Chevrolet Blazer EV Body Structure

Dr. Hoda Eiliat

General Motors

It didn’t just win the 2024 MotorTrend SUV of the Year®. It earned it. Evaluated among a field of 40 SUVs across the industry in every category - big, small, gas, hybrid, EV and luxury – Blazer EV stands alone on top.

To bring home the honors, the all-electric SUV excelled in MotorTrend’s six key criteria:

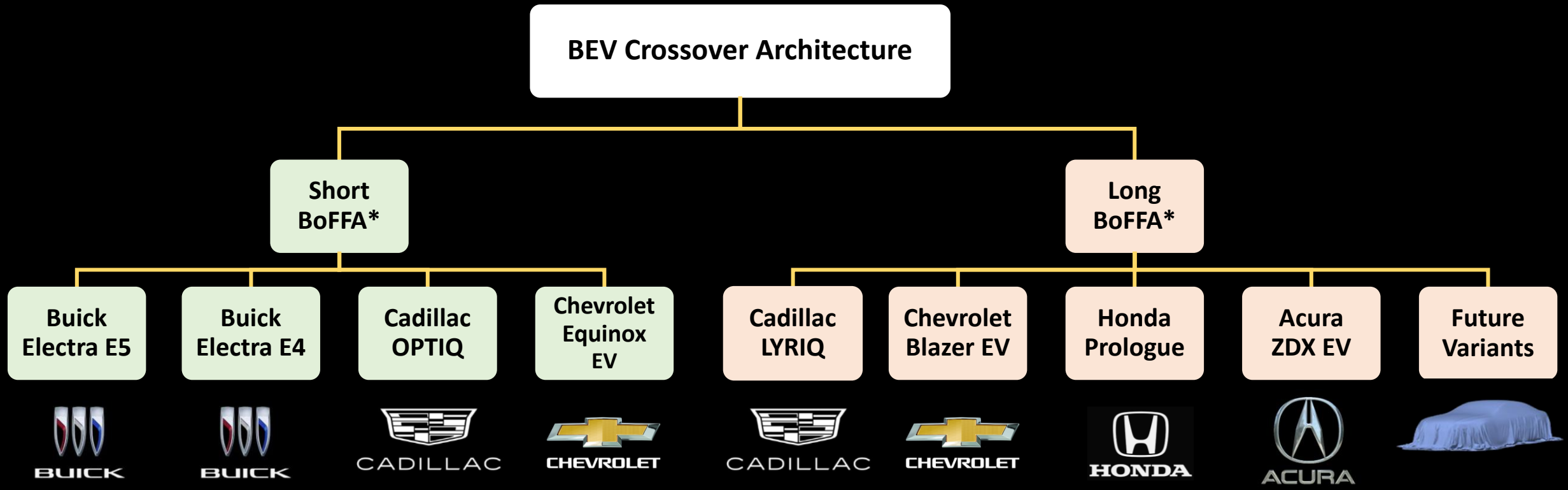
Safety
Efficiency
Value
Advancement in design
Engineering excellence
Performance of intended function

Our vision is a world with zero crashes, zero emissions and zero congestion.
GM is positioned to design, engineer, and produce EVs for every style and price point, and we are rapidly building a competitive advantage in batteries, software, vehicle integration, manufacturing and customer experience.

Outline

- ❑ BEV3 Crossover Architecture
  - Blazer EV Trim Levels
- ❑ Manufacturing Plant
- ❑ Body Structure
  - VisBOM
  - Materials Composition
- ❑ Rechargeable Energy Storage System
  - VisBOM
  - Materials Composition
- ❑ Load Management
  - Front and Rear Loading
  - Structural Enablers
- ❑ Load Management: Side Loading
- ❑ BIW Stiffness
- ❑ B-pillar 3rd Gen AHSS Application
- ❑ Joining and Sealing Strategy

GM BEV Crossover Architecture



*BoFFA=Ball of Foot to Front Axle, meaning the longitudinal dimension from front wheel center to driver's ball of foot

Blazer EV Trim Levels

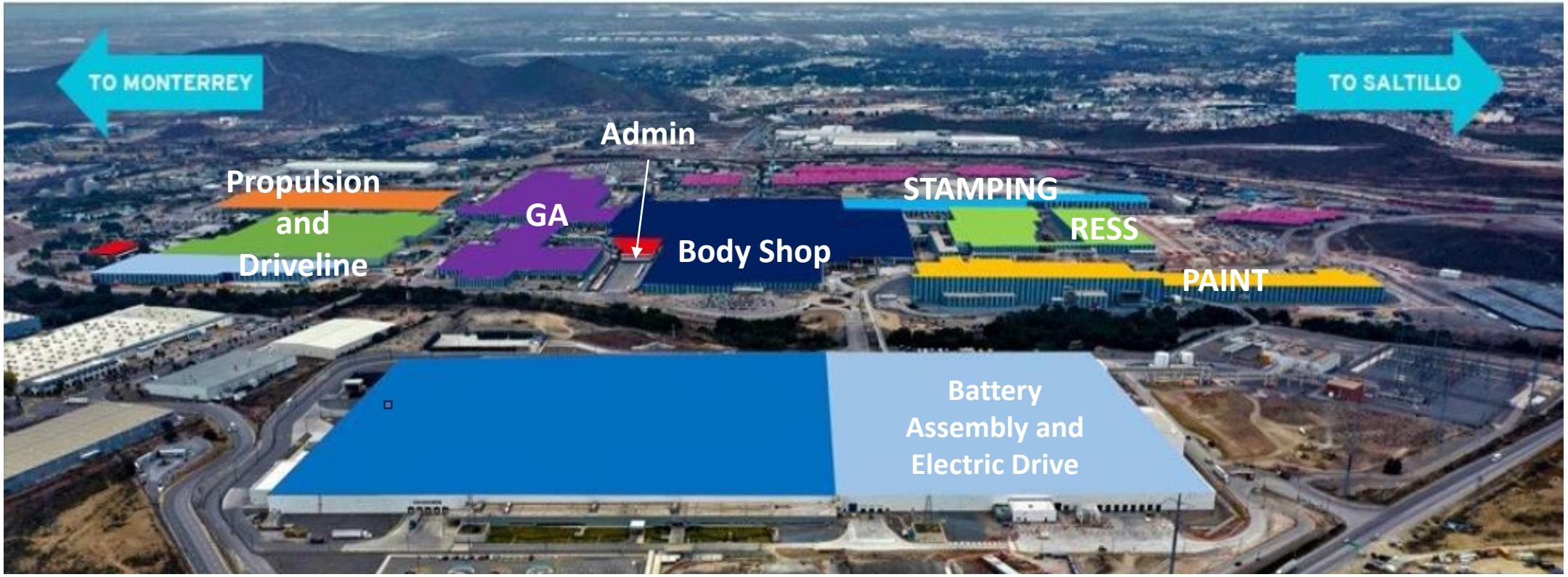
LT

RS

SS

Police Pursuit

Plant: Ramos Arizpe, Mexico



In 2021, Ramos was transformed in a matter of 5 months to adopt the BEV production by adding a dedicated BEV Body Shop. The GA is common for ICE and BEV products.

This plant produces: ICE vehicles (Chevrolet Blazer) and EVs: Chevrolet Blazer EV, Chevrolet Equinox EV and Honda Prologue.

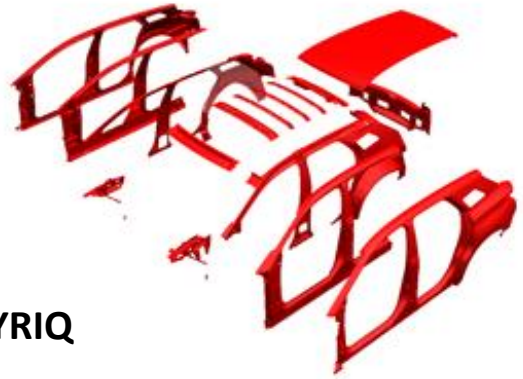
Outline

- ❑ BEV3 Crossover Architecture
  - Blazer EV Trim Levels
- ❑ Manufacturing Plant
- ❑ Body Structure
  - VisBOM
  - Materials Composition
- ❑ Rechargeable Energy Storage System
  - VisBOM
  - Materials Composition
- ❑ Load Management
  - Front and Rear Loading
  - Structural Enablers
- ❑ Load Management: Side Loading
- ❑ BIW Stiffness
- ❑ B-pillar 3rd Gen AHSS Application
- ❑ Joining and Sealing Strategy

