

## THE LEXUS GS

### SUMMARY

The Lexus GS remains the only premium sports saloon to offer customers the choice of two full hybrid powertrains, in the form of the GS 300h and GS 450h. The UK range was extended for the 2016 model year with a new GS 300h Executive Edition feature model, and across the board there were upgrades to the exterior and interior design and equipment specifications. The Lexus Safety System+ package of active safety and driver assistance features became standard on all GS models.

### Design and Packaging

Lexus has taken its L-finesse design principles further in its revision of the GS, introducing powerful new exterior styling with a new frontal appearance that presents a stronger interpretation of Lexus's trademark spindle grille and a new three-lamp LED headlight cluster.

Changes to the cabin focus on improving functionality and the quality and finish of materials. The driver-focused cockpit presents excellent ergonomics and HMI systems that set a new benchmark for on-board technologies that are clear, quick and intuitive to use.

The central 12.3-inch multimedia display is controlled using an improved Remote Touch Interface and offers a useful new full-screen function. The head-up display is brighter and clearer and presents a wider range of data, including Lexus Safety System+ status information.

The GS 300h Executive Edition model provides an entry point to the model range and comes equipped as standard with leather upholstery, heated front seats, Lexus Premium Navigation with 12.3-inch display, LED headlamps, smart entry and push-button start, parking sensors, 17-inch alloy wheels, Drive Mode Select, Vehicle Dynamics Integrated Management and power-folding, heated, auto-dimming door mirrors. Its Lexus Safety System+ includes Pre-Crash Safety system with pedestrian detection, Adaptive Cruise Control, Traffic Sign Recognition, Lane Keep Assist and Automatic High Beam.

### Powertrains

The GS 450h is the performance flagship of the range, its total system output of 341bhp (254kW) enabling nought to 62mph acceleration in 5.9 seconds and a top speed of 155mph. These figures notwithstanding, it delivers combined cycle fuel economy of 46.3mpg (45.6 with 19-inch wheels) and 141g/km CO<sub>2</sub> emissions (145 with 19-inch wheels).

The GS 300h's combined system power of 220bhp (164kW) gives official fuel and CO<sub>2</sub> figures from 64.2mpg and 104g/km (Executive Edition with 17-inch wheels).

### **Driving Dynamics**

Measures have been taken to further improve the GS's dynamics and driver rewards, led by an increase in body rigidity, achieved using structural adhesives and spot, laser and laser screw welding techniques. The suspension, steering and brakes have been tuned to provide sharp, accurate steering, excellent body control, high-speed stability and the ride comfort expected of a Lexus saloon.

On F Sport models there is further tuning of the suspension settings to increase the efficiency of the Adaptive Variable Suspension.

GS 450h F Sport models are fitted with larger, 18-inch ventilated front brake discs and are equipped with Lexus Dynamic Handling, which co-ordinates all aspects of front and rear wheel control to achieve more agile, sharp and confident handling with more direct response to driver inputs.

### **Safety**

All versions of the GS are fitted with Lexus Safety System+, equipping the car with a series of technologically advanced active safety and driver assistance features.

The package includes a Pre-Crash Safety system with pedestrian detection function, Adaptive Cruise Control, Lane Keeping Assist with Sway Warning, Traffic Sign Recognition and Automatic High Beam system.

Higher grade (F Sport and Premier) models benefit from an Adaptive High-beam System, as well as a Blind Spot Monitor and Rear Cross Traffic Alert. All versions feature a tyre pressure warning system, with an auto-location system to show individual tyre pressures.

### **GS IN DETAIL**

## **DESIGN**

- More muscular, powerful styling, including a projecting spindle front grille
- Cabin improved for better functionality and use of premium quality materials
- Exclusive F Sport exterior and interior styling, including F-pattern mesh grille, 19-inch 10-spoke alloy wheels, LFA-style meters and aluminium trim detailing

### **Exterior design**

Lexus has built on the muscular qualities of the GS's design to produce even more powerful styling that reflects the combination of long-journey comfort and sporting agility that is the hallmark of a genuine grand tourer.

The front, side and rear styling has been revised and the new grille and bumper design has produced a larger front overhang, taking the car's overall length to 4,880mm – an increase of 30mm.

The GS presents a new interpretation of the Lexus grille, which projects forward from the car. The inner section echoes the spindle shape of the outer frame and extends rearwards to define the lines and surface of the bonnet's centre section.

The grille's horizontal bars are colour co-ordinated in grey and black, with the colours reversed between the upper and lower grille sections. The bars are aerodynamically shaped to manage airflow into the engine compartment.

All versions feature a new, slimmer headlight design. On F Sport and Premier models there is a three-LED lamp arrangement, each element containing both high and low-beam LEDs. The low-beam LEDs are each formed in the distinctive Lexus L-motif. The LED daytime running lights are set into the upper surface of the new projecting front bumper, set in the familiar Lexus arrowhead shape.

The spindle grille neatly incorporates the brake cooling ducts and new-design fog lamps are integrated into the bumper's outer corners, emphasising the car's broad stance and low centre of gravity.

To the side, a character line along the sill moulding is set 20mm lower than before. The line kicks up below the rear door, adding to the dynamic impression and creating a coherent line that links the front and rear bumpers.

The bootlid is underscored by a chrome trim, and rear LED combination lamps are set in an evolution of the Lexus L-motif. The lower bumper colour has been changed from black to a metallic dark grey.

There are four alloy wheel designs: nine-spoke 17-inch for the GS 300h Executive Edition; five-spoke 18-inch for Luxury and Premier models; 10-spoke 19-inch for the F Sport versions; and a 19-inch multi-spoke wheel available as an option for Premier grade models.

### **Interior design**

The GS's cabin presents improvements in functionality and the quality of trim materials and finish. It is spacious, but provides a driver-focused cockpit that delivers great comfort over long journeys.

Lexus has made good use of new and advanced Human Machine Interface technologies and ergonomic design to give the driver quick and clear access to controls and information. The dashboard is divided into an upper Display Zone and a lower Operation Zone. The Display Zone takes in an ultra-wide, 12.3-inch multimedia display, ideally positioned for at-a-glance viewing; the Operation Zone includes the latest version of Lexus's Remote Touch Interface control.

The large Optitron meters have a more pronounced 3D appearance and greater clarity – the needles are light-emitting along their full length. The rev counter scale is non-linear, emphasising the GS's delivery of low rpm torque and high rpm power.

