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General Motors

GM Communications
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FOR RELEASE: 2004-01-01

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The Sixth Generation Chevrolet Corvette: More Power, Passion and Precision

DETROIT - Marking the sixth generation of its legacy, the 2005 Chevrolet Corvette delivers more power, passion and precision to reach a new standard of performance car excellence.

The 2005 Corvette Coupe will be introduced at the North American International Auto Show in Detroit in January 2004, with production slated to begin in the third quarter. A convertible version will be unveiled in the first half of 2004, with its production beginning in fall 2004.

"The C6 represents a comprehensive upgrade to the Corvette," said Dave Hill, chief engineer of the Corvette and vehicle line executive for GM Performance Cars. "Our goal is to create a Corvette that does more things well than any performance car. We've thoroughly improved performance and developed new features and capabilities in many areas, while at the same time systematically searching out and destroying every imperfection we could find."

The development of the 2005 Corvette intends to not only replace the outgoing C5 Corvette (1997-2004), but also to create a 21st century Corvette that both thrills the legions of traditional loyalists and captures the imagination of a new generation of performance enthusiasts. The formula from the C5 era remains: extremely high performance capabilities in a car that offers great style, value and quality, with surprising comfort for daily driving. The 2005 Corvette builds on that foundation and reaches beyond with dramatic increases in performance and refinement, wrapped in a passionate

new design.

The sixth generation Corvette blends technical sophistication with expressive style. Five inches shorter than the current car, the 2005 Corvette cuts a tighter, more taut profile - with virtually no loss of usable space. More than just visual, the new dimensions make the car more agile and "tossable," with upgrades in handling, acceleration and braking. At 0.28 coefficient of drag, the 2005 Corvette is the most aerodynamically efficient Corvette ever and has improved anti-lift characteristics that enable improved high-speed stability and confidence.

"The C6 is more competition-influenced - given our championship experience with Corvette Racing - than any previous Corvette," Hill said. "Our goal was a performance car at home in virtually any environment. That means more than just raw performance. It calls for improved ride comfort, a precisely-built and technically-sophisticated interior, and a sleek new body that is fresh and contemporary, while still instantly recognized as the new Corvette."

With countless enhancements, ranging from major changes to minor adjustments, the sixth generation aims to perfect the Corvette formula of power, passion and precision delivered with great value.

Power:
A new LS2 6.0-liter small-block V-8 is the standard engine in the 2005 Corvette. It is based on GM's new Gen IV small-block family of engines.

The LS2 raises the bar for standard performance in the Corvette, delivering estimated peak output levels of 400 horsepower and 400 lb.-ft. of torque. It is the largest, most powerful standard small-block engine ever offered in Corvette.

Major revisions to the manual and automatic transmissions provide Corvette with significant improvements geared towards performance driving. The Tremec six-speed manual gearbox is available with two sets of ratios, one with more aggressive acceleration characteristics reserved for Corvette's Z51 Performance Package that emulates the performance of the C5's landmark Z06 model. Improved shifting characteristics are another major improvement, with new synchronizers that reduce travel by 10 percent, and a shifter knob that is an inch shorter and redesigned for greatly improved driver operation.

The Hydra-Matic 4L65-E automatic transmission is an upgraded version of the C5's 4L60-E, strengthened and revised to accommodate the LS2's 400 lb.-ft. of torque. It includes GM's advanced Performance Algorithm Shifting, which automatically selects the optimal gear for a given driving condition, making it a willing accomplice for performance driving and hard cornering. The transmission now shifts at higher revs to take advantage of the higher engine output.

Not only does the LS2 engine deliver impressive horsepower, but in a true measure of real-world efficiency, it also boasts the best combination of horsepower and fuel economy among the world's best performance cars. When the LS2's 400 horsepower is multiplied by its 22.6 mpg combined city/highway mileage estimates, it yields a total of 9,040. Here's how the 2005 Corvette compares with some of its key competitors:

Vehicle	**HP**	**mpg comb**	**Index**
2005 Corvette Corvette	400	22.6	9,040
Porsche 911 GT2	477	18.2	8,681
Porsche Turbo	444	18.2	8,081
Dodge Viper	500	15.5	7,750
Porsche 911	340	20.6	7004
Ferrari 575 Maranello	515	12.7	6,541
Ferrari Modena	400	12.7	5,080

The bottom line? The LS2 gives Corvette power in the range of exotic cars that cost tens of thousands more, combined with fuel efficiency better than some family sedans.

Passion:

The signature of the sixth generation is an expressive new design that is a worthy extension of the Corvette lineage, distilling classic Corvette design cues in a completely fresh and contemporary fashion.

2005 Corvette features a taut new body with greatly revised exterior dimensions - 5 inches shorter than the C5, and roughly 1 inch narrower - with excellent aerodynamics. This new package not only aids the car's agility and performance, it also helped designers give the sixth generation a lean, muscular form.

The new Corvette features more character and flair, expressed in an absolutely purposeful manner.

The car includes larger wheels (18-inch in front, 19-inch in rear) topped by dramatic fender forms, with a crisp and tapered rear deck and fascia that support improved high-speed performance. Compared to the outgoing C5, this new generation Corvette has much more character in its front and rear fascia areas. The exposed lamps combine with the grille to create much more of a "face" on the car. The rear fascia is more expressive and lean, with truly round taillamps and integrated exhaust tips.

While using the latest advanced computer-aided design techniques, the styling of the 2005 Corvette relied heavily on traditional hand sculpting and the personal passion of designers and engineers. Sculptors pored over every millimeter of the car's surface. The aerodynamic development combined digital simulations, Corvette Racing experience and more than 400 hours of wind tunnel testing.

The passion on the outside is reflected in an all-new interior. The twin-cockpit layout incorporates sophisticated contours, leather-like surfaces that are richer and softer, and pleasing details including metallic accents and an expressive use of color.

Precision:
Interior. A central element of the 2005 Corvette is an all-new interior that includes greatly improved materials, craftsmanship and functionality. The interior delivers premium quality with new technology meant to enhance, not distract from, performance driving. 2005 Corvette continues the dual cockpit design theme that has been a Corvette hallmark.

The instrument panel and door trim areas make extensive use of cast skin, which retains the look and feel of genuine leather with excellent softness, low gloss and low glare that conveys an overall premium appearance and quality. Anodized aluminum accents the interior in key functional areas, such as the manual shift knob and door release buttons. This material includes a screen-printed appliqué that minimizes sun glare, and is resistant to temperature changes and fingerprints.

