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All-new 2009 Ram Truck First to Offer Multi-link, Coil-spring Rear Suspension

Engineering the New Ram

January 12, 2008, Auburn Hills, Mich. - Among numerous segment-exclusive features in the all-new 2009 Ram Truck are two that aren't readily visible, yet certainly help the new Ram stand out from the herd.

One segment-exclusive feature is under the hood-a new generation of the famous HEMI® V-8 engine. The other feature is under the pickup bed-a new rear-suspension setup featuring coil springs fitted to a solid rear axle held in place with multiple links.

"Our all-new 2009 Ram Truck provides everything you expect in a modern truck-and more-in terms of power, capability, durability, innovation and amenities," said Scott Kunselman, Vice President - Body-on-Frame Product Team.

Engines

Ram Trucks have long been a favorite with customers for their HEMI® power, and for 2009, Ram offers a new generation of the famous 5.7-liter HEMI V-8. The HEMI take-rate for Ram Truck continues to hover above 40 percent. While the all-new engine maintains key architectural features that make "HEMI" synonymous with "power," these features are optimized to improve engine breathing, and new technologies have been added to maximize performance and improve fuel economy and refinement.

Features of the new 5.7-liter HEMI include:

- Variable Valve Timing (VVT)
- Expanded operating range of Multiple Displacement System (MDS)
- Increased compression ratio
- Active intake manifold with long runners for low-end torque and short runners for high-rpm power
- Improved cylinder head port flow efficiency
- Reduced-restriction exhaust and induction systems

The result is improved idle quality and overall refinement, more horsepower (13 percent), more torque (8 percent) and better fuel economy. The new 5.7-liter HEMI V-8 delivers 390 hp (291 kW) and 407 lb.-ft. (548 N·m) of torque (up from 345 horsepower and 375 lb.-ft. of torque), while providing an estimated improvement of 4 percent in fuel economy.

The new HEMI powers the all-new 2009 Ram Truck to shockingly fast performance: the R/T regular-cab 4x2 model equipped with a short bed and 4:10 gears can accelerate from 0-60 mph in 6.1 seconds.

Of course, there's more to the all-new 2009 Ram's engine lineup.

An available 4.7-liter V-8 provides 310 horsepower (231 kW) and 330 lb.-ft. (447 N·m) of torque with increased fuel economy.

The 4.7-liter V-8 follows the HEMI engine's lead as it uses two spark plugs per cylinder, and leverages increased compression ratio, improved cylinder head port flow, and a new slant/squish combustion system designed to substantially increase fuel economy, power and torque. This engine is also compatible with E85 fuel, earning the Flexible Fuel Vehicle (FFV) designation that provides customers the option of operating their vehicle on ethanol, gasoline or a mixture of the two.

Standard on all-new 2009 Ram Truck two-wheel-drive regular cab and Quad Cab® models is a 3.7-liter Magnum V-6

engine, generating 210 horsepower (156 kW) and 235 lb.-ft. (319 N·m) of torque. Similar to the 4.7-liter and 5.7-liter V-8s, the 3.7-liter V-6 is equipped with Electronic Throttle Control, which provides engine torque control while compensating for changes in engine load caused by the air-conditioning compressor, alternator and power steering pump.

Transmissions

The 545RFE five-speed automatic transmission is standard on 2009 Ram Truck pickups equipped with the 5.7-liter HEMI and optional on Ram pickups equipped with the 4.7-liter V-8. It is a fully electronically-controlled transmission containing three planetary gear sets that provide a wide ratio capability for optimum performance. It also offers a tow-haul mode that balances engine speed and load conditions, which improves performance and fuel economy while reducing engine noise during towing or heavy hauling.

For the all-new 2009 Ram Truck, the five-speed automatic includes the new addition of Electronic Range Select (ERS), which enables the driver to manually limit the highest available transmission gear, allowing manual upshifts and downshifts based on road speed and engine speed. Also new is an optional floor-mounted automatic shifter-available in the Ram Truck for the first time.

Optional on 2009 Ram Truck models equipped with the 3.7-liter V-6 engine (two-wheel drive only) is the 42RLE four-speed transmission. Also a multi-range, fully electronically controlled transmission, it is equipped with an electronically modulated converter clutch that increases fuel economy while maintaining smooth operation by allowing the torque converter clutch to begin engaging at a lower engine speed than previous four-speed transmissions. ERS is also included in the four-speed automatic, as is tow-haul mode.

The standard transmission for all-new 2009 Ram Truck models equipped with the 3.7-liter is the Getrag 238 six-speed manual. Encased in a two-piece, die-cast aluminum housing, the six-speed provides optimum gear ratios for performance, while minimizing noise, vibration and harshness with hard-finished gears. Shift feel is enhanced by shift rails supported with ball bearings and Teflon bushings.

