COLLISION INDUSTRY CONFERENCE

Great Designs In Steel - Collision Repair Considerations

PRESENTED BY:

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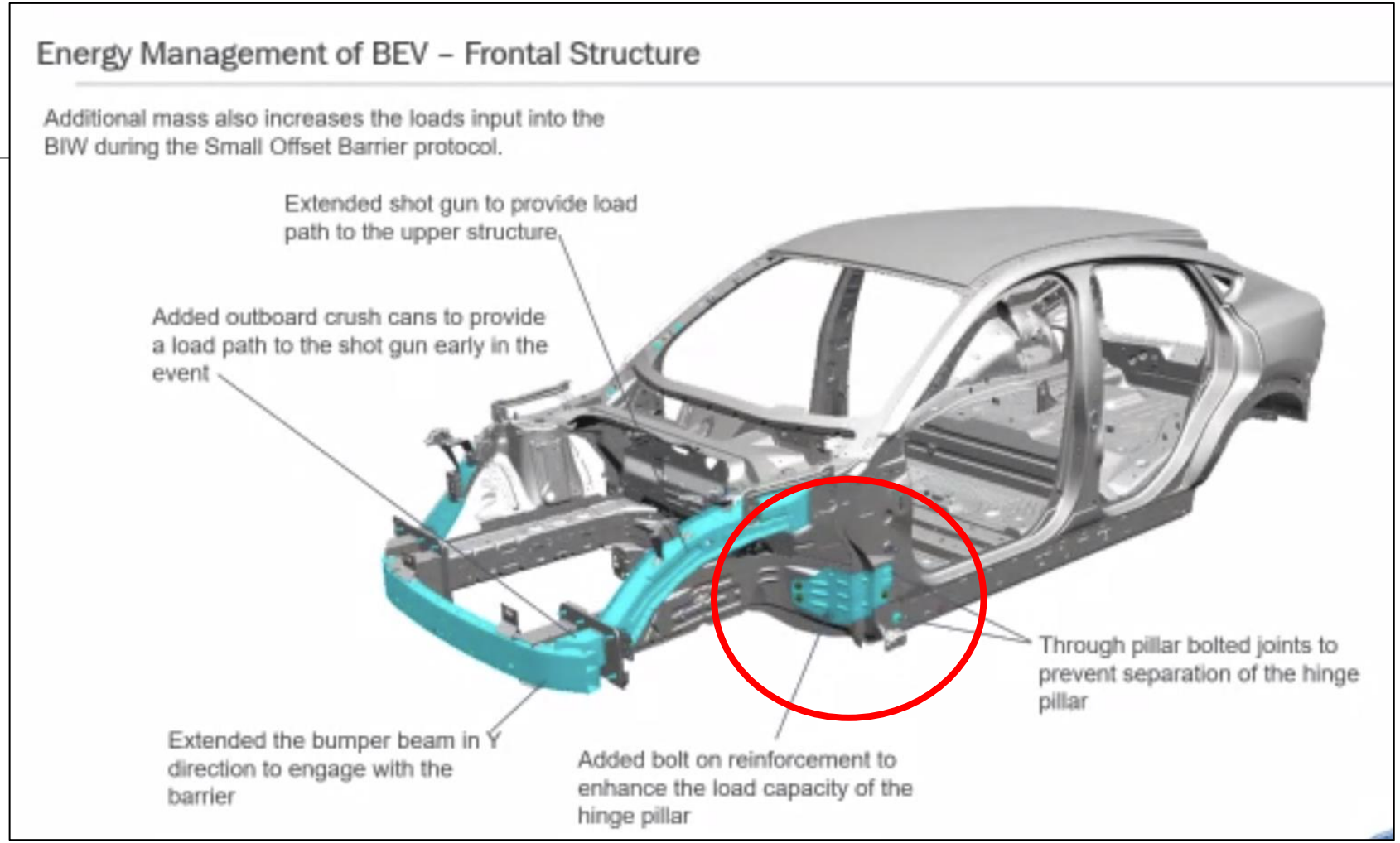
DIRECTOR OF INDUSTRY RELATIONS

