

TOYOTA COROLLA CROSS HYBRID & TOYOTA COROLLA CROSS 1.8V & 1.8G

The all-new Toyota Corolla Cross Hybrid, the first Toyota model with Hybrid Electric Vehicle (HEV) technology to be assembled in Malaysia, brings to Malaysians Toyota's advanced HEV technology which was introduced in the late 1990s with the Prius, the world's mass-produced first sedan with a hybrid powertrain. Since then, Toyota has continuously improved the technology, offering it in a wide variety of models in different segments worldwide.

As the pioneer and leader in HEV technology, Toyota has sold over 19 million HEVs globally. In Europe, hybrid models now account for over 50% of Toyota's annual sales volume while in almost every market, Toyota offers some models with hybrid electric technology and aims to increase the offerings in the years to come.

To achieve its goals of carbon neutrality by 2050, Toyota is using an inclusive, multi-technology approach that ensures no customer is left behind. Different countries and regions have different conditions that require different technologies and approaches. For Malaysia, HEV technology is deemed the best approach in view of the network of battery recharging stations still in development. HEVs are self-charging and only require petrol to run the internal combustion engine that is part of the hybrid powertrain. In Malaysia, there are some 3,700 petrol stations throughout the country, as compared to around 500 recharging stations (as at the end of 2021) which are mostly in urban areas.

For Malaysian consumers, the HEV is therefore the best solution rather than battery electric vehicles which also use more expensive technologies. There is no need for 'range anxiety', a concern of motorists with regard to the available electrical energy in the battery pack which needs to be recharged regularly. A HEV can be driven like any car with a petrol engine while offering far greater fuel efficiency as the electric motor also contributes power to move the vehicle.

Toyota's HEV technology has been constantly improved over more than two decades and the Toyota Hybrid Electric System is now in its 4th generation. Over the years, the system has become more compact, more efficient, more powerful and battery technology too has been constantly advanced. The fun-to-drive element is still maintained with a HEV while the motorist is also doing his or her part to protect the environment because hybrid powertrains emit lower levels of carbon dioxide, the greenhouse gas which causes global warming.

For those who prefer a conventional version, the locally-assembled Corolla Cross 1.8V and 1.8G is also available with only the 1.8-litre petrol engine and 7-speed Sequential Shiftmatic (CVT). This is similar to the model introduced last year with updated features.

HOW A HYBRID SYSTEM WORKS

‘Hybrid’, as the term suggests, is a combination of two or more items and in the case of a HEV powertrain, there are two electric motors as well as a petrol engine. There are various operating methods using the motor and engine separately or together. Toyota’s HEV system employs both at the same time, varying the power drawn from each depending on the driving conditions. Typically, when moving off, only the electric motor is used, giving efficient and strong acceleration. As the speed rises, the computer brings in the engine to provide additional power.

The Toyota Hybrid Electric System has two electric motors for more efficient operation. The primary one is used to propel the vehicle and a smaller secondary one for starting and charging the battery pack.

Fuel savings are achieved whenever the electric motor is used. Besides starting off, it may be possible to run on just the electric motor for a short distance in EV mode, which gives a smooth and noiseless experience similar to a pure electric vehicle. During cruising, when there is no strong acceleration needed or on flat terrain, less of the engine power might be needed so the electric motor will be used more to maintain the desired speed.

As mentioned earlier, a HEV does not need external charging of its battery pack. The recharging occurs continuously as the vehicle is running and even when braking, a regenerative process recovers the energy that is usually lost and channels it to the battery pack. The driver does not need to do anything as recharging is automatic when needed. Should there be some occasions when the energy in the battery pack is too low, then the engine will take over running the car. As long as there is sufficient petrol in the fuel tank, the vehicle can continue running – unlike a fully electric vehicle which would be unable to continue.

For additional fuel saving, the HEV also has an Auto Stop system which will shut down the engine whenever the vehicle is stopped for an extended period of time. Idling is a period when fuel consumption is at its highest as the vehicle is not moving but the engine is still consuming fuel. By shutting it down at such times, fuel can be saved.