Blazer EV VisBOM

Body Upper Structure Vis-BOM

Base Roof

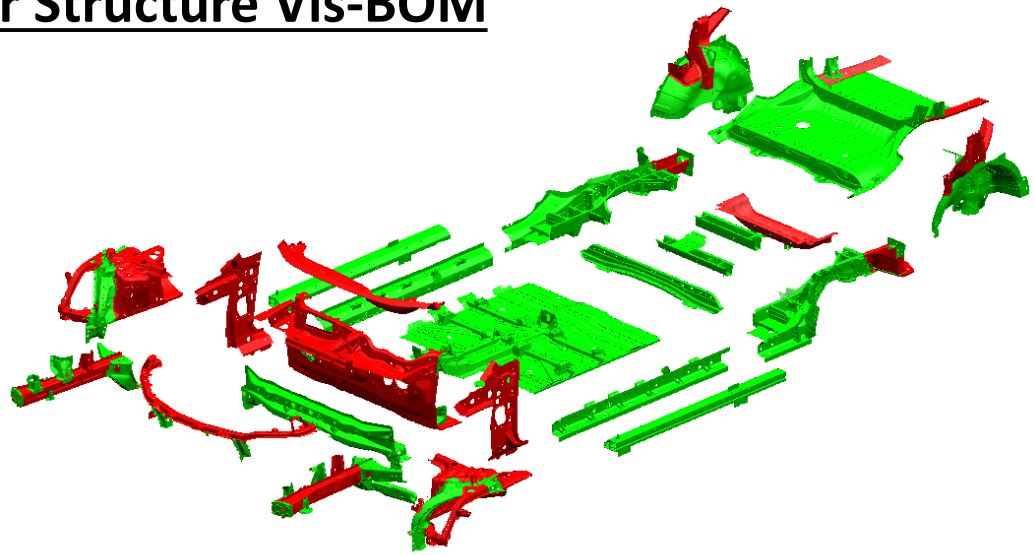


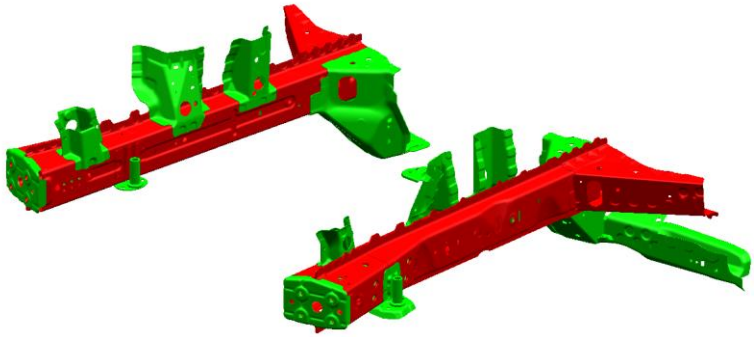
SunRoof

New

Carry-over from Cadillac LYRIQ

Body Lower Structure Vis-BOM



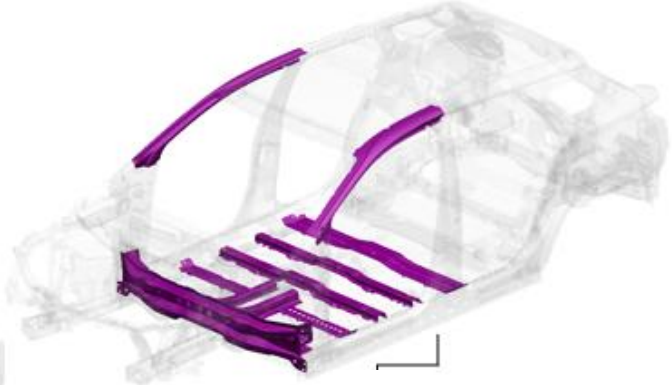


New Stamping for High Mass Variant Rail

Common with Low Mass Variant Rail

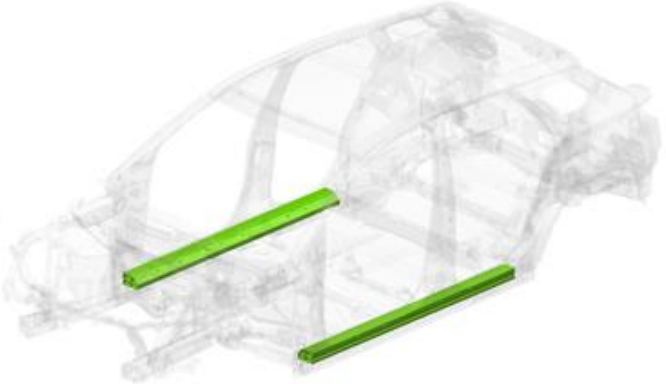
Blazer EV Body Structure: Materials Composition

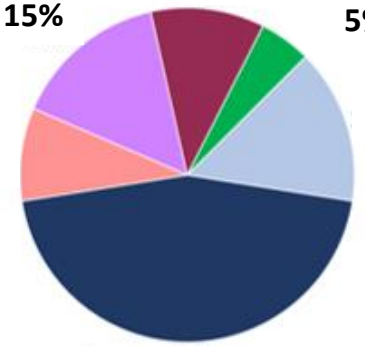
Press Hardened Steel (PHS)

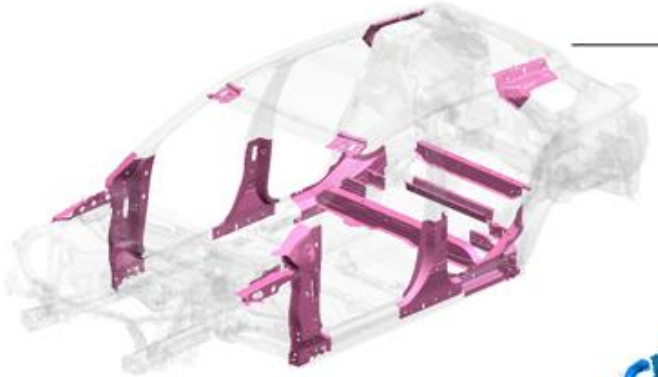


Ultra High Strength Steel
MP and MS, **GEN3** (≥ 980 MPa)

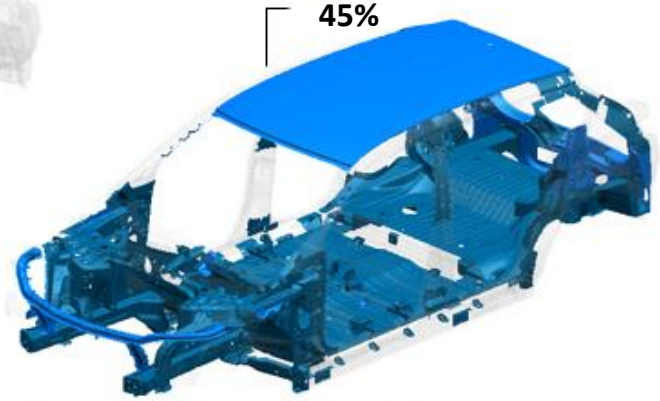
Aluminum 6082 - T6







Advanced High Strength Steel
DP (590 - 780 MPa)

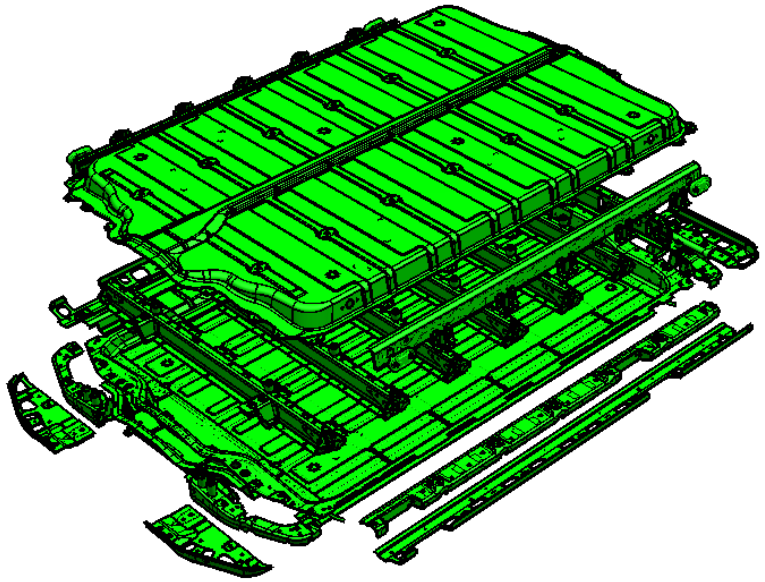


Mild Steel

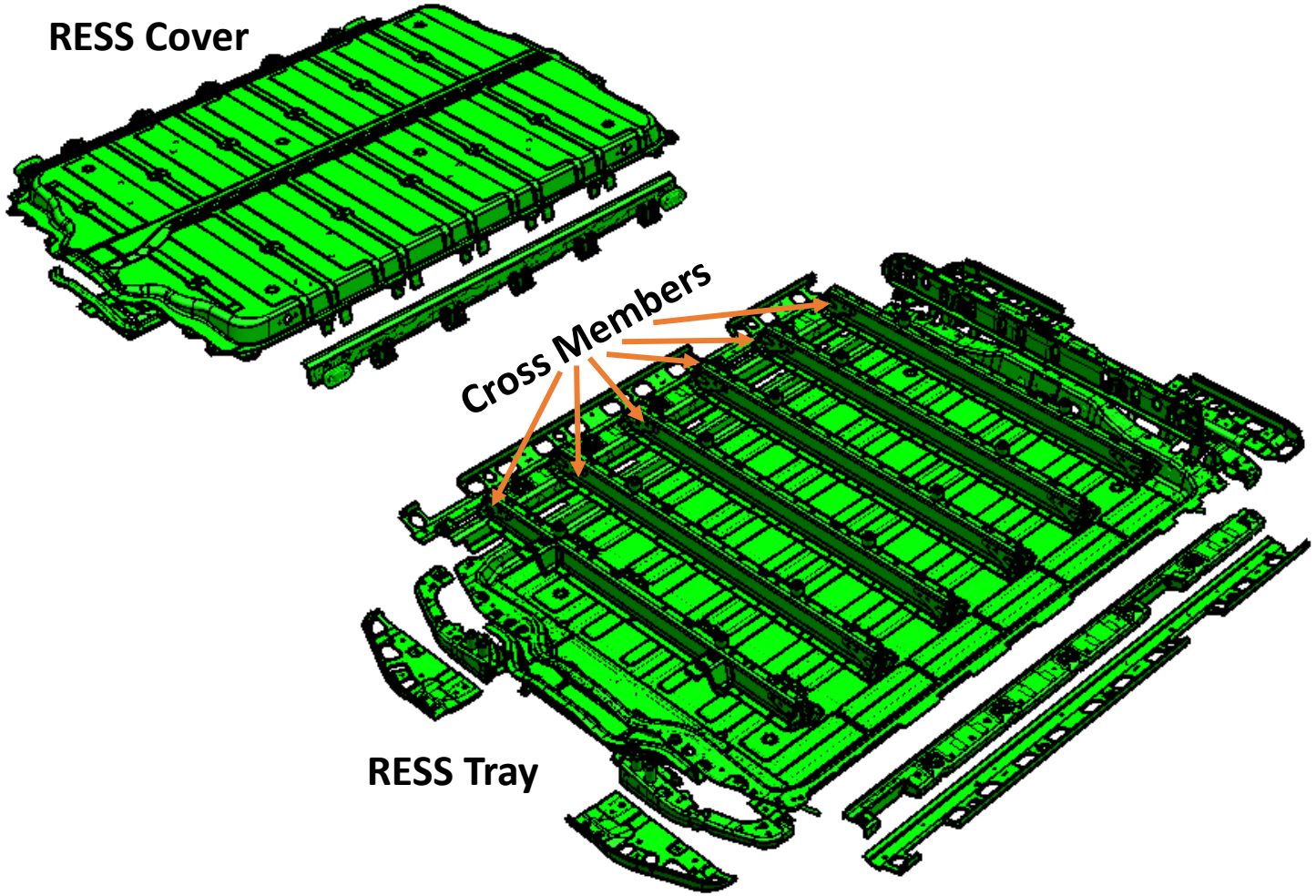
Medium High Strength Steel (Yield Strength 180 – 550 MPa)

Blazer EV RESS VisBOM

Isometric View



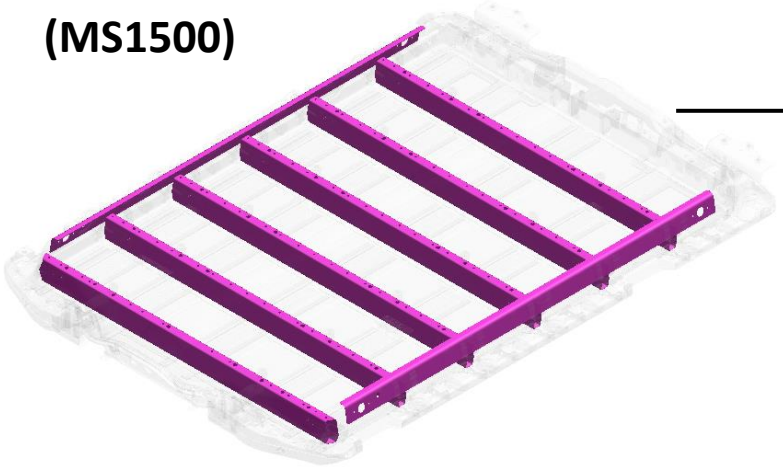
12 Mod RESS Vis-BOM



Carry-over from Cadillac LYRIQ

Blazer EV RESS Structure: Materials Composition
All Steel

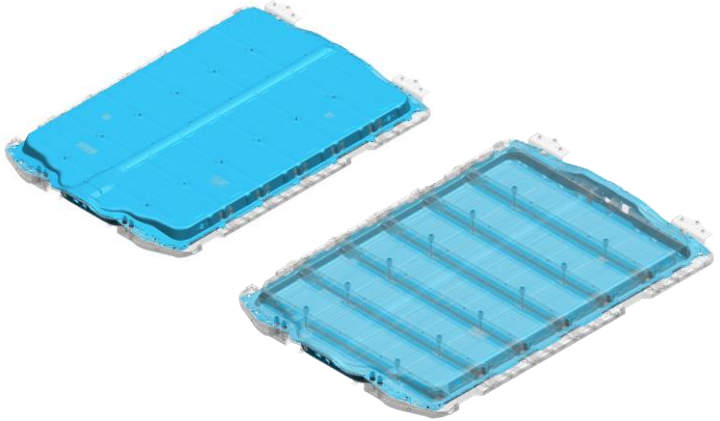
Martensitic Steel (MS1500)

