

THE LEXUS HYBRID RANGE



 LEXUS

A BREAKTHROUGH SOLUTION

For a long time luxury car manufacturers struggled with the question of how to deliver more power without simply building bigger engines that burn more fuel and produce more emissions. Driven by the pursuit of perfection, in 2004 Lexus introduced a breakthrough solution: Lexus Hybrid Drive.

By intelligently combining a highly efficient petrol engine with one or more high-output electric motors, Lexus Hybrid Drive achieves what was previously impossible: the power and acceleration of a high-performance luxury car with the impressive fuel economy and lower emissions of a smaller car. As these characteristics are delivered with such unparalleled quietness, responsiveness and sophistication, it takes the automotive experience to a higher level.

Today, Lexus Hybrid Drive is available in a range of four breakthrough Full Hybrid luxury cars: the RX 450h crossover and the forthcoming CT 200h compact, now both specified with second-generation Lexus Hybrid Drive; the GS 450h performance hybrid sedan; and the flagship LS 600h luxury hybrid sedan with permanent All-Wheel Drive.





LEXUS: PIONEERS OF HYBRID

At present, Lexus is still the only luxury car manufacturer to offer a comprehensive range of Full Hybrid vehicles. Each one features an incredibly advanced powertrain. This provides you with the ultimate smooth ride, seamless linear acceleration, better fuel economy and far fewer harmful emissions. All this, together with unsurpassed luxury.

In 2004, the launch of the RX 400h SUV introduced Lexus Hybrid Drive to the world. And, with each new model, we have continued to refine and redefine the technology. Today, with the LS 600h, GS 450h, RX 450h and forthcoming CT 200h compact, we offer a complete range of luxurious Full Hybrid vehicles.

However, not all hybrids are created equal, and hybrid technology can vary from one car manufacturer to another. Generally, there are two types of hybrid vehicles: Mild Hybrids and Full Hybrids. With a Mild Hybrid vehicle, the petrol or diesel engine is usually the major power source, while the electric motor merely assists the engine. For the vehicle to operate, the petrol (or diesel) engine must be turned on. In the more advanced hybrid vehicles, known as Full Hybrids, the combustion engine and electric motor work alongside each other, seamlessly. These vehicles not only start using electric power alone, but can also be driven solely by electric power. At Lexus, all our hybrid vehicles are - and have always been - Full Hybrids.





UNIQUE DRIVING EXPERIENCE

You may be attracted to a Lexus Hybrid Drive car because you admire the intelligence and efficiency with which it extracts more performance from every drop of fuel. Or because you want to reduce your environmental impact. But, whatever your reasons, you will be rewarded with a sophisticated driving experience that has no parallel.

Lexus Hybrid Drive cars are a joy to drive. The instantaneous delivery of torque makes acceleration extremely rapid. Combine this with the extraordinary smoothness of Electronic-Continuously Variable Transmission, which has none of the jumps between gears of a regular transmission, and the feeling is unlike anything you can experience in a conventionally-powered vehicle. It's an astonishing surge of power, which we describe as 'linear acceleration'.

Lexus Hybrid Drive cars are extremely quiet, indeed almost uncannily so. And, since Lexus hybrids are usually driven by just their electric motor(s) when starting and travelling slowly, they are much quieter than cars which are powered by petrol alone.

HIGH EFFICIENCY, LOW EMISSIONS

By combining a hybrid battery, electric motor(s) and petrol engine, Lexus Hybrid Drive is able to significantly reduce fuel consumption (to that typical of much smaller cars) while still delivering incredible performance for all types of driving situations. Furthermore, fuel consumption and emissions are zero when the engine is turned off and the vehicle is operating in electric-only mode using the advanced compact battery to power the car's electric motor(s). Additionally, on the RX 450h, LS 600h and forthcoming CT 200h, the driver can select Electric Vehicle mode for electric-only, emission-free driving over short, low-speed distances.