THE COROLLA CROSS HYBRID

The locally-assembled Corolla Cross Hybrid is one of over 40 models in Toyota’s current range. It uses the latest fourth generation of the Toyota Hybrid Electric System which is more durable than the previous generation. Better cooling (very important for hybrid system battery packs) is one of the contributors to this increased durability.

Many components have also been reduced in size, making them lighter and more compact. The nickel-metal hydride (Ni-MH) battery pack, which can store a large amount of electrical energy in its 168 cells, is positioned under the rear seat instead of in the boot area, to realise

maximizing the 440-litre cargo volume. Locating the high-voltage battery pack under the seat also helps to lower the vehicle's centre of gravity for added stability.

The Toyota Hybrid Electric System for the Corolla Cross Hybrid consists of two electric motors and a 1.8-litre 4-cylinder engine (2ZR-FXE) tuned for RON95 petrol. The 16-valve DOHC engine, which has VVT-i (variable valve timing with intelligence) for increased efficiency, produces 72 kW/98 ps at 5,200 rpm with 142 Nm of torque at 3,600 rpm. From the primary electric motor comes 53 kW (equal to 72 ps) and 163 Nm of torque, maximum torque being available from almost idling speed.

Power delivery is via an E-CVT specially engineered for use in HEVs. Small and light, its virtual ratios have been optimized for high levels of fuel efficiency and driving performance. The internal gears have also been designed to minimize noise levels.

There are 4 modes – NORMAL | SPORT | ECO | EV – which the driver can select at the touch of a button while on the move to suit driving preferences or to maximize fuel-saving. In the NORMAL mode, there is an efficient balance of performance and fuel-saving, while the SPORT mode gives stronger acceleration, adding a fun-to-drive character. Although the Toyota Hybrid Electric System already reduces fuel consumption, the ECO mode can stretch each litre of petrol further. This is achieved by moderating performance and use of the air-conditioning system.

The EV mode is a unique mode in the Corolla Cross Hybrid which give an experience similar to driving a fully electric vehicle. In this mode, only the electric motor is used so there are zero emissions and the vehicle moves around noiselessly. The distance can be several hundred metres (depending on battery condition and driving speed) and would be ideal when moving around a carpark looking for a space.

The automatic dual-zone air-conditioning system in the Corolla Cross Hybrid is also unique, specially designed for HEVs. Unlike conventional air-conditioning systems which use an engine-driven compressor to pump the refrigerant around, the system in the Corolla Cross Hybrid is electrically powered. It can therefore run even when the engine is off, drawing its power from the battery pack. Should the battery pack capacity be low, the engine will restart to recharge it as it continues to power the air-conditioner's electric compressor.

TOYOTA NEW GLOBAL ARCHITECTURE (TNGA)

In recent years, all the latest Toyota models have been developed using the Toyota New Global Architecture (TNGA). This architecture can be used for many different types of models, including HEVs and SUVs like the Corolla Cross Hybrid and Corolla Cross Petrol. While having common elements to reduce cost, the variability of the architecture also allows engineers to have flexibility to differentiate models by incorporating specific features.

There is high rigidity, agility and ride comfort while, at the same time, a lower centre of gravity can be achieved to improve stability while the eye level of the driver is higher. In the case of the Corolla Cross, the ground clearance is also higher at 161 mm, in keeping with the crossover

SUV image and functionality of the model. With the 5.2-metre turning radius – best-in-class – parking and moving around are also easy.

EXTERIOR DESIGN

Although having the same name as the all-time bestselling car in the world, the Corolla Cross Hybrid has an entirely different appearance. Its design is that of a crossover SUV, the first time such a variant has been offered in the Corolla family. The addition of this SUV bodystyle gives customers an additional choice, especially as SUVs are very much in demand today.

The product concept for the Corolla Cross was 'Dignity Urban Vogue', with a distinctive design blending toughness with urban refinement and functionality. Compared to the earlier imported versions introduced last year, the locally assembled versions are enhanced with new features. All models have Bi-LED headlamps with LED Daytime Running Lights that employ a Light Curtain design. LEDs are also used for the rear lighting units.

Besides being energy-efficient, LEDs have advantages over other lighting technologies. These include producing light that is closest to daylight, quicker light-up times, and having a much longer service life. They are also more durable and resistant to vibrations.