The 4.2-inch colour multi-information display set between the meters features additional multimedia links so that phone caller and audio track details can be shown.

The 380mm-diameter steering wheel has a double-stitched leather cover; for added grip, the leather is perforated on the F Sport models. The wood and leather wheel fitted to Premier grade versions also features an integrated heater, which works in conjunction with the S-Flow air conditioning system. Electric steering wheel adjustment is provided across the range.

The sweeping horizontal flow of the dashboard has been given extra emphasis with a full-width metal trim, redesigned air vents and an analogue clock with automatic GPS time adjustment. Other trim touches include metal detailing on the shift lever, steering wheel, air vents, door handles and switchgear.

Changes to the upholstery include a horizontal stitched quilting pattern for the GS 300h Luxury, together with grain leather accenting on the side of the seatback.

The quality of the interior illumination has been improved with a centrally mounted LED rear lamp and a change to a warmer ambient lighting tone throughout.

The GS 300h Executive Edition can be specified with Black or Sandstone leather upholstery, with black grained trim inlays. For the GS 300h Luxury, the options are a Rich Cream, Noble Brown, or Black leather, again with black trim. F Sport models offer the choice of Dark Rose, Topaz Brown or Black with aluminium details and the Premier versions provide semi-aniline leather in Black, Topaz Brown, Noble Brown, Rich Cream or Sandstone with grey Shimamoku wood trim.

### **F Sport styling**

Both F Sport models have an exclusive spindle grille design, displaying a strong three-dimensional form and an F-pattern mesh. The large front bumper side bezels add emphasis to the vehicle's wide, low stance.

The wheels are 10-spoke, 19-inch alloys with a bright machined finish, and eight paint colours are available, including Azure Blue and F Sport White which are exclusive to the grade.

In the cabin the driver's meter in the instrument binnacle is inspired by the LFA supercar. There is also a large, eight-inch multi-information display.

The steering wheel and shift lever are wrapped in grippy perforated leather and the sporting feel extends to aluminium pedals and scuff plates. The GS F Sport has a special aluminium *naguri*-style aluminium patterned trim, created by applying a traditional Japanese woodcraft technique to metal machining. The choice of interior colours includes Dark Rose, exclusive to F Sport.

### **POWERTRAINS**

- GS the only model in its class to offer the choice of two full hybrid powertrains
- GS 300h produces 220bhp (164kW) and returns fuel economy from 64.2mpg
- GS 450h has maximum output of 341bhp (254kW), enabling sub-six-second acceleration from nought to 62mph

## **GS 300h**

The GS 300h's full hybrid system uses a 178bhp (133kW), 2.5-litre direct injection Atkinson cycle petrol engine and a powerful, 141bhp (105kW) electric motor. Peak torque of 221Nm is delivered between 4,200 and 5,400rpm and the combined output of the system is 220bhp (164kW).

Drive is to the rear wheels, via an electronic continuously variable transmission (E-CVT), with power automatically sourced from the engine and electric motor together, or from the motor alone, according to driving conditions, driver input and the drive mode selected.

As well as the engine and motor, the hybrid system also features a generator, a high-performance nickel-metal hydride battery and a power split device which uses planetary reduction gears to re-allocate power from the engine, electric motor and generator as required. There is also a compact power control unit which governs the high-speed interaction of the system's components.

Acceleration from rest to 62mph can be accomplished in nine seconds and maximum speed is 119mph. Official fuel economy and CO<sub>2</sub> emissions figures are from 64.2mpg and 104g/km (Executive Edition with 17-inch wheels).

Advanced technologies have been used to optimise integration of the engine into the hybrid system, improving performance while minimising fuel consumption and emissions. Its Atkinson cycle timing gives an expansion stroke that is longer than the compression stroke, resulting in more efficient conversion of combustion energy into drive power. By using the Atkinson cycle, a higher compression ratio (13.0:1) and other technologies, Lexus has achieved an exceptional thermal efficiency for the engine of 38.5 per cent.

Details in the engine's design do yet more to secure fuel efficiency, including the use of in-cylinder direct injectors with a side slit and optimised injection hole shape; a revised intake port; improved air flow and the use of roller-arm valve gear and a roller-type D-4 pump gear.

The friction between the sliding parts within the camshafts has been greatly reduced. Using a low-friction timing chain with better wear-stretch performance and a stretch belt to reduce tension also cuts the amount of friction. Reducing friction losses in this way adds to the engine's overall fuel efficiency.

Intelligent variable valve-timing on both intake and exhaust camshafts (Dual VVT-i) significantly improves engine performance. It allows a greater overlap between intake and exhaust valve operation which delivers benefits in low and top-end torque, as well as helping reduce exhaust emissions and give better cold-start performance.

The high-efficiency exhaust gas recirculation system is water-cooled and has a step motor valve that is more responsive than conventional technology. These elements optimise EGR gas flow and help realise excellent fuel economy.

Lexus has also introduced a number of measures that further improve the quietness and smoothness that are characteristics of its hybrid powertrains.

The location of the port injectors has been optimised, together with port injection performance during idling and low-load driving, and the shape of the crankshaft. Noise and vibration levels have been reduced by increasing the rigidity of the cylinder block and intake manifold, optimising the efficiency of the balance shaft and the use of resin gears within the balance shaft.

### **GS 450h**

The GS 450h has the same hybrid system architecture as the GS 300h, but is a significantly more powerful proposition, featuring a 288bhp (215kW) 3.5-litre Atkinson cycle petrol engine and a compact, 197bhp (147kW), water-cooled electric motor. Maximum engine torque is 352Nm at 4,500rpm.

The total system output of 341bhp (254kW) enables nought to 62mph acceleration in 5.9 seconds and a top speed of 155mph. These figures notwithstanding, it delivers combined cycle fuel economy of 46.3mpg (45.6 with 19-inch wheels) and 141g/km CO<sub>2</sub> emissions (145 with 19-inch wheels).

The V6 underwent specific changes to achieve optimum performance within a full hybrid system, including the adoption of the Atkinson cycle, a high, 13.0:1 compression ratio, a mid-port intake tumble generator and the latest generation of D-4S direct injection technology.

### **Lexus Hybrid Drive in operation**

Like all other Lexus hybrid models, the GS 300h and 450h are full hybrids, capable of operating on their electric power alone, as well as with the petrol engine and electric motor working together. Performance is exceptionally quiet, smooth and refined.

