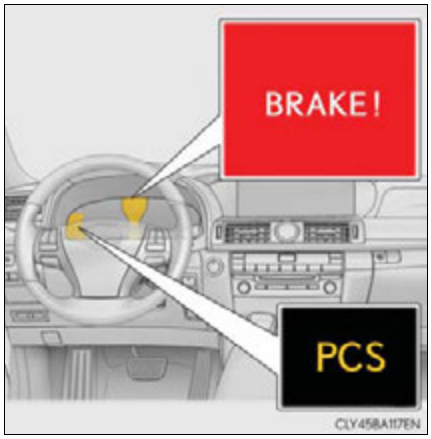
PCS (Pre-Collision System)*

When the sensor detects that a frontal collision is highly likely or even unavoidable, safety systems such as the brakes and seat belts are automatically engaged to help avoid a collision or to lessen impact as well as vehicle damage.

Pre-collision warning

When a high possibility of a frontal collision is detected, the pre-collision system warning light flashes, a buzzer sounds and a message is shown on the multi-information display to urge the driver to take evasive action.

Pre-collision warning can be disabled using the pre-collision braking off switch.



Pre-collision seat belts (front seat only)

If the pre-collision sensor detects that a collision is unavoidable, the pre-collision system will retract the seat belt before the collision occurs. The same will happen if the driver makes an emergency braking or loses control of the vehicle. (→P. 40)

Pre-collision brake assist

When there is a high possibility of a frontal collision, the system applies greater braking force in relation to how strongly the brake pedal is depressed.

*: If equipped

Pre-collision braking

When there is a high possibility of a frontal collision, the system warns the driver using a warning light, warning display and buzzer. If the system determines that a collision is unavoidable, the brakes are automatically applied to help avoid a collision or to reduce the collision speed.

When the vehicle is being stopped by pre-collision braking, the brake will be engaged for a maximum of 2 seconds and then released automatically. This pre-collision braking can be canceled by depressing the accelerator pedal or brake pedal.

Pre-collision braking can be disabled using the pre-collision braking off switch.

Suspension control

When there is a high possibility of a frontal collision, the operation of suspension control helps prevent the front of the vehicle from dropping when the brakes are applied suddenly.

Steering gear control (VGRS) (vehicles with camera sensors)

When the system determines that a collision is unavoidable, the steering gear ratio is changed to help improve the response to steering input.

Driver monitor system (if equipped)

When the system determines that there is a possibility of a collision, and either the driver is not facing forward or the driver's eyes are closed, pre-collision warnings are given in advance to warn the driver. If the system determines that the conditions to operate pre-collision alert braking have been met even when the possibility of a collision increases further, pre-collision alert braking will operate.

Pre-collision alert braking can be disabled using the pre-collision braking off switch.

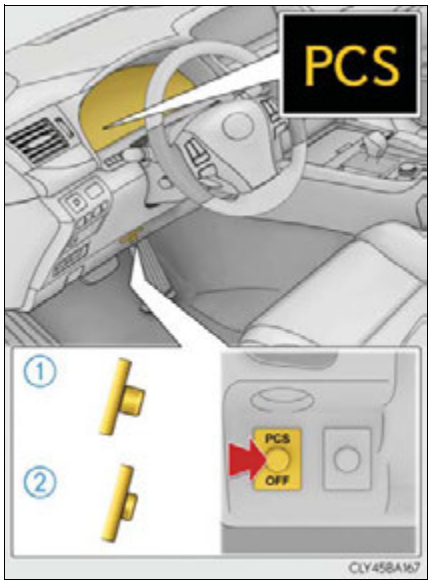
Disabling pre-collision braking

Pre-collision warning, pre-collision braking and pre-collision alert braking (vehicles with driver monitor system) can be switched between enabled and disabled by pressing the pre-collision braking off switch.

① Enabled

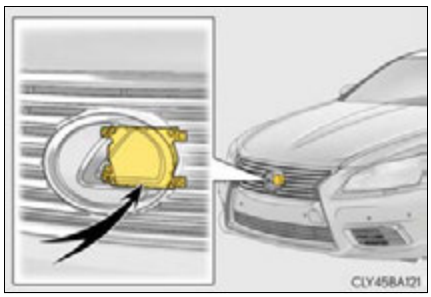
② Disabled

The pre-collision system warning light comes on when the system is disabled.

