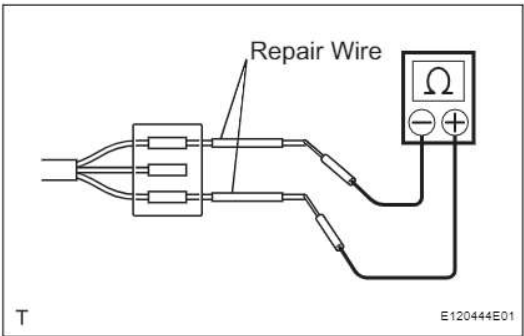
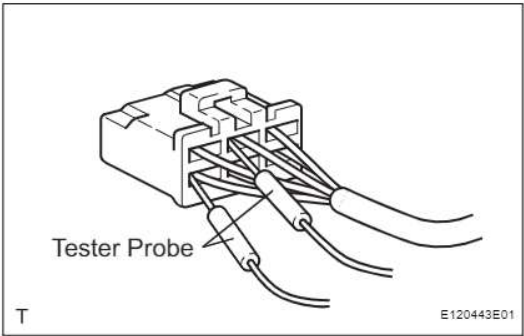


CAN COMMUNICATION SYSTEM

PRECAUTION

1. STEERING SYSTEM HANDLING PRECAUTIONS
- (a) Care must be taken when replacing parts. Incorrect replacement could affect the performance of the steering system and result in a driving hazard.
2. SRS AIRBAG SYSTEM HANDLING PRECAUTIONS
- (a) The vehicle is equipped with an SRS (Supplemental Restraint System) such as the driver's airbag and front passenger airbag. Failure to carry out service operations in correct sequence could cause unexpected SRS deployment during servicing and may lead to a serious accident. Before servicing (including installation/removal, inspection and replacement of parts), be sure to read the precautionary notice for the supplemental restraint system (see page RS-1).
3. CONNECTOR HANDLING
- (a) When inserting tester probes into a connector, insert them from the rear of the connector.



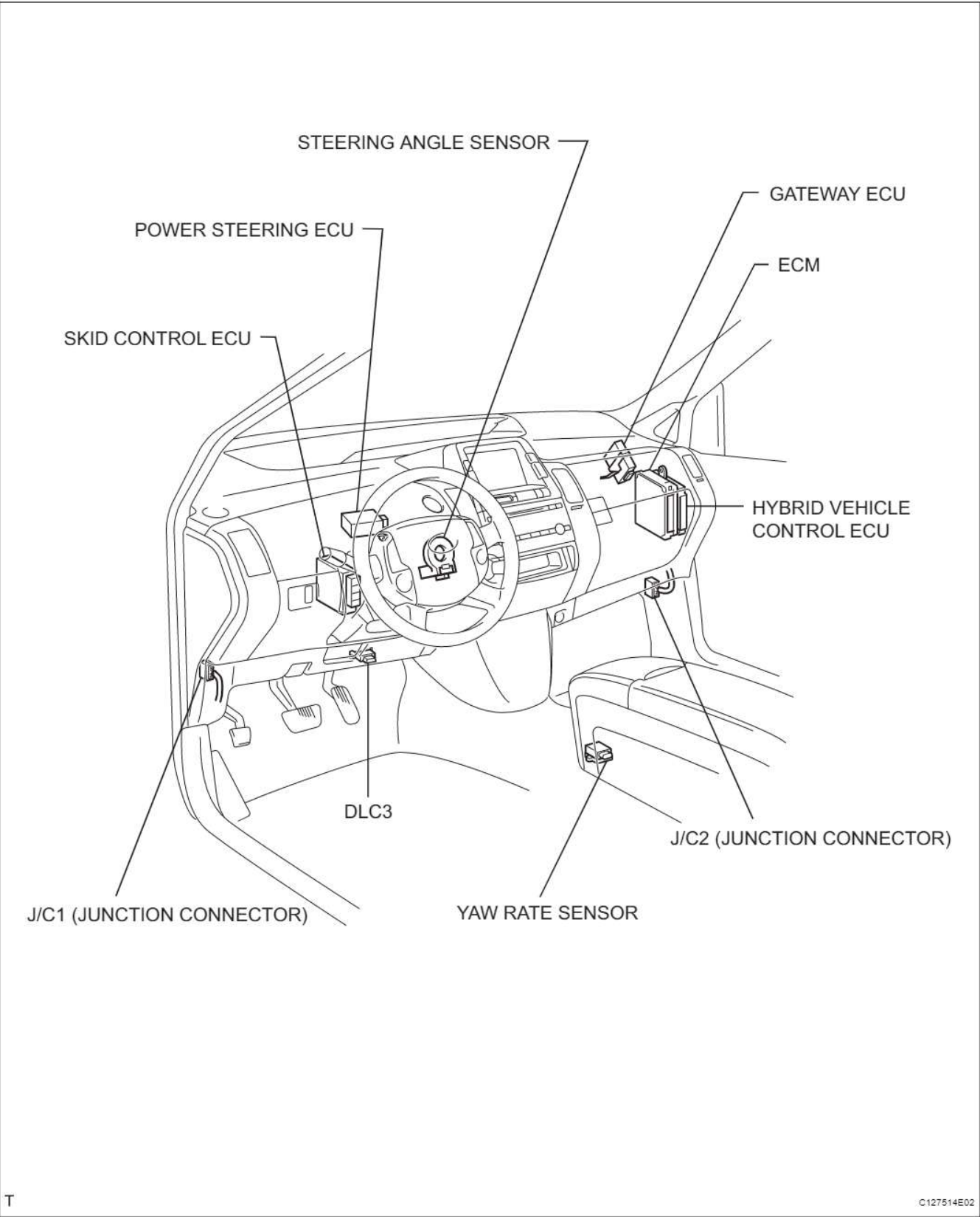
- (b) Use a repair wire to check the connector if it is impossible to check continuity from the rear of the connector.
4. PRECAUTION FOR DISCONNECTING THE BATTERY CABLE
- NOTICE:
- When disconnecting the negative (-) battery terminal, initialize the following system after the terminal is reconnected.

