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STEEL 2015!!

The All New 2015 Chevrolet Colorado and GMC Canyon Cab Structure



Presented by: Wendy Malone
Midsize Truck Upper Structure Lead Engineer





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Outline

- ✧ Product Overview – get to know the GM Midsize Trucks
- ✧ Structural Review

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“The 2015 Chevrolet Colorado has been engineered to meet our consumer’s active lifestyles, offering them more capability, versatility and fuel efficiency than any other midsize pickup on the market – no other truck in the segment comes close.”



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“Not everyone needs full-size capability, but they still deserve strength and true-truck attributes that come in larger models.”



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Midsize Truck: CAB/BED CONFIGURATIONS

- Crew Cab with 6'2" box
- Crew Cab with 5'2" box
- Extended Cab with 6'2" box



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GMs Three Truck Strategy:

A truck for every buyer and their varied needs.



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Three Capable Trucks



	COLORADO		SILVERADO LD		3500 HD
	Crew Cab Short Bed	Crew Cab Long Bed	Double Cab Standard Bed	Crew Cab Short Bed	Crew Cab Standard Bed
Max. Payload	1,590 lbs.	1,540 lbs.	2,101 lbs.	2,007 lbs.	4,319 lbs.
Max. Trailering	7,000 lbs.	7,000 lbs.	11,500 lbs.	11,400 lbs.	13,000 lbs.
Length	212.7"	225"	230"	229.5"	239.5"
Width	74.3"	74.3"	80"	80"	96"
Wheelbase	128.3"	140.5"	143.5"	143.5"	153.7"
Height (2WD)	70.6"	70.4"	73.9"	74.2"	78.4"
Cargo Box Length	62.7"	74"	78.9"	69.3"	78.9"

Source: MY2010 EPA, GM, FORD, RAM

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Proven Powertrain Lineup

Two gasoline engines available at launch

- ✧ 2.5L I-4
- ✧ 3.6L V6
- ✧ Millions of real-world customer miles affirm their durability and reliability

Diesel engine available for 16MY

- ✧ 2.8L 4-cylinder Duramax® Turbo-Diesel
- All engines are mated with a 6-speed transmission
- A manual transmission will be available on extended cab 4 cylinder configurations.



2.5L I-4

2.8L Turbo-Diesel



3.6L V6



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Manufacturing



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Built For Versatility

- Quiet Cabin
- 4G/My Link 
- Interior Comfort
- Proactive Safety

Seamless transition
from work week to
weekend adventure

Exterior
Styling

Bed
Adaptability

Best in Class
Payload &
Towing

Off Road
Performance

Best in Class
Fuel Economy

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All New Architecture

- ✧ All new Midsize Truck Body on Frame Architecture
- ✧ Upper and lower structure designed to meet North American safety standards and customer needs
- ✧ New inlaid doors
- ✧ Noise reduction
- ✧ Better fit and finish
- ✧ Box designed for payload and versatility
- ✧ True truck capability in a midsize package

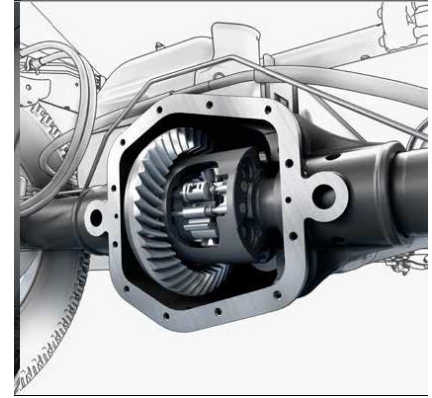
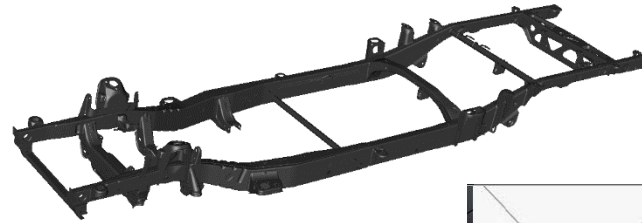


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Shared DNA with Full Size Truck

- ✧ Fully Boxed Frame
- ✧ Eaton Locking Rear Differential
- ✧ Shear-Style Body Mounts
- ✧ Inlaid doors, triple door seals
- ✧ Pickup Box strategy
- ✧ CornerStep Rear Bumper and box grab handle
- ✧ EZ Lift & Lower Tailgate



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Segment Leading Payload and Towing

- ✧ Max. payload 1,620 lbs.
- ✧ Base towing is 3,500 lbs.
- ✧ Bumper hitch standard
- ✧ Max. towing 7,000 lbs.
- ✧ Requires Z82 Towing Package



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Aerodynamics

- ✧ Hundreds of hours spent in the wind tunnel
- ✧ Importance on Aero to support “best in class” fuel economy



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Other Fuel Economy Enablers

Content/Styling

- ✧ Front-end sealing
- ✧ Tow hook seals
- ✧ Box-to-cab seals
- ✧ Tailgate spoiler
- ✧ Rear tire air deflectors
- ✧ Improved hood-to-windshield closeouts

Technologies

- ✧ Electric Power Steering
- ✧ Active aero shutters



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A More Functional Pickup Box

- ✧ Available GearOn™ Accessories: Tiered Storage Cross Rails, Cargo Divider, Adjustable tie-downs, Utility Rack Stanchions, Utility Rack Load Stops
- ✧ Additional Bed Accessories: Drop-in Bedliner, Spray-in Bedliner, Tonneau Cover, Bed Rubber Mat, Convenience Bed Net, Bed Toolbox, to name a few.



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Safety System

Prevent

- Forward Collision Alert
- StabiliTrak Electronic Stability Control
- Lane Departure Warning
- Turn by Turn navigation

Protect

- Airbags
- Safety Belts
- **Vehicle Structure**

Respond

- Automatic Crash Response 
- Automatic Fuel shutoff
- Automatic Door Unlock
- Automatic Flashers



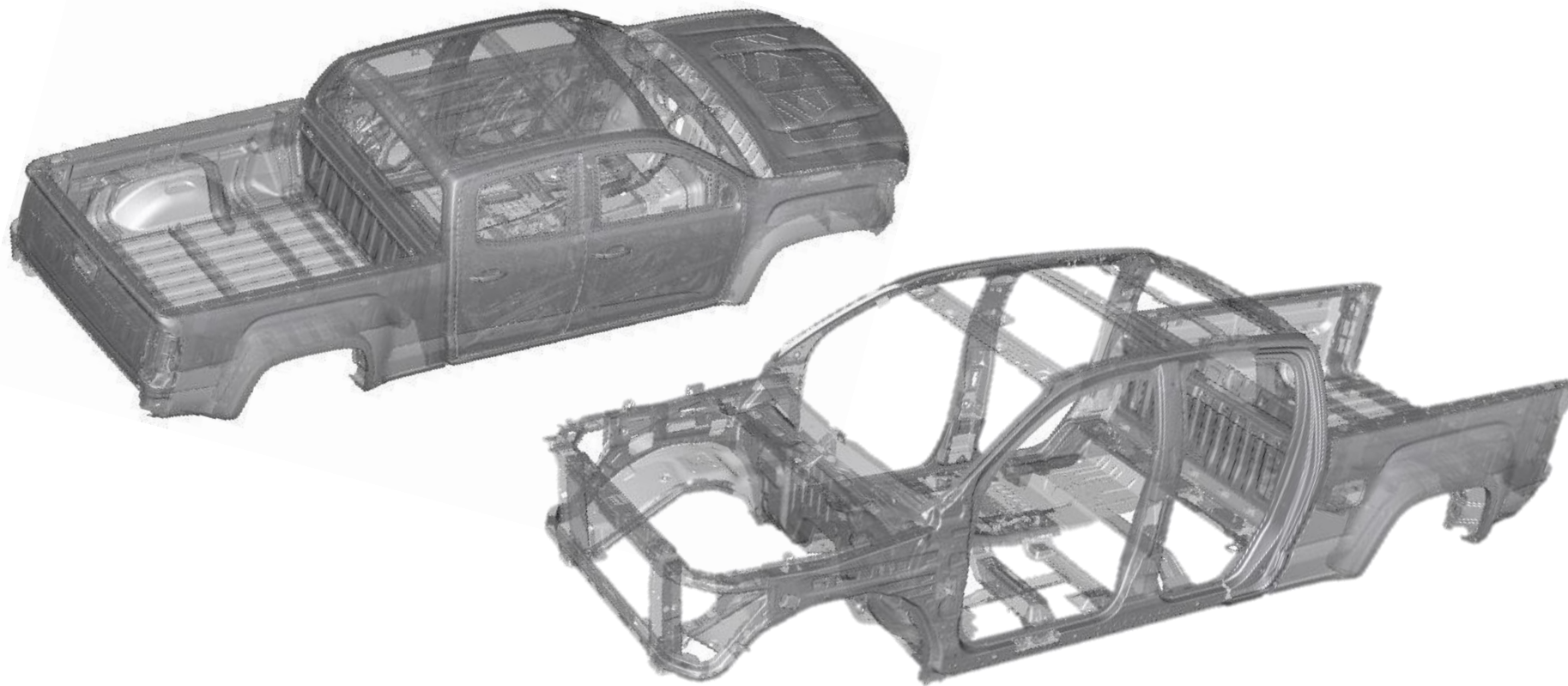
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Structural Review



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Body-in-White Objectives

✧ Performance goals of the BIW

- Updated structure to conform with latest materials, joint constructions and best practices.
- Comply with all Regulatory and IIHS Standards
- Emphasis on noise & vibration performance
- Mass Reduction w/o comprised durability

✧ Manufacturing goals

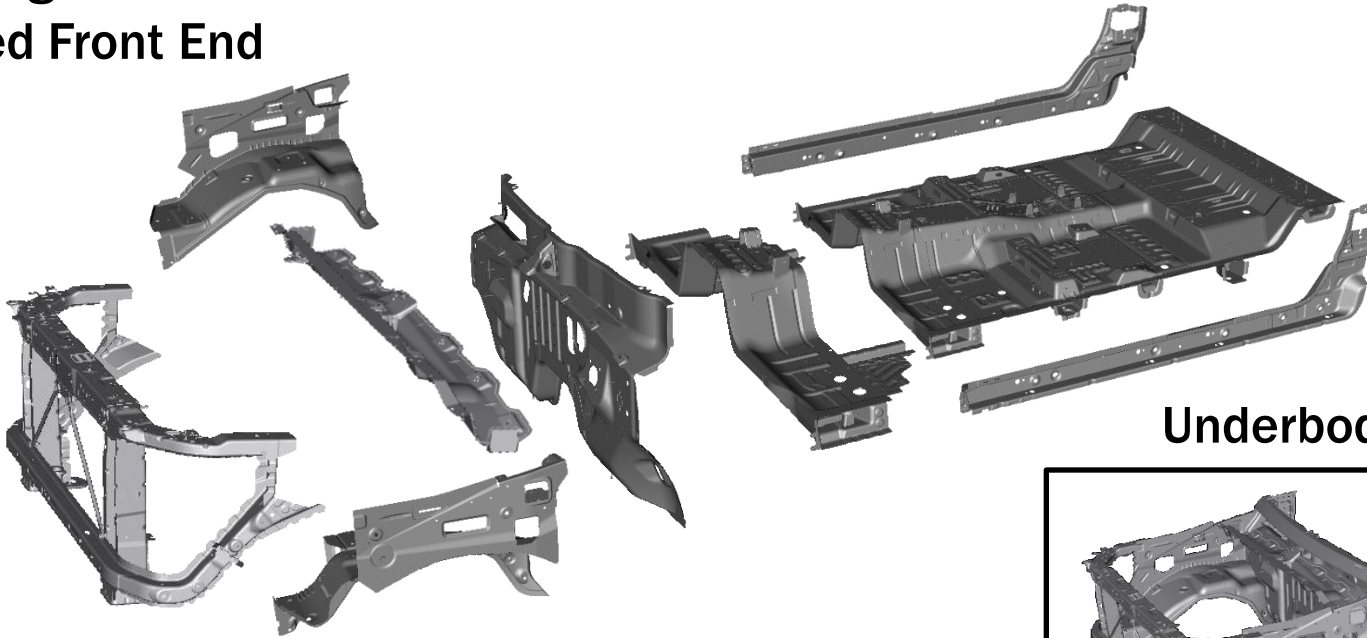
- All New Body shop with flexibility to build with existing Van line
- Follow an established Bill of Process
- Part Commonality within the architecture

