

CRUISE CONTROL SYSTEM

PRECAUTION

1. NOTICE FOR INITIALIZATION
- NOTICE:
- When the cable of the negative (-) battery terminal is disconnected, initialize the following system(s) after the cable is reconnected.

System Name	See procedure
Power Window Control System	IN-32

2. NOTICE FOR HYBRID SYSTEM ACTIVATION
- NOTICE:
- When the warning light is illuminated or the battery has been disconnected and reconnected, pressing the power switch may not start the system on the first try. If so, press the power switch again.

• With the power switch's power mode changed to ON (IG), disconnect the battery. If the key is not in the key slot during reconnection, DTC B2799 may be output.
3. NOTICE FOR CRUISE CONTROL SYSTEM
- NOTICE:
- Push the cruise control main switch ON-OFF button "off" and reset the cruise control if the CRUISE main indicator light blinks while driving with cruise control. When the cruise control cannot be set by this procedure or canceled immediately after setting, there may be a problem in the cruise control system. Do not inspect the cruise control system under the following road conditions:
- Heavy traffic

• Steep downhill

• Sharp turns

• Icy or snowy roads

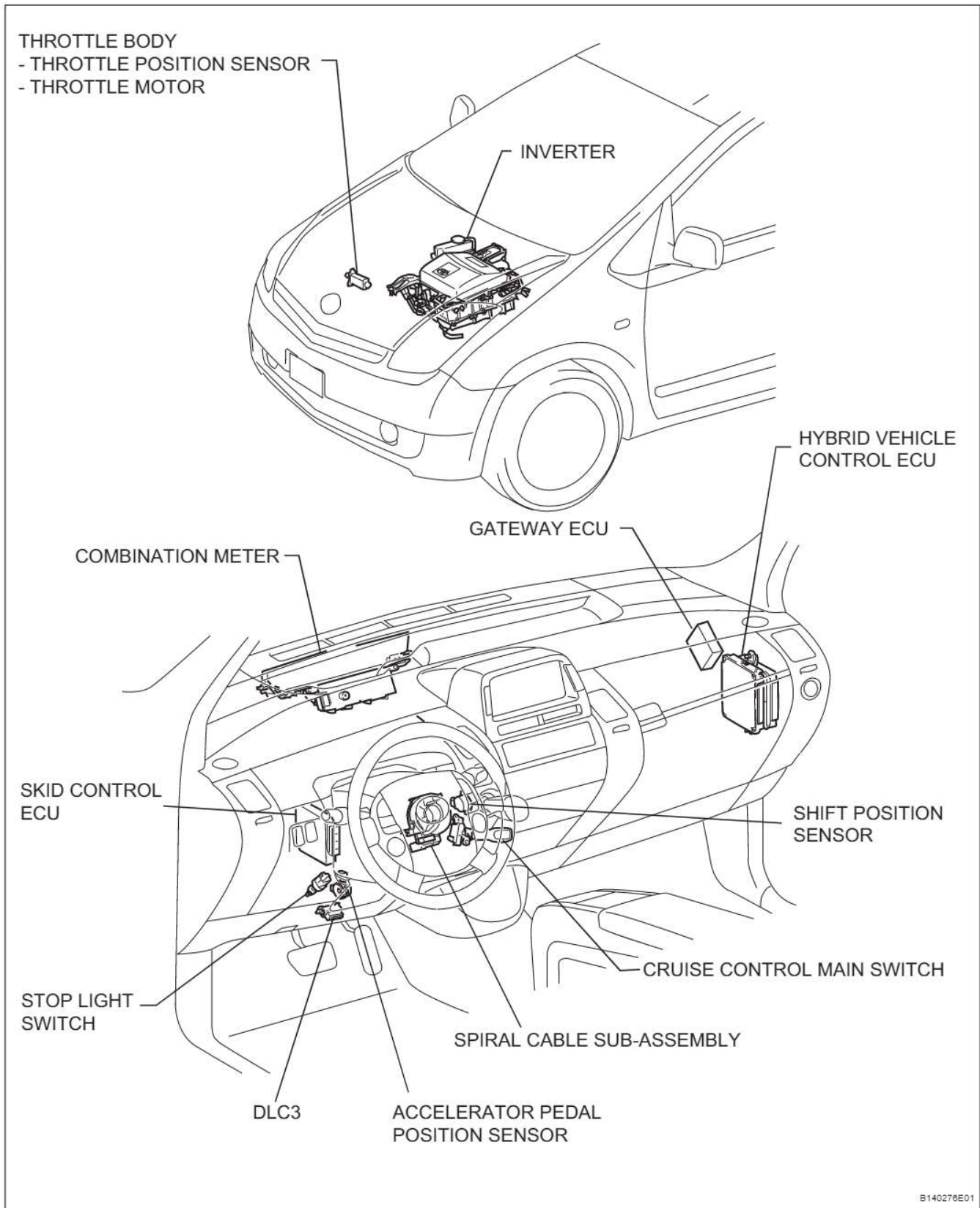
• Slippery roads



CC-2

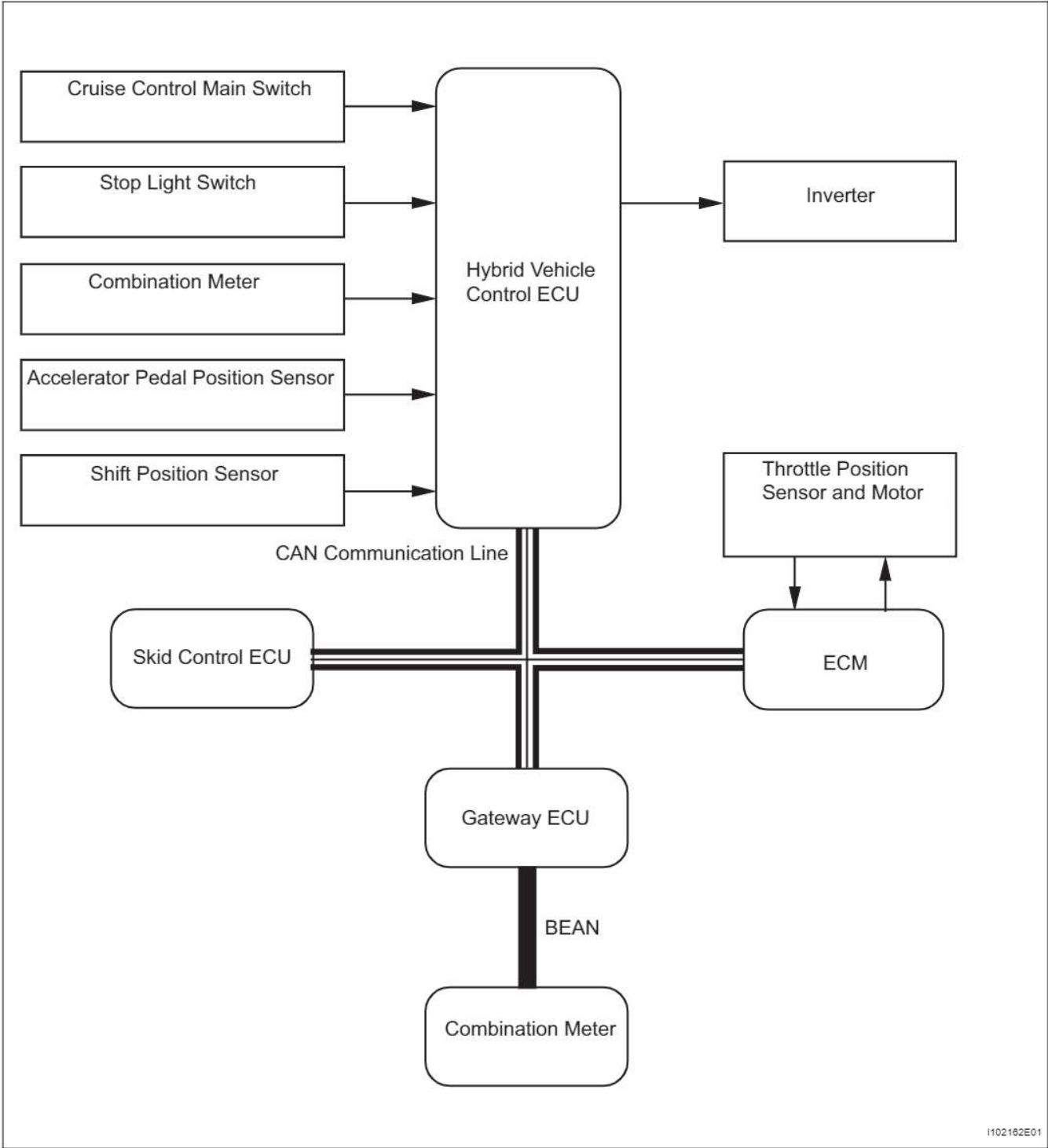
CRUISE CONTROL – CRUISE CONTROL SYSTEM

PARTS LOCATION



SYSTEM DIAGRAM

CC



Communication method

Transmitting ECU	Receiver	Signals	Communication Method
Hybrid Vehicle Control ECU	ECM	Engine torque demand signal	CAN
	Combination Meter	• CRUISE main indicator signal • Cruise control warning signal	• CAN • BEAN
Skid Control ECU	Hybrid Vehicle Control ECU	Cruise control cancel signal	CAN

SYSTEM DESCRIPTION

1. CRUISE CONTROL SYSTEM DESCRIPTION

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

Receiving signals from each switch and sensor, the hybrid vehicle control ECU controls constant speed driving by optimizing the use of the engine and motor driving force.

2. LIMIT CONTROL

(a) Low speed limit

The lowest possible limit of the speed setting range is approximately 40 km/h (25 mph). The cruise control system cannot be set when the driving speed is below the low speed limit. Constant speed control will be automatically canceled and the stored vehicle speed will be erased when the vehicle speed goes below the low speed limit while the constant speed control is in operation.

