

CRUISE CONTROL SYSTEM

PRECAUTION

NOTICE:

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

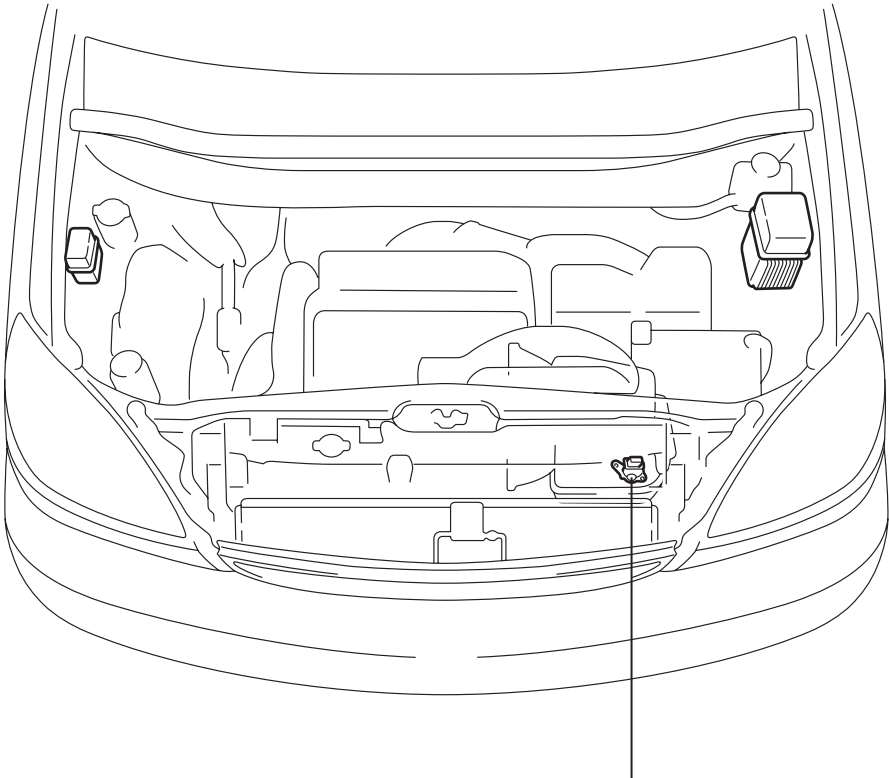
System Name	See procedure
Lighting System (Adaptive Front-Lighting System)	(See page LI-17)
Power Window Control System	(See page WS-12)
Power Back Door System	(See page ED-33)
Sliding Roof System	(See page RF-4)

1. HANDLING PRECAUTION FOR CRUISE CONTROL SYSTEM

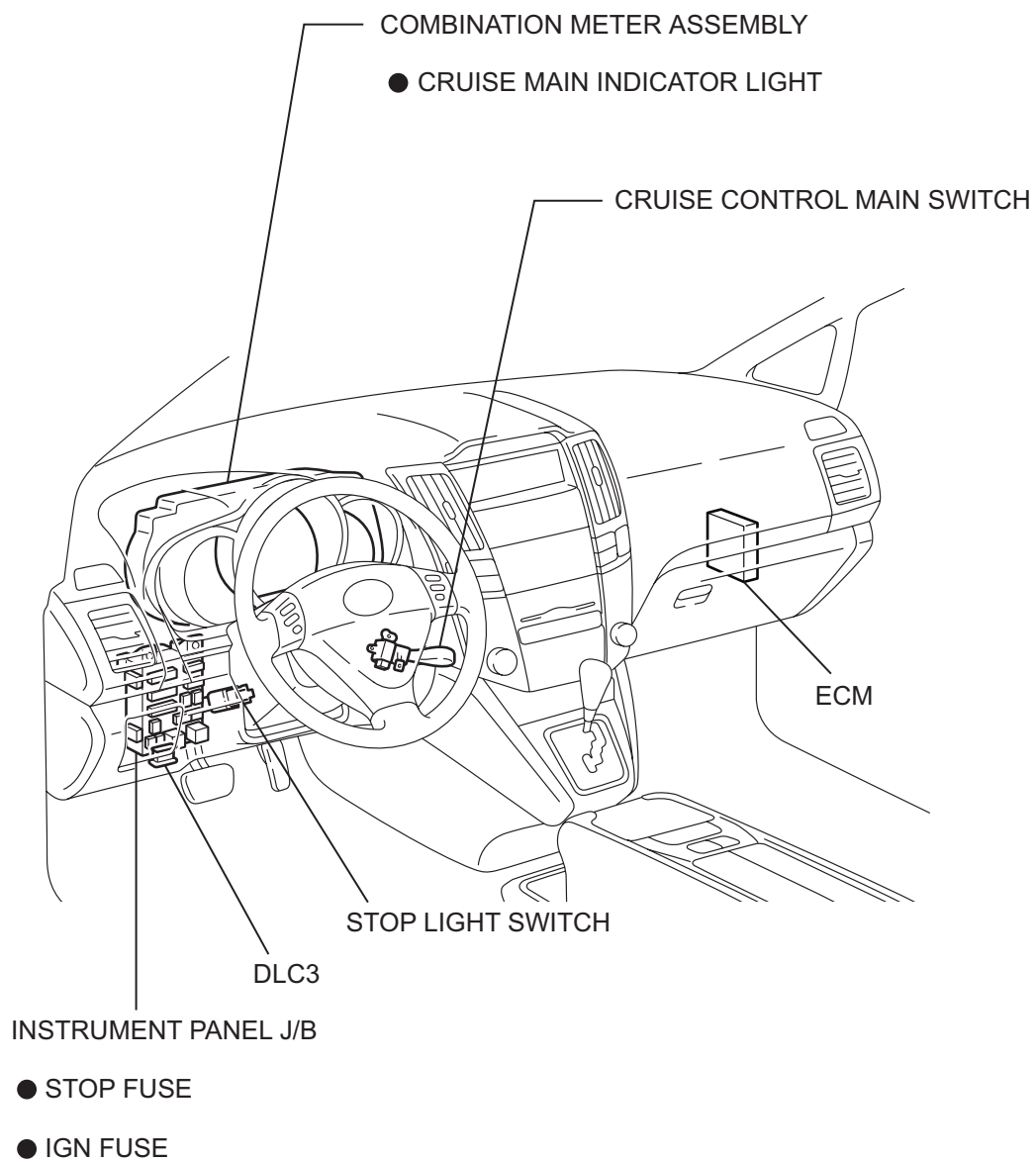
- (a) Turn the cruise control main switch OFF when not using the cruise control system.
- (b) Be careful as the vehicle speed increases when driving downhill with the cruise control system on.
- (c) The RESUME/ACCEL operation changes according to the cruise control system status. When the cruise control system is operating, ACCEL operates. When the cruise control system is not operating, RESUME operates.
- (d) When the cruise control system is operating and the CRUISE main indicator light blinks, turn the cruise control main switch OFF to reset the cruise control system. After the reset, if the cruise control main switch cannot be turned ON, or the cruise control system is canceled immediately after turning the cruise control main switch 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 downhill
 - Roads with sharp turns
 - Icy or snowy roads
 - Slippery roads

PARTS LOCATION

CC



SHIFT POSITION SENSOR



CC

N

SYSTEM DIAGRAM

Communication Table:

Sender	Receiver	Signal	Line
ECM	Combination Meter ECU	CRUISE indicator operation signal	CAN BEAN (Instrument Panel Bus)

SYSTEM DESCRIPTION

1. CRUISE CONTROL SYSTEM

This system is controlled by the ECM, and is activated by the throttle position sensor and motor. The ECM controls the following functions: ON-OFF, -/SET, +/-RES, CANCEL, vehicle speed operation, motor output control, and overdrive control.

- The ECM compares the driving vehicle speed from the speed sensor with the stored vehicle speed set through the cruise control main switch assembly. The ECM controls the throttle valve motor of the throttle position sensor and motor to close the valve when the driving speed is less than the stored speed.
- The ECM receives signals such as ON-OFF, -/SET, +/-RES, and CANCEL from the cruise control main switch assembly and executes them.
- The ECM illuminates the combination meter's CRUISE main indicator light when it receives the cruise control main switch ON signal.
- The ECM cancels the cruise control system when the brake pedal is depressed and the ECM receives the stop light switch signal.
- The ECM cancels the cruise control system when the shift lever is moved from D (5th, 4th 3rd, 2nd or 1st gear) to N, and the ECM receives the PNP switch 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 driving vehicle speed is below the low speed limit. Cruise control operation will be automatically canceled.

(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 beyond the high speed limit.

3. OPERATION OF CRUISE CONTROL

The cruise control main switch operates 7 functions: SET, COAST, TAP-DOWN, RESUME, ACCEL, TAP-UP, and CANCEL. The SET, TAP-DOWN and COAST functions, and the RESUME, TAP-UP and ACCEL functions are operated with the same switch. The cruise control main switch assembly is an automatic return type switch which turns on only while operating it in each arrow direction and turns off after releasing it.

(a) SET CONTROL

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

(b) COAST CONTROL

When the cruise control main switch is set to -/SET and held in that position while the cruise control system is operating, the ECM sends a "throttle valve opening angle 0°" demand signal to the cruise control system. Then the vehicle speed, when the cruise control main switch is released, is stored and maintained.

HINT:

An actual throttle valve opening angle of 0° is not possible due to the idle speed control, etc.

(c) TAP-DOWN CONTROL

When tapping down the cruise control main switch to -/SET (for approximately 0.5 second) while the cruise control system is in operation, the stored vehicle speed decreases each time by approximately 1.6 km/h (1.0 mph). When the cruise control main switch is released from -/SET and the difference between the driving and stored vehicle speed is more than 5 km/h (3 mph), the vehicle speed is stored and constant speed control is maintained.

(d) ACCELERATION CONTROL

The throttle valve motor of the throttle position sensor and motor is instructed by the ECM to open the throttle valve when +/RES 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 +/RES, the vehicle speed is stored and the vehicle is controlled at a constant speed.

(e) TAP-UP CONTROL

When tapping up the cruise control main switch to +/RES (for approximately 0.5 second) while the cruise control system is in operation, the stored vehicle speed increases each time by approximately 1.6 km/h (1.0 mph). However, when the difference between the driving and the stored vehicle speed is more than 5 km/h (approximately 3.1 mph), the stored vehicle speed will not be changed.

(f) RESUME CONTROL

If cruise control operation was canceled with the stop light switch 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 in operation (the stored vehicle speed in the ECM is maintained).

- Depressing the brake pedal
- Moving the shift lever to any position except D (6th, 5th and 4th gears)
- Pushing the cruise control main switch to CANCEL
- Turning the cruise control main switch 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) (See page [CC-45](#)).

HOW TO PROCEED WITH TROUBLESHOOTING

1 VEHICLE BROUGHT TO WORKSHOP

NEXT

2 PROBLEM SYMPTOM CONFIRMATION

NEXT

3 CHECK MULTIPLEX COMMUNICATION SYSTEM

Refer to the how to proceed with troubleshooting (See page [MP-6](#)).

(a) Check for output DTCs.

Result

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

HINT:

The ECM of this system is connected to the multiplex communication system. Therefore, before starting troubleshooting, make sure to check that there is no trouble in the multiplex communication system.

B

PROCEED TO "MULTIPLEX COMMUNICATION SYSTEM"

A

4 CHECK CAN COMMUNICATION SYSTEM

Refer to the precaution (See page [CA-1](#)).

(a) Check for output DTCs.

Result

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

HINT:

The ECM of this system is connected to the CAN communication system. Therefore, before starting troubleshooting, make sure to check that there is no trouble in the CAN communication system.

B

PROCEED TO "CAN COMMUNICATION SYSTEM"

A

5 DTC CHECK AND CLEARRefer to the DTC check/clear (See page [CC-13](#)).

NEXT

6 DTC CHECK (OTHER THAN MPX AND CAN SYSTEM DTC)Refer to the DTC check/clear (See page [CC-13](#)).**Result**

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

A

GO TO STEP 8

B

7 DTC CHARTRefer to the diagnostic trouble code chart (See page [CC-14](#)).

NEXT

GO TO STEP 11

8 PROBLEM SYMPTOM SIMULATION**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 10

A

9 SYMPTOM SIMULATIONRefer to the electronic circuit inspection procedure (See page [IN-36](#)).

NEXT

CC

10 PROBLEM SYMPTOMS TABLE

Refer to the problem symptoms table (See page [CC-10](#)).

NEXT

11 CIRCUIT INSPECTION

NEXT

12 TERMINALS OF ECU

Refer to the terminals of ECU (See page [CC-11](#)).

NEXT

CC

13 IDENTIFICATION OF PROBLEM

NEXT

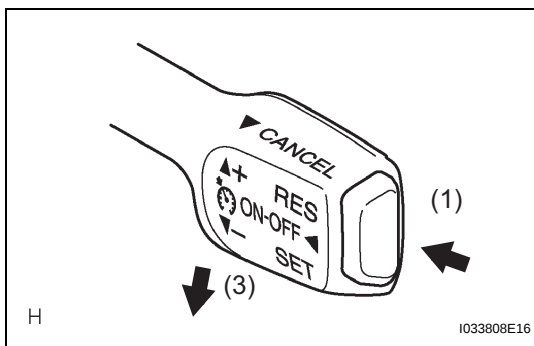
14 REPAIR OR REPLACE

NEXT

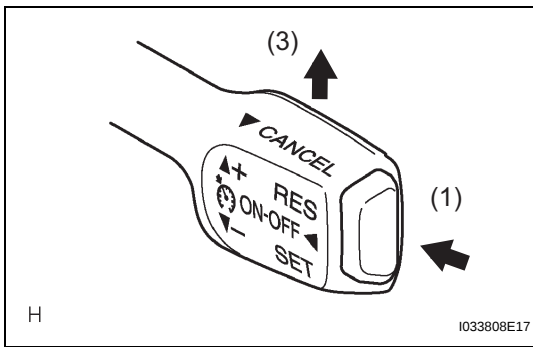
15 CONFIRMATION TEST

NEXT

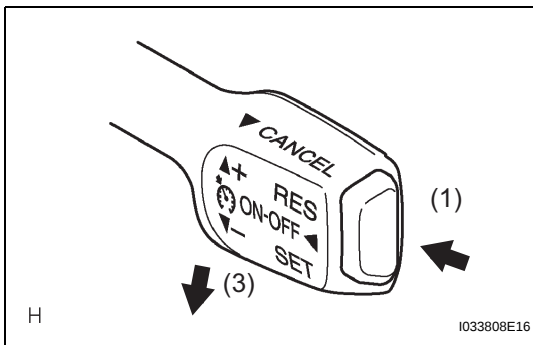
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**ROAD TEST****1. PROBLEM SYMPTOM CONFIRMATION**

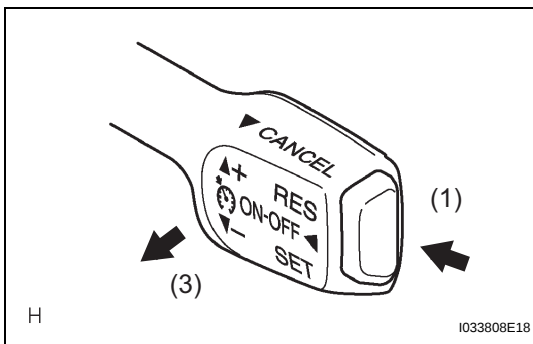
- (a) Inspect SET function.
 - (1) Turn the main switch ON.
 - (2) Drive at the required speed (40 km/h (25 mph) or higher).
 - (3) Push the cruise control main switch to -/SET.
 - (4) After releasing the switch, check that the vehicle cruises at the set speed.



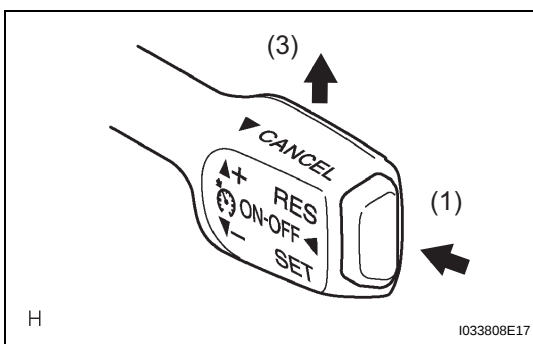
- (b) Inspect the ACC (ACCEL) switch.
- (1) Turn the main switch ON.
 - (2) Drive at the required speed (40 km/h (25 mph) or higher).
 - (3) Push the cruise control main switch to -/SET.
 - (4) Check that vehicle speed increases while the cruise control main switch is pushed to +/RES, and that the vehicle cruises at the newly set speed when the switch is released.
 - (5) Momentarily push the cruise control main switch to +/RES and then immediately release it. Check that vehicle speed increases by approximately 1.6 km/h (1.0 mph) (tap-up control).



- (c) Inspect the COAST function.
- (1) Turn the main switch 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 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) Momentarily push the cruise control main switch to -/SET, and then immediately release it. Check that vehicle speed decreases by approximately 1.6 km/h (1.0 mph) (tap-down control).



- (d) Inspect the CANCEL function.
- (1) Turn the main switch ON.
 - (2) Drive at the required speed (40 km/h (25 mph) or higher).
 - (3) Push the cruise control main switch to -/SET.
 - (4) When performing 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 to any position except D (6th, 5th, and 4th gears)
 - Turning the main switch OFF
 - Pulling the cruise control main switch to CANCEL



- (e) Inspect the RES (RESUME) function.
- (1) Turn the main switch ON.
 - (2) Drive at the required speed (40 km/h (25 mph) or higher).
 - (3) Push the cruise control main switch to -/SET.
 - (4) Cancel the cruise control system according to 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 drives at the set speed.

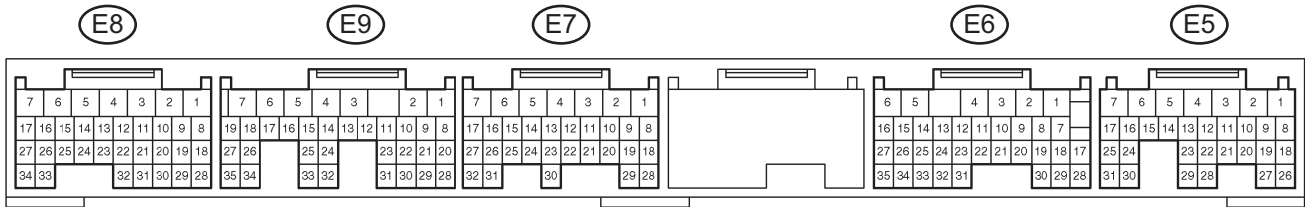
PROBLEM SYMPTOMS TABLE

CRUISE CONTROL SYSTEM

Symptom	Suspected area	See page
Main switch cannot be turned ON. (CRUISE main indicator light on combination meter does not illuminate.)	1. Cruise control switch circuit	CC-20
	2. CRUISE main indicator light circuit	CC-24
	3. ECM	CC-11
Vehicle speed setting cannot be done. (Although indicator light in combination meter is lit when the main switch is turned ON, they go off when vehicle speed is set.)	1. Cruise control switch circuit	CC-20
	2. ECM	CC-11
Setting cannot be done. (Indicator light in combination meter is lit when the main switch is turned ON and they remain ON while setting.)	1. Cruise control switch circuit	CC-20
	2. Stop light switch circuit	CC-16
	3. PNP switch circuit	AX-42
	4. Combination meter system	ME-4
	5. ECM	CC-11
While the vehicle is driving with cruise control, the set control is canceled. (CRUISE main indicator light remains illuminated.)	1. Cruise control switch circuit	CC-20
	2. Vehicle speed sensor circuit	CC-15
	3. Stop light switch circuit	CC-16
	4. CRUISE main indicator light circuit	CC-24
	5. Park/neutral position switch circuit (DTC P0705)	AX-42
	6. ECM	CC-11
Hunting (Speed is not constant.)	1. Vehicle speed sensor circuit	CC-15
	2. ECM	CC-11
Vehicle speed setting cannot be canceled. (When Coast, Acceleration, Resume, Set speed change and Control switch are operated.)	1. Cruise control switch circuit	CC-20
	2. ECM	CC-11
DTC is not output, or is output when it should not be.	1. Diagnosis circuit	CC-25
	2. ECM	CC-11
CRUISE MAIN indicator light does not come on.	1. Cruise control switch circuit	CC-20
	2. CRUISE main indicator light circuit	CC-24
	3. ECM	CC-11
	4. Combination meter	ME-4

TERMINALS OF ECU

1. CHECK HYBRID VEHICLE CONTROL ECU



Symbols (Terminals No.)	Wiring Color	Terminal Description	Condition	Specified Condition
TC - E1 (E5-20 - E7-1)	BR - BR	Ground	Ignition switch ON	10 to 14 V
			Ignition switch ON Connect terminals TC and CG of DLC3	2 V or less
ST1- - E1 (E6-12 - E7-1)	GR - BR	Stop light signal	Ignition switch ON Depress brake pedal	1 V or less
			Ignition switch ON Release brake pedal	10 to 14 V
STP - E1 (E6-19 - E7-1)	B - BR	Stop light signal	Ignition switch ON Depress brake pedal	10 to 14 V
			Ignition switch ON Release brake pedal	1 V or less
CCS - E1 (E6-24 - E7-1)	P - BR	Cruise control main switch circuit	Ignition switch ON CANCEL switch hold ON	10 to 14 V
			Ignition switch ON -/SET switch hold ON	6.6 to 10.1 V
			Ignition switch ON +/RES switch hold ON	4.5 to 7.1 V
			Ignition switch ON MAIN switch hold ON	2.3 to 4 V
			Ignition switch ON	1 V or less

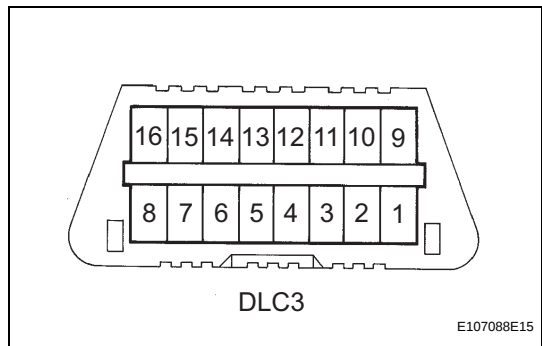
DIAGNOSIS SYSTEM

1. DESCRIPTION

The 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 is not displayed when checking for DTCs, there may be a problem with the combination meter or the CAN communication and multiplex communication system. Use the intelligent tester to check and solve the problem.

2. CHECK DLC3

- (a) The vehicle's ECM uses ISO 9141-2 for communication. The terminal arrangement of DLC3 complies with SAE J1962 and matches the ISO 9141-2 format.



Terminal No.	Terminal Description	Condition	Specified Condition
4	Chassis ground	Always	Below 1 Ω
7	Bus "+" line	During transmission	Pulse generation
16	Battery positive	Always	11 to 14 V

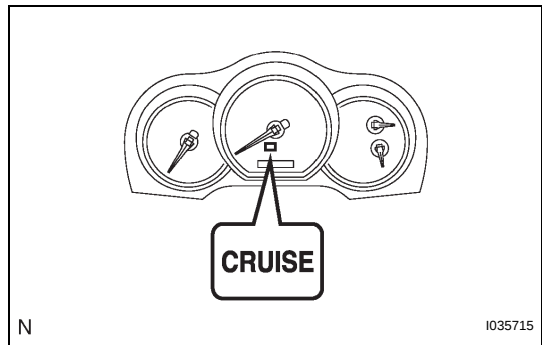
HINT:

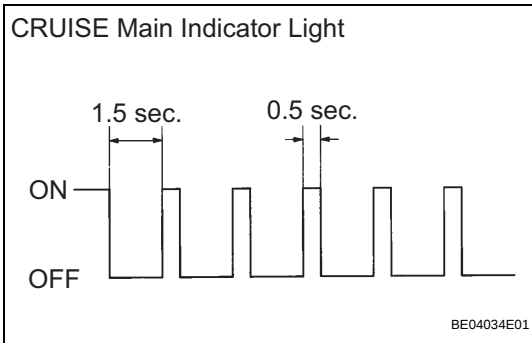
If the display shows "UNABLE TO CONNECT TO VEHICLE" after connection the intelligent tester to the DLC3 and turning the ignition ON, there is a problem either with the vehicle or with the tool.

- If communication is normal when connection the tool to another vehicle, inspect the DLC3 on the original vehicle.
- If communication is still not possible when connection the tool to another vehicle, the problem is probably in the tool itself. Consult the Service Department listed in the tool's instruction manual.

3. CHECK INDICATOR

- (a) Turn the ignition switch on.





- (b) Check that the CRUISE main indicator light illuminates when the cruise control main switch is turned ON, and that the indicator light turns off when the main switch is turned OFF. If the results are not as specified, inspect the CRUISE main indicator light circuit (See page [CC-24](#)).

HINT:

- While driving with cruise control, the ECM activates AUTO CANCEL of the cruise control system when a malfunction in one of the following occurs: vehicle speed sensors, stop light switch or other related parts. When AUTO CANCEL is activated, the CRUISE main indicator light outputs the blinking pattern shown to the left. At the same time, data of the malfunction is stored as a DTC.

DTC CHECK / CLEAR

1. DTC CHECK

- (a) Connect the intelligent tester to the DLC3.
- (1) Connect the intelligent tester to the Controller Area Network Vehicle Interface Module (CAN VIM). Then connect the CAN VIM to the Data Link Connector 3 (DLC3).

- (b) Turn the ignition switch on.
- (c) Read the DTCs by following the prompts on the tester screen.

HINT:

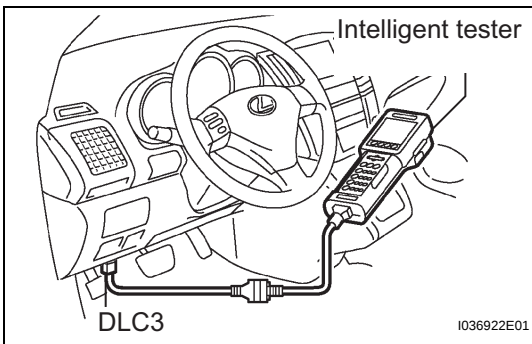
Refer to the intelligent tester operator's manual for further details.

2. DTC CLEAR

- (a) Connect the intelligent tester to the DLC3.
- (b) Turn the ignition switch on.
- (c) Operate the intelligent tester to erase the codes.

HINT:

Refer to the intelligent tester operator's manual for further details.



DATA LIST / ACTIVE TEST

1. READ DATA LIST

- (a) While the intelligent tester is connected to the DLC3 and with the ignition switch turned to the ON position, the CRUISE CONTROL data list can be displayed. Follow the prompts on the tester screen to access the data list.

CC (ECM):

Item	Measurement Item / Display (Range)	Normal Condition	Diagnostic Note
VEHICLE SPD	Vehicle speed / min.: 1 km/h (0.6 mph), max.: 255 km/h (158 mph)	Actual vehicle speed	-
MEMORY SPD	Cruise control memorized speed / min.: 1 km/h (0.6 mph), max.: 255 km/h (158 mph)	Actual stored vehicle speed	-
THROTTLE	Required throttle opening angle / min.: 0°, max.: 125°	Actual required throttle opening	-
CRUISE CONTROL	Cruise control system active condition / ON or OFF	ON: Cruise control activated OFF: Cruise control inactivated	-
MAIN SW (MAIN)	Main SW signal (Main CPU) / ON or OFF	ON: Main SW ON (Pushed on) OFF: Main SW OFF (Pushed off)	"3"
MAIN SW (SUB)	Main SW signal (Sub CPU) / ON or OFF	ON: Main SW ON (Pushed on) OFF: Main SW OFF (Pushed off)	"3"
CCS READY M	Cruise control system standby condition (Main CPU) / ON or OFF	ON ↔ OFF: Change ON / OFF each time Main SW is pushed in.	"1"
CCS READY S	Cruise control system standby condition (Sub CPU) / ON or OFF	ON ↔ OFF: Change ON / OFF each time Main SW is pushed in.	"1"
CCS INDICATOR M	Cruise indicator signal (Main CPU) / ON or OFF	ON: "CCS READY" ON OFF: "CCS READY" OFF	"2"
CCS INDICATOR S	Cruise indicator signal (Sub CPU) / ON or OFF	ON: "CCS READY" ON OFF: "CCS READY" OFF	"2"
CANCEL SW	CANCEL SW signal / ON or OFF	ON: CANCEL SW ON OFF: CANCEL SW OFF	-
SET/COAST SW	-/SET SW signal / ON or OFF	ON: -/SET SW ON OFF: -/SET SW OFF	-
RES/ACC SW	+/RES SW signal / ON or OFF	ON: +/RES SW ON OFF: +/RES SW OFF	-
STP LIGHT SW2 M	Stop light SW signal (Main CPU) / ON or OFF	ON: Brake pedal depressed OFF: Brake pedal released	-
STP LIGHT SW2 S	Stop light SW signal (Sub CPU) / ON or OFF	ON: Brake pedal depressed OFF: Brake pedal released	-

HINT:

- "3" is OK but "1" is NG → ECM failure.
- "1" is OK but "2" is NG → DTC output or ECM failure.
- "3" is but cruise indicator not turn on → CRUISE MAIN indicator or wire harness or ECM failure.

