PRECAUTION

1. NOTICE FOR INITIALIZATION

NOTICE:

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

System Name	See Procedure
Advanced Parking Guidance System	INFO

2. HANDLING PRECAUTION FOR CRUISE CONTROL SYSTEM

(a) Turn the cruise control main switch (ON-OFF button) off when not using the cruise control system.

(b) Be careful as the vehicle speed increases when driving downhill with the cruise control system on.

(c) The +RES operation changes according to the cruise control system status. When the cruise control system is operating, the + function operates. When the cruise control system is not operating, the RES function operates.

(d) If the cruise main indicator light blinks while the cruise control system is operating, turn the cruise control main switch (ON-OFF button) off to reset the cruise control system. After the reset, if the cruise control main switch (ON-OFF button) cannot be turned on, or the cruise control system is canceled immediately after turning the cruise control main switch (ON-OFF button) on, the system may have a malfunction.

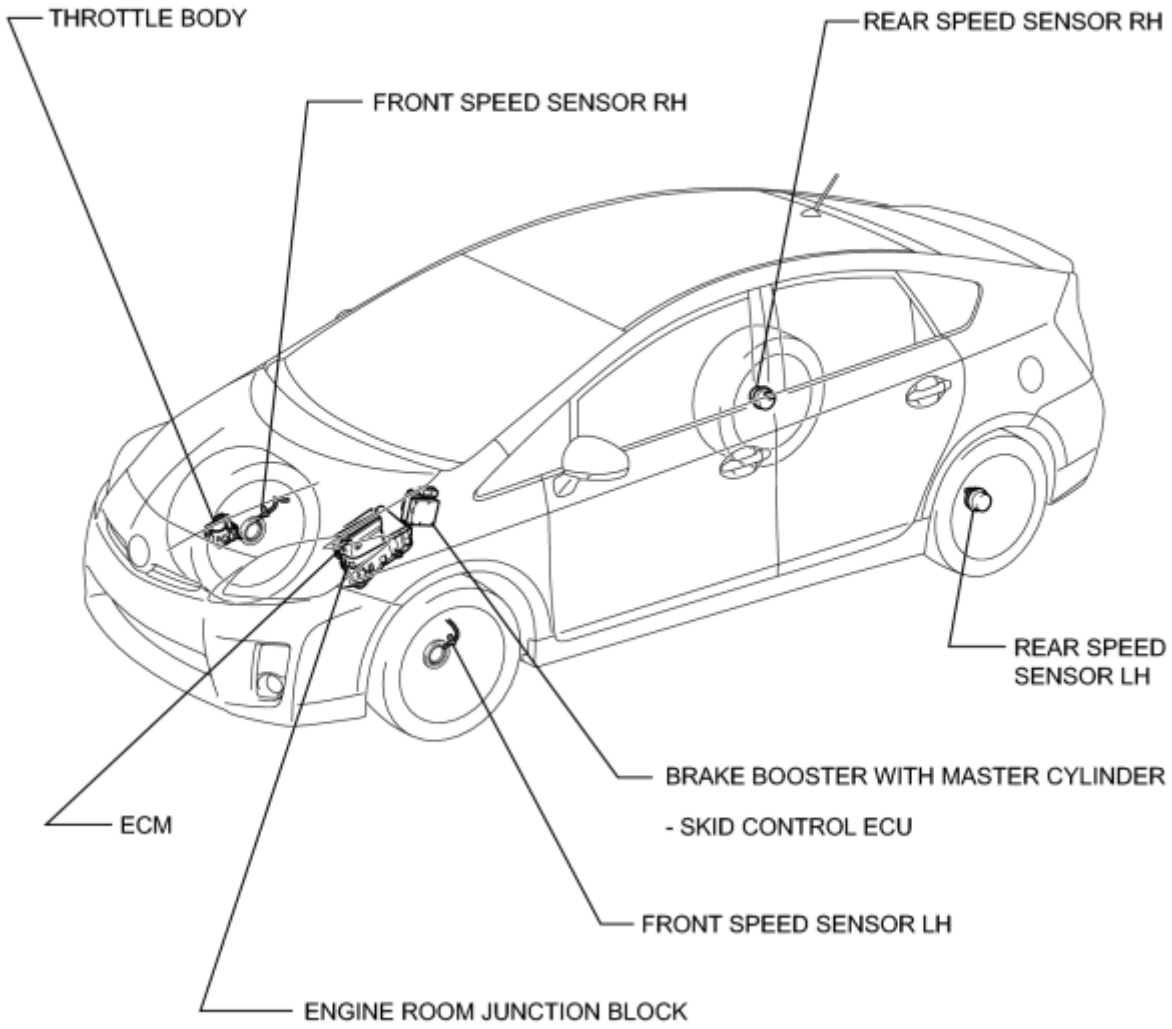
(e) Do not use the cruise control system where the road conditions are as follows:

- Heavy traffic
- Steep decline
- Roads with sharp turns
- Icy or snowy roads
- Slippery roads

(f) Do not use the cruise control system while towing.

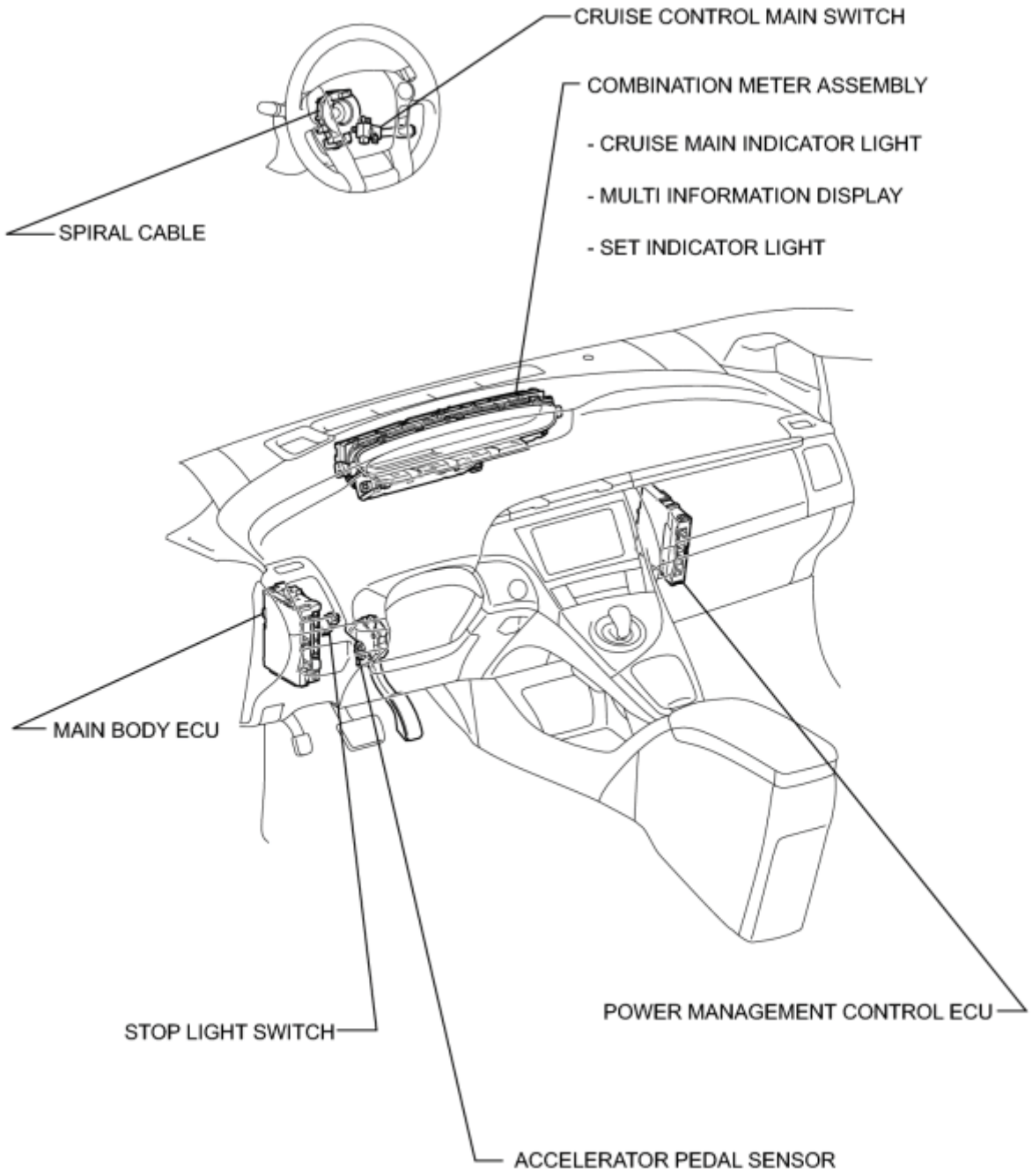
PARTS LOCATION

ILLUSTRATION



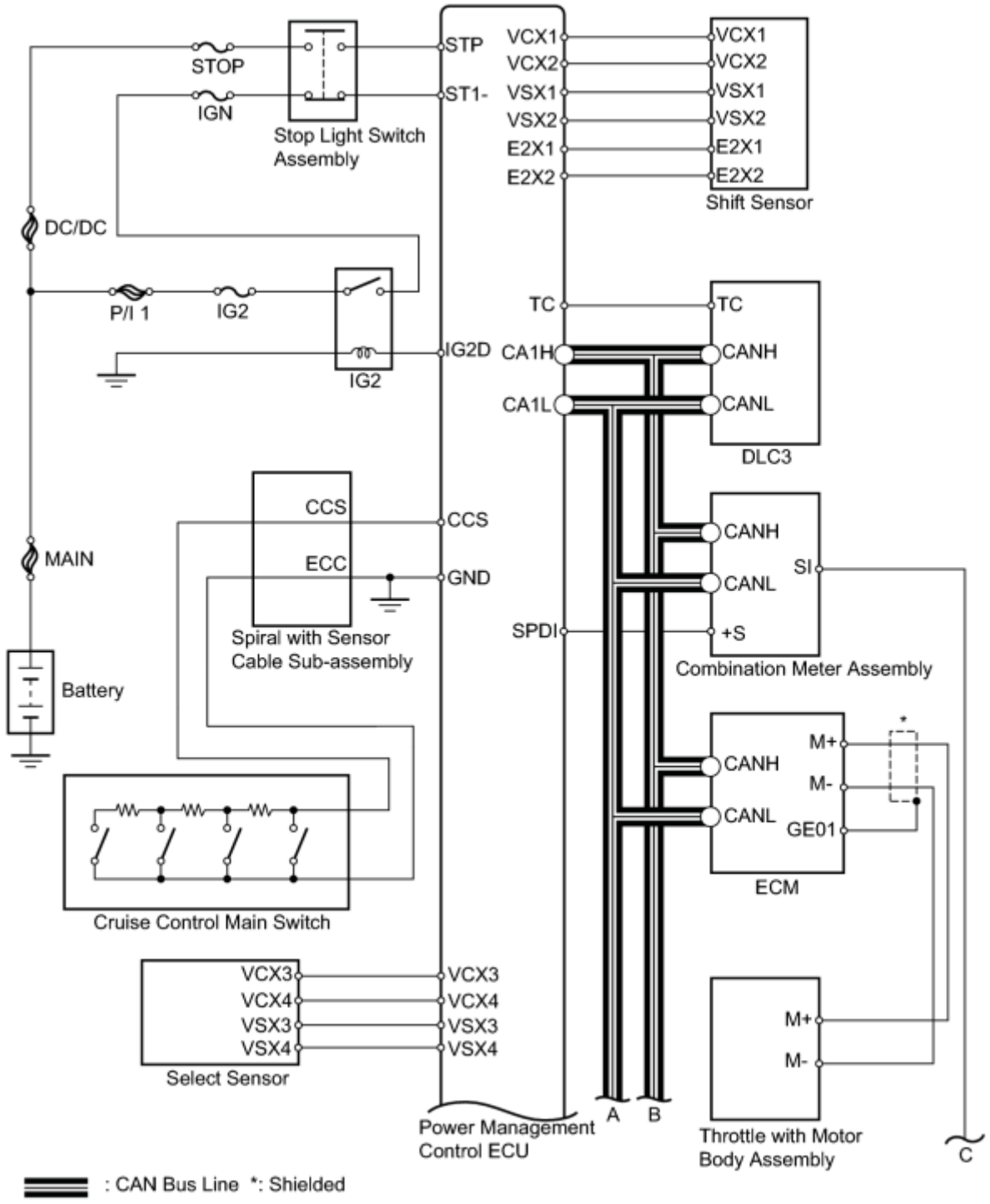
H

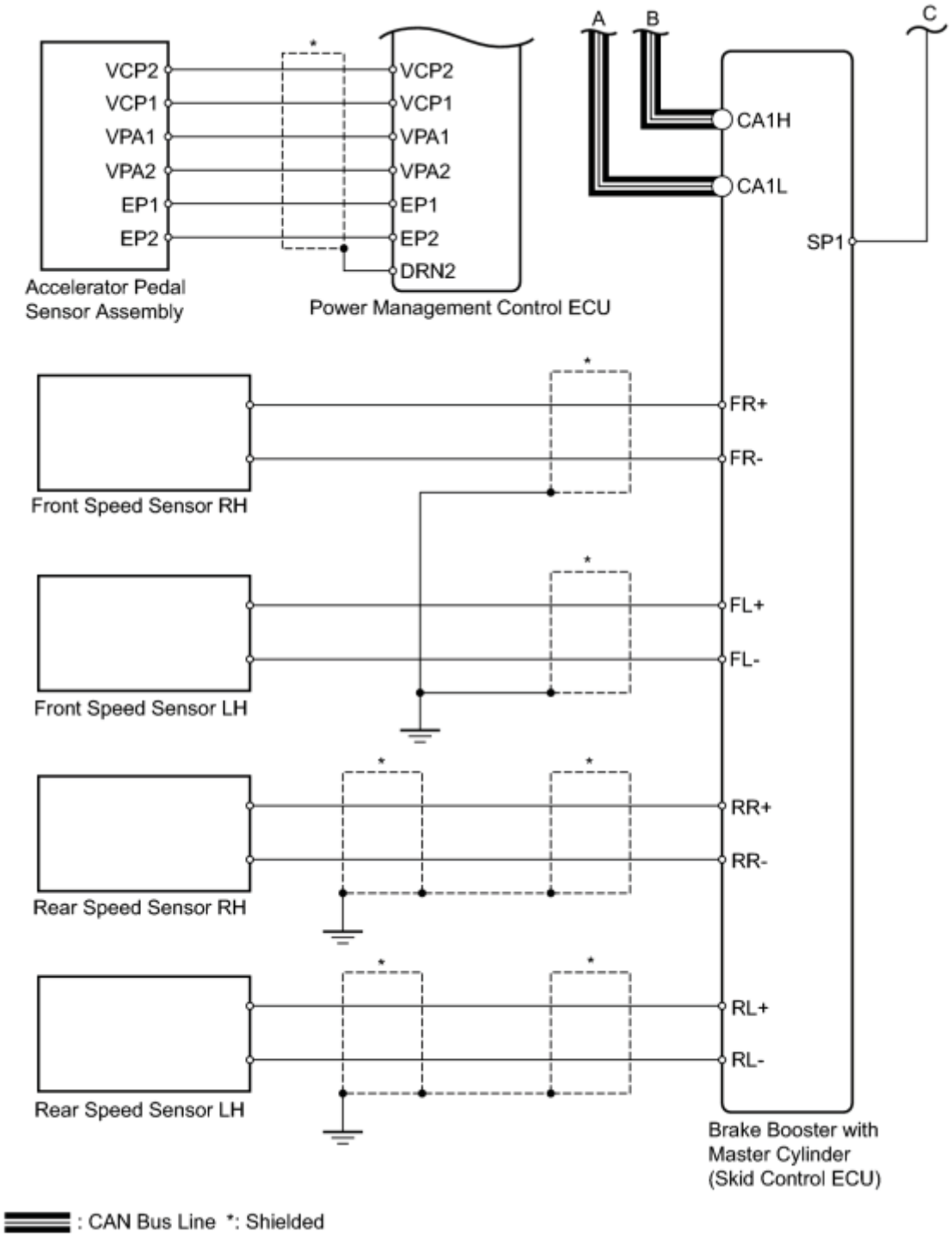
ILLUSTRATION


CRUISE CONTROL MAIN SWITCH
COMBINATION METER ASSEMBLY
- CRUISE MAIN INDICATOR LIGHT
- MULTI INFORMATION DISPLAY
- SET INDICATOR LIGHT
SPIRAL CABLE
MAIN BODY ECU
STOP LIGHT SWITCH
POWER MANAGEMENT CONTROL ECU
ACCELERATOR PEDAL SENSOR

H

SYSTEM DIAGRAM





c

Communication Table

Sender	Receiver	Signal	Line
Power management control ECU	Combination meter assembly (Cruise Main Indicator	• Cruise main indicator and SET indicator operation signal • Cruise control diagnosis signal	CAN

Sender	Receiver	Signal	Line
	Light) ("SET" Indicator)		
Brake booster with master cylinder (skid control ECU)	Power management control ECU	Electronically controlled brake system malfunction signal	CAN
Power management control ECU	ECM	Throttle actuator operation signal	CAN
ECM	Power management control ECU	Throttle position signal	CAN

SYSTEM DESCRIPTION

1. CRUISE CONTROL SYSTEM

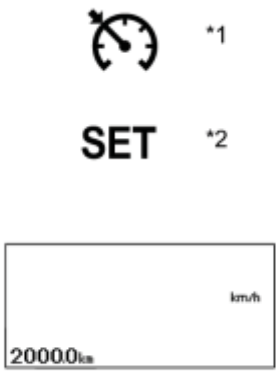
The cruise control system maintains constant vehicle speed. It enables the driver to adjust the vehicle speed by operating the cruise control main switch without using the accelerator pedal.

The power management control ECU receivers signals from each switch and sensor, and maintains constant vehicle speed by optimizing the use of the engine and motor driving force.

- The power management control ECU receives signals such as ON-OFF, - SET, + RES, and CANCEL from the cruise control main switch and executes the command.
- The power management control ECU illuminates the combination meter's cruise main indicator light when it receives a cruise control main switch (ON-OFF button) ON signal.

Text in Illustration

*1	Cruise Main Indicator Light
*2	"SET" Indicator



- The power management control ECU displays "SET" on the multi-information display when constant speed control is started by pushing the cruise control main switch to "- SET".
- The power management control ECU cancels cruise control operation when the brake pedal is depressed and the power management control ECU receives a stop light switch signal.
- The power management control ECU cancels cruise control operation when the shift lever is moved from D to N or B position, and the power management control ECU receives a shift position sensor signal.

2. LIMIT CONTROL

(a) Low speed limit

The lowest possible limit of the speed setting range is set at approximately 40 km/h (25 mph). The cruise control system cannot be set when the vehicle speed is below the low speed limit. Cruise control operation will

be automatically canceled but the stored vehicle speed will be retained when the vehicle speed drops below the low speed limit of 40 km/h (25 mph) while the cruise control is in operation.

(b) High speed limit

The highest possible limit of the speed setting range is set at approximately 200 km/h (125 mph). The cruise control system cannot be set when the driving vehicle speed is over the high speed limit. Also, + RES cannot be used to increase speed over the high speed limit.

3. CRUISE CONTROL OPERATION

The cruise control main switch operates 7 functions: SET, -, TAP-DOWN, RES, +, TAP-UP, and CANCEL. The SET, TAP-DOWN, and - functions, and the RES, TAP-UP, and + functions are operated with the same switch. The cruise control main switch is an automatic return type switch which turns on only while it is being operated in the direction of each arrow and turns off after being released.

(a) SET CONTROL

Vehicle speed is stored and constant speed control is maintained when pushing the cruise control main switch to - SET while driving with the main switch on (the cruise main indicator light and "SET" indicator come on), and the vehicle speed is within the set speed range (between the low and high speed limits).

(b) - CONTROL

The power management control ECU decreases the cruise control demand speed and controls the engine and motor driving force to decelerate the vehicle when - SET on the cruise control main switch is pressed and held while the cruise control system is in operation. When the cruise control main switch is released from - SET, vehicle speed is stored and constant speed control is maintained.

(c) TAP-DOWN CONTROL

When tapping down the cruise control main switch to - SET (for approximately 0.6 seconds) while the cruise control system is in operation, the stored vehicle speed decreases each time by approximately 1.6 km/h (1 mph). When the cruise control main switch is released from - SET and the difference between the driving and stored vehicle speeds is more than 5 km/h (3 mph), the vehicle speed is stored and constant speed control is maintained.

(d) + CONTROL

The power management control ECU increases the cruise control demand speed and controls the engine and motor driving force to accelerate the vehicle when pushing and holding the cruise control main switch to + RES while the cruise control system is in operation.

When the cruise control main switch is released from + RES, vehicle speed is stored and constant speed control is maintained.

(e) TAP-UP CONTROL

When tapping up the cruise control main switch to + RES (for approximately 0.6 seconds) while the cruise control system is in operation, the stored vehicle speed increases each time by approximately 1.6 km/h (1 mph).

However, when the difference between the driving and the stored vehicle speeds is more than 5 km/h (3 mph), the stored vehicle speed will not be changed.

(f) RES CONTROL

If cruise control operation was canceled with the stop light switch assembly or the CANCEL switch, and if driving speed is within the limit range, pushing the cruise control main switch to + RES restores vehicle speed memorized at the time of cancellation, and maintains constant speed control.

(g) MANUAL CANCEL CONTROL

Performing any of the following cancels the cruise control system while it is operating (the stored vehicle speed in the ECM is maintained).

- Depressing the brake pedal
- Moving the shift lever from D to N or B position
- Pushing the cruise control main switch to CANCEL
- Turning the cruise control main switch (ON-OFF button) off (the stored vehicle speed in the ECM is not maintained)

4. AUTO CANCEL (FAIL-SAFE)

This system has an automatic cancellation function (fail-safe) 

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HOW TO PROCEED WITH TROUBLESHOOTING

HINT:

- Use the following procedure to troubleshoot the cruise control system.
- *: Use the Techstream.

1.	VEHICLE BROUGHT TO WORKSHOP

NEXT

2.	INSPECT BATTERY VOLTAGE

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 COMMUNICATION FUNCTION OF CONTROLLER AREA NETWORK (CAN)*

(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

4.	CHECK FOR DTC*

Refer to DTC Check / Clear INFO.

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

(b) Clear the DTCs.

(c) Recheck for DTCs. Try to reproduce the DTCs by duplicating the conditions indicated by the DTCs.

Result:

Result	Proceed to
DTC does not reoccur	A

Result	Proceed to
DTC reoccurs	B

B ▶ INFO GO TO DTC CHART

A ▼

5.	PROBLEM SYMPTOMS TABLE

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 7

A ▼

6.	OVERALL ANALYSIS AND TROUBLESHOOTING*

(a) Terminals of ECU INFO

(b) Data List / Active Test INFO

NEXT ▼

7.	ADJUST, REPAIR OR REPLACE

NEXT ▼

8.	CONFIRMATION TEST

NEXT ▶ **END**

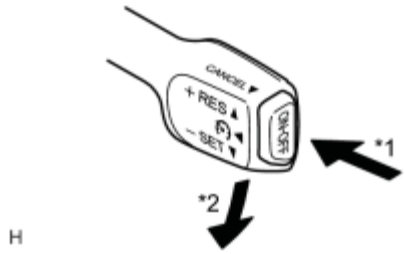
ROAD TEST

1. PROBLEM SYMPTOM CONFIRMATION

(a) Inspect the SET function.

Text in Illustration

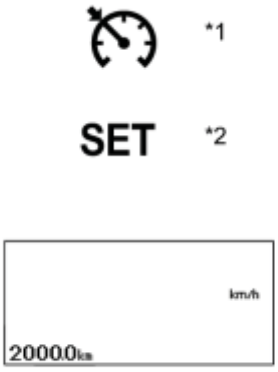
*1	ON/OFF
*2	- SET



(1) Turn the cruise control main switch (ON-OFF button) on.

(2) Check that the cruise main indicator light illuminates on the combination meter assembly.

(3) Drive at a speed of between 40 km/h (25 mph) and 200 km/h (125 mph).



(4) Push the cruise control main switch to - SET.

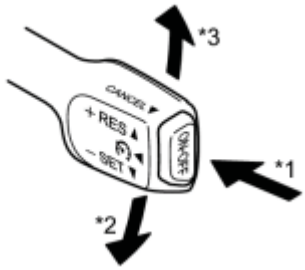
Text in Illustration

*1	Cruise Main Indicator Light
*2	"SET" Indicator

(5) Check that "SET" is indicated on the multi-information display.

(6) After releasing the switch, check that the vehicle cruises at the set speed.

(b) Inspect the + function.



Text in Illustration

*1	ON/OFF
*2	- SET
*3	+ RES

(1) Turn the cruise control main switch (ON-OFF button) on.

(2) Drive at the required speed (40 km/h (25 mph) or higher).

(3) Push the cruise control main switch to - SET.

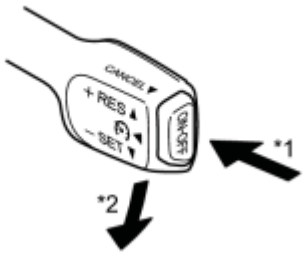
(4) Check that vehicle speed increases while the cruise control main switch is pushed to + RES, and that the vehicle cruises at the newly set speed when the switch is released.

(5) Push the cruise control main switch to + RES and then release it immediately. Check that vehicle speed increases by approximately 1.6 km/h (1 mph) (tap-up control).

(c) Inspect the - function.

Text in Illustration

*1	ON/OFF
*2	- SET



H

(1) Turn the cruise control main switch (ON-OFF button) on.

(2) Drive at a speed of between 40 km/h (25 mph) and 200 km/h (125 mph).

(3) Push the cruise control main switch to - SET.

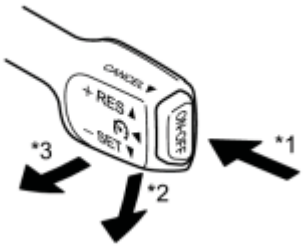
(4) Check that vehicle speed decreases while the cruise control main switch is pushed to - SET, and the vehicle cruises at the newly set speed when the switch is released.

(5) Push the cruise control main switch to - SET, and then release it immediately. Check that vehicle speed decreases by approximately 1.6 km/h (1 mph) (tap-down control).

(d) Inspect the CANCEL function.

Text in Illustration

*1	ON/OFF
*2	- SET



*3	CANCEL

(1) Turn the cruise control main switch (ON-OFF button) on.

(2) Drive at a speed of between 40 km/h (25 mph) and 200 km/h (125 mph).

(3) Push the cruise control main switch to - SET.

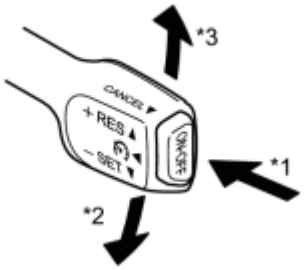
(4) When performing any one of the following, check that the operation of the cruise control system is cancelled, normal driving resumes and "SET" on the multi-information display goes off.

- Depressing the brake pedal
- Moving the shift lever from D to N or selecting 3rd, 2nd, or 1st gear with the shift lever in S
- Turning the cruise control main switch off
- Pulling the cruise control main switch to CANCEL

(e) Inspect the RES function.

Text in Illustration

*1	ON/OFF
*2	- SET
*3	+ RES



(1) Turn the cruise control main switch (ON-OFF button) on.

(2) Drive at a speed of between 40 km/h (25 mph) and 200 km/h (125 mph).

(3) Push the cruise control main switch to - SET.

(4) Cancel cruise control operation by performing any of the above operations (other than turning the main switch off).

(5) After pushing the cruise control main switch to "+ RES" at a speed of more than 40 km/h (25 mph), check that the vehicle resumes the speed set prior to the cancellation and that "SET" is also displayed on the multi-information display.

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.

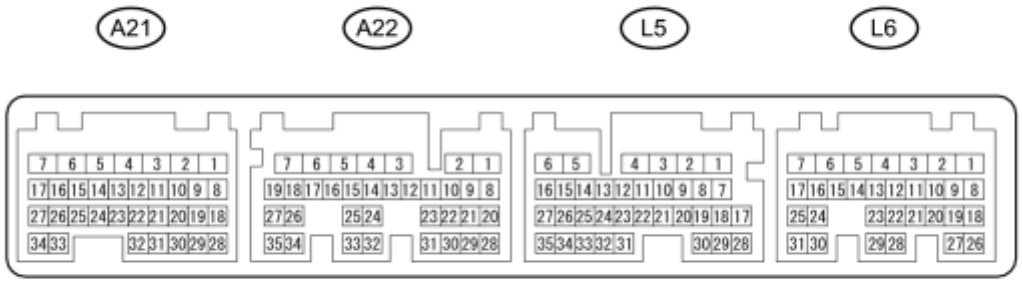
Cruise Control System

Symptom	Suspected Area	See page
The cruise control main switch cannot be turned on.	Cruise control switch circuit	INFO
	CRUISE main indicator light circuit	INFO
	Power management control ECU	INFO
Vehicle speed setting cannot be performed (the cruise main indicator light on the combination meter illuminates when the main switch is turned on, but turns off when SET function is operating).	Cruise control switch circuit	INFO
	Power management control ECU	INFO
Vehicle speed setting cannot be performed (the cruise main indicator light on the combination meter illuminates when the main switch is turned on, and remains illuminated when SET function is operating).	Stop light switch circuit	INFO
	Vehicle speed sensor circuit	INFO
	Cruise control switch circuit	INFO
	Hybrid control system	INFO
	Power management control ECU	INFO
The cruise control is canceled while it is operating.	Stop light switch circuit	INFO
	Hybrid control system	INFO
	Electronically controlled brake system	INFO
	Cruise control switch circuit	INFO
	Vehicle speed sensor circuit	INFO
	Power management control ECU	INFO

Symptom	Suspected Area	See page
Pulling back on the control main switch does not cancel the cruise control. (The cruise main indicator light remains on.)	Cruise control switch circuit	INFO
	Power management control ECU	INFO
Pulling back on the control main switch does not cancel the cruise control. (The cruise main indicator light goes off.)	Power management control ECU	INFO
The cruise control is not canceled when vehicle speed drops below the low speed limit. (The cruise main indicator light remains on.)	Vehicle speed sensor circuit	INFO
	Power management control ECU	INFO
The cruise control is not canceled when vehicle speed drops below the low speed limit. (The cruise main indicator light goes off.)	Power management control ECU	INFO
Depressing the brake pedal does not cancel the cruise control. (The cruise main indicator light remains on.)	Stop light switch circuit	INFO
	Power management control ECU	INFO
Depressing the brake pedal does not cancel the cruise control. (The cruise indicator main light goes off.)	Power management control ECU	INFO
Moving the shift lever does not cancel the cruise control. (The cruise main indicator light remains on.)	Hybrid control system	INFO
	Power management control ECU	INFO
Moving the shift lever does not cancel the cruise control. (The cruise indicator main light goes off.)	Power management control ECU	INFO
Hunting (Speed is not constant.)	Vehicle speed sensor circuit	INFO
	SFI system	INFO
	Power management control ECU	INFO
The cruise main indicator light remains blinking.	TC and CG terminal circuit	INFO
	Power management control ECU	INFO
The "SET" indicator does not comes on (SET function operate normally)	Cruise SET indicator light circuit	INFO
	Power management control ECU	INFO

TERMINALS OF ECU

1. CHECK POWER MANAGEMENT CONTROL ECU

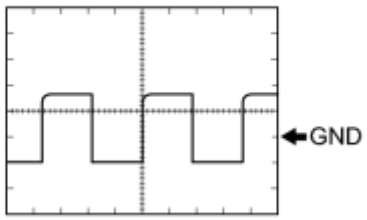


Terminal No. (Symbol)	Wiring Color	Terminal Description	Condition	Specified Condition
A22-7 (ST1-) - L5-6 (E1)	R - BR	Stop light switch signal	Power switch on (IG), Brake pedal released	7.5 to 14 V
A22-7 (ST1-) - L5-6 (E1)	R - BR	Stop light switch signal	Power switch on (IG), Brake pedal depressed	Below 1 V
A22-23 (STP) - L5-6 (E1)	L - BR	Stop light switch signal	Brake pedal released	Below 1 V
A22-23 (STP) - L5-6 (E1)	L - BR	Stop light switch signal	Brake pedal depressed	7.5 to 14 V
L5-6 (E1) - Body ground	BR - Body ground	Earth (ground) circuit of power management control ECU	Always	Below 1 Ω
L5-11(TC) - L5-6 (E1)	P - BR	Terminal TC of DLC3	Power switch on (IG)	11 to 14 V
L5-11(TC) - L5-6 (E1)	P - BR	Terminal TC of DLC3	Terminals TC and CG of DLC3 connected	Below 1 V
L5-14 (SPDI) - L5-6 (E1)	V - BR	Vehicle speed signal	Driving at 20 km/h (12 mph)	Pulse generation (see waveform 1)
L6-22 (CCS) - L5-6 (E1)	R - BR	Cruise control main switch circuit	Power switch on (IG)	10 to 14 V
L6-22 (CCS) - L5-6 (E1)	R - BR	Cruise control main switch circuit	Power switch on (IG), MAIN switch on	Below 1 V
L6-22 (CCS) - L5-6 (E1)	R - BR	Cruise control main switch circuit	Power switch on (IG), + RES switch on	2.3 to 4.0 V
L6-22 (CCS) - L5-6 (E1)	R - BR	Cruise control main switch circuit	Power switch on (IG), - SET switch on	4.5 to 7.1 V

Terminal No. (Symbol)	Wiring Color	Terminal Description	Condition	Specified Condition
L6-22 (CCS) - L5-6 (E1)	R - BR	Cruise control main switch circuit	Power switch on (IG), CANCEL switch on	6.6 to 10.1 V
L6-24 (CA1L) - L5-6 (E1)	W - BR	CAN communication line	Power switch on (IG)	Pulse generation (see waveform 2)
L6-25 (CA1H) - L5-6 (E1)	B - BR	CAN communication line	Power switch on (IG)	Pulse generation (see waveform 3)

(a) WAVEFORM 1

(1) Vehicle speed signal



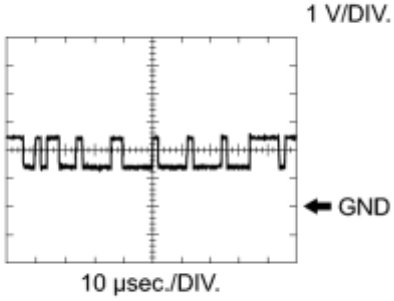
c

Power Management Control ECU Terminal Name	Between SPDI and E1
Tester Range	5 V/DIV., 20 ms./DIV.
Condition	Driving at 20 km/h (12 mph)

- The wavelength becomes shorter as the vehicle speed increases.
- Depending on the vehicle, the output waveform voltage may rise to 12 V if influenced by optionally installed systems.

(b) WAVEFORM 2

(1) CAN communication signal



T

Power Management Control ECU Terminal Name	Between CA1L and E1
Tester Range	1 V/DIV., 10 µsec./DIV.
Condition	Power switch on (IG)

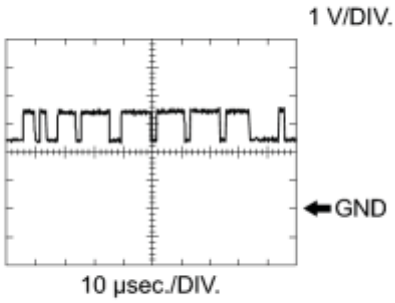
HINT:

The waveform varies depending on the CAN communication signal.

(c) WAVEFORM 3

(1) CAN communication signal

Power Management Control ECU Terminal	Between CA1H and E1



Name	
Tester Range	1 V/DIV., 10 µsec./DIV.
Condition	Power switch on (IG)

HINT:

The waveform varies depending on the CAN communication signal.

T

DIAGNOSIS SYSTEM

1. DESCRIPTION

The power management control ECU controls the cruise control system of the vehicle. The data and DTCs relating to the cruise control system can be read from the DLC3 of the vehicle. If either DTC or CRUISE OK is not displayed on the multi-information display on the combination meter when checking for DTCs, there may be a problem with either the combination meter or the CAN communication system. Use the Techstream to check and solve the problem.

HINT:

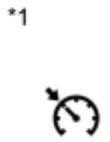
If a vehicle speed sensor, stop light switch or any other related part malfunctions, the power management control ECU cancels cruise control operation automatically.

2. CHECK DLC3

(a) Check the DLC3 INFO.

3. CHECK INDICATOR

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



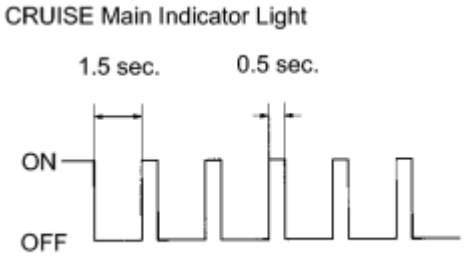
Text in Illustration

*1	Cruise Main Indicator Light

(b) Check that the CRUISE main indicator light turns on when the cruise control switch (ON-OFF button) is turned on, and that the indicator light turns off when the control switch (ON-OFF button) is turned off.

HINT:

- If the indicator check result is not normal, proceed to troubleshooting for the cruise main indicator light circuit INFO.
-



If a malfunction occurs in the speed sensor or stop light switch, etc., during cruise control driving, the power management control ECU activates the AUTO CANCEL of the cruise control and turns on and

off the CRUISE main indicator light to inform the driver of a malfunction. At the same time, the malfunction is stored in memory as a diagnostic trouble code.

DTC CHECK / CLEAR

1. CHECK DTC

(a) Connect the Techstream to the DLC3.

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

(c) Tune the Techstream on.

(d) Enter the following menus: Powertrain / Cruise Control / Trouble Codes.

(e) Read the DTCs.

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: Powertrain / Cruise Control / Trouble Codes.

(e) Clear the DTCs.

FAIL-SAFE CHART

HINT:

If the following conditions are detected while cruise control is in operation, the system clears the stored vehicle speed in the hybrid vehicle control ECU and cancels the cruise control operation.

Vehicle Condition	Auto Cancel Condition	Re-operation Condition
Cruise main indicator light blinks	• There is problem with input circuit of stop light switch circuit • There is problem with cancel circuit • There is problem with electronically controlled brake system • There is open or short in stop light switch circuit • Communication stop between brake booster with master cylinder (skid control ECU) and power management control ECU • There is problem with hybrid vehicle control system	• Turn cruise control main switch on again • Turn power switch off then on (IG) again
Cruise main indicator light remains on (Cruise control is canceled)	• Vehicle speed is lower than low speed limit (approximately. 40 km/h (25 mph)) while running with cruise control on • Electronically controlled brake system operates	Push cruise control main switch to + RES
	• Vehicle speed is lower than stored speed by approximately 16 km/h (10 mph) or more	Push cruise control main switch to - SET

DATA LIST / ACTIVE TEST

1. DATA LIST

HINT:

Using the Techstream to read the Data List allows 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 is disturbed. Reading the Data List information early in troubleshooting is 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 is 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: Powertrain / Cruise Control / Data List.

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

Cruise Control (Power Management Control ECU)

Tester Display	Measurement Item/Range	Normal Condition	Diagnostic Note
CCS Vehicle Spd	Vehicle speed/min.: 0 km/h (0 mph), max.: 255 km/h (159 mph)	Actual vehicle speed is displayed	-
CCS Mem Vehicle Spd	Vehicle speed/min.: 0 km/h (0 mph), max.: 255 km/h (159 mph)	Actual vehicle speed stored in memory	-
Cruise Control	Cruise control/ON or OFF	ON: Cruise control activated OFF: Cruise control deactivated	-
Main SW M-CPU	Cruise control switch (M-CPU)/ON or OFF	ON: Cruise main switch on OFF: Cruise main switch off	-
CCS Ready M-CPU	Cruise control system standby condition (M-CPU)/ON or OFF	Each time main switch is pushed, ON/OFF changes	-
CCS Indicator M-CPU	Cruise main indicator (M-CPU)/ON or OFF	ON: Cruise main indicator light on OFF: Cruise main indicator light off	-

Tester Display	Measurement Item/Range	Normal Condition	Diagnostic Note
Cancel Switch	CANCEL switch/ON or OFF	ON: CANCEL switch on OFF: CANCEL switch off	-
SET/COAST Switch	- SET switch/ON or OFF	ON: - SET switch on OFF: - SET switch off	-
RES/ACC Switch	+ RES switch/ON or OFF	ON: + RES switch on OFF: + RES switch off	-
Stop Light SW M-CPU	Stop light switch signal (Main CPU)/ON or OFF	ON: Brake pedal depressed OFF: Brake pedal released	-
Cruise Operation Status	Shift position signal (D position)/ON or OFF	ON: Shift lever in D OFF: Shift lever not in D	-
Cruise Request Driving Force	Cruise control driving force signal/min.: -51.2 kN, max.: 51.2 kN	Actual driving force	-
# Codes	Number of present trouble codes/min.: 0, max.: 255	Number of DTCs displayed	-

2. ACTIVE TEST

HINT:

Using the Techstream to perform Active Tests allows relays, VSVs, actuators and other items to be operated without removing any parts. This non-intrusive functional inspection can be very useful because intermittent operation may be discovered before parts or wiring is disturbed. Performing Active Tests early in troubleshooting is one way to save diagnostic time. Data List information can be displayed while performing Active Tests.

(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 Electrical / Combination Meter / Active Test.

(e) According to the display on the Techstream, perform the "Active Test".

Combination Meter

Tester Display	Test Part	Control Range	Diagnostic Note
Indicat. Lamp Cruise	Cruise main indicator light	ON / OFF	-

DIAGNOSTIC TROUBLE CODE CHART

HINT:

If a trouble code is displayed during the DTC check, inspect the trouble areas listed for that code. For details of the code, refer to the "See page" below.

