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Advanced Structural Technologies and Sound-deadening Materials Form 2008 Dodge Avenger's Safe, Solid Structure and Minimize Noise, Vibration and Ride Harshness

- High-strength steel reduces Avenger's weight, improves impact performance
- Dual-phase steel manages impact energy more effectively
- Sealants and sound-deadening materials create whisper quiet driving experience and reduce noise, vibration and ride harshness

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The all-new 2008 Dodge Avenger features many advanced steel technologies that reduce weight and unwanted noise, while creating a safe, solid, stiff structure that provides excellent impact performance, a smooth ride and solid handling. Top that with world-class levels of sealants and sound-deadening materials, and the Dodge Avenger offers an exceptionally quiet ride, void of road, wind and powertrain noise.

"Through the extensive use of sealants and sound-deadening materials, we've created a nice, quiet cabin, which makes for a pleasant environment for drivers to listen to Avenger's radio or the available MyGIG™ Multimedia Navigation system," said Larry Lyons, Vice President — Front-wheel-drive Product Team.

High-strength Steel Forms a Protective Shell Around Vehicle Occupants

Avenger has among the highest combined percentages of high-strength and ultra-high-strength, hot-stamped steel among production-volume vehicles on U.S. roads today. The higher weight-to-strength ratio of high-strength steel gave engineers the ability to reduce Avenger's overall weight, while also developing a safety cage that keeps occupants protected.

"By mass, Avenger's body structure is a combined 30 percent mix of hot-stamped and high-strength steel," said Dennis Krozek, Chief Engineer — Dodge Avenger. "Hot-stamped steel A-pillars, B-pillars and roof-rail reinforcements reduce upper body weight by 30 lbs. compared with traditional steel."

In addition to high-strength and hot-stamped steel, Avenger also features dual-phase steel in the rear rails, tunnel reinforcement and sills. Dual-phase steel allows these components to handle greater loads than conventional steels, which helps them manage impact energy more effectively, while still being relatively easy to stamp and control dimensionally. In addition, in the event of a high-speed front impact, the design of the structure and the properties of the steel combine to protect the occupants by absorbing the impact energy in a controlled manner.

Dual-phase and high-strength steels are strategically located in the Avenger's sill construction providing an efficient cross-section-to-weight balance. As many as four layers of metal (including dual-phase and high-strength steel of various shapes and sizes) provide optimum impact energy management. Dodge Avenger also features very large sills, which make the body structure substantially stiffer than its predecessor in bend and torsion.

Sealants, Sound Deadening Materials and Fine-tuning Reduce Noise, Vibration and Harshness

The all-new Dodge Avenger's use of structural adhesives is world-class. Components joined with new structural adhesives improve stiffness and impact energy management compared with other joining methods such as spot welding and laser welding.

Tougher, more elastic adhesives add strength to Avenger's joints during an impact. Avenger's stronger joints create a more rigid structure and minimize noise, vibration and harshness in the passenger compartment, giving the Avenger more body stiffness, which contributes to its excellent ride quality, comfort and interior quietness.

The Avenger's overall torsion and bending stiffness give it excellent on-road performance and a solid feel and ride comfort, while allowing the body to remain tight and quiet. Avenger's front-wheel-drive architecture and the three-box vehicle design contribute to a torsional (twist) stiffness of 17,925 ft.-lb./degree (32.2 Hz) and a bending stiffness of 66,703 lb./in. (26.3 Hz), which is 1.7 times stiffer in torsion and 1.6 times stiffer in bending than the vehicle it replaces.

The Avenger also benefits from extensive application of pumpable and moldable sealers in the upper body to reduce noise, vibration and harshness (NVH) characteristics. Seam sealing is applied both inside and outside the body, instead of just inside of the body. Avenger's doors are triple sealed to reduce wind noise. A continuous, one-piece channel-type weather strip mounted in a three-piece roll-formed channel in the upper door frames seals both sides of the windows to prevent wind noise and water leaks.

Chrysler Group engineers also extensively tuned the new Avenger and added many special treatments to alleviate road, wind and powertrain noise and vehicle shake, including:

- All engines include acoustic engine covers to absorb and dampen noise
- Powertrain and body mounts are tuned to minimize shake, as well as improve instrument panel stiffness, steering column-to-instrument panel stiffness and instrument-panel-to-body stiffness
- The air induction system, accessory drive mounting and exhaust system are tuned to reduce powertrain noise and improve sound quality
- The A-pillar and exterior mirrors were aerodynamically developed in the wind tunnel to reduce wind noise
- An NVH package isolates the passenger compartment from powertrain inputs and other sources of NVH
- Multiple rib-like indentations in the floor pan and applied mastic sound-deadening material reduce boom and add to Avenger's extremely quiet ride
- Expandable Polyurethane Foam (PUR®) injected into cavities in the body structure prevents noise from being transmitted to the passenger compartment
- Every hole and cavity is covered with a plug or patch
- Bituminous mastic pads are bonded to the floor pan to dampen vibration and act as a noise barrier
- Dampers on the dash and the rear wheel houses consisting of a layer of mastic between two layers of metal are adhesive bonded to flat surfaces that might otherwise resonate

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