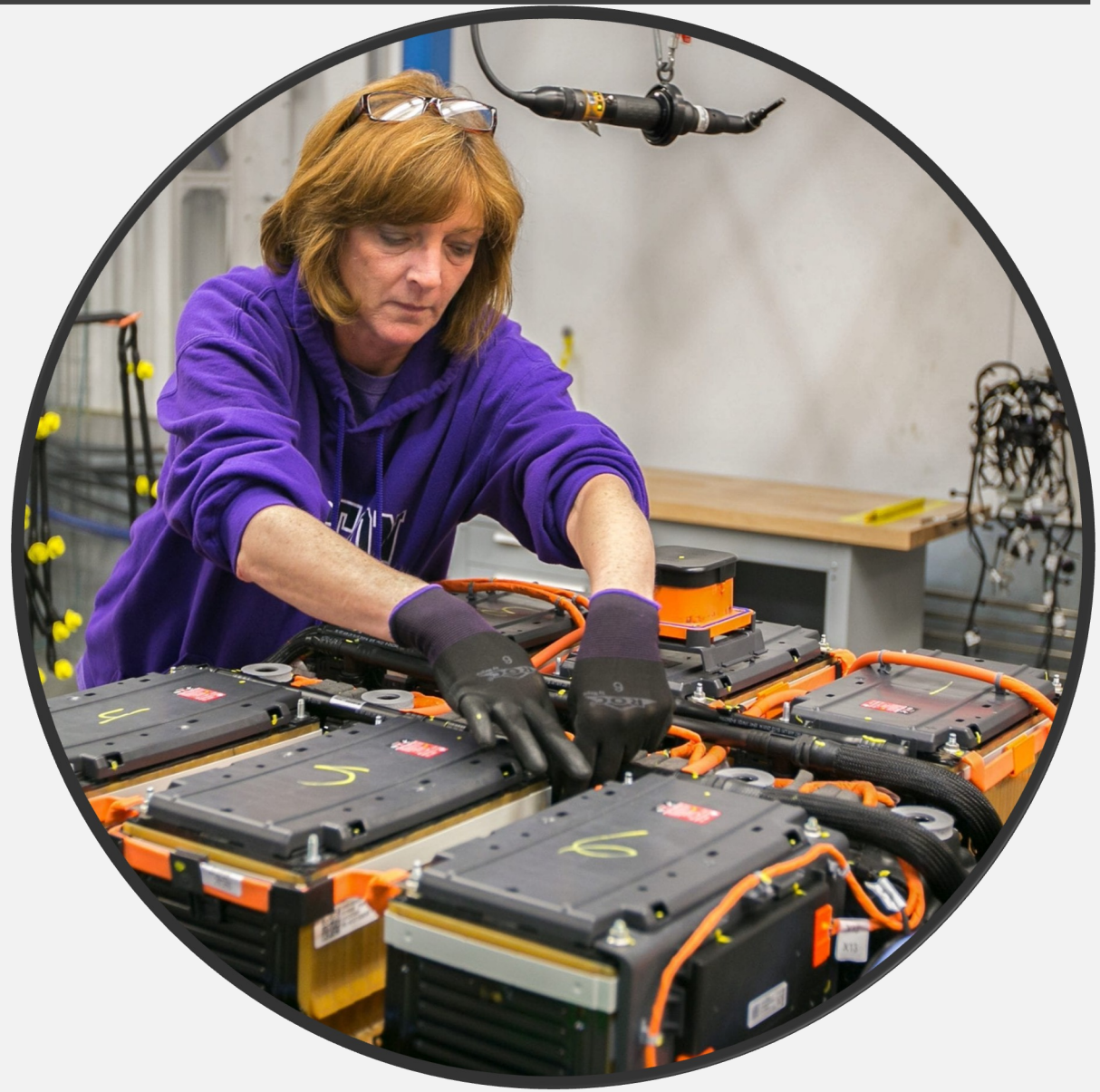
Richard Branson

Let’s Talk Careers and Training

TECHFORCE STUDY

While **232,000** techs were needed in 2021 across automotive, diesel, and collision repair, schools were graduating only **42,000**.

In collision alone, the demand was **35,000** techs while only **4,500** graduated.