COLLISION HUB

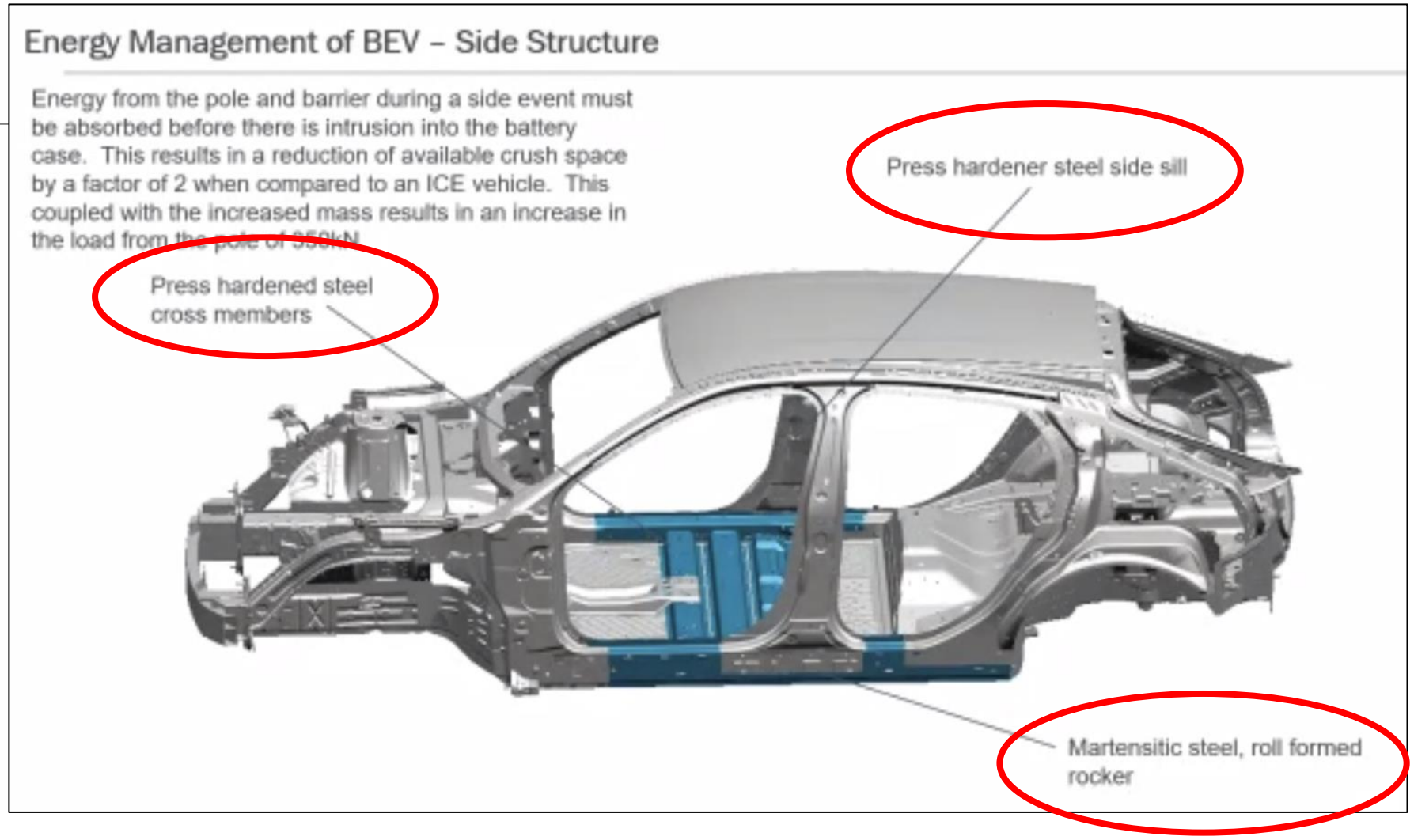
Ford Mustang Mach E

- Safety Item
- Replace Only



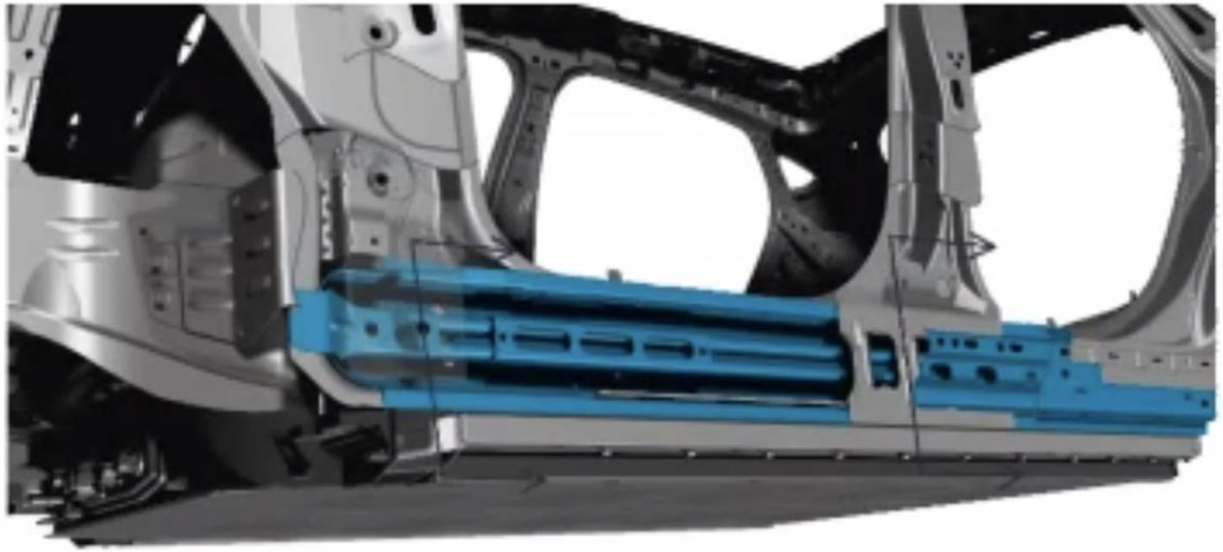
Ford Mustang Mach E (cont'd)

- **Replace Only**



Ford Mustang Mach E (cont'd)

Multi-piece AHSS Roll Form Rocker Tuned to Handle BEV Loads



3-Piece Martensitic Roll Form

- M1500-M1700 MPa for smaller sections
- Thru-bolts at front joint tie components together to create solid node for Small Overlap modes
- Extended to the leading edge of the hinge pillar section for early engagement

Dual Purpose Design

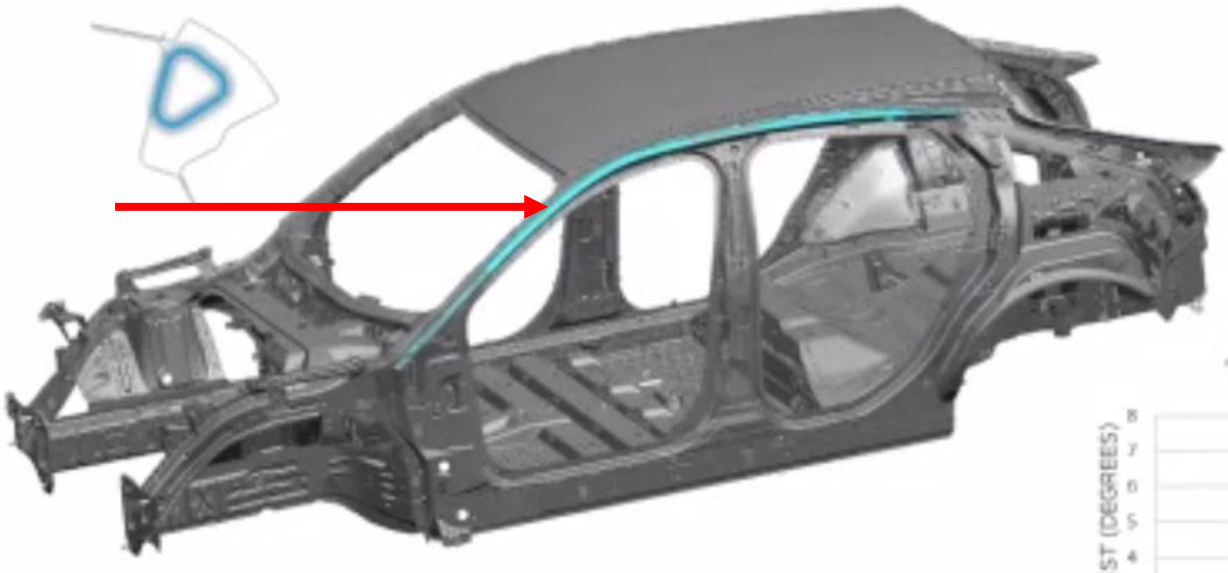
- Continuous side impact coverage AND stability for Front SORB Modes ~$50/veh savings & Equivalent weight/performance vs Extruded AL
- Multipiece steel construction allowed for traditional welding in Body shops while still offering numerous tuning options that work in concert with bolt on battery tray structure to optimize energy absorption

