Tech Center News

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2020 CT4 Has Rear Wheel Drive Performance

The Cadillac brand is going worldwide.

Cadillac has taken the next step in the realignment of its sedan portfolio with the global introduction of the first-ever CT4 sport sedan, said Cadillac spokesman Stefan Cross.

The car was first revealed to customers through a social media campaign that virtually puts viewers in the driver's seat simulating the car's liberating drive experience, Cross said. The 2020 CT4 is poised to appeal to a new generation of sport-luxury customers.

Driven by an all-turbocharged propulsion portfolio and leveraging Cadillac's award-winning rear-wheel-drive architecture (AWD available on every model), the CT4 delivers a driving experience unmatched by frontdrive competitors, Cross said. It also incorporates the latest Cadillac technologies, including available Super Cruise1 (available in calendar year 2020), the world's first true handsfree driver assistance feature for more than 200,000 miles of compatible highways in the U.S. and Canada.

The CT4's profile is designed to leverage the natural, long dash-to-front-axle proportional advantage of the rear-drive wide stance, expresses presence, confidence and performance

"We developed CT4 to appeal to youthful buyers in the luxury market who may be new to the Cadillac brand," said Andrew Smith, executive director of global Cadillac design. "The vehicle was intended to draw attention, using a combination of great proportions, taught surfacing and Cadillac family details that hint at the athletic driving experience this vehicle offers.

The new CT4 is built on Cadillac's award-winning RWD sedan architecture. Exceptional balance from near-perfect weight distribution contributes to one of the segment's nimblest, most responsive driving experiences. Enhancements of the front and rear suspension systems, including Cadillac's signature double-pivot MacPherson-type front suspension (with dual lower

ball joints), are designed to improve road isolation and driver feedback.

"Cadillac is dedicated to building the most exhilarating sportluxury sedans," said Rob Kotarak, Cadillac chief engineer. "Every element of the CT4 is designed to bring innovative technologies right to the driver, providing discerning driving dynamics with cutting edge precision."

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platform and, along with its The 2020 Cadillac CT4 Sport edition has rear-wheel drive, which gives it a crisper turning performance.

GM, U-M Studying How New Auto Tech Changes Driving

New automotive technologies will change the way people use transportation. The big question is how?

As General Motors moves toward its vision of a world with zero crashes, the company partnered with the University of Michigan Transportation Research Institute (UMTRI) to understand the real-world effectiveness of some of its available active safety, driver assistance, and advanced headlighting features that may prevent or mitigate different types of crashes, said GM spokeswoman Gina Peera.

The results show that several of these features are making a statistically significant impact in helping to reduce automobile crashes.

The study leveraged 3.7 million GM vehicles across 20 different models from 2013-2017, Peera

port crash databases available to UMTRI from 10 states.

After comparing the crash instances involving vehicles with and without active safety features, the study showed that certain features evaluated had an impact in preventing the types of crashes the features were designed to help prevent or mitigate.

Significant findings from the joint study between GM and the University of Michigan include Automatic Emergency Braking (or Forward Automatic Braking) with Forward Collision Alert reduced rear-end striking crashes by 46 percent.

Lane Keep Assist with Lane Departure Warning reduced lane departure-related crashes by 20 percent.

Lane Change Alert with Side Blind Zone Alert reduced lane said. Fifteen different systems change crashes by 26 percent. Rear Vision Camera alone, Rear

Park Assist functionality, Rear that cause a staggering amount Cross Traffic Alert (which nearly always includes the two previous backing features) and Reverse Automatic Braking (which includes all the previous backing features) produced, respectively, an estimated 21 percent, 38 percent, 52 percent, and 81 percent reduction in backing crashes.

IntelliBeam and High-Intensity Discharge headlight features provided 35 percent and 21 percent reductions, respectively, in nighttime pedestrian/bicyclist/animal crashes, with a 49 percent reduction when offered together.

This study is groundbreaking in terms of the broad range of vehicles and active safety and headlighting features examined," said GM Safety Technical Fellow, Raymond Kiefer.

"The results show that the General Motors active safety systems evaluated are addressing a wide range of common crashes

of injuries, property damage and cost to our customers and society, putting General Motors well on its way toward a vision of zero crashes.

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Raymond Kiefer

General Motors Wants Many Points of View

by Jim Stickford

Making a great car is as much an art as a science, which is why GM's General Mobility Advancement Cultural Committee recently hosted an event for Wayne State students of a variety of different disciplines at the Tech Center in Warren.

Orlando Hodges, a senior advisor for OnStar Technical, said the mobility committee latest meeting was held during the summer and had 15 Wayne State students in attendance.

We are shooting to held these Mobility Committee meetings on a quarterly basis," Hodges said. "We want to educate students on how mobility systems and technology take form and what positions at GM are available.'

Hodges said the Mobility Committee consists different people at GM, including Anna Saadatjoo of Vehicle Manufacturing Intellectual Property, and Matt Mackay of GM Governance and Risk Leadership.

The meeting – "GMobility: Where I End Up Matters" was about presenting the visiting students with information on how the idea of mobility has changed

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VW EV Tech Cost Billions, Will **Public Buy?**

by DAVID McHUGH **ÅP** Business Writer

FRANKFURT, Germany (AP) -Volkswagen is rolling out what it bills as the breakthrough electric car for the masses, the leading edge of a wave of new batterypowered vehicles about to hit the European auto market. The cars are the result of massive investments in battery technology and new factories driven by environmental regulation and concerns about global warming.

But it's not at all clear whether consumers are ready to buy them.

Electric cars remain a niche product with less than 2 percent of the market due to higher prices and worries about a lack of places to charge. It adds up to a risky undertaking for the companies. "The industry has spent billions developing its new generation of electric vehicles," wrote analyst Max Warburton at research firm Bernstein. "Clean sheet designs with dedicated platforms...have been engineered at great cost. Battery pack assembly plants have been built. Huge cell supply contracts with Asian suppliers have been signed." "But this money is being spent without convincing evidence that customers are waiting for these cars." Volkswagen is betting that the ID.3, with a roomy interior, brisk acceleration and battery range of up to 550 kilometers (340 miles) for the top model, will

were evaluated using police re-



It's free admission on Sept. 21 at the Michigan Science Center.

FCA Helping Science Center Educate Today's Children

one of the greatest gifts of all.

To that end, the FCA Foundation, the charitable foundation of Fiat Chrysler Automobiles, will sponsor free general admission to the Michigan Science Center (MiSci) Saturday, Sept. 21 in recognition of Smithsonian Museum Day, an annual celebration of boundless curiosity hosted by museums across America, said FCA spokesman Kevin Frazier.

"We are proud to provide the community with access to this important educational resource,' said Shane Karr, head of External

As the saying goes, knowledge is Affairs, FCA – North America and President, FCA Foundation. "The FCA Foundation recognizes its responsibility to the greater community around us and believes that education, particularly in the fields of science, technology, engineering and math (STEM), and developing the workforce of tomorrow are essential to building strong and sustainable communities."