Cruise Control System

DTC Code	Detection Item	Trouble Area	See page
P0571	Brake Switch "A" Circuit	- Stop light switch assembly - Stop light switch assembly circuit - Power management control ECU	INFO
P0575	Cruise Control Input Circuit	- Power management control ECU	INFO
P1578	Brake System Malfunction	- Electronically controlled brake system	INFO
U0122	Lost Communication with Vehicle Dynamics Control Module	- Brake booster with master cylinder (skid control ECU) - CAN communication system - Power management control ECU	INFO

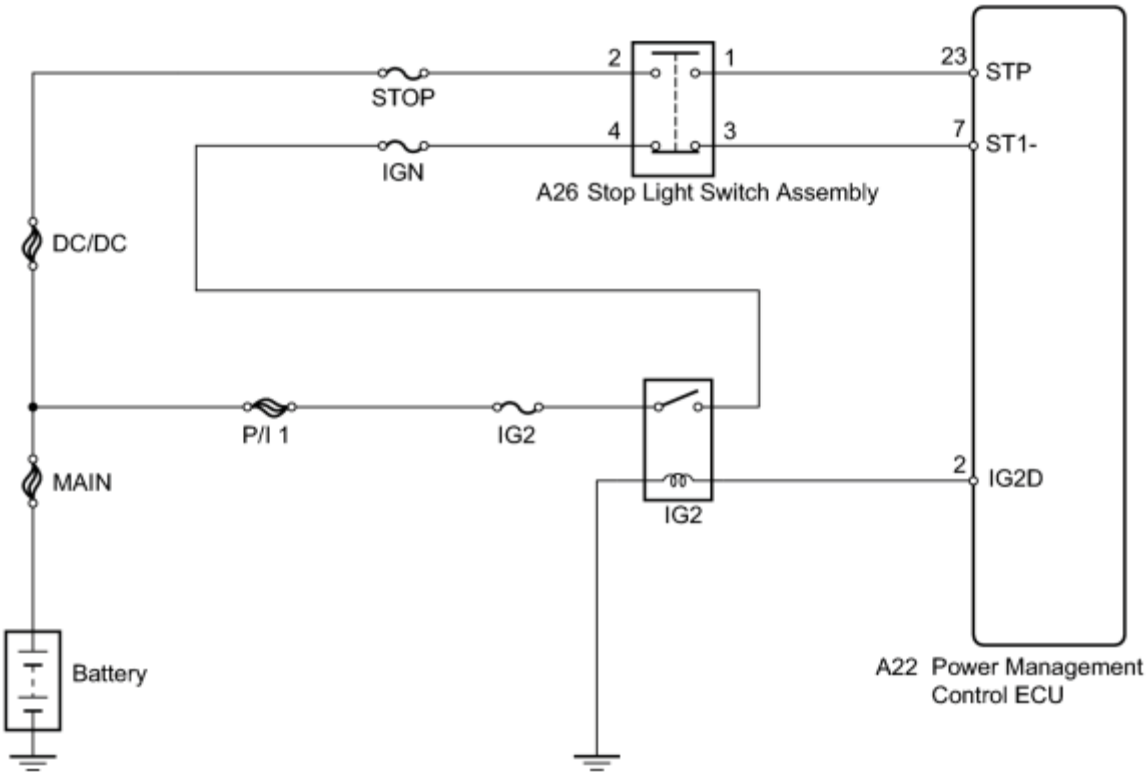
DTC	P0571	Brake Switch "A" Circuit

DESCRIPTION

When the brake pedal is depressed, the stop light switch assembly sends a signal to the power management control ECU. When the power management control ECU receives this signal, it cancels the cruise control. The fail-safe function operates to enable normal driving even if there is a malfunction in the stop light signal circuit. Cruise control cancellation occurs when voltage is applied to terminal STP. When the brake is applied, voltage is normally applied to terminal STP of the power management control ECU through the STOP fuse and the stop light switch assembly, and the power management control ECU turns the cruise control off.

DTC	DTC Detection Condition	Trouble Area
P0571	Voltage of STP signal and that of ST1- signal of power management control ECU are less than 1 V for 0.5 seconds or more	• Stop light switch assembly • Stop light switch assembly circuit • Power management control ECU

WIRING DIAGRAM



INSPECTION PROCEDURE

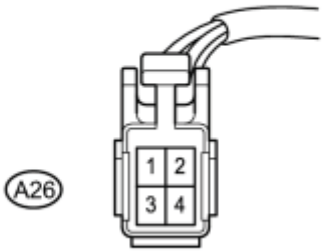
NOTICE:

Inspect the fuses for circuits related to this system before performing the following inspection procedure.

PROCEDURE

1.	INSPECT STOP LIGHT SWITCH ASSEMBLY (POWER SOURCE)

*1



(a) Disconnect the stop light switch assembly connector.

N

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

Standard Voltage:

Tester Connection	Condition	Specified Condition
A26-2 - Body ground	Always	11 to 14 V

Text in Illustration

*1	Front view of wire harness connector (to Stop Light Switch Assembly)

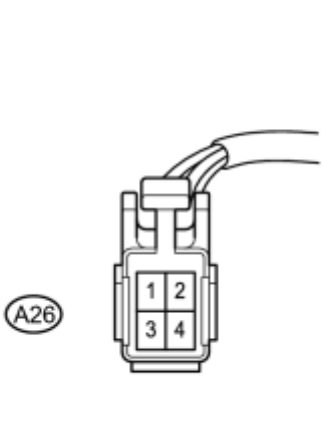
(c) Reconnect the stop light switch assembly connector.

NG ▶ REPAIR OR REPLACE HARNESS OR CONNECTOR (STOP LIGHT SWITCH ASSEMBLY - BATTERY)

OK ▼

2.	INSPECT STOP LIGHT SWITCH ASSEMBLY (POWER SOURCE)

(a) Disconnect the stop light switch assembly connector.



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

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

Standard Voltage:

Tester Connection	Switch Condition	Specified Condition
A26-4 - Body ground	Power switch on (IG)	11 to 14 V

Text in Illustration

*1	Front view of wire harness connector (to Stop Light Switch Assembly)

(d) Reconnect the stop light switch assembly connector.

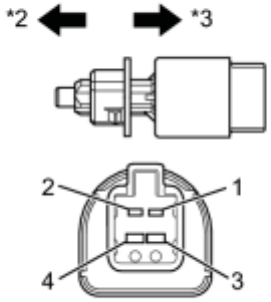
NG ▶ REPAIR OR REPLACE HARNESS OR CONNECTOR (STOP LIGHT SWITCH ASSEMBLY - IG2 RELAY)

OK ▼

3.	INSPECT STOP LIGHT SWITCH ASSEMBLY

(a) Remove the stop light switch assembly INFO.

*1



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

Standard Resistance:

Tester Connection	Switch Condition	Specified Condition
1 - 2	Switch pin not pushed	Below 1 Ω
3 - 4	Switch pin not pushed	10 kΩ or higher
1 - 2	Switch pin pushed	10 kΩ or higher
3 - 4	Switch pin pushed	Below 1 Ω

Text in Illustration

*1	Component without harness connected (Stop Light Switch Assembly)
*2	Not pushed
*3	Pushed

(c) Reinstall the stop light switch assembly INFO.

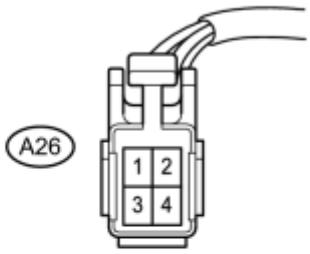
NG ▶ REPLACE STOP LIGHT SWITCH ASSEMBLY

OK ▼

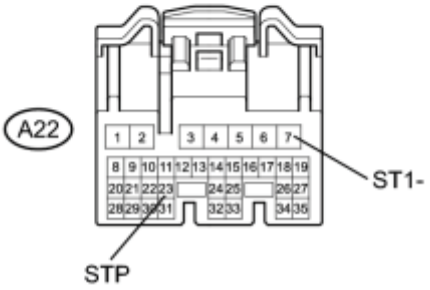
4.	CHECK HARNESS AND CONNECTOR (POWER MANAGEMENT CONTROL ECU - STOP LIGHT SWITCH ASSEMBLY)

(a) Disconnect the power management control ECU connector.

*1



*2



(b) Disconnect the stop light switch assembly connector.

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

Standard Resistance (Check for Open):

Tester Connection	Condition	Specified Condition
A22-23 (STP) - A26-1	Always	Below 1 Ω
A22-7 (ST1-) - A26-3	Always	Below 1 Ω

Standard Resistance (Check for Short):

Tester Connection	Condition	Specified Condition
A22-23 (STP) or A26-1 - Body ground	Always	10 kΩ or higher
A22-7 (ST1-) or A26-3 - Body ground	Always	10 kΩ or higher

Text in Illustration

*1	Front view of wire harness connector (to Stop Light Switch Assembly)
*2	Front view of wire harness connector (to Power Management Control ECU)

(d) Reconnect the stop light switch assembly connector.

(e) Reconnect the power management control ECU connector.

NG ▶ REPAIR OR REPLACE HARNESS OR CONNECTOR (POWER MANAGEMENT CONTROL ECU - STOP LIGHT SWITCH ASSEMBLY)

OK ▶ **REPLACE POWER MANAGEMENT CONTROL ECU**

DTC	P0575	Cruise Control Input Circuit

DESCRIPTION

This DTC indicates the internal abnormalities of the power management control ECU.

DTC	DTC Detection Condition	Trouble Area
P0575	When both of the following conditions are met: • STP signals input to the power management control ECU supervisory CPU and control ECU are different for 0.15 seconds or more • 0.4 seconds have passed after cruise cancel input signal (STP input) is input to the power management control ECU	Power management control ECU

HINT:

The power management control ECU receives signals from each sensor to control all functions of the cruise control system. When a trouble code is detected, the fail-safe function activates and remains on until the power switch is turned off.

INSPECTION PROCEDURE

PROCEDURE

1.	READ OUTPUT DTC (P0575)

(a) Connect the Techstream to the DLC3.

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

(c) Turn the Techstream on.

(d) Clear the DTC INFO.

(e) Perform the following to make sure that the DTC detection conditions are met.

HINT:

If the detection conditions are not met, the malfunction cannot be detected.

(1) Drive the vehicle at a speed of 40 km/h (25 mph) or more.

(2) Turn the cruise control main switch (ON-OFF button) on.

(3) Push the -SET switch to activate the cruise control.

(f) Enter the following menus: Powertrain / Cruise Control / Trouble Codes.

(g) Read the DTCs.

Result:

Result	Proceed to
DTC is not output	A
DTC P0575 is output	B

B ▶ REPLACE POWER MANAGEMENT CONTROL ECU

A ▶ **USE SIMULATION METHOD TO CHECK**

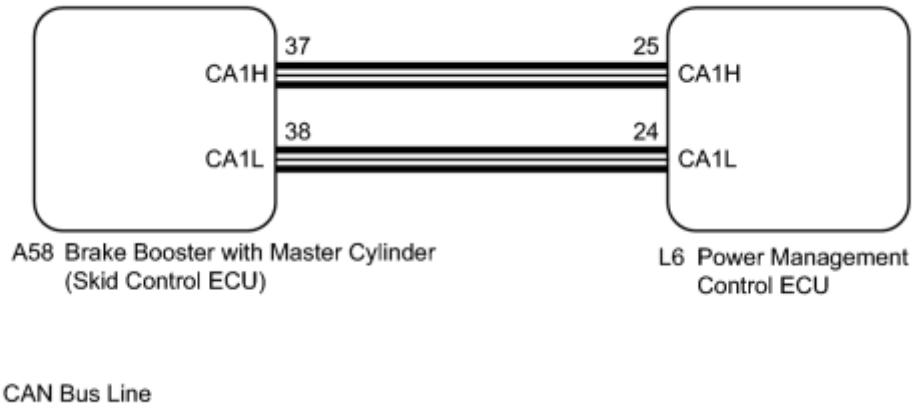
DTC	P1578	Brake System Malfunction

DESCRIPTION

This DTC is output when the electronically controlled brake system has a problem. Check the electronically controlled brake system when this DTC is output.

DTC No.	DTC Detection Condition	Trouble Area
P1578	The power management control ECU receives a brake system error signal for 0.2 sec. or more while the cruise control is in operation	Electronically controlled brake system

WIRING DIAGRAM



INSPECTION PROCEDURE

HINT:

This circuit uses CAN communication. Therefore, if there are any malfunctions in the communication circuit, one or more DTCs in the CAN communication system are output.

PROCEDURE

1.	CHECK DTC (ELECTRONICALLY CONTROLLED BRAKE SYSTEM)

(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 / ABS/VSC/TRAC / Trouble Codes.

(e) Read the DTC.

Result:

Result	Proceed to
DTC is not output	A
DTC is output	B

B GO TO ELECTRONICALLY CONTROLLED BRAKE SYSTEM

A

2.	CHECK WHETHER DTC OUTPUT RECORDS (CRUISE CONTROL SYSTEM)

(a) Connect the Techstream to the DLC3.

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

(c) Turn the Techstream on.

(d) Perform the following to make sure that the DTC detection conditions are met.

HINT:

If the detection conditions are not met, the malfunction cannot be detected.

(1) Drive the vehicle at a speed of 40 km/h (25 mph) or more.

(2) Turn the cruise control main switch (ON-OFF button) on.

(3) Push the -SET switch to activate the cruise control.

(e) Enter the following menus: Powertrain / Cruise Control / Trouble Codes.

(f) Read the DTCs.

Result:

Result	Proceed to
DTC is not output	A
DTC P1578 is output	B

B REPLACE BRAKE BOOSTER WITH MASTER CYLINDER

A **USE SIMULATION METHOD TO CHECK**

3.	REPLACE BRAKE BOOSTER WITH MASTER CYLINDER

Replace the brake booster with master cylinder (skid control ECU) INFO.

NEXT

4.	CHECK WHETHER DTC OUTPUT RECORDS (CRUISE CONTROL SYSTEM)

(a) Connect the Techstream to the DLC3.

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

(c) Turn the Techstream on.

(d) Clear the DTC INFO.

(e) Perform the following to make sure that the DTC detection conditions are met.

HINT:

If the detection conditions are not met, the malfunction cannot be detected.

(1) Drive the vehicle at a speed of 40 km/h (25 mph) or more.

(2) Turn the cruise control main switch (ON-OFF button) on.

(3) Push the -SET switch to activate the cruise control.

(f) Enter the following menus: Powertrain / Cruise Control / Trouble Codes.

(g) Read the DTCs.

Result:

Result	Proceed to
DTC is not output	A
DTC P1578 is output	B

B REPLACE POWER MANAGEMENT CONTROL ECU

A **END**

DTC	U0122	Lost Communication with Vehicle Dynamics Control Module

DESCRIPTION

The vehicle speed sensor sends the vehicle speed signal to the brake booster with master cylinder (skid control ECU), and then it is sent to the power management control ECU.

DTC Code	DTC Detection Condition	Trouble Area
U0122	While power switch is on (IG), communication stop between brake booster with master cylinder (skid control ECU) and power management control ECU continues for 2.6 seconds or more	• Brake booster with master cylinder (skid control ECU) • CAN communication system • Power management control ECU

INSPECTION PROCEDURE

Refer to CAN Communication System INFO.

PROCEDURE

1.	CHECK CAN COMMUNICATION SYSTEM

(a) Connect the Techstream to the DLC3.

(b) Select "Bus Check" from the "System Select".

(c) Select "Communication Malfunction DTC" from the "Bus Check" screen, and then select "Enter".

Result:

Result	Proceed to
CAN communication system DTC is not output	A
CAN communication system DTC is output	B

B ▶ GO TO CAN COMMUNICATION SYSTEM

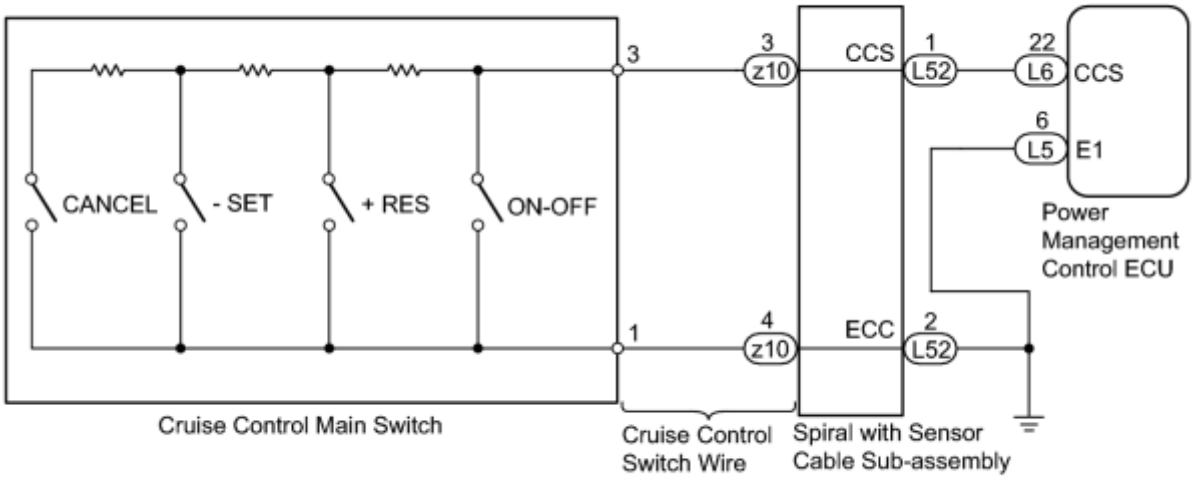
A ▶ **USE SIMULATION METHOD TO CHECK**

Cruise Control Switch Circuit

DESCRIPTION

The cruise control main switch operates 7 functions: SET, -, TAP-DOWN, RES, +, TAP-UP, and CANCEL. The SET, TAP-DOWN, and - functions, and the RES, TAP-UP, and + functions are operated with the same switch. The cruise control main switch is an automatic return type switch which turns on only while it is being operated it in the direction of each arrow and turns off after being released. The internal contact point of the cruise control main switch is turned on with the switch operation. Then the power management control ECU reads the voltage value that has been changed by the switch operation to control SET, -, RES, +, and CANCEL.

WIRING DIAGRAM

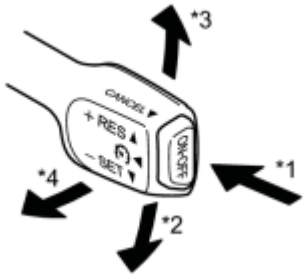


INSPECTION PROCEDURE

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: Powertrain / Cruise Control / Data List.

(e) Check the Data List for proper functioning of the cruise control main switch.

Cruise Control (Power Management Control ECU)

Techstream Display	Measurement Item/Range	Normal Condition	Diagnostic Note
Main SW M-CPU	Cruise control switch (Main CPU)/ON or OFF	ON: Cruise main switch (ON-OFF button) on OFF: Cruise main switch (ON-OFF button) off	-
Cancel Switch	CANCEL switch signal/ON or OFF	ON: CANCEL switch on OFF: CANCEL switch off	-
SET/COAST Switch	- SET switch signal/ON or OFF	ON: - SET switch on OFF: - SET switch off	-
RES/ACC Switch	+ RES switch signal/ON or OFF	ON: + RES switch on OFF: + RES switch off	-

Text in Illustration

*1	ON/OFF
*2	- SET
*3	+ RES
*4	CANCEL

OK:

When the cruise control main switch is operated, the display changes as shown above.

Result

Result	Proceed to
OK	A
NG (All items are defective)	B
NG (1 to 3 items are defective)	C

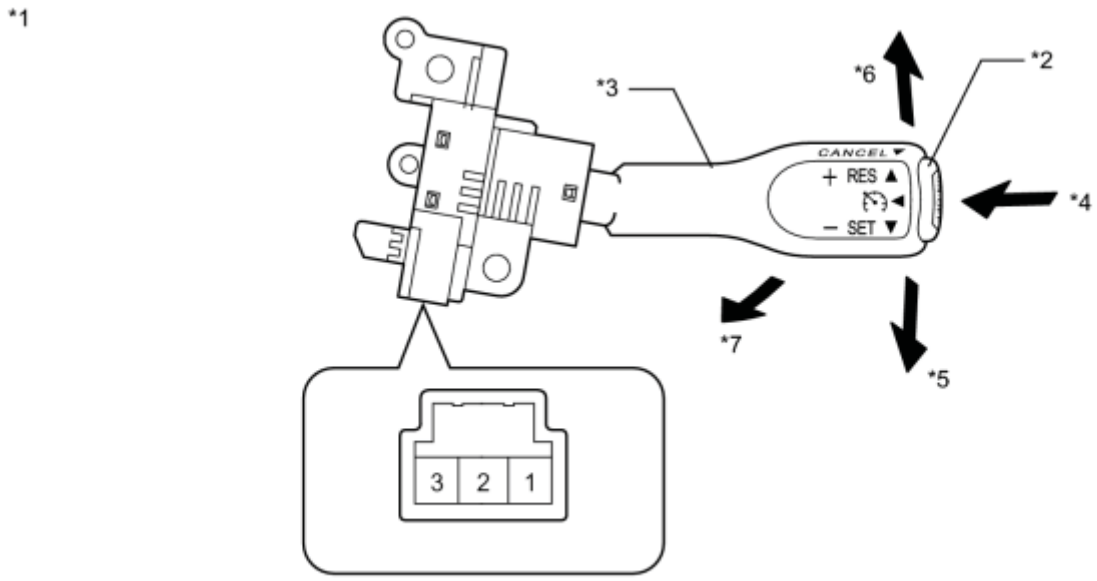
C REPLACE CRUISE CONTROL MAIN SWITCH

B INSPECT CRUISE CONTROL MAIN SWITCH

A **PROCEED TO NEXT SUSPECTED AREA SHOWN IN PROBLEM SYMPTOMS TABLE**

2.	INSPECT CRUISE CONTROL MAIN SWITCH

(a) Remove the cruise control main switch INFO.



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

Standard Resistance:

Tester Connection	Switch Condition	Specified Condition
1 - 3	Main switch off*1	1 MΩ or higher
	Main switch on	Below 2.5 Ω
	+ RES	235 to 245 Ω
	- SET	617 to 643 Ω
	CANCEL	1509 to 1571 Ω

*1: The cruise control main switch lever is in the neutral position.

Text in Illustration

*1	Component without harness connected (Cruise Control Main Switch)	*2	Main Switch
*3	Lever	*4	ON-OFF
*5	- SET	*6	+ RES
*7	CANCEL	-	-

(c) Install the cruise control main switch INFO.

NG ▶ REPLACE CRUISE CONTROL MAIN SWITCH

OK

▼

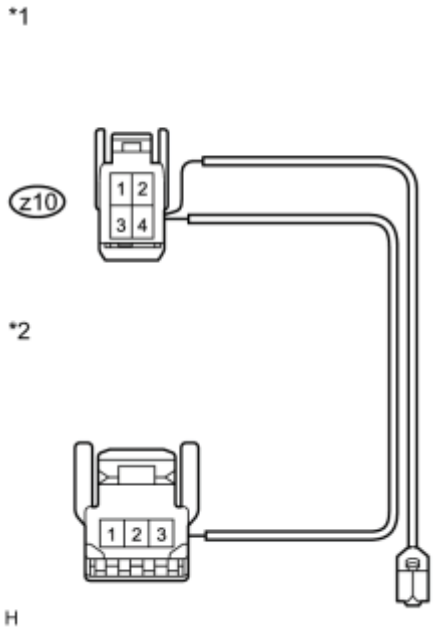
3.	CHECK HARNESS AND CONNECTOR (CRUISE CONTROL MAIN SWITCH - SPIRAL CABLE SUB-ASSEMBLY)

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

(b) Disconnect the connector from the cruise control main switch.

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

Standard Resistance:



Tester Connection	Condition	Specified Condition
Cruise control main switch side connector terminal 3 - z10-3	Always	Below 1 Ω
Cruise control main switch side connector terminal 1 - z10-4	Always	Below 1 Ω

Text in Illustration

*1	Front view of wire harness connector (to Spiral with Sensor Cable Sub-assembly)
*2	Front view of wire harness connector (to Cruise Control Main Switch)

(d) Reconnect the connector to the cruise control main switch.

(e) Reconnect the connector to the spiral with sensor cable sub-assembly.

NG ▶ REPAIR OR REPLACE HARNESS OR CONNECTOR (CRUISE CONTROL MAIN SWITCH - SPIRAL CABLE SUB-ASSEMBLY)

OK

▼

4.	CHECK SPIRAL WITH SENSOR CABLE SUB-ASSEMBLY

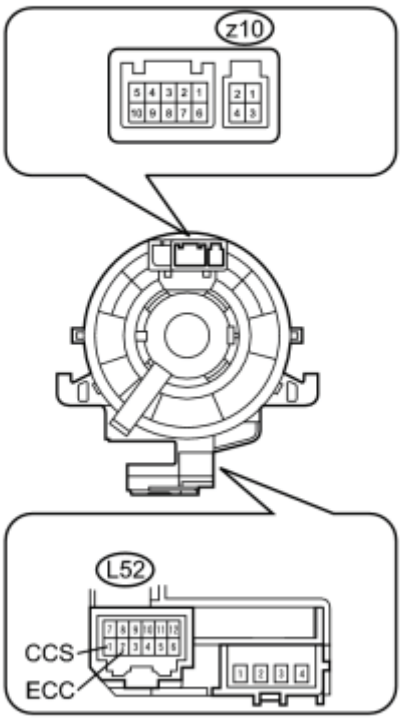
NOTICE:

The spiral with sensor cable sub-assembly is an important part of the SRS airbag system. Incorrect removal or installation of the spiral with sensor cable sub-assembly may cause airbag deployment. Be sure to read the page shown in the brackets.

*1

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

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



Standard Resistance:

Tester Connection	Condition	Specified Condition
z10-3 - L52-1 (CCS)	The spiral with sensor cable sub-assembly is centered	Below 1 Ω
	The spiral with sensor cable sub-assembly position is 2.5 rotations to the left	
	The spiral with sensor cable sub-assembly position is 2.5 rotations to the right	
z10-4 - L52-2 (ECC)	The spiral with sensor cable sub-assembly is centered	Below 1 Ω
	The spiral with sensor cable sub-assembly position is 2.5 rotations to the left	
	The spiral with sensor cable sub-assembly position is 2.5 rotations to the right	

Text in Illustration

*1	Component without harness connected (Spiral with Sensor Cable Sub-assembly)

HINT:

The spiral with sensor cable sub-assembly makes a maximum of approximately 5 rotations.

(c) Remove the spiral with sensor cable sub-assembly INFO.

NG ▶ REPLACE SPIRAL WITH SENSOR CABLE SUB-ASSEMBLY

OK

▼

5.	CHECK HARNESS AND CONNECTOR (SPIRAL CABLE SUB-ASSEMBLY - POWER MANAGEMENT CONTROL ECU)

(a) Disconnect the power management control ECU connector.

(b) Disconnect the spiral with sensor cable sub-assembly connector.

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

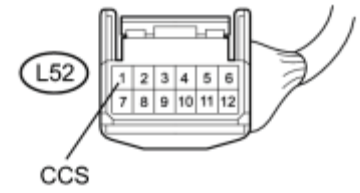
Standard Resistance (Check for Open):

Tester Connection	Condition	Specified Condition
L52-1 (CCS) - L6-22 (CCS)	Always	Below 1 Ω

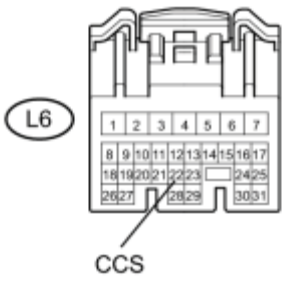
Standard Resistance (Check for Short):

Tester Connection	Condition	Specified Condition
L52-1 (CCS) or L6-22 (CCS) - Body ground	Always	10 kΩ or higher

*1



*2



Text in Illustration

*1	Front view of wire harness connector (to Spiral with Sensor Cable Sub-assembly)
*2	Front view of wire harness connector (to Power Management Control ECU)

(d) Reconnect the spiral with sensor cable sub-assembly connector.

(e) Reconnect the power management control ECU connector.

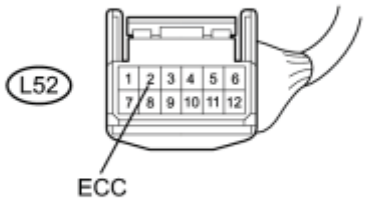
NG ▶ REPAIR OR REPLACE HARNESS OR CONNECTOR (SPIRAL CABLE SUB-ASSEMBLY - POWER MANAGEMENT CONTROL ECU)

OK

▼

6.	CHECK HARNESS AND CONNECTOR (SPIRAL WITH SENSOR CABLE SUB-ASSEMBLY - BODY GROUND)

*1



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

c

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

Standard Resistance:

Tester Connection	Condition	Specified Condition
L52-2 (ECC) - Body ground	Always	Below 1 Ω

Text in Illustration

*1	Front view of wire harness connector (to Spiral with Sensor Cable Sub-assembly)

(c) Reconnect the spiral with sensor cable sub-assembly connector.

NG ▶ REPAIR OR REPLACE HARNESS OR CONNECTOR (SPIRAL WITH SENSOR CABLE SUB-ASSEMBLY - BODY GROUND)

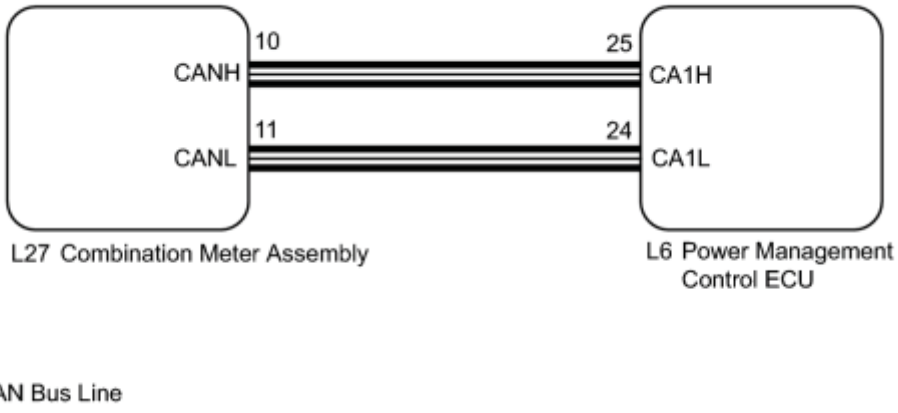
OK ▶ **REPLACE POWER MANAGEMENT CONTROL ECU**

Cruise Main Indicator Light Circuit

DESCRIPTION

- The power management control ECU detects a cruise control switch signal and sends it to the combination meter assembly through CAN. Then the cruise main indicator light comes on.
- The cruise main indicator light circuit uses CAN for communication. If there is a malfunction in this circuit, check for DTCs in the CAN communication system before troubleshooting this circuit.

WIRING DIAGRAM



INSPECTION PROCEDURE

PROCEDURE

1.	PERFORM ACTIVE TEST 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 Electrical / Combination Meter / Active Test.

(e) Check the cruise main indicator light by performing the Active Test.

Combination Meter

Techstream Display	Test Part	Control Range	Diagnostic Note
Indicat. Lamp Cruise	Cruise main indicator light	ON / OFF	-

OK:

The display changes as shown above according to Active Test operation.

NG ▶ REPLACE NO. 3 METER CIRCUIT PLATE
OK
▼

2.	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: Powertrain / Cruise Control / Data List.

(e) Check the Data List for proper functioning of the cruise main indicator light.

Cruise Control

Techstream Display	Measurement Item/Range	Normal Condition	Diagnostic Note
CCS Indicator M-CPU	Cruise main indicator (M-CPU)/ON or OFF	ON: Cruise main indicator light on OFF: Cruise main indicator light off	-

OK:

The display changes as shown above according to cruise control main switch operation.

NG ▶ REPLACE POWER MANAGEMENT CONTROL ECU
OK ▶ **PROCEED TO NEXT SUSPECTED AREA SHOWN IN PROBLEM SYMPTOMS TABLE**

Cruise SET Indicator Light Circuit

DESCRIPTION

- The power management control ECU detects a cruise control switch signal and sends it to the combination meter assembly through CAN. Then the SET indicator light comes on.
- The SET indicator light circuit uses CAN for communication. If there is a malfunction in this circuit, check for DTCs in the CAN communication system before troubleshooting this circuit.

WIRING DIAGRAM

Refer to "Cruise Main Indicator Light Circuit" INFO.

INSPECTION PROCEDURE

PROCEDURE

1.	PERFORM ACTIVE TEST 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 Electrical / Combination Meter / Active Test.

(e) Check the SET indicator light by performing the Active Test.

Combination Meter

Tester Display	Test Part	Control Range	Diagnostic Note
Indicat. Lamp SET	CRUISE SET indicator light	SET indicator light BLINK / OFF	-

OK:

The SET indicator light blinks or goes off according to Techstream operation.

NG ▶ REPLACE NO.3 METER CIRCUIT PLATE
OK
▼

2.	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: Powertrain / Cruise Control / Data List.

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

Cruise control

Tester Display	Measurement Item/Range	Normal Condition	Diagnostic Note
SET/COAST Switch	- SET switch / ON or OFF	ON: - SET switch ON OFF: - SET switch off	-

OK:

The display changes as shown above according to cruise control main switch operation.

NG ▶ REPLACE POWER MANAGEMENT CONTROL ECU
OK ▶ **PROCEED TO NEXT SUSPECTED AREA SHOWN IN PROBLEM SYMPTOMS TABLE**

TC and CG Terminal Circuit

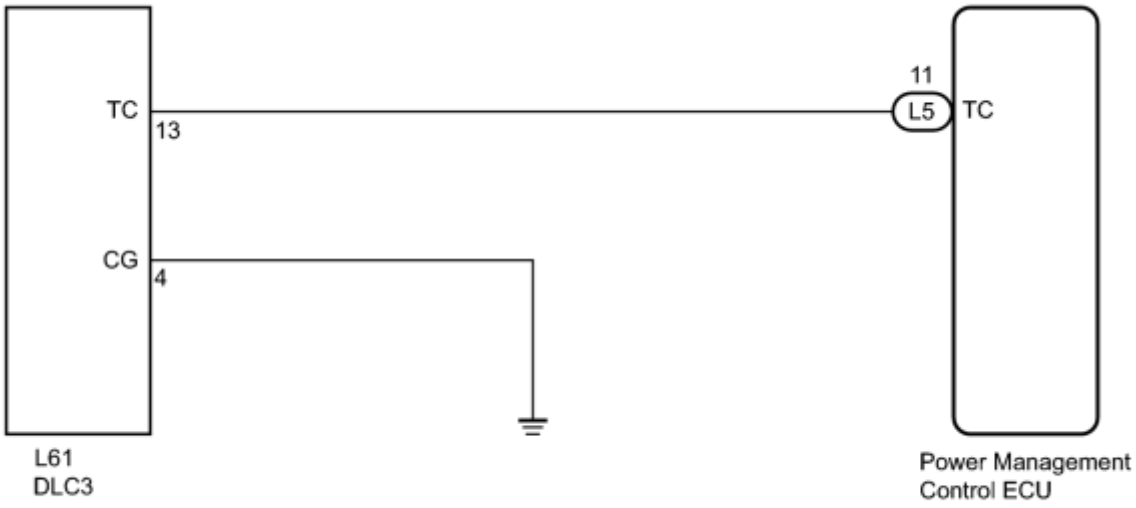
DESCRIPTION

Connecting terminals TC and CG of the DLC3 causes the system to enter self-diagnostic mode. If a malfunction is present, the cruise main indicator light will blink.

HINT:

When a particular warning light remains blinking, a ground short in the wiring of terminal TC of the DLC3 or an internal ground short in the relevant ECU is suspected.

WIRING DIAGRAM



INSPECTION PROCEDURE

PROCEDURE

1.	CHECK HARNESS AND CONNECTOR (TERMINAL TC of DLC3 - POWER MANAGEMENT CONTROL ECU)

(a) Disconnect the power management control ECU connector.

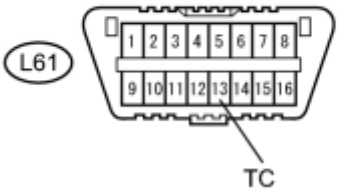
(b) Measure the resistance according to the value(s) in the table below.

Standard Resistance:

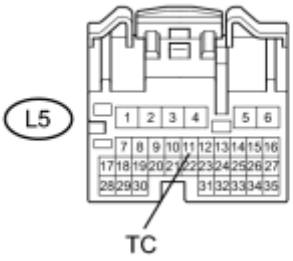
Tester Connection	Condition	Specified Condition

L5-11 (TC) - L61-13 (TC)	Always	Below 1 Ω

*1



*2



Text in Illustration

*1	DLC3
*2	Front view of wire harness connector (to Power Management Control ECU)

(c) Connect the power management control ECU connector.

NG ▶ REPAIR OR REPLACE HARNESS OR CONNECTOR (DLC3 - POWER MANAGEMENT CONTROL ECU)

OK

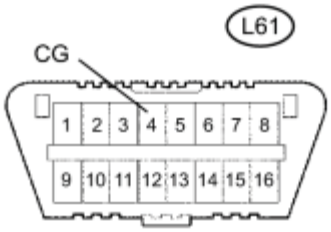
▼

2.	CHECK HARNESS AND CONNECTOR (TERMINAL CG of DLC3 - BODY GROUND)

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

Standard Resistance:

*1



Tester Connection	Condition	Specified Condition
L61-4 (CG) - Body ground	Always	Below 1 Ω

Text in Illustration

*1	DLC3

NG ▶ REPAIR OR REPLACE HARNESS OR CONNECTOR (DLC3 - BODY GROUND)

OK

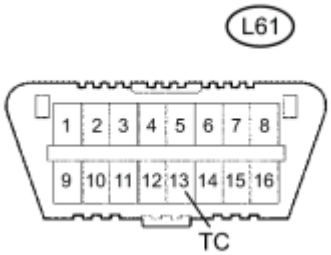
▼

3.	CHECK HARNESS AND CONNECTOR (TERMINAL TC of DLC3 - BODY GROUND)

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

Standard Resistance:

*1



Tester Connection	Condition	Specified Condition
L61-13 (TC) - Body ground	Always	10 kΩ or higher

Text in Illustration

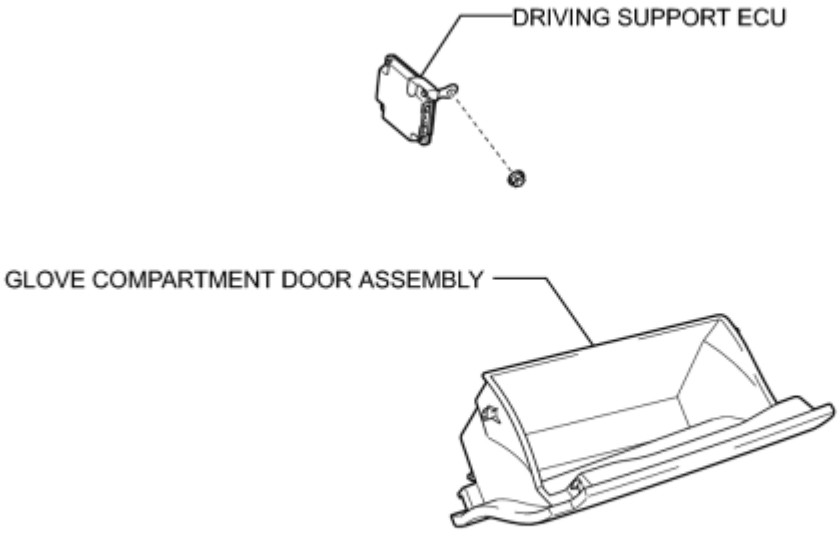
*1	DLC3

NG ▶ REPAIR OR REPLACE HARNESS OR CONNECTOR OR EACH ECU

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

COMPONENTS

ILLUSTRATION



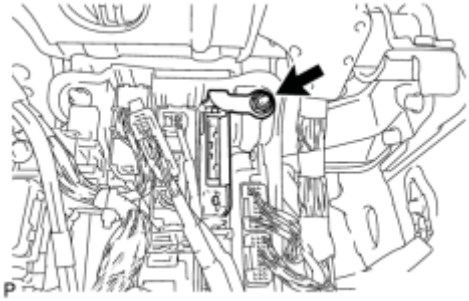
P

REMOVAL

1. REMOVE GLOVE COMPARTMENT DOOR ASSEMBLY INFO

2. REMOVE DRIVING SUPPORT ECU

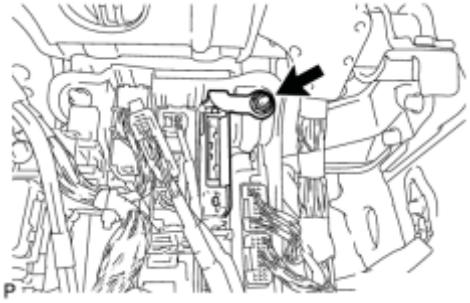
(a) Disconnect the connector.



(b) Remove the nut and driving support ECU.

INSTALLATION

1. INSTALL DRIVING SUPPORT ECU



(a) Install the driving support ECU with the nut.

NOTICE:

Do not install the driving support ECU if it has been damaged or impacted in any way.

(b) Connect the connector.

2. INSTALL GLOVE COMPARTMENT DOOR ASSEMBLY INFO

PRECAUTION

1. NOTICE FOR INITIALIZATION

NOTICE:

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

System Name	See Procedure
Advanced Parking Guidance System	INFO

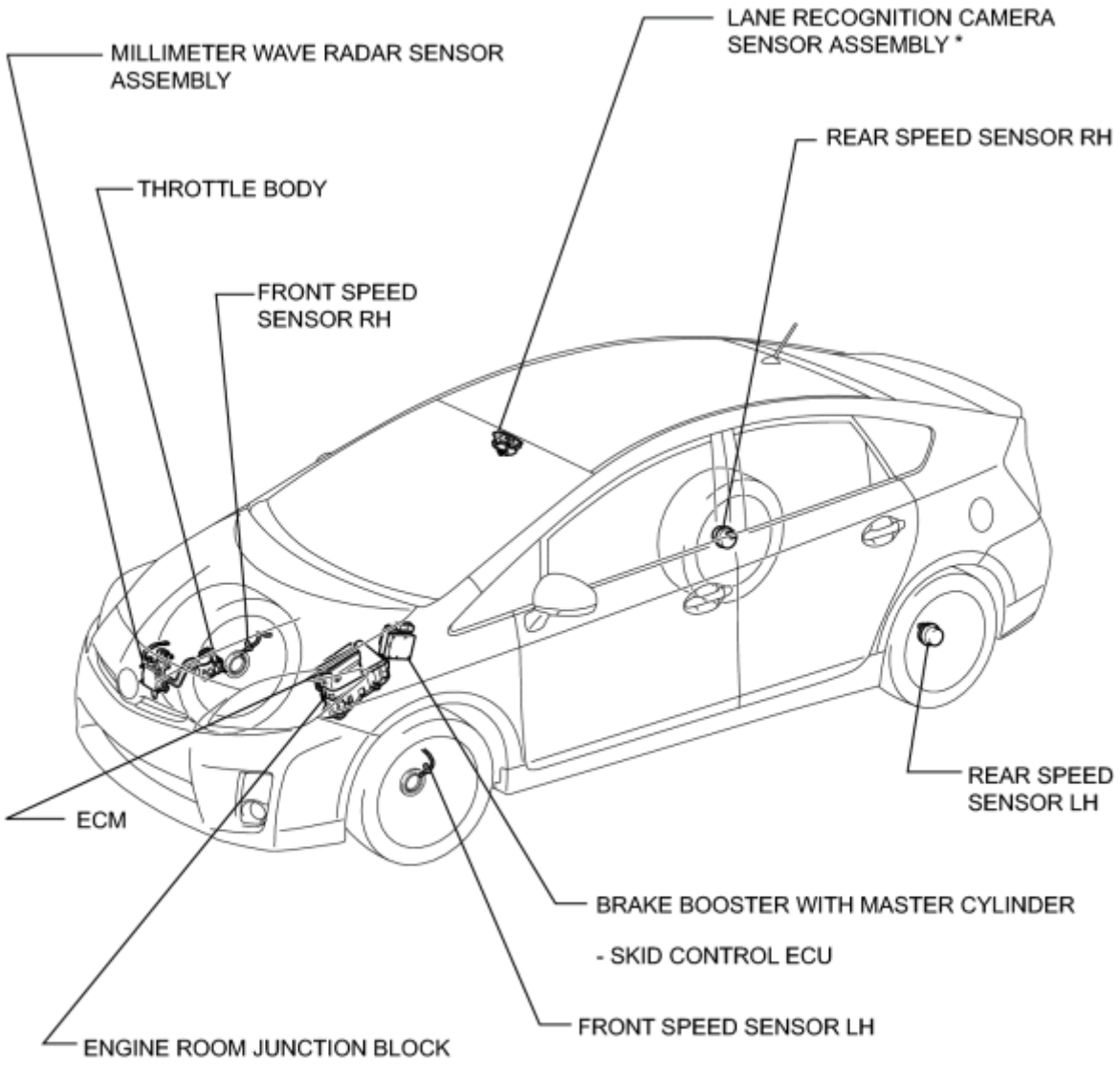
2. HANDLING PRECAUTION FOR DYNAMIC RADAR CRUISE CONTROL SYSTEM

Keep in mind the following points when inspecting the dynamic radar cruise control system.