Importantly for urban driving, Lexus hybrid vehicles produce 70% fewer smog-forming emissions than the average new vehicle. Emissions of CO₂, CO, NO_x and HC are much lower than from vehicles of similar refinement and performance. And, as Lexus Hybrid Drive uses either a 4-cylinder, V6 or V8 petrol engine, no diesel soot and very few other particles are produced. You'll also notice that - when you come to a halt, at low speeds, while braking, or often when you take your foot off the accelerator - the petrol engine will switch off silently and automatically. At these times, 'zero emissions' are being produced and no fuel is being used.





SMOOTH PROGRESS

Using advanced battery technology, perfected over many years with our supplier, Lexus Hybrid Drive vehicles can operate purely on electric power at start-up and at lower speeds. Progress is quiet and noise levels are significantly less than those of conventionally-powered cars.

In addition, the revolutionary hybrid transmission and electric motor(s) reduce the hesitation and vibration associated with shifting between fixed gear ratios in a regular transmission. Noise is further reduced as the petrol engine does not have to be running to operate the electric-powered air conditioner in Lexus hybrid vehicles, while Electric Power Steering eliminates the hydraulic pump associated with steering noise and vibration.

LEXUS HYBRID DRIVE

To create the world's first family of luxury hybrid cars, Lexus had to develop advanced systems and new components – and then make them work together seamlessly.

Lexus Hybrid Drive components:

- A. Petrol engine
- B. Hybrid transmission
- C. Power Control Unit
- D. Advanced compact battery
- E. High-performance electric motors

ULTRA-SMOOTH PETROL ENGINE

Lexus Hybrid Drive cars are built around ultra-smooth and efficient 4-cylinder, V6 and V8 petrol engines. The painstaking development of high rigidity components, the optimum balance of all moving parts, the minimisation of friction and unprecedented precision assembly all contribute to remarkable refinement and quietness. State-of-the-art valve and direct injection technology help deliver optimum engine efficiency throughout the power band.

HYBRID TRANSMISSION

The two motive forces of Lexus Hybrid Drive are combined via the Electronic-Continuously Variable Transmission, a planetary automatic transmission with infinitely variable gear ratios that continuously change depending on vehicle speed and engine rpm. The result: gear changes so smooth that they are almost impossible to discern.



POWER CONTROL UNIT

The advanced Power Control Unit (PCU) is one of the key components in Lexus Hybrid Drive. Similar in size to a conventional car battery, it seamlessly controls the allocation of the car's power resources to ensure optimum efficiency at all times. Featuring breakthrough cooling technology, the PCU makes sure you have astonishing power when you need it. At other times, it is efficiently storing electrical energy in the hybrid battery for later use.

ADVANCED COMPACT BATTERY

This is where the electric power generated by Lexus Hybrid Drive is stored until it's required. Our nickel-metal hydride advanced compact batteries provide high power output in relation to their light weight. Built for longevity, they do not require recharging from an outside power source.

HIGH-PERFORMANCE ELECTRIC MOTOR(S)

Advanced electro-mechanical operation, compact design and low weight ensure that our water-cooled synchronous motor(s) deliver remarkable levels of instantaneous torque. Operation is very smooth and almost silent.

HIGHLY INTELLIGENT POWER

After owning a Lexus hybrid for a while you may begin to take an interest in the power flow animations on the car's central display screen. Watching them, you'll start to realise why there's far more to this car than meets the eye. And it's all overseen by the Power Control Unit, which is constantly working behind the scenes to optimise power distribution according to your needs - and those of the environment.

- At low speeds - in city traffic, for example - power usually comes from the electric motor(s) alone. It's virtually silent and free of all emissions - not just CO₂ but also NO_x and particulates. And that means cleaner air for all to breathe.

- If you should want breathtaking acceleration, it's there: just put your foot down and you get immediate access to the combined forces of a high-performance petrol engine and one or more high-output electric motors.