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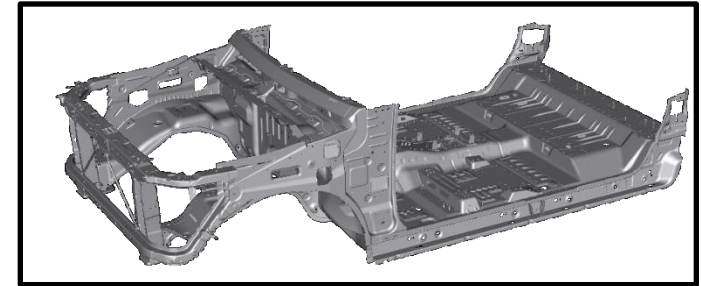
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Assembly Strategy – Underbody Structure

Integrated
Welded Front End



Underbody Complete



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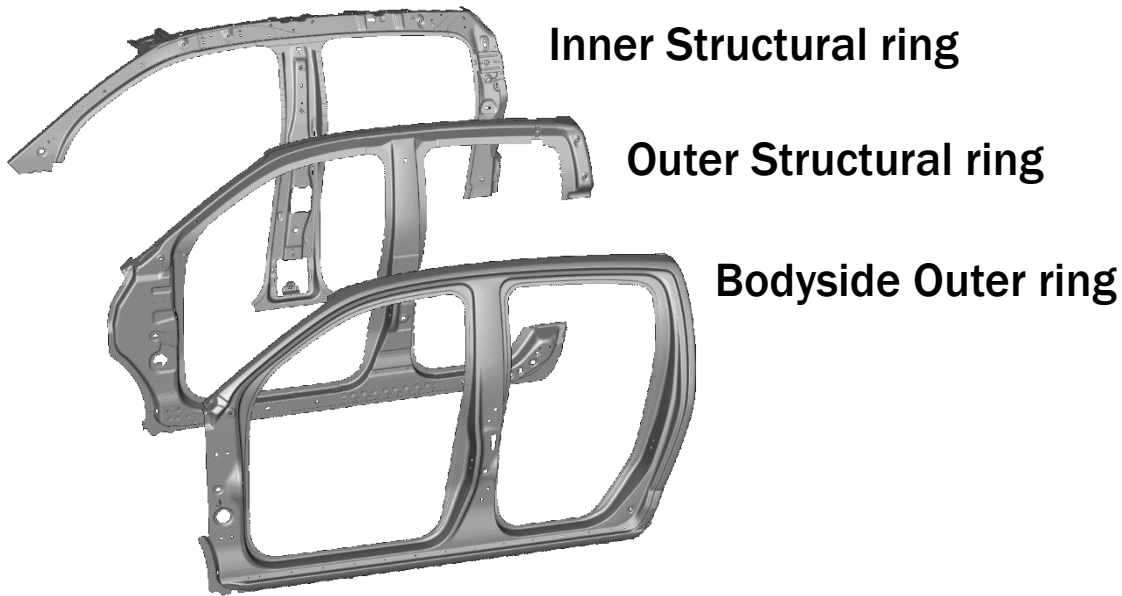
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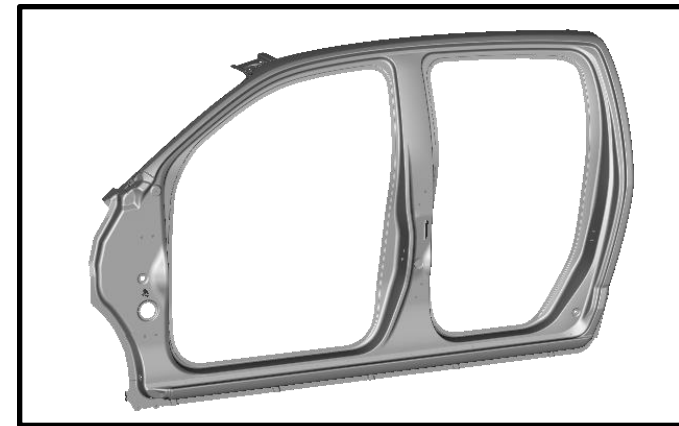
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Assembly Strategy – Upper Structure

Modular Build Bodyside Subassembly



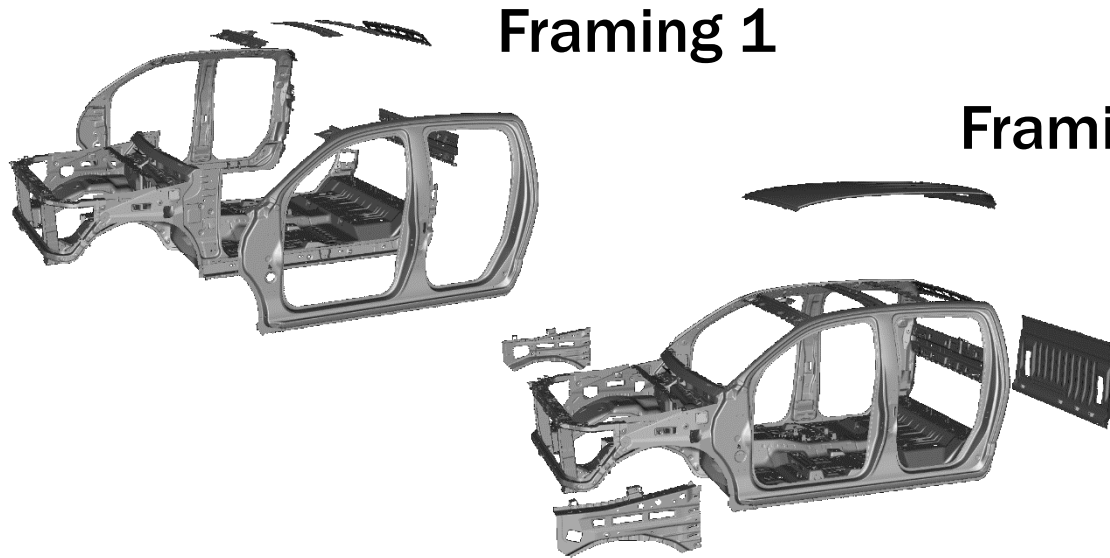
Bodyside Complete



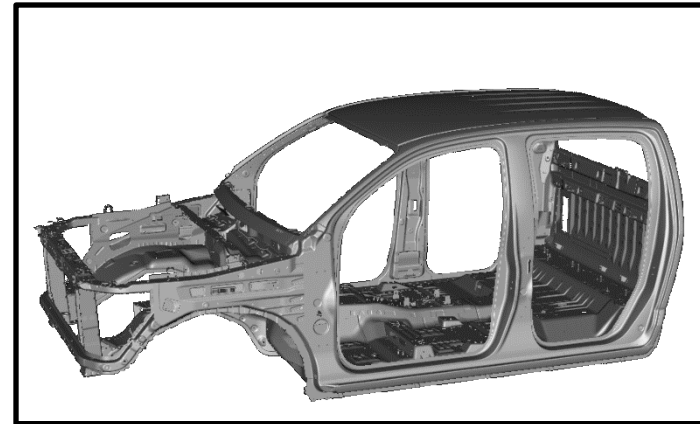
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Assembly Strategy – Framing



Body-in-White Complete

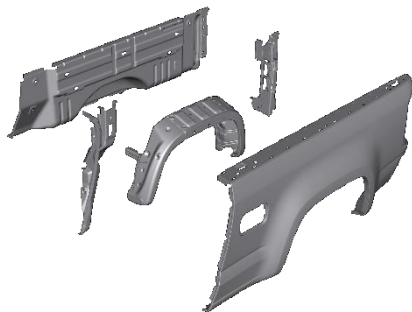


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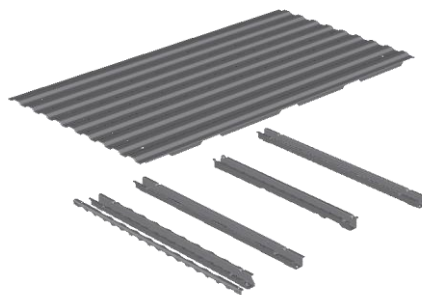
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Assembly Strategy – Box Sides

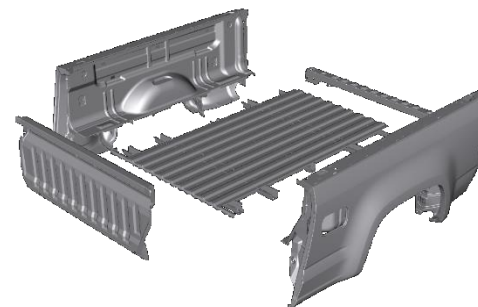
Box Side subs



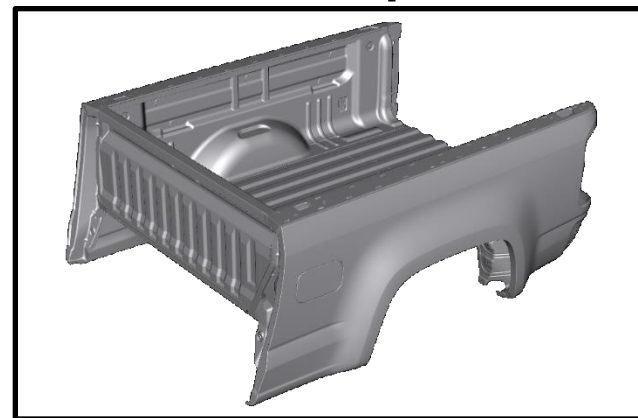
Floor sub



Box Assembly



Box Complete



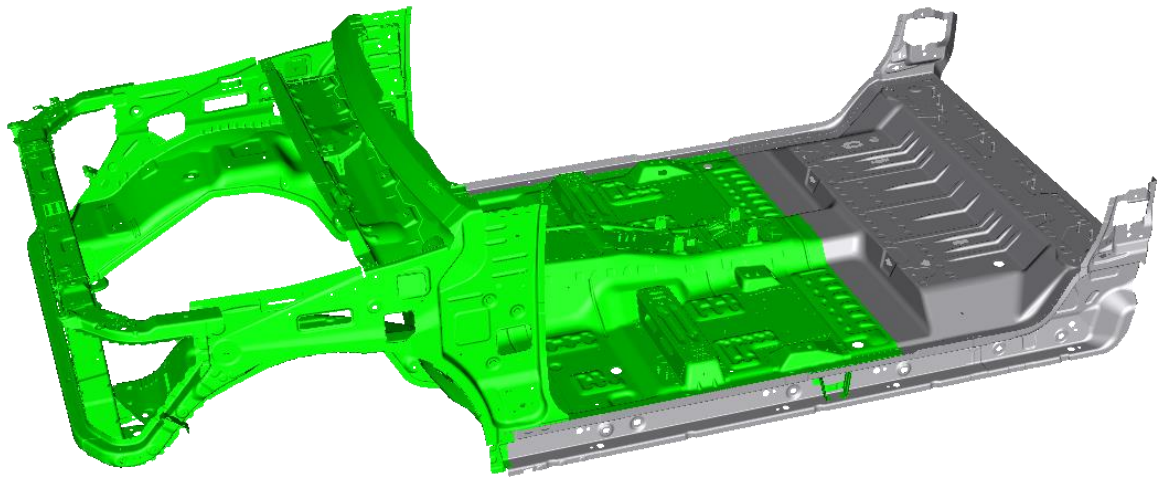
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Part Commonality

