

Lexus and Toyota Will Make Automated Braking Standard on Nearly Every Model and Trim Level by End of 2017

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NEW YORK, N.Y., March 21, 2016 – Advanced automatic safety technology that was once available on only the most expensive new vehicles is about to be included as standard equipment on almost every Lexus and Toyota model and trim level in the United States. Announced today at the New York Auto Show, Toyota will begin to include the *Lexus Safety System +™* and *Toyota Safety Sense™* packages, anchored by automatic emergency braking (AEB), on almost every new vehicle by the end of 2017.

The announcement marks a major commitment by Toyota to help save lives and reduce highway injuries. Making Lexus Safety System +™ and Toyota Safety Sense™ standard equipment on almost every model by the end of 2017 will make AEB technology widely available four years ahead of the 2022 industry target announced last week by the National Highway Traffic Safety Administration (NHTSA) and Insurance Institute for Highway Safety (IIHS).

“At Toyota, we are committed to creating better ways to move for everyone,” said Jim Lentz, CEO of Toyota Motor North America. “High-level driver assist technologies can do more than help protect people in the event of a crash; they can help prevent some crashes from ever happening in the first place. We are proud to help lead this industry in standardizing these systems and bring automated braking to our customers sooner rather than later.”

Already available as a low-cost option on a broad range of Lexus and Toyota vehicles, Lexus Safety System +™ and Toyota Safety Sense™ are designed to help address three key areas of driver assistance: preventing or mitigating frontal collisions – including pedestrians; helping keep drivers within their lane; and enhancing road safety during nighttime driving. Technologies include Toyota’s Pre-Collision System, Lane Departure Alert, and Automatic High Beams.

Twenty-five out of thirty Lexus and Toyota models will include Lexus Safety System +™ or Toyota Safety Sense™ as standard equipment. Model-specific target dates for offering these advanced, active safety packages as standard equipment will be announced at a later date. Models that will not offer the systems standard by the end of 2017 include Lexus GX, Toyota Mirai, 4Runner, and 86 (jointly developed with Subaru), and Scion iA (developed by Mazda). Mirai and Scion iA currently provide pre-collision including AEB as standard equipment.

About Toyota Safety Sense

The Toyota Safety Sense™ C (TSS-C) package features three proprietary active safety technologies and combines a camera and laser beam for enhanced performance and reliability. The package can help prevent or mitigate collisions in a wide range of vehicle speeds.

- Pre-collision System (PCS) – Vehicle Detection

PCS uses a camera and laser beam to detect the vehicle ahead. When the system determines there is a possibility of collision, it prompts the driver to take evasive action and brake by using an audio and visual alert. These alerts operate when the vehicle's speed is between approximately 7 to 87 miles-per-hour. If the driver notices the hazard and brakes, the system may provide additional braking force using Brake Assist ^{*3}. If the driver does not brake in a set time, and the system determines that the possibility of a frontal collision with another vehicle is extremely high, the system may automatically apply the brakes, reducing speed by approximately 19 mph ^{*1} in order to help the driver reduce the impact and in certain cases avoid the collision. The operational range of PCS covers speeds at which at least 80 percent of rear-end collisions occur (i.e. relative speeds of between approximately 7 – 50 mph).

- Lane Departure Alert (LDA)

LDA uses a camera to detect visible white and yellow lane markings in front of the vehicle and the vehicle's position on the road. If the system determines that the vehicle is starting to unintentionally deviate from its lane, the system alerts the driver with an audio and visual alert. When the alerts occur, the driver must check the surrounding road situation and carefully operate the steering wheel to move the vehicle back to the center part of their lane.

- Automatic High Beam (AHB)

AHB⁴ is a safety system designed to help drivers see more of what's ahead at nighttime without dazzling other drivers. When enabled, Automatic High Beams uses an in-vehicle camera to help detect the headlights of oncoming vehicles and tail lights of preceding vehicles, then automatically switches between high and low beams as appropriate to provide the most light possible and enhance forward visibility.

Toyota Safety Sense™ P combines a camera and millimeter-wave radar for enhanced performance and reliability. In addition to the three active safety technologies included in the Toyota Safety Sense™ C package, the Pre-collision System offered with this package also includes a pedestrian detection function. Toyota Safety Sense P also offers Radar Cruise Control functionality. (see below) TSS-P enhances the Pre-Collision System by enhancing speed ranges/speed reduction capability for potential collisions with a preceding vehicle and adding a Pedestrian Detection function, enhances LDA by adding a Steering Assist function on certain models, and adds Dynamic Radar Cruise Control.

- Pre-Collision System with Pedestrian Pre-collision function – Vehicle and Pedestrian Detection

Vehicle Detection

PCS uses millimeter-wave radar and a camera to help detect the vehicle ahead of the vehicle. When the system determines there is a possibility of collision it prompts the driver to take evasive action and brake, by using an audio and visual alert. These alerts operate when the vehicle's speed is between approximately 7 miles-per-hour and the vehicle's top speed. If the driver notices the hazard and brakes, the system may

provide additional braking force using Brake Assist*³. If the driver does not brake in a set time and the system determines that the possibility of a frontal collision with another vehicle is extremely high, the system may automatically apply the brakes, reducing speed in order to help the driver reduce the impact and in certain cases avoid the collision. For potential collisions with vehicles, the enhanced PCS system included with the TSS- P package operates at relative speeds of between 7 miles-per-hour and the vehicle's top speed, reducing speed by approximately 25 mph*².

