

# All-New 2013 Avalon Combines More Emotional Styling, Improved Dynamic Performance, and Greater Refinement to Help Reposition Toyota's Flagship Sedan Within the Segment

October 31, 2012

TORRANCE, Calif., Oct. 31, 2012 – For 2013, Toyota has dramatically altered the chemistry of Avalon's formula, creating a new potent and persuasive sedan that helps shift the product's generational appeal while symbolizing Toyota's exciting new design and product direction for future sedans.

"The 2013 Avalon showcases Toyota car-building prowess and infuses the Avalon nameplate with new levels of excitement, dynamic capability, and refinement", said Bill Fay, Group Vice President and General Manager Toyota Division. Relying heavily on the Caltly Design Research (Newport Beach, Calif. and Ann Arbor, Mich.) design and Toyota Technical Center-Ann Arbor's (TTC-AA) engineering expertise, the new Avalon is a vastly enhanced product that utilizes Toyota's best in-market car-building resources to produce this new world-class sedan, and makes a statement.

"The point of the new Avalon is to show the market that 'Toyota is Back!' It will lead the charge for great styling, great handling performance, and the highest and best level of technologies," said Randy Stephens, chief engineer of Avalon.

The all-new 2013 Avalon will combine passionate styling, innovation, and an elevated level of craftsmanship to help reposition Toyota's flagship sedan within the highly competitive premium mid-size segment.

## **Exterior**

For the mission of re-positioning the Avalon brand and shifting consumer perception of the sedan, Caltly fashioned an exterior that offers a much more athletic expression in sheet metal. The new Avalon sedan represents a dramatic styling departure from previous Avalon models.

The 2013 Avalon's elegant and athletic design offers a longer flowing roofline creating a more appealing side silhouette with a lower vehicle beltline that suggests a sense of motion with a road holding stance. Its chiseled shoulder line sculpted into side sheet metal starts over the front wheels and creates a strong, fluid body side design cue adding to its athletic stance. The new Avalon exterior is designed to communicate a greater sense of performance and agility to better match the car's vastly enhanced dynamic capability.

Compared to the 2012 model, the new Avalon offers more compact and athletic exterior dimensions and with a greater styling sophistication that does not sacrifice interior comfort. The vehicle's stance has also been improved with more taut and compact exterior dimensions. Overall height has been reduced by 0.98 inch (25 mm) while the overhangs have been reduced by 0.59 inch (15 mm) at the front and 1.77 inches (45 mm) at the rear. Filling the wheel well, the gap between the body and the tires has been reduced by 0.27 inch (7 mm) compared to the previous Avalon model. The new Avalon's visual stance has been further enhanced by 1.29-inch (33 mm) reduction in width of the rear side rails surrounding the rear glass to tighten the proportions of the greenhouse. Vehicle tread has been increased by 0.39 inch (10 mm) at the front and 0.59 inch (15 mm) at the rear, widening the wheel placement underneath the more athletic Avalon body.

Keeping with the more athletic and expressive design theme, the new Avalon's exterior lighting compliments the design lines. The industry-first Quadrabeam™ headlight cluster utilizes a sleek and compact double-eye PES headlight design with two square glass condenser lenses that have been adopted for the low beams and offer outstanding lighting performance. Halogen and High Intensity Discharge (HID) bulbs are available for low beam double-eye PES front lamps. Available Daytime Running Lights (DRL's) using six high-performance LEDs bulbs are available lending a distinct, more modern image to the front of the vehicle.

A stronger, more expressive front-fascia design with larger grille opening creates an aggressive appearance while enhancing cooling air flow and pedestrian impact protection. The new Avalon's exterior turn-signal indicators have been located at the lower section of the front bumper to contribute to the slim and sleek appearance. The 2013 Avalon's sleek and sculpted rear tail lights utilize LED lamps to help ensure visibility and reduce the gap of unlit dark area between the trunk and rear quarter panel.

