

Edited by **Kevin Jost**

Chicago Auto Show highlights

The 99th running of the Chicago Auto Show saw several renamed and revised production vehicles, but new concepts were in short supply. Trucks and cross-overs dominated portions of the press preview schedule, but all-new and next-generation cars also took stage spins.



2008 Pontiac G8



2008 Saturn Astra



"Only four in 10 people are aware that there's a car called the Ford Five Hundred," said Mark Fields, President of the Americas for Ford Motor Co. In 2008, the Ford Five Hundred becomes the Ford Taurus.

Pontiac unveiled a new model. "The G8 is the latest example of our revamped global product development in action," Bob Lutz, **General Motors'** Vice Chairman for Global Product Development, said about Pontiac's first rear-wheel-drive sedan in more than 20 years.

Holden, GM's Australian subsidiary, developed the new global rear-wheel-drive (RWD) architecture and made the Holden Commodore the first application with the car's Australian launch in July 2006.

The 2008 Pontiac will be sold in two models: G8 and G8 GT. Standard features will include four-wheel independent suspension, four-wheel disc brakes with ABS and traction control, 18-in aluminum wheels (19-in wheels available with sport package), and roof rail side-impact airbags for both front and rear occupants.

G8's base model will be powered by a 3.6-L V6 that produces 261 hp (195 kW) at 6300 rpm and 250 lb-ft (339 N·m) of torque at 3200 rpm. The G8 GT will employ a 6.0-L V8 that produces 362 hp (270 kW) at 5700 rpm and 391 lb-ft (530 N·m) of torque at 4400 rpm. The Hydra-Matic 5L40 five-speed automatic, Hydra-Matic 6L80 six-speed automatic, and the TR6060 six-speed manual transmissions are offered.

Global market needs influenced the midsize sedan's engineering. For example, "The fuel system is forward of the rear-wheel center line. If it was rearward of the center line, we would have had to relocate it because of FMVSS 301 standards," said Douglas Houlihan, Global Vehicle Chief Engineer for Global RWD Vehicles at GM Holden.

Advance planning is key to the global development mind-set. "We don't want re-engineering or new tooling roadblocks as that would hinder us from bringing a vehicle to another market," said Gene Stefanyszyn, Global Vehicle Line Executive for Global RWD Vehicles at GM Holden. The production versions of the next-generation **Chevrolet** Camaro coupe and convertible will share the G8's

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2008 Ford Taurus X



2008 Dodge Dakota

base rear-wheel-drive architecture.

GM sold more than 500,000 units of the **Opel** Astra last year in Europe, and that same vehicle—with minor modifications—comes to North America as the 2008 **Saturn** Astra in three- and five-door models. The standard powertrain setup for all models is the 1.8-L Ecotec DOHC four-cylinder engine (140 hp [104 kW] at 6300 rpm and 126 lb-ft [171 N·m] of torque at 3800 rpm) and a five-speed manual transmission.

Astra's unitized body structure puts a safety cage around the passenger compartment. Safety features on the vehicle include active head restraints, collapsible pedals, and six standard airbags. The five-door Astra has standard 16-in wheels, while the three-door has standard 17-in aluminum wheels.

Compared to its European counterpart, the Saturn Astra has different crash-management attributes. "We've added energy-absorbing materials—such as foam and plastic cone-shaped inserts—in the upper greenhouse area, which is basi-

cally above the car's beltline. Those changes were done in order to meet the FMVSS 201u head-impact requirements for the U.S.," said Al Manzor, Program Engineering Manager for the Saturn Astra. The vehicle's front and rear fascias were modified with additional energy-absorbing foam and revised bumper beams to meet U.S. 5-mph bumper requirements.

Saturn Astra also needed emissions revisions to meet North American requirements. "We've added dual catalytic converters in the exhaust system and an evaporative canister to the fuel system," said Manzor. Engine calibration changes were made to manage emissions as well as the exhaust and fuel systems.

Three vehicles from the **Ford** lineup will be renamed in the 2008 model year. The Ford Five Hundred becomes the Ford Taurus, the **Mercury** Montego becomes the Mercury Sable, and the Ford Freestyle becomes the Taurus X.

In addition to the name changes, the Taurus and Sable sedans and Taurus X crossover will employ a different engine than the 3.0-L V6 used in 2007. By using the 3.5-L V6 (the same engine powers the 2007 Ford Edge and **Lincoln** MKX) horsepower increases 30%.

For 2008 all-wheel-drive models, the engine will be mated to an all-new six-speed automatic transmission versus the **ZF-Batavia** supplied continuously variable transmission (CVT) in current vehicles. The current **Aisin**-supplied six-speed transmission also will be replaced by the new automatic transmission.