- As there is a limitation on the vehicle-to-vehicle distance controlling capability, do not overly rely on the dynamic radar cruise control system.
- Do not neglect to pay constant attention to the vehicle-to-vehicle distance and the traffic conditions when using the dynamic radar cruise control system. Decelerate with the brake pedal, or accelerate with the accelerator pedal, according to the situation, to keep an appropriate distance with the vehicle in front.
- When the vehicle in front decelerates rapidly or another vehicle moves in front of the vehicle, decelerating in time to avoid a collision may not be possible without additional braking.
- The dynamic radar cruise control system is designed to assist in maintaining an appropriate distance with the vehicle in front. However, the system alone is not sufficient. It is imperative that the driver pays attention at all times.
- The millimeter wave radar sensor can automatically detect dirt on the sensor face and inform the driver, but dirt may not always be detected. Keep the sensor face clean.
- The dynamic radar cruise control system does not work, or give vehicle-approaching warning, for vehicles which are stopped or driving at significantly slower speeds. Always pay attention to those other vehicles.
- The millimeter wave radar sensor detection area is narrow at close range, so detection of a vehicle moving just in front may be delayed, or a motorcycle running on the side of the same lane may not be detected. The distance to the vehicle in front may not be maintained properly due to these reasons.
- Even if + (ACCEL) is operated to increase the set vehicle speed, the vehicle does not accelerate because the speed is controlled in accordance with the speed of the vehicle in front while driving with the vehicle-to-vehicle distance control mode on (follow-up cruising). However, as the set vehicle speed has been increased by + (ACCEL) operation, the vehicle keeps accelerating to the set speed when there is no vehicle in front. Check the set speed with the set vehicle speed indication on the display.
- The controlled vehicle distance may be shorter than the set vehicle distance when cruising on a long downhill road.
- The cruise control main switch (ON-OFF button) must be turned off and then on if all of the following occur: 1) the cruise main indicator light blinks, 2) the master warning light illuminates at the same time as a "pong" sound, and 3) the fail message is shown on the multi-information display.
- The vehicle-approaching warning buzzer does not sound in the constant speed control mode because the presence of the vehicle in front and the distance to it are not judged as in the vehicle-to-vehicle distance control mode. Pay attention to the distance to the vehicle in front.
- The dynamic radar cruise control system has 2 cruise control modes: constant speed control mode and vehicle-to-vehicle distance control mode. Confirm which mode is selected when using the dynamic radar cruise control system.

PARTS LOCATION

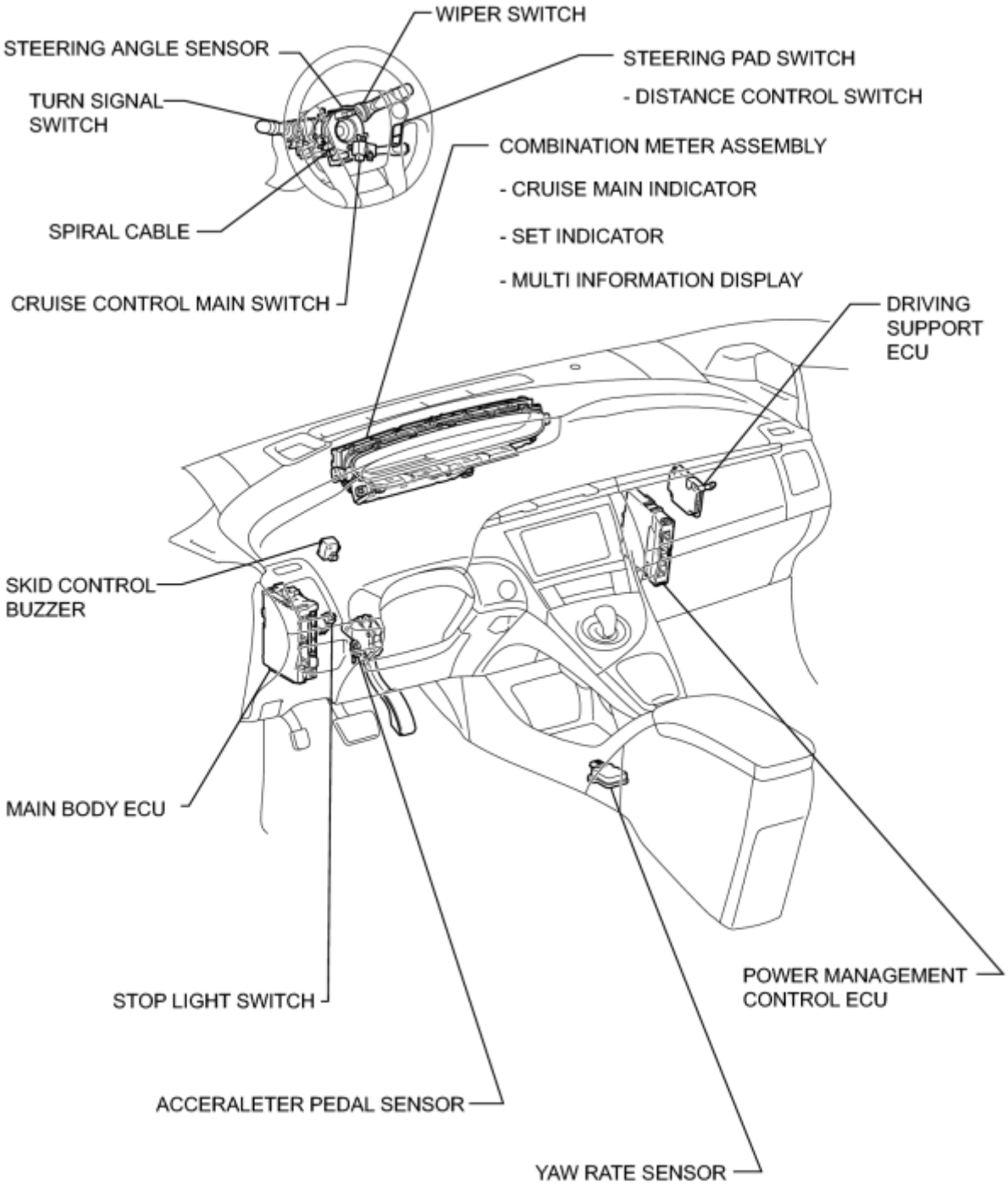
ILLUSTRATION



*: with Lane Keeping Assist System

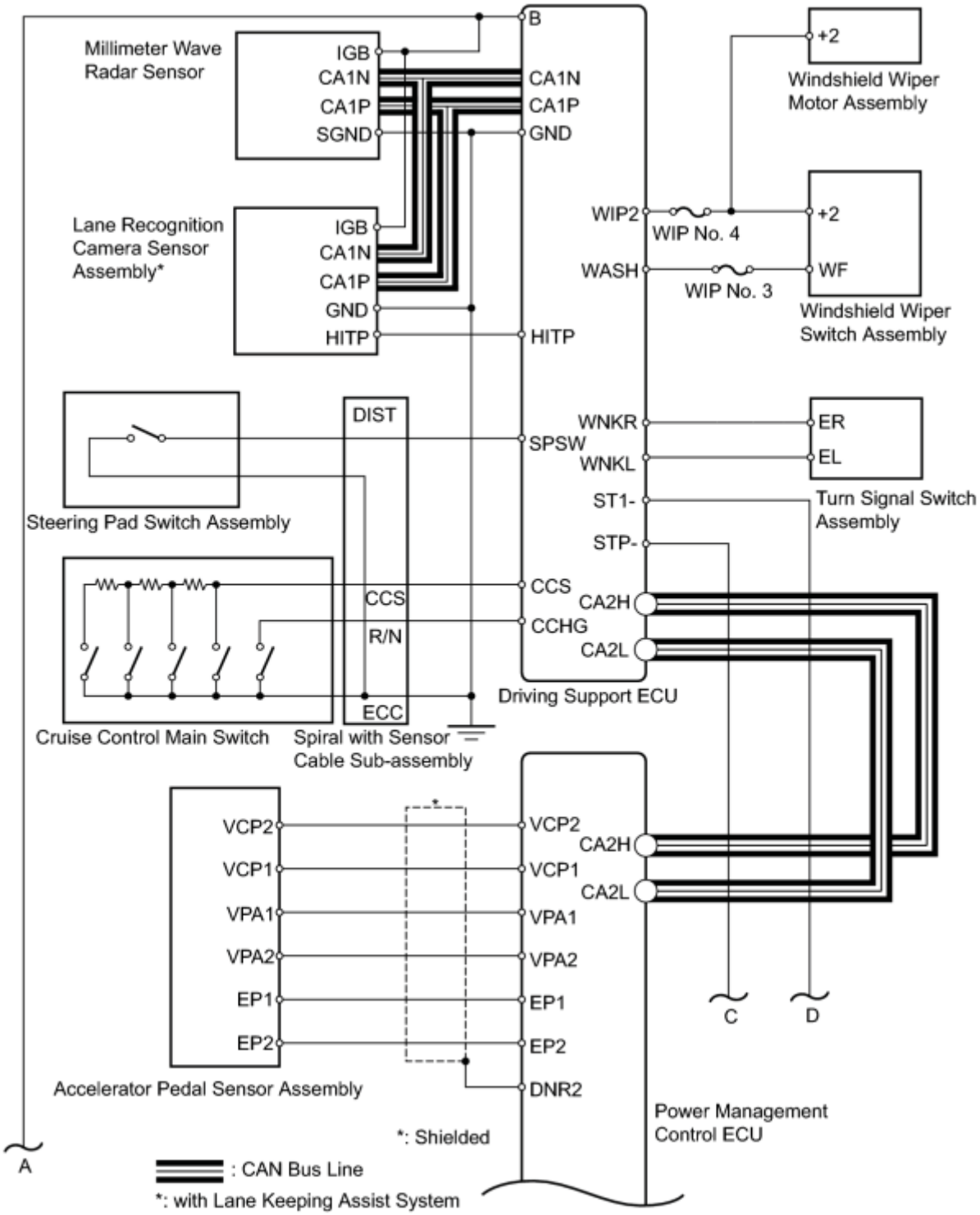
H

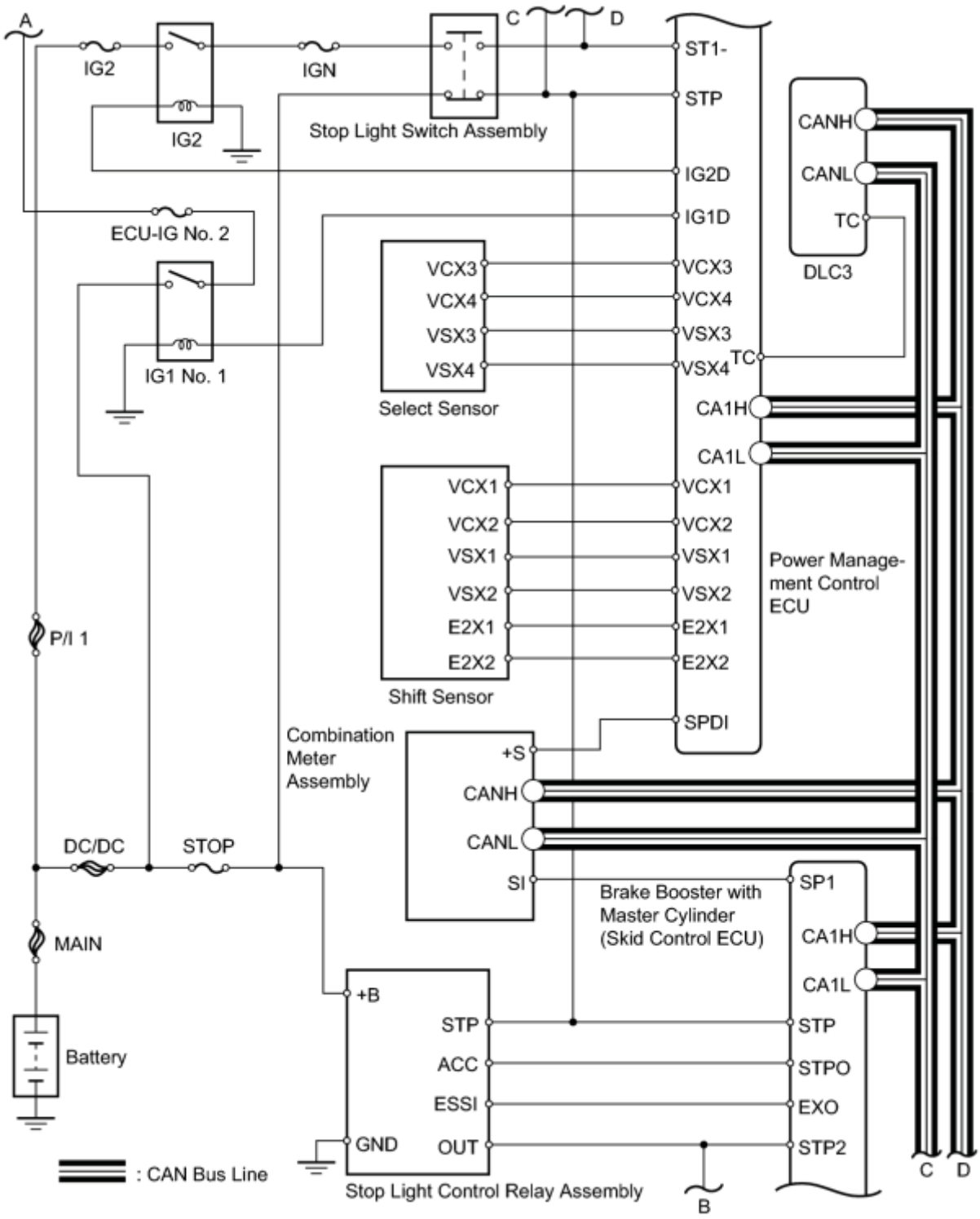
ILLUSTRATION

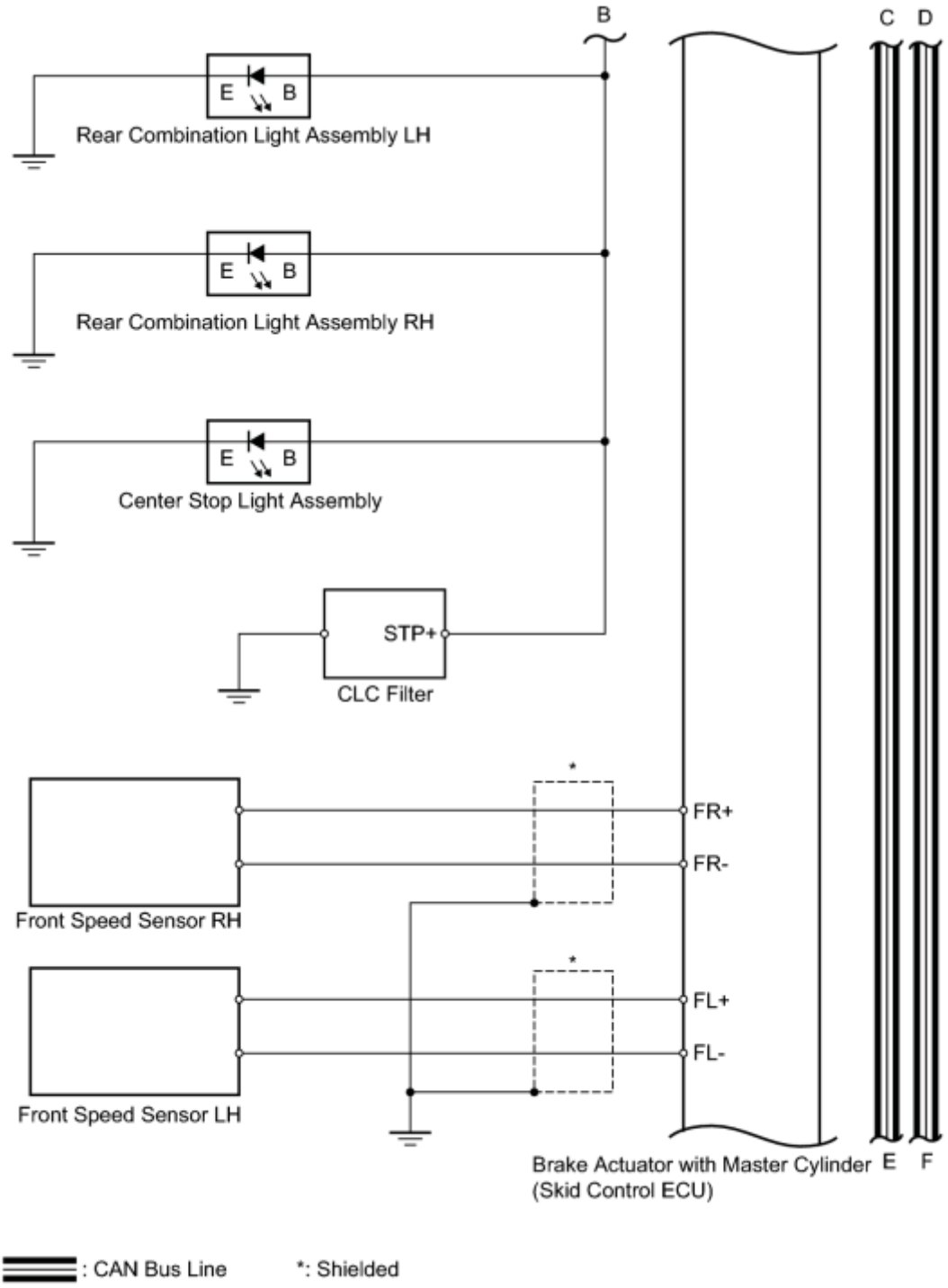

WIPER SWITCH
STEERING ANGLE SENSOR
STEERING PAD SWITCH
- DISTANCE CONTROL SWITCH
TURN SIGNAL SWITCH
COMBINATION METER ASSEMBLY
- CRUISE MAIN INDICATOR
- SET INDICATOR
- MULTI INFORMATION DISPLAY
SPIRAL CABLE
CRUISE CONTROL MAIN SWITCH
DRIVING SUPPORT ECU
SKID CONTROL BUZZER
MAIN BODY ECU
POWER MANAGEMENT CONTROL ECU
STOP LIGHT SWITCH
ACCERALETER PEDAL SENSOR
YAW RATE SENSOR

H

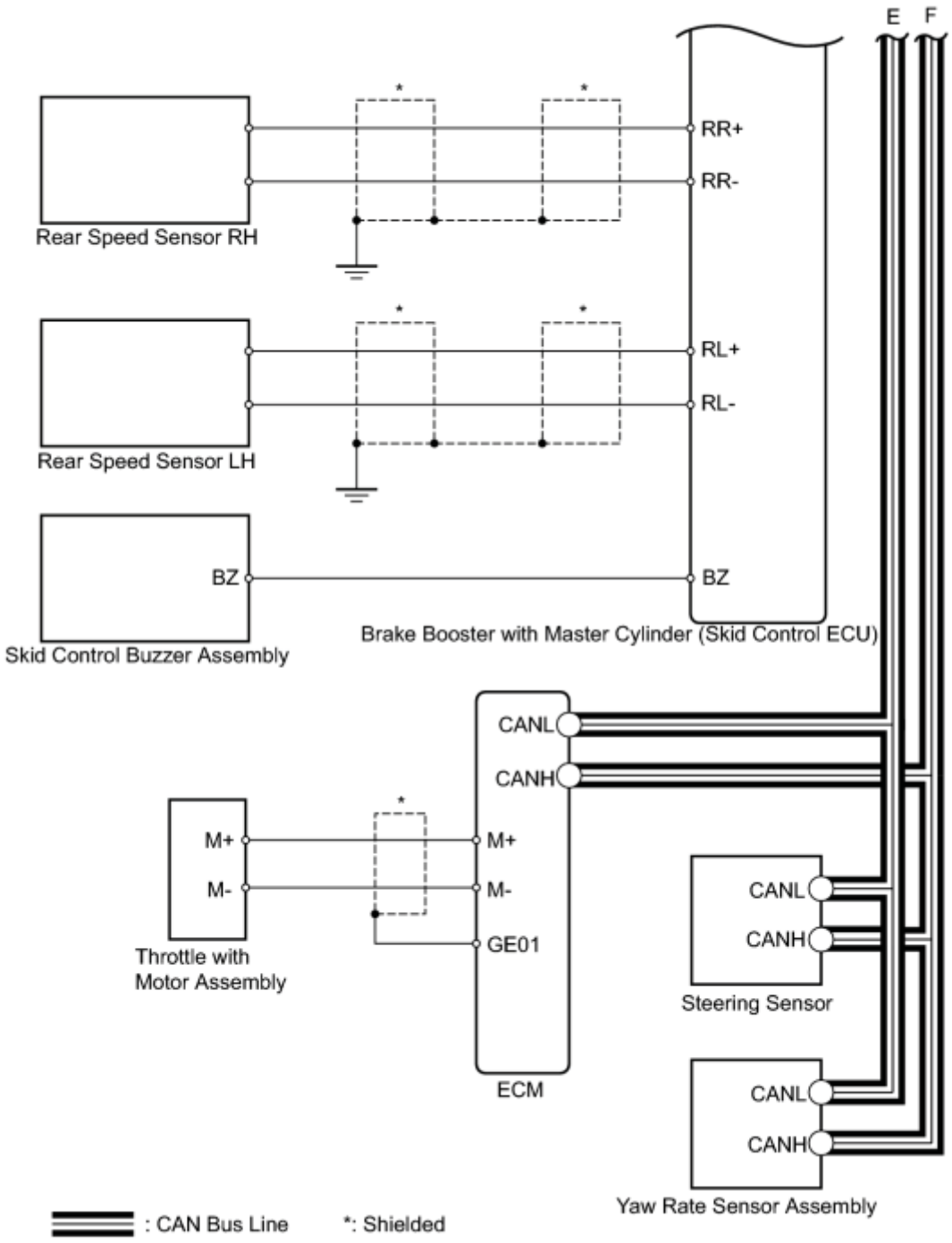
SYSTEM DIAGRAM




A
IG2
IG2
IGN
C
D
Stop Light Switch Assembly
ST1-
STP
IG2D
IG1D
CANH
CANL
TC
DLC3
ECU-IG No. 2
IG1 No. 1
VCX3
VCX4
VSX3
VSX4
Select Sensor
VCX3
VCX4
VSX3
VSX4
TC
CA1H
CA1L
VCX1
VCX2
VSX1
VSX2
E2X1
E2X2
Shift Sensor
VCX1
VCX2
VSX1
VSX2
E2X1
E2X2
Power Management Control ECU
SPDI
P/I 1
Combination Meter Assembly
+S
CANH
CANL
SI
DC/DC
STOP
Brake Booster with Master Cylinder (Skid Control ECU)
SP1
CA1H
CA1L
MAIN
Battery
+B
STP
ACC
ESSI
GND
OUT
STP
STPO
EXO
STP2
: CAN Bus Line
Stop Light Control Relay Assembly
B
C
D



: CAN Bus Line *: Shielded



c

Communication Table

Sender	Receiver	Signal	Line
Power Management Control ECU	Driving Support ECU	Actual driving force signal	CAN
		Accelerator pedal idle position signal	
		Accelerator pedal position signal	

Sender	Receiver	Signal	Line
		Shift position signal (D and R)	
		Cruise control operation signal	
		Cruise control cancel demand signal	
		Hybrid control system malfunction signal	
		SFI system malfunction signal	
Driving Support ECU	Power Management Control ECU	Target driving force signal	CAN
		Forward vehicle relative speed	
Brake Booster with Master Cylinder (Skid Control ECU)	Driving Support ECU	Speed signal	CAN
		Speed sensor signal	
		Vehicle acceleration signal	
		Brake control operation signal	
		Electronically controlled brake system malfunction signal	
		Speed sensor warning signal	
		Stop light switch control relay malfunction signal	
		Skid control buzzer malfunction signal	
		Cruise control cancel demand signal	
		Yaw rate sensor zero point signal	
Driving Support ECU	Brake Booster with Master Cylinder (Skid Control ECU)	Skid control buzzer operate demand signal	CAN
		Brake control demand signal	
Driving Support ECU	Combination Meter Assembly	Vehicle approach warning signal	CAN
		Forward vehicle detection signal	
		Cruise control diagnosis signal	
		Vehice-to-vehicle distance signal	
		Dirt present on millimeter wave radar sensor signal	
		Bad weather detection signal	
		Vehice-to-vehicle distance control signal	
		Vehice-to-vehicle distance control check mode signal	
		Vehice-to-vehicle distance control standby signal	
		Constant speed cruise signal	

Sender	Receiver	Signal	Line
		Cruise indicator light operation signal	
		Cruise control warning signal	
		Dynamic radar cruise warning signal	
		Cruise control vehicle speed signal	
		Millimeter wave radar sensor beam axis deviation signal	
		Country specification information signal	
Combination Meter Assembly	Driving Support ECU	Country specification information signal	CAN
Main Body ECU	Driving Support ECU	Country specification information signal	CAN
Yaw Rate Signal	Driving Support ECU	Yaw rate signal	CAN
		Yaw rate sensor malfunction signal	
Steering Sensor (Built into Spiral with Sensor Cable Sub-assembly)	Driving Support ECU	+B open circuit malfunction signal	CAN
		Steering sensor malfunction signal	
		Steering angle signal	
		Steering signal zero point signal	

SYSTEM DESCRIPTION

1. GENERAL

(a) The dynamic radar cruise control system has two cruise control modes: constant speed control mode and vehicle-to-vehicle distance control mode.

- Vehicle-to-vehicle distance control mode is always selected when starting the dynamic radar cruise control system.
- Operation of constant speed control mode is the same as that for a conventional cruise control system.

(b) This system maintains the vehicle running at the speed that the driver has set, as long as there are no vehicles ahead. Then, the system maintains the vehicle distance that has been set by the driver. If the system detects a vehicle driving at a slower speed ahead while the driver is driving at a constant speed, it closes the throttle valve to decelerate. If further deceleration is required, the system controls the brake actuator in order to apply the brakes. Thereafter, if there are no vehicles ahead within the set vehicle-to-vehicle distance because either the vehicle ahead or the driver has changed lanes, the system accelerates slowly to reach the set vehicle speed and resumes driving at the constant speed.

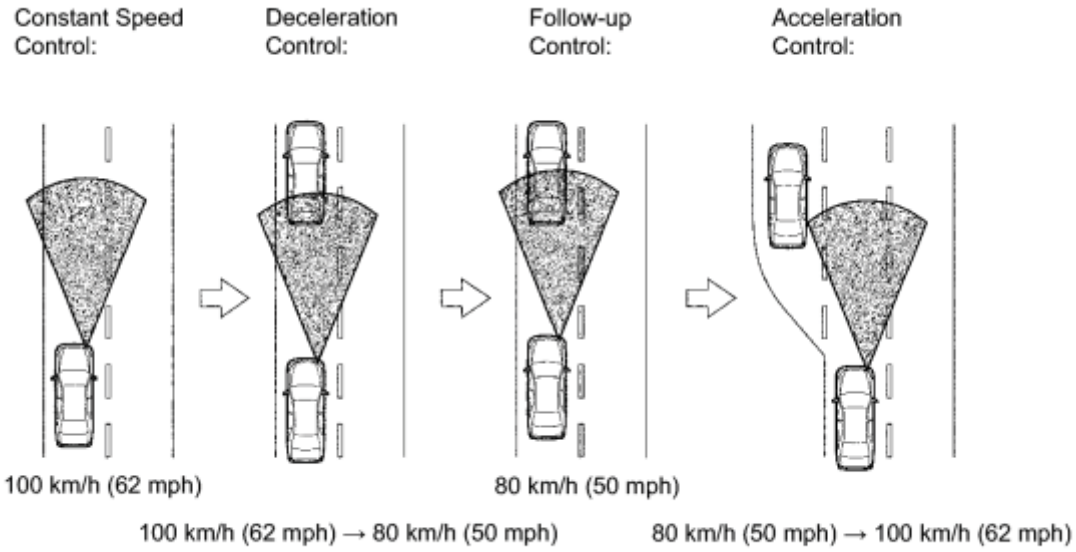
(c) Constant speed control mode is designed to maintain a constant cruising speed. The vehicle-to-vehicle distance control mode is designed to control cruising at a constant speed function, deceleration cruising function, follow-up cruising function, and acceleration cruising function.

(d) The millimeter wave radar sensor and the driving support ECU control the system while the vehicle-to-vehicle distance control mode is operating, and send signals to each actuator and ECU.

(e) In vehicle-to-vehicle distance control mode, the dynamic radar cruise control system receives signals from the yaw rate sensor and the steering angle sensor. Based on these signals, the system then estimates curve radius and compensates for information on the preceding vehicle while turning. It can also compensate using brake control when approaching another vehicle.

(f) This system judges the presence of a vehicle in front and the distance to it based on the signals from the radar sensor while vehicle-to-vehicle distance control mode is in operating. Using this information, the system informs the driver of any danger with the warning buzzer, performs brake control, and turns on the stop light when approaching the vehicle in front.

(g) The following illustration shows a control example under the following conditions: own vehicle speed is 100 km/h (62 mph) and the speed of the vehicle in front is 80 km/h (50 mph). Setting of the vehicle distance can be changed to 3 distances by operating the distance control switch (distance control switch): long (approximately 50 m (160 ft.)), middle (approximately 40 m (130 ft.)), and short (approximately 30 m (100 ft.)) when the vehicle speed is approximately 80 km/h (50 mph).



HINT:

- Vehicle distance increases and decreases in accordance with vehicle speed.
- Controlling condition is indicated on the multi-information display in the combination meter.

2. FUNCTION OF MAIN COMPONENTS

Item	Outline
Combination Meter Assembly (Cruise main indicator Light)	• Comes on when the main switch (ON-OFF button) is on • If the driving support ECU detects a malfunction, this light flashes to warn the driver
Combination Meter Assembly (Master Warning Light)	If the driving support ECU detects an automatic cancel signal while the vehicle is operating under cruise control, this light comes on to inform the driver
Combination Meter Assembly (Buzzer)	If the driving support ECU detects an automatic cancel signal while the vehicle is operating under cruise control, this buzzer sounds only once to inform the driver
Combination Meter Assembly (Multi-information Display)	• The driving support ECU displays "SET" on the multi-information display when constant speed control is started by pushing the cruise control main switch to "- SET". • While the system is in vehicle-to-vehicle distance control mode, the multi-information display receives signals from the driving support ECU, in order to display system conditions in the graphic area • If the driving support ECU detects a malfunction signal while the vehicle is operating under cruise control, a warning message will be displayed in the warning area to inform the driver
Cruise Control Main Switch (ON-OFF button)	Turns the cruise control system on or off

Item	Outline
Cruise Control Main Switch (Control Switch)	• Vehicle speed setting, deceleration setting, preset speed resumption, acceleration setting, and cancel signals are output to the driving support ECU through the operation of this switch • Switches the control mode: constant speed control mode and vehicle-to-vehicle distance control mode
Steering Pad Switch (Vehicle-to-vehicle Distance Control Switch)	While the system is in vehicle-to-vehicle distance control mode, the driver can operate the steering pad switch (vehicle-to-vehicle distance control switch) to select the vehicle-to-vehicle distance in three stages: long, middle, and short
Stop Light Switch Assembly	Detects the depression of the brake pedal and transmits its signal to the ECM
Windshield Wiper Switch	Transmits wiper control switch information to the driving support ECU
Millimeter Wave Radar Sensor	Radiates radar rays forward, uses the reflected rays for detecting the presence of a vehicle in front, vehicle-to-vehicle distance, and relative speed, and transmits this information to the driving support ECU
Steering Angle Sensor	Detects the angle and direction of steering and transmits its signal to the driving support ECU
Vehicle Speed Sensor (SP1)	A vehicle speed signal which is output from the brake booster with master cylinder (skid control ECU) is sent to the driving support ECU
Yaw Rate Sensor	Detects the yaw rate of the vehicle and transmits its signal to the driving support ECU
Brake Booster with Master Cylinder (Skid Control ECU)	• Actuates the brakes in accordance with signals from the brake booster with master cylinder (skid control ECU) • While the system is in vehicle-to-vehicle distance control mode, the brake booster with master cylinder (skid control ECU) actuates the brake actuator in accordance with a brake request signal received from the driving support ECU • Upon receiving a signal from the driving support ECU, the brake booster with master cylinder (skid control ECU) sounds the skid control buzzer
Skid Control Buzzer	This buzzer sounds upon receiving a signal from the brake booster with master cylinder (skid control ECU)
Power Management Control ECU	Controls the dynamic radar cruise control system in accordance with signals from switches, sensors, and the driving support ECU
Throttle Position Sensor and Motor	Upon receiving a signal from the ECM, the throttle control motor actuates the throttle valve
Driving Support ECU	• While the system is in vehicle-to-vehicle distance control mode, the driving support ECU detects a vehicle in front based on a signal from the millimeter wave radar sensor. Then, the driving support ECU calculates the acceleration or deceleration rate in order to attain the target vehicle-to-vehicle distance, and outputs a request signal to the ECM and brake booster with master cylinder (skid control ECU) • If the driving support ECU detects a malfunction in the dynamic radar cruise control system, it will store DTCs (Diagnostic Trouble Codes)

3. LIMIT CONTROL

(a) Low speed limit

The lowest possible limit of the speed setting range is set at approximately 40 km/h (25 mph). The cruise control system cannot be set when the driving vehicle speed is below the low speed limit. Cruise control operation will be automatically canceled when the vehicle speed decreases below the low speed limit of 40 km/h (25 mph) while the cruise control is operating.

(b) High speed limit (constant speed control mode)

The highest possible limit of the speed setting range is set at approximately 200 km/h (125 mph). The cruise control system will be set at the high speed limit when the cruise control is set and the vehicle speed is over the high speed limit. Also, + RES cannot be used to increase speed over the high speed limit.

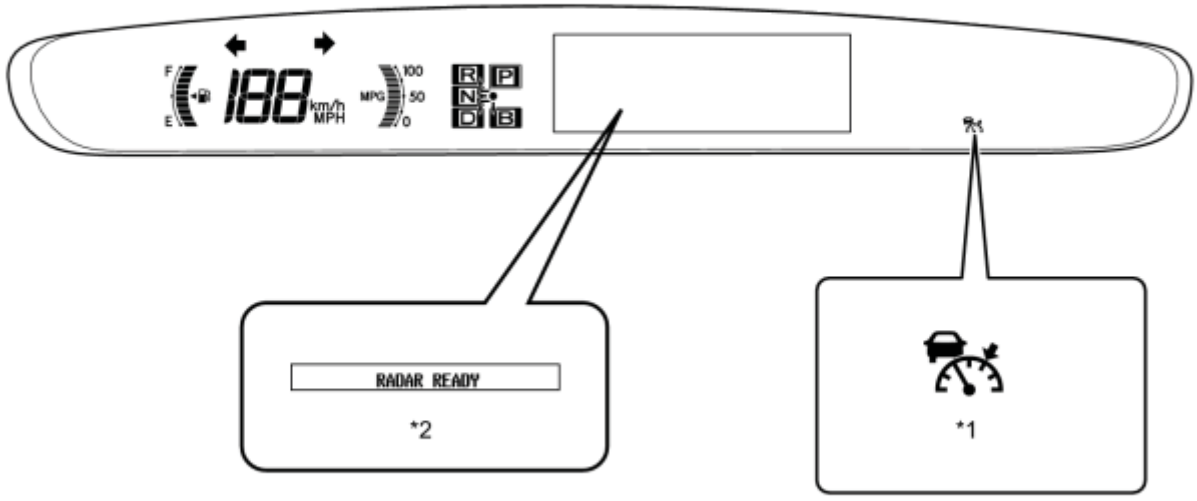
(c) High speed limit (vehicle-to-vehicle distance control mode)

The highest possible limit of the speed setting range is set at approximately 170 km/h (105 mph).

4. CRUISE CONTROL OPERATION

The cruise control main switch operates 8 functions: SET, - (COAST), TAP-DOWN, RES (RESUME), + (ACCEL), TAP-UP, CANCEL, and MODE. The SET, TAP-DOWN, and - (COAST) functions, and the RES (RESUME), TAP-UP, and + (ACCEL) functions are operated with the same switch. The cruise control main switch is an automatic return type switch which turns on only while operating it in the direction of each arrow and turns off after releasing it. The dynamic radar cruise control system has two cruise control modes: the constant speed control mode and vehicle-to-vehicle distance control mode.

- The vehicle-to-vehicle distance control mode is always selected when starting up the dynamic radar cruise control system (cruise main indicator light and "RADAR READY" indicator comes on).



H

Text in Illustration

*1	Cruise Main Indicator Light (Vehicle-to-vehicle distance control mode)	*2	"RADAR READY" Indicator

- Operation of the constant speed control mode is the same as that for a conventional cruise control system.

(a) MODE CONTROL

Pushing the switch to MODE for more than 1 second while driving with the cruise control main switch ON-OFF button on ("RADAR READY" is on) switches the mode to constant speed control mode.

(b) SET CONTROL (Constant speed control mode)

The vehicle speed is stored and constant speed control is maintained when pushing the switch to - SET while driving with the vehicle speed within the set speed range (between the low and high speed limits) after pushing the cruise control main switch ON-OFF button on, and entering constant speed control mode (cruise main indicator light and "SET" indicator comes on).

Text in Illustration

*1	Cruise Main Indicator Light (Constant speed control mode)
*2	"SET" Indicator

(c) SET CONTROL (Vehicle-to-vehicle distance control mode)

The vehicle speed is stored and vehicle-to-vehicle distance control is maintained when pushing the switch to - SET while driving with the cruise control main switch on ("RADAR READY" is on), and vehicle speed is within the set speed range (between the low and high speed limits) (cruise main indicator light and "SET" indicator comes on).

Text in Illustration

*1	Cruise Main Indicator Light (Vehicle-to-vehicle distance control mode)
*2	"SET" Indicator

(d) - (COAST) CONTROL (Constant speed control mode)

The power management control ECU decreases the cruise control demand speed and controls the engine and motor driving force to decelerate the vehicle when - SET on the cruise control main switch is pressed and held while the cruise control system is operating. When the cruise control main switch is released from - SET, vehicle speed is stored and constant speed control is maintained.

(e) - (COAST) CONTROL (Vehicle-to-vehicle distance control mode)

When the cruise control main switch is held to - SET while the cruise control system is operating, the stored vehicle speed decreases by approximately 5 km/h or 5 mph per second.

(f) TAP-DOWN - (CONTROL) (Constant speed control mode)

When tapping down the cruise control main switch to - SET (for approximately 0.6 seconds or less) while the constant speed control mode is operating, the stored vehicle speed decreases each time by approximately 1.6 km/h (1 mph). When the cruise control main switch is released from - SET and the difference between the driving and stored vehicle speeds is more than 5 km/h (3 mph), the driving vehicle speed is stored and constant speed control is maintained.

(g) TAP-DOWN CONTROL (Vehicle-to-vehicle distance control mode)

When tapping down the cruise control main switch to - SET (for approximately 0.6 seconds or less) while the vehicle-to-vehicle distance control mode is operating, the stored vehicle speed decreases each time by approximately 1.6 km/h or 1 mph.

(h) + (ACCEL) CONTROL (Constant speed control mode)

The power management control ECU increases the cruise control demand speed and controls the engine and motor driving force to accelerate the vehicle when + RES on the cruise control main switch is pressed and held while the cruise control system is operating.

When the cruise control main switch is released from + RES, vehicle speed is stored and constant speed control is maintained.

(i) + (ACCEL) CONTROL (Vehicle-to-vehicle distance control mode)

When + RES on the cruise control main switch is pressed and held while vehicle-to-vehicle distance control mode is operating, the stored vehicle speed increases by approximately 5 km/h or 5 mph per second. Pushing the cruise control main switch to + RES while following the vehicle in front with the vehicle-to-vehicle distance control mode does not increase the actual vehicle speed, but changes only the set vehicle speed.

(j) TAP-UP CONTROL (Constant speed control mode)

When tapping up the cruise control main switch to + RES (approximately 0.6 seconds or less) while the constant speed control mode is operating, the stored vehicle speed increases each time by approximately 1.6 km/h (1 mph). However, when the difference between the driving and the stored vehicle speeds is more than 5 km/h (3 mph), the stored vehicle speed will not be changed.

(k) TAP-UP CONTROL (Vehicle-to-vehicle distance control mode)

When tapping up the cruise control main switch to + RES (for approximately 0.6 seconds or less) while vehicle-to-vehicle distance control mode is operating, the stored vehicle speed increases each time by approximately 1.6 km/h or 1 mph.

(l) MANUAL CANCEL CONTROL

Performing any of the following cancels the cruise control system while it is operating (the stored vehicle speed in the driving support ECU is maintained).

- Depressing the brake pedal
- Moving the shift lever from D to N or, selecting 3rd, 2nd, or 1st range with the shift lever in S
- Pushing the cruise control main switch to CANCEL
- Turning the cruise control main switch off (the stored vehicle speed in the driving support ECU is not maintained)

(m) RES (RESUME) CONTROL

If the cruise control operation was canceled by the stop light switch, CANCEL switch, or shift lever operation, and if driving speed is within the set speed range, pushing the cruise control main switch to + RES restores the vehicle speed memorized at the time of cancellation, and maintains constant speed control. In constant speed control mode, once the vehicle speed drops below the low speed limit, RESUME operation is possible after accelerating past the low speed limit and pushing the cruise control main switch to + RES.

5. BRAKE CONTROL

The driving support ECU determines the distance to the vehicle in front, relative speed, target decreasing speed, and deceleration rate. Based on these data, the ECU transmits a brake demand signal to the brake booster with master cylinder (skid control ECU) via the driving support ECU.

6. AUTO CANCEL (FAIL-SAFE)

This system has an automatic cancellation function (fail-safe) INFO.

HOW TO PROCEED WITH TROUBLESHOOTING

HINT:

- Use the following procedure to troubleshoot the dynamic radar cruise control system.
- *: Use the Techstream.

1.	VEHICLE BROUGHT TO WORKSHOP

NEXT

2.	INSPECT BATTERY VOLTAGE

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 COMMUNICATION FUNCTION OF CONTROLLER AREA NETWORK (CAN)*

(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

4.	CHECK FOR DTC*

Refer to DTC Check / Clear INFO.

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

(b) Clear the DTCs.

(c) Recheck for DTCs. Try to prompt the DTCs by duplicating the conditions indicated by the DTCs.

Result:

Result	Proceed to
DTC does not reoccur	A

Result	Proceed to
DTC reoccurs	B

B ▶ INFO GO TO DTC CHART

A ▼

5.	PROBLEM SYMPTOMS TABLE

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 ▼

6.	OVERALL ANALYSIS AND TROUBLESHOOTING*

(a) Terminals of ECU INFO

(b) Data List / Active Test INFO

NEXT ▼

7.	ADJUST, REPAIR OR REPLACE

NOTICE:

When the millimeter wave radar sensor is replaced with a new one, adjustment of the radar sensor beam axis must be performed INFO.

NEXT ▼

8.	CONFIRMATION TEST

NEXT ▶ **END**

ROAD TEST

1. PROBLEM SYMPTOM CONFIRMATION

HINT:

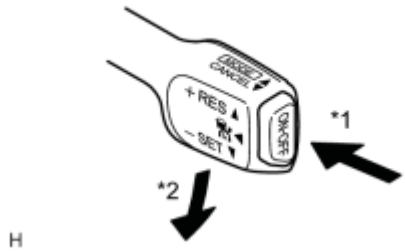
The dynamic radar cruise control system has two cruise control modes: the constant speed control mode and vehicle-to-vehicle distance control mode.

- The vehicle-to-vehicle distance control mode is always selected when starting up the dynamic radar cruise control system.
- Operation of the constant speed control mode is the same as that for a conventional cruise control system.