Common Crew Cab and Extended Cab

- Complete Front Structure
- Hinge Pillar Inners
- Front Floor Structure



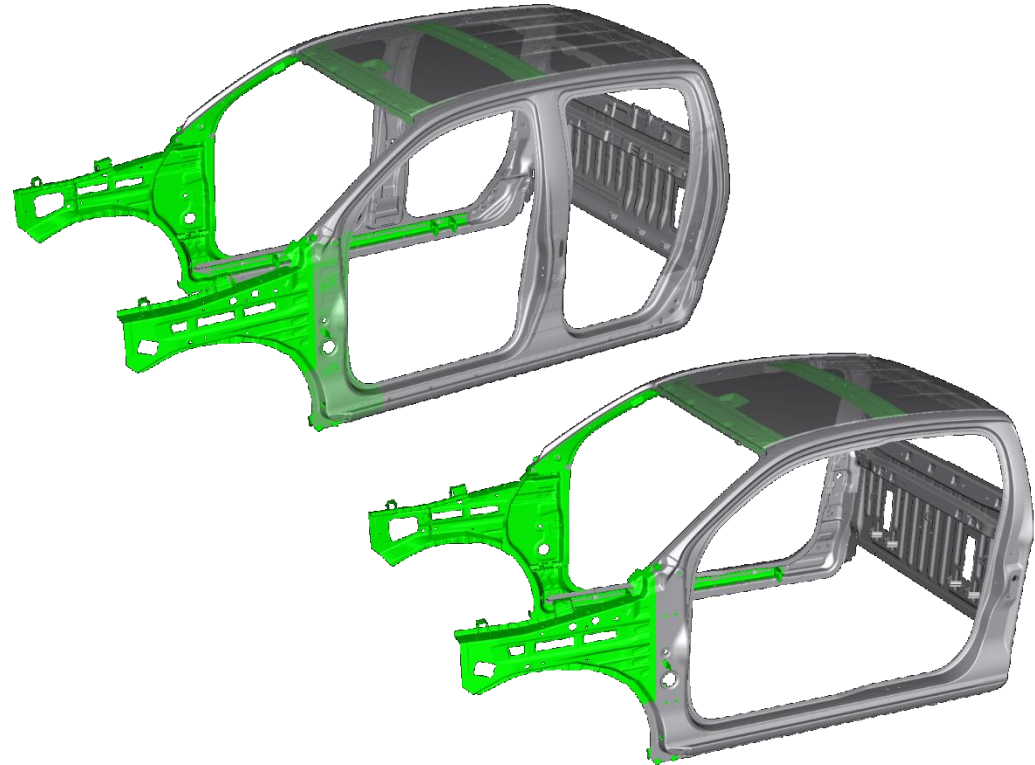
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Part Commonality

Common Crew Cab and Extended Cab

- Upper Motor Rails
- Front Body Hinge Pillar Outers
- A Pillar Inners
- Front Header
- Console Bracket
- #2 Roof Bow
- Fender Brackets
- Some Rocker Content
 - Reinforcement L brackets
 - Bulkheads

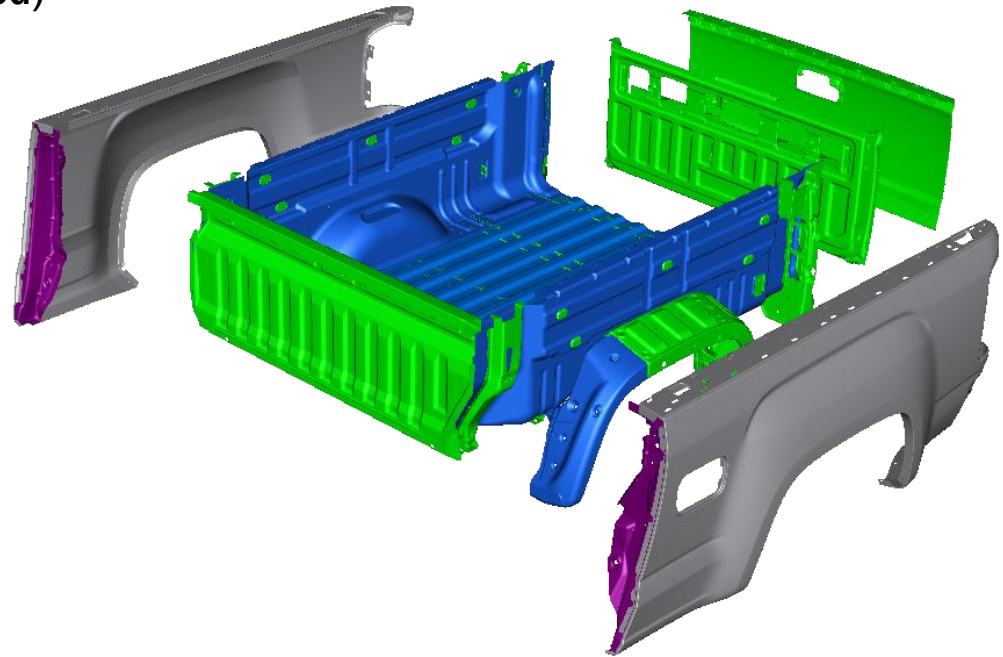


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Part Commonality

-  Common All Boxes / All Brands
-  Depends on Box length (6'2" or 5'2")
-  Depends on Cab Style (Crew vs Extended)
-  Depends on:
 - Cab style (Crew vs Extended)
 - Box Length (Long vs Short)
 - Brand specific (Chevrolet vs GMC)



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Safety Performance

-  PRESS HARDENED STEEL
-  ULTRA HIGH-STRENGTH STEEL
-  ADVANCED HIGH-STRENGTH STEEL
-  HIGH-STRENGTH STEEL



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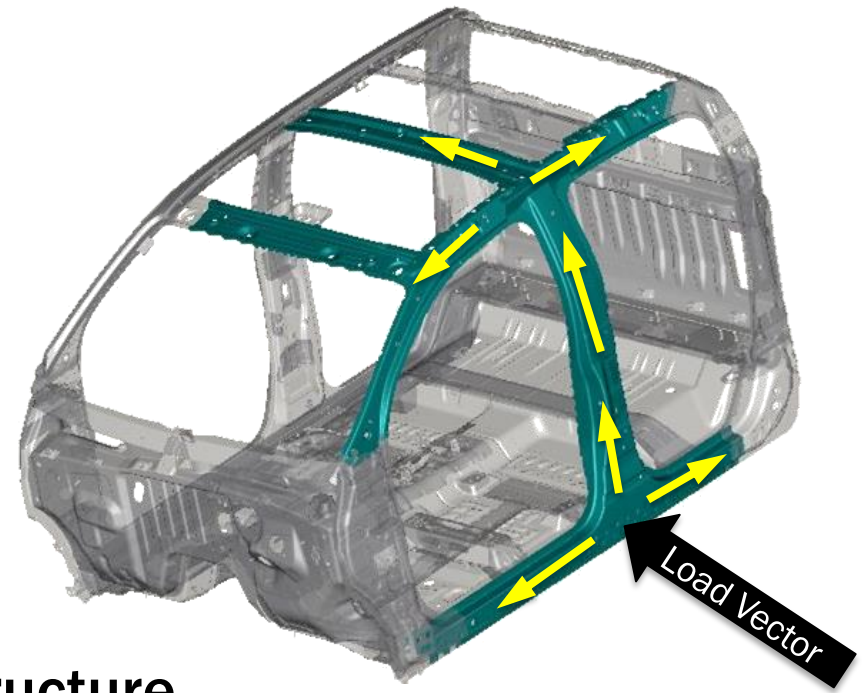
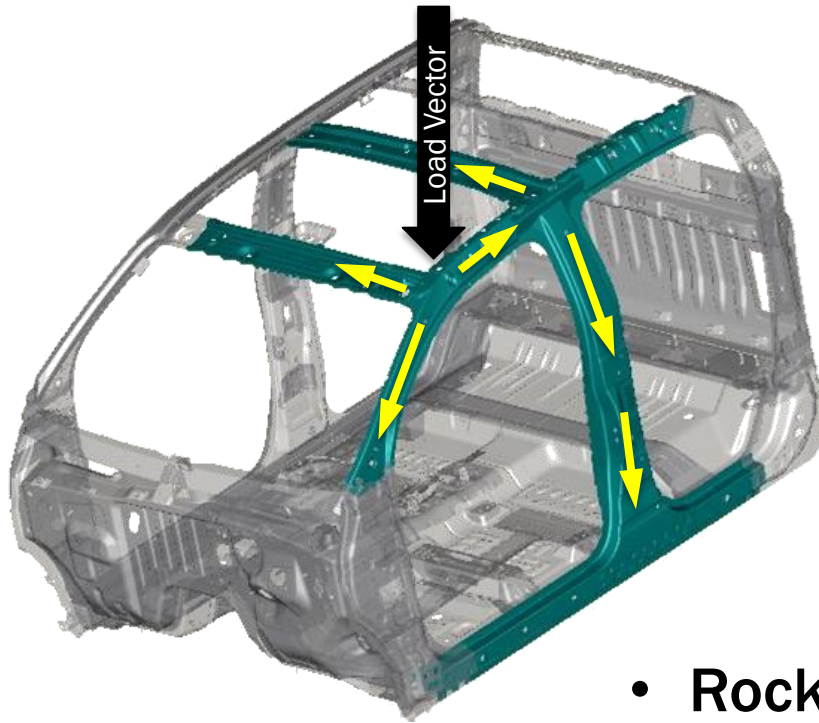
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Roof Strength & Side Impact

