Updated: January 2017

PRIUS PLUG-IN

- Prius Plug-in, the flagship of Toyota's Prius family
- Prius, the hybrid pioneer, now one of the world's best-selling vehicles
- Toyota plug-in technology proven and optimised through results of five-year global trials
- Extended EV all-electric driving and freedom from "range anxiety"
- Modular quality of Toyota's Hybrid Synergy Drive platform paves the way for development of diverse eco cars

In 2012 the Toyota Prius grew from being a single model to become a family of full hybrid vehicles, with the launch of the seven-seat Prius+ MPV, quickly followed by the introduction of Toyota's first rechargeable full hybrid, Prius Plug-in.

Prius Plug-in offers all the familiar virtues of Prius, and then some. Like its sister model, it is powered by a smooth, refined and ultra-efficient full hybrid powertrain, but thanks to rechargeable lithium-ion battery technology, it can cover longer distances and reach higher speeds on electric power alone, cutting tailpipe emissions to zero. And unlike all-electric vehicles, once the charge in the battery is used up, the car switches seamlessly to its hybrid petrol engine, so the driver need have no concern about being able to complete a longer journey.

Thanks to this development of Toyota's Hybrid Synergy Drive system, Prius Plug-in achieves a low benchmark in its class for CO_2 emissions, 49g/km.

With the benefit of extensive feedback from its five-year long global PHEV trial project, Toyota has given Prius Plug-in a 15.5-mile EV range. This offers the best compromise between the distance the car can be driven on electric power, performance, packaging, vehicle weight and price. Toyota has found that this range is sufficient to meet the daily commuting requirements of 80 per cent of Europeans.

Recharging the battery is simple and speedy, using a power point linked to a standard domestic or workplace supply, or an on-street charging point. Prius Plug-in comes with a charging cable set as standard, including five metres of cabling, that can be stored neatly in a dedicated area beneath the boot floor. In 2015, Toyota appointed Chargemaster as its preferred supplier to provide both business and retail customers with site surveys and installation of the appropriate hardware. Chargemaster operates the POLAR network, the largest charging network in the UK with more

than 3,000 charging points.

The on-the-road price for Prius Plug-in is £33,950, but this falls to £31,450 with the benefit of a £2,500 Government incentive for new plug-in vehicle purchases, provided through the Office for Low Emission Vehicles (OLEV).

Toyota environmental and technological leadership

Almost 20 years since its European launch, the Toyota Prius continues to maintain its environmental and technological leadership. Moreover, it now ranks as one of the world's best-selling cars.

More than eight million Toyota and Lexus full hybrid vehicles have been sold around the world, with Prius accounting for a significant proportion of the total. In the UK Prius sales have passed 73,000 since the first generation model was introduced in 2000.

Prius paved the way for a series of further full hybrid Toyota models to be offered in Europe, including the British-built Auris Hybrid, Yaris Hybrid and the seven-seat Prius+ MPV. These have helped bring the benefits of hybrid to a wider customer base by meeting customers' different motoring needs and preferences.

Hybrid Synergy Drive – Toyota's core technology platform

Prius Plug-in is a further application of Hybrid Synergy Drive, Toyota's core technology platform. The system's modular design makes it adaptable for use with different energy sources, so it can readily be used for plug-in hybrid electric vehicles, pure electric vehicles and fuel cell vehicles.

In the case of plug-in hybrids, the system's architecture and its ability to provide long distance driving ranges remain essentially the same, but it uses a more powerful lithium-ion battery that is recharged from an external power supply.

Toyota's technology vision for an all-electric vehicle uses a simpler Hybrid Synergy Drive architecture, with no petrol engine and a battery that provides sufficient power to drive the vehicle for several hours before it needs recharging from an external source.

Toyota has further adapted the system for a fuel cell vehicle, in which a hydrogen fuel cell is used in place of petrol engine, and drive is provided by a powerful electric motor. Because the fuel cells generate electricity to charge the battery pack, the vehicle requires no external recharging, just refilling with hydrogen gas in the same manner as a Prius needs petrol. This technology has successfully been brought to market in the Toyota Mirai, the world's first production fuel cell

saloon.

Plug-in technology proven through extensive trials

Before it went on sale, Prius Plug-in was tested in an extensive global PHEV (plug-in hybrid electric vehicle) leasing project.

The first phase began in 2007, 10 years after the launch of the first generation Prius, and involved 20 vehicles – four of them in Europe. The aim was to carry out intensive research and development through real life road trials, with a focus on the relationship between the new technology and its users.

