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Advanced Technologies Give Jeep® Compass Excellent Durability, Ride and Handling, and Body Stiffness, While Reducing Noise, Vibration and Harshness

- Jeep® Compass underbody designed to meet demanding durability requirements
- High-strength steel reduces weight, improves impact performance
- Sealers and sound-absorbent materials create a quiet interior

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When developing Jeep® Compass, engineers used high-strength, lightweight and sound-absorbent materials to create a safe, quiet body structure that is designed to both meet impact performance criteria and be durable enough to be a Jeep.

Jeep Compass' unitized body includes a structural safety cage to provide excellent occupant protection. While the Jeep Compass underbody architecture is shared with Dodge Caliber for platform compatibility, the Jeep Compass has been modified to make it uniquely Jeep.

"Jeep Compass' underbody is designed to meet more demanding durability requirements based on Jeep vehicle requirements," said Matt Liddane, Chief Engineer—Jeep Compass. "A new body/chassis durability test cycle, which combines the passenger car and the Jeep cycle in severity, was created to test the Jeep Compass and Patriot."

Engineers validated the durability of the Jeep Compass' body structure through state-of-the art computer simulation, an extensive battery of laboratory fatigue tests, road-test simulation and real-time Proving Ground tests. This extensive testing ensures that the Jeep Compass' body structure is durable enough to withstand the wear and tear that comes with a minimum of 100,000 miles of driving and at least 10 years of salt-belt corrosion.

High-strength Steel Reduces Weight, Improves Impact Performance

Jeep Compass' body components combine to form a structural safety cage that provides occupant protection in the event of an impact. By mass, 40 percent of Jeep Compass' body structure is constructed of high-strength and hot-stamped steel, making it one of the few current production vehicles to feature such a high level of combined advanced steel technologies.

"The higher weight-to-strength ratio of high-strength steel allowed us to develop a body-in-white safety cage that meets more aggressive front-, side- and rear-impact requirements, but without the added weight of regular steel," Liddane added. "Hot-stamped steel used on the A- and B-pillar and roof-rail reinforcements reduce Compass' overall weight by 44 lbs."

The Jeep Compass uses a tailor-rolled, hot-stamped steel B-pillar. Its two-piece B-pillar construction features a lower section made from mild-strength steel to maximize energy absorption, which is combined with a tailor-rolled, ultra-high-strength upper portion for enhanced occupant protection.

For rear-occupant side-impact protection, Jeep Compass also features a hot-stamped steel cross-car beam that is bolted to the body structure underneath the rear seat. During a side-impact event, the beam works together with the integrated foam in the rear doors to transfer impact energy from one side of the vehicle to the other. The beam is designed to take up to 60 percent of the load during a side-impact event. Steel beams within the front and rear doors

provide additional side-impact occupant protection.

Jeep Compass also features a hydroformed front closure and upper cross member. These modules previously had been limited to trucks and larger sport-utility vehicles (SUVs), but technological advances now allow for smaller diameter tubes and thinner walls, making them practical for a compact SUV like the Jeep Compass. The strength and versatility of this design reduces weight, while providing a flexible base for mounting many parts and components.

The dual-phase steel—used in Jeep Compass' front and rear rails, tunnel reinforcements and floor cross members—represents some of the steel industry's latest technology. In the event of a high-speed front impact, the structure and steel combine to protect the occupants by absorbing the impact energy in a controlled manner. Dual-phase steel tunnel reinforcements and floor cross members also allow the rails to handle greater impact loads than conventional steel. The steel's structural benefits also make the Jeep Compass stiffer for better ride quality and a quieter interior.

Sealants and Sound-deadening Materials Create a Quiet Interior

Jeep Compass' use of sealers and structural adhesives is world-class, giving customers a smooth ride with minimal road, wind and powertrain noise.

Seam sealing, which was previously only added to the inside of a vehicle's body, is applied to both Jeep Compass' interior and exterior, adding stiffness to the body and reducing noise, vibration and harshness (NVH) characteristics. Compass' doors are triple sealed above the beltline and double sealed below to form a strong sound and moisture barrier. A continuous, one-piece channel weather strip mounted in the upper door frame provides effective sealing against wind noise and water leaks.

Compass also includes an NVH package designed to isolate passenger compartments from powertrain noise. This includes balance shafts on the 2.4-liter World Engine, a low-rumble intake manifold, acoustic engine box silencers, fender silencers, isolated air-conditioning lines, a three-layer metal-plastic-metal oil pan, select-fit engine bearings and tappets, wheelhouse outer silencers, sound-deadening material in the instrument panel and carpet with sound barrier.

Aerodynamic and Appealing

Extensive development went into shaping the Jeep Compass' upper body and rear liftgate to ensure the vehicle is both aerodynamic and visually appealing. To reduce drag, Compass' rear liftgate spoiler was developed to separate the air stream from the rear of the vehicle. The roof, rear side D-pillar and taillamps also were shaped to help separate the air cleanly.

Engineers designed several of Compass' exterior body features to reduce wind noise. Large exterior rearview mirrors are designed to provide good visibility while minimizing aerodynamic drag and turbulent wind noise. Compass' windshield water channel and radio antenna were refined in the Chrysler Group's state-of-the-art AeroAcoustic wind tunnel to minimize wind noise. A lip on the trailing edge of the hood directs air flow over the wipers, reducing wind noise inside the vehicle.

The following additional features help reduce drag:

- An air dam under the front fascia streamlines the airflow around the Jeep Compass, rather than under, increasing air flow to the cooling system
- Front and rear tire spoilers designed into the fascia and side sill moldings direct air around the tires to reduce drag
- Two large underbody panels help close out a cavity between the floor pan and the fuel tank to eliminate drag-inducing turbulence
- The muffler is angled up slightly at the rear and its height is tuned to direct airflow out from underneath the back of the vehicle
- Body-side character lines are optimized to reduce drag

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