(b) High speed limit

The highest possible limit of the speed setting range is approximately 180 km/h (112 mph). The cruise control system cannot be set when the driving speed is over the high speed limit. Speed up using RESUME/+ with the cruise control main switch assembly also cannot be set beyond the high speed limit.

3. CRUISE CONTROL OPERATION

(a) Cruise control main switch

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 share the same switch. Each function can be controlled by moving the switch in the directions of the arrows on the cruise control main switch assembly. The switch will return automatically after it is released.

(b) 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-OFF button "on" (CRUISE main indicator light is on), and the vehicle speed is within the set speed range (between the low and high speed limits).

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CRUISE CONTROL – CRUISE CONTROL SYSTEM**CC-5**

- (c) **Coast control**
The hybrid vehicle control ECU decreases the cruise control demand speed and controls the engine and motor driving force to decelerate the vehicle when -/SET on the cruise control main switch is pressed and held while the cruise control system is in operation. Vehicle speed, when the cruise control main switch is released from -/SET, is stored and constant speed control is maintained.
- (d) **Tap-down control**
When tapping down on the cruise control main switch to -/SET (for approx. 0.5 seconds) while the cruise control system is in operation, the stored vehicle speed decreases 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 (3.1 mph) and the cruise control main switch is released from -/SET, the vehicle speed will be stored and constant speed control is maintained.
- (e) **Acceleration control**
The hybrid vehicle control ECU increases the cruise control demand speed and controls the engine and motor driving force to accelerate the vehicle when +/RES on the cruise control main switch is pressed and held while the cruise control system is in operation. Vehicle speed, when the cruise control main switch is released from +/RES, is stored and constant speed control is maintained.
- (f) **Tap-up control**
When tapping up on the cruise control main switch to +/RES (for approx. 0.5 seconds) 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 (3.1 mph), the stored vehicle speed will not be changed.
- (g) **Resume control**
If constant speed control 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 restarts constant speed control.
- (h) **Manual cancel control**
Doing any of the following cancels the cruise control system while in operation. (The stored vehicle speed in the hybrid vehicle ECU is maintained).
- Depressing the brake pedal
 - Shifting into any position except D
 - Pushing the cruise control main switch to CANCEL

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- Pushing the cruise control main switch ON-OFF button "off" (The stored vehicle speed in the hybrid vehicle control ECU is not maintained).
- (i) Auto cancel (fail-safe)
This system has an automatic cancellation function (fail-safe) (see page [CC-12](#)).

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HOW TO PROCEED WITH TROUBLESHOOTING

- HINT:
- Use these procedures to troubleshoot the cruise control system.
 - *: Use the intelligent tester.

1

VEHICLE BROUGHT TO WORKSHOP

NEXT

2

INSPECT BATTERY VOLTAGE

Standard voltage:
11 to 14 V
If the voltage is below 11 V, recharge or replace the battery before proceeding.

NEXT

3

CHECK INDICATOR LIGHT

NEXT

4

CHECK DTC*

- (a) Check for DTCs and note any codes that are output.
(b) Delete the DTC.
(c) Recheck for DTCs, and try to prompt the DTC by simulating the original activity that the DTC suggests.

Result	
Result	Proceed to
DTC does not reoccur	A
DTC reoccurs	B

B

Go to step 7

A

5

PROBLEM SYMPTOMS TABLE

Result	
Result	Proceed to
Fault is not listed in problem symptoms table	A
Fault is listed in problem symptoms table	B

B

Go to step 7

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CRUISE CONTROL – CRUISE CONTROL SYSTEM

A

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OVERALL ANALYSIS AND TROUBLESHOOTING*

- (a) Terminals of ECU (see page [CC-9](#))
- (b) DATA LIST / ACTIVE TEST (see page [CC-13](#))

NEXT

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REPAIR OR REPLACE

CC

NEXT

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CONFIRMATION TEST

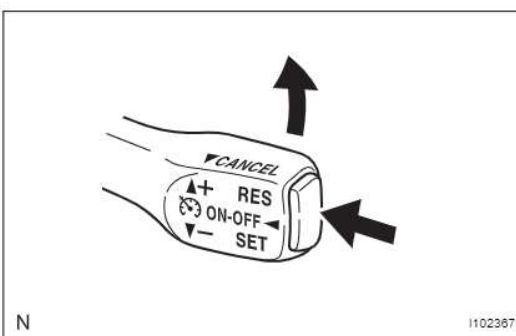
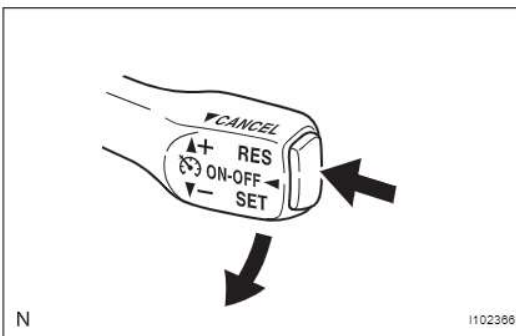
NEXT

END

ROAD TEST

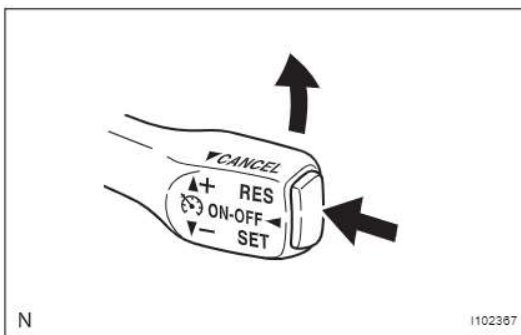
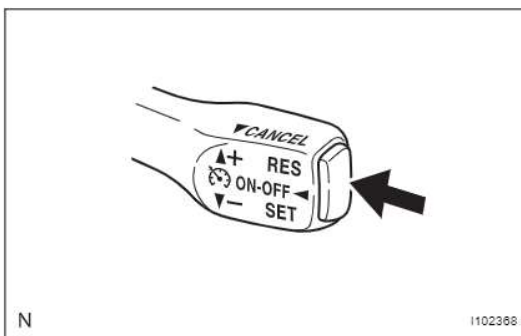
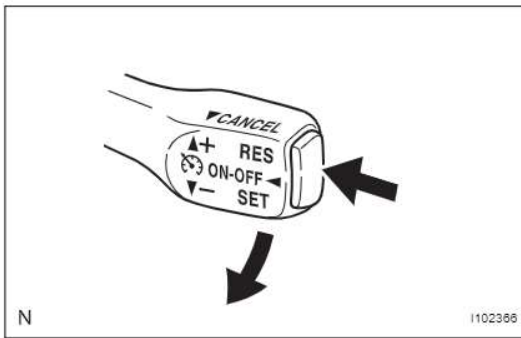
1. PROBLEM SYMPTOM CONFIRMATION

- (a) Inspect the SET function.
 - (1) Push the ON-OFF button "on".
 - (2) Drive at the required speed (40 km/h (25 mph) or higher).
 - (3) Push the cruise control main switch to -/SET.
 - (4) Check that the vehicle cruises at the set speed after releasing the switch.
- (b) Inspect the "+ (ACCEL)" function.
 - (1) Push the ON-OFF button "on".
 - (2) Drive at the required speed (40 km/h (25 mph) or higher).
 - (3) Push the cruise control main switch to -/SET.
 - (4) Check that vehicle speed increases while the cruise control main switch is pushed to +/RES, and that the vehicle cruises at the newly set speed when the switch is released.
 - (5) 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 function).



CRUISE CONTROL – CRUISE CONTROL SYSTEM

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- (c) Inspect the "- (COAST)" function.
- (1) Push the ON-OFF button "on".
 - (2) Drive at the required speed (40 km/h (25 mph) or higher).
 - (3) Push the cruise control main switch to -/SET.
 - (4) Check that vehicle speed decreases while the cruise control main switch is pushed to -/SET, and that 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 function).
- (d) Inspect the CANCEL function.
- (1) Push the ON-OFF button "on".
 - (2) Drive at the required speed (40 km/h (25 mph) or higher).
 - (3) Push the cruise control main switch to -/SET.
 - (4) When doing one or more of the following, check that the cruise control system is canceled and that the normal driving mode is reset:
 - Depressing the brake pedal
 - Shifting into any position except D
 - Pushing the ON-OFF button "off"
 - Pulling the cruise control main switch to CANCEL
- (e) Inspect the RES (RESUME) function.
- (1) Push the ON-OFF button "on".
 - (2) Drive at the required speed (40 km/h (25 mph) or higher).
 - (3) Push the cruise control main switch to -/SET.
 - (4) When doing one or more of the following, check that the cruise control system is canceled and that the normal driving mode is reset:
 - Depressing the brake pedal
 - Shifting into any position except D
 - Pulling the cruise control main switch to CANCEL
 - (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 restores the speed which was maintained before cancellation.