The viability of PHEVs requires simultaneous research into the development of an infrastructure for public, private and commercial recharging. Toyota worked with a partner energy company to explore this issue and identify suitable equipment and procedures.

The second phase, from December 2009, centred on a worldwide limited lease project involving 600 prototype Prius Plug-in, 20 of which were leased to selected partners and customers in London. These included businesses and local and national government organisations.

Real world driver behaviour analysis

The road trials around the world allowed Toyota to fine tune its PHEV research and development. Gathering feedback from users helped the company better understand customer expectations, while also spurring on the development of a public recharging infrastructure.

All the leased vehicles were fitted with data retrieval devices which monitored everyday activities, such as when and how often the vehicle was charged, the level of battery power at the time of charging, journey times, the percentage of EV driving and the EV range achieved, and fuel efficiency.

The PHEVs were used both for city driving and for longer journeys outside the urban environment. With each car covering an average 8,190 miles a year, the project participants together amassed around half a million miles of PHEV driving.

With more than 90 per cent of journeys covering less than 12.5 miles, the PHEV's zero emissions EV driving range was sufficient to meet a significant proportion of the motorists' daily requirements. More than one third of users also made longer trips of more than 60 miles at least once a week; thanks to the PHEV's ability to operate as a full hybrid, these could be made with no concern about whether the car would have sufficient charge to cover the distance – "range anxiety".

Comparative fuel efficiency figures from the tests show that the Toyota PHEV consumed 36 per cent less fuel than a comparable, best-in-class diesel vehicle, and almost 50 per cent less than the best-in-class petrol-powered car. Those users who maximised the PHEV's potential and made best use of the recharging infrastructure were able to achieve average fuel consumption of more than 141mpg.

Extended EV range with no constraints

Electricity has high potential to serve as an alternative to oil. It can be produced from renewable sources such as solar, wind, tidal and hydro-electric power, it can be readily supplied, and it is carbon neutral at the point of consumption.

However, although the environmental merits of EVs as urban commuter transport are well proven, further development of these vehicles is currently handicapped by the weight, size and cost of the large capacity batteries they need to provide a satisfactory driving range. Another issue is the lack of an adequate recharging infrastructure.

In focusing on PHEV technology, Toyota has addressed the matters of driving range, cost and infrastructure. Prius Plug-in is a full hybrid in which the electric motor and petrol engine can drive the wheels. It has an extended fully electric EV mode for city driving, while the hybrid system's petrol engine comes into play seamlessly to give the car true long range capability.

The car's EV range and its ultra-low CO_2 emissions qualify Prius Plug-in for the UK Government's Plug-in Car incentive, which reduces the vehicle purchase price by £2,500. Its 49g/km CO_2 emissions attract a zero annual road tax (VED) charge and exempt the model from the London congestion charge.

Smart Grid for a future low carbon society

Toyota's PHEVs and EVs will play an important role in the development of a low carbon society. But there is a risk that, if a large number of vehicle batteries are charged simultaneously at a specific time of day, peak power demand will increase. That makes it crucial for the most efficient charging times to be identified.

In response to this challenge, Toyota is researchin a Smart Grid concept, an electricity network in which power supply and demand are controlled using IT tools to ensure a stable power supply and the best possible energy savings.

The Smart Grid is designed to help people live a comfortable, low carbon lifestyle by connecting

vehicles, homes and people. At its heart is Toyota's Smart House, which is currently on test in Japan. The house is equipped with a Home Energy Management System which controls the generation of electricity by solar panels, its storage in a home battery and its efficient consumption, including setting optimum vehicle charging times. The plug-in or electric vehicle is integral to the system, with the vehicle battery able to provide power to the household in an emergency.

The Smart Houses in each district are connected to a Toyota Smart Centre, a local information hub which monitors power company and household power generation, and the power used by each home. The centre can plan energy consumption and storage and give advice to help even out demand and ensure electricity is used efficiently throughout the community.

Advanced IT technologies and large scale information infrastructures are necessary to establish the Smart Grid, and co-operation between different industries and government agencies is essential. To that end, Toyota is participating in tests to evaluate the next generation of eco-cars and introduce its Smart Grid on a global scale, with projects in Japan, the USA, China and France already under way.

PACKAGING AND DESIGN

- Specific frontal design, exterior trim features and colour range
- Dedicated interior features, including new two-step heater and air conditioning co-ordination
- Five seats and 443 litres of load space – just two litres less than the standard Prius

Prius Plug-in shares the characteristic sweeping silhouette of the third generation Prius. Its kerb weight is 1,455kg, just 55kg more than its standard sister model, and the weight of its lithium-ion battery has been kept down to just 80kg – half the weight of the battery used in the prototype plug-in model and only 38kg more than the nickel metal-hydride battery in the standard Prius.