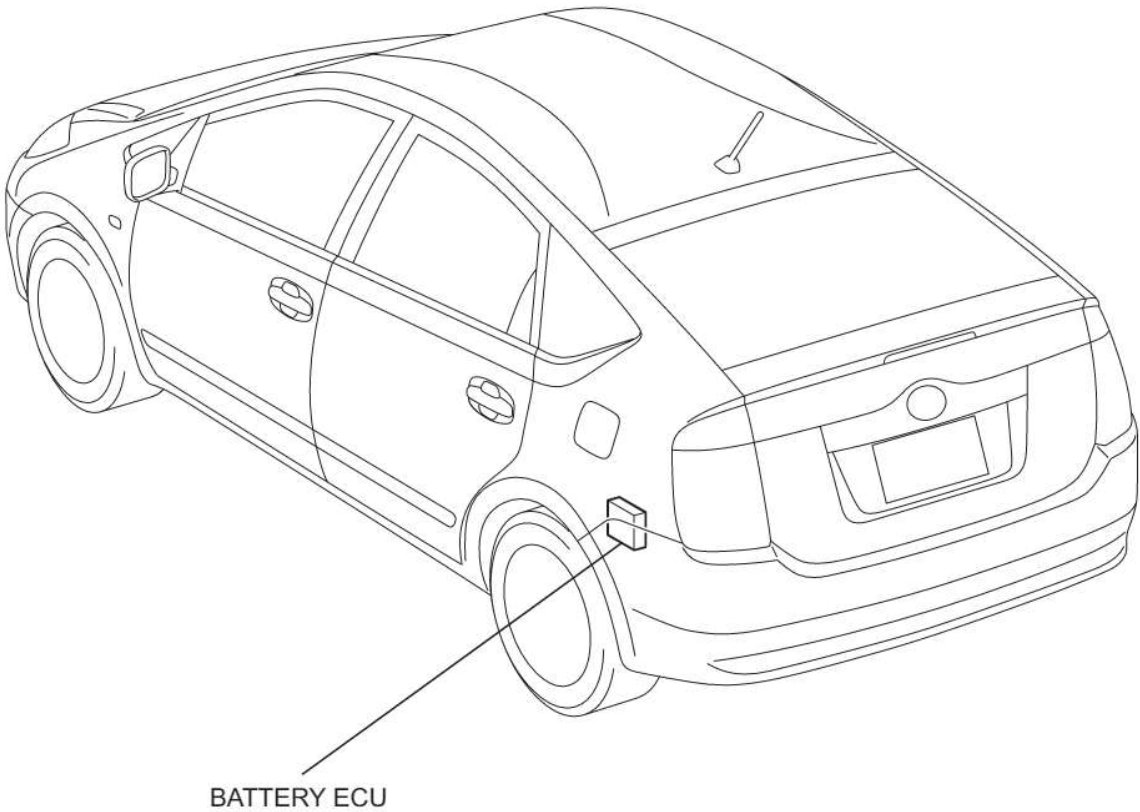
System Name	See procedure
Power Window Control System	IN-32

