



TOYOTA

Highlander

2025

Owner's Manual Excerpt for Driving Support Systems

Toyota Safety Sense 2.5+	223
LTA (Lane Tracing Assist)	239

This document contains excerpts from the vehicle's Owner's Manual for certain driving support systems.

Refer to the full Owner's Manual for detail on all vehicle systems.

All page numbers refer to the page of the Owner's Manual.

Toyota Safety Sense 2.5 +

The Toyota Safety Sense 2.5 + consists of the following drive assist systems and contributes to a safe and comfortable driving experience:

Driving assist system

■ PCS (Pre-Collision System)

→P.228

■ LTA (Lane Tracing Assist)

→P.239

■ AHB (Automatic High Beam)

→P.212

■ RSA (Road Sign Assist)*

→P.261

*: If equipped

■ Dynamic radar cruise control with full-speed range

→P.249



WARNING

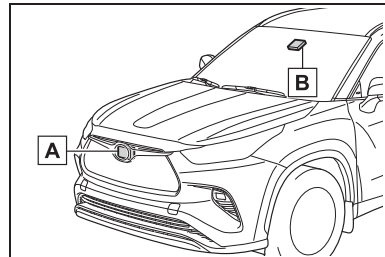
■ Toyota Safety Sense 2.5 +

The Toyota Safety Sense 2.5 + is designed to operate under the assumption that the driver will drive safely, and is designed to help reduce the impact to the occupants and the vehicle in the case of a collision or assist the driver in normal driving conditions.

As there is a limit to the degree of recognition accuracy and control performance that this system can provide, do not overly rely on this system. The driver is always responsible for paying attention to the vehicle's surroundings and driving safely.

Sensors

Two types of sensors, located behind the front grille and windshield, detect information necessary to operate the drive assist systems.



A Radar sensor

B Front camera

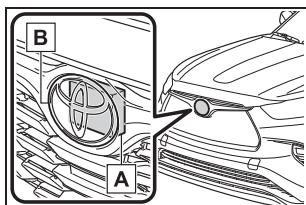
WARNING

■ To avoid malfunction of the radar sensor

Observe the following precautions.

Otherwise, the radar sensor may not operate properly, possibly leading to an accident resulting in death or serious injury.

- Keep the radar sensor and the radar sensor cover clean at all times.



A Radar sensor

B Radar sensor cover

If the front of the radar sensor or the front or back of the radar sensor cover is dirty or covered with water droplets, snow, etc., clean it.

Clean the radar sensor and radar sensor cover with a soft cloth to avoid damaging them.

- Do not attach accessories, stickers (including transparent stickers) or other items to the radar sensor, radar sensor cover or surrounding area.
- Do not subject the radar sensor or its surrounding area to a strong impact.
If the radar sensor, front grille, or front bumper has been subjected to a strong impact, have the vehicle inspected by your Toyota dealer.

- Do not disassemble the radar sensor.
- Do not modify or paint the radar sensor or radar sensor cover.
- In the following cases, the radar sensor must be recalibrated. Contact your Toyota dealer for details.
 - When the radar sensor or front grille are removed and installed, or replaced
 - When the front bumper is replaced

■ To avoid malfunction of the front camera

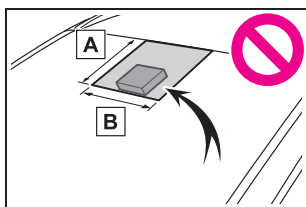
Observe the following precautions.

Otherwise, the front camera may not operate properly, possibly leading to an accident resulting in death or serious injury.

- Keep the windshield clean at all times.
- If the windshield is dirty or covered with an oily film, water droplets, snow, etc., clean the windshield.
- If a glass coating agent is applied to the windshield, it will still be necessary to use the windshield wipers to remove water droplets, etc. from the area of the windshield in front of the front camera.
- If the inner side of the windshield where the front camera is installed is dirty, contact your Toyota dealer.

⚠ WARNING

- Do not attach objects, such as stickers, transparent stickers, etc., to the outer side of the windshield in front of the front camera (shaded area in the illustration).