DIAGNOSTIC TROUBLE CODE CHART

CRUISE CONTROL SYSTEM

DTC No.	Detection Item	Trouble Area	See page
P0500	Vehicle Speed Sensor Malfunction	1. Combination meter assembly 2. Vehicle speed sensor 3. Vehicle speed sensor circuit 4. ECM	CC-15
P0571	Brake Switch "A" Circuit	1. Stop light switch assembly 2. Stop light switch assembly circuit 3. ECM	CC-16
P0607	Control Module Performance	ECM	CC-19

DTC	P0500	Vehicle Speed Sensor Malfunction
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DESCRIPTION

DTC No.	DTC Detection Condition	Trouble Area
P0500/21	The malfunction code is output when the vehicle speed signal from the vehicle speed sensor is cut for 0.14 sec. or more while cruise control is in operation.	• Combination meter assembly • Vehicle speed sensor • Vehicle speed sensor circuit • ECM
P0503/23	Momentary interruption and noise malfunction codes are detected when a rapid change of vehicle speed occurs while cruise control is in operation.	

WIRING DIAGRAM

HINT:

See page [ES-218](#)

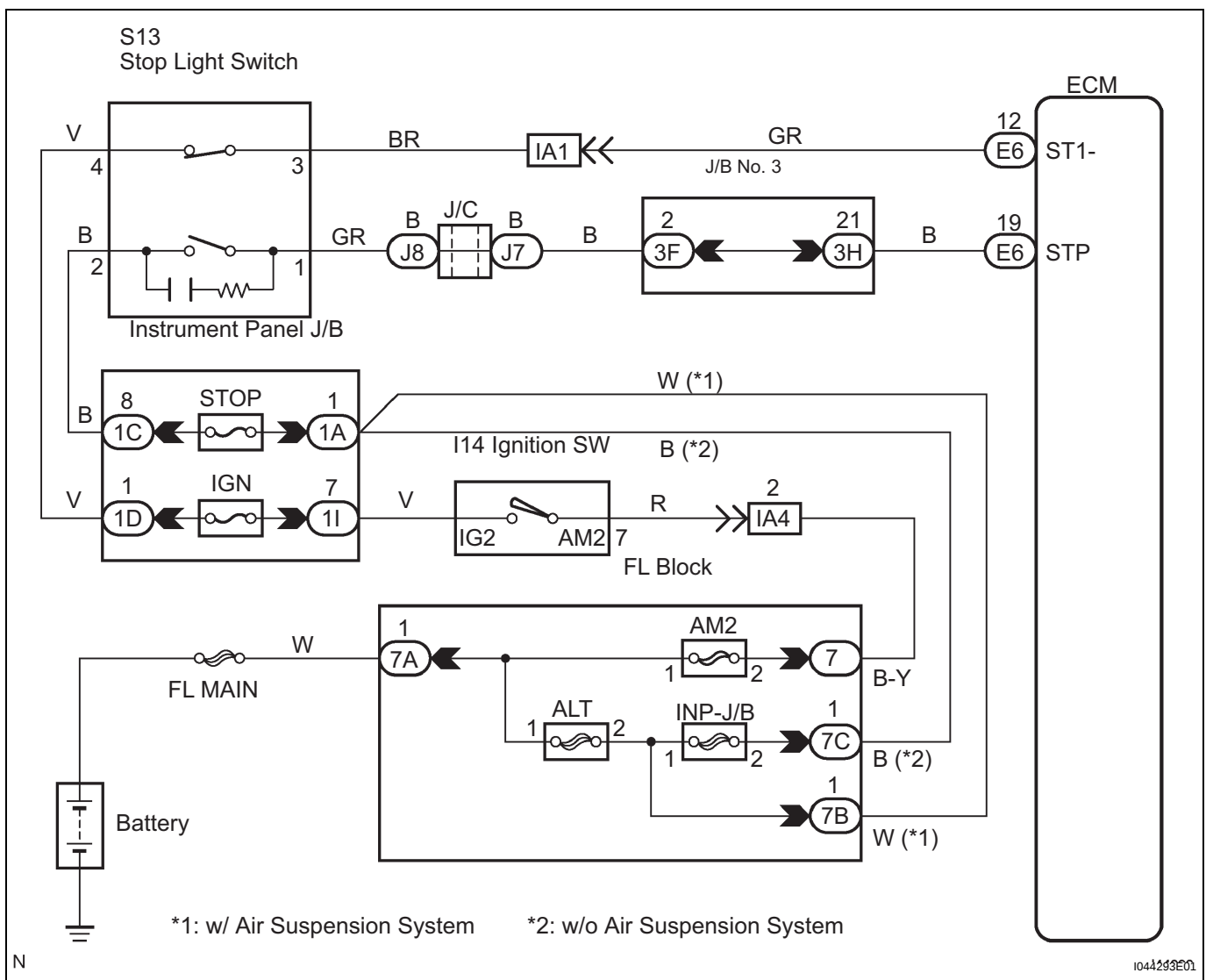
HINT:

See page [ES-218](#)

DTC**P0571****Brake Switch "A" Circuit****DESCRIPTION**

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

DTC No.	DTC Detection Condition	Trouble Area
P0571	When voltage of STP terminal and that of ST1- terminal on the ECM are less than 1 V for 0.5 sec. or more	• Stop light switch • Stop light switch circuit • ECM

WIRING DIAGRAM**CC**

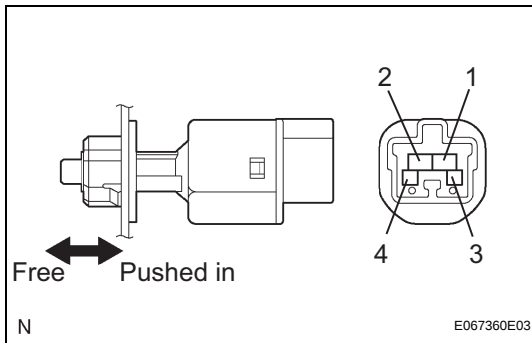
1 INSPECT STOP LIGHT SWITCH OPERATION

- (a) Check that the stop light lights up when the brake pedal is depressed, and goes off when the brake pedal is released.

NG

INSPECT STOP LIGHT SWITCH CIRCUIT

OK

2 INSPECT STOP LIGHT SWITCH ASSEMBLY

- (a) Disconnect the stop light switch assembly connector.
(b) Measure the resistance according to the value(s) in the table below.

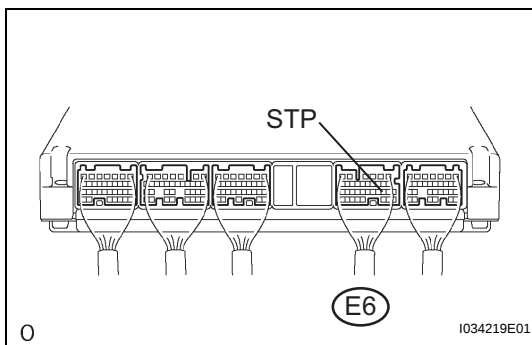
Resistance

Switch condition	Tester Connection	Specification
Switch pin free	1 - 2	1 Ω or less
Switch pin free	3 - 4	10 k Ω or higher
Switch pin pushed in	1 - 2	10 k Ω or higher
Switch pin pushed in	3 - 4	1 Ω or less

NG

REPLACE STOP LIGHT SWITCH ASSEMBLY

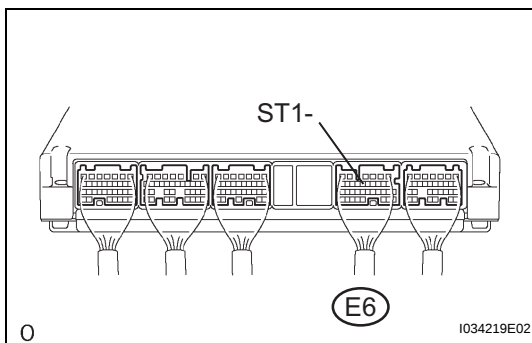
OK

3 INSPECT ECM

- (a) Remove the ECM with the connectors still connected.
(b) Disconnect the E6 connector from ECM.
(c) Turn the ignition switch to the ON position.
(d) Measure the voltage according to the value(s) in the table below.

Voltage

Pedal condition	Tester connection	Specification
Depressed	E6-19 (STP) - Body ground	10 to 14 V
Released	E6-19 (STP) - Body ground	1 V or less



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

Voltage

Pedal condition	Tester connection	Specification
Depressed	E6-12 (ST1-) - Body ground	10 to 14 V
Released	E6-12 (ST1-) - Body ground	1 V or less

NG

REPAIR OR REPLACE HARNESS OR CONNECTOR

OK

REPLACE ECM

CC

DTC	P0607	Control Module Performance
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DESCRIPTION

This DTC indicates the internal abnormalities of the ECM.

DTC No.	DTC Detection Condition	Trouble Area
P0607/54	The ECM has a supervisory CPU and a control ECU inside. When each input STP signal is different for 0.15 secs. or more, the malfunction code is output. The malfunction code is output after 0.4 secs. have passed from the time the cruise cancel input signal (STP input) is input the ECM.	ECM

HINT:
When a malfunction code is detected, the fail safe must be kept on until the ignition switch is turned OFF.

1	REPLACE ECM
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CC

NEXT

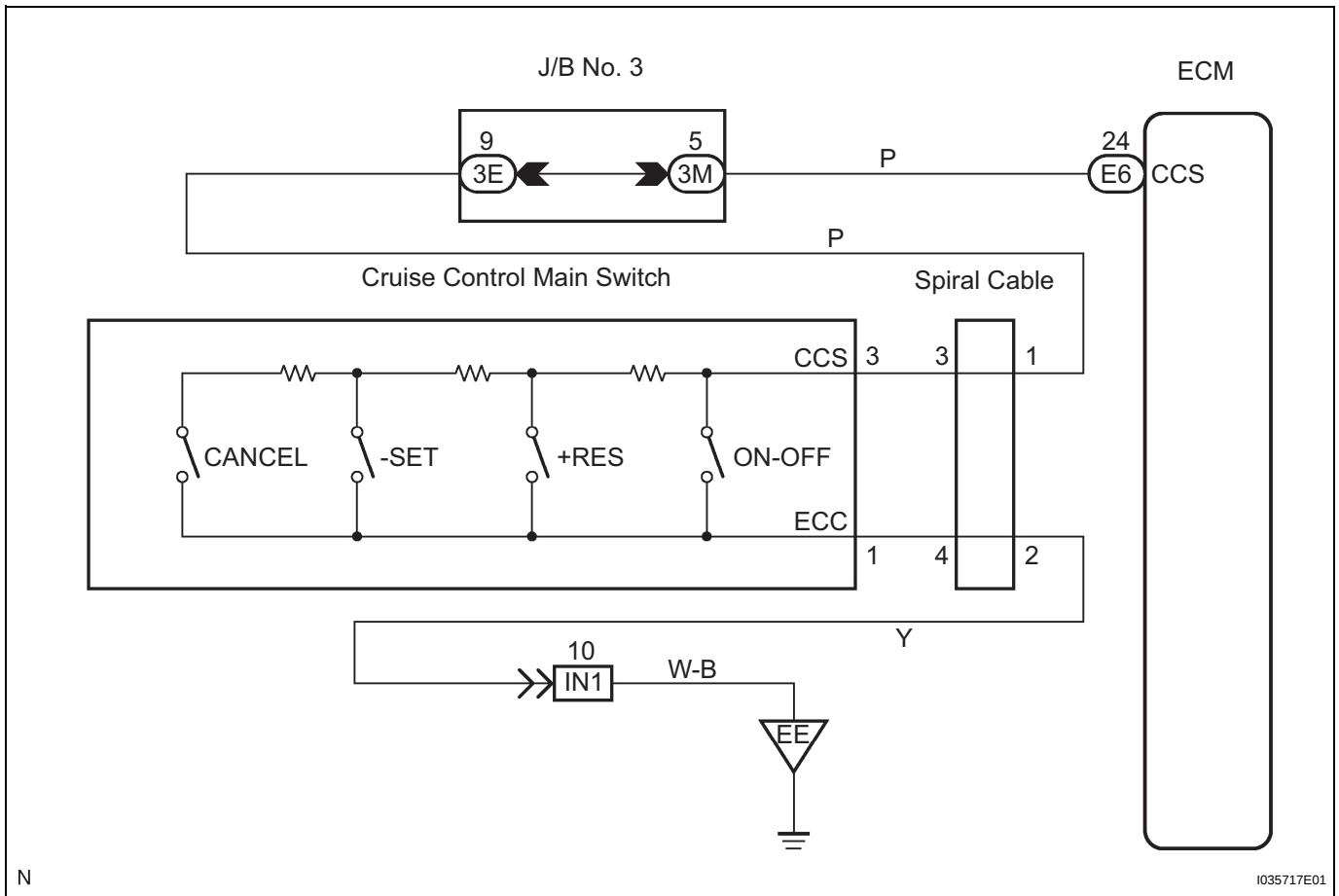
END

Cruise Control Switch Circuit

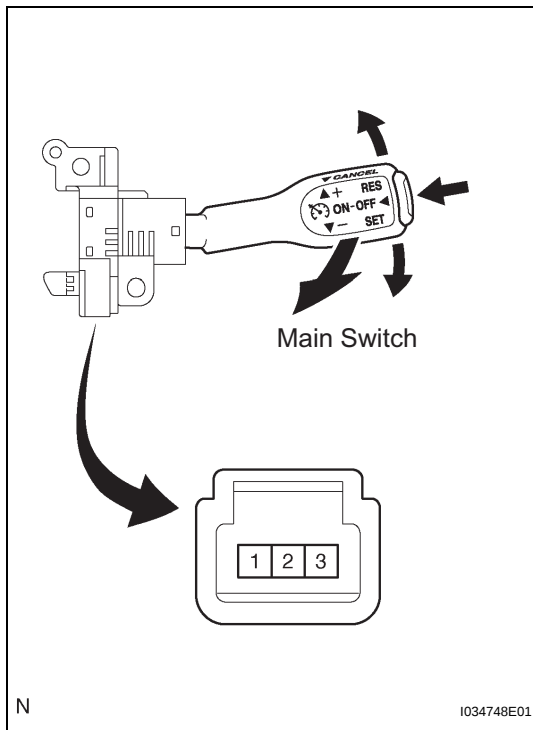
DESCRIPTION

The cruise control main switch operates 7 functions: SET, COAST, TAP-DOWN, RESUME, ACCEL, TAP-UP, and CANCEL. The SET, TAP-DOWN and COAST functions, and the 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 each arrow direction and turns off after releasing it. The internal contact point of the cruise control main switch is turned on with the switch operation. Then the ECM reads the resistance value that has been changed by the switch operation to control SET, COAST, RESUME, ACCEL and CANCEL.

WIRING DIAGRAM


1
INSPECT CRUISE CONTROL MAIN SWITCH

(a) Disconnect the cruise control main switch connector.



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

Resistance

Switch condition	Tester connection	Resistance (Ω)
Neutral	1 - 3	∞ (No continuity)
+ / RES	1 - 3	210 to 270
- / SET	1 - 3	560 to 700
CANCEL	1 - 3	1,380 to 1,700
Main Switch OFF	1 - 3	10 k Ω or higher
Main Switch ON	1 - 3	1 Ω or less

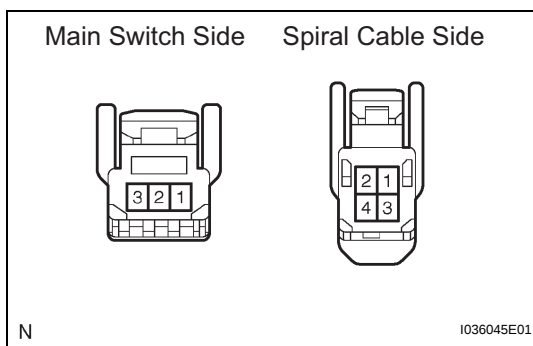
NG

REPLACE CRUISE CONTROL MAIN SWITCH

OK

2

CHECK AND REPLACE HARNESS OR CONNECTOR



- (a) Disconnect the main switch side connector and spiral cable side connector.
- (b) Measure the resistance according to the value(s) in the table below.

Resistance

Tester Connection	Condition	Specification
Main switch side 1 - Spiral cable side 3	Always	1 Ω or less
Main switch side 3 - Spiral cable side 4	Always	1 Ω or less

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

Resistance

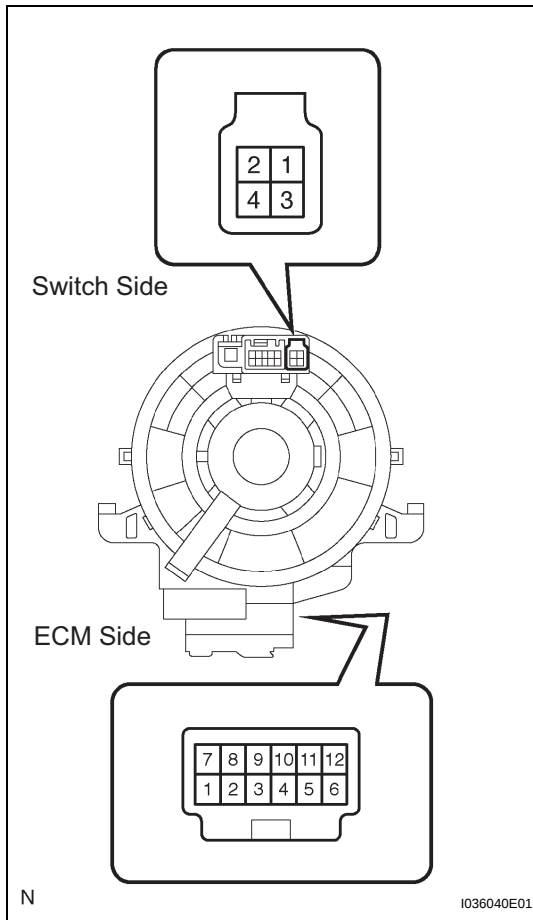
Tester Connection	Condition	Specification
Main switch side 1 - Body ground	Always	10 k Ω or higher

Tester Connection	Condition	Specification
Main switch side 3 - Body ground	Always	10 k Ω or higher

NG

**REPAIR OR REPLACE HARNESS OR
CONNECTOR**

OK

3 INSPECT SPIRAL CABLE SUB-ASSEMBLY

- (a) Disconnect the spiral cable connector.
(b) Measure the resistance according to the value(s) in the table below.

Resistance

Tester Connection	Specification
Switch side 3 to ECM side 1	1 Ω or less
Switch side 4 to ECM side 2	1 Ω or less

NG

REPLACE SPIRAL CABLE SUB-ASSEMBLY

CC

OK

4 CHECK AND REPLACE HARNESS OR CONNECTOR

- (a) Disconnect the spiral cable connector and ECM connector.
(b) Measure the resistance according to the value(s) in the table below.

Resistance

Tester Connection	Condition	Specification
Spiral cable 1 - CCS (E6 - 24)	Always	1 Ω or less

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

Resistance

Tester Connection	Condition	Specification
CCS (E6 - 24) - Body ground	Always	10 kΩ or higher
Spiral cable 2 - Body ground	Always	10 kΩ or higher

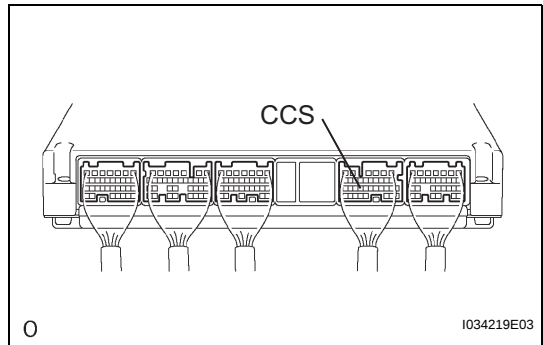
NG

REPAIR OR REPLACE HARNESS OR CONNECTOR

OK

5

INSPECT ECM



- (a) Remove the ECM with connector.
- (b) Turn the ignition switch to the ON position.
- (c) Measure the voltage according to the value(s) in the table below.

Voltage

Switch position	Tester condition	Specification
Neutral	CCS (E6-24) - Body ground	10 to 14 V
CANCEL	CCS (E6-24) - Body ground	6.6 to 10 V
-/ SET	CCS (E6-24) - Body ground	4.5 to 7.1 V
+/ RES	CCS (E6-24) - Body ground	2.3 to 4 V
Main Switch ON	CCS (E6-24) - Body ground	1 V or less

NG

REPLACE ECM

OK

PROCEED TO NEXT CIRCUIT INSPECTION SHOWN IN PROBLEM SYMPTOMS TABLE

Cruise Main Indicator Light Circuit

DESCRIPTION

- The ECM detects a cruise control switch signal and sends it to the combination meter via BEAN. Then the CRUISE main indicator light comes on.
- The CRUISE main indicator light circuit uses BEAN for communication. If there is a malfunction in this circuit, check for DTCs in multiplex communication system before troubleshooting this circuit.

1

PERFORM ACTIVE TEST BY INTELLIGENT TESTER

- Connect the intelligent tester to the DLC3.
- Check the CRUISE main indicator light by using ACTIVE TEST.

Combination Meter:

Item	Test Details	Diagnostic Note
CRUISE INDIC	"CRUISE" indicator is ON/OFF	-

OK:

Indicator light comes on / goes off.

NG

REPLACE COMBINATION METER ASSEMBLY

OK

2

READ VALUE OF INTELLIGENT TESTER

- Connect the intelligent tester to the DLC3.
- Turn the ignition switch on, and turn the intelligent tester main switch on.
- Check the DATA LIST for proper functioning of the CRUISE main indicator light.

Hybrid Vehicle Control ECU (Cruise Control):

Item	Measurement Item / Display (Range)	Normal Condition	Diagnostic Note
CCS INDICATOR M	Cruise indicator signal (Main CPU) / ON or OFF	ON: "CCS READY" ON OFF: "CCS READY" OFF	-

OK:

When cruise control main switch operation is performed, the result will be same as above.

NG

REPLACE ECM

OK

PROCEED TO NEXT CIRCUIT INSPECTION SHOWN IN PROBLEM SYMPTOMS TABLE

CC

TC and CG Terminal Circuit

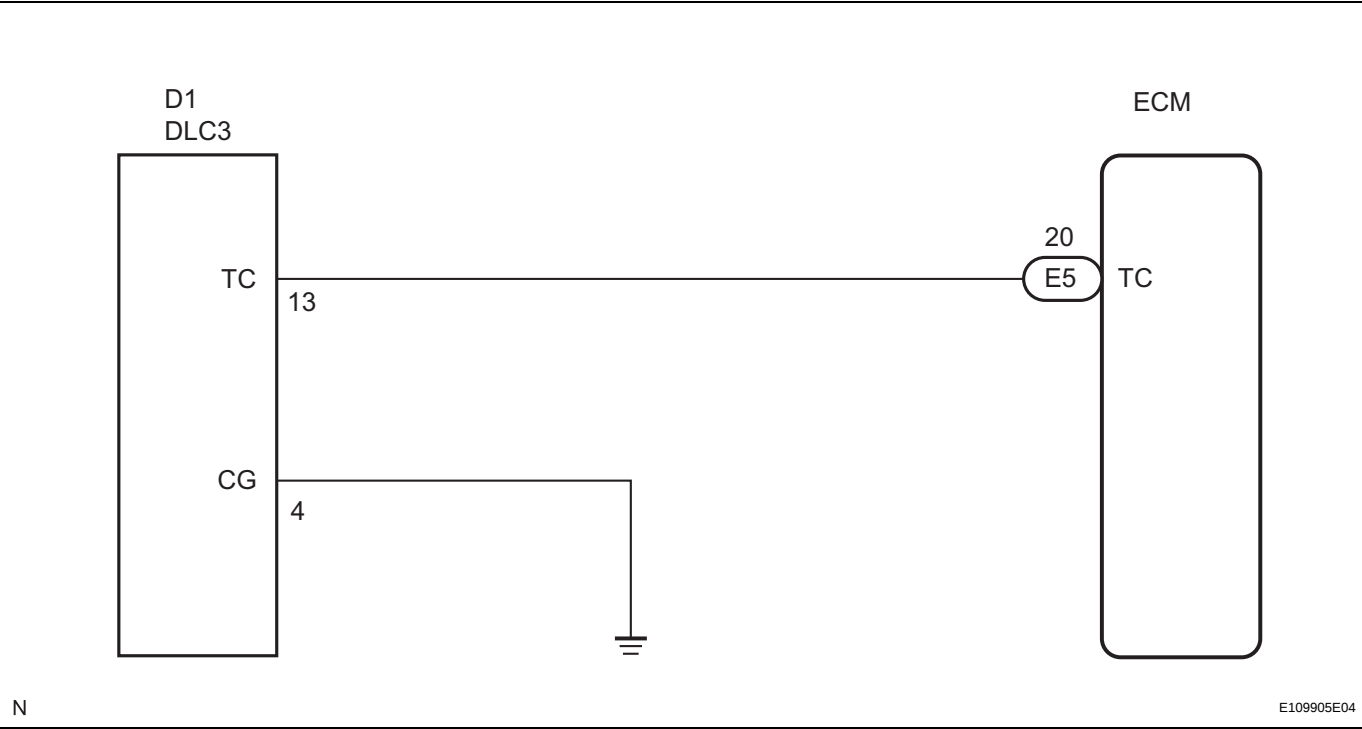
DESCRIPTION

Connecting terminals TC and CG of the DLC3 causes the system to enter self-diagnostic mode. If a malfunction is present, DTCs will be output.

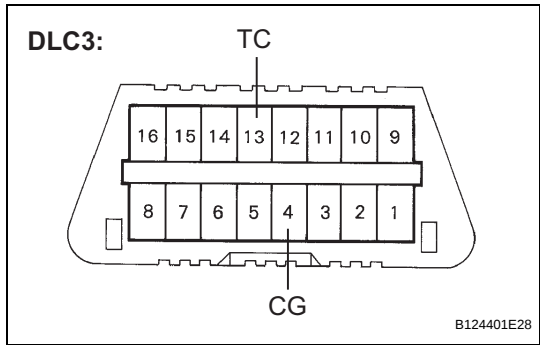
HINT:

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



1INSPECT DLC3 (TC TERMINAL VOLTAGE)



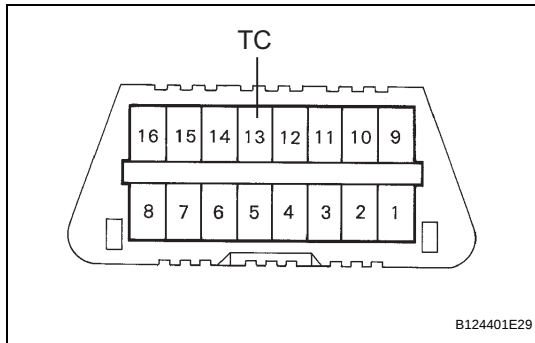
- (a) Turn the ignition switch to the ON position.
(b) Measure the voltage according to the value(s) in the table below.

Voltage

Tester Connection	Condition	Specified Condition
TC (DLC3 - 13) - CG (DLC3 - 4)	IG switch ON	10 to 14 V

OK

NGGo to step 3

2 CHECK HARNESS AND CONNECTOR (DLC3 - ECM)

- (a) Disconnect the connector from ECM.
 (b) Measure the resistance according to the value(s) in the table below.