Exterior. The 2005 Corvette features exposed headlamps, the first time since 1962 that a production Corvette has not had a mechanism to conceal the lamps when not in use. The fixed Xenon High-Intensity Discharge lamps provide superior lighting performance in a compact, high-tech package that integrates seamlessly into the design and aerodynamics of the car.

Technologies. Corvette contains many new electronic technologies including Keyless Access with push-button start, and optional features such as a reconfigurable head-up display, DVD-navigation

system with voice activation, XM Satellite Radio and OnStar.

Chassis. As the next logical step in the evolution of GM's Performance Car Architecture, 2005 Corvette's chassis and structure are significantly enhanced. While the overall design philosophy continues from the C5 Corvette, the details contain a host of improvements.

The key features of the structure - low weight, high strength, cored composite floors, enclosed center tunnel, rear axle-mounted transmission and aluminum cockpit structure - all have been extensively revised to extend Corvette's total performance, with enhanced structural integrity, feel, refinement and quietness. Overall vehicle weight is projected to mirror the C5, despite mass-increasing features such as larger wheels and tires, more robust brakes and increased body acoustics and interior features.

Suspension. None of the suspension bits has been carried over from C5. The short-long arm and transverse leaf spring independent suspension configuration remains, but the cradles, control arms, knuckles, springs, dampers, bushings, stabilizer bars, and steering gear are all redesigned. The Extended Mobility Tires (EMT) also are new, taking advantage of the latest sidewall design and compound technology for run-flat capabilities, and play a critical role in the tuning of the suspension for excellent handling and comfortable ride.

Ride & Handling. Improvements in ride and handling include greater lateral acceleration, more body control, less noise transmitted from the road, and better traction and stability in corners. The specific tuning changes in the chassis and suspension include suspension and steering geometry optimized for better handling and ride, advanced compounds in the tires, new directional control arm bushings, increased caster angle and greater suspension ride travel. The result is a Corvette that is more poised at even higher handling levels, yet easier to drive.

Suspension Choices. Three suspension choices allow drivers to choose the setup that best suits their driving style - Standard, Magnetic Selective Ride Control, and Z51 Performance Package. The Standard suspension is tuned for a balance of ride comfort and precise handling.

Magnetic Selective Ride Control. The optional F55 Magnetic Selective Ride Control suspension features magneto-rheological dampers able to detect road surfaces and adjust the damping rates to those surfaces almost instantly for optimal ride and body control. Magnetic Ride Control debuted on the 2003 50th Anniversary Edition Corvette, and is the world's fastest reacting suspension, replacing

mechanical valves with nearly instantaneous reactions of magneto-rheological fluid. The system has been improved for the 2005 Corvette, allowing drivers more differentiation in character between the system's two settings, "Tour" and "Sport."

Z51 Performance Package. The Z51 Performance Package brings Corvette Coupe performance very close to the same level as the widely admired Z06. The Z51 offers more aggressive dampers and springs, larger stabilizer bars, and larger, cross-drilled brake rotors for optimum track performance capability while still providing a well-controlled and comfortable ride. Extensive racetrack testing reveals that a 2005 Corvette equipped with the Z51 suspension almost equals the lap time of a C5 Z06 - marking a major advance in the overall performance of a Corvette Coupe by nearly approximating the extreme performance capabilities of the vaunted Z06 at a remarkable value.

Eliminating Imperfections. The 2005 Corvette also seeks to eliminate the little imperfections and potential "dis-satisfiers" that sports car customers formerly had to accept. All of the major user interfaces - the hood, the doors, and the rear hatch - have been painstakingly designed for top quality performance, look and feel. The hood is still forward-hinged, but is 15 percent smaller, 35 percent lighter, and 40 percent stiffer than the previous Corvette. The rear hatch has a power-operated single-cinching latch for excellent fit and easy operation. Doors are stiffer and easier to close, doing so with a more refined sound. There are no traditional door handles on the 2005 Corvette. The 2005 Corvette features GM's Keyless Access with Push Button Start technology. By detecting the proximity of the key fob, the system both unlocks the doors and allows it to be started.

The removable-roof panel is 15 percent larger, yet offers the same structural stiffness as C5's while weighing just one pound more. The roof panel comes standard painted body color, or is available with optional tinted clear or with a dual-roof package. With new indexing side-window glass and redesigned seals, Corvette is much more free from wind noise, too. And the many improvements in tires, suspension, and body structure yield impressive reductions in road noise, while improving overall quality perception and making long trips that much more pleasurable.

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For Release: Jan. 1, 2004, 12:01 a.m.

UNDER THE SKIN: BENEATH 2005 Corvette's SHAPELY CURVES LIES STATE-OF-THE-ART PERFORMANCE TECHNOLOGY

2005 Corvette is the result of lessons learned from C5-R's successes on the track combined with fresh thinking about what a 21st century sports car should be. As the next logical step in the evolution of GM's Performance Cars Architecture, it takes its robust and real-world-validated backbone structure and enhances it with completely new suspension components.

The key features of the backbone structure – low weight, high strength via hydroformed steel frame rails, cored composite floors, enclosed center tunnel, rear-mounted transmission and aluminum cockpit structure – enable C6's top speed, world-class handling, quiet ride and fuel efficiency.

Where the structure has been shortened, it has been strengthened to enhance its crashworthiness. Optimization in key areas – front rails, front bumpers, and hood-hinges – resulted in a design that is more robust yet shorter and lighter than its predecessor.

Enhanced structure, all-new suspension

While the foundation has been enhanced, every suspension component that attaches to it has been changed – none of the suspension bits have been carried over from C5. The short-long arm and transverse leaf spring independent suspension design remains, but the control arms, springs, dampers, bushings, stabilizer bars, and steering gear are completely redesigned. The Extended Mobility Tires (EMT) are also new, taking advantage of the latest compound technology for run-flat capabilities, and play a critical role in the tuning of the suspension for maximum handling and a comfortable ride.

Smoother ride, better handling

Improvements in ride and handling include greater lateral acceleration, more body control, a more relaxing ride, less noise transmitted from the road, and better traction and stability in corners. The specific tuning changes in the chassis and suspension include suspension and steering geometry optimized for better handling and ride, advanced compounds in the tires, new directional control arm bushings, and greater suspension travel achieved through more clearance in the hub knuckles and dampers. The progressive rates of the front and rear composite leaf springs have been tuned to take advantage of the greater travel of the suspension.