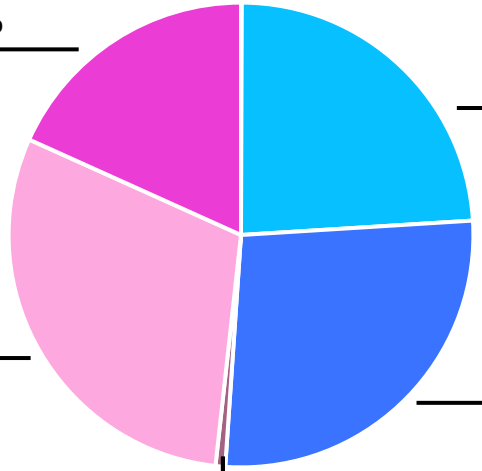


18%

Medium High Strength Steel (BH270)

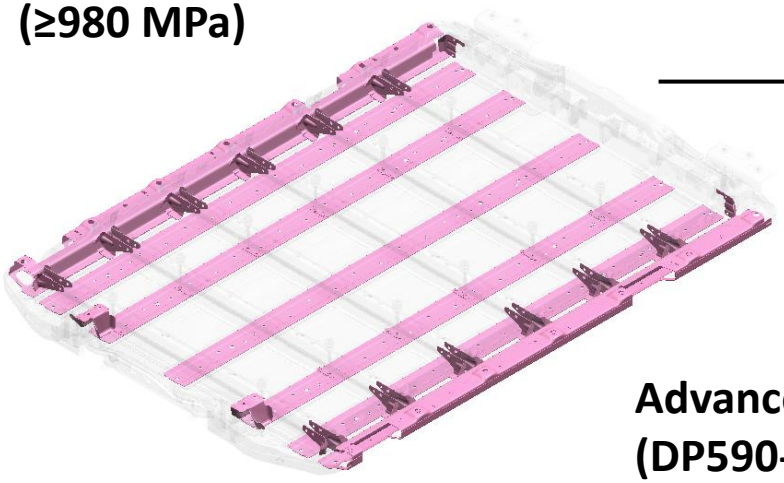
33%





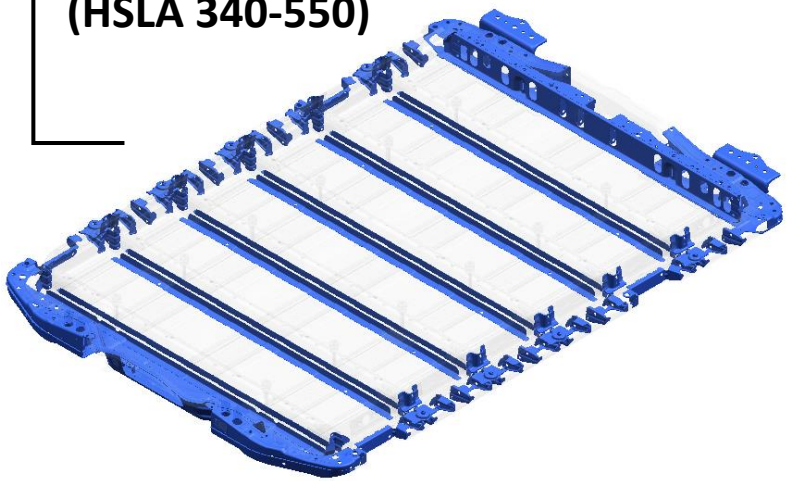
25%

Ultra High Strength Steel (≥980 MPa)



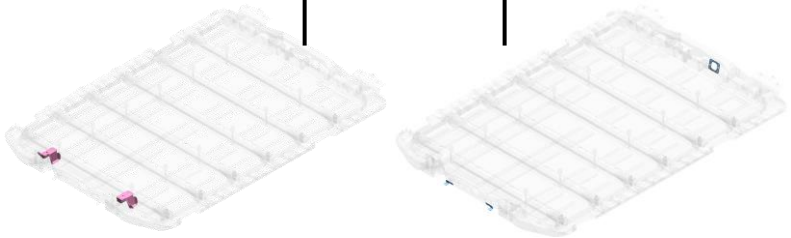
23%

Medium High Strength Steel (HSLA 340-550)



0.7%

0.1%



Advanced High Strength Steel (DP590-780)

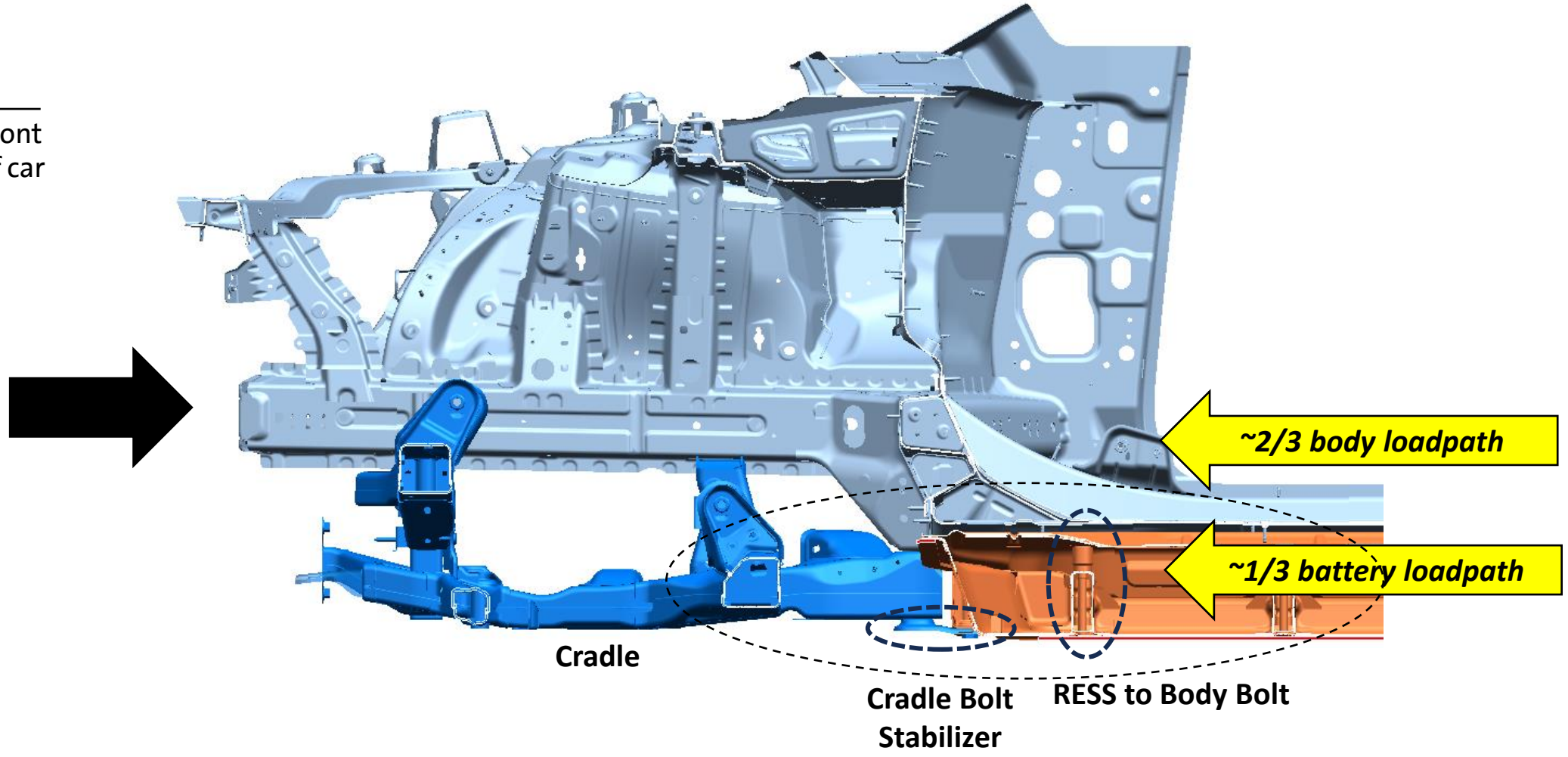
Mild Steel

Outline

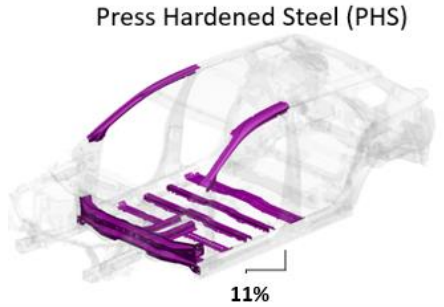
- ❑ BEV3 Crossover Architecture
  - Blazer EV Trim Levels
- ❑ Manufacturing Plant
- ❑ Body Structure
  - VisBOM
  - Materials Composition
- ❑ Rechargeable Energy Storage System
  - VisBOM
  - Materials Composition
- ❑ Load Management
  - Front and Rear Loading
  - Structural Enablers
- ❑ Load Management: Side Loading
- ❑ BIW Stiffness
- ❑ B-pillar 3rd Gen AHSS Application
- ❑ Joining and Sealing Strategy