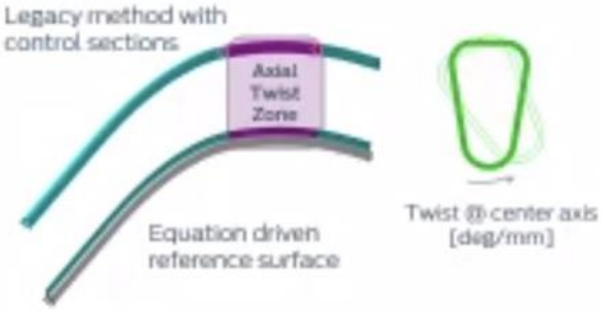
- **Safety Item**
- **Replace Only**

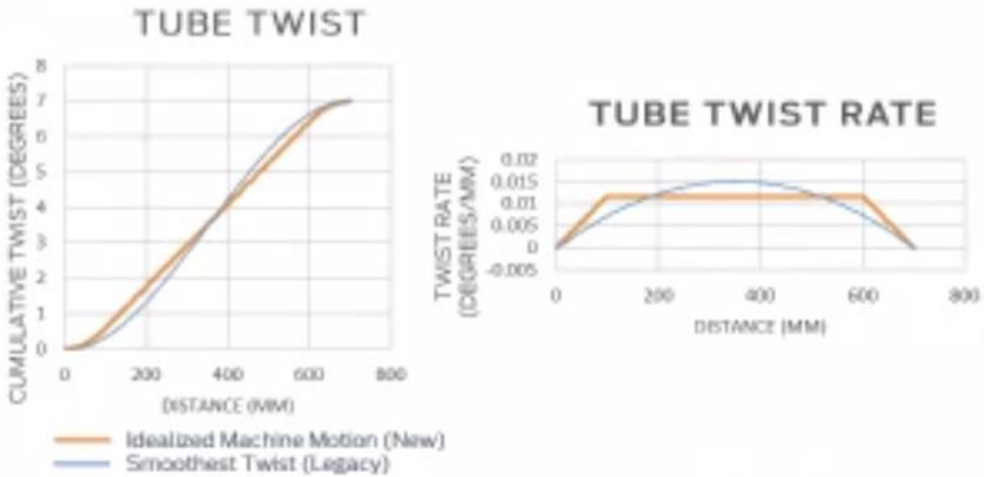
Ford Mustang Mach E (cont'd)

Energy Management of BEV – A-pillar & Roof Rail

Ford's unique 3D roll-formed design applies a M1700 tube throughout the A-pillar and Roof Rail structure for consistent AHSS strength and package efficiency.







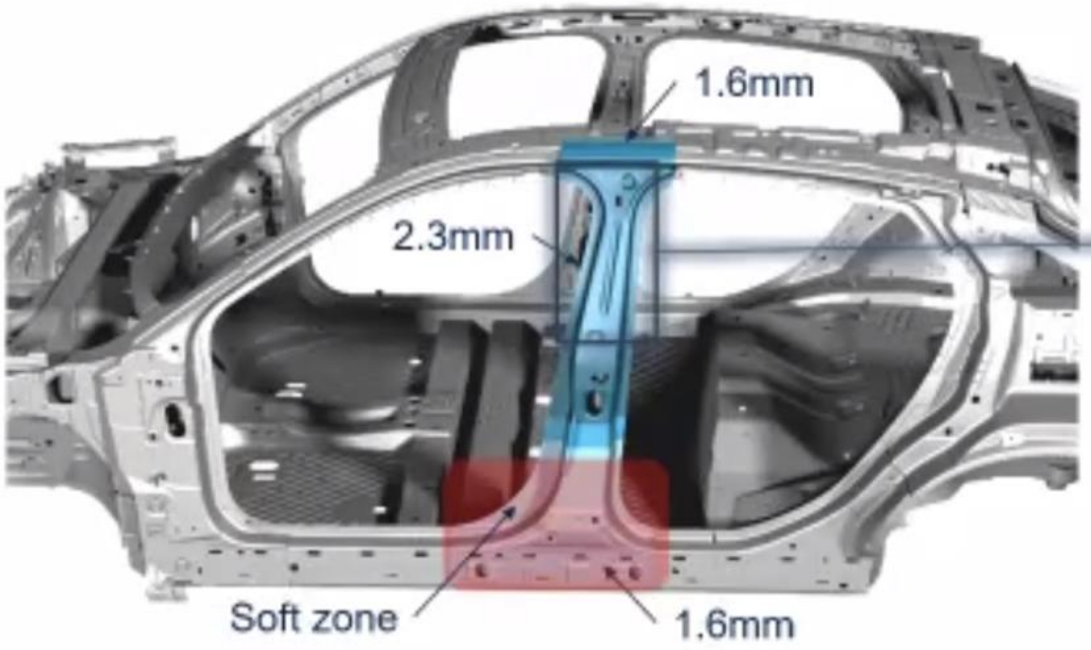
A-pillar & Roof Rail Structure

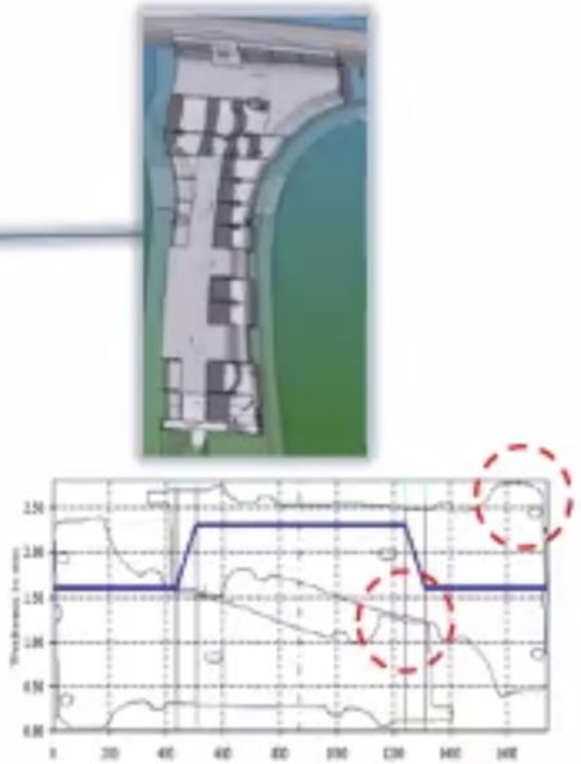
- Smooth, constantly varying twist rate from prior design method using loft control sections developed for hydroforming was difficult for the 3D roll form machine controller to reproduce
- New method utilizes an equation driven reference surface to include the twist unit's transfer function directly into the model reducing cumulative twist error and improving surface consistency.

Ford
Go Further

Ford Mustang Mach E (cont'd)

B-Pillar Design for BEV in CUV package: TRB, Soft zone & Insert Technologies





Customized B-pillar Structure

- TRB + Insert delivered 1.8kg weight reduction vs. PWB.
- Boron soft zone in lower pillar enabled a balanced B pillar response during high loads and strain interface to a stiff rocker section.