The lower bumper forms part of the 'Double Trapezoid' design at the front to suggest stability. A unified look is achieved by the way the fenders on either side wrap inwards towards the grille. While SUVs can sometimes be bulbous, the profile of the Corolla Cross is sleek, with the silhouette highlighted by an axis line running from the front to the rear of the body.

The solid forms of the rear fenders are fused to the body, smoothly interfacing with the aerodynamically tapered cabin. The flared fenders provide an imposing stance as well as a sense of stability. A roof rail is now included as standard to add to the sporty and adventurous image. Overall, the design evokes the classic qualities of SUVs, communicating strength and purpose.

18-inch alloy wheels are fitted to the Corolla Cross Hybrid and Corolla Cross 1.8V, with stylish thin spokes matching the intricate design seen on the vehicle body. The Corolla Cross 1.8G has 17-inch alloy wheels as standard. For the spare wheel, a temporary space-saver type is provided and stored within the floor of the cargo area.

While the Corolla Cross Hybrid and Corolla Cross Petrol variants have similar looks, the HEV model can be recognized by blue accents in certain areas such as the brand logo on the grille and engine as well as in the headlights. Corolla Cross Hybrid customers also have an exclusive colour choice – Celestite Grey Metallic – besides the Red Mica Metallic, Platinum White Pearl, Silver Metallic and Nebula Blue Metallic available for both models.

INTERIOR DESIGN

The passenger car-like interior of today's SUVs was pioneered by the RAV4 some 25 years ago. This is continued in the Corolla Cross, with leather upholstery giving a tough premium expression. The front seats have a design with a unique silhouette which visually unites the

headrest and seat shoulder, with U-shaped sections for the seat cushion. The rear of the backrests have a concave profile which increases knee space for rear occupants.

To enable drivers of any size and height to achieve a comfortable position, the seat has 8-way Power Adjustment. The seat and backrest angle, height and position can be easily adjusted using the levers at the side of the seat. Furthermore, the leather-wrapped steering wheel can be set to just the right position by the tilt/telescopic steering column.

The extra height of the vehicle is not only used for ground clearance but also interior space, providing significantly better headroom than other competitor SUV models in the same class. The wide body dimensions also allow the centre console to be wider, for more storage space.

The generous instrument panel cross-section is wrapped around to the door trims to give the impression of the space expanding outwards, its structure supported by the console pillars and 'floating' door grips that express the toughness of an SUV.

Additionally, interior illumination is provided near storage spaces, not only making it easier when locating items but also adding a premium ambience around the cabin for both the 1.8 Hybrid and 1.8V variants.

The blue accents on the exterior that identify the Corolla Cross Hybrid are also evident in the instrument panel. There is an exclusive colour 7-inch Multi Information Display (MID) with two styles – detailed and simple. The instrumentation is also customized to show the hybrid powertrain performance and functions. Due to the quietness of operation, a READY indicator is shown to let the driver know when the system is ready to run when the START/STOP button is pressed.

For added convenience, various types of information are presented to the driver in the MID and one of the displays shows the flow of power and electricity between the engine, motor, battery pack and wheels. The flows are displayed in real-time and shows the driver when the battery is being recharged and the level of electricity in it.

To help the driver of the Corolla Cross Hybrid achieve the best fuel economy, an ECO display in the instrument panel provides guidance on accelerating optimally. At the end of each journey, the driver can refer to an ECO Score to see how eco-friendly the driving style has been. With such a feature, drivers may be inspired to achieve a good score daily and save more fuel!

A large 9-inch panel in the middle of the dashboard provides information for the infotainment systems, as well as the image from the rearview camera. The system is Apple CarPlay and Android Auto ready so compatible smartphone apps can easily be transferred and accessed from the dashboard. Other connectivity options include USB mirroring, AUX and Bluetooth.

To assist the driver during parking or manoeuvring the vehicle is a 3D Panoramic View Monitor which also uses the display on the 9-inch panel. Utilising small cameras on all sides of the vehicle, a 3-dimension view of the surroundings on all sides is presented to the driver. This not only enables easier positioning of the vehicle but also allows the driver to spot hazards or little children that might not be visible from the driver's seat.