CA-2

CAN COMMUNICATION – CAN COMMUNICATION SYSTEM

PARTS LOCATION





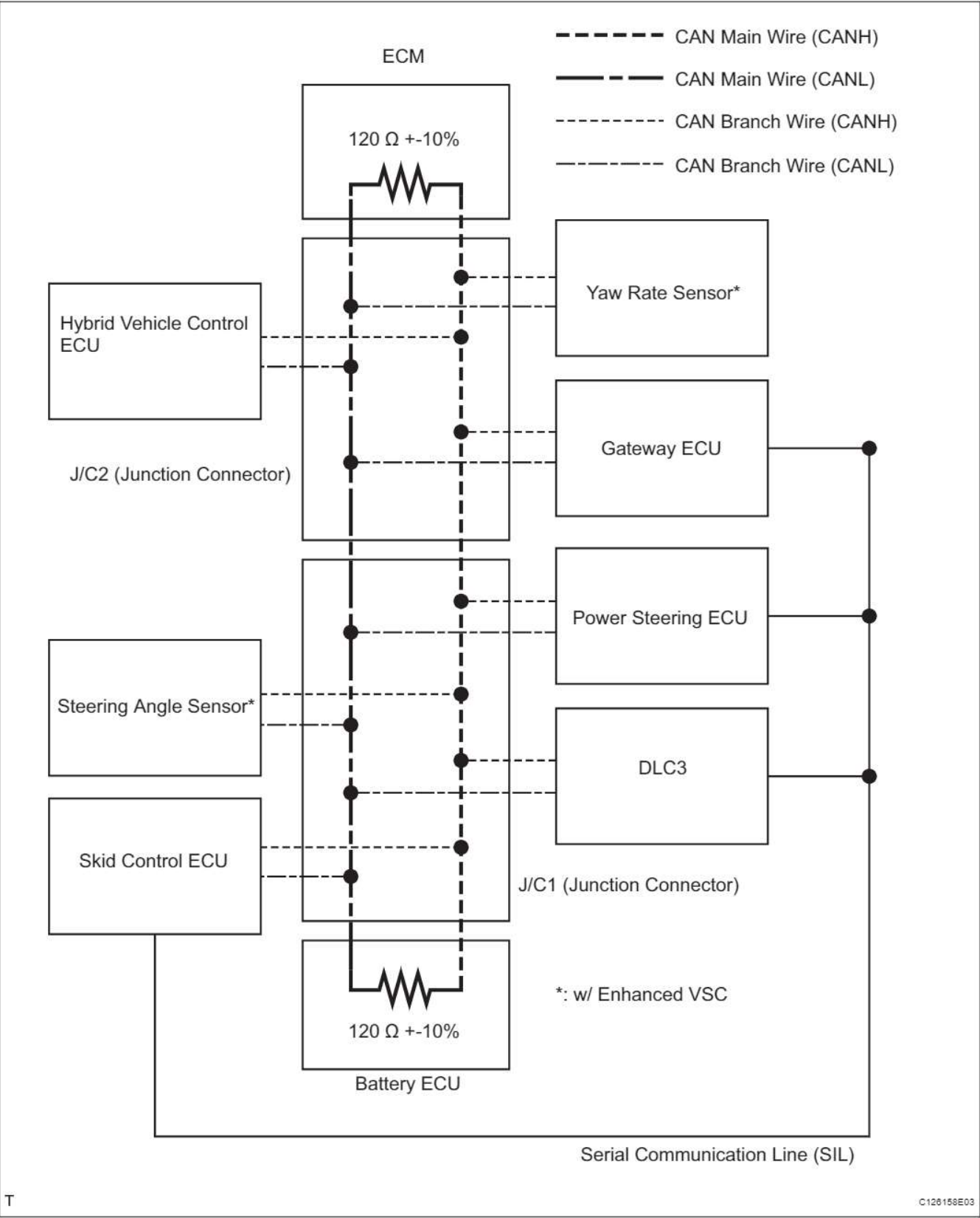
T

C127513E03

CA-4

CAN COMMUNICATION – CAN COMMUNICATION SYSTEM

SYSTEM DIAGRAM



CAN COMMUNICATION – CAN COMMUNICATION SYSTEM**CA-5****HINT:**

- The skid control ECU detects and stores steering sensor and yaw rate sensor DTCs and performs DTC communication by receiving information from the steering sensor and yaw rate sensor.
- The ECM, hybrid vehicle control ECU, and battery ECU use the CAN communication system to perform DTC communication instead of the conventional communication line (SIL).

CA

CA-6

CAN COMMUNICATION – CAN COMMUNICATION SYSTEM

SYSTEM DESCRIPTION**1. BRIEF DESCRIPTION**

- (a) The CAN (Controller Area Network) is a serial data communication system for real time application. It is a multiplex communication system equipped for a vehicle and has a high communication speed (500 kbps) and a function to detect malfunctions.
- (b) By pairing the CANH and CANL bus lines, the CAN performs communication based on differential voltage.
- (c) The many ECUs (sensors) installed on the vehicle operate by sharing information and communicating with each other.
- (d) The CAN has 2 resistors of 120 Ω which are necessary to communicate with the main wire.

2. DEFINITION OF TERMS

- (a) Main wire
 - (1) The main wire is the wire harness between the 2 terminus circuits on the bus (communication line). This is the main bus in the CAN communication system.
- (b) Branch wire
 - (1) The branch wire is the wire harness which diverges from the main wire to the ECU or sensor.
- (c) Terminus circuit
 - (1) The terminus circuit is a circuit which is placed to convert communication current of the CAN communication into bus voltage. It consists of a resistor and condenser. 2 terminus circuits are necessary on a bus.

3. ECUS OR SENSORS WHICH COMMUNICATE THROUGH CAN COMMUNICATION SYSTEM

- (a) Hybrid Vehicle Control ECU
- (b) Battery ECU
- (c) ECM
- (d) Skid Control ECU
- (e) Steering Angle Sensor
- (f) Yaw Rate Sensor
- (g) Power Steering ECU
- (h) Gateway ECU

4. DIAGNOSTIC CODE FOR CAN COMMUNICATION SYSTEM

- (a) DTCs for the CAN communication system are as follows: U0123, U0124, U0126, U0293, U0100, U0073, U0111, U0129, U0131, U0146, P3108-594

NOTICE:

If U0146 or P3108-594 is output, the multiplex communication system may be malfunctioning.

5. REMARKS FOR TROUBLESHOOTING

- (a) Trouble in the CAN bus (communication line) can be checked from the DLC3 (except when there is a wire break other than in the branch wire of the DLC3).

NOTICE:

Do not insert the tester directly into the DLC3 connector. Be sure to use a service wire.

- (b) DTCs regarding the CAN communication system can be checked using the intelligent tester via the CAN VIM.
- (c) The CAN communication system cannot detect trouble in the branch wire of the DLC3 even though the DLC3 is also connected to the CAN communication system.