"The real-world fuel economy benefits are about the same between a six-speed and a CVT. And because we make the new six-speed automatic transmission that gives us the opportunity to share the

power pack—the engine and transmission—across multiple vehicle programs and platforms," said Ben Winter, Chief Nameplate Engineer for the 2008 Taurus, Taurus X, and Sable.

NVH improvements will make the three 2008 vehicles quieter. "The articulation index at 70 mph has improved by five percentage points," said Winter, adding "that will make it easier to have an in-car conversation or use Sync voice communications."

Sound insulation will be added to the 2008 vehicles in the floor, roof, dash panel, and A-, B-, and C-pillars. In addition, the engine mounting system goes from a cradle mount to a pendulum mount in 2008. "The engine mounts to the front body rails as opposed to the subframe," said Winter.

The vehicles also will have a stiffer body structure on the rear floor under the spare tire and behind the rear seat where the package tray attaches to the body side. Those changes will result in increased torsional rigidity as well as a lessening of road noise. Wind-noise improvements will occur because of smaller, more aerodynamic side mirrors as well as other sound package modifications.

The restyled 2008 **Dodge** Dakota features a revamped 4.7-L V8 engine that elicits more horsepower, increased torque, and better fuel economy. "Over 30% of the parts are new or significantly modified from the 2007 engine, including cylinder heads, cams, pistons, connecting rods, intake and exhaust manifolds, valvetrain, fuel system, the addition of two spark plugs [per cylinder] and electronic throttle control," noted Joe Guertin, Director of V8 Engines for the **Chrysler** Group.

Using new and revised parts contributed to the engine now achieving 290 hp (216 kW) (a 25% increase) and 320 lb-ft (434 N·m) of torque (a 10% increase). The 2008 engine employs a slant/squish combustion chamber design vs. the previous "more conventional flat squish combustion chamber design with a flat-top piston," noted Guertin.

The new design "improves the combustion efficiency by directing the air/fuel mixture towards the center of the combustion chamber when the piston is at the top of stroke. This also improves engine knock tolerance, especially in the peak torque speed range," according to Guertin.

A lighter weight piston/rod assembly

resulted from a change in materials. "The mass reductions achieved were a result of a forged steel connecting rod, instead of powder metal, and optimized design of both the piston and connecting rod," Guertin noted.

Dakota's revised V8 engine also benefits from an altered cylinder head port flow. "The port flow was improved by increasing size and shape of the cylinder head ports using analytical flow modeling tools. Valve diameter and lift were also increased. The intake and exhaust manifold also needed to be improved in order

to take full advantage of the cylinder head port flow improvements," noted Guertin.

Compared to the 2007 engine, the new engine's brake specific fuel consumption (BSFC) was improved by 4%. "In the new Dodge Dakota, the new 4.7L V8 gets up to 6% improvement in fuel economy. Additional fuel-economy improvement was realized through integration of this engine to the vehicle," according to Guertin. The engine's low-end torque allowed for a more efficient torque converter lock-up strategy and



2008 Nissan Pathfinder



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2008 Toyota Highlander and hybrid powertrain

transmission shift schedules.

The new Magnum V8 is E85 compatible. Standard engine for the Dakota is a 3.7-L Magnum V6. Both engines come with an optional remote starter. The carryover transmissions are a six-speed manual, a four-speed automatic, and a five-speed automatic.

From a styling perspective, the Dakota gets a new front end—hood, fenders, headlamps, grille, and fascia—as well as the addition of a cargo box utility rail system and a tailgate spoiler. In the interior, the alterations include a new instrument panel (IP), center console, and under-seat storage boxes. “It’s a collapsible storage system. You can fold up the sides of the two boxes, and then each box can be removed from the vehicle by depressing a lever,” said Bob Feldmaier, Chief Engineer for the 2008 midsize Dakota pickup truck. Each thermoplastic box matches the length of the split-folding rear bench seat.

The storage containers are accessible once the rear seat bottoms are folded against the seatback. “This storage system is something that nobody else has. We came up with the idea, and a supplier [China-based **Vikeda**] makes the part for us,” said Feldmaier.

Nissan’s Armada SUV and the Titan full-size pickup truck will have unique IPs for 2008. “When Armada first launched, it shared the IP with the Titan. Now, there are distinct differences between the two,” said Randy Dale, Senior Manager of SUV Product Line for Nissan. **Visteon** remains the IP supplier for both Armada and Titan.

The Armada further tweaked the interior presentation with additions such as new door panels and a power-operated fold down/up third-row seat. Redesigned

front and rear fascias, a one-piece roof-rack design (vs. the 2007 two-piece design), and front-of-vehicle parking sonar are among the exterior alterations.