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CRUISE CONTROL – CRUISE CONTROL SYSTEM

PROBLEM SYMPTOMS TABLE

HINT:

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

Cruise control system

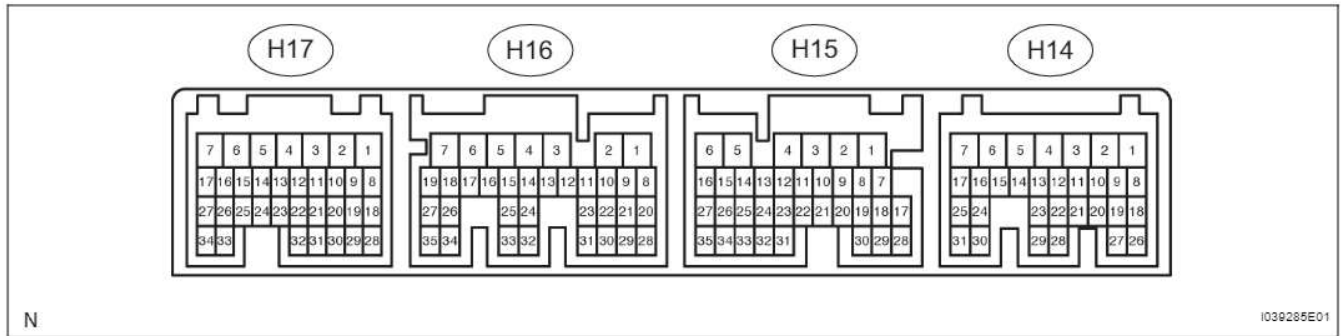
Symptom	Suspected area	See page
ON-OFF button cannot be pushed on (CRUISE main indicator light on combination meter does not come on)	1. Cruise control switch circuit	CC-23
	2. Cruise main indicator light circuit	CC-29
	3. Combination meter	-
	4. Hybrid vehicle control ECU	-
Vehicle speed cannot be set (indicator light on combination meter comes on when ON-OFF button is pushed on, but it goes off when vehicle speed is set)	1. Cruise control switch circuit	CC-23
	2. Hybrid vehicle control ECU	-
Setting cannot be done (indicator light on combination meter come on when ON-OFF button is pushed on, and it remains on while setting)	1. Cruise control switch circuit	CC-23
	2. Stop light switch circuit	CC-19
	3. Shift position sensor circuit	HV-102
	4. Combination meter	-
	5. Hybrid vehicle control ECU	-
Cruise control is canceled while driving (CRUISE main indicator light remains on)	1. Cruise control switch circuit	CC-23
	2. Vehicle speed sensor circuit	CC-15
	3. Stop light switch circuit	CC-19
	4. Cruise main indicator light circuit	CC-29
	5. Hybrid vehicle control ECU	-
Hunting occurs (speed is not constant)	1. Vehicle speed sensor circuit	CC-15
	2. Hybrid vehicle control ECU	-
Setting cannot be canceled (when functions such as COAST, ACCEL, RESUME, set speed change are operated with control switch)	1. Cruise control switch circuit	CC-23
	2. Hybrid vehicle control ECU	-

CRUISE CONTROL – CRUISE CONTROL SYSTEM

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TERMINALS OF ECU

1. CHECK HYBRID VEHICLE CONTROL ECU



(a) Measure the voltage of the connectors.

Symbols (Terminals No.)	Wiring Color	Terminal Description	Condition	Specified Condition
ST1 (H15-2) - GND1 (H14-1)	G - W-B	Stop light signal	Power switch is ON (IG), depress brake pedal	Below 1 V
			Power switch is ON (IG), release brake pedal	10 to 14 V
STP (H15-3) - GND1 (H14-1)	L - W-B		Power switch is ON (IG), depress brake pedal	10 to 14 V
			Power switch is ON (IG), release brake pedal	Below 1 V
CCS (H14-13) - GND1 (H14-1)	V - W-B	Cruise control main switch circuit	Power switch is ON (IG)	10 to 14 V
			Power switch is ON (IG), CANCEL switch is held on	6.6 to 10.1 V
			Power switch is ON (IG), -/SET switch is held on	4.5 to 7.1 V
			Power switch is ON (IG), +/-RES switch is held on	2.3 to 4.0 V
			Power switch is ON (IG), ON-OFF button is pushed on	Below 1 V
SPDI (H14-19) - GND1 (H14-1)		Vehicle speed input signal	Power switch is ON (IG), slowly turn wheel	Below 1 V to above 5 V

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

DIAGNOSIS SYSTEM

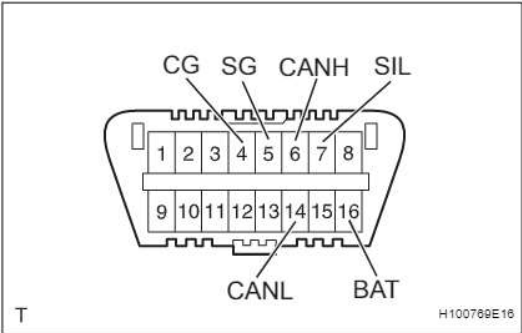
1. DESCRIPTION

The ECU controls the function of cruise control on this vehicle. Data of the cruise control or DTC can be read from DLC3 of the vehicle. When a trouble occurs with cruise control, check that the CRUISE main indicator light does not come on but DTC inspection is performed. Therefore when there seems to be a problem with the cruise control, use the intelligent tester (with CAN VIM) or SST to check and troubleshoot it.

2. CHECK DLC3

The hybrid vehicle control ECU of the vehicle uses ISO 15765-4 for communication. The terminal arrangement of the DLC3 complies with SAE J1962 and matches the ISO 15765-4 format.

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Symbols (Terminal No. 1)	Terminal Description	Condition	Specified condition
SIL (7) - SG (5)	Bus "+" line	During transmission	Pulse generation
CG (4) - Body ground	Chassis ground	Always	Below 1 Ω
SG (5) - Body ground	Signal ground	Always	Below 1 Ω
BAT (16) - Body ground	Battery positive	Always	11 to 14 V
CANH (6) - CANL (14)	HIGH-level CAN bus line	Power switch is OFF*	54 to 67 Ω
CANH (6) - Battery positive	HIGH-level CAN bus line	Power switch is OFF*	1 MΩ or higher
CANH (6) - CG (4)	HIGH-level CAN bus line	Power switch is OFF*	3 MΩ or higher
CANL (14) - Battery positive	LOW-level CAN bus line	Power switch is OFF*	1 MΩ or higher
CANL (14) - CG (4)	LOW-level CAN bus line	Power switch is OFF*	3 MΩ or higher

NOTICE:

***: Before measuring the resistance, leave the vehicle as is for at least 1 minute and do not operate the power switch, other switches or doors.**

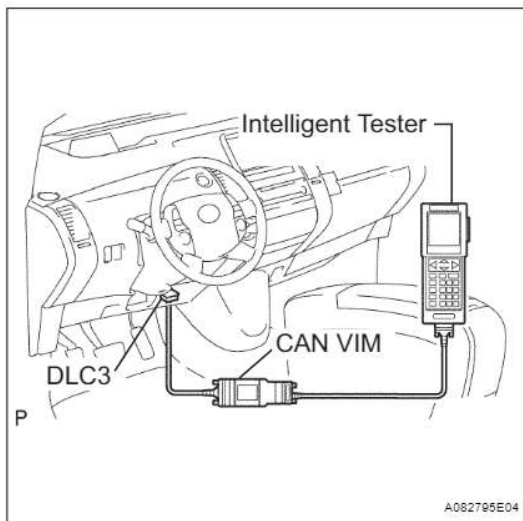
If the result is not as specified, the DLC3 may have a malfunction. Repair or replace the harness and connector.

HINT:

Connect the cable of the intelligent tester (with CAN VIM) to the DLC3, turn the power switch ON (IG) and attempt to use the tester. If the display indicates that a communication error has occurred, there is a problem either with the vehicle or with the tester.

CRUISE CONTROL – CRUISE CONTROL SYSTEM

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- If communication is normal when the tester is connected to another vehicle, inspect the DLC3 of the original vehicle.
- If communication is still not possible when the tester is connected to another vehicle, the problem may be in the tester itself. Consult the Service Department listed in the tester's instruction manual.



3. CHECK INDICATOR

- Turn the power switch ON (IG).
- Check that the CRUISE main indicator light comes on when the cruise control 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 there is a problem with the indicator light, inspect the CRUISE main indicator light circuit (see page CC-29).
- If a malfunction occurs in the vehicle speed sensor, stop light switch or other related parts while driving with cruise control, and the hybrid vehicle control ECU activates AUTO CANCEL of the cruise control and then the CRUISE main indicator light starts to blink, informing the driver of the malfunction. At the same time, data of the malfunction is stored as a DTC.

DTC CHECK / CLEAR

1. CHECK DTC

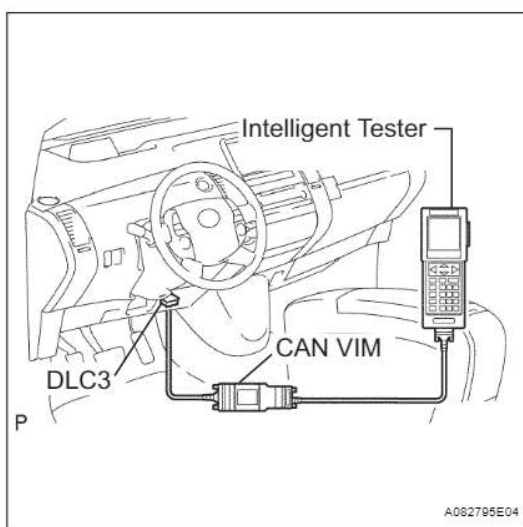
- Using the intelligent tester (with CAN VIM), check for DTCs.
 - Connect the intelligent tester (with CAN VIM) to the DLC3.
 - Turn the power switch ON (IG).
 - Read the DTCs by following the prompts on the tester screen.

HINT:

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

2. CLEAR DTC

- Using the intelligent tester (with CAN VIM), clear the DTCs.
 - Connect the intelligent tester (with CAN VIM) to the DLC3.
 - Turn the power switch ON (IG).



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- (3) Erase the DTCs by following the directions on the tester screen.

HINT:

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

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CRUISE CONTROL – CRUISE CONTROL SYSTEM**CC-15****FAIL-SAFE CHART****1. FAIL-SAFE CHART**

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

Cruise control system

Vehicle Condition	Auto Cancel Condition	Re-operation Condition
CRUISE main indicator light blinks	When either condition below is met: • There is an open or short in stop light switch circuit • Vehicle speed signal changes suddenly	Push cruise control main switch ON-OFF button "on" again
CRUISE main indicator light blinks	There is a problem with input circuit of stop light switch circuit	When either condition below is met: • Indicator light blinks until cruise control main switch ON-OFF button is pushed on again • Constant speed control is prohibited until the power switch is turned OFF
CRUISE main indicator light turns off	When either condition below is met: • Vehicle speed is below the low speed limit (approx. 40 km/h (approx. 25 mph)) while driving with cruise control on • Vehicle speed is lower than stored speed by approx. 16 km/h (approx. 9.9 mph) or more while driving with cruise control on	Push cruise control main switch to -/RES

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CRUISE CONTROL – CRUISE CONTROL SYSTEM

DATA LIST / ACTIVE TEST

1. READ DATA LIST

HINT:

Using the intelligent tester's DATA LIST allows switch, 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.