(a) Inspect the SET function.

Text in Illustration

*1	ON/OFF
*2	- SET



(1) Turn the main switch on.

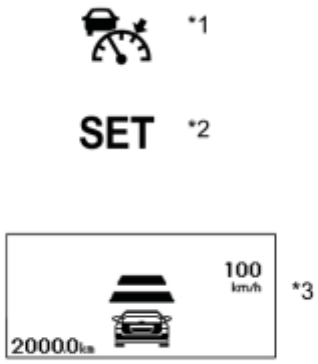
(2) Check that the cruise main indicator light illuminates on the combination meter assembly.

(3) Drive at a speed between 50 km/h (30 mph) and 170 km/h (105 mph).

(4) Push the cruise control main switch to - SET.

Text in Illustration

*1	Cruise Main Indicator Light
*2	"SET" Indicator
*3	Multi-information Display



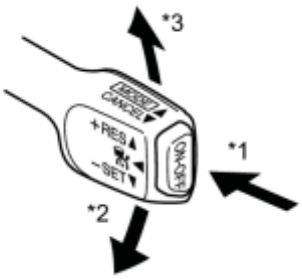
(5) Check that "SET" is indicated on the multi-information display.

(6) After releasing the switch, check that the vehicle cruises at the set speed.

(b) Inspect the + (ACCEL) function.

Text in Illustration

*1	ON/OFF
*2	- SET
*3	+ RES



(1) Turn the main switch on.

(2) Drive at a speed between 50 km/h (30 mph) and 170 km/h (105 mph).

(3) Push the cruise control main switch to - SET.

(4) Check that vehicle speed increases while the cruise control main switch is pushed to + RES, and that the vehicle cruises at the newly set speed when the switch is released.

(5) Push the cruise control main switch to + RES and then release it immediately. Check that vehicle speed increases* (tap-up control).

HINT:

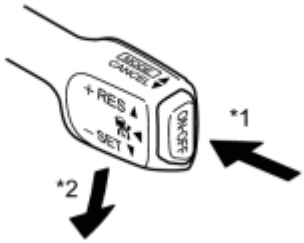
*: Constant speed control mode: increases by 1.6 km/h (1.0 mph); vehicle-to-vehicle distance control mode: increases by 1 km/h or 1 mph.

(c) Inspect the - (COAST) function.

Text in Illustration

*1	ON/OFF

*2	- SET



H

(1) Turn the main switch on.

(2) Drive at a speed between 50 km/h (30 mph) and 170 km/h (105 mph).

(3) Push the cruise control main switch to - SET.

(4) Check that vehicle speed decreases while the cruise control main switch is pushed to - SET, and the vehicle cruises at the newly set speed when the switch is released.

(5) Push the cruise control main switch to - SET, and then release it immediately. Check that vehicle speed decreases* (tap-down control).

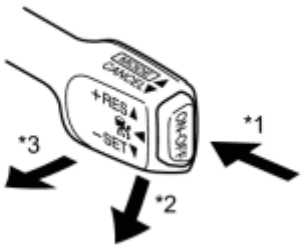
HINT:

*: Constant speed control mode: decreases by 1.6 km/h (1.0 mph); vehicle-to-vehicle distance control mode: decreases by 1.6 km/h or 1 mph.

(d) Inspect the CANCEL function.

Text in Illustration

*1	ON/OFF
*2	- SET
*3	CANCEL



(1) Turn the main switch on.

(2) Drive at a speed between 50 km/h (30 mph) and 170 km/h (105 mph).

(3) Push the cruise control main switch to - SET.

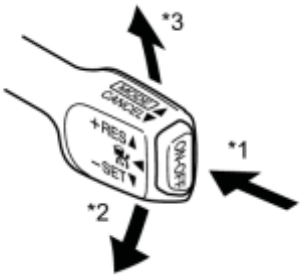
(4) When performing any one of the following, check that the cruise control system is canceled and that the normal driving mode is reset.

- Depressing the brake pedal
- Moving the shift lever from D to N or selecting shift lever in B
- Turning the main switch off
- Pulling the cruise control main switch to CANCEL

(e) Inspect the RES (RESUME) function.

Text in Illustration

*1	ON/OFF
*2	- SET



*3	+ RES

(1) Turn the main switch on.

(2) Drive at a speed between 50 km/h (30 mph) and 170 km/h (105 mph).

(3) Push the cruise control main switch to - SET.

(4) Cancel the cruise control system by performing any of the above operations (other than turning the main switch off).

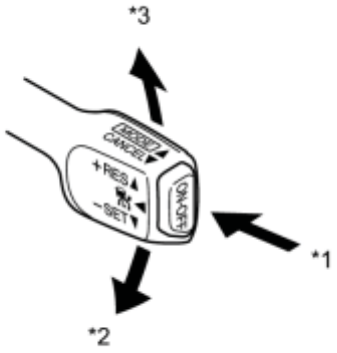
(5) After pushing the cruise control main switch to "+ RES" at a driving speed of more than 40 km/h (25 mph), check that the vehicle resumes the speed set prior to the cancellation and that "SET" is also displayed on the multi-information display.

HINT:

The stored vehicle speed is retained even if vehicle speed drops below 40 km/h (25 mph) once. The previously stored vehicle speed can be resumed by pushing the cruise control main switch to + RES when vehicle speed returns to approximately 40 km/h (25 mph) or more.

OPERATION CHECK

1. INPUT SIGNAL CHECK



H

(a) Connect the Techstream to the DLC3.

(b) Check the cruise control main switch using the Data List function of the Techstream (ON-OFF, - SET and + RES).

Text in Illustration

*1	ON/OFF
*2	- SET
*3	+ RES

2. INSPECT MODE SWITCH

H

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

Text in Illustration

*1	ON/OFF
*2	MODE

(b) Turn the cruise control main switch on. Then push the main switch to MODE for 1 second or more to change to the constant speed control mode. Check that "RADAR READY" goes off on the display.

(c) Check that the cruise main indicator light (vehicle-to-vehicle distance control mode) goes off and the cruise main indicator light (constant speed control mode) illuminates.

Text in Illustration

*1	Multi-information Display

*2	Cruise Main Indicator Light (Vehicle-to-vehicle distance control mode)
*3	Cruise Main Indicator Light (Constant speed control mode)

NOTICE:

Do not push any other switches before pushing the main switch to MODE. If another switch is pushed, turn the main switch off and repeat the procedure above.

HINT:

If a malfunction is detected, turn the power switch off and repeat the procedure above.

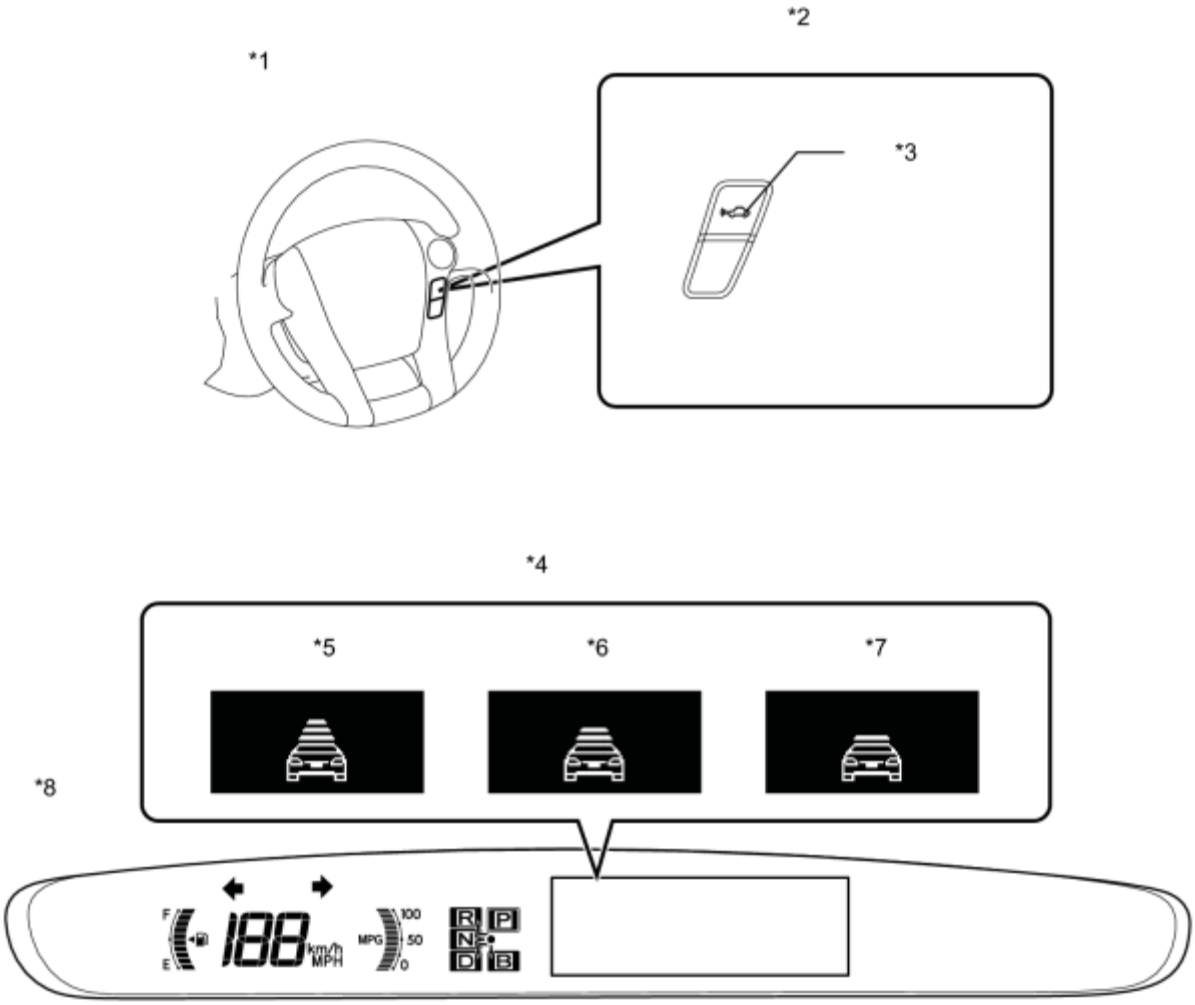
3. INSPECT STEERING PAD SWITCH ASSEMBLY

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

(b) Turn the cruise control main switch (ON-OFF button) on.

(c) Turn on the vehicle-to-vehicle distance control switch of the steering pad switch.

(d) Check that the indication of the vehicle-to-vehicle distance, which is shown on the multi-information display on the combination meter, changes from long to middle to short in that order.



Text in Illustration

*1	Steering Wheel	*2	Steering Pad Switch
*3	Distance Control Switch	*4	Multi-information Display
*5	Long	*6	Middle
*7	Short	*8	Combination Meter

HINT:

The indication is automatically set to long each time the engine is started.

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.

Dynamic Radar Cruise Control System

Symptom	Suspected Area	See page
The cruise control main switch (ON-OFF button) cannot be turned on.	Driving support ECU power source circuit	INFO
	Cruise control switch circuit	INFO
	CRUISE main indicator light circuit	INFO
	Power management control ECU	INFO
	Driving support ECU	INFO
Setting cannot be changed between constant speed control mode and vehicle-to-vehicle distance control mode.	Cruise control switch circuit	INFO
	Combination meter assembly	INFO
	Driving support ECU	INFO
Set distance cannot be changed.	Distance control switch circuit	INFO
	Combination meter assembly	INFO
	Driving support ECU	INFO
Setting cannot be canceled in vehicle-to-vehicle distance control mode.	Combination meter assembly	INFO
	Millimeter wave radar sensor assembly	INFO
	Driving support ECU	INFO
Vehicle speed setting cannot be performed. (The cruise main indicator light on combination meter illuminates when main switch is turned on, but turns off when operating SET function.)	Cruise control switch circuit	INFO
	Driving support ECU	INFO
Vehicle speed setting cannot be performed with the constant speed mode. (The cruise main indicator light on combination meter illuminates when main switch is turned on, and remains on when operating SET function is	Stop light switch circuit	INFO
	Vehicle speed sensor circuit	INFO

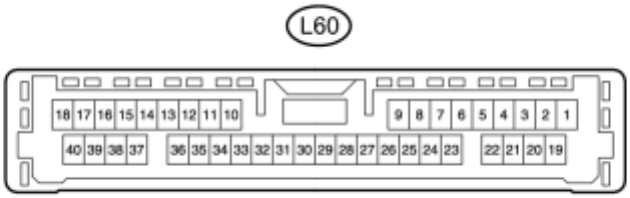
Symptom	Suspected Area	See page
operating.)	Cruise control switch circuit	INFO
	Hybrid control system	INFO
	Driving support ECU	INFO
Vehicle speed setting cannot be performed with the vehicle-to-vehicle distance control mode. (The cruise main indicator light on combination meter illuminates when main switch is turned on, and remains on when SET function is operating.)	Millimeter wave radar sensor	INFO
	Stop light switch circuit	INFO
	Vehicle speed sensor circuit	INFO
	Cruise control switch circuit	INFO
	Hybrid control system	INFO
	Wiper signal circuit	INFO
	Electronically controlled brake system	INFO
While vehicle is driven with cruise control on, the control is canceled.	Stop light switch circuit	INFO
	Hybrid control system	INFO
	Electronically controlled brake system	INFO
	Cruise control switch circuit	INFO
	Vehicle speed sensor circuit	INFO
	Wiper signal circuit	INFO
	Driving support ECU	INFO
Pulling back on the control main switch does not cancel the cruise control. (The cruise main indicator light remains on.)	Cruise control switch circuit	INFO
	Driving support ECU	INFO
Pulling back on the control main switch does not cancel the cruise control. (The cruise main indicator light goes off.)	Driving support ECU	INFO
The cruise control is not canceled when vehicle speed drops below the low speed limit. (The cruise main indicator light remains on.)	Vehicle speed sensor circuit	INFO
	Driving support ECU	INFO
The cruise control is not canceled when vehicle speed drops below the low speed limit. (The cruise main indicator light goes off.)	Driving support ECU	INFO
Depressing the brake pedal does not cancel the cruise control. (The cruise main indicator light remains on.)	Stop light switch circuit	INFO
	Driving support ECU	INFO
Depressing the brake pedal does not cancel the cruise control. (The cruise main indicator light goes off.)	Driving support ECU	INFO
Vehicle speed cannot be canceled with wiper HI. (The cruise main indicator	Wiper signal circuit	INFO

Symptom	Suspected Area	See page
light remains on.)	Driving support ECU	INFO
Vehicle speed cannot be canceled with wiper HI. (The cruise main indicator light goes off.)	Driving support ECU	INFO
Moving the shift lever does not cancel the cruise control. (The cruise main indicator light remains on.)	Hybrid control system	INFO
	Driving support ECU	INFO
Moving the shift lever does not cancel the cruise control. (The cruise main indicator light goes off.)	Driving support ECU	INFO
Hunting (Speed is not constant.)	Vehicle speed sensor circuit	INFO
	SFI system	INFO
	Hybrid control system	INFO
	Driving support ECU	INFO
Even though front millimeter wave radar sensor is not dirty, CLEAN RADAR SENSOR is displayed	Millimeter wave radar sensor assembly is dirty	-
	Adjust front millimeter wave radar sensor assembly	INFO
	Millimeter wave radar sensor assembly	INFO
No information on the multi-information display	Combination meter assembly	INFO
Beam axis of millimeter wave radar sensor cannot be adjusted (completed).	Check position, distance and angle of reflector	INFO
	Check installation of millimeter wave radar sensor	INFO
	Millimeter wave radar sensor assembly	INFO
	Driving support ECU	INFO
Alarm buzzer does not sound.	Skid control buzzer circuit	INFO
	Electronically controlled brake system	INFO
	Millimeter wave radar sensor assembly	INFO
	Driving support ECU	INFO
No brake control (when decelerating)	Electronically controlled brake system	INFO
	Driving support ECU	INFO
The SET indicator light does not illuminate (SET function operates normally)	Cruise SET indicator light circuit	INFO

Symptom	Suspected Area	See page
	Driving support ECU	INFO
The cruise main indicator light remains blinking	TC and CG terminal circuit	INFO
	Driving support ECU	INFO

TERMINALS OF ECU

1. CHECK DRIVING SUPPORT ECU



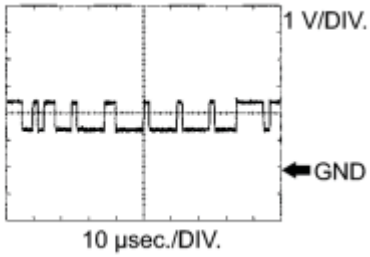
Terminal No. (Symbol)	Wiring Color	Terminal Description	Condition	Specified Condition
L60-6 (SPSW) - L60-25 (GND)	R - W-B	Steering pad switch signal (distance control signal)	Power switch on (IG) Distance control switch off	10 to 14 V
L60-6 (SPSW) - L60-25 (GND)	R - W-B	Steering pad switch signal (distance control signal)	Power switch on (IG) Distance control switch on	6 to 7 V
L60-10 (CCHG) - L60-25 (GND)	G - W-B	Cruise control main switch signal	Power switch on (IG), MODE switch off	10 to 14 V
L60-10 (CCHG) - L60-25 (GND)	G - W-B	Cruise control main switch signal	Power switch on (IG), MODE switch on	Below 1 V
L60-17 (CA2L) - L60-25 (GND)	W - W-B	CAN communication signal	Power switch on (IG)	Pulse generation (See waveform 1)
L60-18 (CA1N) - L60-25 (GND)	L - W-B	CAN communication signal	Power switch on (IG)	Pulse generation (See waveform 2)
L60-23 (CCS) - L60-25 (GND)	V - W-B	Cruise control main switch signal	Power switch on (IG)	10 to 14 V
L60-23 (CCS) - L60-25 (GND)	V - W-B	Cruise control main switch signal	Power switch on (IG), CANCEL switch	6.6 to 10.1 V

Terminal No. (Symbol)	Wiring Color	Terminal Description	Condition	Specified Condition
			on	
L60-23 (CCS) - L60-25 (GND)	V - W-B	Cruise control main switch signal	Power switch on (IG), -SET switch on	4.5 to 7.1 V
L60-23 (CCS) - L60-25 (GND)	V - W-B	Cruise control main switch signal	Power switch on (IG), +RES switch on	2.3 to 4.0 V
L60-23 (CCS) - L60-25 (GND)	V - W-B	Cruise control main switch signal	Power switch on (IG), Main switch on	Below 1 V
L60-24 (HITP) - L60-25 (GND)	G - W-B	CAN signal (Hi temperature)	Power switch on (IG)	-
L60-25 (GND) - Body ground	W-B - Body ground	Earth (ground circuit of driving support ECU)	Always	Below 1 Ω
L60-27 (STP-) - L60-25 (GND)	Y - W-B	Stop light signal	Brake pedal released	Below 1 V
L60-27 (STP-) - L60-25 (GND)	Y - W-B	Stop light signal	Brake pedal depressed	7.5 to 14 V
L60-28 (ST1-) - L60-25 (GND)	R - W-B	Stop light signal	Power switch on (IG), Brake pedal released	7.5 to 14 V
L60-28 (ST1-) - L60-25 (GND)	R - W-B	Stop light signal	Power switch on (IG), Brake pedal depressed	Below 1 V
L60-30 (+B) - L60-25 (GND)	B - W-B	Power source	Power switch on (IG)	11 to 14 V
L60-32 (WIP2) - L60-25 (GND)	P - W-B	Wiper switch signal	Power switch on (IG), Wiper switch off	Below 1 V
L60-32 (WIP2) - L60-25 (GND)	P - W-B	Wiper switch signal	Power switch on (IG), Wiper switch LO position	6 to 7 V
L60-32 (WIP2) - L60-25 (GND)	P - W-B	Wiper switch signal	Power switch on	11 to 14 V

Terminal No. (Symbol)	Wiring Color	Terminal Description	Condition	Specified Condition
			(IG), Wiper switch HI position	
L60-39 (CA2H) - L60-25 (GND)	B - W-B	CAN communication signal	Power switch on (IG)	Pulse generation (See waveform 3)
L60-40 (CA1P) - L60-25 (GND)	Y - W-B	CAN communication signal	Power switch on (IG)	Pulse generation (See waveform 4)

(a) WAVEFORM 1

(1) CAN communication signal

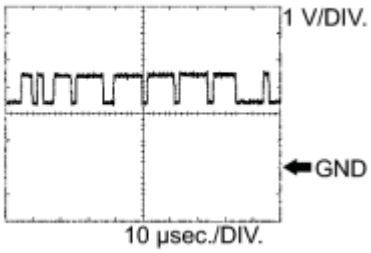


Driving support ECU Terminal Name	Between CA2L and GND
Tester Range	1 V/DIV., 10 µsec./DIV.
Condition	Power switch on (IG)

HINT:

The waveform varies depending on the CAN communication signal.

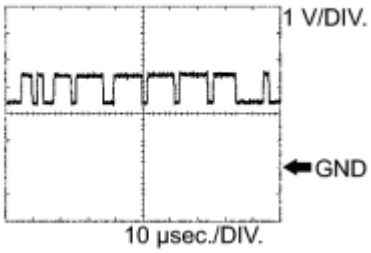
(b) WAVEFORM 2



(1) CAN communication signal

Driving support ECU Terminal Name	Between CA1N and GND
Tester Range	1 V/DIV., 10 µsec./DIV.
Condition	Power switch on (IG)

(c) WAVEFORM 3



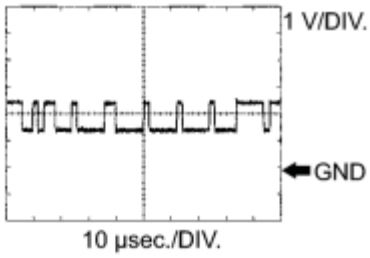
(1) CAN communication signal

Driving support ECU Terminal Name	Between CA2H and GND
Tester Range	1 V/DIV., 10 µsec./DIV.
Condition	Power switch on (IG)

HINT:

The waveform varies depending on the CAN communication signal.

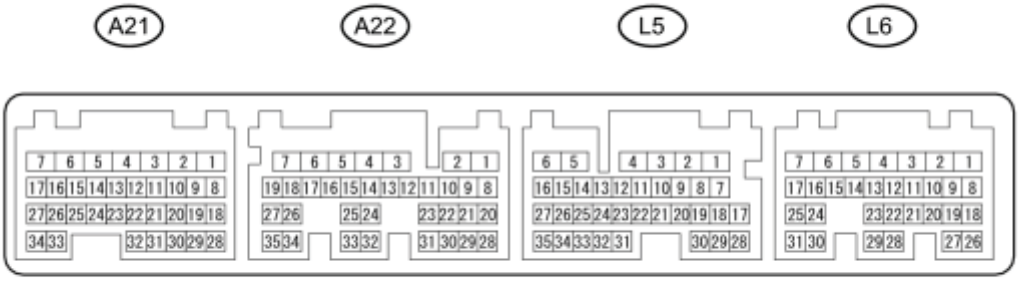
(d) WAVEFORM 4



(1) CAN communication signal

Driving support ECU Terminal Name	Between CA1P and GND
Tester Range	1 V/DIV., 10 µsec./DIV.
Condition	Power switch on (IG)

2. CHECK POWER MANAGEMENT CONTROL ECU

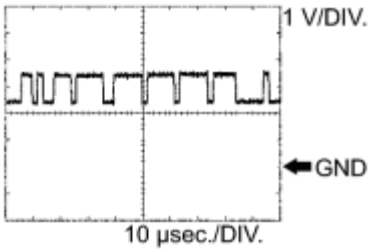


Terminal No. (Symbol)	Wiring Color	Terminal Description	Condition	Specified Condition
L5-6 (E1) - Body ground	BR - Body ground	Earth (ground) circuit of power management control ECU	Always	Below 1 Ω
L5-11 (TC) - L5-6 (E1)	P - BR	Terminal TC of DLC3	Power switch on (IG)	11 to 14 V
L5-11 (TC) - L5-6 (E1)	P - BR	Terminal TC of DLC3	Terminals TC and CG of DLC3 connected	Below 1 V
L5-34 (CA2H) - L5-6 (E1)	P - BR	CAN communication line	Power switch on (IG)	Pulse generation (see waveform 1)
L5-35 (CA2L) - L5-6 (E1)	V - BR	CAN communication line	Power switch on (IG)	Pulse generation (see waveform 2)
L6-24 (CA1L) - L5-6 (E1)	W - BR	CAN communication line	Power switch on (IG)	Pulse generation

Terminal No. (Symbol)	Wiring Color	Terminal Description	Condition	Specified Condition
				(see waveform 2)
L6-25 (CA1H) - L5-6 (E1)	B - BR	CAN communication line	Power switch on (IG)	Pulse generation (see waveform 1)

(a) WAVEFORM 1

(1) CAN communication signal



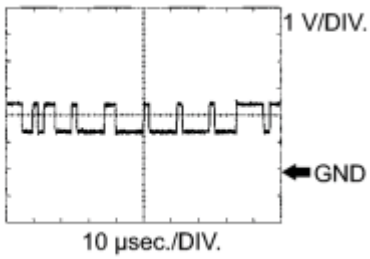
Power management control ECU Terminal Name	Between CA1H - E1 or CA2H - E1
Tester Range	1 V/DIV., 10 µsec./DIV.
Condition	Power switch on (IG)

HINT:

The waveform varies depending on the CAN communication signal.

(b) WAVEFORM 2

(1) CAN communication signal



Power management control ECU Terminal Name	Between CA1L - E1 or CA2L - E1
Tester Range	1 V/DIV., 10 µsec./DIV.
Condition	Power switch on (IG)

HINT:

The waveform varies depending on the CAN communication signal.

DIAGNOSIS SYSTEM

1. DIAGNOSIS FUNCTION

(a) The diagnosis function makes the master warning light and the multi-information display come on, and the cruise main indicator light blinks as shown in the illustration. When a malfunction occurs in the dynamic radar cruise control system, the DTCs are stored in the driving support ECU.

Text in Illustration

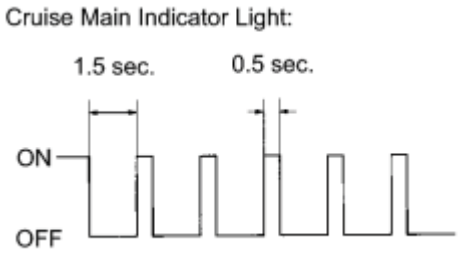
*1	Multi-information Display
*2	Master Warning Light
*3	Cruise Main Indicator Light (Constant speed control mode)
*4	Cruise Main Indicator Light (Vehicle-to-vehicle distance control mode)

HINT:

During constant speed control mode, the cruise main indicator light (constant speed control mode) flashes. During vehicle-to-vehicle distance control, the cruise main indicator light (vehicle-to-vehicle distance control mode) flashes.

NOTICE:

The master warning light goes off if the system returns to normal condition.



2. DESCRIPTION

(a) The driving support ECU controls the dynamic radar cruise control system of the vehicle. The data and DTCs relating to the dynamic radar cruise control system can be read from the DLC3 of the vehicle. If either DTC or CRUISE OK is not displayed on the multi-information display on the combination meter assembly when checking for DTCs, there may be a problem with either the combination meter or the CAN communication system. Use the Techstream to check and solve the problem.

3. CHECK DLC3

(a) Check the DLC3 INFO.

4. CHECK INDICATOR

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

Text in Illustration

*1	Multi-information Display
*2	Cruise Main Indicator Light (Vehicle-to-vehicle distance control mode)

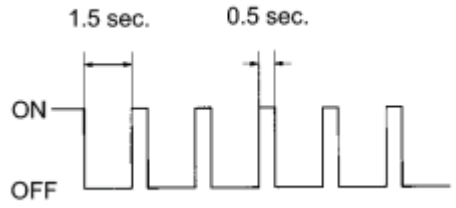
(b) Check that the cruise main indicator light and RADAR READY indicator come on when the main switch ON-OFF button is pushed on, and that the indicator light and the indicator go off when the ON-OFF button is pushed off.

HINT:

- If the indicator check result shows a problem, proceed to troubleshooting the combination meter assembly.
- If a malfunction occurs in the vehicle speed sensors, the stop light switch assembly, or other related parts during cruise control driving, the ECU actuates AUTO CANCEL of the cruise control and blinks the cruise main indicator light. This indicator light informs the driver of the malfunction. At the same

time, the malfunction is stored as a diagnostic trouble code.

Cruise Main Indicator Light:



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: Powertrain / Radar Cruise / Trouble Codes.

(e) Read the DTCs.

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: Powertrain / Radar Cruise / Trouble Codes.

(e) Clear the DTCs.

FAIL-SAFE CHART

1. Constant speed control mode and vehicle-to-vehicle distance control mode:

If the following conditions are detected while the dynamic radar cruise control system is operating, the system clears the stored vehicle speed in the ECM and cancels the dynamic radar cruise control operation.

HINT:

During constant speed control mode, the cruise main indicator light (constant speed control mode) flashes. During vehicle-to-vehicle distance control, the cruise main indicator light (vehicle-to-vehicle distance control mode) flashes.

Text in Illustration

*1	Multi-information Display
*2	Master Warning Light
*3	Cruise Main Indicator Light (Constant speed control mode)
*4	Cruise Main Indicator Light (Vehicle-to-vehicle distance control mode)

Vehicle Condition	Auto Cancel Condition	Fail-safe Deactivation Condition
• Cruise main indicator light blinks • Master warning light comes on • "CHECK CRUISE SYSTEM" is displayed • "Pong" warning sound is heard	Millimeter wave radar sensor or driving support ECU country specification information malfunction	Turn cruise control main switch (ON-OFF button) on again

2. Vehicle-to-vehicle distance control mode:

If the following conditions are detected while the dynamic radar cruise control system is operating, the system clears the stored vehicle speed in the ECM and cancels the dynamic radar cruise control operation.

Text in Illustration

*1	Multi-information Display
*2	Master Warning Light
*3	Cruise Main Indicator Light (Vehicle-to-vehicle distance control mode)

Vehicle Condition	Auto Cancel Condition	Fail-safe Deactivation Condition
• Cruise main indicator light blinks • Master warning light comes on • "CHECK CRUISE SYSTEM" is displayed • "Pong" warning sound is heard	• Open or short in stop light switch circuit • Problem with vehicle speed signal • There is problem with millimeter wave radar sensor • Beam axis of millimeter wave radar sensor deviates • Other than condition above dynamic radar cruise control system malfunction • Malfunction in the hybrid vehicle control system	Power switch on (IG) again

3. Vehicle-to-vehicle distance control mode:

If the following conditions are detected while the dynamic radar cruise control system is operating, the system maintains the stored vehicle speed in the ECM and cancels the dynamic radar cruise control operation.

Text in Illustration

*1	Multi-information Display
*2	Master Warning Light
*3	Cruise Main Indicator Light (Vehicle-to-vehicle distance control mode)

Vehicle Condition	Auto Cancel Condition	Fail-safe Deactivation Condition
• Master warning light	There is dirt on millimeter wave radar	Recover from condition on left

comes on • Cruise main indicator light blinks • "CLEAN RADAR SENSOR" is displayed • "Pong" warning sound is heard	sensor	(RESUME operation is possible after recovery)
• Cruise main indicator light blinks • Master warning light comes on • "CRUISE NOT AVAILABLE " is displayed • "Pong" warning sound is heard	• Wiper switch is in HI position • Millimeter wave radar sensor is least sensitive because of bad weather such as rain, fog, snow, and sandstorms	• Recover from condition on left (RESUME operation is possible after recovery) • Turn cruise control main switch on again

4. Constant speed control mode and vehicle-to-vehicle distance control mode:

If the following conditions are detected while the dynamic radar cruise control system is operating, the system clears the stored vehicle speed and cancels the dynamic radar cruise control operation.

Vehicle Condition	Auto Cancel Condition	Fail-safe Deactivation Condition
Cruise main indicator light goes off	• Vehicle speed is lower than low speed limit (approximately 40 km/h (25 mph)) while cruise control is operating • Constant Speed Control Mode: Vehicle speed is lower than stored vehicle speed by 16 km/h (10 mph) or more while cruise control is operating	Push the cruise control main switch to + RES

DATA LIST / ACTIVE TEST

1. DATA LIST

HINT:

Using the Techstream to read the Data List allows 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 is disturbed. Reading the Data List information early in troubleshooting is 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 is faulty or not.

(a) Connect the Techstream to the DLC3.

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

(c) Turn the Techstream on.

(d) Entire the following menus: Powertrain / Radar Cruise / Data List.

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

Radar Cruise

Tester Display	Measurement Item/Range	Normal Condition	Diagnostic Note
Cruise Control Main Switch	Cruise control switch signal/ON or OFF	ON: Main switch on OFF: Main switch off	-
RES/ACC Switch	+RES switch signal/ON or OFF	ON: +RES switch on OFF: +RES switch off	-
SET/COAST Switch	-SET switch signal/ON or OFF	ON: -SET switch on OFF: -SET switch off	-
Distance Control Switch	Distance control switch signal/ON or OFF	ON: Distance control switch on OFF: Distance control switch off	-
PCS Brake OFF Switch	Pre-collision cancel switch status/ON or OFF	ON: Pre-collision cancel switch on OFF: Pre-collision cancel switch off	-
Cruise Control	Cruise control system operation	ON: Cruise control system	-

Tester Display	Measurement Item/Range	Normal Condition	Diagnostic Note
	signal/ON or OFF	operating OFF: Cruise control system not operating	
Constant Speed Mode	Constant speed mode signal/ON or OFF	ON: Dynamic radar cruise control system is in constant speed mode OFF: Dynamic radar cruise control system is in vehicle-to-vehicle distance control mode	-
Cruise Control Mode	Cruise control mode signal/All Spd, Hi Spd or Normal	All Spd: Vehicle-to-vehicle distance control mode (w/ full-speed following function) Hi Spd: Vehicle-to-vehicle distance control mode (w/o full-speed following function) Normal: Constant speed mode	-
CCS Mem Vehicle Spd	Cruise control memorized speed/min.: 0 km/h (0 mph), max.: 320 km/h (199 mph)	Memorized speed: Cruise control activated	-
Vehicle Distance	Distance to vehicle in front/min.: 0 m (0 ft.), max.: 255 m (836.65 ft.)	Actual distance to vehicle	-
Stop Light SW 1 (M CPU)	Stop light switch (Main-CPU) signal/ON or OFF	ON: Brake pedal depressed OFF: Brake pedal released	-
Stop Light SW 1 (S CPU)	Stop light switch (Sub-CPU) signal/ON or OFF	ON: Brake pedal depressed OFF: Brake pedal released	-
Stop Light SW 2 (M CPU)	Stop light switch (Main-CPU) signal/ON or OFF	ON: Brake pedal depressed OFF: Brake pedal released	-
Wiper (Hi)	Windshield wiper switch Hi signal/ON or OFF	ON: Windshield wiper switch Hi position OFF: Windshield wiper switch except Hi position	-
Wiper (Lo)	Windshield wiper switch Lo signal/ON or OFF	ON: Windshield wiper switch Lo position OFF: Windshield wiper switch except Lo position	-
Tail Light	Tail light switch signal/ON or OFF	ON: Tail light switch on OFF: Tail light switch off	-

Tester Display	Measurement Item/Range	Normal Condition	Diagnostic Note
Vhcl Spd Calc-Whl Spd	Vehicle speed/min.: -327 km/h (-203 mph), max.: 327 km/h (204 mph)	Actual vehicle speed	-
Vhcl Spd-Brake ECU	Vehicle speed/min.: -327 km/h (-203 mph), max.: 327 km/h (204 mph)	Actual vehicle speed	-
Invalid Whl Spd Sens Num	Invalid wheel speed sensor/min.: 0, max.: 255	Actual invaild wheel speed sensor	-
Rear Whl Spd LH Sensor	Rear speed sensor LH signal/Normal or Abnormal	Normal: Rear speed sensor LH is normal Abnormal: Rear speed sensor LH is abnormal	-
Rear Whl Spd RH Sensor	Rear speed sensor RH signal/Normal or Abnormal	Normal: Rear speed sensor RH is normal Abnormal: Rear speed sensor RH is abnormal	-
Front Whl Spd LH Sensor	Front speed sensor LH signal/Normal or Abnormal	Normal: Front speed sensor LH is normal Abnormal: Front speed sensor LH is abnormal	-
Front Whl Spd RH Sensor	Front speed sensor RH signal/Normal or Abnormal	Normal: Front speed sensor RH is normal Abnormal: Front speed sensor RH is abnormal	-
Vehicle Acceleration	Vehicle acceleration/min.: -5 m/s2, max.: 5 m/s2	Actual vehicle acceleration	-
Whl Spd/Deceleration Sen	Wheel speed sensor/Deceleration sensor signal/Avail or Not Avail	Avail: Wheel speed sensor/Deceleration sensor availed Not Avail: Wheel speed sensor/Deceleration sensor not availed	-
Closed Throttle Position	Accelerator pedal idle position signal/ON or OFF	ON: Accelerator pedal released OFF: Accelerator pedal depressed	-
Yaw Rate Sensor	Yaw rate value/min.: -100 deg/s, max.: 100 deg/s	Actual yaw rate value	-
Deceleration Sensor 1	Deceleration value/min.: -14.7 m/s2, max.: 14.7 m/s2	Actual deceleration value	-
Deceleration Sensor 2	Deceleration value/min.: -14.7 m/s2, max.: 14.7 m/s2	Actual deceleration value	-
Tar Accel for ACC	Target vehicle acceleration for vehicle-to-vehicle distance control mode/min.: -5.12	Actual target vehicle acceleration	-

Tester Display	Measurement Item/Range	Normal Condition	Diagnostic Note
	m/s2, max.: 5.12 m/s2		
Tar Accel for CCS	Target vehicle acceleration for constant speed mode/min.: -5.12 m/s2, max.: 5.12 m/s2	Actual target vehicle acceleration	-
Request Driving Force	Cruise control system request driving force/min.: -65536 N, max.: 65534 N	Actual request driving force	-
ECM/PCM Command	Origin of the driving force request/Pedal, None or DS	Pedal: Accelerator pedal depressed None: Driving force not requested DS: Radar cruise control system operating	-
Max Val of Available DF	Maximum value of available driving force/min.: -65536 N, max.: 65534 N	Actual available driving force maximum value	-
Min Val of Available DF	Minimum value of available driving force/min.: -65536 N, max.: 65534 N	Actual available driving force minimum value	-
Forward Vhcl Relative Spd	Vehicle ahead relative speed/min.: -128 m/s, max.: 127 m/s	Actual vehicle ahead relative speed	-
Vehicle Approach Warning	Forward vehicle approach warning signal/ON or OFF	ON: Forward vehicle approach OFF: Forward vehicle not approach	-
Vhcl Stability Ctrl Buzz	Skid control buzzer operation signal/ON or OFF	ON: Skid control buzzer operating OFF: Skid control buzzer not operating	-
Brk Rqst to Elec Ctrl Brk	Braking request to brake control/Not Ctrl, None, Exist, None , Exist or Disable	Driving support ECU control demand	-
Forward Vehicle Detect	Vehicle ahead detection signal/Detect or No Dtct	Detect: Vehicle ahead detected No Dtct: Vehicle ahead not detected	-
CCS Main SW-Ready	Dynamic radar cruise control system standby condition/ON or OFF	ON: Dynamic radar cruise control system standby OFF: Dynamic radar cruise control system not standby	-
CCS System Check	Multi-information display "Cruise Control System Check" display signal/ON or OFF	ON: "Cruise Control System Check" displayed OFF: "Cruise Control System Check" not displayed	-
FRS-Dirt	Memorized dirt on millimeter wave radar sensor history	ON: Dirt on millimeter wave radar	-

Tester Display	Measurement Item/Range	Normal Condition	Diagnostic Note
		sensor history memorized OFF: Dirt on millimeter wave radar sensor history not memorized	
Bad Wthr Hist(F Radar Sen)	Memorized millimeter wave radar sensor bad weather history/ON or OFF	ON: Millimeter wave radar sensor bad weather history memorized OFF: Millimeter wave radar sensor bad weather history not memorized	-
Frnt Radar Sens Temp Hi	Millimeter wave radar sensor high temperature abnormality/ON or OFF	ON: Millimeter wave radar sensor abnormal OFF: Millimeter wave radar sensor normal	-
CCS Cancel by Low Spd	Dynamic radar cruise control system (constant speed mode) low speed cancel signal/ON or OFF	ON: Low speed cancel signal ON OFF: Low speed cancel signal OFF	-
Cancl CCS by Com Delay	Dynamic radar cruise control system (constant speed mode) cancel signal/ON or OFF	ON: Cancel signal ON OFF: Cancel signal OFF	-
Cancl CCS by RAM Malfnc	Dynamic radar cruise control system (constant speed mode) cancel signal/ON or OFF	ON: Cancel signal ON OFF: Cancel signal OFF	-
A-CCS Cancl-Radar/Wip	Dynamic radar cruise control system (vehicle-to vehicle distance control mode) cancel signal/ON or OFF	ON: Cancel signal ON OFF: Cancel signal OFF	-
Country# (F Radar Sens)	Millimeter wave radar sensor country signal/JPN, NA, EURO, AUS SAFC, OTHER, TWN, CHINA, THAI, GCC, NOFIX	Actual country code	-
Steering Angle	Steering angle/min.: -3072 deg, max.: 3070.5 deg	Actual steering angle	-
Zero Point Angle Sens	Zero point steeromg angle sensor/min.: -3072 deg, max.: 3070.5 deg	Actual zero point steering angle	-
Radar	Millimeter wave radar sensor operation signal/Emission or Stop	Emission: Millimeter wave radar sensor signal sent Stop: Millimeter wave radar sensor signal stopped	-
#Codes	Number of present trouble codes/min.: 0, max.: 255	Number of DTCs displayed	-

2. ACTIVE TEST

HINT:

Using the Techstream to perform Active Test allows relays, VSVs, actuators and parts. This non-intrusive functional inspection can be very useful because intermittent operation may be discovered before parts or wiring is disturbed. Performing Active Test early in troubleshooting is one way to save diagnostic time. Data List information can be display while performing Active Test.

(a) Connect the Techstream to the DLC3.

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

(c) Turn the Techstream on.

(d) For Cruise Main Indicator Light (Combination Meter):

Enter the following menus: Body Electrical / Combination Meter / Active Test.

(e) For Skid Control Buzzer (ABS/VSC/TRAC):

Enter the following menus: Chassis / ABS/VSC/ TRAC / Active Test.

(f) Perform Active Test according to the display on the tester.

HINT:

The power switch must be turned on (IG) to proceed with the Active Test using the Techstream.

Combination Meter

Tester Display	Test Part	Control Range	Diagnostic Note
Indicat. Lamp Cruise	Cruise main indicator light (Constant speed control mode)	OFF or ON	Confirm that the vehicle is stopped with engine idling
Indicat. Radar Cruise	Cruise main indicator light (Vehicle-to-vehicle distance control mode)	OFF or ON	Confirm that the vehicle is stopped with engine idling

ABS/VSC/TRAC

Tester Display	Test Part	Control Range	Diagnostic Note
Buzzer	Skid control buzzer	Buzzer ON/OFF	Buzzer can be heard

DIAGNOSTIC TROUBLE CODE CHART

HINT:

If a trouble code is displayed during the DTC check, inspect the trouble areas listed for that code. For details of the code, refer to the "See page" below.

