

# GS 450h Offers V8-Like Performance with Low Emissions

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## 2011 Lexus GS 450h 007

- 340 HP Total Output with Combined 23 MPG Ratings
  - Powerful Torque Provides Smooth Acceleration
  - Seamlessly Blends Refinement and Sportiness

After receiving stylish exterior changes in 2010, the GS 450h enters the 2011 model year as one of the most refined hybrid luxury sport sedans available today with a myriad of convenience features. The GS 450h features impressive fuel economy ratings for the smooth and powerful acceleration it provides. In its fifth model year, the GS 450h continues to be a favorite fun-to-drive vehicle.

### **Engine/Transmission/Drivetrain/Performance**

Based on the GS platform and featuring Lexus Hybrid Drive technology, the GS 450h offers V8-like performance with greater fuel efficiency. In addition to boosting performance and fuel efficiency while lowering emissions, Lexus Hybrid Drive technology also further accentuates the brand's renowned smooth, quiet operation.

As a full hybrid, the GS 450h is capable of operating in gas-only or electric-only modes, or a combination of the two. With its unique transmission, the GS 450h was the first hybrid vehicle to enable the electric drive motor to contribute to highway performance, not just slow-speed driving.

The GS 450h model's version of the Lexus Hybrid Drive powertrain combines a powerful 3.5-liter V6 engine with a compact, permanent magnet electric motor – all driving the rear wheels. The hybrid powertrain collectively produces 340 horsepower and can effortlessly accelerate the GS 450h from zero-to-60 mph in just 5.2 seconds.

Just as impressive as the GS 450h's acceleration from a stop is how quickly and powerfully torque is delivered during mid-range acceleration. The hybrid system's electric-drive motor delivers maximum torque immediately upon demand. This unique power-delivery characteristic is most noticeable, and most useful, during 30-to-50 mph passing and in traffic-merging maneuvers. The GS 450h returns EPA-estimated fuel economy of 22 mpg city/25 highway/23 combined and is certified as a Super-Low Emissions Vehicle II (SULEV II).

The gasoline V6 uses an Electronic Throttle Control System with intelligence (ETCS-i) and a dual fuel-injection system that combines the benefits of direct injection with those of port injection. Dual Variable Valve Timing with intelligence (VVT-i) operates on the intake and exhaust valves to further enhance power and torque across a broad engine speed range.

The GS 450h hybrid powertrain uses two motor-generators, MG1 and MG2 (the drive motor). Each performs specific functions and can operate as both a motor and a generator, although MG1 is used as a starter motor and provides no motive force. The engine-driven generator (MG1) can charge the battery pack or provide additional power to MG2 as needed.

A 288-volt DC Nickel Metal Hydride (Ni-MH) battery pack is installed behind the rear seat area. The battery's power is directed through a "boost converter" that can efficiently raise voltage to a maximum 650V DC. An inverter changes this to AC, providing its elevated power to the 147-kW electric motor, which turns as high as 14,400 rpm. A 12-volt auxiliary battery powers various vehicle systems, including audio and navigation.

Power from the gas engine and MG2 is distributed to the rear drive wheels via a planetary gear-type Electronically-controlled Continuously Variable Transmission (ECVT). This special transmission, which

eliminates specific gear ratios, features a two-speed torque-multiplication device that allows drivers to select from among three driving modes: Power, Normal and Snow. “Normal” provides the smoothest operation and is ideal for city or suburban driving; “Power” sharpens accelerator pedal response, and “Snow” mode softens accelerator pedal response making it easier to travel on slippery road surfaces.

The ECVT consists of a motor generator, motive power-dividing mechanism, two-stage motor-reduction device, electrically powered oil pump and hydraulic control system. The two-stage torque-multiplication device varies the gear ratio in two stages by controlling a planetary gear and two wet brakes, similar to the way a conventional automatic transmission operates.

This configuration allows the electric drive motor to operate in high or low ranges, with seamless transitions between the two. MG2 can therefore contribute power not just for acceleration, but at higher cruising speeds as well.

The GS 450h is driven solely by its electric motor when starting, traveling slowly, and during low-load driving, the resulting super-quiet operation enhancing the luxury experience. A regenerative braking system further boosts system efficiency. When the vehicle is coasting or the brakes are applied, the electric motors function as generators, capturing kinetic energy that would normally be lost as heat through the brakes and transforming it into useable electricity to recharge the batteries.

### **Chassis/Body/Suspension/Tires/Brakes**

The GS 450h matches its powerful acceleration with responsive handling while maintaining the ultra-comfortable ride that is synonymous with the Lexus brand. Instead of attempting to mask noise, the engineers designed fans and motors to significantly reduce cabin-noise intrusion. Fluid-filled front-engine mounts, additional sound-absorbing asphalt sheets behind the instrument panel, and a sound-absorbing windshield further enhance the quiet ride that redefines the term “Lexus-like.”

Double-wishbone front and multilink rear suspension systems endow the GS 450h with engaging handling performance. Like the V8-powered GS 460 gas model, the GS 450h is equipped as standard with Adaptive Variable Suspension (AVS), a driver-selectable shock absorber damping system.

The standard 18 x 8-inch aluminum alloy wheels are unique to the GS 450h and equipped with 245/40R18 Z-rated summer performance tires; all-season run-flat tires are available. An optional Active Power Stabilizer system helps to further reduce body sway during cornering. The system uses an Electronic Control Unit (ECU) to calculate the force needed to counter excess body sway, which is then applied to the stabilizer bars by front and rear electric-powered actuators.