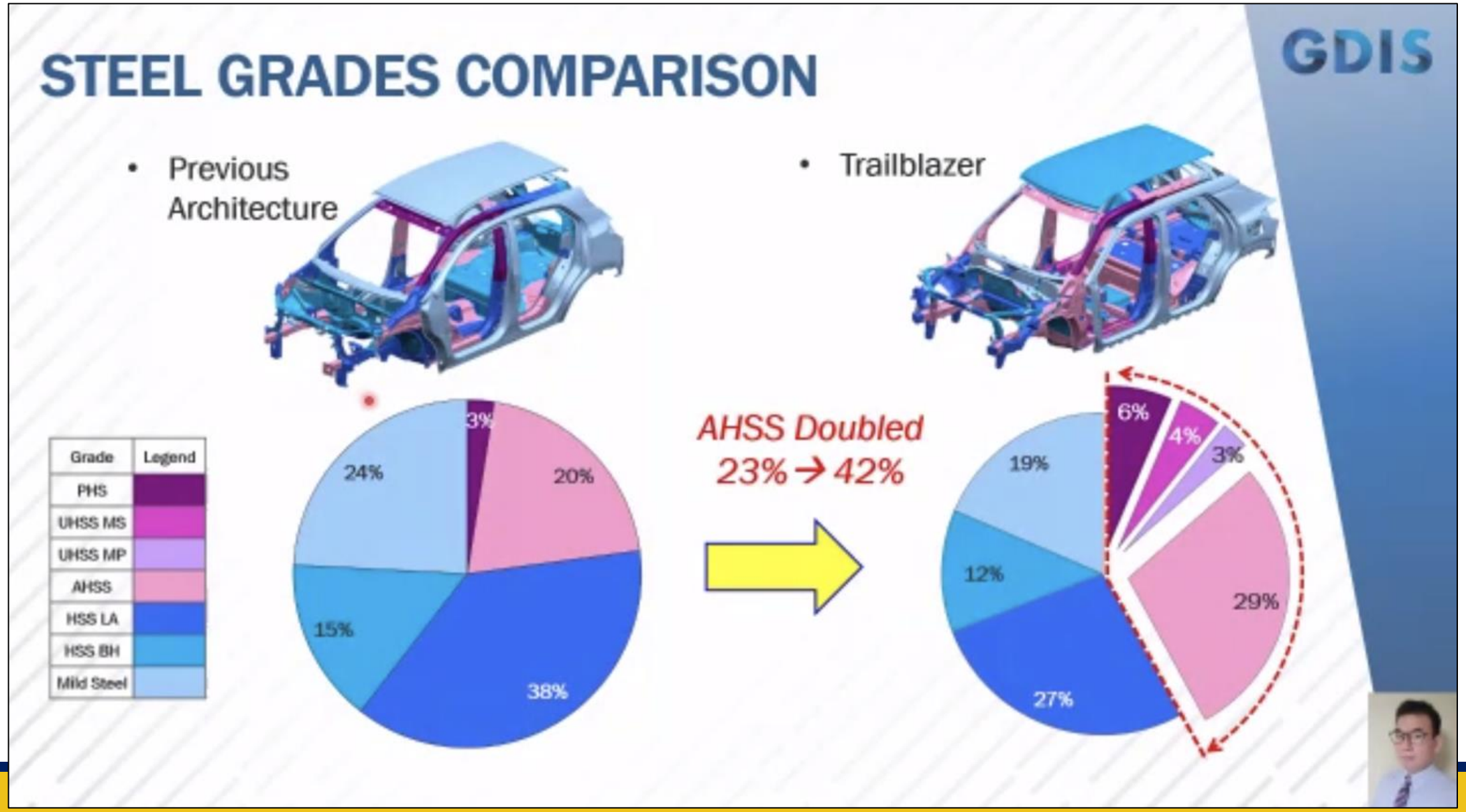
2-out blank and efficient cost

Key Control Points and trim lines optimized to maintain

Ford
Go Further

Chevrolet Trailblazer

Chevrolet Trailblazer (cont'd)



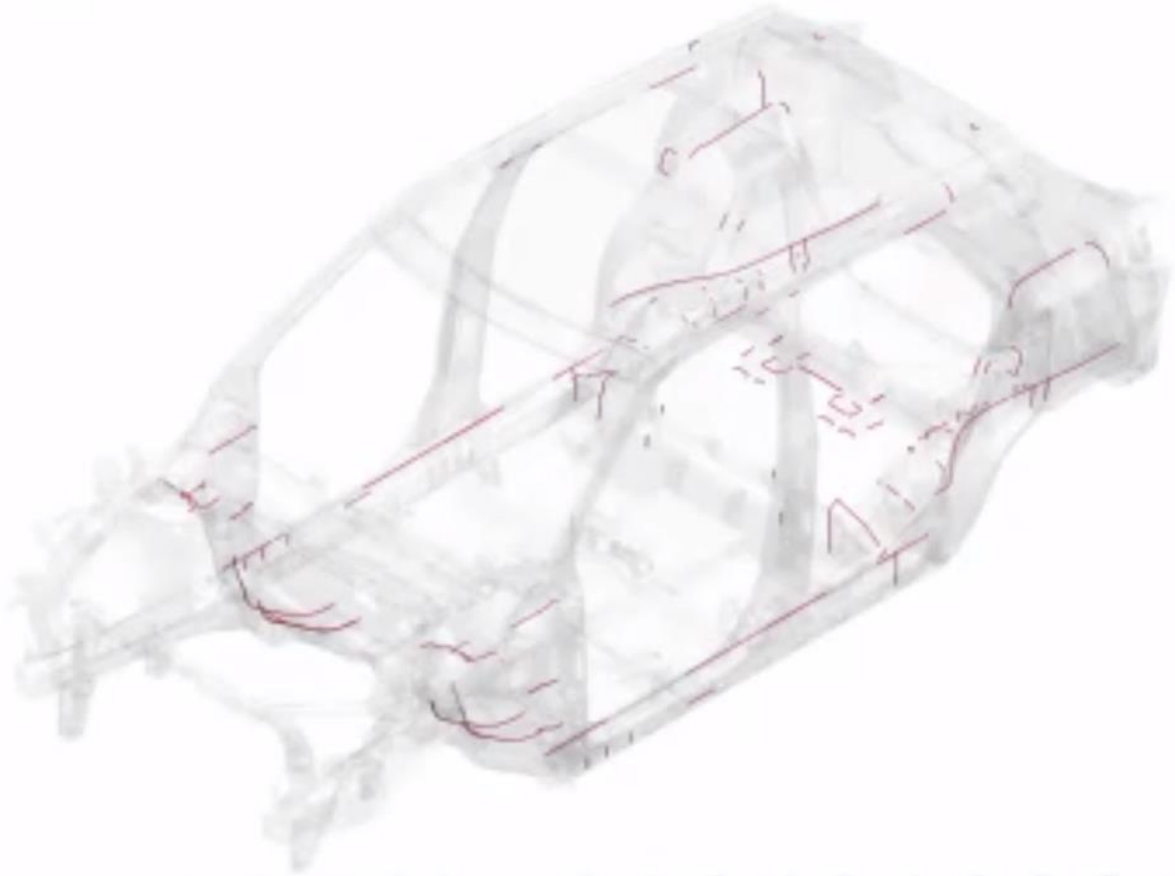
Chevrolet Trailblazer (cont'd)