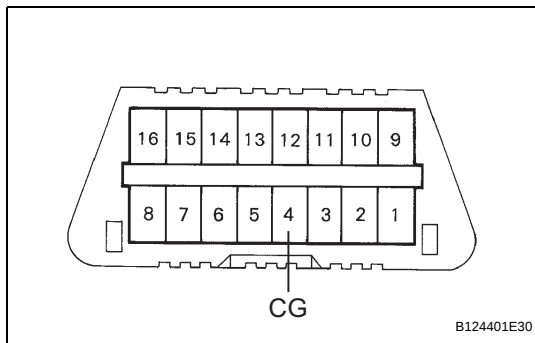
Resistance

Tester Connection	Condition	Specified Condition
TC (E5 - 20) - TC (DLC3 - 13)	Always	1 Ω or less

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

Resistance

Tester connection	Condition	Specified condition
TC (E5-20) - Body ground	Always	10 k Ω or higher

NG**REPAIR OR REPLACE HARNESS OR CONNECTOR****CC****OK****REPLACE ECM****3 CHECK HARNESS AND CONNECTOR (DLC3 - BODY GROUND)**

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

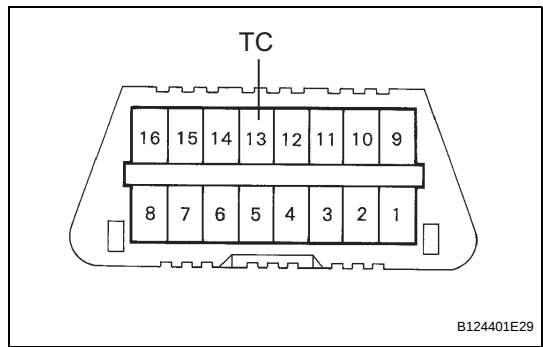
Resistance

Tester Condition	Condition	Specified Condition
CG (DLC3 - 4) - Body ground	Always	1 Ω or less

NG**REPAIR OR REPLACE HARNESS OR CONNECTOR****OK**

4

CHECK HARNESS AND CONNECTOR (DLC3 - ECM)



- (a) Disconnect the connector from ECM.
- (b) Measure the resistance according to the value(s) in the table below.
- Resistance

Tester Connection	Condition	Specified Condition
TC (E5 - 20) - TC (DLC3 - 13)	Always	1 Ω or less

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

Tester connection	Condition	Specified condition
TC (E5-20) - Body ground	Always	10 kΩ or higher

NG

REPAIR OR REPLACE HARNESS OR CONNECTOR

OK

REPLACE ECM

DYNAMIC LASER CRUISE CONTROL SYSTEM

PRECAUTION

NOTICE:

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

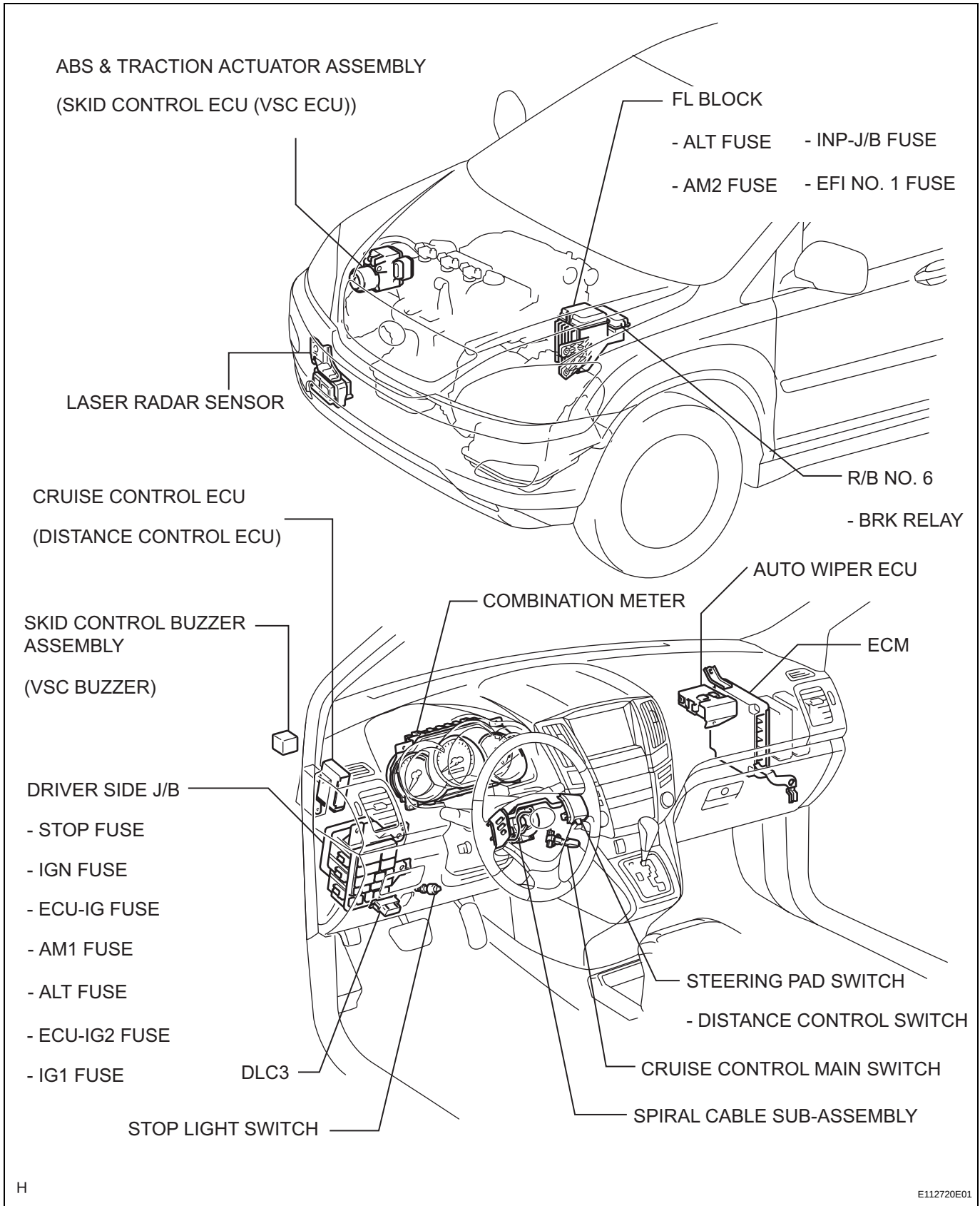
System Name	See procedure
Lighting System (Adaptive Front-Light System)	(See page LI-17)
Sliding Roof System	(See page RF-4)
Power Window System	(See page WS-12)
Power Back Door System	(See page ED-33)

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 has functions to automatically detect dirt on the sensor face and inform the driver, but is not perfect. 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.

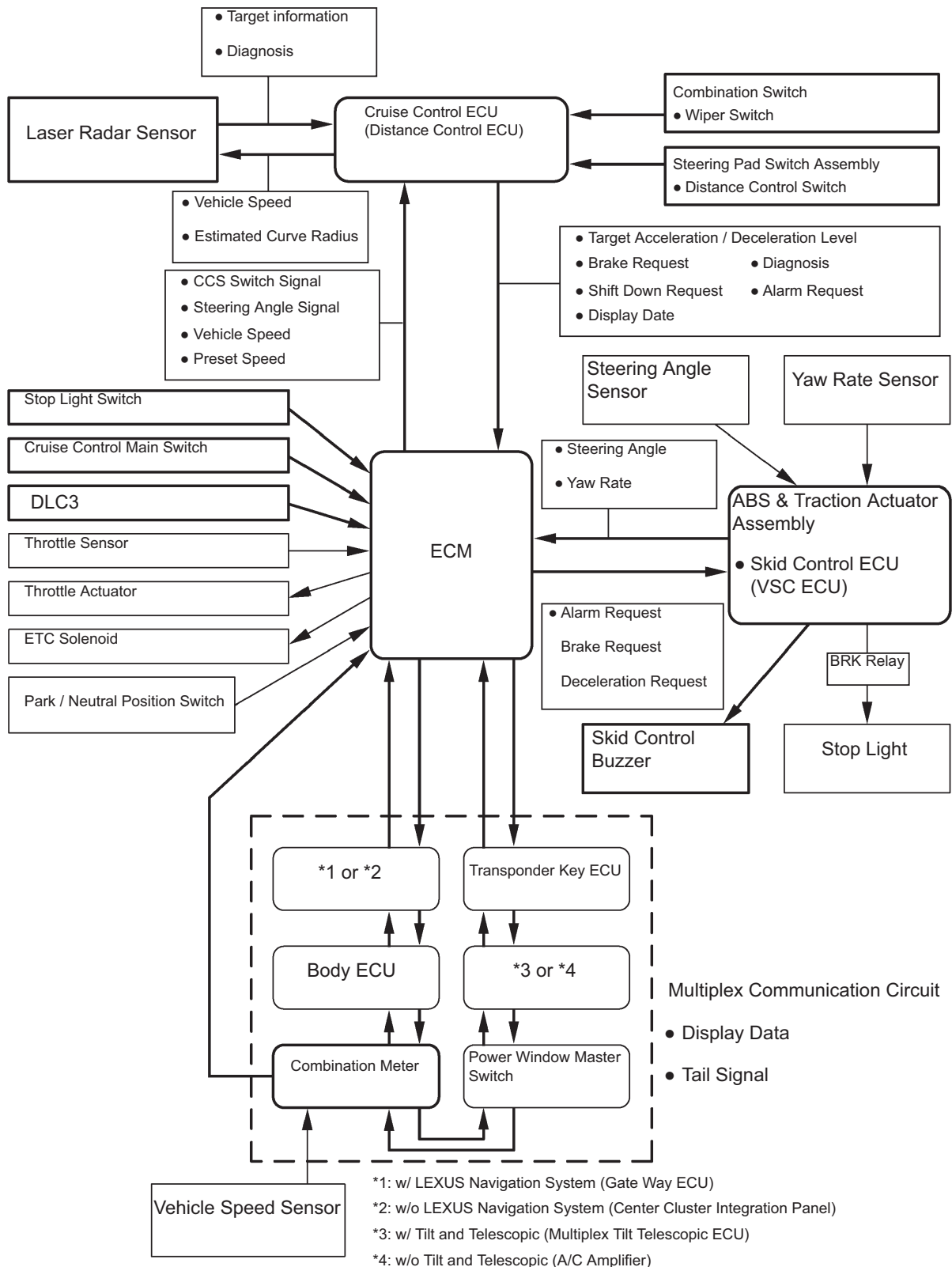
- Even if ACCEL is operated to increase the set vehicle speed, the vehicle does not accelerate because the speed is controlled in accordance with the speed of the vehicle in front while driving with the vehicle-to-vehicle distance control mode on (follow-up cruising). However, as the set vehicle speed has been increased by ACCEL operation, the vehicle keeps accelerating 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 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 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: the 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



SYSTEM DIAGRAM

Dynamic Laser Cruise Control System:



SYSTEM DESCRIPTION

1. DYNAMIC LASER CRUISE CONTROL SYSTEM DESCRIPTION

- (a) This system maintains the vehicle running at the fixed speed that the driver has set, as long as there are no vehicles ahead in the same lane. Then, the system maintains the vehicle distance that has been set by the driver.

If the system detects a vehicle moving at a slower speed ahead while the driver is driving at a fixed 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.

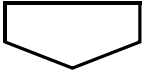
Thereafter, if there are no front vehicles within the set vehicle-to-vehicle distance because either the vehicle ahead or the driver has changed lanes, the system accelerates slowly to reach the set vehicle speed and resumes driving at the fixed speed.

- (b) Fixed speed cruise control mode is designed to maintain a fixed cruising speed. The vehicle-to-vehicle distance control mode is designed to control cruising at a fixed speed function, deceleration cruising function, follow-up cruising function and acceleration cruising function.
- (c) A steering pad switch (Distance control switch) for setting the distance to the front vehicle is provided on the steering wheel pad.
- With this switch, the vehicle distance can be set in the following three stages: LONG, MIDDLE, and SHORT.

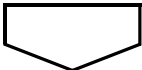
HOW TO PROCEED WITH TROUBLESHOOTING

The intelligent tester can be used at step 4, 5, 10.

1 VEHICLE BROUGHT TO WORKSHOP



2 PROBLEM SYMPTOM CONFIRMATION



3 CHECK BODY MULTIPLEX COMMUNICATION SYSTEM

(a) Check that the DTCs output.

HINT:

The ECM of this system is connected to the multiplex communication system. Therefore, before starting troubleshooting, make sure to check that there is no trouble in the multiplex communication system.

CC

MULTIPLEX DTC OUTPUTS (PROCEED TO "BODY MULTIPLEX COMMUNICATION SYSTEM")



NO MULTIPLEX DTC (GO TO STEP 5)

4 DTC CHECK (OTHER THAN MULTIPLEX DTC)

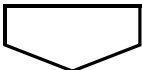


MALFUNCTION CODE (GO TO STEP 6)



NORMAL CODE (GO TO STEP 7)

5 DTC CHART

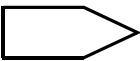


GO TO STEP 10

6 PROBLEM SYMPTOM SIMULATION

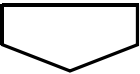


SYMPTOM DOES NOT OCCUR (GO TO STEP 8)



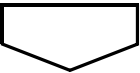
SYMPTOM OCCURS (GO TO STEP 9)

7 SYMPTOM SIMULATION



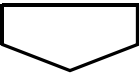
GO TO STEP 10

8 PROBLEM SYMPTOMS TABLE

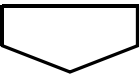


9 CIRCUIT INSPECTION

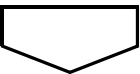
CC



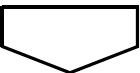
10 TERMINAL OF ECU



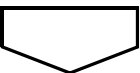
11 IDENTIFYING PROBLEM



12 REPAIR OR REPLACE



13 CONFIRMATION TEST



END

ROAD TEST

1. PROBLEM SYMPTOM CONFIRMATION

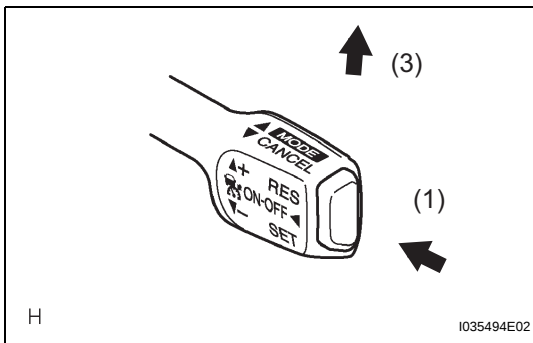
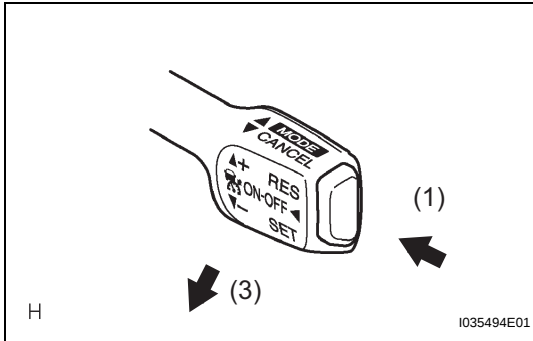
HINT:

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.

- (1) Turn the main switch ON.
- (2) Drive at the required speed (40 km/h (25 mph) or higher).
- (3) Push the cruise control main switch to SET/COAST.
- (4) After releasing the switch, check that the vehicle cruises at the set speed.



(b) Inspect the ACC (ACCEL) function.

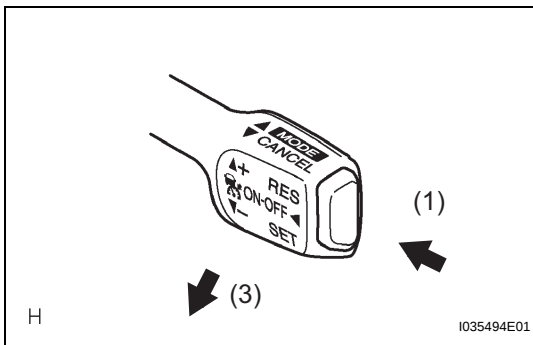
- (1) Turn the main switch ON.
- (2) Drive at the required speed (40 km/h (25 mph) or higher).
- (3) Push the cruise control main switch to -/SET.
- (4) Check that vehicle speed increases while the cruise control main switch is pushed to +/RES, and that the vehicle cruises at the newly set speed when the switch is released.
- (5) Momentarily push the cruise control main switch +/RES and then immediately release it. Check that vehicle speed increases* (tap-up control).

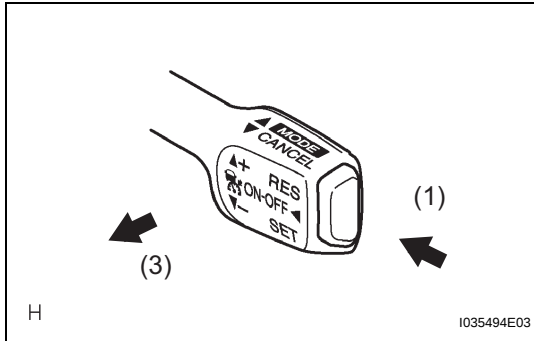
HINT:

*: Constant speed control mode: increases by 1.6 km/h (1.0 mph); vehicle-to-vehicle distance control mode: increases by 5 km/h (3 mph)

(c) Inspect the COAST function.

- (1) Turn the main switch 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 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.





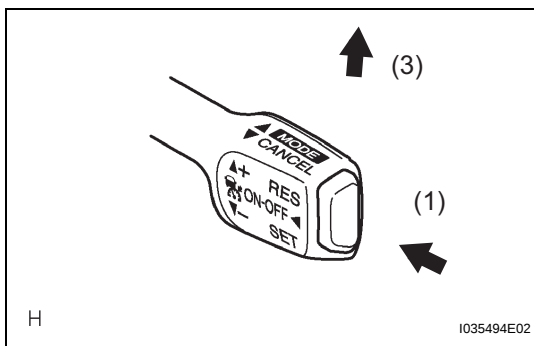
- (5) Momentarily push the cruise control main switch to -/SET, and then immediately release it. Check that vehicle speed decreases* (tap-down control).

HINT:

*: Constant speed control mode: decreases by 1.6 km/h (1.0 mph); vehicle-to-vehicle distance control mode: decreases by 5 km/h (3 mph).

- (d) Inspect the CANCEL function.

- (1) Turn the main switch ON.
- (2) Drive at the required speed (40 km/h (25 mph) or higher).
- (3) Push the cruise control main switch to -/SET.
- (4) When performing one of the following, check that the cruise control system is cancelled and that the normal driving mode is reset.
 - Depressing the brake pedal
 - Moving the shift lever to any position except D (6th, 5th and 4th gears)
 - Turning the main switch OFF
 - Pulling the cruise control main switch to CANCEL



- (e) Inspect the RES (RESUME) function.

- (1) Turn the main switch ON.
- (2) Drive at the required speed (40 km/h (25 mph) or higher).
- (3) Push the cruise control main switch to -/SET.
- (4) Cancel the cruise control system according to 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 drives at the set speed.

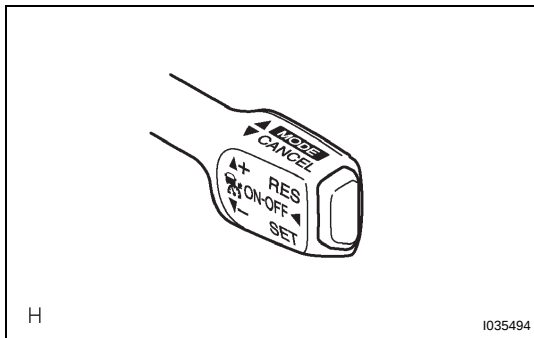
HINT:

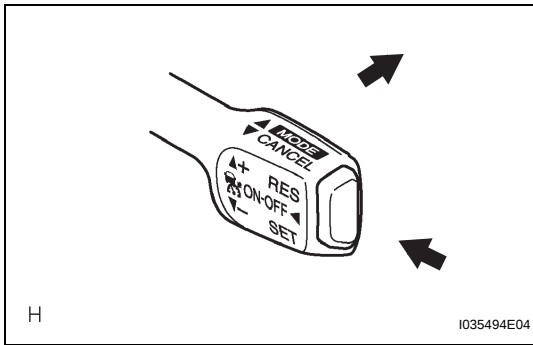
The stored vehicle speed is retained even if vehicle speed goes below 40 km/h (25 mph) once. The previously stored vehicle speed can be resumed by pushing the cruise control main switch to +/- RES when vehicle speed returned to approximately 40 km/h (25 mph) or more.

OPERATION CHECK

1. INPUT SIGNAL CHECK

- (a) Connect the intelligent tester to the DLC3.
- (b) Check the cruise control main switch using the DATA LIST function in the intelligent tester (ON-OFF, CANCEL, -/SET, +/-RES, and MODE).



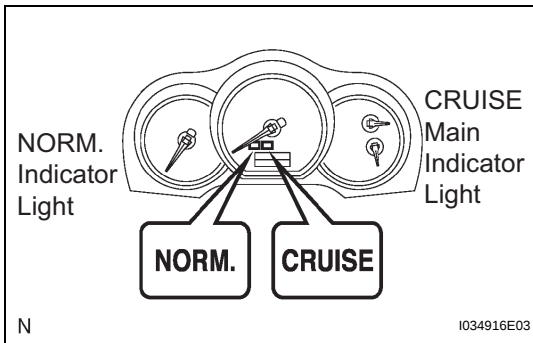


2. INSPECT MODE SWITCH

- (a) Turn the ignition switch on.

HINT:

Dynamic laser cruise is default mode.



- (b) After pushing the ON-OFF button on, push the cruise control main switch to MODE for at least 1 second without any other control. Make sure that "NORMAL." is indicated and no indication is shown in the display.

NOTICE:

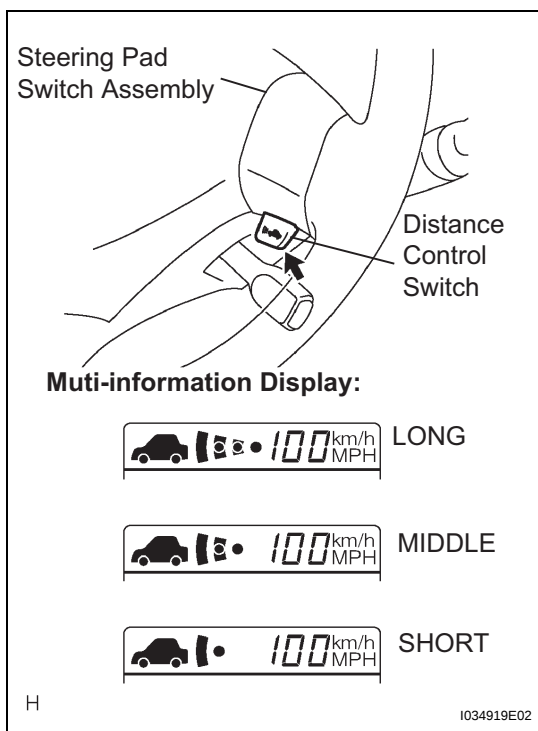
Do not push any other switches before pushing the main switch to MODE. If another switch is pushed, turn the main switch OFF and repeat the procedure above.

HINT:

If the system cannot switch to the constant speed control mode, push the ON-OFF button off once, and perform the same procedures as shown above. If a malfunction is still detected in the system, and then start the engine and perform the above procedure.

3. INSPECT STEERING PAD SWITCH ASSEMBLY

- (a) Turn the switch on.
- (b) Push on the ON-OFF button of the cruise control main switch.
- (c) Push on the distance control switch of the steering pad switch.



- (d) Check the the indication multi-information display of the combination meter, changes from "LONG", "MIDDLE" to "SHORT" in order.

HINT:

The indication is immediately set to "LONG" each time the engine is started.

PROBLEM SYMPTOMS TABLE

If a normal code is displayed during the DTC check but the problem still occurs, check the circuits for each problem symptom in the order given in the table below and proceed to the relevant troubleshooting page.

HINT:

Inspect the "Fuse" and "Relay" before confirming the suspected area as shown in the charts below.

Inspect each malfunction circuit in numerical order for the corresponding symptom.

If the malfunction still exist even after checking and confirming that all the circuit are normal, replace the ECM.

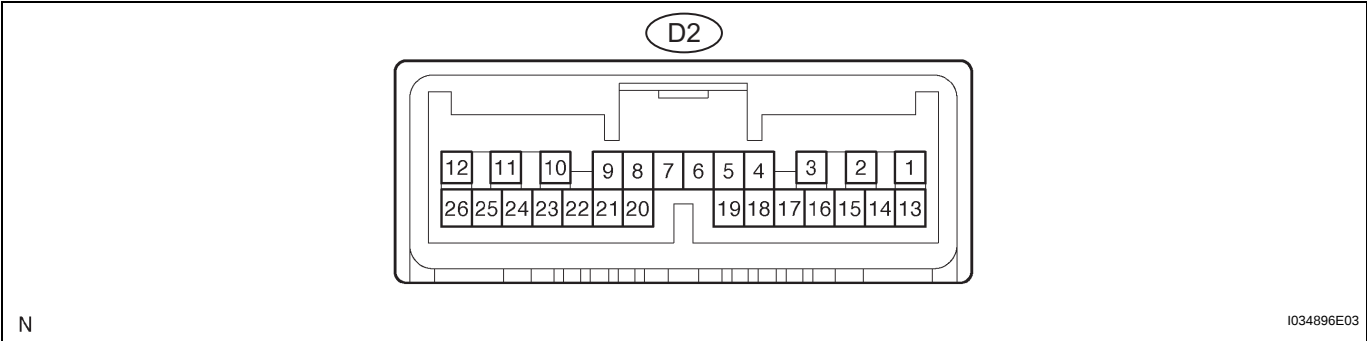
DYNAMIC LASER CRUISE CONTROL SYSTEM

Symptom	Suspected area	See page
Main switch cannot be turned ON. (Cruise indicator light in combination meter does not come on.)	1. Cruise control switch circuit	CC-75
	2. CRUISE main indicator light circuit	CC-88
	3. ECM	CC-39
Vehicle speed setting cannot be done. (Although indicator light in combination meter comes on when the main switch is turned ON, it goes off when vehicle speed is set.)	1. Cruise control switch circuit	CC-75
	2. ECM	CC-39
Setting cannot be done. (Indicator light in combination meter comes on when the main switch is turned ON and it remains ON while setting.)	1. Cruise control switch circuit	CC-75
	2. Stop light switch circuit	CC-51
	3. Park/Neutral position switch circuit	AX-42
	4. Combination meter system	ME-4
	5. ECM	CC-39
While the vehicle is driven with cruise control, the set control is canceled. (Indicator light and CRUISE remain ON.)	1. Cruise control switch circuit	CC-75
	2. Vehicle speed sensor circuit	CC-50
	3. Stop light switch circuit	CC-51
	4. Cruise main indicator light circuit	CC-88
	5. Park/Neutral position switch circuit	AX-42
	6. ECM	CC-39
Hunting (Speed is not constant.)	1. Vehicle speed sensor circuit	CC-50
	2. Malfunction in speedometer circuit	ME-23
	3. Laser radar sensor circuit	CC-58
	4. Distance control ECU circuit	-
	5. ECM	CC-39
Setting cannot be canceled. (When Coast, Acceleration, Resume, Set speed change and Control switch are operated.)	1. Cruise control switch circuit	CC-75
	2. ECM	CC-39
Erroneous detection or lost sight of the vehicle ahead.	1. Clean laser radar sensor	-
	2. Improper aiming of laser sensor beam axis	CC-59
Alarm buzzer does not sound.	1. Buzzer circuit	CC-60
	2. VSC system	BC-3
	3. Laser radar sensor circuit	CC-58
	4. Distance control ECU	CC-39
	5. ECM	CC-39
Set distance cannot be changed.	1. Combination meter system	ME-4
	2. Distance control switch	CC-81
	3. ECM	CC-39
No display.	1. Combination meter system	ME-4
	2. ECM	CC-39

Symptom	Suspected area	See page
No brake control (when decelerating)	1. ABS solenoid circuit	BC-3
	2. VSC system	BC-3
	3. Distance control ECU	CC-39
	4. VSC system	BC-3
Constant speed mode cannot be ON.	1. Cruise control switch circuit	CC-75
	2. ECM	CC-39
	3. Combination meter system	ME-4
Vehicle speed setting cannot be canceled with wiper Lo/Hi. (Including automatic wiper)	1. Rain sensor circuit	WW-19
	2. Wiper signal circuit	WW-14
	3. Distance control ECU	CC-39
	4. ECM	CC-39
Setting cannot be canceled in SNOW mode.	1. Pattern select switch circuit	AX-125
	2. Automatic transmission system	AX-6
	3. ECM	CC-39
Unable to adjust (complete) the optical axis of the laser radar sensor.	1. Check for DTC P1570/73	CC-58
	2. Check the position, distance and angle of the reflector	CC-96
	3. Check the installation of the laser radar sensor	CC-101
	4. Laser radar sensor	CC-39
	5. ECM	CC-39

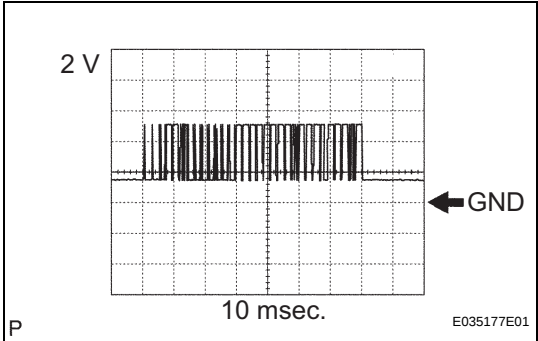
TERMINALS OF ECU

1. CHECK DISTANCE CONTROL ECU

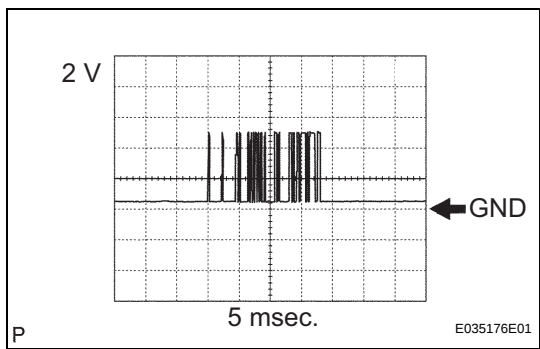


Symbols (Terminal No.)	Wiring Color	Terminal Description	Condition	Specified Condition
B - GND (D2-1 - D2-12)	P - R	Battery	Always	10 to 14 V
WIP2 - GND (D2-2 - D2-12)	W - R	Wiper switch signal	Ignition switch ON, Wiper switch: OFF → HI	Below 1 V → 10 to 14 V
WASH - GND (D2-3 - D2-12)	V - R	Washer switch signal	Ignition switch ON, Washer switch: OFF → ON	10 to 14 V → Below 1 V
SGND - Body ground (D2-10 - Body ground)	R - Body ground	Ground	Always	Below 1 Ω
GND - Body ground (D2-12 - Body ground)	R - Body ground	Ground	Always	Below 1 Ω
IGB - GND (D2-13 - D2-12)	V - R	Ignition switch on signal	Ignition switch ON	10 to 14 V
MODE - GND (D2-16 - D2-12)	LG - R	Distance control switch signal	Ignition switch ON, Distance control switch OFF → ON	10 to 14 V → Below 1 V
LRDD - GND (D2-22 - D2-12)	B - R	Laser radar sensor input signal	Ignition switch ON	Pulse generation (see waveform 1)
LRRD - GND (D2-23 -D2-12)	W - R	Laser radar sensor input signal	Ignition switch ON	Pulse generation (see waveform 2)
ELC - GND (D2-24 -D2-12)	L-B - R	ECM input signal	Ignition switch ON	Pulse generation (see waveform 3)
LCS - GND (D2-25 -D2-12)	GR - R	ECM input signal	Ignition switch ON	Pulse generation (see waveform 4)