- A** From the top of the windshield to approximately 0.4 in. (1 cm) below the bottom of the front camera
- B** Approximately 7.9 in. (20 cm) (Approximately 4.0 in. [10 cm] to the right and left from the center of the front camera)
- If the part of the windshield in front of the front camera is fogged up or covered with condensation or ice, use the windshield defogger to remove the fog, condensation or ice. (→P.322)
- If water droplets cannot be properly removed from the area of the windshield in front of the front camera by the windshield wipers, replace the wiper insert or wiper blade.
- Do not attach window tint to the windshield.
- Replace the windshield if it is damaged or cracked. After replacing the windshield, the front camera must be recalibrated. Contact your Toyota dealer for details.

- Do not allow liquids to contact the front camera.
- Do not allow bright lights to shine into the front camera.
- Do not dirty or damage the front camera. When cleaning the inside of the windshield, do not allow glass cleaner to contact the lens of the front camera. Also, do not touch the lens. If the lens is dirty or damaged, contact your Toyota dealer.
- Do not subject the front camera to a strong impact.
- Do not change the installation position or direction of the front camera or remove it.
- Do not disassemble the front camera.
- Do not modify any components of the vehicle around the front camera (inside rear view mirror, etc.) or ceiling.
- Do not attach any accessories to the hood, front grille or front bumper that may obstruct the front camera. Contact your Toyota dealer for details.
- If a surfboard or other long object is to be mounted on the roof, make sure that it will not obstruct the front camera.
- Do not modify the headlights or other lights.

■ If a warning message is displayed on the multi-information display

A system may be temporarily unavailable or there may be a malfunction in the system.

- In the following situations, perform the actions specified in the table. When the normal operating conditions are detected, the message will disappear and the system will become operational.

If the message does not disappear, contact your Toyota dealer.

Situation	Actions
When the area around a camera is covered with dirt, moisture (fogged up, covered with condensation, ice, etc.), or other foreign matter	Using the wiper and A/C function, remove the dirt and other attached matter (→P.322).
When the temperature around the front camera is outside of the operational range, such as when the vehicle is in the sun or in an extremely cold environment	If the front camera is hot, such as after the vehicle had been parked in the sun, use the air conditioning system to decrease the temperature around the front camera. If a sunshade was used when the vehicle was parked, depending on its type, the sunlight reflected from the surface of the sunshade may cause the temperature of the front camera to become excessively high.
	If the front camera is cold, such after the vehicle is parked in an extremely cold environment, use the air conditioning system to increase the temperature around the front camera.
The area in front of the front camera is obstructed, such as when the hood is open or a sticker is attached to the part of the windshield in front of the front camera.	Close the hood, remove the sticker, etc. to clear the obstruction.
When "Pre-Collision System Radar In Self Calibration Unavailable See Owner's Manual" is displayed.	Check whether there is attached materials on the radar sensor and radar sensor cover, and if there is, remove it.

- In the following situations, if the situation has changed (or the vehicle has been driven for some time) and the normal operating conditions are detected, the message will disappear and the system will become operational.

If the message does not disappear, contact your Toyota dealer.

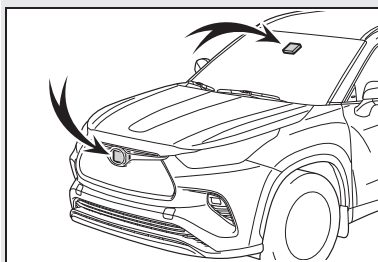
- When the temperature around the radar sensor is outside of the operational range, such as when the vehicle is in the sun or in an extremely cold environment
- When the front camera cannot detect objects in front of the vehicle, such as when driving in the dark, snow, or fog, or when bright lights are shining into the front camera
- Depending on the conditions in the vicinity of the vehicle, the radar may judge the surrounding environment cannot be properly recognized. In that case, "Pre-Collision System Unavailable See Owner's Manual" is displayed.

