GREAT DESIGNS IN STEEL

2021 CADILLAC ESCALADE STRUCTURE REVIEW

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VEHICLE INTRODUCTION

+ New Dimensions
+ Material Utilization
+ Safety Strategies
+ Reduced Cabin Noise
+ Ride and Structural Feel
LARGEST AND LONGEST ESCALADE EVER

NEW ARCHITECTURE ENABLES THE FREEDOM TO EXPAND YOUR ENTOURAGE

124 mm longer wheelbase Escalade
180 mm longer overall Escalade

104 mm longer wheelbase Escalade ESV
66 mm longer overall Escalade ESV

Cadillac Escalade

5,382 mm

1,948 mm

Cadillac Escalade ESV

5,763 mm

1,940 mm
ARCHITECTURE SHARING STRATEGY

Escalade

Shared
Modified
New

Escalade ESV
Expanded use of HSS
Strategically placed UHSS/AHSS for occupant protection

Enabled increased use of lightweight panels
Higher gages used where stiffness most needed
MILD STEEL USAGE COMPARISON

Previous Generation

New Cadillac Escalade
HIGH STRENGTH STEEL USAGE COMPARISON

Previous Generation

New Cadillac Escalade
AHSS STEEL USAGE COMPARISON

Previous Generation

New Cadillac Escalade
UHSS USAGE COMPARISON

Previous Generation

New Cadillac Escalade
PHS STEEL USAGE COMPARISON

Previous Generation

New Cadillac Escalade
New Cadillac Escalade – Roof Rail Inner (Gen 3 steel)
The New Cadillac Escalade body structure was tuned to balance high strength steel use with lower gauge mild steel panels.
SAFETY

- Collision Energy Management
- Every Seating Position
PHS A-pillar Reinforcement designed to create a strong upper load path for front impact and roof strength.

PHS B-pillar Reinforcement (tailor rolled blank) designed for side impact and roof strength.

High strength rocker with optimized reinforcements to transfer load in both front and side impact test conditions.

Hinge pillar/rocker corner reinforced for load distribution and optimal energy absorption.

Reinforced occupant cage for load distribution and intrusion mitigation.

High strength front structure for energy absorption and pitch management.

Material Strength:
- Low
- High
- AHSS
- Stainless
- UHSS
- PHS
- Aluminum
Upper Load Path

Impact Load travels from the radiator support, through the upper rail then is distributed by the front body hinger pillar into the green house and the rocker section.
Lower Load Path
The lower load path is shared between the rocker section and the tunnel. The rocker section is stabilized by transitioning off some of the front loads toward the center of the floor structure.
SIDE POLE IMPACT BIW LOAD PATHS
SIDE POLE IMPACT BIW LOAD PATHS

Crush box (yellow) enables engagement between the body in white and frame for efficient load transfer in side impacts.

GM Patent #10392053
ESCALADE CENTER PILLAR CONSTRUCTION

Previous Generation

- 340LA B-Pillar Outer Brace
- PHS B-pillar Outer Reinforcement

New Cadillac Escalade

- Composite B-Pillar Outer Brace
- PHS B-pillar Outer Reinforcement (Tailor Rolled Blank)
New Cadillac Escalade – B-Pillar Structural Insert
DYNAMIC FUEL MANAGEMENT ≠ CABIN BOOM
HOW WE SET THE FOUNDATION

Frame to body interface
+ All new frame and underbody
+ Mounts aligned with primary structure
Improved body stiffness
BODY MOUNT INTERFACES

#1 Mount

#2 Mount

#3 Mount
ROAD NOISE

Road Noise, Topology - 20 MPH

- BASELINE
- BASELINE + TOPOLOGY LOAD PATH IMPROVEMENTS

3 dB improvement

3 dB
2 dB

Road Noise, Soft Mounts - 20 MPH

- BASELINE
- BASELINE + TOPOLOGY LOAD PATH IMPROVEMENTS

2.5 dB
ARCHITECTURAL DECISIONS TO SUPPORT NOISE & VIBRATION

- Optimized Roof Bows
- Stiffer Quarter Panel Baffles
- Hinge and Latch Reinforcements
- Optimized Liftgate Structure
OPTIMIZATION OF PANEL GEOMETRY

Geometry Disrupts Panel Modes

Reduced Exhaust Boom Response

Rear Floor Panel
REDUCTIONS OF CUSTOMER FACING ROAD AND POWERTRAIN LOW FREQUENCY NOISE

Low Speed Coarse Road Noise
- Baseline
- Baseline + Boom Package

Powertrain Cruising Noise
- Baseline
- Baseline + Boom Package

6dB taken out of primary boom range

10dB taken out of the low RPM powertrain noise
CREATING THE EXCLUSIVE CADILLAC EXPERIENCE

Creating the exclusive Cadillac experience

- Improved body response at key occupant to body interfaces
- Stiffer Body Structure
- New Shear mount design at Frame to Body Interfaces
- New Independent Rear Suspension
GLOBAL STIFFNESS IMPROVEMENTS

- Lateral Stiffness: +10%
- Bending Stiffness: +28%
- Global Static Torsion: +46%

Previous Generation vs New Escalade
All Body interface stiffness increased by 30-100%
DRIVER REAR INBOARD SEAT TRACK RESPONSE

SPALLED CONCRETE @ 45 MPH

![Graph showing Fore / Aft Response, Lateral Response, and Vertical Response with 6 dB and 3 dB differences between Previous Generation and New Cadillac Escalade.](image)
GREAT DESIGNS IN STEEL

THE ALL NEW 2021 ESCALADE

Cadillac