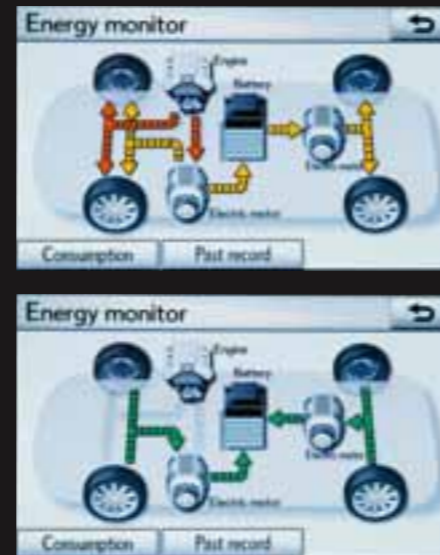
- When you're cruising at higher speeds, the electric motor(s) shut down and the petrol engine takes the leading role, powering the car while simultaneously converting surplus engine power into electricity to be stored in the advanced compact battery for future use.

- Electricity is also generated while the car is braking, making use of kinetic energy that is wasted in other cars. For this to happen, the electric motor(s) intelligently change role and act as a generator.

- As you coast or descend a hill, the system may see an opportunity to save petrol by switching off the engine. At the same time, it may also decide the time is right to convert more kinetic energy into electrical energy for storage in the advanced compact battery.

- At a standstill (when you're waiting at traffic lights, for instance) Lexus Hybrid Drive usually switches off its petrol engine, thus saving fuel and minimising emissions that could be damaging to the global and local environment.

But the electric motor(s) are always on standby and available for immediate take-off.



The RX 450h and forthcoming CT 200h's second-generation Lexus Hybrid Drive is extremely intelligent and offers an innovative range of advanced new control features such as Electric Vehicle mode for

'zero emissions' driving and ECO mode for reducing the cars' environmental impact.

THE LEXUS HYBRID RANGE

In 2004, Lexus was the first marque to introduce hybrid technology to the luxury car, with the launch of the RX hybrid SUV. Since then, we have continued to refine our hybrid technology through multiple model generations, and cars with Lexus Hybrid Drive have covered millions of kilometres in real-life driving conditions.

Today, Lexus remains the only luxury carmaker to offer a complete range of high-performance hybrid vehicles.

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CT 200h

FULL HYBRID COMPACT

With production commencing at the end of 2010, the groundbreaking new CT 200h – the world's first Full Hybrid luxury compact – has been specially developed for tomorrow's forward thinking driver. Powered by second-generation Lexus Hybrid Drive, the car lets you adjust its performance characteristics to suit your mood – thanks to a choice of driving modes. Electric Vehicle mode allows you to drive almost silently at up to 45 km/h on the electric motor alone, emitting no CO₂ or NO_x. ECO and NORMAL modes offer a relaxing drive, with particular attention paid to ride comfort, smooth acceleration and noise minimisation. For a more dynamic drive, SPORT mode delivers extra responsiveness and also transforms the hybrid power meter to a tachometer, changing instrument illumination from blue to red.

Taking Lexus L-finesse design to the next level, the 5-door CT 200h is enhanced by short overhangs, a low, wide stance and innovative sports styling. An integrated rear spoiler manages airflow behind the car, while sculpted front wings guide air along the streamlined cabin sides and lower body aerodynamics cut noise even further. Additionally, efficient LED low-beam headlights and LED rear lights add beauty and reduce the consumption of electric energy for lighting by up to 30%.

Inside, the new CT 200h offers outstanding Lexus quality, comfort and ergonomics, while Remote Touch on the centre console gives intuitive control of many advanced features, including entertainment, climate and navigation.

- Lexus Hybrid Drive
- 1.8-litre 4-cylinder petrol
- Electric Vehicle mode
- ECO mode
- NORMAL mode
- SPORT mode
- Electronic-Continuously Variable Transmission
- Front-Wheel Drive
- 8 sensor-controlled airbags

Selected options and packages

- Light Emitting Diode low-beam headlights
- Mark Levinson® Premium Surround system
- Hard Disk Drive navigation package
- Remote Touch
- Pre-Crash Safety System with Adaptive Cruise Control*

* Not available in all countries. Please consult your local Lexus Authorised Retailer regarding availability in your country.