Blazer EV Load Management

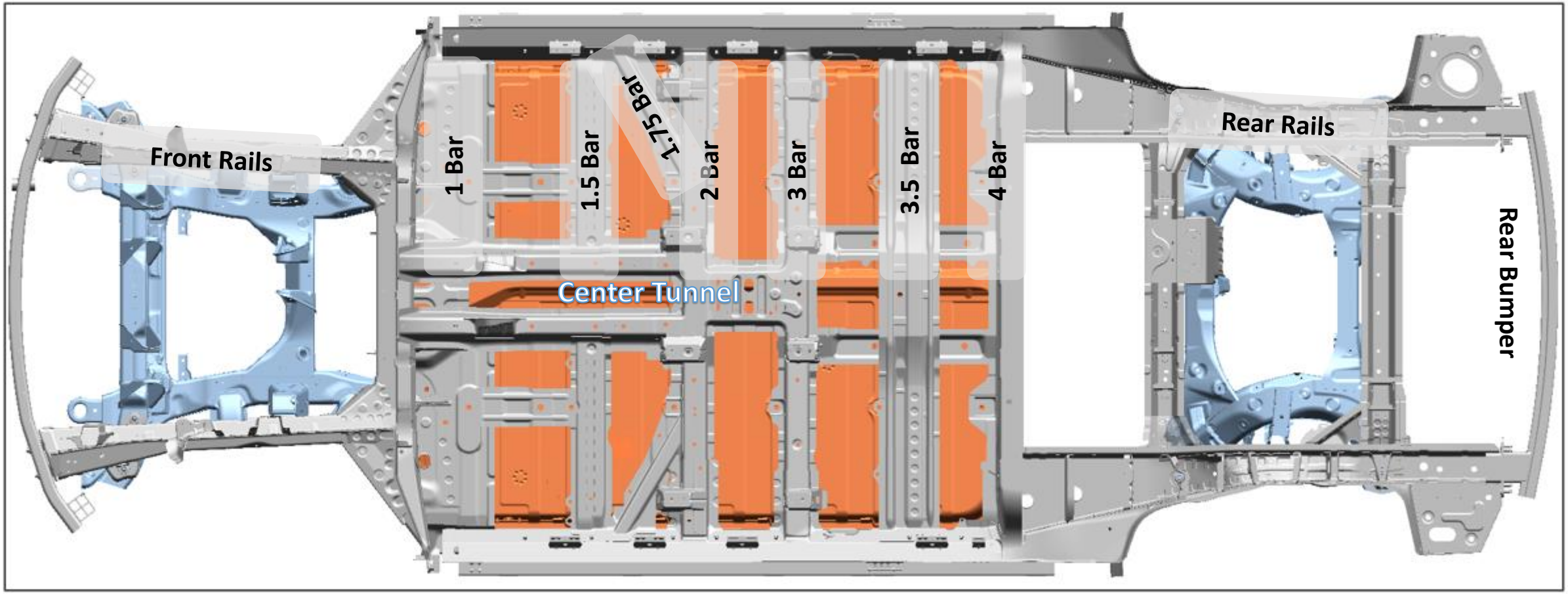
Load management strategy utilizes both the body and battery load paths



Blazer EV
Body Structures Topology



Top View



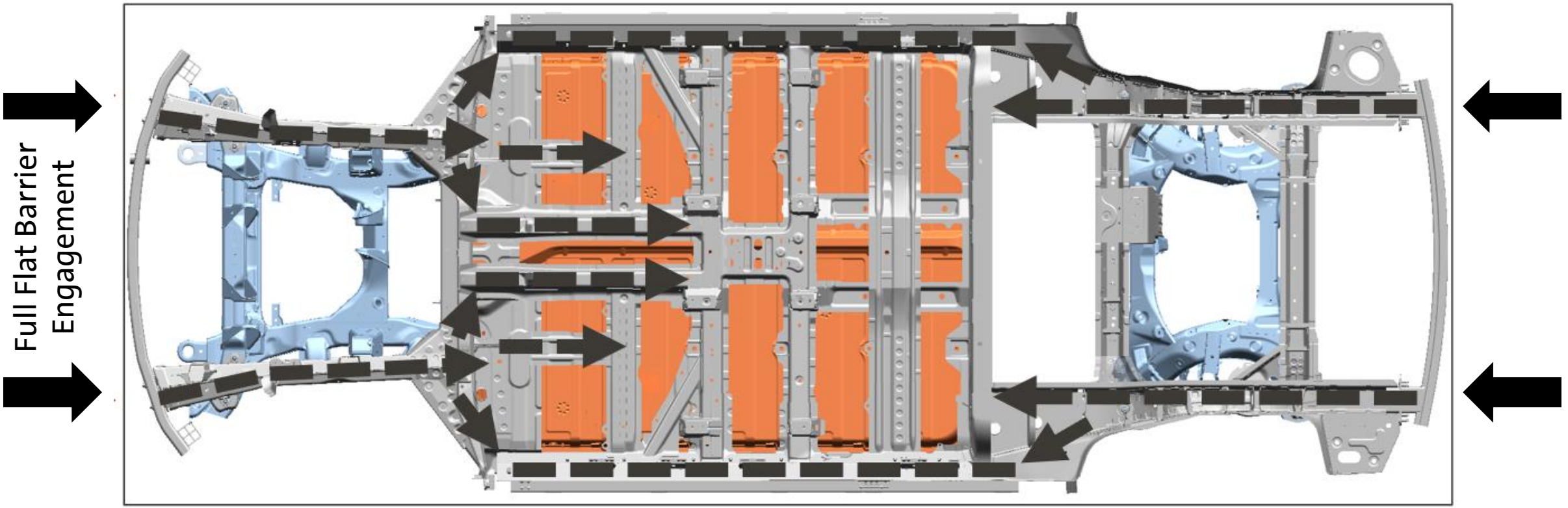
Front and Rear Cradle

Body Structure

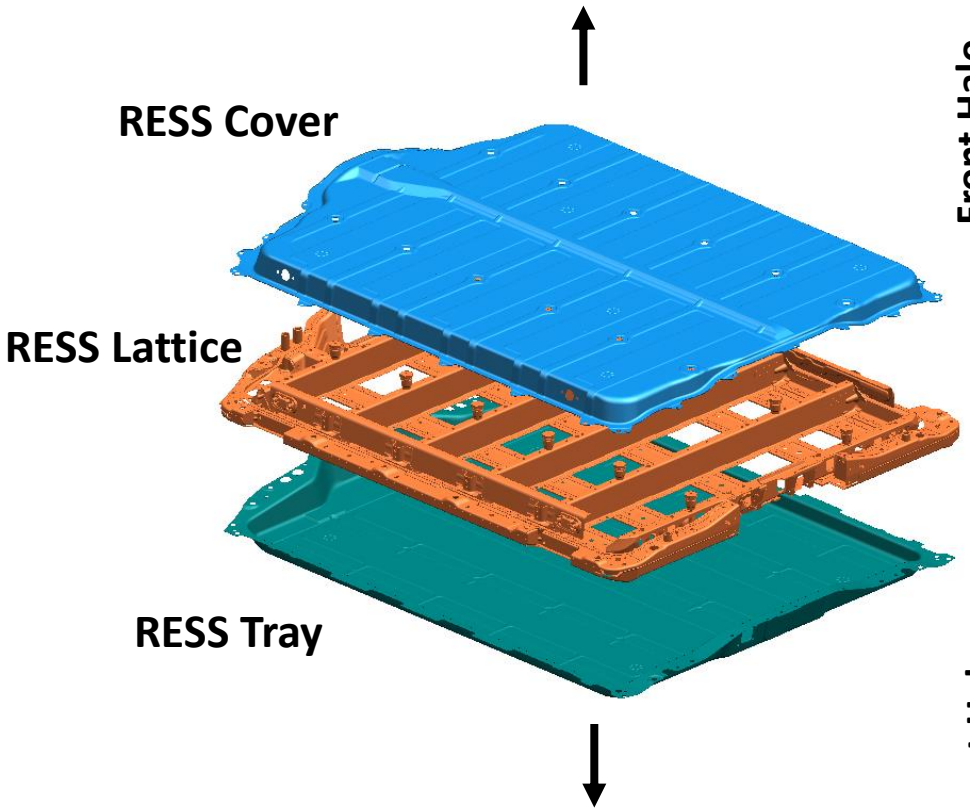
RESS

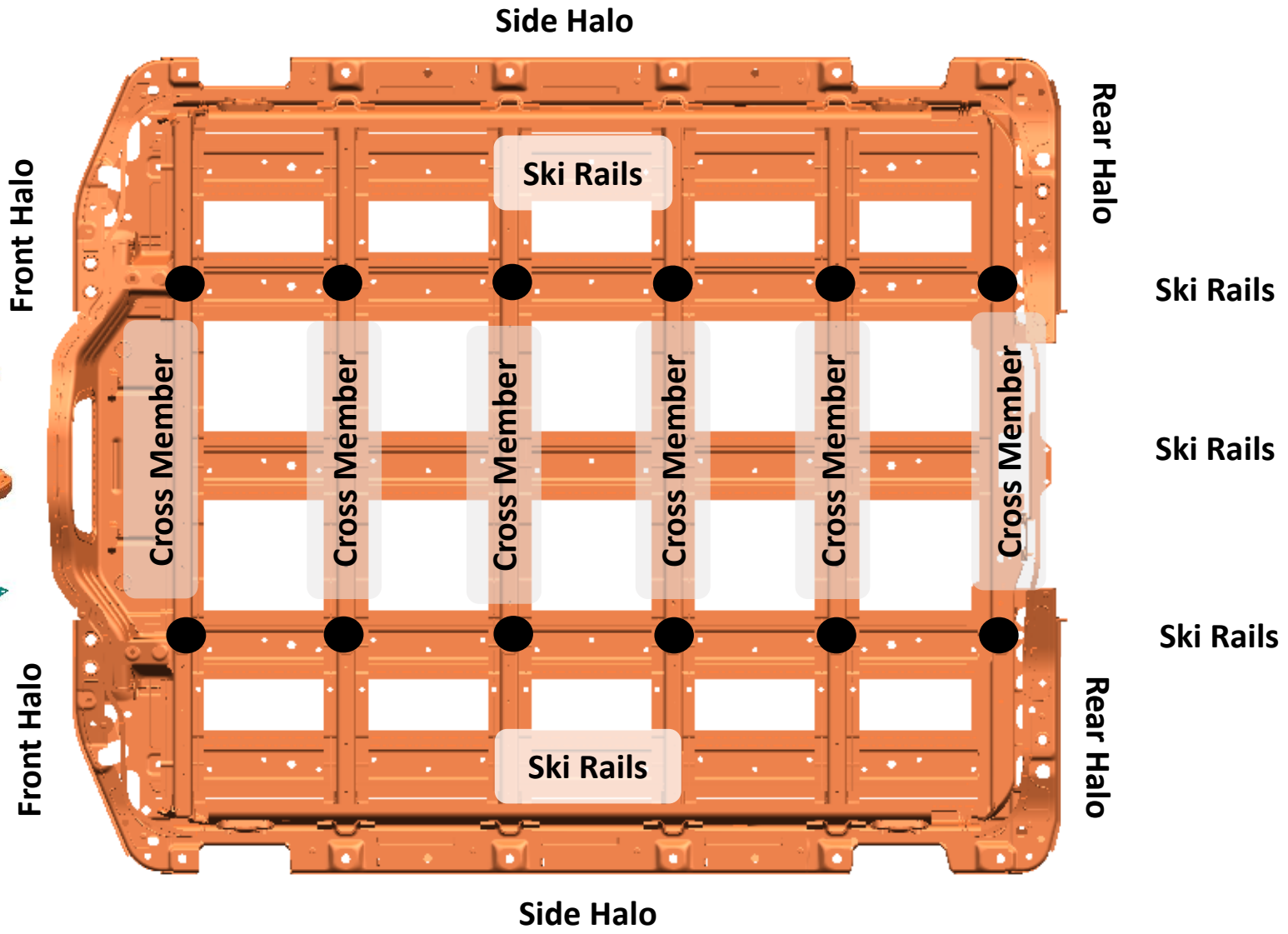
Blazer EV
Body Structures Front and Rear Loading Topology

