PARK ASSIST / MONITORING: ADVANCED PARKING GUIDANCE SYSTEM: PRECAUTION (2010 Prius)

PRECAUTION

1. PRECAUTION FOR DISCONNECTING CABLE FROM NEGATIVE BATTERY TERMINAL

NOTICE:

When disconnecting the cable from the negative (-) battery terminal, initialize the following system after the terminal is reconnected.

SYSTEM NAME	SEE PROCEDURE
Advanced Parking Guidance System	INFO

2. POINTS TO NOTE WHEN SERVICING

(a) Pay attention to the following points when servicing.

(1) When disconnecting the cable from the negative (-) battery terminal, "System initializing" may appear on the navigation receiver assembly. In this case, restore the steering angle neutral point INFO .

(2) Depending on the parts that are replaced or operations that are performed during vehicle inspection or maintenance, calibration of other systems as well as the advanced parking guidance system may be needed INFO .

HINT:

Each adjusted value for the calibration of the advanced parking guidance system will be stored in the parking assist ECU.

(3) When the lens of the rear television camera assembly is dirty, wash the lens with water and wipe it off with a soft cloth to obtain clear images. For heavy dirt, use neutral detergent to clean the lens.

3. NOTES FOR REAR TELEVISION CAMERA

(a) Notes for the rear television camera assembly

(1) The advanced parking guidance system may not function properly if subjected to a severe blow by any hard object.

(2) Do not scrub the cover part of the camera (resin made). Scrubbing may scratch the cover and affect the image. Prevent organic solvents, waxes, bond removing solvents or glass coating from adhering to the cover. If such material adheres to the cover, clean it off immediately and wash with water.

(3) Exposing the camera to a sudden temperature change may affect proper functioning of the camera.

(4) A clear image may not appear if the camera is dirty with snow, mud, etc. In that case, wash it with water and wipe off the lens. Use a detergent to remove dirt if necessary.

(b) Images are difficult to discern even in normal conditions if:

(1) Noise may occur in the image depending on electrical devices used in the cabin.

(2) Noise may occur in the image if the outer mirror switch assembly is operated.

(3) Noise may occur in the image if accessories that generate radio waves have been installed.

(4) The camera screen is frosted over (the image immediately after turning the power switch on (IG) may be blurred or darker than normal).

(5) The camera lens is dirty with snow, mud, etc.

(6) A strong beam of light, such as a sunbeam or headlight, hits the camera.

(7) It is too dark around the camera (at night etc.).

(8) The ambient temperature around the camera is either too high or too low.

(9) The vehicle is tilted at a steep angle.

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(10) The ambience of the camera is too bright. (When a strong light, such as a sunbeam reflected off the vehicle body, hits the camera, the image may be blurred. This is called the "SMEAR" phenomenon, peculiar to the CCD camera.)

4. NOTES FOR ULTRASONIC SENSOR

(a) Under the following conditions, the detection function may not function properly:

(1) A sensor or the front bumper is not installed in the correct position.

(2) A sensor is improperly located due to damage to the front bumper.

(3) A sensor is covered with foreign matter, such as mud or snow (detection function returns to normal when the sensor is cleaned).

(4) A sensor is frozen (detection function returns to normal when the temperature of the sensor rises).

(5) A hand is blocking a sensor.

HINT:

- In very cold weather where a malfunction display appears, the sensor may not be able to detect obstacles.
- If the sensor has malfunction, the advanced parking guidance system DTC will be output INFO .
- If the malfunction display appears, visually check the sensor first. If the sensor is free of foreign matter but the malfunction display remains, the sensor may have a malfunction.

(b) The detection range may be affected by the following conditions:

HINT:

Depending on a shape of a parked vehicle or an obstacle such as a wall or post near the parking space, the detection range may change even though the sensors are operating normally.

(1) A sensor or the front bumper is not installed in the correct position.

(2) A sensor is improperly located due to damage to the front bumper.

(3) A sensor is covered with foreign matter, such as mud or snow.

(4) The vehicle is in an excessively hot or excessively cold area.

(c) Under the following conditions, a detection error may occur:

HINT:

Depending on a shape of a parked vehicle or an obstacle such as a wall or post near the parking space, the detection range may change even though the sensors are operating normally.

(1) A sensor or the front bumper is not installed in the correct position.

(2) A sensor is improperly located due to damage to the front bumper.

(3) Driving on a bumpy road, an unpaved road or in tall grass.

(4) Ultrasonic waves are received from the horn or parking sonar system of another vehicle, a motorcycle engine, or the air brakes of a large vehicle.

(5) It is raining heavily or the sensor is splashed with water.

(6) The vehicle is tilted at a steep angle.

(7) The vehicle is equipped with a fender pole or a wireless antenna mechanism.

(8) A sensor is covered with foreign matter, such as mud or snow.

(9) The vehicle is moving forward or backward towards high curbs or objects that are perpendicular to the ground.

(10) A sensor is sprayed with high pressure water or steam.

(d) The sensors cannot detect the following objects:

(1) Thin objects, such as wires and ropes.

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PARK ASSIST / MONITORING: ADVANCED PARKING GUIDANCE SYSTEM: PRECAUTION (2010 Prius)

(2) Materials that absorb ultrasonic waves, such as cotton, snow, etc.

(3) Objects with sharp edges.

(4) Short objects.

(5) Objects that are tall and protrude toward the vehicle above the detection range of the sensors.

(e) Other notices:

(1) The sensors cannot detect objects directly under the bumper. (A sensor may detect low objects and thin poles, and then lose track of them.)

(2) Beware that the detection range of the ultrasonic sensor is limited. In certain conditions, some objects may not be detected. As a result, always make sure to check all around the vehicle when driving or parking.

(3) The sensors may not be able to detect obstacles that are too close to the sensor.

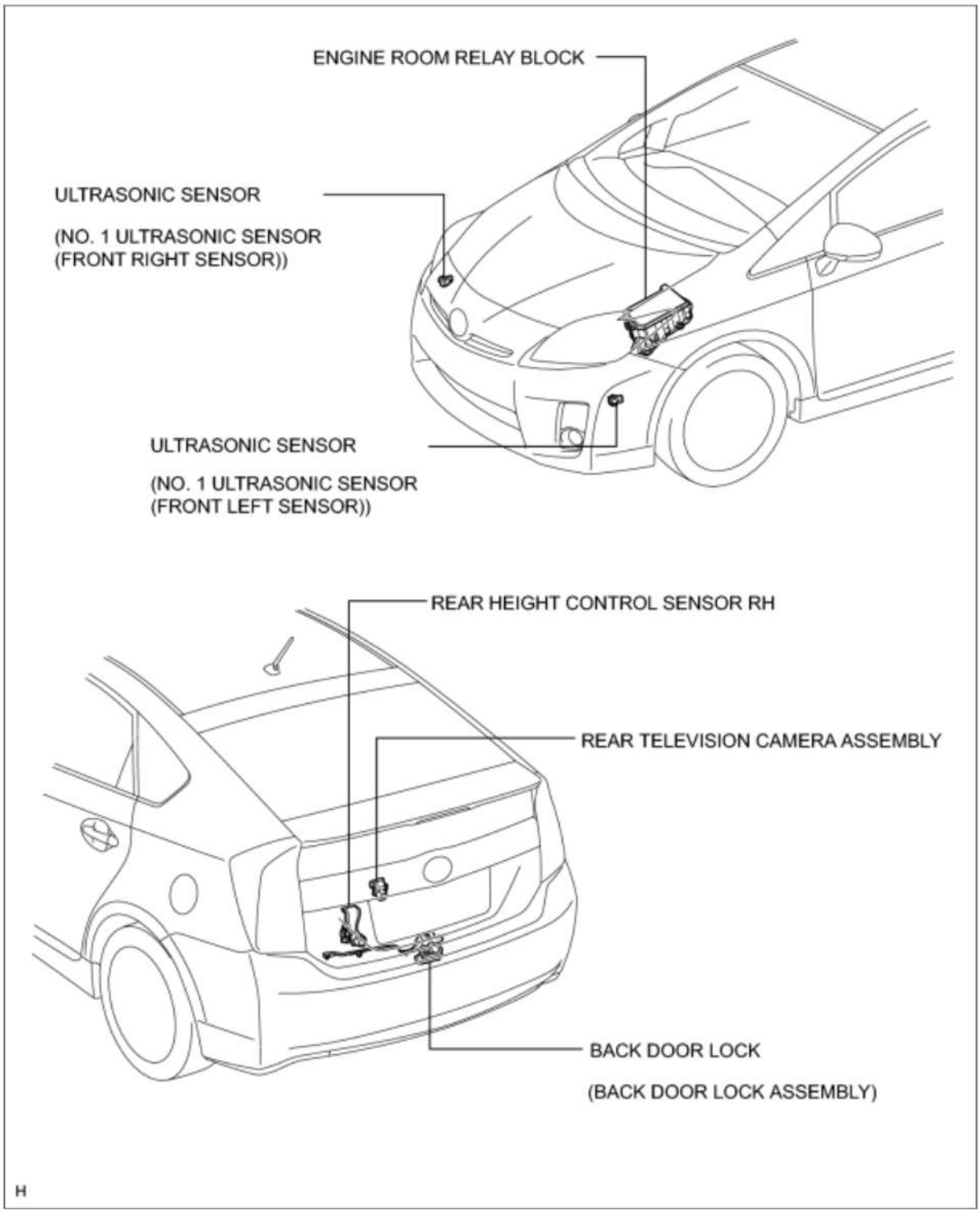
(4) The sensors may not be able to detect obstacles if the sensors have been dropped or subjected to a strong impact.

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PARK ASSIST / MONITORING: ADVANCED PARKING GUIDANCE SYSTEM: PARTS LOCATION (2010 Prius)

PARTS LOCATION

ILLUSTRATION

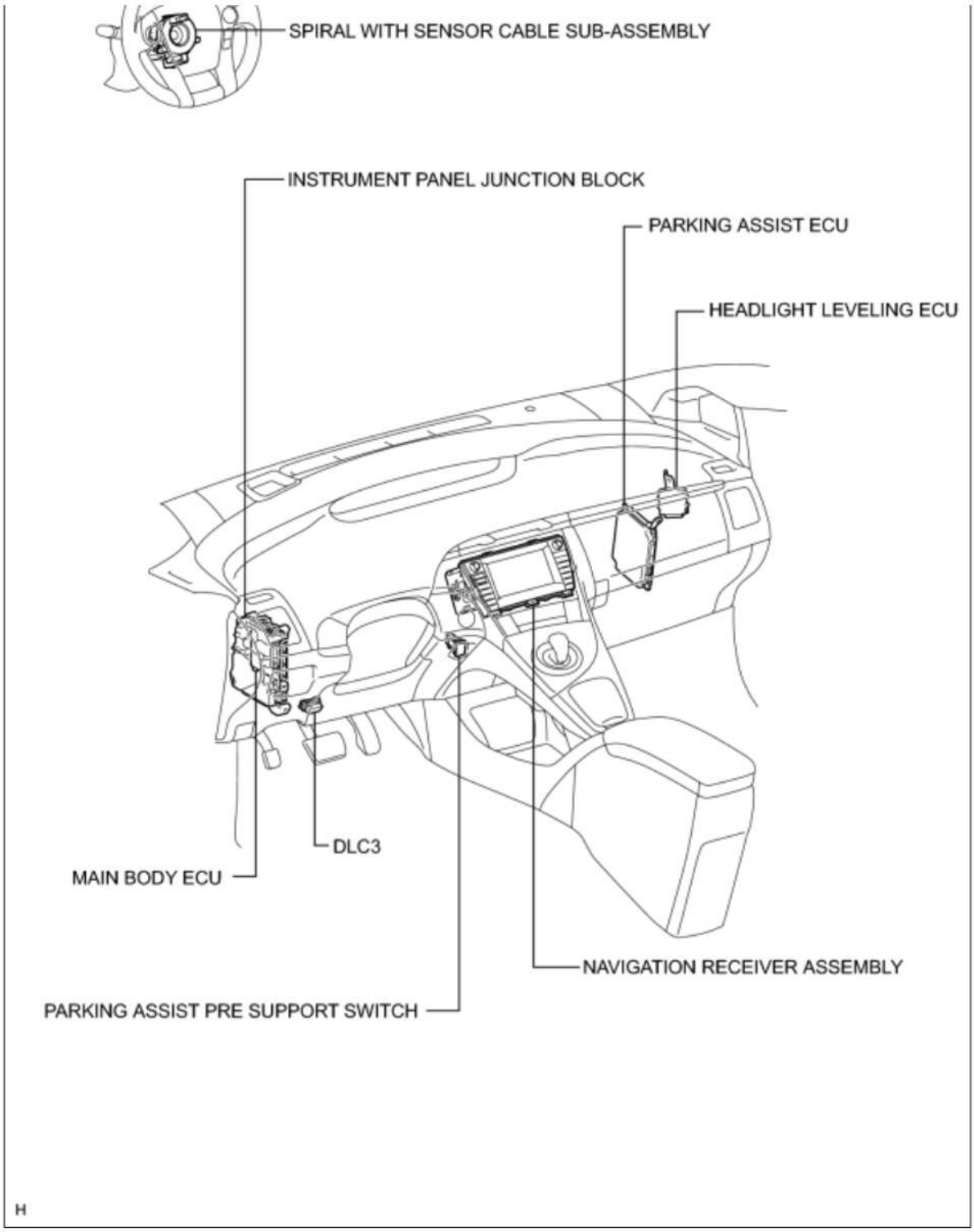


ILLUSTRATION



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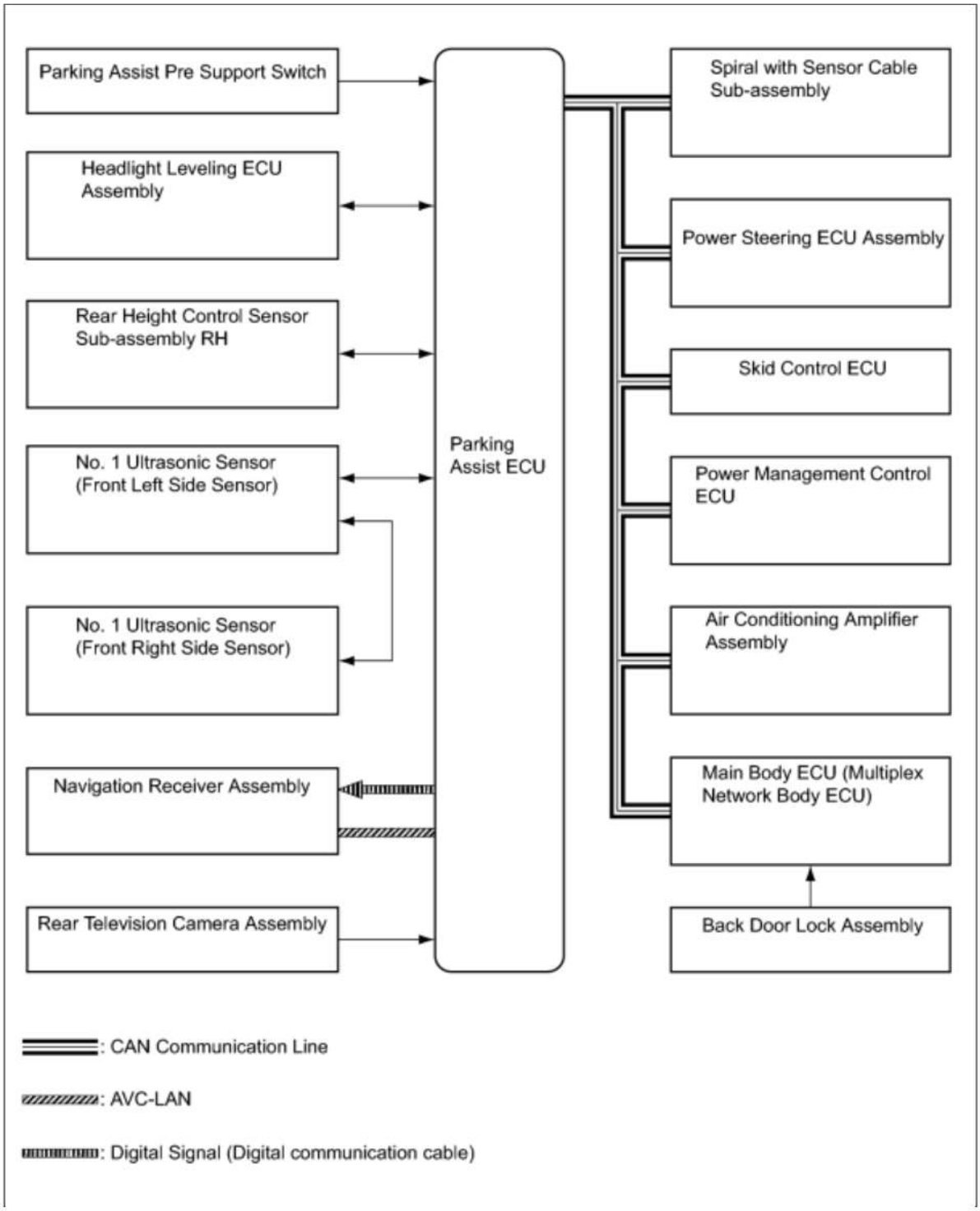
PARK ASSIST / MONITORING: ADVANCED PARKING GUIDANCE SYSTEM: PARTS LOCATION (2010 Prius)



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PARK ASSIST / MONITORING: ADVANCED PARKING GUIDANCE SYSTEM: SYSTEM DIAGRAM (2010 Prius)

SYSTEM DIAGRAM



Communication Table

SENDER	RECEIVER	SIGNAL	LINE
Navigation Receiver Assembly		Vehicle angle data	AVC-LAN
Spiral with Sensor Cable Sub-assembly		Steering angle	CAN
Power Steering ECU Assembly		Current status	CAN
		• Current status	

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PARK ASSIST / MONITORING: ADVANCED PARKING GUIDANCE SYSTEM: SYSTEM DIAGRAM (2010 Prius)

Skid Control ECU	Parking Assist ECU	• Current status • G • Vehicle speed	CAN
Power Management Control ECU		• Current status • Shift position information • Accelerator opening angle • Front HV motor revolution angle • Vehicle information	CAN
Air Conditioning Amplifier Assembly		Outside temperature	CAN
Main Body ECU		• Parking brake information • Back door courtesy	CAN
Parking Assist ECU	Navigation Receiver Assembly	Display	GVIF
	Power Steering ECU Assembly	• Target steering angle • Current status	CAN
	Power Management Control ECU	Creep up rate request	CAN

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PARK ASSIST / MONITORING: ADVANCED PARKING GUIDANCE SYSTEM: SYSTEM DESCRIPTION (2010 Prius)

SYSTEM DESCRIPTION

1. GENERAL

(a) The parking assist ECU uses vehicle condition signals from the spiral with sensor cable sub-assembly, power steering ECU, skid control ECU, power management control ECU, etc. to make calculations and estimates. These results are used to make various guidelines, which are combined together with video from the rear television camera, and output to the navigation receiver assembly. Also, control signals are output to each ECU and the advanced parking guidance system various controls are performed.

(b) This system has a rear television camera assembly mounted on the back door to display an image of the area behind the vehicle on the navigation receiver assembly display. The display panel also shows a composite view consisting of the area behind the vehicle and parking guidelines to assist the driver in parking the vehicle by monitoring the area behind the vehicle.

(c) This system is equipped with a self-diagnosis system, which is operated on a designated window that appears on the display panel, just as in the navigation system.

2. FUNCTION OF COMPONENTS

(a) The parking assist ECU controls the system by using information from the following components.

COMPONENT	FUNCTION
Rear Television Camera Assembly	• Mounted on the back door to the transmit an image of the area behind the vehicle to the parking assist ECU. • Has a color video camera that uses a Charge Coupled Device (CCD) and a wide-angle lens.
Parking Assist ECU	Receives vehicle condition signals from various ECUs, makes frame based on calculations, combines the frame with video from the rear television camera, and outputs the video with frame to the navigation receiver assembly. Also, control signals are output to each ECU and the advanced parking guidance system various controls are performed.
Navigation Receiver Assembly	• Receives video signals containing a composite of an image of the area behind the vehicle and the frame signals from the parking assist ECU, and displays them on the display panel. • Uses the yaw rate detected by the gyro sensor that is built into the navigation receiver assembly to transmit the movement of the vehicle to the parking assist ECU.
Spiral with Sensor Cable Sub-assembly	Detects the angle of the steering wheel and sends the resulting signals to the parking assist ECU through CAN communication.
ECM	Sends the shift position signal to the parking assist ECU through CAN communication.
Skid Control ECU	Sends stop switch, vehicle speed, driving distance, and other vehicle condition signals to the parking assist ECU.
Power Steering ECU Assembly	Sends EPS failure, intervention steering, and other related vehicle condition signals to the parking assist ECU. Also, based on advanced parking guidance control signals and steering-related signals, performs steering control.
Parking Assist Pre Support Switch	Sends the switch operation signal to the parking assist ECU.
No. 1 Ultrasonic Sensor	Controlled by the parking assist ECU and detects an available parking space.
Air Conditioner Amplifier Assembly	Sends the outside temperature signal to the parking assist ECU through CAN communication.
Rear Height Control	

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Sensor Sub-assembly RH	Sends the vehicle height signal to the parking assist ECU.

3. OPERATION EXPLANATION

(a) The parking assist ECU receives the camera activation information from the navigation receiver assembly. Then, the parking assist ECU switches the display signal for the navigation receiver assembly from the navigation system to the advanced parking guidance system.

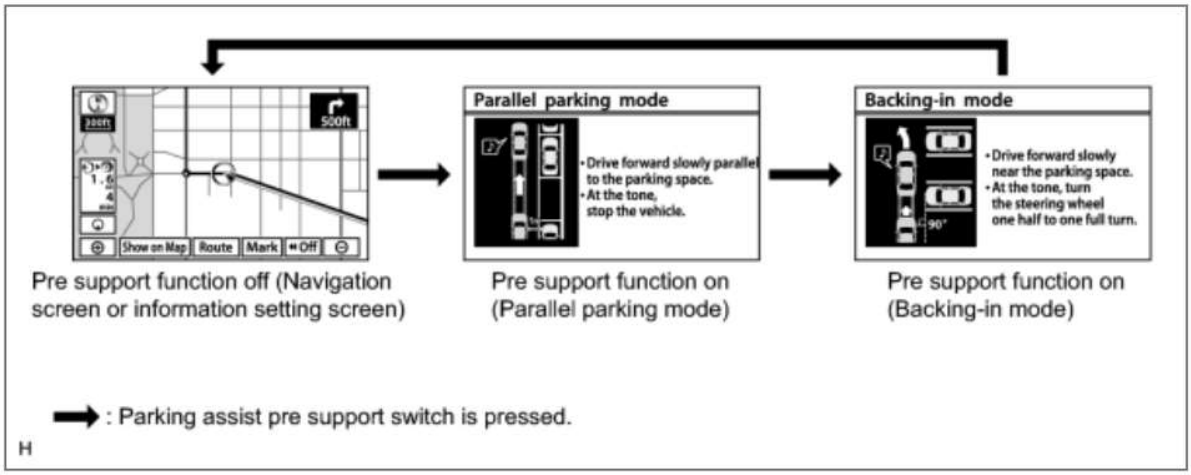
4. PRE SUPPORT FUNCTION

(a) Function Description

(1) A pre support function is provided to assist the driver with initial positioning of the vehicle when backing-in mode or parallel parking mode operation is used.

(b) Pre Support Function Operation Condition

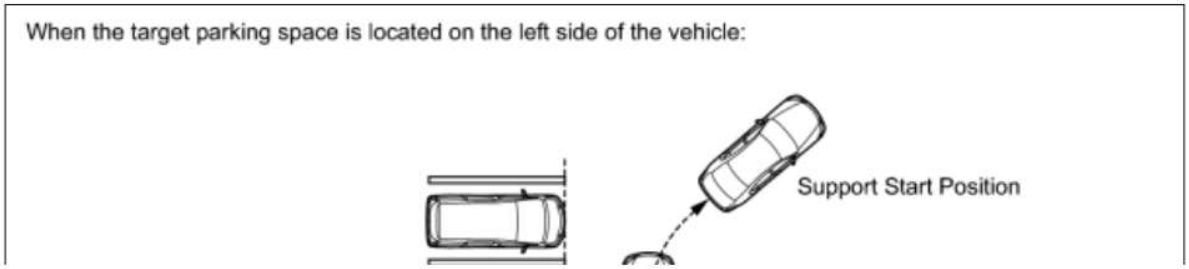
(1) For the pre support function, when the advanced parking guidance system is operating normally (no DTCs are stored) and the following conditions are met, pressing the parking assist pre support switch changes the image displayed on the screen and pre support operation starts.



SCREEN DISPLAYED ON NAVIGATION RECEIVER ASSEMBLY	SHIFT POSITION	VEHICLE SPEED	SCREEN DISPLAYED (DISPLAY SWITCHES IN THE FOLLOWING SEQUENCE WHEN PARKING ASSIST PRE SUPPORT SWITCH IS PRESSED)
Navigation screen or information setting screen	Other than P or R	15 km/h (9.3 mph) or less	Pre support off (Navigation screen or information setting screen) → Pre support on (Parallel parking mode) → Pre support on (Backing-in mode) → Pre support off (Navigation screen or information setting screen)*1

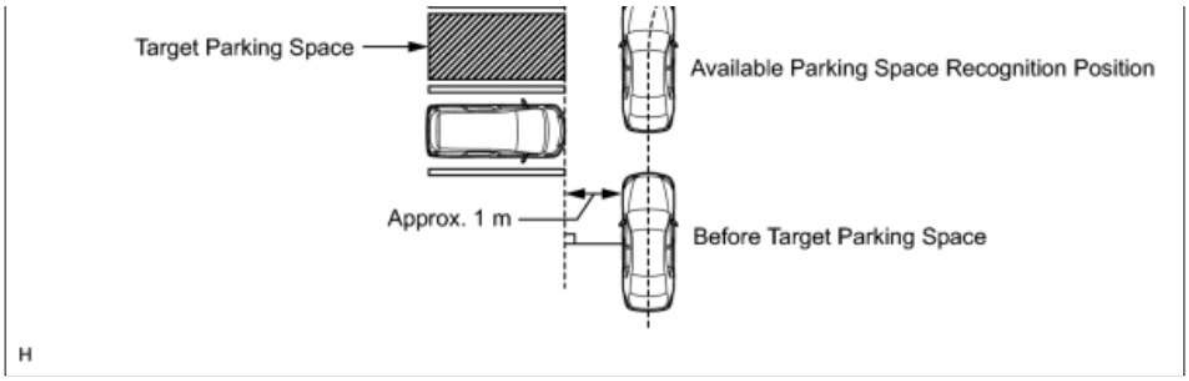
*1: A tone sounds when the screen transfers.

(c) Backing-in Mode Operation



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PARK ASSIST / MONITORING: ADVANCED PARKING GUIDANCE SYSTEM: SYSTEM DESCRIPTION (2010 Prius)



(1) Press the parking assist pre support switch before the target parking space to turn on the pre support function (backing-in mode).

(2) Drive the vehicle slowly while keeping a distance of approximately 1 m (3.3 ft.) from and perpendicular to the target parking space or vehicles around the target parking space. When the ultrasonic sensor (No. 1 ultrasonic sensor) detects an available parking space, start to turn the steering wheel from the straight ahead position when the tone sounds.

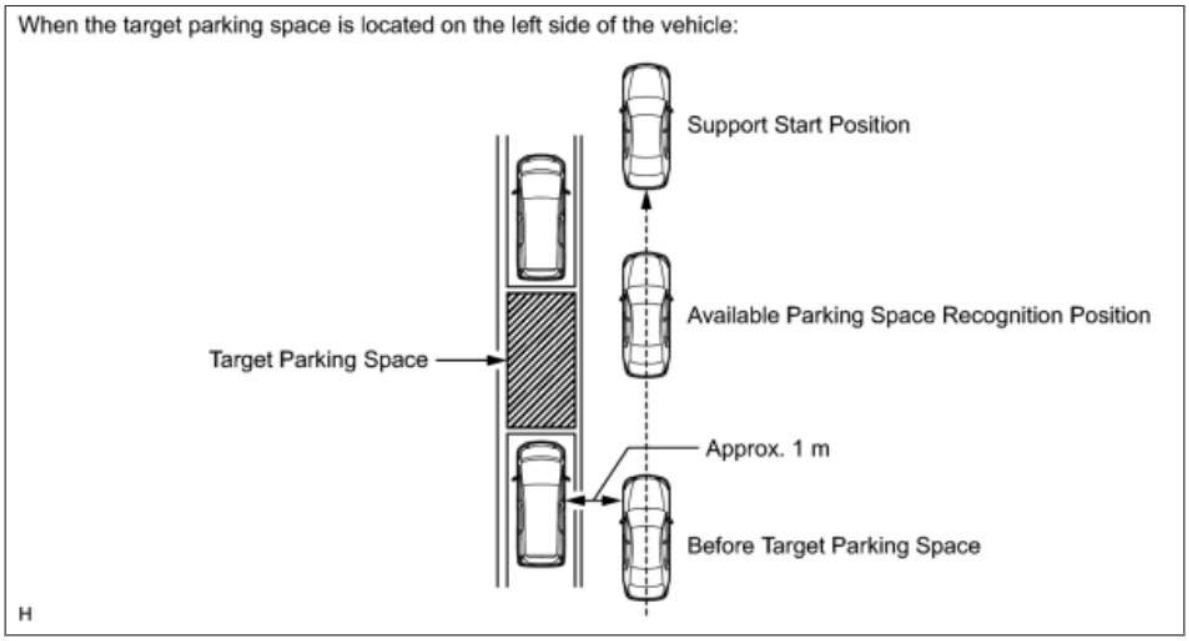
HINT:

- An available parking space may not be detected by the ultrasonic sensor (No. 1 ultrasonic sensor) depending on the distance between the vehicle being parked and the target parking space or vehicles around the target parking space, vehicle orientation and vehicle speed.
- A target parking space may not be detected by the ultrasonic sensor (No. 1 ultrasonic sensor) depending on the conditions around the target parking space. For details, refer to Precautions for the parking space detection sensor INFO .
- When the ultrasonic sensor (No. 1 ultrasonic sensor) cannot detect a target parking space, a tone will not sound.

(3) Drive the vehicle while turning the steering wheel and when the vehicle reaches the support start position (the tone will sound twice), stop the vehicle, return the steering wheel to the straight ahead position, and move the shift lever to R.

(4) When the advanced parking guidance screen is displayed, the target parking frame will also displayed for the target parking space that is detected by the ultrasonic sensor (No. 1 ultrasonic sensor) during the pre support function operation.

(d) Parallel Parking Mode Operation



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PARK ASSIST / MONITORING: ADVANCED PARKING GUIDANCE SYSTEM: SYSTEM DESCRIPTION (2010 Prius)

(1) Press the parking assist pre support switch before the target parking space to turn on the pre support function (parallel parking mode).

(2) Drive the vehicle slowly while keeping a distance of approximately 1 m (3.3 ft.) from and parallel to the target parking space or vehicles around the target parking space to allow the ultrasonic sensor (No. 1 ultrasonic sensor) to start detection.

HINT:

- For parallel parking mode, a tone will not sound when the ultrasonic sensor (No. 1 ultrasonic sensor) detects the available parking space.
- An available parking space may not be detected by the ultrasonic sensor (No. 1 ultrasonic sensor) depending on a distance between the vehicle being parked and the target parking space or vehicles around the target parking space, vehicle orientation and vehicle speed.
- A target parking space may not be detected by the ultrasonic sensor (No. 1 ultrasonic sensor) depending on the conditions around the target parking space. For details, refer to Precautions for the parking space detection sensor INFO .

(3) Drive as is and stop the vehicle when the vehicle reaches the support start position (the tone will sound twice), and move the shift lever to R.

HINT:

When the ultrasonic sensor (No. 1 ultrasonic sensor) cannot detect a target parking space, the tone will not sound.

(4) When the advanced parking guidance screen is displayed, the target parking frame will also be displayed for the target parking space that is detected by the ultrasonic sensor (No. 1 ultrasonic sensor) during the pre support function operation.

5. COMMUNICATION SYSTEM OUTLINE

(a) The components of the advanced parking guidance system communicate with each other through the AVC-LAN. The parking assist ECU judges the vehicle angle data transmitted via the AVC-LAN from the navigation receiver assembly (the data is calculated by the navigation receiver assembly by integrating the yaw rate of the gyro sensor built into the navigation receiver assembly).

(b) If a short circuit or open circuit occurs in the AVC-LAN, communication is interrupted and this system will stop functioning.

6. DIAGNOSTIC FUNCTION OUTLINE

(a) This advanced parking guidance system has a diagnostic function displayed in the navigation receiver assembly. This function enables the calibration (adjustment and verify) of the advanced parking guidance system INFO .

(b) The advanced parking guidance system can check the following items by using the Techstream.

ITEM	PROCEED TO
DTC	INFO
Data List / Active Test	INFO

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PARK ASSIST / MONITORING: ADVANCED PARKING GUIDANCE SYSTEM: HOW TO PROCEED WITH TROUBLESHOOTING (2010 Prius)

HOW TO PROCEED WITH TROUBLESHOOTING

HINT:

- Use the following procedure to troubleshoot the advanced parking guidance system.
- *: Use the Techstream.

1.	**VEHICLE BROUGHT TO WORKSHOP**

NEXT

2.	**INSPECT BATTERY VOLTAGE**

(a) Measure the battery voltage with the power switch off.

Standard Voltage:
11 to 14 V

If the voltage is below 11 V, replace or recharge the battery before proceeding to the next step.

NEXT

3.	**CHECK NAVIGATION SYSTEM**

(a) Refer to the navigation system INFO .

Result:

RESULT	PROCEED TO
Navigation system is normal	A
Navigation system is abnormal	B

B **GO TO NAVIGATION SYSTEM**

A

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4.	**CHECK COMMUNICATION FUNCTION OF CAN COMMUNICATION SYSTEM***

(a) Use the Techstream to check if the CAN communication system is functioning normally.

Result:

RESULT	PROCEED TO
CAN DTC is not output	A
CAN DTC is output	B

B ▶ INFO **GO TO CAN COMMUNICATION SYSTEM**

A ▼

5.	**CHECK FOR DTC***

(a) Check for DTCs and note any codes that are output INFO .

(b) Clear the DTC INFO .

(c) Recheck for DTCs. Try to prompt the DTC by simulating the original activity that the DTC suggests.

Result:

RESULT	PROCEED TO
DTC is output	A
DTC is not output	B

B ▶ **Go to step 7**

A ▼

6.	**DIAGNOSTIC TROUBLE CODE CHART***

(a) Refer to Diagnostic Trouble Code Chart INFO .

NEXT ▶

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NEXT Go to step 9

7.	PROBLEM SYMPTOMS TABLE

(a) Refer to Problem Symptoms Table INFO .

Result:

RESULT	PROCEED TO
Fault is not listed in Problem Symptoms Table	A
Fault is listed in Problem Symptoms Table	B

B Go to step 9

A

8.	OVERALL ANALYSIS AND TROUBLESHOOTING*

(a) Data List / Active Test INFO

(b) Terminals of ECU INFO

NEXT

9.	CIRCUIT INSPECTION

NEXT

10.	ADJUST, REPAIR OR REPLACE

NEXT

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PARK ASSIST / MONITORING: ADVANCED PARKING GUIDANCE SYSTEM: HOW TO PROCEED WITH TROUBLESHOOTING (2010 Prius)

11.	**CONFIRMATION TEST**

NEXT END

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PARK ASSIST / MONITORING: ADVANCED PARKING GUIDANCE SYSTEM: INITIALIZATION (2010 Prius)

INITIALIZATION

1. INITIALIZE ADVANCED PARKING GUIDANCE SYSTEM

(a) When "System initializing" message is displayed on the navigation receiver assembly, correct the steering angle neutral point using the following method.

(1) Fully turn the steering wheel to the right and left on the flat ground.

NOTICE:

Memorizing the steering angle neutral point must be carried out with the hybrid system started. Apply the parking brake, depress the brake pedal, push the P position switch, and ensure that the vehicle is not moving.

HINT:

"?" button is displayed at the same time as "System initializing" message. If the "?" button is selected, this method is displayed.

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PARK ASSIST / MONITORING: ADVANCED PARKING GUIDANCE SYSTEM: CALIBRATION (2010 Prius)

CALIBRATION

1. ADJUST ADVANCED PARKING GUIDANCE SYSTEM

(a) This advanced parking guidance system can be set from the diagnostic screen of the navigation receiver assembly.

(b) If the following operations are performed, it is necessary to perform adjustments and checks on the diagnostic screen.

PART NAME	OPERATION	ADJUSTMENT ITEM	PROCEED TO
Spiral with sensor cable sub-assembly	• Removal and installation of the spiral with sensor cable sub-assembly • Removal and installation of the connector of the spiral with sensor cable sub-assembly	Steering angle neutral point	INFO
		Steering angle setting	INFO
Spiral with sensor cable sub-assembly	Replacement	Steering angle neutral point	INFO
		Steering angle setting	INFO
Parking assist ECU	Replacement	Parking assist ECU initialization	Step 2
Suspension, tires, etc.	The vehicle height changes because of suspension or tire replacement	Height control sensor vehicle height difference (Height set)	Step 3
		Rear television camera optical axis (Camera position setting)	Step 4
Rear television camera assembly	• Replacement • Installation angle of the rear television camera changes because of the removal and installation of the rear television camera, etc.	Rear television camera optical axis (Camera position setting)	Step 4
Rear height control sensor sub-assembly RH	• Replacement • Installation position of the rear height control sensor sub-assembly RH changes because of the removal and installation of the rear height control sensor sub-assembly RH	Height control sensor vehicle height difference (Height set)	Step 3
		Rear television camera optical axis (Camera position setting)	Step 4
		Lighting system initialization	INFO
Rear bumper cover	• Replacement • Installation position of the rear bumper cover changes because of the removal and installation of the rear bumper cover	Rear bumper position (BUMPER)	Step 5

HINT:

The adjustment values stored while performing advanced parking guidance system calibration are stored in the parking assist ECU.

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2. PARKING ASSIST ECU INITIALIZATION

HINT:

Be sure to check for DTCs before performing this procedure INFO **.**

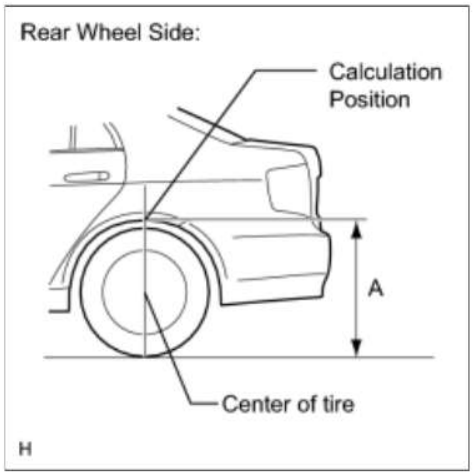
(a) Preparation for adjustment

(1) Park the vehicle on the flat place with the steering wheel centered.

HINT:

Before parking the vehicle, be sure to move the vehicle forward and in reverse to check that the tires are facing straight ahead with the steering wheel centered.

(2) Adjust the tire pressure to the specification.



(3) Measure the distance A between the ground and the edge of a rear wheel arch.

(4) Calculate the difference between the distance A and the standard height below.

Standard:
697 mm (2.29 ft.)

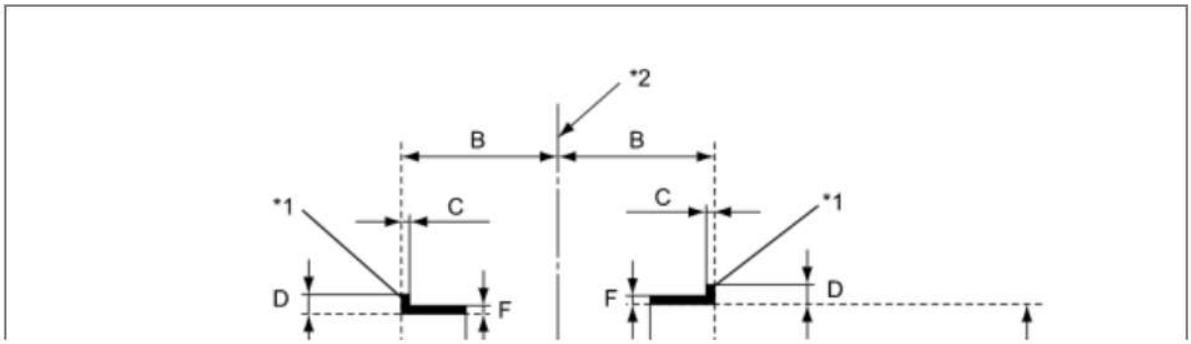
HINT:

Subtract the standard value from the measured value to get the standard height. When the measured value is 707 mm: 707 - 697 = +10 (standard height is +10 mm).

(5) Set a target bar for optical axis adjustment of the rear television camera.

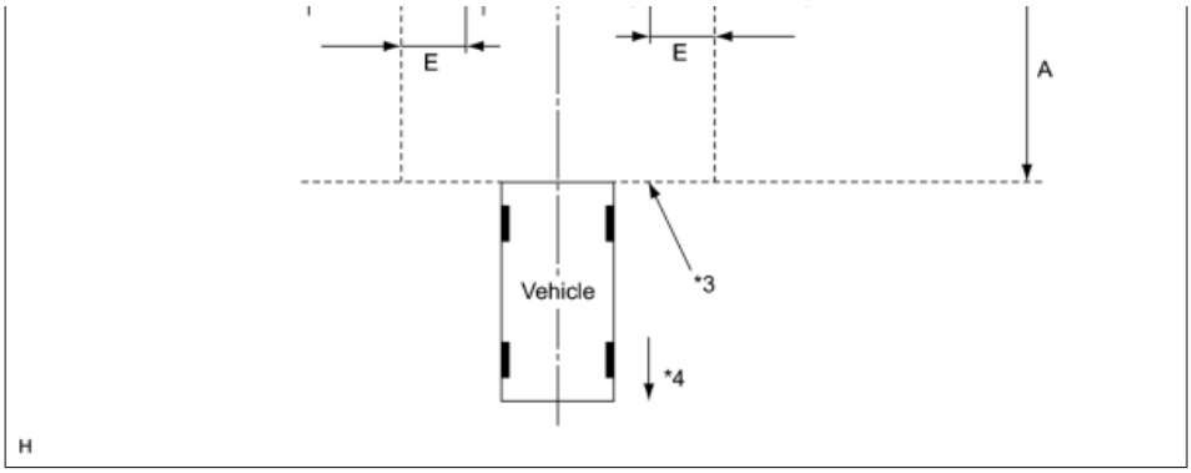
HINT:

Only when adjusting the optical axis of the camera, create a target bar for adjustment.



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PARK ASSIST / MONITORING: ADVANCED PARKING GUIDANCE SYSTEM: CALIBRATION (2010 Prius)



Dimension:

A	B	C	D	E	F
1100 mm (3.61 ft.)	1600 mm (5.25 ft.)	30 mm (1.18 in.)	100 mm (3.94 in.)	500 mm (1.64 ft.)	30 mm (1.18 in.)

Text in Illustration

*1	Target Bar for Camera Adjustment	*2	Vehicle Center
*3	Bumper Edge	*4	Front Side

HINT:

Check the tape color on the navigation receiver assembly and choose a tape color which can be easily seen.

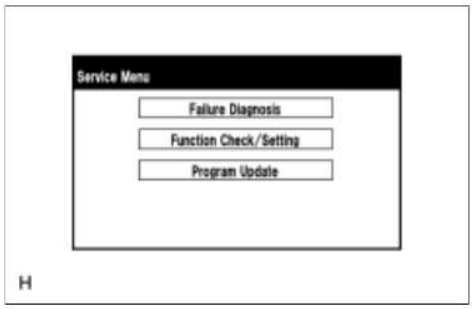
(b) Start diagnostic mode INFO .

NOTICE:

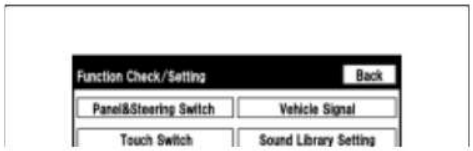
Mode setting must be carried out with the hybrid system started. Apply the parking brake, depress the brake pedal, push the P position switch, and ensure that the vehicle is not moving.

HINT:

The displayed items may differ depending on vehicle specifications.

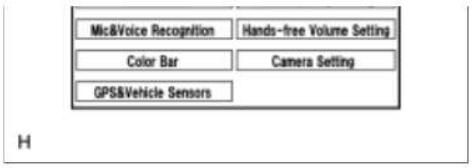


(1) Select "Function Check/Setting" on the Service Menu screen.

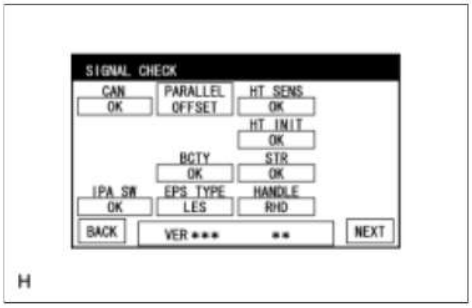


(2) Select "Camera Setting" on the Function Check/Setting screen

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(3) Check that "CHK" (red) is not displayed on the SIGNAL CHECK screen.



- When "CHK" (red) is displayed for any items except "EPS TYPE" on the SIGNAL CHECK screen, selecting "NEXT" will not change the screen to the INDIVIDUAL SETTING screen.
- When "CHK" (red) is displayed for any items except "EPS TYPE" and "HT INIT" on the SIGNAL CHECK screen, perform inspections using the SIGNAL CHECK screen INFO .

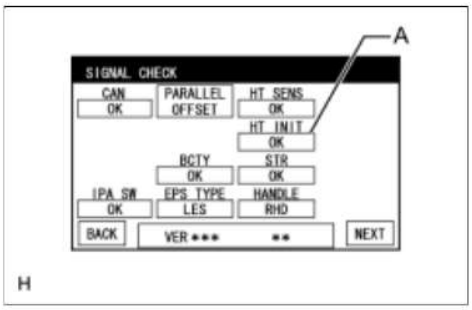
HINT:

When the screen is not change to the HEIGHT SET screen, check for DTCs and perform troubleshooting based on the output DTCs INFO .

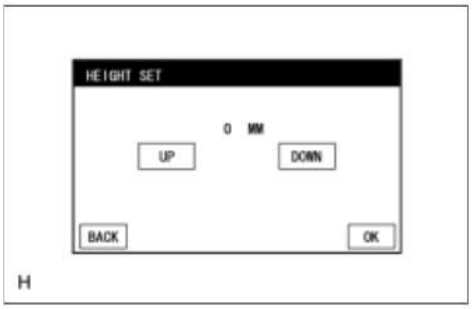
(c) HEIGHT SET

NOTICE:

- The height control sensor vehicle height difference setting must be performed on the flat place.
- Before performing the television camera optical axis adjustment, the height control sensor vehicle height difference must be performed in the "HEIGHT SET" screen.



(1) Select the indicator "A" for "HT INIT" on the SIGNAL CHECK screen.



(2) Press "UP" and "DOWN" to input the calculated difference.

- A positive value is indicated in green and a negative value is indicated in red.
- When a value is "10 MM" in green, it means +10 mm.
- Available setting range: -102 mm to +102 mm (can be adjusted in 1 mm increments)

(3) After inputting the calculated difference, select "OK". The height control sensor vehicle height difference setting will be recorded.

HINT:

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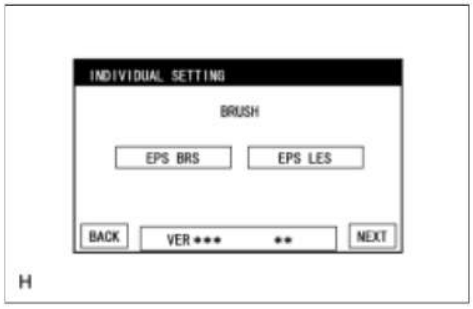
PARK ASSIST / MONITORING: ADVANCED PARKING GUIDANCE SYSTEM: CALIBRATION (2010 Prius)

- When "OK" is selected, a beep will sound to confirm that the height difference set values have been stored.
- The setting value will not be stored unless "OK" is selected.
- Until a beep finishes sounding, the adjustment values are not stored.
- When "BACK" is selected, the screen changes to SIGNAL CHECK screen without storing the set values.
- Press "OK" with the vehicle in the same condition as when the vehicle height was measured.
- If a person was in the driver seat when the vehicle height was measured, press "OK" with the same person in the driver seat.
- On the "SIGNAL CHECK" screen, check that the indicator "A" for "HT INIT" is "OK" (blue).

(4) Select "NEXT" on the SIGNAL CHECK screen.

(d) INDIVIDUAL SETTING

(1) Confirm the vehicle specification and select the EPS brush specification.