The result is a Corvette that is more poised at higher limits of handling.

“It’s a much more pleasing ride,” says Mike Neal, ride and handling development engineer for the 2005 Corvette. “It’s less touchy, it’s less tuggy, it’s better isolated, it’s quieter for road noise. It’s all of those things and still a better handling car. Handling is our first priority in the Corvette.”

Suspension choices

Three suspension choices allow drivers to choose the setup that best suits their style of driving. Each of the choices (Corvette Standard, Magnetic Selective Ride Control, and Z51 Performance Package) provides outstanding handling, but each also offers drivers the ability to tailor the car’s handling traits to specific preferences.

The Standard suspension is tuned for a balance of ride comfort and precise handling. The optional F55 Magnetic Selective Ride Control suspension adds to the Standard suspension magneto-rheological dampers that are able to detect road surfaces and adjust the damping rates to those surfaces almost instantly for optimal ride and body control.

The optional Z51 Performance Package is a competition-ready system for the true performance enthusiast. It offers more aggressive dampers and springs, larger stabilizer bars, Goodyear Supercar tires with an asymmetrical tread pattern, and larger, cross-drilled brake rotors for outstanding handling performance that is still comfortable for daily driving. Beyond the suspension bits, the Z51 is a total system that takes the “regular” C6 to near-exotic levels of performance. It features gear ratios borrowed from the previous Corvette Z06 for maximum acceleration performance, and includes coolers added for the transmission and power steering systems for aggressive, track-oriented use. The result is a car that very nearly equals the Z06 in track performance – representing a tremendous value.

Next-generation Extended Mobility Tires

The 2005 Corvette takes full advantage of the latest advancements in tire technology, thanks to its long-running partnership with Goodyear. That experience resulted in Extended Mobility Tires that improve

both handling capability and ride quality. The tires feature new compounds and sidewall design which permit the tire to absorb impacts yet resist heat generated by zero-pressure use. The new compounds also provide the tremendous grip that Corvette buyers require for top performance. Despite its lower profile, the design of the new sidewall is more compliant over bumps and impacts, which improves ride comfort while reducing noise and isolating the car from road surface imperfections.

Goodyear is supplying two different tires, depending on the suspension package. For the Standard and F55 Magnetic Selective Ride Control suspensions, a standard directional-tread tire is offered for a balance between handling and ride. The Z51 Performance Package – the choice for the serious enthusiast – features an asymmetrical-tread tire that offers maximum handling performance. The wheel and tire sizes are the same for the Z51 option, which will deliver handling abilities similar to the 2004 Z06, despite the slightly narrower width of the new tires.

More robust brakes

With its increased horsepower and top speed, heartier braking is critical to C6's overall balance of performance. The brake systems have been re-engineered from the previous generation Corvette to provide improved durability and excellent performance.

The C6 brake system focuses its improvements chiefly on heat dissipation and durability requisite of the car's upgraded overall performance capability. For the Standard and F55 Magnetic Ride configurations, the brake rotors remain the same diameter as the C5, at 12.8 inches in front and 12.0 inches in the rear. However, the rotors themselves have been thoroughly redesigned. The front rotors weigh 2 pounds more than the C5, aiding durability. They also generate less heat against the brake pads, which improves wear and reduces fade. In all brake applications, the front calipers utilize dual pistons and the rears use single pistons.

The Z51 Performance Package extends the Corvette's braking capability with larger diameter rotors (13.4 inches in front and 13.0 inches in rear) that are cross-drilled.

Dynamic chassis control systems

Three standard dynamic chassis control systems – anti-lock braking, traction control, and Active Handling – operate in concert to provide a strong, but unobtrusive safety net for spirited driving.

"Our philosophy for Active Handling is that it should allow drivers to experience the higher handling limits of C6 without interfering with their enjoyment of the car," explains Dave Hill chief engineer of the Corvette and vehicle line executive for GM Performance Cars. "Our commitment to continuous improvement has resulted in the industry's most sporting stability system available."

The anti-lock braking system detects and intervenes to prevent wheel lockup during braking and features four channels plus a steering sensor. ABS is tied into the Active Handling stability system and shares sensors for steering angle, wheel speed, and acceleration and deceleration in all directions. Traction control initiates individual wheel braking and/or engine torque reduction after sensing excessive wheelspin. Active Handling stability control influences the attitude of the car by applying braking to individual wheels. The optional Magnetic Selective Ride system integrates with these systems to enhance handling and body control by optimizing damping rates based on input from changing road surfaces.

In keeping with Corvette's performance heritage, and unlike more intrusive systems of some competitors, the Corvette Team developed a calibration philosophy based on how Corvette drivers actually drive their cars.

"We felt it was better to calibrate the system around our knowledge of what our customers are going to do, rather than a system that intervenes heavily and slows them down," explains Hill. "Our intent was to encourage Corvette drivers to keep the system on. We wanted our Active Handling System to work with the drivers in their spirited driving, rather than against them."

In all, the C6's dynamic chassis control systems are smarter, less intrusive, and more adept at making the total driving experience precisely what Corvette owners have come to expect from their car.

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For Release: Jan. 1, 2004, 12:01 a.m.

2005 CORVETTE DESIGN: LEANER AND MORE PASSIONATE

The exterior of the 2005 sixth generation Corvette is a modern blend of form, function, and emotion. Corvette combines performance technology with expressive style – attributes central to Corvette's well-established mission.

The 2005 Corvette propels that foundation into the future with an all-new expression of style that is completely fresh, yet unmistakably “Corvette.” In terms of function, Corvette also pushes forward with a body that incorporates state-of-the-art performance technology and sophisticated quality.

Corvette design reflects its serious performance. From the very beginning engineers envisioned that that next Corvette would take a logical step up in performance. That meant a more powerful car that was also more agile, more “placeable” and “tossable” on the race track, while also more comfortable in daily driving and at home in any environment. Distilling the dimensions of 2005 Corvette into a smaller package would emphasize its potency and the musculature that flexed beneath its tauter surfaces.

An overall length of 174.6 inches (4435 mm) and an overall width of 72.6 inches (1844 mm) were established as the target dimensions. Even though 2005 Corvette is now 5.1 inches shorter and 1.1 inches narrower than C5, efficient packaging and a wheelbase that is 1.1 inches longer allow 2005 Corvette to maintain current levels of interior room and class-leading cargo space. And, yes, there is still room for two golf bags.