As with every member of the Prius family, the exterior design focuses on the highest aerodynamic efficiency to improve fuel economy, handling stability and quietness, supporting the benefits gained from the car's lightweight, high-tensile steel and aluminium construction and its Hybrid Synergy Drive powertrain. The result is a Cd 0.25 drag coefficient, the same as that of the regular Prius.

The front of the car features an upper grille aperture that has been kept as small as possible to maintain a smooth airflow over the upper body. The lower grille has been made larger, and incorporates a chrome-finish moulding and an upper trim panel with a silver accent.

The extended section of the upper headlamp has a smoked blue paint finish, which further distinguishes Prius Plug-in from the rest of the Prius family. In profile the appearance is like the

standard hatchback, except for the battery charger lid on the right hand rear wing, decorated with a silver plug symbol.

Other details specific to the model include silver accents on the door handles, 10-spoke 15-inch alloy wheels and a Plug-in Hybrid logo on the front wing. At the rear the LED lamp clusters have clear lenses and the trim above the licence plate has a silver finish. The Hybrid Synergy Drive badges incorporate a plug-in symbol.

Interior design

The compact packaging of the lithium-ion battery pack means there is no compromise in the space available for rear seat passengers, or in the load area. Prius Plug-in can accommodate five people and has a 443-litre luggage capacity with the rear seats in place, just two litres less than the standard Prius. With the 60:40 rear seats folded down there is a flat loadspace floor and a load volume of 1,120 litres.

The dual-zone dashboard is the same as that in the regular Prius, designed to minimise the time the driver has to look away from the road ahead to view information, and to offer excellent functionality in the controls and switchgear. The appearance is slightly different, thanks to a high brightness silver trim and a Plug-in Hybrid logo.

The upper display zone features both a head-up display and a central meter cluster, positioned at an ideal distance for at-a-glance reading of vehicle status information. The LED meter incorporates a display which can be changed using a Touch Tracer control, and an Eco Drive Support Monitor, with expanded content in line with Prius Plug-in's specific system functions.

The lower command zone is characterised by a distinctive, asymmetric 'bridge' construction which positions the shift lever within close reach of the driver while creating a handy storage space below. This area of the dashboard focuses on the full colour Toyota Touch multimedia screen, giving the driver easy access to the car's audio and navigation systems.

The front seats have a two-step heater with a control system that suppresses temperature fluctuations and improves comfort. In Eco mode, the heaters are co-ordinated with the air conditioning system, activating to warm up occupants more quickly and reducing the load on the aircon, which in turn improves the car's overall fuel efficiency.

HYBRID SYNERGY DRIVE POWERTRAIN

- First application of Toyota Hybrid Synergy Drive in a plug-in hybrid electric vehicle
- No range anxiety and no need to modify driving patterns

- Extended EV driving range of about 15.5 miles – more than enough for a return journey from Trafalgar Square to Canary Wharf
- EV driving with zero tailpipe emissions at speeds up to 51mph
- Official PHEV combined fuel consumption 134.5mpg – 45 per cent lower than the standard Prius – with 49g/km CO_2 emissions
- Compact, lightweight, high capacity lithium-ion battery can be fully recharged in an hour-and-a-half

Prius Plug-in marks the first use of Toyota's Hybrid Synergy Drive technology in a PHEV.

It's designed to meet the needs of urban customers, with an all-electric EV driving range of about 15.5 miles, enabling typical commuter journeys to be accomplished with zero tailpipe emissions. Thanks to the hybrid powertrain's petrol engine, Prius Plug-in is equally able to accomplish long distance trips.

Prius Plug-in is a full hybrid, so can operate in in all-electric mode or with its electric motor and petrol engine in combination. It delivers seamless acceleration with an electronic CVT, and remarkably quiet operation.

Once the car has reached the limit of its EV driving range, its hybrid petrol engine automatically comes into play. This means there is none of the concern about whether the car can reach its destination without running out of power – the "range anxiety" that is typically associated with full electric vehicles. Furthermore, there is no need for the driver to adopt a different driving style or behaviour.

Performance

Total system output from the Hybrid Synergy Drive powertrain is 134bhp (100kW), giving 0-62mph acceleration in 11.4 seconds and a 112mph top speed. Acceleration in EV mode is brisk, making Prius Plug-in nimble in the stop-start flow of city traffic.