Top View



Blazer EV
RESS Topology and Attachment Points



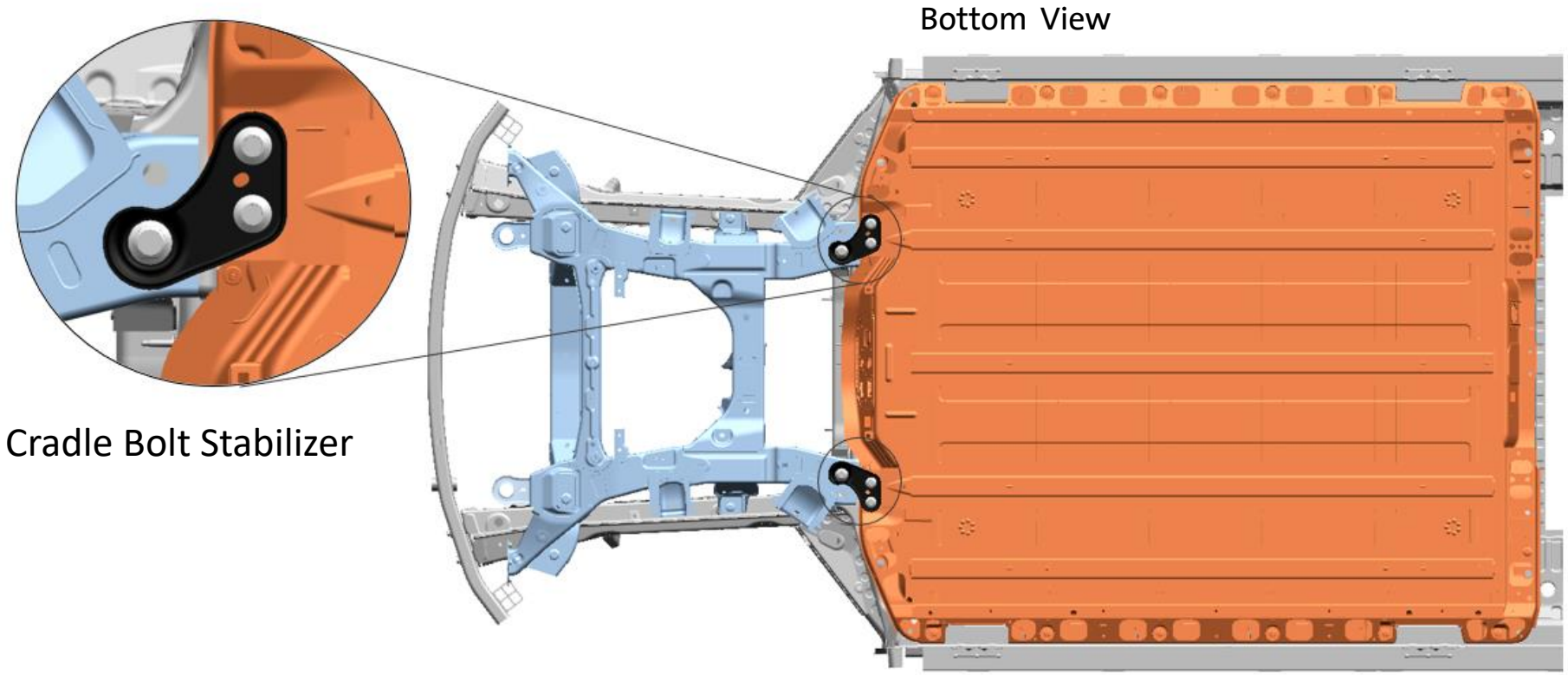


Blazer EV Structural Enablers

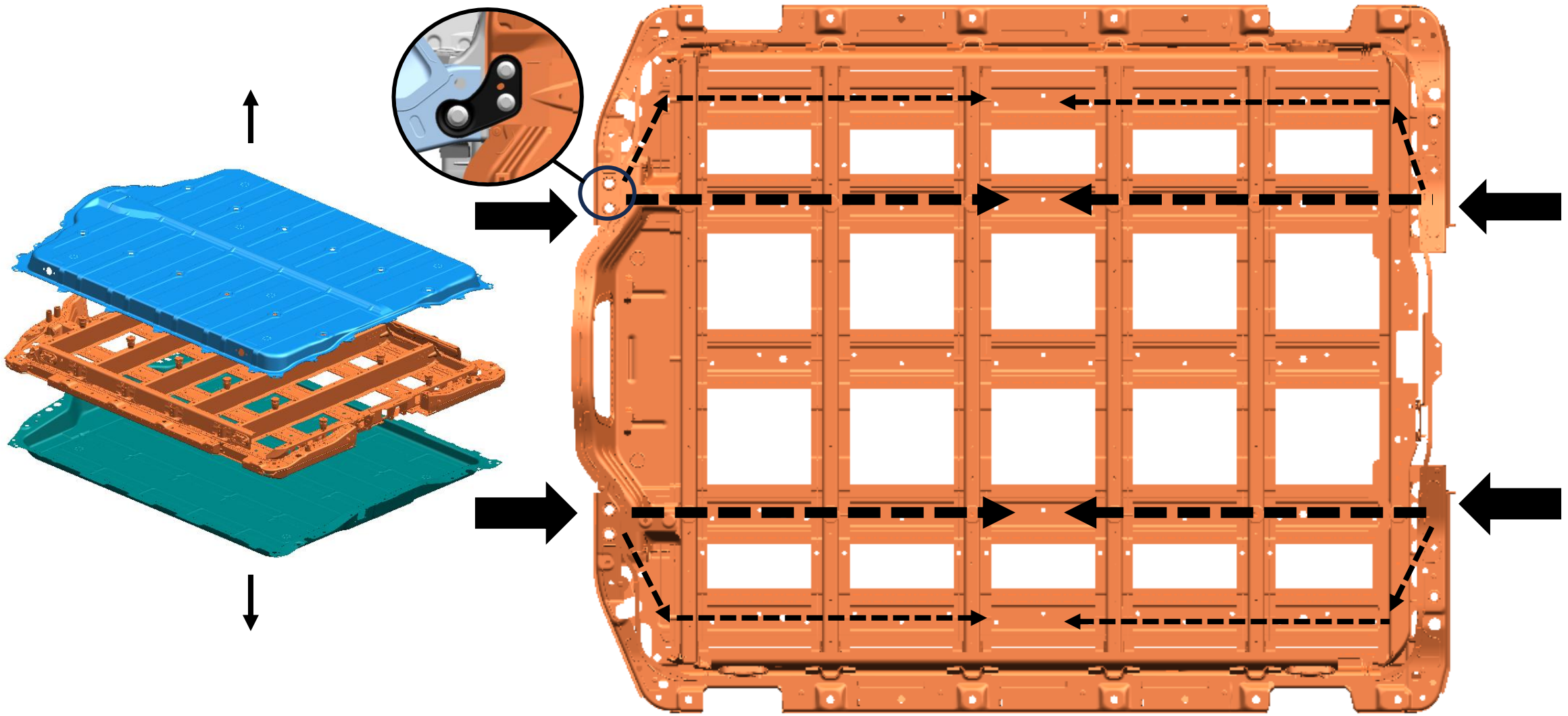
Load Management Strategy utilizing a Structurally Integrated Battery Tray

To minimize the intrusion into the battery space during the front crash event, an integrated battery structure can be utilized to manage transfer of the load (~ 30%).

Cradle Bolt Stabilizer (Shear Plate) which attaches Body, Cradle and RESS; provides secondary shear and stabilizes load transfer.



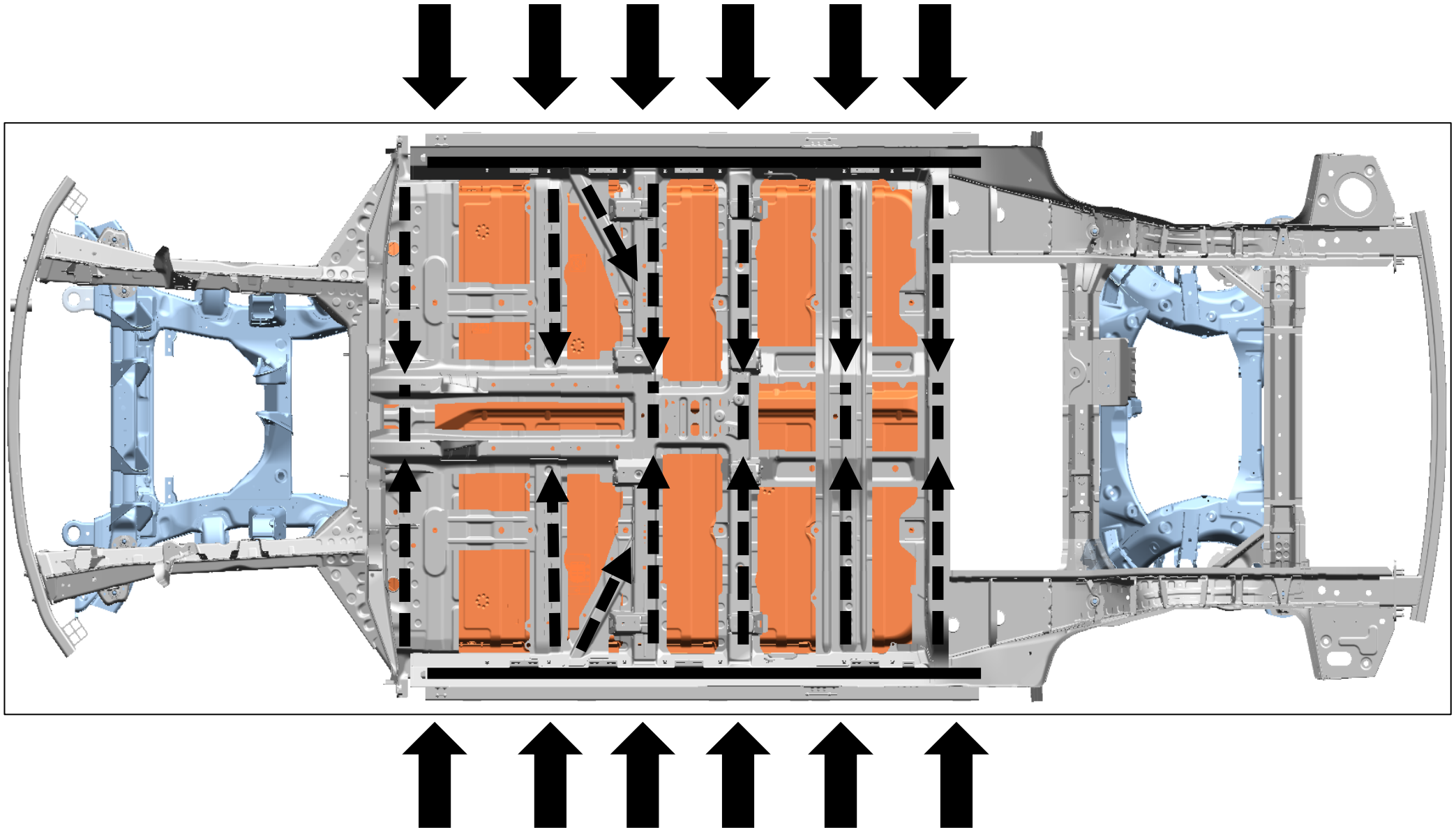
Blazer EV
RESS Front and Rear Loading Topology