Reducing two areas of the 2005 Corvette front-end architecture enabled the overall shortening of the car:

- The front sections of the hydroformed rails were shortened by 2.4 inches (60 mm).
- The fore/aft dimension of the front bumper beam was shortened by .63-inch (16 mm). The previous beam was roll-formed; the new beam is made from two C-channels of high-strength, 180 ksi steel that are seam-welded together.

In the rear, the length was reduced by more effective positioning of energy-absorbing foam and by shortening the rear fascia and bumper structure.

2005 Corvette’s overall dimensions are similar to those of the Porsche 911, another respected performer on the road and track.

A Corvette at 100 yards

The tighter, more athletic dimensions of the car were not only engineering calculations; in the design studio, the concept for a leaner, more passionate Corvette was gaining momentum. In addition, Tom Peters, chief designer of the 2005 Corvette, charged his team with designing a 21st century performance car that would propel Corvette forward, not merely reflect on the car’s rich heritage.

“Designing the next Corvette is both every designer’s dream and a tremendous challenge,” said Peters. “Everybody has their personal vision of what a Corvette should look like. Part of what makes Corvette so successful is its sense of history and heritage. But, in our view Corvette should look forward.”

The driving factor behind the exterior design was to keep it as fresh and new as possible, yet distill the passion of Corvette design best exemplified by the classic “mid-year” Corvettes of 1963 through 1967.

“The flair and personality of those older Corvettes have stood the test of time,” said Peters. “There are some basic aesthetic attributes that form the foundation of Corvette design which are powerful, pure, and simple.”

The following features were identified as essential to Corvette design and were incorporated into 2005 Corvette:

- An expressive front-end “face”
- A tense, flexed look
- Powerful, dramatic arching fender forms
- Side extractors
- Round taillamps and their relationship to the license plate
- Performance-oriented exhaust tips.

“We wanted the 2005 Corvette to say ‘Corvette’ at 100 yards,” said Dave Hill, chief engineer of the Corvette and vehicle line executive for GM Performance Cars. “But, it achieves this in a way that is unmistakably fresh, new and compelling. This is a design in which the more you look, the more you see.”

Design Walk-Around

Egg crate grille heritage

“An expressive ‘face’ has always been a part of Corvette’s image, and 2005 Corvette’s new, center-mounted grille continues that tradition,” said Peters.

The grille also is necessary as 2005 Corvette switches from the 100 percent “bottom breathing” air intake of C5 to a hybrid air intake of 60-percent front/40-percent bottom. Its egg crate grille design is reminiscent of Corvettes from both the ’50s as well as the mid-year cars – a subtle tribute to Corvette’s heritage.

Exposed, HID headlamps

“2005 Corvette has exposed headlamps for the first time on a Corvette since 1962, and believe me, there was a lot of emotional discussion around that,” said Peters. “We finally settled on exposed headlamps because they fit the theme for the new Corvette – lean, purposeful, performance oriented.”

Additionally, fixed headlights offer the advantages of lower weight, less complexity, and superior lighting performance. The 2005 Corvette utilizes a HID Xenon low-beam projector-beam lens and a tungsten-halogen high-beam projector lens.

The projectors are housed within a polycarbonate enclosure, which also contains the parking lights, side-turn markers, and daytime running lights (DRL) for an integrated appearance. Both lenses are encircled by chrome rings that add a tasteful touch of brightwork, while the bottom of the headlamp assembly, or bezel, is body-colored from the factory, and gives 2005 Corvette an integrated, upscale look.

In addition to superior lighting performance, the 2005 Corvette driver gets improved nighttime aerodynamics, appearance and “flash-to-pass” capability.

Bulged hood section

“2005 Corvette is packing 400 horsepower under the hood, and we wanted the hood design to reflect that power,” said Peters.

The hood’s center bulge implies “muscle power” and radiates outward into the front fenders. The cutline for 2005 Corvette’s hood opening falls in the valley where the fender meets the hood, Peters pointed out.

“That’s a classic sports car styling cue,” he said.

Sharp front fenders

“Walking around the front to the side of 2005 Corvette allows us to appreciate 2005 Corvette’s handsome profile,” said Peters. “The front fenders are both more rounded and more sharply defined. They’re higher by about 10 millimeters and they also feature a beltline crease.”

The fenders carry down tight against the wheels and retain more definition as they traverse into the central fuselage. Combined with the shortened front overhang, the fenders contribute to a more taut, purposeful front-end design.

Larger wheels

2005 Corvette now offers wheels that are 1 inch larger in diameter than C5 as standard: 18.0 x 8.5 inches at the front and 19.0 x 10.0 inches at the rear. The rear wheels are also 0.5 inches wider than C5’s. 2005 Corvette five-spoke flangeless wheels are painted silver as standard; polished aluminum is optional.

Jet fighter profile

2005 Corvette continues the Corvette side-profile tradition of a jet-fighter canopy on a fuselage. Viewed from above, the cockpit style of the car has been extended to the roof, with more defined dual blisters.

“We looked to inspiration from modern jet fighters,” said Peters. “The side profile brings to mind the silhouette of an F22 Raptor – angular and aggressive, but with just the right amount of curves.”

Corvette's new Keyless Access system allows the doors and hatch to operate electronically without exposed handles and key cylinders, allowing the exterior to be free of any visual distraction aside from its own sharply sculpted lines.

Bold rear view

"We paid a lot of attention to designing the rear view of 2005 Corvette," said Peters. "After all, it's the view that most other drivers will see."

The appearance of the rear end was kept bold, simple, and emphasizes the shortened rear overhang.

Round rear lamps

Four round taillamps continue as a Corvette rear styling trademark, a tradition that dates back to 1961 – with variations along the way, such as rounded squares or oval-shaped lights. As one of the key characteristics of Corvette identified early on, round taillamps and their relationship to the license plate were an important styling cue for 2005 Corvette. Reflector optics give the illuminated taillamps a glow reminiscent of jet afterburners.

Accommodating license plate holder

The plate holder enables a more integrated rear-end appearance for 2005 Corvette when it travels abroad and projects an image of being at home wherever it might be. The holder readily accommodates three different plate sizes: the long, narrow rectangular license plates of the United Kingdom and Europe; the taller, wider license plates of Japan; and the short, rectangular license plates of North America.