CA-8

CAN COMMUNICATION – CAN COMMUNICATION SYSTEM

HOW TO PROCEED WITH TROUBLESHOOTING

NOTICE:

- Refer to the troubleshooting procedures of each system if DTCs regarding the CAN communication system are not output.
- If U0100-211 or U0111-208 is output separately by the hybrid vehicle control ECU, refer to "HYBRID CONTROL SYSTEM" (see page [HV-515](#)).

HINT:

*: Use the intelligent tester (with CAN VIM).

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 CAN BUS LINE

(a) Check the CAN bus line (see page [CA-38](#)).

NEXT

4 CHECK FOR INSTALLED SYSTEMS (ECU & SENSOR) THAT USE CAN COMMUNICATION

(a) Check if the enhanced VSC is installed (see page [CA-16](#)).

NEXT

5 CHECK AND CLEAR DTC*

NEXT

6 PERFORM BUS CHECK WITH INTELLIGENT TESTER

(a) Select the "BUS CHECK" (see page [CA-16](#)).

Result

Result	Proceed to
All ECUs and sensors connected to the CAN communication system are displayed.	A

CA

CAN COMMUNICATION – CAN COMMUNICATION SYSTEM

CA-9

Result	Proceed to
An ECU or sensor not connected to the CAN communication system is displayed.	B

- NOTICE:**
- See "MULTIPLEX COMMUNICATION SYSTEM" (page [MP-7](#)) if U0146 (Lost Communication with Gateway "A") and P3108-594 (Lost Communication with A/C System Control Module) are output and "BODY / GATEWAY" appears on the "BUS CHECK" screen of the intelligent tester via the CAN VIM.
 - The systems (ECUs, sensors) that use CAN communication vary depending on the vehicle and option settings. Check which systems (ECUs, sensors) are installed on the vehicle (see page [CA-16](#)).
 - Non-installed ECUs or sensors are not displayed. Do not mistake them for being in the communication stop mode.

B

GO TO PROBLEM SYMPTOMS TABLE
(COMMUNICATION STOP MODE TABLE)

A

7

DTC COMBINATION TABLE

- (a) Confirm the trouble according to the combination of output DTCs regarding the CAN communication system.
HINT:
Previous CAN communication system DTCs may be the cause if CAN communication system DTCs are output and all ECUs and sensors connected to the CAN communication system are displayed on the intelligent tester's "BUS CHECK" screen via the CAN VIM.
- (b) Check DTC combination table (see page [CA-8](#)).

NEXT

8

CIRCUIT INSPECTION

NEXT

9

IDENTIFICATION OF PROBLEM

NEXT

CA-10

CAN COMMUNICATION – CAN COMMUNICATION SYSTEM

10	REPAIR OR REPLACE
----	-------------------

NEXT

11	CONFIRMATION TEST
----	-------------------

NEXT

END

CAN COMMUNICATION – CAN COMMUNICATION SYSTEM

CA-11

PROBLEM SYMPTOMS TABLE

Result list of how to proceed with troubleshooting

Symptom	Suspected area	See page
Open in CAN Main Wire	CHECK CAN MAIN WIRE DISCONNECTION	CA-41
Short in CAN Bus Line	CHECK CAN BUS LINE FOR SHORT CIRCUIT	CA-47
Short to B+ CAN Bus Line	CHECK CAN BUS LINE FOR SHORT TO B+	CA-59
Short to GND in CAN Bus Line	CHECK CAN BUS LINE FOR SHORT TO GND	CA-70