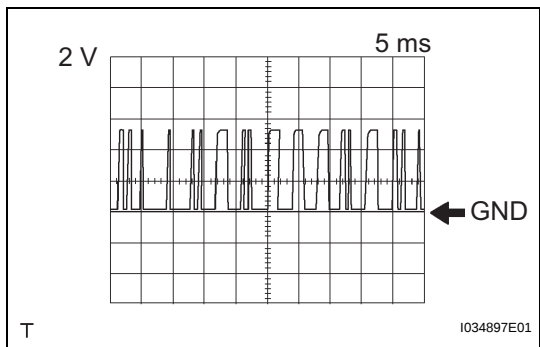
CC



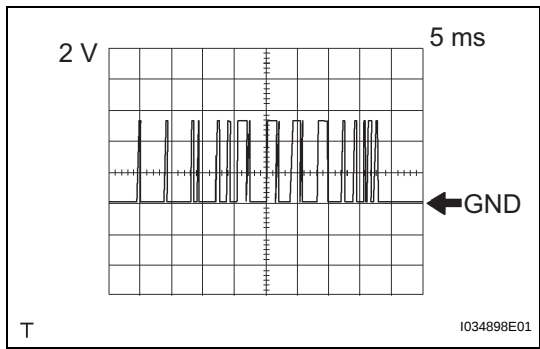
- (a) Reference: waveform 1
- HINT:
- Terminal: LRDD - GND
 - Gauge set: 2 V/DIV, 10 ms./DIV
 - Condition: Ignition switch ON



- (b) Reference: waveform 2
- HINT:
- Terminal: LRRD - GND
 - Gauge set: 2 V/DIV, 5 ms./DIV
 - Condition: Ignition switch ON

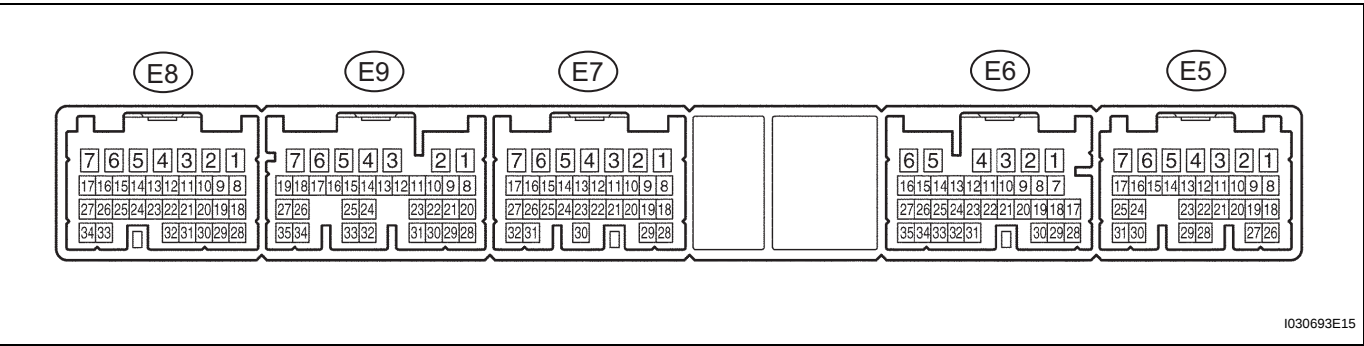


- (c) Reference: waveform 3
- HINT:
- Terminal: ELC - GND
 - Gauge set: 2 V/DIV, 5 ms./DIV
 - Condition: Ignition switch ON



- (d) Reference: waveform 4
- HINT:
- Terminal: LCS - GND
 - Gauge set: 2 V/DIV, 5 ms./DIV
 - Condition: Ignition switch ON

2. CHECK ECM



Symbols (Terminal No.)	Wiring Color	Terminal Description	Condition	Specified Condition
E1 - Body ground (E7-1 - Body ground)	BR - Body ground	Ground	Always	Below 1 Ω
LGND - Body ground (H31-5 - Body ground)	Y - Body ground	Ground	Always	Below 1 Ω
LCS - E1 (E7-19 - E7-1)	W-R - BR	Distance control ECU input signal	Ignition switch ON	Pulse generation (see waveform 1)

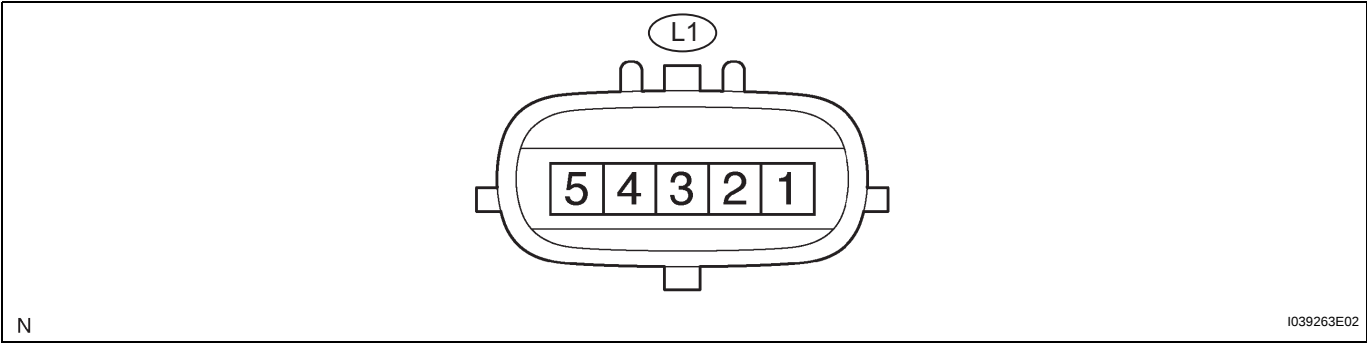
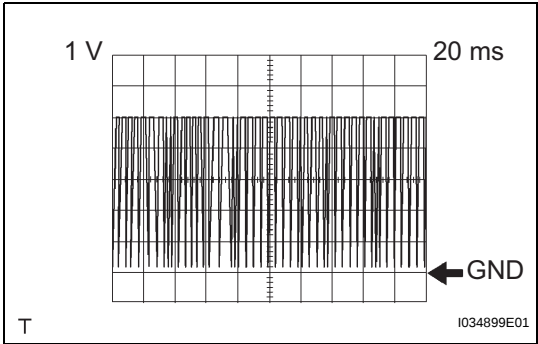
Symbols (Terminal No.)	Wiring Color	Terminal Description	Condition	Specified Condition
CCHG - E1 (E7-28 - E7-1)	P - BR	Distance control switch signal	Ignition switch ON Cruise control main switch ON MODE switch ON	Below 1 V
			Ignition switch ON Cruise control main switch ON MODE switch ON	10 to 14 V
ELC - E1 (E6-12 - E7-1)	B-R - BR	Distance control ECU output signal	Ignition switch ON	Pulse generation (see waveform 1)
ST1- - E1 (E6-12 - E7-1)	GR - BR	Stop light signal	Brake pedal depressed (Stop light switch ON)	Below 1 V
			Brake pedal depressed (Stop light switch OFF)	10 to 14 V
SPD - E1 (E6-17 - E7-1)	LG - BR	Speed signal	Engine start → Car stoppage	Below 1.5 V → 4.7 to 16 V
			During pedal released (Pulse generated)	3 to 7 V
STP - E1 (E6-19 - E7-1)	B - BR	Stop light signal	Brake pedal released (Stop light switch OFF)	Below 1 V
			Brake pedal depressed (Stop light switch ON)	10 to 14 V
CCS - E1 (E6-24 - E7-1)	P - BR	Cruise control main switch signal	Ignition switch ON CANCEL switch ON -/SET switch ON +/RES switch ON Main switch ON	10 to 16 V 6.6 to 10.1 V 4.5 to 7.1 V 2.3 to 4.0 V Below 1 V
ENG+ - ENG- (E5-24 - E5-30)	LG - L	Skid control signal	Ignition switch ON	Pulse generation (see waveform 1)
TRC+ - TRC- (E5-25 - E5-31)	Y - G	Skid control signal	Ignition switch ON	Pulse generation (see waveform 1)

CC

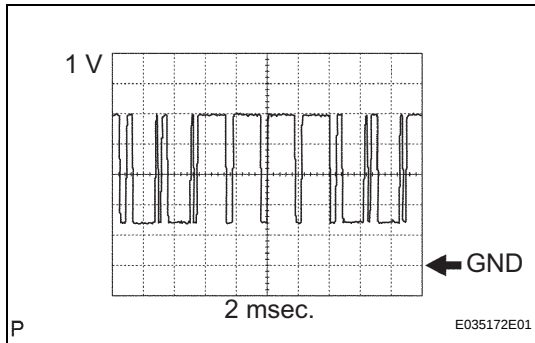
If the value is not within the standard range, some defects on the vehicle is suspected.

- (a) Reference: waveform 1
HINT:
- Terminal: LCS - E1
 - Gauge set: 1V/DIV, 20 ms./DIV
 - Condition: Ignition switch ON

3. CHECK LASER SENSOR



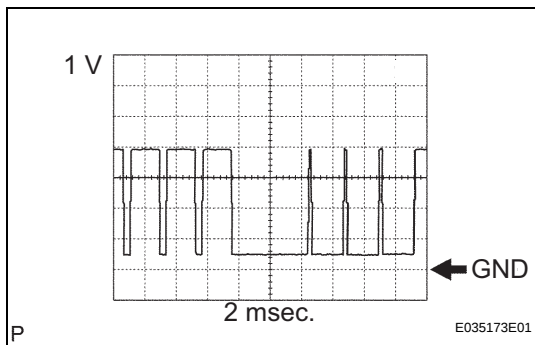
Symbols (Terminals No.)	Wiring Color	Terminal Description	Condition	Specified Condition
LGND - Body ground (L1-1 - Body ground)	BR - Body ground	Distance signal	Always	Below 1 Ω
SGND - Body ground (L1-2 - Body ground)	R - Body ground	Ground	Always	Below 1 Ω
LRDD - SGND (L1-3 - L1-2)	B - R	Laser radar sensor output signal	Ignition switch ON	Pulse generation (see waveform 1)
LRRD - SGND (L1-4 - L1-2)	W - R	Laser radar sensor input signal	Ignition switch ON	Pulse generation (see waveform 2)
IGB - SGND (L1-5 - L1-2)	V - R	Ignition switch signal	Ignition switch ON	10 to 14 V



(a) Reference: waveform 1

HINT:

- Terminal: LRDD - SGND
- Gauge set: 1 V/DIV, 2 msec./DIV
- Condition: Ignition switch ON

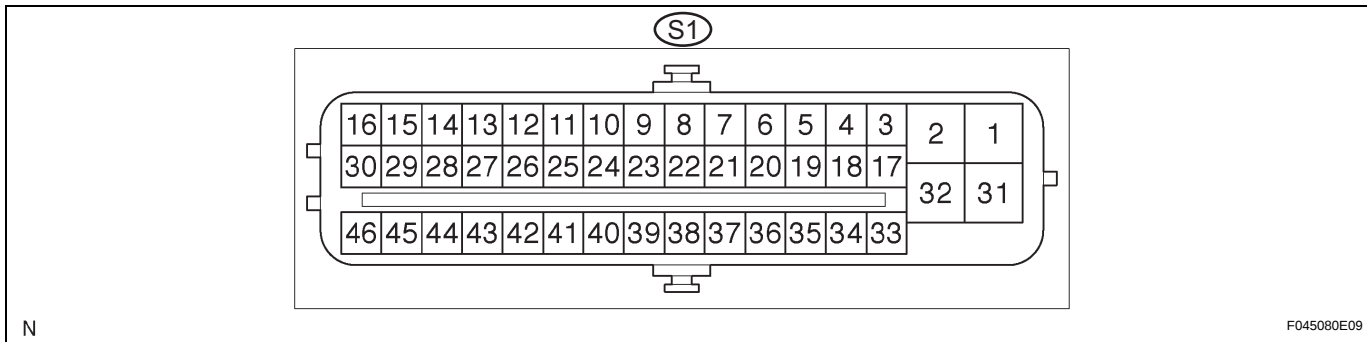


(b) Reference: waveform 2

HINT:

- Terminal: LRRD - SGND
- Gauge set: 1 V/DIV, 2 msec./DIV
- Condition: Ignition switch ON

4. BRAKE ACTUATOR ASSEMBLY (SKID CONTROL ECU)



Symbols (Terminals No.)	Wiring Color	Terminal Description	Condition	Specified Condition
BZ (S1 - 30) - GND (S1 - 32)	O - W-B	Skid control buzzer signal	Ignition switch ON Skid control buzzer is not sounded	10 to 14 V (*1)
ENG+ (S1 - 9) - ENG- (S1 - 23)	G - L-B	ECM signal	Ignition switch ON	Pulse generation (*1)
TRC+ (S1 - 8) TRC- (S1 - 22)	BR - P	ECM signal	Ignition switch ON	Pulse generation (*2)
STPO (S1 - 16) - GND1 (S1 - 32)	G - W-B	Stop light signal	Ignition switch ON	10 to 14 V (*1)

Symbols (Terminals No.)	Wiring Color	Terminal Description	Condition	Specified Condition
STP2 (S1 - 21) - GND1 (S1 - 32)	GR - W-B	Stop light signal	Brake pedal released (Stop light switch OFF)	Below 1.0 V (*1)
			Brake pedal depressed (Stop light switch OFF)	10 to 14 V (*1)
STP1 (S1 - 27) - GND1 (S1 - 32)	W - W-B	Stop light signal	Brake pedal released (Stop light switch OFF)	(*1)
			Brake pedal depressed (Stop light switch OFF)	(*1)

*1: Since the waterproof connector is used, disconnect the connector from the ECU and check the wire harness.

*2: Since the waterproof connector is used, check the wire harness of the ECM side.

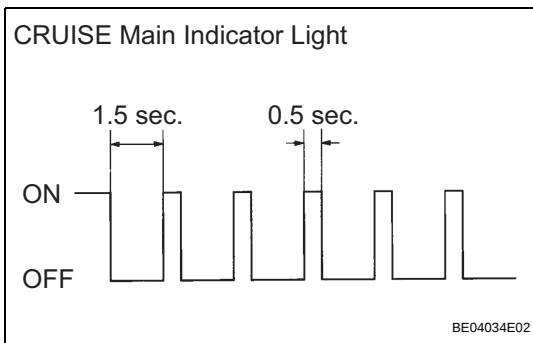
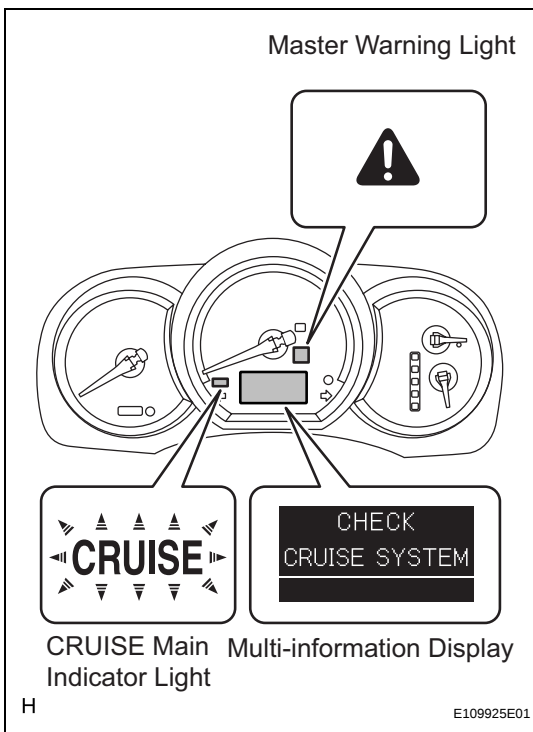
DIAGNOSIS SYSTEM

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 laser cruise control system, the DTCs are stored in the ECM.

NOTICE:

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

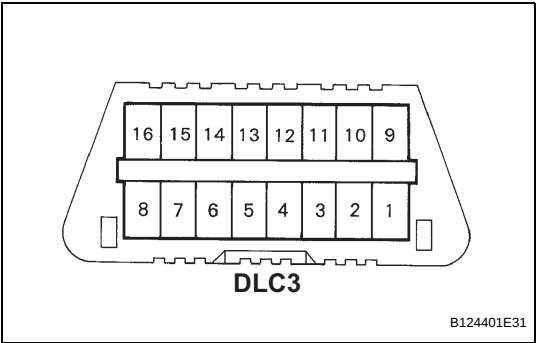


- Since the stored data in the ECM is erased by disconnecting the EFI and ETCS fuses or the battery terminal, do not disconnect them until the inspection has been completed.

2. DESCRIPTION

- (a) The ECM controls the cruise control function and dynamic laser cruise control in a vehicle. Data on the cruise control system, dynamic laser cruise control system and the DTCs can be read from DLC3 in the vehicle. If the CRUISE main indicator light does not come on after the DTC check, there is a malfunction in the cruise control and dynamic laser cruise control system.

Use the intelligent tester to check and solve the problem.



3. CHECK DLC3

- (a) The vehicle's ECM uses ISO 9141-2 for communication. The terminal arrangement of DLC3 complies with SAE J1962 and matches the ISO 9141-2 format.

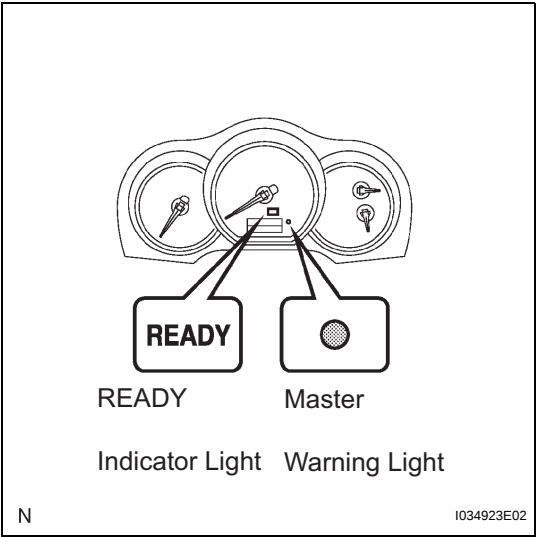
Terminal No.	Connection / Specified Condition	Condition
4	Chassis ground - Body ground / 1 Ω or less	Always
7	Bus "+" line / Pulse generation	During Communication
16	Battery positive - Body ground / 9 to 14 V	Always

HINT:

If the display shows "UNABLE TO CONNECT TO VEHICLE" after connecting the intelligent tester to the DLC3 and turning the ignition ON, there is a problem either with the vehicle or with the tool.

- If communication is normal when connecting the tool to another vehicle, inspect the DLC3 on the original vehicle.
- If communication is still not possible when connecting the tool to another vehicle, the problem is probably in the tool itself. Consult the Service Department listed in the tool's instruction manual.

CC

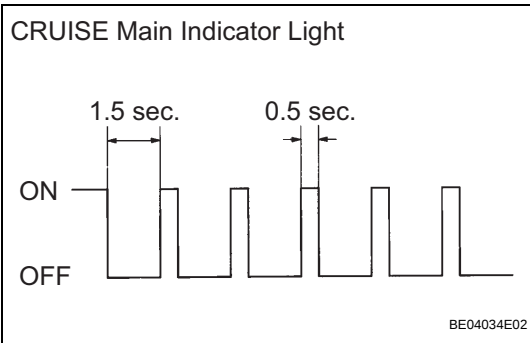


4. CHECK INDICATOR

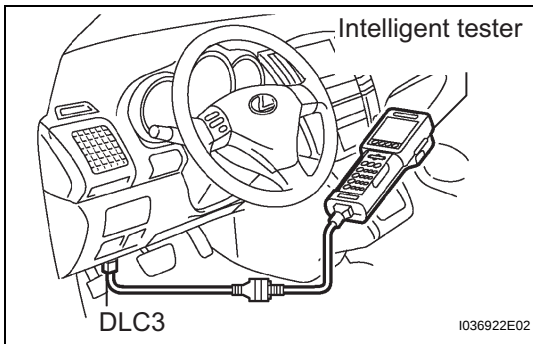
- (a) Turn the ignition switch on.
- (b) Check that the CRUISE main indicator light and READY indicator come on when the main switch ON-OFF button is pushed on, and that the indicator light goes off when the ON-OFF button is pushed off.

HINT:

- If the indicator check result shows a problem, proceed to troubleshooting for the combination meter section.



- If a malfunction occurs in the vehicle speed sensors, the stop light switch, 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.



DTC CHECK / CLEAR

1. CHECK DTC

- (a) Checking for DTCs.
 - (1) Connect the intelligent tester to the DLC3.
 - (2) Turn the ignition switch to the ON position.
 - (3) Read the DTCs by following the prompts on the tester screen.

HINT:

The intelligent tester has the "Snapshot" function which records the monitored data.

Refer to the Intelligent Tester Operator's Manual for further details.

- (b) Clearing DTCs.
 - (1) Connect the intelligent tester to the DLC3.
 - (2) Turn the ignition switch to the ON position.
 - (3) Clear the DTCs following the prompts on the tester screen.

HINT:

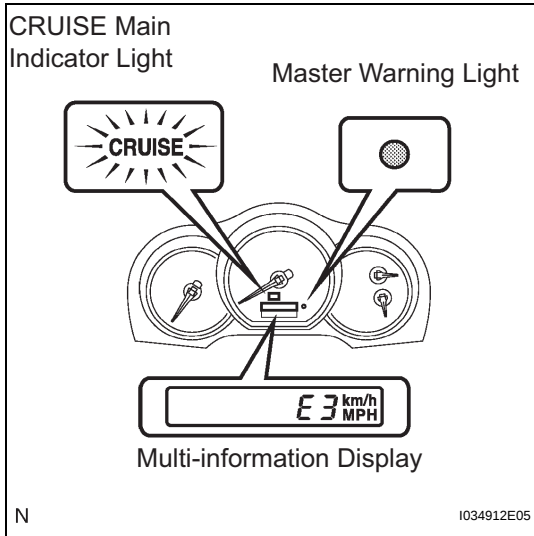
Refer to the Intelligent Tester Operator's Manual for further details.

FAIL-SAFE CHART

1. AUTO CANCEL FUNCTION (FAIL-SAFE FUNCTION):

HINT:

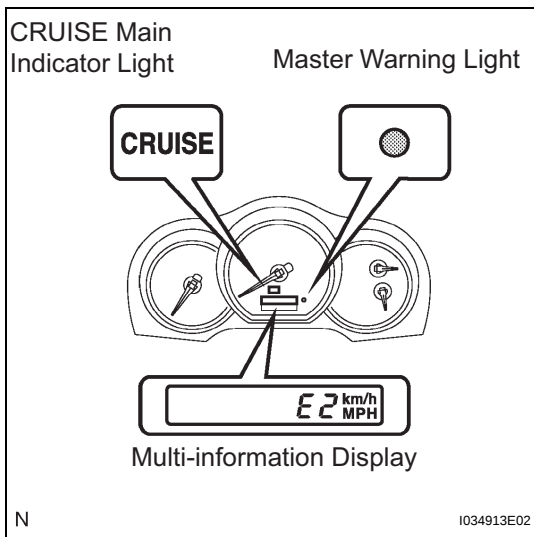
If a system malfunction occurs, the applicable DTCs will appear on the multi-information display.



- (a) The CRUISE main indicator light keeps blinking until the main switch is turned off, the master warning light comes on with the warning sound "Pop", and the display shows "E3". The cruise control operation is suspended until turning the main switch ON again. The auto cancel function deletes the stored vehicle speed and cancels the cruise control operation in the following conditions.

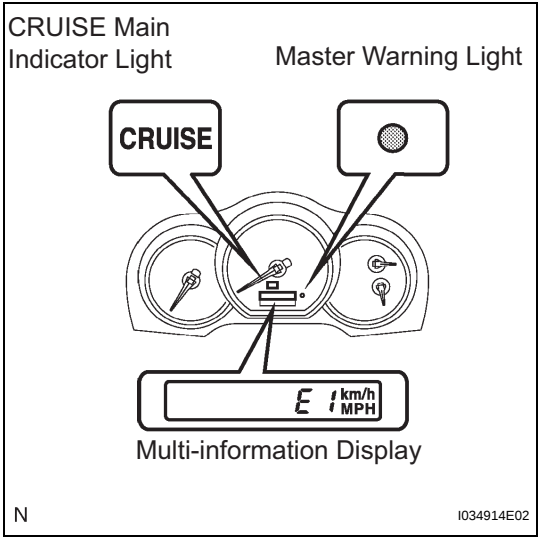
- (1) When the vehicle speed signal malfunctions.
- (2) When the electronic throttle parts malfunction.
- (3) When the stop light switch has an open or short circuit.
- (4) When the laser radar sensor malfunctions. (*1)
- (5) When the light axis of the laser sensor is off position. (*1)

*1: Only in the vehicle-to-vehicle distance control mode.



- (b) The CRUISE main indicator light blinks, the master warning light comes on with the warning sound "Pop", and the display shows "E2". The cruise control operation is suspended until the canceling condition is resolved (in the vehicle-to-vehicle distance control mode only). The auto cancel function cancels the cruise control operation in the following condition.

- (1) When the wiper (Hi, Lo) operate (including the auto wiper).
- (2) When the pattern select switch is in the "SNOW" mode.
- (3) When the laser radar sensor receives strong light, such as sunlight, from the front side.
- (4) When the vehicle-to-vehicle distance measurement is extremely unstable because of bad weather.



- (c) The auto cancel function cancels the cruise control operation in the following conditions. At this time, the CRUISE main indicator light blinks, the master warning light comes on with the warning sound "Pop" and the display shows "E1". The cruise control operation is suspended until the canceling condition is resolved (in the vehicle-to-vehicle distance control mode only).
- (1) When the laser radar sensor has dirt on it.
- HINT:
While the dynamic laser cruise control is operated, the ECM outputs a malfunction code for 0.15 sec. or more when it detects dirt.

2. **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 in operation, the system clears the stored vehicle speed and cancels the dynamic radar cruise control operation.

HINT:
In the vehicle-to-vehicle distance control mode, the stored vehicle speed in the ECM is maintained.

CC

Vehicle Condition	Auto Cancel Condition	Fail-safe Deactivation Condition
CRUISE main indicator light goes off	- Vehicle speed is lower than low speed limit (approx. 40 km/h (25 mph)) while running with cruise control system in operation - Vehicle speed is lower than stored vehicle speed by 16 km/h (9.9 mph) or more while running with cruise control system in operation	- Turn cruise control main switch ON again*1 - Push the cruise control main switch to RESUME/ACCEL*2

- HINT:
- *1: Constant speed control mode
- *2: Vehicle-to-vehicle distance control mode

DATA LIST / ACTIVE TEST

1. READ DATA LIST

HINT:

Using the intelligent tester's DATA LIST allows switch, sensor, actuator and other item values to be read without removing any parts. Reading the DATA LIST early in troubleshooting is one way to save time.

- Connect the intelligent tester to the DLC3.
- Turn the ignition switch on.
- Read the DATA LIST according to the display on the tester.

LASER CRUISE:

Item	Measurement Item / Display (Range)	Normal Condition	Diagnostic Note
ACCEL REQUEST	Accelerator request signal / min.: -2621.44 k/h/s, max.: 2621.36 k/h/s	0.8 k/h/s: No vehicle in front	-
VEHICLE DISTANCE	Laser radar sensor / min.: 0 m (0 ft), max.: 255 m (836.65 ft)	Distance to the vehicle in front	-
STEERING ANGLE	Steering angle sensor / min.: -36864 deg, max.: 36862.88 deg	Approx. 0 deg: When driving straight	-
ALARM RQST	Alarm request signal / NOT REQ, REQUEST	REQUEST: When beeping NOT REQ: When not beeping	-
SHIFT DOWN RQST	Shift down request signal / NOT REQ, REQUEST	NOT REQ: Always	-
L/C OPTION FLAG	Laser cruise option flag / NO, YES	YES: Vehicle-to-vehicle distance mode	-
DISTANCE TIME	Car distance time setting condition / SHRT, MID, LONG, NO	The vehicle select by distance control switch	-
YAW RATE	Yaw rate data / min.: -7999.98 deg/s, max.: 7999.74 deg/s	Approx. 0 deg: When driving straight	-
MAIN SW (MAIN)	Main SW signal (Main CPU) / ON or OFF	ON: Main SW ON (Pushed in) OFF: Main SW OFF (Pushed out)	*3
MAIN SW (SUB)	Main SW signal (Sub CPU) / ON or OFF	ON: Main SW ON (Pushed in) OFF: Main SW OFF (Pushed out)	*3
CCS READY M	Cruise control system stand by condition (Main CPU) / ON or OFF	ON ↔ OFF: Change ON/OFF each time Main SW is Pushed in.	*1
CCS READY S	Cruise control system stand by condition (Sub CPU) / ON or OFF	ON ↔ OFF: Change ON/OFF each time Main SW is Pushed in.	*1
CCS INDICATOR M	Cruise indicator signal (Main CPU) / ON or OFF	ON: "CCS READY" ON OFF: "CCS READY" OFF	*2
CCS INDICATOR S	Cruise indicator signal (Sub CPU) / ON or OFF	ON: "CCS READY" ON OFF: "CCS READY" OFF	*2
CRUISE CONTROL	Cruise control system active condition / ON or OFF	ON: Cruise control activated OFF: Cruise control inactivated	-
SHIFT D POS	PNP SW signal (D position) / ON or OFF	ON: Shift D position OFF: Except shift D position	-
STP LIGHT SW1-S	Stop lamp SW signal (Sub CPU) / ON or OFF	ON: Brake pedal depressed OFF: Brake pedal released	-
STP LIGHT SW2-S	Stop lamp SW signal (Sub CPU) / ON or OFF	ON: Brake pedal depressed OFF: Brake pedal released	-
STP LIGHT SW2-M	Stop lamp SW signal (Main CPU) / ON or OFF	ON: Brake pedal depressed OFF: Brake pedal released	-
RES/ACC SW	+/RES SW signal / ON or OFF	ON: +/RES SW ON OFF: +/RES OFF	-

Item	Measurement Item / Display (Range)	Normal Condition	Diagnostic Note
SET/COAST SW	-/SET SW signal / ON or OFF	ON: -/SET SW ON OFF: -/SET SW OFF	-
CANCEL SW	CANCEL SW signal / ON or OFF	ON: CANCEL SW ON OFF: CANCEL SW OFF	-
VEHICLE SPD	Vehicle speed sensor / min.: 0 km/h (0 mph), max.: 255 km/h (158 mph)	Actual vehicle speed	-
MEMORY SPD	Cruise control memorized speed / min.: 0 km/h (0 mph), max.: 255 km/h (158 mph)	Memorized speed: Cruise control activated	-
THROTTLE	Required throttle opening angle / min.: 0 deg, max.: 125 deg	Required throttle opening angle (0° - 84°): Cruise control activated	-

HINT:

*3 is OK, but *1 is NG → ECM failure

*1 is OK, but *2 is NG → DTC output or ECM failure

*3 is OK, but CRUISE main indicator light does not come on → Indicator or W/H or ECM failure

2. ACTIVE TEST**HINT:**

Performing the ACTIVE TEST using the intelligent tester allows components such as the relay, VSV, and actuator to operate without parts removal. Performing the ACTIVE TEST as the first step of troubleshooting is one way to shorten labor time.