Crisp roof and decklid

"On the coupe the fender shapes emphasize crisper transitions and creases that run all the way to the back of the decklid and draw the eye to the taut body form," said Peters.

A center high-mounted stoplight (CHMSL) is integrated into the molded black spoiler located on the rear decklid. The CHMSL is lit using light emitting diodes (LED), as was the lamp on the C5.

Diffused rear fascia

"We wanted to enhance the effect of the skin of the car being drawn down more tightly to the body and also reduce the visual weight of the rear end," said Peters. "So we added a diffuser to the bottom of the rear fascia to enhance air flow and to add visual interest to the rear of 2005 Corvette."

Four circular exhaust tips are integrated into the rear diffuser. The tips exit from the center of the diffuser and pick up the circular theme established by the four round taillamps. Framing the rear fascia with the

black CHMSL, functional spoiler at the top and the black diffuser at the bottom produces a narrower cross section. In this way, the rear of 2005 Corvette is reduced both dimensionally and visually.

Expressive exterior colors

The 2005 2005 Corvette will be offered in eight exterior colors:

- Precision Red (new)
- Daytona Sunset Orange (new)
- Le Mans Blue
- Millennium Yellow
- Magnetic Red
- Machine Silver
- Arctic White
- Black

Easier interfaces

All of the major user interfaces – the hood, the doors, and the hatch – have been improved for ease of operation. Doing so improves perceived quality and sets the stage for more favorable impressions behind the wheel.

Easier operating hood

The hood is still forward-hinged, but is 15 percent smaller, 35 percent lighter, and 40 percent stiffer. Closing efforts were reduced while closing energy increases by 50 percent. The result? A hood that latches securely from a single position – the driver no longer needs to run to the opposite side in order to check or secure the hood latch.

Reduced effort hatch

Hatch-closing efforts were reduced thanks to the optimization of locations for hinges, gas struts, and bumper stops. A power-operated single-cinching latch makes sure the hatch seals securely every time it is closed. To make closing more convenient, a hand-hold is designed into the hatch's inside bottom edge. Protected from the elements, the hand-hold stays clean and, to the relief of fastidious Corvette owners everywhere, and prevents fingerprints from collecting on the edge of the hatch.

Doors - Keyless Access with Push Button Start

There are no traditional door handles on the 2005 Corvette. Instead, it features the Keyless Access with Push Button Start system, which replaces traditional door and hatch mechanics with solenoids and electronic actuators. External handles and key tumblers are replaced by membrane-activated switches

tucked into a pocket behind each door. The door edge is protected by a small black molding, keeping the finish fingerprint- and scratch-free.

By detecting the proximity of the key fob, the system both unlocks the car doors and allows it to be started. With the key fob in a pocket or purse, one can simply approach the car and touch the pad located on each door and the door unlocks and unlatches. The ignition is operated via a rocker switch located on the instrument panel. As long as the fob is somewhere inside the cockpit and the brake or clutch is depressed, the engine starts at the touch of the button.

Open-air motoring

The removable-roof panel is 15 percent larger, yet offers the same structural stiffness as C5's and weighs just 1 pound more. The roof panel is available painted body-color as standard, optional tinted clear, or with a dual-roof package. With new indexing side-window glass and redesigned seals, the roof panel system also contributes to a quieter interior. The simple three-lever release system makes the panel easier to remove, and the snap-in storage system makes it easier to stow. Small items, bags or briefcases can now be stored underneath the panel when it is stowed.

Improved aerodynamics

The opening to the air is larger and Corvette now moves through the air more easily, too. Thanks to more than 400 hours in the wind tunnel, the shape of the exterior has been optimized for a drag coefficient of .28. It's an impressively low number, and even more so when you consider the 2005 Corvette has a larger engine with greater cooling needs; shorter front and rear overhangs; an overall length that is 5.1 inches shorter; and has wider rear tires, all of which conspire to make reducing drag difficult.

With a targeted top speed of 180 mph, reducing lift and increasing stability was a critical job in the car's development. That's where the aero experience gained from Corvette Racing's C5-R championship-winning efforts paid huge dividends. With C5-R basically an extension of the "street" car, its race and product development teams communicate constantly, and knowledge gained in one program often crosses over into the other. Aero work, thermal analysis, and tire development are among the most fertile areas of transfer between these two "worlds" of Corvette.

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For Release: Jan. 1, 2004, 12:01 a.m.

INTERIOR MOTIVES: A LOOK INSIDE THE 2005 CORVETTE COCKPIT

The dual-cockpit theme of the Corvette interior design was driven by three imperatives: Maintain or improve the C5's already excellent ergonomics, use high quality materials, and execute with precision.

“The overall theme was inspired by Corvette's dual-cockpit heritage, with a flowing, wraparound upper feature line and two-tone split between the instrument panel upper and lower,” said Eric Clough, lead interior designer. “We wanted the surfacing to echo the high-tension character of the exterior to unify the whole car. The result lends spaciousness to the passenger and a nestled cluster pod for the driver. Switches and controls are located in modular groupings set into soft skin to reduce visual clutter.”

Interior materials are significantly upgraded for comfort and aesthetics. The instrument panel and doors are covered with cast-skin foam-in-place trim that is soft to the touch with low gloss to minimize glare. To the eye, it looks like a leather-wrapped, padded panel. To the touch, it is warm and inviting. This advanced material has double the life of conventional automotive paneling materials, resists fading and sun damage, and minimizes interior fogging, which can occur as plasticizers migrate out of the material. Aluminum trim plates with a woven-type tactile surface add richness and emphasize features.

The interior is assembled with a high degree of precision, evidenced in the flush-fit radio and climate controls, the surrounding trim plates, and the instrument panel-to-door closure. Taken as a whole, the sum of these refinements adds up to a dramatically new – but distinctly Corvette – interior.

All the luxuries of a modern sports car

The new Corvette offers tremendous performance, an interior that is comfortable and tastefully appointed, and a full complement of electronic luxury features that complete the package for a 21st century sports car. With its high-powered audio system, optional onboard navigation and head-up display, Corvette will appeal to those who love technology and the convenience it brings to the modern driving environment.

Sound entertainment

If a Corvette owner gets tired of the great sounds emanating from the vehicle’s four tailpipes, the Corvette is not lacking for other modes of auditory entertainment. An AM/FM radio with CD player and MP3 capability is

standard. New technology enhances conventional radio reception despite the antenna being completely concealed within the windshield glass. An improved optional Bose audio system with an in-dash six-disc changer and XM Satellite Radio (continental U.S. only) add to the choices available to the audiophile owner.