STRUCTURAL ADHESIVE

- *Better Torsional Stiffness, Crash Performance*

Total : 19.4 m

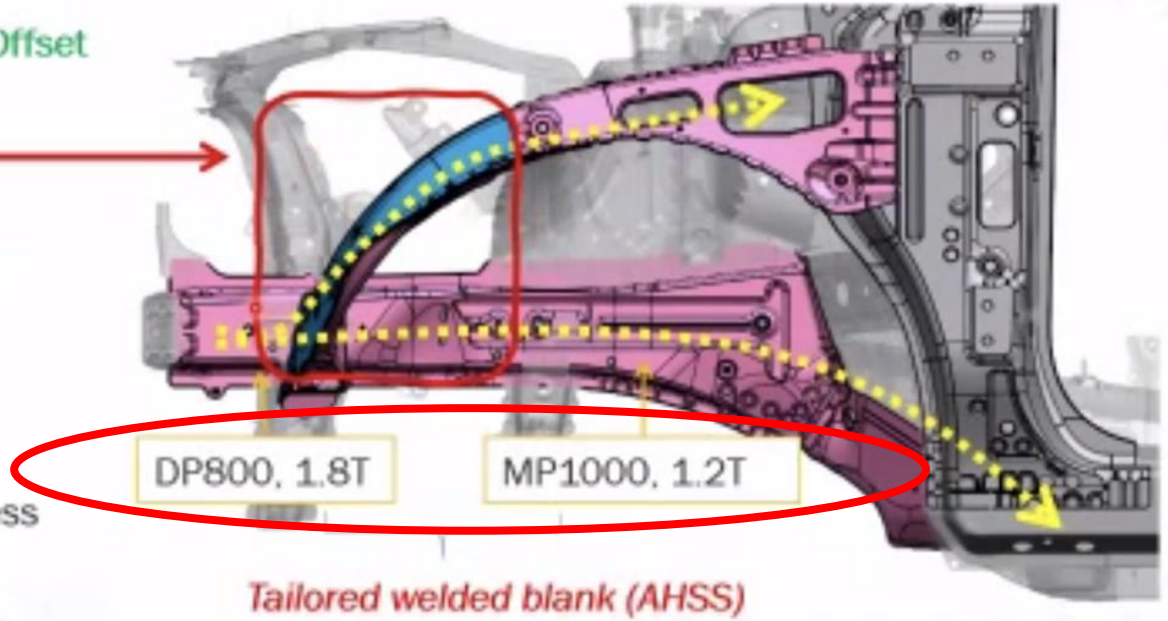
160% Increase



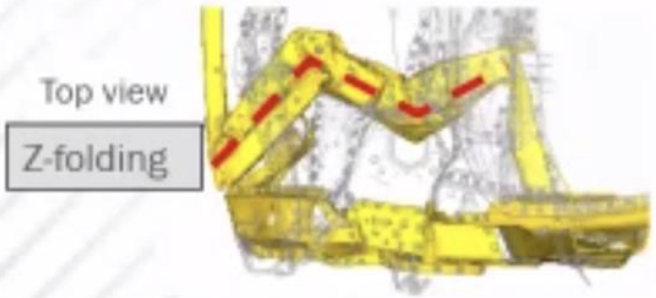
Chevrolet Trailblazer (cont'd)

ENERGY ABSORPTION ZONE DESIGN

- Design Optimization
  - ❖ Splayed Front Rail
    - Better Engagement For Small Offset
    - Multi bending points
  - ❖ Elephant Trunk
    - Continuous Connection
    - New Load Path to Upper Rail
    - Increased Stiffness
- Material Optimization
  - ❖ Engineered Blank
    - TWB : Multi Grade and Thickness



Tailored welded blank (AHSS)



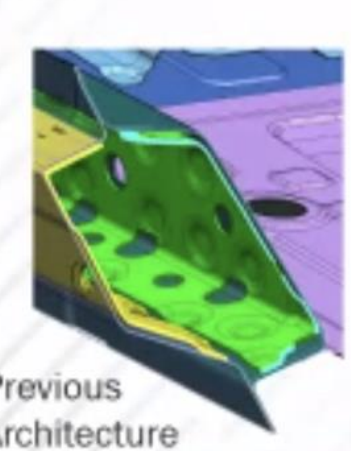
- **Replace Only**

Chevrolet Trailblazer (cont'd)

PROTECTION ZONE DESIGN

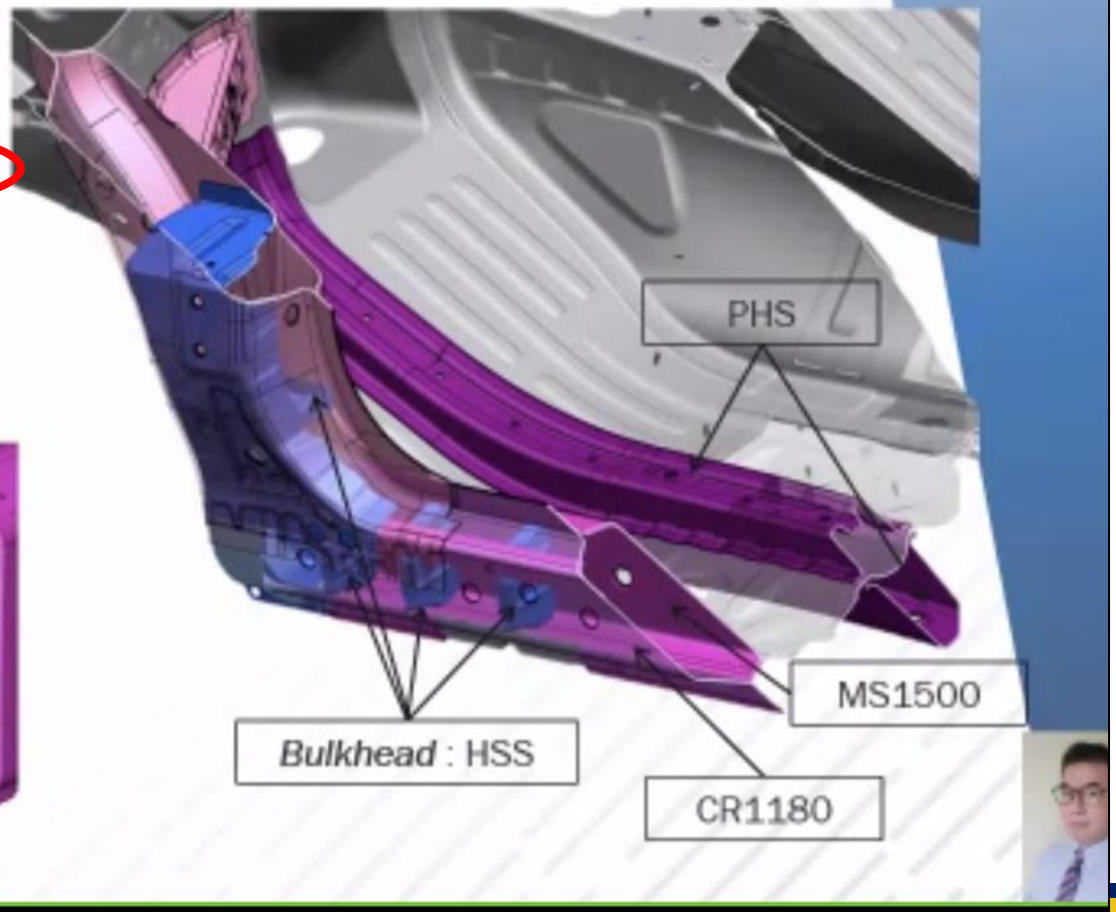
- Design Optimization
  - Bulkhead Structure: Sustains Sections
  - Strip Reinforcement: Stabilizes Corner
- Material Optimization
  - UHSS MP1180 & MS1500 for Rocker
  - TRB for Dash Lower REINF
  - Hinge Pillar Inner Upgrade