> Free general admission from 10 a.m. to 5 p.m. includes access to 250+ hands-on exhibits, live

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FCA Helps Local Science Center Teach Children

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shows, Spark!Lab from the Smithsonian, Kids Town, STEM Playground, Space gallery and more, Frazier said. Guests may also enjoy Global Soundscapes: Mission to Record the Earth. an ear-opening interactive film exploring the science of sound ecology from the dramatic soundscapes of Costa Rica's rainforests to Hawaii's coral reefs and Mongolia's vast grasslands.

"Smithsonian Museum Day is all about empowering and advancing the hopes and ambitions of those in our community, particularly school-age children and those in underrepresented communities. Such days are made possible through generous supporters like the FCA Foundation," said MiSci president and CEO Christian Greer. "At MiSci, our mission is to inspire curious minds of all ages and Museum Day is an opportunity to do just that.'

The Michigan Science Center (MiSci) inspires nearly 300,000 curious minds of all ages every year through STEM (science, technology, engineering, and math) discovery, innovation and interactive education in Detroit and across the state of Michigan, Frazier said.

As the STEM hub of the state, MiSci focuses on developing and introducing expanded education programs, exhibits, and initiatives that empower and enrich all children and all communities with STEM. Through our Traveling Science Program and distance learning initiative, ECHO, we are expanding beyond our Detroit-based facility, with a goal of reaching all 83 counties of Michigan.

With the Toyota Engineering 4D Theater, live stage shows, a planetarium, lab activities, 250+ hands-on exhibits and more. there are dozens of ways to customize vour MiSci visit.

Free tickets are available on a

2020 CT4 Cadillac Offers RWD Performance

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Selectable vehicle drive modes are standard and allow customers to enhance their vehicle settings for different preferences and conditions. The modes, Tour, Sport, Snow/Ice and Track, are joined by new My Mode and V Mode (V-Series), which can alter the calibrations for transmission shifting, suspension, steering and brake feel, front/rear torque split (with AWD), vehicle sound character and other vehicle attributes.

CT4 leverages Cadillac's turbocharging proficiency as the foundation for its spirited performance, Cross said. The brand's 2.0L Twin-Scroll Turbo engine, with three-step sliding camshaft technology along with Active Fuel Management and automatic stop/start, is standard and SAE-certified at 237 hp and 258 lb.-ft of torque. It is backed by an eight-speed automatic transmission.

Cadillac's new 2.7L segmentfirst Dual-Volute Turbo engine is available on Premium Luxury and is standard on V-Series. Horsepower is estimated at 309 hp with 348 lb.-ft of torque in the Premium Luxury model and 325 hp and 380 lb.-ft of torque in the CT4-V. It is matched with a segment-exclusive 10-speed automatic transmission with Electronic Precision Shift.

Like the 2.0L Turbo engine, the 2.7L Turbo also features a threestep sliding camshaft design, along with Active Fuel Management and automatic stop/start. Additional technologies include Active Thermal Management, which uses targeted engine heating and cooling to improve performance in hot and cold ambient temperatures.

There is also an integrated exhaust manifold, which recovers heat for faster engine and transmission warm-up, along with quicker turbo response.

The vehicle has an efficient electric water pump enables continual cabin heating, even when

the engine is off during stop/start ers engaged by detecting and sigevents.

Its tandem solenoid starter enables a faster response from a stop/start event and enables a smoother drive-away.

The CT4 benefits from GM's new digital vehicle platform, a new electronic architecture that enables the adoption of the company's next generation of technologies.

The platform enables faster signal transmissions as well as continuous vehicle improvements through over-the-air updates and enhanced cybersecurity measures.

Cadillac offers the Super Cruise driver assistance feature on the CT4 (available in calendar year 2020). It enables customers to drive hands-free on an expanded range of more than 200,000 miles of compatible highways in the U.S. and Canada, using LiDAR map data, high-precision GPS, a state-of-the-art driver attention system and a network of camera and radar sensors. The driver attention system helps keep drivnaling when drivers need to pay more attention to the road.

Powered by a high-output version of the 2.7L Dual-Volute Turbo engine rated at a Cadillac-estimated 325 hp; and backed by a 10-speed automatic transmission. An additional V-Series variant was previewed at the Chevrolet Detroit Grand Prix in June, representing the next step in Cadillac's V-Series performance legacy, Cross said.

The CT4 was unveiled to customers through an immersive social media campaign that kicked off with an interactive Instagram story, to be followed by multiple video clips on YouTube, Twitter and Instagram, all designed to appeal to viewers' sensory nature.

"The first-ever Cadillac CT4 changes the sport-luxury sedan game, fusing technology and performance in a distinctive design for customers who want to express themselves," said Melissa Grady, Cadillac chief marketing officer.

"Because the CT4 is equal parts technology and performance, we wanted to reveal it in a way that would stimulate the senses and evoke emotions our customers might feel when behind the wheel"

The 2020 CT4 will be available for ordering later this year. It will be manufactured at GM's Lansing Grand River facility, which received a \$211-million investment to build the next-generation Cadillac sedans.

Pricing and additional information on the CT4 will be announced closer to the start of regular production.



CT4 Interior

Macomb Seeking 'Meals on Wheels' Help

The Macomb Community Action Office of Senior Services is sending a call for action out to Macomb County residents and businesses asking them to consider becoming a volunteer for the Meals on Wheels program, said Macomb County spokes-woman Roneeka Pleasant-Brown.

The call for action is motivated by gaps within the program's delivery routes created by the departure of "snowbird volunteers.'

It is the goal of the Office of Senior Services to fill these gaps as soon as possible, Brown said.

Macomb County has the largest Meals on Wheel program in the state of Michigan. Pleasant-Brown said.

Meals are delivered Monday through Friday to over 1,800 seniors. Meals on Wheels is a national program designed for older adults who are homebound and unable to prepare meals for themselves.

Volunteers that deliver for Meals on Wheels give seniors a nutritious meal and also provide a welfare check to ensure they are safe. Volunteers can deliver as many times a week as they like. Delivery routes are available in several areas, Pleasant-Brown said.

All volunteers must be at least 18 years of age or be accompanied by a parent or authorized adult.

All volunteers will be required

to pass a background check. If planning to help deliver meals, please plan to use your own vehicle and to be on the road for an estimated two hours.

Delivery drivers must have a valid driver's license and proof of insurance,Pleasantcurrent Brown said.

To learn more about the program and how to help or to volunteer for service, please contact the Macomb Community Action Office of Senior Services at the telephone number 586-469-5228 or fill out the registration form online at mca.macombgov.org.



586-578-0996



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Michigan Rejects **Immigration Plan**

DETROIT (AP) - Michigan officials say they don't want new federal rules to discourage immigrants from applying for public assistance.

Beginning mid-October, the government will take into consideration whether green card applicants have received Medicaid, food stamps, housing vouchers and other forms of public assistance.