It is possible to display the DATA LIST during the ACTIVE TEST.

- Connect the intelligent tester to the DLC3.
- Turn the ignition switch to the ON position.
- According to the display on the tester, perform the "ACTIVE TEST".

HINT:

The ignition switch must be turned to the ON position to proceed Active Test using a intelligent tester.

ABS/TRAC/VSC:

Item	Vehicle Condition / Test Details	Diagnostic Note
VSC / BR WARN BUZ	Turns skid control buzzer ON / OFF	Buzzer can be heard

METER:

Item	Vehicle Condition / Test Details	Diagnostic Note
CRUISE INDIC	"CRUISE" indicator is ON / OFF	-
L-CRUISE DISP	"Multi-information display" is ON / OFF	-
L-CRS CHECK IND	"Master warning light" is ON / OFF	-
L-CRS READY IND	"READY" indicator light is ON / OFF	-
L-CRS NORMAL	"NORM." indicator light is ON / OFF	-

DIAGNOSTIC TROUBLE CODE CHART

DYNAMIC LASER CRUISE CONTROL SYSTEM

DTC No.	Detection Item	Trouble Area	See page
P0500	Vehicle Speed Sensor Malfunction	1. Vehicle speed sensor 2. Vehicle speed sensor signal circuit 3. Combination meter 4. ECM	CC-50
P0571	Brake Switch "A" Circuit	1. Stop light switch assembly 2. Stop light switch signal assembly circuit 3. ECM	CC-51
P0571	Stop Light Switch Circuit Malfunction	1. BRK relay 2. BRK relay circuit 3. Skid control ECU 4. Communication circuit 5. Cruise control ECU (Distance control ECU) 6. ECM	CC-54
P0607	Control Module Performance	ECM (This DTC indicates a malfunction in the ECM. When this DTC is output, it is necessary to replace ECM.)	CC-57
P1570	Radar Sensor Malfunction	Laser sensor	CC-58
P1572	Improper Aiming of Radar Sensor Beam Axis	Laser sensor	CC-59
P1575	Warning Buzzer Malfunction	1. Skid control buzzer assembly 2. Skid control buzzer circuit 3. Skid control ECU	CC-60
P1578	Brake System Malfunction	VSC system	CC-64
P1615	Communication Error from Distance Control ECU to ECM	1. Communication circuit 2. Cruise control ECU (Distance control ECU) 3. ECM	CC-65
P1616	Communication Error from ECM to Distance Control ECU	1. Communication circuit 2. Cruise control ECU (Distance control ECU) 3. ECM	CC-67
U0100	Lost Communication with ECM/PCM "A"	1. Communication circuit 2. Cruise control ECU (Distance control ECU) 3. ECM	CC-67
U0100	Communication Stop from ECM to Distance Control ECU, VSC	1. Communication circuit 2. Skid control ECU 3. ECM	CC-69
U0122	Lost Communication with Vehicle Dynamics Control Module	1. Communication circuit 2. Skid control ECU 3. ECM	CC-71
U0235	Lost Communication with Cruise Control Front Distance Range Sensor	1. Communication circuit 2. Laser sensor 3. Cruise control ECU (Distance control ECU)	CC-73

DTC**P0500****Vehicle Speed Sensor Malfunction****DESCRIPTION**

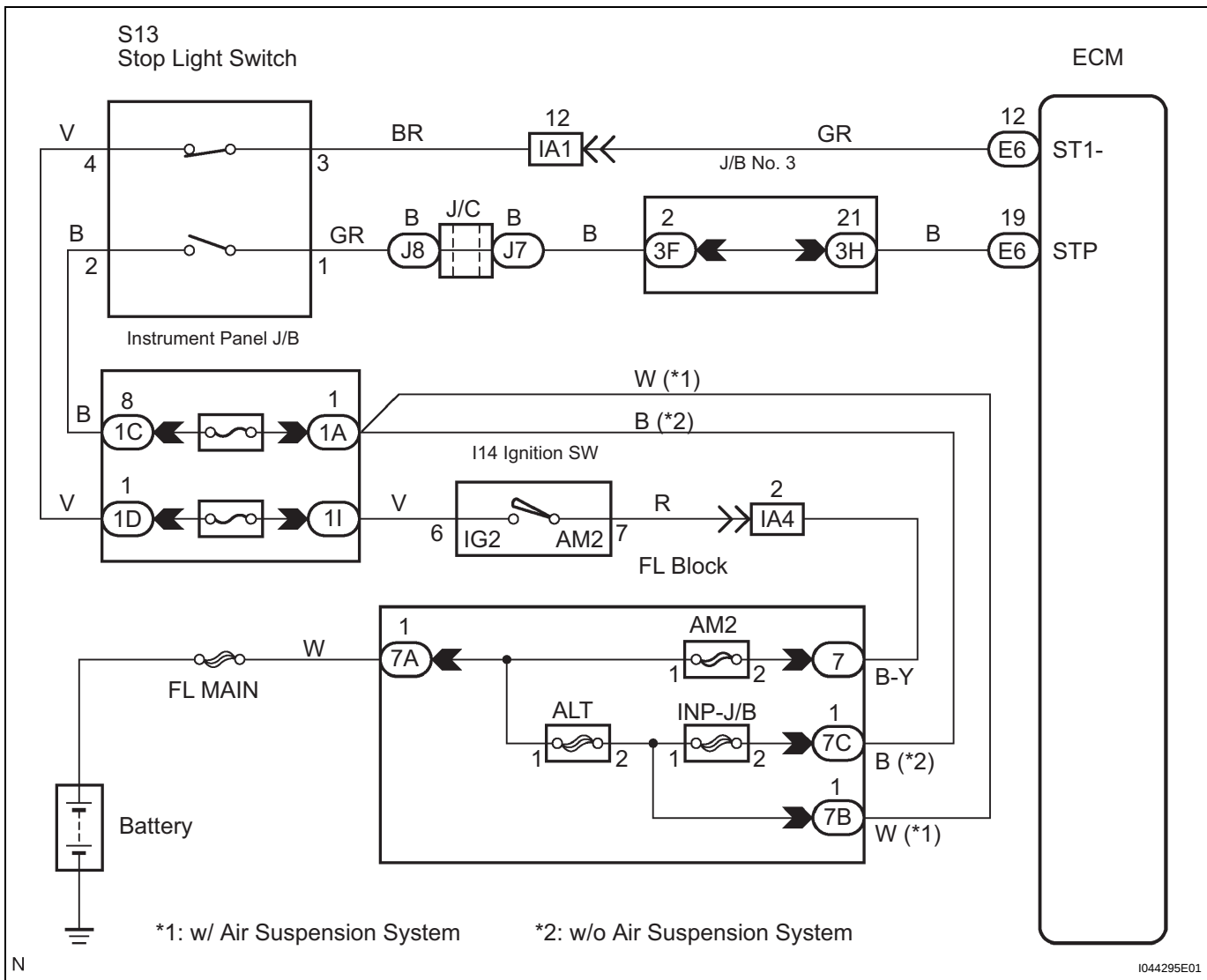
DTC No.	DTC Detection Condition	Trouble Area
P0500/21	The malfunction code is output when the vehicle speed signal from the vehicle speed sensor is cut for 0.14 sec. or more while cruise control is in operation.	• Combination meter • Vehicle speed sensor • Vehicle speed sensor signal circuit • ECM
P0503/23	Momentary interruption and noise are detected when a rapid change of vehicle speed occurs while the cruise control is in operation.	

WIRING DIAGRAM

DTC**P0571****Brake Switch "A" Circuit****DESCRIPTION**

When the brake pedal is depressed, the stop light switch sends a signal to the ECM. When the ECM 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. The cancellation condition occurs when voltage is applied to terminal STP. When the brake is applied, voltage is normally applied to terminal STP of the ECM through the STOP SW fuse and the stop light switch, and the ECM turns the cruise control off.

DTC No.	DTC Detection Condition	Trouble Area
P0571	- The malfunction code is output when the voltage of the STP terminal and that of the ST1- terminal on the ECM are less than 1 V for 0.5 sec. or more - When the following conditions are realized, a malfunction is detected. - The STP terminal voltage is less than 1 V. - The ST1- terminal voltage is less than 1 V. - For more than 0.5 sec. or more.	- Stop light switch - Stop light switch circuit - ECM

CC**WIRING DIAGRAM**

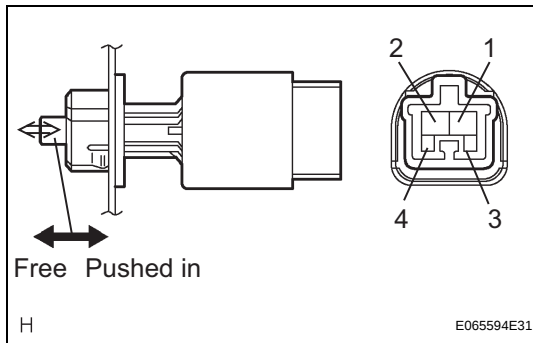
1 CHECK STOP LIGHT SWITCH OPERATION

- (a) Check that the stop light comes on when brake pedal is depressed, and goes off when the brake pedal is released.

NG

**INSPECT STOP LIGHT SWITCH CIRCUIT
(STOP LIGHT - STOP LIGHT SWITCH)**

OK

2 INSPECT STOP LIGHT SWITCH ASSEMBLY

- (a) Disconnect the stop light switch assembly connector
(b) Measure the resistance according to the value(s) in the table below.

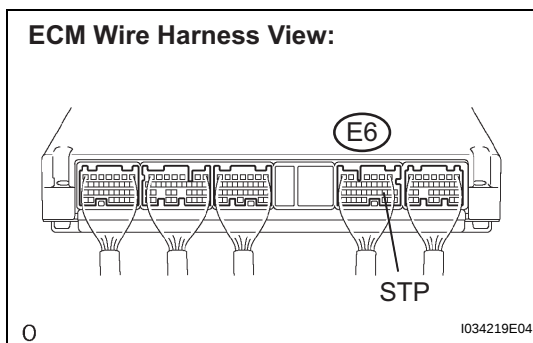
Resistance

Switch condition	Tester connection	Specified value
Switch pin free	1 - 2	Below 1 Ω
	3 - 4	10 k Ω or higher
Switch pin pushed in	1 - 2	10 k Ω or higher
	3 - 4	Below 1 Ω

NG

REPLACE STOP LIGHT SWITCH ASSEMBLY

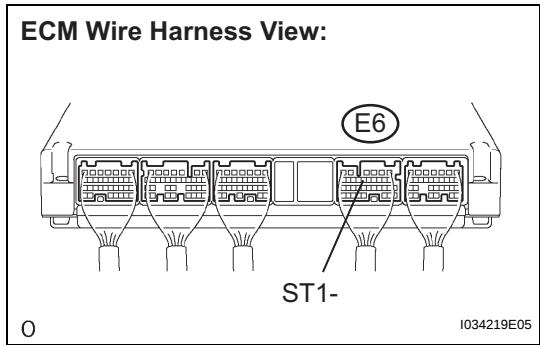
OK

3 INSPECT ECM

- (a) Remove the ECM with the connector.
(b) Turn the ignition switch to the ON position.
(c) Measure the voltage between terminal STP (E6-19) of the ECM connector and body ground according to the values in the table below.

Standard voltage

Condition	Specified value
Brake pedal is depressed	10 to 14 V
Brake pedal is released	Below 1 V



- (d) Measure the voltage between terminal ST1- (E6-19) of the ECM connector and body ground according to the values in the table below.

Standard voltage

Condition	Specified value
Brake pedal is depressed	Below 1 V
Brake pedal is released	10 to 14 V

NG

REPAIR OR REPLACE HARNESS OR CONNECTOR

OK

REPLACE ECM

DTC**P0571****Stop Light Switch Circuit Malfunction****DESCRIPTION**

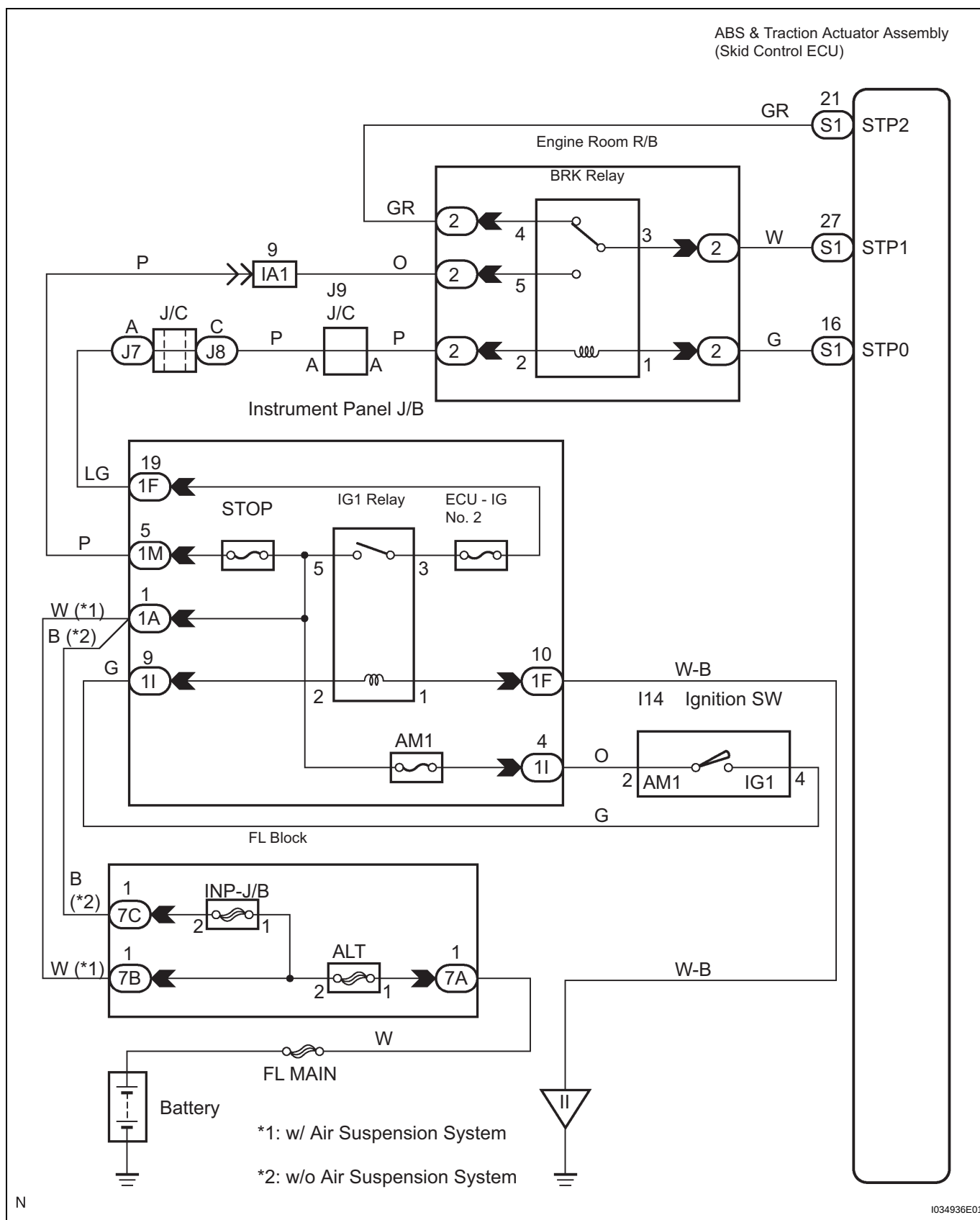
The ECM receives the brake demand signal from the cruise control ECU (distance control ECU) and transmits it to the ABS & traction actuator assembly (skid control ECU).

The ABS & traction actuator assembly (skid control ECU) receives a signal from the ECM and operates the brake actuator.

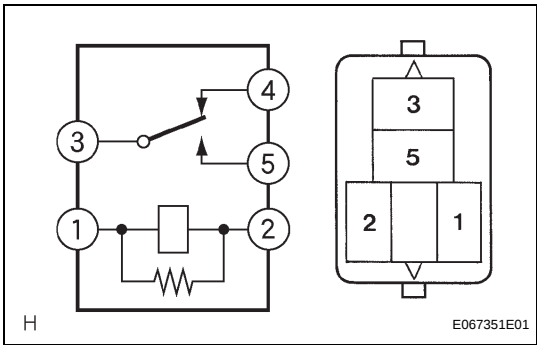
The ABS & traction actuator assembly (skid control ECU) operates the brake actuator and illuminates the stop light by operating the BRK relay at the same time.

DTC No.	DTC Detection Condition	Trouble Area
P0571/76	This malfunction code is output when the ECM detects the BRK relay error signal from the ABS & traction actuator assembly (skid control ECU) for 0.2 sec. or more while the dynamic cruise control is in operation.	• BRK relay • BRK relay circuit • ABS & traction actuator assembly (Skid control ECU)

ABS & Traction Actuator Assembly (Skid Control ECU)



1 CHECK BRK RELAY



- (a) Remove the BRK relay from the engine room R/B No.1.
- (b) Check operation of the BRK relay.

Standard resistance

Terminal No.	Condition	Specified value
3 - 5	Always	10 kΩ or higher
3 - 5	When battery voltage is applied to terminal 1 and 2.	Below 1 Ω

NG

REPLACE BRK RELAY

OK

2 CHECK WIRE HARNESS AND CONNECTOR (BRK RELAY - BATTERY)

- (a) Check for an open or short circuit in harness and connector between the BRK relay and battery (See page [IN-36](#)).

NG

REPAIR OR REPLACE HARNESS OR CONNECTOR

OK

3 CHECK WIRE HARNESS AND CONNECTOR (BRK RELAY - SKID CONTROL ECU)

- (a) Check for an open or short circuit in harness and connector between the BRK relay and skid control ECU (See page [IN-36](#)).

NG

REPAIR OR REPLACE HARNESS OR CONNECTOR

OK

REPLACE ABS AND TRACTION ACTUATOR ASSEMBLY

DTC	P0607	Control Module Performance
-----	-------	----------------------------

DESCRIPTION

This DTC indicates a malfunction in the ECM.

HINT:

When a malfunction is detected, the fail-safe must be kept on until the ignition switch is turned off.

DTC No.	DTC Detection Condition	Trouble Area
P0607/54	- The malfunction code is output after 0.4 sec. have passed from the time the cruise cancel input signal (STP input) is input into the ECM. - The ECM has a supervisory CPU and a control ECU inside. When each input STP signal is different for 0.15 sec. or more, the malfunction code is output.	ECM

1	REPLACE ECM
---	-------------

CC

NEXT

END

DTC**P1570****Radar Sensor Malfunction****DESCRIPTION**

The laser sensor emits laser beams 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 your own vehicle and an object in front. This data is transmitted to the cruise control ECU (distance control ECU).

DTC No.	DTC Detection Condition	Trouble Area
P1570	The ECM outputs this trouble code when it detects the communication error signal (from the cruise ECU (distance control ECU) to the laser sensor) for 0.15 sec. or more while the dynamic laser cruise is in operation.	Laser sensor

HINT:

The laser sensor monitors the laser emission and reception by itself. This DTC is detected when it cannot monitor.

When rain drops or snowflakes strike the laser sensor face, the distance between the vehicle in front and your own vehicle cannot be measured correctly.

The dynamic laser cruise control system functions by detecting the reflector of the vehicle directly in front. In the following cases, the system may not be able to detect the vehicle in front and may not properly maintain the correct vehicle-to-vehicle distance.

- The vehicle in front is a tall trailer.
- The back of the vehicle in front is extremely dirty.
- Emission from the vehicle in front or from other lanes are heavy.
- The vehicle in front has no reflector.
- The laser sensor is receiving a strong flash of light (sunlight, etc.).

1**ADJUST LASER SENSOR****HINT:**

It is necessary to make the ECM recognize spec information (whether the vehicle is equipped with the dynamic laser or not). When this procedure has not been carried out, this DTC may be output.

(a) Clear the DTC and then recheck for DTCs.

OK:

DTC is not output.

HINT:

If DTC P1570 is still output after performing the above procedures, replace the laser sensor.

NG**REPLACE LASER SENSOR****OK****SYSTEM OK****CC**

DTC	P1572	Improper Aiming of Radar Sensor Beam Axis
-----	-------	---

DESCRIPTION

This DTC is output when the scanning angle of the laser sensor is incorrect.
This DTC is also output when the laser sensor optical axis is in an incorrect position is detected.

DTC No.	DTC Detection Condition	Trouble Area
P1572	The ECM outputs this trouble code when the ECU detects that the laser sensor optical axis is in an incorrect position (0.15 sec. or more) while dynamic laser cruise control is in operation.	Laser sensor

HINT:
If the optical axis deviates to the upper/lower side +/- 2° or more and/or the right/left side +/- 4° or more, this DTC is detected.

1	ADJUST LASER SENSOR
---	---------------------

CC

NEXT

END

DTC**P1575****Warning Buzzer Malfunction****DESCRIPTION**

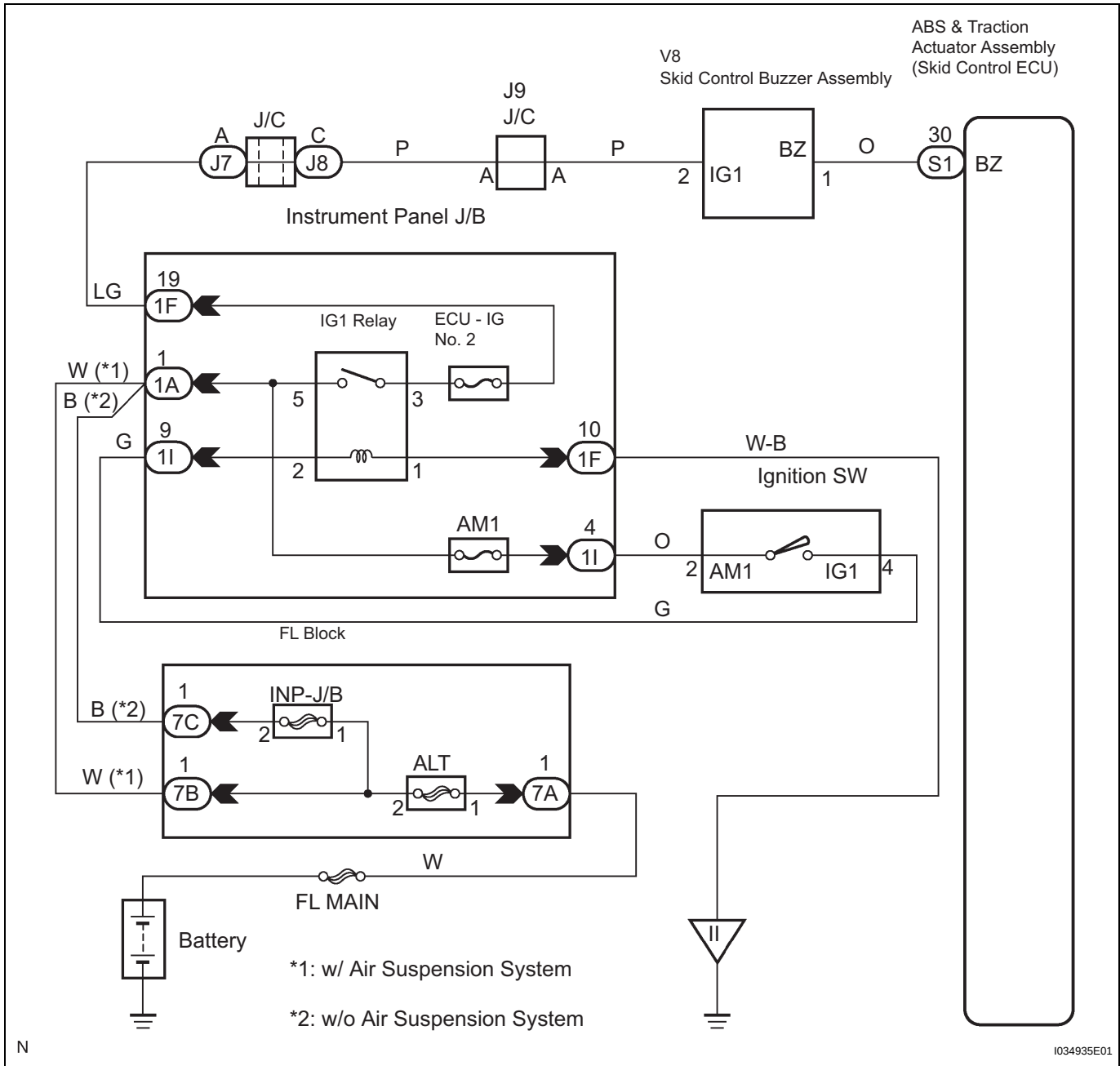
The Skid control ECU receives the alarm demand signal from the ECU and operates the skid control buzzer. The buzzer sounds to warn that the distance between the vehicle in front and your own vehicle is shortening.

DTC No.	DTC Detection Condition	Trouble Area
P1575	ECM receives buzzer abnormal signal for 0.2 sec. or more while dynamic radar cruise control is in operation	• Skid control buzzer • Skid control buzzer circuit • Skid control ECU

HINT:

If the vehicle ahead in the same lane significantly decreases its speed or another vehicle moves in front of your own vehicle, adequate deceleration cannot be applied and the vehicle-to-vehicle distance will shorten. At this time, the system sounds the buzzer and the master warning light blinks to inform the driver.

WIRING DIAGRAM



HINT:

When not using a intelligent tester, start from step 2.

1**PERFORM ACTIVE TEST BY SKID CONTROL BUZZER ASSEMBLY**

- Connect the intelligent tester to the DLC3.
- Turn the ignition switch to the ON position, and turn the intelligent tester main switch ON.
- Select the item "VSC/BR WARN BUZ" in the ACTIVE TEST, and operate it with the intelligent tester.
- Check that the skid control buzzer sounds with the intelligent tester by selection "ON" or "OFF".

Result

Condition	Proceed to
OK (When checking from the DTC)	A
OK (When checking from the PROBLEM SYMPTOM TABLE)	B
NG	C

B

**PROCEED TO NEXT CIRCUIT INSPECTION
SHOWN IN PROBLEM SYMPTOMS TABLE**

C

Go to step 2

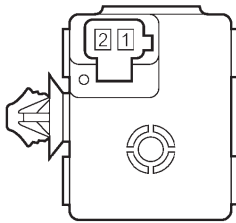
A

REPLACE ABS AND TRACTION ACTUATOR ASSEMBLY

2

INSPECT SKID CONTROL BUZZER ASSEMBLY

Connector Front View:



- Disconnect the skid control buzzer assembly connector.
- Connect battery positive terminal lead connected to terminal 2 of the skid control buzzer assembly connector, battery negative terminal lead to terminal 1.
- Check that the buzzer sounds.

Standard

Tester Connection	Condition	Specified Condition
1 - 2	When battery voltage is applied to terminal 1 and 2.	Buzzer sounds

NG

**REPLACE SKID CONTROL BUZZER
ASSEMBLY**

OK**3**

CHECK WIRE HARNESS AND CONNECTOR (SKID CONTROL BUZZER ASSEMBLY - SKID CONTROL ECU)

- Check for an open or short circuit in harness and connector between the skid control buzzer assembly and the skid control ECU (See page [IN-36](#)).

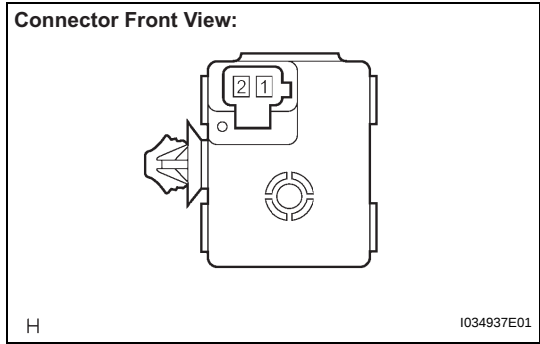
NG

**REPAIR OR REPLACE WIRE HARNESS OR
CONNECTOR**

OK**CC**

4

CHECK WIRE HARNESS AND CONNECTOR (SKID CONTROL BUZZER ASSEMBLY - BATTERY)



- (a) Turn the ignition switch to the ON position.
- (b) Measure the voltage between terminal 2 of the skid control buzzer assembly and body ground.