VEHICLE SPECIFICATION	EPS BRUSH SPECIFICATION
for 15 inch tire models	EPS BRS (Brush type)
for 17 inch tire models	EPS LES (Brushless type)

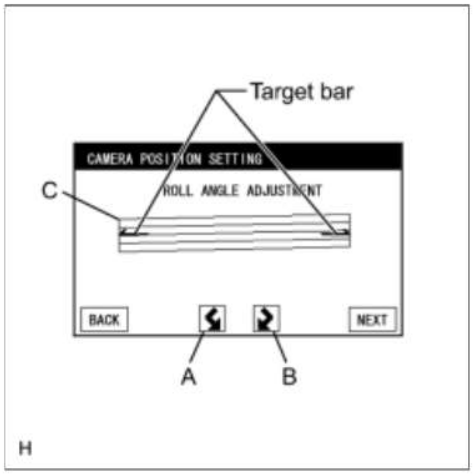
- Selected EPS brush specification is indicated in blue.
- EPS brush refers to the type of motor used for the EPS system (with brushes or brushless).

(2) Select "NEXT" on the INDIVIDUAL SETTING screen.

(e) CAMERA POSITION SETTING (ROLL ANGLE ADJUSTMENT)

NOTICE:

Before performing the television camera optical axis adjustment, the height control sensor vehicle height difference setting must be performed in the "HEIGHT SET" screen.



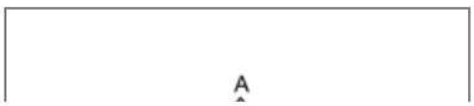
- When the back door is open, the "Back door is open. Do not use the rear view monitor when the back door is not completely closed." message will be displayed and television camera optical axis adjustment will not be possible.
- If the "Back door is open. Do not use the rear view monitor when the back door is not completely closed." message is displayed even when the back door is closed, perform inspections according to Problem Symptoms Table (A back door open warning message is displayed even after back door is closed) INFO .

(1) Select switches A and B to rotate C so that it is parallel to the target adjustment bar.

(2) Select "NEXT" on the CAMERA POSITION SETTING (ROLL ANGLE ADJUSTMENT) screen.

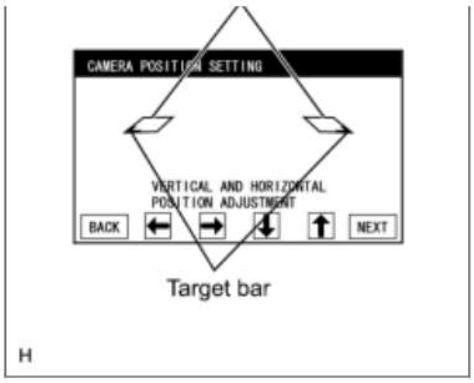
(f) CAMERA POSITION SETTING (VERTICAL AND HORIZONTAL POSITION ADJUSTMENT)

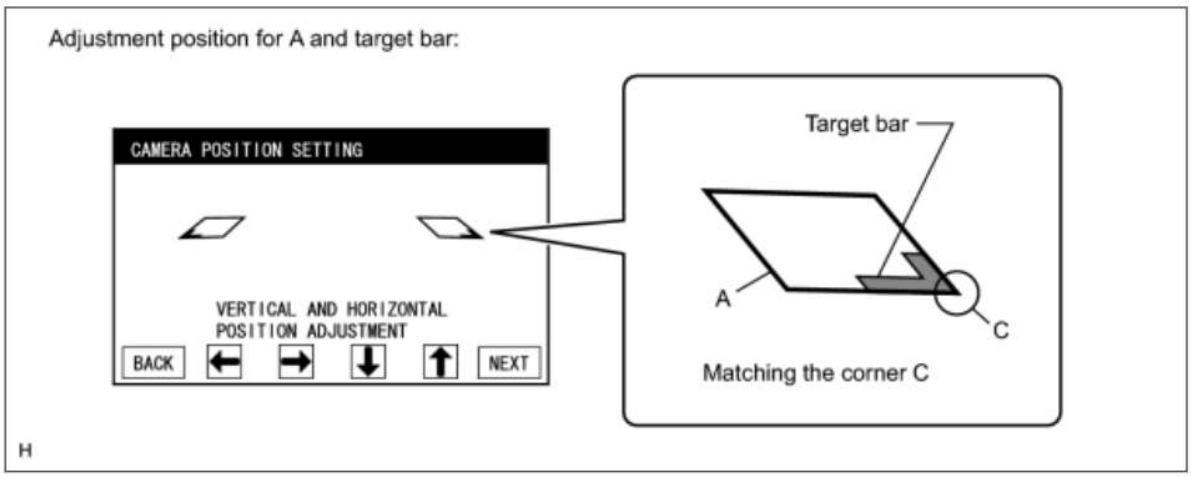
(1) By pressing the left and right, and up and down switches, move the parallelograms (A) vertically and horizontally so that the corners of the target bars (C) and the corners of the parallelograms (A) match.



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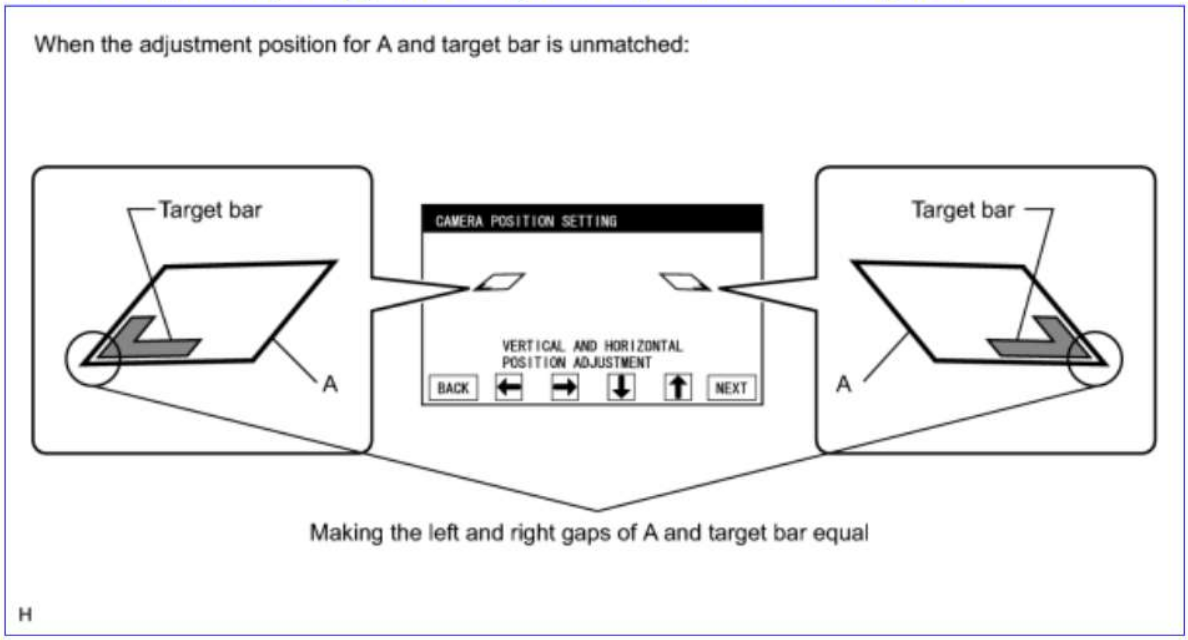
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NOTICE:

- If the left and right parallelograms (A) and target bars do not match completely, just match the corners of the target bars (C) with the corners of the parallelograms (A).
- If the left and right parallelograms (A) and the corners of the target bars (C) do not match, make the gaps between each parallelogram (A) and the target bars equal on the left and right sides.

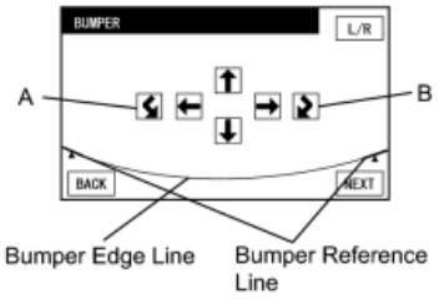


(2) Select "NEXT" on the CAMERA POSITION SETTING (VERTICAL AND HORIZONTAL POSITION ADJUSTMENT) screen.

(a) BUMPER (SIMULTANEOUS ADJUSTMENT)

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Adjustment for left and right bumpers reference lines:



(1) By pressing the left and right, up and down and A and B switches, move the bumper reference lines vertically and horizontally or rotate them so that the bumper reference lines overlap or contact the bumper edge line.

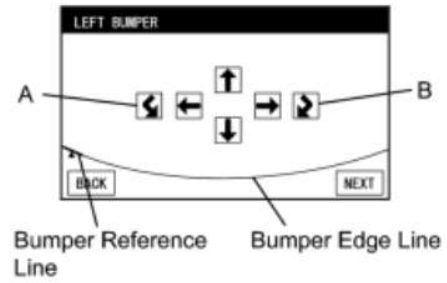
HINT:

If the bumper reference lines do not overlap or contact the bumper edge line, select "L/R" to perform bumper reference line position adjustment (individual adjustment).

(2) When the bumper reference lines and bumper edge line overlap or contact each other, select "NEXT".

(h) LEFT BUMPER

Adjustment for left bumper reference line:



(1) By pressing the left and right, up and down and A and B switches, move the left bumper reference line vertically and horizontally or rotate it so that the bumper reference lines overlap or contact the bumper edge line.

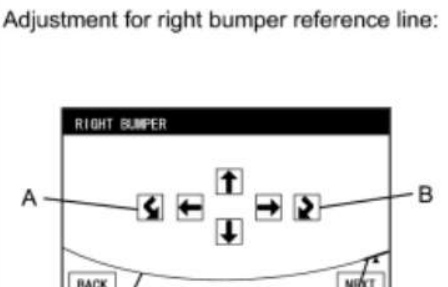
HINT:

When the left bumper reference line overlaps or contacts the bumper edge line in the bumper reference line position adjustment (individual adjustment) step, select "NEXT".

(2) Select "NEXT" on the LEFT BUMPER screen.

(i) RIGHT BUMPER

Adjustment for right bumper reference line:



(1) By pressing the left and right, up and down and A and B switches, move the right bumper reference line vertically and horizontally or rotate it so that the bumper reference lines overlap or contact the bumper edge line.

HINT:

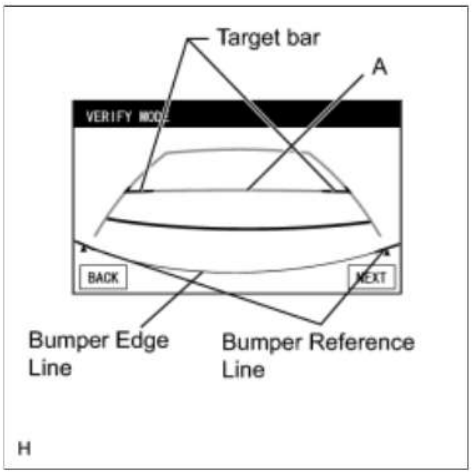
When the right bumper reference line overlaps or contacts the bumper edge line in the bumper reference line position adjustment (individual adjustment) step, select "NEXT".

(2) Select "NEXT" on the RIGHT BUMPER screen.

(j) VERIFY MODE

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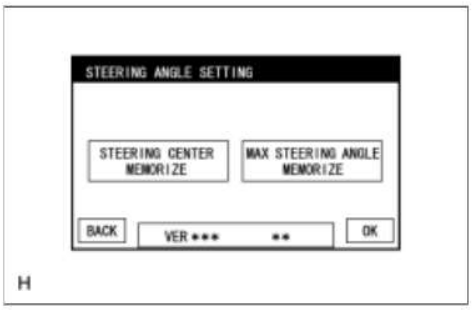
(1) Check that line A (indicating 1100 mm forward from the bumper edge) and the target bars are nearly overlapping and that the bumper reference lines and bumper edge line are nearly overlapping. With the steering wheel centered, check that the predicted path line is straight (overlapping the vehicle width extension lines).

(2) Selecting "NEXT" on the VERIFY MODE screen will be completed the camera aiming adjustment.

HINT:

- When "NEXT" is selected, a beep will sound to confirm that the camera aiming adjustment values have been stored.
- The adjustment value will not be stored unless "NEXT" is selected.
- Until a beep finishes sounding, the adjustment values are not stored.

(k) STEERING ANGLE SETTING



(1) Perform the STEERING CENTER MEMORIZE operation.

- Check that the steering wheel is centered, and then select "STEERING CENTER MEMORIZE".

HINT:

When performing removal and installation, or replacement of the television camera, steering angle adjustment is not required.

(2) Perform the MAX STEERING ANGLE MEMORIZE operation.

- After adjusting the steering angle neutral point, turn the steering wheel to the left and right lock positions and select "MAX STEERING ANGLE MEMORIZE". The maximum steering angle is then stored and the screen changes to the Function Check/Setting screen.

HINT:

- It is also possible to start by initially turning the steering to the right side.
- When "MAX STEERING ANGLE MEMORIZE" is selected, a beep will sound to confirm that the steering adjustment values have been stored.
- Until a beep finishes sounding, the adjustment values are not stored.
- The adjustment value will not be stored unless "MAX STEERING ANGLE MEMORIZE" is selected after turning the steering wheel side to side.
- When "BACK" is selected, the screen changes to VERIFY MODE without storing the set values.
- The "OK" button does not respond until the system stores the steering angle neutral point and maximum steering angle.
- Even if no DTCs are detected, selecting "MAX STEERING ANGLE MEMORIZE" may not cause the adjustment value to be stored if the steering sensor is malfunctioning.
- If selecting "MAX STEERING ANGLE MEMORIZE" does not cause the adjustment value to be stored after adjusting the steering angle, replace the spiral with sensor cable sub-assembly

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stored after adjusting the steering angle, replace the spiral with sensor cable sub-assembly INFO .

(l) Finish diagnostic mode INFO .

(m) Confirm steering angle adjustment.

HINT:

If the steering angle has been adjusted, confirm the steering angle adjustment on the advanced parking guidance screen after finishing diagnosis mode.

(1) Check on the advanced parking guidance screen that the predicted path line moves until the steering wheel is fully turned to either the left or right.

HINT:

If the predicted path line stops moving before the steering wheel is fully turned to either the left or right, the steering angle adjustment values have not been stored correctly. In this case, perform "STEERING CENTER MEMORIZE" and "MAX STEERING ANGLE MEMORIZE" again.

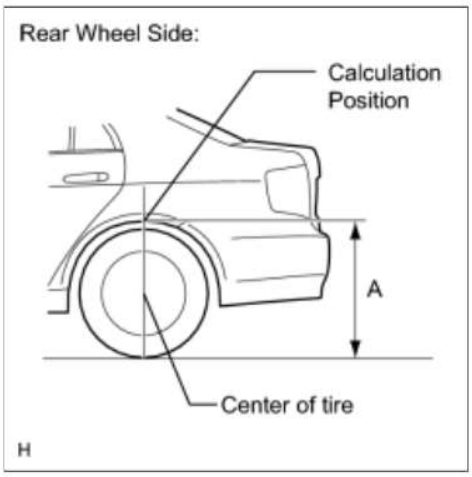
3. HEIGHT CONTROL SENSOR VEHICLE HEIGHT DIFFERENCE SETTING (HEIGHT SET)

(a) Preparation for adjustment

HINT:

- The height control sensor vehicle height difference setting must be performed on the flat place.
- Before performing the television camera optical axis adjustment, the height control sensor vehicle height difference setting must be performed in the "HEIGHT SET" screen.

(1) Adjust the tire pressure to the specification.



(2) Measure the distance A between the ground and the edge of a rear wheel arch.

(3) Calculate the difference between the distance A and the standard height below.

Standard:
697 mm (2.29 ft.)

HINT:

Subtract the standard value from the measured value to get the standard height. When the measured value is 707 mm: 707 - 697 = +10 (standard height is +10 mm).

(b) Start diagnostic mode.

NOTICE:

Mode setting must be carried out with the hybrid system started. Apply the parking brake, depress the

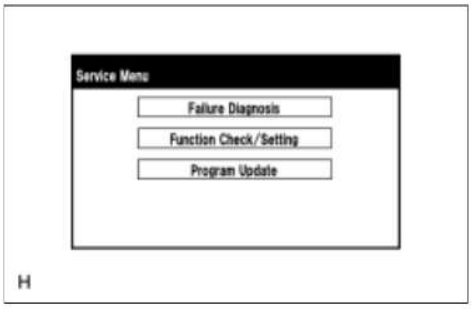
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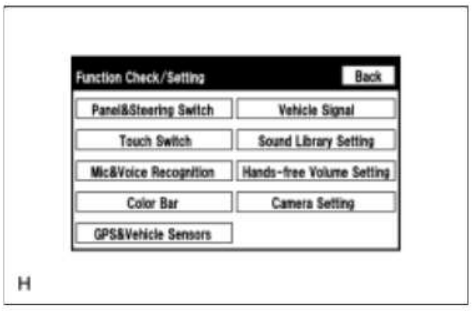
Mode setting must be carried out with the hybrid system started. Apply the parking brake, depress the brake pedal, push the P position switch, and ensure that the vehicle is not moving.

HINT:

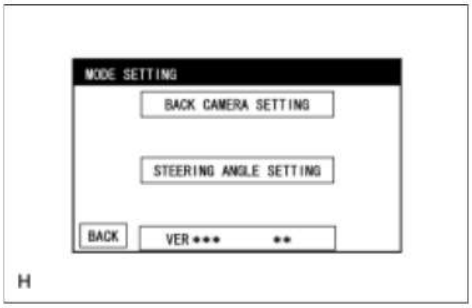
The displayed items may differ depending on vehicle specifications.



(1) Select "Function Check/Setting" on the Service Menu screen.



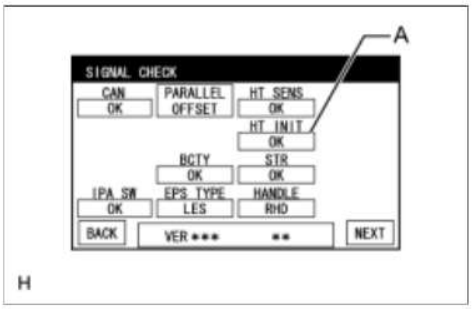
(2) Select "Camera Setting" on the Function Check/Setting screen.



(3) Select "BACK CAMERA SETTING" on the MODE SETTING screen.

HINT:

To select a grayed out item, select and hold the item for 2 seconds or more.



(4) Select the indicator "A" for "HT INIT" on the SIGNAL CHECK screen.

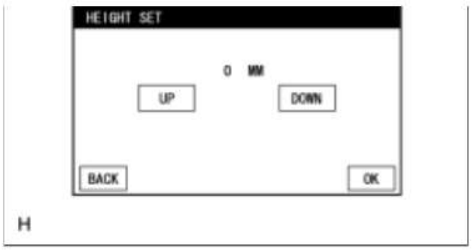
- When "CHK" (red) is displayed for any items except "EPS TYPE" and "HT INIT" on the SIGNAL CHECK screen, perform inspections using the SIGNAL CHECK screen.
- When the screen is not change to the HEIGHT SET screen, check for DTCs and perform troubleshooting based on the output DTCs.

(c) HEIGHT SET



(1) Press "UP" and "DOWN" to input the calculated difference.

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- A positive value is indicated in green and a negative value is indicated in red.
- When a value is "10 MM" in green, it means +10 mm.
- Available setting range: -102 mm to +102 mm (can be adjusted in 1 mm increments)

(2) After inputting the calculated difference, select "OK". The height control sensor vehicle height difference setting will be recorded.

HINT:

- When "OK" is selected, a beep will sound to confirm that the height difference set values have been stored.
- The setting value will not be stored unless "OK" is selected.
- Until a beep finishes sounding, the adjustment values are not stored.
- When "BACK" is selected, the screen changes to SIGNAL CHECK screen without storing the set values.
- Press "OK" with the vehicle in the same condition as when the vehicle height was measured.
- If a person was in the driver seat when the vehicle height was measured, press "OK" with the same person in the driver seat.
- On the "SIGNAL CHECK" screen, check that the indicator "A" for "HT INIT" is "OK" (blue).

(d) Finish diagnostic mode.

4. REAR TELEVISION CAMERA OPTICAL AXIS ADJUSTMENT (CAMERA POSITION SETTING)

HINT:

Be sure to check for DTCs before performing this procedure.

(a) Preparation for adjustment

NOTICE:

Before performing the television camera optical axis adjustment, the height control sensor vehicle height difference setting must be performed in the "HEIGHT SET" screen.

(1) Park the vehicle with the steering wheel centered.

HINT:

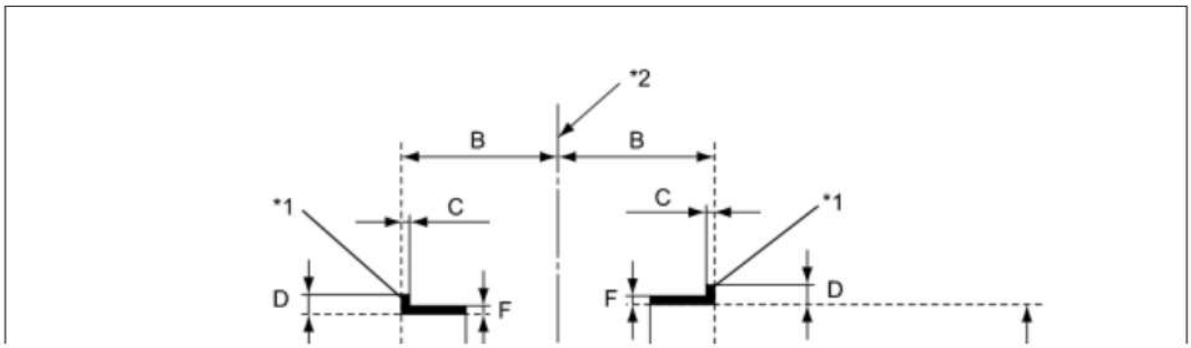
Before parking the vehicle, be sure to move the vehicle forward and in reverse to check that the tires are facing straight ahead with the steering wheel centered.

(2) Adjust the tire pressure to the specification.

(3) Set a target bar for optical axis adjustment of the rear television camera.

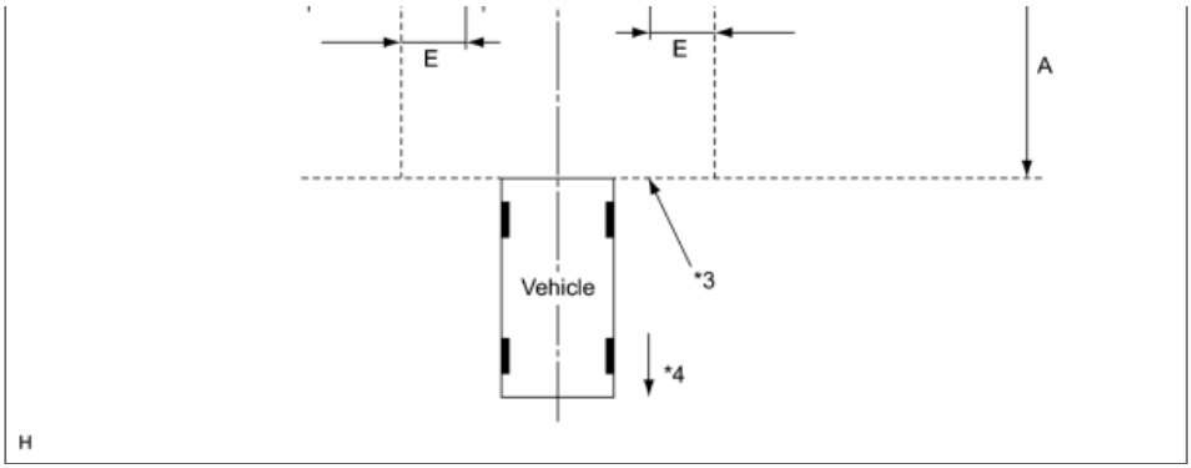
HINT:

Only when adjusting the optical axis of the camera, create a target bar for adjustment.



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Dimension:

A	B	C	D	E	F
1100 mm (3.61 ft.)	1600 mm (5.25 ft.)	30 mm (1.18 in.)	100 mm (3.94 in.)	500 mm (1.64 ft.)	30 mm (1.18 in.)

Text in Illustration

*1	Target Bar for Camera Adjustment	*2	Vehicle Center
*3	Bumper Edge	*4	Front Side

HINT:

Check the tape color on the navigation receiver assembly and choose a tape color which can be easily seen.

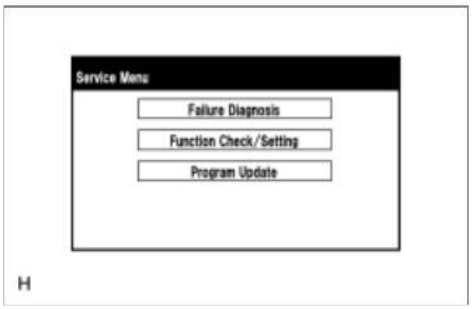
(b) Start diagnostic mode.

NOTICE:

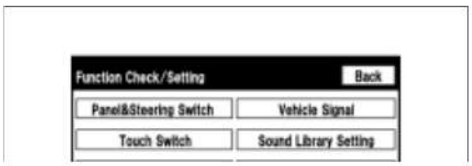
Mode setting must be carried out with the hybrid system started. Apply the parking brake, depress the brake pedal, push the P position switch, and ensure that the vehicle is not moving.

HINT:

The displayed items may differ depending on vehicle specifications.



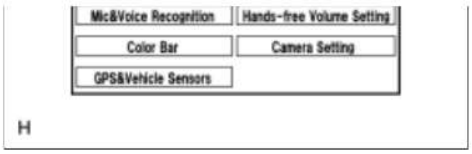
(1) Select "Function Check/Setting" on the "Service Menu" screen.

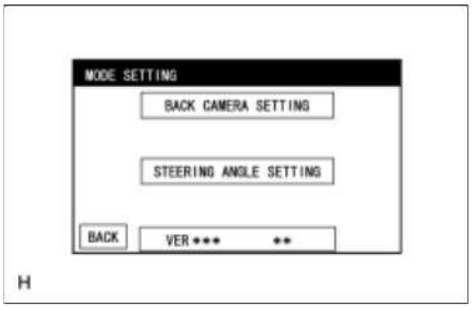


(2) Select "Camera Setting" on the Function Check/Setting screen.

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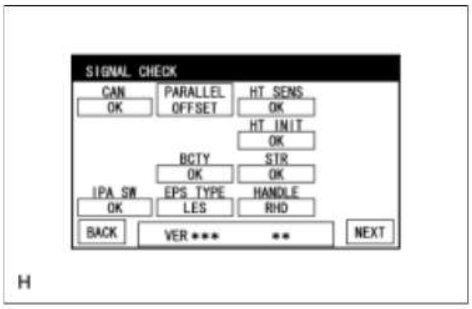




(3) Select "BACK CAMERA SETTING" on the MODE SETTING screen.

HINT:

To select a grayed out item, select and hold the item for 2 seconds or more.



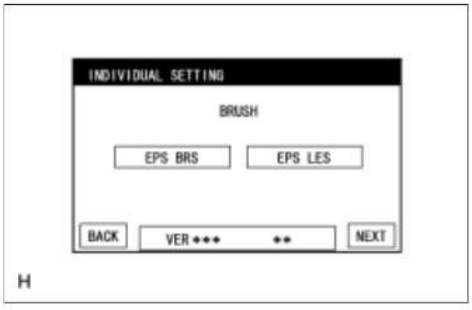
(4) Select "NEXT" on the SIGNAL CHECK screen.

- When "CHK" (red) is displayed for any items except "EPS TYPE" on the SIGNAL CHECK screen, selecting "NEXT" will not change the screen to the INDIVIDUAL SETTING screen.
- When "CHK" (red) is displayed for any items except "EPS TYPE" and "HT INIT" on the SIGNAL CHECK screen, perform inspections using the SIGNAL CHECK screen.

(c) INDIVIDUAL SETTING

(1) Confirm the vehicle specification and select the EPS brush specification.

VEHICLE SPECIFICATION	EPS BRUSH SPECIFICATION
for 15 inch tire models	EPS BRS (Brush type)
for 17 inch tire models	EPS LES (Brushless type)



- Selected EPS brush specification is indicated in blue.
- EPS brush refers to the type of motor used for the EPS system (with brushes or brushless).
- If the selected EPS brush specification does not match the vehicle specification, select the one that matches the vehicle specification.
- When the EPS brush specification is modified, steering angle setting is required INFO .

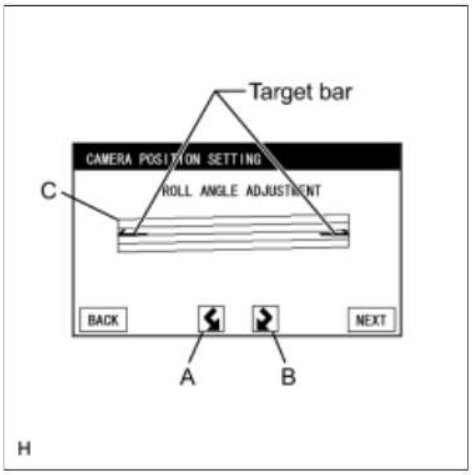
(2) Select "NEXT" on the INDIVIDUAL SETTING screen.

- The INDIVIDUAL SETTING screen will not be displayed when "BACK" is selected after switching to the CAMERA POSITION SETTING (ROLL ANGLE ADJUSTMENT) screen.
- To display the INDIVIDUAL SETTING screen again, go back to the Function Check/Setting screen, select "Camera Setting" and repeat the steps.

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(d) CAMERA POSITION SETTING (ROLL ANGLE ADJUSTMENT)



NOTICE:

Before performing the television camera optical axis adjustment, the height control sensor vehicle height difference setting must be performed in the "HEIGHT SET" screen.

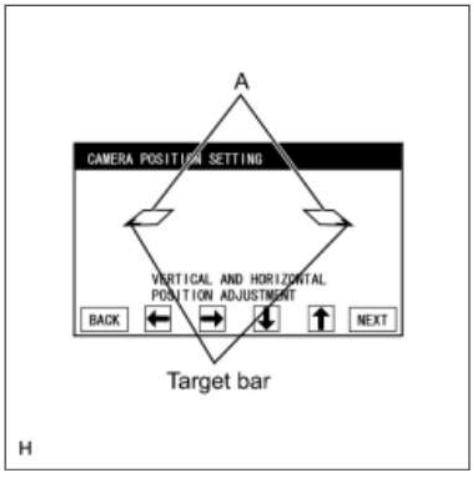
- When the back door is open, the "Back door is open. Do not use the rear view monitor when the back door is not completely closed." message will be displayed and television camera optical axis adjustment will not be possible.
- If the "Back door is open. Do not use the rear view monitor when the back door is not completely closed." message is displayed even when the back door is closed, perform inspections according to Problem Symptoms Table (A back door open warning message is displayed even after back door is closed).

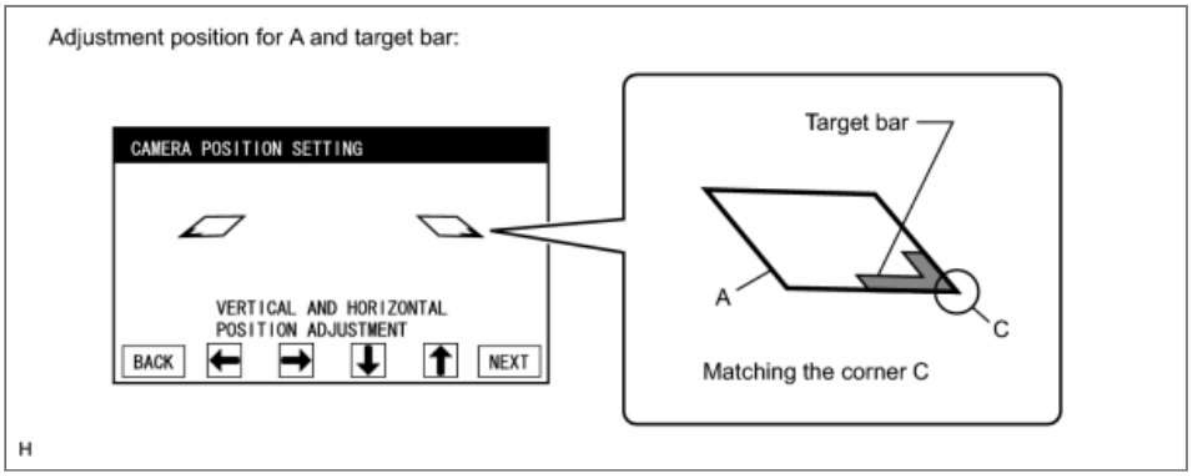
(1) Select switches A and B to rotate C so that it is parallel to the target adjustment bar.

(2) Select "NEXT" on the CAMERA POSITION SETTING (ROLL ANGLE ADJUSTMENT) screen.

(e) CAMERA POSITION SETTING (VERTICAL AND HORIZONTAL POSITION ADJUSTMENT)

(1) By pressing the left and right, and up and down switches, move the parallelograms (A) vertically and horizontally so that the corners of the target bars (C) and the corners of the parallelograms (A) match.





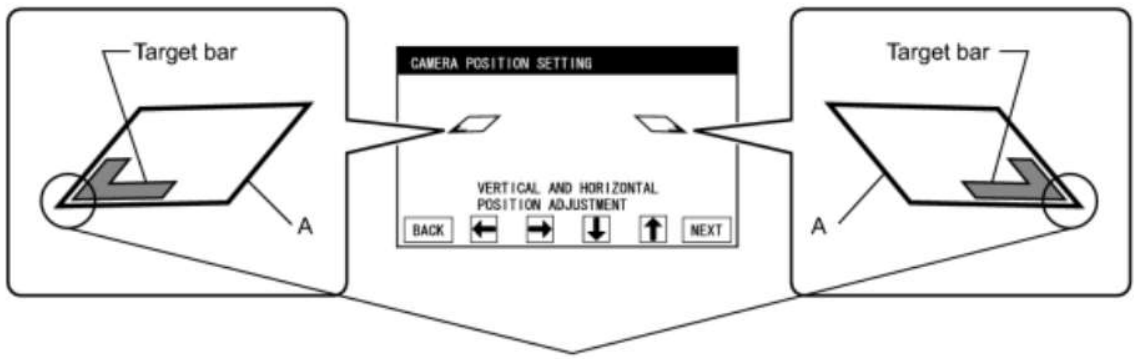
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PARK ASSIST / MONITORING: ADVANCED PARKING GUIDANCE SYSTEM: CALIBRATION (2010 Prius)

NOTICE:

- If the left and right parallelograms (A) and target bars do not match completely, just match the corners of the target bars (C) with the corners of the parallelograms (A).
- If the left and right parallelograms (A) and the corners of the target bars (C) do not match, make the gaps between each parallelogram (A) and the target bars equal on the left and right sides.

When the adjustment position for A and target bar is unmatched:

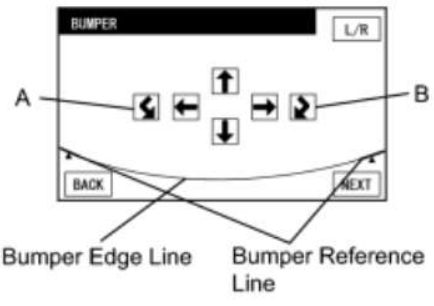


Making the left and right gaps of A and target bar equal

H

(2) Select "NEXT" on the CAMERA POSITION SETTING (VERTICAL AND HORIZONTAL POSITION ADJUSTMENT) screen.

Adjustment for left and right bumpers reference lines:



H

(f) BUMPER (SIMULTANEOUS ADJUSTMENT)

(1) By pressing the left and right, up and down and A and B switches, move the bumper reference lines vertically and horizontally or rotate them so that the bumper reference lines overlap or contact the bumper edge line.

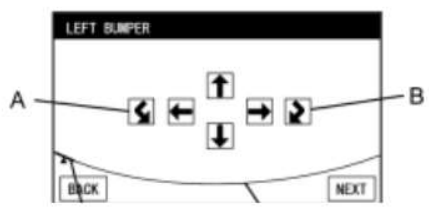
HINT:

If the bumper reference lines do not overlap or contact the bumper edge line, select "L/R" to perform bumper reference line position adjustment (individual adjustment).

(2) When the bumper reference lines and bumper edge line overlap or contact each other, select "NEXT".

(g) LEFT BUMPER

Adjustment for left bumper reference line:

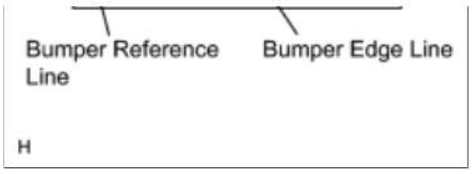


(1) By pressing the left and right, up and down and A and B switches, move the left bumper reference line vertically and horizontally or rotate it so that the bumper reference lines overlap or contact the bumper edge line.

HINT:

When the left bumper reference line overlaps or contacts the bumper

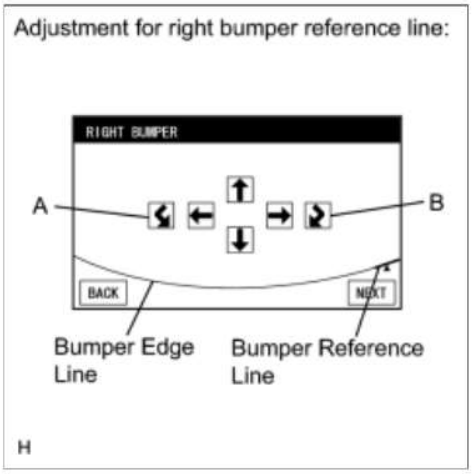
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edge line in the bumper reference line position adjustment (individual adjustment) step, select "NEXT".

(2) Select "NEXT" on the LEFT BUMPER screen.

(h) RIGHT BUMPER



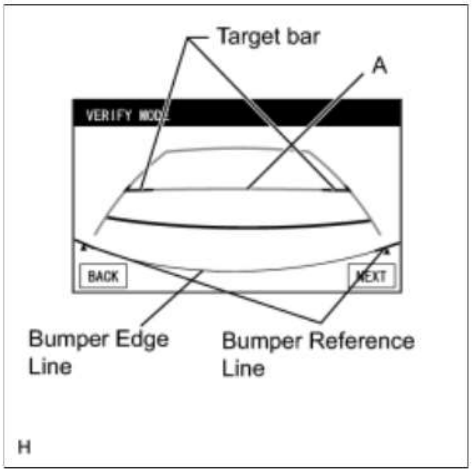
(1) By pressing the left and right, up and down and A and B switches, move the right bumper reference line vertically and horizontally or rotate it so that the bumper reference lines overlap or contact the bumper edge line.

HINT:

When the right bumper reference line overlaps or contacts the bumper edge line in the bumper reference line position adjustment (individual adjustment) step, select "NEXT".

(2) Select "NEXT" on the RIGHT BUMPER screen.

(i) VERIFY MODE



(1) Check that line A (indicating 1100 mm forward from the bumper edge) and the target bars are nearly overlapping and that the bumper reference lines and bumper edge line are nearly overlapping. With the steering wheel centered, check that the predicted path line is straight (overlapping the vehicle width extension lines).

(2) Selecting "NEXT" on the VERIFY MODE screen will be completed the camera aiming adjustment.

HINT:

- When "NEXT" is selected, a beep will sound to confirm that the camera aiming adjustment values have been stored.
- The adjustment value will not be stored unless "NEXT" is selected.
- Until a beep finishes sounding, the adjustment values are not stored.

(j) Finish diagnostic mode.

5. BUMPER POSITION SETTING

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PARK ASSIST / MONITORING: ADVANCED PARKING GUIDANCE SYSTEM: CALIBRATION (2010 Prius)

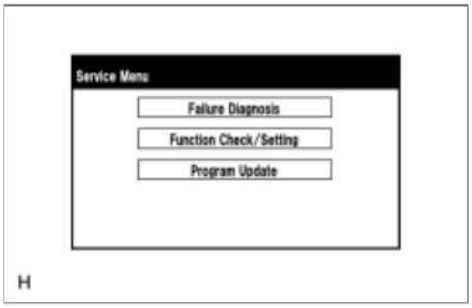
(a) Start diagnostic mode.

NOTICE:

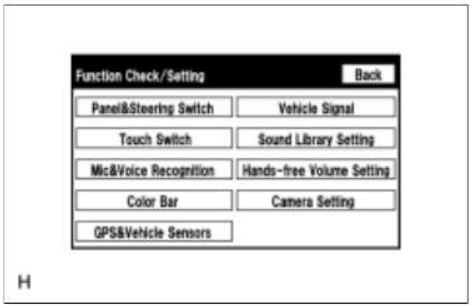
Mode setting must be carried out with the hybrid system started. Apply the parking brake, depress the brake pedal, push the P position switch, and ensure that the vehicle is not moving.

HINT:

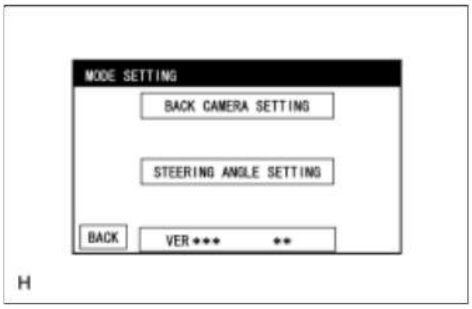
The displayed items may differ depending on vehicle specifications.



(1) Select "Function Check/Setting" on the "Service Menu" screen.



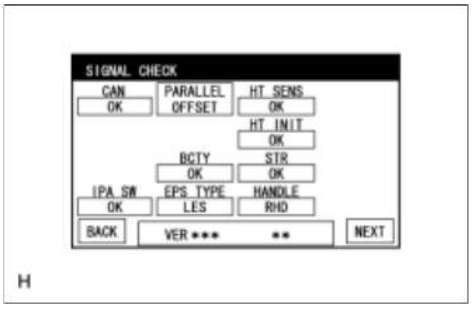
(2) Select "Camera Setting" on the Function Check/Setting screen.



(3) Select "BACK CAMERA SETTING" on the MODE SETTING screen.

HINT:

To select a grayed out item, select and hold the item for 2 seconds or more.



(4) Select "NEXT" on the SIGNAL CHECK screen.

- When "CHK" (red) is displayed for any items except "EPS TYPE" on the SIGNAL CHECK screen, selecting "NEXT" will not change the screen to the INDIVIDUAL SETTING screen.
- When "CHK" (red) is displayed for any items except "EPS TYPE" and "HT INIT" on the SIGNAL CHECK screen, perform inspections using the SIGNAL CHECK screen.

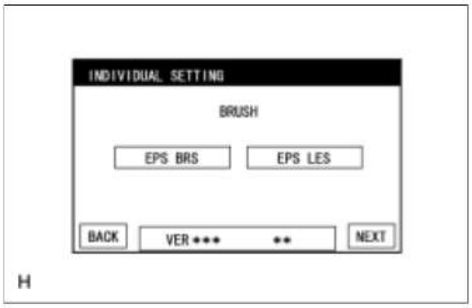
(b) INDIVIDUAL SETTING

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PARK ASSIST / MONITORING: ADVANCED PARKING GUIDANCE SYSTEM: CALIBRATION (2010 Prius)

(1) Confirm the vehicle specification and select the EPS brush specification.

VEHICLE SPECIFICATION	EPS BRUSH SPECIFICATION
for 15 inch tire models	EPS BRS (Brush type)
for 17 inch tire models	EPS LES (Brushless type)

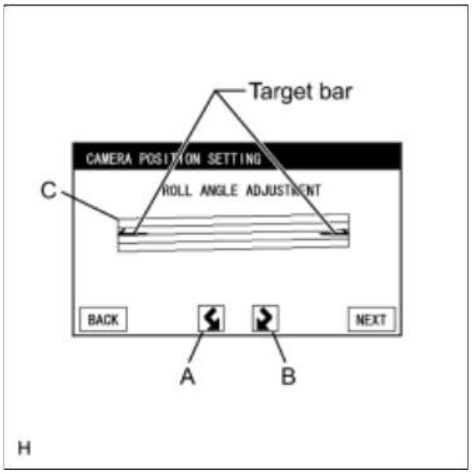


- Selected EPS brush specification is indicated in blue.
- EPS brush refers to the type of motor used for the EPS system (with brushes or brushless).
- If the selected EPS brush specification does not match the vehicle specification, select the one that matches the vehicle specification.
- When the EPS brush specification is modified, steering angle setting is required.

(2) Select "NEXT" on the INDIVIDUAL SETTING screen.

- The INDIVIDUAL SETTING screen will not be displayed when "BACK" is selected after switching to the CAMERA POSITION SETTING (ROLL ANGLE ADJUSTMENT) screen.
- To display the INDIVIDUAL SETTING screen again, go back to the Function Check/Setting screen, select "Camera Setting" and repeat the steps.

(c) CAMERA POSITION SETTING (ROLL ANGLE ADJUSTMENT)

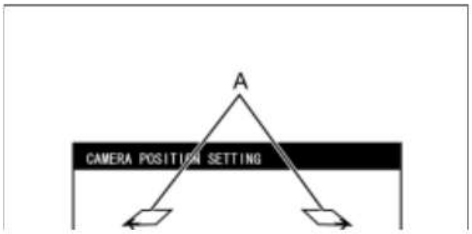


- When only bumper reference line position adjustment is required after servicing the vehicle, CAMERA POSITION SETTING (ROLL ANGLE ADJUSTMENT) is unnecessary. Select "NEXT".
- When the back door is open, the "Back door is open. Do not use the rear view monitor when the back door is not completely closed." message will be displayed and television camera optical axis adjustment will not be possible.
- If the "Back door is open. Do not use the rear view monitor when the back door is not completely closed." message is displayed even when the back door is closed, perform inspections according to Problem Symptoms Table (A back door open warning message is displayed even after back door is closed).

(1) Select switches A and B to rotate C so that it is parallel to the target adjustment bar.

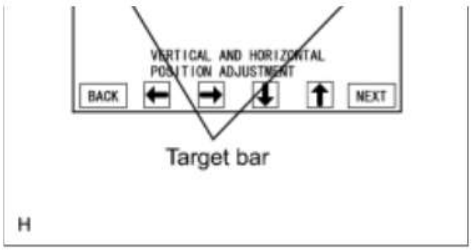
(2) Select "NEXT" on the CAMERA POSITION SETTING (ROLL ANGLE ADJUSTMENT) screen.

(d) CAMERA POSITION SETTING (VERTICAL AND HORIZONTAL POSITION ADJUSTMENT)



(1) By pressing the left and right, and up and down switches, move the parallelograms (A) vertically and horizontally so that the corners of the target bars (C) and the corners of the parallelograms (A) match.

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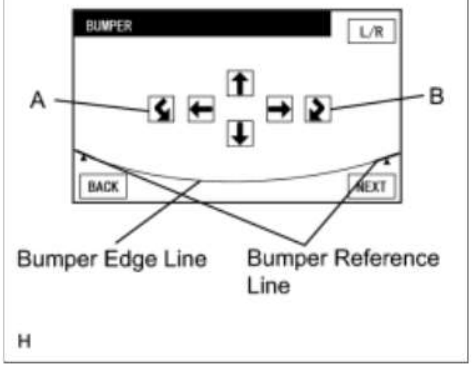


HINT:

When only bumper reference line position adjustment is required after servicing the vehicle, CAMERA POSITION SETTING (ROLL ANGLE ADJUSTMENT) is unnecessary. Select "NEXT".

(2) Select "NEXT" on the CAMERA POSITION SETTING (VERTICAL AND HORIZONTAL POSITION ADJUSTMENT) screen.

Adjustment for left and right bumpers reference lines:



(e) BUMPER (SIMULTANEOUS ADJUSTMENT)

(1) By pressing the left and right, up and down and A and B switches, move the bumper reference lines vertically and horizontally or rotate them so that the bumper reference lines overlap or contact the bumper edge line.

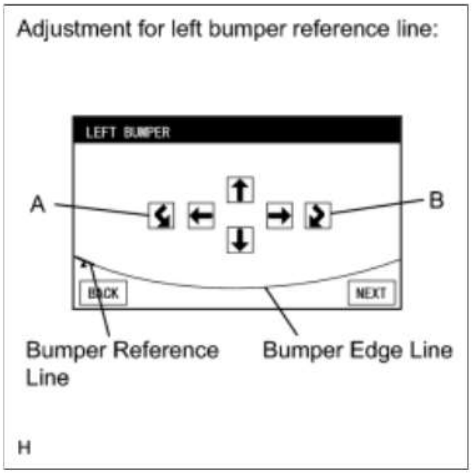
HINT:

If the bumper reference lines do not overlap or contact the bumper edge line, select "L/R" to perform bumper reference line position adjustment (individual adjustment).

(2) When the bumper reference lines and bumper edge line overlap or contact each other, select "NEXT".

(f) LEFT BUMPER

Adjustment for left bumper reference line:



(1) By pressing the left and right, up and down and A and B switches, move the left bumper reference line vertically and horizontally or rotate it so that the bumper reference lines overlap or contact the bumper edge line.

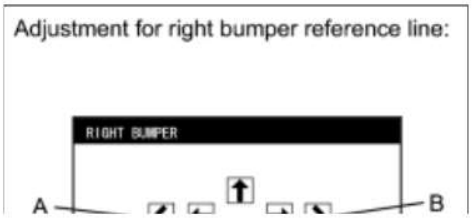
HINT:

When the left bumper reference line overlaps or contacts the bumper edge line in the bumper reference line position adjustment (individual adjustment) step, select "NEXT".