RX 450h

FULL HYBRID CROSSOVER

The visionary new RX 450h is a sophisticated crossover with the handling, performance, refinement and ride of a luxury sedan. Yet, by fully harnessing the technology of Lexus Hybrid Drive, CO₂ emissions are only 148 g/km, extraordinarily low for a vehicle of its size. And, with the new Front-Wheel Drive version, this value is lowered even further to just 140 g/km.

The stunning new RX 450h offers all the classic space of a large SUV, while exuding an unmistakable aura of dynamism. But the beauty of the car goes much deeper than looks and exceptional comfort: it takes another important step towards maximising driving pleasure while minimising environmental impact. This is made possible by second-generation Lexus Hybrid Drive, which intelligently combines a breakthrough 3.5-litre V6 petrol engine with two high-output electric motors and an advanced compact battery. Working together, these power sources provide a maximum combined output of 220 kW. When accelerating firmly, the driver experiences astonishingly smooth linear power, with none of the jumps or delays of a conventional transmission, achieving 0 - 100 km/h in just 7.8 seconds.

- Lexus Hybrid Drive, 220 kW system output
- 3.5-litre V6 (Atkinson Cycle) petrol
- Electric Vehicle mode
- ECO mode
- Electronic-Continuously Variable Transmission
- All-Wheel Drive or Front-Wheel Drive
- 10 sensor-controlled airbags
- 18" alloy wheels
- Organic Light Emitting Diode multi-information display
- Vehicle Dynamics Integrated Management

Selected options and packages

- 19" alloy wheels
- Light Emitting Diode low-beam headlights
- 15-speaker Mark Levinson® Premium Surround system with 6-CD/DVD changer
- Hard Disk Drive navigation package (Remote Touch)
- Pre-Crash Safety System with Adaptive Cruise Control*
- Rear seat entertainment
- Executive, Technology, Luxury and Premier grades

* Not available in all countries. Please consult your local Lexus Authorised Retailer regarding availability in your country.



GS 450h

FULL HYBRID PERFORMANCE SEDAN

The dynamic GS 450h offers outstanding performance, thanks to the intelligent and seamless combination of a 3.5-litre V6 direct-injection petrol engine and a high-output electric motor. The GS 450h is both extraordinarily swift and effortlessly smooth - accelerate firmly and you'll experience astonishing linear power delivery, achieving 0 - 100 km/h in less than 6 seconds.

As you enjoy the car's sophisticated fusion of luxury, style and comfort, a highly intelligent Power Control Unit is constantly optimising power distribution. In the city and at low speeds it will make most use of emission-free electric power, while at higher speeds the V6 takes the leading role.

Advanced energy management makes the GS 450h substantially more frugal than comparable high-performance sedans. Come to a halt or drive downhill, and the petrol engine often shuts down silently to save fuel and reduce emissions. When braking, the kinetic energy wasted in conventional cars is converted into electrical energy to charge the battery.

- Lexus Hybrid Drive, 254 kW system output
- 3.5-litre V6 petrol
- Electronic-Continuously Variable Transmission
- Rear-Wheel Drive
- 8 sensor-controlled airbags
- 17" alloy wheels
- Adaptive Variable Suspension
- Touch-screen display
- Vehicle Dynamics Integrated Management

Selected options and packages

- 18" alloy wheels
- Active stabilisers
- Luxury package
- Hard Disk Drive navigation and multimedia packages (Touch-screen)
- Pre-Crash Safety System with Adaptive Cruise Control*
- Semi-aniline leather seat package

* Not available in all countries. Please consult your local Lexus Authorised Retailer regarding availability in your country.



LS 600h/LS 600h L

FULL HYBRID LUXURY SEDAN

At the heart of the new Lexus flagship is the most powerful Lexus Hybrid Drive yet seen in a production car. The LS 600h delivers an unprecedented combination of rapid acceleration, quiet running, impressive fuel economy and lower emissions. The car's great power is delivered seamlessly to the road via its Electronic-Continuously Variable Transmission and permanent All-Wheel Drive, whilst Vehicle Dynamics Integrated Management ensures remarkably poised handling.

