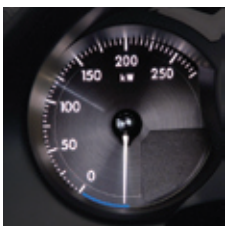


LEXUS GS450h - LUXURY PERFORMANCE HYBRID



INSTEAD OF A TYPICAL REV COUNTER, THE GS450h IS FITTED WITH A SPECIALLY DESIGNED ENERGY MONITOR TO MEASURE POWER FLOW IN KILOWATTS AND THE AMOUNT OF ENERGY BEING REGENERATED FROM THE WHEELS.



DURING REGENERATIVE BRAKING.



DURING NORMAL DRIVING.



THE 7" ELECTRO MULTI-VISION (EMV) DISPLAY IN THE CENTRE CONSOLE OF GS450h DISPLAYS FUEL CONSUMPTION IN REAL TIME AND AN ENERGY MONITOR WHICH SHOWS THE FLOW OF ENERGY BETWEEN THE PETROL ENGINE, ELECTRIC MOTOR, THE BATTERY AND REAR WHEELS SO YOU CAN SEE THE INNOVATIVE HYBRID SYSTEM IN ACTION.

The GS450h features the world's first performance hybrid system with a front-mounted engine and rear-wheel drive. This system offers an extremely quiet ride and a new sense of driving performance while reducing impact on the environment. The transmission of the GS450h consists of a power split device, a generator, an electric motor and reduction gears. The power split device divides the petrol engine's energy into two separate paths. One delivers power to the final reduction gear and then the driving wheels, while the other generates electrical energy to be stored in the battery and drive the electric motor. The power split device is electronically controlled, and therefore functions as a Electronic Continuously Variable Transmission (ECVT).

START UP, DRIVING AND DECELERATION

When the GS450h is first started, or operating under a light load, the petrol engine is stopped and only the electric motor is used. This allows for a smooth and quiet start and for initial acceleration. In normal driving situations, both the 3.5 litre V6 petrol engine and the electric motor may be used to drive the vehicle. However, this power may also be partially directed via to the hybrid system's generator to ensure high and reliable levels of battery power. Under full acceleration or when overtaking, the petrol engine is supported by the high speed compact electric motor that also receives electrical energy from the hybrid battery. When decelerating, the rear wheels drive the electric motor which in turn acts as a generator to convert the vehicle's kinetic energy into electricity. This recycled energy is then used to charge the vehicle's battery. Because the battery is recharged by both the petrol engine and by the energy recovered when decelerating, the hybrid battery will never require external recharging.

POWER CONTROL

The petrol engine in GS450h benefits from a dual VVT-i (Variable Valve Timing - intelligent), which helps the engine to breathe with maximum efficiency, and from a dual injection system. Both of these systems vary the amount of fuel and air needed to suit the conditions to further aid fuel economy and reduce emissions.

BATTERY MONITORING SYSTEM

Using sensors, this system helps to ensure that the voltage, current and temperature of the hybrid battery are kept at optimum levels.



LEXUS GS450h Hybrid System

1 High power, clean running V6 petrol engine

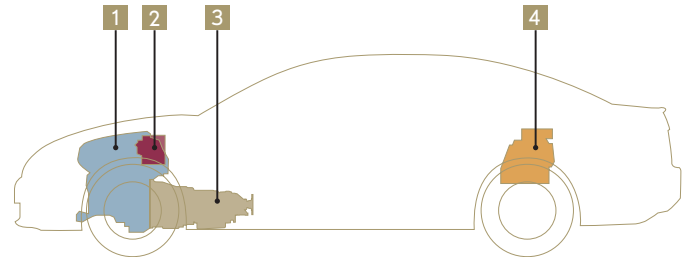
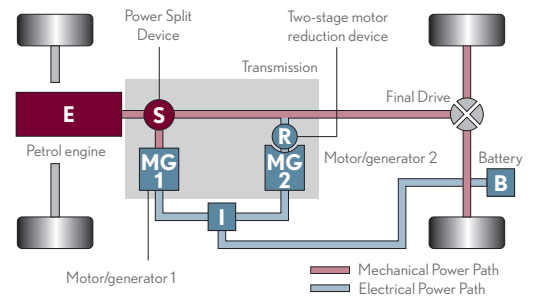
2 Compact high output inverter

Converts and boosts voltage of the hybrid system and provides overall control.

3 Hybrid transmission

Featuring an Electronic Continuously Variable Transmission (ECVT) and a two-stage reduction device.

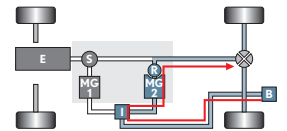
4 Compact high output Ni-MH battery



Operating modes

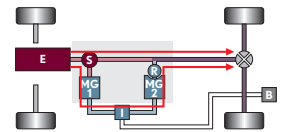
1 Startup

When starting off under a light load, the vehicle is generally powered only by its high-output electric motor



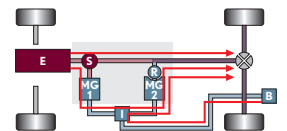
2 Normal driving

During normal driving the petrol engine starts. Engine power is divided into two paths: one drives the electric generator to produce electricity and another drives the wheels. The engine is controlled to maintain the optimal balance between power, fuel consumption and emissions. Minimising engine use also contributes to quietness.



3 Full throttle acceleration

During full acceleration, electric power is also supplied to the electric motor by the battery. Adding drive from the high output electric motor to the power from the engine provides instant and exhilarating response and a seamless sense of continual acceleration unique to GS450h.



4 Deceleration

When decelerating the wheels drive the electric motor which acts as a generator to convert the vehicle's kinetic energy into electric power that recharges the battery.