The car's extended EV range significantly enhances its overall fuel efficiency, with an official figure of 134.5mpg, an improvement of 45 per cent on the performance of the standard Prius. At the same time, CO_2 emissions have fallen to an unprecedented 49g/km, and levels of NOx are much lower than from diesel engines with comparable performance. When running in EV mode, there are no harmful tailpipe emissions.

Prius Plug-in remains impressively efficient when operating in full hybrid mode, too. Once the limit of its EV range has been reached, the Hybrid Synergy Drive system still returns combined cycle

fuel consumption of 76.4mpg and 85g/km CO_2 emissions. These figures remain lower than those of the regular Prius, mainly due to the fact the new lithium-ion battery used in Prius Plug-in can recover energy under braking more efficiently, recharging the battery more quickly and enabling greater use of the car's EV mode. In addition Prius Plug-in is fitted with low rolling resistance tyres.

PHEV system architecture

Prius Plug-in's full hybrid system features a 1.8 litre VVT-i petrol engine, a powerful electric motor, a generator, a high performance lithium-ion battery and a power control unit. A power split device uses a planetary gear set to combine and reallocate power from the engine, electric motor and generator, as driving conditions require.

A key factor in the successful installation of the system in the car's front-engine/front-wheel drive platform is that the electric motor, generator and power split device are housed in a single transmission casing that is about the same size as a conventional gearbox. The system uses a seamless E-CVT continuously variable transmission controlled through shift-by-wire technology and an electronic shift lever.

Unlike a conventional, belt-driven CVT, Hybrid Synergy Drive delivers drive torque through a power split device. The generator is connected to the sun gear, the engine to the planetary gear pinion carrier, and the electric motor to the outer, ring gear, which itself is directly connected to the differential, which drives the wheels. This means, with power transmitted to the ring gear from the engine, electric motor, or combination of both, the rotational speed of the ring gear determines the speed of the vehicle.

The lightweight and compact four-cylinder, 1,797cc Atkinson cycle VVT-i petrol engine develops 98bhp (73kW) at 5,200rpm and 142Nm of torque at 4,400rpm. The high performance, permanent magnet, synchronous 60kW electric motor generates a maximum 207Nm of torque from zero rpm. Engine and motor combine to give a total system output of 134bhp (100kW).

The electric motor, powered by the lithium-ion battery, works in tandem with the petrol engine to boost acceleration when required in normal driving. The allocation of power is constantly adjusted between the engine and electric motor to achieve optimum performance with maximum fuel efficiency.

When Prius Plug-in is in EV mode, the electric motor alone powers the driven wheels. The EV range - up to a maximum of about 15.5 miles – is dictated by the level of battery charge and driving conditions. However, once the EV battery charge has been exhausted, the car automatically operates as a full hybrid until it is recharged from an external power supply. This means there are

none of the driving range constraints associated with conventional, all-electric vehicles.

As well as maximising the efficiency of the Hybrid Synergy Drive system, and regardless of which driving mode is selected, the electric motor also acts as a high output generator during deceleration and under braking to effect regenerative braking. This recovers kinetic energy that would usually be lost as heat as electric energy for storage in the lithium-ion battery.

Compact, lightweight, high capacity lithium-ion battery

Prius Plug-in's lithium-ion battery pack is fundamental to the successful commercialisation of Toyota's PHEV technology.

Toyota opted to use lithium-ion batteries as their characteristics are ideal for use in a plug-in hybrid. They have a higher volume-energy density and are very compact, and this allows for a longer EV driving range with little penalty in terms of weight or packaging. They can be recharged quickly and are effective when used in a regenerative braking system.

The battery pack used for Prius Plug-in has been developed by Toyota in a joint venture partnership with Panasonic EV Energy. Its capacity is 4.4kWh – almost four times greater than the battery in the standard Prius – and its state-of-charge for use has been improved to about 60 per cent.

The battery's gross energy output has been reduced by about 22 per cent, compared to the 5.2kWh pack that was fitted to Toyota's prototype vehicles, but the EV range has actually been extended by about a quarter.

The Hybrid Synergy Drive system's Power Control Unit also gained a new voltage boost converter with greater durability in order to manage the new battery's higher voltage.

In spite of the increase in power output, significant changes have been made to the 288-cell pack used in the PHEV prototype so that it can be installed in Prius Plug-in with no impact on rear seat passenger accommodation or space in the boot – the space available is almost identical to that in the standard Prius.

The capacity of each battery cell has been increased four-fold compared to those in the prototype vehicle. The new pack has 56 cells in a single structure, comprising a stack of four 14-cell series-connected batteries.

These revisions, and the adoption of a new aluminium frame, have reduced the pack's volume

from 201.7 to 87.2 litres and cut its weight by half, from 160 to 80kg. As a result, Prius Plug-in weighs only 55kg more than a standard Prius.