(2) Select "NEXT" on the LEFT BUMPER screen.

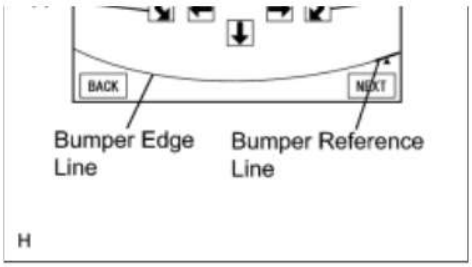
(g) RIGHT BUMPER

Adjustment for right bumper reference line:



(1) By pressing the left and right, up and down and A and B switches, move the right bumper reference line vertically and horizontally or rotate it so that the bumper reference lines overlap or contact the bumper edge line.

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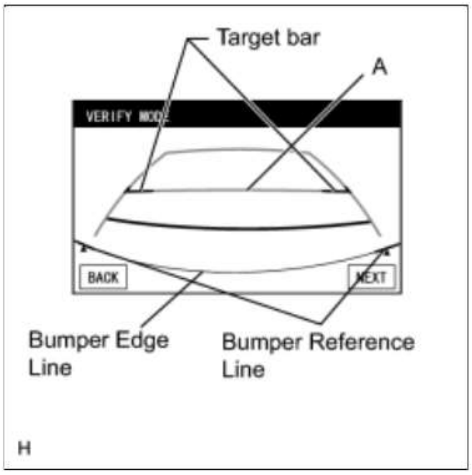


HINT:

When the right bumper reference line overlaps or contacts the bumper edge line in the bumper reference line position adjustment (individual adjustment) step, select "NEXT".

(2) Select "NEXT" on the RIGHT BUMPER screen.

(h) VERIFY MODE



(1) Check that the bumper reference lines and bumper edge line are nearly overlapping.

(2) Selecting "NEXT" on the VERIFY MODE screen will be completed the camera aiming adjustment.

HINT:

- When "NEXT" is selected, a beep will sound to confirm that the bumper position adjustment values have been stored.
- The adjustment value will not be stored unless "NEXT" is selected.
- Until a beep finishes sounding, the adjustment values are not stored.

(i) Finish diagnostic mode.

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PARK ASSIST / MONITORING: ADVANCED PARKING GUIDANCE SYSTEM: PROBLEM SYMPTOMS TABLE (2010 Prius)

PROBLEM SYMPTOMS TABLE

HINT:

- Use the table below to help determine the cause of problem symptoms. If multiple suspected areas are listed, the potential causes of the symptoms the listed in order of probability in the "Suspected Area" column of the table. Check each symptom by checking the suspected areas in the order they are listed. Replace parts as necessary.
- Inspect the fuses and relays related to this system before inspecting the suspected areas below.

NOTICE:

The following inspection procedure of the advanced parking guidance is described on the assumption that the navigation system is normal. If navigation system has any malfunction, first proceed with troubleshooting of the navigation system.

General

SYMPTOM	SUSPECTED AREA	SEE PAGE
When the shift lever is in R, the advanced parking guidance image is not displayed (screen is not black).	Reverse signal circuit (Navigation System)	INFO
	Navigation receiver assembly	INFO
When the shift lever is in R, the advanced parking guidance image is not displayed (screen is black).	Power source circuit	INFO
	Image from camera for advanced parking guidance is abnormal	INFO
	Parking assist ECU	INFO
When the shift lever is not in R, the advanced parking guidance image is displayed.	Reverse signal circuit (Navigation System)	INFO
	Navigation receiver assembly	INFO
	Parking assist ECU	INFO

Display Malfunction

SYMPTOM	SUSPECTED AREA	SEE PAGE
Image from camera for the advanced parking guidance is abnormal.	Image from camera for advanced parking guidance is abnormal	INFO
	Parking assist ECU	INFO

Switch Malfunction

SYMPTOM	SUSPECTED AREA	SEE PAGE
The illumination of the parking assist pre support switch does not illuminate.	Parking assist pre support switch inspection	INFO
	Harness or connector	-
The touch switch on the navigation receiver display does not operate at all.	Touch SW inspection (Navigation System)	INFO
	Navigation receiver assembly	INFO
	Parking assist ECU	INFO

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PARK ASSIST / MONITORING: ADVANCED PARKING GUIDANCE SYSTEM: PROBLEM SYMPTOMS TABLE (2010 Prius)

Pre Support Function Malfunction

SYMPTOM	SUSPECTED AREA	SEE PAGE
Pre support function does not operate.	Pre support function operation condition (System Description)	INFO
	Signal check (Diagnosis System)	INFO
	Parking assist ECU	INFO
When the target parking position is set after pre support operation, the initial display position of the target parking space is very far from the actual parking space.	Pre support function (System Description)	INFO
	Notes for ultrasonic sensor (Precaution)	INFO
	Ultrasonic sensor	INFO
	Front bumper cover	INFO
	Parking assist ECU	INFO
"Check APGS. Have your vehicle checked by a dealer." is displayed on the pre support screen.	Parking assist ECU	INFO
"APGS not available now." is displayed on the pre support screen.	Correct the steering angle neutral point	INFO
"APGS not available now." is displayed on the pre support screen though the steering angle neutral point has been corrected.	Spiral with sensor cable sub-assembly	INFO
	Steering angle setting (Diagnosis System)	INFO
	Parking assist ECU	INFO

Advanced Parking Guidance Function Malfunction

SYMPTOM	SUSPECTED AREA	SEE PAGE
The vehicle width extension line is not overlapping with the predicted path line when the steering wheel is centered.	Check the installation of steering wheel	-
	Steering angle setting (Diagnosis System)	INFO
	Check the installation of rear television camera assembly	INFO
	Height control sensor vehicle height difference setting	INFO
	Rear television camera optical axis adjustment	INFO
	Parking assist ECU	INFO
The predicted path line stops before turning the steering wheel to the lock position.	Steering angle setting (Diagnosis System)	INFO
"Check APGS System. Have your vehicle checked by a dealer." is displayed on the advanced parking guidance screen.	Parking assist ECU	INFO

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PARK ASSIST / MONITORING: ADVANCED PARKING GUIDANCE SYSTEM: PROBLEM SYMPTOMS TABLE (2010 Prius)

Projected course guidelines are not displayed on the advanced parking guidance screen.	Parking assist ECU	INFO
"System initializing." is displayed.	Correct the steering angle neutral point	INFO
"System initializing." is displayed though the steering angle neutral point has been corrected.	Spiral with sensor cable sub-assembly	INFO
	Steering angle setting (Diagnosis System)	INFO
	Parking assist ECU	INFO
"System not ready." is displayed.	Parking assist ECU initialization	INFO
"System not ready." is displayed though the parking assist ECU initialization has been performed.	Parking assist ECU	INFO
The assist operation stops frequently ("System cannot assist under current conditions." is displayed).	Inspect the tire (tire size, tire pressure, tire worn)	-
	Parking assist ECU	INFO
The assist operation stops frequently ("Use on flat surface." is displayed).	Parking assist ECU	INFO
A set parking position and an actual parking position swerve to the right or the left at parallel parking mode.	Parallel parking offset (Diagnosis System)	INFO
A rear bumper edge and a bumper reference line swerve at the advanced parking guidance screen.	Check the installation of the rear television camera assembly	INFO
	Height control sensor vehicle height difference setting	INFO
	Rear television camera optical axis adjustment	INFO
The vehicle does not move to a set parking position.	Vehicle does not move to set parking position	INFO
When the target parking position is set, the initial display position of the target parking space is very far from the actual parking position.	Notes for ultrasonic sensor (Precaution)	INFO
	Ultrasonic sensor	INFO
	Front bumper cover	INFO
	Parking assist ECU	INFO
"CHK" message(s) are displayed on the SIGNAL CHECK screen.	"CHK" message(s) are displayed on the SIGNAL CHECK screen	INFO
A back door open warning message is displayed even after the back door is closed.	"Message indicating back door is open is displayed even after back door is closed"	INFO

Guide Voice Malfunction

SYMPTOM	SUSPECTED AREA	SEE PAGE
A guide voice for the advanced parking guidance system is mute or too small (a voice for navigation system is normal).	Check the DTC (Navigation System)	INFO
	Parking assist ECU	INFO
	Navigation receiver	INFO

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PARK ASSIST / MONITORING: ADVANCED PARKING GUIDANCE SYSTEM: PROBLEM SYMPTOMS TABLE (2010 Prius)

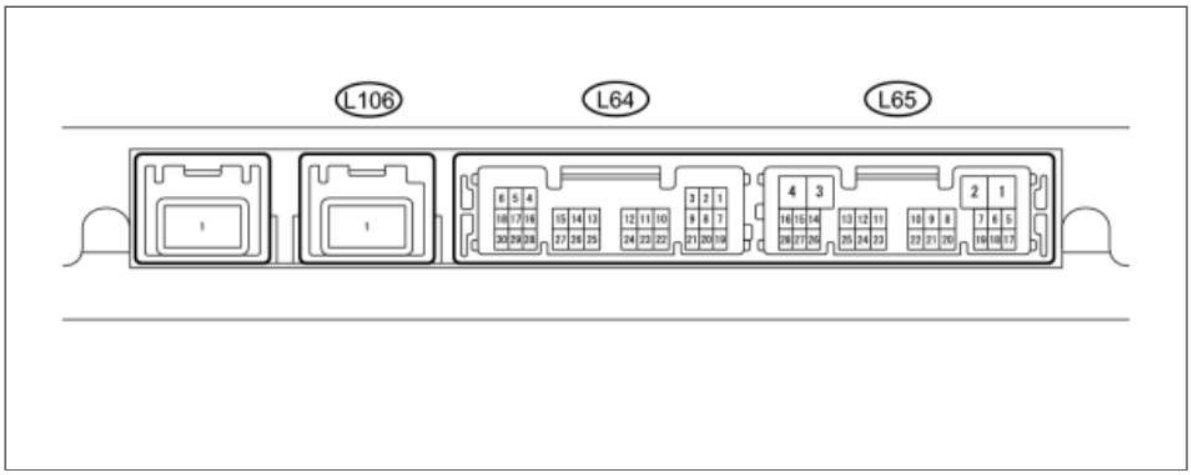
	assembly	

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PARK ASSIST / MONITORING: ADVANCED PARKING GUIDANCE SYSTEM: TERMINALS OF ECU (2010 Prius)

TERMINALS OF ECU

1. PARKING ASSIST ECU



(a) Disconnect the L65 connector from the parking assist ECU.

(b) Measure the voltage and resistance of each terminal of the wire harness side connector.

TERMINAL NO. (SYMBOL)	WIRING COLOR	TERMINAL DESCRIPTION	CONDITION	SPECIFIED CONDITION
L65-1 (+B) - L65-3 (GND1)	SB - W-B	Power source signal	Always	11 to 14 V
L65-3 (GND1) - Body ground	W-B - Body ground	Ground	Always	Below 1 Ω
L65-7 (IG) - L65-3 (GND1)	B - W-B	IG power source signal	Power switch on (IG)	11 to 14 V
L65-8 (ACC) - L65-3 (GND1)	GR - W-B	ACC power source signal	Power switch on (ACC)	11 to 14 V

If the result is not as specified, there may be a malfunction on the wire harness side.

(c) Reconnect the L65 connector to the ECU.

(d) Measure the voltage and resistance, and check for pulses according to the value(s) in the table below.

TERMINAL NO. (SYMBOL)	WIRING COLOR	TERMINAL DESCRIPTION	CONDITION	SPECIFIED CONDITION
L64-11 (CV-) - L65-3 (GND1)	B - W-B	Rear television camera ground	Always	Below 1 V
L64-12 (CV+) - L65-3 (GND1)	R - W-B	Rear television camera display signal (NTSC) input	Power switch on (IG) Shift lever in R Under normal conditions	Pulse generation (See waveform 1)
			Power switch on (IG) Shift lever in R Camera lens is covered, blacking out screen	Pulse generation (See waveform 2)
L64-13 (CGND) - L65-3 (GND1)	Shield - W-B	Rear television camera ground (shield)	Always	Below 1 V
L64-14 (CB+) -	W - W-B	Power source to rear television	Power switch on (IG)	5.2 to 7.0 V

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PARK ASSIST / MONITORING: ADVANCED PARKING GUIDANCE SYSTEM: TERMINALS OF ECU (2010 Prius)

L65-3 (GND1)	W - W-B	camera	Shift lever in R	5.8 to 7.0 V
L64-19 (CSB3) - L65-3 (GND1)	G - W-B	Power source to ultrasonic sensor	Power switch on (IG)	7 to 9 V
L64-20 (CSG3) - L65-3 (GND1)	R - W-B	Ultrasonic sensor ground	Always	Below 1 Ω
L64-21 (LIN3)	GR	Ultrasonic sensor signal input and output	-	-
L65-11 (ISSW) - L65-3 (GND1)	L - W-B	Parking assist pre support signal input	Power switch on (IG) Parking assist pre support switch pushed in	Below 1 V
			Power switch on (IG) Parking assist pre support switch not pushed	4.75 to 5.25 V
L65-21 (CANL) - L65-3 (GND1)	BR - W-B	CAN communication signal	CAN communication circuit	Pulse generation
L65-22 (CANH) - L65-3 (GND1)	Y - W-B	CAN communication signal	CAN communication circuit	Pulse generation
L65-24 (TX-) - L65-25 (TX+)	P - LG	AVC-LAN communication signal	-	-

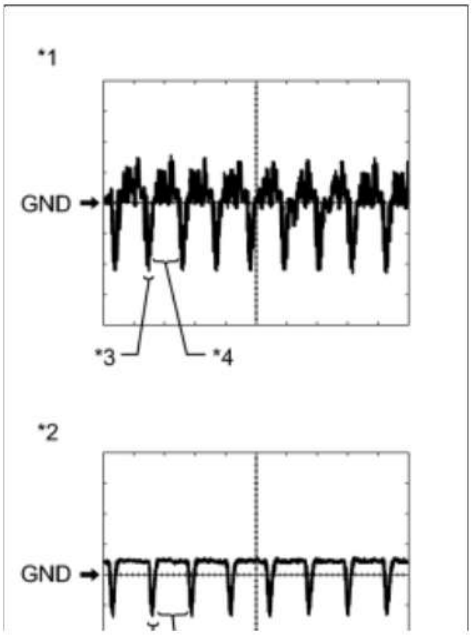
If the result is not as specified, the ECU may have a malfunction.

(e) Reference (Oscilloscope waveform):

HINT:

A waterproof connector is used for the rear television camera assembly. Therefore, inspect the waveform at the parking assist ECU with the connector connected.

(1) Waveform 1 (under normal conditions)



ITEM	CONTENT
Terminal No. (Symbol)	L64-12 (CV+) - L65-3 (GND1)
Tool Setting	200 mV/DIV., 50 µsec./DIV.
Condition	Power switch on (IG), shift lever in R

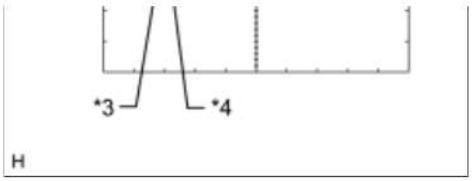
HINT:

The video waveform changes according to the image sent by the rear television camera assembly.

(2) Waveform 2 (camera lens is covered, blacking out the screen)

ITEM	CONTENT
Terminal No. (Symbol)	L64-12 (CV+) - L65-3 (GND1)
Tool Setting	200 mV/DIV., 50 µsec./DIV.
Condition	Power switch on (IG), shift lever in R

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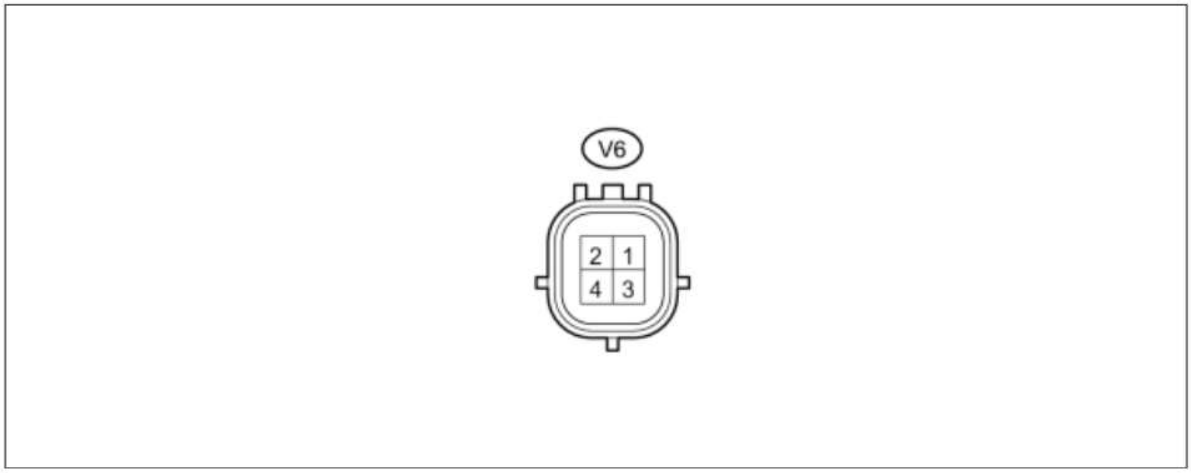
HINT:

The video waveform changes according to the image sent by the rear television camera assembly.

Text in Illustration

*1	Waveform 1 (under normal conditions)
*2	Waveform 2 (camera lens is covered, blacking out the screen)
*3	Synchronized Signal
*4	Video Waveform

2. REAR TELEVISION CAMERA ASSEMBLY



(a) Disconnect the V6 connector from the rear television camera assembly.

(b) Measure the voltage of each terminal of the wire harness side connector.

TERMINAL NO. (SYMBOL)	WIRING COLOR	TERMINAL DESCRIPTION	CONDITION	SPECIFIED CONDITION
V6-3 (CGND) - Body ground	W-B - Body ground	Ground	Always	Below 1 V
V6-4 (CB+) - V6-3 (CGND)	W - W-B	Power source	Power switch on (IG) Shift lever in R	5.8 to 7.0 V

If the result is not as specified, there may be a malfunction on the wire harness side.

(c) Reconnect the V6 connector to the rear television camera assembly.

(d) Check for pulses according to the value(s) in the table below.

TERMINAL NO. (SYMBOL)	WIRING COLOR	TERMINAL DESCRIPTION	CONDITION	SPECIFIED CONDITION
			Power switch on (IG)	Pulse generation

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V6-2 (CV+) - V6-1 (CV-)	R - B	Display signal	Shift lever in R Under normal conditions	(See waveform 1)
			Power switch on (IG) Shift lever in R Camera lens covered, blacking out screen	Pulse generation (See waveform 2)

HINT:

A waterproof connector is used for the rear television camera assembly. Therefore, inspect the waveform at the parking assist ECU with the connector connected.

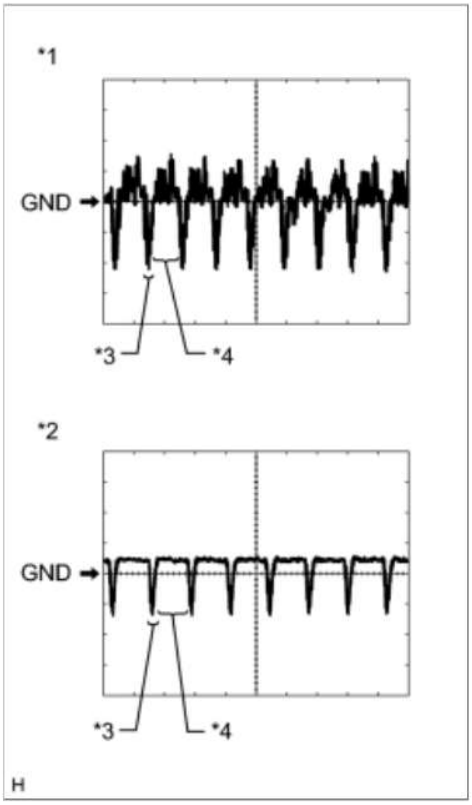
If the result is not as specified, the camera may have a malfunction.

(e) Reference (Oscilloscope waveform):

HINT:

A waterproof connector is used for the rear television camera assembly. Therefore, inspect the waveform at the parking assist ECU with the connector connected.

(1) Waveform 1 (under normal conditions)



ITEM	CONTENT
Terminal No. (Symbol)	V6-2 (CV+) - V6-1 (CV-)
Tool Setting	200 mV/DIV., 50 µsec./DIV.
Condition	Power switch on (IG), shift lever in R

HINT:

The video waveform changes according to the image sent by the rear television camera assembly.

(2) Waveform 2 (camera lens is covered, blacking out the screen)

ITEM	CONTENT
Terminal No. (Symbol)	V6-2 (CV+) - V6-1 (CV-)
Tool Setting	200 mV/DIV., 50 µsec./DIV.
Condition	Power switch on (IG), shift lever in R

HINT:

The video waveform changes according to the image sent by the rear television camera assembly.

Text in Illustration

*1	Waveform 1 (under normal conditions)
*2	Waveform 2 (camera lens is covered, blacking out the screen)

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*3	Synchronized Signal
*4	Video Waveform

3. NAVIGATION RECEIVER ASSEMBLY INFO

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PARK ASSIST / MONITORING: ADVANCED PARKING GUIDANCE SYSTEM: DIAGNOSIS SYSTEM (2010 Prius)

DIAGNOSIS SYSTEM

1. ADVANCED PARKING GUIDANCE OR DIAGNOSIS SYSTEM

(a) For advanced parking guidance system diagnosis, signals received by the parking assist ECU can be checked and the advanced parking guidance system can be calibrated, adjusted and checked using the navigation receiver assembly.

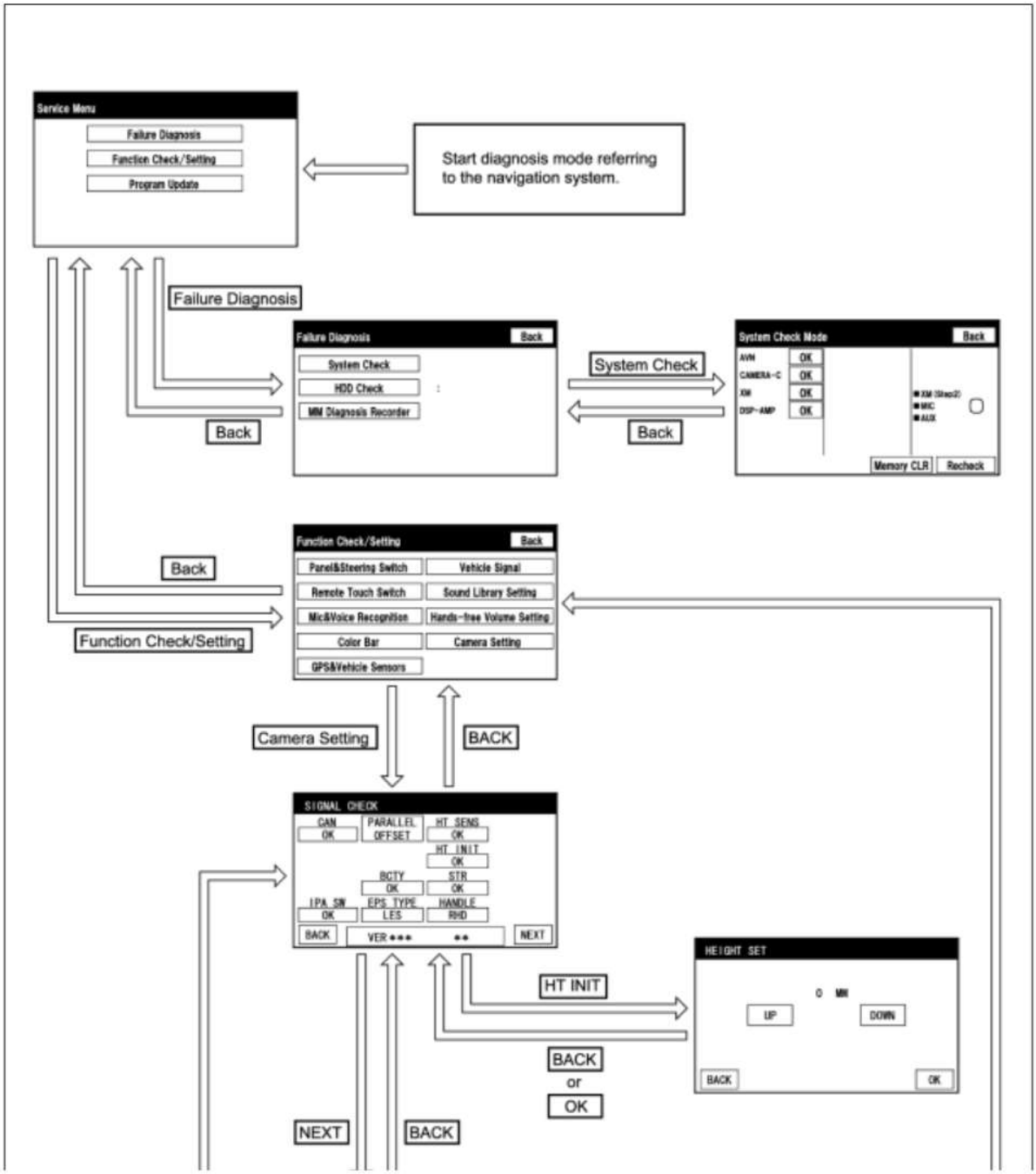
NOTICE:

Depending on the parts that are replaced or operations that are performed during vehicle inspection or maintenance, calibration of other systems as well as the advanced parking guidance system may be needed INFO **.**

HINT:

The displayed screens and items may differ depending on vehicle specifications.

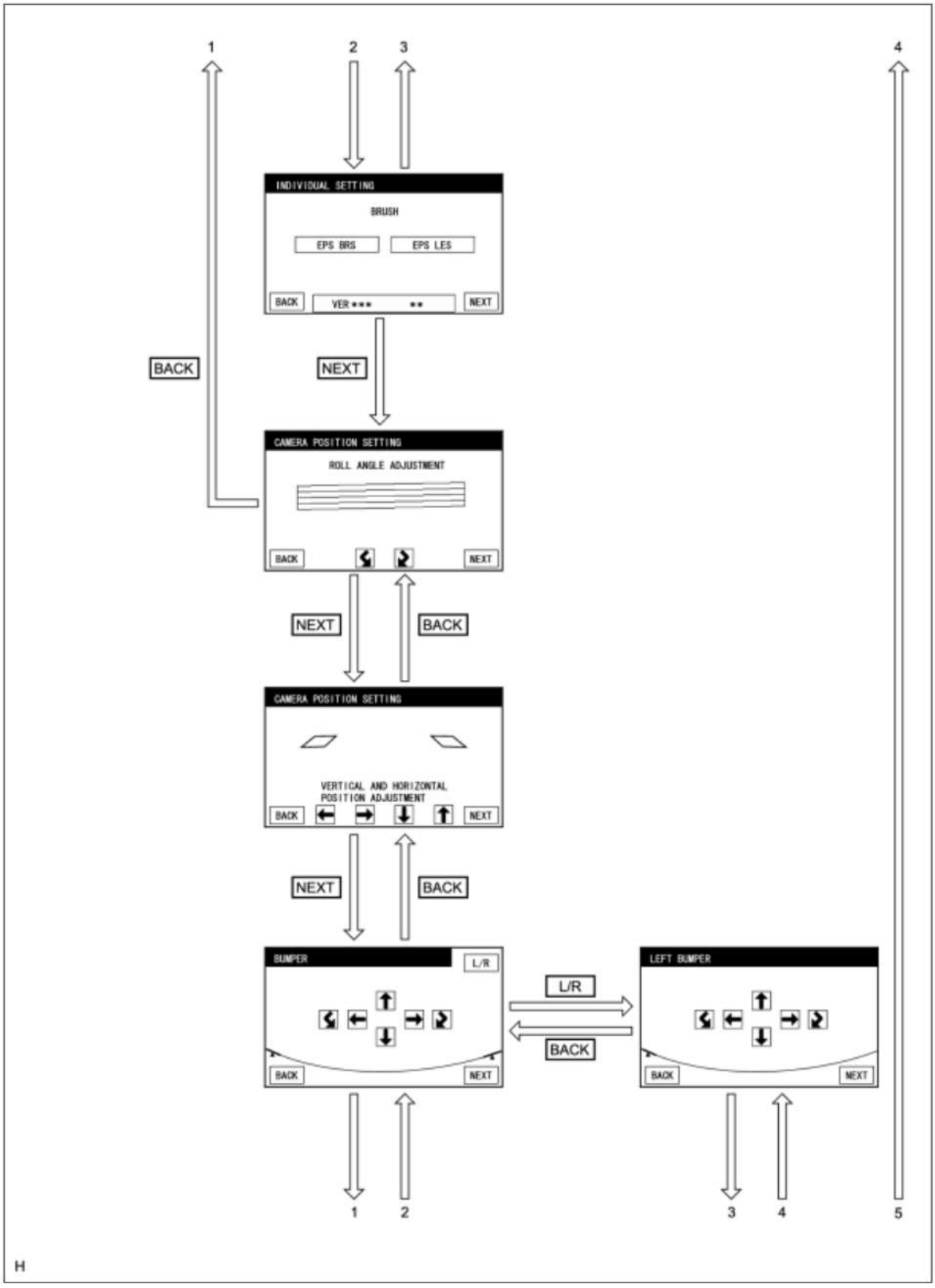
2. DIAGNOSIS SCREEN TRANSITION (during parking assist ECU initialization)



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PARK ASSIST / MONITORING: ADVANCED PARKING GUIDANCE SYSTEM: DIAGNOSIS SYSTEM (2010 Prius)

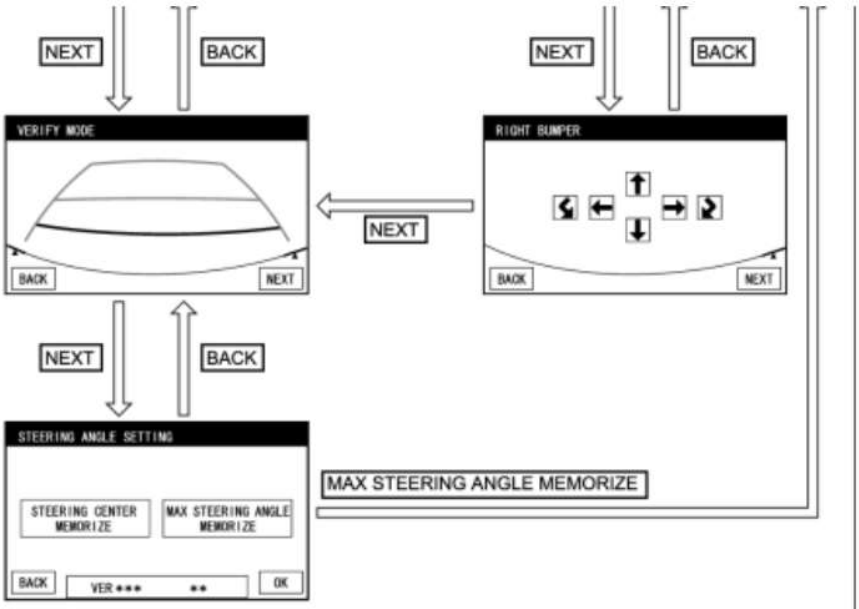






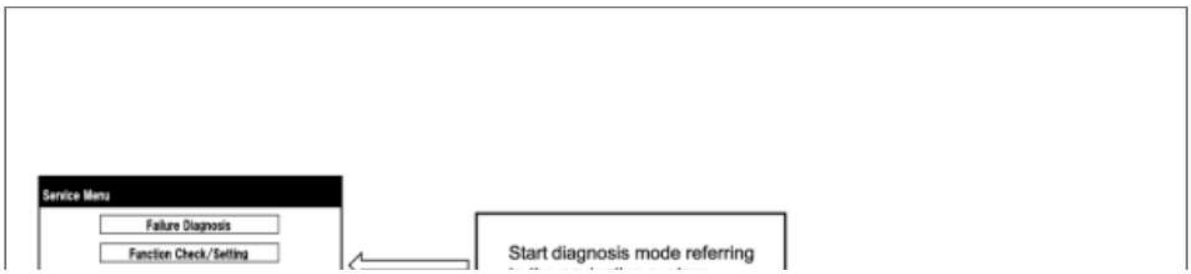
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PARK ASSIST / MONITORING: ADVANCED PARKING GUIDANCE SYSTEM: DIAGNOSIS SYSTEM (2010 Prius)



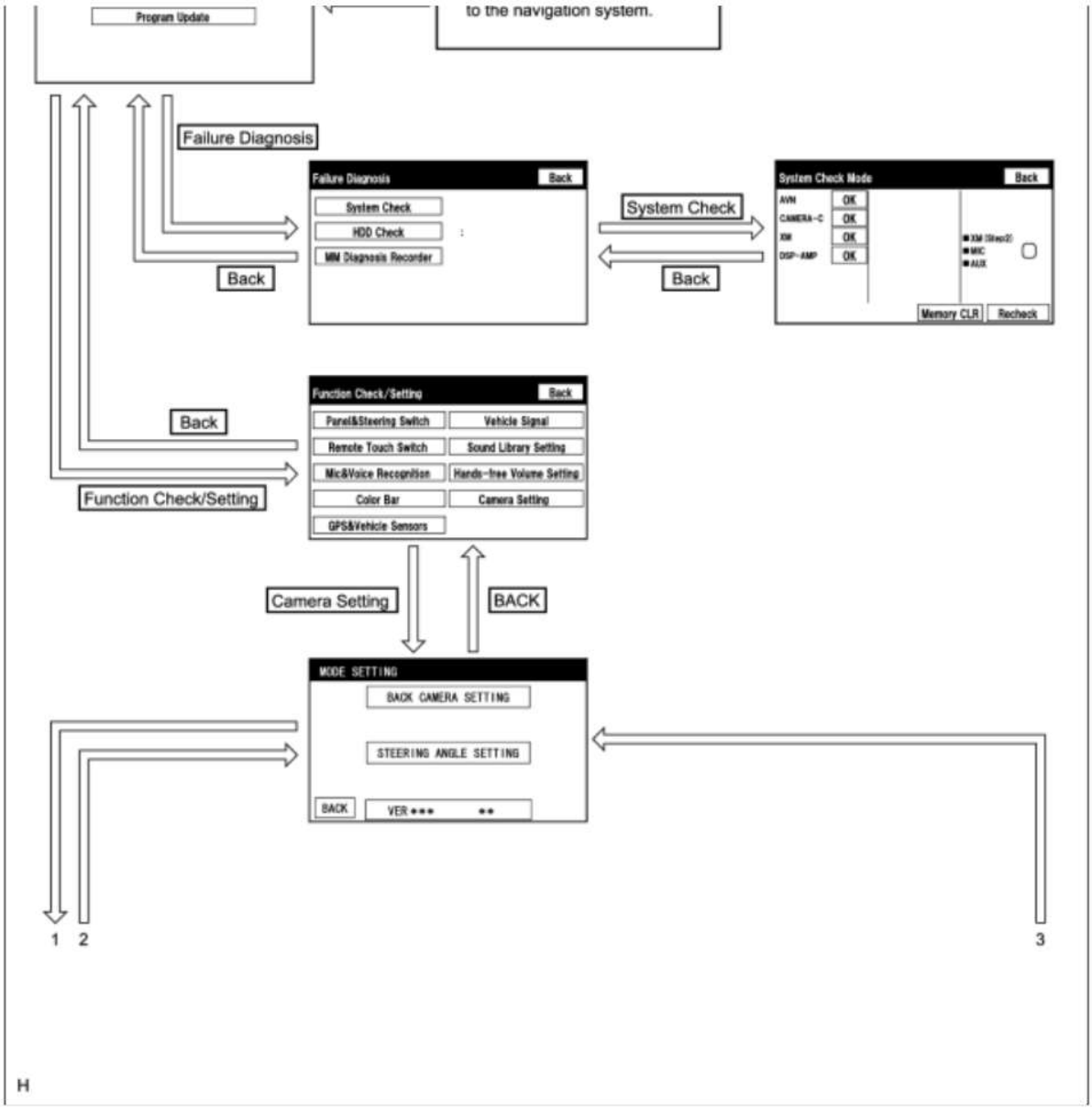
H

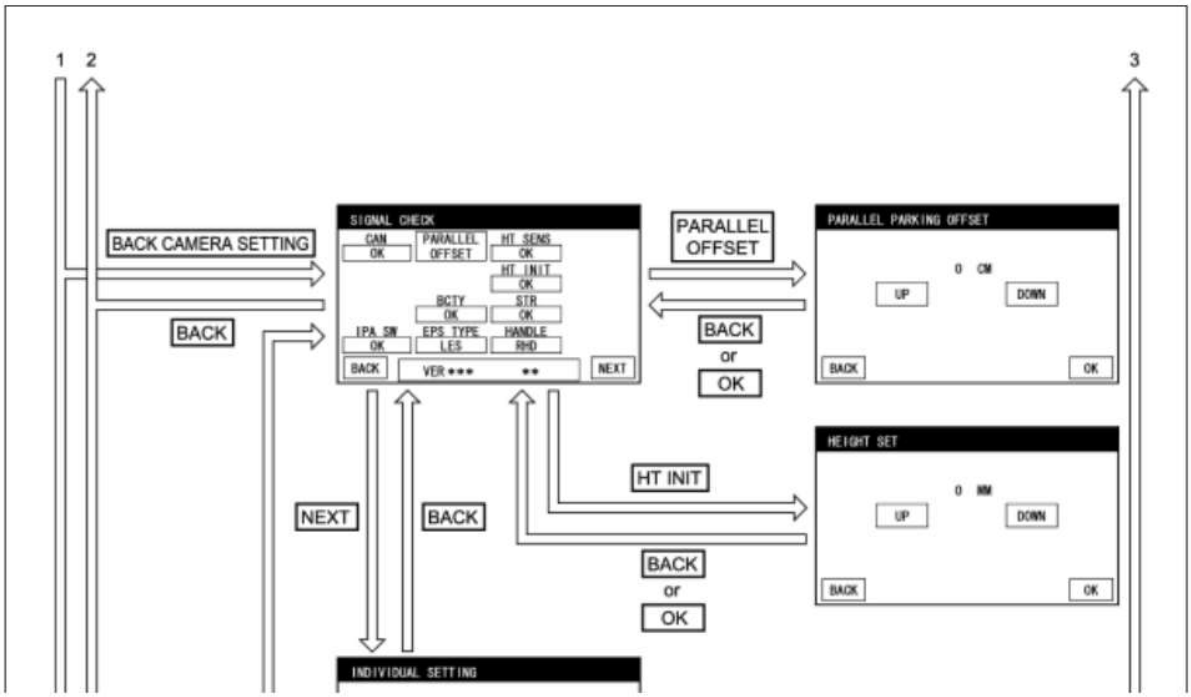
3. DIAGNOSIS SCREEN TRANSITION (after parking assist ECU initialization)



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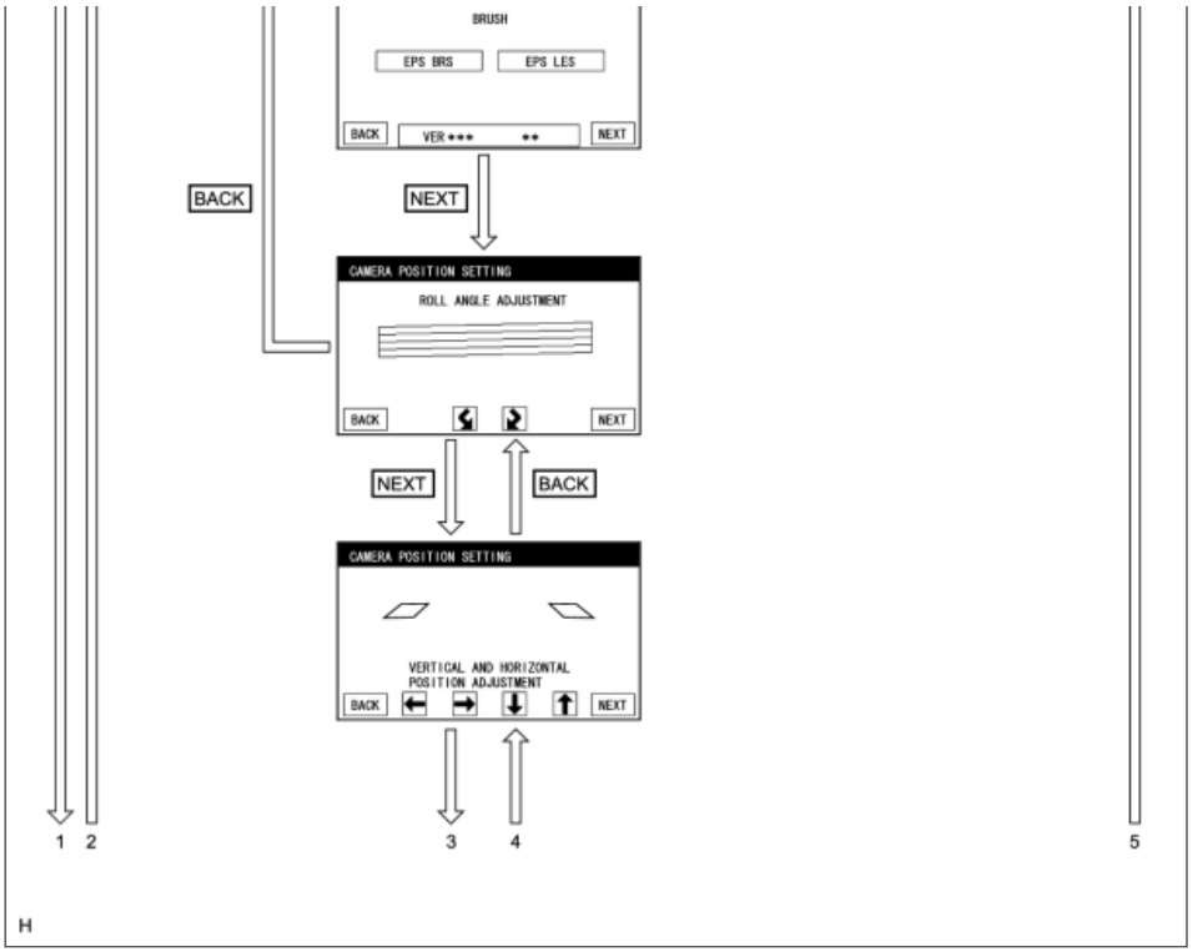
PARK ASSIST / MONITORING: ADVANCED PARKING GUIDANCE SYSTEM: DIAGNOSIS SYSTEM (2010 Prius)

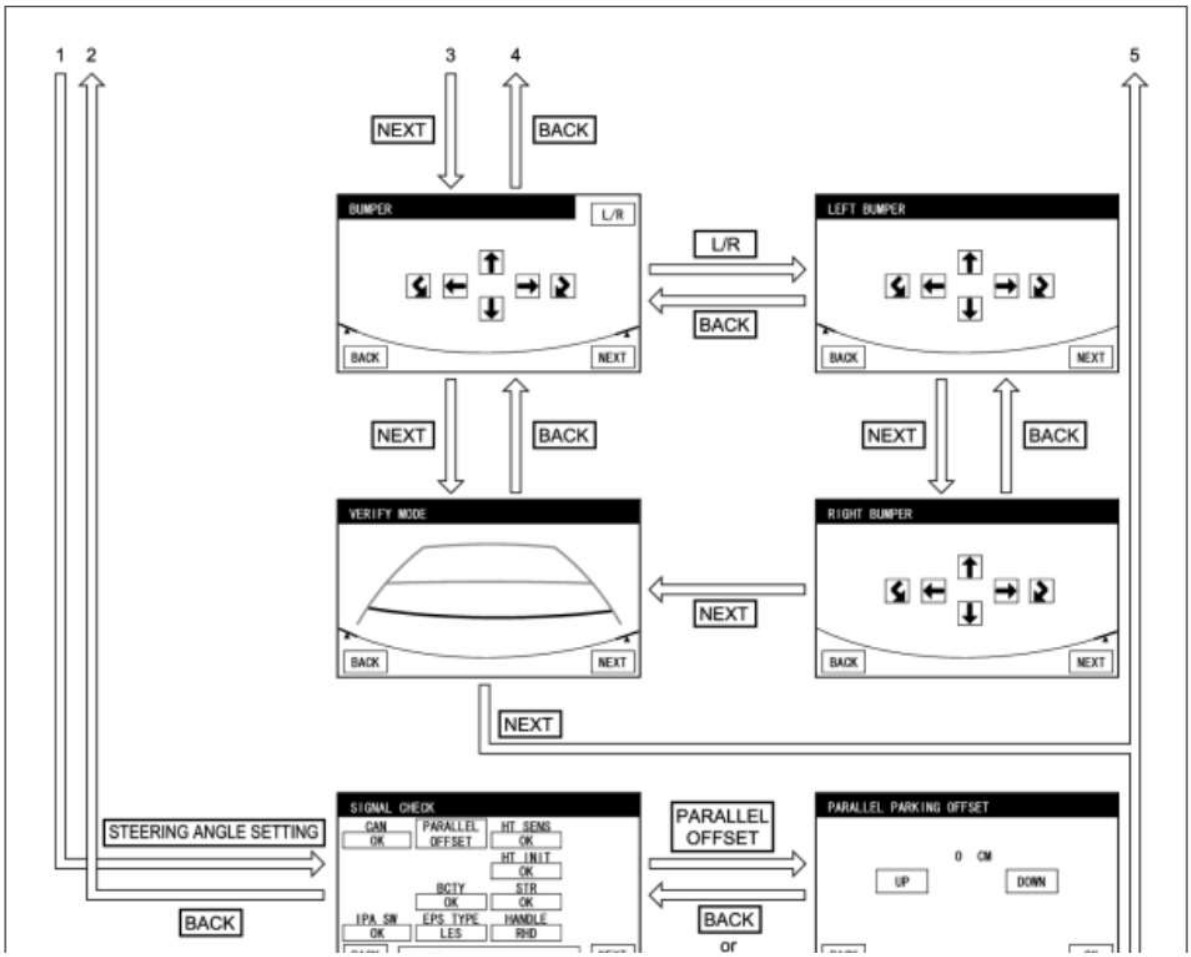




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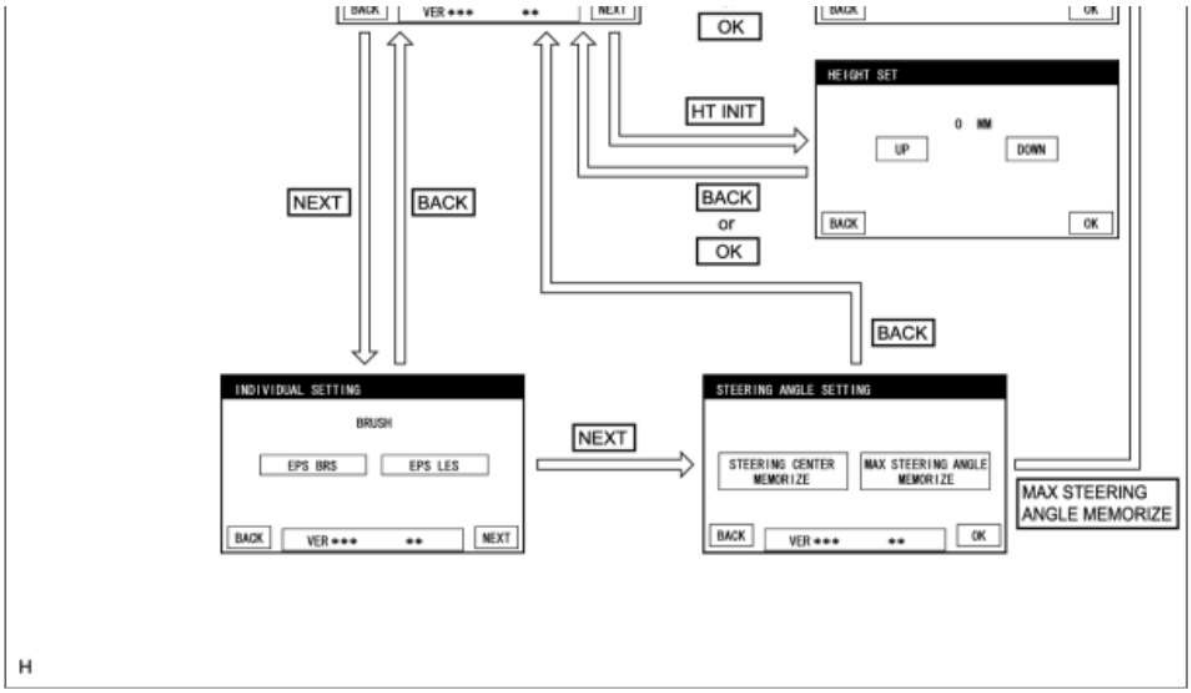
PARK ASSIST / MONITORING: ADVANCED PARKING GUIDANCE SYSTEM: DIAGNOSIS SYSTEM (2010 Prius)





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PARK ASSIST / MONITORING: ADVANCED PARKING GUIDANCE SYSTEM: DIAGNOSIS SYSTEM (2010 Prius)



4. DIAGNOSTIC MODE

(a) Start diagnostic mode INFO .