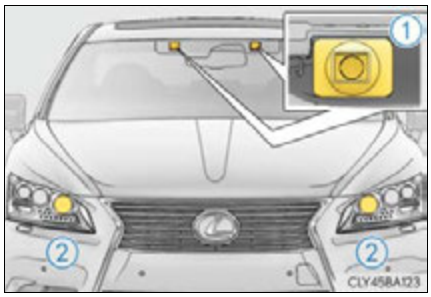


Radar sensor

The radar sensor detects vehicles or other obstacles on or near the road ahead and determines whether a collision is imminent based on the position, speed, and heading of the obstacles.



Camera sensors (if equipped)



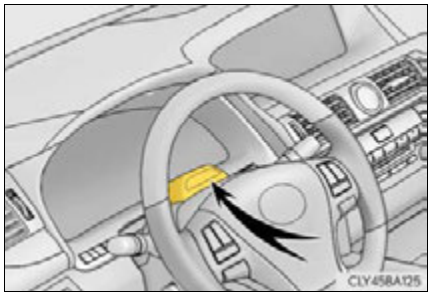
The camera sensors detect pedestrians and other three-dimensional objects on or near the road ahead together with the radar sensor while the vehicle is moving.

When the headlights are on, near-infrared rays are projected to ensure proper detection performance in the night time.

① Camera sensors

② Near-infrared ray transmitters

Driver monitor sensor (vehicles with driver monitor system)



The driver monitor sensor detects the direction the driver is facing and whether the driver's eyes are open or closed.

The system determines whether the driver is facing forward and whether or not the driver's eyes are closed.

■ The pre-collision system is operational when

● Pre-collision warning:

▶ Vehicles without camera sensors

- The pre-collision braking off switch is not pressed.
- Vehicle speed is greater than about 10 mph (15 km/h).
- The speed at which your vehicle is approaching the obstacle or the vehicle running ahead of you is greater than about 10 mph (15 km/h).

▶ Vehicles with camera sensors

- The pre-collision braking off switch is not pressed.
- Vehicle speed is greater than about 4 mph (5 km/h).
- The speed at which your vehicle is approaching the obstacle or the vehicle running ahead of you is greater than about 4 mph (5 km/h).

● Pre-collision seat belts (operating conditions A):

- Vehicle speed is greater than about 19 mph (30 km/h).
- The system detects sudden braking or skidding.
- The front occupants are wearing a seat belt.

● Pre-collision seat belts (operating conditions B):

- Vehicle speed is greater than about 4 mph (5 km/h).
- The speed at which your vehicle is approaching the obstacle or the vehicle running ahead of you is greater than about 19 mph (30 km/h).
- The front occupants are wearing a seat belt.

● Pre-collision brake assist:

- The VSC OFF switch is not pressed.
- Vehicle speed is greater than about 19 mph (30 km/h).
- The speed at which your vehicle is approaching the obstacle or the vehicle running ahead of you is greater than about 19 mph (30 km/h).
- The brake pedal is depressed.

● Pre-collision braking:

▶ Vehicles without camera sensors

- The pre-collision braking off switch is not pressed.
- The VSC OFF switch is not pressed.
- Vehicle speed is greater than about 10 mph (15 km/h).
- The speed at which your vehicle is approaching the obstacle or the vehicle running ahead of you is greater than about 10 mph (15 km/h).

▶ Vehicles with camera sensors

- The pre-collision braking off switch is not pressed.
- The VSC OFF switch is not pressed.
- Vehicle speed is greater than about 4 mph (5 km/h).
- The speed at which your vehicle is approaching the obstacle or the vehicle running ahead of you is greater than about 4 mph (5 km/h).

● Suspension control:

- Vehicle speed is greater than about 4 mph (5 km/h).
- The speed at which your vehicle is approaching the obstacle or the vehicle running ahead of you is greater than about 19 mph (30 km/h).

● Steering gear control (VGRS) (vehicles with camera sensors):

- Vehicle speed is greater than about 19 mph (30 km/h).
- The speed at which your vehicle is approaching the obstacle or the vehicle running ahead of you is greater than about 19 mph (30 km/h).

● Pre-collision alert braking (vehicles with driver monitor system):

- The pre-collision braking off switch is not pressed.
- The VSC OFF switch is not pressed.
- The system determines that the driver is not facing forward, or that the driver's eyes are closed.
- Vehicle speed is greater than about 25 mph (40 km/h).
- The speed at which your vehicle is approaching the vehicle running ahead of you is greater than about 25 mph (40 km/h).
- The steering is not being turned.