The more sculpted, athletic exterior design also helps the new Avalon cut through the wind with a low 0.28 coefficient of drag that helps fuel efficiency and on-road stability. The rear tapering design of the new Avalon body and the floor under covers help enhance vehicle stability at speed while improving airflow. The Avalon side mirrors offer improved aerodynamics to help reduce wind noise while also offering a weight reduction of 14.6 ounces (415 grams) compared to the outgoing model. The side mirrors alone help reduce the coefficient of drag by 0.001 compared to the previous model. These new aerodynamic side mirrors offer features such as; a turn signal lamp, electrical adjustment, a mirror heater, memory positioning, a puddle lamp, available Blind Spot Monitor indicator, and electro-chromatic glass. Also, the new Avalon is equipped with a new, lighter weight, more aerodynamic wiper design that stays in contact with the window longer. The new Avalon's rear valance houses stainless steel dual exhaust outlets integrated into the body.

The hybrid model is distinguished by blue-trimmed Toyota emblems at the front and rear of the vehicle. In addition to unique hybrid badges located on the trunk lid, front doors and a hidden exhaust outlet. The new 2013 Avalon will launch with two new colors, Moulin Rouge Mica and Champagne Mica, to compliment overall color choices for consumers.

## **Interior**

The all-new 2013 Avalon's Caltly-designed interior elaborates on the exterior's elegant, athletic theme to create a premium interior experience that combines high technology and craftsmanship with an artistic level of sculpted surfaces. Looking outside the cabin, the sculpted dash panel and its concave surfaces in front of the passenger help add to the sense of the cabin spaciousness. This panel is covered in supple, hand-stitched premium soft-touch material with the seam adding some creative flair as it goes across the dash panel. The broad, low and layered dash-board design helps divide the panel area into a balance between an intimate driver space, with focused angles on the meter, and a wide open passenger space.

The instrument panel has been widened by 1.18 inches (30 mm) in the upper region and 2.56 inches (65 mm) in the lower region compared to the outgoing model, helping enhance the interior's spaciousness. The driver is engaged by an Optitron-type combination meter, which produces a sharp, high quality display and 3.5-inch Thin-film Transistor (TFT) color multi-information display. The Avalon Hybrid's display features a needle-type Hybrid System Indicator, which displays hybrid power output and regeneration. An Eco area on the dial display helps show when the vehicle is being driven in an Eco-sensitive manner, and it can help guide a driver's throttle input to develop economical driving habits.

The new Avalon's interior surfaces are finished in premium materials such as hand sewn soft-touch material for the dash panel, unique smoke chrome trim surrounding the center panel, and high-quality glossy panel trim around the shifter. All of this attention to detail to touch surfaces and subtle enhancements to texture and visual appeal are aimed at elevating the overall interior experience for driver and passengers. Extensive use of soft-

touch materials helps enhance the interior's feeling of quality and comfort. A generous, dense-foam support is used beneath the supple soft-touch material covering many of the interior's touch surfaces, while a soft-skin surface with a deep foam construction is used for many of the dash surfaces to create a greater sense of tactile quality.

The 2013 Avalon's interior surfaces are available in three color themes: almond to help create a warm elegant, luxurious atmosphere; light grey that stays cooler and creates a modern interior space; and black that offers a greater sense of driving performance.

The new Avalon's front seats offer revised side bolstering using a lighter, denser foam material that helps improve body positioning for driver and passenger. In keeping with the road-trip oriented nature of this premium sedan, the seats still offer a high level of comfort and support for longer travels. As for adjustment, Avalon's seats are available as either 10-way or eight-way power adjustable for the driver's seat, and available 8-way and 4-way adjustment for the passenger seat. Compared to the seats in the outgoing model, the new Avalon seats offer 0.40 inch (10 mm) more seat-length adjustment toward the rear limit and 0.40 inch (10 mm) more seat height adjustment. The driver's seat incorporates a seat-cushion length extender available on the 10-way adjustable seat. A pneumatic four-way lumbar support is built into the driver's seat and a two-way lumbar support for the passenger. An electric seat heater and seat ventilation system have been adopted to help enhance driver and passenger seat comfort.

The 2013 Avalon's rear seats offer improved body retention with better side bolster support and also offer available rear-seat heating. Avalon seating surfaces are covered with a medium grain, genuine leather material or available premium leather with a finer grain.

