



*Do you hear what I hear? General Motors development engineer Frank Delekta applies his acute sense of hearing to help deliver segment-leading interior quietness to the Chevrolet Cruze.*

## Chrysler Models Named IIHS's Top Safety Picks

AUBURN HILLS – Chrysler is turning up the volume on the safety front, one might say.

That's because the Insurance Institute for Highway Safety (IIHS) has named 11 models from Chrysler Group LLC as Top Safety Picks for 2012.

The 2012 models include the Chrysler Town & Country 300 and 200; Dodge Grand Caravan, Durango, Charger, Journey and Avenger; Jeep Grand Cherokee and Patriot, and the Fiat 500.

The IIHS annually recognizes vehicles that do the best job of protecting people in front, side, rollover and rear crashes based on a "good" rating in a series of tests conducted by the Institute.

Additionally, the vehicles must be equipped with standard electronic stability control systems.

Following their introduction last year, both the Chrysler 300 and Dodge Charger return again after achieving the highest ratings. Both models received 'good' ratings in all four categories.

Also returning to the list are the Jeep Grand Cherokee, Dodge Durango and Chrysler 200. The three models were introduced last year and received top marks from the In-

## Highly Efficient Vehicles Will Make Up Half By Year 2040

NEW YORK – Exxon Mobil Corp. expects to see more and more hybrids on the world's roads, with gas-sipping models making up half of all vehicles by 2040.

The largest publicly traded oil and gas company last week released its annual energy outlook. It says the use of hybrids – vehicles that rely on both gas and electricity for power – and other gains in fuel efficiency will keep energy demand in check in the U.S. and other major industrialized countries for years.

Exxon predicts that energy demand will remain flat through 2040 in developed nations.

However, Exxon also says that China and other developing nations will continue to increase their thirst for oil and other petroleum-based fuels. Energy demand within developing nations is expected to rise nearly 60 percent from 2010 to 2040.

Overall, gains in efficiency will cut fuel consumption and help the global economy. Exxon predicts that from now to 2040, world GDP will grow an average of 2.9 percent per year, while energy demand will grow by only 0.9 percent.

Exxon's projections show the world having enough natural gas to last 250 years at current consumption levels.

stitute, too. Dodge Avenger and Journey have been named Top Safety Picks by IIHS for four consecutive years.

Recently, the 2012 Chrysler Town & Country and Dodge Grand Caravan, along with the 2012 Fiat 500, were named Top Safety Picks. Both minivans are sales leaders, too.

The 2012 models of Town & Country and Grand Caravan received strength-to-weight ratio ratings of 4.51, among the highest of the minivans tested and above the IIHS requirement of

The Fiat 500 features a comprehensive list of safety features, including seven air bags.

Among the latest safety in-

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## Engineers Lend Their Ears to Car Acoustics

DETROIT – As an avid sport fisherman, General Motors development engineer Frank Delekta enjoys the peace, quiet and tranquility of Michigan lakes and streams.

His sense for silence – and the use of advanced technology – served him and his team well in their mission to bring luxury-like interior quietness to the Chevrolet Cruze.

The engineering team used a number of noise-reducing and noise-canceling technologies on the Cruze body structure, including 30 distinct acoustical treatments.

For example, the acoustic package on the Cruze is a Liquid Applied Sound Deadener applied strategically throughout the body structure and melted into place when the body passes through the paint oven.

The doors have triple seals and feature fiberglass "blankets" that serve as water, airflow and noise barriers. They close with a solid, precise sound and no resonance.

Before devising these solutions and many more, engineers performed intensive testing throughout the vehicle's development.

Delekta and his colleagues have significantly sharpened their hearing skills because of their years of experience working in GM's Squeak and Rattle Lab at the Milford (Mich.) Proving Ground.

"I have a pretty acute sense of hearing," said Delekta. "Outside of work, if I ask someone, 'Did you hear that?' the answer is almost always 'No.' I hear noises that others don't."

Delekta's team leveraged Chevrolet's design and engi-

neering talent in North America, Asia and Europe, all regions where the Cruze is sold.

Engineers reported on noises they heard while driving across a variety of real-world roads at various speeds. The team replicated those conditions in the lab to find the source of the noise.

Among the tools was a state-of-the-art environmental four-post simulator that mimics the world's most-challenging road surfaces.

This intense testing allowed engineers to adjust for interior compartment noise early in the vehicle development process.

The team didn't just beat up the Cruze at room temperature. Test vehicles were put into a climatic anechoic chamber to evaluate the sounds that can emerge at extreme temperatures – from

minus 20 to 120 degrees Fahrenheit in the same day, which is an impressive range.