LTA (Lane Tracing Assist)

While driving on a road with clear white (yellow) lane lines, the LTA system warns the driver if the vehicle may deviate from the current lane or course^{*}, and also can slightly operate the steering wheel to help avoid deviation from the lane or course^{*}. Also, while the dynamic radar cruise control with full-speed range (→P.249) is operating, this system will operate the steering wheel to maintain the vehicle's lane position.

The LTA system recognizes white (yellow) lane lines or a course^{*} using the front camera. Additionally, it detects preceding vehicles using the front camera and radar.

^{*}: Boundary between asphalt and the side of the road, such as grass, soil, or a curb



**WARNING****■ Before using LTA system**

- Do not rely solely upon the LTA system. The LTA system does not automatically drive the vehicle or reduce the amount of attention that must be paid to the area in front of the vehicle. The driver must always assume full responsibility for driving safely by paying careful attention to the surrounding conditions and operating the steering wheel to correct the path of the vehicle. Also, the driver must take adequate breaks when fatigued, such as from driving for a long period of time.
- Failure to perform appropriate driving operations and pay careful attention may lead to an accident, resulting in death or serious injury.

■ Situations unsuitable for LTA system

In the following situations, use the LTA switch to turn the system off. Failure to do so may lead to an accident, resulting in death or serious injury.

- Vehicle is driven on a road surface which is slippery due to rainy weather, fallen snow, freezing, etc.
- Vehicle is driven on a snow-covered road.
- White (yellow) lines are difficult to see due to rain, snow, fog, dust, etc.
- Vehicle is driven in a temporary lane or restricted lane due to construction work.
- Vehicle is driven in a construction zone.

- A spare tire, tire chains, etc. are equipped.

- When the tires have been excessively worn, or when the tire inflation pressure is low.
- When your vehicle is towing a trailer or during emergency towing.

■ Preventing LTA system malfunctions and operations performed by mistake

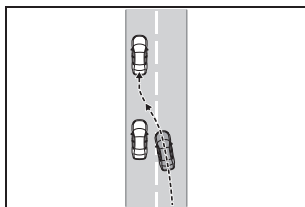
- Do not modify the headlights or place stickers, etc. on the surface of the lights.
- Do not modify the suspension etc. If the suspension etc. needs to be replaced, contact your Toyota dealer.
- Do not install or place anything on the hood or grille. Also, do not install a grille guard (bull bars, kangaroo bar, etc.).
- If your windshield needs repairs, contact your Toyota dealer.

■ Conditions in which functions may not operate properly

In the following situations, the functions may not operate properly and the vehicle may depart from its lane. Drive safely by always paying careful attention to your surroundings and operate the steering wheel to correct the path of the vehicle without relying solely on the functions.

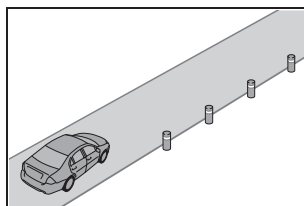
WARNING

- When the follow-up cruising display is displayed (→P.245) and the preceding vehicle changes lanes. (Your vehicle may follow the preceding vehicle and also change lanes.)

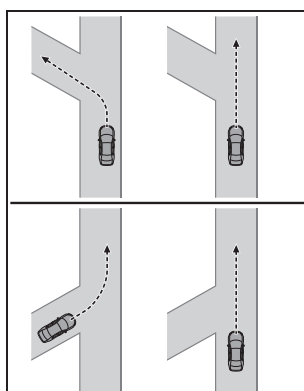


- When the follow-up cruising display is displayed (→P.245) and the preceding vehicle is swaying. (Your vehicle may sway accordingly and depart from the lane.)
- When the follow-up cruising display is displayed (→P.245) and the preceding vehicle departs from its lane. (Your vehicle may follow the preceding vehicle and depart from the lane.)
- When the follow-up cruising display is displayed (→P.245) and the preceding vehicle is being driven extremely close to the left/right lane line. (Your vehicle may follow the preceding vehicle and depart from the lane.)
- Vehicle is being driven around a sharp curve.