Weight Reduction : 11.22kg



Previous Architecture

Trailblazer



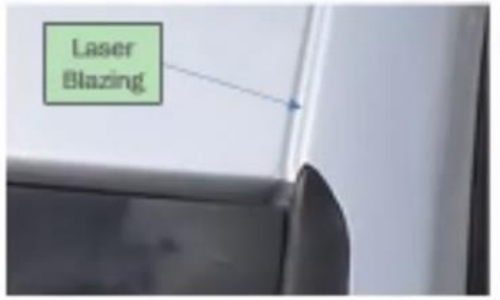
Chevrolet Trailblazer (cont'd)

APPLICATION OF ROOF LASER BRAZING

GDIS

Clean, Aesthetically Pleasing Joint for Customers!!

Previous Architecture



Trailblazer

- Manufacturing process

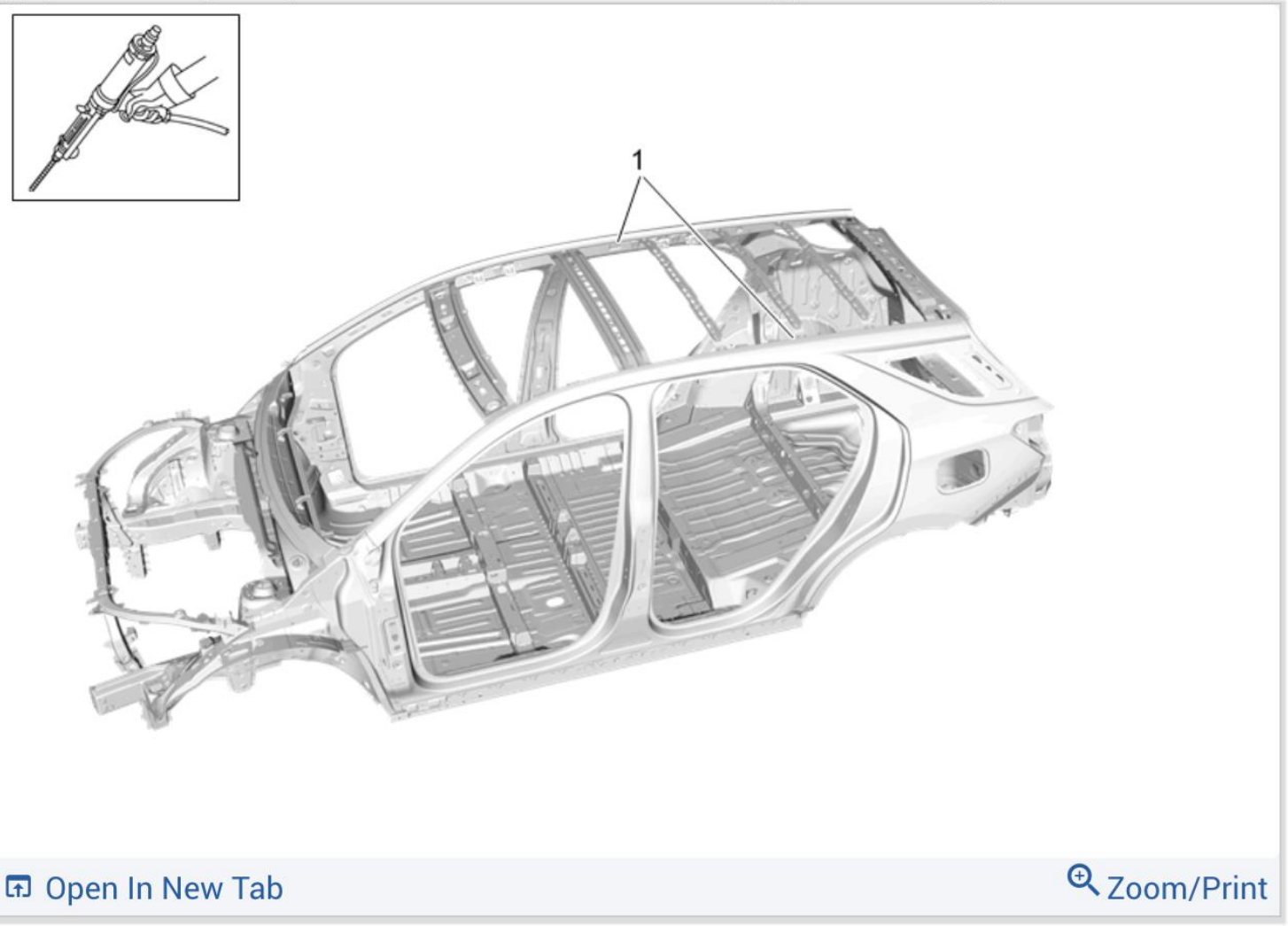
Laser Brazing

Robotic Grinding

Inspection & Repair

Chevrolet Trailblazer (cont'd)

8. Apply a 12 mm (1/2 in) bead of the windshield urethane (1) to the mating surface of the body side panels.



Cadillac Escalade (cont'd)