Pedestrian Detection

In certain conditions, the PCS system with the TSS-P package may also help to detect pedestrians. The in-vehicle camera of PCS detects a potential pedestrian based on size, profile, and motion of the detected pedestrian. If PCS determines that the possibility of a frontal collision with a pedestrian is high under certain conditions, it prompts the driver to take evasive action and brake by using an audio and visual alert, followed by Brake Assist*³. These alerts operate when the vehicle's speed is between approximately 7 and 50 miles-per-hour. If the driver does not brake in a set time and the system determines that the risk of collision with a pedestrian is extremely high, the system may automatically apply the brakes, reducing speed in order to help the driver reduce the impact and in certain cases avoid the collision. The PCS included with the TSS-P package may operate automated brake for potential collisions with a pedestrian when vehicle speeds are between 7-50 mph, and may reduce vehicle speed by up to 19 mph*¹.

- **Dynamic Radar Cruise Control**

On highways, TSS-P equipped vehicles include Dynamic Radar Cruise Control⁵ functions similar to conventional "constant speed" cruise control in that it helps vehicles travel at a consistent speed set by the driver, but this system adds a vehicle-to-vehicle distance control mode which assists the driver by adjusting vehicle speed (within a set range) to help maintain a pre-set distance to a preceding vehicle when the preceding vehicle is traveling at a lower speed. By using a forward-facing camera and millimeter-wave radar to monitor a preceding vehicle merging into or out of the lane, Dynamic Radar Cruise Control helps maintain smooth acceleration and deceleration while driving.

- **Lane Departure Alert (LDA) with Steering Assist function**

In addition to the alert function of LDA found in TSS-C vehicles, TSS-P equipped vehicles with Electronic Power Steering assist (EPS) will feature a Steering Assist function. When equipped and enabled, if the system determines that the vehicle is on a path to unintentionally depart from its visibly marked lane, the system will provide small corrective steering inputs to the steering wheel for a short period of time to help the driver keep the vehicle in its lane.

Lexus Safety System +™ integrates several of Lexus’s existing active safety technologies: under certain conditions, the Pre-Collision System (PCS) helps prevent and mitigate collisions; Lane Departure Alert (LDA) helps prevent vehicles from departing from their lanes; and Automatic High Beam (AHB) helps ensure enhanced forward visibility during nighttime driving. As part of a multi-faceted approach to active safety, the Lexus Safety System +™ package combines millimeter-wave radar with a camera, achieving high reliability and performance.

- Pre-collision System – Pedestrian and Object

This system uses millimeter-wave radar and a camera to detect pedestrians in addition to vehicles under certain conditions. To help prevent or mitigate collisions, the system activates an audio and visual alert in addition to brake assist, followed by automated braking if the driver does not brake in time. Automated braking operates at relative speeds of between 7 – 50 mph for potential collisions with pedestrians, and can reduce speed by approximately 19 mph*¹. For potential collisions with vehicles, the PCS system operates at relative speeds of between 7 mph and the vehicle’s top speed, reducing speed by approximately 25 mph*².

- Lane Departure Alert (LDA)

LDA uses a camera to detect visible white and yellow lane markings. If the vehicle starts to deviate from a lane, LDA alerts the driver with an audio-visual alert and steering wheel vibration. Some models are also equipped with Lane Keep Assist, which provides steering input to help make it easier for the driver to remain within lane markings.

- Automatic High Beam (AHB)

AHB⁴ is a safety system designed to help drivers see more of what’s ahead at nighttime without dazzling other drivers. When enabled, Automatic High Beams uses an in-vehicle camera to help detect the headlights of oncoming vehicles and tail lights of preceding vehicles, then automatically switches between high and low beams as appropriate to provide the most light possible and enhance forward visibility. AHB is designed to function at speeds of approximately 25 mph or higher.

- Dynamic Radar Cruise Control (DRCC)

On highways, Lexus Safety System +™ equipped vehicles include Dynamic Radar Cruise Control⁵ functions similar to conventional “constant speed” cruise control in that it helps vehicles travel at a consistent speed set by the driver, but this system adds a vehicle-to-vehicle distance control mode which assists the driver by adjusting vehicle speed (within a set range) to help maintain a pre-set distance to a preceding vehicle when the preceding vehicle is traveling at a lower speed. By using a forward-facing camera and millimeter-wave radar to monitor a preceding vehicle moving into or out of the lane, DRCC helps maintain smooth acceleration and deceleration while driving.

**1 Results achieved during testing using a vehicle travelling at 19 mph and a stationary vehicle / pedestrian; system operation depends on driving environment (including road and weather) and vehicle circumstances.*

**2 Results achieved during testing using a vehicle travelling at 25 mph and a stationary vehicle; system operation depends on driving environment (including road and weather) and vehicle circumstances.*

**3 Brake Assist is designed to help the driver take full advantage of the benefits of ABS. It is not a substitute for safe driving practices. Braking effectiveness also depends on proper brake-system maintenance, tire and road conditions.*

**4 AHB is designed to work at speeds of approximately 25 mph or higher*

**5 DRCC is designed to work at speeds of approximately 25 mph to 110 mph*

Drivers should always be responsible for their own safe driving. Please always pay attention to your surroundings and drive safely. Depending on the conditions of roads, vehicles, and weather, etc., the system(s) may not work as intended.