In the course of any journey, the Lexus Hybrid Drive will operate in different modes to maximise the vehicle's overall efficiency.

At rest, the engine stops automatically to conserve fuel. In low engine efficiency conditions, such as when starting up and driving at low to mid-range engine speeds, the vehicle will run when possible on its electric motor alone, with no CO<sub>2</sub>, NOx or particulate tailpipe emissions.

In normal driving conditions, the system automatically allocates power from the petrol engine and electric motor to achieve optimum performance with maximum fuel efficiency.

During deceleration and under braking, the electric motor works as a high-output generator to provide regenerative braking. This captures kinetic energy that would normally be lost as heat and stores it as electricity in the high-performance battery.

The smooth electronic continuously variable transmission has a six-step, sequential Shiftmatic override gear change function, which lets the driver enjoy the kind of performance expected of a sporting coupe, but with the excellent fuel economy that's a hallmark of Lexus's hybrid power technology.

The GS 300h and 450h's Drive Mode Select provides four selectable modes to help the driver exploit the potential of the full hybrid powertrain, including an EV mode which allows for ultra-quiet running on electric motor power alone (when the level of battery charge and driving conditions permit), with zero fuel consumption and tailpipe emissions. On F Sport models with Adaptive Variable Suspension a further Sport S+ mode is available.

## **DRIVING DYNAMICS**

- More rigid body produced using new adhesive and welding techniques
- Improved noise and vibration performance
- Suspension, steering and brakes optimised for ride comfort, agility and steering feel
- GS 450h F Sport with Dynamic Rear Steering and Lexus Dynamic Handling system

### **Increased body rigidity**

From 2016, the GS has a more rigid body, achieved by adding 188 extra spot welding points, increased use of structural adhesive across 2.25 metres of body part joints and 132 additional laser screw welding points around the door apertures.



Together these measures improve ride comfort and secure even more precise vehicle movement in response to the driver's steering inputs.

### **Improved noise, vibration and aerodynamic performance**

The GS has established low levels of noise and vibration but its performance has been further improved thanks to the addition of sound-absorbing material to the upper cowl, creating an even quieter cabin.

The model showcases Lexus's introduction of aerodynamic damping, a new approach to managing airflow over a vehicle body. The concept involves brining the airflow closer to the body and using it to help control vehicle movement, giving greater handling stability.

In a further development of this technique, the bottom edge of the GS's new front bumper has been set 10mm further forward, adjusting the airflow volume passing under the vehicle to promote even better stability at high speed.

### **Suspension, steering and brakes**

The GS uses double wishbone front and multilink rear suspension to achieve excellent ride quality with agility and steering feel, with a particular focus on rear-end stability.

Special attention has been paid to the coil spring characteristics and the shape of the shock absorber free piston in both front and rear systems, and the shape and spring characteristics of the front anti-roll bar. These measures enhance ride comfort and handling stability.

The electric power steering has been revised and the intermediate shaft damper has been removed to improve the steering column's rigidity and steering response (this does not apply to the Variable Gear Ratio Steering featured on the GS 450h F Sport).

The powerful, fade-free braking system features 17-inch front ventilated discs – 18-inch on F Sport and Premier models.

### **Adaptive Variable Suspension**

The AVS system, fitted to the F Sport and Premier models, allows the driver to fine-tune the car's ride with a choice of two damper settings: Normal for everyday driving and Sport S+ mode for improved body control and precise steering responses when cornering.

AVS automatically adjusts suspension performance at all four wheels independently, activating the adjustable damping force shock absorbers, in response to the way the car is being driven, vehicle body motion and road surface conditions.

Selecting Sport S+ mode automatically increases the difference between inner and outer shock absorber damping through corners, to further reduce vehicle roll. At the same time, the VGRS reduces the steering gear ratio by about 10 per cent, and the electric power steering increases the level of steering assist torque by about four per cent. Together this minimises body roll, sharpens vehicle handling and improves steering feel.

### **Selectable drive modes**

The GS has a Drive Mode Select system that allows the driver to choose between Eco, Normal, Sport and, on F Sport and Premier models, Sport S+ driving modes, to make the most of either the car's environmental efficiency, or its dynamic qualities.

In Eco mode, engine power output, throttle opening and the air conditioning are controlled to maximise fuel economy in all driving conditions. The air conditioning temperature and airflow volume are co-operatively controlled, reducing the system's heating and cooling capacity, which helps reduce fuel consumption.

In Sport mode, engine output and throttle opening are optimised to improve power delivery at intermediate throttle angles and the amount of steering assistance is reduced. Together these measures provide responsive acceleration and a sporting steering feel.

Sport S+ mode, available on the GS F Sport and Premier models, adjusts powertrain output with co-ordinated control of the Vehicle Dynamics Integrated System, including the Adaptive Variable Suspension, electric power steering and, on the GS 450h F Sport, the Variable Gear Ratio Steering and Dynamic Rear Steering.

Sport S+ mode automatically increases the difference between inner and outer wheel shock absorber damping through corners to reduce body roll. At the same time steering gear ratio is reduced and Variable Flow Control increases the steering assist torque. Body roll is reduced, handling is sharpened and steering feel is improved for an all-round more rewarding dynamic driving experience.

Ambient illumination of the driver's instruments changes according to the mode selected: blue for Eco and red for Sport and Sport S+. When the Sport modes are chosen, the hybrid system power indicator in the display automatically changes into a tachometer.

On F Sport and Premier models equipped with Adaptive Variable Suspension, the driver can make use of a "Customize" function in the Drive Mode Select. This allows a combination of individual powertrain, chassis and air conditioning settings to be selected. The choices made can be displayed on the multimedia screen.

### **F Sport driving dynamics**

The GS F Sport models benefit from retuned front and rear suspension to further enhance the performance of the Adaptive Variable Suspension, maximising body control and steering response.

The front and rear shock absorbers are modified for AVS damping control, and the use of low-viscosity oil reduces friction and improves the shocks' efficiency. The rear shock absorbers are inclined further to the rear, with larger and stiffer lower bushing.

The F Sport models further gain larger, 18-inch ventilated front disc brakes for greater stopping power.

### **Lexus Dynamic Handling**

The GS 450h F Sport is equipped with the Lexus Dynamic Handling system, making it the world's first hybrid with integrated four-wheel steering.

