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## 2005 Dodge Magnum Engineering Press Releases

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### **All-New 2005 Dodge Magnum the Heart and Soul of a Performance Car**

- **Diverse Powertrain Offering Creates Distinctly Different Models**
- **First Use of Chrysler Group 5-Speed Automatic for Best Combination of Performance, Fuel Economy and Smoothness**
- **Industry First: Multi-Displacement System Saves Fuel While Retaining HEMI® Power**

Dodge Magnum was engineered to provide style, comfort, performance and utility in a sports wagon. The powertrain systems were optimized to deliver the best combination of these attributes.

Three engines and two transmissions were developed to provide the optimum powertrain options for Dodge Magnum SE, Magnum SXT and Magnum RT. The 2.7-liter DOHC V-6 provides the Magnum SE with outstanding combination of performance, fuel economy, quietness and durability. The Magnum SXT utilizes the 3.5-liter SOHC V-6 engine with improved performance, fitting a mid-level sports wagon. For the ultimate in performance, the Magnum RT comes standard with the 5.7-liter HEMI® V-8.

Transmissions were matched to the engines to provide the best combination of performance, smoothness and fuel economy. Two transmissions will be available in the Magnum vehicles. A passenger car Chrysler Group five-speed automatic will be offered for the first time ever in the Dodge Magnum. The five-speed automatic transmission will be controlled by Chrysler Group's AutoStick Driver-Selectable Range Control. This shifter accommodates fully-automatic shifting, or the driver can manually select a gear range. The rear-wheel drive Dodge Magnum SE and Magnum SXT will be equipped with a revised version of a proven Chrysler Group four-speed automatic transmission.

### **5.7-LITER HEMI® V-8**

The modern HEMI engine offers more power and torque than any Chrysler Group vehicle passenger car engine since the legendary 426 HEMI of the '60s and '70s. Today's engine produces 340 hp @ 5000 rpm and 390 lb.-ft. of torque at 4000 rpm.

The new HEMI has been engineered to deliver outstanding performance, and also provide minimal noise, vibration, and harshness, smoothness and low emissions. Fuel economy has also been improved, but not at the expense of performance. Chrysler Group has developed and will be the first to offer to offer Multi-Displacement System (MDS) on a modern, large volume vehicle in North America.

"The Chrysler Group MDS seamlessly alternates between smooth, high fuel economy four-cylinder mode when less power is needed, and V-8 mode when more power from the 5.7L HEMI engine is in demand," said Eric Ridenour, Executive Vice President Product Development Chrysler Group. "This optimizes fuel economy when V-8 power is not needed, without sacrificing vehicle performance—2005 Chrysler 300C and Dodge Magnum RT owners will get the maximum benefit without any compromises."

Owners of the Dodge Magnum RT will receive the powerful benefit of the HEMI engine with the fuel economy that

they would only expect from a smaller, less powerful engine.

"The MDS was part of the engine's original design," said Bob Lee, Vice President Powertrain Product Team Chrysler Group. "This resulted in a cylinder-deactivation system that is elegantly simple and completely integrated into the engine design. The benefits are fewer parts, maximum reliability and lower cost."

Some of the significant technologies enabling the Chrysler Group MDS are the speed of electronic controls, the sophistication of the algorithms controlling the systems and the use of Electronic Throttle Control ETC. The HEMI will be able to transition from eight cylinders to four in 40 milliseconds (0.040 seconds).

The HEMI engine with MDS has completed over 6.5 million customer-equivalent miles through Chrysler Group's development and durability testing. It is covered by the 7-Year/70,000-mile Limited Powertrain warranty.

The HEMI engine that powers the Dodge Magnum RT uses aluminum cylinder heads with hemispherical combustion chambers for outstanding airflow leading to high power and torque. Dual ignition (two spark plugs per cylinder) increases peak power and torque, reduces exhaust emissions, increases fuel economy and provides a smooth idle. The combustion system has been refined and the engine uses direct-mount accessories for quiet operation.

The engine is equipped with ETC which enables several of the technologies used to maximize vehicle smoothness, performance, safety and fuel economy.

### **3.5-LITER SOHC V-6 ENGINE**

The 3.5-liter V-6 engine used to power the Magnum SXT is derived from versions of this engine used in prior Chrysler Group vehicles. An all-new active three-plenum intake manifold provides high power and torque over the entire operating band, with 250 hp at 6400 rpm and 250 lb.-ft. of torque at 4000rpm. This engine provides the perfect blend of performance economy.

A new active three-plenum intake manifold with electronically controlled manifold tuning valve and short-runner valves provides more power to the 3.5-liter. Additionally, ETC is used on this engine in the Dodge Magnum SXT.