The door panels are designed to help enhance the elegant nature of the interior while offering improved armrest comfort by incorporating foam that is 0.23 inch (6 mm) thicker than on the previous model. The door panel is also covered by durable synthetic leather with ornate stitching that matches the armrests. The available door panel pull cups are made of a premium soft-touch material, and LED lighting illuminates the door panel's controls. Smoked chrome bezels and plated accents adorn the inside door handles and power window switch bezels to help improve appearance. The power-window actuation is handled by a variable-rate window motor that slows the window as it approaches the top of the window frame to help reduce wind noise and add refinement. All four of the new Avalon's power windows are equipped with a window obstruction feature that reverses window operation when an object is detected.

Beyond styling, the Avalon interior remains highly functional with abundant and improved storage space. Located beneath the HVAC controls in the center console is the eBin™ electronics storage tray. This new tray design allows storage for two devices (cellphones or iPod for instance) side-by-side on a premium, higher friction surface. Charging jacks are located below the tray that can be opened and closed with cables passing neatly through the cable slot cut into the bottom of the tray. The tray is also illuminated by LED light for improved night visibility managing cables. Beneath this tray is an electronics storage box where devices can also be stored completely out of sight while charging. Two DC 12V power outlets, an AUX and a USB jack are accessible in the storage box.

For the Avalon Limited, the two chrome-decorated cup holders located in the center console are lit by LED ambient lighting. The lighting volume for the cup holders can be adjusted in three levels by operating the switch on the overhead console.

A large-capacity rear console box is big enough to store a tissue box and also includes a detachable sliding tray to store smaller items. The convenient sliding armrest lid covering the storage box offers up to 1.61 inches (41 mm) of travel to more comfortably function as an armrest, and can be opened and closed in any position. The storage box also contains another 12V DC outlet to facilitate charging or powering accessories. To the left of the

steering wheel is a coin box that can be actuated by push button control and utilizes a damper mechanism to help achieve smoother opening and closing. The new Avalon is equipped with a 0.24-cu.-ft. (6.9-liter) glove box with detachable tray can be locked with a key for security. The glove box is illuminated with LED light. The 2013 Avalon offers 16.0-cu. ft. of luggage capacity for the gasoline model and 14.0 cubic feet for the Avalon Hybrid model.

### **Powertrains**

A primary focus for the new Avalon was to enhance its dynamic character while maintaining superior fuel economy. The challenge was met by the TTC engineering team by utilizing a proven V6 to achieve better performance with superior fuel economy, and also creating the first Avalon Hybrid. The gas-powered Avalon features a powerful, all-aluminum 3.5-liter V6 engine mated to a conventional six-speed automatic transmission. Avalon Hybrid is equipped with a modified version of the 2.5-liter Hybrid Synergy Drive system that also propels the Camry Hybrid.

### **V6 Engine**

The Avalon utilizes a 3.5-liter, 90-degree, DOHC, six-cylinder engine that features Dual VVT-i (Variable Valve Timing with intelligence) to help offer superior power and efficiency by optimizing the intake and exhaust valve events to increase engine performance across the entire rev range. This robust V6 produces 268 horsepower at 6,200 rpm and 248 lbs.-ft. of torque at 4,700 rpm, and provides the new Avalon with competitive acceleration and a 0-to-60 mph time estimated at less than seven seconds. The fact that this brisk acceleration occurs with a more fuel-economy friendly 3.23-to-1 final drive ratio as compared to a 3.54 final drive ratio on the outgoing model is testament to the Avalon's weight reduction and improved drivetrain tuning.

The V6-powered Avalon features a hydraulic automatic transmission that has been optimized for improved fuel economy and performance from a lightweight front-wheel-drive transaxle. The transmission can be shifted from D mode into S mode on the shift gate, where shifts can be actuated with + or – shifts of the lever. The Sport mode adopts highly responsive upshift control and throttle blipping downshift control, which are adopted for quicker shifting performance. Steering-wheel-mounted paddle shifters help actuate fast, responsive shifts while keeping both hands on the wheel. The transmission response is further enhanced by utilization of a faster-locking torque converter that locks up early even in second gear. The transmission is also kept at an optimal temperature for consistent performance with an automatic transmission fluid warmer. The shift gate is actuated by a lever and shift knob that is covered by either standard leather or premium leather.