This technology integrates Dynamic Rear Steering, Variable Gear Ratio Steering and electric power steering to co-ordinate all aspects of front and rear wheel control and provide agile, sharp and confident driving behaviour, with more direct vehicle response to driver inputs.

LDH monitors vehicle speed, steering direction and driver inputs to calculate the optimum angle for all four wheels. Using VGRS at the front and DRS at the rear, it can independently adjust the front and rear wheel steering angles to improve turn-in response, rear grip, vehicle stability and overall agility when cornering.

At speeds below 50mph (80km/h), the front and rear wheels turn in opposite directions; above this speed they turn in the same direction.

## **ON-BOARD TECHNOLOGY**

- Improved Remote Touch Interface with 12.3-inch multimedia display
- Head-up display with expanded information range
- S-Flow air conditioning with nanoe technology
- Premium quality audio systems

### **Improved Remote Touch Interface with 12.3-inch multimedia display**

Lexus's Remote Touch Interface is designed for easy and intuitive operation. It is linked to the world's largest multimedia display – a 12.3-inch, full colour LCD screen with an ultra-wide 24:9 format.

The Remote Touch system in the new GS uses a haptic joystick mechanism, much like a computer mouse, with which users can scroll quickly and smoothly across the display. The Enter function can be controlled by simply pushing the controller, or by using switches on either side of the unit. There is also a Back function switch, located in front of the Remote Touch knob.

The display can be used in full-screen format, for example to show a navigation map, or it can show two types of information simultaneously, such as map and audio, night view and map, or navigation and incoming call.

Shortcut and main menus have been added to the voice recognition display and a speed dial function is now included in the hands-free phone system.

### **Head-up display with expanded information range**

The head-up display featured on GS Premier models is designed for clarity, using a wedge-shaped PVC film inserted between the layers of glass in the windscreen. This also eliminates the risk of double-image projection.

Maximum brightness has been increased and the contrast ratio adjusted accordingly to ensure excellent visibility in all conditions.

The range of information that can be displayed has been increased. In addition to vehicle speed, audio, navigation, Eco driving performance, Sport mode tachometer and shift indicator, it can now show the status of the Lexus Safety System+ features. This includes the Pre-Crash Safety system, Adaptive Cruise Control, Lane-Keeping Assist and Traffic Sign Recognition displays.

### **S-Flow air conditioning with nanoe technology**

The triple-zone S-Flow air conditioning system fitted to 2016 GS Premier models uses a lighter, quieter and more efficient compressor.

The S-Flow technology maintains optimum passenger comfort while reducing the amount of power used. Its sensors determine if the front passenger seat or rear seats are occupied; if they are vacant, it automatically closes the air vents serving those seats.

The target airflow volume is customised for each seat using a Temperature Airflow Output control. When the thermal load is large, for example when cooling down in summer, or warming up in winter, the air conditioning operates throughout the cabin to obtain a comfortable temperature quickly. Once the interior temperature has been stabilised, the system then focuses only on the occupied seats.

The system also features upper and lower independent, multi-layer air mix technology so that the cabin environment can be tailored to suit driver and front and rear passengers. For example the upper air mix can be set for coolness to deal with the effects of sun through the windows, while the lower air mix can be set for warmth. A two-tier interior/exterior air control prevents window fogging by introducing low humidity exterior air into the upper half of the cabin while circulating interior air to maintain heating around the foot area.

The air conditioning incorporates nanoe technology, an air cleaning technology that operates automatically when the system is switched on. It releases minute nanoe particles – negatively charged ions wrapped in water molecules – through the driver's dashboard air vent.

These nanoe ions can purify the air and eliminate odours by attaching themselves to airborne particles and molecules. They can also deodorise the seats and roof lining to create a cleaner cabin environment. And, because nanoe moisture content is about 1,000 times that of conventional ions, they are also said to have a moisturising effect on human skin and hair.

### **Premium quality audio systems**

Two audio systems are available in the new GS. The standard system features a fully digital Class-D amplifier that can create virtually distortion-free sound with minimal voltage losses. The natural sound dynamics and rich harmonies it generates are faithfully reproduced by a 12-speaker layout.

The top-of-the-range 17-speaker Mark Levinson Premium Audio system (fitted as standard on Premier grade models) uses the same technologies as those found in top-end home audio systems. It uses a Generation III ML5 amplifier which generates a total 835 Watts while consuming just 6.5 Amps.

The system uses Clari-Fi playback technology, which compensates for the loss of high frequencies and lack of clarity which can occur when using digital music players and other compressed sound sources. This ensures a clearer, rich sound is reproduced, close to the original recording quality.

GreenEdge power-saving technology has been incorporated in each of the 17 speakers, enabling twice the volume to be developed for the same power consumption. The technology covers a wider frequency band than conventional systems, giving it an enhanced dynamic range.

Five 90mm GreenEdge Unity speakers are used, which have a coaxial structure which integrates mid and high-range units within the same structure. Their location around the cabin gives a consistent timbre for both front and rear occupants, resulting a new level of surround sound, definition atmosphere and quality.

## **SAFETY**

- Lexus Safety System+ standard on all GS models
- Elements include Pre-Crash Safety system, Adaptive Cruise Control, Lane-Keeping Assist, Sway Warning, Automatic High Beam/Adaptive High-beam System and Traffic Sign Recognition
- Step 5 Vehicle Dynamics Integrated Management
- Improved passive safety with strategically engineered bodyshell

## **ACTIVE SAFETY**

### **Lexus Safety System+**

All versions of the GS are fitted with Lexus Safety System+, a comprehensive package of active safety and driver assistance technologies that can help prevent an accident happening, or mitigate the consequences of a collision across a wide range of different traffic scenarios.

It equips the car with a Pre-Crash Safety system, Adaptive Cruise Control, Lane-Keeping Assist with Sway Warning, Traffic Sign Recognition and Automatic High Beam. The F Sport

and Premier models equipped with triple-unit LED headlights feature the more sophisticated Adaptive High-beam System.

### **Pre-Crash Safety System**

The Pre-Crash Safety system is at the heart of the Lexus Safety System+. It uses a front-mounted camera and millimetre-wave radar to detect vehicles and pedestrians on the road ahead. If it calculates a risk of a collision, it automatically warns the driver and the Pre-Crash Brake Assist engages to provide extra braking force the moment the brake pedal is pressed.