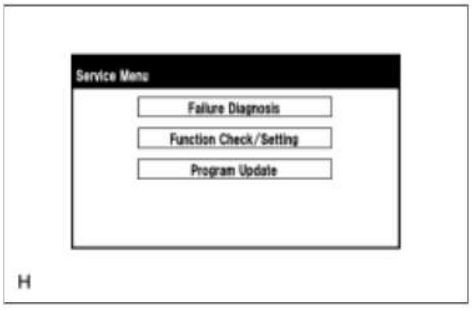
(b) Failure diagnosis.

(c) System check (check using system check mode screen).

(d) Finish diagnostic mode.

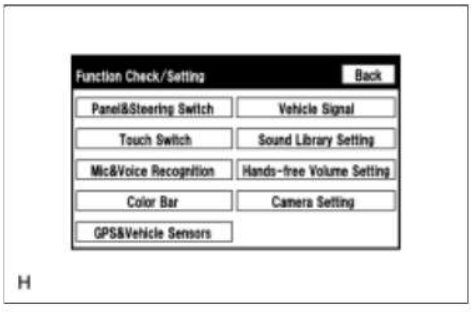
5. SIGNAL CHECK (parking assist ECU input signal)

(a) Start diagnostic mode INFO .



(1) Select "Function Check/Setting" on the Service Menu screen to display the Function Check/Setting screen.

(2) Select "Camera Setting" on the Function Check/Setting screen.



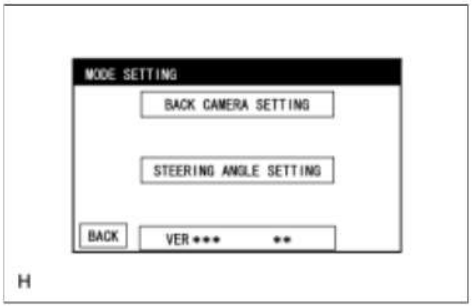
HINT:

After "Camera Setting" is selected, the screen transitions differ depending on whether initialization of the parking assist ECU was performed after parking assist ECU replacement.

PARKING ASSIST ECU INITIALIZATION	SCREEN TRANSITION
Not performed	SIGNAL CHECK screen
Performed	MODE SETTING screen

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PARK ASSIST / MONITORING: ADVANCED PARKING GUIDANCE SYSTEM: DIAGNOSIS SYSTEM (2010 Prius)



(3) When the screen changes to the MODE SETTING screen, select "BACK CAMERA SETTING" to display the SIGNAL CHECK screen.

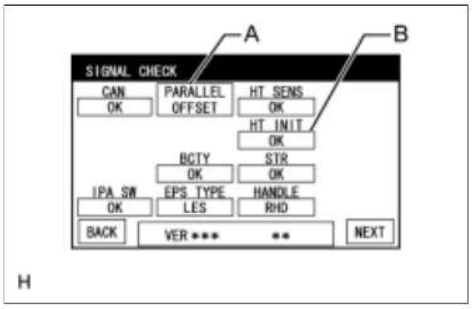
HINT:

To select a grayed out item, select and hold the item for 2 seconds or more.

(b) SIGNAL CHECK

(1) On the SIGNAL CHECK screen, the following contents are possible:

- Inspect the state of signals sent to the parking assist ECU.
- Confirm the state of the height control sensor vehicle height difference setting.
- Adjust the parking position for parallel parking mode.



ITEM	INSPECTION DETAIL	NOTE
CAN	CAN communication status	When "CHK" (red) is displayed, selecting "NEXT" will not change to the next screen.
IPA SW	Parking assist pre support switch signal input	
BCTY	CAN communication condition with main body ECU (multiplex network body ECU)	
EPS TYPE	Brush information for EPS currently selected	-
HT SENS	Height control sensor signal input	When "CHK" (red) is displayed, selecting "NEXT" will not change to the next screen.
HT INIT	Vehicle height difference setting status	
STR	Steering angle sensor signal input	
HANDLE	Steering position signal input	

- When "CHK" (red) is displayed, perform inspections based on the result of the following inspections.
- If performing the adjustment after proceeding to the next screen, confirm that all items display "OK" (blue) before selecting "NEXT".
- Select the following buttons changes to each adjustment screen.

BUTTON	TRANSIT SCREEN	ADJUSTMENT CONTENTS
A	PARALLEL PARKING OFF SET	Parking position for parallel parking mode
B	HEIGHT SET	Height control sensor vehicle height difference setting INFO

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(c) CAN inspection

HINT:

If "CHK" (red) is displayed for "CAN", check for DTCs and perform troubleshooting based on the output DTCs INFO .

(d) IPA SW inspection

(1) Check that "OK" (blue) is displayed for "IPA SW" and select "OK".

(2) Check that "OK" (blue) changes to "CHK" (red). Press the parking assist pre support switch and check that "CHK" (red) returns to "OK" (blue).

HINT:

If "CHK" (red) remains displayed or the "IPA SW" inspection result is not normal, perform troubleshooting according to Problem Symptoms Table ("CHK" message(s) are displayed on the SIGNAL CHECK screen) INFO .

(e) BCTY inspection

HINT:

If "CHK" (red) is displayed for "BCTY", check for DTCs and perform troubleshooting based on the output DTCs INFO .

(f) EPS TYPE inspection

(1) Confirm the vehicle specification and check that the EPS brush information shown under "EPS TYPE" matches the vehicle specification.

VEHICLE SPECIFICATION	EPS BRUSH SPECIFICATION
for 15 inch tire models	EPS BRS (Brush type)
for 17 inch tire models	EPS LES (Brushless type)

NOTICE:

- If the EPS brush information shown under "EPS TYPE" does not match the vehicle specification, change the EPS brush specification to one that matches the vehicle specification.
- The EPS brush specification can be changed on the INDIVIDUAL SETTING screen which is displayed after "NEXT" is selected.
- When the EPS brush specification is modified, steering angle setting is required INFO .

(g) HT SENS inspection

HINT:

If "CHK" (red) is displayed for "HT SENS", check for DTCs and perform troubleshooting based on the output DTCs INFO .

(h) HT INIT inspection

HINT:

If "CHK" (red) is displayed for "HT INIT", perform troubleshooting according to the table below.

DISPLAYED	CAUSE	TROUBLESHOOTING

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CONTENT		
CHK (red)	• Vehicle height difference setting is not completed • Rear height control sensor sub-assembly RH is malfunctioning	• If "CHK" (red) is also displayed for "HT SENS", check for DTCs and perform troubleshooting based on the output DTCs INFO . • If "OK" (blue) is displayed for "HT SENS", perform vehicle height difference setting INFO .

(i) STR inspection

HINT:

If "CHK" (red) is displayed for "STR", check for DTCs and perform troubleshooting based on the output DTCs INFO .

(j) HANDLE inspection

HINT:

If "CHK" (red) is displayed for "HANDLE", check for DTCs and perform troubleshooting based on the output DTCs INFO .

(k) Finish diagnostic mode INFO .

6. CALIBRATION WHEN SERVICING VEHICLE

NOTICE:

Depending on the parts that are replaced or operations that are performed during vehicle inspection or maintenance, calibration of other systems as well as the advanced parking guidance system may be needed INFO .

7. STEERING ANGLE SETTING (after parking assist ECU is initialized)

HINT:

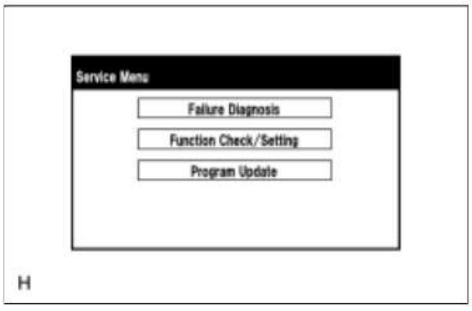
If the vehicle width extension lines and predicted path lines are not aligned when the steering wheel is centered, or if the predicted path line does not move before the steering wheel is fully turned to either the left or right, adjust the steering angle settings.

(a) Center the steering wheel and stop the vehicle.

(b) Start diagnostic mode.

NOTICE:

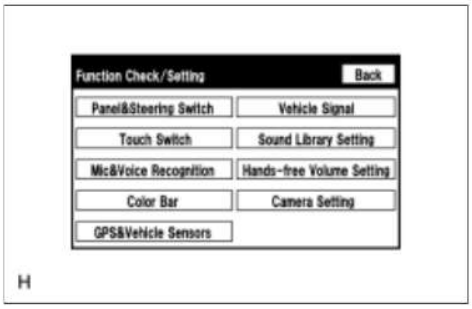
Steering angle setting must be carried out with the hybrid system started. Apply the parking brake, depress the brake pedal, push the P position switch, and ensure that the vehicle is not moving.



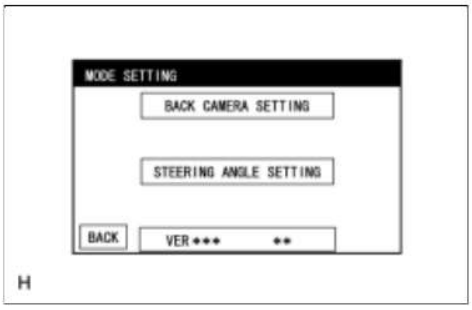
(1) Select "Function Check/Setting" on the Service Menu screen.

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PARK ASSIST / MONITORING: ADVANCED PARKING GUIDANCE SYSTEM: DIAGNOSIS SYSTEM (2010 Prius)



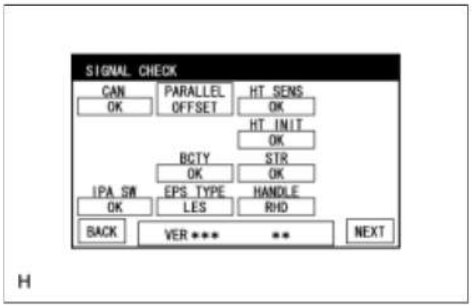
(2) Select "Camera Setting" on the Function Check/Setting screen.



(3) Select "STEERING ANGLE SETTING" on the MODE SETTING screen.

HINT:

To select a grayed out item, select and hold the item for 2 seconds or more.



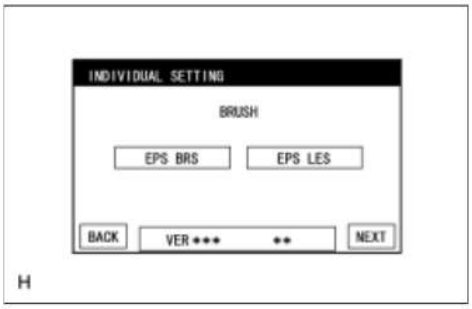
(4) Select "NEXT" on the SIGNAL CHECK screen.

- When "CHK" (red) is displayed for any items on the SIGNAL CHECK screen, selecting "NEXT" will not change the screen to the STEERING ANGLE SETTING screen.
- When "CHK" is displayed for any items on the SIGNAL CHECK screen, perform inspections using the SIGNAL CHECK screen.

(c) Individual setting

(1) Confirm the vehicle specification and select the EPS brush specification.

VEHICLE SPECIFICATION	EPS BRUSH SPECIFICATION
for 15 inch tire models	EPS BRS (Brush type)
for 17 inch tire models	EPS LES (Brushless type)



- Selected EPS brush specification is indicated in blue.
- EPS brush refers to the type of motor used for the EPS system (with brushes or brushless).

NOTICE:

If the selected EPS brush specification does not match the vehicle specification, select the one that matches the vehicle specification.

(2) Select "NEXT" on the INDIVIDUAL SETTING screen.

- The INDIVIDUAL SETTING screen will not be displayed when "BACK" is selected after switching to the STEERING ANGLE SETTING screen.
- To display the INDIVIDUAL SETTING screen again, go back to the Function Check/Setting screen, select "Camera Setting" and repeat the

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steps.

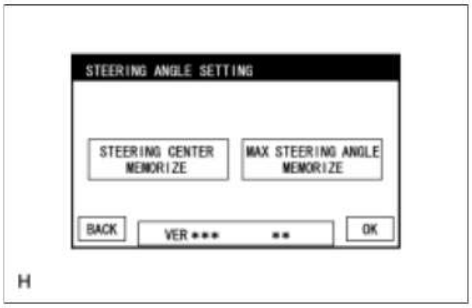
(d) Steering angle setting

(1) Check that the steering wheel is centered (approximately +/- 5 degrees or less) and select "STEERING CENTER MEMORIZE".

(2) After the centered steering position is memorized, turn the steering wheel to the left and then to the right full lock positions and select "MAX STEERING ANGLE MEMORIZE".

HINT:

It is also possible to start by initially turning the steering wheel to the right side.



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(3) Select "MAX STEERING ANGLE MEMORIZE" to store the steering angle adjustment value and change the screen to the MODE SETTING screen.

- When "MAX STEERING ANGLE MEMORIZE" is selected, a beep will sound to confirm that the steering angle adjustment values have been stored.
- The adjustment values will not be stored unless "MAX STEERING ANGLE MEMORIZE" is selected.
- Until a beep finishes sounding, the adjustment values are not stored.
- When "BACK" is selected, the screen changes to SIGNAL CHECK without storing the set values.
- Even if "OK" is selected, the adjustment values will not be stored.
- If the steering angle settings have not been adjusted, selecting "MAX STEERING ANGLE MEMORIZE" will not cause the adjustment values to be stored.
- Even if no DTCs are detected, selecting "MAX STEERING ANGLE MEMORIZE" may not cause the adjustment value to be stored if the steering sensor is malfunctioning.
- If selecting "MAX STEERING ANGLE MEMORIZE" does not cause the adjustment value to be stored after adjusting the steering angle, replace the spiral with sensor cable sub-assembly INFO .

(e) Finish diagnostic mode.

(f) Confirm steering angle adjustment.

HINT:

If the steering angle has been adjusted, confirm the steering angle adjustment on the advanced parking guidance screen after finishing diagnosis mode.

(1) Check on the advanced parking guidance screen that the predicted path line moves until the steering wheel is fully turned to either the left or right.

HINT:

If the predicted path line stops moving before the steering wheel is fully turned to either the left or right, the steering angle adjustment values have not been stored correctly. In this case, perform "STEERING CENTER MEMORIZE" and "MAX STEERING ANGLE MEMORIZE" again.

8. PARKING POSITION HORIZONTAL ADJUSTMENT FOR PARALLEL PARKING MODE

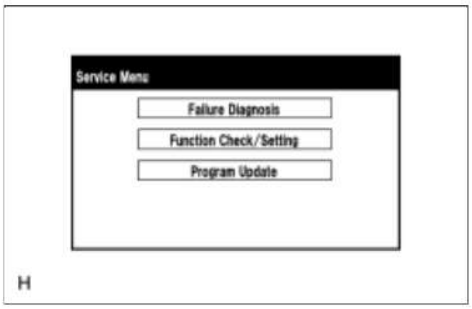
(a) Start diagnostic mode.

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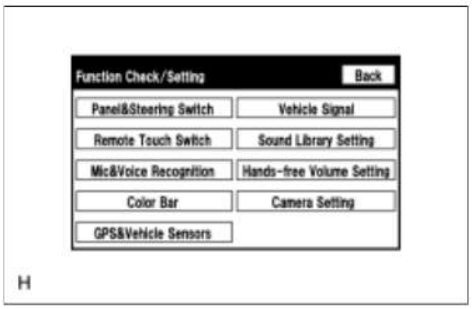
PARK ASSIST / MONITORING: ADVANCED PARKING GUIDANCE SYSTEM: DIAGNOSIS SYSTEM (2010 Prius)

NOTICE:

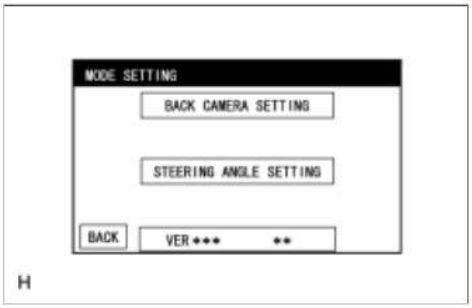
Parallel parking offset must be carried out with the hybrid system started. Apply the parking brake, depress the brake pedal, push the P position switch, and ensure that the vehicle is not moving.



(1) Select "Function Check/Setting" on the Service Menu screen.



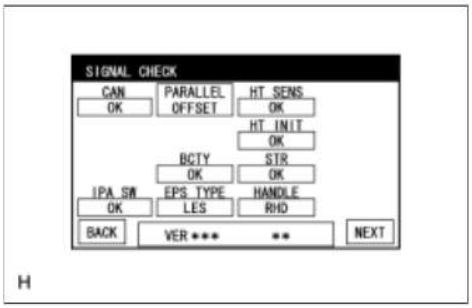
(2) Select "Camera Setting" on the Function Check/Setting screen.



(3) Select "BACK CAMERA SETTING" or "STEERING ANGLE SETTING" on the MODE SETTING screen.

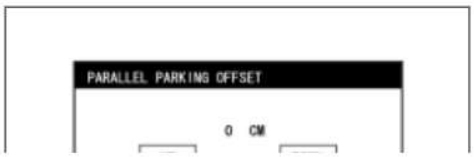
HINT:

To select a grayed out item, select and hold the item for 2 seconds or more.



(4) Select "PARALLEL OFFSET" on the SIGNAL CHECK screen.

(b) PARALLEL PARKING OFFSET



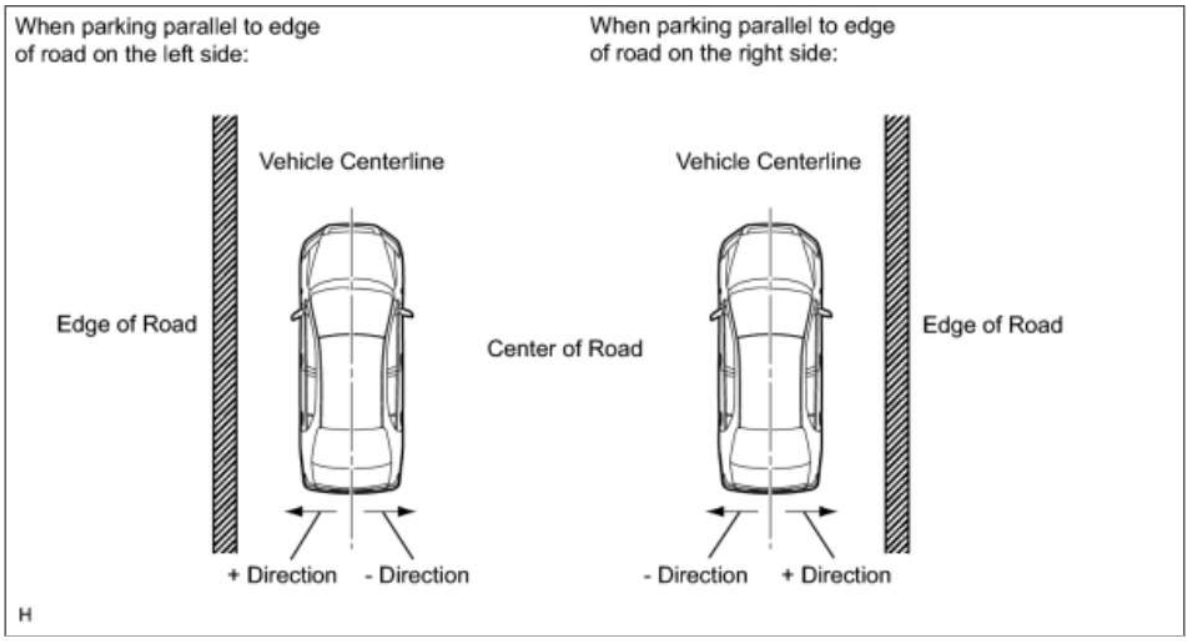
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HINT:

The PARALLEL PARKING OFFSET screen allows the parking position to be offset when the actual parking position deviates to the right or left of the set target parking position during parallel parking mode.

(1) Press "UP" or "DOWN" to adjust the parallel parking position horizontal offset amount.



HINT:

- A positive value is indicated in green and a negative value is indicated in red.
- The + direction indicates an offset toward the edge of the road, the - direction indicates an offset toward the road surface.
- When a value is shown as "10 CM" in red, it means -10 cm (the parking position is offset 10 cm towards the center of the road).
- Available setting range: +20 cm to -40 cm (can be adjusted in 1 cm increments)

(2) When "OK" is selected, the screen switches to the signal connection screen and a set value is stored.

- When "OK" is selected, the set value is stored after a "beep" sounds for confirmation.
- The memory is not updated until "OK" is selected.
- Until a beep finishes sounding, the adjustment values are not stored.
- When "BACK" is selected, the screen switches to the signal connection screen without storing a value (values entered are not stored).

(c) Finish diagnostic mode.

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PARK ASSIST / MONITORING: ADVANCED PARKING GUIDANCE SYSTEM: DTC CHECK / CLEAR (2010 Prius)

DTC CHECK / CLEAR

1. CHECK DTC

(a) Connect the Techstream to the DLC3.

(b) Turn the power switch on (IG).

(c) Turn the Techstream on.

(d) Enter the following menus: Chassis / Advanced Parking Guidance System / Trouble Codes.

(e) Check the details of the DTCs INFO .

2. CLEAR DTC

(a) Connect the Techstream to the DLC3.

(b) Turn the power switch on (IG).

(c) Turn the Techstream on.

(d) Enter the following menus: Chassis / Advanced Parking Guidance System / Trouble Codes.

(e) According to the display on the Techstream, select the trouble code data display with the clear button.

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DATA LIST / ACTIVE TEST

1. DATA LIST

HINT:

Using the Techstream to read the Data List allows the values or states of switches, sensors, actuators and other items to be read without removing any parts. This non-intrusive inspection can be very useful because intermittent conditions or signals may be discovered before parts or wiring disturbed. Reading the Data List information early in troubleshooting one way to save diagnostic time.

NOTICE:

In the table below, the values listed under "Normal Condition" are reference values. Do not depend solely on these reference values when deciding whether a part faulty or not.

(a) Connect the Techstream to the DLC3.

(b) Turn the power switch on (IG).

(c) Turn the Techstream on.

(d) Enter the following menus: Chassis / Advanced Parking Guidance System / Data List.

(e) According to the display on the Techstream, read the Data List.

Advanced Parking Guidance System

TESTER DISPLAY	MEASUREMENT ITEM/RANGE	NORMAL CONDITION	DIAGNOSTIC NOTE
AVC-LAN Master Connect Status	AVC-LAN communication condition/OK or NG	OK: AVC-LAN communication condition normal NG: AVC-LAN communication condition abnormal	-
AVC-LAN Master Reset Status	AVC-LAN communication condition/OK or NG	OK: AVC-LAN communication condition normal NG: AVC-LAN communication condition abnormal	-
AVC-LAN Master Status	AVC-LAN communication condition/OK or NG	OK: AVC-LAN communication condition normal NG: AVC-LAN communication condition abnormal	-
AVC-LAN Connect Status	AVC-LAN communication condition/OK or NG	OK: AVC-LAN communication condition normal NG: AVC-LAN communication condition abnormal	-
AVC-LAN Sending Status	AVC-LAN communication condition/OK or NG	OK: AVC-LAN communication condition normal NG: AVC-LAN communication condition abnormal	-
AVC-LAN Regist Complete Status	AVC-LAN communication condition/OK or NG	OK: AVC-LAN communication condition normal NG: AVC-LAN communication condition abnormal	-
AVC-LAN Regist Request Status	AVC-LAN communication condition/OK or NG	OK: AVC-LAN communication condition normal NG: AVC-LAN communication condition abnormal	-

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ON/OFF Parameter Status	AVC-LAN communication condition/OK or NG	OK: AVC-LAN communication condition normal NG: AVC-LAN communication condition abnormal	-
ROM/SUM Check	Parking assist ECU information/OK or NG	OK: Parking assist ECU normal NG: Parking assist ECU abnormal	-
Mirror Check	Parking assist ECU information/OK or NG	OK: Parking assist ECU normal NG: Parking assist ECU abnormal	-
High-Speed RAM Check	Parking assist ECU information/OK or NG	OK: Parking assist ECU normal NG: Parking assist ECU abnormal	-
EEPROM Status (Initial read)	Parking assist ECU information/OK or NG	OK: Parking assist ECU normal NG: Parking assist ECU abnormal	-
RAM Check	Parking assist ECU information/OK or NG	OK: Parking assist ECU normal NG: Parking assist ECU abnormal	-
IG Voltage Low Status	IG voltage input to parking assist ECU/OK or NG	OK: IG voltage normal NG: IG voltage abnormal (too low)	-
IG Voltage High Status	IG voltage input to parking assist ECU/OK or NG	OK: IG voltage normal NG: IG voltage abnormal (too high)	-
ACC Voltage Low Status	ACC voltage input to parking assist ECU/OK or NG	OK: ACC voltage normal NG: ACC voltage abnormal (too low)	-
ACC Voltage High Status	ACC voltage input to parking assist ECU/OK or NG	OK: ACC voltage normal NG: ACC voltage abnormal (too high)	-
CPU Busy Status	Parking assist ECU information/OK or NG	OK: Parking assist ECU normal NG: Parking assist ECU abnormal	-
CPU Communication Status	Parking assist ECU information/OK or NG	OK: Parking assist ECU normal NG: Parking assist ECU abnormal	-
Integer Arithmetic Status	Parking assist ECU information/OK or NG	OK: Parking assist ECU normal NG: Parking assist ECU abnormal	-
FPU Calculation Status	Parking assist ECU information/OK or NG	OK: Parking assist ECU normal NG: Parking assist ECU abnormal	-
AISIC Output Status	Output condition of camera display signal/OK or NG	OK: Output condition of camera display signal normal NG: Output condition of camera display signal abnormal	-
EPS Status	EPS (Power Steering System) status/OK or NG	OK: EPS available NG: EPS not available	-
Wheel Speed Sensor (4wheel)	Effectivity of speed signal from speed signal sensor/OK or NG	OK: Speed signal effective NG: Speed signal not effective	-
Height Sensor Volt Status (L)	Power supply for rear height control sensor sub-assembly RH (Low)/OK or NG	OK: Power supply for rear height control sensor sub-assembly RH normal NG: Power supply for rear height control sensor sub-assembly RH abnormal	-
		OK: Power supply for rear height	

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Height Sensor Volt Status (H)	Power supply for rear height control sensor sub-assembly RH (High)/OK or NG	OK: Power supply for rear height control sensor sub-assembly RH normal NG: Power supply for rear height control sensor sub-assembly RH abnormal	-
Height Sensor Status	Vehicle height signal from rear height control sensor sub-assembly RH/OK or NG	OK: Signal from rear height control sensor sub-assembly RH normal NG: Signal from rear height control sensor sub-assembly RH abnormal	-
Height Sensor Status (Fixing)	Vehicle height signal from rear height control sensor sub-assembly RH (Fixing)/OK or NG	OK: Rear height control sensor sub-assembly RH normal NG: Rear height control sensor sub-assembly RH fixing	-
FLS Sensor Status (Left)	No. 1 ultrasonic sensor (front left sensor) condition/OK or NG	OK: No. 1 ultrasonic sensor (front left sensor) normal NG: No. 1 ultrasonic sensor (front left sensor) abnormal	-
FLS Sensor Status (Right)	No. 1 ultrasonic sensor (front right sensor) condition/OK or NG	OK: No. 1 ultrasonic sensor (front right sensor) normal NG: No. 1 ultrasonic sensor (front right sensor) abnormal	-
Temp Sensor Activate Status	Ambient temperature sensor status/valid or invalid	OK: Ambient temperature sensor available NG: Ambient temperature sensor not available	-
Temp Sensor Status	Ambient temperature sensor status/OK or NG	OK: Ambient temperature sensor available NG: Ambient temperature sensor not available	-
A/C Communication Status	Communication condition to air conditioning amplifier assembly/OK or NG	OK: Communication condition available NG: Communication condition not available	-
Number of DTC	Number of stored trouble codes/min.: 0, max.: 255	Number of DTCs will be displayed	-

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PARK ASSIST / MONITORING: ADVANCED PARKING GUIDANCE SYSTEM: DIAGNOSTIC TROUBLE CODE CHART (2010 Prius)

DIAGNOSTIC TROUBLE CODE CHART

HINT:

If a trouble code is output during the DTC check, inspect the trouble areas listed for that code. For details of the code, refer to the "See page" in the DTC chart. Inspect fuses and relays before investigating the trouble areas shown in the table below.

Advanced Parking Guidance System

DTC CODE	DETECTION ITEM	TROUBLE AREA	SEE PAGE
C1611	ECU Malfunction	1. Parking assist ECU initialization (not initialized parking assist ECU) 2. Height control sensor vehicle height difference setting (not initialized parking assist ECU) 3. Rear television camera optical axis adjustment (initialized parking assist ECU) 4. Steering angle setting (initialized parking assist ECU) 5. Parking assist ECU	INFO
C1612	IG Voltage is Low or High	1. Harness or connector 2. Parking assist ECU	INFO
C1613	ACC Voltage is Low or High	1. Harness or connector 2. Parking assist ECU	INFO
C1621	Back Camera Power Supply Failure	1. Harness or connector 2. Rear television camera assembly 3. Parking assist ECU	INFO
C1622	Open or Short Circuit in Back Camera Signal	1. Harness or connector 2. Rear television camera assembly 3. Parking assist ECU	INFO
C1625	Open or Short in Steering Angle Sensor +B	1. Harness or connector 2. Steering angle sensor (spiral with sensor cable sub-assembly)	INFO
C1626	Steering Angle Sensor Failure	1. Steering angle sensor (spiral with sensor cable sub-assembly) 2. Parking assist ECU	INFO
C1627	Vehicle Height Sensor Voltage is Low or High	1. Harness or connector 2. Headlight leveling ECU assembly 3. Parking assist ECU	INFO
C1628	Vehicle Height Sensor Failure	1. Harness or connector 2. Rear height control sensor sub-assembly RH 3. Parking assist ECU	INFO
C1645	Power Steering Control System Failure	Power steering system	INFO
C164A	EPS Communication Malfunction	1. Parking assist ECU 2. Power steering system 3. Power steering ECU	INFO
C164E	Stop Switch Circuit Malfunction	Electronically controlled brake system	INFO
C1657	Hybrid Powertrain Control Module	Hybrid control system	INFO

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PARK ASSIST / MONITORING: ADVANCED PARKING GUIDANCE SYSTEM: DIAGNOSTIC TROUBLE CODE CHART (2010 Prius)

C1658	Speed Sensor Malfunction	Electronically controlled brake system	INFO
C1659	Brake System Malfunction	Electronically controlled brake system	INFO
C1662	Ambient Temperature High	Parking assist ECU	INFO
C168B	AVC-LAN Communication Malfunction	AVC-LAN communication	INFO
C168C	AVC-LAN Command Time Out	AVC-LAN communication	INFO
C1691	Back Camera Initialization Incomplete	1. Height control sensor vehicle height difference setting 2. Rear television camera optical axis adjustment 3. Parking assist ECU	INFO
C1694	Steering Angle Initialization Incomplete	1. Steering angle setting 2. Parking assist ECU	INFO
C1695	Zero point Calibration of Vehicle Height Sensor Incomplete	1. Height control sensor vehicle height difference setting 2. Parking assist ECU	INFO
C1AE0	Front Left Side Sensor	1. No. 1 ultrasonic sensor (front left side sensor) 2. Parking assist ECU	INFO
C1AE5	Front Right Side Sensor	1. No. 1 ultrasonic sensor (front right side sensor) 2. Parking assist ECU	INFO
U0073	Control Module Communication Bus Off	CAN communication system	INFO
U0126	Lost Communication with Steering Angle Sensor Module	CAN communication system	INFO
U0129	Lost Communication with Brake System Control Module	CAN communication system	INFO
U0131	Lost Communication with Power Steering Control Module	CAN communication system	INFO
U0140	Lost Communication with Main Body ECU	CAN communication system	INFO
U0293	Lost Communication with HV ECU	CAN communication system	INFO
U1000	Can Communication Failure(Message Registry)	Parking assist ECU	INFO
C1AEE	APGS Sensor Communication Circuit	1. Harness or connector 2. No. 1 ultrasonic sensor (front left side sensor) 3. No. 1 ultrasonic sensor (front right side sensor) 4. Parking assist ECU	INFO

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PARK ASSIST / MONITORING: ADVANCED PARKING GUIDANCE SYSTEM: C1611: ECU Malfunction (2010 Prius)

DTC	C1611	ECU Malfunction

DESCRIPTION

This DTC is stored if the parking assist ECU judges that there is an internal malfunction as a result of its self check.

HINT:

The parking assist ECU stores different types of information during initialization. If the parking assist ECU cannot read the stored information when it is activated, the parking assist ECU judges that there is an internal malfunction and stores this DTC.

DTC NO.	DTC DETECTION CONDITION	TROUBLE AREA
C1611	When one of the following conditions is met: • ROM/SUM check malfunction • Mirror check malfunction • High-speed RAM check malfunction • EEPROM (Initial read) malfunction • RAM check malfunction • CPU busy malfunction • CPU communication malfunction • Integer arithmetic malfunction • FPU calculation malfunction • AISIC output malfunction	• Parking assist ECU initialization (not initialized parking assist ECU) • Height control sensor vehicle height difference setting (not initialized parking assist ECU) • Rear television camera optical axis adjustment (initialized parking assist ECU) • Steering angle setting (initialized parking assist ECU) • Parking assist ECU

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INSPECTION PROCEDURE

NOTICE:

- When "System initializing" message is displayed on the navigation receiver assembly after the battery terminal disconnected, correct the steering angle neutral point INFO .
- Depending on the parts that are replaced or operations that are performed during vehicle inspection or maintenance, calibration of other systems as well as the advanced parking guidance system may be needed INFO .

PROCEDURE

1.	READ VALUE USING TECHSTREAM

(a) Connect the Techstream to the DLC3.

(b) Turn the power switch on (IG).

PARK ASSIST / MONITORING: ADVANCED PARKING GUIDANCE SYSTEM: C1611: ECU Malfunction (2010 Prius)

(c) Turn the Techstream on.

(d) Enter the following menus: Chassis / Advanced Parking Guidance System / Data List.

(e) Check the Data List for proper functioning of the following items.

Advanced Parking Guidance

TESTER DISPLAY	MEASUREMENT ITEM/RANGE	NORMAL CONDITION	DIAGNOSTIC NOTE
ROM/SUM Check	Parking assist ECU information/OK or NG	OK: Parking assist ECU is normal NG: Parking assist ECU is abnormal	-
Mirror Check	Parking assist ECU information/OK or NG	OK: Parking assist ECU is normal NG: Parking assist ECU is abnormal	-
High-Speed RAM Check	Parking assist ECU information/OK or NG	OK: Parking assist ECU is normal NG: Parking assist ECU is abnormal	-
EEPROM Status (Initial read)	Parking assist ECU information/OK or NG	OK: Parking assist ECU is normal NG: Parking assist ECU is abnormal	-
RAM Check	Parking assist ECU information/OK or NG	OK: Parking assist ECU is normal NG: Parking assist ECU is abnormal	-
CPU Busy Status	Parking assist ECU information/OK or NG	OK: Parking assist ECU is normal NG: Parking assist ECU is abnormal	-
CPU Communication Status	Parking assist ECU information/OK or NG	OK: Parking assist ECU is normal NG: Parking assist ECU is abnormal	-
Integer Arithmetic Status	Parking assist ECU information/OK or NG	OK: Parking assist ECU is normal NG: Parking assist ECU is abnormal	-
FPU Calculation Status	Parking assist ECU information/OK or NG	OK: Parking assist ECU is normal NG: Parking assist ECU is abnormal	-
AISIC Output Status	Output condition of camera display signal/OK or NG	OK: Output condition of camera display signal is normal NG: Output condition of camera display signal is abnormal	-

Result:

RESULT	PROCEED TO
OK is displayed for all items.	A
NG is displayed for EEPROM status (Initial read).	A
NG is displayed except EEPROM status (Initial read).	B

B ▶ **REPLACE PARKING ASSIST ECU**

A ▼

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2.	ADJUST SETTINGS (PARKING ASSIST ECU INITIALIZATION)

HINT:

- The parking assist ECU stores different types of information during initialization. If the parking assist ECU cannot read the stored information when it is activated, the parking assist ECU judges that there is an internal malfunction and stores this DTC.
- If the parking assist ECU cannot read the stored information when it is activated, allowing the ECU to store the information again may return the system to normal.

(a) Use the transition of diagnosis screens (note which transition pattern occurs) to confirm if the parking assist ECU was able to properly store the information from initialization INFO .

HINT:

The procedure to make the parking assist ECU store the vehicle information differs when the parking assist ECU has stored the information (initialized) and when the information has not been stored (not initialized).

(b) Perform the following procedure depending on the memory conditions to register the vehicle information into the parking assist ECU.

CONDITION	PROCEDURE
Not initialized	Parking assist ECU initialization INFO
Initialized	• Height control sensor vehicle height difference setting INFO • Rear television camera optical axis adjustment INFO • Steering angle setting INFO

NEXT

3.	CHECK DTC OUTPUT

(a) Clear the DTCs INFO .

(b) Check for DTCs INFO .

Result:

RESULT	PROCEED TO
DTC C1611 is output	A
No DTC is output	B

HINT:

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PARK ASSIST / MONITORING: ADVANCED PARKING GUIDANCE SYSTEM: C1611: ECU Malfunction (2010 Prius)

- If DTC C1611 is output, perform the procedure to allow the parking assist ECU to store the vehicle information again.
- If DTC C1611 is still output after performing the procedure to make the parking assist ECU store the vehicle information 3 times, replace the parking assist ECU.
- If DTC C1611 is output frequently, replace the parking assist ECU even though the DTC is not output when rechecking for DTCs.

B ▶ **END**

A ▶ **REPLACE PARKING ASSIST ECU**

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PARK ASSIST / MONITORING: ADVANCED PARKING GUIDANCE SYSTEM: C1612: IG Voltage is Low or High (2010 Prius)

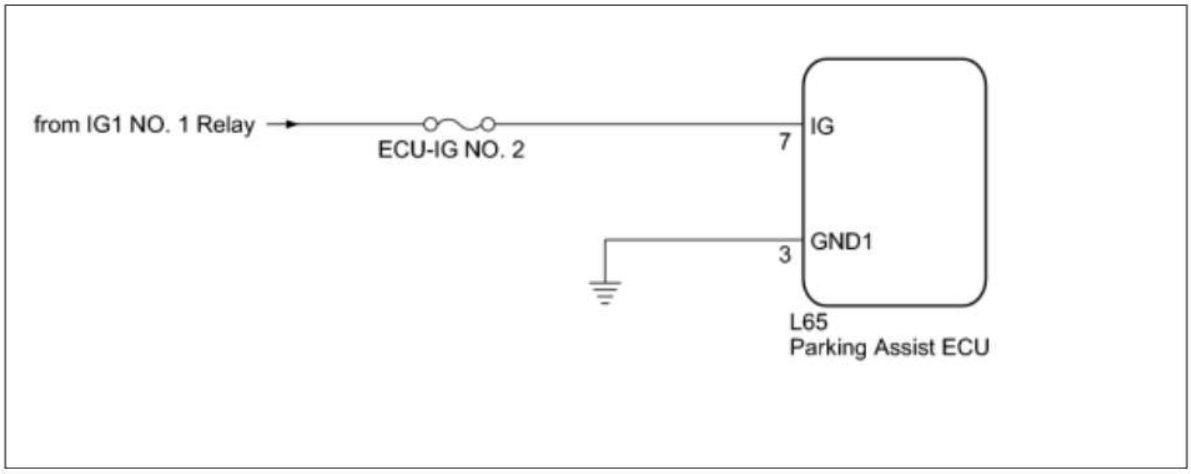
DTC	C1612	IG Voltage is Low or High

DESCRIPTION

This DTC is stored if the parking assist ECU judges as a result of its self check that the voltage received by terminal IG is low or high.

DTC NO.	DTC DETECTION CONDITION	TROUBLE AREA
C1612	• IG voltage is low • IG voltage is high	• Harness or connector • Parking assist ECU

WIRING DIAGRAM



INSPECTION PROCEDURE

NOTICE:

- When "System initializing" message is displayed on the navigation receiver assembly after the battery terminal disconnected, correct the steering angle neutral point INFO .
- Depending on the parts that are replaced or operations that are performed during vehicle inspection or maintenance, calibration of other systems as well as the advanced parking guidance system may be needed INFO .

PROCEDURE

1.	CHECK DTC OUTPUT

(a) Clear the DTCs INFO .

(b) Check for DTCs INFO .

Result:

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PARK ASSIST / MONITORING: ADVANCED PARKING GUIDANCE SYSTEM: C1612: IG Voltage is Low or High (2010 Prius)

RESULT	PROCEED TO
DTC C1612 is output	A
No DTC is output	B

HINT:

If the parking assist ECU cannot read the stored information when it is activated, allowing the ECU to store the information again may return the system to normal.

B ▶ **USE SIMULATION METHOD TO CHECK**

A ▼

2.	**CHECK HARNESS AND CONNECTOR (PARKING ASSIST ECU IG VOLTAGE)**

(a) Disconnect the L65 connector from the parking assist ECU.

(b) Measure the voltage according to the value(s) in the table below.

Standard Voltage:

TESTER CONNECTION	CONDITION	SPECIFIED CONDITION
L65-7 (IG) - L65-3 (GND1)	Power switch on (IG)	11 to 14 V

NG ▶ **REPAIR OR REPLACE HARNESS OR CONNECTOR**

OK ▶ **REPLACE PARKING ASSIST ECU**

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PARK ASSIST / MONITORING: ADVANCED PARKING GUIDANCE SYSTEM: C1613: ACC Voltage is Low or High (2010 Prius)

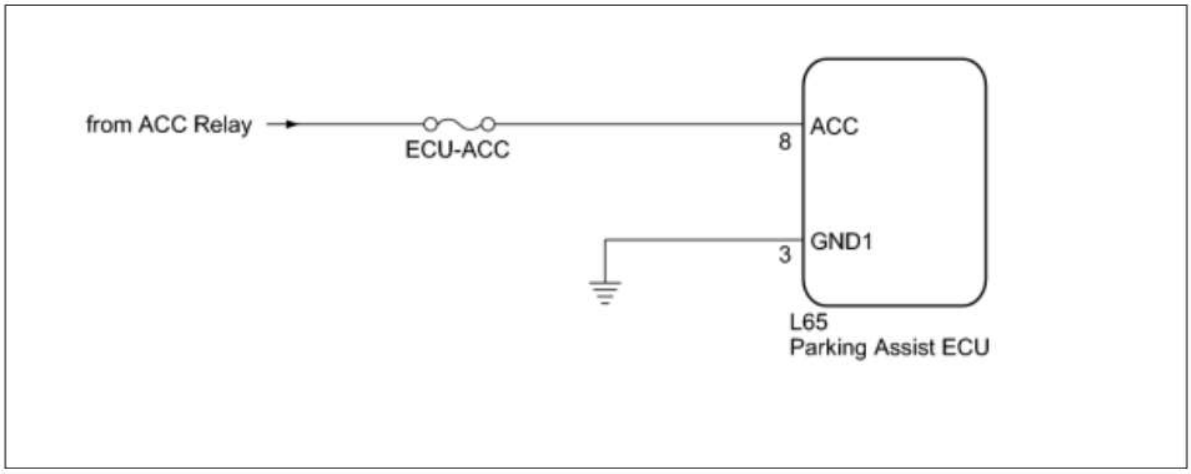
DTC	C1613	ACC Voltage is Low or High

DESCRIPTION

This DTC is stored if the parking assist ECU judges as a result of its self check that the voltage received by terminal ACC is not normal.

DTC NO.	DTC DETECTION CONDITION	TROUBLE AREA
C1613	• ACC voltage is low • ACC voltage is high	• Harness or connector • Parking assist ECU

WIRING DIAGRAM



INSPECTION PROCEDURE

NOTICE:

- When "System initializing" message is displayed on the navigation receiver assembly after the battery terminal disconnected, correct the steering angle neutral point INFO .
- Depending on the parts that are replaced or operations that are performed during vehicle inspection or maintenance, calibration of other systems as well as the advanced parking guidance system may be needed INFO .

PROCEDURE

1.	CHECK DTC OUTPUT

(a) Clear the DTCs INFO .

(b) Check for DTCs INFO .

Result:

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PARK ASSIST / MONITORING: ADVANCED PARKING GUIDANCE SYSTEM: C1613: ACC Voltage is Low or High (2010 Prius)

RESULT	PROCEED TO
DTC C1613 is output	A
No DTC is output	B

HINT:

If the parking assist ECU cannot read the stored information when it is activated, allowing the ECU to store the information again may return the system to normal.

B ▶ **USE SIMULATION METHOD TO CHECK**

A ▼

2.	**CHECK HARNESS AND CONNECTOR (PARKING ASSIST ECU ACC VOLTAGE)**

(a) Disconnect the L65 connector from the parking assist ECU.

(b) Measure the voltage according to the value(s) in the table below.

Standard Voltage:

TESTER CONNECTION	CONDITION	SPECIFIED CONDITION
L65-8 (ACC) - L65-3 (GND1)	Power switch on (ACC)	11 to 14 V

NG ▶ **REPAIR OR REPLACE HARNESS OR CONNECTOR**

OK ▶ **REPLACE PARKING ASSIST ECU**

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PARK ASSIST / MONITORING: ADVANCED PARKING GUIDANCE SYSTEM: C1621,C1622: Back Camera Power Supply Failure (2010 Prius)

DTC	**C1621**	**Back Camera Power Supply Failure**

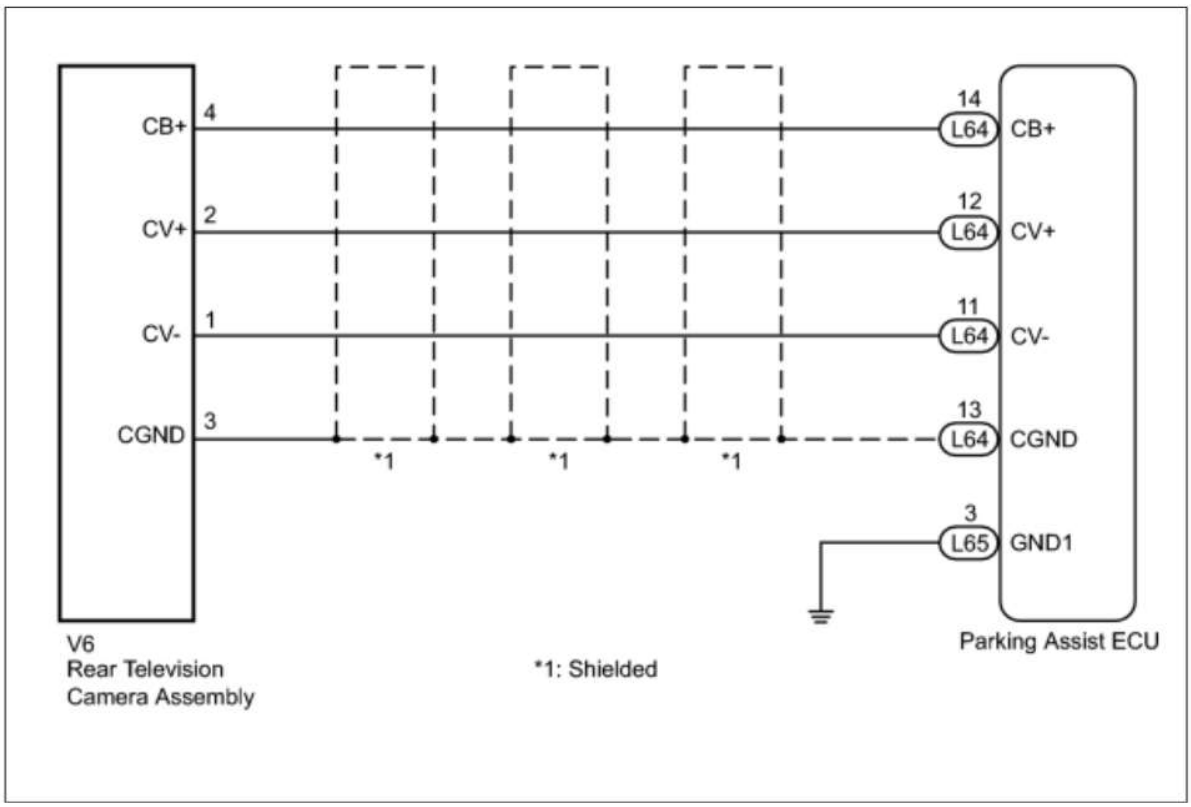
DTC	**C1622**	**Open or Short Circuit in Back Camera Signal**

DESCRIPTION

These DTCs are stored if the parking assist ECU judges as a result of its self check that the signals or signal lines between the parking assist ECU and rear television camera assembly are not normal.

