Lexus CT 200h Offers Exceptional Fuel Economy and Dynamic Driving Experience

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Last year marked the introduction of the all-new CT 200h, Lexus' fifth hybrid vehicle and second dedicated hybrid. As Lexus continues to dominate the luxury hybrid market, the CT 200h premium hybrid demonstrates the brand's commitment to unparalleled quality, sophistication and technology. In its second model year, the CT features a new Vehicle Proximity Notification System that helps alert pedestrians and cyclists of an oncoming vehicle under certain conditions by emitting a low audible warning sound. In addition, it brings one new exterior color as Nebula Gray Pearl replaces Smoky Granite Mica for 2012.

The CT 200h's size, packaging, full hybrid technology and ultra-low emissions perfectly meet the requirements of a young, highly discerning, environmentally conscientious customer base. Yet it offers no compromise on the refinement and driving pleasure which hallmark the progressive luxury inherent in every Lexus.

Available in standard and Premium models, the CT 200h boasts remarkably low fuel consumption and has an impressive combined EPA-estimated fuel economy rating of 42 mpg, 43 mpg city and 40 mpg on the highway utilizing regular 87-octane gasoline. Moreover, the CT 200h can be operated in a switchable EV mode which generates zero emissions.

Engine and Hybrid System
The CT 200h's Lexus Hybrid Drive features a unique energy management system paired with a four-cylinder gas engine. Through the application of brand-specific engineering solutions and software tuning, Lexus engineers focused on enhancing both the environmental and driving performance of the full hybrid series/parallel system, as well as its Ultra-low Noise, Vibration and Harshness (NVH) levels.

Utilizing the most recent generation hybrid system, the CT 200h takes advantage of Lexus' continuous engineering advances to maximize fuel economy, minimize emissions and deliver driving pleasure. A highly efficient engine design, an exhaust heat recovery system, major efforts to reduce parasitic losses, an evaporative emissions system and driver-selectable driving modes all make notable contributions. Significant efforts were also made to minimize engine noise.

An Atkinson-cycle engine design was chosen for its high efficiency and compatibility with hybrid operation in the CT 200h. The twin-cam engine uses four valves per cylinder and Variable Valve Timing with Intelligence (VVT-i) on the intake side. The engine is undersquare, with an 3.17-inch bore diameter and 3.48-inch stroke, and has a relatively high compression ratio of 13.0:1. Peak output equals 98 horsepower and in combination with the hybrid drive motor, the CT 200h generates 134 total system horsepower. The CT 200h will accelerate seamlessly from 0-60 mph in 9.8 seconds.

Careful design of the intake system reduces engine pumping losses and its twin resonators minimize intake noise. The cooling system uses a modular construction that combines an aluminum engine radiator, hybrid system radiator, A/C condenser and fan into a single assembly for minimal weight. Plus, the electric fan speed is controlled via Pulse Width Modulation to reduce energy consumption and noise. Careful ducting of the cooling system helps prevent hot engine air recirculation that tends to occur at low speeds and while idling, further enhancing efficiency.

One of the keys to lower fuel consumption involves heat. The CT employs an exhaust heat recovery system that captures the heat of spent exhaust gases to speed engine coolant warm-up and allow the hybrid system to stop the engine earlier and more often in the driving cycle when it's not needed, for example in low power demand conditions in city driving.

Using a two-motor hybrid system, the CT 200h uses an 80 horsepower drive motor that combines with the gas engine. (Note that the sum of the engine and motor power are not equal to the total system power as the operation of the engine and motor cannot be maximized in the same operation range). A second motor in the hybrid system serves as both engine starter and generator to charge the hybrid battery pack.

The efficient two-motor system also uses an Electronically-Controlled Continuously Variable Transmission (E-CVT) that is a model of efficiency, simplicity and compact size with extremely smooth and quiet operation. A motor speed-reduction planetary gear unit helps provide high power output in this small package.

An electric transmission oil pump eliminates another source of parasitic loss to further increase efficiency. Electronic operation allows a control strategy that invokes the oil pump only when needed, and since the oil also flows over the drive motor, overall efficiency of the motor and transmission are improved.

For a fun-to-drive experience, the CT 200h also incorporates a drive-mode selector that allows the driver to toggle between four distinct modes: Normal, Sport, Eco or EV. Each mode changes the rate of throttle opening for a given throttle-pedal angle. Normal mode has an essentially linear throttle response that gives naturally progressive power. Sport mode can be selected when the driver wants a more dynamic experience. In Eco mode, air conditioning settings are adjusted and the throttle response is reduced relative to the pedal angle to emphasize fuel economy. Under certain circumstances, the EV mode can allow the vehicle to be driven short distances using only the electric motors.