Quick and convenient recharging

Prius Plug-in's battery pack can be fully recharged in an hour-and-a-half from a standard 230V domestic power supply. The battery charger inlet is located under flush mounted panel in the rear right-hand wing.

The battery charger itself is positioned beneath the hybrid battery pack and converts AC electricity into DC current. When connected to a 230V power source, it operates with a charging efficiency of about 84 per cent.

Several improvements have been made to the system fitted to Toyota's PHEV prototypes, and a charge timer has been added, allowing users to set charging start and finish times.
A CCID (charging circuit interrupter device) inside the battery charger cable will automatically block AC current supply should there be any electrical leakage during charging. Its size has been reduced compared to the prototype system, and the power plug can now be removed and replaced if required.

The charger cable has also been made more flexible to make it easier to handle in cold weather. Different, replaceable plugs are available to fit the diverse outlets in different countries and regions around the world. The cable is stored in a dedicated compartment under the loadspace floor.

Following analysis of the prototype PHEV, the battery charger connector has also been modified to make it easier to use. Finished in blue, the connector's main body has a scratch-resistant finish. A freeze-proof lock release button has been adopted, chrome plated to protect against corrosion. A padlock-type cable lock can be fitted to the lock release button for improved security.

The battery charger inlet itself has been changed for greater ease of use. Its inner and outer lids have been integrated to make the opening and connection process simpler. An LED lamp inside the lid illuminates the inlet connector, and a battery charger lamp next to the connector indicates the battery charging status.

DRIVING DYNAMICS

- Smooth, quiet driving experience, free from range anxiety
- Improved Eco driving modes, with EV range of about 15.5 miles
- Eco Drive Support monitor helps drivers maximise their car's efficiency and EV driving range
- Revised suspension and electric power steering

The new Prius Plug-in offers seamless acceleration and remarkably quiet running over an extended EV range, with high fuel efficiency and ultra-low emissions.

The characteristics of Toyota's full hybrid powertrain require no change in driving style or behaviour, and the system can even help drivers maximise the performance benefits of Hybrid Synergy Drive through PHEV-specific support monitors.

As well as being able to cover around 15.5 miles in EV mode, Prius Plug-in can tackle long range journeys by switching seamlessly to its full hybrid system, so avoiding the range anxiety associated with the current generation of all-electric vehicles.

Eco driving

Prius Plug-in has three on-demand drive modes: HV, EV and EV-City.

When the driver selects HV (hybrid vehicle) mode, the car operates in much the same fashion as the standard Prius, with the Hybrid Synergy Drive system seamlessly engaging the petrol engine when required.

When EV mode is selected, Prius Plug-in can draw on the hybrid battery's full capacity and will remain in electric drive mode for urban driving with minimal noise and zero tailpipe emissions for up to about 15.5 miles, at speeds up to 51mph. The petrol engine will start up if the system judges that extra power is needed, but using light to medium throttle inputs will keep it switched off throughout EV mode operation.

With EV-City mode, the characteristics of EV mode are matched, but more forceful use of the throttle can be made before the petrol engine kicks in, allowing drivers to use the car in inner city zero emission zones.

Eco mode can be activated independently, when the car is running in HV, EV or EV-City modes. In any drive mode, throttle response to the driver's use of the accelerator pedal is reduced and the air conditioning system is adjusted to achieve better fuel economy. Depending on driving conditions, this can help drivers achieve a noticeable reduction in fuel consumption.

Eco Drive Support

Prius Plug-in's drive modes are complemented by comprehensive eco-driving support to help drivers who want to develop a more environmentally efficient driving style.

Like its Prius sister model, it is equipped with an Eco Drive Support Monitor, with a number of PHEV-specific functions to help users maximise the benefits of the extended EV driving range.

The hybrid system indicator bar graphic now shows the point at which the engine will start under acceleration, so the driver can moderate throttle inputs and ensure best use is made of the EV and EV-City modes.

The energy monitor, which displays current engine operating conditions and the flow of electric power in real time, incorporates plug-in connection status and remaining charge time displays. If the ignition is turned on while the vehicle is being charged externally, the connection status will appear, together with an indication of the approximate time needed for the battery to be fully recharged, rounded up to the nearest tenth of an hour.

Thanks to a Toyota first, users can set start and finish battery charging times, with both displayed on the Eco Drive Support Monitor.

The Hybrid System Indicator and the Energy Monitor both feature an EV driving range display, next to the battery state-of-charge indicator, showing how far the car can travel under electric motor power, on the remaining level of battery charge, to the nearest tenth of a mile.