Communication stop mode table

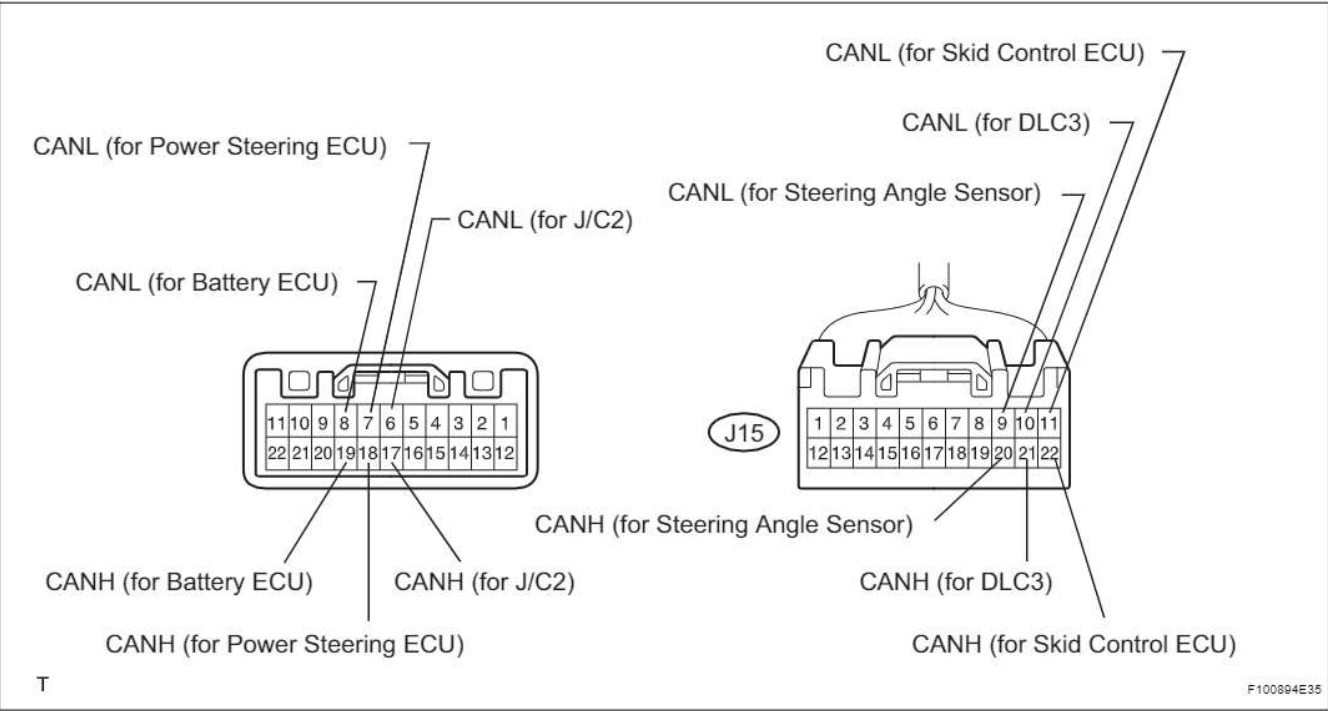
Symptom	Suspected area	See page
HYBRID CONTROL is not displayed on intelligent tester via CAN VIM.	HYBRID VEHICLE CONTROL ECU COMMUNICATION STOP MODE	CA-21
ABS / VSC / TRAC is not displayed on intelligent tester via CAN VIM.	SKID CONTROL ECU COMMUNICATION STOP MODE	CA-23
STEERING SENSOR is not displayed on intelligent tester via CAN VIM.	STEERING ANGLE SENSOR COMMUNICATION STOP MODE	CA-30
YAW / DECELERAT is not displayed on intelligent tester via CAN VIM.	YAW RATE SENSOR COMMUNICATION STOP MODE	CA-32
EPS is not displayed on intelligent tester via CAN VIM.	POWER STEERING ECU COMMUNICATION STOP MODE	CA-26
BODY / GATEWAY is not displayed on intelligent tester via CAN VIM.	GATEWAY ECU COMMUNICATION STOP MODE	CA-28
ENGINE is not displayed on intelligent tester via CAN VIM.	ECM ECU COMMUNICATION STOP MODE	CA-34
HV BATTERY is not displayed on intelligent tester via CAN VIM.	BATTERY ECU COMMUNICATION STOP MODE	CA-36

CA

TERMINALS OF ECU

HINT:
This section describes the standard CAN values for all CAN related components.

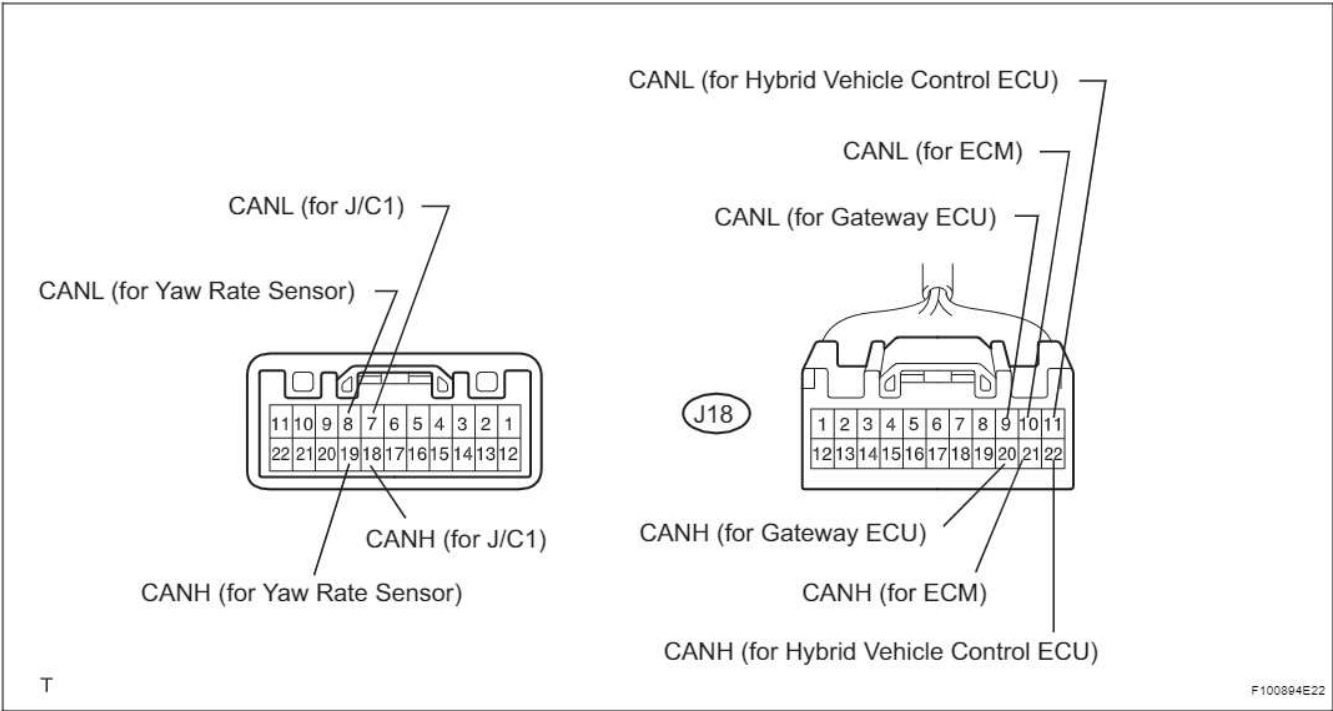
1. JUNCTION CONNECTOR (J/C1)



(a) Terminal arrangement and connection.