If the driver fails to react and the system judges a collision to be imminent, the brakes are automatically applied to reduce vehicle speed by about 25mph (40km/h), potentially bringing the car to a stop and helping mitigate the force of any impact.

On the GS 450h F Sport, it also implements close interaction between the Variable Gear Ratio Steering and the Dynamic Rear Steering incorporated in the Vehicle Dynamics Integrated Management, improving vehicle response to the driver's emergency steering inputs, increasing the chances of avoiding a hazard.

### **Adaptive Cruise Control**

The same radar unit is used to provide Adaptive Cruise Control, which helps the driver maintain a safe distance from the vehicle in front, down to very low speeds and standstill. Once the way ahead is clear, the GS automatically accelerates to its pre-set cruising speed; if the car has been brought to a halt, the driver simply needs to press the accelerator briefly to reactivate the system.

### **Lane-Keeping Assist and Sway Warning**

The package also includes Lane-Keeping Assist, which recognises when the new GS is deviating from its lane on the highway and helps the driver steer the vehicle safely back to its correct path. Lane Departure Alert uses a camera on the windscreen to track the vehicle's course between lane markings painted on the road surface. If it judges that the vehicle is about to move out of its lane without the turn indicator being used, the system lights up a warning on the multi-information display and vibrates the steering wheel. It will also apply appropriate steering control force to help bring the vehicle back on course.

Lane-Keeping Assist provides an extra layer of assistance, automatically providing steering inputs to keep the car safely within its lane, notably when the Adaptive Cruise Control is being

used. In a first for a Lexus, Lane-Keeping Assist can be used even at very low speed, when the Adaptive Cruise Control is operating. The driver can also choose which alert they prefer (warning sound or vibrating steering wheel) and the sensitivity of the warning, via the multi-information display. The system can also be switched off, if desired.

The system also includes a Sway Warning function. This monitors the car's position in its lane and the driver's steering inputs. If it detects degrees of vehicle swaying, caused by driver distraction or drowsiness, it will sound an alert and display a warning on the multi-information display, recommending the driver takes a break.

### **Automatic High Beam and Adaptive High-beam System**

Lexus Safety System+ further includes Automatic High Beam, which detects oncoming traffic and vehicles ahead and automatically switches the headlights between high and low beam.

The F Sport and Premier models, which feature a triple-LED headlight system, feature the more sophisticated Adaptive High-beam System, which gives even better illumination by adjusting light distribution to avoid dazzling other road users, instead of switching the headlights to low beam.

### **Traffic Sign Recognition**

The driver gains a "second set of eyes" when it comes to important road signs on motorways and major routes. The Traffic Sign Recognition system uses a front camera to recognise principal warning and command signs, which are then replicated on the multi-information display, reducing the risk of the driver not being aware of speed limits, lane closures and other important information.

If the system detects the driver is disobeying no overtaking, no entry and speed limit commands, it will give visual and audible alerts. The driver can customise the system's operation using switches on the steering wheel to adjust the multi-information display.

### **Step 5 Vehicle Dynamics Integrated Management**

The latest, Step 5 generation of Lexus's VDIM system enhances the GS's performance, traction control and vehicle stability.

Sensors throughout the vehicle provide comprehensive status data, which the VDIM uses for integration of the Electronically Controlled Brake, four-wheel independent braking, ABS, EBD,



traction control and Vehicle Stability Control active safety systems with the electric power steering, and, on the GS 450h F Sport, the Variable Gear Ratio Steering, Adaptive Variable Suspension and Dynamic Rear Steering systems.

On the GS 450h F Sport, the VDIM incorporates the Lexus Dynamic Handling system, which allows it to control the steering angle of all four wheels, achieving the ideal slip angle to help govern the vehicle's lateral motion. This gives extra stability, for example when there is a risk of understeer or oversteer when cornering, or braking on surfaces with different levels of grip between the left and right hand wheels.

Through this integrated control of all the elements related to vehicle movement, including motor torque, brakes and steering, VDIM not only optimises the activation of braking, stability and traction control systems, it can also improve the vehicle's overall kinetic performance.

Furthermore, whereas conventional safety systems are only activated immediately after the limits of a vehicle's performance envelope have been reached, VDIM activates control before that limit. As a result the performance threshold is extended through less obtrusive intervention, making for a more rewarding driving experience.

### **Blind Spot Monitor and Rear Cross Traffic Alert**

The Blind Spot Monitor uses radars mounted on the corners of the rear bumper to detect vehicles approaching from the rear in adjacent lanes, in the driver's blind spots.

When vehicles are detected, the system activates a warning light in the corresponding door mirror. If the turn indicators are working at the time, the light will flash.

The Rear Cross Traffic Alert uses the same radar technology as the Blind Spot Monitor to alert the driver to vehicles approaching from either side when reversing out of a parking space, flashing the icon in the door mirrors, sounding a warning buzzer and indicating from which direction the vehicle is approaching.

The Blind Spot Monitor and Rear Cross Traffic Alert are standard features on F Sport and Premier grade versions of the GS.

### **Tyre pressure warning system**

All GS models are fitted with a tyre pressure warning system with an auto-location function, which displays individual tyre pressures, highlighting any low pressure value in amber to alert the driver. A warning is also signalled in the main combination meter.

## **PASSIVE SAFETY**

### **Body structure**

Lexus works to stringent car-to-car impact compatibility standards to give the new GS the best possible safety performance in frontal, off-set, side-on and rear collisions.

Comprehensive use of high and ultra-high-tensile steel in the bodyshell allows for the transfer and dispersal of impact loads, minimising cabin deformation.

A sliding spacer improves the way frontal and small overlap collision loads are dispersed. This ensures impact from the outer side of the front side member is also sustained by the body frame, while the use of a torque box and A-shaped brace protects occupants against impact with the front wheels.

Special attention has been paid to side impact protection, with ultra-high-tensile steel used for the rocker panel's outer reinforcement, an increase in sheet thickness in the rear door impact beam and the use of hot press sheet steel in the construction of the centre pillars.

### **Pedestrian protection**

The front bumper, cowl and bonnet are designed to offer better pedestrian protection in the event of a collision.

The bead height and pitch of the bonnet have an improved, thinner design and the front of the bonnet structure has been designed to deform easily on contact with a pedestrian's upper legs. A gap between the bonnet and top of the headlamps helps reduce the force of a head impact.

