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The monster has landed!

Z06

2006 CORVETTE

IF YOU like straight talk, here it is. The car seen on these pages, the 2006 Chevrolet Corvette Z06, represents the most audacious vehicle Chevrolet has ever produced for public sale. Its seven-liter LS7 V8 engine produces 500 hp, and it weighs 3,130 pounds for a weight-to-power ratio *19 percent* better than its '04 predecessor. It has an aluminum frame and other components made of magnesium, carbon fiber and titanium. Properly driven, the Z06 should sprint to 60 mph in first gear, and in under four seconds. It should corner at over 1.0 g with its immense Goodyear rubber gripping the tarmac. Its top speed is projected to be well over 190 mph — Chevrolet won't say exactly. The 2006 Z06 will cost somewhere between an '05 C6 coupe and a Dodge Viper. By a wholesome measure it is the most wicked Corvette in history and destined to redefine the sports car performance-for-money equation worldwide. GM projects that one in seven Corvettes rolling off the Bowling Green, Ky., assembly line starting in July will be Z06s — about 5,000 units a year — with dealers taking first deliveries in late summer 2005.

Better get in line now.

As indicated in the accompanying story on the new C6.R factory race car (see page 24), the '06 Z06 was designed in tandem with the C6.R, and built on the shoulders of the amazing C5-R. Except for a few minor engine, body and interior components that are shared with C6, the Z06 is a unique property that, remarkably, will be built alongside the C6.

There were several big drivers for developing the new Z06. One was to utilize lessons learned in the C5-R racing program, including engine development and aerodynamics. The next was the need to build an extreme-performance Corvette occupying a higher level than the current C6 Z51, which already has inched within a breath of the C5 Z06's capabilities. And third, GM wanted to answer the growing posse of supercars from Dodge, Ford, Ferrari, Porsche and Aston Martin. The Z06 will answer the challenge with comparable supercar performance, plus luggage capacity, easy servicing and touring capability, at a fraction of the cost.



The Z06 interior (left) features a 20-mm-smaller steering wheel with special trim. The car will be available with or without options such as XM Satellite Radio and a navigation system.

Huge 10-spoke aluminum wheels (top right) scarcely cover the enormous six-piston front brake calipers. Goodyear Eagle F1 Supercar EMT rubber is specially designed for Z06.

There will be no mistaking a Z06 in your mirror (right). The center air inlet feeds the radiator, while a longer nose and splitter add downforce.



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At seven liters (427 cu. in.) and 500 hp, the LS7 engine (left) is the biggest, strongest small-block in GM history. It features a titanium valvetrain and dry-sump lubrication to withstand severe use.

The tachometer's 7000-rpm redline (below) serves notice of the LS7 engine's purpose. Surrounding the center brake light, a small "wickerbill" measurably aids the Z06's high-speed stability (bottom).



7-Liter LS7 Engine

The engine is the soul of any machine. And in the Z06's case that soul has been sold to the devil, as the all-new 427-cu.-in. LS7 engine is literally a racing engine for the street. Hand-assembled in Wixom, Mich., it develops 500 hp at 6200 rpm and 475 lb.-ft. of torque at 4800 rpm. The biggest-ever small-block V8 features an aluminum block with iron cylinder liners for durability, and an open-web design to reduce pumping losses when the pistons travel downward. The crankshaft is forged steel and nestles in the block with six-bolt main bearings. Forged titanium connecting rods, valves and valve springs reduce reciprocating mass and allow a 7000 rpm redline, the highest ever in a GM street engine. The cylinder heads are direct descendents of the C5-R, and feature computer numerical control (CNC)-shaped ports that help the engine breathe in harmony with the camshaft's .591-inch lift — the highest of any GM street cam in history.

All LS7 engines will be assembled by hand at GM's new performance build center in Wixom. The build process includes align boring and deck-plate honing of the cylinders, a procedure normally associated with the building of racing engines. It is almost unheard of in a production-vehicle engine.

Enormous cornering potential of over 1.0 g required Corvette engineers to dramatically improve the oiling system's reliability and effectiveness. The result is an eight-quart dry-sump system. Instead of being carried in a deep "wet sump" under the engine, oil is now carried in an external tank located at the right rear corner of the engine bay. The system uses twin oil pumps driven off the nose of the crankshaft; one pump lifts oil from the bottom of the engine into the oil tank, and the other delivers it to the engine's bearing surfaces. As in the C6's LS2, the oil is synthetic Mobil 1. Changes are conducted at the tank and oil level is checked with a dipstick.