Voltage

Condition	Specified value
Turn the ignition switch to the ON position	10 to 14 V

NG

REPAIR OR REPLACE WIRE HARNESS OR CONNECTOR

OK

REPLACE ABS AND TRACTION ACTUATOR ASSEMBLY

DTC	P1578	Brake System Malfunction
-----	-------	--------------------------

DESCRIPTION

This DTC is output when the VSC system has a problem. Check the VSC system when this DTC is output.

DTC No.	DTC Detection Condition	Trouble Area
P1578	ECM receives brake system error signal for 0.2 sec. or more while dynamic radar cruise control is in operation	Brake system

1	CHECK BRAKE SYSTEM
---	--------------------



END

DTC	P1615	Communication Error from Distance Control ECU to ECM
-----	-------	--

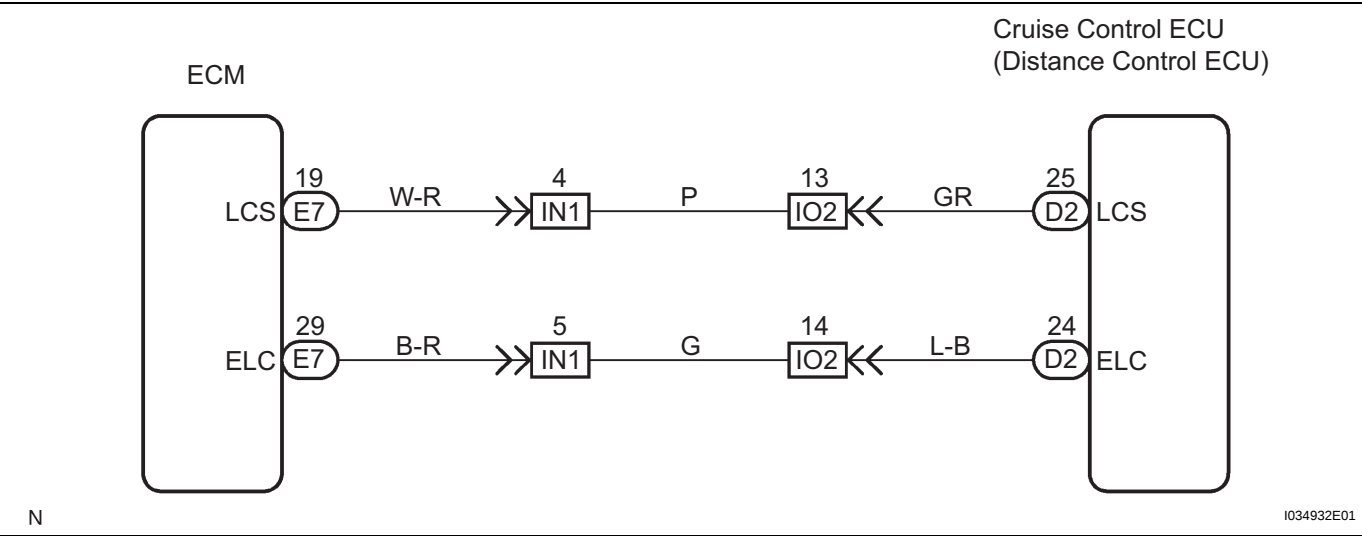
DESCRIPTION

The cruise control ECU (distance control ECU) and ECM transmit the data for vehicle general control and diagnosis function along the communication line.

The cruise control ECU (distance control ECU) determines the distance, relative speed, and target deceleration speed based on the signal from the laser radar sensor, and transmits a control demand signal to the ABS & traction actuator assembly (skid control ECU).

DTC No.	DTC Detection Condition	Trouble Area
P1615/61	The malfunction code is output when the communication between the cruise control ECU (distance control ECU) and ECM is invalid for 0.5 sec. or more, while the laser radar sensor is in operation, or the communication from the cruise control ECU (distance control ECU) becomes logically distant for 0.5 sec. or more.	• Communication circuit • Cruise control ECU (Distance control ECU) • ECM

WIRING DIAGRAM



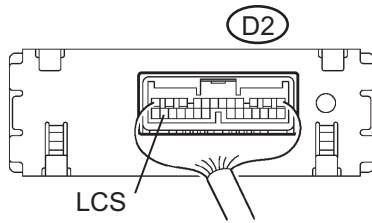
1	CHECK WIRE HARNESS AND CONNECTOR (DISTANCE CONTROL ECU - ECM)
---	---

- (a) Check for an open or short in harness and connector between the distance control ECU and ECM (See page [IN-36](#)).

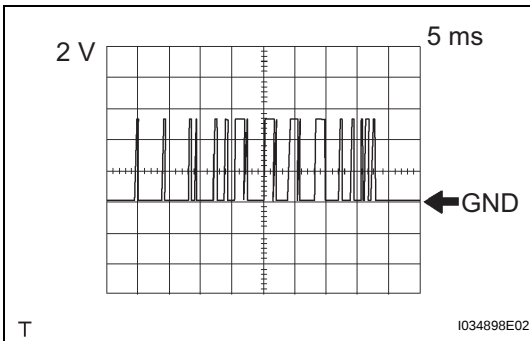
OK

NG

REPAIR OR REPLACE WIRE HARNESS OR CONNECTOR

2**INSPECT CRUISE CONTROL ECU ASSEMBLY (DISTANCE CONTROL ECU)****Wire Harness View:**

- (a) Remove the cruise control ECU (distance control ECU) with the connector.
(b) Turn the ignition switch to the ON position.



- (c) Check the signal waveform between terminal LCS (D2-25) of the distance control ECU and body ground.

Standard:

Waveform similar to that in the illustration to the left is output.

HINT:

- Gauge set: 2 V/DIV, 5 ms./DIV
- Condition: Ignition switch ON

NG**REPLACE CRUISE CONTROL ECU ASSEMBLY****OK****REPLACE ECM****CC**

DTC	P1616	Communication Error from ECM to Distance Control ECU
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DTC	U0100	Lost Communication with ECM/PCM "A"
------------	--------------	--

DESCRIPTION

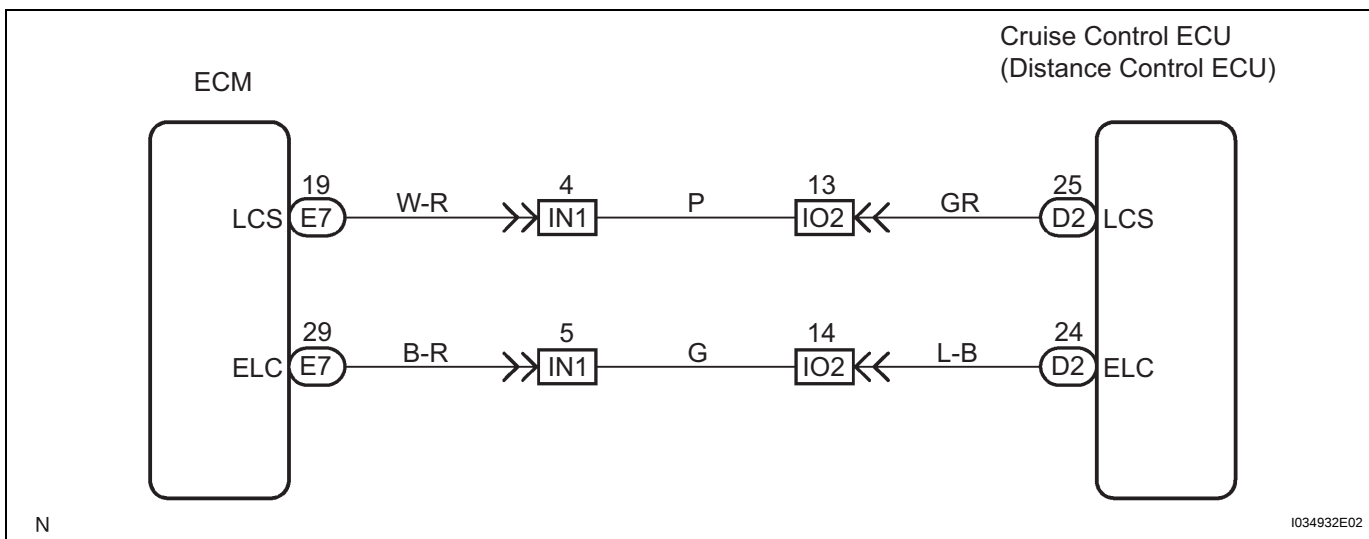
The ECM and cruise control ECU (distance control ECU) transmit the data for vehicle general control and diagnosis function along the communication line.

The ECM transmits the current speed / stored speed and steering angle signal from the ABS traction actuator assembly (skid control ECU) to the cruise control ECU (distance control ECU).

This sit is detected when the cruise control ECU (distance control ECU) responds to the ECM to inform that the information sent from the cruise control ECU (distance control ECU) to ECM has problem.

DTC No.	DTC Detection Condition	Trouble Area
P1616/62	The malfunction code is output when the ECM detects a communication error signal between the ECM and cruise control ECU (distance control ECU) for 0.15 sec. or more.	- Communication circuit - ECM - Cruise control ECU (Distance control ECU)

CC WIRING DIAGRAM



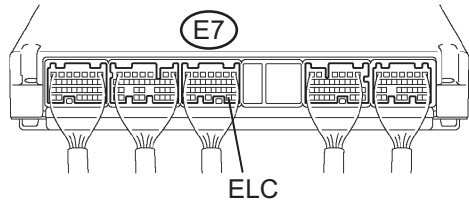
1	CHECK WIRE HARNESS AND CONNECTOR (ECM - DISTANCE CONTROL ECU)
----------	--

- (a) Check for an open or short circuit in harness and connector between the ECM and distance control ECU (See page [IN-36](#)).

NG

REPAIR OR REPLACE WIRE HARNESS OR CONNECTOR

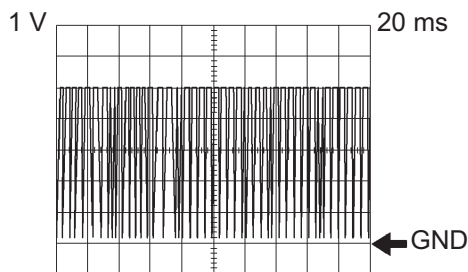
OK

2 INSPECT ECM**ECM Wire Harness View:**

O

I034219E06

- (a) Remove the ECM with the connector.
- (b) Turn the ignition switch to the ON position.



T

I034899E02

- (c) Check the signal waveform between terminal ELC (E7-29) of the ECM and body ground.

Standard:

Waveform similar to that in the illustration to the left is output.

HINT:

- Gauge set: 1 V/DIV, 20 ms./DIV
- Condition: Ignition switch ON

NG**REPLACE ECM****OK****CC****REPLACE CRUISE CONTROL ECU ASSEMBLY**

DTC	U0100	Communication Stop from ECM to Distance Control ECU, VSC
-----	-------	--

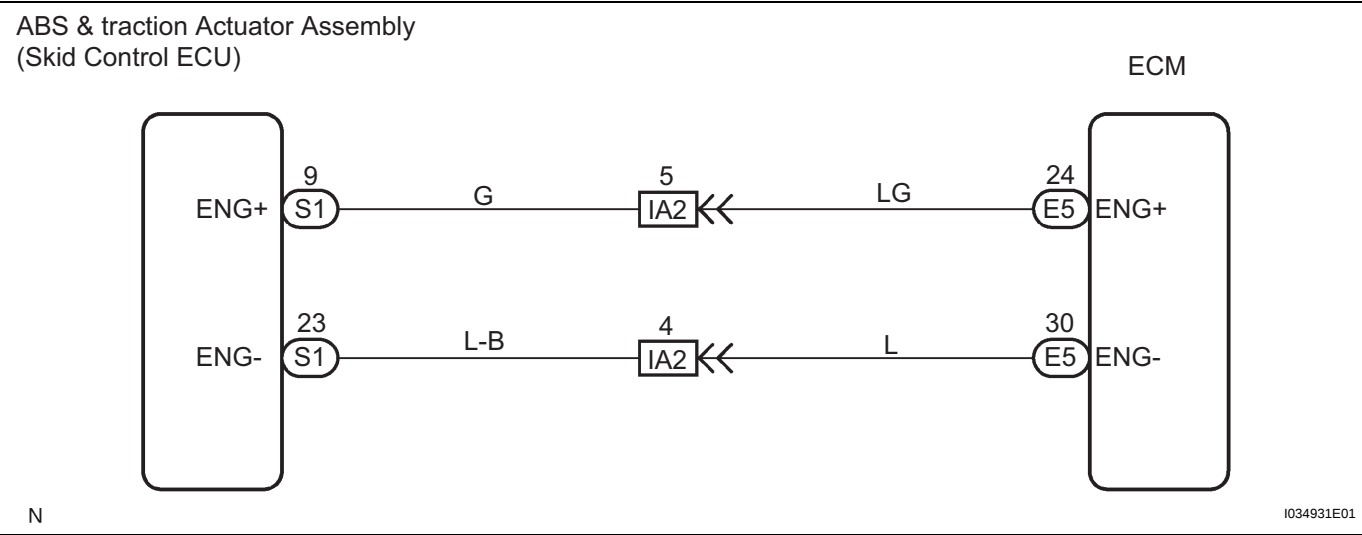
DESCRIPTION

The ECM and ABS & traction actuator assembly (skid control ECU) transmit the data for vehicle general control and diagnosis function along the communication line.

The ECM receives the alarm demand signal and brake demand signal from the cruise control ECU (distance control ECU), and transmits them to the ABS & traction actuator assembly (skid control ECU).

DTC No.	DTC Detecting Condition	Trouble Area
U0100/65	The malfunction code is output when the ECM receives the communication error signal for 1.0 sec. or more while the dynamic laser cruise control is in operation.	• Communication circuit • ECM • ABS & traction actuator assembly (Skid control ECU)

WIRING DIAGRAM



1	CHECK WIRE HARNESS AND CONNECTOR (ECM - SKID CONTROL ECU)
---	---

- (a) Check for an open or short circuit in harness and connector between the ECM and the skid control ECU (See page [IN-36](#)).

OK

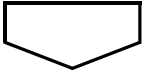
NG

REPAIR OR REPLACE WIRE HARNESS OR CONNECTOR

2	REPLACE ECM
---	-------------

HINT:

If the problem still occurs after the replacement, replace the ABS & traction actuator assembly.



REPLACE ABS AND TRACTION ACTUATOR ASSEMBLY

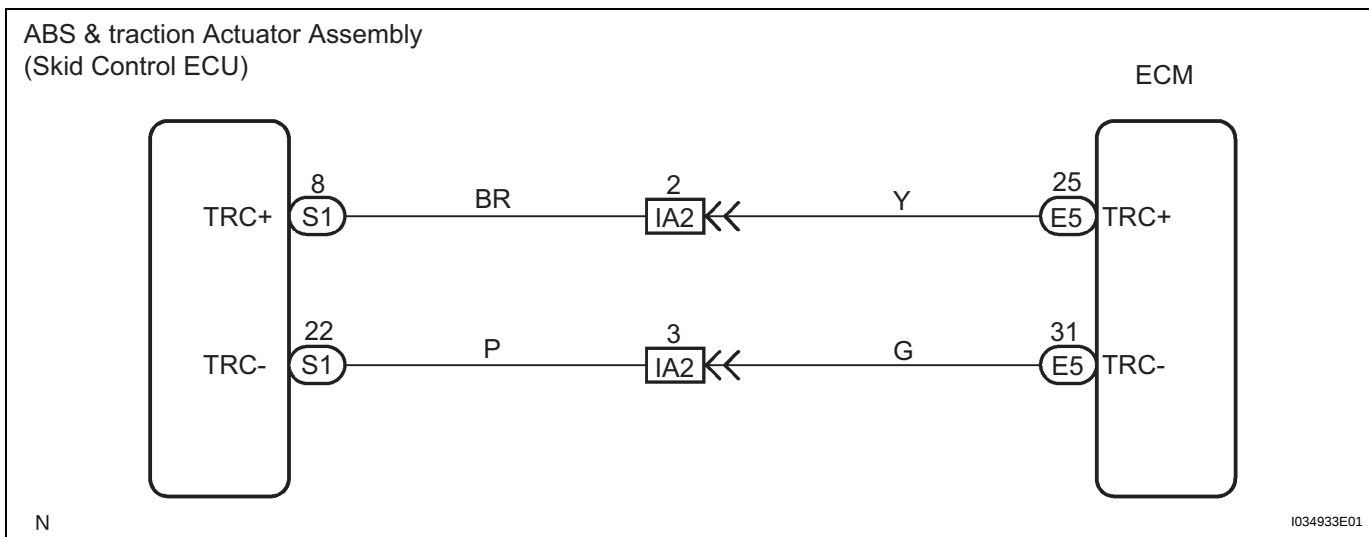
DTC**U0122****Lost Communication with Vehicle Dynamics Control Module****DESCRIPTION**

The ABS & traction actuator assembly (skid control ECU) and ECM transmit the data for vehicle general control and diagnosis function along the communication line.

The dynamic laser cruise control system receives information about the laser radar sensor, steering angle sensor and yaw rate sensor from the ABS & traction actuator assembly (skid control ECU). It identifies the vehicle in front and follows it keeping a proper vehicle-to-vehicle distance.

When the ABS & traction actuator assembly (skid control ECU) receives the steering angle signal from the steering angle and the acceleration / deceleration signal from the yaw rate sensor, it transmits them to the ECM.

DTC No.	DTC Detecting Condition	Trouble Area
U0122/64	The malfunction code is output when communication between the ABS & traction actuator assembly (skid control ECU) and ECM is invalid for 0.5 sec. or more while the laser radar sensor is in operation, or the communication from the ABS & traction actuator assembly (skid control ECU) becomes logically discordant for 0.5 sec. or more.	- Communication circuit - ABS & traction actuator assembly (Skid control ECU) - ECM

WIRING DIAGRAM**1****CHECK WIRE HARNESS AND CONNECTOR (ECM - SKID CONTROL ECU)**

- (a) Check for an open or short circuit in harness and connector between the ECM and the skid control ECU (See page [IN-36](#)).

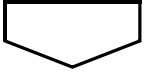
NG**REPAIR OR REPLACE WIRE HARNESS OR CONNECTOR****OK**

2**REPLACE ABS AND TRACTION ACTUATOR ASSEMBLY (SKID CONTROL ECU)**

HINT:

If the problem still occurs after the replacement, replace the ECM.

When a malfunction is detected in the skid control ECU, replace the ABS & traction actuator assembly.

**REPLACE ECM**

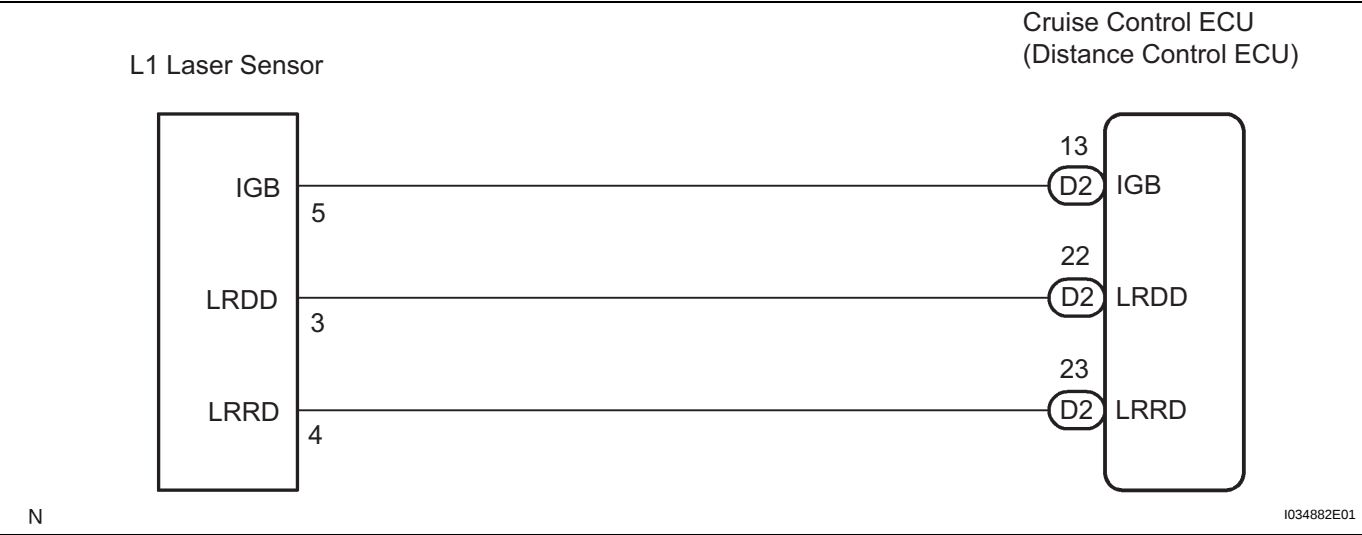
DTC	U0235	Lost Communication with Cruise Control Front Distance Range Sensor
-----	-------	--

DESCRIPTION

The laser sensor and cruise control ECU (distance control ECU) transmit the data for general vehicle control and diagnosis function along the communication line.
The laser sensor transmits information about the vehicle in front to the cruise control ECU (distance control ECU).

DTC No.	DTC Detection Condition	Trouble Area
U0235	This trouble code is output when the ECM detects the communication error signal (from the laser sensor to the cruise control ECU (distance control ECU)) for 0.15 sec. or more while the dynamic laser cruise control is in operation.	• Communication circuit • Laser sensor • Cruise control ECU (Distance control ECU)

WIRING DIAGRAM



1	CHECK WIRE HARNESS AND CONNECTOR (DISTANCE CONTROL ECU - LASER RADAR SENSOR)
---	--

- (a) Check for a open or short circuit in harness and connector between the distance control ECU and the laser radar sensor (See page [IN-36](#)).

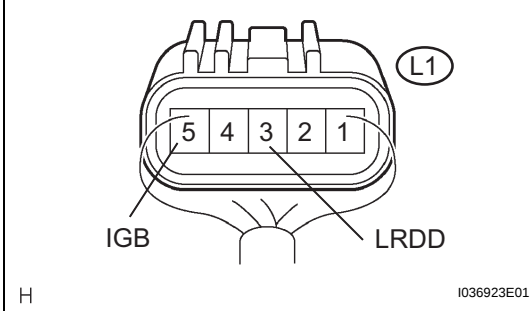
NG

REPAIR OR REPLACE WIRE HARNESS OR CONNECTOR

OK

2 INSPECT LASER RADAR SENSOR

Laser Radar Sensor Wire Harness View:



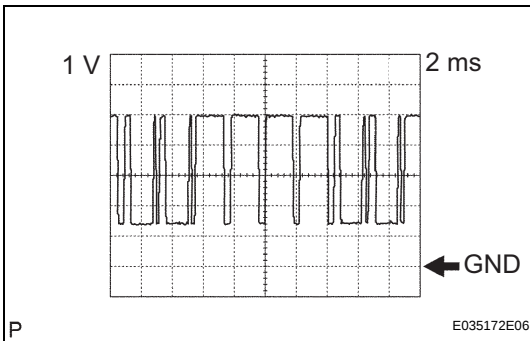
- (a) Remove the laser radar sensor with the connector.
- (b) Turn the ignition switch to the ON position.
- (c) Measure the voltage between terminal IGB (L1-5) of the laser radar sensor and body ground.

Voltage:**10 to 14 V**

- (d) Check the signal waveform between terminal LRDD (L1-3) of the laser sensor and body ground.

Standard:**Waveform similar to that in the illustration to the left is output.****HINT:**

- Gauge set: 2 V/DIV, 10 ms./DIV
- Condition: Ignition switch on

**OK****NG****REPLACE LASER RADAR SENSOR****REPLACE CRUISE CONTROL ECU ASSEMBLY****CC**

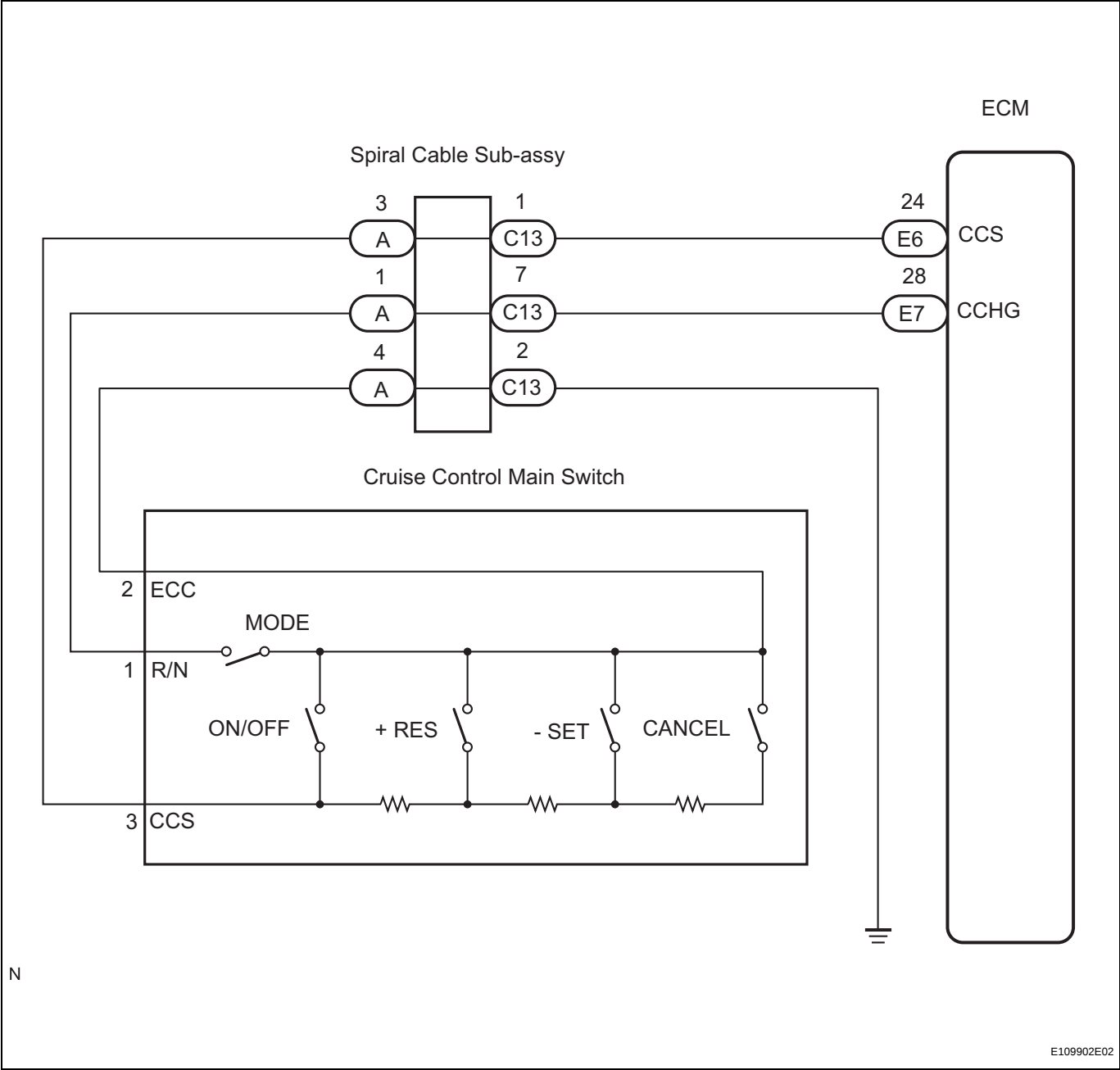
Cruise Control Switch Circuit

DESCRIPTION

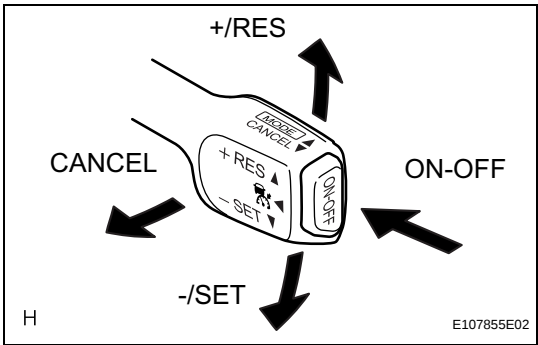
The cruise control main switch operates 8 functions: SET, COAST, TAP-DOWN, RESUME, ACCEL, TAP-UP, CANCEL and MODE. The SET, TAP-DOWN and COAST functions, and the RESUME, TAP-UP and ACCEL functions are operated with the same switch. The cruise control main switch is an automatic return type switch which turns on only while operating it in each arrow direction and turns off after releasing it. The internal contact point of the cruise control main switch is turned on with the switch operation. The ECM then reads the resistance value that has been changed by the switch operation to control MODE, SET, COAST, RESUME, ACCEL and CANCEL. 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 laser cruise control system.
- The operation of the constant speed control mode is the same as that for a conventional cruise control system.

WIRING DIAGRAM



1 READ VALUE OF INTELLIGENT TESTER



- (a) Connect the intelligent tester to the DLC3.
- (b) Turn the ignition switch on, and turn the intelligent tester main switch on.

- (c) Check the DATA LIST for proper functioning of the cruise control main switch.

LASER CRUISE:

Item	Measurement Item / Display (Range)	Normal Condition	Diagnostic Note
MAIN SW (MAIN)	Main switch signal (Main CPU) / ON or OFF	ON: Main switch ON (Pushed on) OFF: Main switch OFF (Pushed off)	-
CANCEL SW	CANCEL switch signal / ON or OFF	ON: CANCEL switch ON OFF: CANCEL switch OFF	-
SET/COAST SW	-/SET switch signal / ON or OFF	ON: -/SET switch ON OFF: -/SET switch OFF	-
RES/ACC SW	+/RES switch signal / ON or OFF	ON: +/RES switch ON OFF: +/RES switch OFF	-

OK:
When cruise control main switch operation is performed, the result will be same as above.