All models have switches on the steering wheel to provide easier operation of many functions and systems. These cover the audio, MID, telephony and voice commands. With the steering wheel-mounted switches, the hands do not have to be taken off the steering wheel, improving driving safety.

Besides USB ports for recharging personal electronic devices, there is also an optional wireless charging pad which can be installed in the recess below the centre display panel. A clip is provided to secure compatible smartphones when they are being recharged wirelessly.

The air-conditioning system operated by an electric compressor has automatic operation to keep the cabin at the desired temperature. Airflow and temperature can be set differently for the driver and front passenger and with the S-Flow function, the airflow will be concentrated only on seats with people sitting on them. Cool air is also carried to the rear occupants by additional vents between the front seats.

For added quietness to make journeys more comfortable and pleasant, noise levels in the cabin are reduced by the use of an insulator sheet under the bonnet to isolate noise from the engine bay. The windscreen glass is also an acoustic type, reducing transmission of wind and other external noises.

Besides the convenience of a Smart Entry & Push Start System to lock/unlock the doors and start/stop the engine, the Corolla Cross also comes with a Power Back Door that opens and closes automatically by just positioning a foot under the rear bumper which has a proximity sensor. This allows for handsfree operation which will be convenient when both hands are holding bags or other items.

The cargo area, accessible through an opening that is 1,110 mm wide, has a volume of 440 litres with the rear backrests raised. Like all SUVs, one or both of the rear backrests can be folded down, extending the length of the floor as well as the available volume. With both backrests down, it is possible to carry two road bicycles (with front wheels removed). The 17-inch Temporary spare tyre and toolkit which includes a portable tyre pump are stowed below the floor. To conceal the items in the cargo area, there is a tonneau cover which can be rolled up when not needed.

SAFETY TECHNOLOGIES AND FEATURES

Besides the high-strength TNGA platform, the structure of the Corolla Cross is engineered to withstand impact forces from all sides during an accident, reducing or preventing injuries to the occupants. In crash testing and technical evaluation by ASEAN NCAP, the Corolla Cross Hybrid and Corolla Cross, as with many other Toyota models, has received a maximum 5-star safety rating.

The Corolla Cross Hybrid and Corolla Cross 1.8V come with Toyota Safety Sense (TSS) 2.0, a suite of Active Safety technologies that help a driver avoid accidents or reduce the damaging effects should a collision occur. TSS, which uses a radar and sensors, consists of 5 main systems – Pre-Collision System (PCS), Lane Departure Alert (LDA) with Steering Assist, Lane Tracing Assist (LTA), Dynamic Radar Cruise Control (DRCC) - All Speed, and Automatic High Beam (AHB.)

PCS helps to reduce the potential of frontal collision by constantly monitoring the road ahead. If a collision is likely, the driver will get a warning and audible image on the meter display. Failure to act in time will result in the vehicle's brakes being activated automatically to stop the car. In some cases, avoiding a collision might not be possible but the earlier braking action can help reduce damage.

LDA with Steering Assist initially alerts the driver when the vehicle drifts away from its traffic lane. If the driver does not make corrections, then the steering system will apply a small amount of force to the steering wheel to guide it back into its lane. This function can also perform steering assist on urban highways with curves and helps reduce vehicle swaying during straight line driving.

LTA assists in steering wheel operation to avoid further deviation from the lane. The system uses the camera and millimetre wave radar to recognize lane markers or a preceding vehicle's driving path and estimates the vehicle's position in the lane. LDA and LTA will prove useful when a driver loses concentration due to fatigue.

DRCC – All Speed uses both a camera sensor and millimetre wave radar to scan the road ahead for other vehicles. If a vehicle is detected ahead, the speed is reduced from the set speed so that a safe gap is maintained. When there is no longer a vehicle ahead, the vehicle will increase its speed to the set cruise control speed automatically. The DRCC is able to function at all speeds and can bring the vehicle to a complete stop if the preceding vehicle stops without the driver needing to depress the brake pedal. It can also automatically resume moving when the vehicle ahead starts to move. With DRCC, long-distance motoring can be more enjoyable with less fatigue experienced.