It is part of the Trump administration's aggressive plan to restrict legal immigration.

Thirteen attorney generals across the country, including Michigan's, have sued the federal government over this new rule.



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COVERS THE TECH CENTER AND THE IMMEDIATE AREA

GMobility Group Needs New Minds to Make the Future

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and advanced over the past several years and how the future of mobility can affect people, products, services and mobility deliverv systems.

The Wayne State students represented various academic disciplines, ranging from engineering, entrepreneurial management, archival systems and communications.

"We wanted to expose students to different ideas and how to connect with the auto industry away from their textbooks," Hodges said. "To develop the mobility tech and systems of the future, it's necessary to explore opportunities with careers in logistics, patents in manufacturing, engineering, supplier services, information technology, business services, marketing communications and software development. We wanted the students to see how mobility functions within cultural norms. These students will be in forefront of future developments and delivery systems to improve our lifestyle choices.'

When it comes to creating mobility systems, whether it's a way to connect smart phones to a vehicle's electronics, or coming up with an app to order rides, it's usually engineers who do much of the design, Hodges said. But engineers have spent a great deal of time and money being trained to think and act in specific ways. Those ways don't always result in the most user-friendly system. But when you have people from different disciplines bringing different points of view, it can result in a much more fuser friendly system. This is important because a vehicle's technology has become a much stronger selling point than in the past.



Students from Wayne State got to hear about how GM is looking to hire people with different skill sets.

"Marco Gatti, a manager in Research and Development, told students about his engineering and law background," Hodges said. "He told the students not to be afraid to combine any of their skills. The students had a lot of questions that were amazing to hear. These are students with entrepreneurial bent and they want to hear what it takes to get a modern vehicle to market.

It's important recruit students who are prepared to deal with the demands of day-to-day operations of mobility tech, Hodges said.

"For example, I'm dealing a project of OnStar," Hodges said. We need students who can come in and are prepared and trained to handle its daily operations based on our OnStar customers' needs. Can this person answer a customer's question about what to do. I, for example, have a communications background."

Hodges credited WSU professor Gary Shields and the WSU In-

novation Hub for developing the kind of curriculum and students who can meet GM's needs.

"WSU is in a great forwardthinking mode," Hodges said. "So we invited professors to bring

students who might be interested in what we had to say.'

By recruiting these types of students, it will be possible to develop what's needed for the car of the future, Hodges said.

Fed Investigation Gets UAW Official Arrested

DETROIT (AP) - A Missouribased official at the United Auto Workers has been charged in Detroit with corruption in an alleged scheme to embezzle union money and also spend cash on golf clubs, cigars and swanky stays in California.

Vance Pearson of St. Charles, Mo., was arrested Sept. 12. He is director of UAW's Region 5, which covers thousands of union members in more than a dozen states. Pearson is the 10th person charged in an investigation of union finances. But most of the corruption cases so far have centered on a Detroit training center jointly run by the UAW and Fiat Chrysler.

Pearson was due to appear in federal court in St. Louis. It wasn't immediately known if he has a lawyer who could comment.

Nine people have been convicted.





Macomb, AT&T Food Help

AT&T has provided financial support to the recent partnership formed between McLaren Macomb's Medical Outreach Clinic (MOC) and the Macomb Food Program.

Launched in the spring, the partnership provides patients seeking treatment at the MOC – a doctor's office on wheels - the opportunity to also collect fresh food, including fruits and vegetables, from the Macomb Food Program.

All services are provided free of charge, and the support from ship's ability to continue its as- Pleasant-Brown said. sistance at no cost, said Macomb County spokeswoman Roneeka Pleasant-Brown. Representatives from AT&T were able to join representatives from McLaren Macomb as well as the Macomb Food Program along with Macomb County Executive Mark A. Hackel to accept the \$2,000 gift on Sept. 5 at St. Peter's Parish Hall (92 New Street) in Mount Clemens, Pleasant-Brown said. "The purpose for the Medical Outreach Ĉlinic is to provide care for those who don't readily have access to it otherwise," said Dr. Richard Chalmers, a family physician and medical director of the MOC. "But more so, our aim is to increase the overall health of those in our community, and that cannot be achieved without proper nutrition. This has been a great partnership with the Macomb Food Program and, with the sup-

port of AT&T, one we're thrilled to be able to continue."

Through this partnership, the underserved patients receiving medical care and treatment will have access to food - which includes fresh fruits and vegetables - through the Macomb Food Program, a division of Macomb County Health and Community Services, and its Fresh to You Mobile Food Pantry, which is parked next to the MOC.

The Macomb Food Program was created to provide Macomb County residents immediate re-AT&T will aid in the partner-lief to those in need of food. The group is currently supplying more than 60 pantries and hunger relief organizations throughout Macomb County, Pleasant-Brown said. The MOC and Fresh to You Mobile Food Pantry will be on-site at the following locations, days and times:

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- St. Peter's Parish Hall (92 New St. in Mount Clemens) -10 a.m. to noon Thursdays (except the third Thursday of the month).
- Grace Episcopal Church (115 South Main St. in Mount Clemens) – 10 a.m. to noon third Tuesday of the month. To learn more about the MOC or to make an appointment, call Pleasant-Brown 586-493-3642, said.

To learn more about the Macomb Food Program, its services and network of pantries, visit mca.macombgov.org/MCA-ES-Food.

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Global Safety a Priority For GM

by Jim Stickford

Safety is something GM takes seriously, which is why the company has an annual worldwide Global Safety day, said Maryann Combs, vice president of Global Vehicle Safety.

Combs said that this year's Global Safety Day was held on Sept. 11, and it was the fifth year the company held the event.

This emphasis on safety is, in part, due to the Chevrolet Cobalt ignition switch recall of 2014.

In June of 2014 GM CEO Mary Barra released a report by former U.S. Attorney Anton Valukas about the trouble GM had with the ignition switch of the Cobalt.

"Overall the report found that, from start to finish, the Cobalt saga was riddled with failures which led to tragic results for many," Barra said at the time of the report's release.

After the report was issued GM created Global Vehicle Safety, Combs said. It was part of a larger company-wide move toward emphasizing both vehicle safety and a safe work environment for all GM employees.

"In my role, we look at product safety around the world," Combs said. "We believe that the foundation of safety covers three realms – before, during and after a crash."

The before part of safety means putting in technology that can prevent an accident altogether. Things like blind-spot alert and lane drift alerts.

"We will have emergency braking technology in six more models in 2020 and it will be standard tech by 2022," Combs said. "It's tech like this that helps avoid a crash in the first place."

The during part includes technology like airbags and improved designs of the vehicle's body and chassis, as well as improvements in interior space such as seat placement and seat design.

The after portion includes systems such as active OnStar technology that will call drivers after an accident is detected. And GM now offers post-crash electrical checks, Combs said.