Acceleration from 0-to-60 mph is rated at 9.8 seconds. Responsive passing acceleration that benefits from the instant torque of the electric motor and the E-CVT's ability to quickly find the optimal gear ratio enhance the driving experience.

Chassis/Body/Suspension/Tires/Brakes

Agile handling, excellent body control, and smooth ride in the CT 200h begin with a stiff body structure. The CT body is designed with superior stiffness overall with added focus in strategically located areas that have the greatest effect on ride, handling and noise.

Setting a new benchmark in premium compact segment ride comfort and handling, the Lexus CT 200h features a unique suspension design which combines a MacPherson strut front system with a fully independent double-wishbone rear suspension. The compact double-wishbone rear suspension design uses low-mount coil springs that help improve cargo space. As in the front suspension, rebound springs are used to aid both handling and ride, while all mountings and bushings are optimized to help provide an excellent combination of ride, handling and low noise.

Introduced for the first time on a Lexus, a unique lateral performance damper system has been designed to absorb and minimize body vibrations to offer a more linear steering feel and further enhanced ride comfort. In lieu of conventional fixed bracing, this system features a front performance damper connecting the left and right front suspension towers, and a rear damper connecting the left and right sides of the rear structural frame.

With construction similar to that of a typical monotube suspension damper, the front and rear performance damper assemblies differ according to the variations in body rigidity, noise and vibration of their surroundings, optimizing their ability to absorb body torsion, flexure and fine vibrations. Their installation has reduced vehicle floor vibrations across a wide frequency range, reduced body flex in left and right front suspension tower

displacement, and even lowered audio system white noise levels.

Aerodynamic work was conducted with both computational fluid dynamic (CFD) analysis and wind tunnel evaluation to identify noise sources, assist designers to create appropriate design elements and prove countermeasures. As a result, strategically placed seals, barriers and insulation material are used to eliminate noise paths and insulate passengers from noise sources. Equal attention has been paid to underbody airflow management, the minimization of the vehicle's coefficient of lift essential to both fuel efficiency and handling stability.

The CT 200h employs Lexus' experience with Electric Power Steering (EPS). Its energy saving and lightweight design characteristics make it ideally suited for use in conjunction with the Lexus Hybrid Drive powertrain. The vehicle-speed sensitive steering has been optimized to provide ideal steering feel at any speed. Inertia compensation control, friction feedback and recovery control assist in tailoring the steering feel and effort. The EPS system also helps improve fuel economy by reducing parasitic losses.

Like all Lexus vehicles, the CT 200h braking system is comprehensive, and as a Lexus hybrid it is augmented by regenerative braking which also helps recharge the hybrid battery pack and improve fuel economy. The electronic controlled brake (ECB) system actuator is managed by the ECB computer and acts on the system's hydraulic brake components. The ECB computer also controls the interaction between the four-wheel disc friction brakes and the regenerative brake system.

Standard 17-inch aluminum alloy wheels on the CT 200h are equipped with P215/45 R17 allseason tires. All wheels feature the direct-type Tire Pressure Monitor System (TPMS).

Safety

As with every Lexus, the CT 200h's body structure plays a key role in the fundamental safety characteristics of the CT 200h. To help protect the driver and passengers, the body is designed to be strong but strategically resilient to help absorb and distribute energy in the event of a crash. High strength steel components are carefully located in the body structure, doors and other areas to help ensure strength in key areas.

The CT 200h incorporates an advanced standard eight-airbag Supplemental Restraint System (SRS) with dual-stage airbags and knee airbags for driver and front passenger, side curtain airbags, and front seat-mounted side airbags to help protect passengers in certain types of severe frontal or side collisions.

Additionally, front and rear seats feature three-point, Emergency Locking Retractor (ELR) seatbelts. The driver, front passenger and rear outer seatbelts are also equipped with a pre-tensioner and force limiter function. The ELR is designed to lock up the seatbelt when excessive load is applied over a preset value. During a collision, the force limiter fractionally reduces seatbelt tension to lower occupant chest impact forces.

An optional Pre-Collision System (PCS) with Dynamic Radar Cruise Control can help reduce collision damage. Dynamic Radar Cruise Control uses millimeter-wave radar to measure and help maintain a pre-set distance from a vehicle traveling ahead. PCS is equipped with a front-mounted radar sensor that can detect certain obstacles in front of the car. The PCS computer helps determine whether a frontal collision is unavoidable using information from the radar sensor, vehicle speed, steering angle and yaw-rate inputs. In such a situation, PCS alerts the driver with audible and visual warnings, and preinitializes Brake Assist (BA) so that increased braking will be applied the instant the driver depresses the pedal. In addition, PCS will preemptively retract front seat belts.

Luxury/Comfort/Convenience

The CT 200h conveys comfort and style and is first to offer standard NuLuxe, a unique seat material that looks and feels like leather but is manufactured with the environment in mind. Also standard in the CT are 10-way power-adjustable driver's seat with power lumbar support and four-way manual adjustable front passenger seat.