DTC NO.	DTC DETECTION CONDITION	TROUBLE AREA
C1621	Rear television camera power supply failure	• Harness or connector • Rear television camera assembly • Parking assist ECU
C1622	An open or short in the rear television camera signal circuit	• Harness or connector • Rear television camera assembly • Parking assist ECU

WIRING DIAGRAM



INSPECTION PROCEDURE

NOTICE:

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PARK ASSIST / MONITORING: ADVANCED PARKING GUIDANCE SYSTEM: C1621,C1622: Back Camera Power Supply Failure (2010 Prius)

- When "System initializing" message is displayed on the navigation receiver assembly after the battery terminal disconnected, correct the steering angle neutral point INFO .
- Depending on the parts that are replaced or operations that are performed during vehicle inspection or maintenance, calibration of other systems as well as the advanced parking guidance system may be needed INFO .

PROCEDURE

1.	**CHECK HARNESS AND CONNECTOR (PARKING ASSIST ECU - REAR TELEVISION CAMERA)**

(a) Disconnect the L64 connector from the parking assist ECU.

(b) Disconnect the V6 connector from the rear television camera assembly.

(c) Measure the resistance according to the value(s) in the table below.

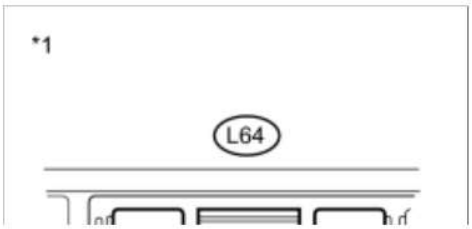
Standard Resistance:

TESTER CONNECTION	CONDITION	SPECIFIED CONDITION
L64-11 (CV-) - V6-1 (CV-)	Always	Below 1 Ω
L64-12 (CV+) - V6-2 (CV+)	Always	Below 1 Ω
L64-13 (CGND) - V6-3 (CGND)	Always	Below 1 Ω
L64-14 (CB+) - V6-4 (CB+)	Always	Below 1 Ω
L64-11 (CV-) - Body ground	Always	10 kΩ or higher
L64-12 (CV+) - Body ground	Always	10 kΩ or higher
L64-13 (CGND) - Body ground	Always	10 kΩ or higher
L64-14 (CB+) - Body ground	Always	10 kΩ or higher

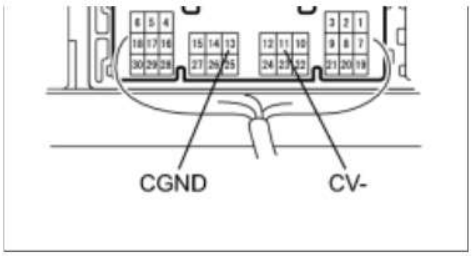
NG ▶ **REPAIR OR REPLACE HARNESS OR CONNECTOR**

OK ▼

2.	**CHECK PARKING ASSIST ECU (CV-, CGND)**



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(a) Reconnect the L64 connector to the parking assist ECU.

(b) Measure the resistance according to the value(s) in the table below.

Standard Resistance:

TESTER CONNECTION	CONDITION	SPECIFIED CONDITION
L64-11 (CV-) - Body ground	Always	Below 1 Ω
L64-13 (CGND) - Body ground	Always	Below 1 Ω

Text in Illustration

*1	Component with harness connected (Parking Assist ECU)

NG ▶ **REPLACE PARKING ASSIST ECU**

OK ▼

3.	**CHECK REAR TELEVISION CAMERA ASSEMBLY (CB+, CGND)**

(a) Disconnect the V6 connector from the rear television camera assembly.

(b) Measure the voltage according to the value(s) in the table below.

Standard Voltage:

TESTER CONNECTION	CONDITION	SPECIFIED CONDITION
V6-3 (CGND) - V6-4 (CB+)	Power switch on (IG) Shift lever in R	5.8 to 7.0 V

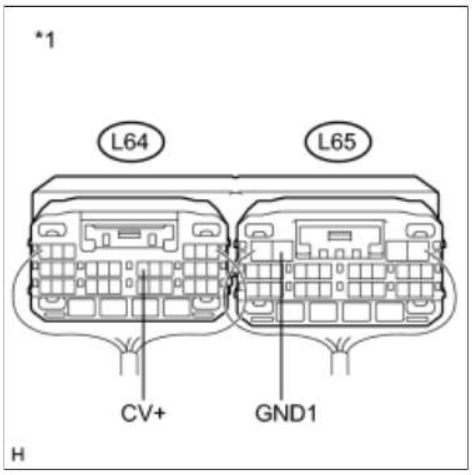
NG ▶ **REPLACE PARKING ASSIST ECU**

OK ▼

4.	**CHECK PARKING ASSIST ECU (CV+, GND1)**

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(a) Reconnect the V6 connector to the rear television camera assembly.



(b) Reconnect the L64 and L65 connectors to the parking assist ECU.

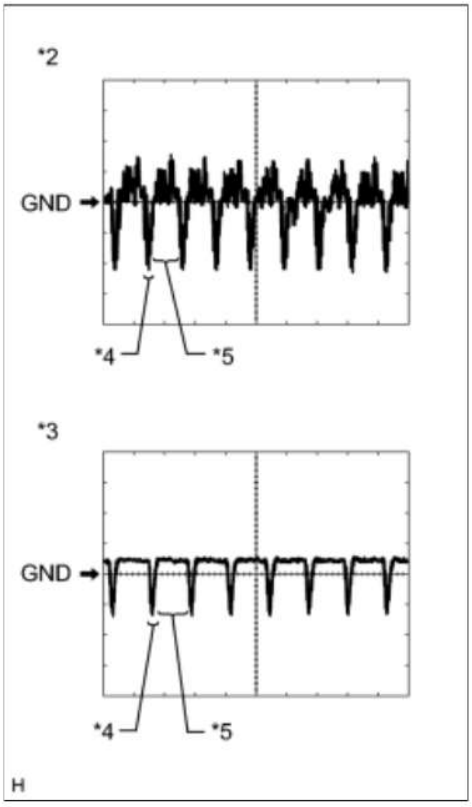
(c) Check the waveform of the rear television camera assembly using an oscilloscope.

HINT:

A waterproof connector is used for the rear television camera assembly. Therefore, inspect the waveform at the parking assist ECU with the connector connected.

OK:

Waveform is as shown in the illustration.



ITEM	CONTENT
Terminal No. (Symbol)	L64-12 (CV+) - L65-3 (GND1)
Tool Setting	200 mV/DIV., 50 µsec./DIV.
Condition	Power switch on (IG), shift lever in R

HINT:

The video waveform changes according to the image sent by the rear television camera assembly.

Text in Illustration

*1	Component with harness connected (Parking Assist ECU)
*2	Waveform 1 (under normal conditions)
*3	Waveform 2 (camera lens is covered, blacking out the screen)
*4	Synchronized Signal
*5	Video Waveform

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PARK ASSIST / MONITORING: ADVANCED PARKING GUIDANCE SYSTEM: C1621,C1622: Back Camera Power Supply Failure (2010 Prius)

NG	REPLACE REAR TELEVISION CAMERA ASSEMBLY
OK	REPLACE PARKING ASSIST ECU

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PARK ASSIST / MONITORING: ADVANCED PARKING GUIDANCE SYSTEM: C1625: Open or Short in Steering Angle Sensor +B (2010 Prius)

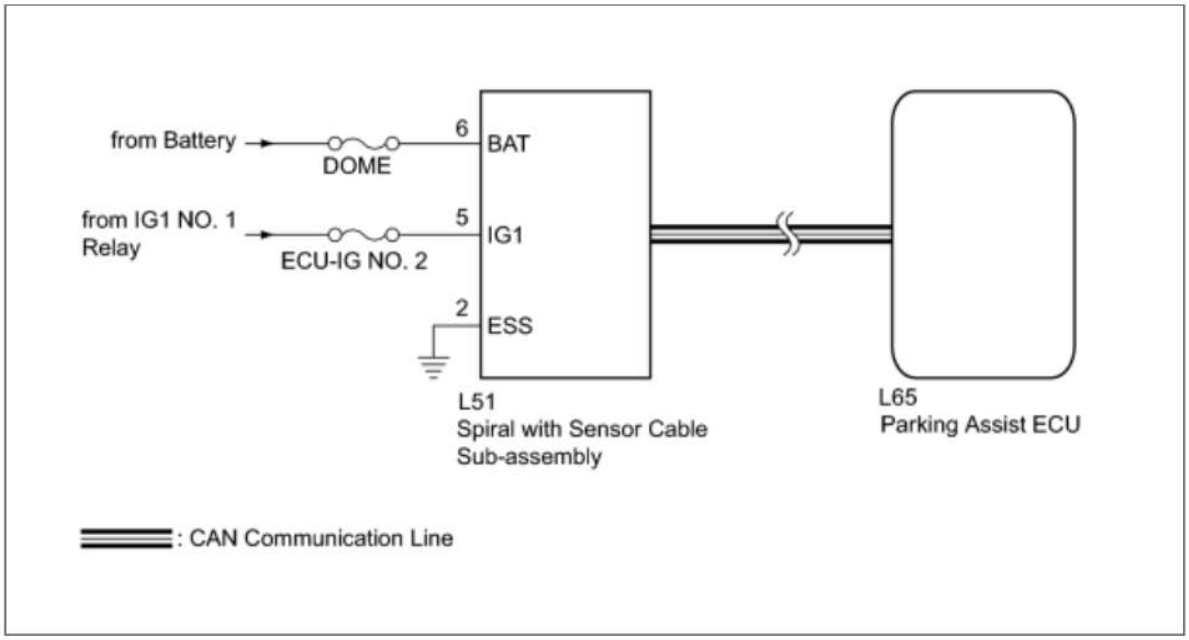
DTC	C1625	Open or Short in Steering Angle Sensor +B

DESCRIPTION

This DTC is stored if the parking assist ECU receives a signal via CAN communication from the spiral with sensor cable sub-assembly that indicates a power supply system problem.

DTC NO.	DTC DETECTION CONDITION	TROUBLE AREA
C1625	Open or short in steering angle sensor +B	• Harness or connector • Steering angle sensor (spiral with sensor cable sub-assembly)

WIRING DIAGRAM



INSPECTION PROCEDURE

NOTICE:

- When "System initializing" message is displayed on the navigation receiver assembly after the battery terminal disconnected, correct the steering angle neutral point INFO .
- Depending on the parts that are replaced or operations that are performed during vehicle inspection or maintenance, calibration of other systems as well as the advanced parking guidance system may be needed INFO .

PROCEDURE

1.	**CHECK HARNESS AND CONNECTOR (SPIRAL WITH SENSOR CABLE SUB-ASSEMBLY POWER SUPPLY)**

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(a) Disconnect the L51 connector from the spiral with sensor cable sub-assembly.

(b) Measure the resistance according to the value(s) in the table below.

Standard Resistance:

TESTER CONNECTION	CONDITION	SPECIFIED CONDITION
L51-2 (ESS) - Body ground	Always	Below 1 Ω

(c) Measure the voltage according to the value(s) in the table below.

Standard Voltage:

TESTER CONNECTION	CONDITION	SPECIFIED CONDITION
L51-5 (IG1) - 2 (ESS)	Power switch on (IG)	11 to 14 V
L51-6 (BAT) - 2 (ESS)	Always	11 to 14 V

NG ▶ **REPAIR OR REPLACE HARNESS OR CONNECTOR**

OK ▶ **REPLACE SPIRAL WITH SENSOR CABLE SUB-ASSEMBLY**

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PARK ASSIST / MONITORING: ADVANCED PARKING GUIDANCE SYSTEM: C1626: Steering Angle Sensor Failure (2010 Prius)

DTC	C1626	Steering Angle Sensor Failure

DESCRIPTION

This DTC is stored if the parking assist ECU receives a signal via CAN communication from the spiral with sensor cable sub-assembly that indicates an internal malfunction.

DTC NO.	DTC DETECTION CONDITION	TROUBLE AREA
C1626	A fail flag is transmitted from the steering angle sensor.	• Steering angle sensor (spiral with sensor cable sub-assembly) • Parking assist ECU

INSPECTION PROCEDURE

NOTICE:

- When "System initializing" message is displayed on the navigation receiver assembly after the battery terminal disconnected, correct the steering angle neutral point INFO .
- Depending on the parts that are replaced or operations that are performed during vehicle inspection or maintenance, calibration of other systems as well as the advanced parking guidance system may be needed INFO .

PROCEDURE

1.	**REPLACE SPIRAL WITH SENSOR CABLE SUB-ASSEMBLY**

(a) Replace the spiral with sensor cable sub-assembly INFO .

NEXT

2.	**CHECK DTC OUTPUT**

(a) Clear the DTCs INFO .

(b) Check for DTCs INFO .

Result:

RESULT	PROCEED TO
DTC C1626 is output	A

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PARK ASSIST / MONITORING: ADVANCED PARKING GUIDANCE SYSTEM: C1626: Steering Angle Sensor Failure (2010 Prius)

No DTC is output	B

B ▶ END

A ▶ REPLACE PARKING ASSIST ECU

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DTC	**C168B**	**AVC-LAN Communication Malfunction**

DTC	**C168C**	**AVC-LAN Command Time Out**

DESCRIPTION

These DTCs are stored if the parking assist ECU judges that there is a problem with the AVC-LAN communication system as a result of self check.

HINT:

These DTCs may be stored due to the battery condition or changes in the power supply waveform when starting the engine, even though there is no problem with the AVC-LAN communication system.

DTC NO.	DTC DETECTION CONDITION	TROUBLE AREA
C168B	• AVC-LAN communication malfunction: No master • AVC-LAN communication malfunction: Master reset • AVC-LAN communication malfunction: Master malfunction • AVC-LAN communication malfunction: Abnormal connection check • AVC-LAN communication malfunction: Transmission not completed • AVC-LAN communication malfunction: Abnormal transmission completion notification • AVC-LAN communication malfunction: Registration request transmission • AVC-LAN communication malfunction: Abnormal ON/OFF parameter	AVC-LAN communication
C168C	• AVC-LAN command time out: Output ON request notification command time out • AVC-LAN command time out: Output OFF request notification command time out • AVC-LAN command time out: Voice production start request notification command time out • AVC-LAN command time out: Voice production end request notification command time out	

INSPECTION PROCEDURE

PROCEDURE

1.	**CHECK DTC OUTPUT**

(a) Clear the DTCs INFO .

(b) Check for DTCs INFO .

Result:

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PARK ASSIST / MONITORING: ADVANCED PARKING GUIDANCE SYSTEM: C168B,C168C: AVC-LAN Communication Malfunction (2010 Prius)

RESULT	PROCEED TO
DTC C168B or C168C is output (w/ navigation system)	A
No DTC is output	B

HINT:

- This DTC may be stored due to the battery condition or changes in the power supply waveform when starting the engine, even though there is no problem with the AVC-LAN communication system.
- If DTC C168B or C168C is output frequently, duplicate the problem symptoms and perform the inspection again, even though the DTC is not output when rechecking for DTCs INFO .

B ▶ **USE SIMULATION METHOD TO CHECK**

A ▶ **GO TO NAVIGATION SYSTEM**

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DTC	C1691	Back Camera Initialization Incomplete

DESCRIPTION

This DTC is stored when the parking assist ECU judges that the back camera initial setting has not been memorized (rear television camera optical axis adjustment is incomplete).

DTC NO.	DTC DETECTION CONDITION	TROUBLE AREA
C1691	Back camera initial setting has not been memorized	• Height control sensor vehicle height difference setting • Rear television camera optical axis adjustment • Parking assist ECU

INSPECTION PROCEDURE

NOTICE:

- When "System initializing" message is displayed on the navigation receiver assembly after the battery terminal disconnected, correct the steering angle neutral point INFO .
- Depending on the parts that are replaced or operations that are performed during vehicle inspection or maintenance, calibration of other systems as well as the advanced parking guidance system may be needed INFO .

PROCEDURE

1.	ADJUST SETTINGS (HEIGHT SET AND CAMERA POSITION SETTING)

(a) Perform the following procedure depending on the memory conditions to register the vehicle information into the parking assist ECU.

HINT:

Before performing the rear television camera optical axis adjustment, the height control sensor vehicle height difference setting must be performed in the "HEIGHT SET" screen.

(1) Height control sensor vehicle height difference setting INFO

(2) Rear television camera optical axis adjustment INFO

NEXT

2.	CHECK DTC OUTPUT

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PARK ASSIST / MONITORING: ADVANCED PARKING GUIDANCE SYSTEM: C1691: Back Camera Initialization Incomplete (2010 Prius)

(a) Clear the DTCs INFO .

(b) Check for DTCs INFO .

Result:

RESULT	PROCEED TO
DTC C1691 is output	A
No DTC is output	B

HINT:

- If DTC C1691 is output, perform the rear television camera optical axis adjustment again.
- If DTC C1691 is still output after performing the height control sensor vehicle height difference setting and rear television camera optical axis adjustment 3 times, replace the parking assist ECU.

B ▶ **END**

A ▶ **REPLACE PARKING ASSIST ECU**

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DTC	C1694	Steering Angle Initialization Incomplete

DESCRIPTION

This DTC is stored when the parking assist ECU judges that the maximum steering angle has not been memorized (steering angle setting is incomplete).

DTC NO.	DTC DETECTION CONDITION	TROUBLE AREA
C1694	Maximum steering angle has not been memorized	• Steering angle setting • Parking assist ECU

INSPECTION PROCEDURE

NOTICE:

- When "System initializing" message is displayed on the navigation receiver assembly after the battery terminal disconnected, correct the steering angle neutral point INFO .
- Depending on the parts that are replaced or operations that are performed during vehicle inspection or maintenance, calibration of other systems as well as the advanced parking guidance system may be needed INFO .

PROCEDURE

1.	ADJUST SETTINGS (STEERING ANGLE SETTING)

(a) Perform the following procedure depending on the memory conditions to register the vehicle information into the parking assist ECU.

(1) Steering angle setting (Diagnosis system) INFO

NEXT

2.	CHECK DTC OUTPUT

(a) Clear the DTCs INFO .

(b) Check for DTCs INFO .

Result:

RESULT	PROCEED TO
DTC C1694 is output	A

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PARK ASSIST / MONITORING: ADVANCED PARKING GUIDANCE SYSTEM: C1694: Steering Angle Initialization Incomplete (2010 Prius)

DTC C1694 is output	A
No DTC is output	B

HINT:

- If DTC C1694 is output, perform the steering angle setting again.
- If DTC C1694 is still output after performing the steering angle setting 3 times, replace the parking assist ECU.

B ▶ **END**

A ▶ **REPLACE PARKING ASSIST ECU**

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DTC	C1695	Zero point Calibration of Vehicle Height Sensor Incomplete

DESCRIPTION

This DTC is stored when the parking assist ECU judges that the zero point calibration of the vehicle height sensor is incomplete (height control sensor vehicle height difference setting is incomplete).

DTC NO.	DTC DETECTION CONDITION	TROUBLE AREA
C1695	Zero point calibration of vehicle height sensor is incomplete	• Height control sensor vehicle height difference setting • Parking assist ECU

INSPECTION PROCEDURE

NOTICE:

- When "System initializing" message is displayed on the navigation receiver assembly after the battery terminal disconnected, correct the steering angle neutral point INFO .
- Depending on the parts that are replaced or operations that are performed during vehicle inspection or maintenance, calibration of other systems as well as the advanced parking guidance system may be needed INFO .

PROCEDURE

1.	ADJUST SETTINGS (HEIGHT CONTROL SENSOR VEHICLE HEIGHT DIFFERENCE SETTING)

(a) Perform the following procedure depending on the memory conditions to register the vehicle information into the parking assist ECU.

(1) Height control sensor vehicle height difference setting INFO

NEXT

2.	CHECK DTC OUTPUT

(a) Clear the DTCs INFO .

(b) Check for DTCs INFO .

Result:

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RESULT	PROCEED TO
DTC C1695 is output	A
No DTC is output	B

HINT:

- If DTC C1695 is output, perform the height control sensor vehicle height difference setting again.
- If DTC C1695 is still output after performing the height control sensor vehicle height difference setting 3 times, replace the parking assist ECU.

B ▶ **END**

A ▶ **REPLACE PARKING ASSIST ECU**

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PARK ASSIST / MONITORING: ADVANCED PARKING GUIDANCE SYSTEM: C1AE0: Front Left Side Sensor (2010 Prius)

DTC	C1AE0	Front Left Side Sensor

DESCRIPTION

This DTC is stored when the parking assist ECU receives an abnormal signal from the No. 1 ultrasonic sensor (front left side sensor) immediately after the power switch is turned on (IG) or while the No. 1 ultrasonic sensor is operating (neither P nor R is selected, and the vehicle is not stopped).

DTC NO.	DTC DETECTION CONDITION	TROUBLE AREA
C1AE0	Ultrasonic sensor (front left side sensor) malfunction	• No . 1 ultrasonic sensor (front left side sensor) • Parking assist ECU

INSPECTION PROCEDURE

NOTICE:

- When "System initializing" message is displayed on the navigation receiver assembly after the battery terminal disconnected, correct the steering angle neutral point INFO .
- Depending on the parts that are replaced or operations that are performed during vehicle inspection or maintenance, calibration of other systems as well as the advanced parking guidance system may be needed INFO .

PROCEDURE

1.	**REPLACE NO. 1 ULTRASONIC SENSOR (FRONT LEFT SIDE SENSOR)**

(a) Replace the No. 1 ultrasonic sensor (front left side sensor) with a normally functioning sensor INFO .

NEXT

2.	**CHECK DTC OUTPUT**

(a) Clear the DTCs INFO .

(b) Check for DTCs INFO .

Result:

RESULT	PROCEED TO

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PARK ASSIST / MONITORING: ADVANCED PARKING GUIDANCE SYSTEM: C1AE0: Front Left Side Sensor (2010 Prius)

DTC C1AE0 is output	A
No DTC is output	B

B ▶ **END (FRONT LEFT SIDE SENSOR WAS DEFECTIVE)**

A ▶ **REPLACE PARKING ASSIST ECU**

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PARK ASSIST / MONITORING: ADVANCED PARKING GUIDANCE SYSTEM: C1AE5: Front Right Side Sensor (2010 Prius)

DTC	C1AE5	Front Right Side Sensor

DESCRIPTION

This DTC is stored when the parking assist ECU receives an abnormal signal from the No. 1 ultrasonic sensor (front right side sensor) immediately after the power switch is turned on (IG) or while the No. 1 ultrasonic sensor is operating (neither P nor R is selected, and the vehicle is not stopped).

DTC NO.	DTC DETECTION CONDITION	TROUBLE AREA
C1AE5	Ultrasonic sensor (front right side sensor) malfunction	• No. 1 ultrasonic sensor (front right side sensor) • Parking assist ECU

INSPECTION PROCEDURE

NOTICE:

- When "System initializing" message is displayed on the navigation receiver assembly after the battery terminal disconnected, correct the steering angle neutral point INFO .
- Depending on the parts that are replaced or operations that are performed during vehicle inspection or maintenance, calibration of other systems as well as the advanced parking guidance system may be needed INFO .

PROCEDURE

1.	**REPLACE NO. 1 ULTRASONIC SENSOR (FRONT RIGHT SIDE SENSOR)**

(a) Replace the No. 1 ultrasonic sensor (front right side sensor) with a normally functioning sensor INFO .

NEXT

2.	**CHECK DTC OUTPUT**

(a) Clear the DTCs INFO .

(b) Check for DTCs INFO .

Result:

RESULT	PROCEED TO

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PARK ASSIST / MONITORING: ADVANCED PARKING GUIDANCE SYSTEM: C1AE5: Front Right Side Sensor (2010 Prius)

DTC C1AE5 is output	A
No DTC is output	B

B ▶ **END (FRONT RIGHT SIDE SENSOR WAS DEFECTIVE)**

A ▶ **REPLACE PARKING ASSIST ECU**

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PARK ASSIST / MONITORING: ADVANCED PARKING GUIDANCE SYSTEM: C1AEE: APGS Sensor Communication Circuit (2010 Prius)

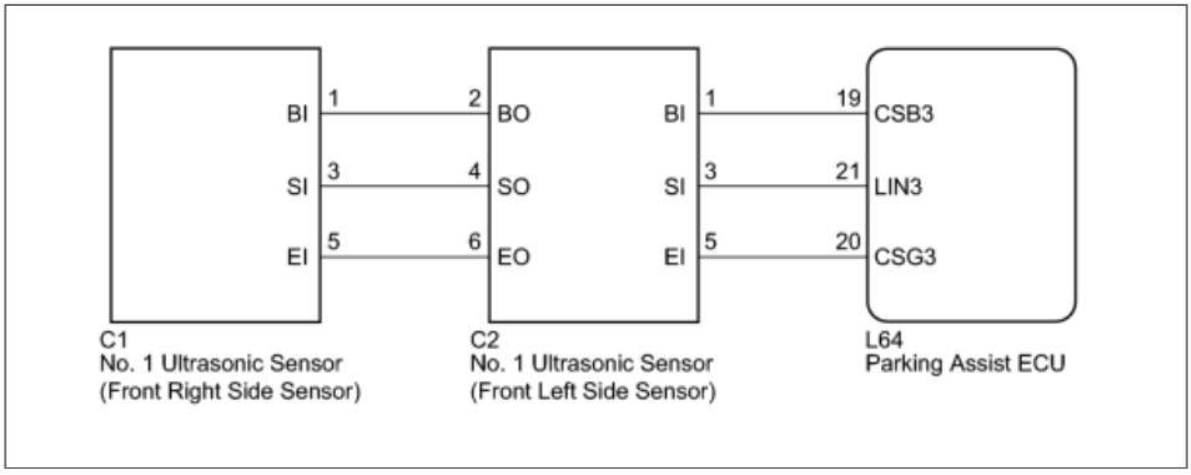
DTC	C1AEE	APGS Sensor Communication Circuit

DESCRIPTION

The parking assist ECU communicates with the No. 1 ultrasonic sensor (front left side sensor), and the No. 1 ultrasonic sensor (front right side sensor) via the No. 1 ultrasonic sensor (front left side sensor). This DTC is stored when the parking assist ECU judges that there is an abnormality in the communication circuit to the No. 1 ultrasonic sensor (front left side sensor) or the No. 1 ultrasonic sensor (front right side sensor) that is connected via the front left side sensor, immediately after the power switch is turned on (IG), or while the sensors are operating (neither P nor R is selected and the vehicle is not stopped).

DTC NO.	DTC DETECTION CONDITION	TROUBLE AREA
C1AEE	Ultrasonic sensor communication bus failure	• Harness or connector • No. 1 ultrasonic sensor (front left side sensor) • No. 1 ultrasonic sensor (front right side sensor) • Parking assist ECU

WIRING DIAGRAM



INSPECTION PROCEDURE

NOTICE:

- When "System initializing" message is displayed on the navigation receiver assembly after the battery terminal disconnected, correct the steering angle neutral point INFO .
- Depending on the parts that are replaced or operations that are performed during vehicle inspection or maintenance, calibration of other systems as well as the advanced parking guidance system may be needed INFO .

PROCEDURE

1.	CHECK HARNESS AND CONNECTOR (PARKING ASSIST ECU - FRONT LEFT SIDE SENSOR)

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PARK ASSIST / MONITORING: ADVANCED PARKING GUIDANCE SYSTEM: C1AEE: APGS Sensor Communication Circuit (2010 Prius)

(a) Disconnect the L64 connector from the parking assist ECU.

(b) Disconnect the C2 connector from the No. 1 ultrasonic sensor (front left side sensor).

(c) Measure the resistance according to the value(s) in the table below.

Standard Resistance:

TESTER CONNECTION	CONDITION	SPECIFIED CONDITION
L64-19 (CSB3) - Body ground	Always	10 kΩ or higher
L64-21 (LIN3) - Body ground	Always	10 kΩ or higher
L64-20 (CSG3) - Body ground	Always	10 kΩ or higher
L64-19 (CSB3) - C2-1 (BI)	Always	Below 1 Ω
L64-21 (LIN3) - C2-3 (SI)	Always	Below 1 Ω
L64-20 (CSG3) - C2-5 (EI)	Always	Below 1 Ω

NG ▶ **REPAIR OR REPLACE HARNESS OR CONNECTOR**

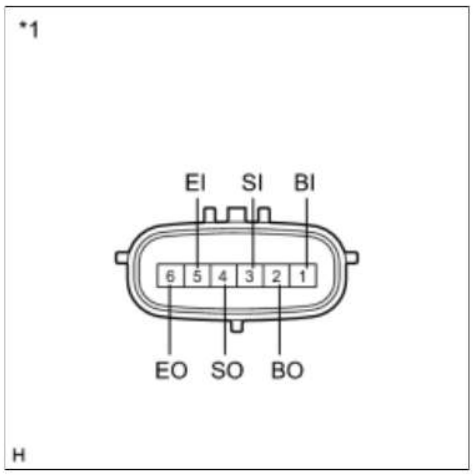
OK ▼

2.	**CHECK NO. 1 ULTRASONIC SENSOR**

(a) Remove the No. 1 ultrasonic sensor (front left side sensor) INFO .

(b) Measure the resistance according to the value(s) in the table below.

Standard Resistance:



TESTER CONNECTION	CONDITION	SPECIFIED CONDITION
1 (BI) - 5 (EI)	Always	10 kΩ or higher
1 (BI) - 2 (BO)	Always	10 kΩ or higher
3 (SI) - 4 (SO)	Always	Below 1 Ω
5 (EI) - 6 (EO)	Always	Below 1 Ω

Text in Illustration

*1	Component without harness connected (No. 1 Ultrasonic Sensor (Front Left Side Sensor))

NG ▶ **REPLACE NO. 1 ULTRASONIC SENSOR (FRONT LEFT SIDE**

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SENSOR)

OK

3.	**CHECK HARNESS AND CONNECTOR (FRONT LEFT SIDE SENSOR - FRONT RIGHT SIDE SENSOR)**

(a) Disconnect the C2 connector from the No. 1 ultrasonic sensor (front left side sensor).

(b) Disconnect the C1 connector from the No. 1 ultrasonic sensor (front right side sensor).

(c) Measure the resistance according to the value(s) in the table below.

Standard Resistance:

TESTER CONNECTION	CONDITION	SPECIFIED CONDITION
C2-2 (BO) - C1-1 (BI)	Always	Below 1 Ω
C2-4 (SO) - C1-3 (SI)	Always	Below 1 Ω
C2-6 (EO) - C1-5 (EI)	Always	Below 1 Ω
C2-2 (BO) - Body ground	Always	10 kΩ or higher
C2-4 (SO) - Body ground	Always	10 kΩ or higher
C2-6 (EO) - Body ground	Always	10 kΩ or higher

NG **REPAIR OR REPLACE HARNESS OR CONNECTOR**

OK

4.	**REPLACE NO. 1 ULTRASONIC SENSOR (FRONT LEFT SIDE SENSOR)** INFO

NEXT

5.	**CHECK DTC OUTPUT**

(a) Clear the DTCs INFO .

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(b) Check for DTCs INFO .

Result:

RESULT	PROCEED TO
DTC C1AEE is output	A
No DTC is output	B

B ▶ **END (FRONT LEFT SIDE SENSOR WAS DEFECTIVE)**

A ▼

6.	**REPLACE NO. 1 ULTRASONIC SENSOR (FRONT RIGHT SIDE SENSOR)** INFO

NEXT ▼

7.	**CHECK DTC OUTPUT**

(a) Clear the DTCs INFO .

(b) Check for DTCs INFO .

Result:

RESULT	PROCEED TO
DTC C1AEE is output	A
No DTC is output	B

B ▶ **END (FRONT RIGHT SIDE SENSOR WAS DEFECTIVE)**

A ▶ **REPLACE PARKING ASSIST ECU**

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DTC	**U0073**	**Control Module Communication Bus Off**

DTC	**U0126**	**Lost Communication with Steering Angle Sensor Module**

DTC	**U0129**	**Lost Communication with Brake System Control Module**

DTC	**U0131**	**Lost Communication with Power Steering Control Module**

DTC	**U0140**	**Lost Communication with Main Body ECU**

DTC	**U0293**	**Lost Communication with HV ECU**

DESCRIPTION

These DTCs are stored if there is a malfunction in the CAN communication system connected to the parking assist ECU.

HINT:

If CAN communication system DTCs are stored, they may also be stored in other systems.

DTC NO.	DTC DETECTION CONDITION	TROUBLE AREA
U0073	Control module communication bus off	CAN communication system
U0126	Lost communication with steering angle sensor	
U0129	Lost communication with brake system	
U0131	Lost communication with power steering control module	
U0140	Lost communication with main body ECU (multiplex network body ECU)	
U0293	Lost communication with HV ECU	

INSPECTION PROCEDURE

PROCEDURE

1.	**CHECK DTC OUTPUT**

(a) Clear the DTCs INFO .

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(b) Check for DTCs INFO .

Result:

RESULT	PROCEED TO
DTC is output	A
No DTC is output	B

HINT:

- If CAN communication system DTCs are stored, they may also be stored in other systems.
- If the CAN communication system has been inspected and repaired in other systems, the DTCs will not be output when rechecking for DTCs.
- If these DTCs are output frequently, duplicate the conditions that cause the problem symptoms and perform the inspection again, even though the DTC was not output when rechecking for DTCs INFO .

B ▶ **USE SIMULATION METHOD TO CHECK**

A ▶ **GO TO CAN COMMUNICATION SYSTEM**

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DTC	**U1000**	**Can Communication Failure(Message Registry)**

DESCRIPTION

This DTC is stored when the parking assist ECU judges that it has an internal CAN malfunction.

DTC NO.	DTC DETECTION CONDITION	TROUBLE AREA
U1000	CAN communication failure (message registry)	Parking assist ECU

INSPECTION PROCEDURE

PROCEDURE

1.	**CHECK DTC OUTPUT**

(a) Clear the DTCs INFO .

(b) Check for DTCs INFO .

Result:

RESULT	PROCEED TO
DTC U1000 is output	A
No DTC is output	B

HINT:

- If the DTC is not output again when rechecking for DTCs, it may have been stored due to a temporary CAN malfunction.
- If DTC U1000 is output frequently, duplicate the problem symptoms and perform the inspection again, even though the DTC is not output when rechecking for DTCs INFO .

B ▶ USE SIMULATION METHOD TO CHECK

A ▶ REPLACE PARKING ASSIST ECU

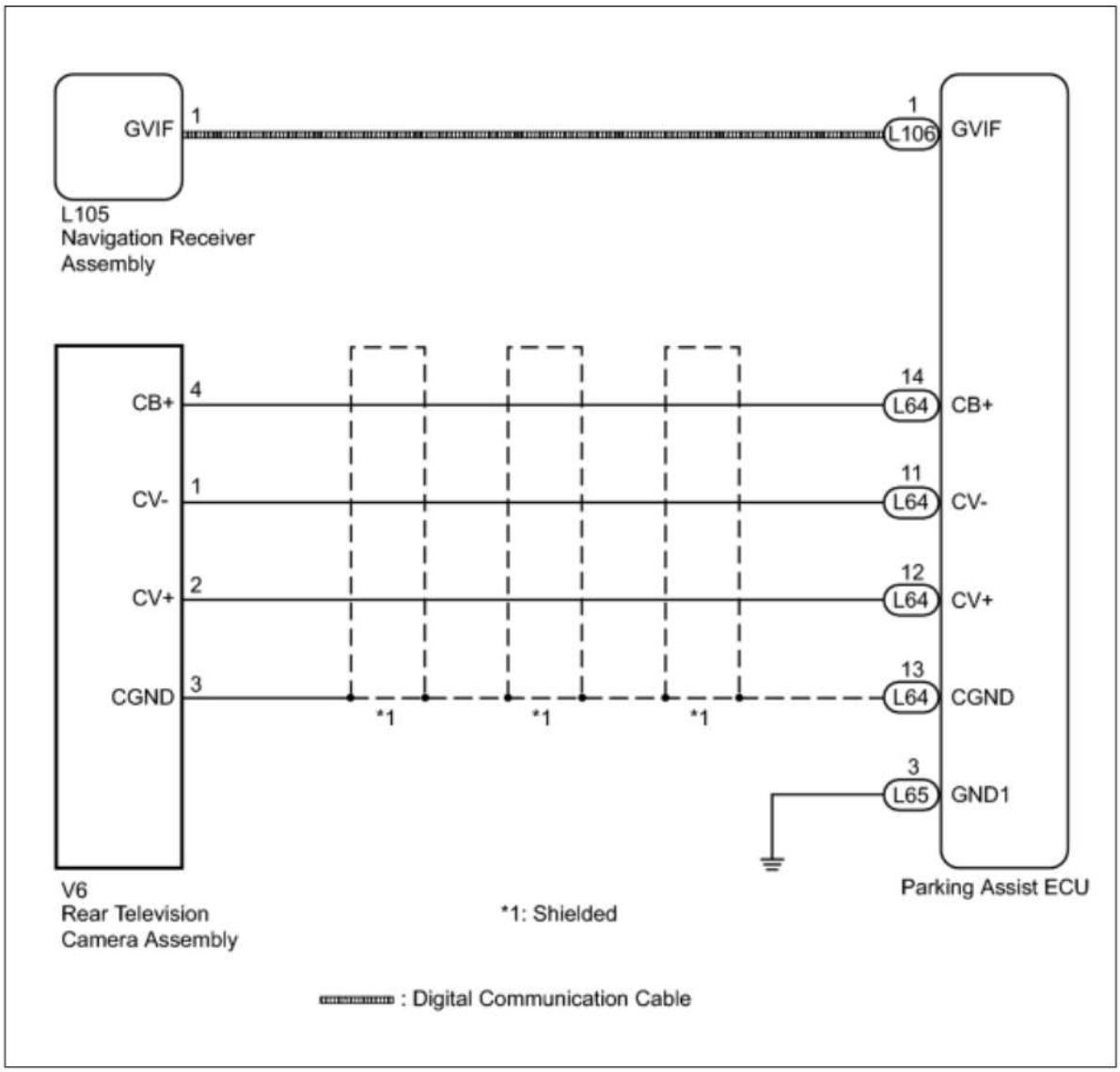
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Image from Camera for Advanced Parking Guidance is Abnormal

DESCRIPTION

The display signal from the rear television camera assembly is transmitted to the navigation receiver assembly via the parking assist ECU.

WIRING DIAGRAM



INSPECTION PROCEDURE

NOTICE:

- When "System initializing" message is displayed on the navigation receiver assembly after the battery terminal disconnected, correct the steering angle neutral point INFO .
- Depending on the parts that are replaced or operations that are performed during vehicle inspection or maintenance, calibration of other systems as well as the advanced parking guidance system may be needed INFO .

HINT:

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PARK ASSIST / MONITORING: ADVANCED PARKING GUIDANCE SYSTEM: Image from Camera for Advanced Parking Guidance is Abnormal (...

Images are difficult to discern even in normal conditions if:

- Noise may occur in the image depending on electrical devices used in the cabin.
- Noise may occur in the image if the outer mirror switch assembly is operated.
- Noise may occur in the image if accessories that generate radio waves have been installed.
- The camera screen is frosted over (the image immediately after turning the power switch on (IG) may be blurred or darker than normal).
- The camera lens is dirty with snow, mud, etc.
- A strong beam of light, such as a sunbeam or headlight, hits the camera.
- It is too dark around the camera (at night etc.).
- The ambient temperature around the camera is either too high or too low.
- The vehicle is tilted at a steep angle.
- The ambience of the camera is too bright. (When a strong light, such as a sunbeam reflected off the vehicle body, hits the camera, the image may be blurred. This is called the "SMEAR" phenomenon, peculiar to the CCD camera.)

PROCEDURE

1.	CHECK HARNESS AND CONNECTOR (PARKING ASSIST ECU - REAR TELEVISION CAMERA) INFO

NG ▶ REPAIR OR REPLACE HARNESS OR CONNECTOR

OK ▼

2.	CHECK PARKING ASSIST ECU (CV-, CGND) INFO

NG ▶ REPLACE PARKING ASSIST ECU

OK ▼

3.	CHECK REAR TELEVISION CAMERA ASSEMBLY (CB+, CGND) INFO

NG ▶ REPLACE PARKING ASSIST ECU

OK ▼

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4.	**CHECK PARKING ASSIST ECU (CV+, GND1)** INFO

NG ▶ **REPLACE REAR TELEVISION CAMERA ASSEMBLY**

OK ▼

5.	**READ VALUE USING TECHSTREAM**

(a) Connect the Techstream to the DLC3.

(b) Turn the power switch on (IG).

(c) Turn the Techstream on.

(d) Enter the following menus: Chassis / Advanced Parking Guidance System / Data List.

(e) Check the Data List for proper functioning of the following items.

Advanced Parking Guidance System

TESTER DISPLAY	MEASUREMENT ITEM/RANGE	NORMAL CONDITION	DIAGNOSTIC NOTE
AISIC Output Status	Output condition of camera display/OK or NG	OK: Output condition of camera display is normal NG: Output condition of camera display is abnormal	-

NG ▶ **REPLACE PARKING ASSIST ECU**

OK ▼

6.	**CHECK DIGITAL COMMUNICATION CABLE CONNECTOR**

(a) Check the digital communication cable connectors.

(1) Check the digital communication cable connectors between the parking assist ECU and navigation receiver assembly for any connection problems INFO .

(b) Check if the same malfunction recurs when the advanced parking guidance screen is displayed.

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Result:

RESULT	PROCEED TO
Malfunction does not reoccur (returns to normal)	A
Malfunction reoccurs	B

B ▶ **REPLACE WIRE HARNESS (DIGITAL COMMUNICATION CABLE)**

A ▶ **END**

7.	REPLACE WIRE HARNESS (DIGITAL COMMUNICATION CABLE)

(a) Replace the digital communication cable between the parking assist ECU and navigation receiver assembly with a new one.

(b) Check if the same malfunction recurs when the advanced parking guidance screen is displayed.

Result:

RESULT	PROCEED TO
Malfunction does not reoccur (returns to normal)	A
Malfunction reoccurs	B

B ▶ **REPLACE NAVIGATION RECEIVER ASSEMBLY**

A ▶ **END**

8.	REPLACE NAVIGATION RECEIVER ASSEMBLY

(a) Replace the navigation receiver assembly with a new or normally functioning one INFO .

(b) Check if the same malfunction recurs when the advanced parking guidance screen is displayed.

Result:

RESULT	PROCEED TO
Malfunction does not reoccur	A
Malfunction reoccurs	B

B ▶ **PROCEED TO NEXT SUSPECTED AREA SHOWN IN PROBLEM SYMPTOMS TABLE**

A ▶ **END**

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PARK ASSIST / MONITORING: ADVANCED PARKING GUIDANCE SYSTEM: Vehicle does not Move to Set Parking Position (2010 Prius)

Vehicle does not Move to Set Parking Position

INSPECTION PROCEDURE

NOTICE:

- When "System initializing" message is displayed on the navigation receiver assembly after the battery terminal disconnected, correct the steering angle neutral point INFO .
- Depending on the parts that are replaced or operations that are performed during vehicle inspection or maintenance, calibration of other systems as well as the advanced parking guidance system may be needed INFO .
- If initialization is necessary while performing an inspection, perform initialization first and then proceed to the next step.

PROCEDURE

1.	**CHECK TIRE SIZE**

(a) Check that the tire pressure and tire size are as specified. Check that there is no excessive wear on the tires.

Result:

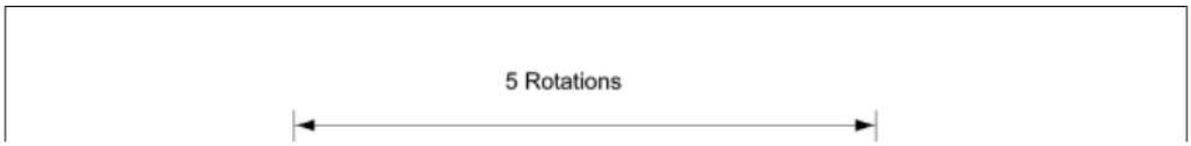
RESULT	PROCEED TO
Tire size is as specified and there is no excessive wear	A
Tire size is as specified but there is excessive wear	B
Tire size is not as specified but there is no excessive wear	A
Tire size is not as specified and there is excessive wear	B
Tire size is totally different from specified size	B

B ▶ **REPLACE TIRES**

A ▼

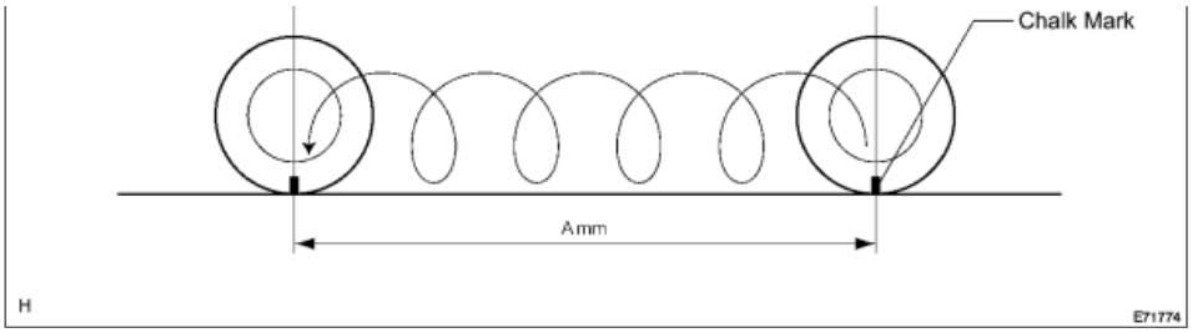
2.	**CHECK TIRE ROTATION**

(a) Check tire movement distance.



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PARK ASSIST / MONITORING: ADVANCED PARKING GUIDANCE SYSTEM: Vehicle does not Move to Set Parking Position (2010 Prius)



(1) On a level surface, center the steering wheel and stop the vehicle.

(2) Apply chalk to a point on the tire and on the ground.

(3) Drive the vehicle straight ahead, and stop the vehicle after the tire rotates 5 times.

(4) Mark the vehicle stop position on the ground, and measure the movement distance A mm (ft.). Check that the measured distance is within the standard range.

Standard:
9582 to 9776 mm (31.44 to 32.07 ft.)

NG ▶ **REPLACE TIRES**

OK ▼

3.	**CHECK SYMPTOMS**

(a) Parallel parking

(1) Move the vehicle to a level surface area with parking spaces.

(2) Using the advanced parking guidance system, perform parallel parking. Check how the vehicle deviates from the set parking position.

HINT:

Begin the check with the vehicle at a 45° angle to the parking space. Perform the check from the right and left side of the parking space.

(3) Select a case below that is most similar to the problem, and follow the instructions.