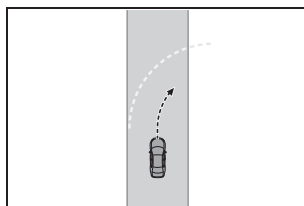
- Objects or patterns that could be mistaken for white (yellow) lines are present on the side of the road (guardrails, reflective poles, etc.).



- Vehicle is driven where the road diverges, merges, etc.



- Repair marks of asphalt, white (yellow) lines, etc. are present due to road repair.



- There are shadows on the road that run parallel with, or cover, the white (yellow) lines.

⚠ WARNING

- The vehicle is driven in an area without white (yellow) lines, such as in front of a tollgate or checkpoint, or at an intersection, etc.
- The white (yellow) lines are cracked, "Botts' dots", "Raised pavement marker" or stones are present.
- The white (yellow) lines cannot be seen or are difficult to see due to sand, etc.
- The vehicle is driven on a road surface that is wet due to rain, puddles, etc.
- The traffic lines are yellow (which may be more difficult to recognize than lines that are white).
- The white (yellow) lines cross over a curb, etc.
- The vehicle is driven on a bright surface, such as concrete.
- If the edge of the road is not clear or straight.
- The vehicle is driven on a surface that is bright due to reflected light, etc.
- The vehicle is driven in an area where the brightness changes suddenly, such as at the entrances and exits of tunnels, etc.
- Light from the headlights of an oncoming vehicle, the sun, etc. enters the camera.
- The vehicle is driven on a slope.
- The vehicle is driven on a road which tilts left or right, or a winding road.
- The vehicle is driven on an unpaved or rough road.
- The traffic lane is excessively narrow or wide.
- The vehicle is extremely tilted due to carrying heavy luggage or having improper tire pressure.
- The distance to the preceding vehicle is extremely short.
- The vehicle is moving up and down a large amount due to road conditions during driving (poor roads or road seams).
- When driving in a tunnel or at night with the headlights off or when a headlight is dim due to its lens being dirty or it being misaligned.
- The vehicle is struck by a crosswind.
- The vehicle is affected by wind from a vehicle driven in a nearby lane.
- The vehicle has just changed lanes or crossed an intersection.
- Tires which differ by structure, manufacturer, brand or tread pattern are used.
- When tires of a size other than specified are installed.
- Snow tires, etc. are equipped.
- The vehicle is being driven at extremely high speeds.

Functions included in LTA system

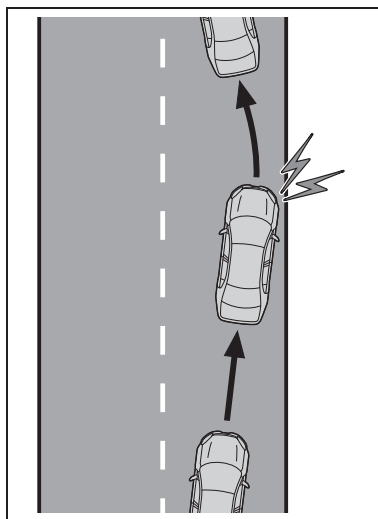
■ Lane departure alert function

When the system determines that the vehicle might depart from its lane or course*, a warning is displayed on the multi-information display, and a warning buzzer will sound to alert the driver.

When the warning buzzer sounds, check the area around your vehicle and carefully operate the steering wheel to move the vehicle back to the center of the lane.

When the system determines that the vehicle might depart from its lane and that the possibility of a collision with an overtaking vehicle in the adjacent lane is high, the lane departure alert will operate even if the turn signals are operating.

*: Boundary between asphalt and the side of the road, such as grass, soil, or a curb

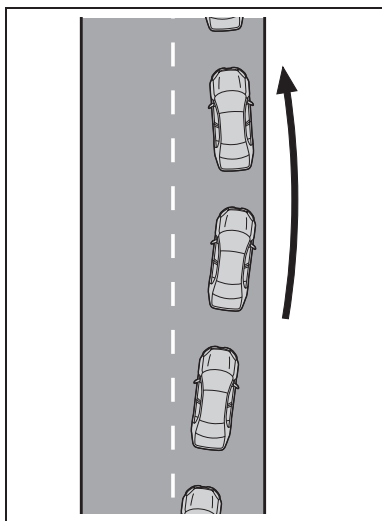


■ Steering assist function

When the system determines that the vehicle might depart from its lane or course*, the system provides assistance as necessary by operating the steering wheel in small amounts for a short period of time to keep the vehicle in its lane.