### **2.7-LITER DOHC V-6 ENGINE**

The 2.7-liter V-6 has proven durable in a variety of Chrysler Group applications, and has been revised to power the Dodge Magnum SE. The engine has been improved to produce more low-speed torque at launch and during mid-range operation for strong performance in every-day driving. The engine produces 190 hp at 6400 rpm, and 190 lb.-ft. of torque at 4000 rpm, and it offers good fuel economy in a vehicle of this size.

Revisions on the 2.7-liter V-6 include an all-new active three-plenum intake manifold that is tuned for improved low-speed torque. In addition, the manifold includes a manifold tuning valve that further adds to low-speed torque during both part-throttle and wide-open throttle operation. This valve increases part-throttle torque eight to 10 percent in the primary driving range of 2100 to 3400 rpm, giving better performance in normal driving.

Another addition to the 2.7-liter for 2005 is the use of ETC. This maintains a more consistent vehicle speed on rolling grades when cruise control is active and interacts with the transmission control system to further minimize gear hunting under these conditions. It also tailors throttle response to pedal movement based on operating conditions. For example, a large pedal motion at a standing start may open the throttle less than the same pedal movement at highway speeds.

### **FIVE-SPEED AUTOMATIC TRANSMISSION**

The Chrysler Group's first five-speed automatic transmission for passenger cars provides a full range of transmission performance to match a great variety of driving styles, situations and road conditions.

"This transmission offers Chrysler Group customers many benefits. The five-speed gear range provides a better balance of performance and fuel economy than a four-speed automatic transmission," said Ridenour. "Fully adaptive electronic control of all shifting makes the powertrain feel responsive without harshness."

The transmission's physical attributes include compact size, robust design for high-torque rating and multiple features providing high efficiency. It also utilizes highly advanced electronic controls such as fully adaptive electronic control and Electronically Modulated Converter Clutch (EMCC).

This five-speed automatic transmission and with all-wheel drive applications is standard equipment with the 5.7-liter

HEMI V-8 engine on the 2005 Dodge Magnum RT and with all-wheel drive applications. It is a DaimlerChrysler transmission built at the Indiana Transmission Plant II in Kokomo, Indiana.

The ratio spread from first to the fifth was selected to minimize fuel consumption and reduce powertrain noise during cruising. An aggressive first-gear ratio provides excellent launch performance, and evenly spaced gear ratios provide smooth acceleration through the gears.

World-class efficiency is achieved through physical and electronic means. This transmission uses bearings to reduce friction in many locations where other transmissions may utilize bushings. The transmission also uses a unique scavenging system that removes oil spun off of the rotating parts by centrifugal force through strategically placed slots in the outside of the case. This saves energy that would be consumed by internal parts rotating in oil. Lubricating holes in the clutches are also positioned to promote quick passage of the transmission fluid through the discs, minimizing viscous losses due to trapped oil.

Fully adaptive electronic control of all shifting makes shifts very smooth. The system monitors the transmission as shifts occur and adjusts hydraulic pressure as needed. In so doing, the controls make the powertrain feel responsive without harshness. Driver recognition software alters shift points based on accelerator pedal usage, brake usage and lateral acceleration. This does not require a compromise between sporty and economical operation, nor is it a question of choosing one or the other.

The Torque Management System uses engine-torque modeling to facilitate smooth transmission shifting. Because of ETC, torque management is more sophisticated and covers a broad torque range.

The shift schedule adapts to individual driving style, driving situation and road conditions, altering shift points based on an accelerator pedal usage, brake usage, lateral acceleration, altitude and load on the car as a result of grades. Electronically controlled engine Torque Management System provides quick wide-open-throttle up shifts and quick two-step (4-2 or 3-1) kick-down shifts that are smoother than would be otherwise possible without this feature.

The transmission ratios are:

1st - 3.58  
2nd - 2.19  
3rd - 1.41  
4th - 1.00  
5th - 0.83  
Reverse - 3.17

Through EMCC, torque converter clutch slippage is electronically modulated and provides for partial engagement in third, fourth or fifth gears. This results in improved shift feel, fuel economy, driveability and cooling. It can be used at lower speeds to provide benefits over a broad speed range. The system disengages as required to provide optimal performance.

#### **FOUR-SPEED AUTOMATIC TRANSMISSION**

The 42RLE four-speed automatic transmission is a variant of the 42LE automatic transmission used on previous Chrysler Group vehicles. It was developed for the Dodge Magnum and is included with both V-6 engines on rear-wheel drive models.