Impact-absorbing materials in the front bumper help reduce the load applied to a pedestrian's legs and the front wings feature a new structure to alleviate head impacts.

The cowl panel and cowl louvre have easily deformable structures, with deformation controlled by the use of different sheet thicknesses.

### **Airbags**

All versions of the GS are equipped with 10 airbags: two-stage front airbags; driver and front passenger knee airbags (the passenger bag is integrated in the glove box); front and rear side

airbags; and curtain airbags.

The front airbags are fitted with sensors that determine the severity of an impact and adjust the force of deployment accordingly.

## **UK MODEL RANGE, SPECIFICATIONS AND PRICES**

- Six-model, full hybrid UK range, led by the GS 300h Executive Edition
- Executive Edition achieves 104g/km CO<sub>2</sub> emissions

The 2016 Lexus GS was introduced in the UK in an all-hybrid, six-model line-up.

Entry point to the range is the GS 300h Executive Edition, featured together with Luxury, F Sport and Premier versions of the GS 300h and F Sport and Premier GS 450h models.

### **GS 300h Executive Edition**

The GS 300h Executive Edition presents a compelling combination of luxury, advanced technologies and Lexus's smooth, refined and highly efficient full hybrid power. CO<sub>2</sub> emissions of 104g/km secure an attractive benefit-in-kind tax rate for company car drivers. Ownership costs are also kept low thanks to official combined cycle fuel consumption of 64.2mpg.

This efficiency is matched by an impressive equipment specification. The standard features include Lexus Premium Navigation with Remote Touch Interface control and 12.3-inch multimedia display, leather upholstery, front seats with heaters and power adjustment, Drive Mode Select, Vehicle Dynamics Integrated Management, LED headlamps, rear lights and daytime running lights, front and rear parking sensors, Smart Entry and push-button start, auto-dimming rear-view mirror, 17-inch alloy wheels, dual-zone automatic air conditioning, 12-speaker audio system with DVD player, DAB and two USB ports and power-folding, auto dimming heated door mirrors.

Like all new GS models, the Executive Edition is equipped with Lexus Safety System+, providing LED headlamps with Automatic High Beam, Pre-Crash Safety system with pedestrian detection, Adaptive Cruise Control, Lane-Keeping Assist with Sway Warning and Traffic Sign Recognition.

### **GS 300h Luxury**

The Luxury version of the GS 300h builds on the Executive Edition specification with new-design 18-inch alloy wheels and front seats that add a ventilation function. Options include a sunroof and a 17-speaker Mark Levinson Surround Sound audio system.

### **GS 300h and GS 450h F Sport**

The F Sport models' equipment features focus on sports styling and performance. The exterior elements include triple-LED headlights with an Adaptive High-beam System, 19-inch F Sport alloy wheels, F Sport front bumper and dedicated spindle grille with F-pattern mesh, and a rear spoiler. The door mirrors incorporate a Blind Spot Monitor and Rear Cross Traffic Alert.

In the cabin there are F Sport front seats with 16-way driver/10-way passenger power adjustment, LFA-style instrument meter, aluminium pedals and foot rest, aluminium scuff plates and trim inlays, and perforated leather trim for the steering wheel and shift lever. A Dark Rose interior colour-way is exclusive to the F Sport models.

Under the skin the models gain Adaptive Variable Suspension, accompanied by an additional Sport S+ mode in the Drive Mode Select system. The GS 450h further benefits from Lexus Dynamic Handling with Variable Gear Ratio Steering and Dynamic Rear Steering.

Options for the F Sport grade are a sunroof and the 17-speaker Mark Levinson Surround Sound audio system.

### **GS 300h and GS 450h Premier**

At the top of the range the Premier models ride on 18-inch alloy wheels (optional 19-inch rims are available). Key features include semi-aniline leather upholstery, triple-zone S-Flow air conditioning with nanoe technology and rear seat controls, heated leather and wood steering wheel, colour head-up display, 17-speaker Mark Levinson Surround Sound audio system, power-adjustable front seats with variable cushion length and calf support for the front passenger, Shimamoku wood trim inlays, electric rear window sunshade and manual rear side window shades and a power bootlid. A sunroof is available as an option.

## **GS TIMELINE AND UK SALES**

1993	January	The Lexus GS300 saloon is unveiled at the Detroit Motor Show. Sales begin in America and Europe later in the year.
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1997	January	An all-new Lexus GS300 is launched in Europe.
2000	November	The new 4.3-litre 32-valve V8 engine used in the LS430 is introduced into the GS range to create the GS430.
2003	July	Sport versions of the GS 300 and GS 430 are added to the UK model range, featuring lowered suspension and additional body styling features.
2005	April	The third generation GS range is launched in Europe with two models – the GS 300 and GS 430. The new GS is the first production Lexus to be styled according to the company's new L-finesse design principles.
2006	May	The Lexus GS 450h is launched, the world's first hybrid-power car to feature a front-engine and rear-wheel drive powertrain.
2008		The GS 460 replaces the GS 430, powered by a new 342bhp 4.6-litre V8 engine.
2009	Dec	The UK range is rationalised into two equipment grades, SE and SE-L for the 2010 model year. A new HDD navigation system is introduced.
2011	August	The fourth generation GS makes its <a href="#">world debut</a> at the Pebble Beach Concours d'Elegance in California
	November	The new <a href="#">GS 250</a> is presented at the Guangzhou motor show in China.
2012	February	<a href="#">UK order books open</a> for the new GS 250 and 450h in the UK. Priced from £32,995, the six model range features SE, Luxury, F Sport and Premier grades.
2013	April	Lexus presents the new <a href="#">GS 300h</a> at the Shanghai motor show.
2014	January	Customer deliveries of the new GS 300h begin in the UK. The GS 250 is deleted from the model range.
2015	January	Lexus unveils the high-performance GS F at the Detroit motor show.
	June	The GS F appears in the UK for the first time at the <a href="#">Goodwood Festival of Speed</a> .
	September	Lexus presents a <a href="#">revised GS range</a> at the Frankfurt motor show.
	October	The GS is adapted for Toyota's <a href="#">first automated driving tests</a> on public roads in Japan.