Result:

Result	Proceed to
OK	A
NG (all items are defective)	B
NG (one to four items are defective)	C

A

PROCEED TO NEXT CIRCUIT INSPECTION SHOWN IN PROBLEM SYMPTOMS TABLE

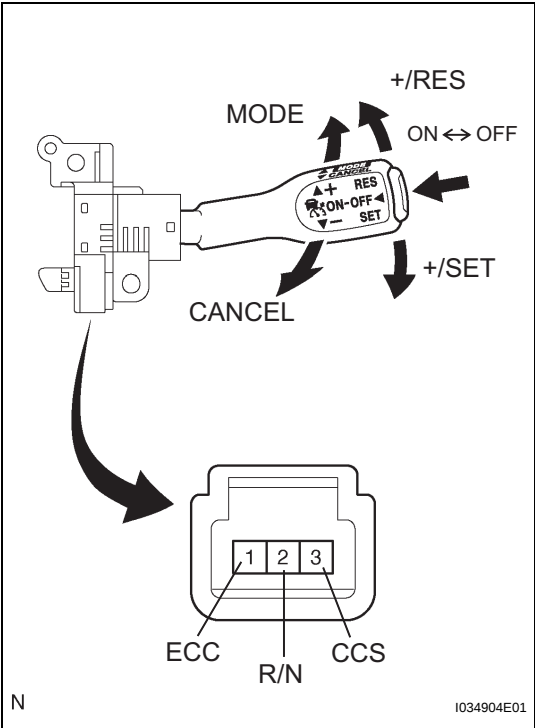
C

REPLACE CRUISE CONTROL MAIN SWITCH

B

2

INSPECT CRUISE CONTROL MAIN SWITCH



- (a) Disconnect the cruise control main switch connector.
(b) Measure the resistance according to the value(s) in the table below.

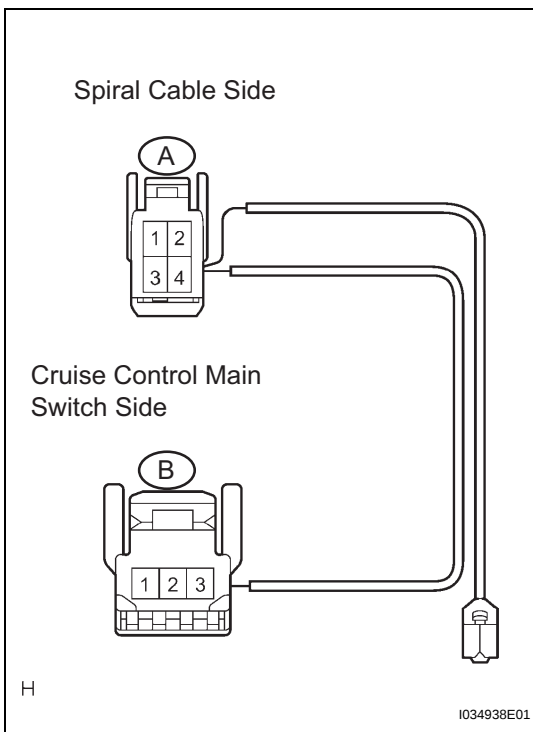
Standard resistance

Tester Connection	Switch Condition	Specified Condition
1 - 2, 1 - 3	Neutral	10 k Ω or higher
1 - 3	+/RES	210 to 270 Ω
1 - 3	-/SET	560 to 700 Ω
1 - 3	CANCEL	1380 to 1700 Ω
1 - 3	Main Switch OFF	10 k Ω or higher
1 - 3	Main Switch OFF	Below 1 Ω
1 - 2	MODE	Below 1 Ω

NG

REPLACE CRUISE CONTROL MAIN SWITCH

OK

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

- (a) Turn the ignition switch OFF.
 (b) Disconnect the cruise control main switch connector and spiral cable connector.
 (c) Check for an open circuit in harness and connector.

Resistance

Terminal No.	Specified value
A-1 - B-2	Below 1 Ω
A-3 - B-3	Below 1 Ω
A-4 - B-1	Below 1 Ω

- (d) Connect the spiral cable connector.
 (e) Check for an open circuit in harness and connector.

Resistance

Terminal No.	Specified value
B-2 - Body ground	10 k Ω or higher
B-3 - Body ground	10 k Ω or higher

NG

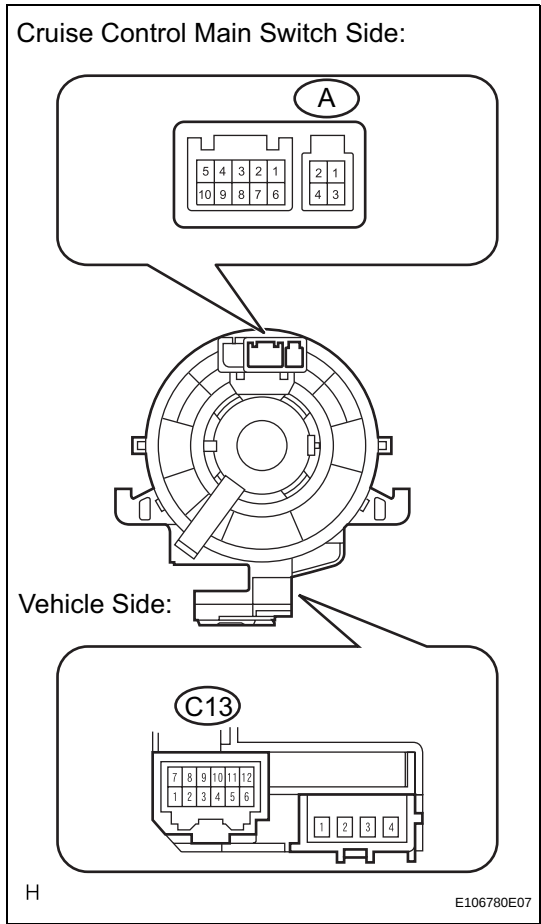
REPAIR OR REPLACE WIRE HARNESS OR CONNECTOR

OK

CC

4

INSPECT SPIRAL CABLE



- (a) Disconnect the spiral cable connector.
(b) Measure the resistance according to the value(s) in the table below.

Standard resistance

Tester Condition	Specified Condition
A-1 - C13-7	Below 1 Ω
A-3 - C13-1	Below 1 Ω
A-4 - C13-2	Below 1 Ω

NG

REPLACE SPIRAL CABLE

OK

5

CHECK WIRE HARNESS AND CONNECTOR (SPIRAL CABLE SUB-ASSEMBLY - ECM)

- (a) Check for an open or short circuit in harness and connector between the spiral cable sub-assembly and ECM (See page [IN-36](#)).

NG

REPAIR OR REPLACE WIRE HARNESS OR CONNECTOR

OK

6

CHECK WIRE HARNESS AND CONNECTOR (SPIRAL CABLE SUB-ASSEMBLY - BODY GROUND)

- (a) Check for an open circuit in harness and connector between the spiral cable sub-assembly and body ground (See page [IN-36](#)).

NG

REPAIR OR REPLACE WIRE HARNESS OR CONNECTOR

OK

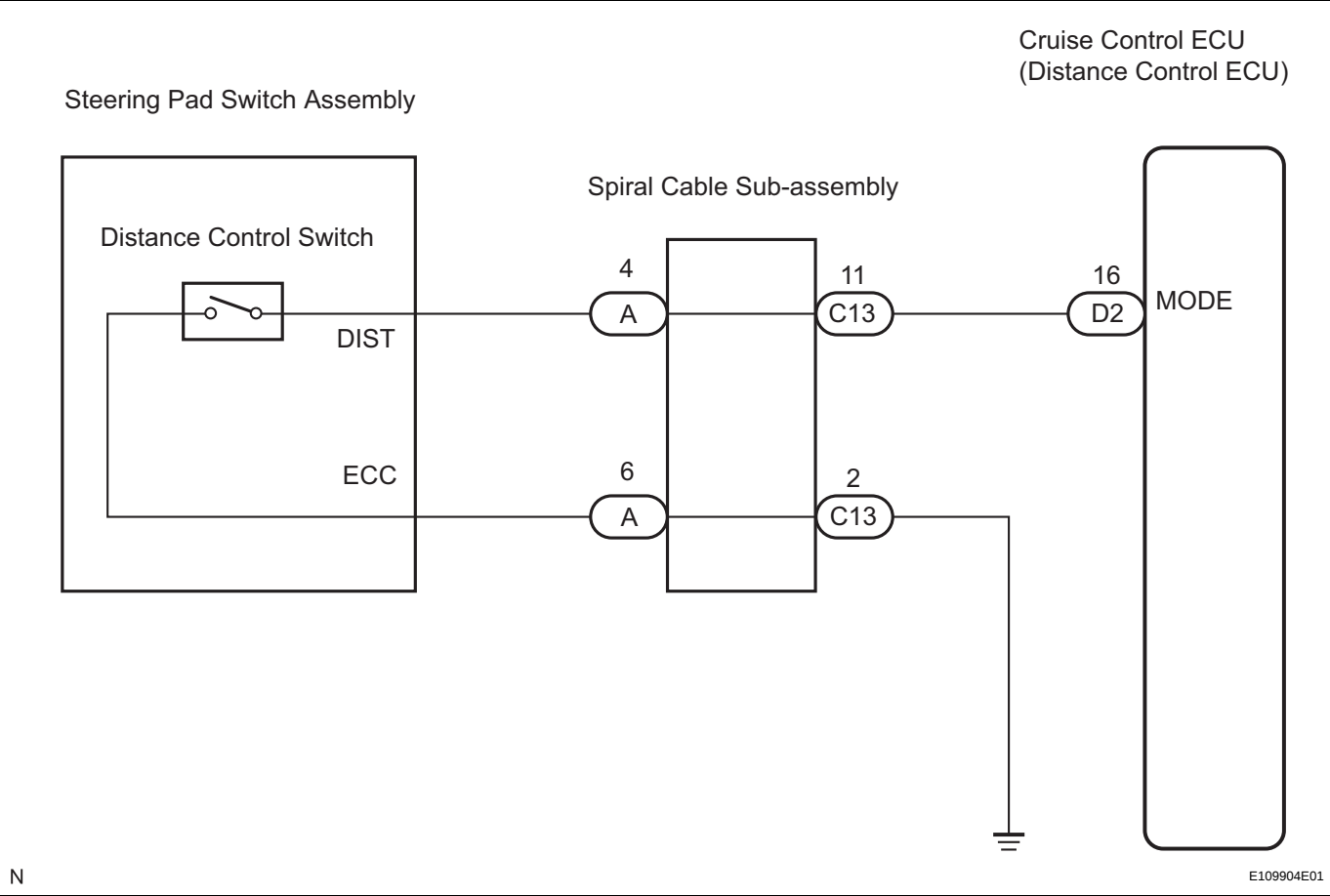
REPLACE ECM

Distance Control Switch Circuit

DESCRIPTION

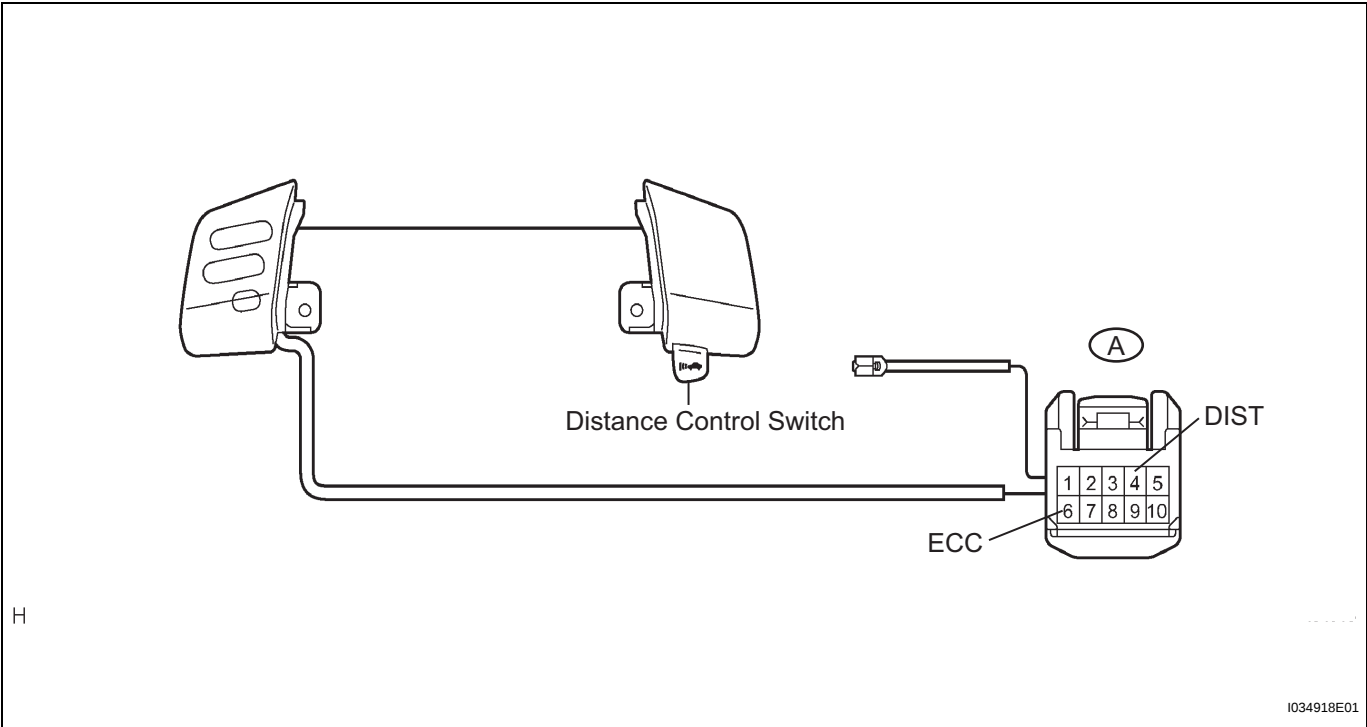
The distance control switch sets the vehicle-to-vehicle distance mode. The distance control switch is installed in the steering pad switch. The vehicle-to-vehicle distance set value can be changed by operating the steering pad switch (distance control switch) while the dynamic radar cruise control system is in operation. The steering pad switch uses the BEAN to communicate with each ECU. Therefore it does not have a direct connection with the ECM. If there are any malfunction in the communication line of the steering pad switch, one or more DTCs in the multiplex communication system are output.

WIRING DIAGRAM



1 INSPECT STEERING PAD SWITCH ASSEMBLY

(a) Remove the steering pad switch assembly.



- (b) Measure the resistance between terminal 4 (DIST) and (ECC) of steering pad switch assembly connector when distance control switch is operated.

Standard resistance

Switch position	Specified value
Distance control switch is ON	Below 1 Ω
Distance control switch is OFF	10 k Ω or higher

HINT:
When a malfunction is detected in the distance control switch, replace the steering pad switch assembly.

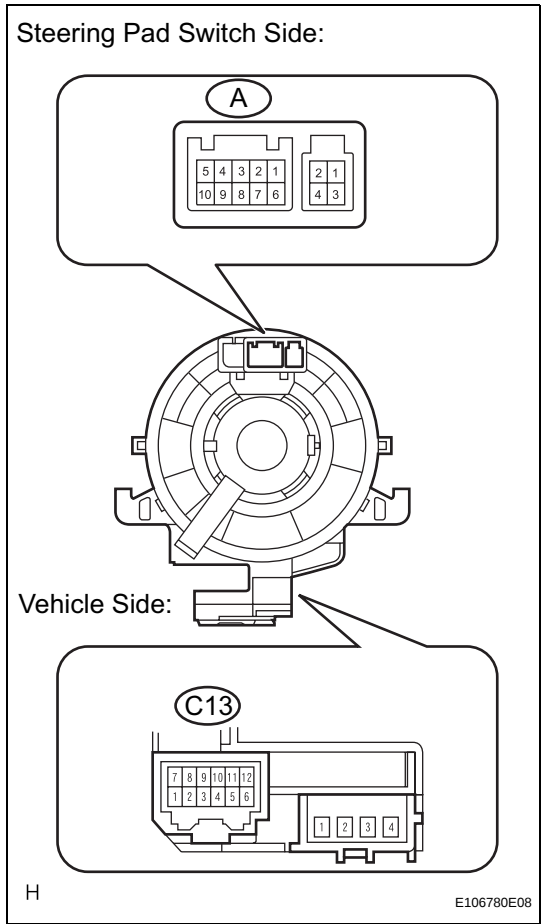
NG

REPLACE STEERING PAD SWITCH ASSEMBLY

OK

2

INSPECT SPIRAL CABLE



- (a) Disconnect the spiral cable connector.
- (b) Measure the resistance according to the value(s) in the table below.

Standard resistance

Tester Connection	Condition	Specified Condition
A-4 - C13-11	Always	Below 1 Ω
A-6 - C13-2	Always	Below 1 Ω

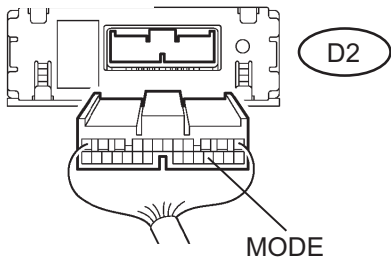
NG

REPLACE SPIRAL CABLE

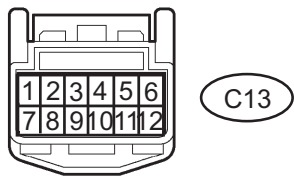
OK

3 CHECK WIRE HARNESS (DISTANCE CONTROL ECU - SPIRAL CABLE)

Distance Control ECU Connector
Wire Harness View:



Spiral Cable Connector
Wire Harness View:



E109734E04

- (a) Disconnect the distance control ECU connector.
(b) Measure the resistance according to the value(s) in the table below.

Standard resistance

Tester Connection	Condition	Specified Condition
C13-11 - D2-16 (MODE)	Always	Below 1 Ω
D2-16 (MODE) - Body ground	Always	10 kΩ or higher

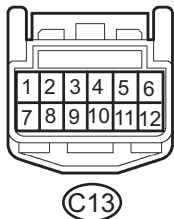
NG

REPAIR OR REPLACE HARNESS OR CONNECTOR

OK

4 CHECK WIRE HARNESS (SPIRAL CABLE - BODY GROUND)

Vehicle Side Connector Front View:



N

E107092E06

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

Standard resistance

Tester Connection	Condition	Specified Condition
C13-2 - Body ground	Always	Below 1 Ω

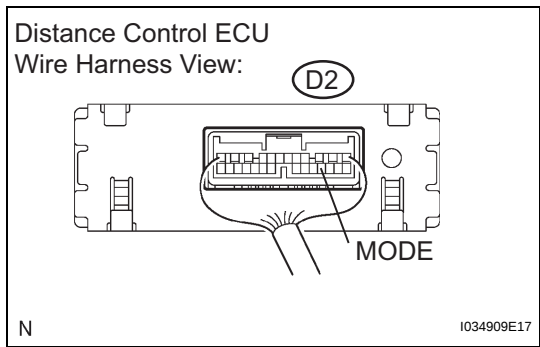
NG

REPAIR OR REPLACE HARNESS OR CONNECTOR

OK

5

INSPECT DISTANCE CONTROL ECU



- (a) Remove the distance control ECU (cruise control ECU) with the connector.
- (b) Turn the ignition switch on.
- (c) Measure the voltage according to the value(s) in the table below.

Standard voltage

Tester Connection	Condition	Specified Condition
D2-16 (MODE) - Body ground	Distance control switch ON	0 to 2 V
D2-16 (MODE) - Body ground	Distance control switch OFF	9 to 16 V

OK

NG

REPLACE DISTANCE CONTROL ECU

CC

PROCEED TO NEXT CIRCUIT INSPECTION SHOWN IN PROBLEM SYMPTOMS TABLE

Wiper Signal Circuit

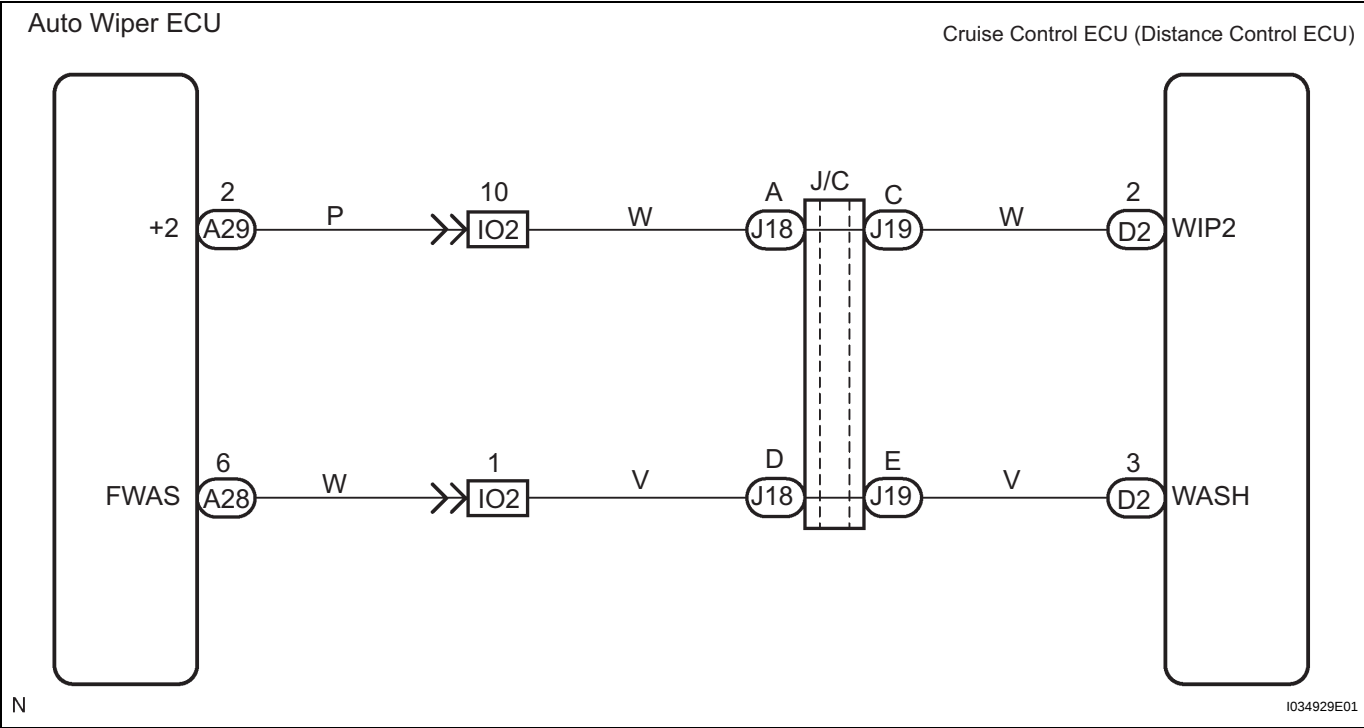
DESCRIPTION

When the cruise control ECU (distance control ECU) detects the wipers are operating, the dynamic laser cruise control system will be canceled.

HINT:

When the wiper is in the LO or HI mode, the dynamic laser cruise control is automatically canceled and goes into the standby mode (In INT (intermittent operation) mode, the laser cruise control is not canceled).

WIRING DIAGRAM



CC

1 INSPECT WIPER AND WASHER SYSTEM

Standard:
Wiper function is normal.

NG GO TO WIPER AND WASHER SYSTEM

OK

2 CHECK WIRE HARNESS AND CONNECTOR (DISTANCE CONTROL ECU - AUTO WIPER ECU)

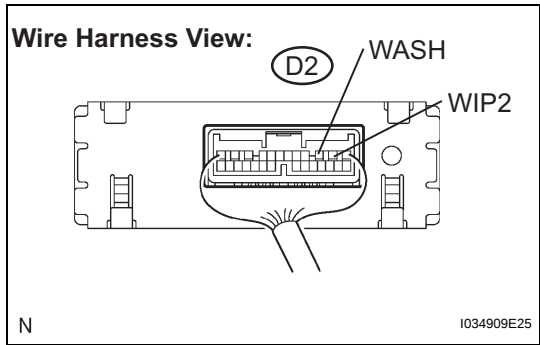
(a) Check for an open or short circuit in harness and connector between the distance control ECU and the auto wiper ECU (See page IN-36).

NG REPAIR OR REPLACE WIRE HARNESS OR CONNECTOR

OK

3

INSPECT CRUISE CONTROL ECU ASSEMBLY



- (a) Remove the cruise control ECU (distance control ECU) with the connector.
- (b) Turn the ignition switch to the ON position.
- (c) Measure the voltage between terminal WIP2 (D2-2) and WASH (D2-3) of cruise control ECU (distance control ECU), when combination switch is operated.

Voltage

Switch	Position	Specified value
Wiper Switch	OFF	Below 1 V
Wiper Switch	HI	10 to 14 V
Washer Switch	OFF	10 to 14 V
Washer Switch	ON	Below 1 V

NG

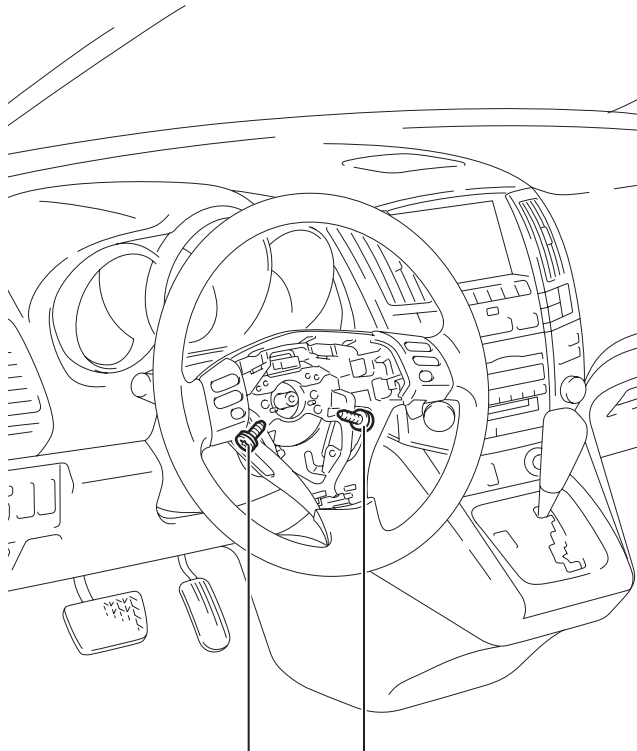
REPLACE CRUISE CONTROL ECU ASSEMBLY

OK

PROCEED TO NEXT CIRCUIT INSPECTION SHOWN IN PROBLEM SYMPTOMS TABLE

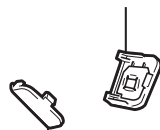
CRUISE CONTROL MAIN SWITCH

COMPONENTS



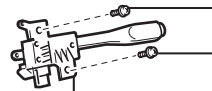
8.8 (90, 78 in.*lbf)

STEERING WHEEL NO.2 COVER LOWER



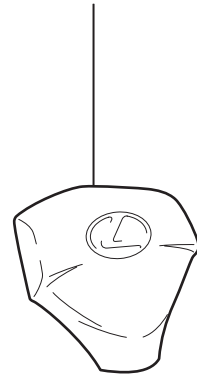
STEERING WHEEL NO.3 COVER LOWER

2.4 (25, 21 in.*lbf)



CRUISE CONTROL MAIN SWITCH

HORN BUTTON ASSEMBLY

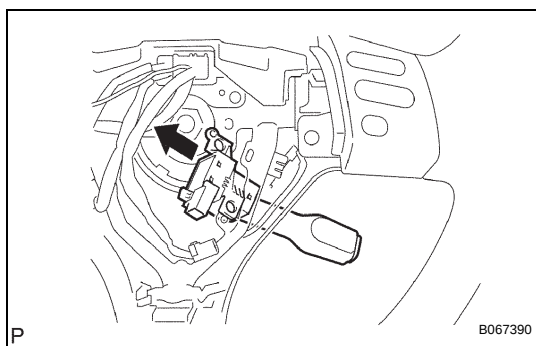
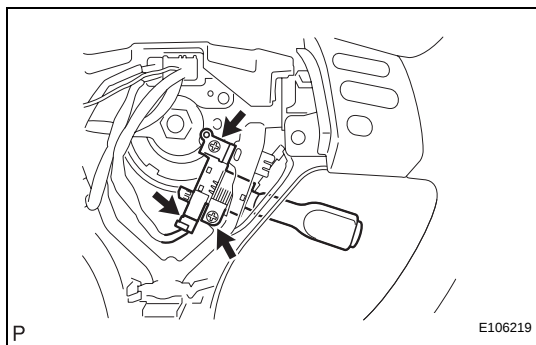


[N*m (kgf*cm, ft.*lbf)]: Specified torque

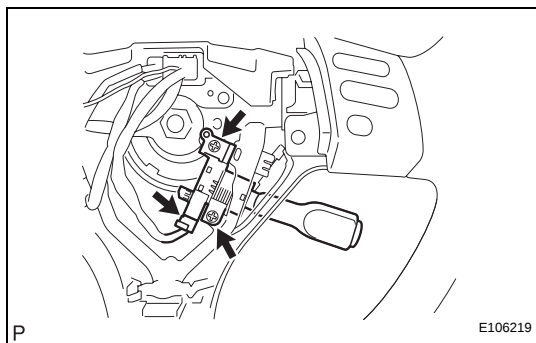
CC

REMOVAL

1. **DISCONNECT CABLE FROM NEGATIVE BATTERY TERMINAL**
CAUTION:
 Wait for 90 seconds after disconnecting the cable to prevent the airbag working. (See page [RS-387](#))
2. **REMOVE STEERING WHEEL NO.3 COVER LOWER**
 (See page [RS-387](#))
3. **REMOVE STEERING WHEEL NO.2 COVER LOWER**
 (See page [RS-387](#))
4. **REMOVE HORN BUTTON ASSEMBLY** (See page [RS-388](#))
5. **REMOVE CRUISE CONTROL MAIN SWITCH**
 - (a) Disconnect the connector.
 - (b) Remove the 2 screws.