"We want to make sure a vehicle's ignition system is working after a crash," Combs said. "If a vehicle is an EV, we can turn off the electrical system after a



Tech Center employees celebrated the drive for safety at festival.

crash. It's important that we take due care of our customers."

But emphasizing before, during and after to achieve safety is not just about putting tech in cars. It's also about protecting employees who make the vehicles and preventing problems in the first place.

"We want a safe workplace," Combs said. "We don't want anyone to be injured on the job."

So as part of GM's commitment to worker safety, employees are encouraged to speak out if they see a problem, Combs said. Employees at Lansing Assembly recently saw a problem and shut down the entire line while it was being addressed.

"That sort of thing is an example of our 'Speak Up for Safety' system," Combs said. "Any employee anywhere in the world can speak up about product and work safety issues. This includes product safety and workplace safety. We want people engaged and we want them to own the idea of safety."

This helps make sure products are safe even before they are built, Combs said. GM now has a philosophy of Speak Up For Safety (SUFS). This part of a companywide emphasis on safety.

As part of GM's emphasis on safety, the company holds an annual safety week, Combs said. During that week a day or two is carved out for all of GM's facilities around the world to hold special safety day events.

"What each facility does is unique to that facility," Combs said. "But the safety day begins with a worldwide broadcast that goes to all GM facilities about the importance of safety. This year Mary Barra spoke as did Mark Reuss and myself. This is something we take seriously."

This year's Global Safety Day at the Tech Center was held on Sept. 11, Combs said. The event has traditionally been held in late August or early September. The fact that this year's safety day fell on the 9/11 anniversary was a coincidence.

"We call this Global Safety Day because we want all our vehicles and all our employees to enjoy safety," Combs said. "Different parts of the world have slightly different safety standards. North American is slightly different from Europe, which is slightly different from Asia or South America. But what unites all those GM facilities around is a real desire for safety. We want everyone to focus on vehicle safety and workplace safety. Every person at every site every day."

Europeans Celebrate Ford Mustangs with Parade

Calling the Mustang a world beater is something the people at Ford can do because the car has fans all over the world.

In fact the largest Mustang parade just took place in Belgium of all places, said Ford spokesman Dan Jones.

Examples from every generation of Mustang since the iconic sports car's launch in 1964 converged on Ford's Lommel Proving Ground on Sept. 7, to help set a new world record for the largest number of Mustangs in a parade.

Ford smashed its own record of 960 vehicles, set in Toluca, Mexico on Dec. 3, 2017, with 1,326 Mustangs from all over Europe making the pilgrimage to Ford's European testing facility in Lommel, Belgium, Jones said.

To set the new record, the Mustangs were driven in an uninterrupted convoy with no more than 20 metres between each car. Vehicles and drivers also participated in a special choreography to celebrate Mustang's 55th anniversary this year, Jones said. The day included a fly-over by a P51 Mustang, the fighter plane that gave its name to Ford's iconic sports car.

More Mustangs are sold in Belgium per head than any other country in Europe, making Ford's Lommel Proving Ground the ideal location for the world record attempt, Jones said.

Mustang was the world's bestselling sports coupe for the fourth year in a row in 2018. Sales continued to rise in the first half of 2019, which saw 5,500 sales in Europe, a 3.7 per cent increase compared with the same period last year.

Ford's Lonnel Proving Ground is where the company refines the sustainability, technology and driving dynamics of its vehicles in Europe, Jones said. The facility covers an area of 3.22 km-squared and features 80 kilometres (50 miles) of track, some of which is designed to simulate public roads, while other tracks feature differing road surfaces enabling engineers to evaluate handling, brakingand comfort.



The largest parade of Mustangs ever was recently held in Belgium.







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Volkswagen Spent Billions on EV Tech, Will Public Buy?

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change things. The company argues that the base price of under 30.000 euros (\$33,000) means the ID.3 is "an electric car for everyone." A key competitor, Tesla's Model 3, goes for about 44,000 euros (\$48,520) in Europe.

The ID.3 is going on display ahead of the Frankfurt Motor Show on Sept. 16. Volkswagen is also revealing a new logo; both moves are aimed at underlining the company's transformation since its 2015 diesel scandal, in which the company was caught using software to cheat on emissions testing and paid more than 30 billion euros (\$33 billion) in fines and penalties.

The company is positioning itself as younger and more oriented toward digital services and zero local emissions electric driving

The company touts the ID.3 as a historic vehicle, the third chapter in the company's history following the Beetle, which became a symbol of postwar German prosperity, and the Golf, of which Volkswagen has sold more than 35 million since 1974.

Volkswagen will start selling it in Europe next year, while in the United States it will first launch an electric SUV at an as-yet unspecified date.

The German company is deploying massive financial and manufacturing capabilities to make a success of its electric

30 billion euros in this area by 2023. It has sunk 1.2 billion euros into a factory in Zwickau in eastern Germany to make the ID.3, the first of eight electric-car plants worldwide including one in Chattanooga, Tenn. The company, which sold 10.8 million vehicles last year, aims for 40 percent of its sales to be electrics by 2030.

Analysts warn that the industry could be saddled with slowselling products that would undermine their earnings in a weakening global car market. Electrics were only 1.8 percent of the European market through the first six months of the year.

That's because the launch of electric cars is so far mainly driven by governmental regulation requirements, not consumer demand.

Above all, companies are rushing to make electric cars to meet tighter rules on carbon emissions and pollutants, particularly in the European Union and China.

The EU has new limits on emissions of carbon dioxide, the main greenhouse gas blamed for global warming, that will kick in fully in 2021 to comply with the Paris climate accord. Cars will have to produce no more than 95 grams of CO2 per kilometer, the equivalent of requiring mileage of 66 miles per gallon under U.S. measurements.

Failure to comply means a fine

cars, saying it will have invested for every gram of C02 over the limit per car. In practice, that means each electric car sold could be worth more than 10,000 euros (\$11,000) in avoided fines, according to Ferdinand Dudenhoeffer, direct of the CAR-Center for Automotive Research at the University of Duisburg-Essen in Germany.

China, a major market for German carmakers, is also pushing for lower-emission vehicles. Regulatory pressure for electric uptake is less certain in the U.S., where the Trump administration has sought to relax standards set by the Obama administration.

So far, electrics are most popular in wealthier countries with per capita incomes over 40,000 euros (\$44,100) a year, such as Norway, Sweden and Switzerland. In poorer countries, electrics are nowhere to be seen. Just 293 were sold in Slovakia and 315 last year in Greece.

Incentives play a big role. In Norway, where electrics were over 30 percent of the market last year, incentives amount to 11,600 euros in tax breaks.

Finding a place to charge is another issue. Tesla has its own network of highway fast-charging stations. A consortium of automakers including Volkswagen aims to have 400 highway charging stations by 2020. But many more are required if electrics are to become mass market cars.

While Volkswagen has been aggressive about electric cars, others are taking a more gradual approach. Daimler has the EQC sport-utility, which shares parts with an existing internal combustion vehicle.