2016	January	The revised GS range goes on sale in the UK, including a new GS 300h Executive Edition model. Lexus Safety System+ is provided as standard on all models
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UK sales in 2017 (all versions): 428

Cumulative UK sales since launch – GS range (1998): 21,610

## LEXUS GS TECHNICAL SPECIFICATIONS

<b>ENGINE</b>	<b>GS 300h</b>	<b>GS 450h</b>
Type	4 cylinders in-line, Atkinson cycle	6-cylinder 60-degree V, Atkinson cycle
Valve mechanism	16-valve DOHC, dual VVT-i	24-valve DOHC with dual VVT-i
Bore x stroke (mm)	90.0 x 98.0	94.0 x 83.0
Displacement (cc)	2,494	3,456
Compression ratio	13.0:1	
Fuel system	EFI, D-4S direct injection	
Max. power (bhp/kW @ rpm)	178/133 @ 6,000	288/215 @ 6,000
Max. torque (Nm @ rpm)	221 @ 4,200-5,400	352 @ 4,500
<b>ELECTRIC MOTOR/GENERATOR</b>		
Motor type	Permanent magnet, synchronous	
Max. voltage (V)	650	
Max. output (bhp/kW)	141/105	197/147
Max. torque (Nm)	300	275
<b>HYBRID BATTERY</b>		
Battery type	Nickel-metal hydride	
Nominal voltage (V)	230.4	288
Number of cells	192	240
<b>LEXUS HYBRID DRIVE SYSTEM</b>		
System type	Series/parallel full hybrid	
System output (bhp/kW)	220/164	341/254
<b>TRANSMISSION</b>		
<b>Type</b>	E-CVT	
Low	3.333	3.900
High	3.333	1.900

Differential		2.764		3.266		
<b>PERFORMANCE</b>		<b>GS 300h</b>			<b>GS 450h</b>	
Max. speed (mph)		119		155		
Max. speed in EV mode (mph)		46.0		24.9		
Max. range in EV mode (miles)		0.62		0.62		
Acceleration 0 – 62mph (sec)		9.0		5.9		
<b>STEERING</b>		<b>GS 300h</b>			<b>GS 450h</b>	
Type		Electric power steering, rack & pinion; Variable Gear Ratio Steering on GS 450h F Sport				
Steering gear ratio		13.2:1		10.3 – 12.0:1 with VGRS		
Turns lock to lock		2.8		2.2 – 2.6 with VGRS		
Min. turning radius (tyre, m)		5.3		5.3		
Min. turning radius (body, m)		5.6		5.6		
<b>BRAKES</b>		<b>GS 300h</b>			<b>GS 450h</b>	
Brake type – front		Ventilated discs				
Brake type – rear		Ventilated discs				
Brake size – front (diameter x thickness, mm)		334 x 30		334 x 30 (Luxury) 356 x 30 (F Sport & Premier)		
Brake size – rear (diameter x thickness, mm)		310 x 22		310 x 18 (Luxury) 310 x 22 (F Sport & Premier)		
Parking brake		Electric, automatic				
<b>FUEL CONSUMPTION, EMISSIONS &amp; INSURANCE</b>		<b>GS 300h</b>			<b>GS 450h</b>	
		<b>17in wheel</b>	<b>18in wheel</b>	<b>19in wheel</b>	<b>18in wheel</b>	<b>19in wheel</b>
Fuel consumption (mpg)	Combined	64.2	57.6	56.5	46.3	45.6
	Urban	61.4	56.5	56.5	42.2	40.9
	Extra-urban	65.7	58.9	57.6	51.4	49.6
CO <sub>2</sub> emissions (g/km)	Combined	104	113	115	141	145
	Urban	107	117	117	156	159
	Extra-urban	101	110	113	129	132
Insurance groups		26E – 28E			40E	

<b>DIMENSIONS – EXTERIOR</b>	<b>GS 300h</b>	<b>GS 450h</b>
Overall length (mm)	4,880	
Overall width – mirrors folded (mm)	1,840	
Overall height (mm)	1,455	
Wheelbase (mm)	2,850	
Front track (mm)	1,575	
Rear track (mm)	1,590	
Front overhang (mm)	900	
Rear overhang (mm)	1,130	
Coefficient of drag (Cd)	0.26	0.27
<b>DIMENSIONS – INTERIOR</b>	<b>GS 300h</b>	<b>GS 450h</b>
Cabin length (mm)	2,050	
Cabin width (mm)	1,535	
Cabin height (mm)	1,180 1,140 (with sunroof)	
Load space capacity – above deck (l)	450	450
Load space height (mm)	517	
Load space width (mm)	947	
Fuel tank capacity (l)	66	
<b>WEIGHTS</b>	<b>GS 300h</b>	<b>GS 450h</b>
Kerb weight (min. – max. kg)	1,730 – 1,770 Executive Edition 1,735 – 1,830 other grades	1,825 – 1,920
Gross vehicle weight (kg)	2,235 Executive Edition 2,265 other grades	2,305
Towing capacity – braked (kg)	500 (not permitted with Executive Edition)	1,500
Towing capacity – unbraked (kg)	Not permitted	750

#### **LEXUS GS EQUIPMENT SPECIFICATIONS**

<b>ACTIVE SAFETY &amp; DRIVING DYNAMICS</b>	<b>EXECUTIVE EDITION (300h)</b>	<b>LUXURY (300h)</b>	<b>F SPORT</b>	<b>PREMIER</b>



Lexus Safety System+ with Pre-Crash Safety with pedestrian detection, Adaptive Cruise Control, Lane-Keeping Assist, Sway Warning, Traffic Sign Recognition and Automatic High Beam	✓	✓	✗	✗
Lexus Safety System+ with Pre-Crash Safety with pedestrian detection, Adaptive Cruise Control, Lane-Keeping Assist, Sway Warning, Traffic Sign Recognition and Adaptive High-beam System	✗	✗	✓	✓
4 driving modes - EV, Normal, Eco and Sport	✓	✓	✗	✗
5 driving modes - EV, Normal, Eco, Sport and Sport S+	✗	✗	✓	✓
Adaptive Variable Suspension (AVS)	✗	✗	✓	✓
ABS	✓	✓	✓	✓
Traction control (TRC)	✓	✓	✓	✓
Vehicle Stability Control (VSC)	✓	✓	✓	✓
Electric power steering (EPS)	✓	✓	✓	✓
Hill Assist Control (HAC)	✓	✓	✓	✓
Vehicle Dynamics Integrated Management	✓	✓	✓	✓
Blind Spot Monitor and Rear Cross Traffic Alert, plus auto-dimming door mirrors	✗	✗	✓	✓
Lexus Dynamic Handling with Dynamic Rear Steering (DRS)	✗	✗	✓ (450h)	✗
Variable Gear Ratio Steering (VGRS)	✗	✗	✓ (450h)	✗
Electronic parking brake	✓	✓	✓	✓
Tyre pressure warning system with auto location	✓	✓	✓	✓
<b>PASSIVE SAFETY</b>	<b>EXECUTIVE EDITION (300h)</b>	<b>LUXURY (300h)</b>	<b>F SPORT</b>	<b>PREMIER</b>
Driver and front passenger 2-stage airbags	✓	✓	✓	✓
Driver and front passenger knee airbags	✓	✓	✓	✓
Driver, front and rear passenger side airbags	✓	✓	✓	✓