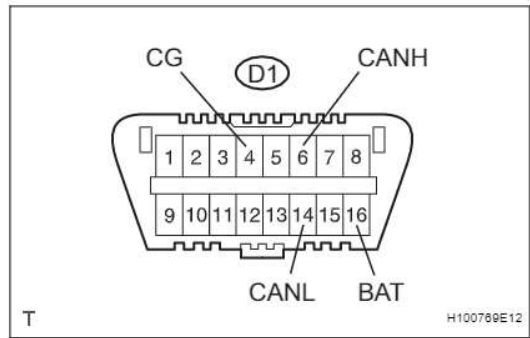
Symbols (Terminal No.)	Connects to
CANL (J15-6)	J/C2
CANH (J15-17)	J/C2
CANL (J15-7)	Power Steering ECU
CANH (J15-18)	Power Steering ECU
CANL (J15-8)	Battery ECU
CANH (J15-19)	Battery ECU
CANL (J15-9)	Steering Angle Sensor
CANH (J15-20)	Steering Angle Sensor
CANL (J15-10)	DLC3
CANH (J15-21)	DLC3
CANL (J15-11)	Skid Control ECU
CANH (J15-22)	Skid Control ECU

2. JUNCTION CONNECTOR (J/C2)



(a) Terminal arrangement and connection

Symbols (Terminal No.)	Connects to
CANL (J18-7)	J/C1
CANH (J18-18)	J/C1
CANL (J18-8)	Yaw Rate Sensor
CANH (J18-19)	Yaw Rate Sensor
CANL (J18-9)	Gateway ECU
CANH (J18-20)	Gateway ECU
CANL (J18-10)	ECM
CANH (J18-21)	ECM
CANL (J18-11)	Hybrid Vehicle Control ECU
CANH (J18-22)	Hybrid Vehicle Control ECU

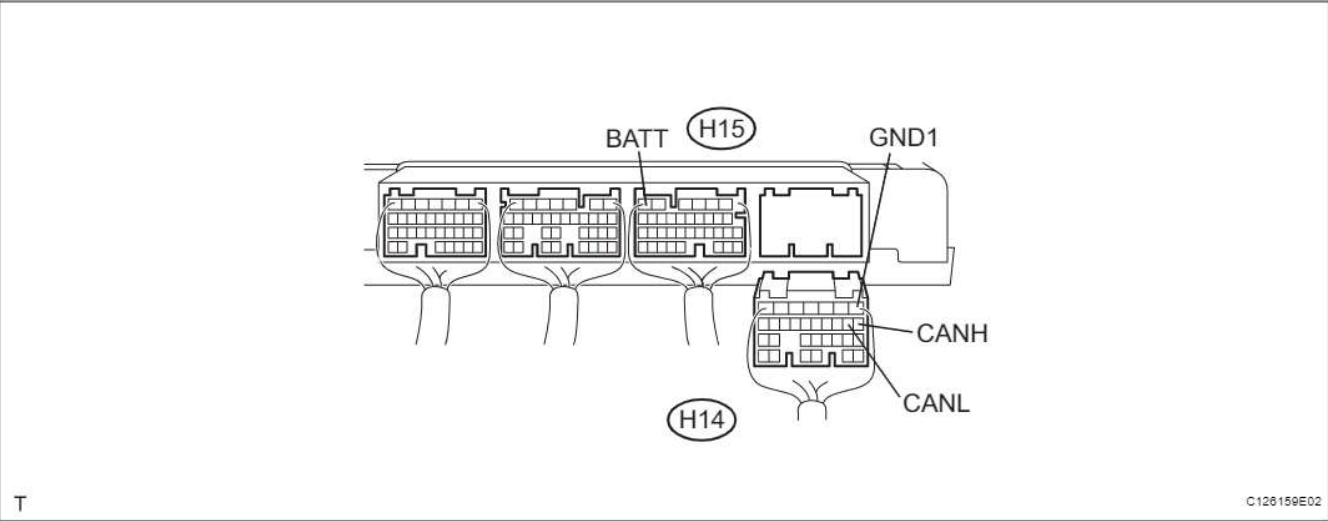


3. CHECK DLC3

(a) Measure the resistance of the connector.

Symbols (Terminal No.)	Wiring Color	Condition	Specified Condition
CANH (D1-6) - CANL (D1-4)	B - W	Power switch OFF	54 to 69 Ω
CANH (D1-6) - CG (D1-4)	B - W-B	Power switch OFF	1 kΩ or more
CANL (D1-14) - CG (D1-4)	W - W-B	Power switch OFF	1 kΩ or more
CANH (D1-6) - BAT (D1-16)	B - G	Power switch OFF	1 MΩ or more
CANL (D1-14) - BAT (D1-16)	W - G	Power switch OFF	1 MΩ or more