The battery state-of-charge display appears in two styles, to differentiate between HV and EV mode using charged electricity only. In EV mode, when battery charge falls below a certain level, the display automatically changes (along with the Hybrid Synergy Drive system) to HV mode. Conversely, when battery power is increased through regenerative braking, the display reverts simultaneously with EV mode being automatically restored.

There is also an EV Driving Ratio indicator which shows what proportion of a journey has been covered on electric motor power alone. This function also includes displays showing the amount of power and fuel used, and how much fuel has been saved by using electricity from external charging.

The trip fuel consumption record has been changed to a bar graph, with a monthly average fuel consumption record and a calendar function.

Finally, drivers can visualise the benefits of external charging by a novel forest display. The system converts the amount of electricity sourced from external charging into a reduction in CO_2 emissions. For every 10kg saved, one tree is planted in the forest. As the number of trees increases, flowers and animals are also added to the display.

Together these Eco Drive Monitor functions can help drivers develop relaxed, fuel-efficient driving techniques that can make the most of the car's EV performance and overall full hybrid system efficiency.

Suspension and steering

Prius Plug-in uses the proven MacPherson front and torsion beam rear suspension featured in the standard Prius. Both have been adjusted, however, to take into account the car's specific weight distribution, to maintain ride comfort and handling stability.

Front and rear shock absorber damping forces have been changed, together with the characteristics of the rubber used for the front suspension's upper support, to improve NVH performance.

The electric power steering's control map has been revised in line with the nominal effect Prius Plug-in's specific weight distribution has on its driving dynamics.

EQUIPMENT, OWNERSHIP COSTS AND UK MARKET

- Single, high specification model
- Features include Toyota Touch & Go Plus multimedia system, eight-speaker JBL sound system with GreenEdge energy-saving technology and heated front seats
- Prius Plug-in qualifies for £2,500 UK Government incentive towards new car purchase price

Prius Plug-in is offered with a single equipment specification that, true to the car's reputation for user-friendly technology, includes a generous range of advanced features.

These include LED daytime running lights and headlights; Toyota Touch & Go Plus with touchscreen controls, satellite navigation, voice recognition, rear-view camera and advanced Bluetooth for phone connection and audio streaming, eight-speaker JBL sound system, rain-sensing wipers and cruise control.

Heated front seats, 15-inch full alloy wheels and leather steering wheel trim are also included in the package.

Black leather upholstery and rear privacy glass are available as options. A Protection Pack (rear parking sensors and boot liner) and a Style Pack (exterior chrome trim elements) are also available.

Toyota Touch & Go Plus

Standard equipment for Prius Plug-in, the Toyota Touch & Go Plus premium package provides satellite navigation, advanced traffic pattern intelligence on programmed routes, voice recognition for calls, music search and play, and phone contacts search and call functions.

The driver can customise speed limits and speed camera warnings, and the navigation display includes 3D city models and landmarks,

The system's connectivity allows access to Google Local Search (using a compatible mobile phone, and pre-registration via a Toyota customer portal) to obtain useful information on navigation locations and downloadable applications for services such as live parking and fuel prices. Drivers may also input journey destinations remotely from home or office, via Google Maps. Points of interest can also be downloaded for entry as destinations.

Touch & Go Plus provides a text-to-speak function and, using Gracenotes, "play more like this" audio selection. The satellite navigation is supported by three years' free map updates, with two updates a year.

JBL GreenEdge premium audio

Prius Plug-in is equipped as standard with a new eight-speaker JBL premium sound system. It uses GreenEdge technology to ensure the speakers, amplifier, equalisation and even the positioning of each components work together to deliver high sound quality and low power consumption.

The JBL GreenEdge amplifier is at the heart of the system, a unit that is two-thirds smaller and lighter than comparable equipment. It uses Tracking Power Technology to measure audio input in real time, so only the necessary amount of electricity is supplied to the amplification circuit. This greatly reduces heat loss and cuts the amount of current drawn from the vehicle's alternator by half.

The high-efficiency JBL GreenEdge speakers generate twice the sound output levels of conventional levels for the same amount of power use. They have custom-designed acoustic lenses that spread a more powerful sound across an even wider frequency range.

Pricing and insurance

The on-the-road price for Prius Plug-in is £33,395, but this falls to £30,895 with the benefit of the £2,500 Government Ultra Low Carbon Car Consumer Incentive available for new vehicle

purchases, provided through the Office for Low Emission Vehicles (OLEV).