The V6-powered gasoline Avalon offers three drive modes: Eco, Normal and Sport. The Eco Mode prioritizes fuel efficiency by balancing driving performance, air conditioning function and fuel efficiency. It reduces driving force when accelerating at low speeds to enhance fuel efficiency. Sport mode helps create a more engaging driving experience by enhancing the Electric Power Steering effort and a more direct, responsive steering feel. It also adjusts throttle response to help increase the sensation of the engine's torque response during acceleration.

The gasoline drivetrain offers superior efficiency and performance for a premium mid-size sedan, with an EPA-rated 25 mpg combined (21 city/31 hwy). When equipped with the 18-inch wheel combination, the 2013 Avalon is EPA-rated at 24 mpg combined.

### **Hybrid Synergy Drive**

The Avalon's Hybrid Synergy Drive uses a 2.5-liter four-cylinder employing the Atkinson cycle to postpone closure of the intake valves and delay the compression cycle, helping reduce intake and exhaust energy losses to improve fuel efficiency. Engine efficiency is further enhanced by using a roller-rocker valvetrain, a variable output oil pump, and an electric water pump to reduce frictional losses. The engine also features VVT-i on the intake side and a revised combustion chamber shape for the Atkinson application. The gasoline engine alone is

rated at 156 horsepower at 5,700 rpm.

The efficient Atkinson cycle four-cylinder is attached to a hybrid application transaxle that acts as a power-split device between the gasoline engine and the two high output electric motors housed in the transaxle. The transmission operates similarly to a CVT (Continuously Variable Transmission), but it houses a planetary gear arrangement that allows for switching between, and even combining propulsion sources (power split device). Low-friction bearings help reduce parasitic losses, and a flywheel damper helps reduce noise and vibration. The transaxle also houses the open differential. One of the motor/generators (MG1) is driven by the engine and functions as a starter and generates electrical power to operate the second electric motor/generator (MG2) and charge the hybrid battery. The second motor (MG2) operates independently to help the gasoline engine and deliver smooth application of electric power from a standing start and when accelerating. The regenerative braking supplied by the MG1 motor also helps slow the vehicle while recovering lost energy and converting it to electricity that is returned to the battery. The electric motors are rated at 105 kW total, and the total system output for the Avalon's Hybrid Synergy Drive is rated at 200 horsepower. The Avalon Hybrid will accelerate from 0 to 60 in about 8.0 seconds.

The Avalon Hybrid is equipped with a proven 244.8-volt Nickel metal-hydride battery that is compact with superior cooling performance. This battery is comprised of 34 modules made up of a total of 204 cells. The Avalon's compact battery pack has been installed inside the luggage compartment and close to the rear seat to help maximize trunk capacity even as the hybrid application moves the 12-volt battery to the trunk. The cooling system remains quiet by utilizing a brushless motor powering the cooling fan and strategic placement of the air inlet.

Other components in the hybrid system are housed in a power-control unit that resides under the hood and includes an inverter that converts high voltage DC (Direct) current to AC (Alternating) current, a water-cooled DC-DC converter that converts the voltage from the 244.8-volt Nickel Metal Hydride (NiMH) hybrid battery to 12-volt DC in order to power auxiliary devices and charge the 12-volt battery. A hybrid control computer manages all of the system's components to deliver optimum power to meet driver demands while coordinating system functions. The power control unit is liquid cooled to maintain its temperature.

The Avalon Hybrid has an EV Mode, ECO Mode and SPORT Mode, with indicators appearing on the color display of the meter cluster. The EV Mode utilizes the battery energy to propel the vehicle using only the electric motor for about one mile at speeds of up to 20 miles per hour when conditions are ideal. The ECO Mode prioritizes fuel-efficient driving by reducing throttle response and energy consumption from the HVAC system to conserve energy. The Sport Mode helps create greater throttle response and acceleration, and a more positive steering feel through the EPS.