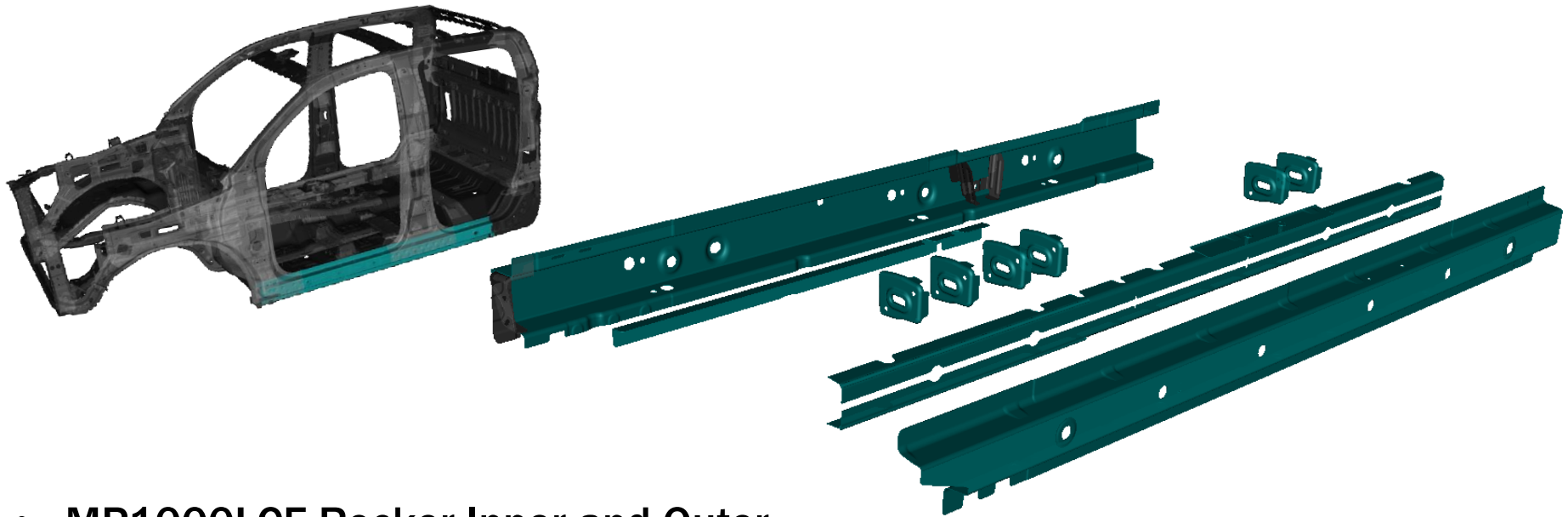


- Rocker Structure
- Center Pillar Structure
- Roof Rail Structure

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Rocker Section Strength

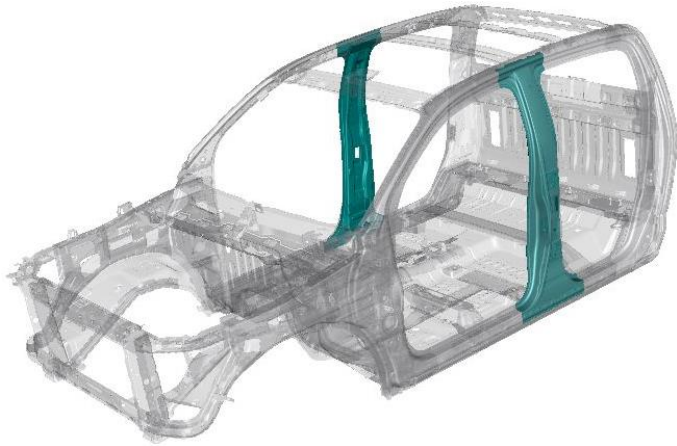


- MP1000LCE Rocker Inner and Outer
- Martensite Grade 13 Internal L reinforcements
- Section stabilizing bulkheads

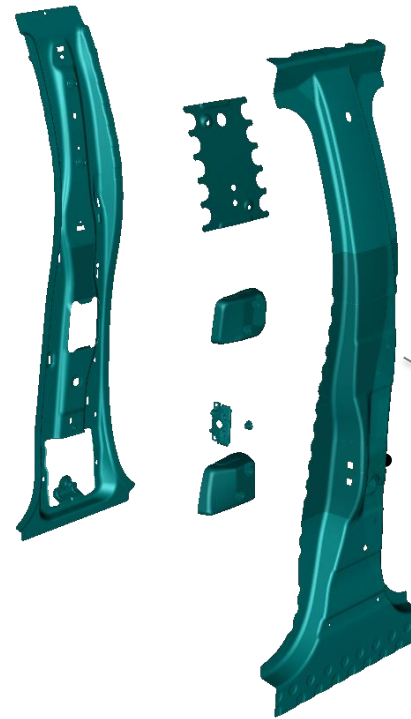
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Center Pillar Structure



- PHS Center Plr Outer (TRB)
- MP1000LCE Center Plr Inner
- Tension Panel
- Local Hinge Reinforcements



TRB – Tailor Rolled Blank

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Roof Rail Section



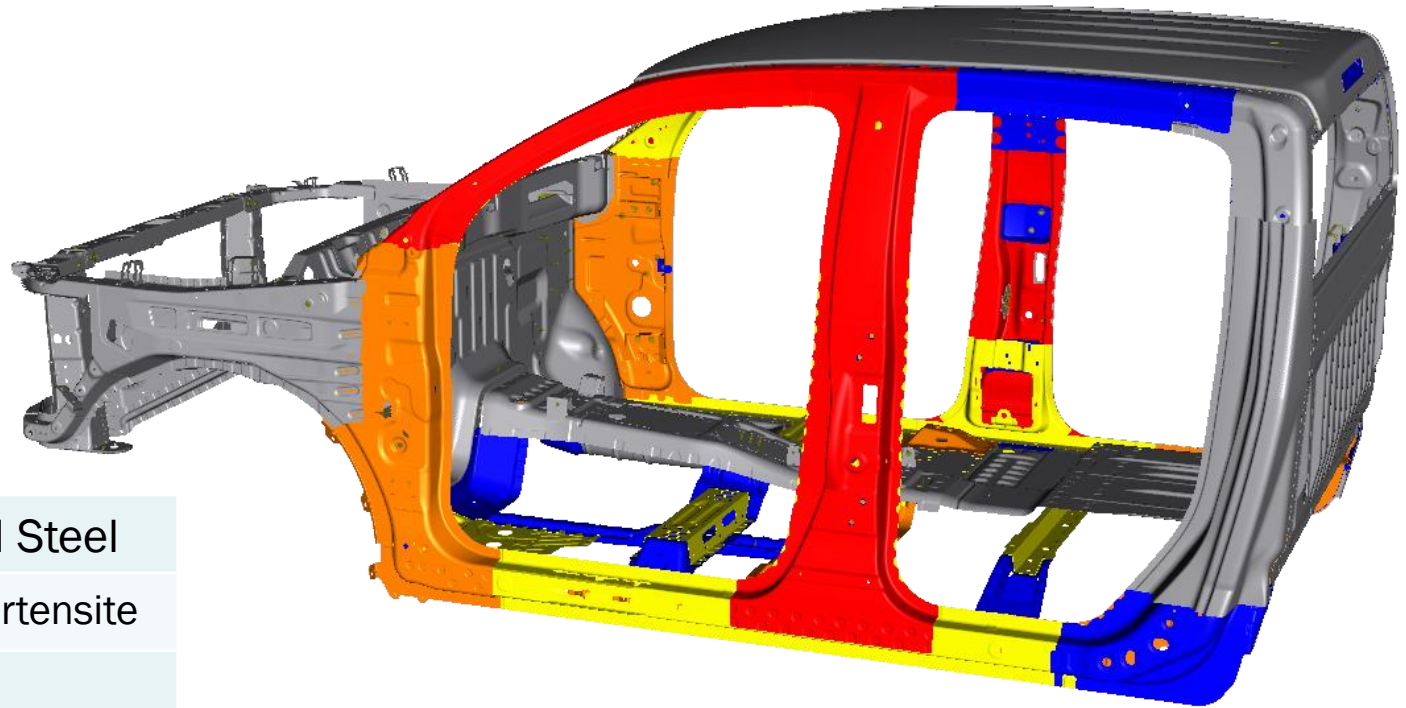
- MP1000LCE Front Header
- DP800 Roof Bow & Extension
- MP1000LCE Windshield Side Frame Inner
- MP1000LCE Roof Rail Inner
- MP1000LCE Reinforcement Inner
- PHS Roof Rail Outer



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Lower & Upper Structure Cutaway Display



	Press Hardened Steel
	Multi-Phase & Martensite
	Dual-Phase
	HSLA
	Bake Hard & Mild Steel

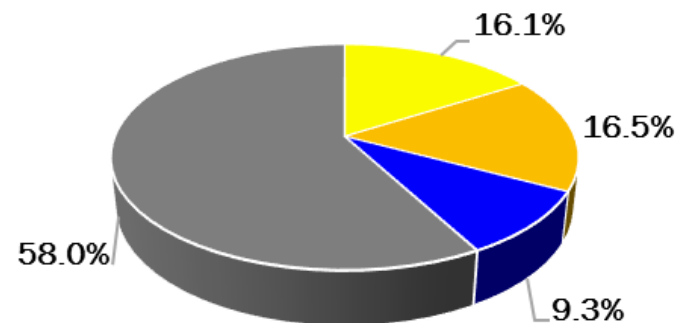
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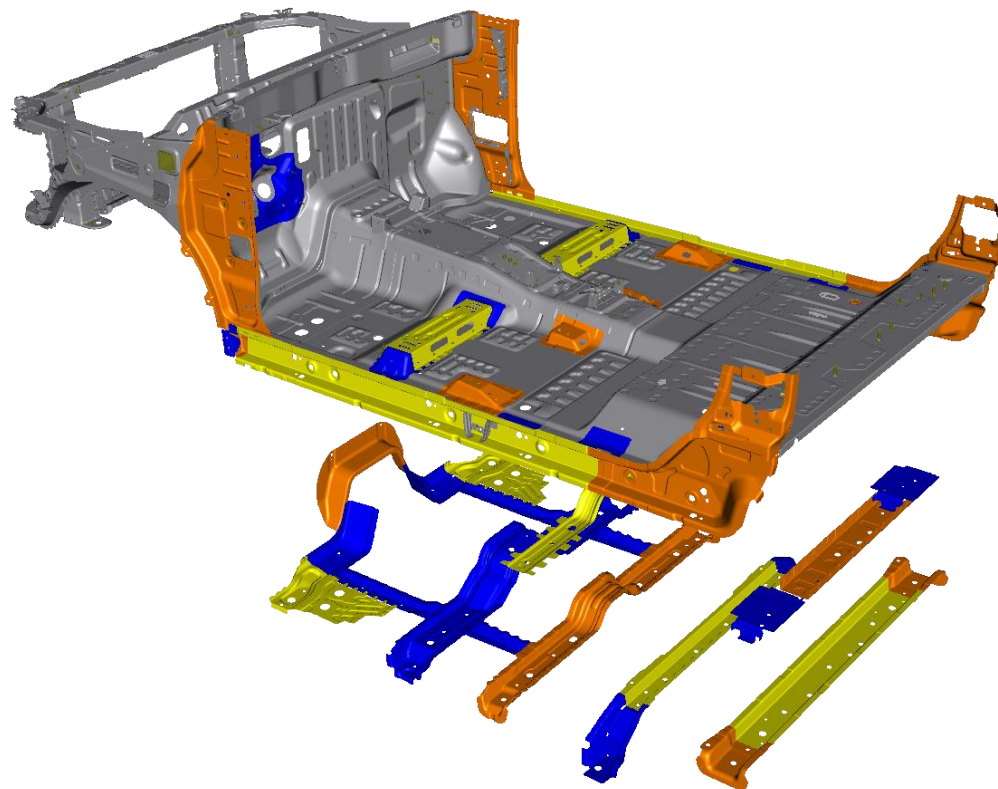
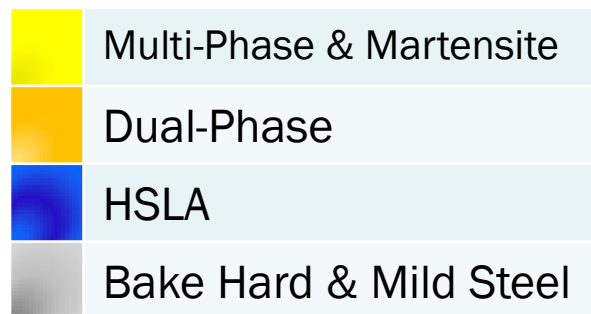
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Lower Structure Visual BOM