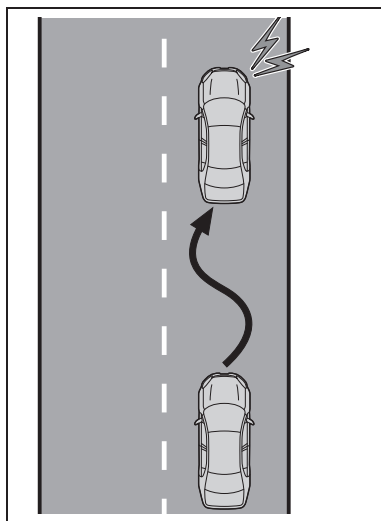
When the system determines that the vehicle might depart from its lane and that the possibility of a collision with an overtaking vehicle in the adjacent lane is high, the steering assist function will operate even if the turn signals are operating.

*: Boundary between asphalt and the side of the road, such as grass, soil, or a curb



■ Vehicle sway warning function

When the vehicle is swaying within a lane, the warning buzzer will sound and a message will be displayed on the multi-information display to alert the driver.

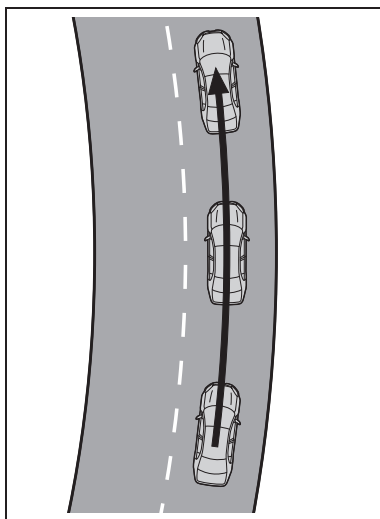


■ Lane centering function

This function is linked with dynamic radar cruise control with full-speed range and provides the required assistance by operating the steering wheel to keep the vehicle in its current lane.

When dynamic radar cruise control with full-speed range is not operating, the lane centering function does not operate.

In situations where the white (yellow) lane lines are difficult to see or are not visible, such as when in a traffic jam, this function will operate to help follow a preceding vehicle by monitoring the position of the preceding vehicle.



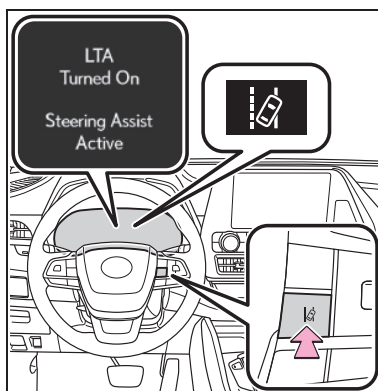
Turning LTA system on

Press the LTA switch to turn the LTA system on.

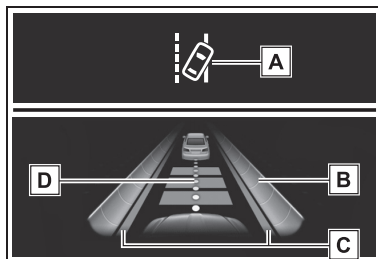
The LTA indicator illuminates and a message is displayed on the multi-information display.

Press the LTA switch again to turn the LTA system off.

When the LTA system is turned on or off, operation of the LTA system continues in the same condition the next time the engine is started.



Indications on multi-information display



A LTA indicator

The illumination condition of the indicator informs the driver of the system operation status.

Illuminated in white: LTA system is operating.

Illuminated in green: Steering wheel assistance of the steering assist function or lane centering function is operating.

Flashing in orange: Lane departure alert function is operating.

B Operation display of steering wheel operation support

Displayed when the multi-information display is switched to the driv-

ing support system information display.

