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## Engineering the All-new Jeep Grand Cherokee: Legendary Jeep Capability Rises to New Heights

- New Quadra Lift™ air suspension system provides height control and lifts vehicle up to 4.5 inches from park mode to a maximum ride height of 11.1 inches of ground clearance and delivers legendary Jeep off-road capability
- New Selec-Terrain™ system offers five terrain settings: Auto, Sand/Mud, Sport, Snow and Rock to match driving conditions and electronically coordinates up to 12 different powertrain, braking and suspension systems
- New independent front and rear suspension systems with class-leading 10.25 inches of travel
- First application of company's all-new, flexible fuel 3.6-liter V-6 engine features Variable- Valve Timing (VVT), 280 hp (209 kW) and 260 lb.-ft. of torque (353 N•m) @ 4,800 rpm – an increase of 33 percent in horsepower, 11 percent in torque, and an 11 percent improvement in fuel economy.
- Choice of three 4x4 systems – Quadra-Trac I®, Quadra-Trac II® and Quadra-Drive® II with Electronic Limited-Slip Differential (ELSD)

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Among the numerous features in the all-new 2011 Jeep Grand Cherokee, there are three that hit the sweet spot between real-world capability and on-road refinement.

First is the all-new Quadra-Lift™ air suspension system that lifts the vehicle up to 4.5 inches from park mode to a maximum off-road height of 11.1 inches and delivers legendary Jeep off-road capability and on-road performance.

Second is the new independent front and rear suspension with improved on-road ride and handling. The rear suspension boasts a class-leading 10.25 inches of travel to maintain legendary Jeep attributes.

Third is an all-new V-6 engine that offers improved fuel economy, performance and refinement.

“Our all-new 2011 Jeep Grand Cherokee provides everything you expect in an SUV and more – more capability, technology, innovation and amenities,” said Phil Jansen, Chief Engineer – Jeep Grand Cherokee, Chrysler LLC. “Jeep Grand Cherokee is about premium on-road performance and legendary Jeep capability. We listened to our customers and took it to the next level, adding significantly improved on-road performance while maintaining the Jeep brand’s legendary four-wheel-drive capability.”

### All-new Air Suspension

The all-new Jeep Grand Cherokee rises above the road and rocks with the all-new Quadra-Lift air suspension system. The Quadra-Lift system features five height settings for optimum ride performance:

- Normal Ride Height (NRH): 8.1 inches of clearance offers improved fuel economy as well as improved aerodynamics during on-road driving
- Off-road 1: Lifts the vehicle an additional 1.5 inches for added height in clearing obstacles (9.6 inches)
- Off-road 2: Delivers legendary Jeep off-road capability and provides an additional 3 inches of height for 11.1 inches of ground clearance
- Park Mode: Lowers the vehicle 1.5 inches from NRH for easy ingress/egress. NRH and Park mode are driver selectable allowing the driver full control over vehicle ride height

- Aero Mode: Lowers the vehicle .6 inches from NRH. Aero Mode is controlled by vehicle speed and adjusts for optimal performance and fuel economy

Quadra-Lift adds up to 4.5 inches of lift span supported by four-corner air springs that provide a cushioned, premium ride. Quadra-Lift operates automatically, or may be controlled manually with console controls.

In addition to the Quadra-Lift air suspension, the all-new Selec-Terrain™ traction control system allows customers to choose the on- and off-road setting for optimum performance. This all-new feature electronically coordinates up to 12 different powertrain, braking and suspension systems, including throttle control, transmission shift, transfer case, Hill-Start Assist and Hill-Descent Control.

The new Selec-Terrain™ system offers five different driving conditions to achieve the best driving experience on all terrains:

- Sand/Mud: Traction control and Quadra-Lift operate with sensitive response to wheel spin, and torque tuned for optimal performance
- Sport: Provides enhanced on-road "fun-to-drive" capability
- Auto: Automatically adapts to any on- or off-road situation
- Snow: Vehicle traction and Quadra-Lift adjust for ultimate performance over snow-covered roads
- Rock: Quadra-Lift suspension raises to maximum height of 11.1 inches, while the transfer case, differentials, and throttle coordinate to provide low-speed control

Selec-Terrain, coupled with the all-new Quadra-Lift air suspension, offers drivers an adjustable suspension span that delivers Trail Rated® performance.

With the front air dam removed and the available Quadra-Lift air suspension, the all-new Jeep Grand Cherokee features a 35.9-degree approach angle, a 29.2-degree departure angle and 25.1-degree breakover angle.

The all-new independent front and rear suspension features isolated front and rear suspension cradles along with variable-rate rear springs to deliver improved on-road handling and comfort while complementing the vehicle's legendary off-road capability. The new rear suspension also allows the spare tire to be stored inside the vehicle as opposed to underneath.

The 2011 Jeep Grand Cherokee is also available with load-leveling shocks. Shocks react to payload levels and mechanically increase vehicle height when the vehicle has added rear payload. When payload is added to the vehicle, the shock's gas pressure increases until the vehicle reaches normal ride height.

Advantages to load-leveling shocks include improved load handling and trailer-tow performance. Load-leveling shocks are available with trailer-tow packages that do not already have the Quadra-Lift air suspension.

### **Premium Powertrains**

The all-new 2011 Jeep Grand Cherokee is available with two leading engine options for North American markets.

The all-new 3.6-liter V-6 engine is an all-new design featuring double-overhead camshafts (DOHC) and a high-pressure die-cast aluminum cylinder block in a 60-degree configuration.