Dynamic Radar Cruise Control System

DTC Code	Detection Item	Trouble Area	See page
C1A01	Driving Support ECU	Driving support ECU	INFO
C1A02	Vehicle Information Not Obtained	- Driving support ECU - Main body ECU	INFO
C1A03	Driving Support ECU Internal Logical Error	Driving support ECU	INFO
C1A05	Stop Light Switch Circuit	- Stop light switch assembly - Stop light switch circuit - Driving support ECU	INFO
C1A06	Stop Light Switch Input Circuit	Driving support ECU	INFO
C1A0A	Front Radar Sensor Region Code Mismatch	- Millimeter wave radar sensor assembly - Main body ECU - Driving support ECU	INFO
C1A0C	Object Recognition Camera Region Code Mismatch	- Lane recognition camera sensor assembly - Driving support ECU	INFO
C1A10	Front Radar Sensor	- Millimeter wave radar sensor assembly - Driving support ECU	INFO
C1A11	Front Radar Sensor Incorrect Axial Gap	- Millimeter wave radar sensor assembly - Driving support ECU	INFO
C1A14	Front Radar Sensor Beam Axis Not Adjusted	- Millimeter wave radar sensor assembly - Driving support ECU	INFO
C1A20	Object Recognition ECU	- Lane recognition camera sensor assembly - Driving support ECU	INFO
C1A22	Object Recognition Camera Incorrect Axial Gap	- Lane recognition camera sensor assembly - Driving support ECU	INFO

DTC Code	Detection Item	Trouble Area	See page
C1A23	Object Recognition Camera Initialization Incomplete	- Lane recognition camera sensor assembly - Driving support ECU	INFO
C1A40	ENG / EHV Device	- Hybrid control system - Power management control ECU - SFI system - ECM - Driving support ECU	INFO
C1A41	Brake Request Value Mismatch between ENG / EHV and Driving Support ECU	- Electronically controlled brake system - Hybrid control system - Power management control ECU - Brake booster with maser cylinder (skid control ECU) - Driving support ECU	INFO
C1A4A	Skid Control Buzzer Circuit	- Electronically controlled brake system - Driving support ECU	INFO
C1A4B	Stop Light Relay Circuit	- Stop light control relay - Stop light control relay circuit - Brake booster with maser cylinder (skid control ECU)	INFO
C1A50	Brake System	- Electronically controlled brake system - Driving support ECU	INFO
P1615	Communication Error from Distance Control ECU to HV ECU	- Driving support ECU - Power management control ECU	INFO
U0122	Lost Communication with Vehicle Dynamics Control Module	- Brake booster with maser cylinder (skid control ECU) - CAN communication system - Driving support ECU	INFO
U0123	Lost Communication with Yaw Rate Sensor Module	- Yaw rate sensor	INFO

DTC Code	Detection Item	Trouble Area	See page
		- CAN communication system - Driving support ECU	
U0126	Lost Communication with Steering Angle Sensor Module	- Steering angle sensor - CAN communication system - Driving support ECU	INFO
U0235	Lost Communication with Cruise Control Front Distance Range Sensor	- Millimeter wave radar sensor assembly - Millimeter wave radar sensor circuit - Driving support ECU	INFO
U0293	Lost Communication with HV ECU	- Power management control ECU - CAN communication system - Driving support ECU - Brake booster with maser cylinder (skid control ECU)	INFO
U1104	Lost Communication with Driving Support ECU	- Driving support ECU - CAN communication system - Millimeter wave radar sensor assembly - Power management control ECU - Brake booster with maser cylinder (skid control ECU)	INFO
U1119	Lost Communication with Object Recognition ECU (CAN)	- Lane recognition camera sensor assembly - CAN communication system - Driving support ECU	INFO

DTC	C1A01	Driving Support ECU

DESCRIPTION

This DTC indicates the internal abnormalities of the driving support ECU.

DTC Code	DTC Detection Condition	Trouble Area
C1A01	While power switch is on (IG) and dynamic radar cruise control system is operating,	Driving

DTC Code	DTC Detection Condition	Trouble Area
	driving support ECU detects an internal malfunction for 1 sec.	support ECU

INSPECTION PROCEDURE

PROCEDURE

1.	READ OUTPUT DTC

(a) Connect the Techstream to the DLC3.

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

(c) Clear the DTCs INFO.

(d) Perform the following to make sure that the DTC detection conditions are met.

HINT:

If the detection conditions are not met, the malfunction cannot be detected.

(1) Drive the vehicle at a speed of 40 km/h (25 mph) or more.

(2) Turn the cruise control main switch on.

(3) Push the -SET switch to activate the cruise control.

(e) Enter the following menus: Powertrain / Radar Cruise / Trouble Codes.

(f) Read the DTCs.

Result:

Result	Proceed to
DTC is not output	A
DTC C1A01 is output	B

B REPLACE DRIVING SUPPORT ECU

A **USE SIMULATION METHOD TO CHECK**

DTC	C1A02	Vehicle Information Not Obtained

DESCRIPTION

When the driving support ECU is replaced with a new one, it acquires the country specification information (destination, steering wheel position, etc.) from the main body ECU. When the country specification information in the driving support ECU and main body ECU do not match, DTC C1A02 is output.

DTC Code	DTC Detection Condition	Trouble Area
C1A02	While power switch is on (IG) and dynamic radar cruise control system is operating, driving support ECU does not receive vehicle destination information	• Driving support ECU • Main body ECU

INSPECTION PROCEDURE

PROCEDURE

1.	CHECK CAN COMMUNICATION SYSTEM

(a) Select the "CAN Bus Check" from the "System Selection Menu" screen on the Techstream.

(b) Select "Communication Malfunction DTC" from the "CAN Bus Check" screen, and then select "Enter".

OK:

CAN communication system DTC is not output.

NG ▶ GO TO CAN COMMUNICATION SYSTEM

OK ▼

2.	CHECK WHETHER DTC OUTPUT RECURS

(a) Connect the Techstream to the DLC3.

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

(c) Clear the DTCs INFO.

(d) Perform the following to make sure that the DTC detection conditions are met.

HINT:

If the detection conditions are not met, the malfunction cannot be detected.

(1) Drive the vehicle at a speed of 40 km/h (25 mph) or more.

(2) Turn the cruise control main switch on.

(3) Push the -SET switch to activate the cruise control.

(e) Enter the following menus: Powertrain / Radar Cruise / Trouble Codes.

(f) Read the DTCs.

Result:

Result	Proceed to
DTC is not output	A
DTC C1A02 is output	B

B ▶ REPLACE DRIVING SUPPORT ECU

A ▶ **USE SIMULATION METHOD TO CHECK**

DTC	C1A03	Driving Support ECU Internal Logical Error
DTC	C1A06	Stop Light Switch Input Circuit

DESCRIPTION

This DTC indicates the internal abnormalities of the driving support ECU.

DTC Code	DTC Detection Condition	Trouble Area
C1A03	Cruise control input signal abnormal	Driving support ECU
C1A06	Stop light switch input signal abnormal	Driving support ECU

INSPECTION PROCEDURE

PROCEDURE

1.	READ OUTPUT DTC

(a) Connect the Techstream to the DLC3.

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

(c) Clear the DTCs INFO.

(d) Perform the following to make sure that the DTC detection conditions are met.

HINT:

If the detection conditions are not met, the malfunction cannot be detected.

(1) Drive the vehicle at a speed of 40 km/h (25 mph) or more.

(2) Turn the cruise control main switch on.

(3) Push the -SET switch to activate the cruise control.

(e) Enter the following menus: Powertrain / Radar Cruise / Trouble Codes.

(f) Read the DTCs.

Result:

Result	Proceed to
DTC is not output	A
DTC C1A03 or C1A06 is output	B

B REPLACE DRIVING SUPPORT ECU

A **USE SIMULATION METHOD TO CHECK**

DTC	C1A05	Stop Light Switch Circuit
DTC	C1A4B	Stop Light Relay Circuit

DESCRIPTION

When the brake pedal is depressed, the stop light switch sends a signal to the driving support ECU. Upon receiving the signal, the driving support ECU cancels the dynamic radar cruise control system. Even if there is a malfunction in the stop light signal circuit while the cruise control is operating, normal driving is maintained due to the fail-safe function. Dynamic radar cruise control is canceled when positive battery voltage is applied to terminal STP-.

When the brake pedal is released, positive voltage is applied to terminal ST1- of the driving support ECU through the IGN fuse and the stop light switch, and the driving support ECU operates the dynamic radar cruise control.

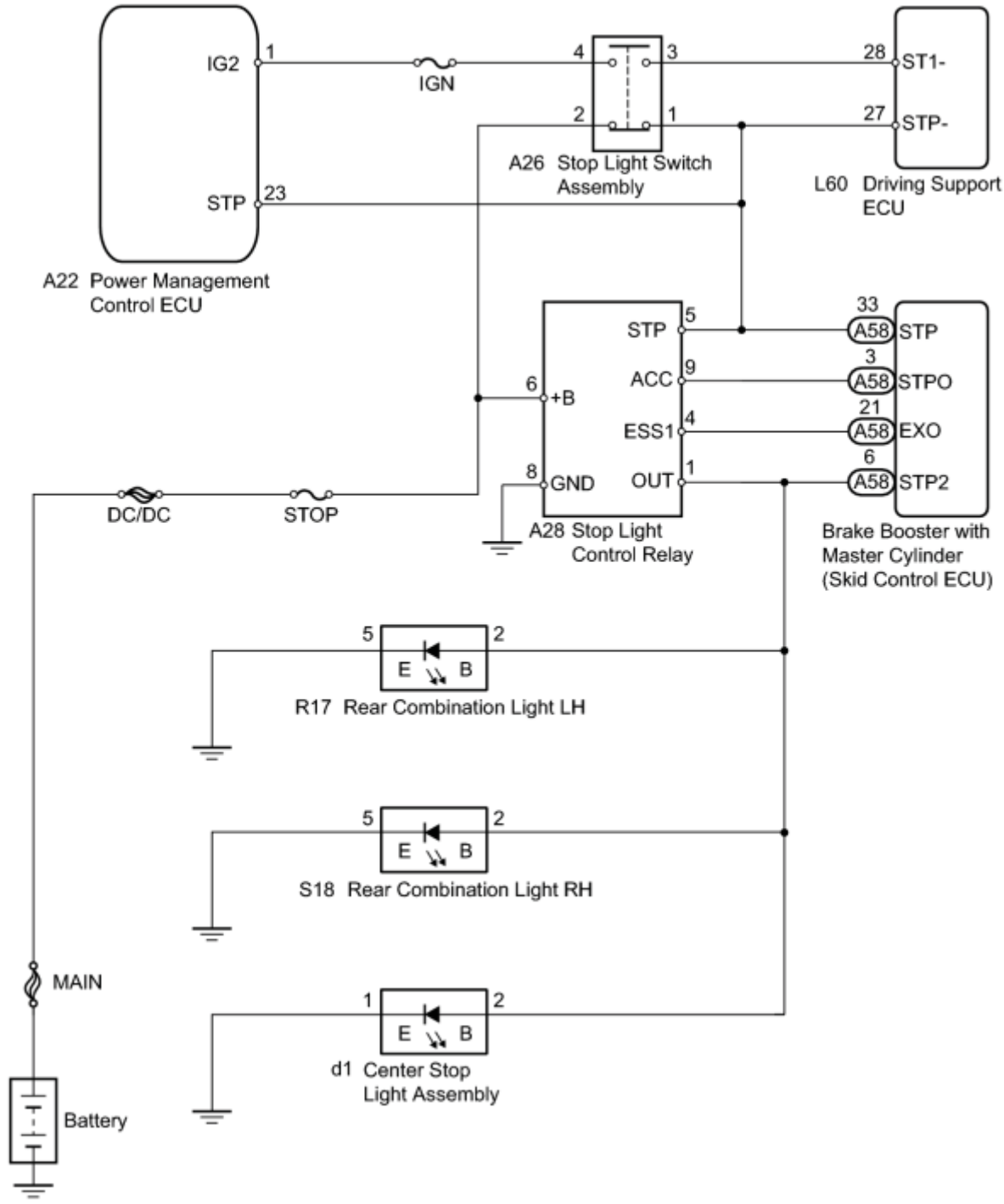
The brake booster with master cylinder (skid control ECU) receives a signal from the driving support ECU and operates the brake actuator. The brake booster with master cylinder (skid control ECU) operates the brake actuator and at the same time illuminates the stop lights by operating the stop light control relay.

The stop light switch assembly sends a brake pedal operation signal to the driving support ECU.

After receiving the signal, the ECM performs fail-safe control by canceling the cruise control function.

DTC No.	DTC Detection Condition	Trouble Area
C1A05	Voltages of terminals ST1- and STP- of driving support ECU are both below 1 V for 1 second	• Stop light switch assembly • Stop light switch circuit • Driving support ECU
C1A4B	This trouble code is stored when the brake booster with master cylinder (skid control ECU) detects a malfunction in the stop light control relay circuit for 1 second while the dynamic cruise control is operating.	• Stop light control relay • Stop light control relay circuit • Brake booster with master cylinder (Skid control ECU)

WIRING DIAGRAM



INSPECTION PROCEDURE

HINT:

Inspect the fuses for circuits related to this system before performing the following inspection procedure.

PROCEDURE

1.	READ VALUE USING TECHSTREAM (STOP LIGHT SWITCH ASSEMBLY)

(a) Connect the Techstream to the DLC3.

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

(c) Turn the Techstream on.

(d) Enter the following menus: Powertrain / Radar Cruise / Data List.

(e) Check the Data List for proper functioning of the stop light switch.

Radar Cruise

Tester Display	Measurement Item/Range	Normal Condition	Diagnostic Note
Stop Light SW 1 (M CPU)	Stop light switch (Main-CPU) signal/ON or OFF	ON: Brake pedal depressed OFF: Brake pedal released	-
Stop Light SW 1 (S CPU)	Stop light switch (Sub-CPU) signal/ON or OFF	ON: Brake pedal depressed OFF: Brake pedal released	-
Stop Light SW 2 (M CPU)	Stop light switch (Main-CPU) signal/ON or OFF	ON: Brake pedal depressed OFF: Brake pedal released	-

OK:

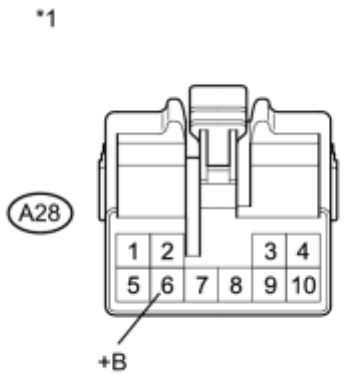
Display changes according to brake pedal operation described in above table.

NG ▶ CHECK HARNESS AND CONNECTOR (STOP LIGHT SWITCH ASSEMBLY - POWER SOURCE)

OK ▼

2.	CHECK HARNESS AND CONNECTOR (STOP LIGHT CONTROL RELAY POWER SOURCE)

(a) Disconnect the stop light control relay connector.



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

Standard Voltage:

Tester Connection	Condition	Specified Condition
A28-6 (+B) - Body ground	Always	11 to 14 V

Text in Illustration

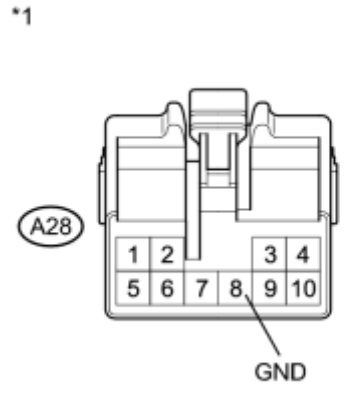
*1	Front view of wire harness connector (to Stop Light Control Relay)

(c) Reconnect the stop light control relay connector.

NG ▶ REPAIR OR REPLACE HARNESS OR CONNECTOR (STOP LIGHT CONTROL RELAY - STOP FUSE)

OK ▼

3.	CHECK HARNESS AND CONNECTOR (STOP LIGHT CONTROL RELAY - BODY GROUND)



(a) Disconnect the stop light control relay connector.

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

Standard Resistance:

Tester Connection	Condition	Specified Condition
A28-8 (GND) - Body ground	Always	Below 1 Ω

Text in Illustration

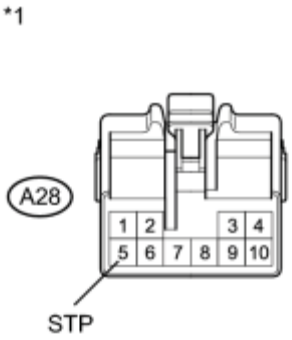
*1	Front view of wire harness connector (to Stop Light Control Relay)

(c) Reconnect the stop light control relay connector.

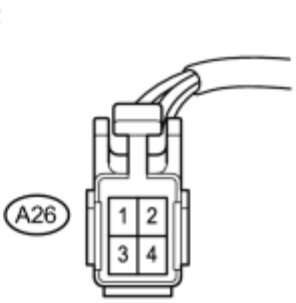
NG ▶ REPAIR OR REPLACE HARNESS OR CONNECTOR (STOP LIGHT CONTROL RELAY - BODY GROUND)

OK ▼

4.	CHECK HARNESS AND CONNECTOR (STOP LIGHT CONTROL RELAY - STOP LIGHT SWITCH ASSEMBLY)



(a) Disconnect the stop light control relay connector.



(b) Disconnect the stop light switch assembly connector.

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

Standard Resistance (Check for Open):

Tester Connection	Condition	Specified Condition
A26-1 - A28-5 (STP)	Always	Below 1 Ω

Standard Resistance (Check for Short):

Tester Connection	Condition	Specified Condition
A26-1 or A28-5 (STP) - Body ground	Always	10 kΩ or higher

Text in Illustration

*1	Front view of wire harness connector (to Stop Light Control Relay)
*2	Front view of wire harness connector (to Stop Light Switch Assembly)

(d) Reconnect the stop light switch assembly connector.

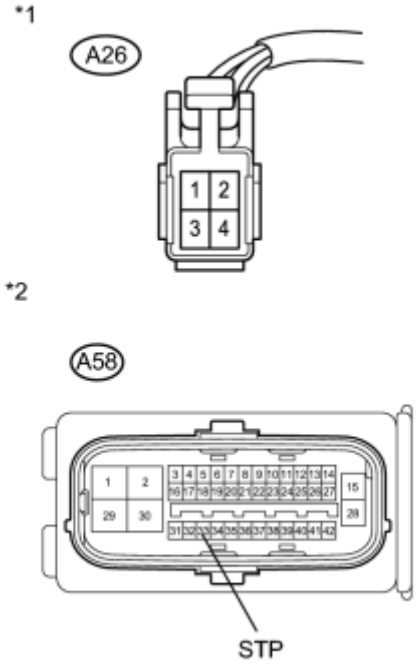
(e) Reconnect the stop light control relay connector.

NG ▶ REPAIR OR REPLACE HARNESS OR CONNECTOR (STOP LIGHT CONTROL RELAY - STOP LIGHT SWITCH ASSEMBLY)

OK ▼

5.	CHECK HARNESS AND CONNECTOR (STOP LIGHT SWITCH ASSEMBLY - SKID CONTROL ECU)

(a) Disconnect the stop light switch assembly connector.



(b) Disconnect the brake booster with master cylinder (skid control ECU) connector.

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

Standard Resistance (Check for Open):

Tester Connection	Condition	Specified Condition
A26-1 - A58-33 (STP)	Always	Below 1 Ω

Standard Resistance (Check for Short):

Tester Connection	Condition	Specified Condition
A26-1 or A58-33 (STP) - Body ground	Always	10 kΩ or higher

Text in Illustration

*1	Front view of wire harness connector (to Stop Light Switch Assembly)
*2	Front view of wire harness connector (to Brake Booster with Master Cylinder (Skid Control ECU))

(d) Reconnect the stop light switch assembly connector.

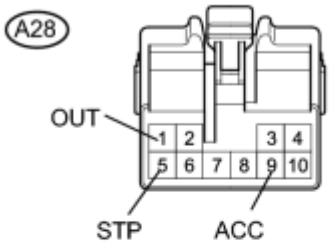
(e) Reconnect the brake booster with master cylinder (skid control ECU) connector.

NG ▶ REPAIR OR REPLACE HARNESS OR CONNECTOR (STOP LIGHT SWITCH ASSEMBLY - SKID CONTROL ECU)

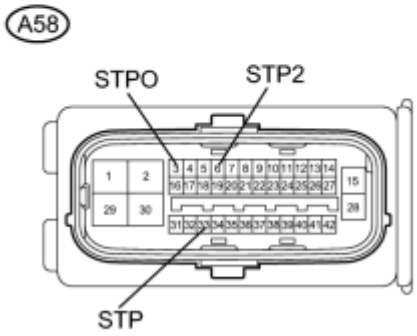
OK ▼

6.	CHECK HARNESS AND CONNECTOR (STOP LIGHT CONTROL RELAY - SKID CONTROL ECU)

*1



*2



(a) Disconnect the stop light control relay connector.

(b) Disconnect the brake booster with master cylinder (skid control ECU) connectors.

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

Standard Resistance (Check for Open):

Tester Connection	Switch Condition	Specified Condition
A28-1 (OUT) - A58-6 (STP2)	Always	Below 1 Ω
A28-5 (STP) - A58-33 (STP)	Always	Below 1 Ω
A28-9 (ACC) - A58-3 (STP0)	Always	Below 1 Ω

Standard Resistance (Check for Short):

Tester Connection	Switch Condition	Specified Condition
A28-1 (OUT) or A58-6 (STP2) - Body ground	Always	10 kΩ or higher
A28-5 (STP) or A58-33 (STP) - Body ground	Always	10 kΩ or higher

Tester Connection	Switch Condition	Specified Condition
A28-9 (ACC) or A58-3 (STP0) - Body ground	Always	10 kΩ or higher

Text in Illustration

*1	Front view of wire harness connector (to Stop Light Control Relay)
*2	Front view of wire harness connector (to Brake Booster with Master Cylinder (Skid Control ECU))

(d) Reconnect the stop light control relay connector.

(e) Reconnect the brake booster with master cylinder (skid control ECU) connectors.

NG ▶ REPAIR OR REPLACE HARNESS OR CONNECTOR (STOP LIGHT CONTROL RELAY - SKID CONTROL ECU)

OK ▼

7.	INSPECT STOP LIGHT CONTROL RELAY

(a) Inspect the stop light control relay INFO.

NG ▶ REPLACE STOP LIGHT CONTROL RELAY

OK ▼

8.	REPLACE BRAKE BOOSTER WITH MASTER CYLINDER (SKID CONTROL ECU)

(a) Replace the brake booster with master cylinder (skid control ECU) INFO.

NEXT ▼

9.	CHECK WHETHER DTC OUTPUT RECORDS (DTC C1A05 OR C1A4B)

(a) Connect the Techstream to the DLC3.

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

(c) Clear the DTCs INFO.

(d) Perform the following to make sure that the DTC detection conditions are met.

HINT:

If the detection conditions are not met, the malfunction cannot be detected.

(1) Drive the vehicle at a speed of 40 km/h (25 mph) or more.

(2) Turn the cruise control main switch on.

(3) Push the -SET switch to activate the cruise control.

(e) Enter the following menus: Powertrain / Radar Cruise / Trouble Codes.

(f) Read the DTCs.

Result:

Result	Proceed to
DTC is not output	A
DTC C1A05 or C104B is output	B

B ▶ REPLACE POWER MANAGEMENT CONTROL ECU
A ▶ **END**

10.	REPLACE POWER MANAGEMENT CONTROL ECU

(a) Replace the power management control ECU INFO.

NEXT ▼

11.	CHECK WHETHER DTC OUTPUT RECORDS (DTC C1A05 OR C1A4B)

(a) Connect the Techstream to the DLC3.

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

(c) Clear the DTCs INFO.

(d) Perform the following to make sure that the DTC detection conditions are met.

HINT:

If the detection conditions are not met, the malfunction cannot be detected.

(1) Drive the vehicle at a speed of 40 km/h (25 mph) or more.

(2) Turn the cruise control main switch on.

(3) Push the -SET switch to activate the cruise control.

(e) Enter the following menus: Powertrain / Radar Cruise / Trouble Codes.

(f) Read the DTCs.

Result:

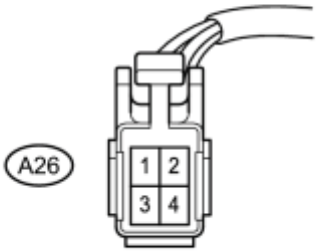
Result	Proceed to
DTC is not output	A
DTC C1A05 or C104B is output	B

B ▶ REPLACE DRIVING SUPPORT ECU

A ▶ **END**

12.	CHECK HARNESS AND CONNECTOR (STOP LIGHT SWITCH ASSEMBLY - POWER SOURCE)

*1



(a) Disconnect the stop light switch assembly connector.

N

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

Standard Voltage:

Tester Connection	Condition	Specified Condition
A26-2 - Body ground	Always	11 to 14 V

Text in Illustration

*1	Front view of wire harness connector (to Stop Light Switch Assembly)

(c) Reconnect the stop light switch assembly connector.

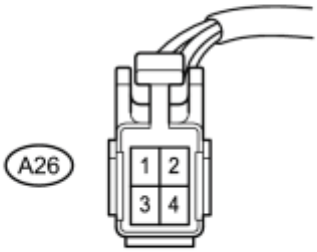
NG ▶ CHECK HARNESS AND CONNECTOR (STOP LIGHT SWITCH ASSEMBLY - STOP LIGHT CONTROL RELAY)

OK ▼

13.	CHECK HARNESS AND CONNECTOR (STOP LIGHT SWITCH ASSEMBLY - POWER SOURCE)

(a) Disconnect the stop light switch assembly connector.

*1



N

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

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

Standard Voltage:

Tester Connection	Condition	Specified Condition
A26-4 - Body ground	Power switch on (IG)	11 to 14 V

Text in Illustration

*1	Front view of wire harness connector (to Stop Light Switch Assembly)

(d) Reconnect the stop light switch assembly connector.

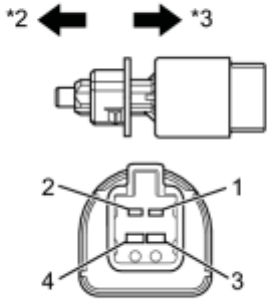
NG ▶ REPAIR OR REPLACE HARNESS OR CONNECTOR (STOP LIGHT SWITCH ASSEMBLY - POWER MANAGEMENT CONTROL ECU)

OK ▼

14.	INSPECT STOP LIGHT SWITCH ASSEMBLY

(a) Remove the stop light switch assembly INFO.

*1



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

Standard Resistance:

Tester Connection	Switch Condition	Specified Condition
1 - 2	Switch pin not pushed	Below 1 Ω
3 - 4	Switch pin not pushed	10 kΩ or higher
1 - 2	Switch pin pushed	10 kΩ or higher
3 - 4	Switch pin pushed	Below 1 Ω

Text in Illustration

*1	Component without harness connected (Stop Light Switch Assembly)
*2	Not pushed
*3	Pushed

(c) Install the stop light switch assembly INFO.

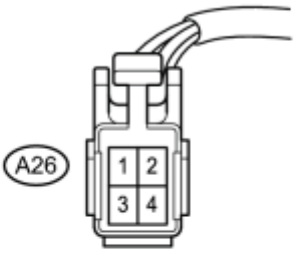
NG ▶ REPLACE STOP LIGHT SWITCH ASSEMBLY

OK ▼

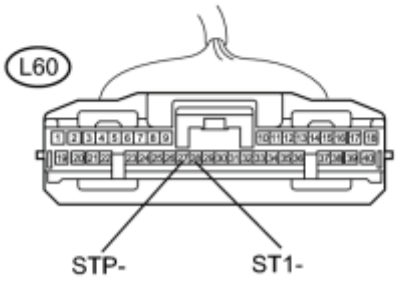
15.	CHECK HARNESS AND CONNECTOR (STOP LIGHT SWITCH ASSEMBLY - DRIVING SUPPORT ECU)

(a) Disconnect the stop light switch assembly connector.

*1



*2



(b) Disconnect the driving support ECU connector.

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

Standard Resistance (Check for Open):

Tester Connection	Switch Condition	Specified Condition
A26-3 - L60-28 (ST1-)	Always	Below 1 Ω
A26-1 - L60-27 (STP-)	Always	Below 1 Ω

Standard Resistance (Check for Open):

Tester Connection	Switch Condition	Specified Condition
A26-3 or L60-28 (ST1-) - Body ground	Always	10 kΩ or higher
A26-1 or L60-27 (STP-) - Body ground	Always	10 kΩ or higher

Text in Illustration

*1	Front view of wire harness connector (to Stop Light Switch Assembly)
*2	Front view of wire harness connector (to Driving Support ECU)

(d) Reconnect the stop light switch assembly connector.

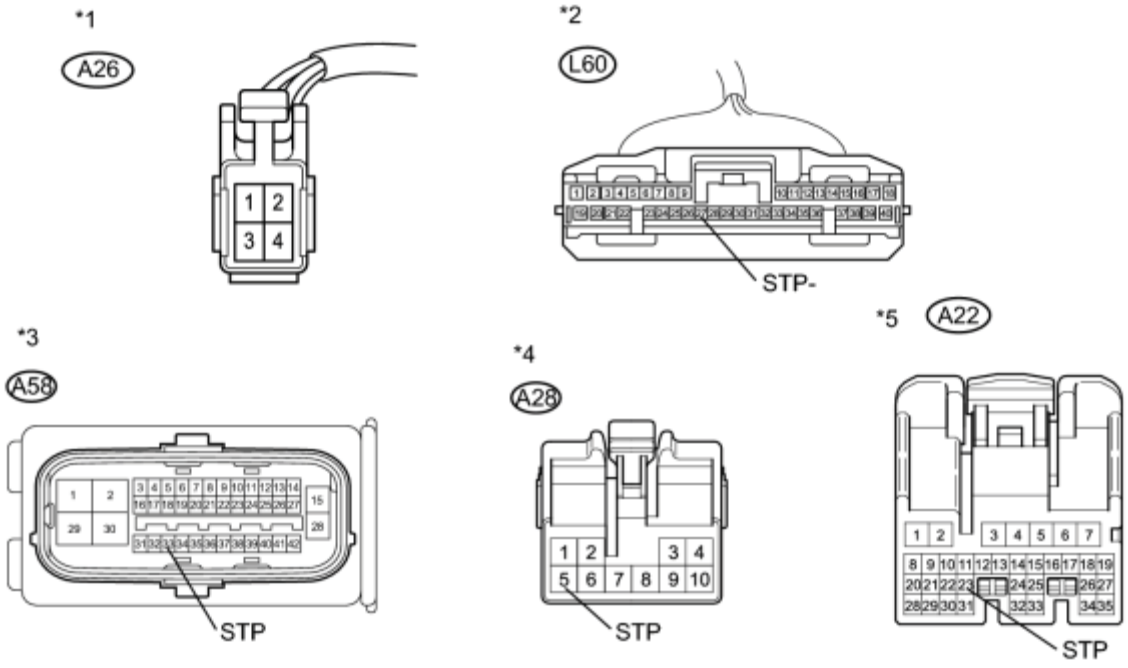
(e) Reconnect the driving support ECU connector.

NG ▶ REPAIR OR REPLACE HARNESS OR CONNECTOR (STOP LIGHT SWITCH ASSEMBLY - DRIVING SUPPORT ECU)

OK ▼

16.	CHECK HARNESS AND CONNECTOR

(a) Disconnect the stop light switch assembly connector.



(b) Disconnect the driving support ECU connector.

(c) Disconnect the stop light control relay connector.

(d) Disconnect the brake booster with master cylinder (skid control ECU) connector.

(e) Disconnect the power management control ECU connector.

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

Standard Resistance (Check for Short):

Tester Connection	Switch Condition	Specified Condition

Tester Connection	Switch Condition	Specified Condition
A26-1 or L60-27 (STP-) - Body ground	Always	10 kΩ or higher
A26-1 or A58-33 (STP) - Body ground	Always	10 kΩ or higher
A26-1 or A28-5 (STP) - Body ground	Always	10 kΩ or higher
A26-1 or A22-23 (STP) - Body ground	Always	10 kΩ or higher

Text in Illustration

*1	Front view of wire harness connector (to Stop Light Switch Assembly)	*2	Front view of wire harness connector (to Driving Support ECU)
*3	Front view of wire harness connector (to Brake Booster with Master Cylinder (Skid Control ECU))	*4	Front view of wire harness connector (to Stop Light Control Relay)
*5	Front view of wire harness connector (to Power Management Control ECU)	-	-

(g) Reconnect the stop light switch assembly connector.

(h) Reconnect the driving support ECU connector.

(i) Reconnect the power management control ECU connector.

(j) Reconnect the stop light control relay connector.

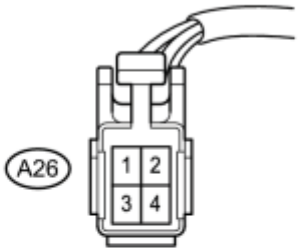
(k) Reconnect the brake booster with master cylinder (skid control ECU) connector.

NG ▶ REPAIR OR REPLACE HARNESS OR CONNECTOR
OK ▶ **REPLACE DRIVING SUPPORT ECU**

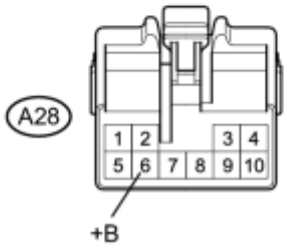
17.	CHECK HARNESS AND CONNECTOR (STOP LIGHT SWITCH ASSEMBLY - STOP LIGHT CONTROL RELAY)

(a) Disconnect the stop light switch assembly connector.

*1



*2



(b) Disconnect the stop light control relay connector.

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

Standard Resistance (Check for Short):

Tester Connection	Switch Condition	Specified Condition
A26-2 or A28-6 (+B) - Body ground	Always	10 kΩ or higher

Text in Illustration

*1	Front view of wire harness connector (to Stop Light Switch Assembly)
*2	Front view of wire harness connector (to Stop Light Control Relay)

(d) Reconnect the stop light switch assembly connector.

(e) Reconnect the stop light control relay connector.

NG ▶ REPAIR OR REPLACE HARNESS OR CONNECTOR (STOP LIGHT SWITCH ASSEMBLY - STOP LIGHT CONTROL RELAY)

OK ▶ **REPAIR OR REPLACE HARNESS OR CONNECTOR (STOP LIGHT SWITCH ASSEMBLY - BATTERY)**

DTC	C1A0A	Front Radar Sensor Region Code Mismatch

DESCRIPTION

The driving support ECU uses the millimeter wave radar sensor and lane recognition camera sensor to detect obstacles in front of the vehicle.

When the millimeter wave radar sensor assembly is replaced with a new one, it acquires the country specification information from the driving support ECU. Also, when the driving support ECU is replaced with a new one, it receives the country specification information from the main body ECU. When the country specification information in the sensor and ECU do not match, DTC C1A0A is output.

DTC Code	DTC Detection Condition	Trouble Area
C1A0A	While power switch is on (IG), country specification information in driving support ECU and front millimeter wave radar sensor do not match for 1 second	• Millimeter wave radar sensor assembly • Main body ECU • Driving support ECU

INSPECTION PROCEDURE

NOTICE:

When the millimeter wave radar sensor is replaced with a new one, adjustment of the radar sensor beam axis must be performed 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: Powertrain / Radar Cruise / Data List / Country# (F Radar Sens).

(e) Read the Data List and check the country specification information of the front millimeter wave radar sensor and vehicle.

Radar Cruise

Tester Display	Measurement Item/Range	Normal Condition	Diagnostic Note
Country# (F	Millimeter wave radar sensor country signal/JPN, NA, EURO,	Actual country	-

Tester Display	Measurement Item/Range	Normal Condition	Diagnostic Note
Radar Sens)	AUS, SAFC, OTHER, TWN, CHINA, THAI, GCC, NOFIX	code	

Result

Result	Proceed to
Country specification information for vehicle and millimeter wave radar sensor match	A
Country specification information for vehicle and millimeter wave radar sensor do not match	B

B ▶ REPLACE MILLIMETER WAVE RADAR SENSOR ASSEMBLY

A ▼

2.	CHECK WHETHER DTC OUTPUT RECURS (DTC C1A0A)

(a) Connect the Techstream to the DLC3.

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

(c) Clear the DTCs INFO.

(d) Perform the following to make sure that the DTC detection conditions are met.

HINT:

If the detection conditions are not met, the malfunction cannot be detected.

(1) Drive the vehicle at a speed of 40 km/h (25 mph) or more.

(2) Turn the cruise control main switch on.

(3) Push the -SET switch to activate the cruise control.

(e) Enter the following menus: Powertrain / Radar Cruise / Trouble Codes.

(f) Read the DTCs.

Result:

Result	Proceed to
DTC is not output	A
DTC C1A0A is output	B

B ▶ REPLACE DRIVING SUPPORT ECU

A ▶ **END**

DTC	C1A0C	Object Recognition Camera Region Code Mismatch

DESCRIPTION

w/ Lane-keeping Assist System

When the lane recognition camera sensor assembly is replaced with a new one, it acquires the country specification information from the driving support ECU. The lane recognition camera sensor assembly has information about the market it is intended for use in (country specification information such as the destination, steering wheel position etc.). When a new camera sensor is installed and the country specification information does not match that of the driving support ECU, the ECU stores DTC C1A0C.

DTC Code	DTC Detection Condition	Trouble Area
C1A0C	While initial check is running, power switch is on (IG) and system is operating, country specification information in driving support ECU and lane recognition camera sensor assembly do not match	• Lane recognition camera sensor assembly • Driving support ECU

INSPECTION PROCEDURE

NOTICE:

When the lane recognition camera sensor assembly is replaced with a new one, adjust the lane recognition camera sensor assembly INFO.

PROCEDURE

1.	REPLACE LANE RECOGNITION CAMERA SENSOR ASSEMBLY

(a) Replace lane recognition camera sensor assembly INFO.

(b) Adjust the lane recognition camera sensor assembly INFO.

NEXT

2.	CHECK DTC OUTPUT

(a) Connect the Techstream to the DLC3.

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

(c) Clear the DTCs INFO.

(d) Perform the following to make sure that the DTC detection conditions are met.

HINT:

If the detection conditions are not met, the malfunction cannot be detected.

(1) Drive the vehicle at a speed of 40 km/h (25 mph) or more.

(2) Turn the cruise control main switch on.

(3) Push the -SET switch to activate the cruise control.

(e) Enter the following menus: Powertrain / Radar Cruise / Trouble Codes.

(f) Read the DTCs.

Result:

Result	Proceed to
DTC is not output	A
DTC is output	B

B ▶ REPLACE DRIVING SUPPORT ECU

A ▶ **USE SIMULATION METHOD TO CHECK**

DTC	C1A10	Front Radar Sensor

DESCRIPTION

The driving support ECU uses the millimeter wave radar sensor and lane recognition camera sensor to detect obstacles in front of the vehicle.

When the driving support ECU receives information that there is a malfunction in the millimeter wave radar sensor assembly, DTC C1A10 is stored.

DTC Code	DTC Detection Condition	Trouble Area
C1A10	While power switch is on (IG), driving support ECU receives information that there is malfunction in millimeter wave radar sensor assembly for 1 second	• Millimeter wave radar sensor assembly • Driving support ECU

INSPECTION PROCEDURE

NOTICE:

When the millimeter wave radar sensor is replaced with a new one, adjustment of the front sensor beam axis must be performed INFO.

PROCEDURE

1.	REPLACE MILLIMETER WAVE RADAR SENSOR ASSEMBLY

(a) Replace the millimeter wave radar sensor assembly INFO.

NEXT

2.	ADJUST MILLIMETER WAVE RADAR SENSOR ASSEMBLY

(a) Adjust the millimeter wave radar sensor assembly INFO.

NEXT

3.	CHECK WHETHER DTC OUTPUT RECURS

(a) Connect the Techstream to the DLC3.

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

(c) Clear the DTCs INFO.

(d) Perform the following to make sure that the DTC detection conditions are met.

HINT:

If the detection conditions are not met, the malfunction cannot be detected.

(1) Drive the vehicle at a speed of 40 km/h (25 mph) or more.

(2) Turn the cruise control main switch on.

(3) Push the -SET switch to activate the cruise control.

(e) Enter the following menus: Powertrain / Radar Cruise / Trouble Codes.

(f) Read the DTCs.

Result:

Result	Proceed to
DTC is not output	A
DTC C1A10 is output	B

B ▶ REPLACE DRIVING SUPPORT ECU

A ▶ **END**

DTC	C1A11	Front Radar Sensor Incorrect Axial Gap
DTC	C1A14	Front Radar Sensor Beam Axis Not Adjusted

DESCRIPTION

The driving support ECU uses the millimeter wave radar sensor and lane recognition camera sensor to detect obstacles in front of the vehicle.

When the vehicle is determined to be driving in a straight line or on a slow curve based on signals from the yaw rate sensor, the millimeter wave radar sensor assembly performs a self diagnosis to check if the sensor beam axis is deviated from the vehicle movement direction. When the millimeter wave radar sensor assembly's beam axis is deviated, the driving support ECU detects this, and outputs DTC C1A11.

After installing a new millimeter wave radar sensor assembly, if the sensor beam axis adjustment is not performed, DTC C1A14 is stored.

DTC Code	DTC Detection Condition	Trouble Area
C1A11	While power switch is on (IG) and after driving at approximately 50 km/h (31 mph) for 10 hours, driving support ECU determines that aim of front millimeter wave radar sensor's beam axis is deviated	• Millimeter wave radar sensor assembly • Driving support ECU
C1A14	Driving at 10 km/h (6 mph) or more while front millimeter wave radar sensor's axis adjustment has not been performed	• Millimeter wave radar sensor assembly • Driving support ECU

INSPECTION PROCEDURE

PROCEDURE

1.	ADJUST FRONT MILLIMETER WAVE RADAR SENSOR

(a) Adjust the front millimeter wave radar sensor INFO.

NEXT

2.	CHECK WHETHER DTC OUTPUT RECURS (C1A11 OR C1A14)

(a) Connect the Techstream to the DLC3.

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

(c) Clear the DTCs INFO.

(d) Perform the following to make sure that the DTC detection conditions are met.

HINT:

If the detection conditions are not met, the malfunction cannot be detected.

(1) Drive the vehicle at a speed of 40 km/h (25 mph) or more.

(2) Turn the cruise control main switch on.

(3) Push the -SET switch to activate the cruise control.

(e) Enter the following menus: Powertrain / Radar Cruise / Trouble Codes.

(f) Read the DTCs.

Result:

Result	Proceed to
DTC is not output	A
DTC C1A11 or C1A14 is output	B

B ▶ REPLACE DRIVING SUPPORT ECU
A ▶ **END**

DTC	C1A20	Object Recognition ECU

DESCRIPTION

w/ Lane-keeping Assist System

When the driving support ECU receives information that there is a malfunction in the lane recognition camera sensor assembly, DTC C1A20 is output.

DTC Code	DTC Detection Condition	Trouble Area
C1A20	While power switch is on (IG), driving support ECU receives information that there is malfunction in lane recognition camera sensor assembly for 1 second or more	• Lane recognition camera sensor assembly • Driving support ECU

INSPECTION PROCEDURE

NOTICE:

When the lane recognition camera sensor assembly is replaced with a new one, adjust the lane recognition camera sensor assembly INFO.

PROCEDURE

1.	REPLACE LANE RECOGNITION CAMERA SENSOR ASSEMBLY

(a) Replace the lane recognition camera sensor assembly INFO.

(b) Adjust the lane recognition camera sensor assembly INFO.

NEXT

2.	CHECK DTC OUTPUT

(a) Connect the Techstream to the DLC3.

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

(c) Clear the DTCs INFO.

(d) Perform the following to make sure that the DTC detection conditions are met.

HINT:

If the detection conditions are not met, the malfunction cannot be detected.

(1) Drive the vehicle at a speed of 40 km/h (25 mph) or more.

(2) Turn the cruise control main switch on.

(3) Push the -SET switch to activate the cruise control.