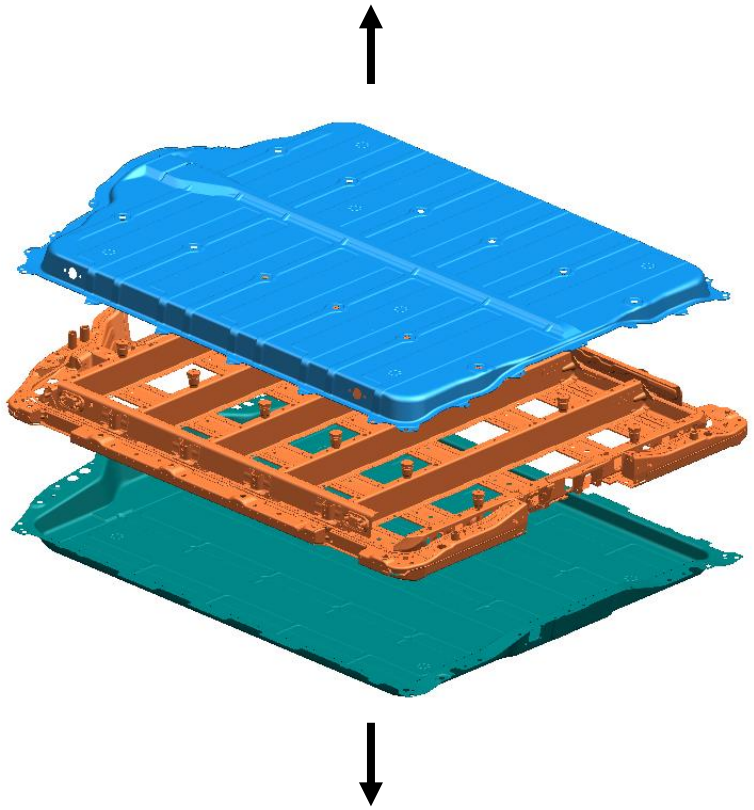
Outline

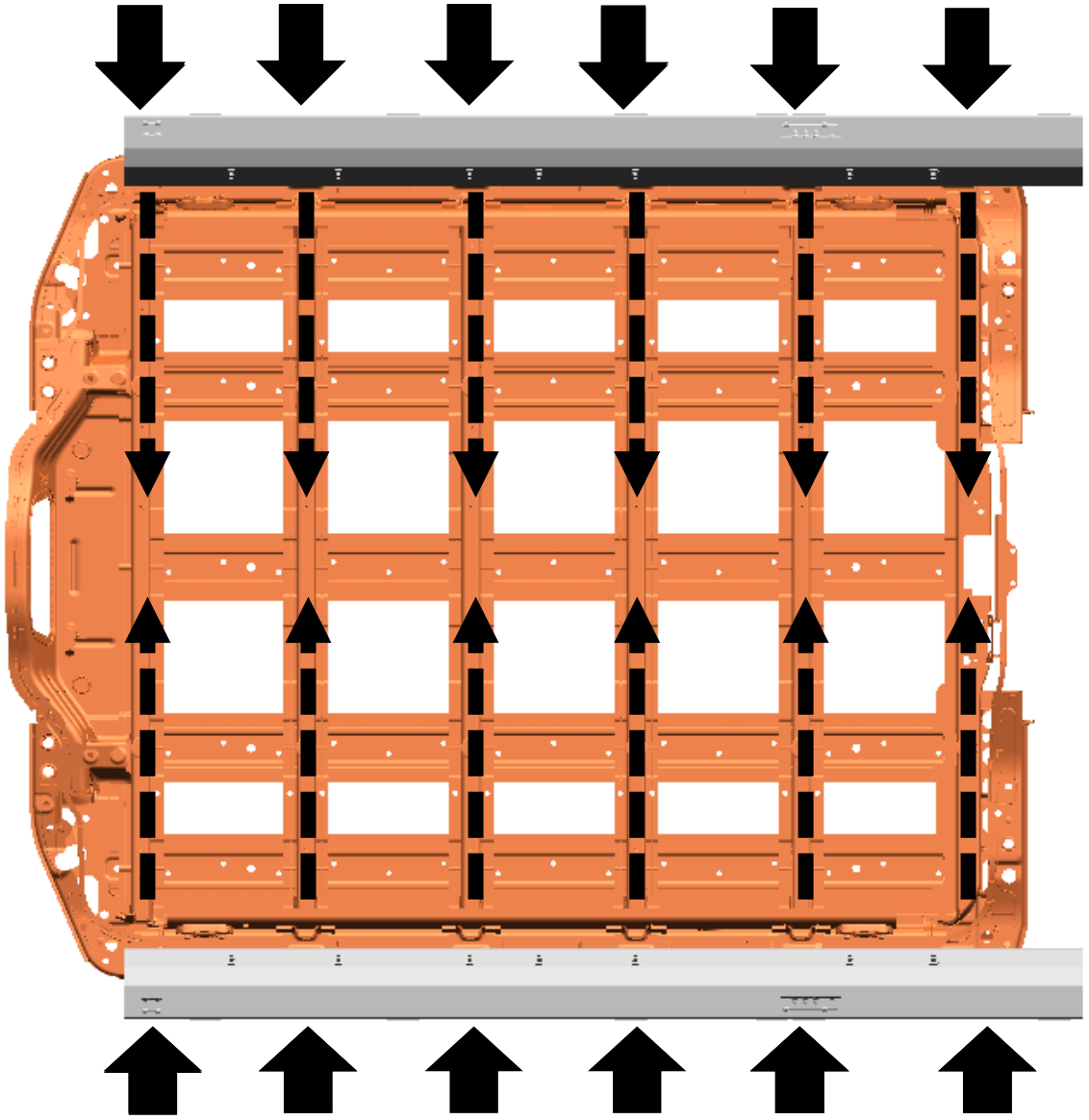
- ❑ BEV3 Crossover Architecture
  - Blazer EV Trim Levels
- ❑ Manufacturing Plant
- ❑ Body Structure
  - VisBOM
  - Materials Composition
- ❑ Rechargeable Energy Storage System
  - VisBOM
  - Materials Composition
- ❑ Load Management
  - Front and Rear Loading
  - Structural Enablers
- ❑ Load Management: Side Loading
- ❑ BIW Stiffness
- ❑ B-pillar 3rd Gen AHSS Application
- ❑ Joining and Sealing Strategy