The structural weight management of the Avalon design benefits the Avalon Hybrid as the premium sedan tips the scales at only 3,585 lbs., which is only 124 lbs. heavier than the gasoline model. Reduced weight, clean aerodynamics and an efficient Hybrid drivetrain combine to give this sedan a combined 40 mpg EPA-rating (40 city/39 hwy). Taking the Avalon's 17-gallon fuel tank into consideration, the Avalon Hybrid can offer amazing range from one tank (theoretically, up to 680 miles considering the EPA-rated fuel economy).

### **Steering and Handling**

The TTC engineering team put great effort toward re-inventing Avalon's road-going character with a dramatic revision of the chassis. The new 2013 Avalon will offer vastly elevated levels of control and handling thanks to revised suspension that benefits from a unibody that is 12 percent more rigid overall, and 23 percent more rigid at the rear than the outgoing model. To take advantage of the new platform's increased rigidity, the suspension tuning has been dramatically revised. The front Macpherson strut suspension is tuned to provide outstanding ride comfort, but also flat cornering with enhanced agility. Inversely wound coil springs are matched to dampers that

help control the wheels with improved steering feel across a variety of surfaces. The rigidity of the 0.98 inch diameter (25 mm) front stabilizer bar and a 0.63-inch (16 mm) rear bar promotes flatter cornering. Unique, more rigid knuckles and lower control arms are adopted for the 18-inch wheel applications that help improve handling and steering feel.

The dual-link rear suspension design helps the vehicle achieve an ideal balance between ride quality and handling precision. This suspension design offers a reduced toe-in angle during turning and braking to help improve rear stability. Pillow ball joints are adopted in one of the suspension arms to help enhance handling precision. Though the Avalon rides on a long, comfortable 111-inch wheelbase, the steering and suspension tuning help the car feel agile and nimble.

The Avalon's electric power steering system (EPS) has incorporated tuning to improve feel while reducing engine driven accessories to help improve fuel economy. This electric rack and pinion system's power assist has been optimized in response to vehicle speed to create a lighter effort sensation at lower speeds and increased effort and on-center feel at higher speeds. The system without speed variable influence requires 2.85 turns from lock to lock. The Avalon steering column offers both tilt and telescopic features, and it can be adjusted plus or minus (+ /-) 0.78 inch (20 mm) from its neutral position for tilt and telescopic directions.

The Avalon's steering wheel has been designed to help improve the driver's tactile feel and control, enhancing driver confidence behind the wheel. The steering wheel's shape, grip and tactile feel helps create enhanced grip to improve the driving sensation. Available smooth, premium leather and padded foam help finish the steering wheel. It also includes a four-direction audio switch to enhance operability, in addition to a cruise control switch, DISP (Display) and TEL (Telephone switch). The steering wheel offers buttons for available voice recognition, vehicle-to-vehicle distance switch for Dynamic Radar Cruise Control. Large paddle-shift toggles attached to the steering wheel, on the V6-powered XLE Touring and Limited Avalon models, help enhance driver control during spirited driving.

The new Avalon and all Avalon Hybrid models ride on aluminum 17-inch wheels with 215/55R17 tires. An 18-inch alloy wheel, on V6-powered XLE Touring and Limited models, is shod with P225/45R18 tires that offer enhanced handling and grip. The 17-inch wheel design on the Avalon Hybrid model features a unique design with thinner spokes.

### **Advanced Technology**

The new 2013 Avalon offers a long list of convenient, user-friendly technologies as one would expect with the Toyota brand's flagship sedan, in addition to offering special features that enhance the car's functionality, capability and the level of safety.

There are two types of climate control systems: one with three-zone independent temperature control and another with two-zone temperature control. The three zone system allows for temperature to be independently set for rear seat, driver seat, and passenger seat; while the two-zone system controls temperature for the driver and passenger seat. The new, highly efficient HVAC system adopts increased diameter ducting, which has been reduced in length and curvature to reduce pressure losses and minimize load on the compressor. A partial air recirculation door has been adopted for the air conditioner unit to help enhance air-heating performance. The HVAC control panel incorporates new IntelliTouch™ capacitive switches located under the grained panel surface. The innovative IntelliTouch™ controls have been tuned to operate conveniently with a light touch, and can even be operated by hands with gloves or longer fingernails. The HVAC fan speed is operated by use of a responsive touch slide. A TFT (Thin-film Transistor) color display is also available as the HVAC display, while a vacuum fluorescent display is standard equipped. A rear HVAC control panel is available on the back of the center console for the three-zone system. On the hybrid model, an electric-powered compressor is integrated into the inverter that enables air conditioning without the engine operating.