Indicates that steering wheel assistance of the steering assist function or lane centering function is operating.

Both outer sides of the lane are displayed: Indicates that steering wheel assist of the lane centering function is operating.

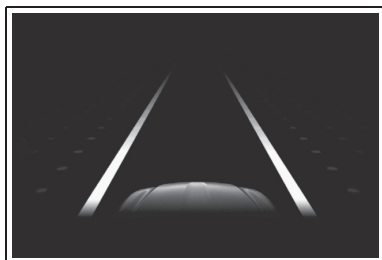
One outer side of the lane is displayed: Indicates that steering wheel assist of the steering assist function is operating.

Both outer sides of the lane are flashing: Alerts the driver that their input is necessary to stay in the center of the lane (lane centering function).

C Lane departure alert function display

Displayed when the multi-information display is switched to the driving support system information display.

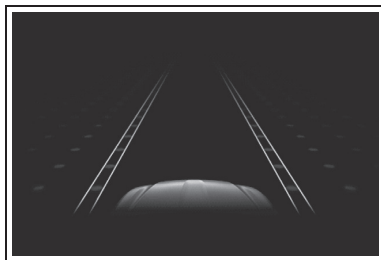
- Inside of displayed lines is white



Indicates that the system is recognizing white (yellow) lines or a course*. When the vehicle departs from its lane, the white line displayed on the side the

vehicle departs from flashes orange.

- Inside of displayed lines is black



Indicates that the system is not able to recognize white (yellow) lines or a course* or is temporarily canceled.

*: Boundary between asphalt and the side of the road, such as grass, soil, or a curb

D Follow-up cruising display

Displayed when the multi-information display is switched to the driving support system information display.

Indicates that steering assist of the lane centering function is operating by monitoring the position of a preceding vehicle.

When the follow-up cruising display is displayed, if the preceding vehicle moves, your vehicle may move in the same way. Always pay careful attention to your surroundings and operate the steering wheel as necessary to correct the path of the vehicle and ensure safety.

Operation conditions of each function

- Lane departure alert function

This function operates when all of the following conditions are met.

- LTA is turned on.
- Vehicle speed is approximately 32 mph (50 km/h) or more.*¹
- System recognizes white (yellow) lane lines or a course*². (When a white [yellow] line or course*² is recognized on only one side, the system will operate only for the recognized side.)
- Width of traffic lane is approximately 9.8 ft. (3 m) or more.
- Turn signal lever is not operated. (Except when another vehicle is in the lane on the side where the turn signal was operated)
- Vehicle is not being driven around a sharp curve.
- No system malfunctions are detected. (→P.249)
- TRAC or VSC is not turned off.

*¹: The function operates even if the vehicle speed is less than approximately 32 mph (50 km/h) when the lane centering function is operating.

*²: Boundary between asphalt and the side of the road, such as grass, soil, or a curb

● Steering assist function

This function operates when all of the following conditions are met in addition to the operation conditions for the lane departure alert function.

- Vehicle is not accelerated or decelerated by a fixed amount or more.
- Steering wheel is not operated with a steering force level suitable for changing lanes.
- ABS, VSC, TRAC and PCS are not operating.
- TRAC or VSC is not turned off.

● Vehicle sway warning function

This function operates when all of the following conditions are met.


- Setting for "Sway Warning" in  of the multi-information display is

set to "ON". (→P.91, 101)

- Vehicle speed is approximately 32 mph (50 km/h) or more.
- Width of traffic lane is approximately 9.8 ft. (3 m) or more.
- No system malfunctions are detected. (→P.249)

● Lane centering function

This function operates when all of the following conditions are met.