■ **Conditions that may trigger the system even if there is no danger of a collision**

- When there is an object by the roadside at the entrance to a curve
- When passing an oncoming vehicle on a curve
- When driving over a narrow iron bridge
- When there is a metal object on the road surface
- When driving on an uneven road surface
- When passing an oncoming vehicle on a left-turn
- When your vehicle rapidly closes on the vehicle in front
- When a grade separation/interchange, sign, billboard, or other structure appears to be directly in the vehicle's line of travel
- When there is a metal plate in the road in front of the vehicle on a downhill slope
- When climbing a steep hill causes an overhead billboard or other metallic structure to appear directly in the vehicle's line of travel
- When driving under an overpass
- When an extreme change in vehicle height occurs
- When passing through certain toll gates
- When driving through a lump of steam or smoke
- When the radar sensor moves off position due to its surrounding area being subjected to a strong impact

When the system is activated in the situations described above, there is also a possibility that the seat belts will retract quickly and the brakes will be applied with a force greater than normal. When the seat belt is locked in the retracted position, stop the vehicle in a safe place, release the seat belt and refasten it.

■ **Obstacles not detected**

The radar sensor cannot detect plastic obstacles such as traffic cones. There may also be occasions when the sensor cannot detect pedestrians, animals, bicycles, motorcycles, trees, or snowdrifts.

■ **A camera sensor cannot detect obstacles in the following situations:**

- A camera sensor is directly receiving intense light, such as sunlight.
- Visibility is poor because of bad weather or other reasons.
- The sensor temperature is extremely high.
- The headlights are not turned on in darkness such as at night or in a tunnel.

■ **Situations in which the pre-collision system does not function properly**

The system may not function effectively in situations such as the following:

- On roads with sharp bends or uneven surfaces
- If a vehicle suddenly moves in front of your vehicle, such as at an intersection
- If a vehicle suddenly cuts in front of your vehicle, such as when overtaking
- In inclement weather such as heavy rain, fog, snow or sand storms
- If the vehicle is skidding when VSC is not operating
- When an extreme change in vehicle height occurs
- When only part of your vehicle's front end collides with, or contacts, a vehicle or object in a frontal collision
- When the radar sensor moves off position due to its surrounding area being subjected to a strong impact
- If an obstacle in front of the vehicle is small
- When the system judges that the driver performed a collision avoidance operation via the accelerator pedal, brake pedal, or steering wheel

■ **Automatic cancelation of the pre-collision system**

When a malfunction occurs due to sensor contamination, etc. that results in the sensors being unable to detect obstacles, the pre-collision system will be automatically disabled. In this case, the system will not activate even if there is a collision possibility.

■ **When there is a malfunction in the system**

The pre-collision system warning light will flash and warning messages will be displayed. (→P. 800, 808)

■ **Certification for the pre-collision system**

▶ For vehicles sold in the U.S.A.

FCC ID: HYQDNMWR004

This device complies with part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) This device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

FCC WARNING
Changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

Radiofrequency radiation exposure Information:

This equipment complies with FCC radiation exposure limits set forth for an uncontrolled environment.

This equipment should be installed and operated with minimum distance of 20 cm between the radiator (antenna) and your body.

This transmitter must not be co-located or operating in conjunction with any other antenna or transmitter.

▶ For vehicles sold in Canada

Operation is subject to the following two conditions: (1) this device may not cause interference, and (2) this device must accept any interference, including interference that may cause undesired operation of the device.

⚠ CAUTION

■ Limitations of the pre-collision system

Do not overly rely on the pre-collision system. Always drive safely, taking care to observe your surroundings and checking for any obstacles or other road hazards. Failure to do so may cause an accident resulting in death or serious injury.

■ Handling the radar sensor

Observe the following to ensure the pre-collision system can function effectively. Otherwise, the system may not function correctly and could result in an accident.

- Keep the sensor and grille cover clean at all times.
  Clean the sensor and grille cover with a soft cloth so you do not mark or damage them.
- Do not subject the sensor or surrounding area to a strong impact.
  If the sensor moves even slightly off position, the system may malfunction. If the sensor or surrounding area is subject to a strong impact, always have the area inspected and adjusted by your Lexus dealer.
- Do not disassemble the sensor.
- Do not attach accessories or stickers to the sensor, grille cover or surrounding area.
- Do not modify or paint the sensor and grille cover.
- Do not replace them with non-genuine parts.