The Avalon features a standard Display Audio System with 6.1-inch TFT touchscreen that offers audio system operation, Bluetooth compatibility, customizable vehicle settings, available rear-camera display, driving information such as fuel consumption, and operation of iPod® and USB devices. The head unit is also available with HD radio broadcasts to provide high quality sound. The Avalon Limited model features a Premium HDD (Hard Disk Drive) Navigation system that includes a seven-inch, high resolution touchscreen display that helps enhance operability. The system utilizes and, DVD playback capability, split-screen capability, audio information or vehicle information can be displayed together with a map on the main navigation screen. The system also includes a music search feature that utilizes a voice driven search for iPod® or USB connected device.

Avalon will also feature Toyota's Entune™ multimedia system, which functions through a smart phone interface and brings applications such as Bing™, iHeartRadio, MovieTickets.com™, OpenTable®, and Pandora® to the vehicle audio display. This audio configuration also features real-time traffic, weather, fuel prices, sports, and stocks.

The Avalon is available with either eight (Display Audio), nine-speaker (Display Audio with Entune) or 11-speaker JBL Synthesis® 7.1 channel matrix sound system (Premium HDD Nav system) that offers outstanding audio system performance. The Premium HDD system offers phenomenal sound quality through 11 JBL speakers with GreenEdge™ technology and includes two subwoofers. A 12 channel external JBL synthesis amplifier also helps boost power. The nine-speaker system utilizes two four-channel amplifiers (one internal and one external) to help boost audio power levels.

The new Avalon is equipped standard with a Smart Key System that locks and unlocks the front doors, and a trunk opening feature that enables opening of the doors when the key fob is within a short distance of the door handle. The key fob's transmitter also allows the engine to be started with the push of a button. The Avalon is equipped with an available rear window power shade that blocks direct sun rays for the rear passengers. The switch activating the power shade is located above the coin box on the instrument panel, and the shade adopts an auto-down function when shifting into reverse. A lighter weight power sunroof design has been adopted to help reduce vehicle weight. The inner rear-view mirror is available with a variety of functions such as a microphone, a compass display and a garage door opener. LED backlighting helps ensure visibility of the buttons in the dark.

### **Safety Technology**

Avalon is available with two millimeter wave radar systems that help add an additional measure of occupant safety. An available Blind Spot Monitor uses radar to enhance safety by helping detect vehicles in the adjacent lane where drivers may be challenged to see them. The same radar technology has been adapted to offer a Rear Cross Traffic Alert that is designed to detect low-speed cross traffic behind the vehicle. The Blind Spot Monitor indicators are on the outside mirrors' surfaces with a display that also appears on the color display, and it can be activated from the blind spot monitor switch on the instrument panel. For the Blind Spot Monitor, the millimeter wave radar sensors are tuned to detect vehicles larger than 125-cc motorcycles at over 10 mph, with a maximum detectable speed differential of 26.8 mph. The system's detection range spans from about 10 feet to 2 feet depending on vehicle location.

The Avalon's Rear Cross Traffic alert uses the sensors in the rear quarter panels to help detect vehicles approaching from the side and behind the vehicle. If cars are approaching within the detection area, a buzzer will sound. The vehicle shift lever must be in Reverse to detect cars, trucks, vans and any vehicle over 125cc motorcycle. The maximum speed of the Avalon can be five mph with a maximum speed of the approaching vehicle not to exceed 18 mph. The system continuously measures the relative speed and position of the approaching vehicle to calculate a potential collision moment, which is the expected time that the vehicle will cross the driver's path.

The Avalon also includes a back monitor display as part of the available back-up camera system, which uses guidelines superimposed on the display to indicate approximate distances.