A huge 90-mm throttle body receives its air in a straight shot, further streamlined with a plug-in-style mass airflow sensor. The injectors are high-flow and the intake valve angle is a narrow 12 degrees for freer breathing, while polymer-coated 11.0:1 slipper pistons reduce mass and friction. Exhaust exits the heads into a pair of hydroformed shorty headers with collectors tuned to scavenge the combustion chambers with maximum efficiency. They pour directly into a pair of close-coupled catalytic converters that nestle right next to the engine for quick warm-up to meet EPA regulations. In another first, the '06 Z06 features a huge three-inch-



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diameter exhaust system that pours into high-volume, rear-mounted mufflers. Under normal driving conditions the mufflers route the exhaust through a series of perforated chambers. But when you stamp on the electronic throttle, a vacuum-operated "Pierburg" valve opens at about 3500 rpm to allow the exhaust to pour straight through each muffler, reducing back pressure. The engine's high compression ratio requires premium fuel but the Z06 is not expected to receive a gas-guzzler penalty. (In fact, initial engineering estimates project it will achieve 16 mpg in city driving and 25 mpg on the highway.) The Z06 sends power back through a high-capacity single-plate clutch and driveshaft to a strengthened and cooled Tremec T56 six-speed manual transmission. It uses standard C6 ratios but the countershaft is now one piece for durability. Meanwhile the limited-slip differential, carried in a big new cast-aluminum housing, features a larger ring gear and two additional clutch plates. The differential also has its own cooler, a

byproduct of a T1 racing kit developed for the C5 by GM SPO.

Hydroformed Aluminum Chassis

The Z06's hydroformed aluminum chassis is as unique as the LS7 engine. At about 200 pounds, the bare chassis is 125 pounds lighter than the C6's steel chassis. It is held together with self-piercing rivets common in aerospace engineering. The result is a light, strong structure. In an automotive first, the engine is carried by a new magnesium cradle that saves 13.2 pounds over a steel unit. There are a number of challenges in using magnesium in exterior structural positions, including corrosion, but solving them resulted in another low-mass victory for the Z06. Magnesium is also used for the roof panel, which is permanently fastened in place. Why a fixed roof? It was required to save mass in the car's aluminum frame, and the Corvette team anticipated that seekers of the "ultimate Corvette" will care more about raw performance

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Z06 designers chose the C6 coupe's fastback body design for its low aero drag. Body-side scoops and vents were perfected in a wind tunnel.

Z06



than open-air driving. Finally, the floors are a new-age sandwich of balsa and carbon fiber.

Suspension design comprises Corvette's familiar short/long-arm front and rear independent systems with monoleaf composite springs and Sachs monotube dampers, all of which are uniquely calibrated for maximum handling. There is proprietary suspension geometry for the Z06 as well.

Another Z06 first is the widest wheels and tires ever fitted to a Corvette. The wheels are ultra-light-weight spun-cast 18 x 9.5-inch-front and 19 x 12-inch-rear units, with huge Goodyear Supercar F1 tires, 275/35ZR-18 front and 325/35ZR-19 rear. Run-flat technology eliminates the need for a spare.

Providing monstrous braking capability for the fastest production Corvette ever was another critical engineering goal. The result is massive 14-inch-front and 13.4-inch-rear radially vented and cross-drilled rotors. The sheer enormity of the brakes was made possible by the weight savings in many

other areas of the car. Though chief engineer David Hill stressed constantly over keeping mass out of the car, the enormous brakes were one area where he agreed to the tradeoff. In front are big six-piston calipers with six individual brake pads — a first for a production car. The advantage of using individual pads is longer wear life (single pads tend to wear more rapidly at their leading edges, meaning that the entire brake pad has to be replaced when just the front is worn). Too, the individual pads allowed casting in a pair of strengthening bridges to reduce caliper flex. The rear four-piston calipers also use individual pads and feature a single strengthening bridge.

Corvette's miraculous Active Handling System is standard on the Z06. Comprising traction control, ABS and anti-spin technology, the system evolved dramatically through the C5 years and now provides one of the most comprehensive safety nets any driver could wish for.

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