The GS 450h is equipped with the brand’s highest level of dynamic handling technology: the Vehicle Dynamics Integrated Management (VDIM) system that goes beyond the capability of other stability and traction-control systems. VDIM is designed to anticipate the onset of a vehicle slide while cornering and then help to automatically correct the situation with a combination of braking, throttle and steering control in a way that is essentially transparent to the driver. VDIM integrates Electric Power Steering (EPS), Variable Gear Ratio Steering (VGRS), Antilock Braking System (ABS), Electronic Brake-force Distribution (EBD), Brake Assist (BA), Vehicle Stability Control (VSC), Electronically Controlled Brakes (ECB), and Traction Control (TRAC).

### **Safety/Security Features**

All Lexus GS models implement a wide array of advanced safety systems. The Supplemental Restraint System (SRS) includes variable-force front airbags for both the driver and front passenger. Sensors are designed to determine the severity of an impact and in turn the airbag deployment force, helping to provide an appropriate level of occupant restraint. The GS features a total of eight standard airbags including seat-mounted side airbags

for the front seats, knee airbags for the driver and front passenger, and front and rear side-curtain airbags.

The optional Pre-Collision System (PCS) can help reduce impact damage in an accident. A millimeter-wave radar sensor helps detect obstacles in front of the car, while vehicle speed, steering-angle and yaw-rate inputs help to determine whether a collision is unavoidable. In such a situation, PCS switches the AVS to sport mode to help provide appropriate chassis response, preemptively retracts front seat belts, and pre-initializes BA so that increased braking will be applied the instant the driver depresses the pedal.

The Adaptive Front-lighting System (AFS) helps illuminate a curve as the driver steers into it. Intuitive Park Assist (IPA) uses ultrasonic sensors to detect the presence of objects close by and warn the driver of their proximity.

### **Luxury/Comfort/Convenience**

As the top model in the GS line, the GS 450h features the highest level of standard luxury equipment and includes features that are optional on other GS models: 10-way power-adjustable heated and ventilated front seats, rain-sensing automatic windshield wipers, rear back-up camera and headlamp washers. Controls are simple and intuitive, avoiding needless complexity.

A power-tilt and telescopic steering wheel helps ensure a comfortable driving position. The standard dual-zone climate-control system filters the air. The SmartAccess keyless entry and push-to-start ignition allows the driver to keep the access fob in a pocket or purse. A rear power sunshade adds to passenger comfort on warm days.

The standard 10-speaker 134-watt Lexus Premium Audio system includes an in-dash, six-disc CD changer, Automatic Sound Levelizer, iPod®/USB connectivity, Bluetooth® hands free phone capability and music streaming, and an integrated XM Radio receiver (complimentary 90-day trial subscription included). When connected to the USB port, the iPod can be controlled through the audio system or steering wheel controls, while information such as names for the artist, track and album is displayed.

### **Luxury Options**

All styles of music come to life in the ultra-quiet Lexus GS interior with the optional 7.1-channel Mark Levinson® Premium Sound system. Featuring a total of 330 watts playing through 14 speakers, the system allows users to play both CDs and DVDs. DVD movies can be viewed on the color seven-inch touch screen when the parking brake is engaged.

The available Hard Disc Drive (HDD) Lexus Navigation System eliminates the need for DVD map discs and offers enhanced Bluetooth® with phonebook download and Voice command, a casual-language—based voice recognition feature. This technology allows the driver to give more flexible, conversational commands for easier access to audio, climate, and navigation system functions. Voice command helps users avoid having to speak commands in a specific order?making tasks easier to accomplish, in fewer steps, and helping to allow drivers to focus more on the road ahead.

System functions include multiple route calculations, route preview, simplified highway junction graphics, and a dual-map screen mode. Bluetooth wireless technology and compatible phones allow the transfer of personal phone books to the navigation system, from which the driver can make hands-free phone calls.

The Lexus GS 450h also offers a telematics system, Lexus Enform® with Safety Connect®, available by subscription. Safety Connect is standard on all vehicles, while vehicles equipped with the optional Navigation system have Lexus Enform with Safety Connect. Complimentary one-year trial subscriptions are included on all purchases of new Lexus vehicles. 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 XM services including XM NavTraffic®, XM NavWeather™ and XM Sports and Stocks services. XM services require separate XM subscriptions. The XM Sports and Stocks service is included with an XM radio subscription. All XM services offer complimentary 90-day trial subscriptions.

### **Exterior Design**

The current generation GS sedans introduced the brand's L-finesse design language. A 112.2-inch wheelbase, long hood, pulled-back cabin and short rear deck create a confident, powerful stance for the GS. A low 0.27 coefficient of drag (Cd) helps to maximize highway fuel efficiency and minimize wind noise. Subtle visual differences distinguish the GS 450h from other GS models. These include a blue hybrid designation on the side rocker moldings, aluminum-and-blue enameled rear model designation, front grille, special 18-inch light-alloy wheels, a Lexus Hybrid Drive engine cover, blue front and rear "L" logos, a blue tint to the headlamps, clear tail lamp covers and a power meter that replaces the tachometer.

### **Interior Design**

Ultra-premium wood, polished-metal accents and leather trim endow the GS interior with a lavish yet high-precision feel. Touch points convey quality, and controls respond fluidly. Regency leather-trimmed seats are available in Light Gray, Parchment or Black leather matched with wood trim in Dark Gray Bird's-eye Maple, Golden Bird's-eye Maple or Red Walnut, respectively. The wood and leather-trimmed three-spoke steering wheel – featuring audio and multi-information display controls – is complemented by a matching shift knob. The three-pod analog instrument cluster features an electrochromic display and variable-transparency glass for high visibility in a variety of light conditions.

### **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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