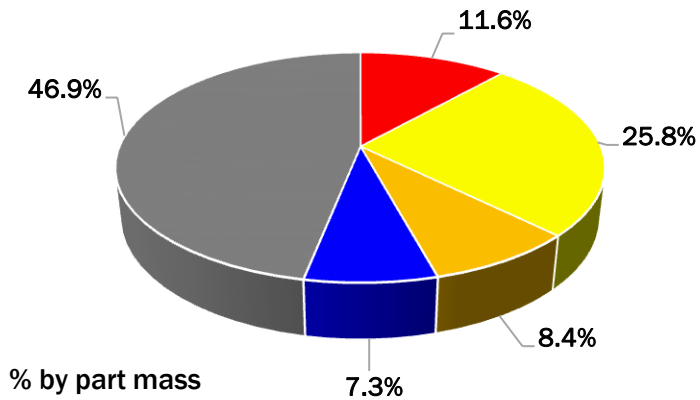
% by part mass



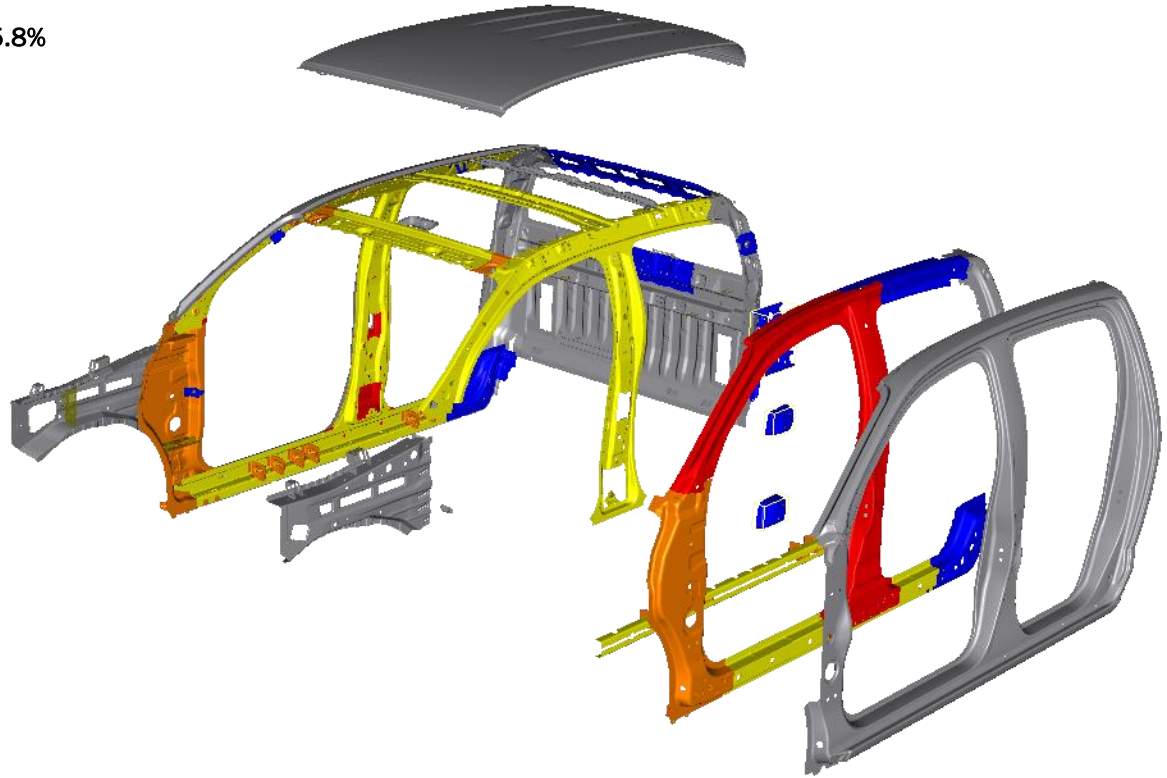
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Upper Structure Visual BOM



	Press Hardened Steel
	Multi-Phase & Martensite
	Dual-Phase
	HSLA
	Bake Hard & Mild Steel



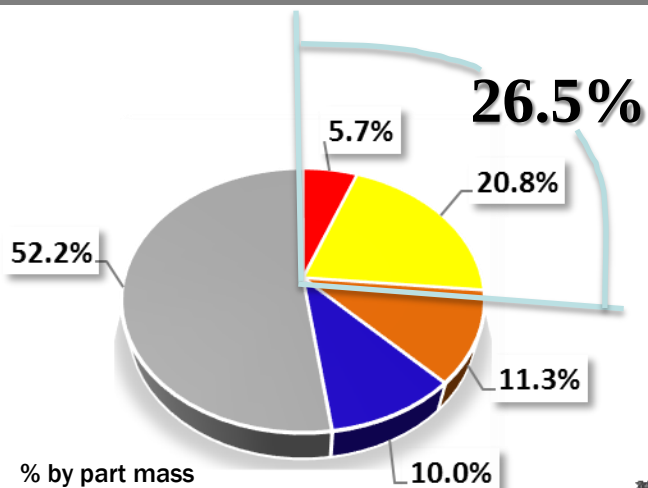
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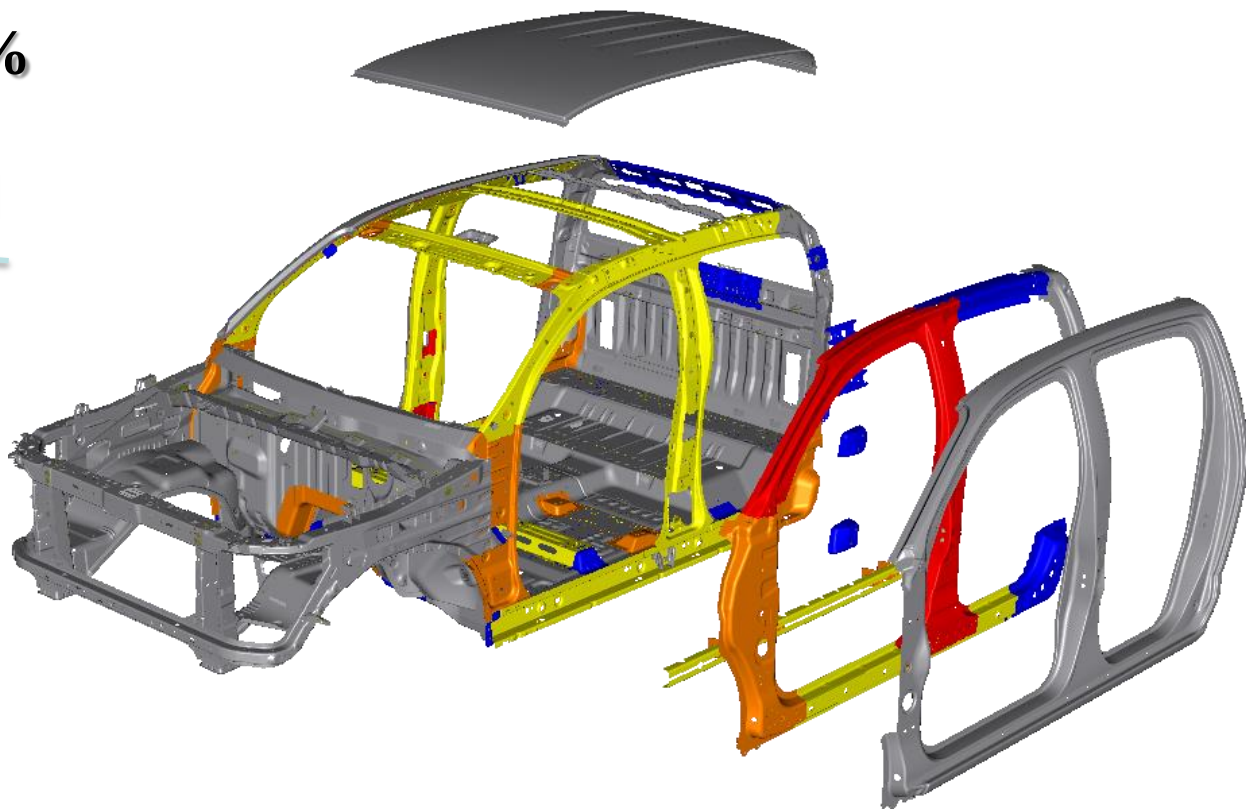
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Body Structure Material Usage



	Press Hardened Steel
	Multi-Phase & Martensite
	Dual-Phase
	HSLA
	Bake Hard & Mild Steel



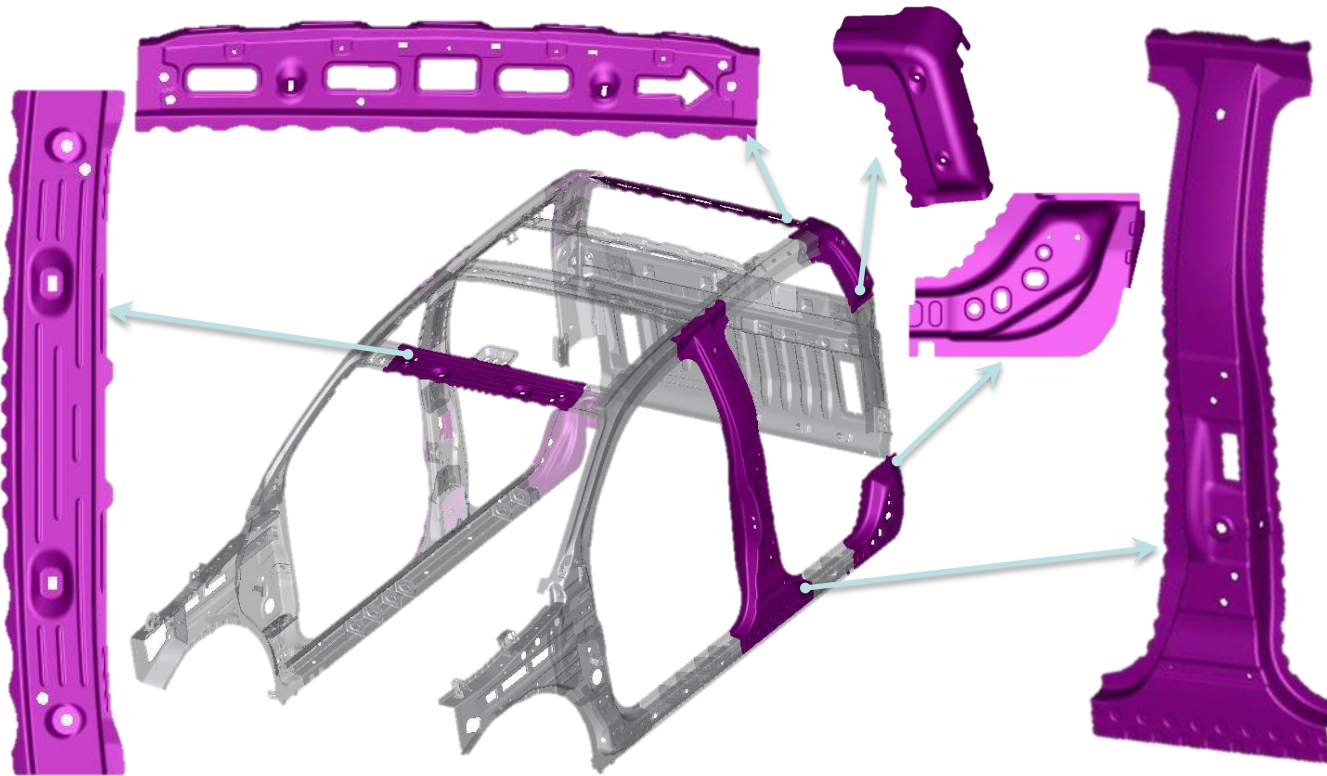
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Mass Reduction: Upper Scalloped Flanges