This four-speed automatic features fully adaptive electronic control of all shifting for smooth operation. Similar to the five-speed, it uses the Torque Management System to smoothly execute quick wide-open-throttle up shifts and down shifts. It also uses EMCC to electronically modulate torque converter lockup and provide for partial engagement in third or fourth gears. This results in improved shift feel, fuel economy, driveability and cooling.

The transmission ratios are:

1st - 2.84  
2nd - 1.57  
3rd - 1.00  
4th - 0.69  
Reverse - 2.21

## **Modern Architecture Creates a Versatile and Fun Sports Wagon**

- **All-New 2005 Dodge Magnum Will be Offered in Both Rear-Wheel Drive and All-Wheel Drive**
- **Rear-Wheel Drive Delivers Vehicle Balance and Handling**
- **All-Wheel Drive Offers Owners Four Season Traction**

### **REAR-WHEEL-DRIVE SYSTEM**

Rear-wheel drive is standard on all 2005 Dodge Magnum vehicles. Using rear-wheel drive as architecture allowed designers to create a taller vehicle with more utility. It also made it possible to have a longer wheelbase, giving the Dodge Magnum a more balanced ride and greater interior room.

"Rear-wheel drive offers the best vehicle balance and handling, and a performance-car experience without any compromises in performance or luxury," said Eric Ridenour, Executive Vice President Product Development Chrysler Group. "It separates the steering and acceleration duties. This eliminates compromises and enables enhanced performance and handling."

Advancements in technology in the last five years enables a rear-wheel drive large car to perform with all-season capability. Electronic Stability Program (ESP), All-Speed Traction Control, and advanced anti-lock brake systems and tire technologies have reached new levels of performance.

The rear-wheel drive system mounts the engine and transmission in a North/South configuration in the vehicle. It includes a two-piece drive shaft that incorporates a unique Chrysler Group collapsing feature to enhance passenger protection during frontal and offset frontal impacts. The remainder of the system consists of a cradle-mounted rear differential and two half shafts. The rear differential is double isolated and precision machining ensures exceptional NVH.

### **ALL-WHEEL-DRIVE SYSTEM**

All-wheel drive provides the solution to those who require the best in passenger-car four-season traction. It is available on Dodge Magnum SXT and Magnum RT.

The all-wheel-drive system adds a front differential and a transfer case compared to the rear-wheel drive configuration. The power is divided between the front and rear differentials and is transmitted to both axles at all times. The transfer case is a planetary center differential that delivers 62 percent of the engine torque to the rear axle and 38 percent to the front.

By driving continuously through all four wheels, the all-wheel-drive system provides excellent cornering balance under all driving conditions, and better traction in snow and wet-weather conditions. Combined with All-Speed Traction Control and ESP, performance and stability are outstanding under all traction conditions.

## **All-New 2005 Dodge Magnum Designed for World-Class Ride and Handling**

- **All-New Front and Rear Suspension**
- **Short and Long Arm Front Independent Suspension**
- **Five-Link Independent Rear Suspension**

Dodge Magnum will offer customers world class ride and handling with outstanding utility. The Magnum SX and SXT models are tuned to offer a smooth ride while maintaining a feeling of control and confidence. Effort was focused on minimizing noise, vibration and harshness, resulting in a driving experience that is smooth and quiet.

The Dodge Magnum RT offers athletic and nimble suspension characteristics tuned for greater handling performance. A well damped ride, with reduced body roll gives the customer a precise and responsive driving experience.

"We designed the suspension to be very responsive while delivering superb ride and comfort," said Eric Ridenour, Executive Vice President Product Development Chrysler Group. "The front and rear suspension are all-new. We used short and long arm design in the front and a sophisticated five-bar link, independent rear suspension. The suspension will delight performance drivers with excellent handling and improved responsiveness while also providing

impressively smooth ride characteristics.â€

### **ALL-NEW FRONT SUSPENSION**

An all-new short and long arm (SLA) front suspension provides excellent handling and ride characteristics.

High upper control arms, which place the upper ball joints above the tires, provide suspension articulation that helps keep the tires perpendicular to the road during cornering for high adhesion. Lateral links and tension struts, rather than one-piece lower control arms, position the lower ends of the steering knuckles. These links attach to the steering knuckle via separate ball joints. Multiple bushings offer flexibility to tune for ride and comfort. This architecture creates a virtual pivot point for the tire to reduce reaction to bumps that would otherwise be perceptible at the steering wheel.

### **ALL-NEW REAR SUSPENSION**

The five-link independent rear suspension system allows independent tuning of handling and ride comfort so that each can be maximized. This leads to a no-compromise situation, and the rear suspension has been developed to complement the performance of the front suspension for a very balanced vehicle.