“We as an industry are finding that we are facing greater and greater difficulty in attracting and recruiting and retaining that human capital that we need to perform these safe and proper repairs”

-Aaron Schulenburg, SCRS executive director.

Technical Support

Industry Feedback

ACADEMY

Student

- Curriculum can be lengthy and it's difficult to stay engaged and motivated
- Curriculum is outdated and not tailored for entry-level learners
- Completing a school program but not having the skills needed to begin working in a shop

Instructor/School

- Difficulty attracting students to the program
- Program completion rates are not as expected
- Non-flexible educational programs that do not easily integrate with curriculum
- Current I-CAR Curriculum
  - Difficult to align curriculum with skill exercises
  - Curriculum modules assume a level of knowledge that some students don't yet have
  - Curriculum modules are lengthy and it's difficult to keep students engaged or sense of accomplishment
- Cost of required tools, equipment, and materials
- Current curriculum does not prepare students for shops
- Minimal interactions with local shops about recruiting talent

Shop

- Current school curriculums do not provide students the skills they need to begin working in a shop
- Finding and retaining entry-level technicians
- Spending excessive funds recruiting and retaining talent
- Minimal interactions with local schools to recruit talent

Technical Support

I-CAR Academy

- Entry-level technician core learning areas based on industry feedback to better prepare students for the industry
- Curriculum separated by core learning areas which result in Badges
- Industry-recognized certification provided upon completion of Badges
- Aligns knowledge learning with skills learning
- Educator and student materials to support live and online teaching and learning
- Credits earned in school translate into the professional environment

Training

Required Training: 27 Courses

Instructor Led Training (ILT)

- Collision: Welcome to The Rivian Adventure – Collision Onboarding
- Collision: RLN Office Hours
- Collision: Rivian Collision Training R1T/R1S Roadshow
- Collision: High Voltage Level 2 Mechanical Training - R1T/R1S and EDV
- Collision: ADAS Recalibration Training - R1T/R1S/EDV

Online Training (OLT)

- EHS: High Voltage - Level 1
- Collision/Service: Rivian EHS High Voltage Glove Protocol
- Collision/Service: Pathways for Collision Repairs
- Collision/Service: Rivian R1T/R1S Functions & Driver Training Overview
- Collision/Service: Rivian R1T/R1S ADAS Sensor & Camera Placement
- Collision/Service: Rivian R1T/R1S Display & Reset
- Collision/Service: Redline EV NanoLeak Locator
- Collision/Service: Rivian R1T Body Panel Adjustment Tips
- Collision: Vehicle Repair guidelines - Vehicle Protection Practices
- Collision: Vehicle Repair Guidelines - Separating Factory Connections
- Collision: Vehicle Repair Guidelines - Separating Mechanically Fastened Connections
- Collision/Service: R1T/R1S Glass, Roof (Removed and Replace)
- Collision/Service: R1T/R1S Front Roof Applique (Remove and Replace)
- Collision/Service: ADAS Recalibration Job Aid - R1T/R1S
- Collision/Service: Rivian EDV Windshield Replacement
- Collision/Service: EDV 12V Battery Removal/Installation

RIVIAN

SUMMARY

With proper resources and mentorship, today's students can navigate a career path that reinforces their passions and enables them to create the positive change the industry needs. Emerging technology enables students to carve out a niche specialty, and fosters compensation that makes them feel secure in their career goals.

THANK YOU

Liz Stein

Liz.stein@oeconnection.com

www.oeconnection.com

EXTRA SLIDES TO ‘PLUG-AND-PLAY’

HOW WE GET THERE

TECHNOLOGY

Envision possible career paths

Engage worldwide methodologies with web-enabled technologies

RESOURCES

Engage top-line web services with cutting-edge deliverables

INSPIRE

Maximize timely deliverables for real-time schemas

PLAN TO EDUCATE AND INSPIRE

EXPLORE	RESEARCH	EDUCATE	ENCOURAGE	REPEAT
Insert	Insert	Insert	Insert	Insert

AREAS OF FOCUS

Understand Training, Resources, and Financial support Available to Students

Develop winning strategies to keep ahead of the competition

Capitalize on low-hanging fruit to identify a ballpark value

Visualize customer directed convergence

Become a Mentor that Inspires and Enables Career Goals to Become a Reality

Iterative approaches to corporate strategy

Establish a management framework from the inside