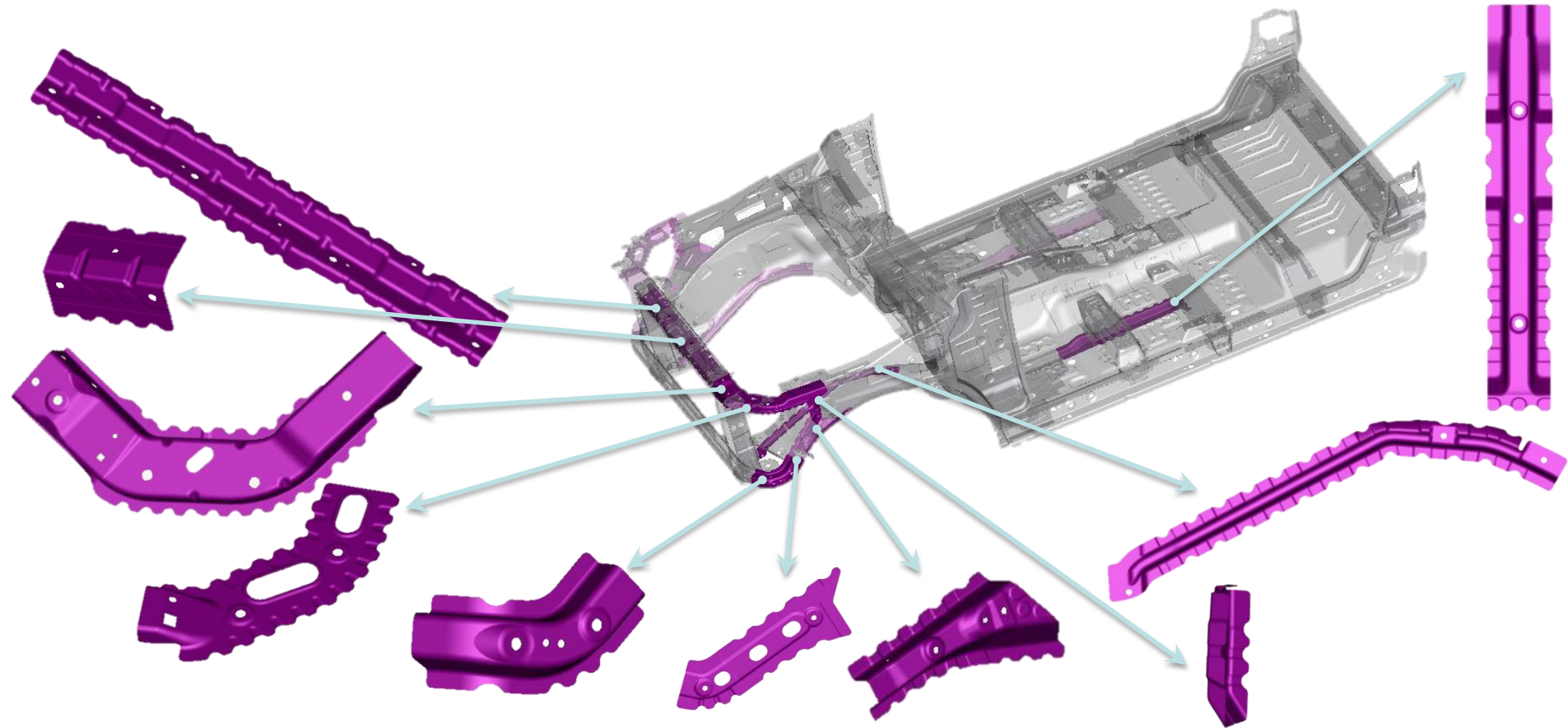


- ✧ Every-gram-matters mentality
- ✧ Cost effective mass saving
- ✧ A standard design practice

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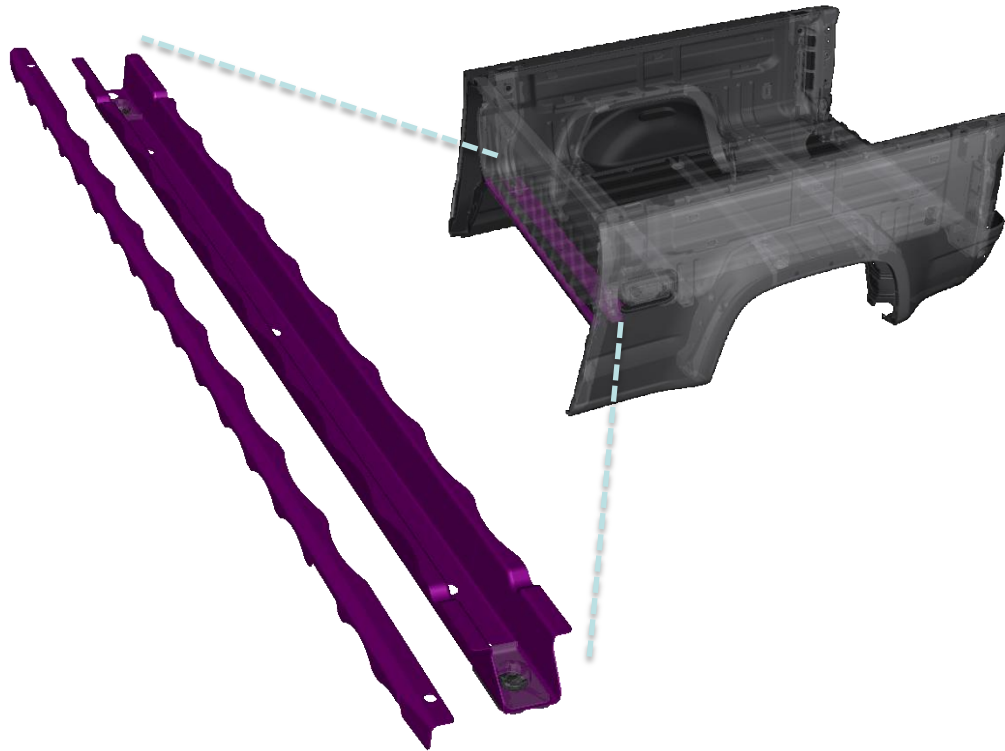
Mass Reduction: Lower Scalloped Flanges



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Mass Reduction: Cross Sill Scalloped Flanges



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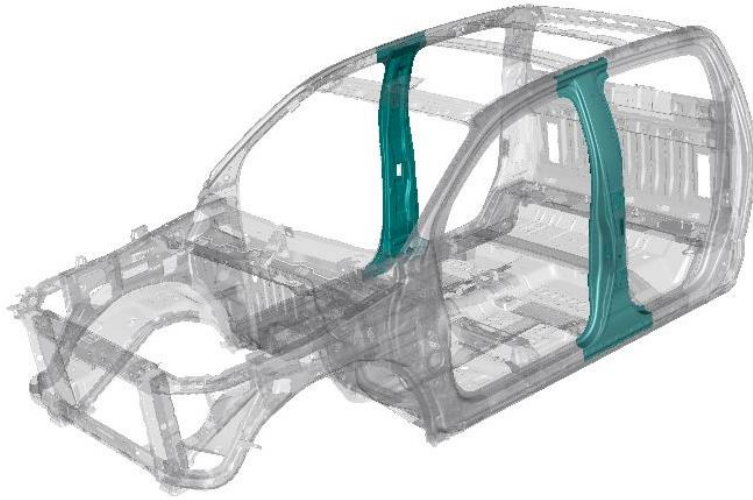
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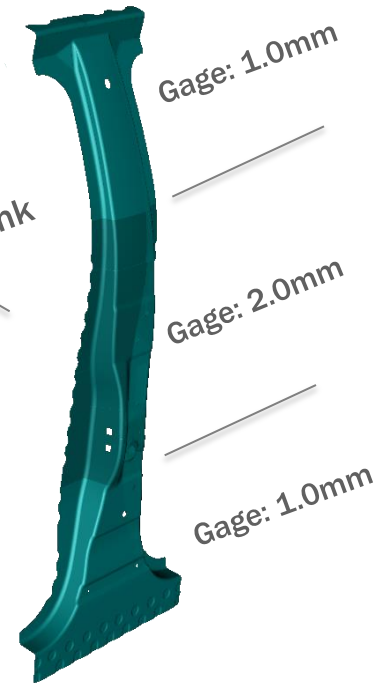
Mass Reduction / Efficiency



Center Pillar Outer Reinforcement

- ✧ Hot Stamped Tailor Rolled Blank
- ✧ Performance tuning
- ✧ Mass Efficiency

TRB – Tailor Rolled Blank



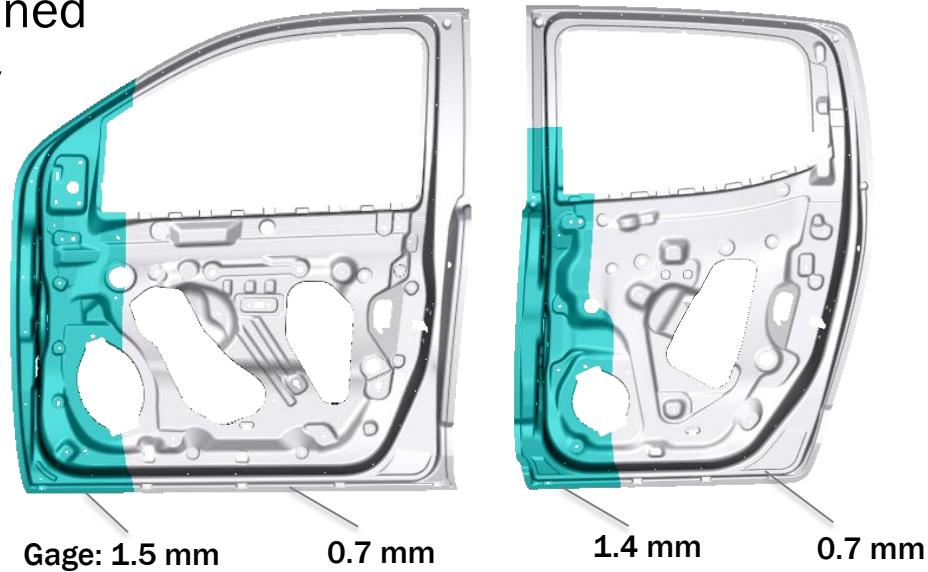
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Mass Reduction / Efficiency