A full-function OnStar system is available, offering Virtual Advisor, Personal Calling, emergency notification, stolen vehicle tracking, routing assistance, and automatic unlocking. And for the first time, Corvette offers onboard navigation as an option. Using a 6.5-inch color touch-screen display, the DVD-based system contains all the map data for the United States and Canada on one disc. Keeping with Corvette's global intentions, the navigation system's voice-recognition software supports multiple languages.

Gauging performance

Monitoring the vehicle's vital signs is critical for the driver of a sports car like the new Corvette. In pursuit of increased at-a-glance readability, the instrument panel, its gauges, and the driver information center have been carefully refined for maximum illumination and legibility – all part of enabling the Corvette Team's driving philosophy of "Hands on the wheel, eyes on the road."

The traditional, easy-to-read analog gauges of C5 provided an excellent starting point for Corvette's designers to refine and enhance. White-on-black numerals inform the driver with clean, straightforward displays for speedometer, tachometer, oil pressure, water temperature, voltage, and fuel level. To reduce visual clutter, major telltales were moved from within the dominant tachometer and speedometer gauges to the area between them.

The speedometer and tachometer are larger in diameter by 5 mm (0.2-inch); the gauge graphics are simplified for increased legibility; and satin-finished aluminum bezels surround each gauge for visual punctuation.

While the analog gauges may appear traditional, the technology used to illuminate them is definitely cutting edge. Using new white LED technology, the gauges are backlit both day and night for a better contrast ratio, even in direct-sun conditions. In addition, the inks used for the graphics and the method of the layers and application are also new to General Motors.

The driver information center utilizes organic light-emitting diode (OLED) technology. OLEDs make possible full-color, full-motion flat-panel displays with a level of brightness and sharpness not possible with other technologies and will be essential to the next wave of personal electronics such as PDAs, cell phones, and flat-screen TVs. Unlike traditional liquid-crystal displays OLEDs are self-luminous and do not require backlighting, eliminating bulky and environmentally undesirable mercury lamps.

The Corvette's DIC expands to a two-line display, which gives the driver more information including trip computer functions, fuel economy, range, tire pressure, and oil life remaining. OLEDs enable improved readability for the DIC – even in bright sunlight – and establish pleasing visual harmony with the rest of the gauges, the radio, and the HVAC controls.

Optional dual-mode head-up display

A menu-selectable head-up display is projected onto the windshield in front of the driver with vehicle speed and other information. The display is focused so that it aligns with the driver's line of sight on the road ahead, allowing the driver to focus on driving while still being able to monitor vehicle speed and other critical vehicle information.

There are two settings for the HUD: Street and Track; and each setting is preprogrammed to display information that is relevant for each respective – and very different – situation. In Street mode, the driver can select between several configurations that feature the speedometer and the turn signal indicators, and then add to it other information such as audio system data, automatic transmission gear position, and high-beam indicator. In Track mode, there is a larger tachometer, a speedometer, engine condition gauges, and a real-time lateral accelerometer that samples and displays the maximum "g-force" experienced during a turn. The HUD uses LCD pixels to construct the alphanumeric characters and graphics, allowing the HUD to change size and shape.

Sumptuous seating

The seats in C5 were noted for their comfort and support, but that didn't mean the Corvette Team was willing to rest on its laurels. Much effort went into making the Corvette seats more supportive and more comfortable, while reducing their weight.

Corvette utilizes a two-layer composite seat frame that is supported by an aluminum base, giving the seats outstanding structural support, especially in the stiffness of the seat backs themselves. Whether the owner chooses the standard seats or the optional sport versions, they will experience an uncompromising seat that offers comfort for long-distance driving as well as increased lateral support for performance driving.

The standard seat offers the driver six-way power adjustment with manual recline; side air bags are not available. The optional sport seat offers six-way power adjustment as well as a power lower-lumbar adjustment and lateral side bolsters for both driver and passenger. The sport seats also include head and torso side impact air bags that deploy through the side faces of the bolsters rather than through a bezel or a trim piece. Seat belt pretensioners are standard. And for the first time ever in a Corvette, heated seats are available.

High-performance cup holders

The 2005 Corvette offers two cupholders designed to handle the car's high lateral acceleration capability. Adequate stability for lateral and fore/aft acceleration was a top priority to keep two travel cups or 20-oz. bottles in place during performance-driving maneuvers.

In addition to improved cup retention, the cupholders have a tambour (sectioned like a roll-top desk cover) door to close the holders when not in use. The door gives the center console and interior a neater, finished appearance, and allows the holder to serve as additional covered storage space when not being used to carry beverages.

Improved interior storage

With all of the stuff modern drivers carry in their busy commuting lives, the more interior storage they have, the happier they are. Corvette takes the problem head on with greatly increased storage capacity throughout the car's interior.

There is now room in the center console for a cell phone, a pair of sunglasses, and six traditional-size CD jewel cases. The lid is easier to open, has more durable hinges, and lock placement improves accessibility regardless of the driver's seat position. Both doors have storage pockets to carry video/DVD cases, and the glove box grows from 0.14 cubic feet to 0.16 cubic feet. The hinges are damped to allow the door to open slowly, an upscale touch befitting a premium automobile.

In the rear cargo area, the doors for the storage pockets are integrated into the floor for a cleaner, more organized look. The doors are hinged, too, so they stay open for ease of access and stay closed during spirited driving. Thanks to the extended mobility tires, the lack of a spare tire gives the storage area more room and a neater appearance.

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For Release: Jan. 1, 2004, 12:01 a.m.

2005 CORVETTE ENGINE: MOST STANDARD POWER EVER

DETROIT - GM today announced the new 2005 Corvette will feature the most powerful standard engine ever in Corvette history: the 400 horsepower, 6.0-liter, small-block V-8.

The new 6.0-liter LS2 is part of the fourth generation of GM's small-block engines. The small-block debuted in 1955 with 265 cubic inches and 195 horsepower. Since then, this legendary family of engines has been an integral component of Corvette's performance history.

"It's almost impossible to talk about Corvette without the small-block," said Dave Muscaro, GM Powertrain's assistant chief engineer of small-blocks for cars. "As Corvette has grown into a world-class sports car, the small-block has grown with it. The LS2 is a state-of-the-art engine that draws on a rich heritage of performance."