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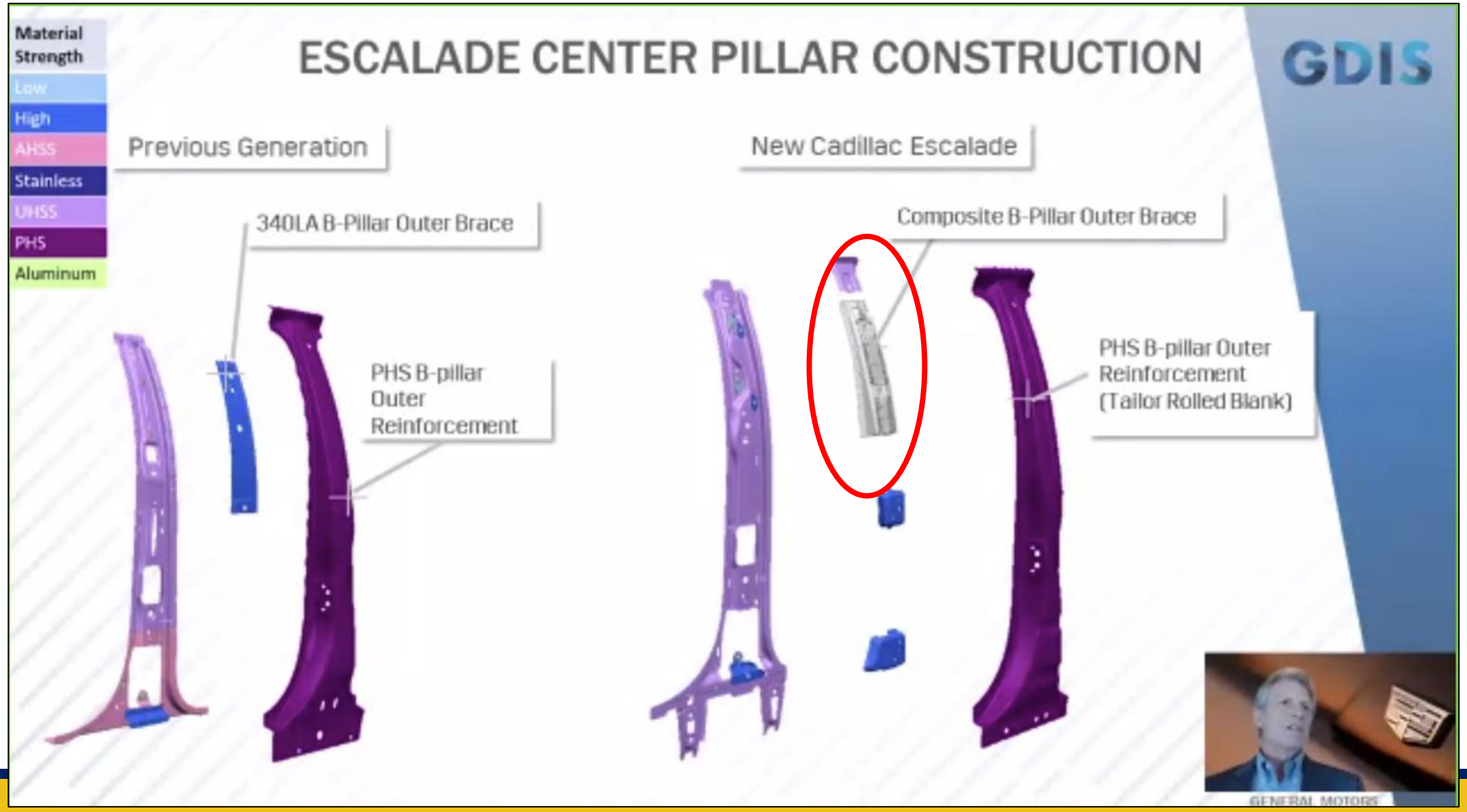
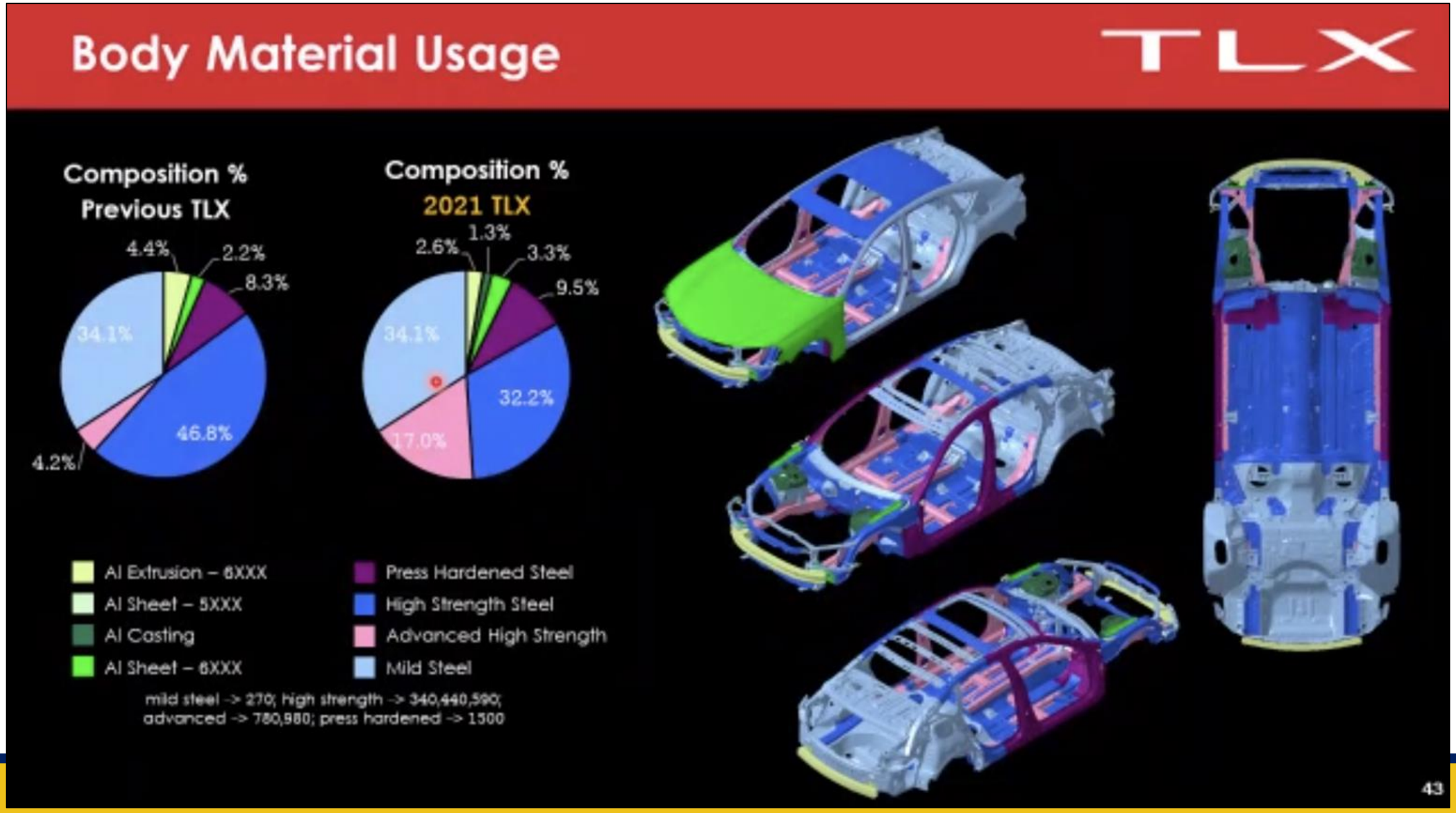
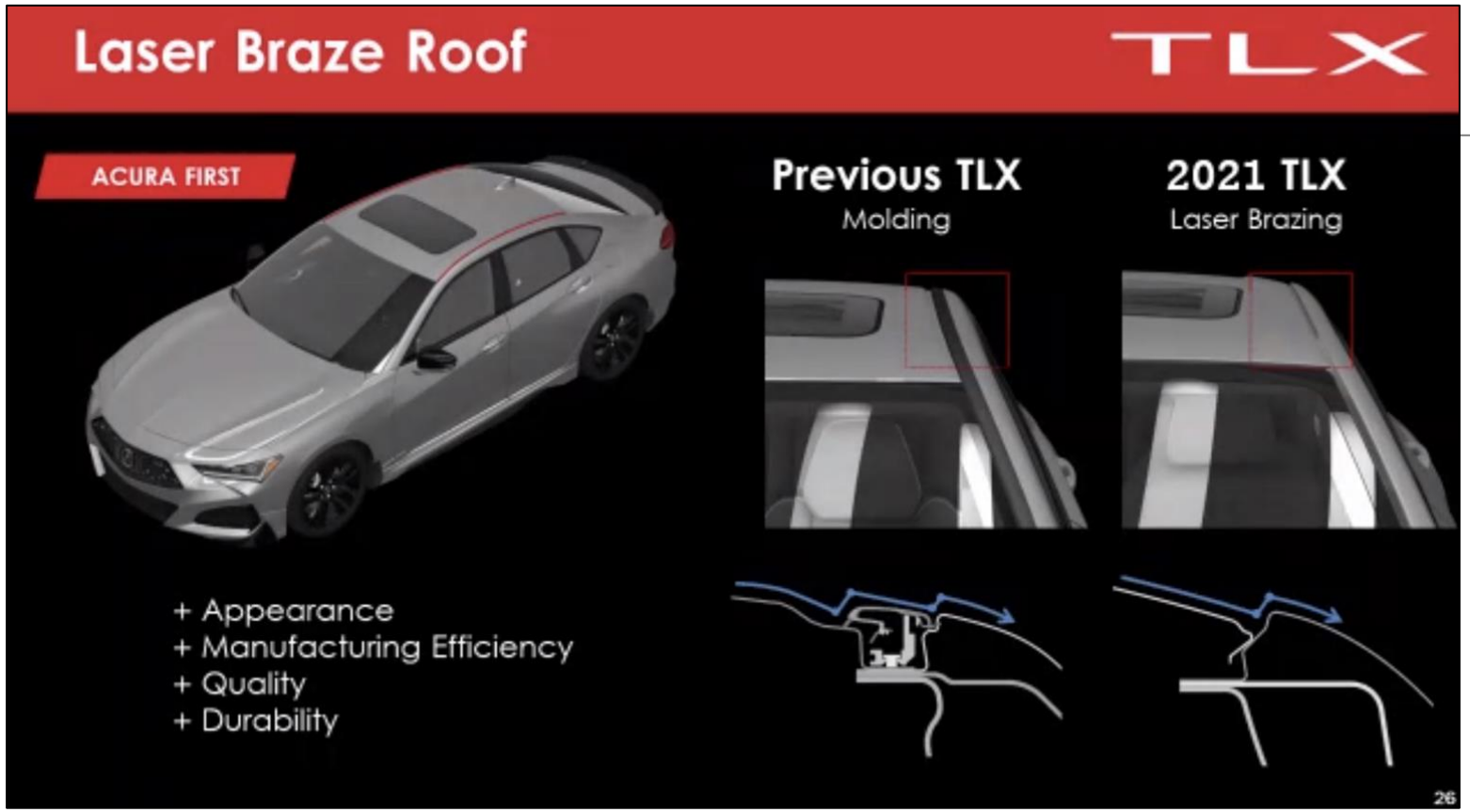