Blazer EV
Body Structures Side Loading Topology



Blazer EV
RESS Side Loading Topology



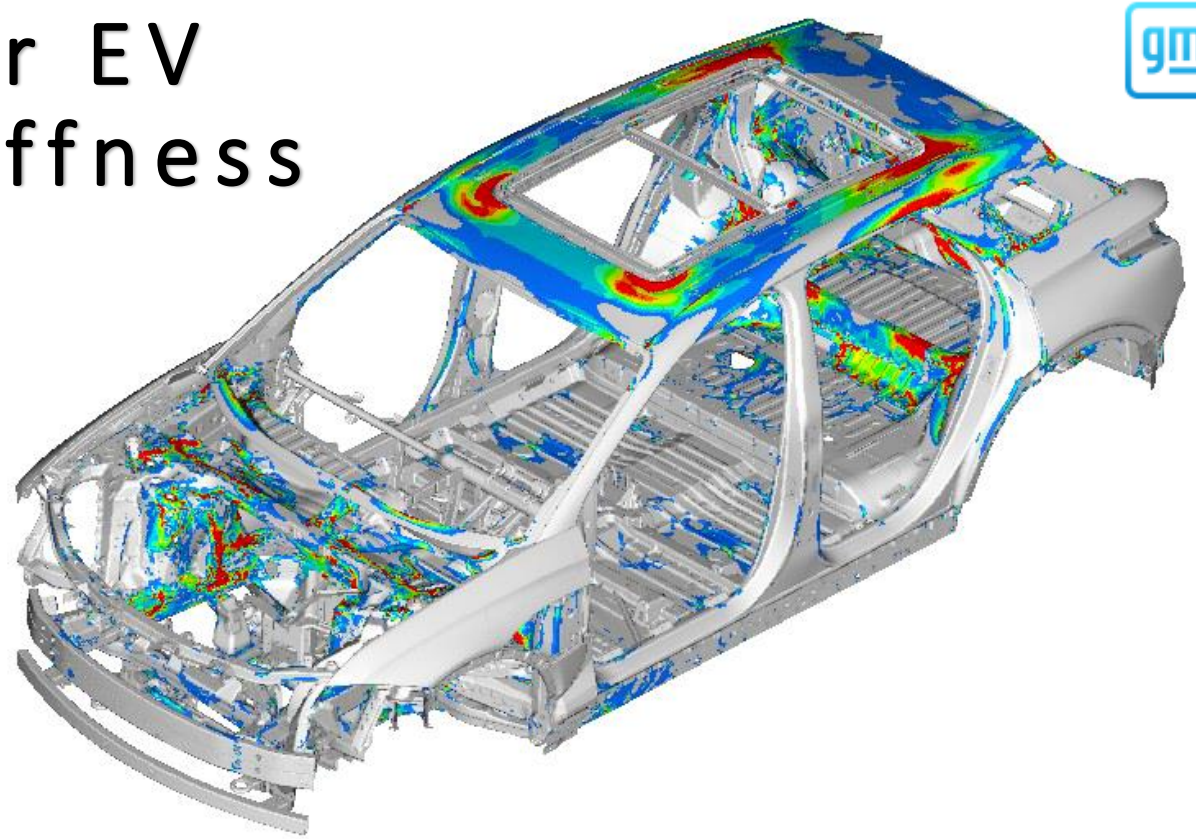


Outline

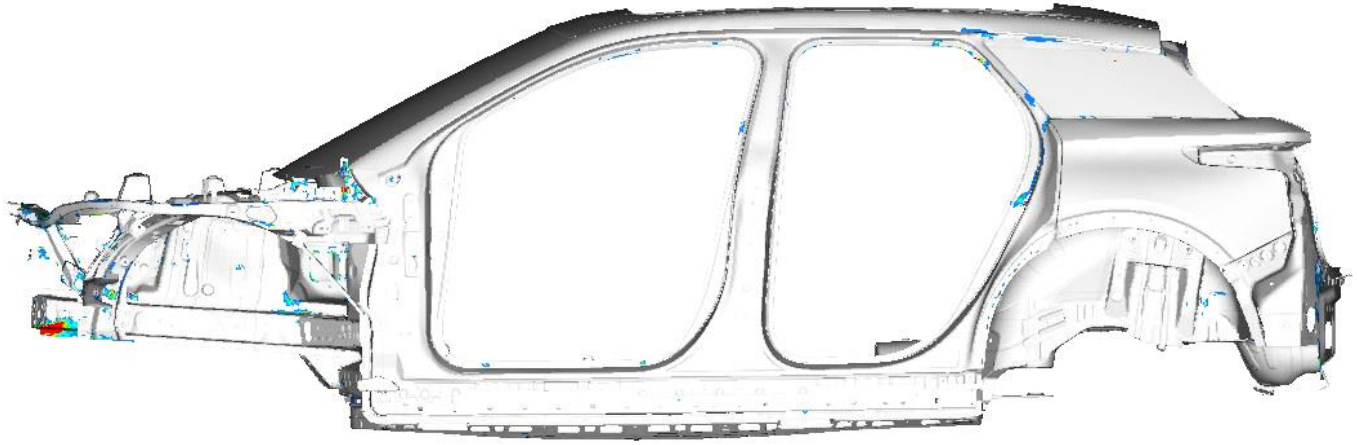
- ❑ BEV3 Crossover Architecture
  - Blazer EV Trim Levels
- ❑ Manufacturing Plant
- ❑ Body Structure
  - VisBOM
  - Materials Composition
- ❑ Rechargeable Energy Storage System
  - VisBOM
  - Materials Composition
- ❑ Load Management
  - Front and Rear Loading
  - Structural Enablers
- ❑ Load Management: Side Loading
- ❑ BIW Stiffness
- ❑ B-pillar 3rd Gen AHSS Application
- ❑ Joining and Sealing Strategy

Blazer EV
BIW Stiffness

Torsion KN-m/deg	
12 MOD Base Roof (Target>31)	34.9
10 MOD Base Roof (Target>28)	32.4
12 MOD Sunroof (Target>31)	31
10 MOD Sunroof (Target>28)	28.4



Bending Hz	
Performance	25.4



Outline

- ❑ BEV3 Crossover Architecture
  - Blazer EV Trim Levels
- ❑ Manufacturing Plant
- ❑ Body Structure
  - VisBOM
  - Materials Composition
- ❑ Rechargeable Energy Storage System
  - VisBOM
  - Materials Composition
- ❑ Load Management
  - Front and Rear Loading
  - Structural Enablers
- ❑ Load Management: Side Loading
- ❑ BIW Stiffness
- ❑ B-pillar 3rd Gen AHSS Application
- ❑ Joining and Sealing Strategy

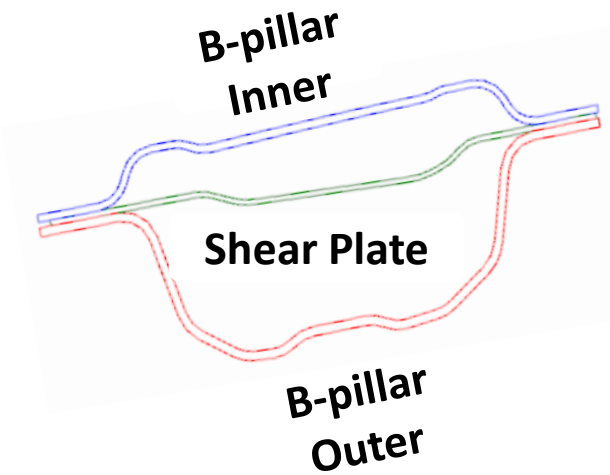
Blazer EV
B-pillar 3rd Gen AHSS Application

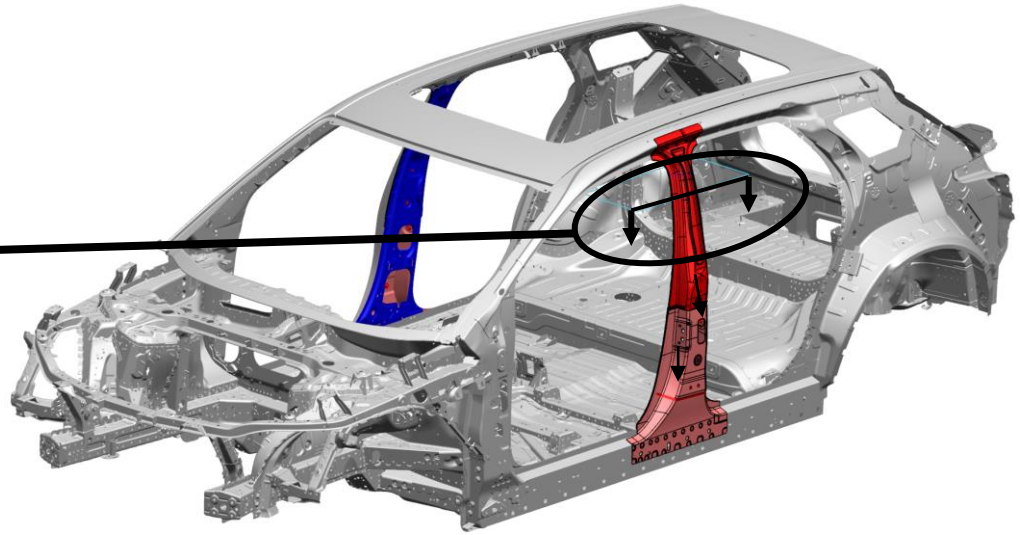
Application of GEN3 Steel enabled:

- Mass Reduction with equivalent vehicle performance (IIHS 2.0 and Roof Crush)
- Cost saving

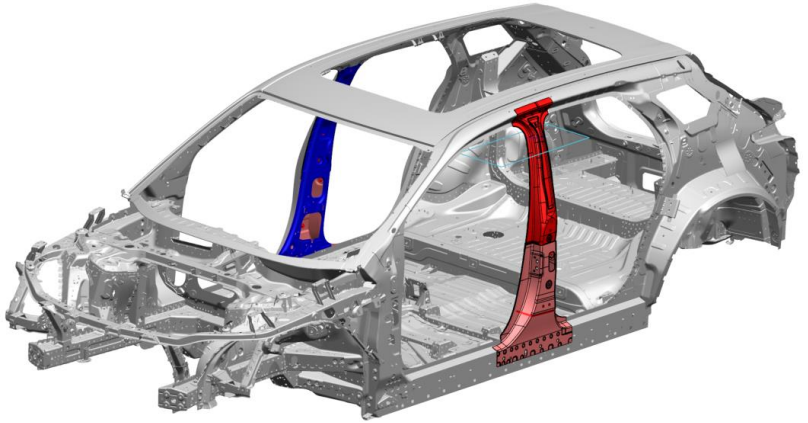
And it is facilitated by:

- Development of a Global Material Spec (GMW17627)
- Unique Forming
- Welding schedules





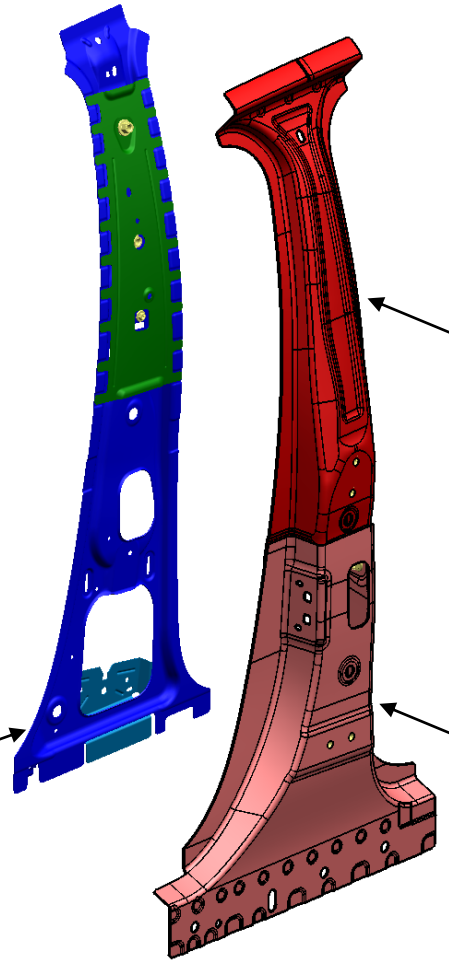
Blazer EV
B-pillar 3rd Gen AHSS Application



B-pillar Structural Material Selection

B-pillar Inner

B-pillar Outer



Main Stamping: MP980 LCE (Thickness: 1.2 mm)

Sheer Plate/Reinforcement: 340 LA (Thickness: 1.2 mm)

Seat belt Retractor Bracket: 420 LA (Thickness: 1.6 mm)

Upper Part: Gen3 1180 Advanced High Strength Steels- Uncoated (Thickness: 1.9 mm)

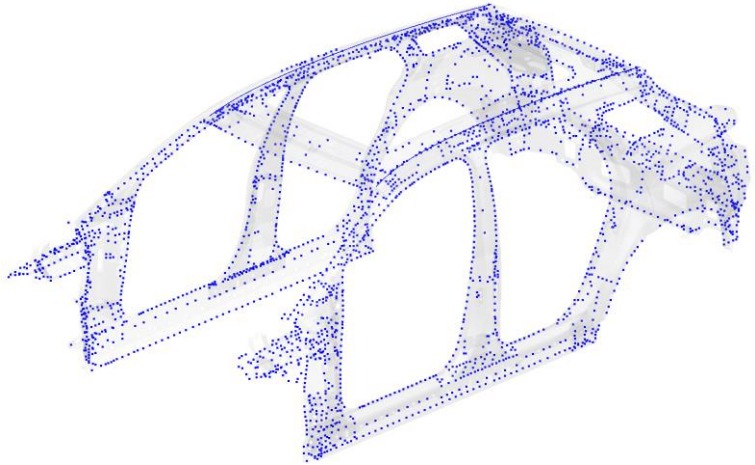
Lower Part : DP590 (Thickness: 1.8 mm)