Curtain shield airbags	✓	✓	✓	✓
<b>SECURITY</b>	<b>EXECUTIVE EDITION (300h)</b>	<b>LUXURY (300h)</b>	<b>F SPORT</b>	<b>PREMIER</b>
Alarm (siren and 2 sensors)	✓	✓	✓	✓
Smart entry and push-button start	✓	✓	✓	✓
<b>COMFORT &amp; CONVENIENCE</b>	<b>EXECUTIVE EDITION (300h)</b>	<b>LUXURY (300h)</b>	<b>F SPORT</b>	<b>PREMIER</b>
Adaptive Cruise Control	✓	✓	✓	✓
Push-button start	✓	✓	✓	✓
Auto-dimming electrochromic rear-view mirror	✓	✓	✓	✓
Leather upholstery with front seat heaters	✓	x	x	x
Leather upholstery with heated/ventilated front seats	x	✓	x	x
F Sport seats with leather upholstery and heated/ventilated front seats	x	x	✓	x
Semi-aniline leather upholstery with heated/ventilated front seats	x	x	x	✓
Electric front seat adjustment – driver 10-way with memory, passenger 10-way	✓	✓	x	x
Electric front seat adjustment – driver 16-way with memory, passenger 10-way	x	x	✓	x
Electric front seat adjustment – driver 18-way with memory, passenger 18-way with memory	x	x	x	✓
Electric lumbar support – driver and passenger 2-way	✓	✓	x	x
Electric lumbar support – driver 4-way and passenger 2-way	x	x	✓	x
Electric lumbar support – driver 4-way, passenger 4-way	x	x	x	✓
Passenger seat with thigh and calf support and rear easy access system	x	x	x	✓
Butterfly front headrests	x	x	x	✓

Rear seat heater	x	x	x	✓
Leather steering wheel and gear shift trim	✓	✓	x	✓
F Sport perforated leather steering wheel and gear knob trim	x	x	✓	x
Electric steering wheel adjustment with paddle shift and easy entry (with lock protect)	✓	✓	✓	✓
Easy access (steering wheel tilt and driver's seat slide)	✓	✓	✓	✓
LED ambient lighting	✓	✓	✓	✓
Aluminium front and rear scuff plates	✓	✓	x	✓
Analogue clock with LED illumination	✓	✓	✓	✓
4.2in colour multi-information display	✓	✓	x	✓
8in colour multi-information display	x	x	✓	x
Dual-zone climate control with clean air filter	✓	✓	✓	x
Tri-zone climate control with nanoe ion generator, illuminated rear heater control panel and rear arm rest with a/c switches	x	x	x	✓
Piano black gloss trim inserts	✓	✓	x	x
Aluminium trim inserts	x	x	✓	x
Grey Shimamoku wood trim inserts	x	x	x	✓
Sports pedals and aluminium foot rest	x	x	✓	x
Electric sunshade on back window	x	x	✓	x
Electric sunshade on back window, manual shades on rear side windows	x	x	x	✓
Protection Pack (including luggage net, tailored boot liner, rubber floor mats and rear bumper protection plate)	Opt	Opt	Opt	Opt
<b>AUDIO, COMMUNICATION &amp; INFORMATION</b>	<b>EXECUTIVE EDITION (300h)</b>	<b>LUXURY (300h)</b>	<b>F SPORT</b>	<b>PREMIER</b>
12-speaker audio system with CD player, RDS and DAB tuner	✓	✓	✓	✓
17-speaker Mark Levinson Premium Surround audio	x	Opt	Opt	✓
12.3in multimedia screen with Remote Touch Interface	✓	✓	✓	x

Rear-view camera with guide monitor	✓	✓	✓	✓
Lexus Premium Navigation	✓	✓	✓	✓
Bluetooth	✓	✓	✓	✓
Aux-in and USB ports	✓	✓	✓	✓
12V accessory power sockets	✓	✓	✓	✓
Colour head-up display	✗	✗	✗	✓
<b>EXTERIOR</b>	<b>EXECUTIVE EDITION (300h)</b>	<b>LUXURY</b>	<b>F SPORT</b>	<b>PREMIER</b>
LED daytime running lights	✓	✓	✓	✓
LED headlamps with Automatic High Beam	✓	✓	✗	✗
Triple LED headlamp with Adaptive High-beam System	✗	✗	✓	✓
LED front fog lamps	✓	✓	✓	✓
LED rear lights	✗	✗	✓	✓
Dusk-sensing headlights with follow-me-home function	✓	✓	✓	✓
Rain-sensing windscreen wipers	✓	✓	✓	✓
Electrically adjustable, folding, heated door mirrors with auto-dimming function	✓	✓	✓	✓
Flush-fitted front and rear parking sensors	✓	✓	✓	✓
F Sport front and rear bumpers and grille	✗	✗	✓	✗
F Sport rear spoiler	✗	✗	✓	✗
Power bootlid closer	✗	✗	✗	✓
Sunroof	✗	Opt	Opt	Opt
Metallic or mica paint	Opt	Opt	Opt	Opt
17in alloy wheels with 225/50R17 tyres	✓	✗	✗	✗
18in 10-spoke alloy wheels with 235/45R18 tyres	✗	✓	✗	✗
19in F Sport alloy wheels with 235/40R19 front & 265/35R19 rear tyres	✗	✗	✓	✗
18in multi-spoke alloy wheels with 235/45R18 tyres	✗	✗	✗	✓
19in alloy wheels	✗	✗	✗	Opt
Temporary spare wheel	✓	✓	✓	✓

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