Acura TLX (cont'd)



Acura TLX (cont'd)



Acura TLX (cont'd)

Front Damper Housing Casting

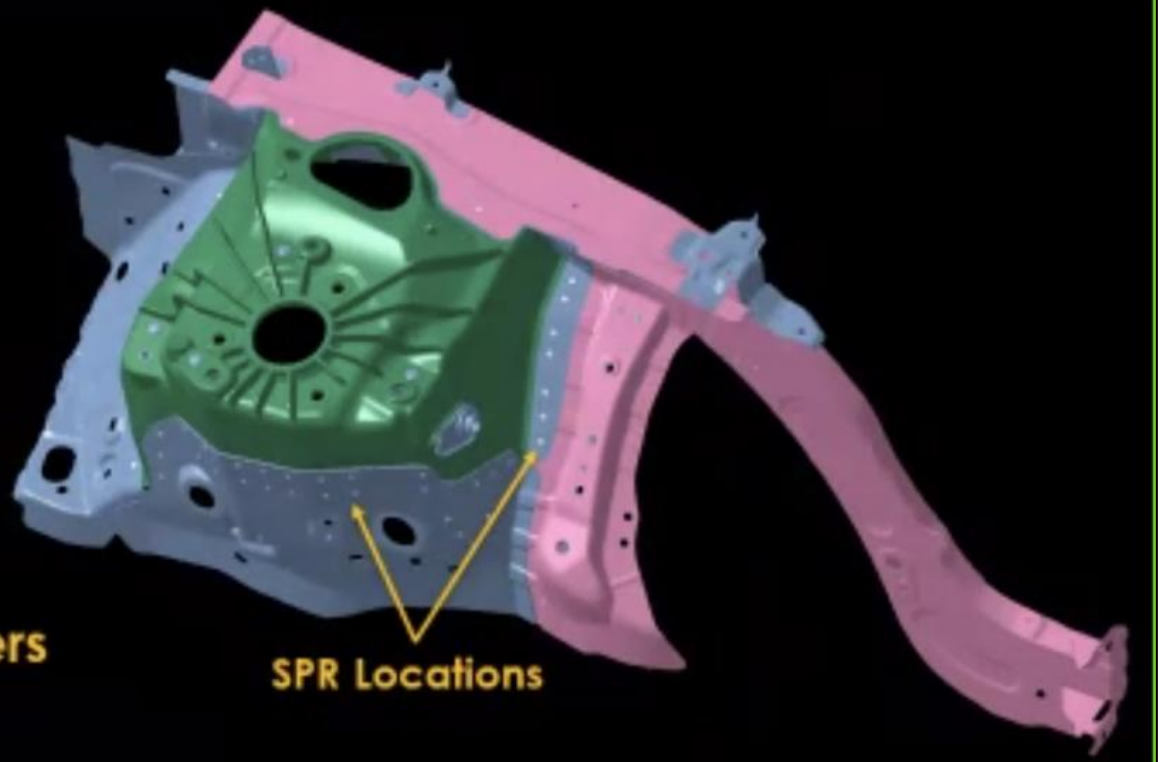
TLX

Mechanical Fastening

54 Self-Piercing Rivets (SPR)

per damper housing

- 3 SPR lengths
- 2 and 3 sheet stacks

Nut plates hold mechanical fasteners

- Steel nut plates applied with blind rivets
- Nut plates are e-coated before assembly