Outline

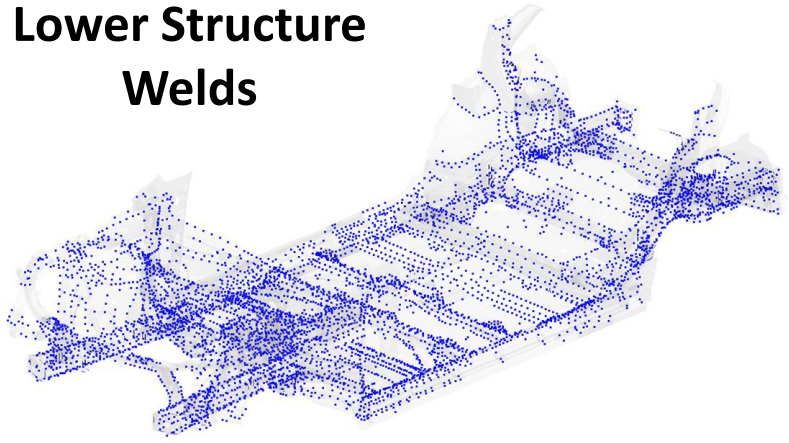
- ❑ BEV3 Crossover Architecture
  - Blazer EV Trim Levels
- ❑ Manufacturing Plant
- ❑ Body Structure
  - VisBOM
  - Materials Composition
- ❑ Rechargeable Energy Storage System
  - VisBOM
  - Materials Composition
- ❑ Load Management
  - Front and Rear Loading
  - Structural Enablers
- ❑ Load Management: Side Loading
- ❑ BIW Stiffness
- ❑ B-pillar 3rd Gen AHSS Application
- ❑ Joining and Sealing Strategy

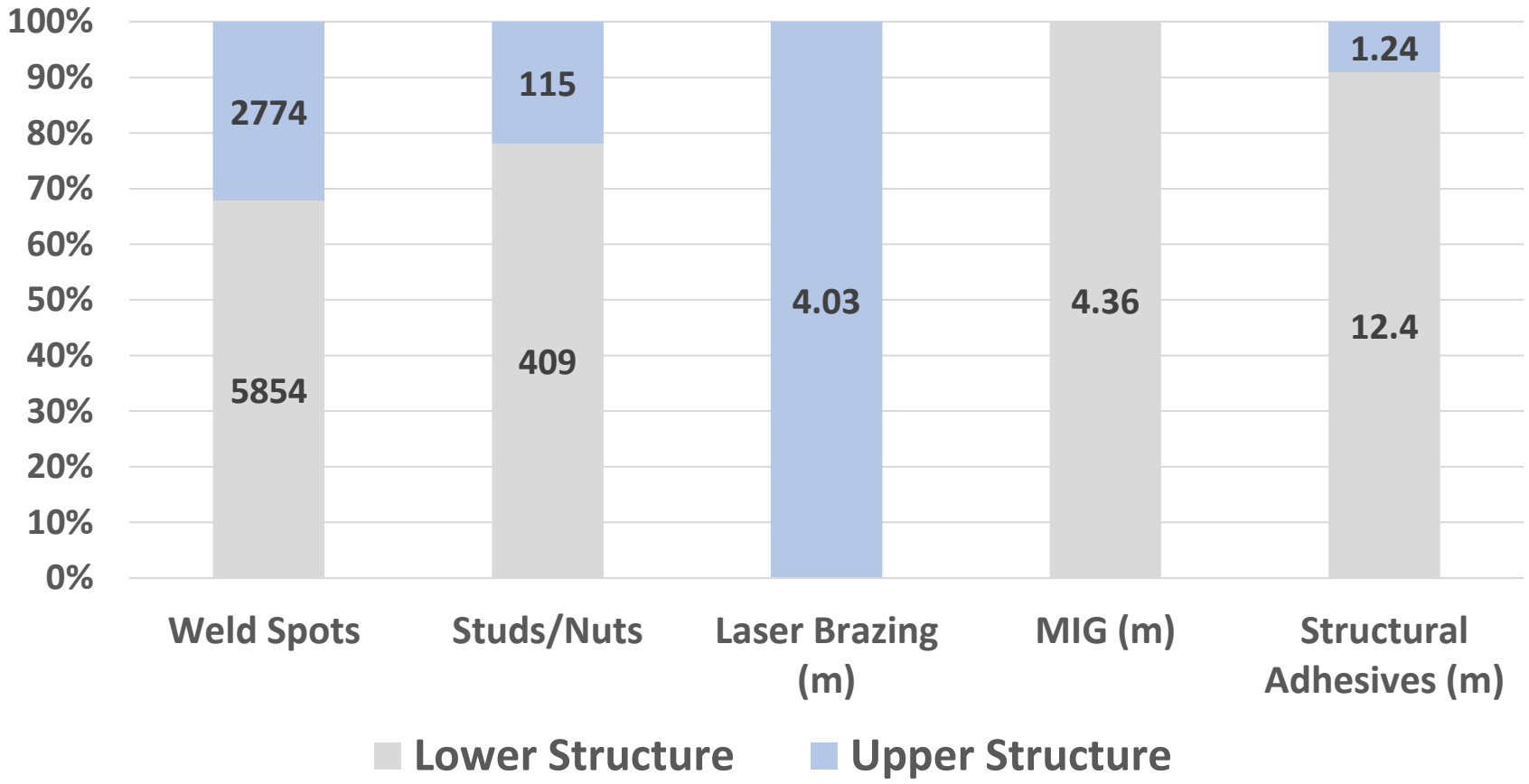
Blazer EV Body Structure Joining Strategy

Upper Structure Welds

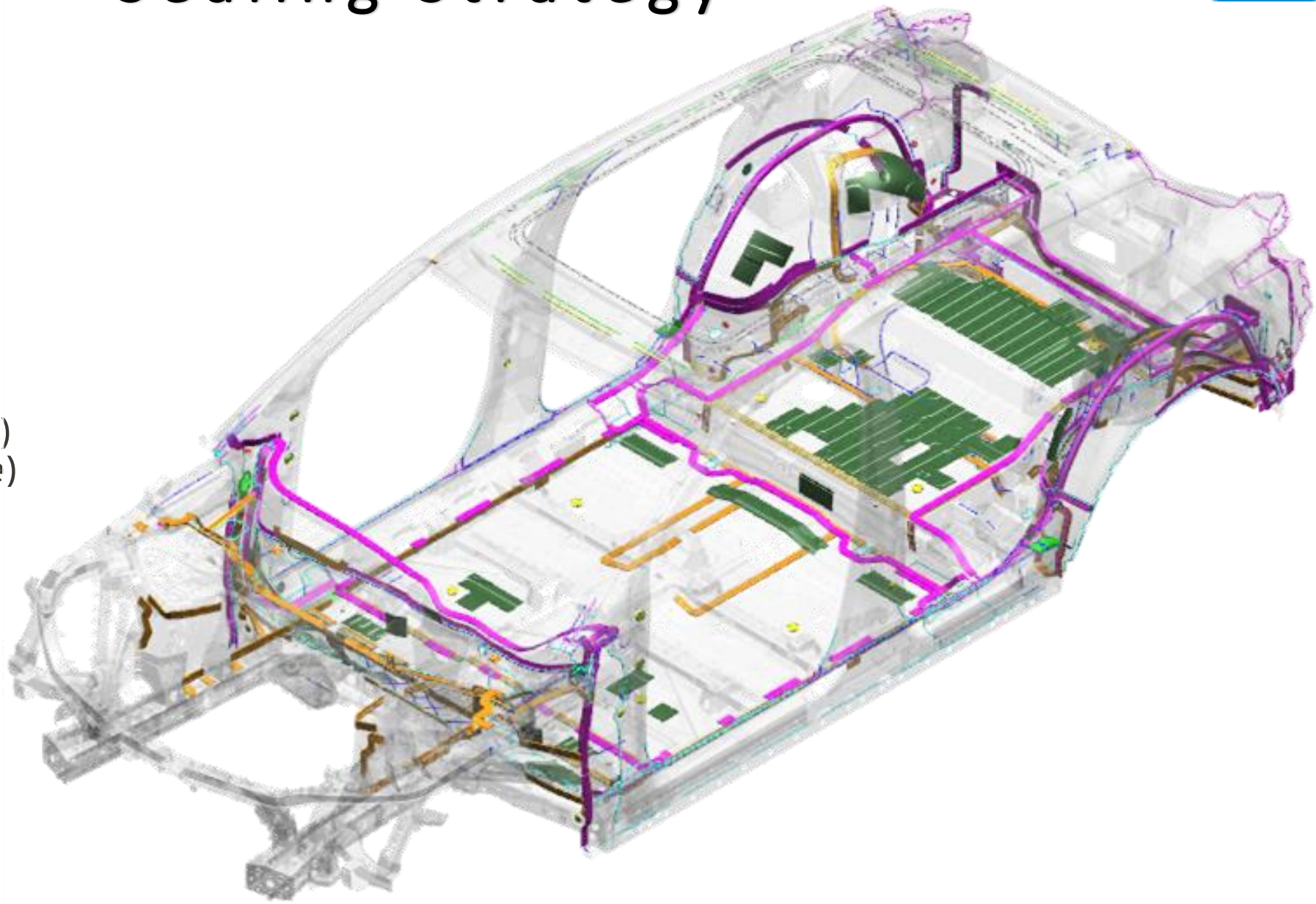


Lower Structure Welds





Blazer EV Body Structure
Sealing Strategy

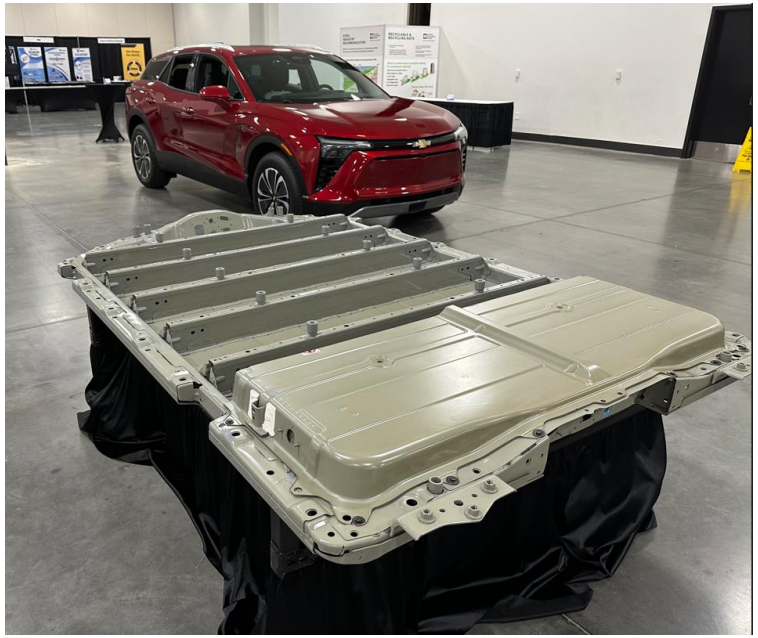


Sealing and Adhesives

- Paint Shop Sealer (dry side)
- Paint Shop Sealer (wet side)
- Body Shop Sealer
- Body Shop Adhesive
- Hemming Adhesive
- Anti Flutter
- Expanding Adhesive
- LASD

Blazer EV continues the Chevrolet legacy of delivering innovative EV for our customers, first seen by the MotorTrend's 2017 Car of the Year winner, the Bolt EV.

MOTORTREND SUV OF THE YEAR 2024®



Chevrolet Blazer EV
Body Structure

Dr. Hoda Eiliat
hoda.eiliat@gm.com
(586) 206 6566

zero emissions

zero congestion

Special Thanks go to:
Art Raymond
Robert Chaney