(e) Enter the following menus: Powertrain / Radar Cruise / Trouble Codes.

(f) Read the DTCs.

Result:

Result	Proceed to
DTC is not output	A
DTC is output	B

B ▶ REPLACE DRIVING SUPPORT ECU
A ▶ **END**

DTC	C1A22	Object Recognition Camera Incorrect Axial Gap
DTC	C1A23	Object Recognition Camera Initialization Incomplete

DESCRIPTION

w/ Lane-keeping Assist System

If the driving support ECU determines that the lane recognition camera sensor assembly axis is deviated, DTC C1A22 is stored. Also, if the lane recognition camera sensor assembly beam axis adjustment is not performed after installing the lane recognition camera sensor assembly, DTC C1A23 is stored.

DTC Code	DTC Detection Condition	Trouble Area
C1A22	While power switch is on (IG), driving support ECU detects lane recognition camera sensor assembly beam axis deviation for 1 second or more	• Lane recognition camera sensor assembly • Driving support ECU
C1A23	While power switch is on (IG), driving support ECU detects that lane recognition camera sensor assembly adjustment has not been completed for 1 second or more	• Lane recognition camera sensor assembly • Driving support ECU

INSPECTION PROCEDURE

NOTICE:

When the lane recognition camera sensor assembly is replaced with a new one, adjust the lane recognition camera sensor assembly INFO.

PROCEDURE

1.	ADJUST LANE RECOGNITION CAMERA SENSOR ASSEMBLY

(a) Adjust the lane recognition camera sensor assembly INFO.

NEXT

2.	CHECK DTC OUTPUT

(a) Connect the Techstream to the DLC3.

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

(c) Clear the DTCs INFO.

(d) Perform the following to make sure that the DTC detection conditions are met.

HINT:

If the detection conditions are not met, the malfunction cannot be detected.

(1) Drive the vehicle at a speed of 40 km/h (25 mph) or more.

(2) Turn the cruise control main switch on.

(3) Push the -SET switch to activate the cruise control.

(e) Enter the following menus: Powertrain / Radar Cruise / Trouble Codes.

(f) Read the DTCs.

Result:

Result	Proceed to
DTC is not output	A
DTC is output	B

B ▶ REPLACE LANE RECOGNITION CAMERA SENSOR ASSEMBLY
A ▶ **END**

3.	REPLACE LANE RECOGNITION CAMERA SENSOR ASSEMBLY

(a) Replace the lane recognition camera sensor assembly INFO.

(b) Adjust the lane recognition camera sensor assembly INFO.

NEXT ▼

4.	CHECK DTC OUTPUT

(a) Connect the Techstream to the DLC3.

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

(c) Clear the DTCs INFO.

(d) Perform the following to make sure that the DTC detection conditions are met.

HINT:

If the detection conditions are not met, the malfunction cannot be detected.

(1) Drive the vehicle at a speed of 40 km/h (25 mph) or more.

(2) Turn the cruise control main switch on.

(3) Push the -SET switch to activate the cruise control.

(e) Enter the following menus: Powertrain / Radar Cruise / Trouble Codes.

(f) Read the DTCs.

Result:

Result	Proceed to
DTC is not output	A
DTC is output	B

B ▶ REPLACE DRIVING SUPPORT ECU
A ▶ **END**

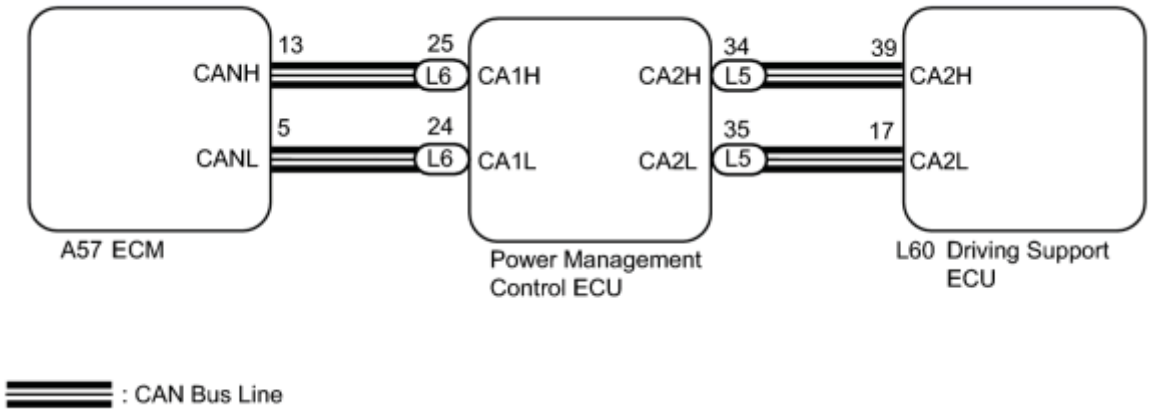
DTC	C1A40	ENG / EHV Device

DESCRIPTION

When the driving support ECU receives a hybrid control system or SFI system malfunction signal from the power management control ECU or ECM via the CAN communication line, DTC C1A40 is stored.

DTC Code	DTC Detection Condition	Trouble Area
C1A40	While power switch is on (IG), hybrid control system or SFI system malfunction signal is detected for 1 second	• Hybrid control system • Power management control ECU • SFI system • ECM • Driving support ECU

WIRING DIAGRAM



INSPECTION PROCEDURE

PROCEDURE

1.	READ OUTPUT DTC (HYBRID CONTROL SYSTEM)

(a) Connect the Techstream to the DLC3.

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

(c) Turn the Techstream on.

(d) Enter the following menus: Powertrain / Hybrid Control / Trouble Codes.

(e) Read the DTCs.

Result:

Result	Proceed to
DTC is not output	A
DTC is output	B

B ▶ GO TO HYBRID CONTROL SYSTEM

A ▼

2.	READ OUTPUT DTC (SFI SYSTEM)

(a) Connect the Techstream to the DLC3.

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

(c) Turn the Techstream on.

(d) Enter the following menus: Powertrain / Engine and ECT / Trouble Codes.

(e) Read the DTCs.

Result:

Result	Proceed to
DTC is not output	A
DTC is output	B

B ▶ GO TO SFI SYSTEM

A ▼

3.	CHECK WHETHER DTC OUTPUT RECURS (DTC C1A40)

(a) Connect the Techstream to the DLC3.

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

(c) Clear the DTCs INFO.

(d) Perform the following to make sure that the DTC detection conditions are met.

HINT:

If the detection conditions are not met, the malfunction cannot be detected.

(1) Drive the vehicle at a speed of 40 km/h (25 mph) or more.

(2) Turn the cruise control main switch on.

(3) Push the -SET switch to activate the cruise control.

(e) Enter the following menus: Powertrain / Radar Cruise / Trouble Codes.

(f) Read the DTCs.

Result:

Result	Proceed to
DTC is not output	A
DTC C1A40 is output	B

B ▶ REPLACE POWER MANAGEMENT CONTROL ECU

A ▶ **USE SIMULATION METHOD TO CHECK**

4.	REPLACE POWER MANAGEMENT CONTROL ECU

(a) Replace the power management control ECU INFO.

NEXT ▼

5.	CHECK WHETHER DTC OUTPUT RECURS (DTC C1A40)

(a) Connect the Techstream to the DLC3.

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

(c) Clear the DTCs INFO.

(d) Perform the following to make sure that the DTC detection conditions are met.

HINT:

If the detection conditions are not met, the malfunction cannot be detected.

(1) Drive the vehicle at a speed of 40 km/h (25 mph) or more.

(2) Turn the cruise control main switch on.

(3) Push the -SET switch to activate the cruise control.

(e) Enter the following menus: Powertrain / Radar Cruise / Trouble Codes.

(f) Read the DTCs.

Result:

Result	Proceed to
DTC is not output	A

Result	Proceed to
DTC C1A40 is output	B

B ▶ REPLACE ECM
A ▶ **END**

6.	REPLACE ECM

(a) Replace the ECM INFO.

NEXT ▼

7.	CHECK WHETHER DTC OUTPUT RECURS (DTC C1A40)

(a) Connect the Techstream to the DLC3.

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

(c) Clear the DTCs INFO.

(d) Perform the following to make sure that the DTC detection conditions are met.

HINT:

If the detection conditions are not met, the malfunction cannot be detected.

(1) Drive the vehicle at a speed of 40 km/h (25 mph) or more.

(2) Turn the cruise control main switch on.

(3) Push the -SET switch to activate the cruise control.

(e) Enter the following menus: Powertrain / Radar Cruise / Trouble Codes.

(f) Read the DTCs.

Result:

Result	Proceed to
DTC is not output	A
DTC C1A40 is output	B

B ▶ REPLACE DRIVING SUPPORT ECU
A ▶ **END**

DTC	C1A41	Brake Request Value Mismatch between ENG / EHV and Driving Support ECU

DESCRIPTION

The brake booster with master cylinder (skid control ECU) receives brake control request signals from the power management control ECU and driving support ECU.

When the request signals received from the power management control ECU and driving support ECU are not consistent, the brake booster with master cylinder (skid control ECU) determines that a malfunction has occurred and sends a malfunction signal to the driving support ECU.

DTC Code	DTC Detection Condition	Trouble Area
C1A41	While power switch is on (IG), brake request signal from power management control ECU and driving support ECU are inconsistent for 1 second	• Electronically controlled brake system • Hybrid control system • Power management control ECU • Brake booster with master cylinder (Skid control ECU) • Driving support ECU

WIRING DIAGRAM

Refer to DTC C1A50 INFO.

INSPECTION PROCEDURE

PROCEDURE

1.	READ OUTPUT DTC (ELECTRONICALLY CONTROLLED BRAKE SYSTEM)

(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 / ABS/VSC/TRAC / Trouble Codes.

(e) Read the DTCs.

Result:

Result	Proceed to

Result	Proceed to
DTC is not output	A
DTC is output	B

B GO TO ELECTRONICALLY CONTROLLED BRAKE SYSTEM

A

2.	READ OUTPUT DTC (HYBRID CONTROL SYSTEM)

(a) Connect the Techstream to the DLC3.

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

(c) Turn the Techstream on.

(d) Enter the following menus: Powertrain / Hybrid Control / Trouble Codes.

(e) Read the DTCs.

Result:

Result	Proceed to
DTC is not output	A
DTC is output	B

B GO TO HYBRID CONTROL SYSTEM

A

3.	CHECK WHETHER DTC OUTPUT RECURS (DTC C1A41)

(a) Connect the Techstream to the DLC3.

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

(c) Clear the DTCs INFO.

(d) Perform the following to make sure that the DTC detection conditions are met.

HINT:

If the detection conditions are not met, the malfunction cannot be detected.

(1) Drive the vehicle at a speed of 40 km/h (25 mph) or more.

(2) Turn the cruise control main switch on.

(3) Push the -SET switch to activate the cruise control.

(e) Enter the following menus: Powertrain / Radar Cruise / Trouble Codes.

(f) Read the DTCs.

Result:

Result	Proceed to
DTC is not output	A
DTC C1A41 is output	B

B ▶ REPLACE DRIVING SUPPORT ECU

A ▶ **USE SIMULATION METHOD TO CHECK**

4.	REPLACE DRIVING SUPPORT ECU

(a) Replace the driving support ECU INFO.

NEXT ▼

5.	CHECK WHETHER DTC OUTPUT RECURS (DTC C1A41)

(a) Connect the Techstream to the DLC3.

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

(c) Clear the DTCs INFO.

(d) Perform the following to make sure that the DTC detection conditions are met.

HINT:

If the detection conditions are not met, the malfunction cannot be detected.

(1) Drive the vehicle at a speed of 40 km/h (25 mph) or more.

(2) Turn the cruise control main switch on.

(3) Push the -SET switch to activate the cruise control.

(e) Enter the following menus: Powertrain / Radar Cruise / Trouble Codes.

(f) Read the DTCs.

Result:

Result	Proceed to
DTC is not output	A
DTC C1A41 is output	B

B ▶ REPLACE BRAKE BOOSTER WITH MASTER CYLINDER

A ▶ **END**

6.	REPLACE BRAKE BOOSTER WITH MASTER CYLINDER

(a) Replace the brake booster with master cylinder (skid control ECU) INFO.

NEXT

7.	CHECK WHETHER DTC OUTPUT RECURS (DTC C1A41)

(a) Connect the Techstream to the DLC3.

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

(c) Clear the DTCs INFO.

(d) Perform the following to make sure that the DTC detection conditions are met.

HINT:

If the detection conditions are not met, the malfunction cannot be detected.

(1) Drive the vehicle at a speed of 40 km/h (25 mph) or more.

(2) Turn the cruise control main switch on.

(3) Push the -SET switch to activate the cruise control.

(e) Enter the following menus: Powertrain / Radar Cruise / Trouble Codes.

(f) Read the DTCs.

Result:

Result	Proceed to
DTC is not output	A
DTC C1A41 is output	B

B ▶ REPLACE POWER MANAGEMENT CONTROL ECU

A ▶ **END**

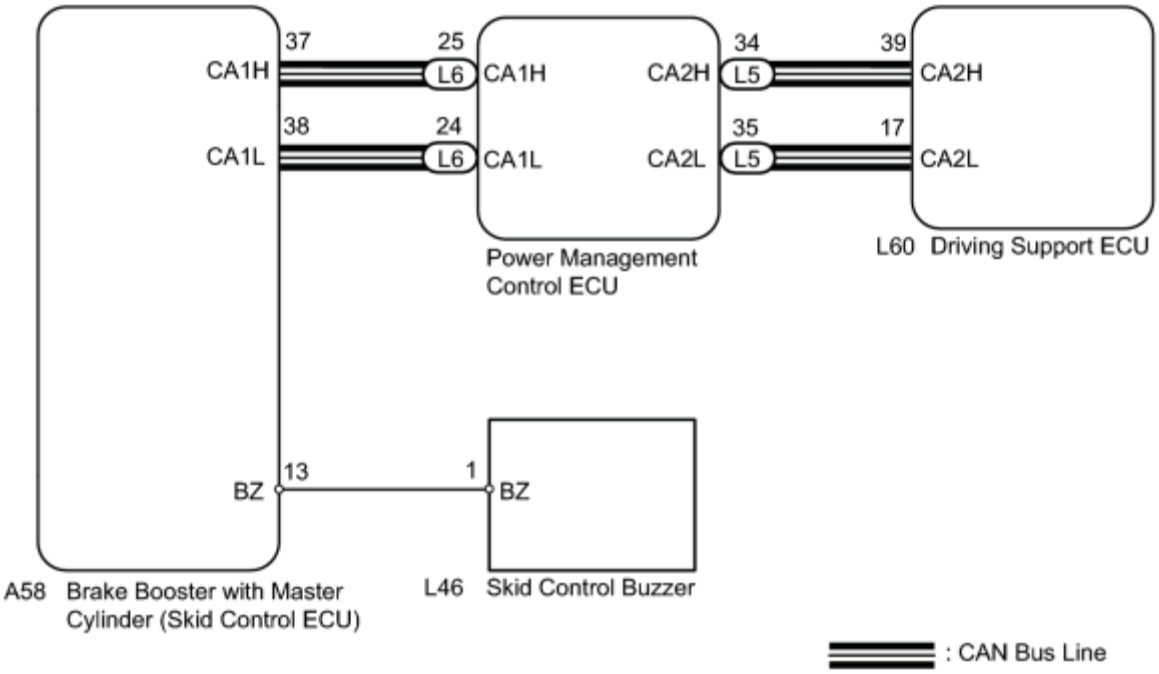
DTC	C1A4A	Skid Control Buzzer Circuit

DESCRIPTION

The driving support ECU sends a sounding signal to the brake booster with master cylinder (skid control ECU) to sound the skid control buzzer.

DTC Code	DTC Detection Condition	Trouble Area
C1A4A	While power switch is on (IG), skid control buzzer circuit malfunction signal is received by brake booster with master cylinder (skid control ECU) for 1 second	• Electronically controlled brake system • Driving support ECU

WIRING DIAGRAM



INSPECTION PROCEDURE

PROCEDURE

1.	PERFORM ACTIVE TEST USING TECHSTREAM (SKID CONTROL BUZZER)

(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 / ABS/VSC/TRAC / Active Test / Buzzer.

(e) Perform the Active Test.

OK:

Skid control buzzer sounds.

NG ▶ GO TO ELECTRONICALLY CONTROLLED BRAKE SYSTEM
OK
▼

2.	CHECK WHETHER DTC OUTPUT RECURS (DTC C1A4A)

(a) Connect the Techstream to the DLC3.

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

(c) Clear the DTCs INFO.

(d) Perform the following to make sure that the DTC detection conditions are met.

HINT:

If the detection conditions are not met, the malfunction cannot be detected.

(1) Drive the vehicle at a speed of 40 km/h (25 mph) or more.

(2) Turn the cruise control main switch on.

(3) Push the -SET switch to activate the cruise control.

(e) Enter the following menus: Powertrain / Radar Cruise / Trouble Codes.

(f) Read the DTCs.

Result:

Result	Proceed to
DTC is not output	A
DTC C1A4A is output	B

B ▶ REPLACE DRIVING SUPPORT ECU
A ▶ **USE SIMULATION METHOD TO CHECK**

3.	REPLACE DRIVING SUPPORT ECU

(a) Replace the driving support ECU INFO.

NEXT

4.	CHECK WHETHER DTC OUTPUT RECURS (DTC C1A4A)

(a) Connect the Techstream to the DLC3.

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

(c) Clear the DTCs INFO.

(d) Perform the following to make sure that the DTC detection conditions are met.

HINT:

If the detection conditions are not met, the malfunction cannot be detected.

(1) Drive the vehicle at a speed of 40 km/h (25 mph) or more.

(2) Turn the cruise control main switch on.

(3) Push the -SET switch to activate the cruise control.

(e) Enter the following menus: Powertrain / Radar Cruise / Trouble Codes.

(f) Read the DTCs.

Result:

Result	Proceed to
DTC is not output	A
DTC C1A4A is output	B

B REPLACE BRAKE BOOSTER WITH MASTER CYLINDER

A **END**

5.	REPLACE BRAKE BOOSTER WITH MASTER CYLINDER

(a) Replace the brake booster with master cylinder (skid control ECU) INFO.

NEXT

6.	CHECK WHETHER DTC OUTPUT RECURS (DTC C1A4A)

(a) Connect the Techstream to the DLC3.

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

(c) Clear the DTCs INFO.

(d) Perform the following to make sure that the DTC detection conditions are met.

HINT:

If the detection conditions are not met, the malfunction cannot be detected.

(1) Drive the vehicle at a speed of 40 km/h (25 mph) or more.

(2) Turn the cruise control main switch on.

(3) Push the -SET switch to activate the cruise control.

(e) Enter the following menus: Powertrain / Radar Cruise / Trouble Codes.

(f) Read the DTCs.

Result:

Result	Proceed to
DTC is not output	A
DTC C1A4A is output	B

B ▶ REPLACE POWER MANAGEMENT CONTROL ECU
A ▶ **END**

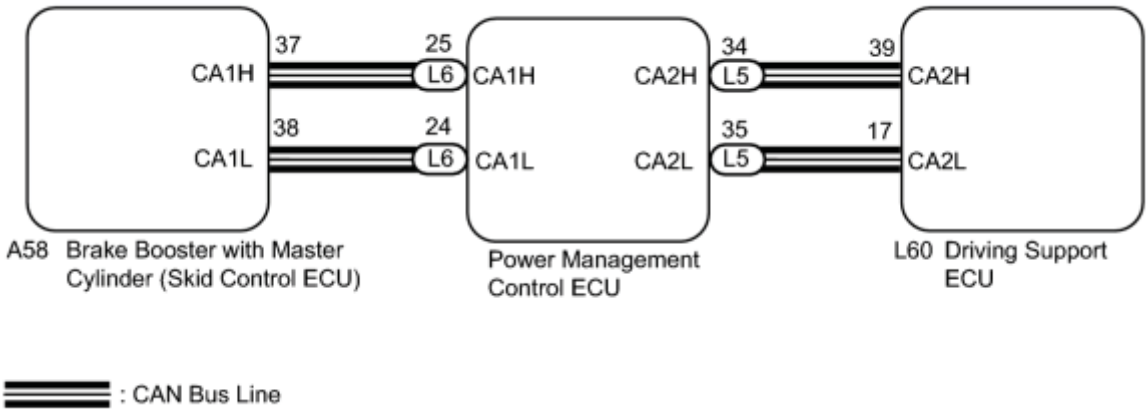
DTC	C1A50	Brake System

DESCRIPTION

When the driving support ECU receives an electronically controlled brake system malfunction signal from the brake booster with master cylinder (skid control ECU) via the CAN communication line, DTC C1A50 is stored.

DTC Code	DTC Detection Condition	Trouble Area
C1A50	When signal malfunction from brake booster with master cylinder (skid control ECU) continues for 1 second while dynamic radar cruise control is operating	• Electronically controlled brake system • Driving support ECU

WIRING DIAGRAM



INSPECTION PROCEDURE

PROCEDURE

1.	READ OUTPUT DTC (ELECTRONICALLY CONTROLLED BRAKE SYSTEM)

(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 / ABS/VSC/TRAC / Trouble Codes.

(e) Read the DTCs.

Result:

Result	Proceed to
DTC is not output	A
DTC is output	B

B GO TO ELECTRONICALLY CONTROLLED BRAKE SYSTEM

A

2.	CHECK WHETHER DTC OUTPUT RECURS (DTC C1A50)

(a) Connect the Techstream to the DLC3.

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

(c) Clear the DTCs INFO.

(d) Perform the following to make sure that the DTC detection conditions are met.

HINT:

If the detection conditions are not met, the malfunction cannot be detected.

(1) Drive the vehicle at a speed of 40 km/h (25 mph) or more.

(2) Turn the cruise control main switch on.

(3) Push the -SET switch to activate the cruise control.

(e) Enter the following menus: Powertrain / Radar Cruise / Trouble Codes.

(f) Read the DTCs.

Result:

Result	Proceed to
DTC is not output	A
DTC C1A50 is output	B

B REPLACE DRIVING SUPPORT ECU

A **USE SIMULATION METHOD TO CHECK**

3.	REPLACE DRIVING SUPPORT ECU

(a) Replace the driving support ECU INFO.

NEXT

4.	CHECK WHETHER DTC OUTPUT RECURS (DTC C1A50)

(a) Connect the Techstream to the DLC3.

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

(c) Clear the DTCs INFO.

(d) Perform the following to make sure that the DTC detection conditions are met.

HINT:

If the detection conditions are not met, the malfunction cannot be detected.

(1) Drive the vehicle at a speed of 40 km/h (25 mph) or more.

(2) Turn the cruise control main switch on.

(3) Push the -SET switch to activate the cruise control.

(e) Enter the following menus: Powertrain / Radar Cruise / Trouble Codes.

(f) Read the DTCs.

Result:

Result	Proceed to
DTC is not output	A
DTC C1A50 is output	B

B ▶ REPLACE BRAKE BOOSTER WITH MASTER CYLINDER
A ▶ **END**

5.	REPLACE BRAKE BOOSTER WITH MASTER CYLINDER

(a) Replace the brake booster with master cylinder (skid control ECU) INFO.

NEXT

6.	CHECK WHETHER DTC OUTPUT RECURS

(a) Connect the Techstream to the DLC3.

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

(c) Clear the DTCs INFO.

(d) Perform the following to make sure that the DTC detection conditions are met.

HINT:

If the detection conditions are not met, the malfunction cannot be detected.

(1) Drive the vehicle at a speed of 40 km/h (25 mph) or more.

(2) Turn the cruise control main switch on.

(3) Push the -SET switch to activate the cruise control.

(e) Enter the following menus: Powertrain / Radar Cruise / Trouble Codes.

(f) Read the DTCs.

Result:

Result	Proceed to
DTC is not output	A
DTC C1A50 is output	B

B ▶ REPLACE POWER MANAGEMENT CONTROL ECU
A ▶ **END**

DTC	P1615	Communication Error from Distance Control ECU to HV ECU

DESCRIPTION

This DTC is stored when a communication error occurs between the driving support ECU and power management control ECU.

DTC No.	DTC Detection Condition	Trouble Area
P1615	All of the following conditions are met (a) Power switch on (IG) (b) Communication error between driving support ECU and power management control ECU for 0.5 seconds or more	• Driving support ECU • Power management control ECU

WIRING DIAGRAM

Refer to DTC C1A40 INFO.

INSPECTION PROCEDURE

PROCEDURE

1.	READ OUTPUT DTC (DYNAMIC RADAR CRUISE CONTROL SYSTEM)

(a) Connect the Techstream to the DLC3.

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

(c) Turn the Techstream on.

(d) Enter the following menus: Powertrain / Radar Cruise / Trouble Codes.

(e) Read the DTCs.

Result:

Result	Proceed to
DTC is not output	A
DTC is output	B

B ▶ GO TO DTC CHART

A ▼

2.	CHECK WHETHER DTC OUTPUT RECURS (DTC P1615)

(a) Connect the Techstream to the DLC3.

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

(c) Turn the Techstream on.

(d) Clear the DTCs INFO.

(e) Turn the power switch off.

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

(g) Enter the following menus: Powertrain / Hybrid Control / Trouble Codes.

(h) Read the DTCs.

Result:

Result	Proceed to
DTC is not output	A
DTC P1615 is output	B

B ▶ REPLACE DRIVING SUPPORT ECU

A ▶ **USE SIMULATION METHOD TO CHECK**

3.	REPLACE DRIVING SUPPORT ECU

(a) Replace the driving support ECU INFO.

NEXT ▼

4.	CHECK WHETHER DTC OUTPUT RECURS (DTC P1615)

(a) Connect the Techstream to the DLC3.

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

(c) Turn the Techstream on.

(d) Clear the DTCs INFO.

(e) Turn the power switch off.

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

(g) Enter the following menus: Powertrain / Hybrid Control / Trouble Codes.

(h) Read the DTCs.

Result:

Result	Proceed to
DTC is not output	A
DTC P1615 is output	B

B ▶ REPLACE POWER MANAGEMENT CONTROL ECU

A ▶ **END**

DTC	U0122	Lost Communication with Vehicle Dynamics Control Module
DTC	U0123	Lost Communication with Yaw Rate Sensor Module
DTC	U0126	Lost Communication with Steering Angle Sensor Module
DTC	U0293	Lost Communication with HV ECU
DTC	U1104	Lost Communication with Driving Support ECU

DESCRIPTION

These DTCs are output when a communication malfunction occurs between the sensors and ECUs.

DTC Code	DTC Detection Condition	Trouble Area
U0122	While dynamic radar cruise control is either preparing for operation or operating and power switch is on (IG), communication stop from brake booster with master cylinder (skid control ECU) to driving support ECU continues for 1 second or more	• Brake booster with master cylinder (Skid control ECU) • CAN communication system • Driving support ECU
U0123	While dynamic radar cruise control is either preparing for operation or operating and power switch is on (IG), communication stop from yaw rate sensor to driving support ECU continues for 1 second or more	• Yaw rate sensor • CAN communication system • Driving support ECU
U0126	While dynamic radar cruise control is either preparing for operation or operating and power switch is on (IG), communication stop from steering angle sensor to driving support ECU continues for 1 second or more	• Steering angle sensor • CAN communication system • Driving support ECU
U0293	While dynamic radar cruise control is either preparing for operation or operating and power switch is on (IG), communication stop from power management control ECU to driving support ECU or brake booster with master cylinder (skid control ECU) continues for 1 second or more	• Power management control ECU • CAN communication system • Driving support ECU • Brake booster with master cylinder (Skid control ECU)
U1104	While dynamic radar cruise control is either preparing for operation or operating and power switch is on (IG), communication stop from driving support ECU to millimeter wave radar sensor assembly, power management control ECU or brake booster with master cylinder (skid control ECU) continues for 1 second or more	• Driving support ECU • CAN communication system • Millimeter wave radar sensor assembly • Power management control ECU • Brake booster with

DTC Code	DTC Detection Condition	Trouble Area
		master cylinder (Skid control ECU)

WIRING DIAGRAM

Refer to System Diagram INFO.

Refer to U0235 INFO.

INSPECTION PROCEDURE

PROCEDURE

1.	READ OUTPUT 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: Powertrain / Radar Cruise / Trouble Codes.

(e) Read the DTCs.

Result:

Result	Proceed to
DTC U1104 is output	A
DTCs other than U1104 are output	B

B ▶ GO TO CAN COMMUNICATION SYSTEM

A ▼

2.	CHECK CAN COMMUNICATION SYSTEM

(a) Select "CAN Bus Check" from the "System Selection Menu" screen on the Techstream.

(b) Select "Communication Malfunction DTC" from the "CAN Bus Check" screen, and then select "Enter".

OK:

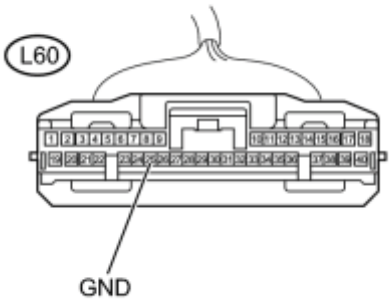
Communication system is normal.

NG ▶ GO TO CAN COMMUNICATION SYSTEM

OK ▼

3.	CHECK HARNESS AND CONNECTOR (DRIVING SUPPORT ECU - BODY GROUND)

*1



(a) Disconnect the driving support ECU connector.

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

Standard Resistance:

Tester Connection	Condition	Specified Condition
L60-25 (GND) - Body ground	Always	Below 1 Ω

Text in Illustration

*1	Front view of wire harness connector (to Driving Support ECU)

(c) Reconnect the driving support ECU connector.

NG ▶ REPAIR OR REPLACE HARNESS OR CONNECTOR (DRIVING SUPPORT ECU - BODY GROUND)

OK ▼

4.	REPLACE DRIVING SUPPORT ECU

(a) Replace the driving support control ECU INFO.

NEXT ▼

5.	CHECK WHETHER DTC OUTPUT RECURS

(a) Connect the Techstream to the DLC3.

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

(c) Clear the DTCs INFO.

(d) Perform the following to make sure that the DTC detection conditions are met.

HINT:

If the detection conditions are not met, the malfunction cannot be detected.

(1) Drive the vehicle at a speed of 40 km/h (25 mph) or more.

(2) Turn the cruise control main switch on.

(3) Push the -SET switch to activate the cruise control.

(e) Enter the following menus: Powertrain / Radar Cruise / Trouble Codes.

(f) Read the DTCs.

Result:

Result	Proceed to
DTC is not output	A
DTC U1104 is output	B

B ▶ REPLACE MILLIMETER WAVE RADAR SENSOR ASSEMBLY
A ▶ **END**

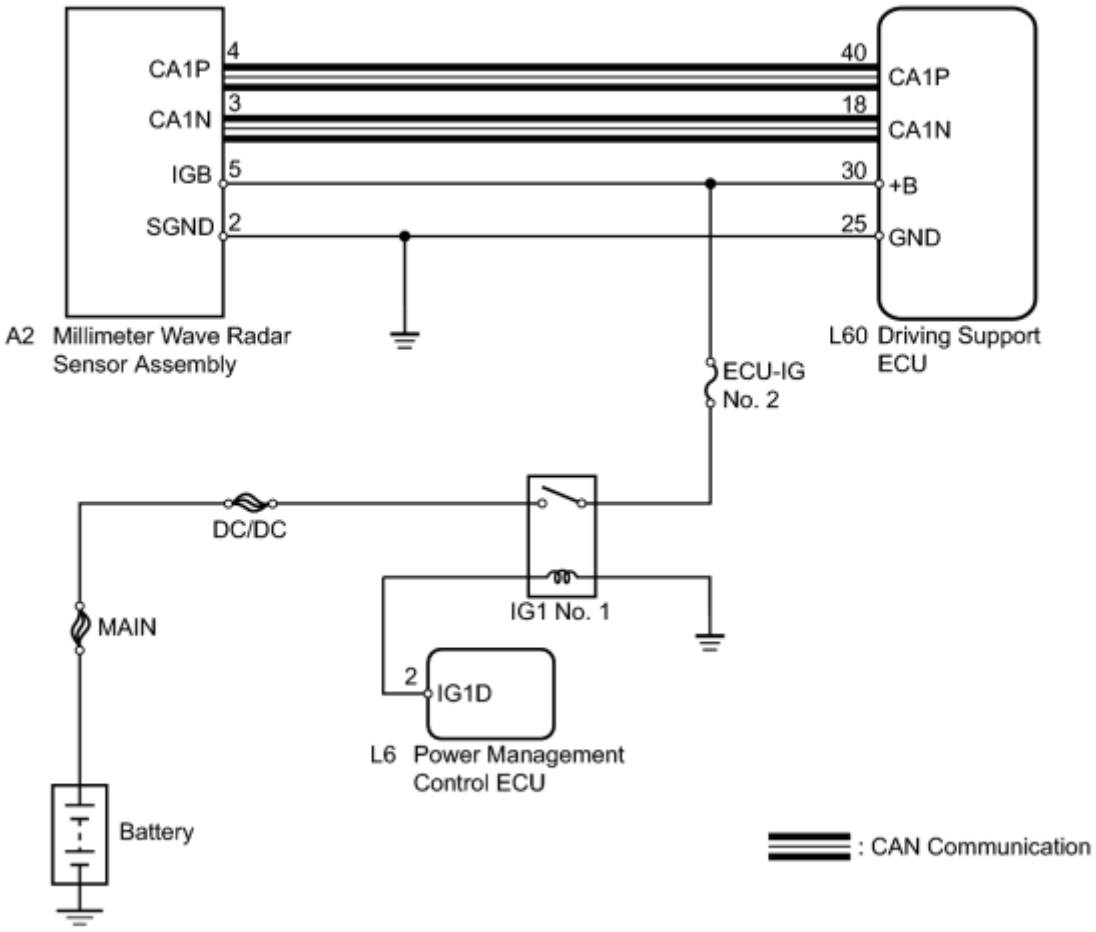
DTC	U0235	Lost Communication with Cruise Control Front Distance Range Sensor

DESCRIPTION

The millimeter wave radar sensor and driving support ECU transmit the data for general vehicle control and diagnosis function along the communication line. The millimeter wave radar sensor assembly transmits information about the vehicle in front to the driving support ECU.

DTC No.	DTC Detection Condition	Trouble Area
U0235	The seat belt control ECU detects a communication error signal (from the millimeter wave radar sensor assembly to the driving support ECU) for 1 second or more while the dynamic radar cruise control is operating	• Millimeter wave radar sensor assembly • Millimeter wave radar sensor circuit • Driving support ECU

WIRING DIAGRAM



INSPECTION PROCEDURE

NOTICE:

When the millimeter wave radar sensor is replaced with a new one, adjustment of the radar sensor beam axis must be performed INFO.

PROCEDURE

1.	CHECK CAN COMMUNICATION SYSTEM

(a) Select "CAN Bus Check" from the "System Selection Menu" screen on the Techstream.

(b) Select "Communication Malfunction DTC" from the "CAN Bus Check" screen, and then select "Enter".

OK:

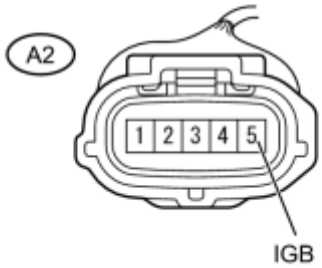
Communication system is normal.

NG ▶ GO TO CAN COMMUNICATION CIRCUIT

OK ▼

2.	CHECK HARNESS AND CONNECTOR (MILLIMETER WAVE RADAR SENSOR POWER SOURCE)

*1



(a) Disconnect the millimeter wave radar sensor assembly connector.

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

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

Standard Voltage:

Tester Connection	Switch Condition	Specified Condition
A2-5 (IGB) - Body ground	Power switch on (IG)	11 to 14 V

Text in Illustration

*1	Front view of wire harness connector (to Millimeter Wave Radar Sensor Assembly)

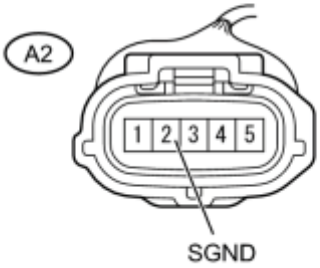
(d) Reconnect the millimeter wave radar sensor assembly connector.

NG ▶ REPAIR OR REPLACE HARNESS OR CONNECTOR (MILLIMETER WAVE RADAR SENSOR ASSEMBLY - IG1 NO. 1 RELAY)

OK ▼

3.	CHECK HARNESS AND CONNECTOR (MILLIMETER WAVE RADAR SENSOR ASSEMBLY - BODY GROUND)

*1



(a) Disconnect the millimeter wave radar sensor assembly connector.

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

Standard Resistance:

Tester Connection	Condition	Specified Condition
A2-2 (SGND) - Body ground	Always	Below 1 Ω

Text in Illustration

*1	Front view of wire harness connector (to Millimeter Wave Radar Sensor Assembly)

(c) Reconnect the millimeter wave radar sensor assembly connector.

NG ▶ REPAIR OR REPLACE HARNESS OR CONNECTOR (MILLIMETER WAVE RADAR SENSOR ASSEMBLY - BODY GROUND)

OK ▼

4.	REPLACE MILLIMETER WAVE RADAR SENSOR ASSEMBLY

(a) Replace the millimeter wave radar sensor assembly INFO.

(b) Adjust the millimeter wave radar sensor assembly INFO.

NEXT

5.	CHECK WHETHER DTC OUTPUT RECURS (DTC U0235)

(a) Connect the Techstream to the DLC3.

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

(c) Clear the DTCs INFO.

(d) Perform the following to make sure that the DTC detection conditions are met.

HINT:

If the detection conditions are not met, the malfunction cannot be detected.

(1) Drive the vehicle at a speed of 40 km/h (25 mph) or more.

(2) Turn the cruise control main switch on.

(3) Push the -SET switch to activate the cruise control.

(e) Enter the following menus: Powertrain / Radar Cruise / Trouble Codes.

(f) Read the DTCs.

Result:

Result	Proceed to
DTC is not output	A
DTC U0235 is output	B

B ▶ REPLACE DRIVING SUPPORT ECU

A ▶ **END**

DTC	U1119	Lost Communication with Object Recognition ECU (CAN)

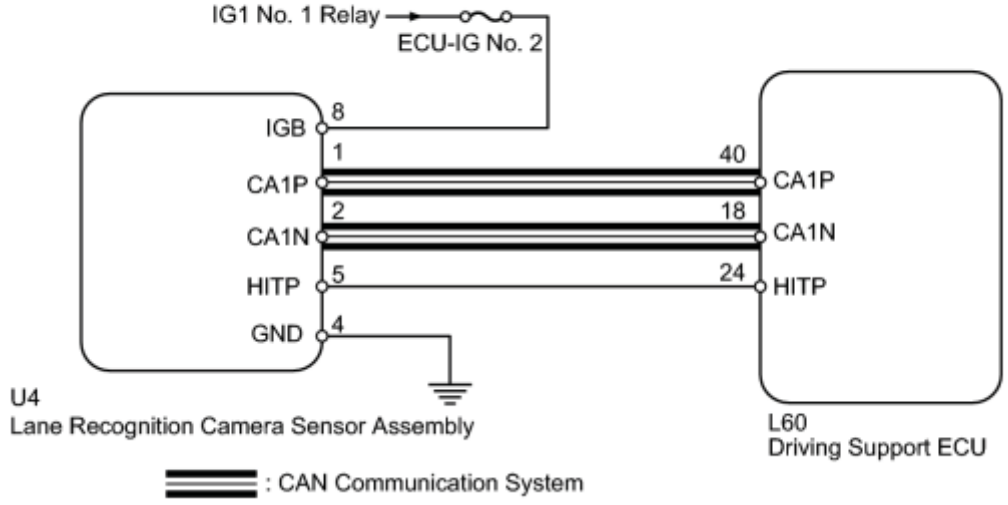
DESCRIPTION

with Lane-keeping Assist System.

Because of the location of the lane recognition camera assembly, it is subject to high temperatures. If the lane recognition camera sensor assembly becomes too hot, the power source is shut down to protect the system. At that time CAN communication also stops. However, in order to inform the driving support ECU that CAN communication has not stopped because of a CAN communication error, on/off signals are periodically sent from the HITP terminal.

DTC Code	DTC Detection Condition	Trouble Area
U1119	While power switch is on (IG), communication stop between lane recognition camera sensor and driving support ECU continues for 1 second or more	• Lane recognition camera sensor assembly • CAN communication system • Driving support ECU

WIRING DIAGRAM



INSPECTION PROCEDURE

HINT:

This circuit uses CAN communication. Therefore, if there are any malfunctions in the communication circuit, one or more DTCs in the CAN communication system are output.

PROCEDURE

1.	CHECK DTC OUTPUT

(a) Connect the Techstream to the DLC3.

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

(c) Clear the DTCs INFO.

(d) Perform the following to make sure that the DTC detection conditions are met.

HINT:

If the detection conditions are not met, the malfunction cannot be detected.

(1) Drive the vehicle at a speed of 40 km/h (25 mph) or more.

(2) Turn the cruise control main switch on.

(3) Push the -SET switch to activate the cruise control.

(e) Enter the following menus: Powertrain / Radar Cruise / Trouble Codes.

(f) Read the DTCs.

Result:

Result	Proceed to
DTC U1119 is output	A
DTC other than U1119 is output	B

B ▶ GO TO CAN COMMUNICATION CIRCUIT

A ▼

2.	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 Electrical / Pre-Collision 2/ Data List / Recog ECU H Temp Hist.

(e) Confirm the judgment history.

Pre-Collision 2:

Tester Display	Measurement Item/Range	Normal Condition	Diagnostic Note
Recog ECU H Temp Hist	Object recognition ECU temperature condition history/ ON or OFF	ON: History exists OFF: No history	-

Result:

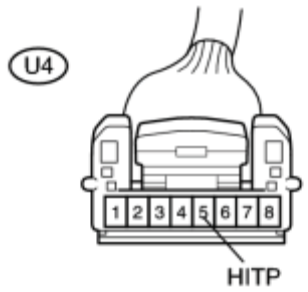
Result	Proceed to
ON is displayed	A
OFF is displayed	B

B ▶ CHECK CAN COMMUNICATION SYSTEM

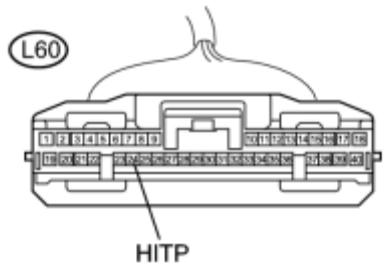
A ▼

3.	CHECK HARNESS OR CONNECTOR (DRIVING SUPPORT ECU - LANE RECOGNITION CAMERA SENSOR)

*1



*2



(a) Disconnect the driving support ECU connector and lane recognition camera sensor connector.

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

Standard Resistance:

Tester Condition	Condition	Specified Condition

Tester Condition	Condition	Specified Condition
U4-5 (HITP) - L60-24 (HITP)	Always	Below 1 Ω
U4-5 (HITP) or L60-24 (HITP) - Body ground	Always	10 kΩ or higher

Text in Illustration

*1	Front view of wire harness connector (to Lane Recognition Camera Sensor Assembly)
*2	Front view of wire harness connector (to Driving Support ECU)

(c) Reconnect the connectors.

NG ▶ REPAIR OR REPLACE HARNESS OR CONNECTOR (DRIVING SUPPORT ECU - LANE RECOGNITION CAMERA SENSOR)

OK ▶ **REPLACE LANE RECOGNITION CAMERA SENSOR ASSEMBLY**

4.	REPAIR OR REPLACE HARNESS OR CONNECTOR (DRIVING SUPPORT ECU - LANE RECOGNITION CAMERA SENSOR)

(a) Repair or replace harness or connector.