The organisation of the Government incentive element of the purchase will be undertaken by the Toyota Centre handling the sale, Toyota (GB) and OLEV, placing no burden on the customer. The price the customer pays will include the grant, so he or she will not have to claim the money back after purchase.

Prius Plug-in has a 16E UK insurance group rating.

TOYOTA GB AND CHARGEMASTER

In 2015, Chargemaster Plc became Toyota's nationwide charging partner for Prius Plug-in Hybrid.

Chargemaster is the UK's leading electric vehicle charging point designer, manufacturer and operator, providing units for the home, workplace and the public sector.

Specifically for Prius Plug-in owners, Chargemaster will provide and install and home charge unit free of charge (subject to Chargemaster terms and conditions). The homecharger offer includes installation and a follow-up service. It provides a wallbox and a built-in 4.5m tethered cable. Its 3.6kW capacity means that a Prius Plug-in can be charged from flat to full in an hour and a half.

To enable faster and safer charging, Chargemaster will set up a dedicated power circuit for the homecharger. The unit is accessed using a key, so the customer can control who uses it. The homecharger incorporates a commuications module, giving the customer free access to their electricity consumption data for three years after installation. This information is available via Chargevision, a dedicated web portal.

Chargemaster operates the national POLAR network, the country's largest public electric car charging service with more than 3,000 charging points. Prius Plug-in customers receive free POLAR membership (subject to terms and conditions).

Customers can check the eligibility criteria for obtaining a free homecharger and other details at the Chargemaster website, www.chargemasterplc.com.

TIMELINE AND UK SALES

YEAR	MONTH	EVENT
1997	December	First generation Prius launched in Japan.
2000	October	Prius launched in the UK.
2004	January	Second generation Prius launched in the UK.

2009	January	The third generation Prius makes its debut at the Detroit motor show.
	August	Third-generation Prius UK sales launched.
	September	Prius Plug-in Hybrid concept car unveiled at Frankfurt motor show.
	December	Toyota announces a global trial leasing programme for Prius Plug-in.
2010	June	Toyota and EDF launch a trial of Prius Plug-in London to gather performance and user intelligence prior a production model being launched.
2011	March	Toyota reveals Prius Plug-in at the Geneva motor show and signals it will quickly advance into production.
	September	Production version of Prius+ appears at the Frankfurt motor show.
2012	July	Prius Plug-in UK sales begin.
2013	June	Global Prius sales pass three million units.
2014	July	A Prius Plug-in sets the first fuel economy record lap at the Nürburgring.
2015	July	Chargemaster Plc becomes Toyota's partner for providing home charging points for Prius Plug-in.
2016	March	An all-new Prius Plug-in is revealed at the New York motor show, constructed on a Toyota New Global Architecture-based platform.
	September	The new Prius Plug-in is presented for the first time in Europe at the Paris motor show.

Prius Plug-In UK sales in 2016: 96

Cumulative UK sales since launch (2012): 1,706

PRIUS PLUG-IN TECHNICAL SPECIFICATIONS

Engine	
Numbers of cylinders and arrangement	4 cylinders, in-line
Valve mechanism	16-valve double overhead cam (DOHC) with VVT-i
Bore x stroke (mm)	80.5 x 88.3
Displacement (cc)	1,798
Compression ratio	13.0:1

Fuel system		Electronic fuel injection	
Max. output (bhp/kW @ rpm)		98/73 @ 5,200	
Max. torque (Nm @ rpm)		142 @ 4,400	
Motor generator			
Motor type		Permanent magnet, synchronous motor	
Max. voltage (DC V)		650	
Max. output (bhp/kW)		81/60	
Max. torque (Nm)		207	
HV battery			
Battery type		Lithium-ion	
Nominal voltage (DC V)		201.6	
Number of battery Cells		56	
Battery capacity (kWh)		4.4	
Max. output (bhp/kW)		36/27	
Hybrid Synergy Drive			
System max. output (bhp/kW)		134/100	
Transmission			
Transmission type		Electric continuously variable transmission (E-CVT)	
Gear ratio	Forward	2.683	
	Reverse	2.683	
Differential gear ratio		3.267	
Performance			
Max. speed (mph)		112	
0-62mph (sec)		11.4	
Fuel consumption		**PHEV**	**HV**
Combined (mpg)		134.5	78.5
Urban (mpg)			
Extra urban (mpg)			
Fuel tank capacity (l)		45	
Emissions & insurance		**PHEV**	**HV**
CO_2	Combined (g/km)	49	84
	Urban (g/km)		
	Extra urban (g/km)		
Carbon monoxide, CO (g/km)		0.1184	
Total hydrocarbons, THC (g/km)		0.0254	
Non-methane hydrocarbons, NMHC (g/km)		0.0227	
Nitrogen oxides, NO_x (g/km)		0.0009	
PM (g/km)		-	