The CT 200h Premium model receives heated front seats and moonroof.

The high-visibility, electro-luminescent instrument cluster offers fresh methods of keeping track of the various systems in the car and helps the driver to conserve fuel. A hybrid system indicator displays the hybrid system output and regenerative charging status, simultaneously indicating the efficiency of the system related to driving style. An auxiliary Eco Drive Indicator light further assists the driver in maintaining the most economical use of system power.

A multi-information display situated in the instrument cluster keeps the driver informed of the numerous actions controlled by the steering wheel-mounted switches. It uses high-contrast organic lightemitting diode (OLED) technology for maximum visibility and indicates various conditions such as fuel consumption, ambient temperature and cruising range. Additionally, several vehicle functions can be customized through use of the display with the steering-wheel mounted multi-information switch.

Climate control is designed to provide comfort and clean air for all passengers. A dual temperature control system is used for front seat occupants and a dedicated rear blower mounted in the center console promotes quick cool down for the rear passengers. A Plasmacluster ion generator, A/C clean air filter and a pollen removal mode help clean air inside the cabin.

The standard six-speaker sound system with Automatic Sound Levelizer (ASL) and in-dash CD player enhance the CT with a rich and clear sound quality. The speakers feature the world's first automotive speakers constructed with sustainable bamboo and resin. The CT also offers Bluetooth® wireless connectivity, an integrated SiriusXM Satellite Radio receiver (includes complimentary 90-day trial subscription) and USB/iPod® connectivity. When an iPod is attached via the USB port it can be operated via steering wheel controls or from the display screen while information such as names for the artist, track and album is displayed on the headunit or available navigation screen.

Luxury Options
Several important elements inside the CT 200h transform the driving experience, making it easier and more relaxed while also helping to enhance the driver's attention to the road ahead and minimize driver distraction.

The optional Navigation Package includes the HDD navigation system, back-up camera and voice command. It also features Bluetooth hands free phone, phone book download capabilities, and Lexus' exclusive Remote Touch controller with user-adjustable haptic feedback. The state-of-the-art device incorporates numerous, highly sophisticated control systems. The controller, similar to a computer mouse, eliminates the need for touch screen controls, allowing the pop-up navigation system screen to be mounted further up the center stack and away from the driver. The driver benefits with a clear, highresolution screen, improved sight lines and reduced eye movement. These advances combined with the physical feedback provided by the controller make the system extremely easy to use.

For comfort and convenience, an optional Premium Audio Package which includes the Lexus premium audio system with 10 speakers and six-disc CD changer, Homelink® and electrochromic rearview mirror with compass is available. An optional Leather Package includes perforated leather seats, driver memory, and rain sensing variable intermittent wipers. Other optional equipment includes: LED low beam headlights with dynamic auto-leveling with headlamp cleaners, Electrochromatic (autodimming) rearview mirror with backup camera and Pre-Collision System with Dynamic Radar Cruise Control.

The Lexus CT 200h also offers a telematics system, Lexus Enform® with Safety Connect®, available by subscription. Complimentary one-year trial subscriptions are included on all purchases of new Lexus vehicles equipped with these features. Safety Connect is standard on all vehicles while Lexus Enform with Safety Connect is on all vehicles equipped with the optional Navigation system. The Lexus Enform and the Safety

Connect response centers operate 24 hours a day, 7 days a week—every day of the year.

Lexus Enform vehicles are factory ready for subscriptions to a variety of innovative SiriusXM services including NavTraffic, NavWeather, Sports, and Stocks. SiriusXM services offer complimentary 90-day trial subscriptions and require separate audio and data subscriptions.

Exterior Design
The CT 200h's designers created a unique combination of elegance and excitement. The front of the CT 200h is the new embodiment of L-finesse, expressing the perfect balance of precision and power. The grille is pushed forward of the headlamps for greater visual integration with the bumper mid-section below. It incorporates a deeper, more sculpted interpretation of the L-finesse signature arrowhead motif. The upper and lower grilles combine to form a unique 'spindle' shape, bringing both bold simplicity and elegant dynamism to the very apex of the vehicle.

The grille is flanked by headlamp clusters clearly positioned on a higher plane than the grille itself. This is a unique characteristic of Lexus models, focusing the eye at the very apex of the vehicle to give the design a resolute look and strengthen the impression of speed and agility.

To enforce this defined expression, the headlamps themselves focus on piercing, single halogen or optional twin LED low beam lamps. Integral, arrowhead-shaped daytime running lamps feature advanced LED headlight technology, making the CT 200h instantly recognizable at first glance. The deep front bumper and sharply sculpted front air dam flow into clean, muscular front wings which reinforce a purposeful, wide-tracked stance hinting at excellent agility and high speed stability.