- (a) Connect the intelligent tester (with CAN VIM) to the DLC3.
- (b) Turn the power switch ON (IG).
- (c) Read the DATA LIST according to the display on the tester.

CC Hybrid vehicle control system

Item	Measurement Item / Display (Range)	Normal Condition	Diagnostic Note
VEHICLE SPD	Cruise control vehicle speed/ min.: 0 km/h (0 mph), max.: 255 km/h (158 mph)	Actual vehicle speed is displayed	-
MEMORY SPD	Cruise control memorized speed/ min.: 1 km/h (0.6 mph), max.: 255 km/h (158 mph)	Actual vehicle speed is displayed	-
THROTTLE	Request opening angle/ min.: 0%, max.: 125%	Actual throttle opening angle is displayed	-
CRUISE CTRL	Cruise control system active condition/ON or OFF	ON: Cruise control is activated OFF: Cruise control is deactivated	-
MAIN SW (MAIN)	CRUISE main switch signal (Main CPU)/ON or OFF	ON: Cruise control main switch ON-OFF button is pushed on OFF: Cruise control main switch ON-OFF button is pushed off	"3"
MAIN SW (SUB)	CRUISE main switch signal (Sub CPU)/ON or OFF	ON: Cruise control main switch ON-OFF button is pushed on OFF: Cruise control main switch ON-OFF button is pushed off	"3"
CCS READY M	Cruise control system standby condition (Main CPU)/ON or OFF	ON ↔ OFF: Switching each time ON-OFF button is pushed	"1"
CCS READY S	Cruise control system standby condition (Sub CPU)/ON or OFF	ON ↔ OFF: Switching each time ON-OFF button is pushed	"1"
CCS INDICATOR M	Cruise indicator signal (Main CPU)/ON or OFF	ON: CRUISE main indicator light is on OFF: CRUISE main indicator light is off	"2"
CCS INDICATOR S	Cruise indicator signal (Sub CPU)/ON or OFF	ON: CRUISE main indicator light is on OFF: CRUISE main indicator light is off	"2"
CANCEL SW	CANCEL switch signal/ON or OFF	ON: Cruise control main switch is pulled to CANCEL OFF: Cruise control main switch is not pulled to CANCEL	-
SET/COAST SW	-/SET switch signal/ON or OFF	ON: Cruise control main switch is pushed to -/SET OFF: Cruise control main switch is not pushed to -/SET	-
RES/ACC SW	+RES switch signal/ON or OFF	ON: Cruise control main switch is pushed to +RES OFF: Cruise control main switch is not pushed to +RES	-
STP LIGHT SW1 M	Stop light switch signal (Main CPU)/ON or OFF	ON: Brake pedal is depressed OFF: Brake pedal is released	-

CRUISE CONTROL – CRUISE CONTROL SYSTEM**CC-17**

Item	Measurement Item / Display (Range)	Normal Condition	Diagnostic Note
STP LIGHT SW2 S	Stop light switch signal (Sub CPU)/ON or OFF	ON: Brake pedal is depressed OFF: Brake pedal is released	-
STP LIGHT SW1 S	Stop light switch signal (Sub CPU)/ON or OFF	ON: Brake pedal is depressed OFF: Brake pedal is released	-
SHIFT D POS	Shift lever position sensor signal (D position)/ON or OFF	ON: Shift position is D OFF: Shift position is not D	-
VEHICLE SPD CHG	Vehicle speed sudden change/ ON or OFF	ON: Changed OFF: Not changing	-

HINT:

"3" is OK but "1" is NG → Hybrid vehicle control ECU failure

"1" is OK but "2" is NG → DTC output or hybrid vehicle control ECU failure

"3" is OK but the CRUISE main indicator light does not turn on → CRUISE main indicator light , wire harness, or hybrid vehicle control ECU failure

CC

DIAGNOSTIC TROUBLE CODE CHART

HINT:
If a malfunction code is displayed during the DTC check, check the circuit indicated by the DTC. For details of each code, refer to the respective "DTC No." in the DTC chart.

Cruise control system

DTC No.	Detection Item	Trouble Area	See page
P0500	Vehicle Speed Sensor "A"	- Vehicle speed sensor - Vehicle speed sensor circuit - Combination meter - Hybrid vehicle control ECU	CC-15
P0571	Brake Switch "A" Circuit	- Stop light switch - Stop light switch circuit - Hybrid vehicle control ECU	CC-19
P0607	Control Module Performance	- Hybrid vehicle control ECU	CC-22

HINT:
DTC P0607 indicates an internal abnormality of the hybrid vehicle control ECU. If this DTC is output, replace the hybrid vehicle control ECU.

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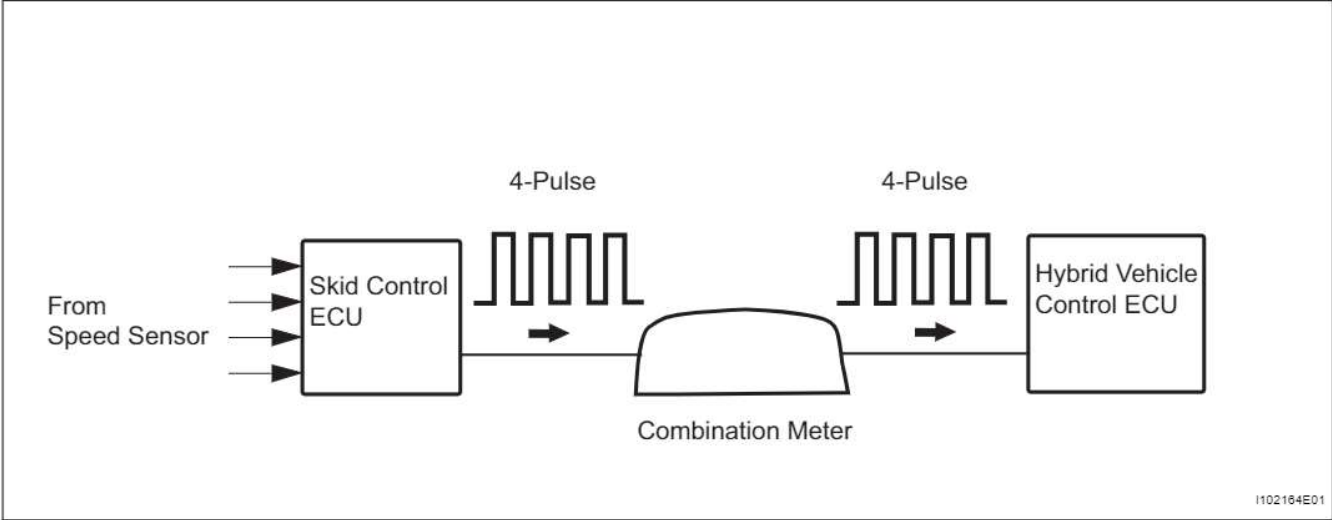
DTC	P0500	Vehicle Speed Sensor "A"
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DESCRIPTION

The speed sensor for the skid control ECU detects wheel speed and sends appropriate signals to the skid control ECU.

The skid control ECU converts these wheel speed signals into 4-pulse signals and outputs them to the hybrid vehicle control ECU via the combination meter.

The hybrid vehicle control ECU determines vehicle speed based on the frequency of these pulse signals.



DTC No.	DTC Detection Condition	Trouble Area
P0500	This trouble code is output when a signal from vehicle speed sensor is cut for 1.4 seconds or more while cruise control is in operation	• Vehicle speed sensor • Vehicle speed sensor circuit • Combination meter • Hybrid vehicle control ECU

WIRING DIAGRAM



CC-20

CRUISE CONTROL – CRUISE CONTROL SYSTEM

INSPECTION PROCEDURE

1 CHECK OPERATION OF SPEEDOMETER

- (a) Drive the vehicle and check if the function of the speedometer in the combination meter is normal.

OK:

Actual vehicle speed and the speed indicated on the speedometer are the same.

HINT:

The vehicle speed sensor is functioning normally when the indication on the speedometer is normal.

NG

GO TO SPEEDOMETER CIRCUIT

OK

2 READ VALUE OF INTELLIGENT TESTER (VEHICLE SPEED SIGNAL)

- (a) Check the DATA LIST for proper functioning of the vehicle speed signal.

Hybrid vehicle control ECU

Item	Measurement Item / Display (Range)	Normal Condition	Diagnostic Note
VEHICLE SPD	Cruise control vehicle speed/ min.: 0 km/h (0 mph), max.: 255 km/h (158 mph)	Actual vehicle speed is displayed	-

OK:

The speed displayed on the tester screen is almost the same as the speed the one indicated on the combination meter.

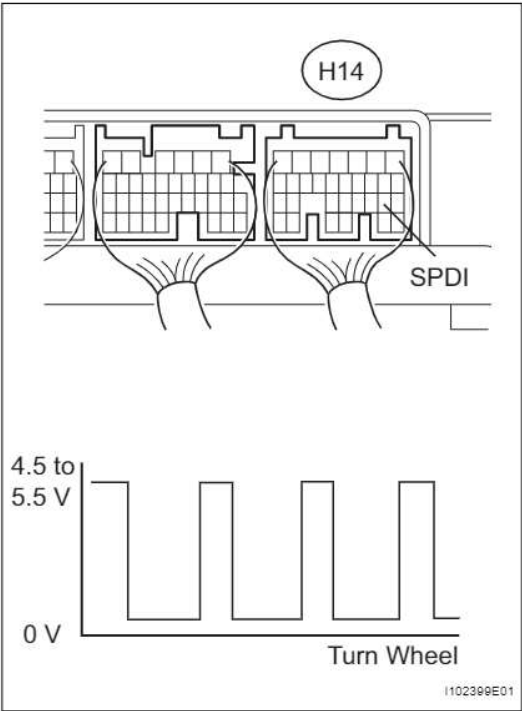
OK

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

NG

3

INSPECT HYBRID VEHICLE CONTROL ECU (SPD VOLTAGE)



- (a) Turn the power switch ON (IG).
- (b) Move the shift lever to neutral.
- (c) Jack up the vehicle.
- (d) Measure the voltage of the connector.