From its beautiful LED headlights to its sculpted tailpipes, the LS 600h is shaped by the captivating aesthetics of Lexus design. The tranquil interior is a showcase for the talents of some of the world's finest automotive craftspeople: exquisitely hand-finished leathers, beautifully grained wood, lustrous varnishes, meticulous stitching - all bear witness to our enduring pursuit of perfection.

For those who seek the last word in luxury, we offer our first-ever long wheelbase version, the LS 600h L.

- Lexus Hybrid Drive, 327 kW system output
- 5.0-litre V8 petrol
- Electric Vehicle mode
- ECO mode
- Electronic-Continuously Variable Transmission
- Permanent All-Wheel Drive
- 8 (LS 600h) to 11 (LS 600h L) sensor-controlled airbags
- 19" alloy wheels with Brembo® brakes
- Automatic High-beam System
- Hard Disk Drive navigation system with Dynamic Route Guidance (Touch-screen)
- 19-speaker Mark Levinson® Reference Surround with 6-CD/DVD changer
- Vehicle Dynamics Integrated Management

Selected options and packages

- Advanced Pre-Crash Safety package*
- Intelligent parking assist
- Rear seat upgrade and entertainment packages (LS 600h)
- Rear seat relaxation and entertainment package (LS 600h L)

* Not available in all countries. Please consult your local Lexus Authorised Retailer regarding availability in your country.



TECHNICAL DATA

LEXUS HYBRID DRIVE



RX 450h
Full Hybrid Crossover



GS 450h
Full Hybrid Performance Sedan



LS 600h / LS 600h L
Full Hybrid Luxury Sedan

	RX 450h	GS 450h	LS 600h / LS 600h L
HYBRID TECHNICAL DATA			
Cylinders/capacity (cm ³)	V6/3456	V6/3456	V8/4969
Max. power (kW@rpm)	183@6000	218@6400	290@6400
Max. torque (Nm@rpm)	317@4800	368@4800	520@4000
Total system output (kW)	220	254	327
Max. speed (km/h)	200 (180)*	240	250
0-100 km/h (sec.)	7.8 (8.2)*	5.9	6.3
Fuel consumption (l/100km, combined)	6.3 (6.0)*	7.6	9.3
CO ₂ emissions (g/km, combined)	148 (140)*	179	218 (219)**
Length (mm)	4770	4850	5060 (5180)**
Width (mm)	1885	1820	1875
Height (mm)	1685	1430	1480
Wheelbase (mm)	2740	2850	2970 (3090)**

* RX 450h with Front-Wheel Drive.

** LS 600h L

- A. Hybrid alloy wheel
- B. Hybrid engine cover
- C. Hybrid energy monitor
- D. Hybrid rear badge
- E. Hybrid side badge
- F. Illuminated scuff plate



HYBRID QUESTIONS AND ANSWERS

How long does the hybrid battery last/keep its charge?

The hybrid battery is covered by the 5 year/100,000 kilometre component warranty of the vehicle. In normal use, we expect the battery to last much longer than the duration of this warranty. The length of time the battery holds its charge is dependent on many factors, including driving style, frequency of vehicle usage and ambient weather conditions.

How far can I travel on battery power alone?

While Lexus Hybrid Drive will operate on battery power alone at low speeds, the system is designed to make optimum use of the petrol engine and electric motor or motors. The actual distance you can travel purely on battery power depends on a variety of factors, including road and weather conditions, the level of battery charge, vehicle load and driving style.

Who developed the advanced compact battery technology?