A Dynamic Radar Cruise Control feature is also available that helps reduce the driver's workload by using radar sensor at the front of the vehicle to help control speed and keep a safe distance from the vehicle running in front. The radar controls the vehicle speed within a preset range to help maintain vehicle to vehicle distance. Like all Toyota models, the Avalon features the STAR™ Safety System, which includes Vehicle Stability Control (VSC), Traction Control (TRAC), Anti-lock Brake System (ABS), Electronic Brake Force Distribution (EBD), Brake Assist (BA), and Smart Stop brake-override Technology (SST).

### **Avalon Structure**

The Avalon relies on a lightweight but highly rigid body structure to help its handling performance and safety. Considerably more high-tensile steel is utilized in the structure, while increasing the number of welds in the front and rear door openings has helped enhance unibody rigidity. The ridgeline of the upper-back reinforcement beneath the rear window deck has also helped improved rear structural rigidity by 23 percent. A larger, rear partition panel bracket also helps improve rear-area rigidity and enhance suspension performance. The hybrid model receives smaller partition panel brackets that help accommodate the battery pack assembly while adding structural rigidity.

The 2013 Avalon unibody is designed to absorb and effectively dissipate frontal, side, and roof impacts to minimize cabin deformity and offer occupants superior protection. Equipped with 10 standard airbags, Toyota feels that new Avalon will be highly rated by both NHTSA (National Highway Traffic Safety Administration), and IIHS (Insurance Institute for Highway Safety).

The additional rigidity and chassis strength does not carry a weight penalty. Thanks to the lightweight steel and intelligent engineering, the Avalon has a curb weight of 3,461 lbs, and it will be the lightest weight vehicle in its segment. The reduction in mass is beneficial to handling, fuel economy, and overall performance.

The exterior body panels are formed from a highly rust-resistant sheet metal to enhance vehicle durability. Chip-resistant primer and anti-chipping tape have been used in vulnerable areas on the body. The rocker panel has been urethane treated to help resist corrosion.

Engineers have sought to create a quiet, refined interior compartment for Avalon where occupants can enjoy conversation and in-car electronics. To that end, reduction of noise has been realized with the help of various counter measures. Sound-absorbing and sound-insulating materials have been strategically placed throughout the instrument panel to help insure quietness. Sound-absorbing material has also been applied to the doors, rear-pillar garnish, roof lining, transmission tunnel, luggage compartment, and package tray to help better control sound entering the cabin.

The EVA (Ethylene-Vinyl Acetate copolymer) material used in the rear seats is also effective at sound insulation. Acoustic-type glass is used for the windshield and side glass to help control noise entering the cabin. Foam material has been used within the body frame A-pillar, B-pillar, rocker panel, and C-pillar to help eliminate outside noise and control wind noise. Additional sound-controlling material has been placed at the sealing sections of the front doors and lower parts of the rear doors to control sound entering the cabin.

### **Braking**

The Avalon's vented front rotor measures 11.6 inches in diameter and 1.1 inches thick, and the solid rear rotor is 11 inches in diameter. The Avalon Hybrid relies on an Electronically Controlled Brake (ECB) to help coordinate components of the braking system which also incorporates an electric motor. Beyond the conventional braking force generated by the Avalon's hydraulic system, the hybrid also adds the regenerative braking force produced by the electric motor/generator in the transaxle. The ECB manages the hydraulic and regenerative motor to



control braking to achieve the highest possible regenerative effect.

The 2013 Avalon is available with a pre-collision system that helps mitigate the effects of vehicle impact. The first stage of the pre-collision system tightens the seat belts and prime hydraulic brake system, and the second stage can compensate for inadequate brake pedal pressure by applying optimal brake system effort.

**Warranty Protection and Toyota Care**

Toyota's 36-month/36,000 mile basic new-vehicle warranty applies to all components other than normal wear and maintenance items. Additional 60-month warranties cover the powertrain for 60,000 miles and against corrosion with no mileage limitation. The hybrid-related components, including the HV battery, battery control module, hybrid control module and inverter with converter, are covered for eight years/100,000 miles.

The 2013 Avalon and Avalon Hybrid will also come standard with Toyota Care, a complimentary plan covering normal factory-scheduled maintenance and 24-hour roadside assistance for two years or 25,000 miles, whichever comes first.

###