Standard voltage

Tester Connection	Specified Condition
SPDI (H14-19) - Body ground	Waveform appears

HINT:
The output voltage fluctuates up and down, similarly to the diagram on the left, when the wheel is turned slowly.

OK

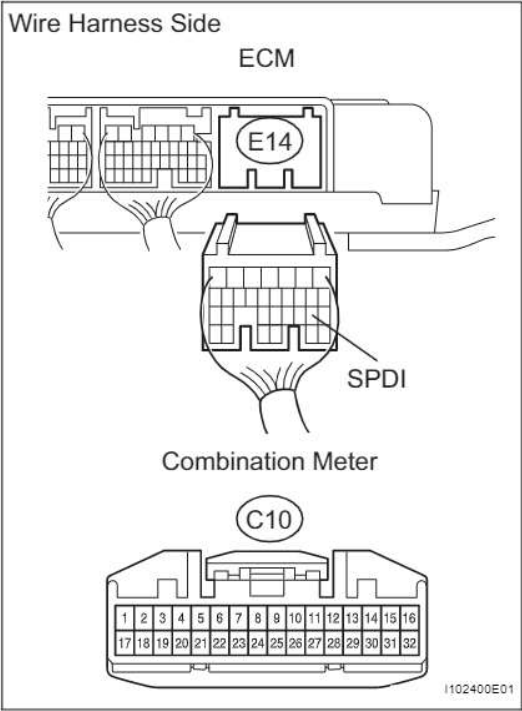
REPLACE HYBRID VEHICLE CONTROL ECU

CC

NG

4

CHECK WIRE HARNESS (ECU - METER)



- (a) Disconnect the H14 ECU connector.
- (b) Disconnect the C10 meter connector.
- (c) Measure the resistance of the wire harness side connectors.

Standard resistance

Tester Connection	Specified Condition
SPDI (H14-19) - C10-13	Below 1 Ω

NG

REPAIR OR REPLACE HARNESS AND CONNECTOR

CC-22

CRUISE CONTROL – CRUISE CONTROL SYSTEM



REPLACE COMBINATION METER ASSEMBLY

CC

DTC	P0571	Brake Switch "A" Circuit
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DESCRIPTION

When the brake pedal is depressed, the stop light switch sends a signal to the hybrid vehicle control ECU. Receiving the signal, the hybrid vehicle control ECU cancels the cruise control. Even if there is a malfunction in the stop light signal circuit while the cruise control is in operation, normal driving is maintained due to fail-safe function.

Cruise control is canceled when positive battery voltage is applied to terminal STP.

When the brake pedal is depressed, positive voltage is applied to terminal STP of the hybrid vehicle control ECU through the STOP fuse and the stop light switch, and the hybrid vehicle control ECU cancels the cruise control.

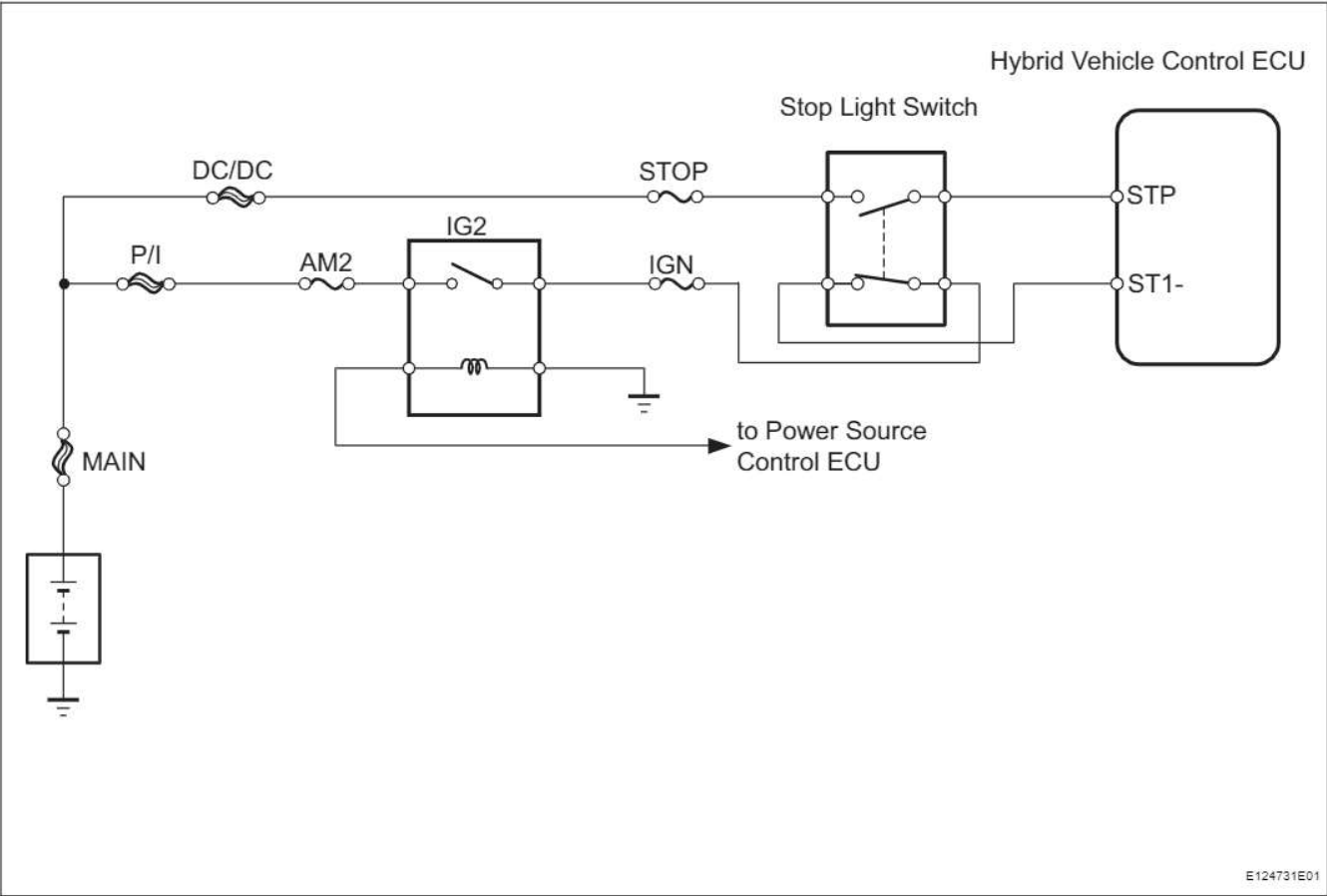
When the brake pedal is released, positive voltage is applied to terminal ST1- of the hybrid vehicle control ECU through the IGN fuse and the stop light switch, and the hybrid vehicle control ECU operates the cruise control.

HINT:

Inspect the fuses and relays before confirming the suspected areas which are shown in the table below.

DTC No.	DTC Detection Condition	Trouble Area
P0571	Trouble code is output when voltages of terminals ST1- and STP of the hybrid vehicle control ECU are both below 1 V for 0.5 seconds or more	• Stop light switch • Stop light switch circuit • Hybrid vehicle control ECU

WIRING DIAGRAM



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CRUISE CONTROL – CRUISE CONTROL SYSTEM

INSPECTION PROCEDURE

1 INSPECT STOP LIGHT SWITCH OPERATION

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

OK:

The stop light turns on/turns off normally.

HINT:

The stop light uses the circuit on the terminal STP side of the hybrid vehicle control ECU.

NG

GO TO STOP LIGHT SWITCH CIRCUIT

OK

2 READ VALUE OF INTELLIGENT TESTER (STOP LIGHT SWITCH)

- (a) Check the DATA LIST for proper functioning of the stop light switch.

ECM

Item	Measurement Item / Display (Range)	Normal Condition	Diagnostic Note
STP LIGHT SW1 M	Stop light switch signal (Main CPU)/ON or OFF	ON: Brake pedal is depressed OFF: Brake pedal is released	-
STP LIGHT SW1 S	Stop light switch signal (Sub CPU)/ON or OFF	ON: Brake pedal is depressed OFF: Brake pedal is released	-
STP LIGHT SW2 S	Stop light switch signal (Sub CPU)/ON or OFF	ON: Brake pedal is depressed OFF: Brake pedal is released	-

OK:

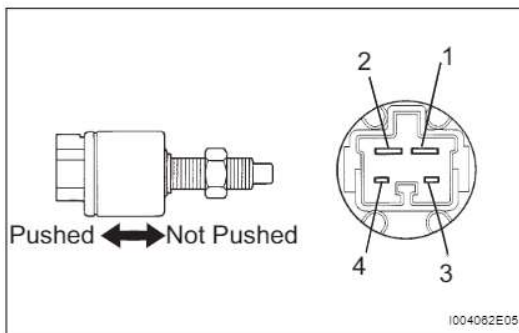
Display changes according to brake pedal operation described in above table.

OK

REPLACE HYBRID VEHICLE CONTROL ECU

NG

3 INSPECT STOP LIGHT SWITCH ASSEMBLY



- (a) Remove the stop light switch.
(b) Measure the resistance of the switch.