Insurance group		16E
Suspension		
Front		MacPherson strut
Rear		Torsion beam
Brakes		
Type	Front	Ventilated discs with ABS and integrated regenerative braking system
	Rear	Solid discs with ABS
Disc diameter (mm)	Front	255
	Rear	259
Parking brake type		Pedal
Steering		
Type		Electric power-assisted rack & pinion
Steering ratio		14.6:1
Turns (lock to lock)		2.8
Min. turning radius (m)	Tyre	5.5
	Body	5.6
Exterior dimensions		
Overall length (mm)		4,480
Overall width (mm)		1,745
Overall height (mm)		1,490
Wheel base (mm)		2,700
Track (mm)	Front	1,525
	Rear	1,520
Overhang (mm)	Front	925
	Rear	855
Ground clearance (mm)		140
Drag coefficient (Cd)		0.25
Interior dimensions		
Length (mm)		1,905
Width (mm)		1,470
Height (mm)		1,225
Luggage compartment		
Max. length – seats up (mm)		863
Max. length – seats folded (mm)		1,830
Max. width (mm)		1,555
Max. height (mm)		601
Load volume – seats up (l)		443

Load volume – seats folded (l)	1,120
Weights	
Kerb weight (kg)	1,425 – 1,455
Gross vehicle weight (kg)	1,840

TOYOTA PRIUS PLUG-IN EQUIPMENT SPECIFICATIONS

SAFETY	
Driver and passenger front airbags	✓
Front side airbags	✓
Driver's knee airbag	✓
Front and rear curtain airbags	✓
ABS with EBD and Brake Assist	✓
Traction Control (TRC)	✓
Steering-assist Vehicle Stability Control (VSC+)	✓
Front seatbelt pretensioners	✓
Three three-point rear seatbelts	✓
Driver and front passenger seatbelt warning light and buzzer	✓
Rear seatbelt indicator light	✓
Active front headrests	✓
Anti theft system (immobiliser and alarm)	✓
Passenger airbag cut-off switch	✓
ISOFIX child seat restraint system	✓
Child-proof rear door locks	✓
Emergency braking signal	✓
INSTRUMENTS AND CONTROLS	
7in Electronic Multi-Vision (EMV) Display	✓
Touch Tracer switches	✓
Head-up display	✓
HV, EV and EV-City drive modes	✓

Multi-function trip computer and Eco Drive Monitor	✓
Push button start	✓
Foot operated parking brake	✓
COMFORT & CONVENIENCE	
Front and rear electric windows	✓
Driver's window with 'one-touch down' and anti-trap functions	✓
Electrically adjustable heated and folding door mirrors	✓
Electric power steering	✓
Tilt and telescopic-adjustable steering wheel	✓
Manual headlight levelling	✓
Remote fuel filler release	✓
Cruise control	✓
Smart Entry & Start	✓
Rain sensing front wipers	✓
Dusk-sensing headlamps	✓
12V power sockets (front and rear)	✓
AUDIO, NAVIGATION AND COMMUNICATIONS	
JBL eight-speaker audio with single CD player	✓
Toyota Touch & Go Plus: touchscreen control for audio and information with satellite navigation, advanced Bluetooth, access to Google Local Search, voice recognition, USB port and rear-view camera	✓
VENTILATION	
Automatic air conditioning	✓
SECURITY	
Immobiliser with alarm system	✓
Remote central door locking	✓
SEATING & UPHOLSTERY	
Cloth upholstery	✓
Leather upholstery	Opt

60:40 split folding rear seats	✓
Height adjustable drivers seat	✓
Electric front seat lumbar adjustment	✓
Adjustable front headrests	✓
Three adjustable rear integrated headrests	✓
EXTERIOR & BODY	
10-spoke 15in alloy wheels	✓
Tyre repair kit	✓
Colour keyed door mirrors	✓
Colour keyed door handles	✓
Colour keyed bumpers	✓
Integrated tailgate spoiler	✓
Rear privacy glass	Opt
Front fog lamps	✓
LED low beam headlights with washers	✓
Water-repellent front side glass	✓
Metallic or pearlescent paint	Opt
OPTION PACKS	
Protection Pack: rear parking sensors, boot liner	Opt
Style Pack: side and lower rear chrome trim, chrome fog lamp surrounds	Opt

ENDS

The mpg figures quoted in this document are sourced from official EU-regulated test results. These are provided for comparison purposes and may not reflect an individual's actual driving experience.

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