Working in partnership with Panasonic EV Energy in Japan, our engineers spent many years perfecting compact battery technology for the

RX 450h, GS 450h, LS 600h and forthcoming CT 200h. The high-output nickel-metal hydride battery pack is linked to a monitoring unit to manage charging conditions, perform failsafe management and control the cooling fan for the system. The battery pack is normally never charged to maximum capacity as this helps to prolong battery life and also provides a reserve to store energy generated from regenerative braking. Importantly, Lexus hybrid batteries have proven to be extremely safe and offer the incredible reliability you expect from Lexus. Designed to be compact for placement in the boot or under the rear seat, the battery is encased in a sealed metal container. This container meets the highest standards of protection, shielding occupants from electromagnetic fields. In the event of an accident, crash sensors immediately disconnect the battery.

What happens during braking?

Lexus Hybrid Drive features regenerative braking technology. The kinetic energy produced during braking is transformed into electricity and stored in the advanced compact battery. This means energy is recaptured which would otherwise be lost as heat, which contributes to efficient and responsible driving.

If I run out of fuel, can I use electricity to drive?

No. Although Lexus Hybrid Drive enables the vehicle to operate on electric power at slow speeds when there is fuel in the tank, it is not designed to run without fuel. Doing so could cause severe damage, so drivers should be sure to keep fuel in the tank at all times, just as you would with a conventional petrol- or diesel-powered car.

Are the specifications of Lexus Hybrid Drive vehicles the same as the equivalent petrol versions, or is the boot smaller for example? What are the other differences?

All Lexus Hybrid Drive models are specified with a hybrid transmission, rather than a conventional automatic gearbox. The luggage space is identical for the RX 350 and RX 450h models. The boot is smaller in the GS and LS hybrid models, although there is still generous storage capacity, while the forthcoming CT 200h luxury compact has ample boot space for this class of vehicle.

What is the maximum speed the hybrid drive vehicle reaches before the petrol engine starts?

This will vary depending on several factors, including the battery charge level, general driving conditions and vehicle load. Under gentle acceleration with a well-charged battery, Lexus Hybrid Drive vehicles are capable of achieving approximately 40 km/h using only the electric motor or motors. It should be noted, however, that Lexus Hybrid Drive is designed to make optimum use of both power sources and is not intended to operate purely as an electric vehicle.

How and when does Lexus Hybrid Drive switch from petrol engine to electric motor or motors? Can I switch it?

Usually, at start-up and at low speeds, only the electric motor or motors power the vehicle. As speed increases, the Power Control Unit (PCU) will switch on the petrol engine to provide additional power. At cruising speeds, the PCU silently shuts down the electric motor(s) and the petrol engine is then the sole source of power. But additional electric power can be delivered in an instant if required, for example, if the driver accelerates hard to overtake.

In the LS 600h, RX 450h and forthcoming CT 200h, the driver can choose to switch to Electric Vehicle mode for a short period where conditions permit.

Can I leave my Lexus Hybrid Drive vehicle for an extended period of time, while on holiday for example, without having to recharge the system?

As with all vehicles, if left for an extended period of time without use, it should be stored in a reasonably protected environment ensuring that the vehicle is not exposed to severe weather conditions. In the unlikely event that the hybrid system's battery discharges completely, the petrol engine will start the car and be used to recharge the hybrid battery. Of greater significance is the risk of discharge of the conventional battery, which could affect non-hybrid vehicles as well.

How reliable is Lexus Hybrid Drive?

Lexus Hybrid Drive has been developed to be as reliable as our petrol- and diesel-powered vehicles. So, in short, very reliable.

EXPERIENCE A LEXUS HYBRID TODAY

The only way to truly understand what makes Lexus Full Hybrid cars so special is to drive one yourself. Please contact your nearest Lexus Authorised Retailer or national Lexus website to arrange a test drive.



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Note: vehicles pictured and specifications detailed in this brochure may vary from models and equipment available in your area. Vehicle body colour might differ slightly from the printed photos in this brochure.

For further information please visit our website www.lexus.eu

Taking care of the environment is a priority for Lexus. We take many measures to ensure that during the lifecycles of our vehicles - from design, production, distribution, sales and service to end-of-life - their environmental impact is minimised. Your retailer will be happy to provide more information on end-of-life vehicle requirements.

* Lexus Europe is a division of Toyota Motor Europe NV/SA.

Printed in Europe, April 2010