(b) Deviation examples

(1) Case 1



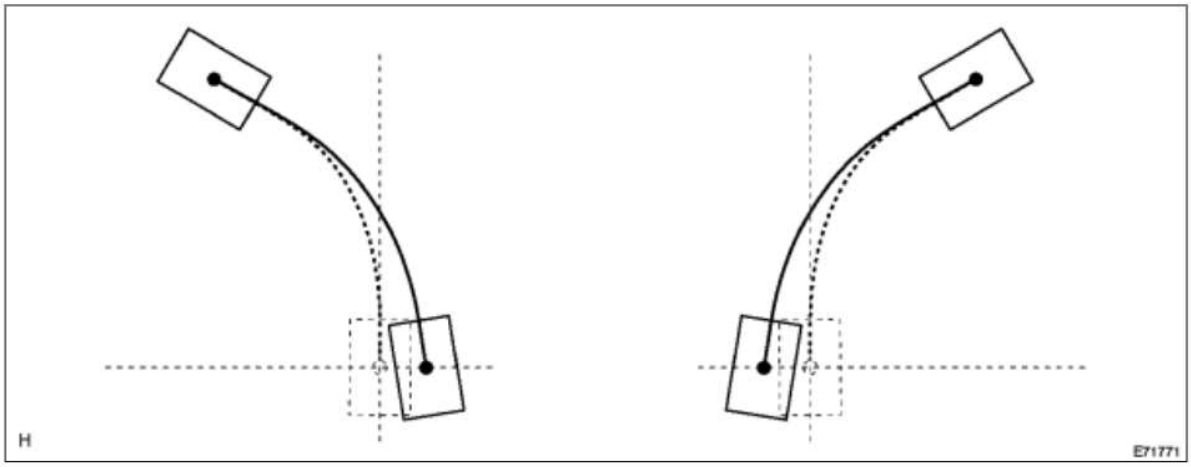
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PARK ASSIST / MONITORING: ADVANCED PARKING GUIDANCE SYSTEM: Vehicle does not Move to Set Parking Position (2010 Prius)



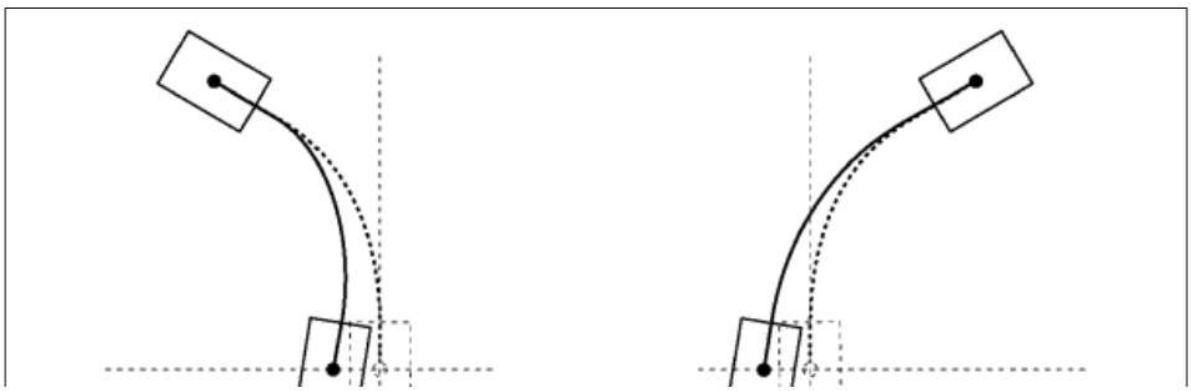
CASE	TYPE OF DEVIATION	CAUSE	PROCEED TO
1	Vehicle deviates toward inner side (steering wheel is turned too much)	• Actual turning radius is small • Television camera adjustment value deviated	A

(2) Case 2



CASE	TYPE OF DEVIATION	CAUSE	PROCEED TO
2	Vehicle deviates toward outer side (steering wheel is turned too little)	• Actual turning radius is large • Television camera adjustment value deviated	B

(3) Case 3

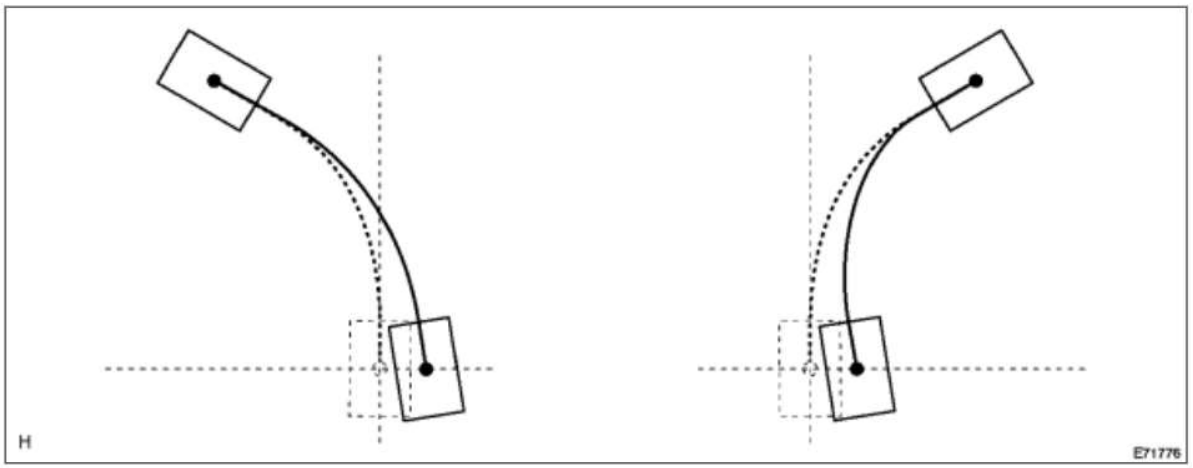


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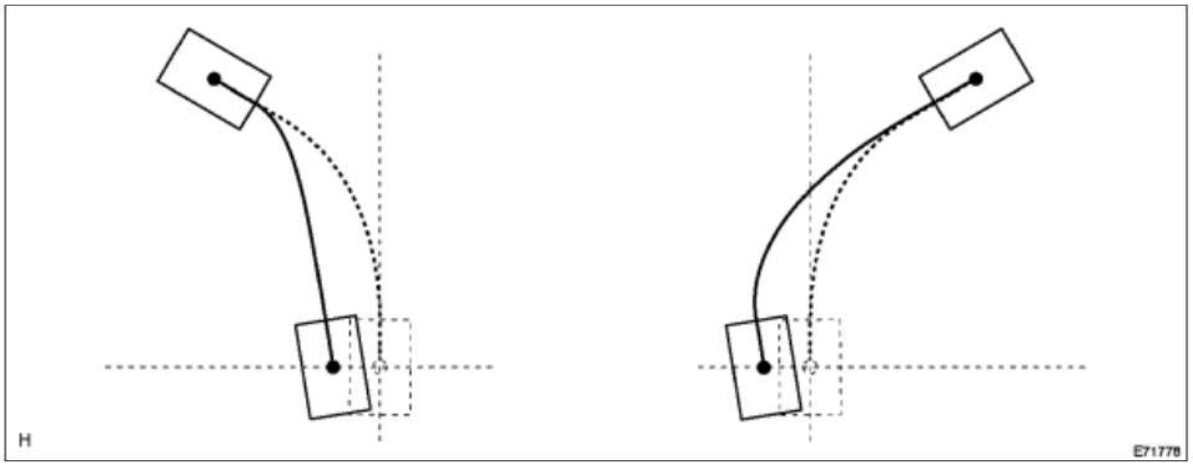
CASE	TYPE OF DEVIATION	CAUSE	PROCEED TO
3	Regardless of side in which parking is performed, vehicle front deviates to right	• Steering angle memorized value deviated • Television camera adjustment value deviated	C

(4) Case 4



CASE	TYPE OF DEVIATION	CAUSE	PROCEED TO
4	Regardless of side in which parking is performed, vehicle front deviates to left	• Steering angle memorized value deviated • Television camera adjustment value deviated	C

(5) Case 5

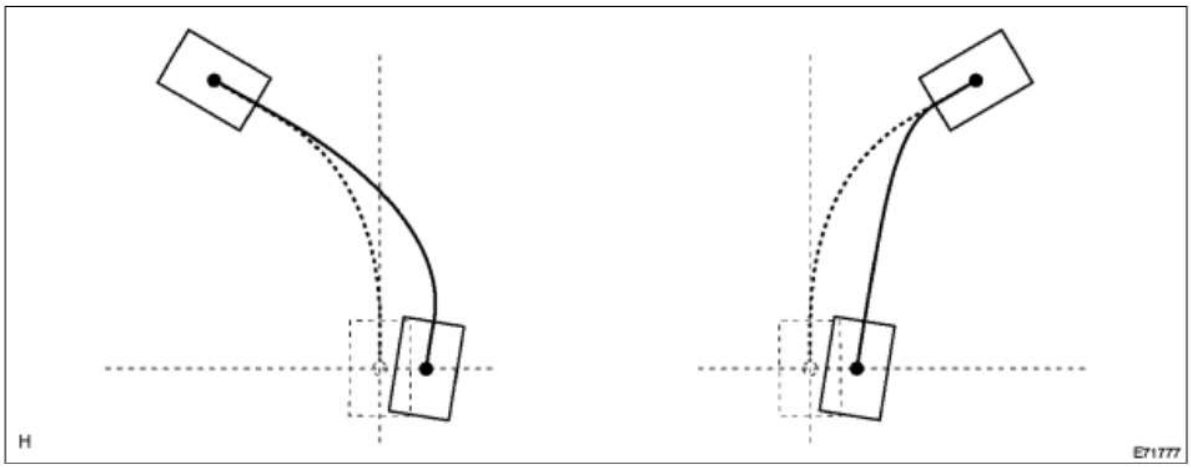


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PARK ASSIST / MONITORING: ADVANCED PARKING GUIDANCE SYSTEM: Vehicle does not Move to Set Parking Position (2010 Prius)

CASE	TYPE OF DEVIATION	CAUSE	PROCEED TO
5	Regardless of side in which parking is performed, entire vehicle deviates to left	• Steering angle memorized value deviated • Television camera adjustment value deviated	C

(6) Case 6



CASE	TYPE OF DEVIATION	CAUSE	PROCEED TO
6	Regardless of side in which parking is performed, entire vehicle deviates to right	• Steering angle memorized value deviated • Television camera adjustment value deviated	C

C ▶ **ADJUST SETTINGS (STEERING ANGLE SETTING)**

B ▶ **CHECK FRONT WHEEL ALIGNMENT**

A

4.	**ADJUST SETTINGS (HEIGHT SET AND CAMERA POSITION SETTING)**

(a) Perform the height control sensor vehicle height difference setting INFO .

(b) Perform the rear television camera optical axis adjustment INFO .

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(c) Check deviation

(1) Operate the advanced parking guidance system and check if the malfunction reoccurs.

OK:
Returns to normal

NG ▶ **CHECK FRONT WHEEL ALIGNMENT**

OK ▶ **END**

5.	CHECK FRONT WHEEL ALIGNMENT

(a) Perform the front wheel alignment inspection INFO .

HINT:

For alignment inspection, follow the toe-in and camber specifications.

Standard:
Returns to normal

HINT:

For alignment adjustment, follow the toe-in and camber specifications.

NG ▶ **ADJUST FRONT WHEEL ALIGNMENT**

OK ▼

6.	CHECK REAR WHEEL ALIGNMENT

(a) Perform the rear wheel alignment inspection INFO .

HINT:

For alignment inspection, follow the toe-in and camber specifications.

Standard:
Returns to normal

HINT:

For alignment adjustment, follow the toe-in and camber specifications.

NG ▶ **ADJUST REAR WHEEL ALIGNMENT**

OK ▶ **REPLACE PARKING ASSIST ECU**

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PARK ASSIST / MONITORING: ADVANCED PARKING GUIDANCE SYSTEM: Vehicle does not Move to Set Parking Position (2010 Prius)

7.	CHECK FRONT WHEEL ALIGNMENT

(a) Perform the front wheel alignment inspection INFO .

HINT:

For alignment inspection, follow the toe-in and camber specifications.

Standard:
Returns to normal

HINT:

For alignment adjustment, follow the toe-in and camber specifications.

NG ▶ **ADJUST FRONT WHEEL ALIGNMENT**

OK ▼

8.	CHECK REAR WHEEL ALIGNMENT

(a) Perform the rear wheel alignment inspection INFO .

HINT:

For alignment inspection, follow the toe-in and camber specifications.

Standard:
Returns to normal

HINT:

For alignment adjustment, follow the toe-in and camber specifications.

NG ▶ **ADJUST REAR WHEEL ALIGNMENT**

OK ▼

9.	ADJUST SETTINGS (HEIGHT SET AND CAMERA POSITION SETTING)

(a) Perform the height control sensor vehicle height difference setting INFO .

(b) Perform the rear television camera optical axis adjustment INFO

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(b) Perform the rear television camera optical axis adjustment .

(c) Check deviation

(1) Operate the advanced parking guidance system and check if the malfunction reoccurs.

OK:

Returns to normal

NG ▶ **REPLACE PARKING ASSIST ECU**

OK ▶ **END**

10.	ADJUST SETTINGS (STEERING ANGLE SETTING)

(a) Perform the steering angle setting INFO .

(b) Check deviation

(1) Operate the advanced parking guidance system and check if the malfunction reoccurs.

OK:

Returns to normal

NG ▶ **ADJUST SETTINGS (HEIGHT SET AND CAMERA POSITION SETTING)**

OK ▶ **END**

11.	ADJUST SETTINGS (HEIGHT SET AND CAMERA POSITION SETTING)

(a) Perform the height control sensor vehicle height difference setting INFO .

(b) Perform the rear television camera optical axis adjustment INFO .

(c) Check deviation

(1) Operate the advanced parking guidance system and check if the malfunction reoccurs.

OK:

Returns to normal

NG ▶ **CHECK FRONT WHEEL ALIGNMENT**

OK ▶ **END**

12.	CHECK FRONT WHEEL ALIGNMENT

(a) Perform the front wheel alignment inspection INFO .

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PARK ASSIST / MONITORING: ADVANCED PARKING GUIDANCE SYSTEM: Vehicle does not Move to Set Parking Position (2010 Prius)

HINT:

For alignment inspection, follow the toe-in and camber specifications.

Standard:
Returns to normal

HINT:

For alignment adjustment, follow the toe-in and camber specifications.

NG ▶ **ADJUST FRONT WHEEL ALIGNMENT**

OK ▼

13.	CHECK REAR WHEEL ALIGNMENT

(a) Perform the rear wheel alignment inspection INFO .

HINT:

For alignment inspection, follow the toe-in and camber specifications.

Standard:
Returns to normal

HINT:

For alignment adjustment, follow the toe-in and camber specifications.

NG ▶ **ADJUST REAR WHEEL ALIGNMENT**

OK ▶ **REPLACE PARKING ASSIST ECU**

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PARK ASSIST / MONITORING: ADVANCED PARKING GUIDANCE SYSTEM: "CHK" message(s) are displayed on the SIGNAL CHECK screen. ...

"CHK" message(s) are displayed on the SIGNAL CHECK screen.

DESCRIPTION

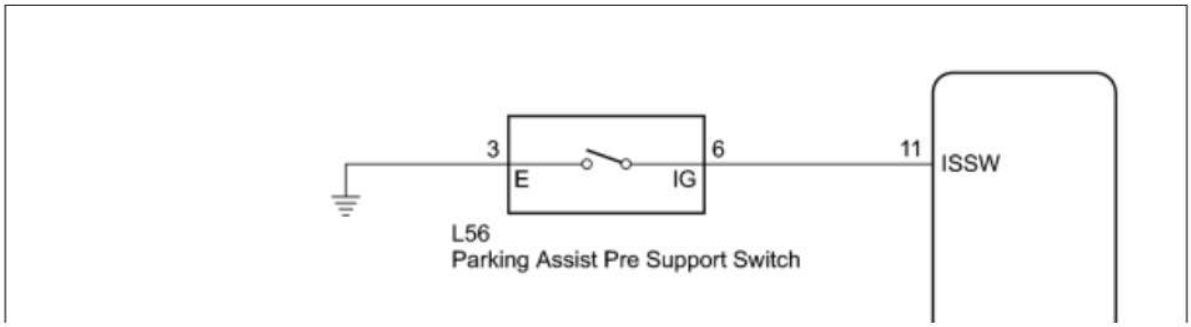
On the SIGNAL CHECK screen, it is possible to check if the state of signals sent to the parking assist ECU is normal INFO .

HINT:

- On the SIGNAL CHECK screen, "OK" (blue) is displayed for items with a normal inspection result or input state.
- On the SIGNAL CHECK screen, "CHK" (red) is displayed for items with an abnormal inspection result or input state.
- Displayed items may differ depending on vehicle specifications.

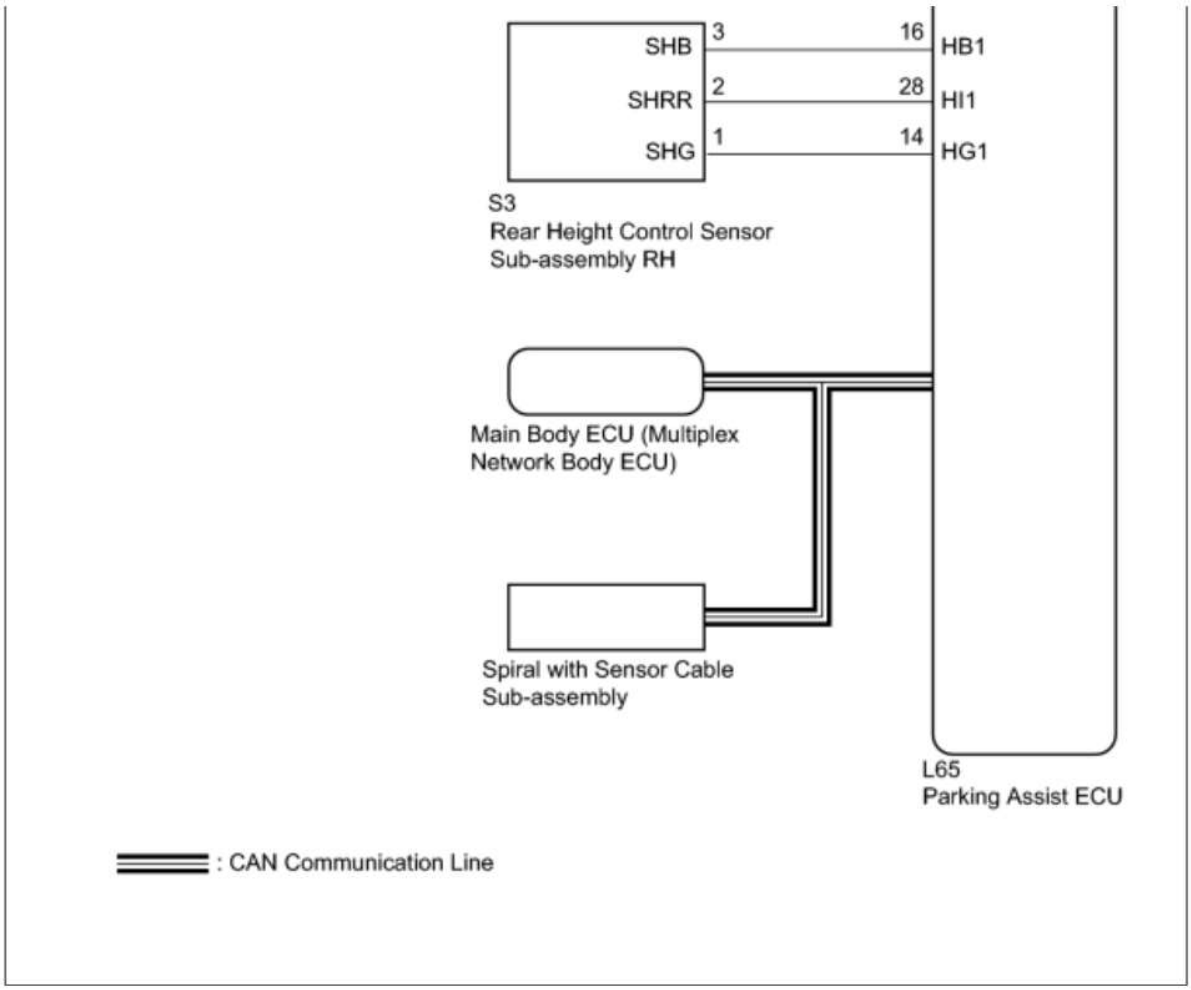
ITEM	SIGNAL INPUT METHOD	DETAIL	DTC OUTPUT WHEN ABNORMAL RESULT IS DISPLAYED	SIGNAL RECEIVER
CAN	CAN communication	CAN communication condition	DTC is output	-
IPA SW	Vehicle wire harness	Parking assist pre support switch signal input	DTC is not output	Parking assist pre support switch
BCTY	CAN communication	CAN communication condition with main body ECU (multiplex network body ECU)	DTC is output	Main body ECU (multiplex network body ECU)
EPS TYPE	-	Brush information for EPS currently selected at individual setting screen	DTC is not output	-
HT SENS	Vehicle wire harness	Height control sensor signal input	DTC is output	Rear height control sensor sub-assembly RH
HT INIT	-	Height control sensor vehicle height difference setting status	DTC is output	-
STR	CAN communication	Steering angle sensor signal input	DTC is output	Spiral with sensor cable sub-assembly
HANDLE	CAN communication	Steering position signal input	DTC is output	Main body ECU (multiplex network body ECU)

WIRING DIAGRAM



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PARK ASSIST / MONITORING: ADVANCED PARKING GUIDANCE SYSTEM: "CHK" message(s) are displayed on the SIGNAL CHECK screen. ...



INSPECTION PROCEDURE

NOTICE:

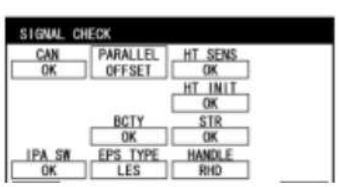
- When "System initializing" message is displayed on the navigation receiver assembly after the battery terminal disconnected, correct the steering angle neutral point INFO .
- Depending on the parts that are replaced or operations that are performed during vehicle inspection or maintenance, calibration of other systems as well as the advanced parking guidance system may be needed INFO .

PROCEDURE

1.	**CHECK DISPLAY CHECK MODE**

(a) Check which items display "CHK" (red) on the SIGNAL CHECK screen.

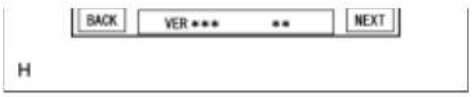
Result:



RESULT	PROCEED TO
"IPA SW" displays "CHK" (red).	A
"HT INIT" displays "CHK" (red).	B

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PARK ASSIST / MONITORING: ADVANCED PARKING GUIDANCE SYSTEM: "CHK" message(s) are displayed on the SIGNAL CHECK screen. ...



Both "HT SENS" and "HT INIT" display "CHK" (red).	C
Any of "CAN", "BCTY", "STR" and "HANDLE" displays "CHK" (red).	C

C ▶ **CHECK DTC OUTPUT**

B ▶ **ADJUST HEIGHT CONTROL SENSOR VEHICLE HEIGHT DIFFERENCE SETTING**

A ▼

2.	**CHECK HARNESS AND CONNECTOR (PARKING ASSIST ECU - PARKING ASSIST PRE SUPPORT SWITCH)**

(a) Disconnect the L65 connector from the parking assist ECU.

(b) Disconnect the L56 connector from the parking assist pre support switch.

(c) Measure the resistance according to the value(s) in the table below.

Standard Resistance:

TESTER CONNECTION	CONDITION	SPECIFIED CONDITION
L65-11 (ISSW) - L56-6 (IG)	Always	Below 1 Ω

NG ▶ **REPAIR OR REPLACE HARNESS OR CONNECTOR**

OK ▼

3.	**INSPECT PARKING ASSIST PRE SUPPORT SWITCH**

(a) Remove the parking assist pre support switch INFO .

(b) Measure the resistance according to the value(s) in the table below.

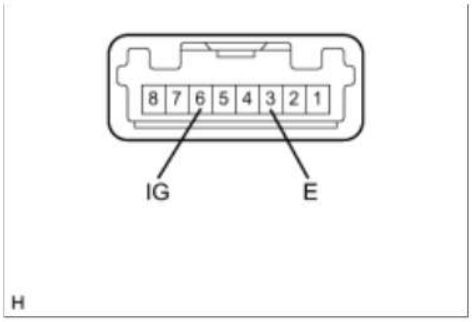
Standard Resistance:

*1

TESTER CONNECTION	CONDITION	SPECIFIED CONDITION
	Parking assist pre support switch	

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PARK ASSIST / MONITORING: ADVANCED PARKING GUIDANCE SYSTEM: "CHK" message(s) are displayed on the SIGNAL CHECK screen. ...



3 (E) - 6 (IG)	Parking assist pre support switch pushed in	Below 1 Ω
	Parking assist pre support switch not pushed	10 kΩ or higher

Text in Illustration

*1	Component without harness connected (Parking Assist Pre Support Switch)

NG ▶ **REPLACE PARKING ASSIST PRE SUPPORT SWITCH**

OK ▶ **REPLACE PARKING ASSIST ECU**

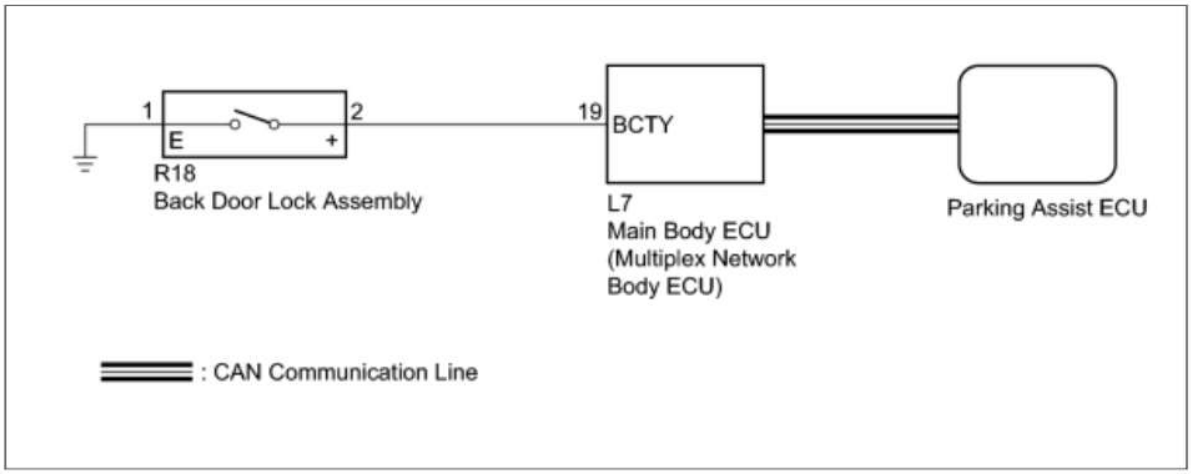
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Message indicating Back Door is Open is Displayed even after Back Door is Closed

DESCRIPTION

The parking assist ECU receives back door lock assembly open/close signals from the main body ECU (multiplex network body ECU) via CAN communication. When the back door is open, the camera aiming cannot be adjusted correctly because the rear television camera assembly is installed on the back door. Therefore, when adjusting the camera aiming calibration while the back door is open, a back door open warning message will be displayed on the screen and camera aiming adjustment will be canceled.

WIRING DIAGRAM



INSPECTION PROCEDURE

NOTICE:

- When "System initializing" message is displayed on the navigation receiver assembly after the battery terminal disconnected, correct the steering angle neutral point INFO .
- Depending on the parts that are replaced or operations that are performed during vehicle inspection or maintenance, calibration of other systems as well as the advanced parking guidance system may be needed INFO .

PROCEDURE

1.	**READ VALUE USING TECHSTREAM**

(a) Connect the Techstream to the DLC3.

(b) Turn the power switch on (IG).

(c) Turn the Techstream on.

(d) Enter the following menus: Body / Main Body / Data List.

(e) Check the Data List for proper functioning of the following item.

Main Body (Main Body ECU (Multiplex Network Body ECU))

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TESTER DISPLAY	MEASUREMENT ITEM/RANGE	NORMAL CONDITION	DIAGNOSTIC NOTE
Back Door Courtesy SW	Back door courtesy switch signal/ON or OFF	ON: Back door open OFF: Back door closed	-

OK:

The back door courtesy switch functions as specified in the normal condition column.

NG ▶ **CHECK HARNESS AND CONNECTOR (MAIN BODY ECU - BACK DOOR LOCK)**

OK ▶ **REPLACE PARKING ASSIST ECU**

2.	CHECK HARNESS AND CONNECTOR (MAIN BODY ECU - BACK DOOR LOCK)

(a) Disconnect the L7 connector from the main body ECU (multiplex network body ECU).

(b) Disconnect the R18 connector from the back door lock assembly.

(c) Measure the resistance according to the value(s) in the table below.

Standard Resistance:

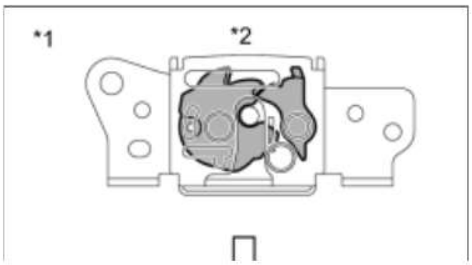
TESTER CONNECTION	CONDITION	SPECIFIED CONDITION
L7-19 (BCTY) - R18-2 (+)	Always	Below 1 Ω
L7-19 (BCTY) - Body ground	Always	10 kΩ or higher
R18-1 (E) - Body ground	Always	Below 1 Ω

NG ▶ **REPAIR OR REPLACE HARNESS OR CONNECTOR**

OK ▼

3.	INSPECT BACK DOOR LOCK ASSEMBLY

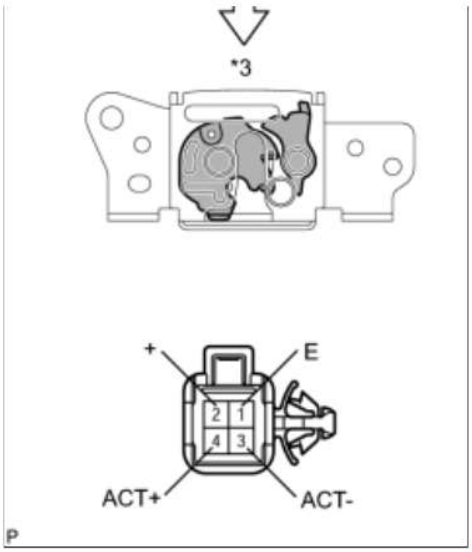
(a) Remove the back door lock assembly INFO .



(b) Check the operation of the door lock motor.

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PARK ASSIST / MONITORING: ADVANCED PARKING GUIDANCE SYSTEM: Message indicating Back Door is Open is Displayed even after Bac...



(1) Move the door lock to the lock position.

(2) Apply battery voltage to the door lock motor and check the operation of the door lock motor.

CONNECTION	RESULT
Battery positive (+) → 4 (ACT+) Battery negative (-) → 3 (ACT-)	Unlocks

(c) Check operation of the door courtesy switch.

(1) Measure the resistance according to the value(s) in the table below.

Standard Resistance:

MEASUREMENT CONDITION	CONDITION	SPECIFIED CONDITION
1 (E) - 2 (+)	Locked	10 kΩ or higher
1 (E) - 2 (+)	Unlocked	Below 1 Ω

Text in Illustration

*1	Component without harness connected (Back Door Lock Assembly)
*2	Lock
*3	Unlock

NG ▶ **REPLACE BACK DOOR LOCK ASSEMBLY**

OK ▶ **REPLACE MAIN BODY ECU (MULTIPLEX NETWORK BODY ECU)**

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ECU Power Source Circuit

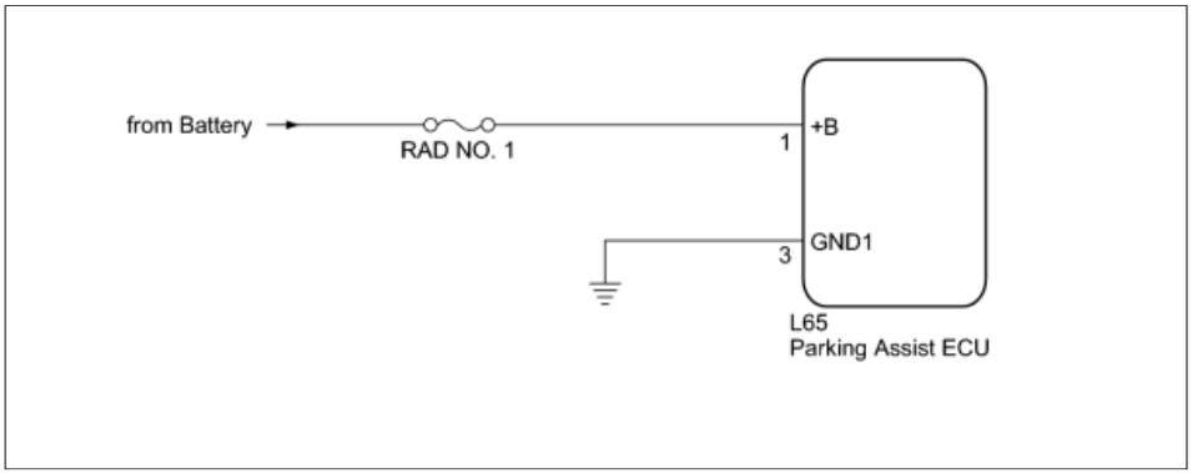
DESCRIPTION

This circuit is the power source circuit to operate the parking assist ECU. The parking assist ECU controls the advanced parking guidance system.

HINT:

- The parking assist ECU is connected to other ECUs via CAN communication or AVC-LAN communication.
- If the parking assist ECU does not operate due to a power source problem, a navigation system DTC may be stored due to an AVC-LAN communication interruption.
- If the parking assist ECU does not operate due to a power source problem, other system DTCs may be stored due to a CAN communication interruption.

WIRING DIAGRAM



INSPECTION PROCEDURE

PROCEDURE

1.	**CHECK HARNESS AND CONNECTOR (PARKING ASSIST ECU - BATTERY AND BODY GROUND)**

(a) Disconnect the L65 connector from the parking assist ECU.

(b) Measure the resistance according to the value(s) in the table below.

Standard Resistance:

TESTER CONNECTION	CONDITION	SPECIFIED CONDITION
L65-3 (GND1) - Body ground	Always	Below 1 Ω

(c) Measure the voltage according to the value(s) in the table below.

Standard Voltage:

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PARK ASSIST / MONITORING: ADVANCED PARKING GUIDANCE SYSTEM: ECU Power Source Circuit (2010 Prius)

TESTER CONNECTION	CONDITION	SPECIFIED CONDITION
L65-1 (+B) - L65-3 (GND1)	Always	11 to 14 V

NG ▶ **REPAIR OR REPLACE HARNESS OR CONNECTOR**

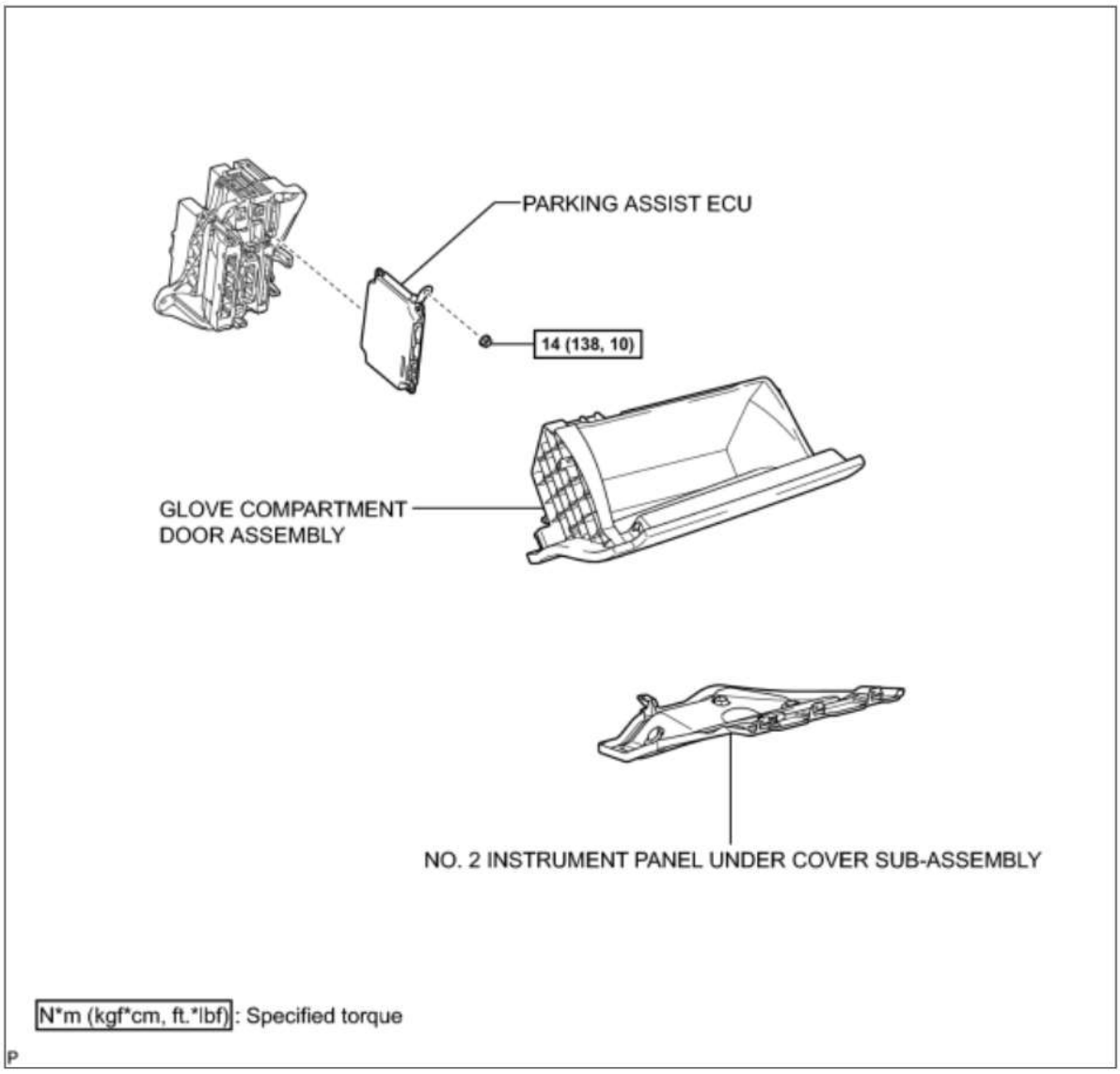
OK ▶ **PROCEED TO NEXT SUSPECTED AREA SHOWN IN PROBLEM SYMPTOMS TABLE**

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PARK ASSIST / MONITORING: PARKING ASSIST ECU: COMPONENTS (2010 Prius)

COMPONENTS

ILLUSTRATION



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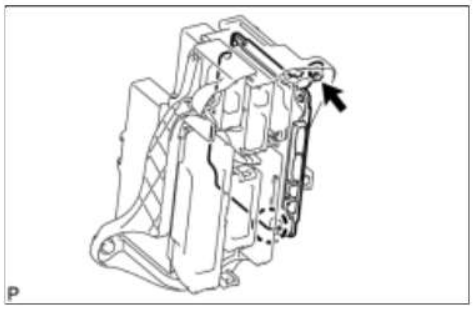
PARK ASSIST / MONITORING: PARKING ASSIST ECU: REMOVAL (2010 Prius)

REMOVAL

1. REMOVE NO. 2 INSTRUMENT PANEL UNDER COVER SUB-ASSEMBLY INFO

2. REMOVE GLOVE COMPARTMENT DOOR ASSEMBLY INFO

3. REMOVE PARKING ASSIST ECU



(a) Remove the nut.

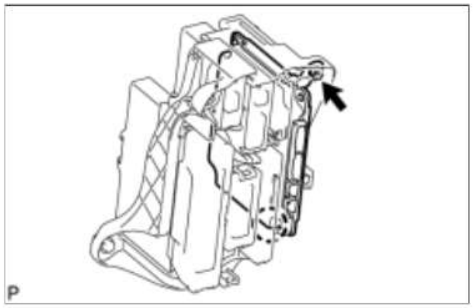
(b) Disengage the claw and remove the parking assist ECU.

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PARK ASSIST / MONITORING: PARKING ASSIST ECU: INSTALLATION (2010 Prius)

INSTALLATION

1. INSTALL PARKING ASSIST ECU



(a) Engage the claw to install the parking assist ECU.

(b) Install the nut.

Torque: 14 N·m (138 kgf·cm, 10ft·lbf)

2. INSTALL GLOVE COMPARTMENT DOOR ASSEMBLY INFO

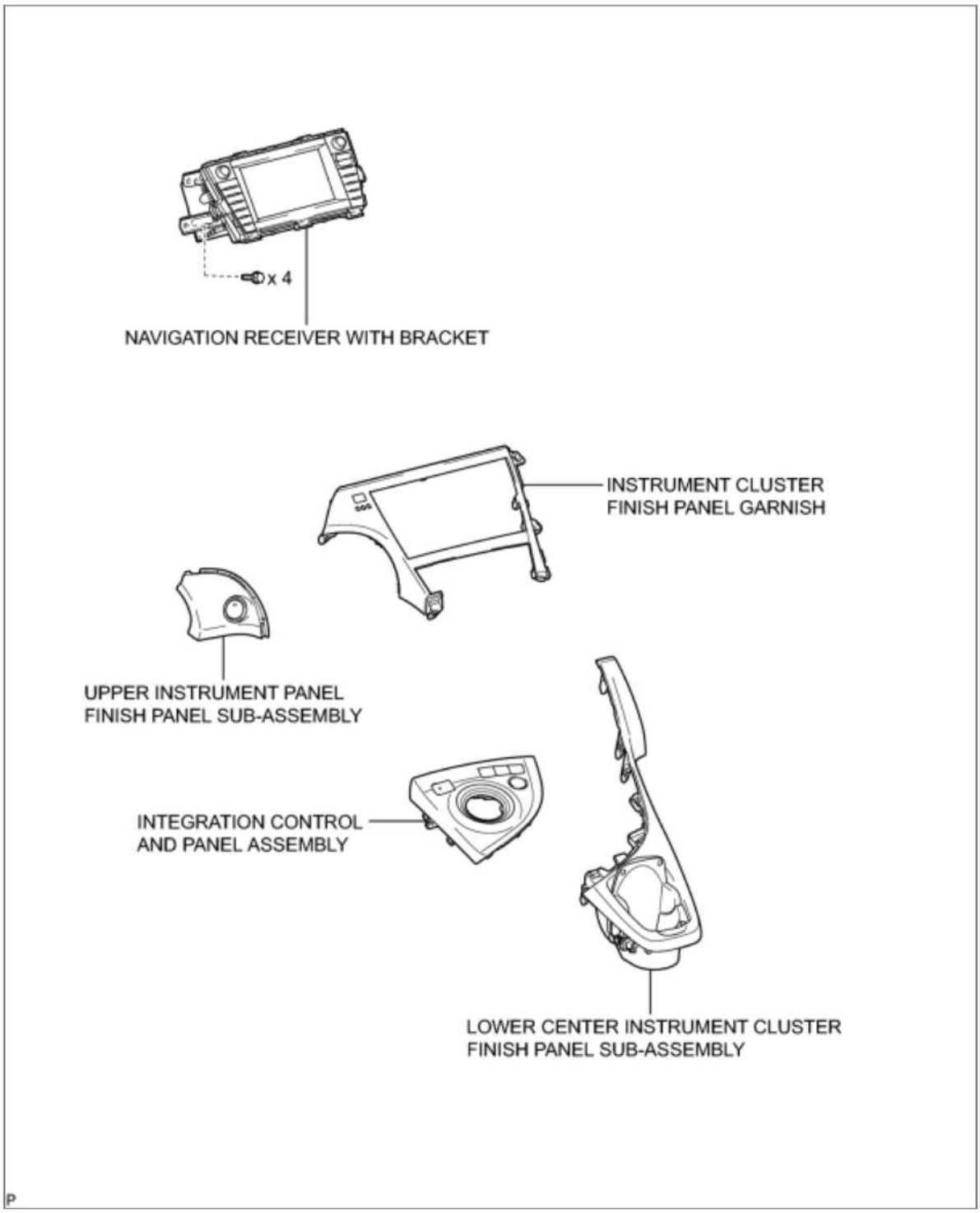
3. INSTALL NO. 2 INSTRUMENT PANEL UNDER COVER SUB-ASSEMBLY INFO

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PARK ASSIST / MONITORING: PARKING ASSIST PRE SUPPORT SWITCH: COMPONENTS (2010 Prius)

COMPONENTS

ILLUSTRATION

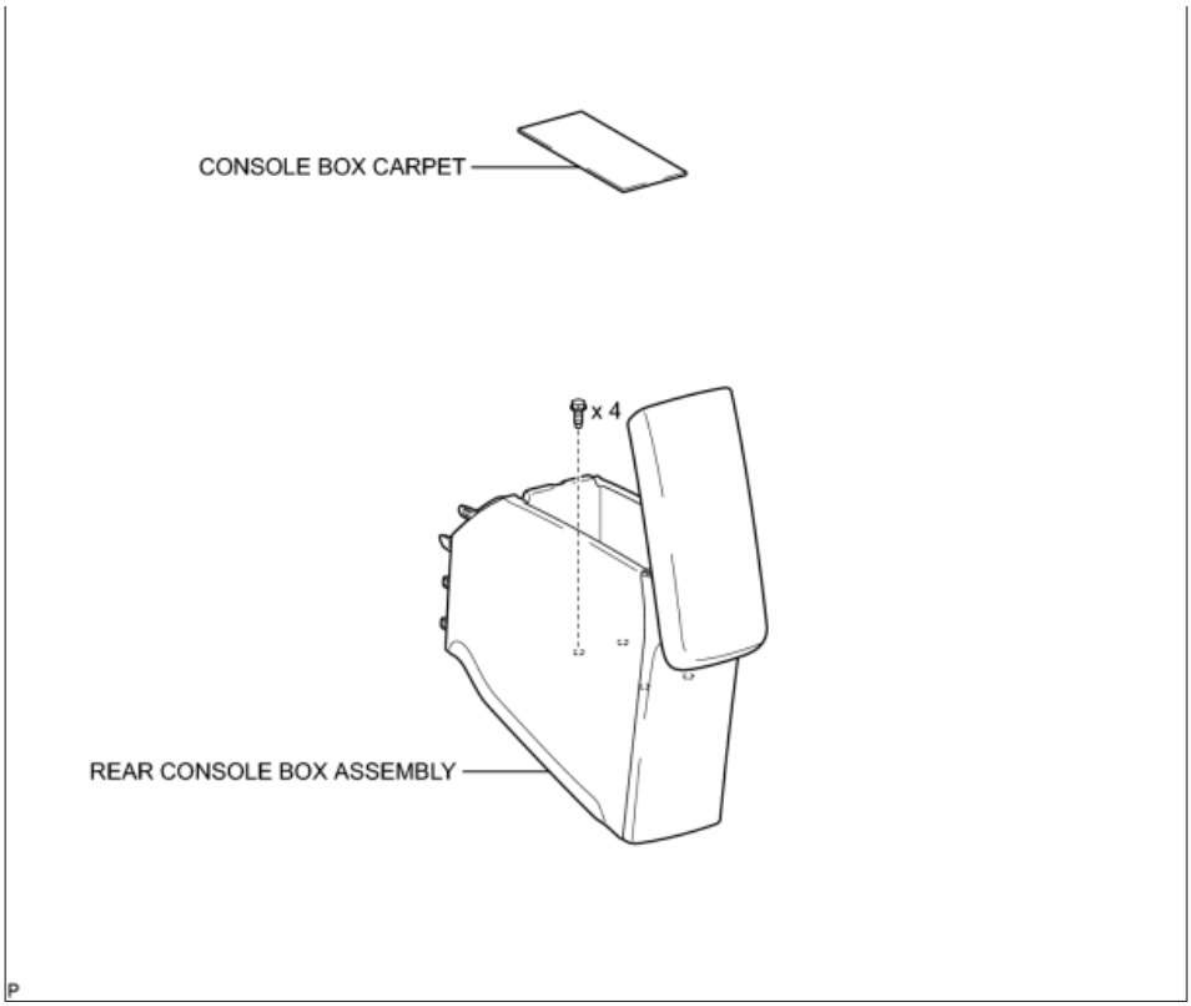


ILLUSTRATION

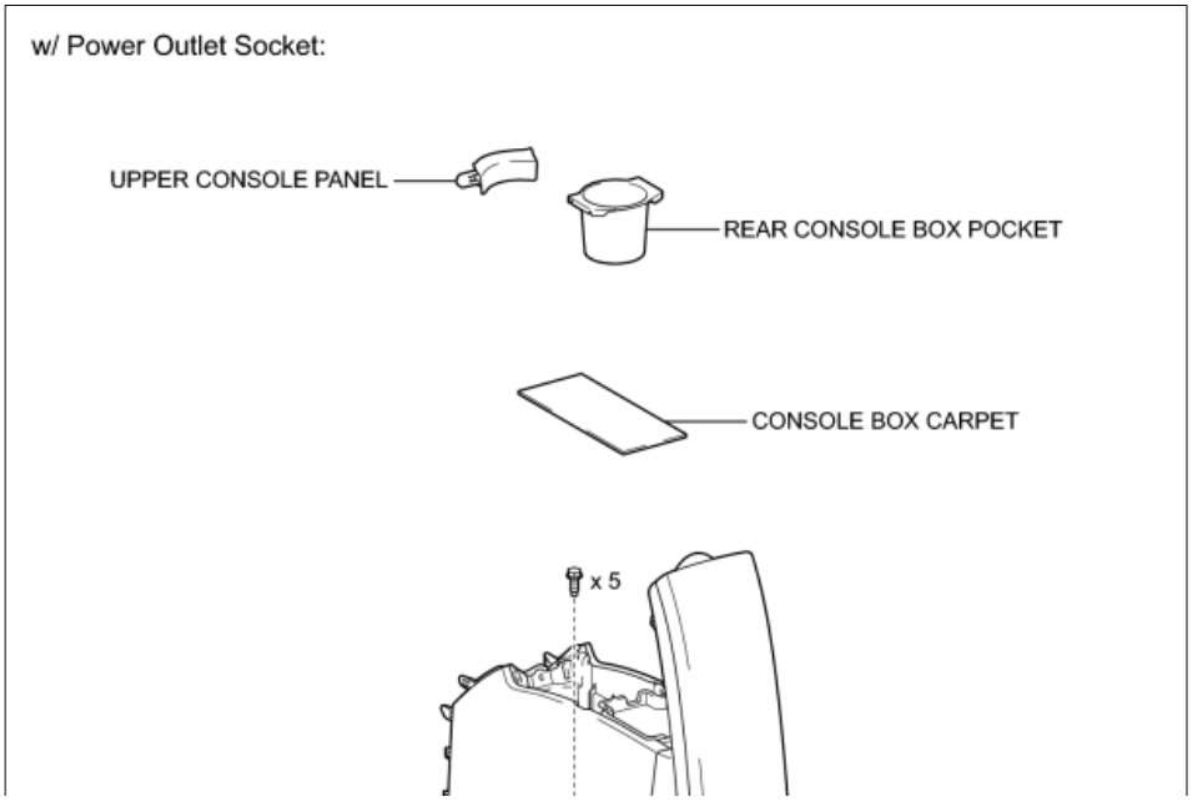
w/o Power Outlet Socket:

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PARK ASSIST / MONITORING: PARKING ASSIST PRE SUPPORT SWITCH: COMPONENTS (2010 Prius)