Multiple aluminum links maintain independent control of camber and toe during suspension movement for excellent handling. Multiple bushings offer flexibility to tune for ride and comfort. Stabilizer bar attachments to the knuckles provide maximum response to vehicle lean on the Dodge Magnum RT.

The rear suspension is isolated from the passenger compartment to provide a quiet and smooth ride. All rear suspension components, except the coil springs and shock absorbers, mount on a steel cradle that attaches to the body structure through four large rubber mounts. Premium urethane jounce bumpers provide smooth progressive engagement over sharp bumps to minimize harshness.

### **ALL-WHEEL DRIVE SUSPENSION**

All-wheel drive models use an SLA front suspension that is slightly different compared to the rear-wheel drive models to accommodate the front drive axle and related components. The SLA suspension uses a forged upper control arm and single-piece cast-iron lower control arm, efficiently packaged around the front-axle drive system.

The steering gear effort and response, and the suspension characteristics, are tuned to the all-wheel drive vehicle's handling characteristics.

### **POWER RACK AND PINION STEERING**

Power rack-and-pinion steering has an overall ratio of 16.1:1 on all models. The steering effort is varied to balance comfort and ease of operation with feel and responsiveness requirements. The steering gear mounts to the suspension cradle through two spool isolators that are tuned to minimize road noise while delivering steering responsiveness. Friction is minimized to enhance steering precision.

The steering systems deliver light parking efforts, without compromising steering performance at speed. In addition, the systems are also tuned to match the handling capabilities of the vehicles.

### **FOUR-WHEEL DISC BRAKES**

Four-wheel disc brakes are standard on Dodge Magnum model. Ducts in the front fascia direct cooling airflow to the front brakes, reducing front-brake temperatures by up to 15 percent in heavy use for enhanced performance and longer lining life.

High caliper stiffness facilitates firm pedal feel and linear response with increasing demand for braking effort.

To reduce rolling resistance for better fuel economy, all models use low-drag calipers. New-technology caliper construction allows minimal drag of the pads on the discs. Tight pad clearance to the rotors maintains maximum pedal feel and responsiveness.

The Dodge Magnum RT features twin-piston aluminum calipers and 13.6-inch vented rotors in the front and single-piston aluminum calipers with 12.6-inch vented rotors in the rear.

The calipers are readily visible through the aluminum wheels, and they have a gray anodized coating for corrosion protection and long-term appearance.

Even the base brake system offered on V-6 rear-wheel drive models offers substantial braking performance and

safety. They feature single-piston aluminum calipers and 12.6-inch vented rotors in the front and single-piston aluminum calipers with solid 12.6-inch rotors in the rear.

#### **ABS (ANTI-LOCK BRAKE SYSTEM) AND ALL-SPEED TRACTION CONTROL**

A combined ABS and Traction Control system is standard with the 3.5- and 5.7-liter engines; it is optional with the 2.7-liter V-6. Dodge Magnum SX and Dodge Magnum SXT are the first Chrysler Group vehicles to offer All-Speed Traction Control.

ABS keeps the vehicle straight while retaining steering capability while braking on slippery surfaces by preventing wheel lock-up. It benefits from state-of-the-art electronics that provide faster system response than in the past.

All-Speed Traction Control enhances mobility and prevents wheel slip when accelerating on slippery surfaces. Depending on how slippery, an automatically activated Winter Mode feature will select lower transmission up-shift speeds on the five-speed automatic transmission. It also provides a measure of directional stability control — an advancement beyond prior traction control systems. Using the wheel-speed sensors, it can detect excessive yaw and help keep the car on the intended course, as for instance, when accelerating around a curve.

In addition to braking the slipping wheel in low traction situations, All Speed Traction Control on the Dodge Magnum models can use throttle control as well. This makes the vehicle less reliant on brake application alone to maintain traction, increasing the operating speed range and more closely modulates speed, resulting in smoother operation. With All-Speed Traction Control reducing engine torque as well as applying the brakes, it is possible to achieve almost seamless torque application at the wheels. All-Speed Traction Control also benefits from state-of-the-art electronics that provides much faster system response than in the past.

#### **ELECTRONIC STABILITY PROGRAM**

Electronic Stability Program, which includes a Brake Assist feature, is standard on Dodge Magnum SXT and RT. It is optional on the Dodge Magnum SE. It is offered for the first time on a North American-built Chrysler Group vehicle.

The system enhances driver control and helps maintain directional stability in turns, including uneven surface conditions and patchy snow, ice or gravel. If there is a discernible difference between what the driver asks through the steering and the vehicles path, ESP applies selective braking and throttle input to put the car back onto the driver's intended path.

The system is calibrated to offer safe control of the vehicle under a variety of conditions, and to operate in a manner that is not intrusive in normal or spirited driving.

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