The LS2 also raises the bar for standard performance in the Corvette, delivering 400 horsepower at 6000 rpm and 400 lb.-ft. of torque at 4400 rpm – an increase of 50 horses and 40 lb.-ft. of torque over the previous Corvette's LS1 engine.

"More than dynamometer numbers, the LS2 engine's range of power and torque is broad and very usable in everyday driving," said Muscaro. "This engine is smoother, and more refined, but at the same time retains tire-thrashing output."

Design changes for the better

Compared to the Gen III-based LS1, the LS2 incorporates several significant changes that help improve performance, reliability and serviceability:

- All-new aluminum block casting incorporates provisions for external knock sensors and revised oil galleries; external sensors improve serviceability
- Cylinder bore diameter increased to 101.6 mm (4.00 inches), increasing displacement to 6.0 liters
- Camshaft lift increased to take advantage of increased cylinder head flow
- Camshaft sensor relocated from the rear of the block to the front of the block provides room for new oil galleries
- Flat-top piston design with lower ring tension reduces friction
- Piston floating wrist pins help quiet the engine
- Redesigned, "wingless" oil pan with cast baffling has reduced mass and provides superior oil control under high-performance driving maneuvers
- Revised exhaust manifolds are 33 percent lighter
- More efficient ignition coils require less energy to provide a comparable spark

- Compression raised to 10.9:1
- Larger, 90-mm single-blade throttle body
- Reduced-mass water pump design with improved sealing capability
- Engine “redline” raised to 6500 rpm
- Revised and more powerful engine controller incorporates all electronic throttle control functions.
- Mass has been reduced by 7 kilograms on the automatic version.

Cylinder heads for the LS2 are derived from designs used in previous Corvette Z06 models, including raised intake ports and an unshrouded-valve combustion chamber design that, when combined with the engine’s flat-top pistons, produces a more efficient swirl of the air/fuel mixture. This efficiency enables a higher 10.9:1 compression ratio, which increases fuel economy and horsepower.

Valves measure 2 inches for the intake and 1.55 inches for the exhaust. The valve springs also have been upgraded to withstand the engine’s increased power and rpm range.

The LS2’s new oil pan was developed to ensure oil delivery commensurate with Corvette’s high-performance capability. Extensive track testing has shown the new design to provide better oil control under the extreme demands of high-rpm/high g-force driving maneuvers. The elimination of the previous “gull wing” oil pan design also reduces the engine’s oil capacity from 6.5 quarts to 5.5 quarts with a dry filter.

Engineers also increased the efficiency and reduced the mass of the exhaust manifolds. Wall thickness of the manifolds is reduced from 4 mm to 3 mm, eliminating weight and helping enhance airflow by approximately 4 percent.

“We sweated the details to ensure the engine maintains a balance between performance and efficiency,” Muscaro said.

Several of the new features of the LS2 were incorporated as continuous improvements to later versions of the Gen III engine, including long-life, iridium-tip spark plugs; pistons with full floating wrist pins; a redesigned water pump that significantly reduces the probability of a leak; and a stronger, long-life timing chain.

Building on a proven foundation

The LS2’s Gen IV architectural roots lie in the proven LS1 5.7-liter Gen III V-8 that was standard in the Corvette C5. It was an engine that redefined performance and efficiency expectations of cam-in-block architecture.

Like the venerable small-block engine introduced in 1955, the modern small-block features a 90-degree cylinder bank arrangement and 4.40-inch bore centers – the distance between the center of one cylinder and the center of the next. The Gen IV builds upon the strengths of the Gen III small-block architecture, including:

Aluminum block with iron cylinder bore liners: The lightweight block is cast from 319-T5 aluminum with cast-in-place iron cylinder bore liners. A die-cast aluminum valley cover and upper deck rails tie together the cylinder banks, increasing torsional and bending stiffness.

Deep skirt block: Structural rigidity and operating smoothness is enhanced because the engine block extends below the crankshaft centerline.

Cross-bolted main caps: Two horizontal cross bolts for each main bearing cap complement four traditional vertical main cap bolts and contribute additional strength and smoothness to the engine's rotating assembly.

Gerotor oil pump: Simple and compact in design, the gerotor-style oil pump fits the shallow oil pan and offers superior pumping capability.

Balanced cylinder head design: Performance and efficiency is enhanced with identical airflow and energy direction for each cylinder.

Coil-near-plug ignition: A separate ignition coil pack and short spark plug wire for each cylinder maximize the efficiency of the delivered coil energy, enhancing fuel efficiency and power.

Electronic throttle control (ETC): Instead of a mechanical linkage between the gas pedal and engine throttle, an electronic throttle control system improves driveability and reduces overall system complexity by eliminating typical conventional mechanical items, such as the idle air control motor, cruise control module and throttle relaxer (traction control).

Because the LS2's new engine controller incorporates ETC commands, the separate ETC module used on the LS1 is no longer required. This allows faster communication of the controller to the throttle, as well as reducing the mass and complexity of the system. Additionally, emissions are slightly improved with the damping of unnecessary throttle movement.

Improvements to the engine's crankcase breathing and ventilation were made similar to the LS6 engine, including moving the crankcase ventilation system's PCV valve away from the rocker covers and into the block valley.

“The small-block V-8 is a powerful and continually refined package that stacks up with the best engines around the globe,” said Muscaro. “The Corvette is simply the best way to showcase its world-class traits.”

Exhaustive efforts

Advances in catalyst substrates made possible catalytic converters that are at the same time more effective and less restrictive for the LS2’s exhaust. The new converters are mounted closer to the exhaust manifold for quicker lightoff and reduced cold-start emissions. As a result, the more restrictive quad catalyst design of the LS1 – with its small, auxiliary “pup” converters – was not necessary to meet emissions requirements. An additional benefit of the exhaust system’s development was the elimination of the LS1’s air injection reaction system.

Subtle adjustments were made to the Corvette exhaust system itself to improve its performance. Sharp angles in the tubing have been replaced with more gradual bends. A larger muffler volume and tri-flow technology eliminated certain periods prone to unwanted noise, particularly between 1500 and 2400 rpm. An inline muffler that flows more efficiently replaces the laterally mounted muffler in the C5. These changes, coupled with one converter per exhaust bank, reduced backpressure in the system and contributed to the LS6’s 400 horsepower and 400 lb.-ft. of torque.

Changing gears

The 2005 Corvette continues to offer drivers thrilling driving dynamics, whether they prefer shifting or leaving it to the transmission. The Tremec T56 six-speed manual is standard and the Hydra-Matic 4L65-E four-speed automatic is optional.