NEXT ▼

5.	CHECK DTC OUTPUT

(a) Connect the Techstream to the DLC3.

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

(c) Clear the DTCs INFO.

(d) Perform the following to make sure that the DTC detection conditions are met.

HINT:

If the detection conditions are not met, the malfunction cannot be detected.

(1) Drive the vehicle at a speed of 40 km/h (25 mph) or more.

(2) Turn the cruise control main switch on.

(3) Push the -SET switch to activate the cruise control.

(e) Enter the following menus: Powertrain / Radar Cruise / Trouble Codes.

(f) Read the DTCs.

Result:

Result	Proceed to
DTC U1119 is not output	A
DTC U1119 is output	B

B ▶ GO TO CAN COMMUNICATION CIRCUIT
A ▶ **END**

6.	CHECK CAN COMMUNICATION SYSTEM

(a) Check CAN communication system INFO.

NG ▶ GO TO CAN COMMUNICATION CIRCUIT
OK
▼

7.	REPLACE LANE RECOGNITION CAMERA SENSOR ASSEMBLY

(a) Replace the lane recognition camera sensor assembly INFO.

(b) Adjust the lane recognition camera sensor INFO.

NEXT
▼

8.	CHECK DTC OUTPUT

(a) Connect the Techstream to the DLC3.

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

(c) Clear the DTCs INFO.

(d) Perform the following to make sure that the DTC detection conditions are met.

HINT:

If the detection conditions are not met, the malfunction cannot be detected.

(1) Drive the vehicle at a speed of 40 km/h (25 mph) or more.

(2) Turn the cruise control main switch on.

(3) Push the -SET switch to activate the cruise control.

(e) Enter the following menus: Powertrain / Radar Cruise / Trouble Codes.

(f) Read the DTCs.

Result:

Result	Proceed to
DTC U1119 is not output	A
DTC U1119 is output	B

B ▶ REPLACE DRIVING SUPPORT ECU

A ▶ **END**

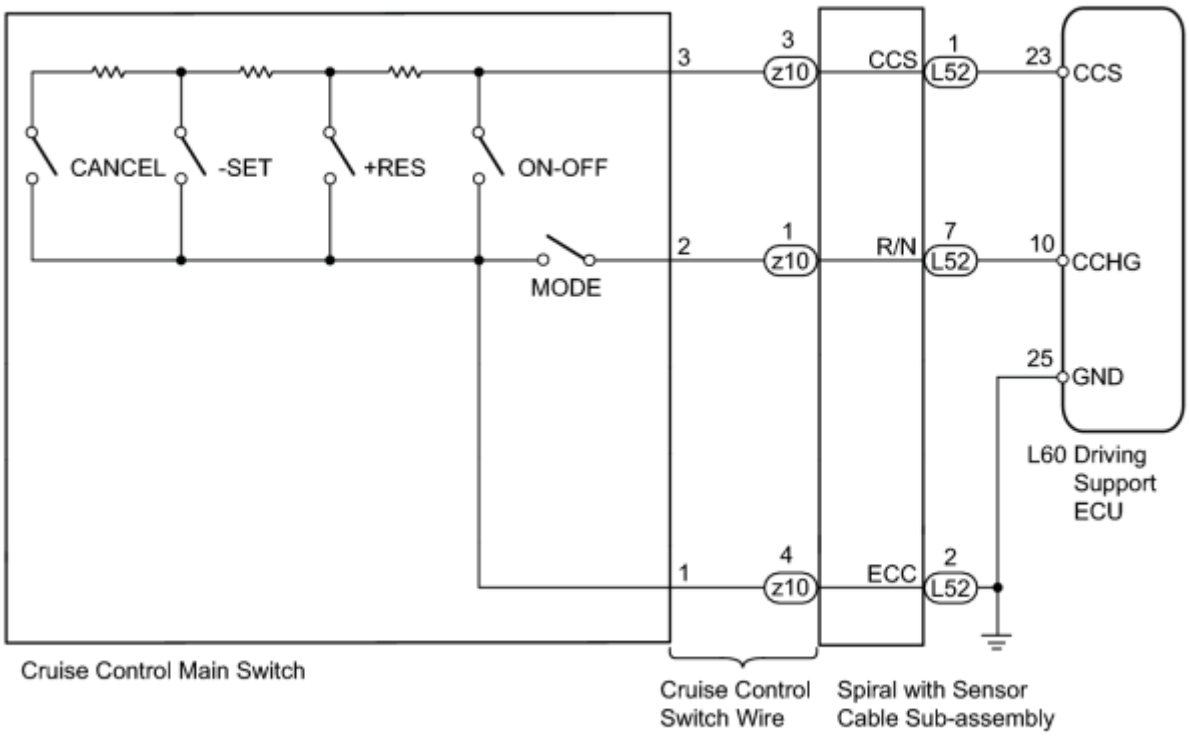
Cruise Control Switch Circuit

DESCRIPTION

The cruise control main switch operates 8 functions: SET, -(COAST), TAP-DOWN, RES (RESUME), + (ACCEL), TAP-UP, CANCEL, and MODE. The SET, TAP-DOWN, and - (COAST) functions, and the RES (RESUME), TAP-UP, and + (ACCEL) functions are operated with the same switch. The cruise control main switch is an automatic return type switch which turns on only while it is being operated it in the direction of each arrow and turns off after being released. The internal contact points of the cruise control main switch are turned on with the switch operation. The driving support ECU then reads the voltage value that has been changed by the switch operation to control MODE, SET, - (COAST), RES (RESUME), + (ACCEL), and CANCEL. The dynamic radar cruise control system has two cruise control modes: constant speed control mode and vehicle-to-vehicle distance control mode.

- Vehicle-to-vehicle distance control mode is always selected when starting up the dynamic radar cruise control system.
- The operation of constant speed control mode is the same as that for a conventional cruise control system.

WIRING DIAGRAM

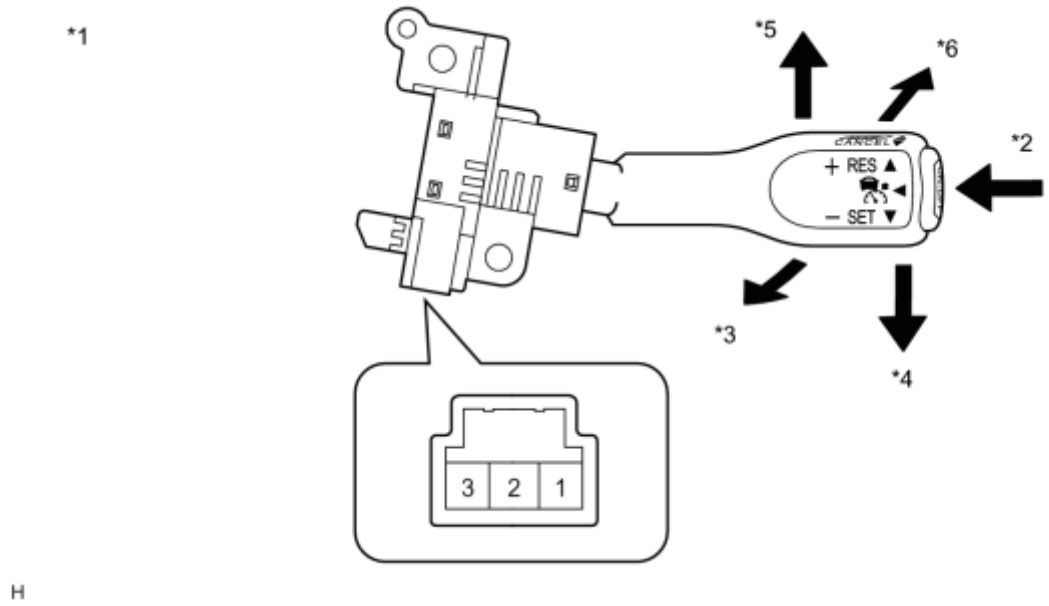


INSPECTION PROCEDURE

PROCEDURE

1.	INSPECT CRUISE CONTROL MAIN SWITCH

(a) Remove the cruise control main switch INFO.



Text in Illustration

*1	Component without harness connected (Cruise Control Main Switch)	*2	ON-OFF
*3	CANCEL	*4	-SET
*5	+RES	*6	MODE

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

Standard Resistance:

Tester Connection	Switch Condition	Specified Condition
1 - 2 1 - 3	Main switch off*1	1 MΩ or higher
1 - 3	Main switch on	Below 2.5 Ω
1 - 2	MODE	Below 2.5 Ω
1 - 3	+ RES	235 to 245 Ω

Tester Connection	Switch Condition	Specified Condition
1 - 3	- SET	617 to 643 Ω
1 - 3	CANCEL	1509 to 1571 Ω

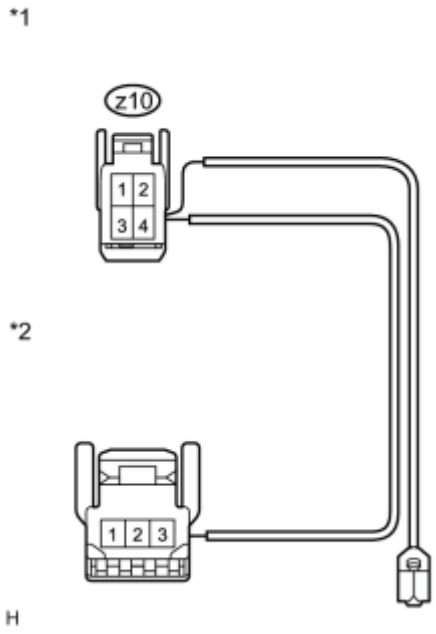
*1: The cruise control main switch lever is in the neutral position.

(c) Reinstall the cruise control main switch INFO.

NG ▶ REPLACE CRUISE CONTROL MAIN SWITCH

OK ▼

2.	CHECK HARNESS AND CONNECTOR (SPIRAL CABLE - CRUISE CONTROL MAIN SWITCH)



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

(b) Disconnect the connector from the cruise control main switch.

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

Standard Resistance:

Tester Connection	Condition	Specified Condition
Cruise control main switch side connector terminal 1 - z10-4	Always	Below 1 Ω
Cruise control main switch side connector terminal 2 - z10-1	Always	Below 1 Ω
Cruise control main switch side connector terminal 3 - z10-3	Always	Below 1 Ω

Text in Illustration

*1	Front view of wire harness connector (to Spiral with Sensor Cable Sub-assembly)

*2	Front view of wire harness connector (to Cruise Control Main Switch)

(d) Reconnect the connector to the spiral with sensor cable sub-assembly.

(e) Reconnect the connector to the cruise control main switch.

NG ▶ REPAIR OR REPLACE HARNESS OR CONNECTOR (SPIRAL CABLE SUB-ASSEMBLY - CRUISE CONTROL MAIN SWITCH)

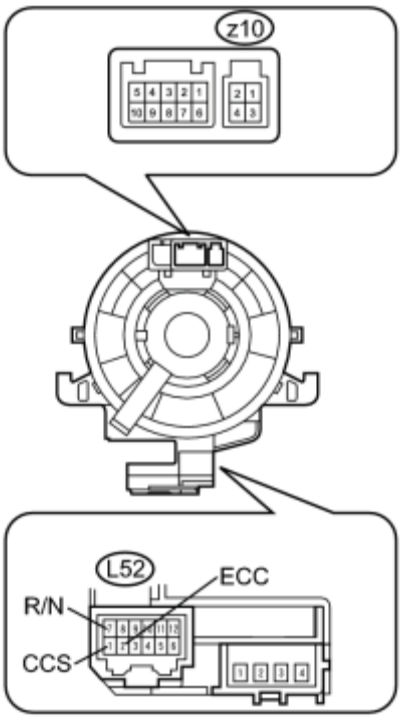
OK ▼

3.	INSPECT SPIRAL WITH SENSOR CABLE SUB-ASSEMBLY

NOTICE:

The spiral with sensor cable sub-assembly is an important part of the SRS airbag system. Incorrect removal or installation of the spiral with sensor cable sub-assembly may cause airbag deployment. Be sure to read the page shown in the brackets.

*1



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

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

Standard Resistance:

Tester Connection	Condition	Specified Condition
z10-1 - L52-7 (R/N)	The spiral with sensor cable sub-assembly is centered	Below 1 Ω
	The spiral with sensor cable sub-assembly position is 2.5 rotations to the left	
	The spiral with sensor cable sub-assembly position is 2.5 rotations to the right	
z10-3 - L52-1 (CCS)	The spiral with sensor cable sub-assembly is centered	Below 1 Ω
	The spiral with sensor cable sub-assembly position is 2.5 rotations to the left	
	The spiral with sensor cable sub-assembly position is 2.5 rotations to the right	
z10-4 - L52-2 (ECC)	The spiral with sensor cable sub-assembly is centered	Below 1 Ω
	The spiral with sensor cable sub-assembly position is 2.5 rotations to the left	
	The spiral with sensor cable sub-assembly position is 2.5 rotations to the right	

Text in Illustration

*1	Component without harness connected (Spiral with Sensor Cable Sub-assembly)

HINT:

The spiral with sensor cable sub-assembly makes a maximum of approximately 5 rotations.

(c) Install the spiral with sensor cable sub-assembly INFO.

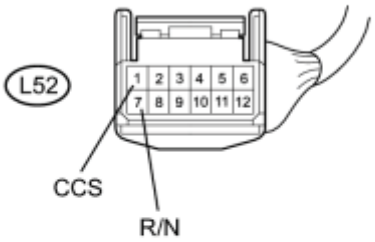
NG ▶ REPLACE SPIRAL WITH CABLE SUB-ASSEMBLY

OK ▼

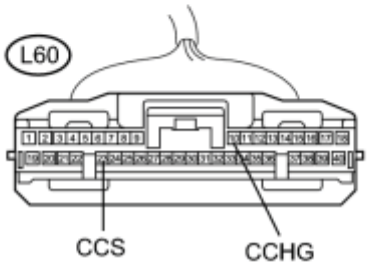
4.	CHECK HARNESS AND CONNECTOR (SPIRAL WITH SENSOR CABLE SUB-ASSEMBLY - DRIVING SUPPORT ECU)

(a) Disconnect the driving support ECU connector.

*1



*2



(b) Disconnect the spiral with sensor cable sub-assembly connector.

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

Standard Resistance (Check for Open):

Tester Connection	Condition	Specified Condition
L60-23 (CCS) - L52-1 (CCS)	Always	Below 1 Ω
L60-10 (CCHG) - L52-7 (R/N)	Always	Below 1 Ω

Standard Resistance (Check for Short):

Tester Connection	Condition	Specified Condition
L60-23 (CCS) or L52-1 (CCS) - Body ground	Always	10 kΩ or higher
L60-10 (CCHG) or L52-7 (R/N) - Body ground	Always	10 kΩ or higher

Text in Illustration

*1	Front view of wire harness connector (to Spiral with Sensor Cable Sub-assembly)
*2	Front view of wire harness connector (to Driving Support ECU)

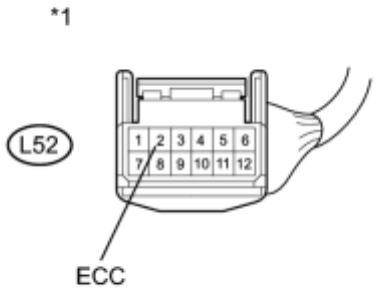
(d) Reconnect the driving support driving support ECU connector.

(e) Reconnect the spiral with sensor cable sub-assembly connector.

NG ▶ REPAIR OR REPLACE HARNESS OR CONNECTOR (SPIRAL WITH SENSOR CABLE SUB-ASSEMBLY - DRIVING SUPPORT ECU)

OK ▼

5.	CHECK HARNESS AND CONNECTOR (SPIRAL WITH SENSOR CABLE SUB-ASSEMBLY - BODY GROUND)



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

c

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

Standard Resistance (Check for Open):

Tester Connection	Condition	Specified Condition
L52-2 (ECC) - Body ground	Always	Below 1 Ω

Text in Illustration

*1	Front view of wire harness connector (to Spiral with Sensor Cable Sub-assembly)

(c) Reconnect the spiral with sensor cable sub-assembly connector.

NG ▶ REPAIR OR REPLACE HARNESS OR CONNECTOR (SPIRAL WITH SENSOR CABLE SUB-ASSEMBLY - BODY GROUND)

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

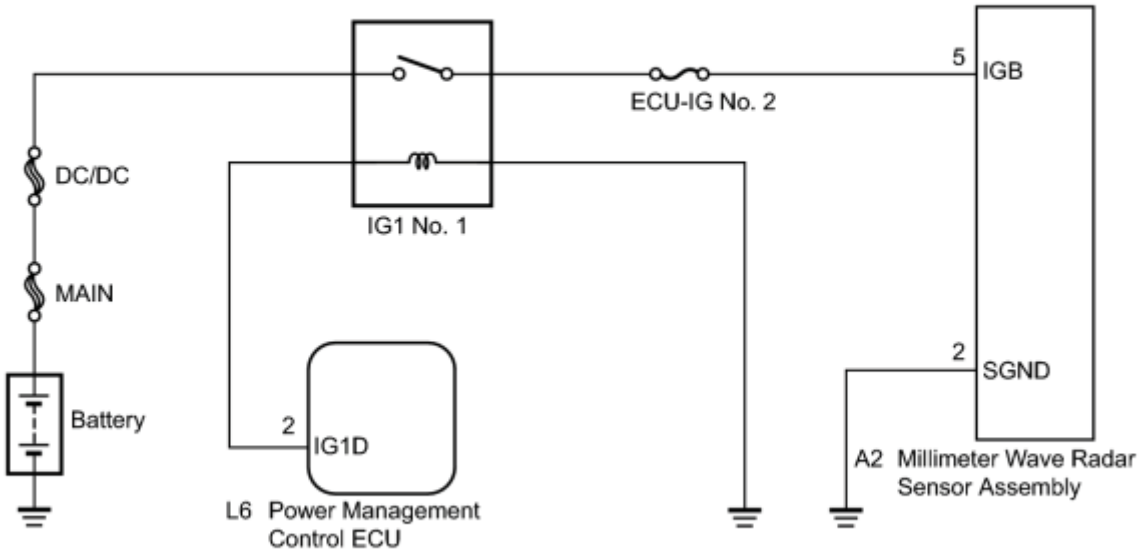
Millimeter Wave Radar Sensor Power Source Circuit

DESCRIPTION

When the power switch is turned on (IG), battery voltage is applied to terminal IGB of the millimeter wave radar sensor assembly.

This circuit provides power to the millimeter wave radar sensor. The millimeter wave radar sensor emits radio waves towards an object in front and measures the distance and direction of the object by receiving the beam reflections. Based on the reflections, the sensor calculates the difference in speed between the vehicle and the object in front. This data is transmitted to the distance control ECU.

WIRING DIAGRAM



INSPECTION PROCEDURE

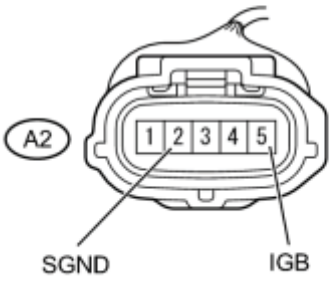
PROCEDURE

1.	CHECK MILLIMETER WAVE RADAR SENSOR ASSEMBLY (IGB VOLTAGE)

(a) Disconnect the millimeter wave radar sensor assembly connector.

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

*1



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

Standard Voltage:

Tester Connection	Condition	Specified Condition
A2-5 (IGB) - A2-2 (SGND)	Power switch on (IG)	10 to 14 V

Text in Illustration

*1	Front view of wire harness connector (to Millimeter Wave Radar Sensor Assembly)

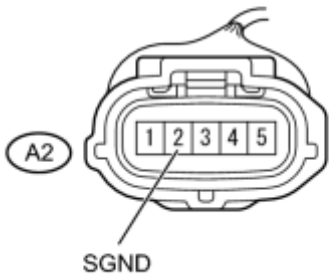
(d) Reconnect the millimeter wave radar sensor assembly connector.

NG ▶ CHECK HARNESS AND CONNECTOR (MILLIMETER WAVE RADAR SENSOR ASSEMBLY - BODY GROUND)

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

2.	CHECK HARNESS AND CONNECTOR (MILLIMETER WAVE RADAR SENSOR ASSEMBLY - BODY GROUND)

*1



(a) Disconnect the millimeter wave radar sensor assembly connector.

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

Standard Resistance (Check for Open):

Tester Connection	Condition	Specified Condition
A2-2 (SGND) - Body ground	Always	Below 1 Ω

Text in Illustration

*1	Front view of wire harness connector

	(to Millimeter Wave Radar Sensor Assembly)

(c) Reconnect the millimeter wave radar sensor assembly connector.

NG ▶ REPAIR OR REPLACE HARNESS OR CONNECTOR (MILLIMETER WAVE RADAR SENSOR ASSEMBLY - BODY GROUND)

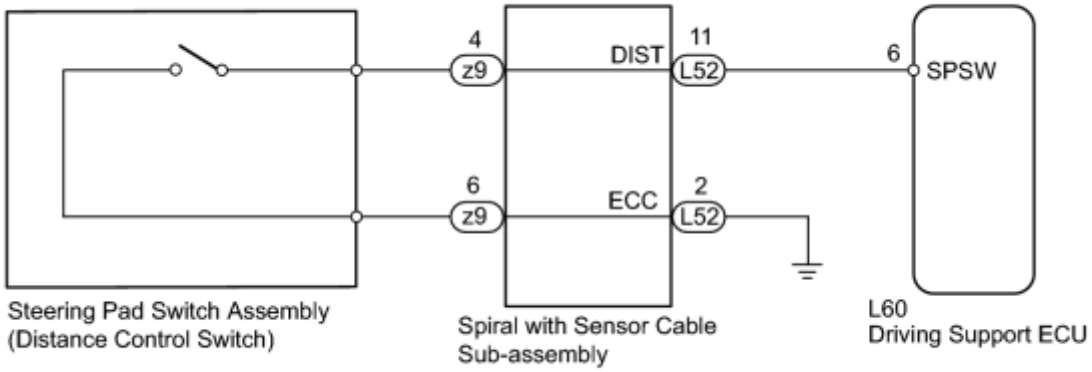
OK ▶ **REPAIR OR REPLACE HARNESS OR CONNECTOR (MILLIMETER WAVE RADAR SENSOR ASSEMBLY - IG1 NO. 1 RELAY)**

Distance Control Switch Circuit

DESCRIPTION

The distance control switch sets vehicle-to-vehicle distance control mode. The distance control switch is installed in the steering pad switch assembly. The vehicle-to-vehicle distance set value can be changed by operating the steering pad switch assembly (distance control switch) while the dynamic radar cruise control system is operating.

WIRING DIAGRAM



INSPECTION PROCEDURE

PROCEDURE

1.	READ VALUE USING TECHSTREAM (DISTANCE CONTROL SWITCH)

(a) Connect the Techstream to the DLC3.

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

(c) Turn the Techstream on.

(d) Enter the following menus: Powertrain / Cruise / Data List / Distance Control Switch.

(e) Check the Data List proper functioning of the distance control switch.

Radar Cruise:

Tester Display	Measurement Item/Range	Normal Condition	Diagnostic Note

Tester Display	Measurement Item/Range	Normal Condition	Diagnostic Note
Distance Control Switch	Distance control switch signal/ON or OFF	ON: Distance control switch on OFF: Distance control switch off	-

OK:

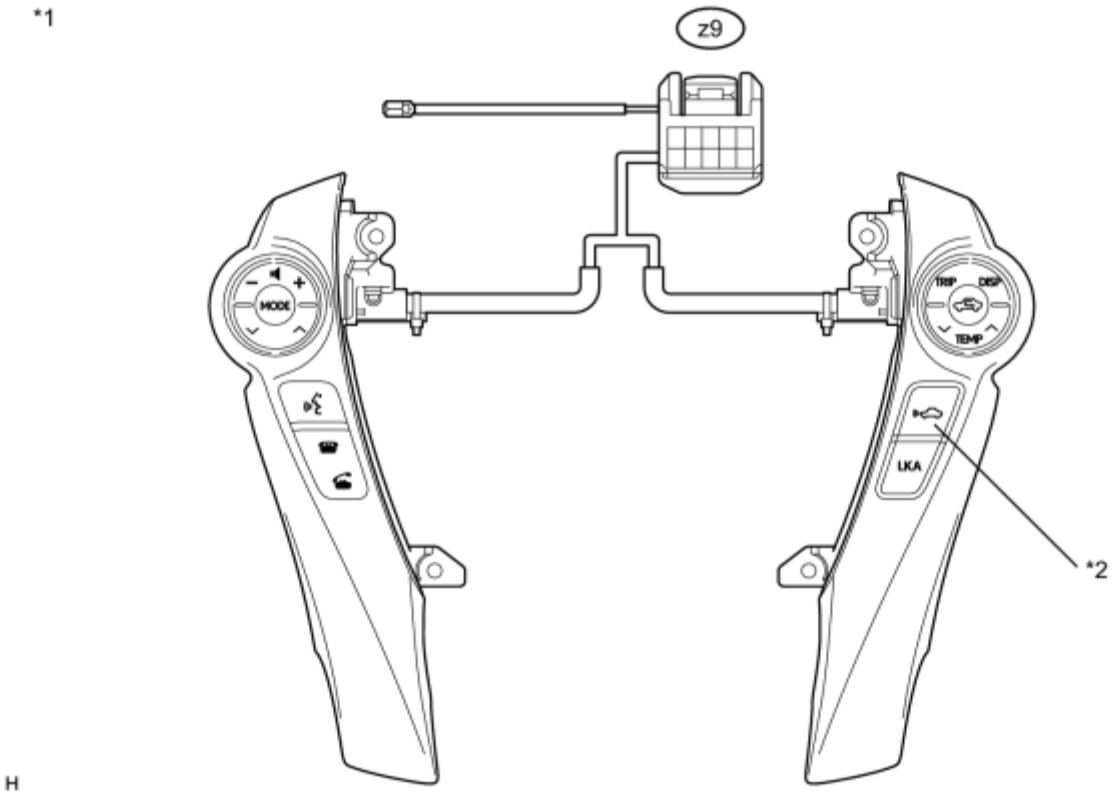
When the distance control switch is operated, the display changes in accordance with switch operation.

NG INSPECT STEERING PAD SWITCH ASSEMBLY

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

2.	INSPECT STEERING PAD SWITCH ASSEMBLY

(a) Remove the steering pad switch assembly INFO.



Text in Illustration

*1	Component without harness connected	*2	Distance Control Switch

	(Steering Pad Switch Assembly)		

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

Standard Resistance:

Tester Connection	Switch Condition	Specified Condition
z9-4 - z9-6	Distance control switch ON	Below 2.5 Ω
z9-4 - z9-6	Distance control switch OFF	10 kΩ or higher

(c) Install the steering pad switch assembly INFO.

NG ▶ REPLACE STEERING PAD SWITCH ASSEMBLY

OK

▼

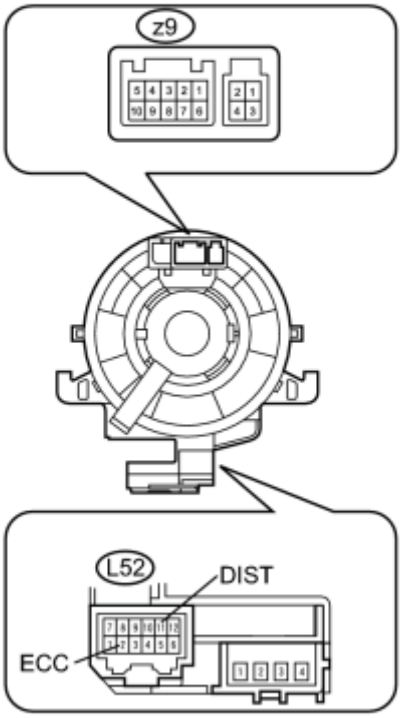
3.	INSPECT SPIRAL WITH SENSOR CABLE SUB-ASSEMBLY

NOTICE:

The spiral with sensor cable sub-assembly is an important part of the SRS airbag system. Incorrect removal or installation of the spiral with sensor cable sub-assembly may cause airbag deployment. Be sure to read the page shown in the brackets.

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

*1



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

Standard Resistance:

Tester Connection	Condition	Specified Condition
z9-4 - L52-11 (DIST)	The spiral with sensor cable sub-assembly is centered	Below 1 Ω
	The spiral with sensor cable sub-assembly position is 2.5 rotations to the left	
	The spiral with sensor cable sub-assembly position is 2.5 rotations to the right	
z9-6 - L52-2 (ECC)	The spiral with sensor cable sub-assembly is centered	Below 1 Ω
	The spiral with sensor cable sub-assembly position is 2.5 rotations to the left	
	The spiral with sensor cable sub-assembly position is 2.5 rotations to the right	

Text in Illustration

*1	Component without harness connected (Spiral with Sensor Cable Sub-assembly)

HINT:

The spiral with sensor cable sub-assembly makes a maximum of approximately 5 rotations.

(c) Install the spiral with sensor cable sub-assembly INFO.

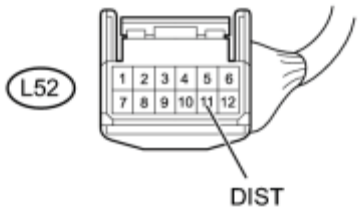
NG ▶ REPLACE SPIRAL WITH CABLE SUB-ASSEMBLY

OK

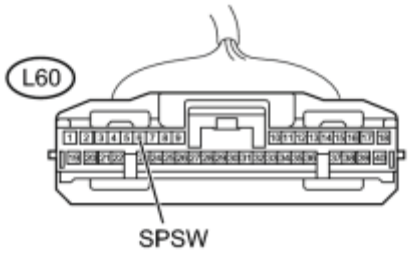
▼

4.	CHECK HARNESS AND CONNECTOR (SPIRAL WITH SENSOR CABLE SUB-ASSEMBLY - DRIVING SUPPORT ECU)

*1



*2



(a) Disconnect the driving support ECU connector.

(b) Disconnect the spiral with sensor cable sub-assembly connector.

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

Standard Resistance:

Tester Connection	Condition	Specified Condition

Tester Connection	Condition	Specified Condition
L60-6 (SPSW) - L52-11 (DIST)	Always	Below 1 Ω
L60-6 (SPSW) or L52-11 (DIST) - Body ground	Always	Below 1 Ω

Text in Illustration

*1	Front view of wire harness connector (to Spiral with Sensor Cable Sub-assembly)
*2	Front view of wire harness connector (to Driving Support ECU)

(d) Reconnect the driving support ECU connector.

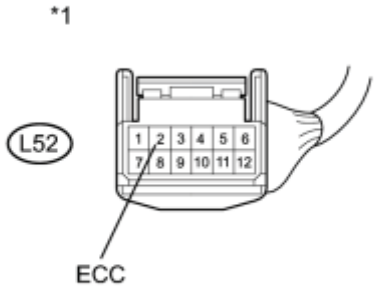
(e) Reconnect the spiral with sensor cable sub-assembly connector.

NG ▶ REPAIR OR REPLACE HARNESS OR CONNECTOR (SPIRAL WITH SENSOR CABLE SUB-ASSEMBLY - DRIVING SUPPORT ECU)

OK

▼

5.	CHECK HARNESS AND CONNECTOR (SPIRAL WITH SENSOR CABLE SUB-ASSEMBLY - BODY GROUND)



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

c

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

Standard Resistance (Check for Open):

Tester Connection	Condition	Specified Condition
L52-2 (ECC) - Body ground	Always	Below 1 Ω

Text in Illustration

*1	Front view of wire harness connector (to Spiral with Sensor Cable Sub-assembly)

(c) Reconnect the spiral with sensor cable sub-assembly connector.

NG ▶ REPAIR OR REPLACE HARNESS OR CONNECTOR (SPIRAL WITH SENSOR CABLE SUB-ASSEMBLY - BODY GROUND)

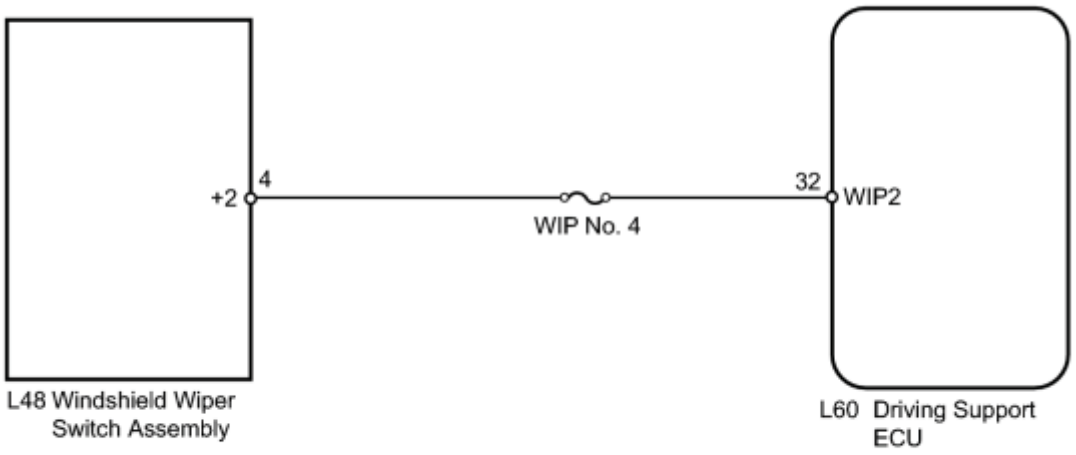
OK ▶ **REPLACE DRIVING SUPPORT ECU**

Wiper Signal Circuit

DESCRIPTION

When the driving support ECU detects that the wipers are operating at high speed, the dynamic radar cruise control system will be canceled.

WIRING DIAGRAM



INSPECTION PROCEDURE

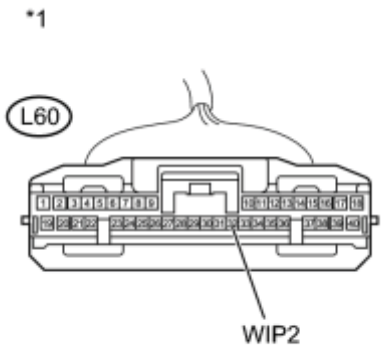
NOTICE:

Inspect the fuses for circuits related to this system before performing the following inspection procedure.

PROCEDURE

1.	INSPECT DRIVING SUPPORT ECU

(a) Disconnect the driving support ECU connector.



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

(c) Set the windshield wiper switch assembly to the HI position.

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

Standard Voltage:

Tester Connection	Condition	Specified Condition
L60-32 (WIP2) - Body ground	Power switch on (IG) Windshield wiper switch assembly Hi position	11 to 14 V

Text in Illustration

*1	Front view of wire harness connector (to Driving Support ECU)

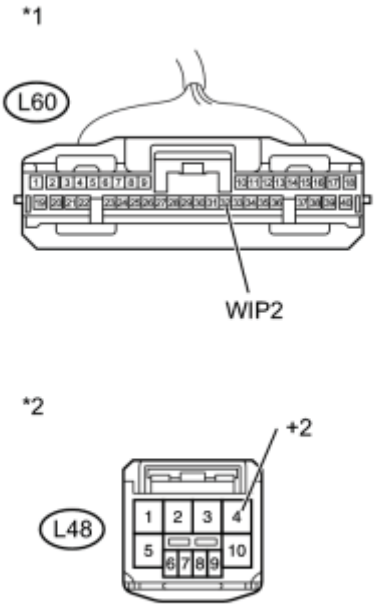
(e) Reconnect the driving support ECU connector.

NG ▶ CHECK HARNESS AND CONNECTOR (DRIVING SUPPORT CONTROL ECU - WINDSHIELD WIPER SWITCH)

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

2.	CHECK HARNESS AND CONNECTOR (DRIVING SUPPORT CONTROL ECU - WINDSHIELD WIPER SWITCH)

(a) Disconnect the driving support ECU connector.



(b) Disconnect the windshield wiper switch assembly connector.

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

Standard Resistance (Check for Open):

Tester Connection	Condition	Specified Condition
L60-32 (WIP2) - L48-4 (+2)	Always	Below 1 Ω

Standard Resistance (Check for Open):

Tester Connection	Condition	Specified Condition
L60-32 (WIP2) or L48-4 (+2) - Body ground	Always	10 kΩ or higher

Text in Illustration

*1	Front view of wire harness connector (to Driving Support ECU)
*2	Front view of wire harness connector (to Windshield Wiper Switch Assembly)

(d) Reconnect the driving support ECU connector.

(e) Reconnect the windshield wiper switch assembly connector.

NG ▶ REPAIR OR REPLACE HARNESS OR CONNECTOR (DRIVING SUPPORT CONTROL ECU - WINDSHIELD WIPER SWITCH)

OK ▶ **GO TO WIPER AND WASHER SYSTEM**

Cruise Main Indicator Light Circuit

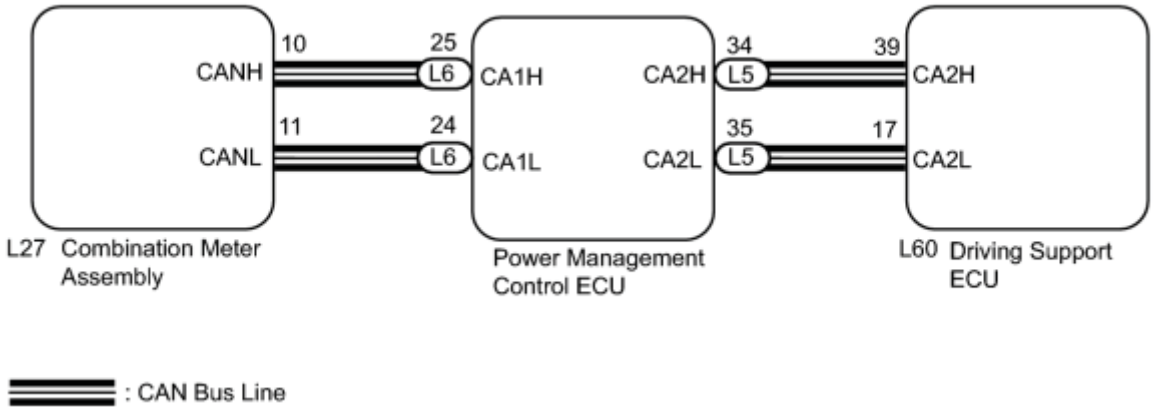
DESCRIPTION

When the cruise control main switch is turned on, the cruise main indicator light and "RADAR READY" indicator come on. This indicates the control condition (presence or absence of a vehicle in front, vehicle-to-vehicle distance, and set vehicle speed) and fail-safe state through the CAN communication system. The master warning light and cruise main indicator light come on and vehicle-to-vehicle distance information is displayed on the combination meter assembly as the alarm buzzer sounds. Items such as "Clean Radar Sensor", "Cruise not Available", "Check Cruise System", and "Radar Cruise Ready" are displayed on the multi-information display on the combination meter assembly when the driving support ECU detects signals from each sensor and actuator and sends them to the combination meter assembly via CAN.

HINT:

If the vehicle in front in the same lane significantly decreases vehicle speed or another vehicle moves in front of your vehicle, adequate deceleration cannot be applied by the cruise control system and the vehicle-to-vehicle distance will shorten. At this time, the system sounds the buzzer and the master warning light blinks to warn the driver. Each indicator in the dynamic radar cruise control uses CAN for communication. Therefore, if there are any malfunctions in this circuit, check for DTCs in the CAN communication system before troubleshooting this circuit.

WIRING DIAGRAM



INSPECTION PROCEDURE

PROCEDURE

1.	PERFORM ACTIVE TEST 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 Electrical / Combination Meter / Active Test.

(e) Check the cruise main indicator light by performing Active Test.

Combination Meter

Tester Display	Test Part	Control Range	Diagnostic Note
Indicat. Lamp Cruise	Cruise main indicator light (Constant speed control mode)	OFF or ON	Confirm that the vehicle is stopped with engine idling
Indicat. Radar Cruise	Cruise main indicator light (Vehicle-to-vehicle distance control mode)	OFF or ON	Confirm that the vehicle is stopped with engine idling

OK:

The display changes in accordance with Active Test operation.

NG ▶ REPLACE NO. 3 METER CIRCUIT PLATE

OK

▼

2.	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: Powertrain / Radar Cruise / Data List.

(e) Check the Data List for proper functioning of the cruise main indicator light.

Radar Cruise

Techstream Display	Measurement Item/Range	Normal Condition	Diagnostic Note
Cruise Control Main Switch	Cruise control switch signal/ON or OFF	ON: Main switch on OFF: Main switch off	-

OK:

When the cruise control main switch is operated, the display changes in accordance with switch operation.

NG ▶ REPLACE DRIVING SUPPORT ECU

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

Cruise SET Indicator Light Circuit

DESCRIPTION

- The driving support ECU detects a cruise control switch signal and sends it to the combination meter assembly through CAN. Then the SET indicator light comes on.
- The SET indicator light circuit uses CAN for communication. If there is a malfunction in this circuit, check for DTCs in the CAN communication system before troubleshooting this circuit.

WIRING DIAGRAM

Refer to "Cruise Main Indicator Light Circuit" INFO.

INSPECTION PROCEDURE

PROCEDURE

1.	PERFORM ACTIVE TEST 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 Electrical / Combination Meter / Active Test.

(e) Check the SET indicator light by performing the Active Test.

Combination Meter

Tester Display	Test Part	Control Range	Diagnostic Note
Indicat. Lamp SET	CRUISE SET indicator light	SET indicator light BLINK / OFF	-

OK:

The SET indicator light blinks or goes off according to Techstream operation.

NG ▶ REPLACE NO.3 METER CIRCUIT PLATE
OK ▼

2.	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: Powertrain / Radar Cruise / Data List.

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

Radar Cruise

Tester Display	Measurement Item/Range	Normal Condition	Diagnostic Note
SET/COAST Switch	- SET switch / ON or OFF	ON: - SET switch ON OFF: - SET switch off	-

OK:

The display changes as shown above according to cruise control main switch operation.

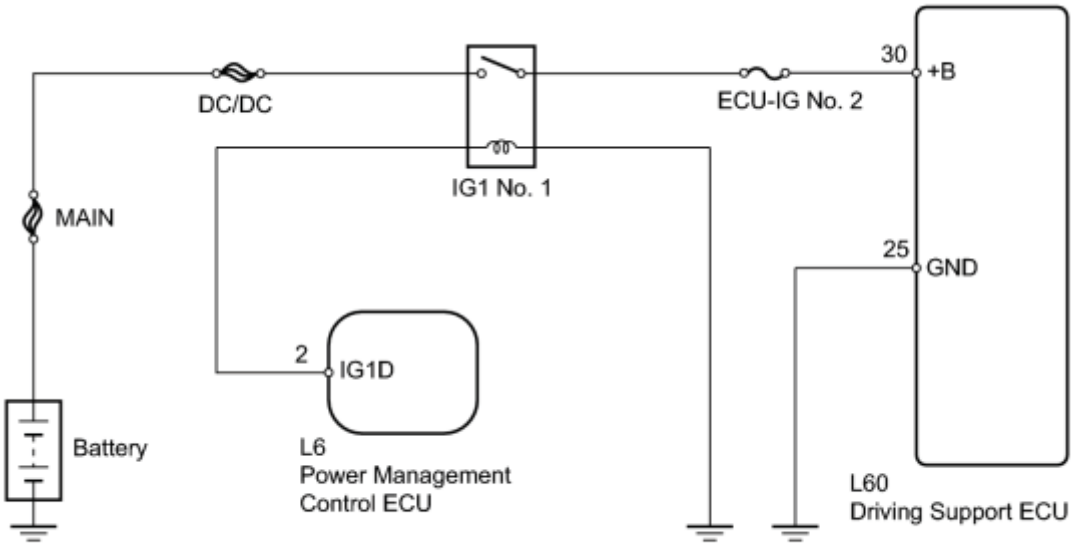
NG ▶ REPLACE DRIVING SUPPORT ECU
OK ▶ **PROCEED TO NEXT SUSPECTED AREA SHOWN IN PROBLEM SYMPTOMS TABLE**

ECU Power Source Circuit

DESCRIPTION

- The driving support ECU assembly controls the cruise control system based on information sent from switches, sensors and ECUs.
- The power management control ECU sends current to the IG1 No. 1 relay. This closes the contact points in the relay so that power is supplied to the driving support ECU +B terminal.