Door Inners

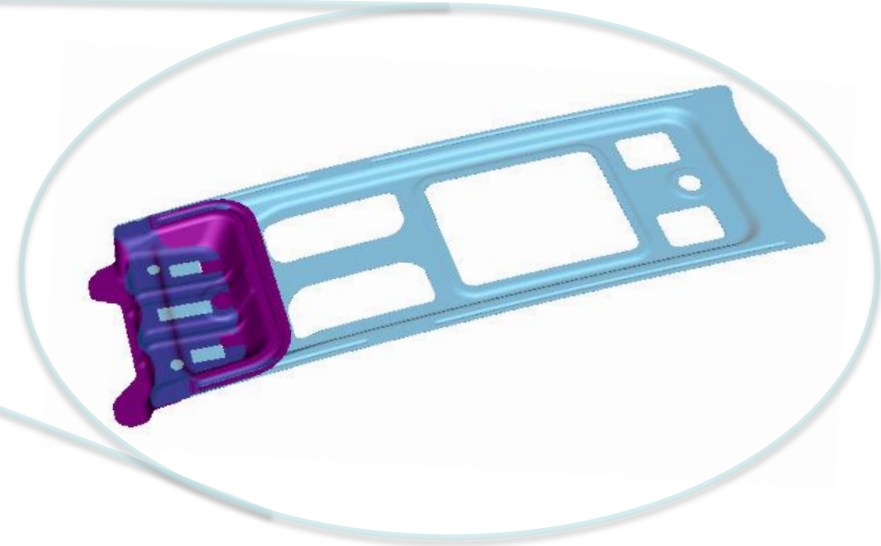
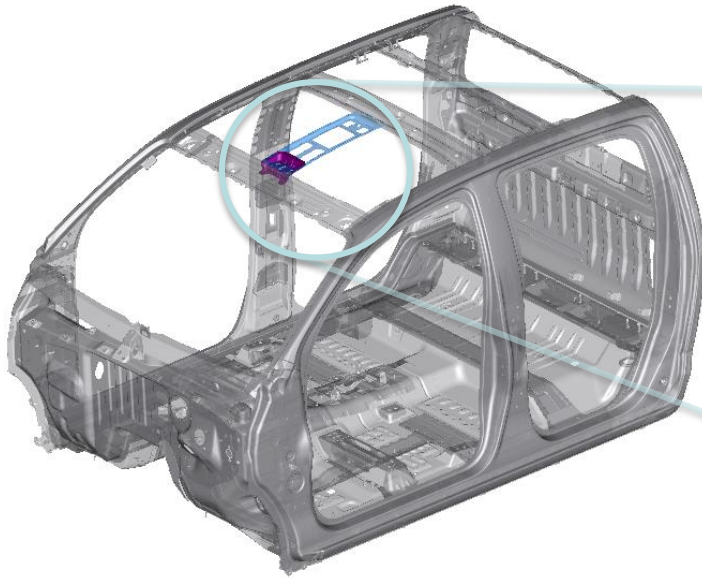
- ✧ Laser Welded Blank
- ✧ Performance tuned
- ✧ Mass efficiency



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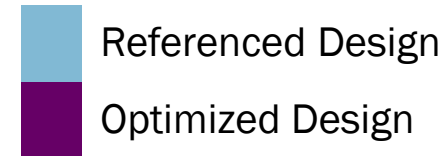
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Mass Reduction / Efficiency



Roof Console Bracket Optimization

- ✧ 64% reduction in mass
- ✧ Piece cost and tooling cost savings

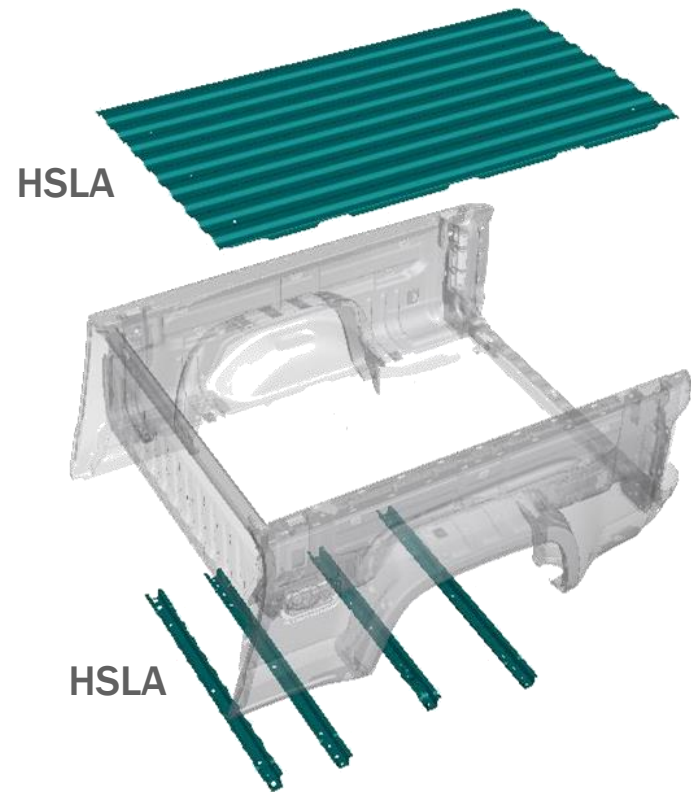


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Mass Reduction

- ✧ Advanced high-strength steels provide increased payload capability while reducing mass compared to stamped-steel designs
- ✧ Roll Form Platform minimizes thinning for increased durability

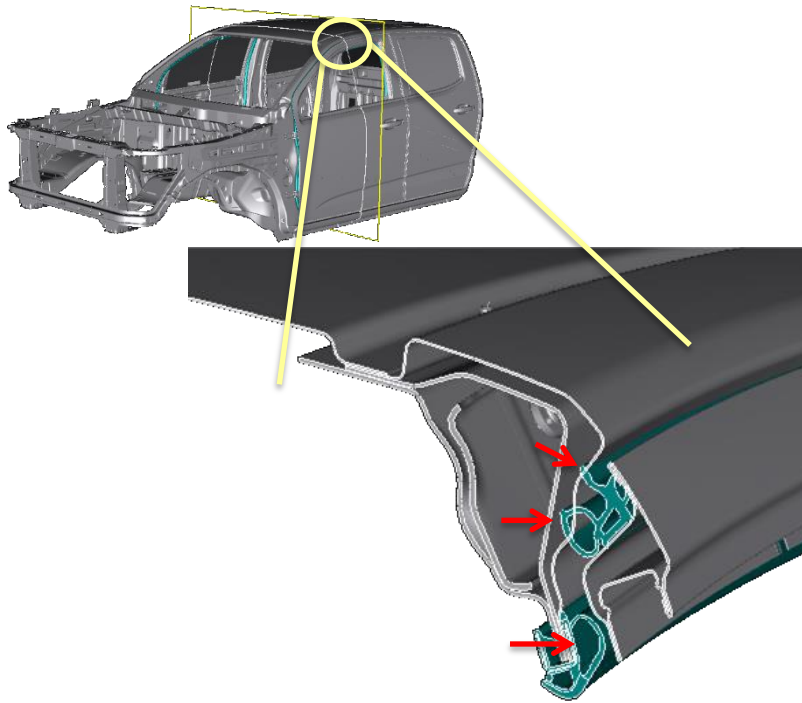


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Noise - Reduction Features

✧ Triple - sealed inlaid doors



✧ Fibrous wheelhouse liners

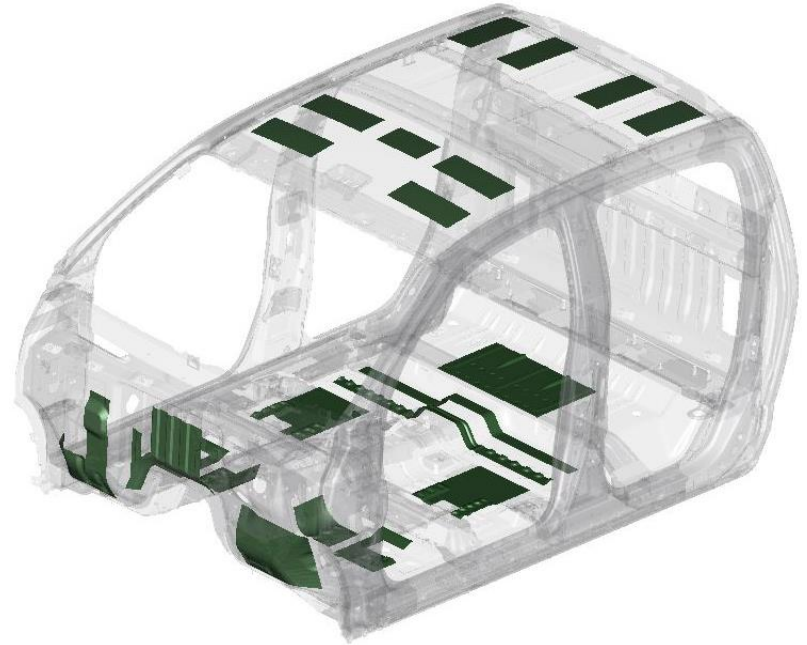


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Noise - Reduction Features

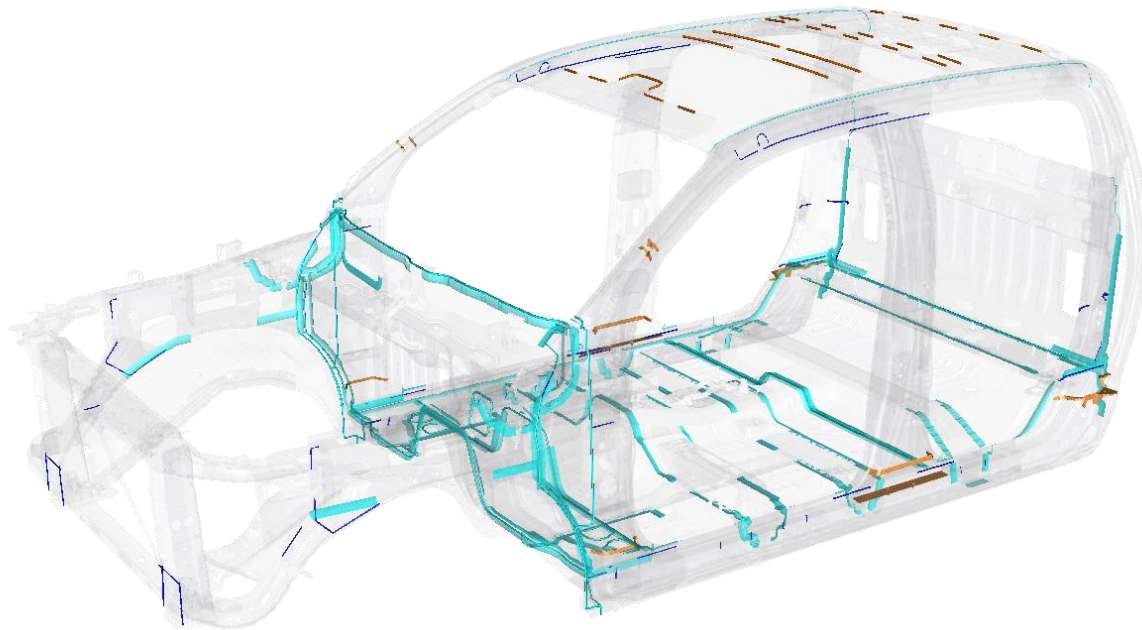
- ✧ Tuned air induction system
- ✧ Hydraulic engine mounts
- ✧ Sound-absorption materials – deadener patches and baffle systems
- ✧ Liquid Applied Sound Deadener
- ✧ Large under floor tunnel acoustic absorber helps shield the interior from road and powertrain noises