That means lower new investment spending by automobile manufacturers.

BMW is launching its iX3 electric SUV and an electric Mini. BMW's experience shows the hazards: it was first with an allelectric car, the i3 city car in 2013, but according to the Bernstein analysis lost money on it and cancelled a successor.

Other new electric cars at the show include Daimler's Smart fortwo and, at the high end of the market, Volkswagen's Porsche is bringing out the Taycan coupe, a direct challenge to Tesla's Model S. In all, some 20 new electric models will hit the market by 2021.

If consumer demand for EVs is lacking, carmakers may have to offload the cars through sales to rental companies and corporate fleets.

They alsom might have to require their own employees to take them as company cars, or subsidize sales with generous financing, all of which would sap their profits.

"We are proceeding on the assumption that there will be many incentives in the market in 2020-2021," said the CAR Center's Dudenhoeffer.

"They are simply condemned to sell these things."

GM, U-M Study Looks at Effect Auto Tech Has

CONTINUED FROM PAGE 1

"A key finding of this work is that we can make substantial gains in safety through deployment of advanced driver assistance systems such as forward and rear emergency braking, rear cross-traffic alert, and others. In addition, we found that the more automated the system, the greater the benefits," said UMTRI Research Associate Professor, Carol Flannagan.

"This work looked at reduction in crashes associated with systems already in the hands of drivers in real-world driving environments. Our working relationship with GM is critical to our ability to evaluate the effects of these systems, and we hope that what we learned can motivate more widespread deployment of the most effective technologies."

The development of smarter and safer vehicles will play a critical role in helping to save lives now and in the future, Kiefer said.

These technologies are critical to General Motor's vision of an automotive world with zero crashes, zero emissions and zero congestion.

For more information and to read the full report, visit http://hdl.handle.net/2027.42/15 0660

Delphi Technolgoies Offers Industry-First SiC Inverter

the first in the industry with volume production of a 800 V silicon carbide (SiC) inverter, one of the key components of highly efficient next-generation electric and hybrid vehicles.

The new inverter enables electrical systems up to 800 volts, significantly extending electric vehicle (EV) range and halving charging times compared with today's state-of-the-art 400 volt systems, said Kristen Kinley, head of the Americas Communications and Director of Global Integrated Content, Delphi Technologies.

The technology, which supports multi voltage platforms, is an evolution of the company's proven high-voltage inverter and builds on 25 years of vehicle electrification experience. Delphi Technologies 800 V inverter uses state-of-the-art silicon carbide MOSFET semiconductors (silicon carbide-based metal-oxidesemiconductor field-effect transistor wide bandgap technology), Kinley said.

The company recently secured a landmark \$2.7 billion customer win for volume production of this technology over eight years with a premier global OEM, Kinley said. Launch is expected in 2022, initially for a high-performance vehicle operating at up to 800 Volts. In early September, the companv unveiled that it is partnering with Cree, a leader in silicon carbide (SiC) semiconductors, to enable next generation of electric vehicles to drive longer distances, have faster charging times and improved efficiency. Delphi Technologies inverters will utilize Cree's Wolfspeed silicon carbide-based MOSFETs. IHS estimates that up to 45 percent of global vehicle production will be electrified by 2025, with around 46 million electrified vehicles being sold annually, rising to up to 57 percent by 2030 (around 62 million vehicles annually), Kinley said. Inverters are one of the highest-value electrification components and their efficiency has an industry-changing

Delphi Technologies of Troy is impact on many aspects of vehicle performance.

"Doubling the voltage from today's typical 400 volts brings a substantial range of benefits, both for the vehicle user and for the vehicle manufacturer," explains Richard F. Dauch, chief executive officer, Delphi Technologies. "We have designed this technology to simplify vehicle manufacturers' multi-voltage strategy as they extend their electric and hybrid vehicle ranges.

At the heart of the new Delphi Technologies inverter is its patented Viper power switch, which combines high levels of integration with unique doublesided cooling.

These critical features allow the company to develop inverters that are 40 percent lighter and 30 percent more compact than competitor inverter technologies.

The latest addition to the Viper power switch range replaces conventional silicon with silicon carbide, a high band gap semiconductor that allows fast switching and can operate at even higher temperatures, Kinley said. "The faster switching alone will allow faster, more compact and lighter motors that offer great efficiency and greater range," said Dauch. "That's in addition to the many benefits of moving to 800 Volts. With the new Delphi Technologies SiC inverter operating at 800 volts, vehicle engineers now have additional flexibility to optimize other powertrain systems, Kinley said. Options include more range or a smaller battery; ultra-fast charging or smaller, lighter, cheaper cables; and greater harvesting of vehicle kinetic energy when braking, further extending vehicle range. The new silicon carbide Viper power switch fits into the same inverter package as the current silicon switch, reducing engineering costs associated with a technology change and simplifying the design of multiple vehicle performance options.



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Ford Looks to Educate Public on How Well EVs Function

A survey of American drivers and those around the world has revealed the majority expect electric vehicles to replace gasoline-engine cars in the near future, yet misconceptions may stop them switching from pump to plug any time soon.

Just 19 percent of Americans would trust an all-electric vehicle in bad weather and only 28 percent would pick one over a gasoline-engine car if they needed to get somewhere in an emergency, said Ford spokeswoman Emma Bergg. Additionally, only 18 percent think an electric car can be faster than a gas-powered car, while just 13 percent would choose an electric vehicle over a traditional one if they needed to tow something.

These were just some of the results that Ford uncovered when it commissioned the survey to better understand attiand misconceptions tudes around electric vehicles ahead of launching its first fully electric model - a Mustang-inspired SUV, Bergg said.

As a result of the survey's findings, Ford has releasing two new "myth-busting" videos in a series aimed at educating customers as they prepare for life away from the fuel pumps, Bergg said.

And Ted Cannis, Ford's global director of electrification, wrote about how Ford is addressing some of these commonly held misconceptions.

"As the head of electrification for Ford, the questions I get from family, friends and colleagues about electric vehicles run the gamut," Cannis wrote. "'Are electric vehicles fast?' 'Do they work in winter?' 'Can I really give up visiting the gas station?' 'Are they capable enough to help me do my job?

The answer to all of the above - at least with Ford's new lineup of electric vehicles - is yes, Cannis wrote. But there remains a gap between what an electric vehicle can do and what customers believe they can do.

This perception gap was evident as recently as a few weeks ago, when we made headlines by demonstrating that Ford's allelectric F-150 prototype could tow more than 1 million pounds. Many were shocked – positively –

Ship Carrying Cars Turns

Over, Feds Investigating

about just how capable and strong an electric vehicle can be.

Helping to de-bunk the widespread misconception among truck customers that an electric pickup truck can't be as capable as gas-powered trucks is a small but an important step, Cannis wrote.