"A component may squeak or rattle at 100 degrees but not below freezing or vice versa," said Delekta. The brutal road and lab testing led to improvements in 74 components, resulting in a quieter ride.

One of these was traced to the audio system itself. A nasty rattle from the rear deck lid was traced to bigger speakers capable of pumping out more volume for decibel-hungry North Americans.

Engineers used an attachment clip to stabilize the panel that houses the rear deck lid speakers, eliminating the sound.

The clip also allows for better audio fidelity through Cruze's optional Pioneer premium speaker system.

## Cadillac ATS to Intro New Turbo 4-Cylinder in U.S.

DETROIT – You know it's got to be a whole new era for GM and Cadillac when Caddy starts bragging about how good its pending four-cylinder engine is.

Cadillac, after all, was an 8-cylinder engine champion for most of the 20th century. But my, how times have changed here in the 21st century.

That's because a new high-performance 2.0L turbocharged four-cylinder engine will debut in the all-new 2013 Cadillac ATS compact luxury sedan, which will be revealed at the 2012 North American International Auto Show in January.

The Cadillac-tuned, direct-

injected engine will produce an estimated 270 horsepower (201 kW). At 135 horsepower per liter, it will be one of the most power-dense automotive engines.

"This engine is the perfect match for the new ATS, which will be a refined performance luxury sedan," said Don Butler, Cadillac vice president of Global Marketing.

"The 2.0T has an exceptionally smooth and responsive power curve that will make the ATS nimble, quick and fun to drive."

The new 2.0T highlights a broad engine lineup that will power the ATS, which is slated to begin production next

summer. Cadillac will also offer a normally aspirated 2.5L four-cylinder engine and a 3.6L V6 engine in the ATS.

The 2.0T builds on the advanced-technology heritage of previous GM turbo engines with features that enhance efficiency, durability and refinement.

Among the 2.0T engine's highlights: a direct-injection twin-cam, four-valve-per-cylinder engine with continuously variable valve timing; twin-scroll turbocharger with air-to-air intercooler; forged-steel crankshaft with modular balance shaft system; and a

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*The direct injected 2.0L turbocharged four-cylinder engine, with an estimated 270 horsepower, will be among the powertrain options available in the all-new 2013 Cadillac ATS compact luxury sedan.*

## GM China Tech Center Phase 2 Reported On Target

SHANGHAI – The second phase of the General Motors China Advanced Technical Center, the most-comprehensive advanced automotive technology development center in China, remains on track to open in the second half of 2012.

Adjacent to the GM China International Operations and GM China Headquarters in Shanghai, the second phase of the two-phase ATC will focus on advanced design, vehicle engineering, advanced powertrain development, urban mobility and manufacturing processes.

Construction began in late summer and is about one-fourth complete.

It will complement the first phase of the ATC, the Advanced Materials Laboratory, which opened in September and is engaged in research and development of battery cells and lightweight materials.

GM China's new battery testing facility is fully operational, with commissioning and correlation tests finished. The lab has been carrying out testing of different submissions from selected Chinese battery suppliers.

Completion of testing is targeted for the first quarter of next year, after which the submissions will be put through GM's rigorous global battery qualification process.

"The establishment of the ATC is proof of GM's commitment to advanced technology leadership," said GM China Group President and Managing Director Kevin Wale.

"Our local team is cooperating with GM teams around the globe to come up with solutions for sustainable development that will benefit China and the world."

The 65,000-square-meter ATC will serve as the home of four key GM technical and design organizations: the China Science Lab, Vehicle Engineering Lab, Advanced Powertrain Engineering Lab and Advanced Design Center.

When complete, it will include 62 test labs and nine research labs, and have more than 300 employees, including engineers, designers, researchers and technicians.

In November, the ATC hosted the first GM Global Research and Development Symposium.

Sixteen world-leading experts from academic institutions, industry and government organizations presented their cutting-edge research findings.

The activity attracted more than 150 professors, researchers, engineers and graduate students, as well as representatives from GM's joint ventures and suppliers.

General Motors traces its roots back to 1908. GM has 11 joint ventures, two wholly owned foreign enterprises and more than 35,000 employees in China.



*GM China Group President and Managing Director Kevin Wale (right), Manufacturing Engineer Michael Mayra (center) and Engineer Xu Chengqi (left) inspect progress on the second phase.*



*The second phase of GM's China Advanced Technical Center (ATC), the most comprehensive advanced automotive technology development center in China, is on track to open in the second half of 2012.*