The CT 200h's sweeping lines mimic the natural flow of wind over and around the bodywork, creating a dynamic yet elegant design that combines beauty with aerodynamic efficiency. The result, a coefficient of drag (Cd) of only 0.29, which both maximizes fuel efficiency and minimizes wind noise to further enhance the exceptional quietness of the Lexus full hybrid's cabin.

In profile the steeply raked windscreen, long flowing roofline and unique, and Lexus slingshot window graphic combine to create an elegant and highly distinctive silhouette. New, compact and aerodynamic door mirrors with an integral, LED side turn signal lamp feature a two-tone finish for a slimmer appearance. The long roof and sweeping character lines of the door form a tapered cabin shape which naturally curves in at the rear to follow the movement of air as it flows into the vehicle's wake.

To the rear, a pronounced step in the tailgate section flows from the muscular rear wheel arch shoulders, emphasizing the wraparound rear window design. Anchored by sweeping tail lamps incorporating a Lexus-unique L-shaped motif first introduced in the LS, this step combines with a broad rear bumper design to reinforce the new full hybrid's wide, firmly planted stance.

The flow of air away from the rear of the CT 200h is carefully controlled through the finely honed trailing edge of the deep roof spoiler, aerodynamic fins at the corners of the rear windows and the sharp, near-vertical junction of rear wing and bumper. Careful aerodynamic detailing of the lower bumper and finned rear undercover smooths airflow from beneath the car, further improving both vehicle stability and fuel consumption.

Interior Design
Lexus' latest adaptation of the L-finesse philosophy is carried into the interior of the CT 200h. A powerful simplicity of form harmonizes with the hand-crafted quality feel of even the smallest details to create a uniquely efficient, elegant and spacious cabin design. The dashboard is divided into two distinct zones: an upper, Display Zone, with an eight-inch, LCD multi-display screen located at an ideal distance for at-a-glance viewing, and a lower, Operation Zone, which allows access to the uniquely designed shift lever and system controls such as the

optional Remote Touch.

This clear division of zones creates the CT 200h's unique fusion of an airy, spacious cabin and a sporty cockpit which places the emphasis on a snug, comfortable and highly focused driving environment. The front seats in the CT 200h feature pronounced side bolsters engineered with internal wire framing for additional lateral support during high-G cornering. Functional driving components are consolidated in the driver's seat surroundings, combining outstanding ergonomics with advanced Human/Machine Interface technologies.

The flattening of the center of the rear seats, the thinning of the front seatbacks and the flat floor of the CT 200h's platform result in a cabin which offers rear seat passenger roominess with spacious leg and headroom. With the compact hybrid battery located low beneath the loadspace floor and the adoption of a fully independent double wishbone configuration minimizing suspension component intrusion into the luggage compartment, the CT 200h offers a spacious cabin and surprisingly large trunk space.

The extensive use of metallic finishes and dark, soft touch materials reinforces the premium quality of the environment. The shape and form of each interior component has been carefully designed to express the true form of the materials, such as the brushed finish of door handle bezel and the highly tactile shift lever, seemingly carved from a single billet, and generously bound leather.

The CT 200h provides customers unprecedented customization opportunities through the widest diversity of color schemes offered in a Lexus model. The interior is available in a choice of Black or Gray leather trim and upholstery, and three NuLuxe finishes –Black, Ecru or Caramel. These finishes are complimented by a choice of Matte Wood, Silver Metallic or Bamboo dashboard panel inserts installed by the dealer.

Improving on its environmental impact, ecological materials and practices are used in the creation of the CT. Interior Ecological Plastics with 30 percent plant-based Polyethylene terephthalate (PET) materials are used for the floor mats, deck side and deck board trim. Also, the new hybrid is more than 80 percent recyclable and is designed to be easily dismantled as recycle marks have been placed on the front, rear and tailgate trim to facilitate optimum recycling.

F Sport Package
An optional F Sport Package takes inspiration from the Lexus F Sport Performance accessories, combining F Sport-tuned suspension and 17-inch wheels with high-gloss finish. Adding to the sporty feel are a front grille with mesh pattern, metal front scuff plates, perforated leather steering wheel, leather shift knob, aluminum sport pedals and metallic trim on the dash panel. Black NuLuxe trimmed seats or
perforated black leather-trimmed seats are also available in the F Sport package.

Warranty
All new Lexus vehicles come with a 48-month/50,000-mile basic limited warranty with roadside assistance for 48 months/unlimited miles. Powertrain and restraint system coverage is provided for 72 months/70,000 miles. Corrosion perforation protection is covered for 72 months, regardless of mileage. The hybrid-related components, including the HV battery, battery-control module, hybrid control module and inverter with converter, are covered for eight years/100,000 miles.

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