AHB improves driving safety at night as it prevents other drivers from being dazzled by glare. Sensors detect the headlights of oncoming vehicles and tail lights of front vehicles, and when present, the system will switch from high to low beams as appropriate depending on lighting conditions of the surroundings.

The Blind Spot Monitor (BSM) & Rear Cross Traffic Alert (RCTA) constantly scans the area along both sides of the car. If there is another vehicle within the driver's blind spot, the driver will be alerted by warnings flashing on the respective door mirrors.

For additional safety, Drive-Start Control is included to prevent sudden starting or unintended acceleration. This can occur if the wrong gear has been selected from PARK while the driver is pressing hard on the accelerator pedal. When such a condition is detected, a warning is flashed on the dashboard and engine output is immediately reduced to avoid an accident.

An Electro-Chromic (EC) Rearview Mirror is fitted in the Corolla Cross Hybrid. The electrochromic layer in the reflective surface dims the glass when sensors detect bright lights behind, thereby preventing the driver from being dazzled.

Other safety technologies which Toyota has developed over many decades are also present in the Corolla Cross Hybrid and Corolla Cross. These include ABS with Electronic Brake-force Distribution (EBD) and Brake Assist, Vehicle Stability Control (VSC) and Traction Control (TC), and Hill-start Assist Control (HAC).

There is also an Emergency Stop Signal (ESS) which activated the hazard warning lights automatically if sudden or strong braking occurs due to an emergency. The flashing lights will alert drivers behind so that they can take their own action to avoid a collision. An Auto Rain Sensor is also fitted, activating the windscreen wipers automatically when raindrops start to fall on the glass.

A Tyre Pressure Warning System is also installed which constantly monitors tyre pressures. In the event that one or more tyres have pressures that are lower than normal or recommended, a warning will be shown for the driver to take the necessary action.

The front and rear occupants are provided with additional protection with 7 SRS airbags at the front and sides of the cabin. Those on the side deploy during a side impact; as they cover the window openings, there is also additional protection against being ejected from the vehicle during violent accidents.

The Corolla Cross is also equipped with a Digital Video Recorder (DVR) at the front (optional for rear) enabling the owner to have a video recording of the vehicle's movements at all times. In the event of an incident, the recordings will be available as evidence. The wide-angle DVR is equipped with a feature to lock video files (preventing erasure or tampering) when a strong impact is detected by the built-in g-sensor.

SECURITY

Toyota Premium Security & Solar Film is installed on all the glass around the cabin before delivery. Tested and approved by Toyota, the film meets JPJ regulations. It reduces solar transmission into the cabin for a cooler environment and also prevents glass breakage by hard objects. Installation is done professionally at UMW Toyota Motor's own Accessories Centre adjacent to the assembly plant in Selangor.

Besides the factory-installed security system that includes an engine immobiliser, the Corolla Cross comes with a Vehicle Telematics System (VTS) to track the vehicle's position using GPS/GSM signals. If the vehicle is stolen, a 24/7 Command Centre will locate it and inform relevant authorities to recover it. During the first 3 years of ownership, subscription to the VTS service will be free of charge.

WARRANTY

Both Corolla Cross models, assembled at UMW Toyota Motor's own assembly plant, come with a warranty of 5 years. The owner can enjoy the full 5-year coverage as there is no limit on mileage covered after original registration.

For peace of mind, the hybrid battery pack has a separate warranty of up to 8 years (also with unlimited mileage). Furthermore, unlike the warranties for hybrid battery packs of other brands, UMW Toyota Motor's warranty package includes the Inverter and Power Management Control ECU for the same length of time. While Toyota has high standards of manufacturing

and quality, there may be very rare occasions when defects may occur and should such parts need replacement, the owner will not be required to bear any of the cost.

Customers can also opt to extend the battery pack and related components warranty for another 2 years, making for a total of 10 years. This longer warranty, which is transferable, will enhance resale value and give more peace of mind to owners

UMW Toyota Motor's nationwide network of over 92 authorized service centres are fully equipped to provide aftersales support for the Corolla Cross Hybrid and Corolla Cross 1.8V & 1.8G. Additionally, with 24SEVEN Road Assist, assistance is available. 24-hours a day, 7 days a week, by just calling a FREEPHONE number from anywhere in Malaysia.

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