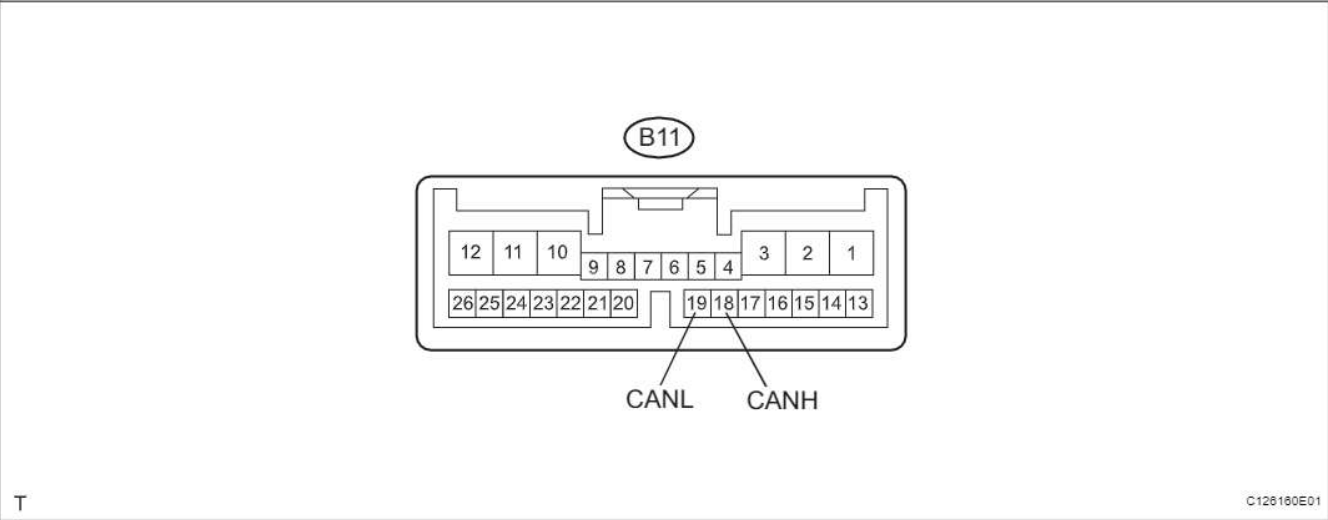
4. CHECK HYBRID VEHICLE CONTROL ECU



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

Symbols (Terminal No.)	Wiring Color	Condition	Specified Condition
CANH (H14-8) - CANL (H10-9)	B - W	Power switch OFF	54 to 69 Ω
CANH (H14-8) - GND1 (H10-1)	B - W-B	Power switch OFF	1 kΩ or more
CANL (H14-9) - GND1 (H10-1)	W - W-B	Power switch OFF	1 kΩ or more
CANH (H14-8) - BATT (H15-6)	B - Y	Power switch OFF	1 MΩ or more
CANL (H14-9) - BATT (H15-6)	W - Y	Power switch OFF	1 MΩ or more

5. CHECK BATTERY ECU



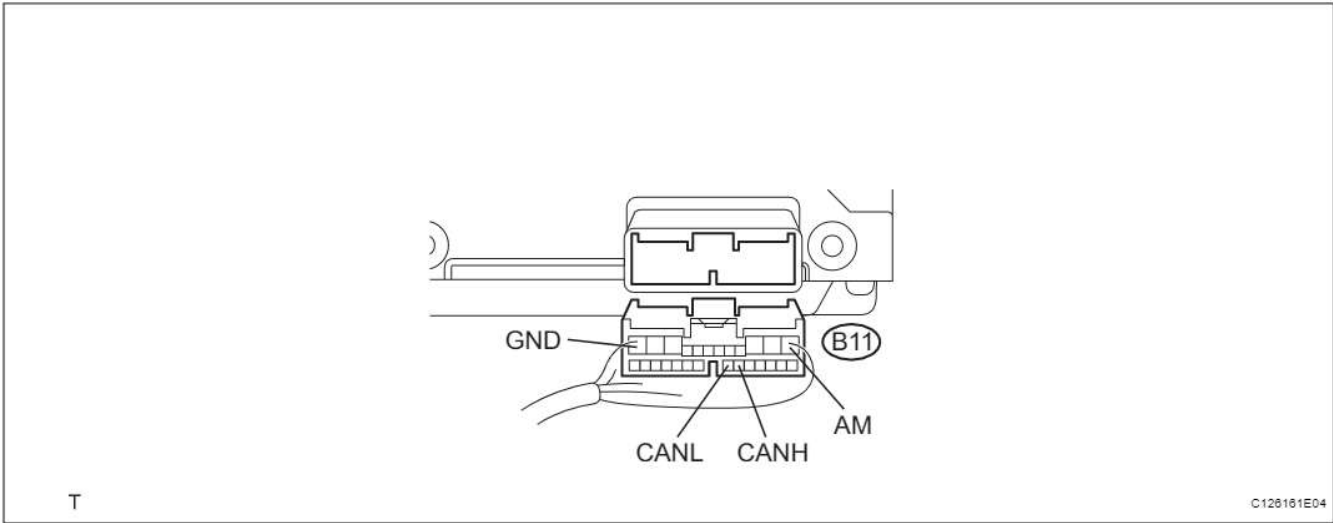
- (a) Measure the resistance of the connector.