Standard resistance

Tester Connection	Switch Condition	Specified Condition
3 - 4	Not pushed	Below 1 Ω
	Pushed	10 k Ω or higher

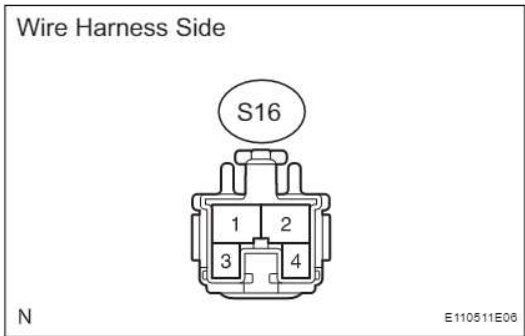
NG

REPLACE STOP LIGHT SWITCH ASSEMBLY

OK

4

CHECK WIRE HARNESS (SWITCH - BATTERY)



- (a) Disconnect the S16 switch connector.
(b) Measure the voltage of the wire harness side connector.
- Standard resistance**

Tester Connection	Specified Condition
S16-3 - Body ground	10 to 14 V

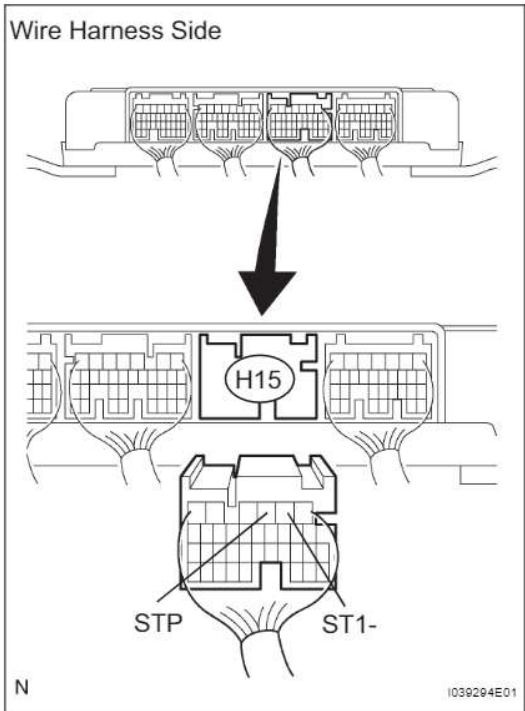
NG

REPAIR OR REPLACE HARNESS AND CONNECTOR

OK

5

CHECK HYBRID VEHICLE CONTROL ECU



- (a) Reconnect the S16 switch connector.
(b) Disconnect the H15 ECU connector.
(c) Turn the power switch ON (IG).
(d) Measure the voltage of the wire harness side connector.
- Standard resistance**

Tester Connection	Switch Connection	Specified Condition
STP (H15-3) - Body ground	Brake pedal is depressed	10 to 14 V
	Brake pedal is released	Below 1 V
ST1- (H15-2) - Body ground	Brake pedal is released	10 to 14 V
	Brake pedal is depressed	Below 1 V

NG

REPAIR OR REPLACE HARNESS AND CONNECTOR

OK

REPLACE HYBRID VEHICLE CONTROL ECU

CC-26

CRUISE CONTROL – CRUISE CONTROL SYSTEM

DTC	P0607	Control Module Performance
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DESCRIPTION

DTC P0607 is stored when an internal abnormality of the hybrid vehicle control ECU is detected.

DTC No.	DTC Detection Condition	Trouble Area
P0607	Hybrid vehicle control ECU has a supervisory CPU and a control CPU. Trouble code is output when input STP signals to each CPU are different for 0.15 seconds or more.	Hybrid vehicle control ECU

HINT:

If DTC P0607 is detected while the cruise control is in operation, the system clears the stored vehicle speed in the hybrid vehicle control ECU and cancels the cruise control operation. At the same time, the CRUISE main indicator light blinks to inform the driver of the malfunction.

When this trouble code is detected, fail-safe remains on until the power switch is turned OFF.

INSPECTION PROCEDURE

1	CHECK DTC
----------	------------------

- (a) Clear the DTC (see page [CC-12](#)).
- (b) Check the DTC (see page [CC-12](#)).

OK:

DTC is not output.

NG

REPLACE HYBRID VEHICLE CONTROL ECU

OK

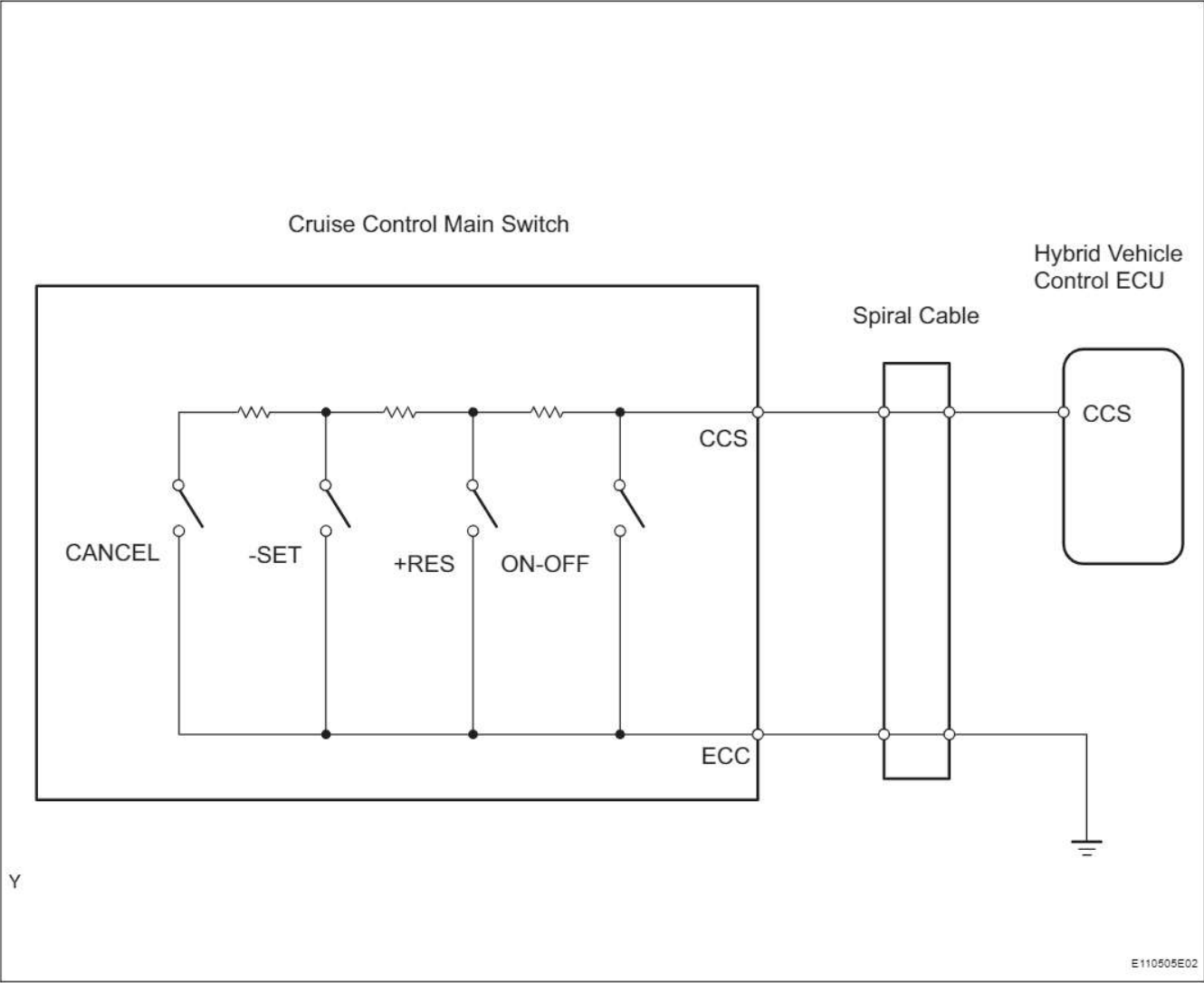
END

Cruise Control Switch Circuit

DESCRIPTION

This circuit sends signals to the ECU depending on the cruise control main switch condition. The battery supplies positive (+) battery voltage to the cruise control main switch. Then terminal CCS of the ECU receives the voltage according to the switch condition.

WIRING DIAGRAM



CC-28

CRUISE CONTROL – CRUISE CONTROL SYSTEM

INSPECTION PROCEDURE

1 READ VALUE OF INTELLIGENT TESTER (CRUISE CONTROL MAIN SWITCH)

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

Hybrid vehicle control ECU

Item	Measurement Item / Display (Range)	Normal Condition	Diagnostic Note
MAIN SW (MAIN)	Cruise control main switch signal (Main CPU) / ON or OFF	ON: Cruise control main switch ON-OFF button is pushed on OFF: Cruise control main switch ON-OFF button is pushed off	-
MAIN SW (SUB)	Cruise control main switch signal (Sub CPU) / ON or OFF	ON: Cruise control main switch ON-OFF button is pushed on OFF: Cruise control main switch ON-OFF button is 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 Switch	+/-RES switch signal / ON or OFF	ON: +/-RES switch ON OFF: +/-RES switch OFF	-

OK:

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

OK

REPLACE HYBRID VEHICLE CONTROL ECU

NG

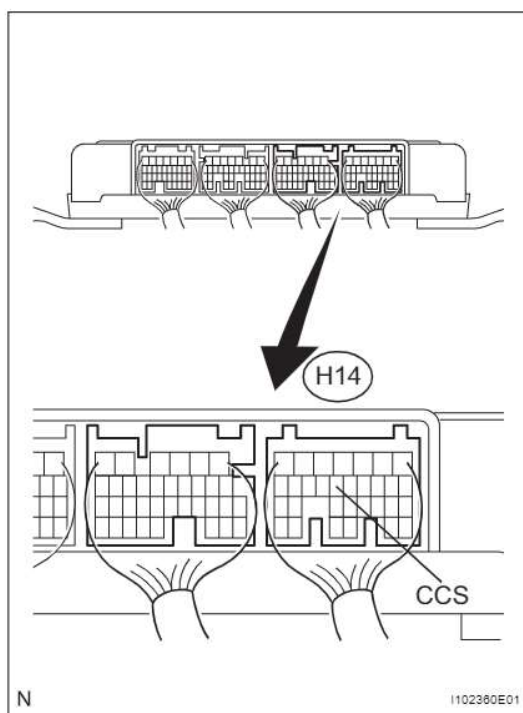
2 CHECK HYBRID VEHICLE CONTROL ECU

- (a) Measure the voltage of the connector.
Standard voltage

Tester Connection	Switch Condition	Specified Condition
H14-13 (CCS) - Body ground	Cruise control main switch off	10 to 14 V
	+/-RES	6.6 to 10.1 V
	-/SET	4.5 to 7.1 V
	CANCEL	2.3 to 4.0 V
	Cruise control main switch on	Below 1 V