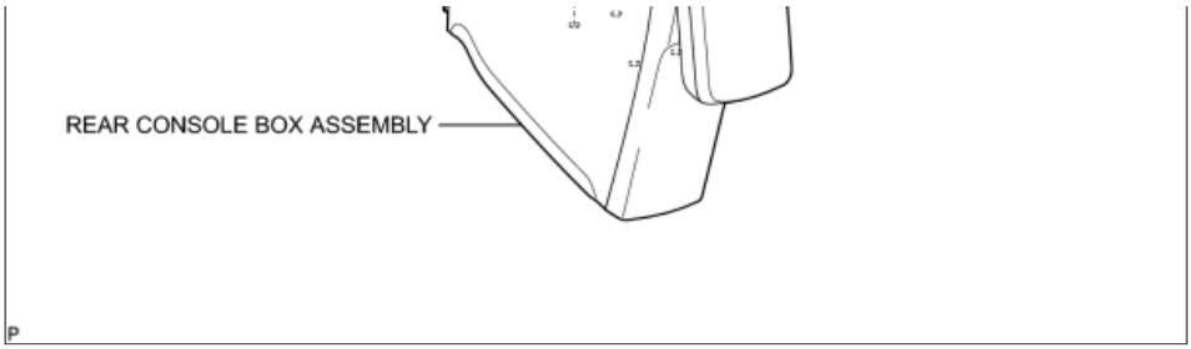


ILLUSTRATION

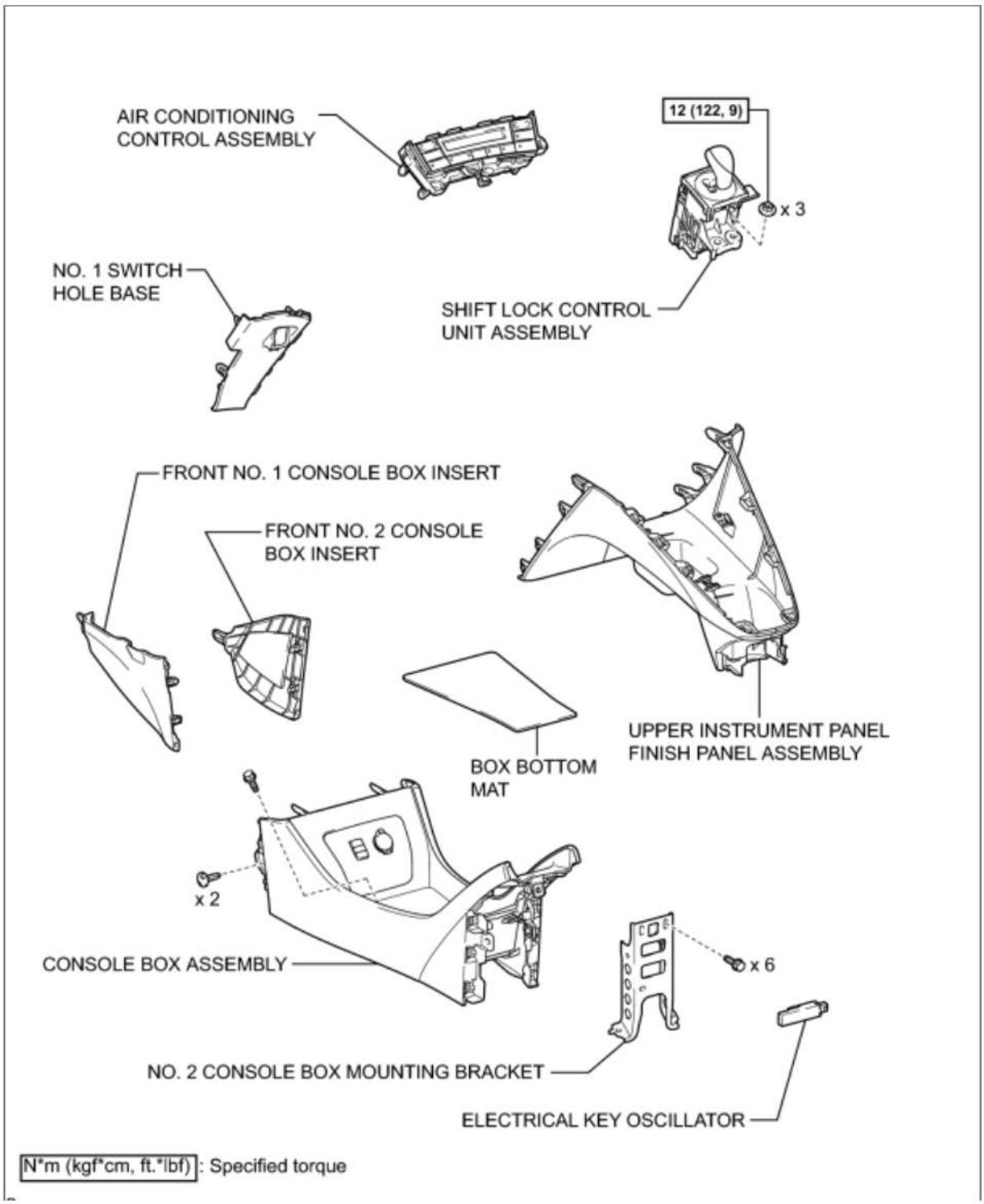


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PARK ASSIST / MONITORING: PARKING ASSIST PRE SUPPORT SWITCH: COMPONENTS (2010 Prius)



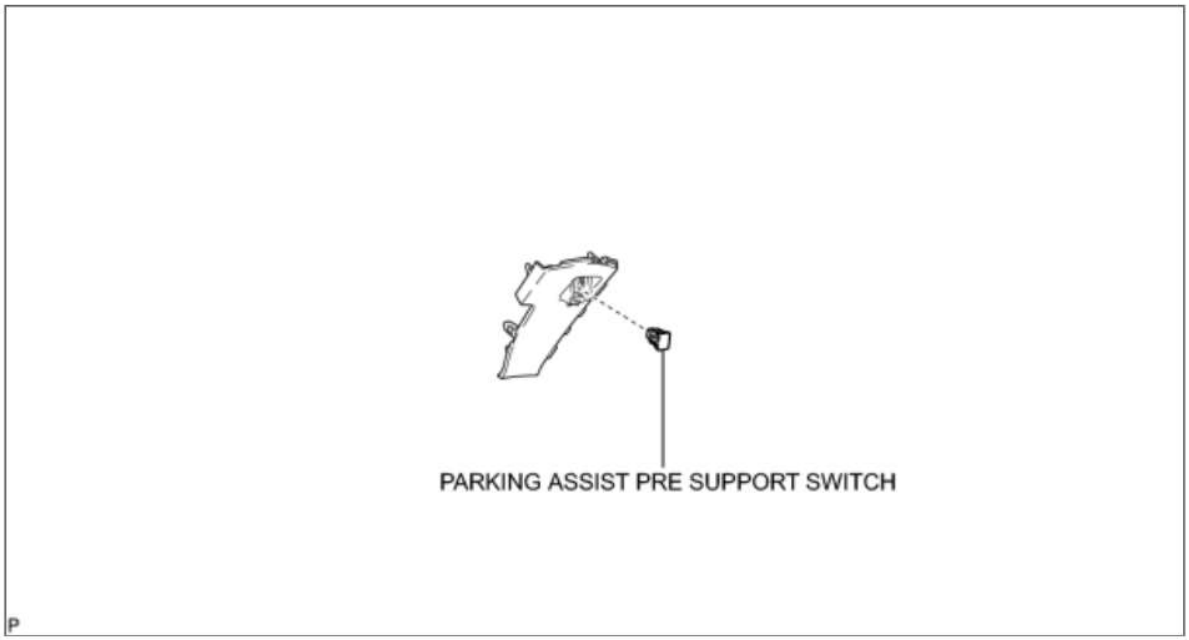
ILLUSTRATION



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PARK ASSIST / MONITORING: PARKING ASSIST PRE SUPPORT SWITCH: COMPONENTS (2010 Prius)

ILLUSTRATION

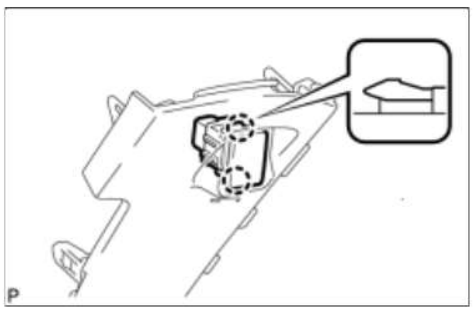


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PARK ASSIST / MONITORING: PARKING ASSIST PRE SUPPORT SWITCH: REMOVAL (2010 Prius)

REMOVAL

1. REMOVE INTEGRATION CONTROL AND PANEL ASSEMBLY INFO
2. REMOVE LOWER CENTER INSTRUMENT CLUSTER FINISH PANEL SUB-ASSEMBLY INFO
3. REMOVE INSTRUMENT CLUSTER FINISH PANEL GARNISH INFO
4. REMOVE UPPER INSTRUMENT PANEL FINISH PANEL SUB-ASSEMBLY INFO
5. REMOVE NAVIGATION RECEIVER WITH BRACKET INFO
6. REMOVE REAR CONSOLE BOX POCKET (w/ Power Outlet Socket) INFO
7. REMOVE UPPER CONSOLE PANEL (w/ Power Outlet Socket) INFO
8. REMOVE CONSOLE BOX CARPET INFO
9. REMOVE REAR CONSOLE BOX ASSEMBLY (w/ Power Outlet Socket) INFO
10. REMOVE REAR CONSOLE BOX ASSEMBLY (w/o Power Outlet Socket) INFO
11. REMOVE ELECTRICAL KEY OSCILLATOR INFO
12. REMOVE NO. 2 CONSOLE BOX MOUNTING BRACKET INFO
13. REMOVE FRONT NO. 1 CONSOLE BOX INSERT INFO
14. REMOVE FRONT NO. 2 CONSOLE BOX INSERT INFO
15. REMOVE BOX BOTTOM MAT INFO
16. SEPARATE CONSOLE BOX ASSEMBLY INFO
17. REMOVE AIR CONDITIONING CONTROL ASSEMBLY INFO
18. REMOVE SHIFT LOCK CONTROL UNIT ASSEMBLY INFO
19. REMOVE UPPER INSTRUMENT PANEL FINISH PANEL ASSEMBLY INFO
20. REMOVE CONSOLE BOX ASSEMBLY INFO
21. REMOVE NO. 1 SWITCH HOLE BASE INFO
22. REMOVE PARKING ASSIST PRE SUPPORT SWITCH



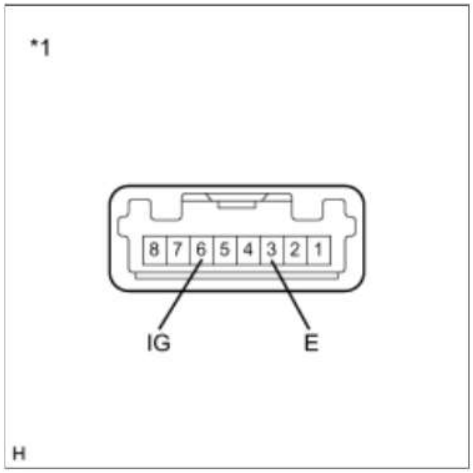
(a) Disengage the 2 claws and remove the parking assist pre support switch.

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PARK ASSIST / MONITORING: PARKING ASSIST PRE SUPPORT SWITCH: INSPECTION (2010 Prius)

INSPECTION

1. INSPECT PARKING ASSIST PRE SUPPORT SWITCH



(a) Measure the resistance according to the value(s) in the table below.

Standard Resistance:

TESTER CONNECTION	CONDITION	SPECIFIED CONDITION
3 (E) - 6 (IG)	Parking assist pre support switch pushed in	Below 1 Ω
	Parking assist pre support switch not pushed	10 kΩ or higher

Text in Illustration

*1	Component without harness connected (Parking Assist Pre Support Switch)

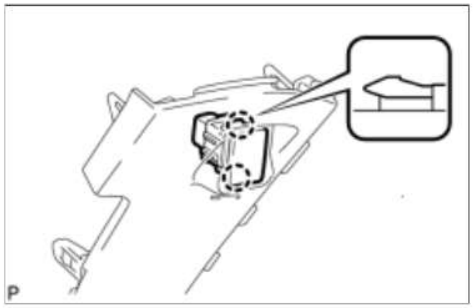
If the result is not as specified, replace the parking assist pre support switch.

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PARK ASSIST / MONITORING: PARKING ASSIST PRE SUPPORT SWITCH: INSTALLATION (2010 Prius)

INSTALLATION

1. INSTALL PARKING ASSIST PRE SUPPORT SWITCH



(a) Engage the 2 claws to install the parking assist pre support switch.

2. INSTALL NO. 1 SWITCH HOLE BASE INFO

3. INSTALL UPPER INSTRUMENT PANEL FINISH PANEL ASSEMBLY INFO

4. INSTALL SHIFT LOCK CONTROL UNIT ASSEMBLY INFO

5. INSTALL AIR CONDITIONING CONTROL ASSEMBLY INFO

6. INSTALL CONSOLE BOX ASSEMBLY INFO

7. INSTALL BOX BOTTOM MAT INFO

8. INSTALL FRONT NO. 2 CONSOLE BOX INSERT INFO

9. INSTALL FRONT NO. 1 CONSOLE BOX INSERT INFO

10. INSTALL NO. 2 CONSOLE BOX MOUNTING BRACKET INFO

11. INSTALL ELECTRICAL KEY OSCILLATOR INFO

12. INSTALL REAR CONSOLE BOX ASSEMBLY (w/ Power Outlet Socket) INFO

13. INSTALL REAR CONSOLE BOX ASSEMBLY (w/o Power Outlet Socket) INFO

14. INSTALL CONSOLE BOX CARPET INFO

15. INSTALL UPPER CONSOLE PANEL (w/ Power Outlet Socket) INFO

16. INSTALL REAR CONSOLE BOX POCKET (w/ Power Outlet Socket) INFO

17. INSTALL NAVIGATION RECEIVER WITH BRACKET INFO

18. INSTALL UPPER INSTRUMENT PANEL FINISH PANEL SUB-ASSEMBLY INFO

19. INSTALL INSTRUMENT CLUSTER FINISH PANEL GARNISH INFO

20. INSTALL LOWER CENTER INSTRUMENT CLUSTER FINISH PANEL SUB-ASSEMBLY INFO

21. INSTALL INTEGRATION CONTROL AND PANEL ASSEMBLY INFO

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PARK ASSIST / MONITORING: PARKING ASSIST PRE SUPPORT SWITCH: INSTALLATION (2010 Prius)

22. INSPECT SHIFT LEVER INFO

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PARK ASSIST / MONITORING: REAR VIEW MONITOR SYSTEM (w/ Navigation System): PRECAUTION (2010 Prius)

PRECAUTION

1. PRECAUTION FOR DISCONNECTING CABLE FROM NEGATIVE BATTERY TERMINAL

NOTICE:

When disconnecting the cable from the negative (-) battery terminal, initialize the following system after the terminal is reconnected.

SYSTEM NAME	SEE PROCEDURE
Advanced Parking Guidance System	INFO

2. NOTES FOR REAR TELEVISION CAMERA

(a) Notes for the rear television camera assembly

(1) The rear view monitor system may not function properly if subjected to a severe blow by any hard object.

(2) Do not scrub the cover part of the camera (resin made). Scrubbing may scratch the cover and affect the image. Prevent organic solvents, waxes, bond removing solvents or glass coating from adhering to the cover. If such material adheres to the cover, clean it off immediately and wash with water.

(3) Exposing the camera to a sudden temperature change may affect proper functioning of the camera.

(4) A clear image may not appear if the camera is dirty with snow, mud, etc. In that case, wash it with water and wipe off the lens. Use a detergent to remove dirt if necessary.

(b) Images are difficult to discern even in normal conditions if:

(1) Noise may occur in the image depending on electrical devices used in the cabin.

(2) Noise may occur in the image if the outer mirror switch assembly is operated.

(3) Noise may occur in the image if accessories that generate radio waves have been installed.

(4) The camera screen is frosted over (the image immediately after turning the power switch on (IG) may be blurred or darker than normal).

(5) The camera lens is dirty with snow, mud, etc.

(6) A strong beam of light, such as a sunbeam or headlight, hits the camera.

(7) It is too dark around the camera (at night etc.).

(8) The ambient temperature around the camera is either too high or too low.

(9) The vehicle is tilted at a steep angle.

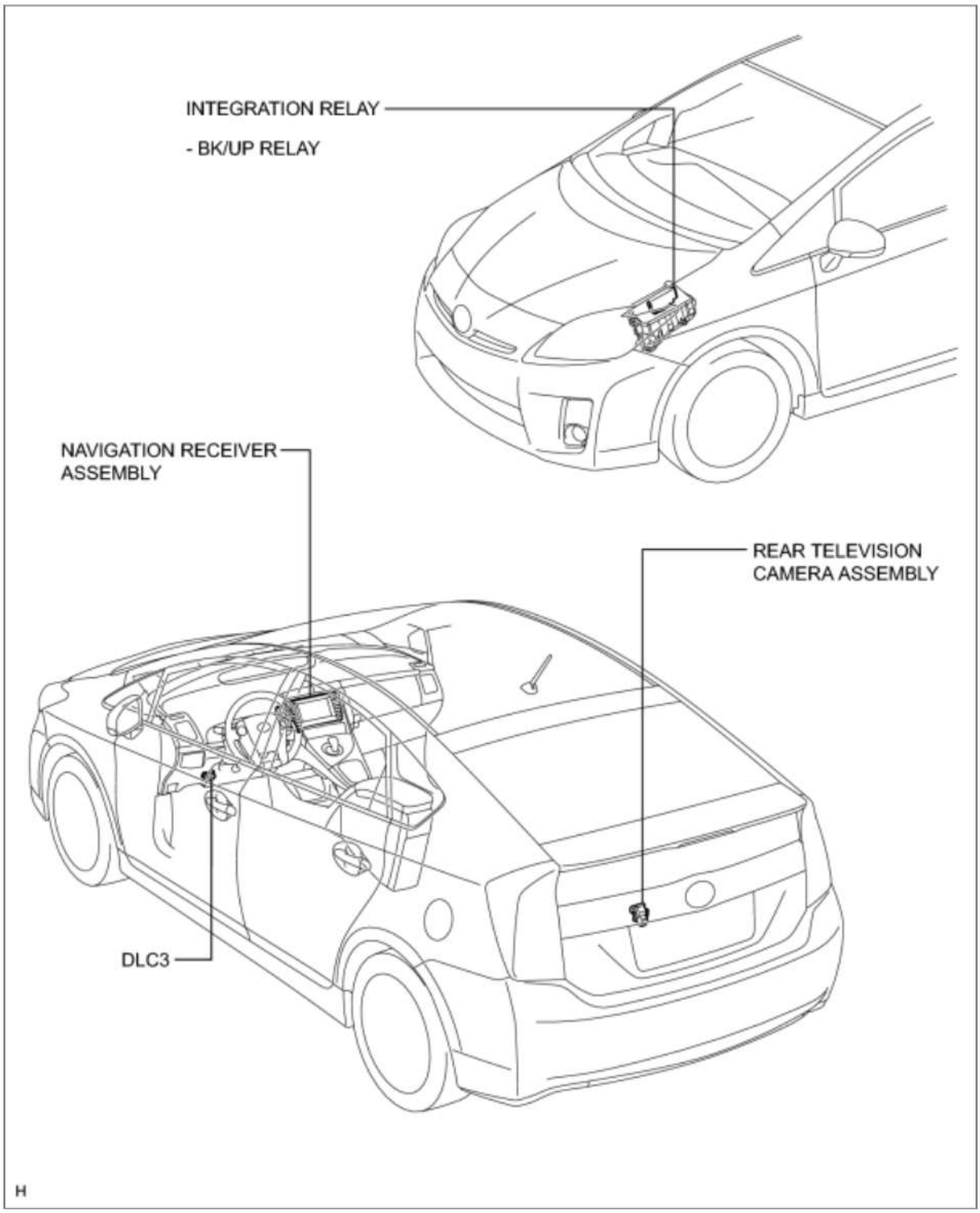
(10) The ambience of the camera is too bright. (When a strong light, such as a sunbeam reflected off the vehicle body, hits the camera, the image may be blurred. This is called the "SMEAR" phenomenon, peculiar to the CCD camera.)

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PARK ASSIST / MONITORING: REAR VIEW MONITOR SYSTEM (w/ Navigation System): PARTS LOCATION (2010 Prius)

PARTS LOCATION

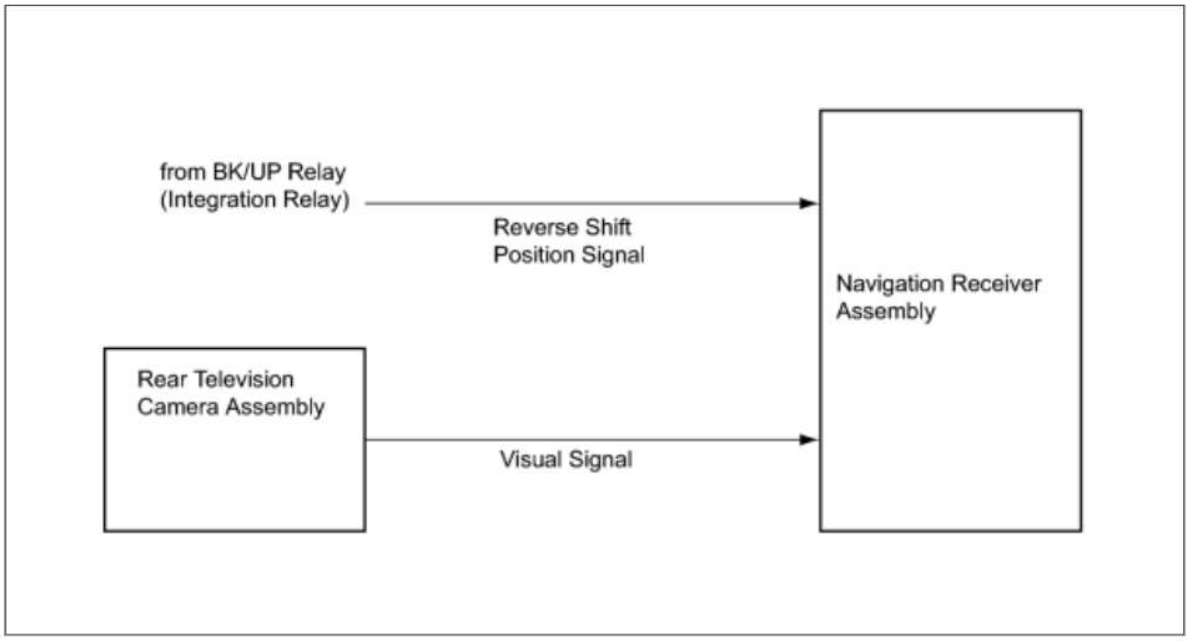
ILLUSTRATION



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PARK ASSIST / MONITORING: REAR VIEW MONITOR SYSTEM (w/ Navigation System): SYSTEM DIAGRAM (2010 Prius)

SYSTEM DIAGRAM



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PARK ASSIST / MONITORING: REAR VIEW MONITOR SYSTEM (w/ Navigation System): SYSTEM DESCRIPTION (2010 Prius)

SYSTEM DESCRIPTION

1. GENERAL

(a) To assist the driver with parking the vehicle by displaying an image of the area behind the vehicle, this system has a television camera mounted on the back door. The system displays the image on the navigation receiver assembly.

(b) This system consists of the following components:

(1) Navigation receiver assembly

(2) Rear television camera assembly

(3) BK/UP relay (integration relay)

2. FUNCTION OF COMPONENTS

(a) The navigation receiver assembly controls the system by using information from the following components:

ITEM	FUNCTION
Rear Television Camera Assembly	• Mounted on the back door to transmit an image of the area behind the vehicle to the navigation receiver assembly. • Has a color video camera that uses a Charge Coupled Device (CCD) and a wide-angle lens.
Navigation Receiver Assembly	• Receives video signals, which contain an image of the area behind the vehicle taken with the rear television camera assembly. • Performs control of the system by receiving the shift position signal from the BK/UP relay (integration relay). • Displays the rear view monitor image on the display panel.
BK/UP Relay (Integration Relay)	Transmits a reverse shift position signal to the navigation receiver assembly.

3. OPERATION EXPLANATION

(a) The navigation receiver assembly receives the reverse shift position signal from the BK/UP relay (integration relay) when the shift lever is moved to R. After receiving the reverse shift position signal, the navigation receiver assembly switches from the navigation system to the rear view monitor system.

4. DIAGNOSTIC FUNCTION

(a) Navigation system has a diagnostic function displayed in the navigation receiver assembly. This function enables the confirmation of the input signal for reverse shift position INFO .

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PARK ASSIST / MONITORING: REAR VIEW MONITOR SYSTEM (w/ Navigation System): HOW TO PROCEED WITH TROUBLESHOOTING (...

HOW TO PROCEED WITH TROUBLESHOOTING

HINT:

- Use the following procedure to troubleshoot the rear view monitor system.
- *: Use the Techstream.

1.	**VEHICLE BROUGHT TO WORKSHOP**

NEXT

2.	**CUSTOMER PROBLEM ANALYSIS**

NEXT

3.	**INSPECT BATTERY VOLTAGE**

(a) Measure the battery voltage with the power switch off.

Standard Voltage:
11 to 14 V

If the voltage is below 11 V, recharge or replace the battery before proceeding to the next step.

NEXT

4.	**PROBLEM SYMPTOM CONFIRMATION**

Result

RESULT	PROCEED TO
Symptom does not occur	A
Symptom occurs	B

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B ▶ **Go to step 6**

A

▼

5.	**SYMPTOM SIMULATION**

NEXT

▼

6.	**CHECK DTC***

(a) Check for DTCs and note any codes that are output INFO .

(b) Clear the DTC INFO .

(c) Recheck for DTCs. Try to prompt the DTC by simulating the original activity that the DTC suggests.

NOTICE:

The navigation receiver assembly may output the DTCs of the following system. If DTCs other than those specified in Diagnostic Trouble Code Chart of the rear view monitor system are output, refer to Diagnostic Trouble Code Chart for the applicable system.

SYSTEM	PROCEED TO
Navigation System	INFO

Result

RESULT	PROCEED TO
DTC is output	A
DTC for the rear view system is not output	B
DTCs for the navigation system are output	C

B ▶ **Go to step 8**

C ▶ **GO TO NAVIGATION SYSTEM**

A

▼

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7.	**DIAGNOSTIC TROUBLE CODE CHART***

(a) Refer to Diagnostic Trouble Code Chart INFO .

NEXT ▶ **Go to step 10**

8.	**PROBLEM SYMPTOMS TABLE**

(a) Refer to Problem Symptoms Table INFO .

Result

RESULT	PROCEED TO
Fault is not listed in Problem Symptoms Table	A
Fault is listed in Problem Symptoms Table	B

B ▶ **Go to step 9**

A

▼

9.	**BASED ON MALFUNCTION SYMPTOM, PERFORM TROUBLESHOOTING BELOW**

(a) Refer to Terminals of ECU INFO .

NEXT

▼

10.	**CIRCUIT INSPECTION**

NEXT

▼

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11.	**ADJUST, REPAIR OR REPLACE**

NEXT

12.	**CONFIRMATION TEST**

NEXT **END**

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PARK ASSIST / MONITORING: REAR VIEW MONITOR SYSTEM (w/ Navigation System): PROBLEM SYMPTOMS TABLE (2010 Prius)

PROBLEM SYMPTOMS TABLE

HINT:

- Use the table below to help determine the cause of problem symptoms. If multiple suspected areas are listed, the potential causes of the symptoms are listed in order of probability in the "Suspected Area" column of the table. Check each symptom by checking the suspected areas in the order they are listed. Replace parts as necessary.
- Inspect the fuses and relays related to this system before inspecting the suspected areas below.

General

SYMPTOM	SUSPECTED AREA	SEE PAGE
When the shift lever is in R, a rear view monitor image is not displayed (screen is not black).	Reverse signal circuit	INFO
	Navigation receiver assembly	INFO
When the shift lever is in R, a rear view monitor image is not displayed (screen is black).	Navigation receiver assembly power source circuit	INFO
	Image from camera for rear view monitor is abnormal	INFO
	Navigation receiver assembly	INFO
When the shift lever is not in R, a rear view monitor image is displayed.	Reverse signal circuit	INFO
	Navigation receiver assembly	INFO

Display Malfunction

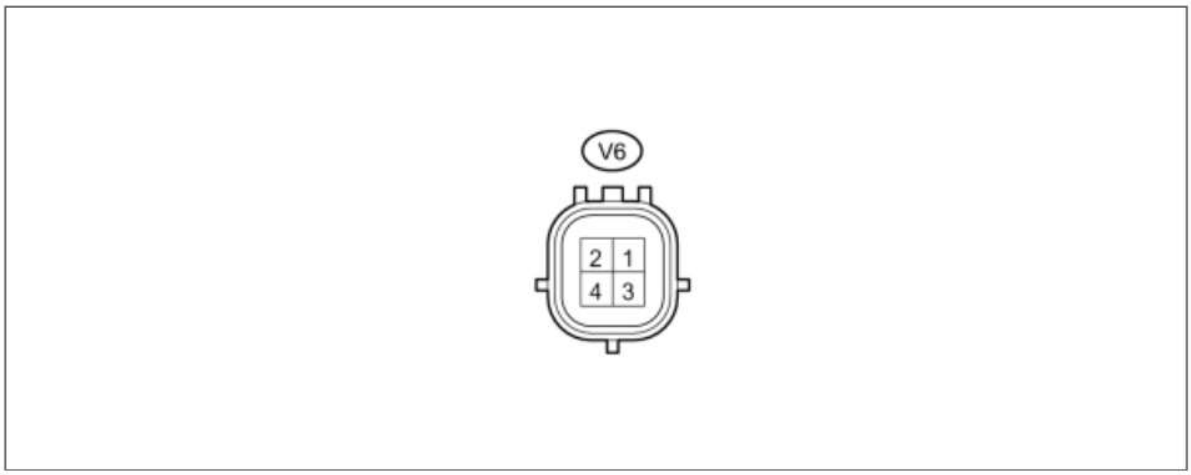
SYMPTOM	SUSPECTED AREA	SEE PAGE
Image from the camera for the rear view monitor is abnormal (color, disorder of picture).	Image from camera for rear view monitor is abnormal	INFO
	Navigation receiver assembly	INFO

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PARK ASSIST / MONITORING: REAR VIEW MONITOR SYSTEM (w/ Navigation System): TERMINALS OF ECU (2010 Prius)

TERMINALS OF ECU

1. REAR TELEVISION CAMERA ASSEMBLY



(a) Disconnect the V6 connector from the rear television camera assembly.

(b) Measure the voltage of each terminal of the wire harness side connector.

TERMINAL NO. (SYMBOL)	WIRING COLOR	TERMINAL DESCRIPTION	CONDITION	SPECIFIED CONDITION
V6-3 (CGND) - Body ground	Shield - Body ground	Ground	Always	Below 1 V
V6-4 (CB+) - V6-3 (CGND)	W - Shield	Power source	Power switch on (IG) Shift lever in R	5.8 to 7.0 V

If the result is not as specified, there may be a malfunction on the wire harness side.

(c) Reconnect the V6 connector to the rear television camera assembly.

(d) Check for pulses between each terminal of the connector.

TERMINAL NO. (SYMBOL)	WIRING COLOR	TERMINAL DESCRIPTION	CONDITION	SPECIFIED CONDITION
V6-2 (CV+) - V6-1 (CV-)	R - B	Display signal	Power switch on (IG) Shift lever in R Under normal conditions	Pulse generation (See waveform 1)
			Power switch on (IG) Shift lever in R Camera lens covered, blacking out screen	Pulse generation (See waveform 2)

If the result is not as specified, the camera may have a malfunction.

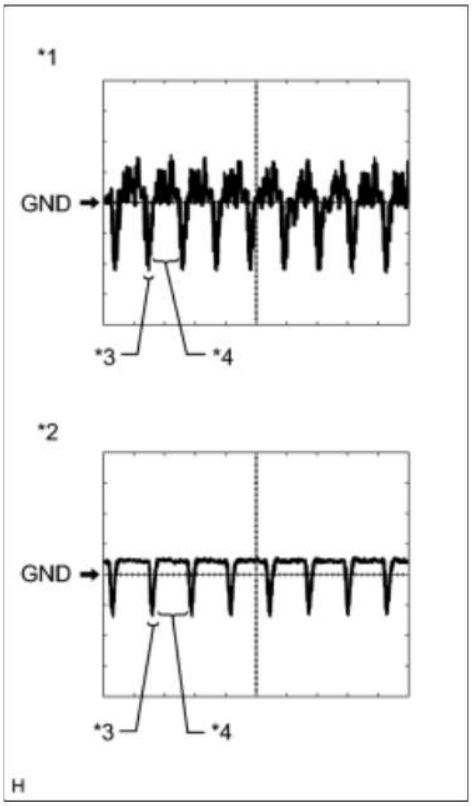
(e) Reference (Oscilloscope waveform):

(1) Waveform 1 (under normal conditions)

ITEM	CONTENT

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ITEM	CONTENT
Terminal No. (Symbol)	V6-2 (CV+) - V6-1 (CV-)
Tool Setting	200 mV/DIV., 50 µsec./DIV.
Condition	Power switch on (IG), shift lever in R



HINT:

The video waveform changes according to the image sent by the rear television camera assembly.

(2) Waveform 2 (camera lens is covered, blacking out the screen)

ITEM	CONTENT
Terminal No. (Symbol)	V6-2 (CV+) - V6-1 (CV-)
Tool Setting	200 mV/DIV., 50 µsec./DIV.
Condition	Power switch on (IG), shift lever in R

HINT:

The video waveform changes according to the image sent by the rear television camera assembly.

Text in Illustration

*1	Waveform 1 (under normal conditions)
*2	Waveform 2 (camera lens is covered, blacking out the screen)
*3	Synchronized Signal
*4	Video Waveform

2. NAVIGATION RECEIVER ASSEMBLY INFO

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PARK ASSIST / MONITORING: REAR VIEW MONITOR SYSTEM (w/ Navigation System): DTC CHECK / CLEAR (2010 Prius)

DTC CHECK / CLEAR

1. CHECK DTC

(a) Connect the Techstream to the DLC3.

(b) Turn the power switch to on (IG).

(c) Turn the Techstream on.

(d) Enter the following menus: Body Electrical / Navigation System / Trouble Codes.

(e) Check the details of the DTCs INFO .

HINT:

The navigation receiver assembly may output the DTCs of the following system. If DTCs other than those specified in Diagnostic Trouble Code Chart of the rear view monitor system are output, refer to Diagnostic Trouble Code Chart for the applicable system.

SYSTEM	PROCEED TO
Navigation System	INFO

2. CLEAR DTC

(a) Connect the Techstream to the DLC3.

(b) Turn the power switch to on (IG).

(c) Turn the Techstream on.

(d) Enter the following menus: Body Electrical / Navigation System / Trouble Codes.

(e) According to the display on the Techstream, select the trouble code data display with the clear button.

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PARK ASSIST / MONITORING: REAR VIEW MONITOR SYSTEM (w/ Navigation System): DIAGNOSTIC TROUBLE CODE CHART (2010 Prius)

DIAGNOSTIC TROUBLE CODE CHART

HINT:

If a trouble code is output during the DTC check, inspect the trouble areas listed for that code. For details of the code, refer to the "See page" in the DTC chart. Inspect fuses and relays before investigating the trouble areas shown in the table below.

Rear View Monitor System (w/ Navigation System)

DTC CODE	DETECTION ITEM	TROUBLE AREA	SEE PAGE
C1622	Open or Short Circuit in Back Camera Signal	1. Harness or connector 2. Navigation receiver assembly 3. Rear television camera assembly	INFO

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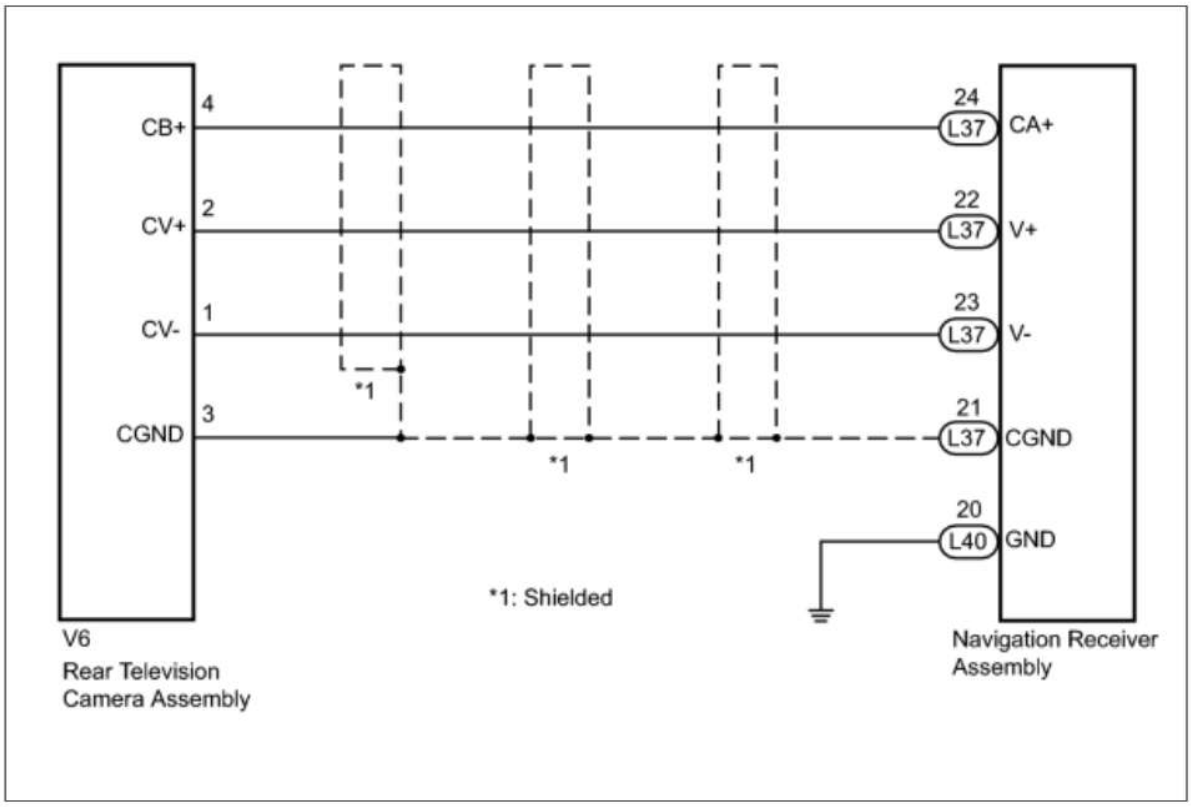
DTC	**C1622**	**Open or Short Circuit in Back Camera Signal**

DESCRIPTION

This DTC is stored if the navigation receiver assembly judges as a result of its self check that the signals or signal lines between the navigation receiver assembly and rear television camera assembly are not normal.

DTC NO.	DTC DETECTION CONDITION	TROUBLE AREA
C1622	Open or short circuit in back camera signal	• Harness or connector • Navigation receiver assembly • Rear television camera assembly

WIRING DIAGRAM



INSPECTION PROCEDURE

PROCEDURE

1.	**CHECK HARNESS AND CONNECTOR (NAVIGATION RECEIVER - REAR TELEVISION CAMERA)**

(a) Disconnect the L37 connector from the navigation receiver assembly.

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(b) Disconnect the V6 connector from the rear television camera assembly.

(c) Measure the resistance according to the value(s) in the table below.

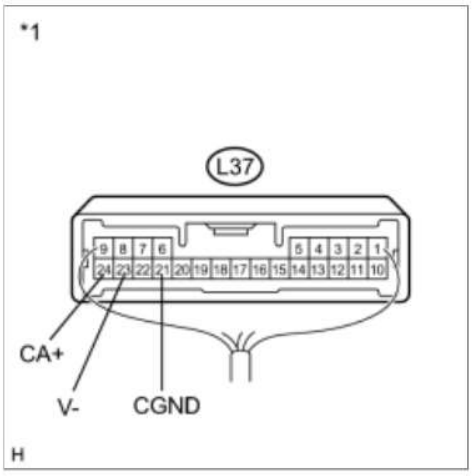
Standard Resistance:

TESTER CONNECTION	CONDITION	SPECIFIED CONDITION
V6-2 (CV+) - L37-22 (V+)	Always	Below 1 Ω
V6-4 (CB+) - L37-24 (CA+)	Always	Below 1 Ω
V6-3 (CGND) - L37-21 (CGND)	Always	Below 1 Ω
V6-1 (CV-) - L37-23 (V-)	Always	Below 1 Ω
V6-2 (CV+) - Body ground	Always	10 kΩ or higher
V6-4 (CB+) - Body ground	Always	10 kΩ or higher
V6-3 (CGND) - Body ground	Always	10 kΩ or higher
V6-1 (CV-) - Body ground	Always	10 kΩ or higher

NG ▶ **REPAIR OR REPLACE HARNESS OR CONNECTOR (NAVIGATION RECEIVER - REAR TELEVISION CAMERA)**

OK ▼

2.	**CHECK NAVIGATION RECEIVER ASSEMBLY**



(a) Reconnect the L37 connector to the navigation receiver assembly.

(b) Measure the resistance according to the value(s) in the table below.

Standard Resistance:

TESTER CONNECTION	CONDITION	SPECIFIED CONDITION
L37-23 (V-) - Body ground	Always	Below 1 Ω
L37-21 (CGND) - Body ground	Always	Below 1 Ω

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L37-21 (CGND) - Body ground	Always	Below 1 Ω

(c) Measure the voltage according to the value(s) in the table below.

Standard Voltage:

TESTER CONNECTION	CONDITION	SPECIFIED CONDITION
L37-24 (CA+) - L37-21 (CGND)	Power switch on (IG) Shift lever in R	5.8 to 7.0 V

Text in Illustration

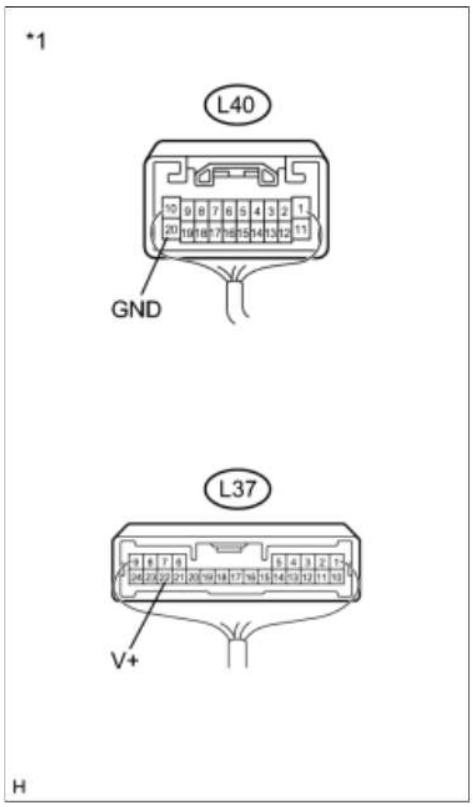
*1	Component with harness connected (Navigation Receiver Assembly)

NG ▶ **REPLACE NAVIGATION RECEIVER ASSEMBLY**

OK ▼

3.	**CHECK REAR TELEVISION CAMERA ASSEMBLY**

(a) Reconnect the V6 connector to the rear television camera assembly.



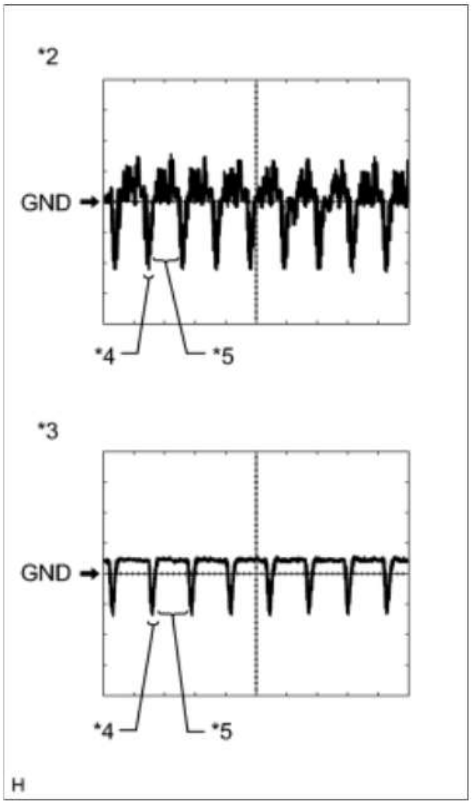
(b) Check that the L37 and L40 connectors are connected to the navigation receiver assembly.

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(c) Check the waveform of the rear television camera assembly using an oscilloscope.

OK:

Waveform is as shown in the illustration.



ITEM	CONTENT
Terminal No. (Symbol)	L37-22 (V+) - L40-20 (GND)
Tool Setting	200 mV/DIV., 50 µsec./DIV.
Condition	Power switch on (IG), shift lever in R

HINT:

The video waveform changes according to the image sent by the rear television camera assembly.

Text in Illustration

*1	Component with harness connected (Navigation Receiver Assembly)
*2	Waveform 1 (under normal conditions)
*3	Waveform 2 (camera lens is covered, blacking out the screen)
*4	Synchronized Signal
*5	Video Waveform

NG ▶ REPLACE REAR TELEVISION CAMERA ASSEMBLY

OK ▶ REPLACE NAVIGATION RECEIVER ASSEMBLY

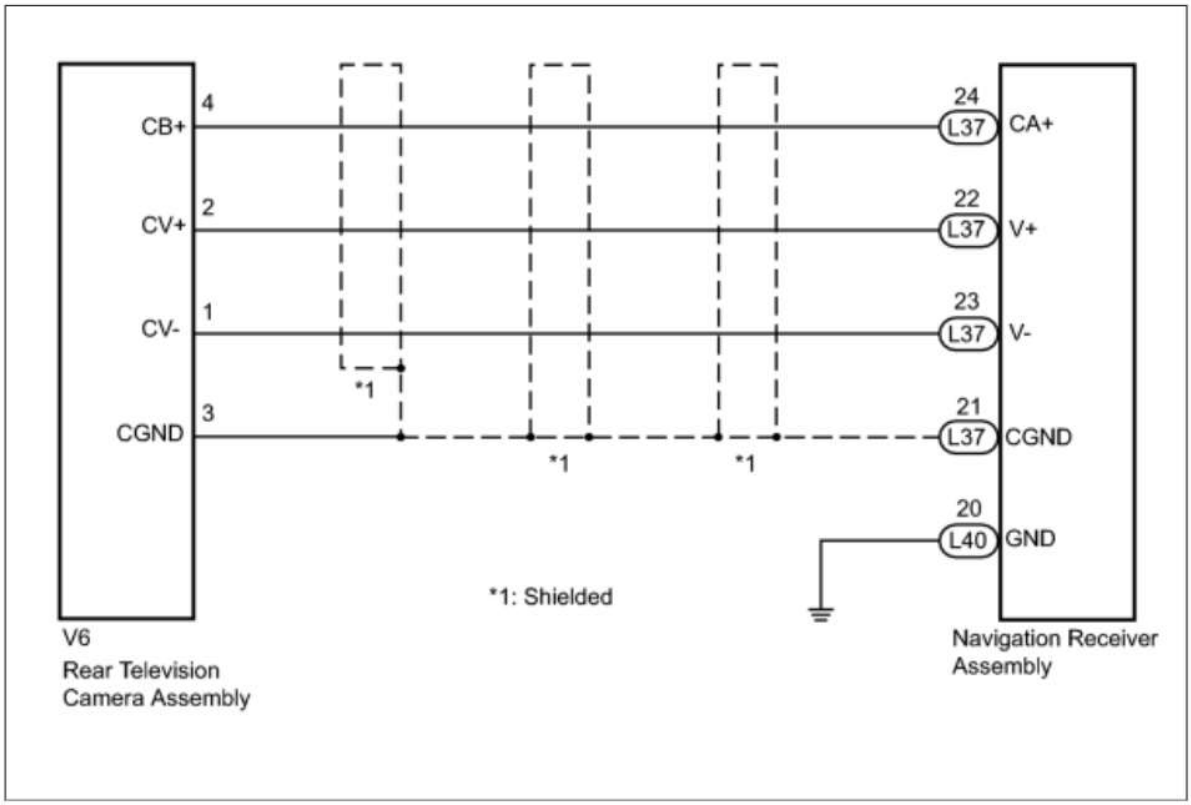
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Image from Camera for Rear View Monitor is Abnormal

DESCRIPTION

The display signal from the rear television camera assembly transmits to the navigation receiver assembly.

WIRING DIAGRAM



INSPECTION PROCEDURE

PROCEDURE

1.	**CHECK HARNESS AND CONNECTOR (NAVIGATION RECEIVER - REAR TELEVISION CAMERA)** INFO

NG ▶ **REPAIR OR REPLACE HARNESS OR CONNECTOR (NAVIGATION RECEIVER - REAR TELEVISION CAMERA)**

OK ▼

2	**CHECK NAVIGATION RECEIVER ASSEMBLY** INFO

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2.	CHECK NAVIGATION RECEIVER ASSEMBLY

NG ▶ REPLACE NAVIGATION RECEIVER ASSEMBLY

OK ▼

3.	CHECK REAR TELEVISION CAMERA ASSEMBLY INFO

NG ▶ REPLACE REAR TELEVISION CAMERA ASSEMBLY

OK ▶ PROCEED TO NEXT SUSPECTED AREA SHOWN IN PROBLEM SYMPTOMS TABLE

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PRECAUTION

1. PRECAUTION FOR DISCONNECTING CABLE FROM NEGATIVE BATTERY TERMINAL

NOTICE:

When disconnecting the cable from the negative (-) battery terminal, initialize the following system after the terminal is reconnected.