"Now, we are out to de-bunk other electric vehicle misconceptions just as we did with the F-150 demonstration: by showing not just telling - so that potential customers can feel confident should they choose an electric vehicle in the future," Cannis wrote. "These myths come straight from the mouths of consumers via an independent global survey across Europe, China, and the U.S.'

For example, more than 90 percent of Americans and Europeans don't believe quick acceleration is a great benefit of electric vehicles.

"So where did this impression come from? Simple: A lot of companies, ourselves included, focused their initial electrification efforts on adhering to regulatory requirements," Cannis wrote. The cost of batteries was high, the price of developing new vehicle platforms was higher, and the necessary charging infrastructure to make it easy on customers simply didn't exist. But that's all changing fast."

To fight this perception, Ford is showcasing the benefits of the electric propulsion system, including the decision to take advantage of the benefits of "instant torque" - a fancy term that means electric vehicles can accelerate "like hell if you want," Cannis wrote. The companyis also investing in an electric vehicle platform with right system power, motors, suspension, and tuning to get something really special that people would love to have.

Another mispercepton held by 42 percent of Americans think electric vehicles still require gas to run.

"It's a question we get all the time. Early on when I started in this position, my family asked me this same question," Cannis wrote. "Nope, no gas. The truth is that when you drive an electric vehicle, you may never have to

stop at a gas station again. In research clinics, I sat down with many electric vehicle owners in diverse places like California, China and Germany. You learn one thing very quickly: Among most owners, all their charging is done from the convenience of their home. Many have never visited a public charging station at all."

Similarly, surveys of U.S. battery electric vehicle owners show that 80 percent of charging occurs at home, followed by charging at work.

Electric vehicles operate entirely on electricity that is stored inside state-of-the-art rechargeable batteries, Cannis wrote. These batteries power electric motors that propel the car forward. No gasoline or diesel fuels required – electric vehicles don't even have or need tailpipes.

Ford has also learned that close to 80 percent of Americans would not pick an electric vehicle for extreme weather, while nearly 65 percent would not choose one for all-wheel drive.

"We get it," Cannis wrote. "At Ford, we are all about safety. We understand that electric vehicles need to operate in a safe and reliable manner in whatever conditions Mother Nature throws at you - and give people the confidence they want when driving through tough conditions.'

Given those impressions, it would probably come as a surprise to most Americans that the top market for electric vehicles in Europe last year was cold and mountainous Norway, with over 35,000 sales in the first half of this year.

It would come as a surprise to most Europeans that hot Southern California and mile-high, snowy Denver are among the top United States markets for electric vehicles.

"At Ford, we've gone to great lengths to test our electric vehicles in extreme conditions. And while it is true that you can anticipate a partial reduction in range in extreme conditions, it is not something that is going to sneak up on you," Cannis wrote. "After all, do you ever notice how you can't travel as far on a tank of gas in the winter - or in the summer if you're blasting the air conditioning?"



This Ford EV being tested in the cold is operating well, contrary to beliefs held by many of the public.

China Reports 7.7 Percent Car Sales Drop

BEIJING (AP) – Chinese auto sales sank 7.7 percent in August from a year earlier extending a painful slump in the industry's biggest global market, an industry group reported Wednesday.

Sales of sedans, SUVs and minivans declined to 1.6 million, according to the Chinese Association of Automobile Manufacturers. Total vehicle sales, including trucks and buses, shrank 6.9 percent to 1.9 million.

Chinese consumer demand has

nomic slowdown and a trade war with Washington.

The industry has recorded monthly sales declines since June 2018, squeezing automakers that are spending heavily to meet government targets to develop electric cars.

Sales of electric and hybrid vehicles fell 15.8 percent from a year ago to 85,000.

The market segment has struggled as the government phases out subsidies that helped to make China the biggest market for electrics. Beijing is using sales quotas to shift the financial burden of promoting electrics to automakers. That raises the cost to buyers.

Sales by Chinese brands fell 10.2 percent in August from a year earlier to 614,000. They lost 1.1 percentage points of market share to 37.2 percent.

Auto sales for the eight months through August were off 12.3 percent from a year earlier at 13.3 million.

Minivan sales declined 22.9 percent through August. SUV sales were off 10 percent and sedans down 12.6 percent.

SAVANNAH, Ga. (AP) - As au- which fill to add weight and help thorities try to answer why a cargo ship carrying 4,200 vehicles overturned on the Georgia coast, maritime experts say investigators will be looking for shifting cargo or other problems that upset the giant vessel's balance the Golden Ray and is now a marenough to make it fall on its side.

lower a vessel's center of gravity.

"There's a lot of different things that could have happened here," said Jim Staples, who worked 17 years as a captain aboard vehicle carriers similar to itime consultant. "We definitely



The U.S. Coast Guard is leading the investigation into what caused the South Korean ship Golden Ray to capsize early on Sept. 8 soon after it departed the Port of Brunswick, about 70 miles (112 kilometers) south of Savannah. The ship's pilot and 23 crew members were all safely rescued, including four men trapped for 36 hours before they could be extracted through a hole drilled into the hull.

Measuring 656 feet long and 83 feet wide, the Golden Ray is roughly the size of a 7-story office building. Such vehicle carries tend to be ungainly and bulky, making them "like a floating shoebox," said Joseph Mur-phy, a retired ship captain and professor of marine transportation at Massachusetts Maritime Institute.

requires a balancing act that involves distributing the weight of its cargo and fuel as well as water in the ship's ballast tanks,

know there's a stability problem with the ship somewhere."

Staples said investigators will be asking whether vehicles in the cargo decks may have shifted and upset the ship's balance, and whether they were lashed down properly. Were the ballast tanks holding enough weight to keep the vessel steady? Staples said crews sometimes wait to fill ballast tanks until they reach open seas to keep muddy water and marine animals from getting sucked into the tanks.

Coast Guard officials have declined to say what might have caused the Golden Ray to list and flip onto its side. The National Transportation Safety board has assigned investigators to assist them.

The weather doesn't appear to be a factor. Hurricane Dorian Keeping those ships upright brushed the Georgia coast with tropical-storm force winds as it passed offshore last week, but that was four days before the Golden Ray overturned.



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Ford Explorer Hybrid Reduces Gas Stops

If one chooses a destination based on the number of stops to purchase fuel needed to complete the journey, a single tank of gas can now open a lot more vistas thanks to the engineers of the new 2020 Ford Explorer Limited Hybrid

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For example, New Yorkers roadtripping to Washington, D.C. and back are looking at a 454-mile journey. Detroiters driving to Toronto and back are on the road for 466 miles, said Ford spokeswoman Michaela Johndrow. And Angelenos making the trip to and from Las Vegas cover just over 500 miles.

No matter the destination, they can all agree - any road trip is better with fewer gas station stops.

Explorer is the ultimate family adventure vehicle - and fewer pit stops is one of the latest reasons why," said Bill Gubing, Explorer chief engineer. "Explorer provides space for the whole family and their gear, it's got great towing capability, and now it has range like no Explorer before."