Corvette engineers thoroughly revised the Tremec gear box and added proprietary technology not offered on other automakers’ high-performance transmissions. The six-speed transmission also has revised gearing when selected with the Z51 performance option. With the Z51, the Tremec is tailored with numerically higher gears to improve acceleration. Also, a lower fifth gear gives the Z51 better fuel efficiency and a higher top speed than base models. To increase durability in sustained high-speed situations, the Z51 and the base European manual-transmission models have a transmission cooler.

Smoother shifting six-speed

2005 Corvette drivers will find more pleasing, performance-oriented shifts with the six-speed transmission. They’re smoother and more precise, with shorter overall throws. The gear shift lever is now an inch shorter, and travel for all synchronizers is reduced by 10 percent. An all-new shift linkage and shift-rail bearings contribute to a more positive, confident feel. Computer Aided Gear Selection (CAGS) continues as a fuel-economy enhancement function for the manual transmission.

Durable 4L65-E delivers automatic performance

The available automatic transmission in the Corvette is the new Hydra-Matic 4L65-E four-speed. An upgraded version of the C5's 4L60-E, the "L65" is strengthened and revised to accommodate the LS2's 400 lb.-ft. of torque.

To beef up the internals, a five-pinion planetary gear set was added – replacing a four-pinion gear set. The extra gear reduces friction and loads carried by all the gears. The washers between the gear sets are made from Teflon, allowing optimal operation at high speed.

For protection from the high temperatures that are generated by high speed, a four-plate oil cooler has been added. When the transmission fluid reaches 127 degrees Celsius (approximately 260 F), the torque converter lock does not disengage, except briefly during shifts. This prevents fluid shear in the torque converter from adding heat to the transmission.

The 4L65-E uses a highly advanced electronic controller that has been specifically calibrated for Performance Algorithm Shifting. This technology automatically selects the optimal gear for a given driving condition, making it a willing accomplice for performance driving and hard cornering. The 4L65-E transmission shifts at higher rpm, compared to the C5's 4L60-E, to take advantage of the LS2's higher horsepower and rev range.

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For Release: Jan. 1, 2004, 12:01 a.m.

Preliminary Specifications

Overview	
Models:	2005 Chevrolet Corvette
Body style / driveline:	two-door hatchback coupe,rear-drive, front-engine
Construction:	composite body panels, hydroformed steel frame with aluminum & magnesium structural and chassis components
Manufacturing location:	Bowling Green, Kentucky
Engine	**6.0L LS2 V-8**
Displacement (liters/cu in/cc):	6.0 / 364 / 5970
Bore & stroke (in / mm):	4 x 3.62 / 101.6 x 92
Block material:	cast aluminum
Cylinder head material:	cast aluminum
Valvetrain:	OHV, 2 valves per cylinder
Fuel delivery:	SFI (sequential fuel injection)
Compression ratio:	10.9:1
Horsepower (hp / kw @ rpm):	400 / 298 @ 6000
Torque (lb-ft @ rpm):	400 @ 4400
Recommended fuel:	93 octane recommended, not required
Maximum engine speed (rpm):	6500
Estimated fuel economy (mpg city / hwy / combined):	19 / 28 / 23 (man) & 18 / 25 / 21 (auto)

Transmissions	**Hydra-Matic 4L65-E**	**Tremec T56 6-speed manual**	**Tremec T56 6-speed manual, w/ optional Z51 Sport Package**
Type:	four-speed automatic, with Performance Algorithm Shifting	6-speed manual	6-speed manual
Gear ratios (:1):			
First:	3.06	2.66	2.97

Second:	1.63	1.78	2.07
Third:	1.00	1.30	1.43
Fourth:	0.70	1.00	1.00
Fifth:	-	0.74	0.71
Sixth:	-	0.50	0.57
Reverse:	2.29	2.90	3.28
Final drive ratio:	std: 2.73; opt: 3.15	3.42	3.42
Chassis/Suspension			
Front:	short/long arm (SLA) double wishbone, cast aluminum upper & lower control arms, transverse-mounted composite leaf spring, monotube shock absorber		
Rear:	short/long arm (SLA) double wishbone, cast aluminum upper & lower control arms, transverse-mounted composite leaf spring, monotube shock absorber		
Traction control:	electronic traction control, active handling		
Steering type:	speed sensitive, magnetic power-assisted rack-and-pinion		
Steering ratio:	16.1:1		
Steering wheel turns, lock-to-lock:	tbd		
Turning circle, curb-to-curb (ft / m):	39 / 12		
Brakes			
Type:	power-assisted disc with ABS, front and rear		
Rotor diameter x thickness (in / mm):	front: 12.8 x 1.26 / 325 x 32; rear: 12.0 x 1 / 305 x 26 Z51 Performance Suspension: front: 13.4 x 1.26 / 340 x 32		

	rear: 13.0 x 1 / 330 x 26	
Wheels/Tires	**Std & Magnetic Selective Ride Control**	**Z51 Sport Package**
Wheel size:	front: 18 x 8.5; rear: 19 x 10	front: 18 x 8.5; rear: 19 x 10
Tires:	Goodyear Eagle F1 GS Extended Mobility front: P245/40ZR-18 rear: P285/35ZR-19	Goodyear Eagle F1 SC Extended Mobility Asymmetric Tread front: P245/40ZR-18 rear: P285/35ZR-19
Dimensions		
Exterior		
Wheelbase (in / mm):	105.7 / 2686	
Overall length (in / mm):	174.6 / 4435	
Overall width (in / mm):	72.6 / 1844	
Overall height (in / mm):	49.1/ 1246	
Track (in / mm):	front: 62.1 / 1577 rear: 60.7 / 1542	
Curb weight (lb / kg):	est. 3245 / 1470	
Weight distribution (% front / rear):	51 / 49	
Interior		
Seating capacity (front / rear):	2 / 0	
Interior Volume (cu ft / L)	52.1 / 1475	
Head room (in / mm):	37.9 / 962	
Leg room (in / mm):	43 / 1093	
Shoulder room	55.2 / 1403	

(in / mm):	
Hip room (in / mm):	53.7 / 1363
Capacities	
Cargo volume (hatchback area) (cu ft / L):	22.4 / 634
Fuel tank (gal / L):	18.0 / 68.1
Engine oil (qt / L):	5.5 / 5.2