- LTA is turned on.
- Setting for "Lane Center" in  of the multi-information display are set to "ON". (→P.91, 101)
- This function recognizes white (yellow) lane lines or the position of a preceding vehicle (except when the preceding vehicle is small, such as a motorcycle).
- The dynamic radar cruise control with full-speed range is operating in vehicle-to-vehicle distance control mode.
- Width of traffic lane is approximately 10 to 13 ft. (3 to 4 m).
- Turn signal lever is not operated.
- Vehicle is not being driven around a sharp curve.
- No system malfunctions are detected. (→P.249)
- Vehicle does not accelerate or decelerate by a fixed amount or more.
- Steering wheel is not operated with a steering force level suitable for changing lanes.
- ABS, VSC, TRAC and PCS are not operating.
- TRAC or VSC is not turned off.
- Hands off steering wheel warning is not displayed. (→P.248)
- The vehicle is being driven in the center of a lane.
- Steering assist function is not operating.

■ Temporary cancelation of functions

- When operation conditions are no longer met, a function may be temporarily canceled. However, when the operation conditions are met again, operation of the func-

tion is automatically restored.
(→P.246)

- If the operation conditions (→P.246) are no longer met while the lane centering function is operating, the buzzer may sound to indicate that the function has been temporarily canceled.

■ Steering assist function/lane centering function

- Depending on the vehicle speed, lane departure situation, road conditions, etc., the driver may not feel the function is operating or the function may not operate at all.
- The steering control of the function is overridden by the driver's steering wheel operation.
- Do not attempt to test the operation of the steering assist function.

■ Lane departure alert function

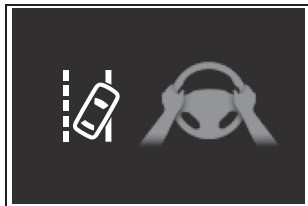
- The warning buzzer may be difficult to hear due to external noise, audio playback, etc.
- If the edge of the course* is not clear or straight, the lane departure alert function may not operate.
- It may not be possible for the system to determine if there is a danger of a collision with a vehicle in an adjacent lane.
- Do not attempt to test the operation of the lane departure alert function.

*: Boundary between asphalt and the side of the road, such as grass, soil, or a curb

■ Hands off steering wheel warning

In the following situations, a warning message urging the driver to hold the steering wheel and the symbol shown in the illustration are displayed on the multi-information display to warn the driver. The warning stops when the system determines

that the driver holds the steering wheel. Always keep your hands on the steering wheel when using this system, regardless of warnings.



- When the system determines the driver is not holding the steering wheel while the lane centering function is operating.

If the driver continues to keep their hands off of the steering wheel, the buzzer sounds, the driver is warned and the function is temporarily canceled. This warning also operates in the same way when the driver continuously operates the steering wheel only a small amount.

- When the system determines that the vehicle may deviate from the lane while driving around a curve while the lane centering function is operating.

Depending on the vehicle condition and road conditions, the warning may not operate.

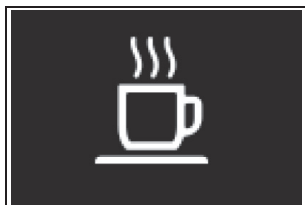
- When the system determines that the driver is driving without holding the steering wheel while the steering wheel assist of the steering assist function is operating.

If the driver continues to keep their hands off of the steering wheel and the steering wheel assist is operating, the buzzer sounds and the driver is warned. Each time the buzzer sounds, the continuing time of the buzzer becomes longer.

■ Vehicle sway warning function

When the system determines that

the vehicle is swaying while the vehicle sway warning function is operating, a buzzer sounds and a warning message urging the driver to rest and the symbol shown in the illustration are simultaneously displayed on the multi-information display.



Depending on the vehicle and road conditions, the warning may not operate.

■ Warning message

If the following warning message is displayed on the multi-information display and the LTA indicator illuminates in orange, follow the appropriate troubleshooting procedure. Also, if a different warning message is displayed, follow the instructions displayed on the screen.

- “LTA Malfunction Visit Your Dealer”

The system may not be operating properly. Have the vehicle inspected by your Toyota dealer.

- “LTA Unavailable”

The system is temporarily canceled due to a malfunction in a sensor other than the front camera. Turn the LTA system off, wait for a little while, and then turn the LTA system back on.

- “LTA Unavailable at Current Speed”

The function cannot be used as the vehicle speed exceeds the LTA operation range. Drive slower.

■ Customization

Function settings can be changed.
(Customizable features:→P.492)