Titan’s short wheelbase is no longer the only option. “We kept the same cabs, King and Crew, but we added two new beds—7- and 8-ft—and as a result, there’s a long wheelbase for the King and the Crew cabs with those new beds,” said Richard Miller, Regional Product Manager—Truck for Nissan.

The Titan also gains NVH enhancements via an engine side dash insulator, a cowl insulator, additional engine cover insulation, an increase in dash insulation, improved sealing of the dash/cowl sheet metal, as well as improved sealing of the HVAC and steering column pass-through.

The same Endurance 5.6-L V8 that powers the Titan and the Armada is now available for the Pathfinder SUV, but the newest V8 application will not match Titan’s 317 hp (236 kW). “Because we’re packaging the V8 into a smaller vehicle, there’s a more restricted exhaust system and that means a slight decline in horsepower,” said Ken Kcomt, Director of Truck/SUV/Light Commercial Vehicle Planning for Nissan. The 2008 Pathfinder’s five-speed automatic transmission adds a manual mode.

Don Esmond, **Toyota** Motor Sales Senior Vice President of Automotive Operations, took advantage of the Chicago International Auto Show in February to premiere details about Toyota’s 2008 Highlander and Highlander Hybrid, just about a year after unveiling the all-new 2007 Tundra in the same venue.

The all-new platform was derived from the current Camry and Avalon, and in its redesign the SUV ended up almost 4 in (102 mm) longer and 3 in (76 mm) wider

than its predecessor. It also increased about 1 in (25 mm) in ground clearance and 3 in (76 mm) in wheelbase. According to Esmond, “Engineers took advantage of Highlander’s substantial dimensions by increasing total interior volume by nearly 12 ft³.”

Part of that space is taken up by second-row captain’s chairs that can be converted to a bench seat for three passengers. Until needed, the folding seat is hidden in a compartment under the front center console. In place of the folding seat, a center stow console can be snapped into place or the area could be left open as a path to the third row, which features foldable headrests for a flat rear cargo area.

Increased vehicle dimensions contributed to a gain of 500 lb (227 kg), as did numerous structural changes made for safety such as reinforcing the shell of the passenger department and crossmembers with high-strength steel. The structural configuration of the hood and the fenders were also redesigned to crumple on impact with a pedestrian or in a collision. On the underside of the hood, a honeycomb structure replaces the slats and ribs that used to appear.

Base, Sport, and Limited models will be available in July, with each featuring a 3.5-L V6 that at 270 hp (201 kW) offers a 55-hp (41-kW) gain over the 3.3 L in the current generation. That 3.5-L engine is currently also used on the Camry, Avalon, and Rav4. Part of the 2GR engine family, it features a bore and stroke of 94 x 83 mm (3.7 x 3.3 in) and offers 249 lb-ft (338 N-m).

“It is much more fuel efficient than the 3.3-L, even though it is larger and more powerful,” said Mark Amstock, National Product Marketing Manager, SUVs/Vans.



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2008 Scion xB and xD

The Hybrid is expected to arrive two months later and be offered as Base and Limited models. It will continue to be equipped with the 3.3-L V6, which Amstock says engineers tweaked to increase the output to 270 hp (201 kW) while still maintaining its 31 city/27 highway fuel economy. While both the 2008 Highlander and Highlander Hybrid will offer nearly the same power output, fuel-economy results on the non-hybrid Highlander were not available at press time.

"Executive Chief Engineer Okane made a lot of electronic refinements to the hybrid system to eke out a few more miles per gallon on the hybrid," said Amstock. "We have an EV mode and an ECON mode."

EV mode involves the operator pressing a button to put the vehicle under battery-electric power only. The vehicle will stay in that mode depending how heavy the gas is applied, as well as the state of charge of the battery. Top speed in that mode is about 25 mph (40 km/h). When the battery is depleted or the driver gets too aggressive with the gas pedal, the system will automatically kick the gasoline engine in and the vehicle out of EV mode. There is no need for the operator to switch back into the hybrid system.

Situations where EV mode can be useful include entering or leaving one's garage either very early or very late without waking anyone, driving past a hospital zone or through a quiet neighborhood, or simply being consciously fuel efficient.

ECON mode also involves pressing a button. In that mode, the system will search out the CVT to find the best fuel efficiency and will stretch out a transmission shift point for power. In this case, the hybrid intuitively modulates the amount of throttle the vehicle gets, according to Amstock. On the ECON gauge itself, bar guides appear that prod the

driver to stay within the set of bars for optimum fuel efficiency. As speed increases, the bars shift up, enabling the driver to maintain optimum fuel efficiency. Both ECON and EV are new to the 2008 Highlander, though have already appeared on the Camry hybrid.