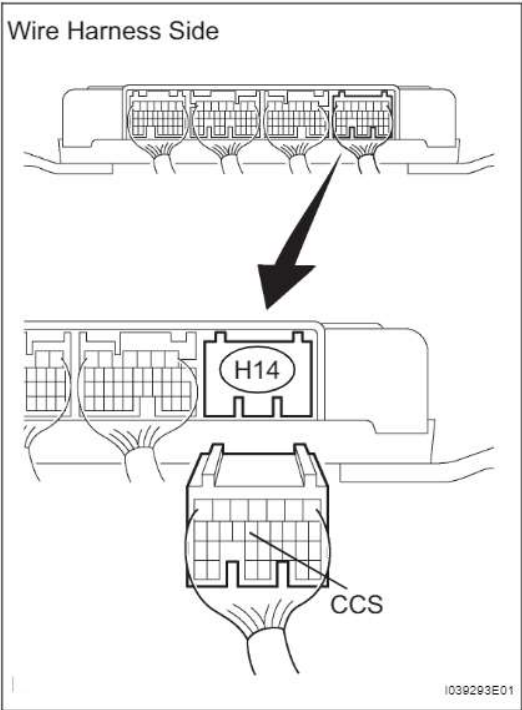
OK

PROCEED TO NEXT CIRCUIT INSPECTION SHOWN IN PROBLEM SYMPTOMS TABLE



NG

3 INSPECT CRUISE CONTROL MAIN SWITCH



- (a) Disconnect the H14 ECU connector.
(b) Measure the resistance of the wire harness side connector.

Standard resistance

Tester Connection	Switch Condition	Specified Condition
H14-13 (CCS) - Body ground	Neutral	10 kΩ or higher
	+ /RES	210 to 270 Ω
	- /SET	560 to 700 Ω
	CANCEL	1,380 to 1,700 Ω
	Cruise control main switch on	Below 1 Ω

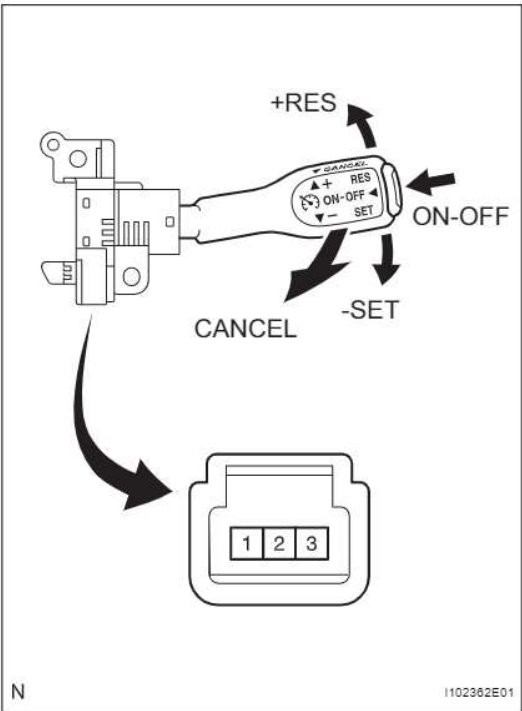
OK

REPLACE HYBRID VEHICLE CONTROL ECU

CC

NG

4 INSPECT CRUISE CONTROL MAIN SWITCH



- (a) Measure the resistance of the switch.

Standard resistance

Tester Connection	Switch Condition	Specified Condition
1 - 3	+ /RES	210 to 270 Ω
	- /SET	560 to 700 Ω
	CANCEL	1,380 to 1,700 Ω
	Cruise control main switch on	Below 1 Ω
	Cruise control main switch off	10 kΩ or higher

NG

REPLACE CRUISE CONTROL MAIN SWITCH

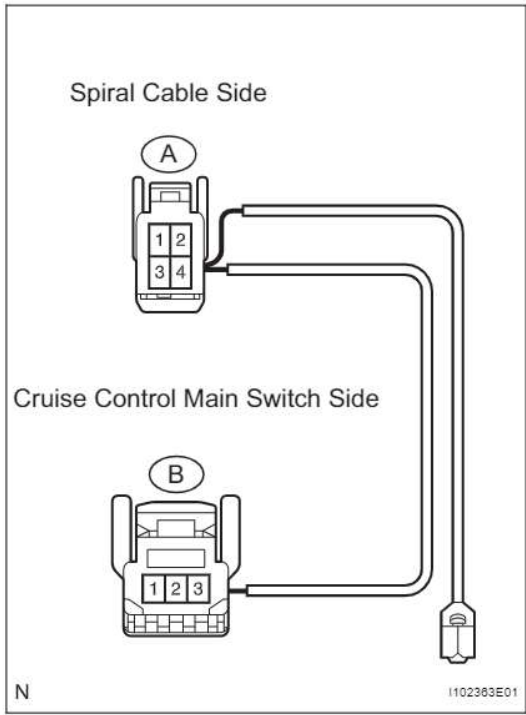
CC-30

CRUISE CONTROL – CRUISE CONTROL SYSTEM

OK

5

REPLACE HYBRID VEHICLE CONTROL ECU



- (a) Disconnect the spiral cable connector.
- (b) Measure the resistance of the wire harness side connectors.

Standard resistance

Tester Connection	Specified Condition
A-3 - B-1	Below 1 Ω
A-4 - B-3	

NG

REPAIR OR REPLACE HARNESS AND CONNECTOR

OK

6

INSPECT SPIRAL CABLE SUB-ASSEMBLY

- (a) Disconnect the spiral cable connector.
- (b) Measure the resistance of the cable.

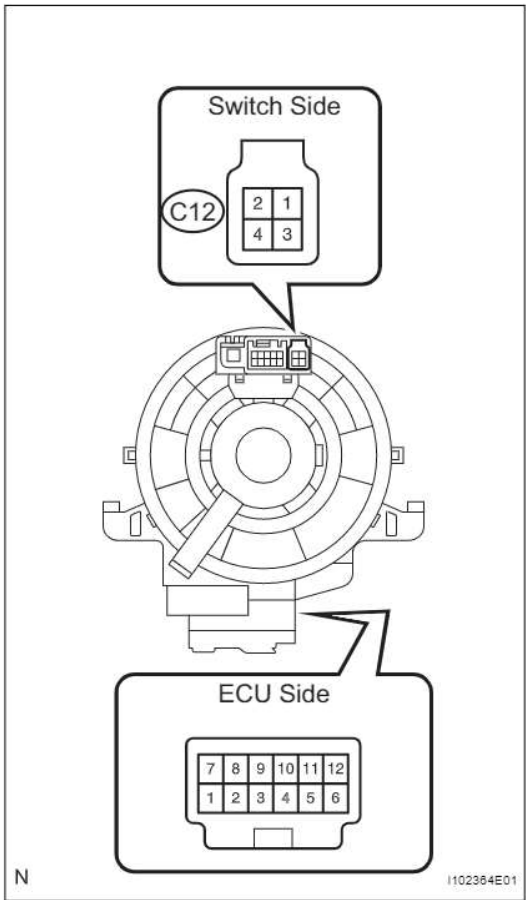
Standard resistance

Tester Connection	Specified Condition
A-3 - C12-1	Below 1 Ω
A-4 - C12-2	

NG

REPLACE SPIRAL CABLE SUB-ASSEMBLY

CC



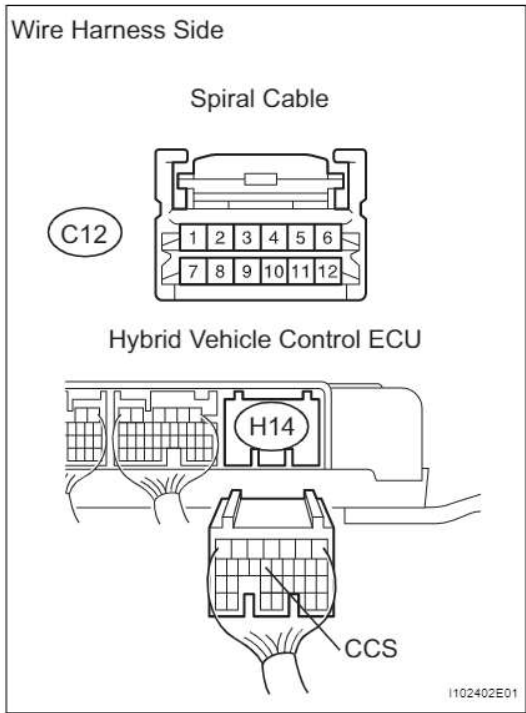
OK

CC-32

CRUISE CONTROL – CRUISE CONTROL SYSTEM

7

CHECK WIRE HARNESS (SPIRAL CABLE - ECU AND BODY GROUND)



- (a) Disconnect the C12 cable connector.
- (b) Disconnect the H14 ECU connector.
- (c) Measure the resistance of the wire harness side connectors.

Standard resistance

Tester Connection	Specified Condition
C12-1 - H14-13 (CCS)	Below 1 Ω
C12-2 - Body ground	

NG

REPAIR OR REPLACE HARNESS AND CONNECTOR

OK

PROCEED TO NEXT CIRCUIT INSPECTION SHOWN IN PROBLEM SYMPTOMS TABLE

CRUISE CONTROL – CRUISE CONTROL SYSTEM

CC-33

Cruise Main Indicator Light Circuit

DESCRIPTION

The hybrid vehicle control ECU outputs the cruise control operation status to the CRUISE main indicator light on the combination meter.