System Name	See Procedure
Advanced Parking Guidance System	INFO

2. NOTES FOR REAR TELEVISION CAMERA

(a) Notes for the rear television camera assembly

(1) The rear view monitor system may not function properly if subjected to a severe blow by any hard object.

(2) Do not scrub the cover part of the camera (resin made). Scrubbing may scratch the cover and affect the image. Prevent organic solvents, waxes, bond removing solvents or glass coating from adhering to the cover. If such material adheres to the cover, clean it off immediately and wash with water.

(3) Exposing the camera to a sudden temperature change may affect proper functioning of the camera.

(4) A clear image may not appear if the camera is dirty with snow, mud, etc. In that case, wash it with water and wipe off the lens. Use a detergent to remove dirt if necessary.

(b) Images are difficult to discern even in normal conditions if:

(1) Noise may occur in the image depending on electrical devices used in the cabin.

(2) Noise may occur in the image if the outer mirror switch assembly is operated.

(3) Noise may occur in the image if accessories that generate radio waves have been installed.

(4) The camera screen is frosted over (the image immediately after turning the power switch on (IG) may be blurred or darker than normal).

(5) The camera lens is dirty with snow, mud, etc.

(6) A strong beam of light, such as a sunbeam or headlight, hits the camera.

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(7) It is too dark around the camera (at night etc.).

(8) The ambient temperature around the camera is either too high or too low.

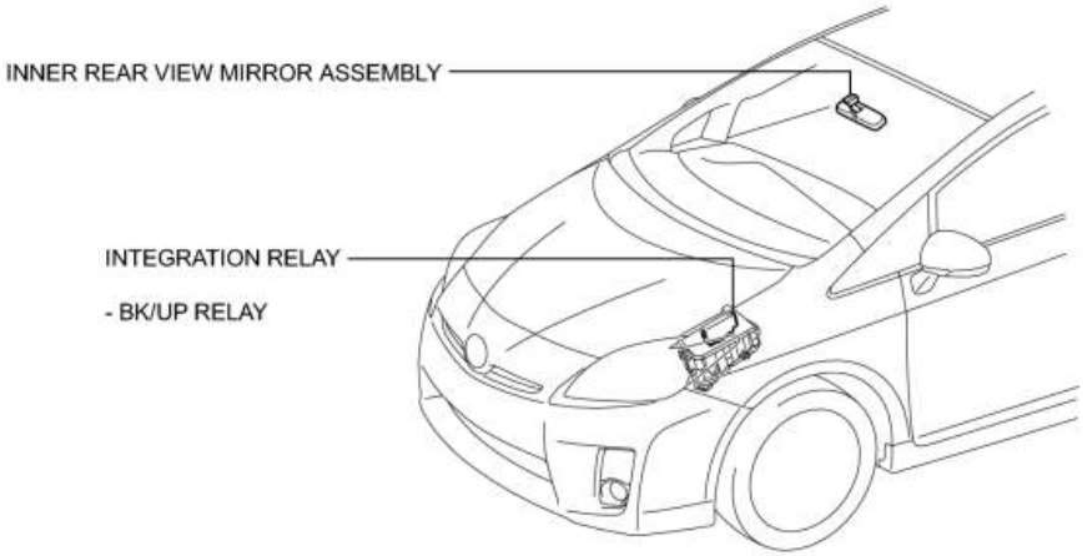
(9) The vehicle is tilted at a steep angle.

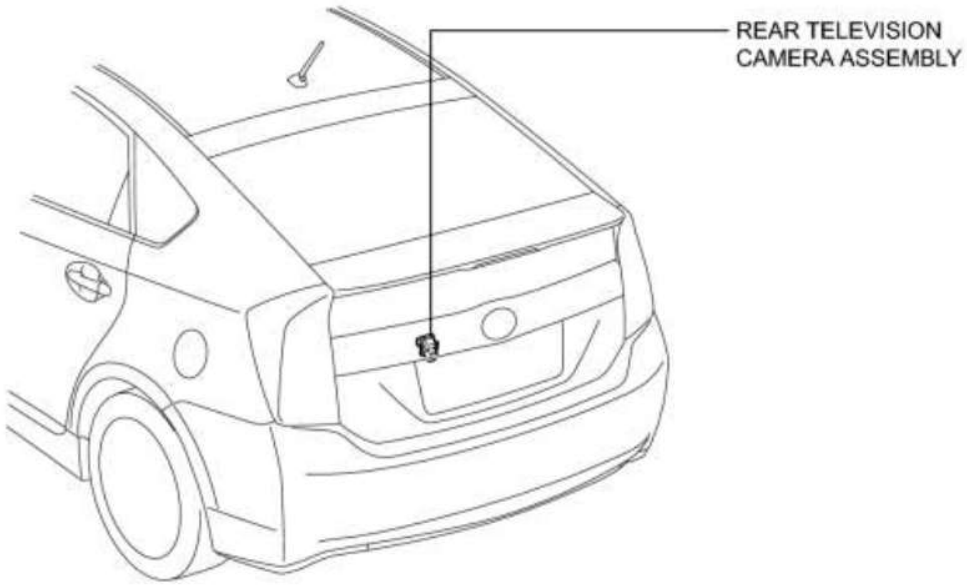
(10) The ambience of the camera is too bright. (When a strong light, such as a sunbeam reflected off the vehicle body, hits the camera, the image may be blurred. This is called the "SMEAR" phenomenon, peculiar to the CCD camera.)

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PARTS LOCATION

ILLUSTRATION



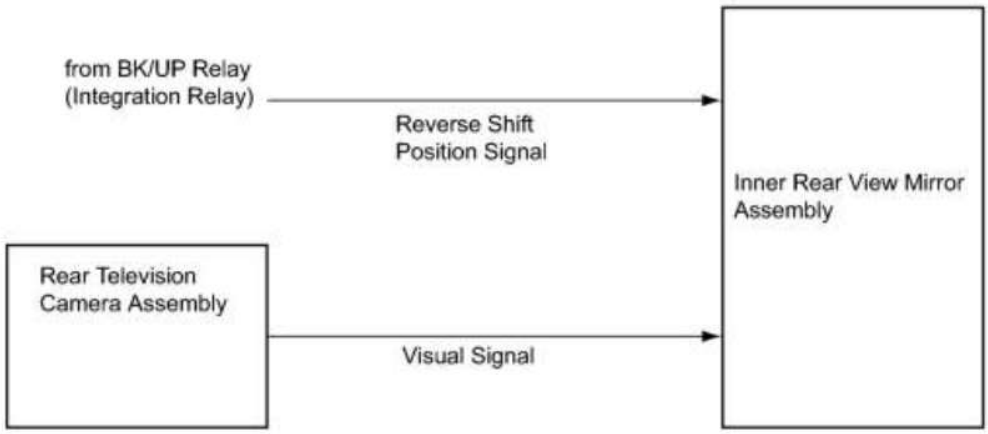


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SYSTEM DIAGRAM



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SYSTEM DESCRIPTION

1. GENERAL

(a) To assist the driver with parking the vehicle by displaying an image of the area behind the vehicle, this system has a television camera mounted on the back door. The system displays the image on the inner rear view mirror assembly.

(b) This system consists of the following components:

(1) Inner rear view mirror assembly

(2) Rear television camera assembly

(3) BK/UP relay (integration relay)

2. FUNCTION OF COMPONENTS

(a) The inner rear view mirror assembly controls the system by using information from the following components:

Item	Function
Television Camera Assembly	• Mounted on the back door to transmit an image of the area behind the vehicle to the inner rear view mirror assembly. • Has a color video camera that uses a Charge Coupled Device (CCD) and a wide-angle lens.
Inner Rear View Mirror Assembly	• Receives video signals, which contain images of the area behind the vehicle taken with the rear television camera assembly. • Performs control of the system by receiving the shift position signal from the BK/UP relay (integration relay). • Displays the rear view monitor image on the display panel.
BK/UP Relay (Integration Relay)	Transmits a reverse shift position signal to the inner rear view mirror assembly.

3. OPERATION EXPLANATION

(a) The inner rear view mirror assembly receives the reverse shift position signal from the BK/UP relay (integration relay) when the shift lever is moved to R. After receiving the reverse shift position signal, the inner rear view mirror assembly switches from except the rear view monitor system to the rear view monitor system.

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HOW TO PROCEED WITH TROUBLESHOOTING

HINT:

Use the following procedure to troubleshoot the rear view monitor system.

1.	VEHICLE BROUGHT TO WORKSHOP

NEXT

2.	CUSTOMER PROBLEM ANALYSIS

NEXT

3.	INSPECT BATTERY VOLTAGE

(a) Measure the battery voltage with the power switch off.

Standard Voltage:

11 to 14 V

If the voltage is below 11 V, recharge or replace the battery before proceeding to the next step.

NEXT

4.	PROBLEM SYMPTOM CONFIRMATION

Result

Result	Proceed to
Symptom does not occur	A
Symptom occurs	B

B Go to step 6

A

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5.	SYMPTOM SIMULATION

NEXT

▼

6.	PROBLEM SYMPTOMS TABLE

(a) Refer to Problem Symptoms Table INFO.

Result

Result	Proceed to
Fault is not listed in Problem Symptoms Table	A
Fault is listed in Problem Symptoms Table	B

B ▶ Go to step 8

A

▼

7.	BASED ON MALFUNCTION SYMPTOM, PERFORM TROUBLESHOOTING BELOW

(a) Refer to Terminals of ECU INFO.

NEXT

▼

8.	ADJUST, REPAIR OR REPLACE

NEXT

▼

9.	CONFIRMATION TEST

NEXT ▶ **END**

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PROBLEM SYMPTOMS TABLE

HINT:

- Use the table below to help determine the cause of problem symptoms. If multiple suspected areas are listed, the potential causes of the symptoms are listed in order of probability in the "Suspected Area" column of the table. Check each symptom by checking the suspected areas in the order they are listed. Replace parts as necessary.
- Inspect the fuses and relays related to this system before inspecting the suspected areas below.

General

Symptom	Suspected Area	See page
When the shift lever is in R, a rear view monitor image is not displayed (screen is not black).	Reverse signal circuit	INFO
	Image from camera for rear view monitor is abnormal	INFO
	Inner rear view mirror assembly	INFO
When the shift lever is in R, a rear view monitor image is not displayed (screen is black).	Inner rear view mirror power source circuit	INFO
	Image from camera for rear view monitor is abnormal	INFO
	Inner rear view mirror assembly	INFO
When the shift lever is not in R, a rear view monitor image is displayed.	Reverse signal circuit	INFO
	Inner rear view mirror assembly	INFO

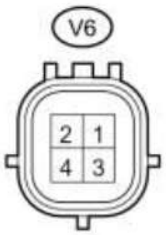
Display Malfunction

Symptom	Suspected Area	See page
Image from the camera for the rear view monitor is abnormal (color, disorder of picture).	Image from camera for rear view monitor is abnormal	INFO
	Inner rear view mirror assembly	INFO

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TERMINALS OF ECU

1. REAR TELEVISION CAMERA ASSEMBLY



(a) Disconnect the V6 connector from the rear television camera assembly.

(b) Measure the voltage of each terminal of the wire harness side connector.

Terminal No. (Symbol)	Wiring Color	Terminal Description	Condition	Specified Condition
V6-3 (CGND) - Body ground	W-B - Body ground	Ground	Always	Below 1 V
V6-4 (CB+) - Body ground	W - Body ground	Power source	Power switch on (IG) Shift lever in R	5.8 to 7.0 V

If the result is not as specified, there may be a malfunction on the wire harness side.

(c) Reconnect the V6 connector to the rear television camera assembly.

(d) Check for pulses between each terminal of the connector.

Terminal No. (Symbol)	Wiring Color	Terminal Description	Condition	Specified Condition
V6-2 (CV+) - V6-1 (CV-)	R - B	Display signal	Power switch on (IG)	Pulse generation

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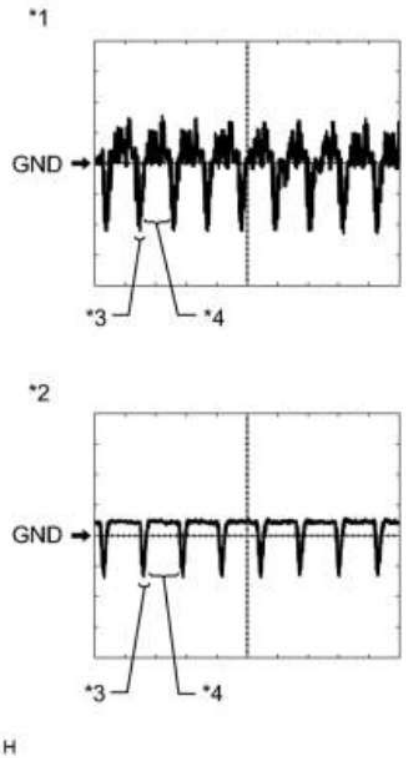
Terminal No. (Symbol)	Wiring Color	Terminal Description	Condition	Specified Condition
			Shift lever in R Under normal conditions	(See waveform 1)
			Power switch on (IG) Shift lever in R Camera lens covered, blacking out screen	Pulse generation (See waveform 2)

HINT:

A waterproof connector is used for the rear television camera assembly. Therefore, inspect the waveform at the inner rear view mirror assembly with the connector connected.

If the result is not as specified, the camera may have a malfunction.

(e) Reference (Oscilloscope waveform):



HINT:

A waterproof connector is used for the rear television camera assembly. Therefore, inspect the waveform at the inner rear view mirror assembly with the connector connected.

(1) Waveform 1 (under normal conditions)

Item	Content
Terminal No. (Symbol)	V6-2 (CV+) - V6-1 (CV-)
Tool Setting	200 mV/DIV., 50 µsec./DIV.
Condition	Power switch on (IG), shift lever in R

HINT:

The video waveform changes according to the image sent by the rear television camera assembly.

(2) Waveform 2 (camera lens is covered, blacking out the

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screen)

Item	Content
Terminal No. (Symbol)	V6-2 (CV+) - V6-1 (CV-)
Tool Setting	200 mV/DIV., 50 µsec./DIV.
Condition	Power switch on (IG), shift lever in R

HINT:

The video waveform changes according to the image sent by the rear television camera assembly.

Text in Illustration

*1	Waveform 1 (under normal conditions)
*2	Waveform 2 (camera lens is covered, blacking out the screen)
*3	Synchronized Signal
*4	Video Waveform

2. INNER REAR VIEW MIRROR ASSEMBLY



H

(a) Disconnect the U7 connector from the inner rear view mirror assembly.

(b) Measure the voltage of each terminal of the wire harness side connector.

Terminal No. (Symbol)	Wiring Color	Terminal Description	Condition	Specified Condition

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Terminal No. (Symbol)	Wiring Color	Terminal Description	Condition	Specified Condition
U7-1 (IG) - Body ground	BE - Body ground	Power switch signal	Power switch off	Below 1 V
			Power switch on (IG)	11 to 14 V
U7-2 (E) - Body ground	W-B - Body ground	Ground	Always	Below 1 V
U7-3 (REV) - U7-2 (E)	P - W-B	Reverse signal	Power switch on (IG) Shift lever in any position except R	Below 1 V
			Power switch on (IG) Shift lever in R	11 to 14 V
U7-13 (CGND) - U7-2 (E)	Shielded - W-B	Rear television camera ground (shielded)	Always	Below 1 V
U7-14 (CB+) - U7-2 (E)	W - W-B	Power source to television camera	Power switch on (IG) Shift lever in R	5.8 to 7.0 V
U7-6 (CV-) - U7-2 (E)	B - W-B	Rear television camera ground	Always	Below 1 V

If the result is not as specified, there may be a malfunction on the wire harness side.

(c) Reconnect the U7 connector to the inner rear view mirror assembly.

(d) Check for pulses between each terminal of the connector.

Terminal No. (Symbol)	Wiring Color	Terminal Description	Condition	Specified Condition
U7-7 (CV+) - U7-2 (E)	R - W-B	Display signal	Power switch on (IG) Shift lever in R Under normal conditions	Pulse generation (See waveform 1)
			Power switch on (IG) Shift lever in R Camera lens covered, blacking out screen	Pulse generation (See waveform 2)

HINT:

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A waterproof connector is used for the rear television camera assembly. Therefore, inspect the waveform at the inner rear view mirror assembly with the connector connected.

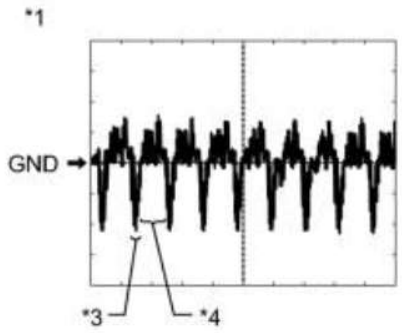
If the result is not as specified, the camera may have a malfunction.

(e) Reference (Oscilloscope waveform):

HINT:

A waterproof connector is used for the rear television camera assembly. Therefore, inspect the waveform at the inner rear view mirror assembly with the connector connected.

(1) Waveform 1 (under normal conditions)

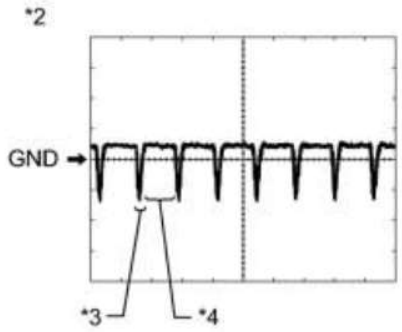


Item	Content
Terminal No. (Symbol)	U7-7 (CV+) - U7-2 (E)
Tool Setting	200 mV/DIV., 50 µsec./DIV.
Condition	Power switch on (IG), shift lever in R

HINT:

The video waveform changes according to the image sent by the rear television camera assembly.

(2) Waveform 2 (camera lens is covered, blacking out the screen)



Item	Content
Terminal No. (Symbol)	U7-7 (CV+) - U7-2 (E)
Tool Setting	200 mV/DIV., 50 µsec./DIV.
Condition	Power switch on (IG), shift lever in R

HINT:

The video waveform changes according to the image sent by the rear television camera assembly.

H

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Text in Illustration

*1	Waveform 1 (under normal conditions)
*2	Waveform 2 (camera lens is covered, blacking out the screen)
*3	Synchronized Signal
*4	Video Waveform

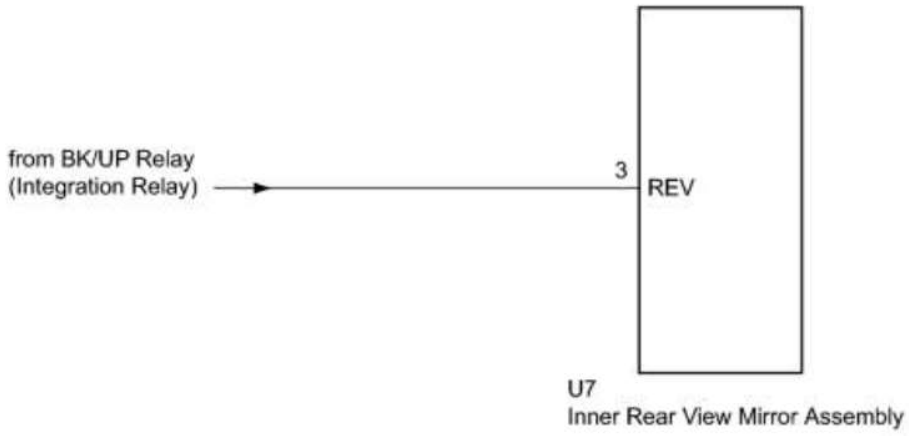
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Reverse Signal Circuit

DESCRIPTION

The inner rear view mirror assembly receives a reverse shift position signal from the BK/UP relay.

WIRING DIAGRAM



INSPECTION PROCEDURE

PROCEDURE

1.	CHECK BACK-UP LIGHT ASSEMBLY

(a) Move the shift lever to R and check if the back-up light comes on.

OK:

The back-up light comes on.

NG ▶ GO TO LIGHTING SYSTEM

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OK

▼

2.	CHECK INNER REAR VIEW MIRROR ASSEMBLY (REV)

(a) Disconnect the U7 connector from the inner rear view mirror assembly.

(b) Measure the voltage according to the value(s) in the table below.

Standard Voltage:

Tester Connection	Condition	Specified Condition
U7-3 (REV) - Body ground	Power switch on (IG) Shift lever in R	11 to 14 V
U7-3 (REV) - Body ground	Power switch on (IG) Shift lever in any position except R	Below 1 V

NG ▶ REPAIR OR REPLACE HARNESS OR CONNECTOR

OK ▶ **PROCEED TO NEXT SUSPECTED AREA SHOWN IN PROBLEM SYMPTOMS TABLE**

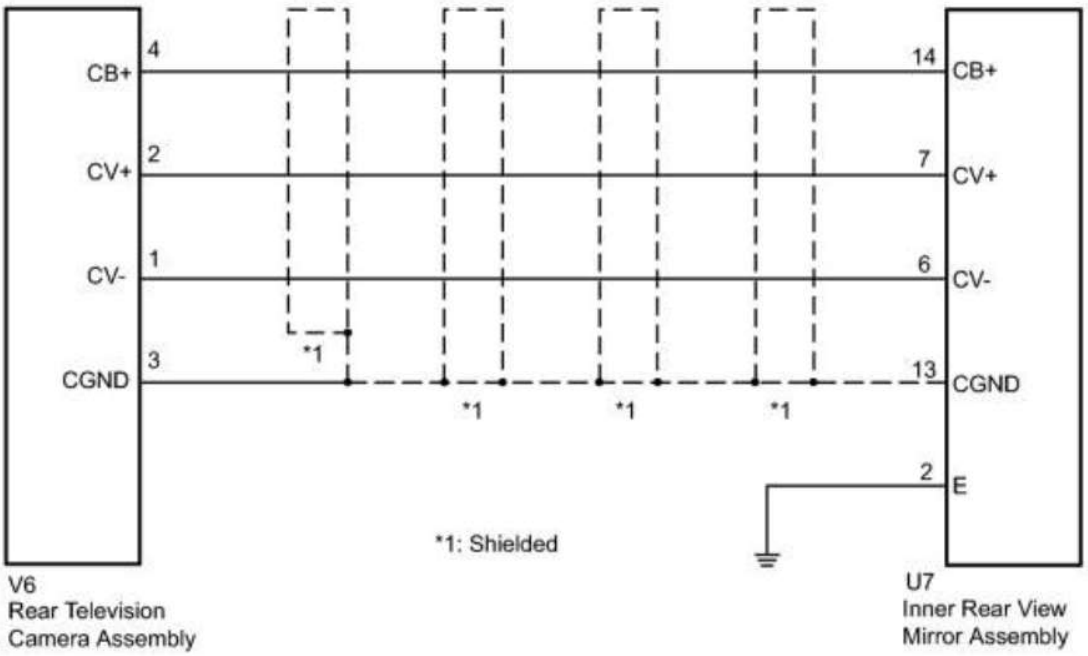
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Image from Camera for Rear View Monitor is Abnormal

DESCRIPTION

The display signal of the rear television camera assembly transmit to the inner rear view mirror assembly.

WIRING DIAGRAM



INSPECTION PROCEDURE

PROCEDURE

1.	CHECK HARNESS AND CONNECTOR (INNER REAR VIEW MIRROR - REAR TELEVISION CAMERA)

(a) Disconnect the U7 connector from the inner rear view mirror assembly.

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(b) Disconnect the V6 connector from the rear television camera assembly.

(c) Measure the resistance according to the value(s) in the table below.

Standard Resistance:

Tester Connection	Condition	Specified Condition
U7-7 (CV+) - V6-2 (CV+)	Always	Below 1 Ω
U7-14 (CB+) - V6-4 (CB+)	Always	Below 1 Ω
U7-6 (CV-) - V6-1 (CV-)	Always	Below 1 Ω
U7-13 (CGND) - V6-3 (CGND)	Always	Below 1 Ω
U7-7 (CV+) - Body ground	Always	10 kΩ or higher
U7-14 (CB+) - Body ground	Always	10 kΩ or higher
U7-6 (CV-) - Body ground	Always	10 kΩ or higher
U7-13 (CGND) - Body ground	Always	10 kΩ or higher

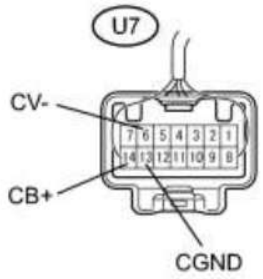
NG ▶ REPAIR OR REPLACE HARNESS OR CONNECTOR

OK

▼

2.	CHECK INNER REAR VIEW MIRROR ASSEMBLY

*1



(a) Reconnect the U7 connector to the inner rear view mirror assembly.

(b) Measure the resistance according to the value(s) in the table below.

Standard Resistance:

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Tester Connection	Condition	Specified Condition
U7-6 (CV-) - Body ground	Always	Below 1 Ω
U7-13 (CGND) - Body ground	Always	Below 1 Ω

(c) Measure the voltage according to the value(s) in the table below.

Standard Voltage:

Tester Connection	Condition	Specified Condition
U7-14 (CB+) - U7-13 (CGND)	Power switch on (IG) Shift lever in R	5.8 to 7.0 V

Text in Illustration

*1	Component with harness connected (Inner Rear View Mirror Assembly)

NG ▶ REPLACE INNER REAR VIEW MIRROR ASSEMBLY

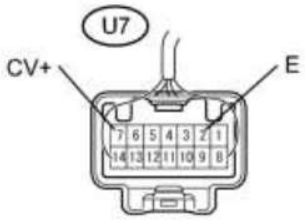
OK

▼

3.	CHECK REAR TELEVISION CAMERA ASSEMBLY

(a) Reconnect the V6 connector to the rear television camera assembly.

*1



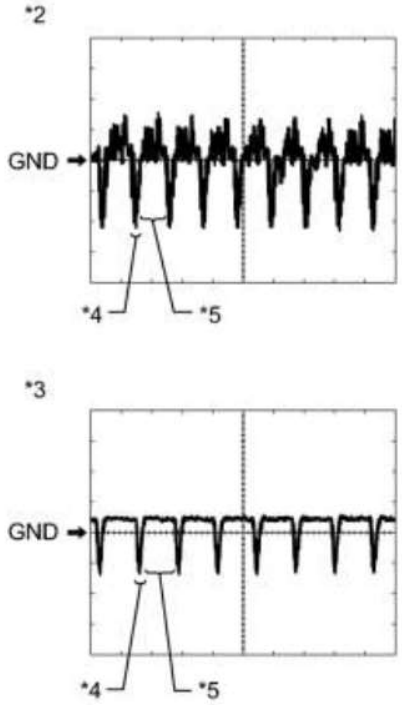
(b) Connect the U7 connector to the inner rear view mirror assembly.

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(c) Check the waveform of the rear television camera assembly using an oscilloscope.

HINT:

A waterproof connector is used for the rear television camera assembly. Therefore, inspect the waveform at the inner rear view mirror assembly with the connector connected.



OK:

Waveform is as shown in the illustration.

Item	Content
Terminal No. (Symbol)	U7-7 (CV+) - U7-2 (E)
Tool Setting	200 mV/DIV., 50 µsec./DIV.
Condition	Power switch on (IG), shift lever in R

HINT:

The video waveform changes according to the image sent by the rear television camera assembly.

Text in Illustration

*1	Component with harness connected (Inner Rear View Mirror Assembly)
*2	Waveform 1 (under normal conditions)
*3	Waveform 2 (camera lens is covered, blacking out the screen)
*4	Synchronized Signal
*5	Video Waveform

NG ▶ REPLACE REAR TELEVISION CAMERA ASSEMBLY

OK ▶ **PROCEED TO NEXT SUSPECTED AREA SHOWN IN PROBLEM SYMPTOMS TABLE**

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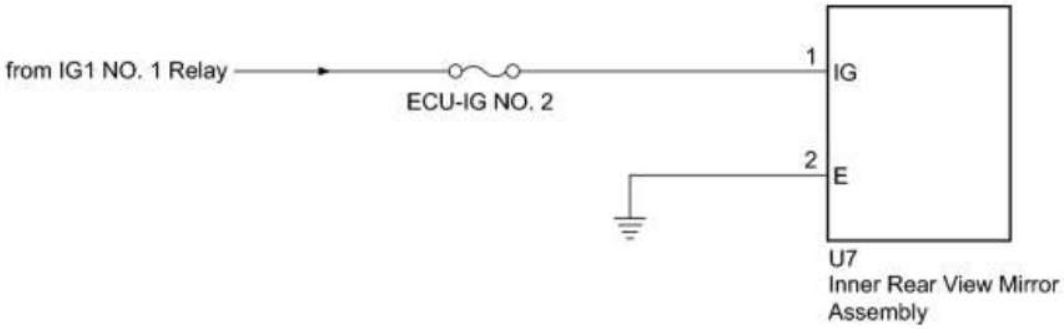
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Inner Rear View Mirror Power Source Circuit

DESCRIPTION

This circuit detects the state of the power switch, and sends it to the inner rear view mirror assembly.

WIRING DIAGRAM



INSPECTION PROCEDURE

NOTICE:

Inspect the fuses for circuits related to this system before performing the following inspection procedure.

PROCEDURE

1.	CHECK HARNESS AND CONNECTOR (BATTERY - INNER REAR VIEW MIRROR ASSEMBLY)

(a) Disconnect the U7 inner rear view mirror assembly connector.

(b) Measure the voltage according to the value(s) in the table below.

Standard Voltage:

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Tester Connection	Switch Condition	Specified Condition
U7-1 (IG) - U7-2 (E)	Power switch on (IG)	11 to 14 V
	Power switch off	Below 1 V

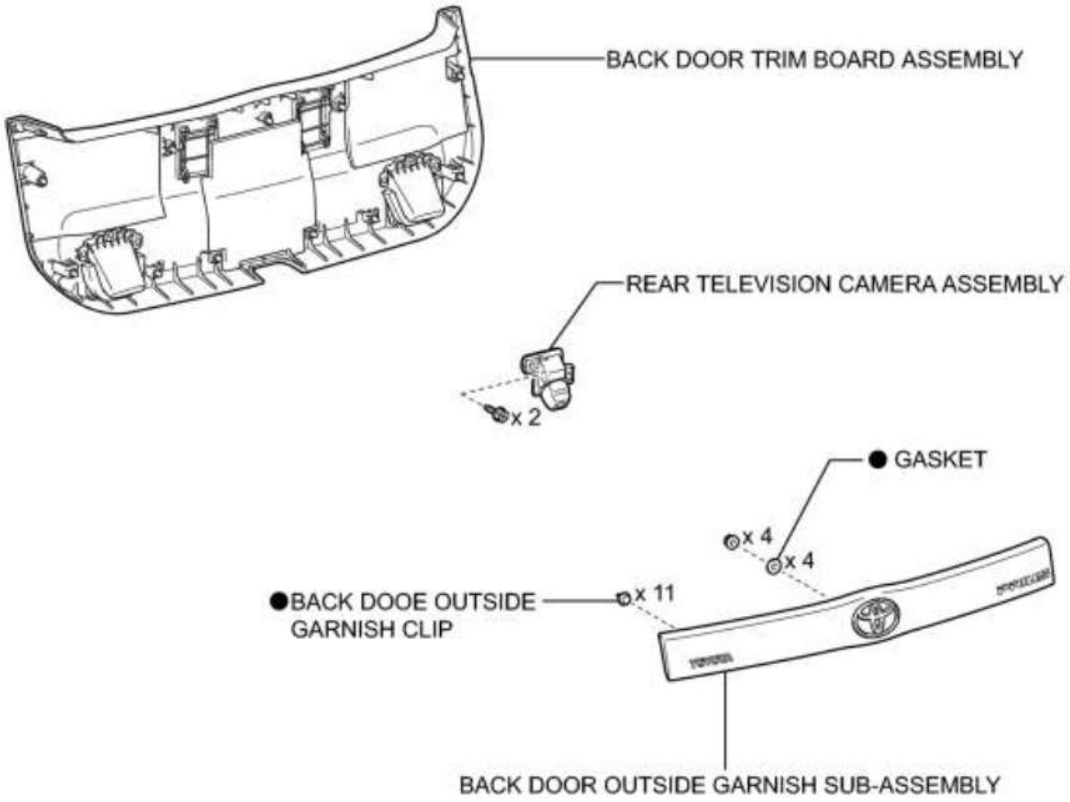
NG ▶ REPAIR OR REPLACE HARNESS OR CONNECTOR

OK ▶ **PROCEED TO NEXT SUSPECTED AREA SHOWN IN PROBLEM SYMPTOMS TABLE**

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COMPONENTS

ILLUSTRATION



● Non-reusable part

P

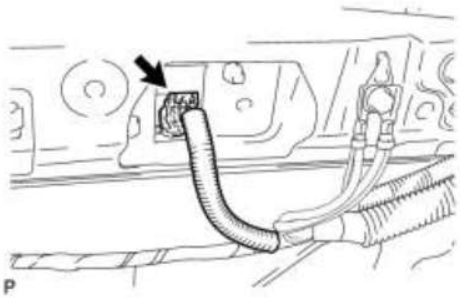
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REMOVAL

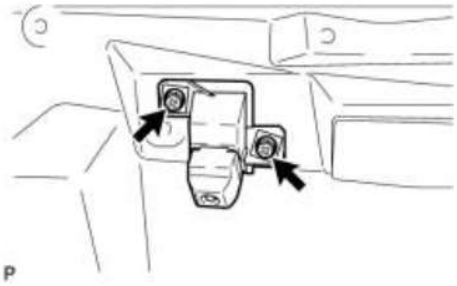
1. REMOVE BACK DOOR TRIM BOARD ASSEMBLY INFO

2. REMOVE BACK DOOR OUTSIDE GARNISH SUB-ASSEMBLY INFO

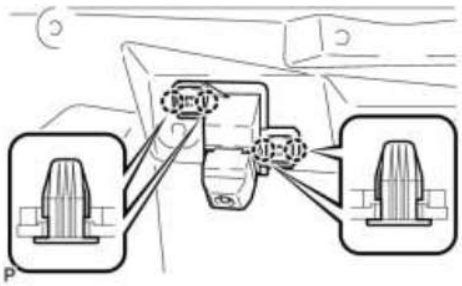
3. REMOVE REAR TELEVISION CAMERA ASSEMBLY



(a) Disconnect the connector.



(b) Remove the 2 screws.

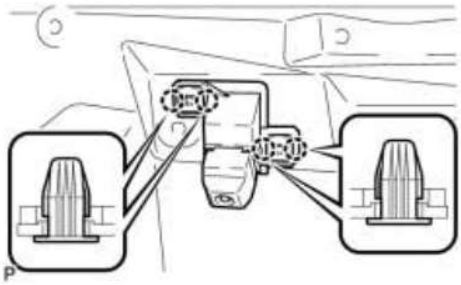


(c) Disengage the 4 claws and remove the rear television camera assembly.

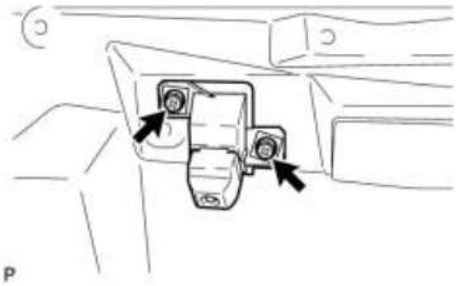
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INSTALLATION

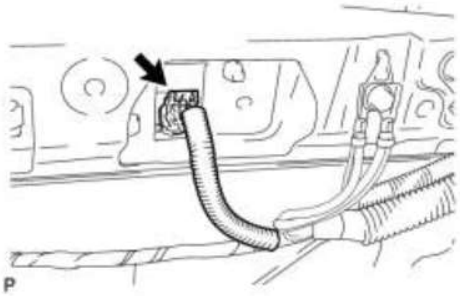
1. INSTALL REAR TELEVISION CAMERA ASSEMBLY



(a) Engage the 4 claws to temporarily install the rear television camera assembly.



(b) Install the rear television camera assembly with the 2 screws.



(c) Connect the connector.

2. INSTALL BACK DOOR OUTSIDE GARNISH SUB-ASSEMBLY INFO

3. INSTALL BACK DOOR TRIM BOARD ASSEMBLY INFO

4. ADJUST REAR TELEVISION CAMERA OPTICAL AXIS (CAMERA POSITION SETTINGS) (w/ Advanced Parking Guidance System)

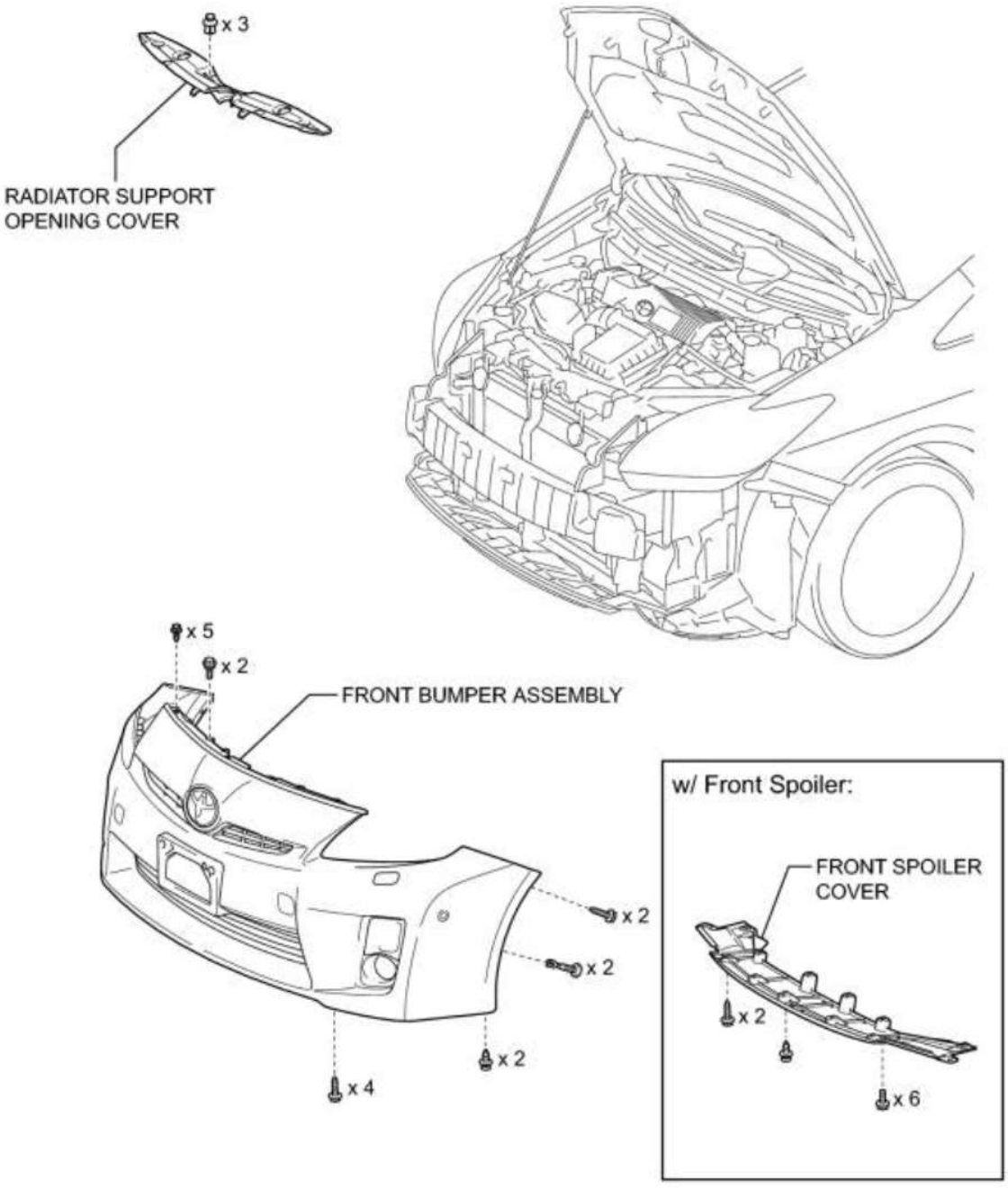
INFO

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COMPONENTS

ILLUSTRATION

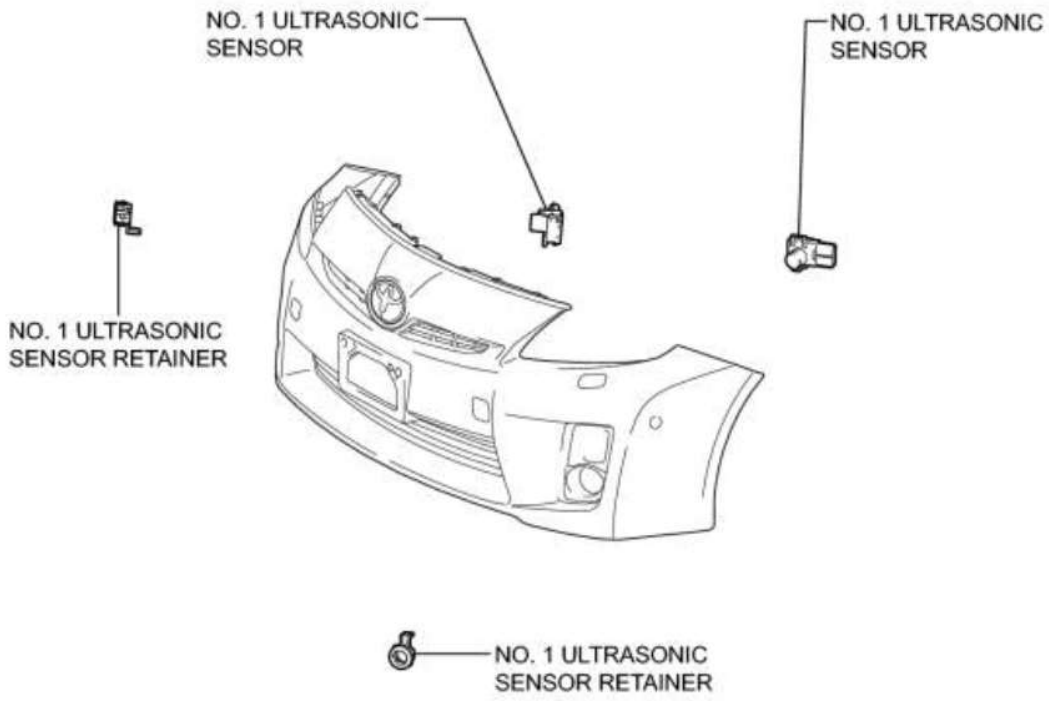
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P

ILLUSTRATION

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P

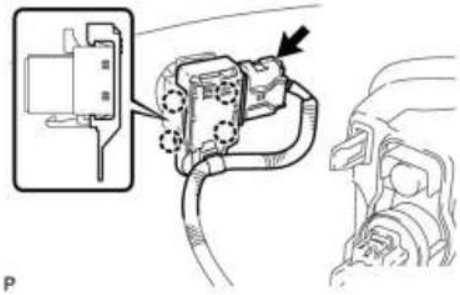
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REMOVAL

1. REMOVE RADIATOR SUPPORT OPENING COVER INFO

2. REMOVE FRONT BUMPER ASSEMBLY INFO

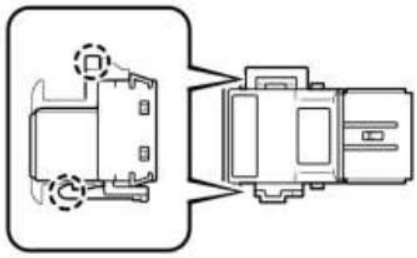
3. REMOVE NO. 1 ULTRASONIC SENSOR



P

(a) Disconnect the connector.

(b) Disengage the 4 claws and disconnect the wire harness with bracket.



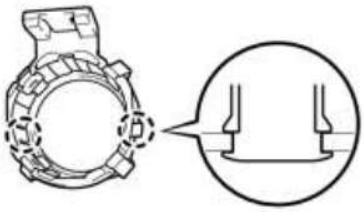
P

(c) Disengage the 2 claws and remove the No. 1 ultrasonic sensor.

HINT:

Use the same procedure for the RH side and LH side.

4. REMOVE NO. 1 ULTRASONIC SENSOR RETAINER



P

(a) Disengage the 2 claws and remove the No. 1 ultrasonic sensor retainer.

HINT:

Use the same procedure for the RH side and LH side.

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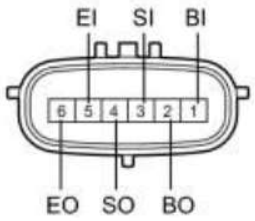
INSPECTION

1. INSPECT NO. 1 ULTRASONIC SENSOR

(a) Measure the resistance according to the value(s) in the table below.

Standard Resistance:

*1



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Tester Connection	Condition	Specified Condition
1 (BI) - 5 (EI)	Always	10 kΩ or higher
1 (BI) - 2 (BO)	Always	10 kΩ or higher
3 (SI) - 4 (SO)	Always	Below 1 Ω
5 (EI) - 6 (EO)	Always	Below 1 Ω

Text in Illustration

*1	Component without harness connected (No. 1 Ultrasonic Sensor)

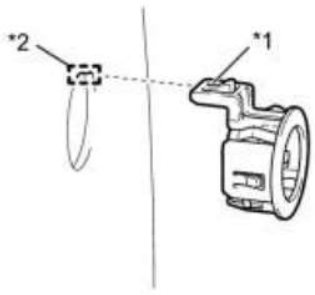
If the result is not as specified, replace the No. 1 ultrasonic sensor.

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INSTALLATION

1. INSTALL NO. 1 ULTRASONIC SENSOR RETAINER

(a) Temporarily install the No. 1 ultrasonic sensor retainer to the front bumper.



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Text in Illustration

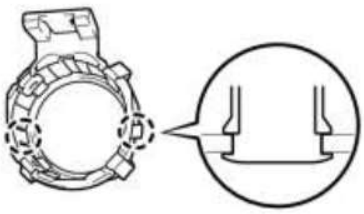
*1	Protrusion
*2	Keyhole

- Do not damage the front bumper with the protrusion when installing the retainer.
- Securely install the No. 1 ultrasonic sensor retainer so that there are no gaps between the retainer and surface of the front bumper.

HINT:

When installing the retainer, align the keyhole and protrusion as shown in the illustration.

(b) Engage the 2 claws to install the No. 1 ultrasonic sensor retainer to the front bumper.



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HINT:

Use the same procedure for the RH side and LH side.

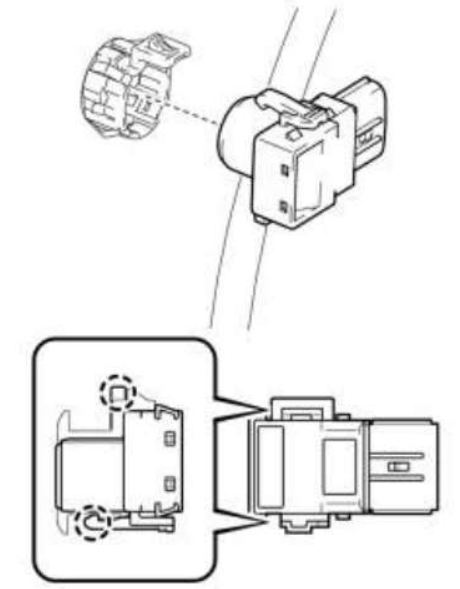
2. INSTALL NO. 1 ULTRASONIC SENSOR

(a) Engage the 2 claws to install the No. 1 ultrasonic sensor as shown in the illustration.

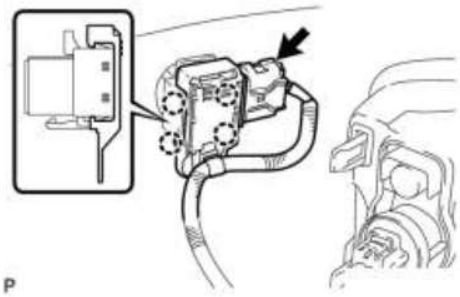
NOTICE:

Push the No. 1 ultrasonic sensor retainer from the outside of the bumper when there is a gap between the retainer and the bumper surface. In this case, do not push on the ultrasonic sensor.

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(b) Engage the 4 claws to connect the wire harness with bracket.

(c) Connect the connector.

HINT:

Use the same procedure for the RH side and LH side.

3. INSTALL FRONT BUMPER ASSEMBLY INFO

4. INSTALL RADIATOR SUPPORT OPENING COVER INFO

5. ADD WASHER FLUID (w/ Headlight Cleaner System) INFO

6. PREPARE VEHICLE FOR FOG LIGHT AIM ADJUSTMENT INFO

7. PREPARE FOR FOG LIGHT AIMING INFO

8. INSPECT FOG LIGHT AIMING INFO

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9. ADJUST FOG LIGHT AIMING INFO

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