The all-new 3.6-liter V-6 engine delivers 280 horsepower (209 kW) @ 6,400 rpm and 260 lb.-ft. (353 N•m) of torque @ 4,800 rpm, an increase of 33 percent in horsepower, 11 percent in torque, and up to an 11 percent improvement in fuel economy.

The 3.6-liter V-6 engine design features a DOHC, and high-flow intake and exhaust ports, which, in combination with dual independent cam phasing, allows optimum volumetric and combustion efficiency over the full speed and load range. This results in an exceptional, flat torque curve along with high specific power. The engine torque exceeds 90 percent of the peak value from 1,600 to 6,400 rpm, which provides a smooth, responsive driving experience.

The reduction of noise, vibration and harshness (NVH) was a key objective for every component during the design phase of the engine and was achieved by utilizing advanced computer-aided engineering techniques. Structural, intake and exhaust areas of the engine are designed to deliver low levels of overall noise and achieve specific sound quality goals. The result is a refined engine in all applications. Idle quality refinement is improved due to use of the dual independent cam phasing.

An environmental-friendly oil filter element and optional integrated oil cooler are used to aid service and enhance reliability. The use of long-life spark plugs and a high-energy coil-on-plug ignition system also helps reduce cost of ownership.

In addition to the all-new V-6 engine, the Jeep Grand Cherokee is also available with the legendary 5.7-liter HEMI® engine. It delivers 360 horsepower (268 kW) and 390 lb.-ft. of torque (520 N•m) @ 4,250 rpm and also features VVT, which delivers performance and towing capability, as well as fuel efficiency with the fuel-saving Multi-displacement System (MDS).

The HEMI engine's fuel-saving MDS seamlessly alternates between smooth, efficient four-cylinder mode when less power is needed and V-8 mode when more power is in demand. This optimizes fuel economy when V-8 power is not required without sacrificing vehicle performance or capability.

The HEMI's VVT improves fuel economy in two ways. First, it reduces the engine's pumping work by closing the intake valve later. Second, it increases the expansion process of the combustion event. This allows more work to be transferred to the crankshaft instead of being rejected out of the exhaust port as heat. VVT improves engine breathing, which improves engine efficiency and power.

The all-new Jeep Grand Cherokee offers unsurpassed trailer tow capability of up to 7,400 lbs. on 4x2 models when coupled with the HEMI V-8.

For international markets, the all-new 2011 Jeep Grand Cherokee will be available in left- and right-hand drive and offer a choice of diesel and petrol powertrains.

### **Transmissions**

Available with the all-new 3.6-liter V-6 engine is the proven W5A580, a five-speed automatic transmission that delivers smooth shifts and optimum fuel economy. The five-speed W5A580 transmission includes Electronic Range Select (ERS) driver-interactive manual control and an electronically modulated torque converter clutch.

The 5.7-liter HEMI V-8 engine is mated to the 545RFE multi-speed automatic transmission. The five-speed transmission includes three planetary gear sets, one over-running clutch, with ERS driver interactive control and an electronically controlled torque converter clutch.

### **Go Anywhere 4x4 Systems**

The 2011 Jeep Grand Cherokee features three 4x4 systems (Quadra-Trac I®, Quadra-Trac II® and Quadra-Drive® II).

Quadra Trac I delivers full-time four-wheel drive without any switches or levers to pull. The system provides smooth operation of the vehicle over a variety of road conditions. This light-weight single-speed case is both proven and efficient for enhanced fuel economy.

The Quadra Trac II's two-speed transfer case uses input from a variety of sensors to determine tire slip at the earliest possible moment and takes corrective action. The system also uses Throttle Anticipate to sense quick movement in the throttle from a stop and maximizes traction before tire slippage occurs. When wheel slippage is detected, as much as 100 percent of available torque is instantly routed to the axle with the most traction.

Quadra Drive II, with a rear Electronic Limited-slip Differential (ELSD), delivers industry-leading tractive capability. The system instantly detects tire slip and smoothly distributes engine torque to tires with traction. In some cases, the vehicle will anticipate low traction and adjust in order to proactively limit or eliminate slip.

Selec-Terrain is standard with Quadra Trac II and Quadra Drive II.

All 2011 Jeep Grand Cherokees equipped with the off-road or the Quadra-Lift group are Trail Rated®. The Jeep Trail Rated badge on the 2011 Jeep Grand Cherokee indicates that the vehicle is designed to perform in a variety of challenging off-road conditions identified by five key consumer-oriented performance categories: Traction, Ground Clearance, Maneuverability, Articulation and Water Fording.

Jeep Trail Rated is a unique methodology used by Jeep Engineering to measure and predict off-road performance for all Jeep vehicles. Through a combination of natural and controlled field tests, Jeep Trail Rated provides a consistent measurement of off-road performance for all Jeep vehicles. Only Jeep vehicles are Trail Rated.

### **Chassis**

Continuing to build on the Jeep brand's legendary off-road capability, the all-new 2011 Grand Cherokee adds premium on-road performance to complete the package.

The all-new 2011 Jeep Grand Cherokee's premium SUV on-road manners and legendary Jeep ruggedness is achieved with more than 5,400 welds in the body alone. The all-new body structure's torsional stiffness is 146 percent more than the current Grand Cherokee and stiffer than the BMW X5 and Toyota Highlander for improved durability and reduced noise, vibration and harshness (NVH).

With more than 3,700 mm of arc welding and 100 m of structural adhesive to augment welding, this marks a 53-percent increase in spot welds, a 42-percent increase in arc welds and a 38-percent increase in structural adhesive compared to the current Grand Cherokee.

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