- (c) Pull the cruise control main switch in the arrow direction to remove it.

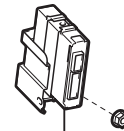
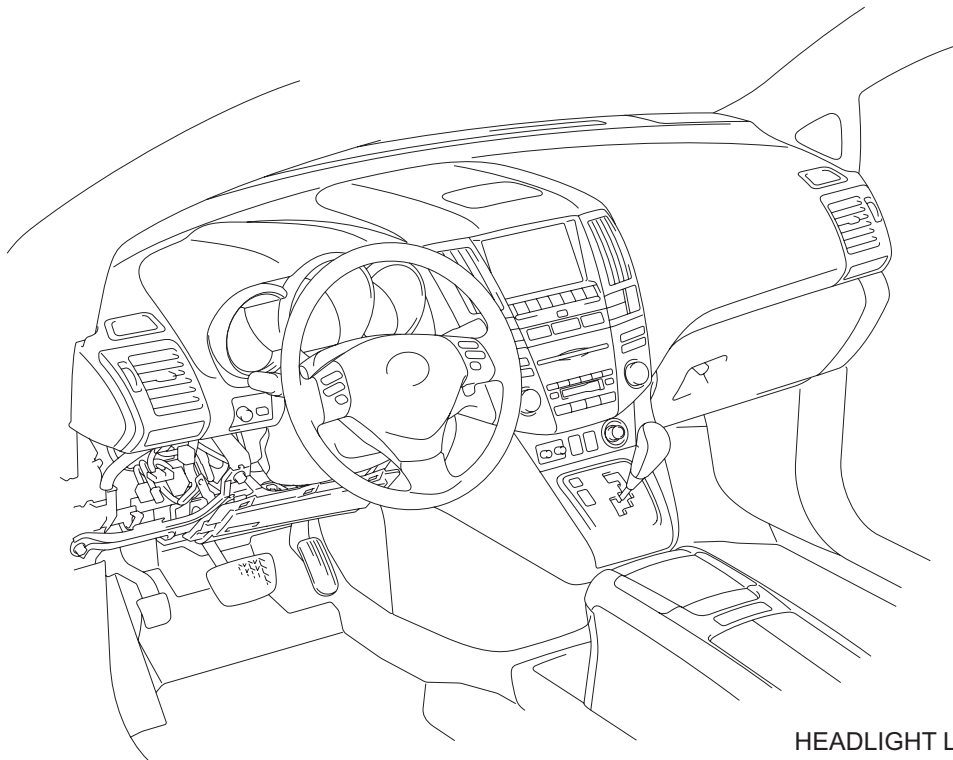


INSTALLATION

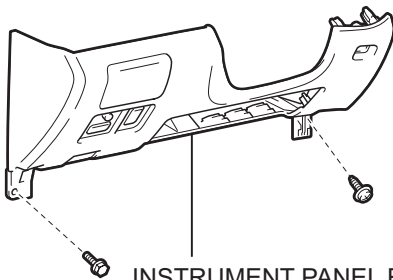
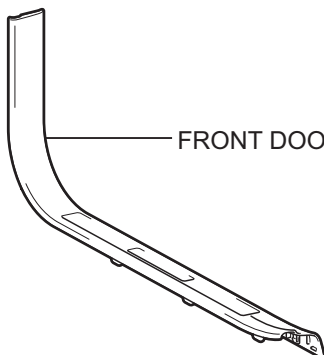
1. **INSTALL CRUISE CONTROL MAIN SWITCH**
 - (a) Install the cruise control main switch with the 2 screws.
Torque: 2.4 N*m (25 kgf*cm, 21 in.*lbf)
 - (b) Connect the connector.
2. **INSTALL HORN BUTTON ASSEMBLY** (See page [RS-388](#))
3. **INSTALL STEERING WHEEL NO.3 COVER LOWER**
 (See page [RS-389](#))
4. **INSTALL STEERING WHEEL NO.2 COVER LOWER**
 (See page [RS-389](#))
5. **CONNECT CABLE TO NEGATIVE BATTERY TERMINAL**
6. **INSPECT SRS WARNING LIGHT**
 (See page [RS-25](#))

DISTANCE CONTROL ECU

COMPONENTS

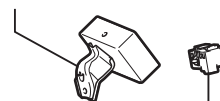


HEADLIGHT LEVELING ECU ASSEMBLY

INSTRUMENT PANEL FINISH
PANEL SUB-ASSEMBLY LOWERDISTANCE CONTROL ECU ASSEMBLY
WITH SKID CONTROL BUZZER ASSEMBLY

FRONT DOOR SCUFF PLATE LH

DISTANCE CONTROL ECU ASSEMBLY

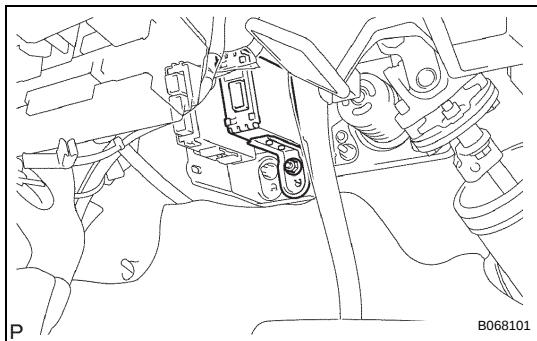


SKID CONTROL BUZZER ASSEMBLY

CC

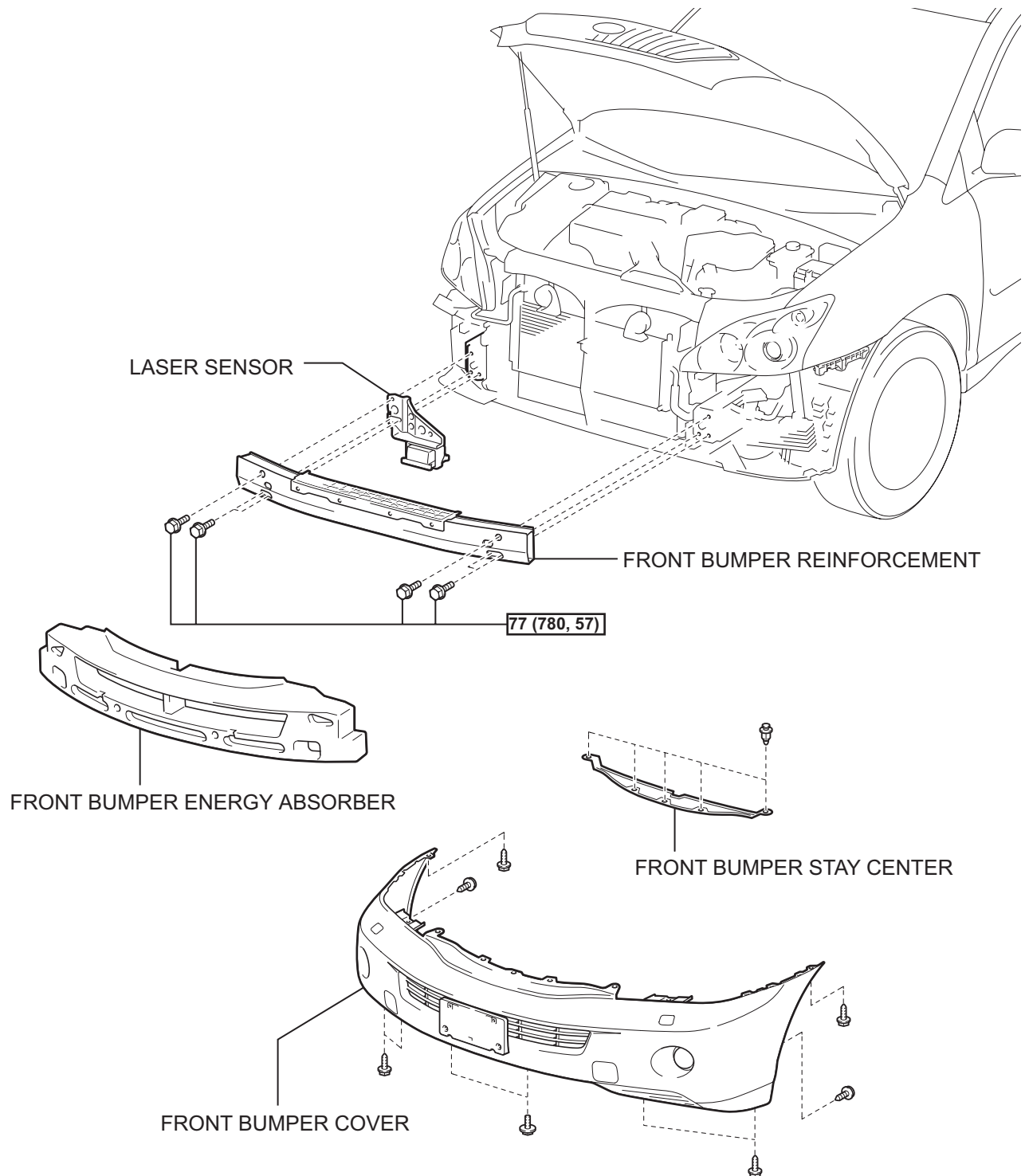
REMOVAL

1. REMOVE FRONT DOOR SCUFF PLATE LH
2. REMOVE INSTRUMENT PANEL FINISH PANEL SUB-ASSEMBLY LOWER
3. REMOVE CRUISE CONTROL ECU ASSEMBLY
 - (a) Disconnect the connector.
 - (b) Remove the nut and cruise control ECU (distance control ECU) assembly.



LASER SENSOR

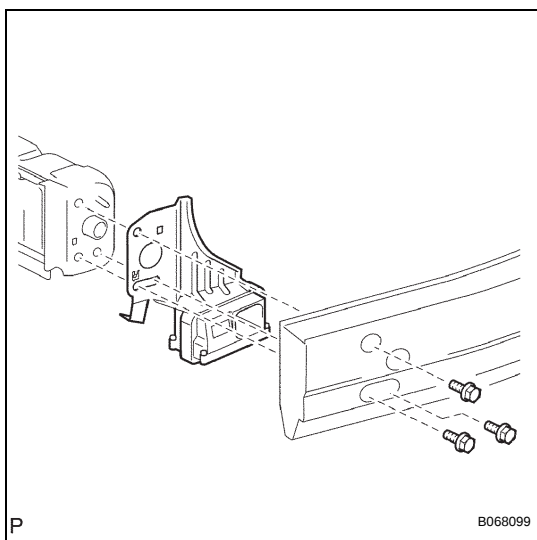
COMPONENTS



N*m (kgf*cm, ft.*lbf) : Specified torque

REMOVAL

1. REMOVE ENGINE UNDER COVER NO.1
2. REMOVE FRONT FENDER SPLASH SHIELD SUB-ASSEMBLY RH
3. REMOVE FRONT FENDER SPLASH SHIELD SUB-ASSEMBLY LH
4. REMOVE FRONT BUMPER COVER (See page [ET-2](#))
5. REMOVE FRONT BUMPER ENERGY ABSORBER
HINT:
[ET-2](#)
6. REMOVE FRONT BUMPER REINFORCEMENT
HINT:
[ET-2](#)
7. REMOVE LASER SENSOR
 - (a) Disconnect the connector and remove the laser sensor.



ADJUSTMENT

CAUTION:

- Do not stare at the luminous portion of the laser during adjustment. The intensity of the laser light is low, but it may result in vision loss.
- If the operation is not carried out as specified, there may be a risk of exposure to hazardous radiation.

HINT:

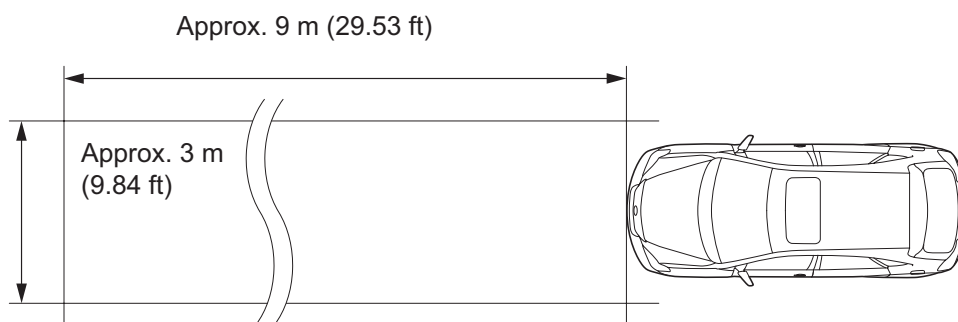
- There is a limitation on laser beam axis adjustment.
- Since the laser sensor is installed in the bumper reinforcement, it is important that the laser sensor, bumper reinforcement, and other related parts are installed properly.
- When the sensor is removed from the vehicle for trouble diagnosis or repair, it is necessary to adjust the laser beam axis after the operation.

1. ADJUST LASER SENSOR

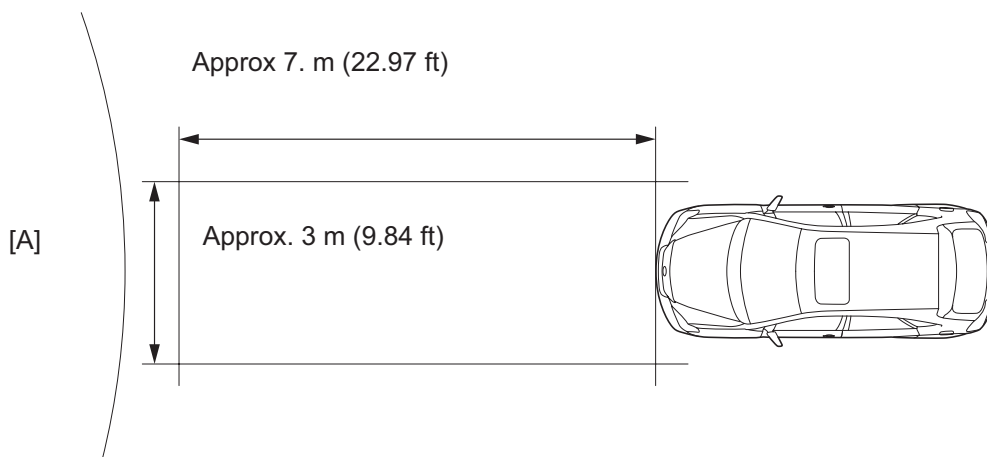
NOTICE:

- Perform measurement indoors on a vehicle at least 9 m (29.53 ft) from the wall. When performing adjustment outdoors, make sure that it is not raining or snowing.
- Check that there are no reflective materials on the ground surface or in the surrounding area.

- If it is impossible to secure a distance of approximately 9 m (29.53 ft) in front of the vehicle, be sure to secure at least 7 m (22.97 ft) from the vehicle, and cover the area marked [A] with a black cloth. If not covered with a black cloth, the laser sensor may detect something other than the target and adjustment cannot be done properly.



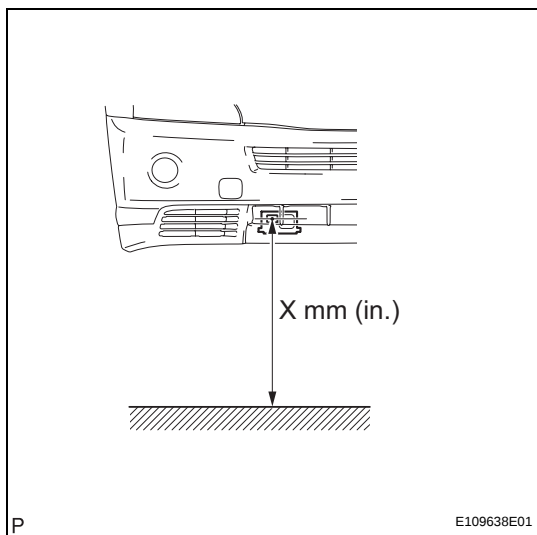
Secure the distance of approx. 9 m (29.53 ft).



P

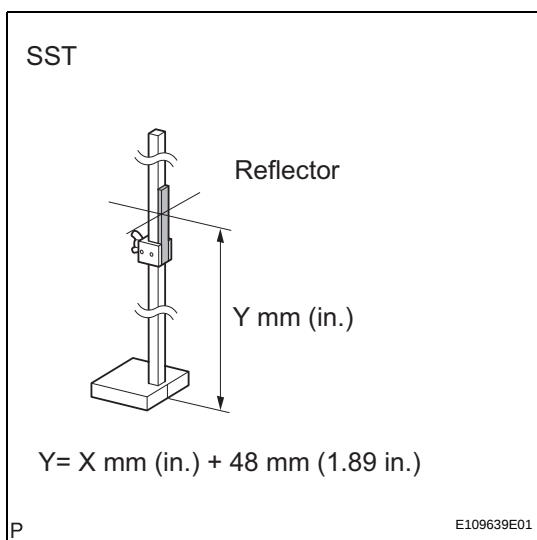
E109637E01

- (a) Preparation for adjusting the laser beam axis
- (1) Adjust the tire pressure properly.
(See page [TW-1](#))
 - (2) Unload any excess items from the vehicle such as from the trunk.
 - (3) Clean the light-luminous and light-receiving portions of the laser sensor.
 - (4) Prepare a 10 m (32.81 ft) string, a string with a sharp-pointed weight (plumb bob), and a 5 m (16.41 ft) tape measure.



(b) Reflector (SST) placement

- (1) Measure the height from the ground to the center of the laser luminous portion.



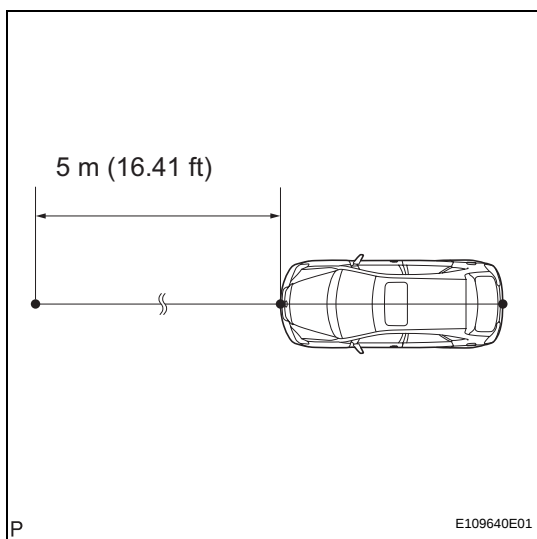
- (2) Adjust the center height of the reflector 48 mm (1.89 in.) higher than the center of the luminous portion.

SST 09870-60000 (09870-60010, 09870-60020)

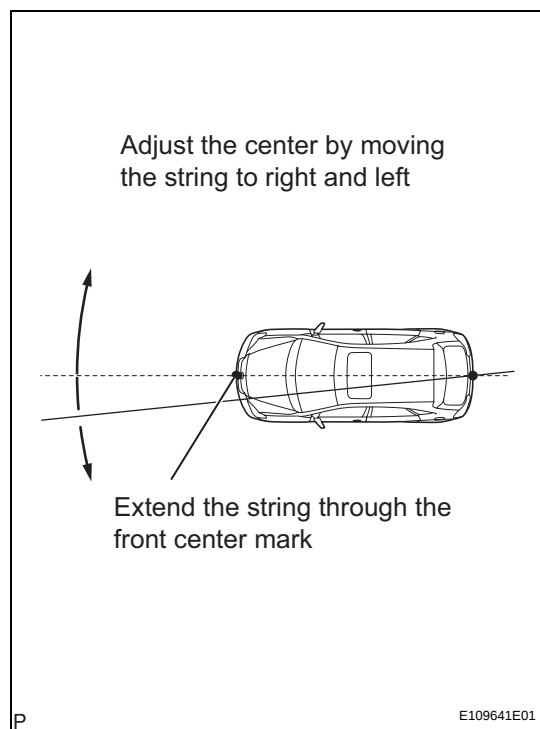
NOTICE:

Adjust the height as precisely as possible.

CC



- (3) From the center (center of the emblem) of the front and rear bumpers, hang down the string with the plumb bob and mark the center points (both front and rear) of the vehicle on the ground surface.



- (4) Extend the 10m (32.81 ft) string from the rear center mark forward through the front center mark. Make a mark 5 m (16.41 ft) forward of the front marked point.

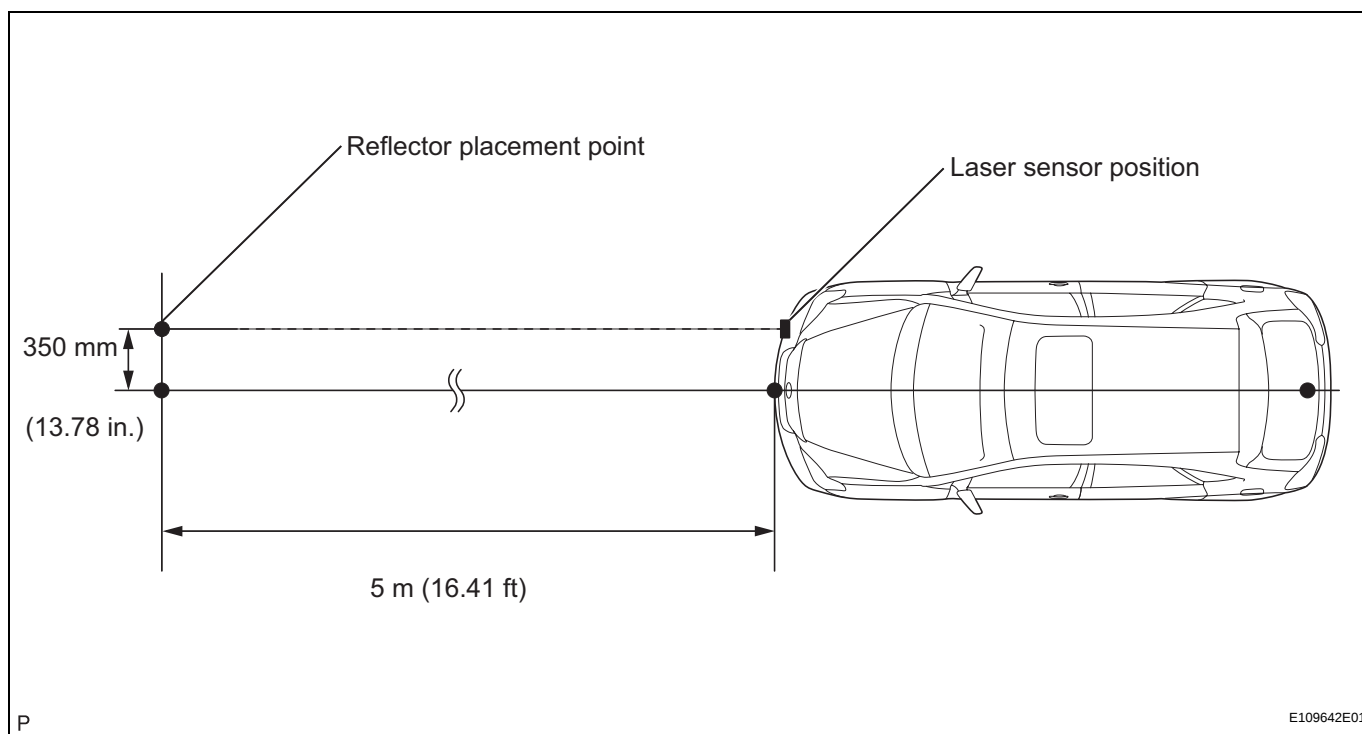
HINT:

Fix one end of the string to the center mark and move the other end right and left at a point 5 m (16.41 ft) from the front of the vehicle center mark intersect.

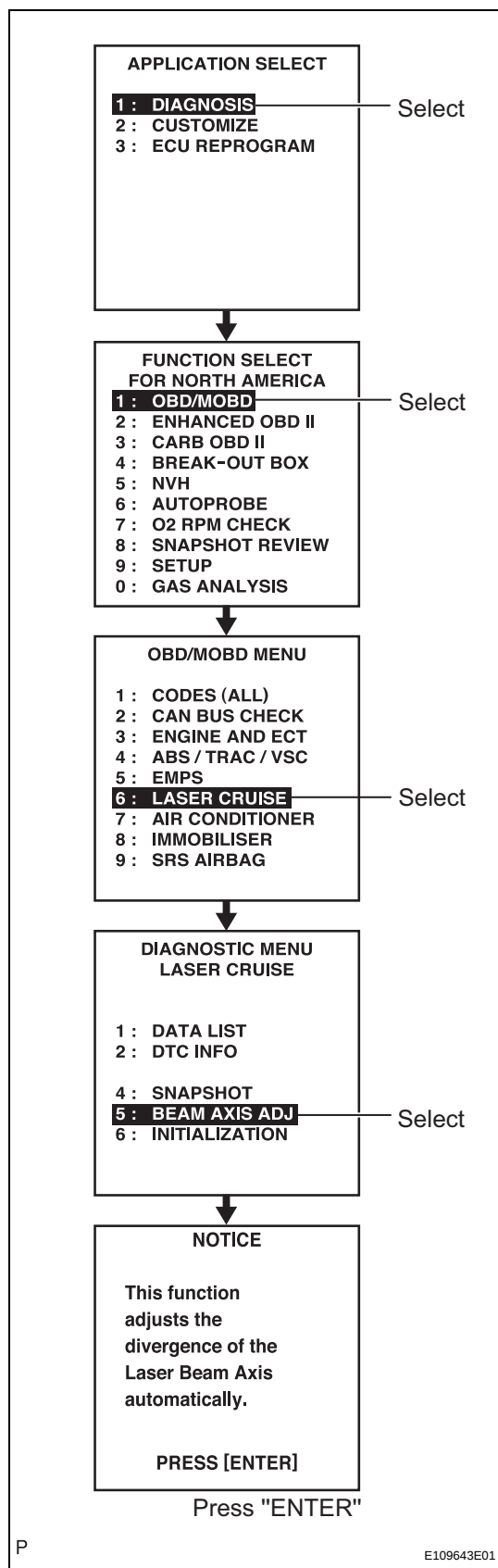
- (5) From the 5 m (16.41 ft) marked position, measure 350 mm (13.78 in.) to the right and place the reflector there.

NOTICE:

Perform the operation as precisely as possible.



- (c) Adjust the laser beam axis
- (1) Turn the ignition switch to the ON position.
 - (2) Push the cruise control main switch button on.
 - (3) Connect the intelligent tester to the DLC3, and turn the power on.



- (4) Operate by following the screen menu and select "BEAM AXIS ADJUST" of "LASER CRUISE", then press the "ENTER" key.
HINT:

- Pressing the "ENTER" key will make the ECM transfer to BEAM AXIS ADJUSTMENT MODE.
- The buzzer sounds for 1 second after transfer.

Confirm divergence
of the Beam Axis.

*1
UPPER/LOWER SIDE: *3
 X.X DEG

*2
LEFT/RIGHT SIDE: *3
 X.X DEG

PRESS [ENTER]

*1. Either UPPER or LOWER is indicated.

*2. Either LEFT or RIGHT is indicated.

*3. Value between 0.0 and 6.3 is indicated.

CC

P

E109644E01

(5) Confirm the current value of the laser beam.
(The default reading is 6.3° when the reflector position is out of range.)

(6) Move the reflector either right or left by 100 mm (3.94 in.) and check that the value changes.

NOTICE:

When the values do not change, it is possible that the direction of the laser sensor is greatly off target, and that the laser sensor is aiming at something different. Check the installation condition of the laser sensor.

(7) Return the reflector to the original position and read the current angle.

Standard

Display	Angle
UPPER/LOWER SIDE	Below 2°
RIGHT/LEFT SIDE	Below 4°

HINT:

When the values displayed on the screen are normal, the values should be within the above standard value ranges. If any value is out of this range, check the installation condition of the bumper reinforcement, etc. as it cannot be adjusted automatically.

(8) Turn the headlight dimmer switch to the TAIL position.

(9) Beam axis adjustment will be performed automatically.

(10) When the adjustment is completed, the UPPER/LOWER SIDE and RIGHT/LEFT SIDE indicators show 0° and the system beeps for 10 seconds. During this time, UPPER and LOWER flash alternately on the screen, and LEFT and RIGHT also flash alternately.

NOTICE:

Adjustment values are calculated and then stored in the laser sensor. The system is not controlled mechanically, and therefore the same value as before is displayed to adjust the beam axis.

Confirm divergence
of the Beam Axis.

UPPER SIDE: 0.0 DEG
LOWER

LEFT SIDE: 0.0 DEG
RIGHT

PRESS [ENTER]

P

E109645

INSTALLATION

1. INSTALL LASER SENSOR

NOTICE:

Do not install the laser sensor if it has been damaged or received some sort of shock.

2. INSTALL FRONT BUMPER REINFORCEMENT (See page [ET-3](#))

3. ADJUST FOG LIGHT AIM

4. CHECK FOG LIGHT AIM

5. ADJUST LASER SENSOR

SST 09870-60000 (09870-60010, 09870-60020)