Toyota sold 170,000 hybrid vehicles in 2006, of which the Highlander accounted for more than 31,000. Those figures make it the second best-selling hybrid in the U.S., after the Prius, according to Toyota. The company expects Toyota/Lexus hybrid sales to exceed 250,000 in 2007.

Referred to by Mark Templin, Vice President, **Scion**, as "the spiritual icon for the Scion brand," the xB will be experiencing a rebirth for the 2008 MY. And Templin meant only good things when he described the vehicle at the Chicago Auto Show as a "more powerful and more sinister second-generation Scion."

First introduced in early 2003 for the 2004 MY, the second-generation xB incorporates design elements first shown on the t2B concept at the 2005 New York International Auto Show. Exterior styling includes soft angles between its wide and flat paneling, wrap-around headlights, inset taillights, a rectangular grille, and a single rear backup light on the left bumper. The xB, described by Scion as an "urban utility vehicle," also features tinted rear windows and turn signals integrated into the side mirrors.

Like many of the next-generation Toyota models, the overall size of the vehicle was enlarged, according to Scion, "to create a more exciting driving experience." Engineers increased the wheelbase by 4 in (102 mm), the overall length by a not-insignificant 12 in (305 mm), the overall width by almost 3 in (76 mm), and decreased overall height more than 1 in (25 mm).

"We've stated in the past that we'll

probably always have a box in the Scion lineup, but our owners told us they wanted a bigger box," said Templin.

An increase in power will help propel the larger xB, which will be equipped with the same 2.4-L dual overhead-cam four-cylinder engine that powers the current tC. The VVT-i (Variable Valve Timing with intelligence) engine produces 158 hp (118 kW), 55 hp (41 kW) more than the engine it replaces. The xB will also stop with larger brakes due to 10.8-in (275-mm) ventilated discs in the front and 10.98-in (279-mm) disc brakes in the rear that are more than 2 in (51 mm) bigger than the previous generation.

Customers will have a choice of either a five-speed manual transmission or a four-speed automatic with sequential shifting, a first for automatic four-speeds in the Scion or Toyota line-up. Being mono spec, the only other decisions left to the customer is exterior color and the choice of three all-new standard wheel covers, which will also be shared with the all-new five-door xD, unveiled at the Chicago show as the replacement for the xA. Production stopped on both the xA and first-generation xB in December, with the xB scheduled to arrive in showrooms this month and xA in August.

Standard features on both vehicles include power steering, windows, door locks, and mirrors; remote keyless entry; air conditioning; four-wheel antilock brakes with Electronic Brake Distribution and Brake Assist; and Vehicle Stability Control with Traction Control, with the latter two being factory options on the xD.

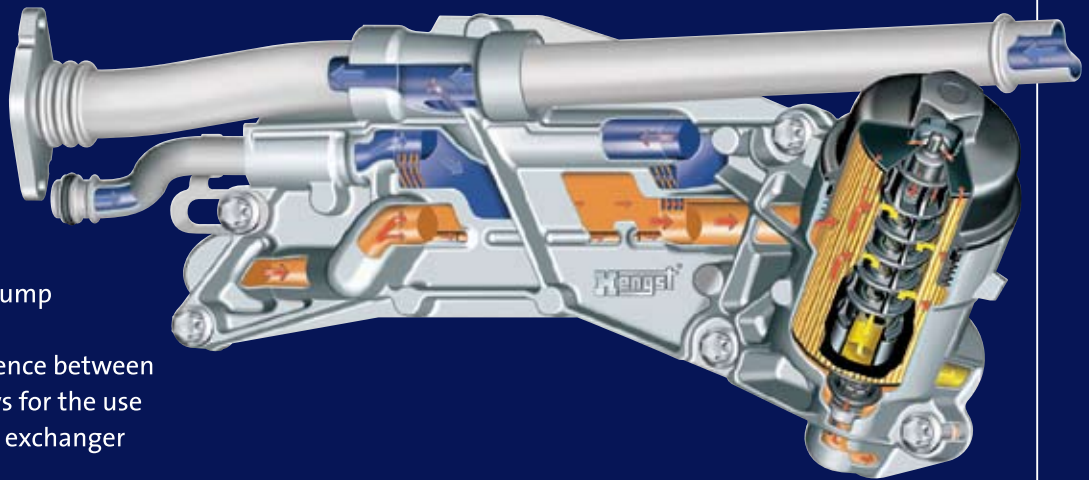
Both the five-speed manual or four-speed automatic transmissions are available on the xD to be mated with a 2ZR-FE 1.8-L VVT-i engine. The 128-hp (95-kW), four-cylinder engine features a roller rocker system and lightweight pistons.

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