Transfer cases

Two transfer cases are available on the all-new 2009 Ram Truck: the NVG 243, which enables part-time four-wheel drive operation with a two-speed gear system; and the NVG 246, which enables an on-demand four-wheel drive system, also with a two-speed gear system. Both transfer cases are engaged with a dash-mounted switch.

The part-time transfer case provides three operating ranges-2HI (two-wheel drive), 4HI (four-wheel drive) and 4LO (low-range reduction four-wheel drive)-plus a neutral position. 2HI is designed for any road surface at any time. 4HI and 4LO are for off-road use. Operating mode may be switched between 2HI and 4HI while the vehicle is in motion, but the vehicle's transmission must be in neutral to engage 4LO. The low-range reduction ratio for 4LO is 2.72:1, which provides increased low-speed torque capability for pulling power in off-road conditions.

The on-demand transfer case provides four operating ranges: auto, 2HI, 4HI and 4LO. The auto range provides optimum versatility by engaging two- or four-wheel drive depending on road conditions. 2HI, 4HI and 4LO function the same as in the part-time transfer case.

Driveshafts are upgraded for increased quality, durability and reliability. The 2009 Ram Truck's driveshafts now incorporate 1350 series universal joints, two-piece thrust washers with triple-lip seals, and improved journal cross strength.

Suspension, steering, wheels

For 2009, Ram introduces a multi-link coil-spring rear suspension, which provides improved ride and handling characteristics with no loss of capability. A coil-spring setup centralizes and absorbs bumps and impacts, while reducing the amount of friction in the spring system. This setup also weighs 40 pounds less than a leaf-spring configuration.

"Our multi-link coil-spring setup provides advantages in ride quality and handling characteristics, but doesn't give up

anything in terms of payload or trailer-towing capability," said Kunselman. "After all, coil-spring setups are commonly used in heavy-duty applications including semi trailers and railroad cars."

Shock absorbers are forward-facing and positioned on the outside of the frame for optimum damping. Shocks are tuned for optimum balance in order to reduce ride harshness and provide more of an absorbent feel.

Power-assisted rack-and-pinion steering is standard on both two-wheel and four-wheel drive 2009 Ram Truck models.

A range of wheels is available among the various 2009 Ram Truck models, from a 17-inch stamped steel wheel that is standard on ST models, to 20-inch aluminum wheels available on SLT, Sport and Laramie models. A full-size spare tire and wheel assembly is standard on all Ram models.

Axles

Four-wheel drive models of the all-new 2009 Ram Truck use a front axle designed for an independent front suspension, incorporating half-shafts that drive front hubs. The axle also has a disconnect system that automatically disengages the axle when four-wheel drive mode is disengaged, for increased fuel economy. The front axle features 3.55 and 3.92 gear ratios.

The rear axle uses a new multi-link mounting design to facilitate a new coil-spring setup, with forward-facing shock absorber brackets. (Previous Ram Truck design incorporated a Hotchkiss leaf-spring design and staggered shock brackets.) Four gear ratios are available: 3.21, 3.55, 3.92 and 4.10. Standard on all 2009 Ram Truck rear axles are an Anti-lock Braking System (ABS) and Electronic Stability Program (ESP), which helps drivers maintain directional stability by applying selective braking and engine control to keep the vehicle on course.

Four-wheel disc brakes are standard on all 2009 Ram Truck models. Front rotors measure 13.2 inches (336 mm) in diameter and are clamped with dual-piston calipers, while rear rotors are 13.8 inches (352 mm) and utilize single-piston calipers. The 2009 Ram Truck features the largest light-duty pickup brake rotors in the industry.

In addition, an optional helical-gear limited-slip rear axle is available. The limited-slip function instantaneously divides torque between the rear wheels in proportion to the traction available to each wheel. However, it's consistently smooth when turning corners because it responds only to variations in traction.

The all-new 2009 Ram Truck's rear axle is constructed of stronger materials for added durability, yet weighs only 15 pounds more.

Chassis

The all-new 2009 Ram Truck uses an improved, low-torsion frame design that contributes to stability and handling precision while decreasing noise, vibration and harshness. Two frame lengths are available: 120-inch and 140-inch.

Portions of the frame are hydroformed for dimensional accuracy (hydroforming reduces the amount of welding that leads to distortion), and side rails are fully boxed. The front frame section incorporates advanced, high-strength steel that maintains overall strength and durability while saving approximately 30 pounds. New for 2009 are redesigned tow-hook brackets (four-wheel drive models). The rear section of the 2009 Ram Truck's frame is all new and supports Ram's new multi-link coil-spring rear suspension.

The all-new 2009 Ram Truck is capable of handling a payload of up to an estimated 1,850 pounds and towing up to an estimated 9,100 pounds.

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