With an 18-gallon fuel tank, the new 2020 Explorer Limited Hybrid RWD has an EPA-estimated range of over 500 miles* per tank of gas, meaning potentially more time on the road and less time filling up.

The 2020 Explorer Limited Hybrid equipped with four-wheel drive has an EPA-estimated range of over 450 miles.

plorer Limited Hybrid has an EPAestimated rating of 27 mpg city /29 mpg highway/28 mpg combined, while a four-wheel-drive version has an EPA-estimated rating of 23 mpg city/26 mpg highway/25 mpg combined.

Explorer Limited Hybrid featuring a 3.3-liter hybrid engine and new 10-speed modular hybrid transmission offers no-compromise capability and can tow up to 5,000 pounds - the same as a properly equipped 2019 Explorer with 3.5-liter EcoBoost engine.

When equipped with a Class III Tow Package, the all-new Explorer Limited Hybrid tows 1,500 pounds more than a 2019 Toyota Highlander Hybrid.

Its no-compromise qualities also extend to the cargo area, Gubing said.

Unlike most previous hybrid vehicles, Explorer Limited Hybrid features a specially designed liquid-cooled lithium-ion battery built into the chassis below the second-row seats to preserve the cargo and passenger space that helped make it such a popular vehicle with families, Gubing said.

EPA-estimate fuel economy ratings for the 2020 Ford Explorer lineup:

- 3.3L Hybrid, RWD, 27 mpg city, 29 mpg highway, 298 mpg combined;
- 3.3L Hybrid 4WD, 23 mpg city, 26 mpg highway, 25 mpg combined;
- 2.3L EcoBoost, RWD 21 mpg city, 28 mpg highway, 24 mpg combined;
- 2.3L EcoBoost 4WD, 20 mpg city, 27 mpg highway, 23 mpg combined;
- 3.0L EcoBoost, 4WD, 18 mpg city; 24 mpg highway, 20 mpg combined.



Rear-wheel- drive-equipped Ex- The new Explorer Hybrid is designed to offer performance and power.

Federal Government Makes VW Change Mileage Labels

by TOM KRISHER AP Auto Writer

DETROIT (AP) - The U.S. Environmental Protection Agency is making Volkswagen Group correct fuel economy labels for about 98,000 gasoline-powered vehicles.

The revisions of about one mile per gallon (0.4 kilometer per liter) cover VWs as well as affiliated brands Audi, Porsche and Bentley, All are from the 2013 through 2017 model years.

The EPA said Aug. 30 that it investigated the gas vehicles after finding that VW cheated on diesel emissions in 2015.

The agency and the California Air Resources Board found that transmission software on the gas vehicles made them shift differently during government lab tests on treadmills so they got better mileage and polluted less than when they were on the road.

The software was on about 1 million vehicles, but only 98,000 were found to have lower mileage than stated on EPA window stickers, according to an EPA statement.

VW Group said it also settled lawsuits filed by owners and will reimburse them for overstated mileage. Under the settlement. valued at \$96.5 million, owners will get payments ranging from \$5.40 to \$24.30 for each month that they have owned or leased the vehicles. Any money that doesn't go to owners will be used for environmental remediation. Attorney fees are not included and will be settled later.

Owners will be notified about their rights and options under the settlement, and eventually they will have to submit a claim

to be compensated, VW said in a statement. The settlement still needs to be approved by a judge.

Models included in the mileage revisions can be found at https://www.epa.gov/recalls/fueleconomy-label-updates.

In September 2015, the EPA discovered that VW had installed software on nearly 600,000 diesel vehicles that turned pollution controls on during government tests and shut them off while the vehicles were on the road.

The company has paid some \$20 billion in fines and civil settlements. It has also pleaded guilty to criminal charges in the United States, and several managers, including former CEO Martin Winterkorn, were charged there.

Winterkorn resigned saying he took responsibility for the fraud, but insisted he personally did nothing wrong.

FCA Recalling Ram Trucks

DETROIT (AP – FCA is adding more than 693,000 Rams in the U.S. to a series of recalls to fix tailgates that can suddenly open.

This covers certain Ram 1500, 2500 and 3500 pickups from 2013 through 2018 with power locking tailgates. Affected 2015 through 2017 trucks have 8-foot beds. The 2013, 2014 and 2018 trucks have beds of all sizes and were built before April 1, 2018.

FCA says it's not aware of any accidents caused by the problem.

A tailgate tab can fracture and cause the gates to unlatch, increasing the risk of cargo falling onto the road.

Dealers will repair the latch.

Toyota, Suzuki Team Up on AV Technology

by YURI KAGEYAMA AP Business Writer

TOKYO (AP) - Japan's top automaker, Toyota, and smaller rival Suzuki are partnering in the development of self-driving car technology, as manufacturers around the world grapple with innovations in the industry.

Under the deal, announced Aug. 28, Toyota will take a 4.9 percent stake in Suzuki Motor Corp. valued at 96 billion yen (\$908 million), and Suzuki will make a 48 billion yen (\$454 million) investment in Toyota.

In 2017, Toyota Motor Corp. and Suzuki agreed to work together in ecological and safety technology.

That deal did not include owning mutual stakes.

Auto manufacturers are facing a costly shift toward the use of artificial intelligence, the internet and other technologies. Partnerships are one way to share the enormous costs.

Last month, Volkswagen AG of Germany said it is investing \$2.6 billion in a Pittsburgh auvehicle company tonomous that's mostly owned by Ford, Artonomous vehicles on the roads in the U.S. and Europe as early as 2021.

Under the deal, Ford will use Volkswangen's electric vehicle platform to build zero-emissions cars for the European market starting in 2023.

In February, BMW and Daimler said they are working together on developing new technology to help create self-driving cars fir the future.

Under their earlier agreement signed in 2017, Toyota and Suzuki are also cooperating in the Indian market, where Suzuki remains a strong player. They said they will continue to expand their collaboration.

"The automobile sector is currently experiencing a turning point unprecedented in both scope and scale," Toyota and Suzuki said in a statement, referring to stronger environmental regulations as well as newcomers in the mobility business.

They said deepening their relationship will help both companies grow and meet challenges presented by a rapidly-changing automotive landscape.

Google autonomous vehicle go AI, with a plan to put au-spinoff Waymo is among the new

players in the area of self-drving vehicle technology. Uber, which offers ride-hailing services and food delivery, is also working on the development of autonomous driving.

Toyota, the maker of the topselling hybrid, Prius, has invested in Uber.

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DETROIT (AP) – The U.S. government's road safety agency is investigating complaints that the automatic emergency braking on the Nissan Rogue can turn on for no apparent reason.

Feds Investigate Nissan on Brakes

554,000 Rogue small SUVs manufactured during the 2017 and 2018 model years.

The National Highway Traffic Safety Administration says 843 owners have complained to the agency and to Nissan about the problem.

Owners reported 14 crashes and five injuries, according to the NHTS.