WIRING DIAGRAM



INSPECTION PROCEDURE

NOTICE:

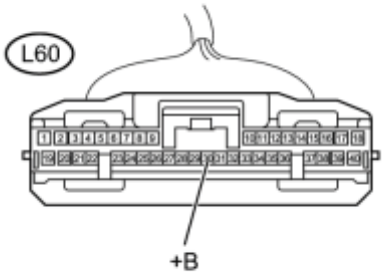
Inspect the fuses for circuits related to this system before performing the following inspection procedure.

PROCEDURE

1.	CHECK DRIVING SUPPORT ECU (+B VOLTAGE)

(a) Disconnect the driving support ECU connector.

*1



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

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

Standard Voltage:

Tester Connection	Switch Condition	Specified Condition
L60-30 (+B) - Body ground	Power switch on (IG)	11 to 14 V

Text in Illustration

*1	Front view of wire harness connector (to Driving Support ECU)

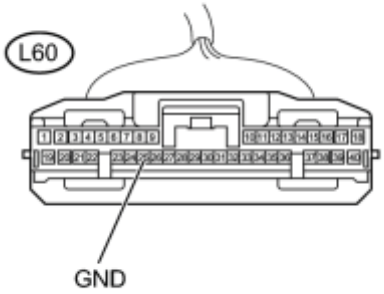
(d) Reconnect the driving support ECU connector.

NG ▶ INSPECT INSTRUMENT PANEL JUNCTION BLOCK ASSEMBLY

OK ▼

2.	CHECK HARNESS AND CONNECTOR (DRIVING SUPPORT ECU - BODY GROUND)

*1



(a) Disconnect the driving support ECU connector.

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

Standard Resistance (Check for Open):

Tester Connection	Condition	Specified Condition
L60-25 (GND) - Body ground	Always	Below 1 Ω

Text in Illustration

*1	Front view of wire harness connector (to Driving Support ECU)

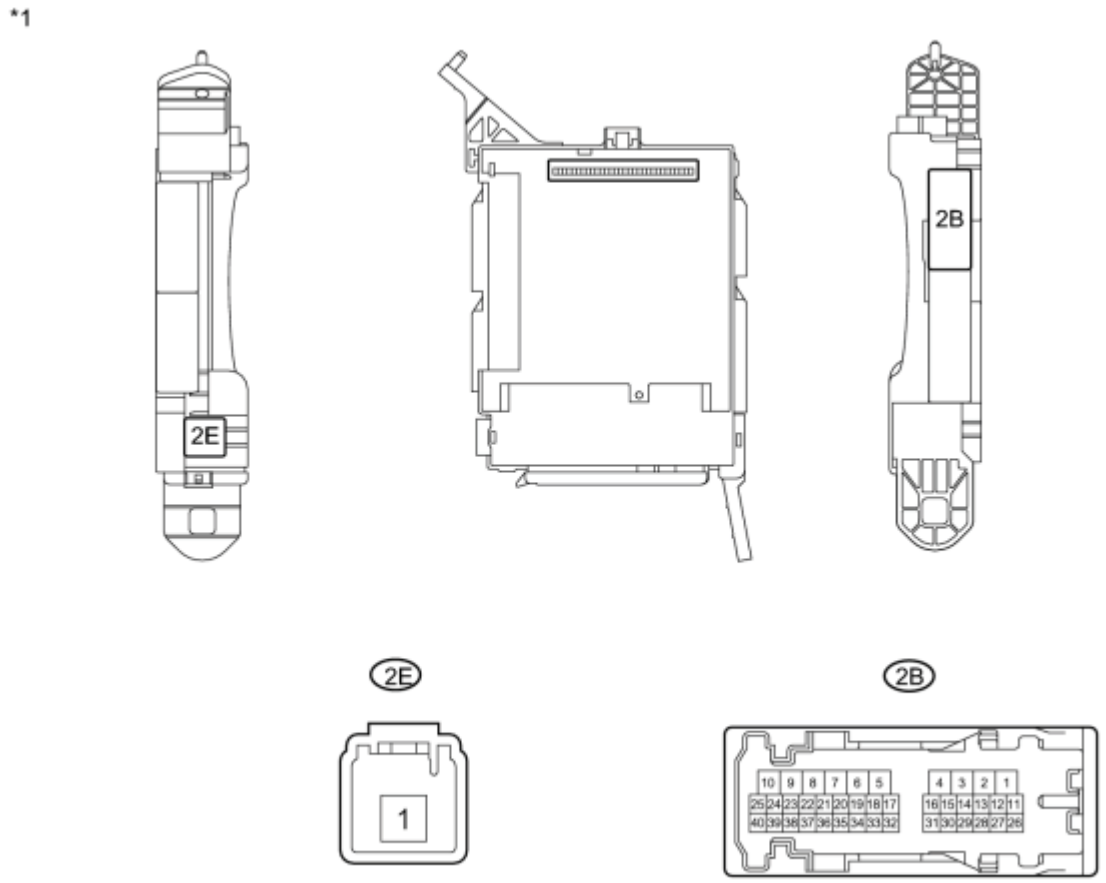
(c) Reconnect the driving support ECU connector.

NG ▶ REPAIR OR REPLACE HARNESS OR CONNECTOR (DRIVING SUPPORT ECU - BODY GROUND)

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

3.	INSPECT INSTRUMENT PANEL JUNCTION BLOCK ASSEMBLY

(a) Remove the instrument panel junction block assembly.



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

Standard Resistance:

Tester Connection	Condition	Specified Condition
2E-1 - 2B-16	Always	10 kΩ or higher
2E-1 - 2B-16	Battery voltage applied between terminals 2B-25 and 2B-6	Below 1 Ω

Text in Illustration

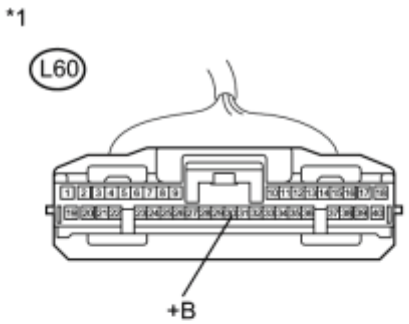
*1	Instrument Panel Junction Block Assembly	-	-

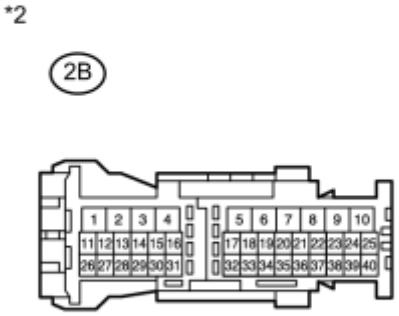
(c) Reinstall the instrument panel junction block assembly.

NG ▶ REPLACE INSTRUMENT PANEL JUNCTION BLOCK ASSEMBLY

OK ▼

4.	CHECK HARNESS AND CONNECTOR (DRIVING SUPPORT ECU - INSTRUMENT PANEL JUNCTION BLOCK)





(a) Disconnect the driving support ECU connector.

(b) Disconnect the instrument panel junction block assembly connector.

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

Standard Resistance:

Tester Connection	Condition	Specified Condition
L60-30 (+B) - 2B-16	Always	Below 1 Ω

Text in Illustration

*1	Front view of wire harness connector (to Driving Support ECU)
*2	Instrument Panel Junction Block

(d) Reconnect the instrument panel junction block assembly connector.

(e) Reconnect the driving support ECU connector.

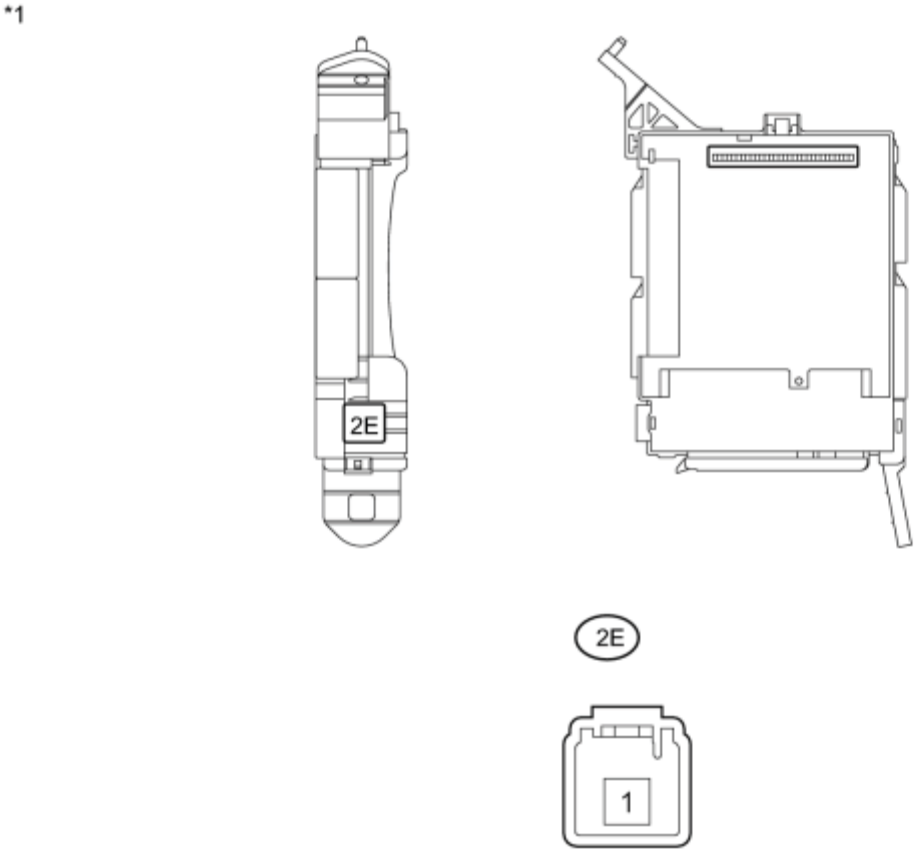
NG ▶ REPAIR OR REPLACE HARNESS OR CONNECTOR (DRIVING SUPPORT ECU - INSTRUMENT

PANEL JUNCTION BLOCK)

OK

5.	CHECK HARNESS AND CONNECTOR (INSTRUMENT PANEL JUNCTION BLOCK POWER SOURCE CIRCUIT)

(a) Disconnect the instrument panel junction block assembly connector.



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

Standard Voltage:

Tester Connection	Switch Condition	Specified Condition
2E-1 - Body ground	Always	11 to 14 V

Text in Illustration

*1	Instrument Panel Junction Block Assembly	-	-

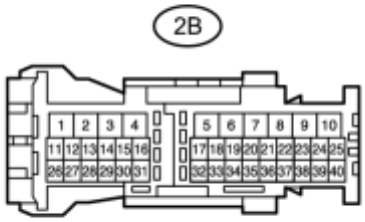
(c) Reconnect the instrument panel junction block assembly connector.

NG ▶ REPAIR OR REPLACE HARNESS OR CONNECTOR (INSTRUMENT PANEL JUNCTION BLOCK ASSEMBLY - BATTERY)

OK ▼

6.	CHECK HARNESS AND CONNECTOR (INSTRUMENT PANEL JUNCTION BLOCK ASSEMBLY - BODY GROUND)

*1



(a) Disconnect the instrument panel junction block assembly connector.

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

Standard Resistance:

Tester Connection	Condition	Specified Condition
2B-6 - Body ground	Always	Below 1 Ω

Text in Illustration

*1	Instrument Panel Junction Block Assembly

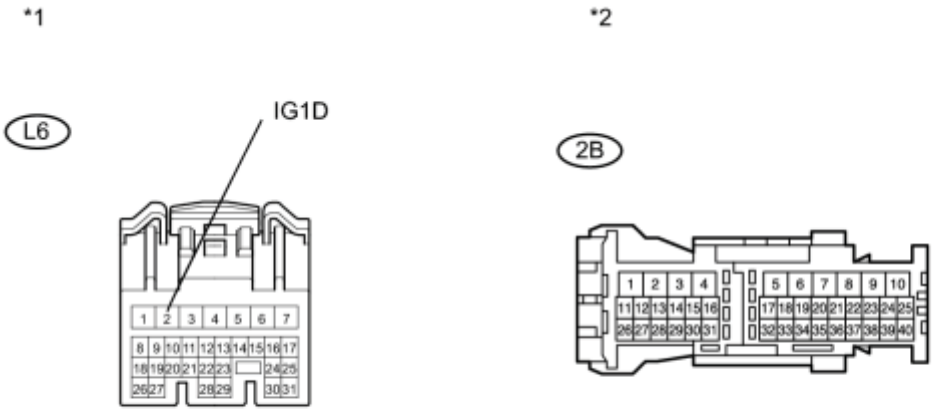
(c) Reconnect the instrument panel junction block assembly connector.

NG ▶ REPAIR OR REPLACE HARNESS OR CONNECTOR (INSTRUMENT PANEL JUNCTION BLOCK ASSEMBLY - BODY GROUND)

OK ▼

7.	CHECK HARNESS AND CONNECTOR (POWER MANAGEMENT CONTROL ECU - INSTRUMENT PANEL J/B ASSEMBLY)

(a) Disconnect the power management control ECU connector.



Text in Illustration

*1	Front view of wire harness connector (to Power Management Control ECU)	*2	Instrument Panel Junction Block Assembly

(b) Disconnect the instrument panel junction block assembly connector.

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

Standard Resistance (Check for Open):

Tester Connection	Condition	Specified Condition
2B-25 - L6-2 (IG1D)	Always	Below 1 Ω

Standard Resistance (Check for Short):

Tester Connection	Condition	Specified Condition
2B-25 or L6-2 (IG1D) - Body ground	Always	10 kΩ or higher

(d) Reconnect the power management control ECU connector.

(e) Reconnect the instrument panel junction block assembly connector.

NG ▶ REPAIR OR REPLACE HARNESS OR CONNECTOR (POWER MANAGEMENT CONTROL ECU - INSTRUMENT PANEL J/B ASSEMBLY)

OK ▶ **GO TO SMART KEY SYSTEM**

TC and CG Terminal Circuit

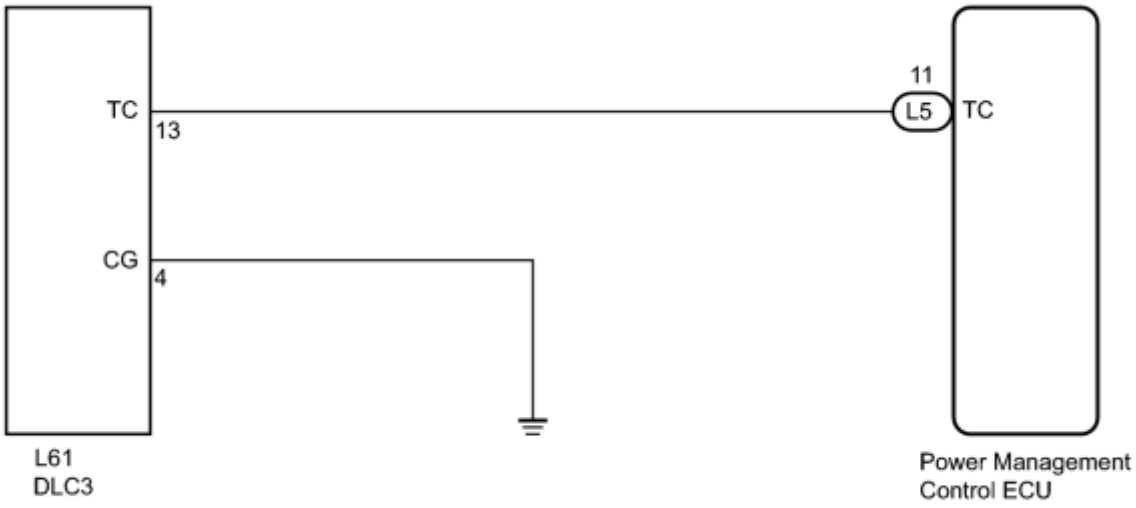
DESCRIPTION

Connecting terminals TC and CG of the DLC3 causes the system to enter self-diagnostic mode. If a malfunction is present, the cruise main indicator light will blink.

HINT:

When a particular warning light remains blinking, a ground short in the wiring of terminal TC of the DLC3 or an internal ground short in the relevant ECU is suspected.

WIRING DIAGRAM

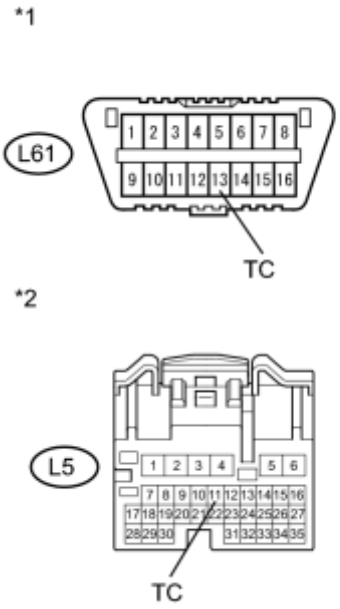


INSPECTION PROCEDURE

PROCEDURE

1.	CHECK HARNESS AND CONNECTOR (TERMINAL TC of DLC3 - ECM)

(a) Disconnect the power management control ECU connector.



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

Standard Resistance:

Tester Connection	Condition	Specified Condition
L5-11 (TC) - L61-13 (TC)	Always	Below 1 Ω

Text in Illustration

*1	DLC3
*2	Front view of wire harness connector (to Power Management Control ECU)

(c) Reconnect the power management control ECU connector.

NG ▶ REPAIR OR REPLACE HARNESS OR CONNECTOR (DLC3 - POWER MANAGEMENT CONTROL ECU)

OK

▼

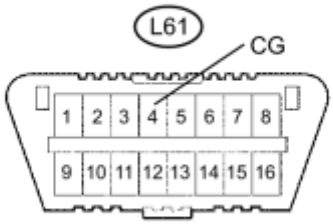
2.	CHECK HARNESS AND CONNECTOR (TERMINAL CG of DLC3 - BODY GROUND)

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

Standard Resistance:

Tester Connection	Condition	Specified Condition
L61-4 (CG) - Body ground	Always	Below 1 Ω

*1



Text in Illustration

*1	DLC3

NG ▶ REPAIR OR REPLACE HARNESS OR CONNECTOR (DLC3 - BODY GROUND)

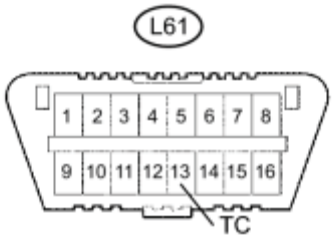
OK

▼

3.	CHECK HARNESS AND CONNECTOR (TERMINAL TC of DLC3 - BODY GROUND)

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

*1



Standard Resistance:

Tester Connection	Condition	Specified Condition
L61-13 (TC) - Body ground	Always	10 kΩ or higher

Text in Illustration

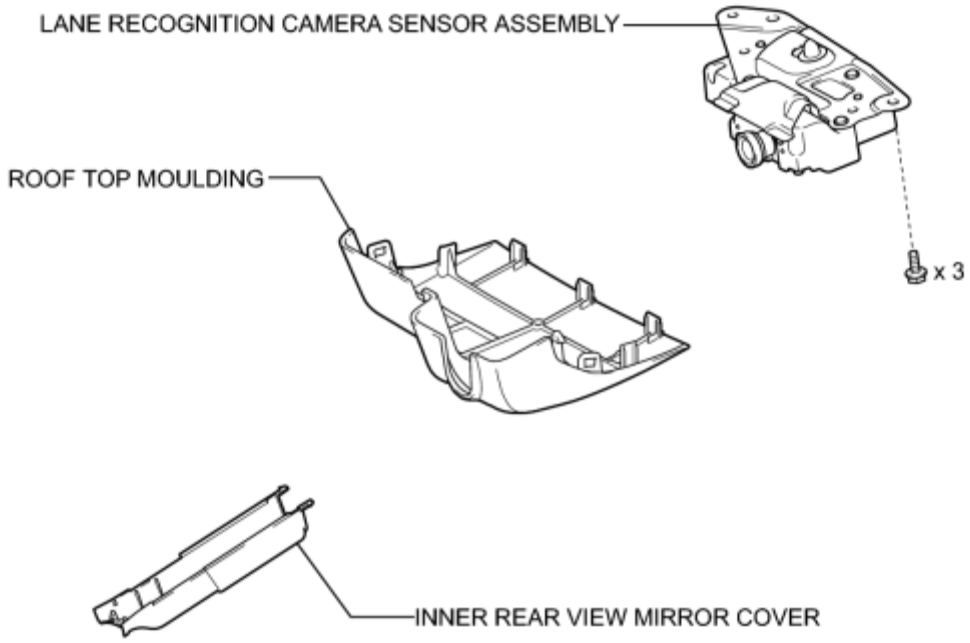
*1	DLC3

NG ▶ REPAIR OR REPLACE HARNESS OR CONNECTOR OR EACH ECU

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

COMPONENTS

ILLUSTRATION

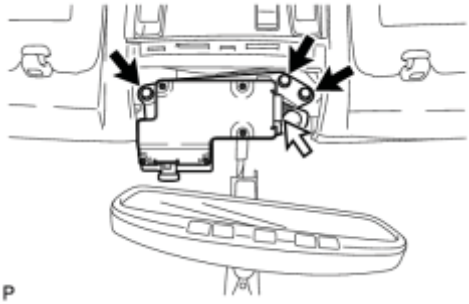


P

REMOVAL

1. REMOVE INNER REAR VIEW MIRROR COVER INFO

2. REMOVE ROOF TOP MOULDING INFO



3. REMOVE LANE RECOGNITION CAMERA SENSOR ASSEMBLY

(a) Disconnect the connector.

(b) Remove the 3 bolts.

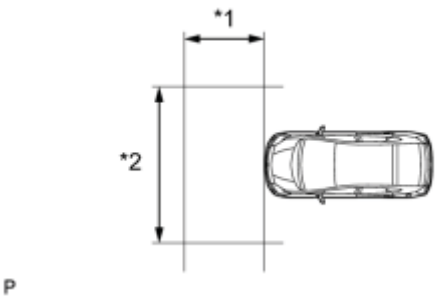
(c) Detach the clip and remove the lane recognition camera sensor assembly.

ADJUSTMENT

HINT:

If the lane recognition camera sensor is replaced or removed and installed, or the toe-in is adjusted, perform the lane recognition camera sensor adjustment.

1. ADJUST LANE RECOGNITION CAMERA SENSOR ASSEMBLY



Text in Illustration

*1	1.5 m or more
*2	3 m or more

- Make sure there are no black and white patterned objects in front of the vehicle.
- Be sure to perform the measurement on a level surface that is free of obstacles and extends 1.5 m (4.92 ft.) or more in front of the vehicle.
- Make sure that there is no wind when performing the measurement.
- Check that there are no reflective materials in the surroundings or on the ground within a 3 m (9.84 ft.) x 3 m (9.84 ft.) area in front of the vehicle.
- Perform the inspection in a bright area.

(a) Prepare for beam axis learning.

(1) Move the vehicle to a level surface.

(2) Make sure the engine oil in the vehicle is at the specified level.

(3) Make sure the engine coolant in the vehicle is at the specified level.

(4) Make sure the fuel tank is full.

(5) Make sure the spare tire is in the vehicle.

(6) Make sure the standard tools are in the vehicle.

(7) Make sure nobody is in the vehicle.

(8) Make sure no extra loads are in the vehicle.

(9) Adjust the tire pressures to the specified pressure.

(10) Clean the windshield.

(11) If the lens of the lane recognition camera sensor is dirty, apply a small amount of lens cleaner to a clean and soft cloth, and clean the lens.

(b) Perform the front wheel alignment adjustment.

(1) Perform the front wheel alignment adjustment INFO.

NOTICE:

Perform this procedure as accurately as possible.

(c) Perform the rear wheel alignment adjustment.

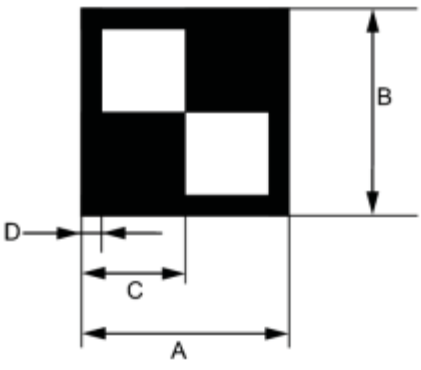
(1) Perform the rear wheel alignment adjustment INFO.

NOTICE:

- Perform this procedure as accurately as possible.

(d) Create a target sheet.

(1) Print or copy the illustration . Check that the dimensions are +/- 5 mm (0.197 in.) of the ones in the table below.



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Dimension:

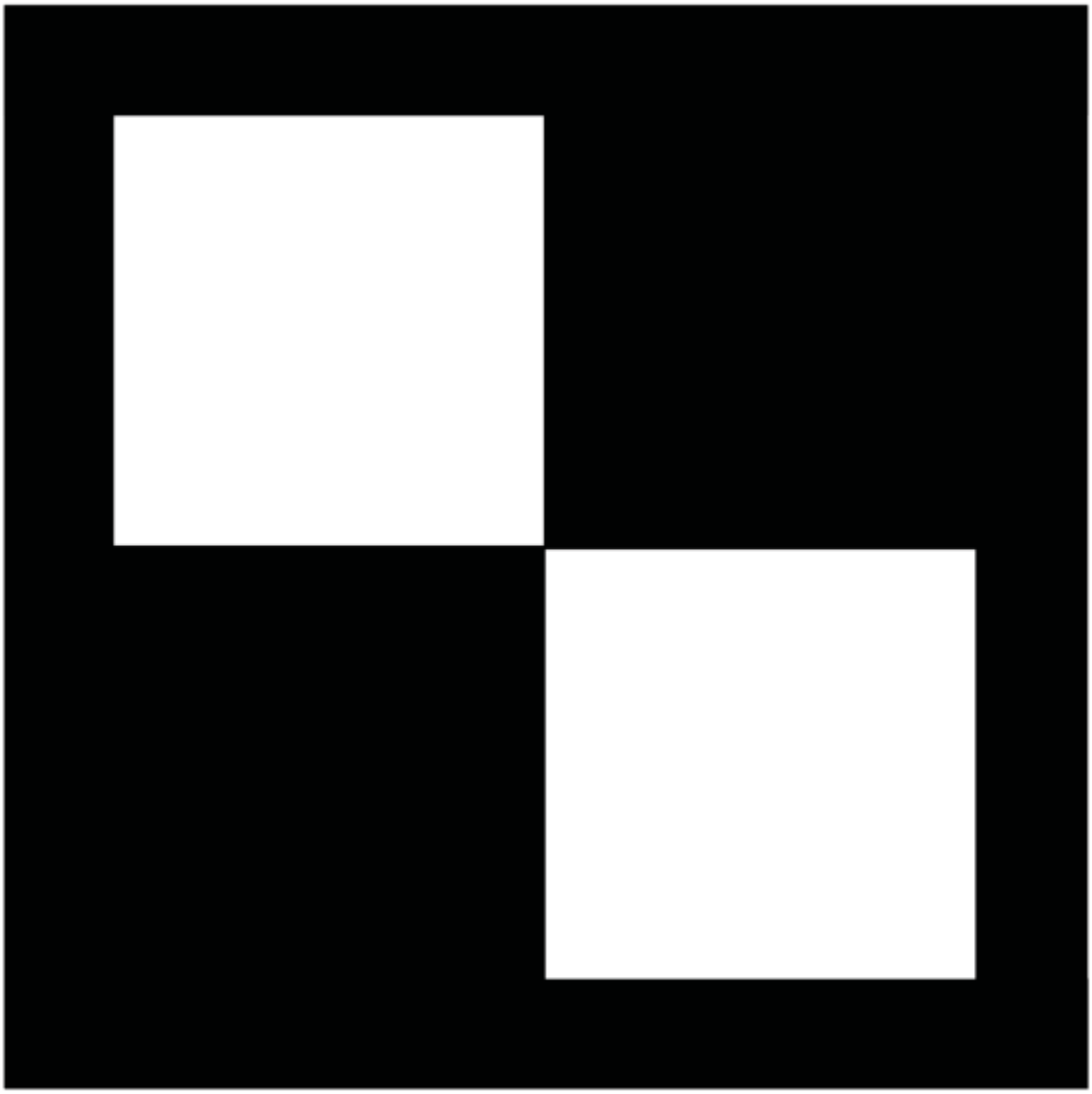
Area	Specification
A	160 mm (6.30 in.)
B	160 mm (6.30 in.)
C	80 mm (3.15 in.)

Area	Specification
D	16 mm (0.630 in.)

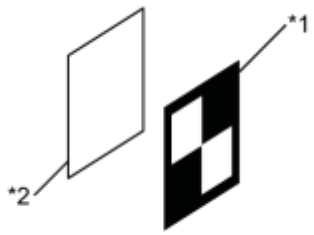
NOTICE:

- Make sure that the black areas of the target sheet it not glossy.
- Make sure that the borders of the black and white areas on the target sheet it straight, and are not warped or blurry.

If the print or copy's dimensions are not as specified, adjust settings and reprint or recopy so that the print or copy's dimensions are as specified.



(e) Attach the target sheet.



P

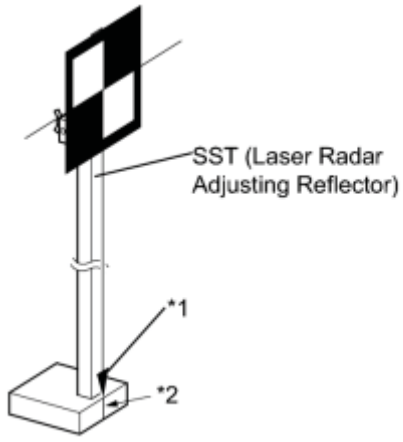
Text in Illustration

*1	Target Sheet
*2	Cardboard, etc.

(1) Place the prepared target sheet on a piece of cardboard of the same size with the black area on the top right, as shown in the illustration. Then use double-sided tape to fix the target sheet in place.

NOTICE:

Do not attach reflective tape, such as transparent adhesive tape, etc. to the target face, as this may affect target recognition.



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(2) Hang a weight with a pointed tip from the center of the target sheet. Then, with double-sided tape, attach the target sheet to the reflector so that the weight aligns with the mark-off line of SST (laser radar adjusting reflector).

SST: 09870-60000

09870-60010

09870-60020

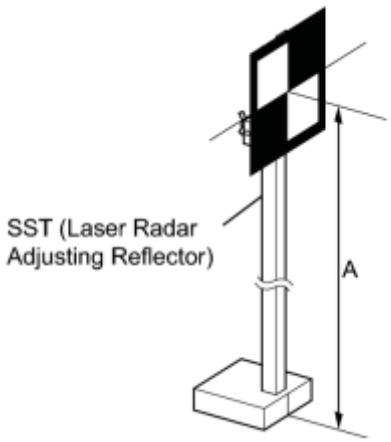
Text in Illustration

*1	Pointed Tip Weight
*2	Mark-off Line

- Perform this procedure as accurately as possible.
- Attach the target sheet so that it is horizontal with the ground.

(3) Move the reflector up and down to position the center of the target at the height shown in the illustration, and fix it in place.

Dimension A:



P

986 mm (3.23 ft.)

SST: 09870-60000

09870-60010

09870-60020

NOTICE:

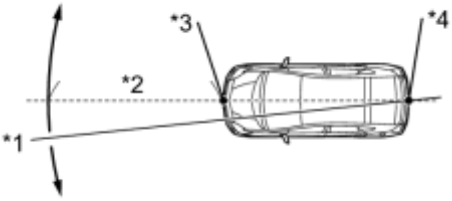
Perform this procedure as accurately as possible.

(f) Measure the target placement point.

NOTICE:

- Do not place black and white patterned objects near the target.
- Face the vehicle toward a wall with no patterns, or make sure the background behind the target has no patterns.
- Perform this procedure as accurately as possible.
- Do not place reflective materials in the area behind the target.
- Make sure the distance between the target and wall is within 3 m (9.84 ft.).
- Make sure the target's shadow is not on the wall, as the camera may have a recognition error.

(1) From the center of the front and back bumpers (center of the emblems), hang a weight with a pointed tip, and mark the front bumper center point A and the rear bumper center point B on the ground.



P

Text in Illustration

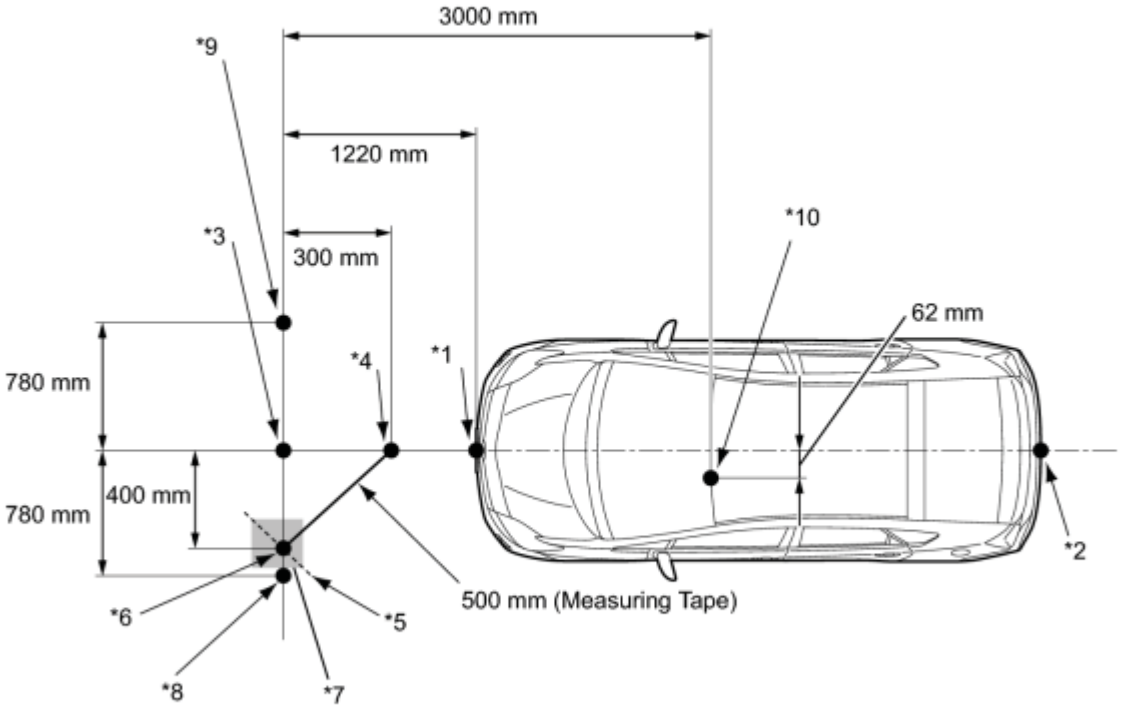
*1	Line
*2	Approx. 2 m
*3	Point A
*4	Point B

(2) Draw a line that connects points A and B, and extend the line approximately 2 m (6.56 ft.) beyond the front of the vehicle.

HINT:

Secure the end of a string to point B. Then hold the other end of the string approximately 2 m (6.56 ft.) in front of the vehicle, and move it to the left or right to align the string with point A to make a straight line.

(3) Mark point C 1220 mm (4.00 ft.) from the front bumper center point A (placement point 1).



P

Text in Illustration

*1	Point A	*2	Point B
*3	Placement Point 1 Point C	*4	Point D
*5	Line E	*6	Point F
*7	Place Tape (Gray Area) Approx. 400 mm from Point C	*8	Placement Point 2 Point G
*9	Placement Point 3 Point H	*10	Lane Recognition Camera Sensor Position

(4) From point C, move 300 mm (11.8 in.) towards the front bumper center point A and mark point D.

(5) From point C, place marking tape at the point 400 mm (1.30 ft.) perpendicular to the line that connects points A and B.

NOTICE:

Place the tape so that there is plenty of surface area along the perpendicular line.

(6) Using a measuring tape of 5 m (16.41 ft.) or more, and point D as the center point, draw the part of a 500 mm (1.64 ft.) circle that overlaps the marking tape (line E).

(7) Mark point F where the following intersect: 1) from point C, the point that is 400 mm (1.30 ft.) perpendicular from the line that connects point A and B; and 2) line E.

(8) Set the measuring tape from point C to F. Then mark point G 780 mm (2.56 ft.) from point C (line extending from point C to F) (placement point 2).

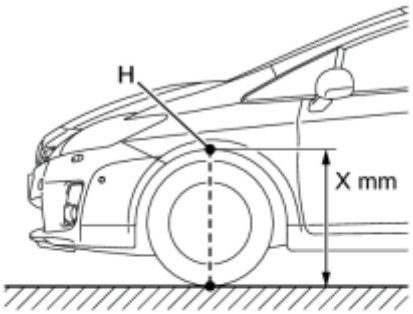
(9) Set the measuring tape from point F to C. Then mark point H 780 mm (2.56 ft.) beyond point C (placement point 3).

(10) Set a string between points G and H, and draw a line on the ground (target placement line).

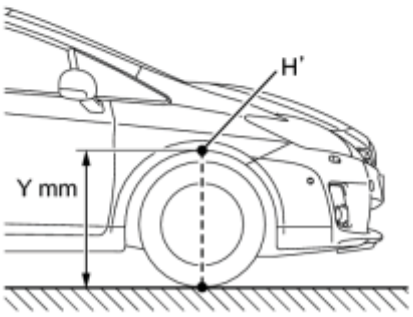
(g) Measure lane recognition camera sensor height.

NOTICE:

- Do not place black and white patterned objects near the target.
- Face the vehicle toward a wall with no patterns, or make sure the background behind the target has no patterns.
- Perform this procedure as accurately as possible.
- Do not place reflective materials in the area behind the target.
- Make sure the distance between the target and wall is within 3 m (9.84 ft.).
- Make sure the target's shadow is not on the wall, as the camera may have a recognition error.



(1) Measure the distance (X mm or in.) from the ground to point H for the front left wheel arch.



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(2) Measure the distance (Y mm or in.) from the ground to point H' for the front right wheel arch.

(3) The average of the 2 distances (X mm or in, Y mm or in.) plus 617 mm (2.03 ft.) is the height of the lane recognition camera sensor.

(h) Memorize camera/target position.

NOTICE:

- Close all doors.
- Perform the procedure with no one in the vehicle.
- During the procedure, do not lean on the vehicle.
- Turn on the clearance lights.
- Do not turn on the headlights.

(1) When using the Techstream:

1. Connect the Techstream to the DLC3.
2. Turn the power switch on (IG).*1
3. Turn the Techstream on.
4. Select "Chassis" from the display screen.
5. Select "Lane Keeping Assist" from the display screen.
6. Select "Utility" from the display screen.
7. Select "Camera/target position memory".

   HINT:

   A buzzer will sound for 1 second.

8. Follow the Techstream display, and continue with the adjustment.

(2) Input the measured height of the lane recognition camera sensor and the horizontal position of the camera "-62 mm (-2.44 in.)" into the input screen. Then press the "Enter" button on the display screen.

(3) Input "3000 mm (9.833 ft.)" for the distance from the camera to the target and "986 mm (3.23 ft.)" for the height of the target into the input screen. Then press the "Enter" button on the display screen.

(4) Press the "Exit" button to finish the camera/target position memory mode.

NOTICE:

If "Error Camera/target position memory" is displayed on the screen, press the "Try Again" button, and repeat from procedure *1 again.

(i) Perform beam axis learning.

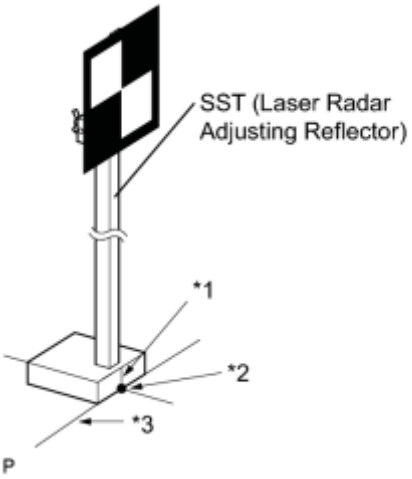
(1) Select "Chassis" from the display screen.

(2) Select "Lane Keeping Assist" from the display screen.*1

(3) Select "Utility" from the display screen.

(4) Select "Camera Axis Adjust" from the display screen.

(5) Follow the Techstream display, and continue with the adjustment.

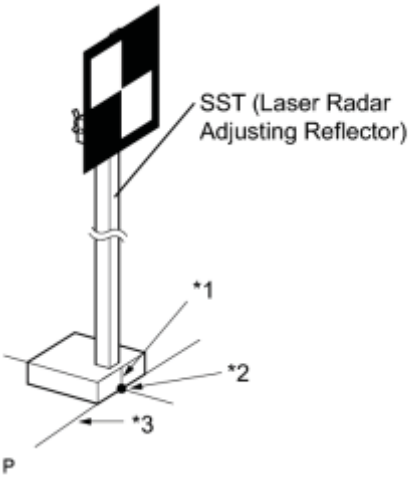


(6) Align the target sheet with the target placement line, and align the mark-off line with placement point 1 (point C).

Text in Illustration

*1	Mark-off Line
*2	Point C
*3	Target Placement Line

(7) Check that the screen displays beam axis learning for target 1, then press the "Enter" button on the display screen.



(8) Align the target sheet with the target placement line, and align the mark-off line with placement point 2 (point G).

Text in Illustration

*1	Mark-off Line
*2	Point G
*3	Target Placement Line

(9) Check that the screen displays beam axis learning for target 2, then press the "Enter" button on the display screen.

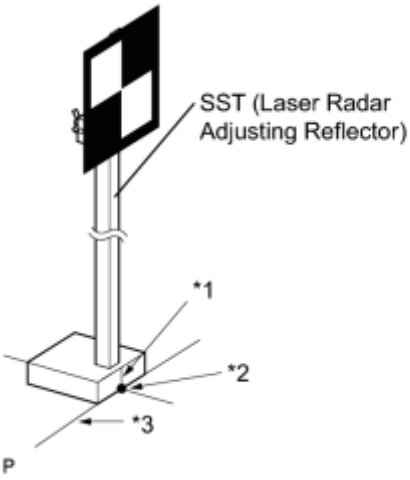
NOTICE:

Within 3 minutes after the screen displays the beam axis learning for target 2, move the target and press the "Enter" button on the display screen.

(10) Align the target sheet with the target placement line, and align the mark-off line with placement point 3 (point H).

Text in Illustration

*1	Mark-off Line
*2	Point H
*3	Target Placement Line



(11) Check that the screen displays beam axis learning for target 3, then press the "Enter" button on the display screen.

NOTICE:

Within 3 minutes after the screen displays the beam axis learning for target 3, move the target and press the "Enter" button on the display screen.

(12) Press the "Exit" button to finish the beam axis learning mode.

If "Error camera axis adjust" is displayed on the screen, press the "Exit" button. Then after checking the conditions below, turn the power switch on (IG) and off, and repeat from procedure *1 again.

- Height of the target.
- Distance from lane recognition camera sensor to target.
- Orientation of target (black area positioned on top right).
- If surrounding area is bright enough.
- If black and white patterned objects are placed near the target.