■ Handling the camera sensors (if equipped)

Observe the following to ensure that the PCS functions effectively:

- Keep the windshield clean at all times.
  PCS effectiveness may be reduced due to the presence of raindrops, condensation, ice or snow on the windshield.
- Do not subject the camera sensor to a strong impact or force, and do not disassemble the camera sensor.
- Do not change the installation position of the camera sensor, or remove and reinstall it. The direction of the camera sensor is precisely adjusted.
- When the windshield fogs up, use the windshield defogger to dry the windshield.
  During cold weather, using the heater with air blowing to the feet may allow the upper part of the windshield to fog up, having a negative effect on the images.
- Do not place anything on the dashboard.
  Images reflected on the windshield may reduce the effectiveness of the camera sensor.
- Do not scratch the camera lens, or let it get dirty.
- Do not attach a sticker or other items to the windshield near the camera sensor.

⚠ CAUTION

■ Headlights (vehicles with camera sensors)

- Observe the following to ensure proper near-infrared ray projection:
  - Keep the headlights clean at all times.
  - The detection performance may deteriorate if the high beams are misaligned or inoperative.
- The near-infrared ray transmitters project strong energy that is not visible. Although the transmitters normally turn off when the vehicle is stopped, never look into the headlights for your safety.

■ Determining the direction the driver is facing and whether the driver's eyes are open or closed (vehicles with driver monitor system)

The direction the driver is facing and whether the driver's eyes are open or closed may not be determined correctly if the following conditions exist:

- There is an object between the driver monitor sensor and the driver's face, such as when the sensor is blocked.
- A part of the driver's face is covered.
- The sensor or the driver's face is exposed to intense light such as sunlight.
- The driving posture is improper.
- The vehicle is parked.

■ Handling the driver monitor sensor (vehicles with driver monitor system)

Observe the following to ensure the driver monitor sensor can function effectively.

Failure to do so may result in a malfunction or may prevent the system from correctly determining the direction the driver is facing and whether the driver's eyes are open or closed, resulting in an unexpected accident.

- Do not disassemble, damage, lift or pull on the sensor.
- Do not select the sensor while driving.
- Do not wet or spill water on the sensor.
- Do not drop anything on or allow anything to hit against the sensor. Do not subject the sensor to an impact.
- Make sure that there are no scratches, dirt or stickers on the side of the sensor that faces the driver.
- Do not place any objects in front of the side of the sensor that faces the driver or cover the sensor.

⚠ CAUTION

■ Cautions regarding the assist contents of the system

By means of alarms and brake control, the pre-collision system is intended to assist the driver in avoiding collisions through the process of LOOK-JUDGE-ACT. There are limits to the degree of assistance the system can provide, so please keep in mind the following important points.

- Assisting the driver in watching the road
  The pre-collision system is only able to detect obstacles directly in front of the vehicle, and only within a limited range. It is not a mechanism that allows careless or inattentive driving, and it is not a system that can assist the driver in low-visibility conditions. It is still necessary for the driver to pay close attention to the vehicle's surroundings.
- Assisting the driver in making correct judgment
  When attempting to estimate the likelihood of a collision, the only data available to the pre-collision system is that from obstacles it has detected directly in front of the vehicle. Therefore, it is absolutely necessary for the driver to remain vigilant and to determine whether or not there is a possibility of collision in any given situation.
- Assisting the driver in taking action
  The pre-collision system's braking assist feature is designed to help reduce the severity of a collision, and so only acts when the system has judged that a collision is unavoidable. This system by itself is not capable of automatically avoiding a collision or bringing the vehicle to a stop safely. For this reason, when encountering a dangerous situation the driver must take direct and immediate action in order to ensure the safety of all involved.

⚠ NOTICE

■ Precautions for cleaning the driver monitor sensor (vehicles with driver monitor system)

- Gently wipe the sensor with a soft cloth to prevent damage.
- Wipe any excess dirt with a cloth dampened with neutral detergent, all liquids having been wringed out of the cloth. After that, wipe again with a dry cloth.
- Do not use benzene, thinner, glass cleaners, wax, etc.