The federal agency says Nissan has issued a technical service bulletin and two customer service actions related to the problem.

It will try to find a cause and determine how often the false braking happens, and could seek a recall.

The investigation was opened in response to a March 21, 2019

petition from the Center for Auto Safety, a nonprofit group that represents consumers in automotive issues.

A message was left Sept. 12 seeking comment from a Nissan The probe covers about spokeswoman about the newlyorderd investigation on the Rouge's emergency braking system turning on suddenly.

> Nissan has said in the past that it has notified all customers of a software update that improves performance of the automated braking system.

> But the Center for Auto Safety said the campaigns don't acknowledge the seriousness of the safety problem and give owners little incentive to get the SUVs fixed.

In its petition, the Center for Auto Safety said that according to the complaints, the Nissan braking system can be triggered by railroad tracks, traffic lights, bridges, parking structures "and other fixed objects that do not pose a threat to the vehicle."

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GM's Green Effort Receives Honors From Government

come a more environmentally friendly company have paid off.

General Motors has received a 2019 Green Power Leadership Award from the U.S. Environmental Protection Agency, said GM spokeswoman Jennifer Korail. The awards recognize companies for their commitment and contribution to helping advance the development of the nation's voluntary green power market.

The EPA last month presented GM with the award for Direct Project Engagement at the 2019 Renewable Energy Markets Conference in San Diego.

We are proud for this recognition from the U.S. Environmental Protection Agency," said Erin Lawrence, energy and carbon optimization engineer at General Motors. "Our efforts and those of other sustainably minded corporations help accelerate the development of renewable resources and advance this market in the U.S. Leveraging renewable power is a demonstration of our commitment to reducing carbon emissions while supporting our RE100 goal to have 100 percent of our electricity use from renewable energy by 2050."

EPA considers green power as electricity generated from environmentally preferable renewable resources, such as wind, solar, geothermal, biogas, biomass and low-impact hydro, Korail saidn. GM was one of only seven organizations nationwide to receive a Leadership Award for direct project engagement. The program recognizes EPA Green Power Partners that distinguish themselves through direct project engagement with on- and offsite projects using a variety of financing structures to access cer-

GM's continuing efforts to be- tified renewable green power. GM received the award for helping to develop a diverse renewable energy supply portfolio, including:

- Exceeding its original renewable energy goal of 125 megawatts (GM has achieved 416MW).
- Advancing its renewable energy goal as a signatory of RE100, a global initiative uniting influential businesses committed to 100 percent renewable electricity.
- Executing the first green tariff in Michigan with Consumers Energy.
- Three new virtual power purchase agreements for wind energy totaling over 800 million kilowatt-hours coming online in 2018.

GM is continuing to leverage a four-pillar strategy announced as part of its RE100 goal in 2016 to pursue a zero emissions future, Korail said. Energy efficiency, renewables, storage and policy are key to advancing the technology needed to achieve this effort. GM is currently accessing about 703.5 million kWh of power annually from a portfolio of various renewable energy systems, equivalent to the electricity use of about 86,750 average U.S. homes annually.

GM's been engaged in various renewable power projects for decades, including landfill gas, wind and solar projects, and is a founding member of the Renewable Energy Buyers Alliance, working to increase demand and delivery of renewable energy.

An organization-wide EPA partner, GM is currently No. 6 on EPA's Green Power Partnership Top 30 On-site generation list, Korail said.



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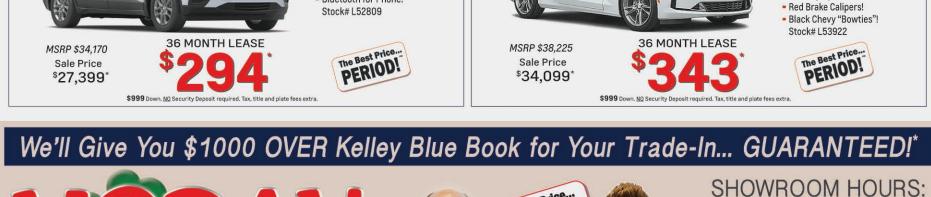
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Aluminum Wheels

BorgWarner's Championship Trophy Given

History was made twice at Team Penske headquarters in Mooresville, N.C. when Roger Penske was awarded his 18th BorgWarner Championship Team Owner's Trophy, 13 more than the next winningest owner; and the BorgWarner Championship Driver's Trophy - for the first time in history – has two faces on it, said BorgWarner spokeswoman Kathy Graham.

2019 Indianapolis 500 winner Simon Pagenaud was presented with his Baby Borg, commemorating his Indianapolis 500 victory, with a special surprise – the likeness of Norman Pagenaud, Simon's Jack Russell Terrier, on the base of the trophy. Norman. already a fan favorite on the IndyCar circuit, rocketed to global acclaim after his photo celebrating the win with Simon was widely circulated.

"The Indianapolis 500 is one of the most coveted race wins in all of motorsports and it is Borg-Warner's honor to present the keepsake trophies to Simon and Roger," said Fred Lissalde, Chief Executive Officer, BorgWarner Inc. "Roger has set a standard of excellence at the Indianapolis 500 that may never be broken. His success at one of the toughest races in motorsports is truly historic. Presenting the Baby Borg to Simon, a fellow countryman from France, for winning the Indianapolis 500 is personally a joy for me," Lissalde said.

In addition to awarding Pagenaud his Baby Borg trophy, Borg-Warner also donated \$20,000 to IndyHumane - The Humane Society of Indianapolis. The donation was made in Simon's name, in recognition of his 2019 Indianapolis 500 win. IndyHumane has been a favorite charity of Pagenaud's for a number of years, beginning when he lived in the Indianapolis area. Simon fostered a dog for Indy Humane during the Month of May in 2014. Also, he has participated in their fundraising event, Mutt Strut at IMS. IndyHumane has served Indianapolis since 1905. They provide vital services to animals through sheltering and adopting animals, positive reinforcement behavior training for shelter animals, and outreach through community and shelter programs.

The Borg-Warner Trophy was created in 1936 as a symbol of technology and innovation in racing. As the oldest, most famous trophy tradition, the Borg-Warner Trophy is the most sought-after motorsports prize.

New Corktown **Apartment Project Opens**

0% APR for 72 Months



DETROIT (AP) - A \$150 million mixed-use development officially has opened just west of downtown in Detroit's Corktown neighborhood on Sept. 8.

Mayor Mark Duggan's office says Elton Park's first phase was completed in just over two years and includes 151 residential units and more than 11,000 square feet (1,021 square meters) of retail space. More than 70 percent of the apartments have been leased.

Duggan says "what had been for years a sea of parking lots and a large vacant building is now a beautiful new residential anchor and public space in Detroit's oldest neighborhood.'

Soave Real Estate has committed to allocating 20 percent of the residential units as affordable housing. Duggan said future phases of Elton Park have the potential to bring an additional 275 to 350 additional residential units and retail to the area.



Remote Entry

• 18" Aluminum Wheels