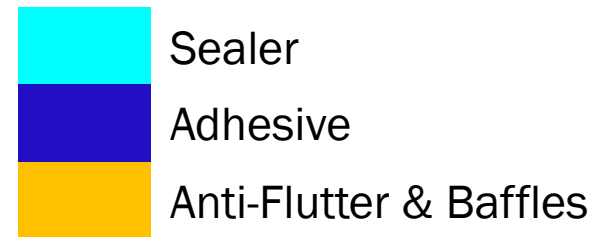
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Noise & Vibration: Body Sealing Strategy



- ✧ Optimized body joints to enable robust sealing.
- ✧ Same targets as the Full Size Truck.

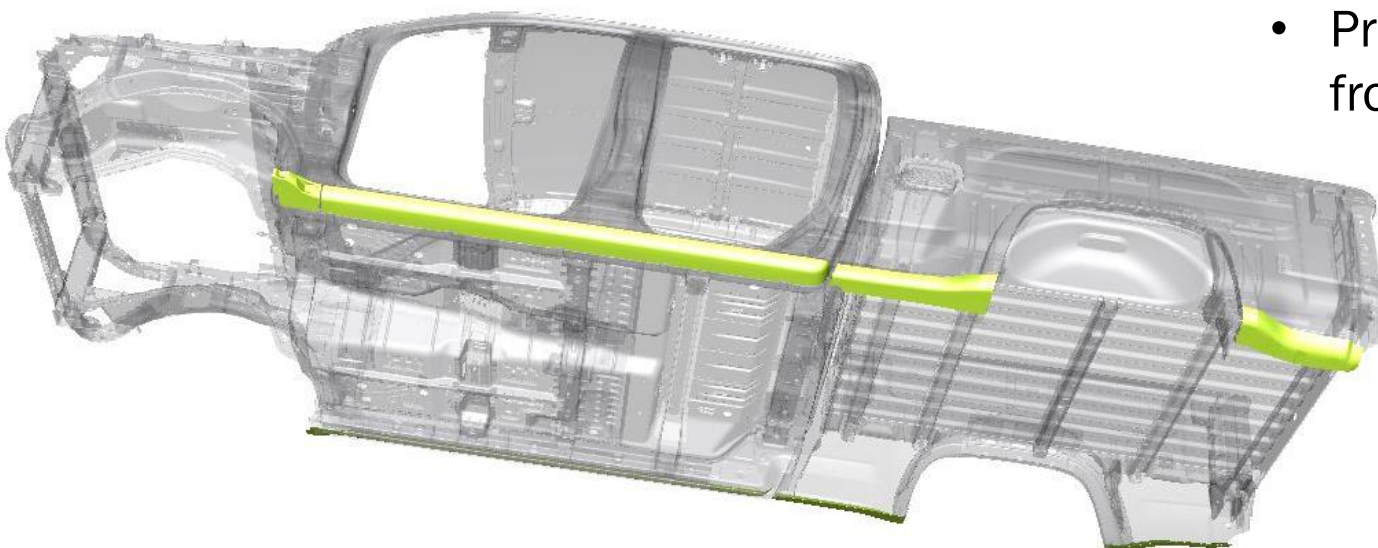


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Anti-Chip Protection

- Provides protection from stones & gravel



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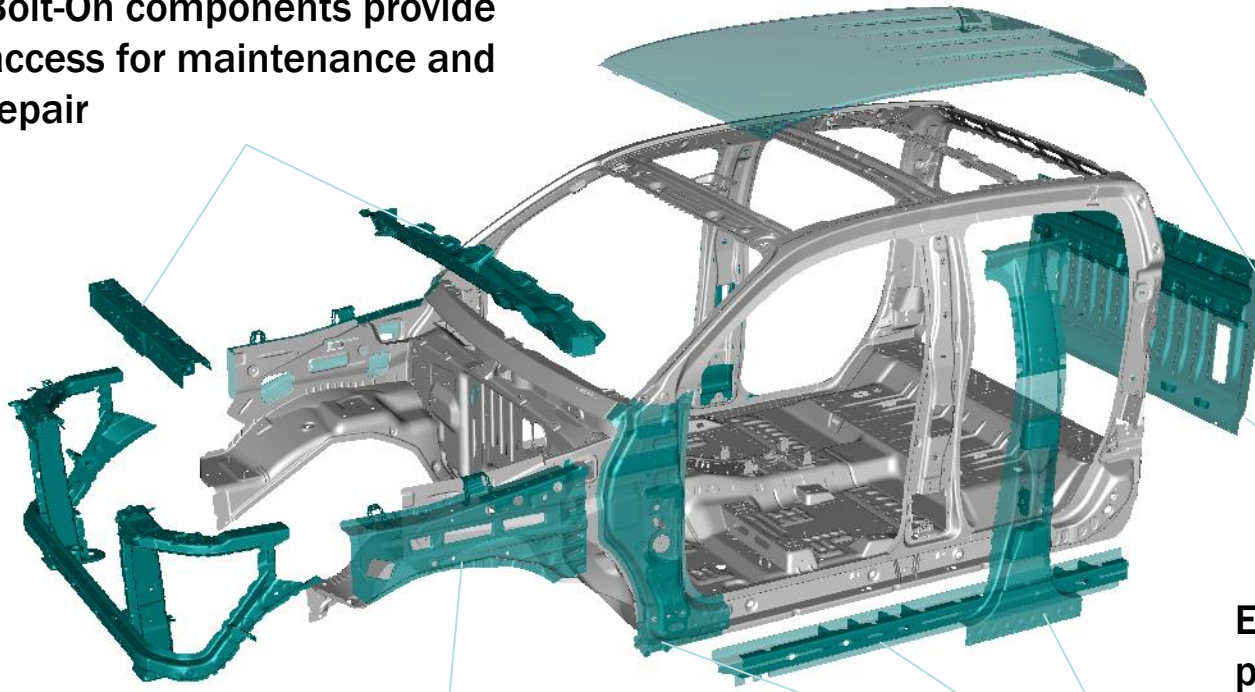
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Body Structure Design for Service

Bolt-On components provide access for maintenance and repair



- ✧ Upfront Design Mindful of Service and Repair
- ✧ Unique Service Assemblies created to support robust repair procedures

Ease of service and post repair quality

Engine support tools and trend set for fit & finish

Internal reinforcements and body sealing

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Closing Summary

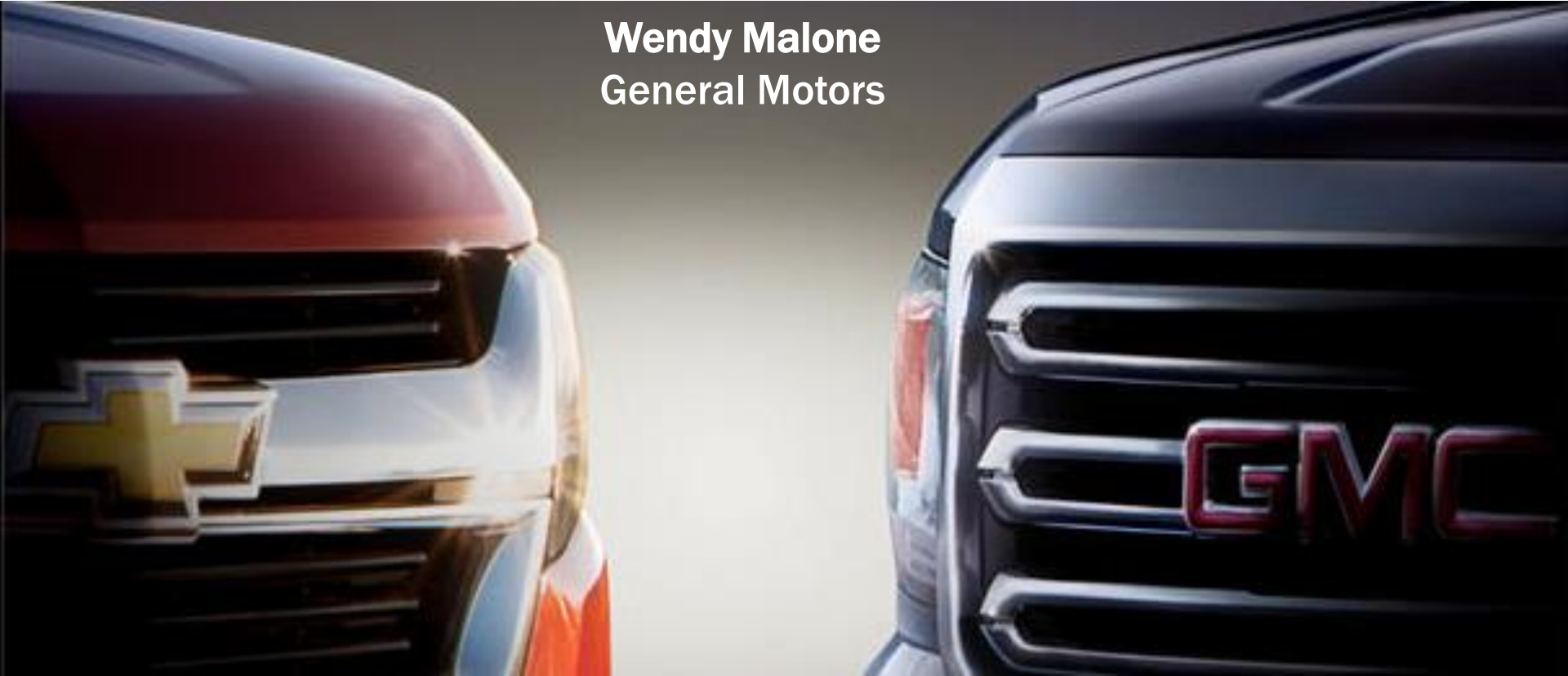
- ✧ GM is Redefining and Reviving the Midsize Truck Segment
- ✧ Capable Package with Customer Focused Details
- ✧ Solid Structural Foundation with deliberate material selections for performance and mass efficiency
- ✧ The Chevrolet Colorado and GM Canyon are bringing the right-sized truck, to the right segment, at the right time.

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Thank You

Wendy Malone
General Motors



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May 18 at www.autosteel.org

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