The CRUISE main indicator light circuit uses CAN and BEAN for communication. If there are any malfunctions in this circuit, check for DTCs in the CAN communication system and the multiplex communication system.

INSPECTION PROCEDURE

1 READ VALUE OF INTELLIGENT TESTER (CRUISE MAIN INDICATOR LIGHT)

CC

- (a) Check the DATA LIST for proper functioning of the CRUISE main indicator light.

Hybrid vehicle control ECU

Item	Measurement Item / Display (Range)	Normal Condition	Diagnostic Note
CCS INDICATOR M	Cruise indicator signal (Main CPU) / ON or OFF	ON: CRUISE main indicator is ON OFF: CRUISE main indicator is OFF	-
CCS INDICATOR S	Cruise indicator signal (Sub CPU) / ON or OFF	ON: CRUISE main indicator is ON OFF: CRUISE main indicator is OFF	-

OK:

Cruise control indicator light illuminates.

Result

Result	Proceed to
OK	A
NG (ON / OFF operates only on tester) (see page ME-11)	B
NG (ON / OFF does not operate only on tester)	C

B

GO TO METER / GAUGE SYSTEM

C

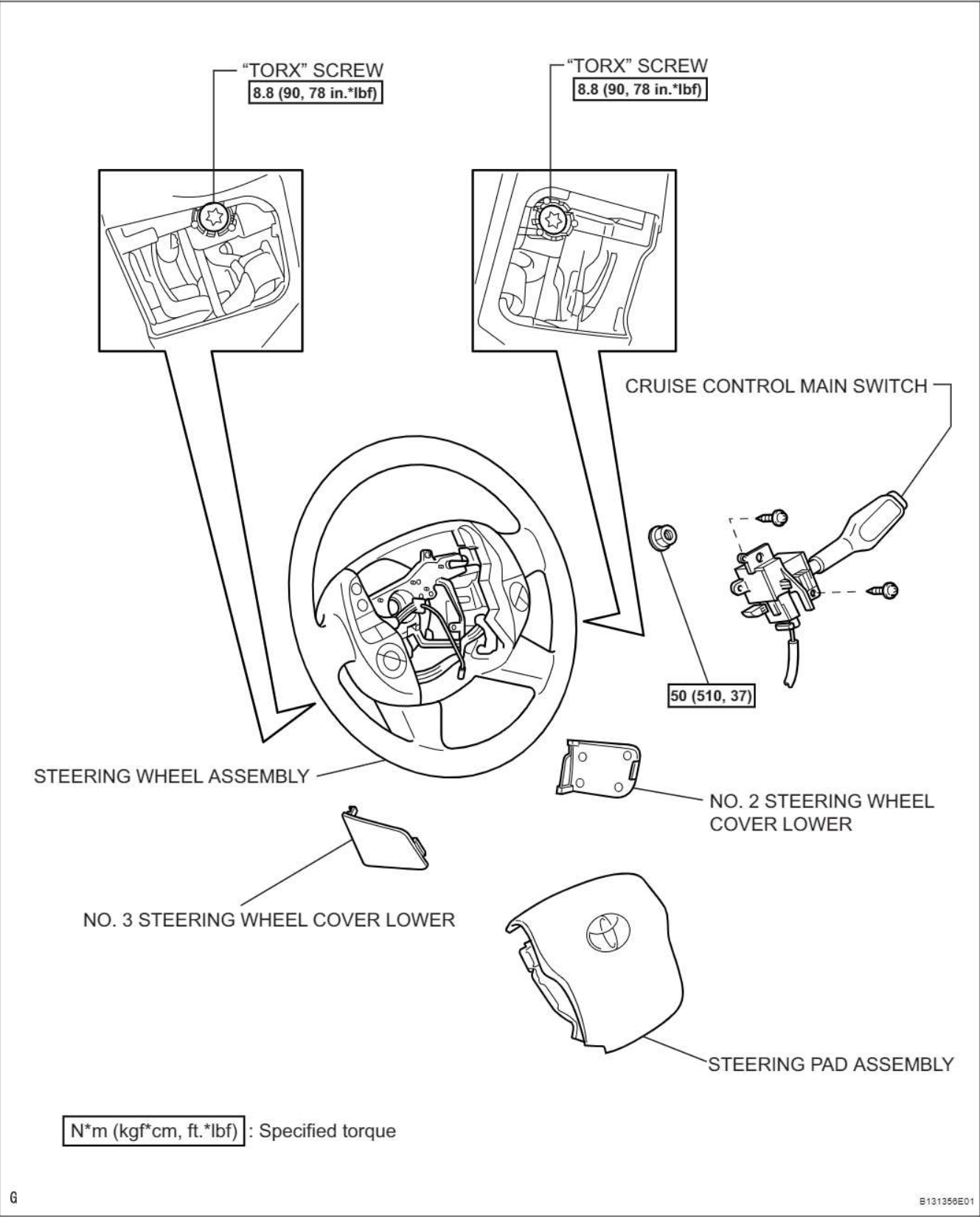
REPLACE HYBRID VEHICLE CONTROL ECU

A

PROCEED TO NEXT CIRCUIT INSPECTION SHOWN IN PROBLEM SYMPTOMS TABLE

CRUISE CONTROL MAIN SWITCH

COMPONENTS



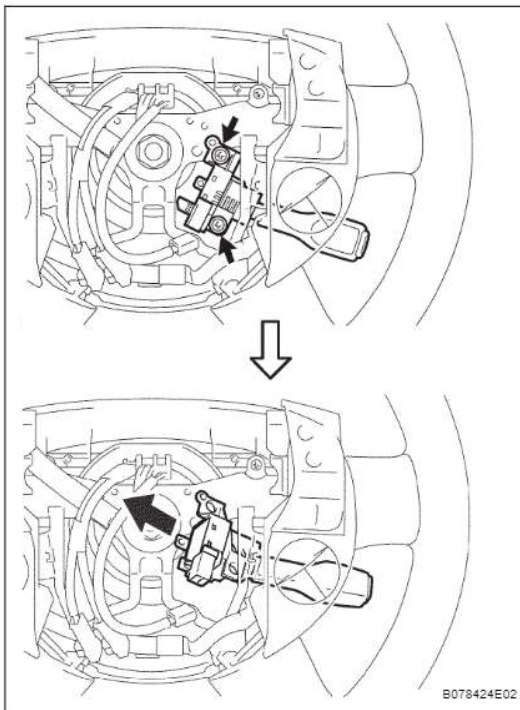
REMOVAL

1. DISCONNECT CABLE FROM NEGATIVE BATTERY TERMINAL

CAUTION:

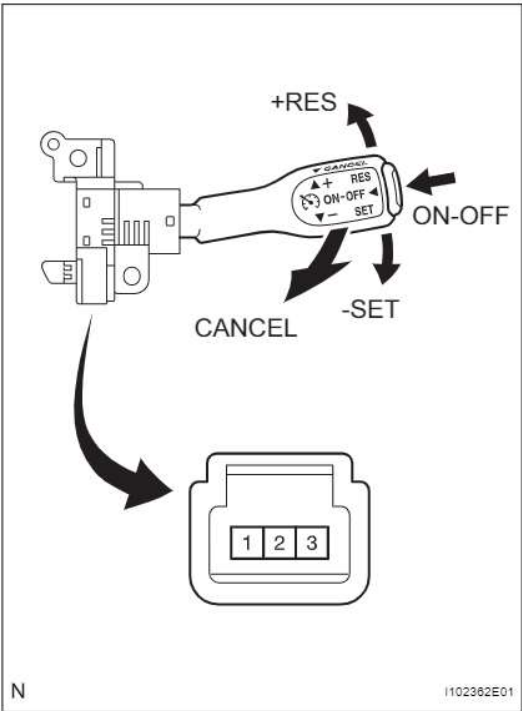
Wait at least 90 seconds after disconnecting the cable from the negative (-) battery terminal to prevent airbag and seat belt pretensioner activation.

2. REMOVE NO. 2 STEERING WHEEL COVER LOWER
3. REMOVE NO. 3 STEERING WHEEL COVER LOWER
4. REMOVE STEERING PAD ASSEMBLY (See page [RS-268](#))
5. REMOVE STEERING WHEEL ASSEMBLY (See page [SR-8](#))
6. REMOVE CRUISE CONTROL MAIN SWITCH
 - (a) Disconnect the connector.
 - (b) Remove the 2 screws and switch.

CC

CC-32

CRUISE CONTROL – CRUISE CONTROL MAIN SWITCH



INSPECTION

1. INSPECT CRUISE CONTROL MAIN SWITCH

(a) Measure the resistance of the switch.

Standard resistance

Tester Connection	Switch Condition	Specified Condition
1 - 3	+RES	210 to 270 Ω
	-SET	560 to 700 Ω
	CANCEL	1,380 to 1,700 Ω
	ON-OFF button is on	Below 1 Ω
	ON-OFF button is off	10 kΩ or higher

If the result is not as specified, replace the switch assembly.

INSTALLATION

1. INSTALL CRUISE CONTROL MAIN SWITCH

- (a) Install the switch with the 2 screws.
- (b) Connect the connector.

2. INSTALL STEERING WHEEL ASSEMBLY (See page [SR-15](#))

3. INSTALL STEERING PAD ASSEMBLY (See page [RS-269](#))

4. INSTALL NO. 2 STEERING WHEEL COVER LOWER

5. INSTALL NO. 3 STEERING WHEEL COVER LOWER

6. CONNECT CABLE TO NEGATIVE BATTERY TERMINAL

7. PERFORM INITIALIZATION

- (a) Perform initialization (see page [IN-32](#)).

NOTICE:

Certain systems need to be initialized after disconnecting and reconnecting the cable from the negative (-) battery terminal.

8. CHECK SRS WARNING LIGHT

- (a) Check the SRS warning light (see page [RS-31](#)).

CC