Symbols (Terminal No.)	Condition	Specified Condition
CANH (B11-18) - CANL (B11-19)	Power switch OFF	108 to 132 Ω

CAN COMMUNICATION – CAN COMMUNICATION SYSTEM

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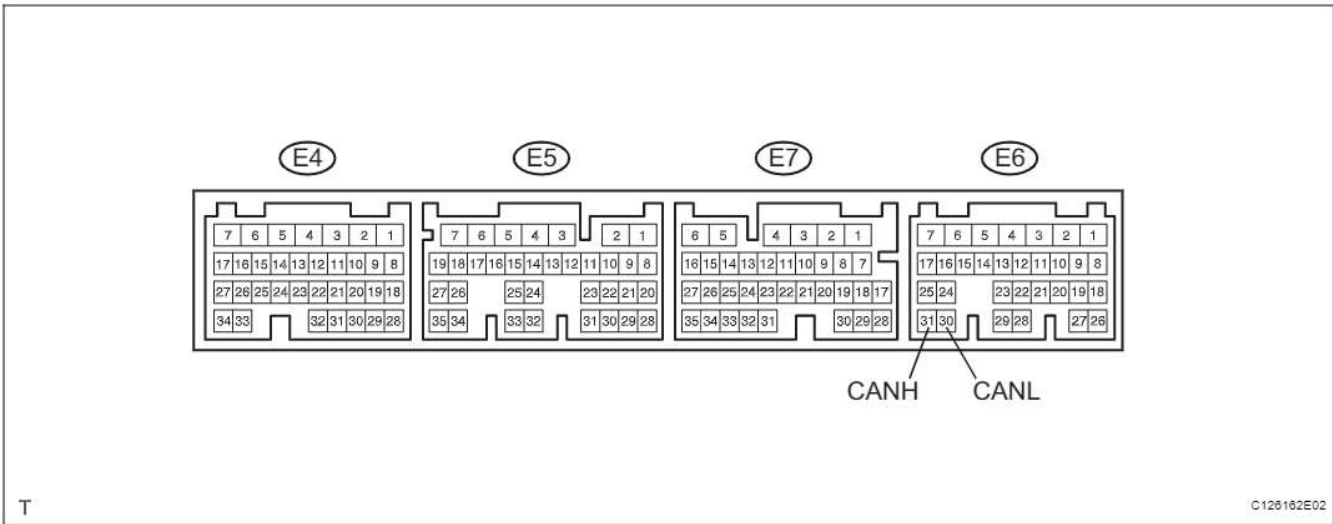
(b) Disconnect the B11 ECU connector.



(c) Measure the resistance of the wire harness side connector.

Symbols (Terminal No.)	Wiring Color	Condition	Specified Condition
CANH (B11-18) - CANL (B11-19)	B - W	Power switch OFF	108 to 132 Ω
CANH (B11-18) - GND (B11-12)	B - W-B	Power switch OFF	1 kΩ or more
CANL (B11-19) - GND (B11-12)	W - W-B	Power switch OFF	1 kΩ or more
CANH (B11-18) - AM (B11-1)	B - G	Power switch OFF	1 MΩ or more
CANL (B11-19) - AM (B11-1)	W - G	Power switch OFF	1 MΩ or more

6. CHECK ECM



(a) Measure the resistance of the connector.

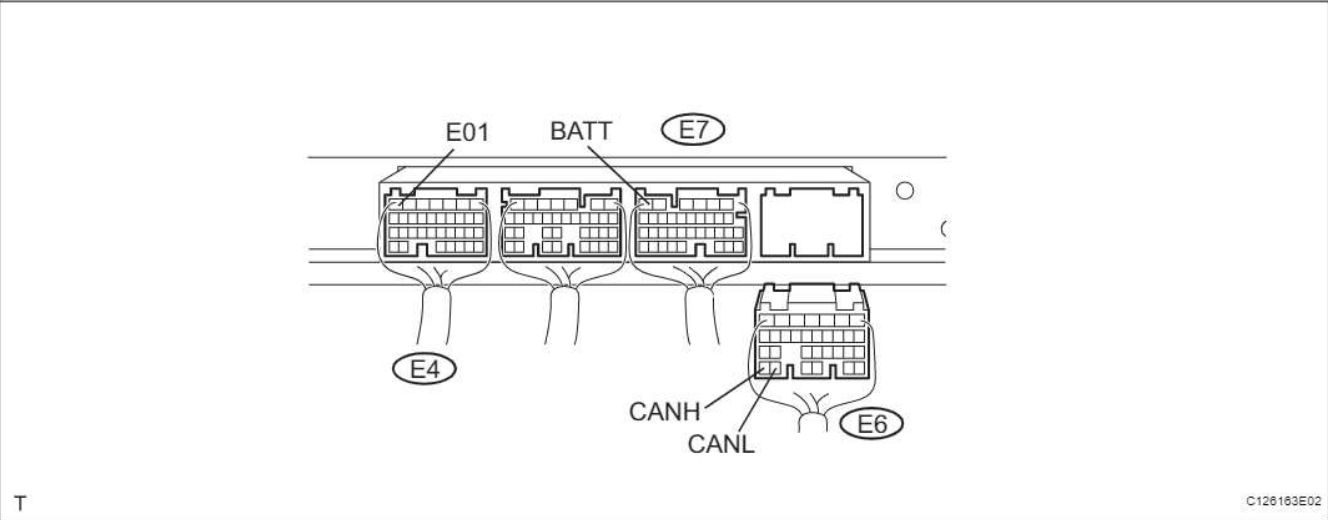
Symbols (Terminal No.)	Condition	Specified Condition
CANH (E6-31) - CANL (E6-30)	Power switch OFF	108 to 132 Ω

(b) Disconnect the E6 ECM connector.

CA-16

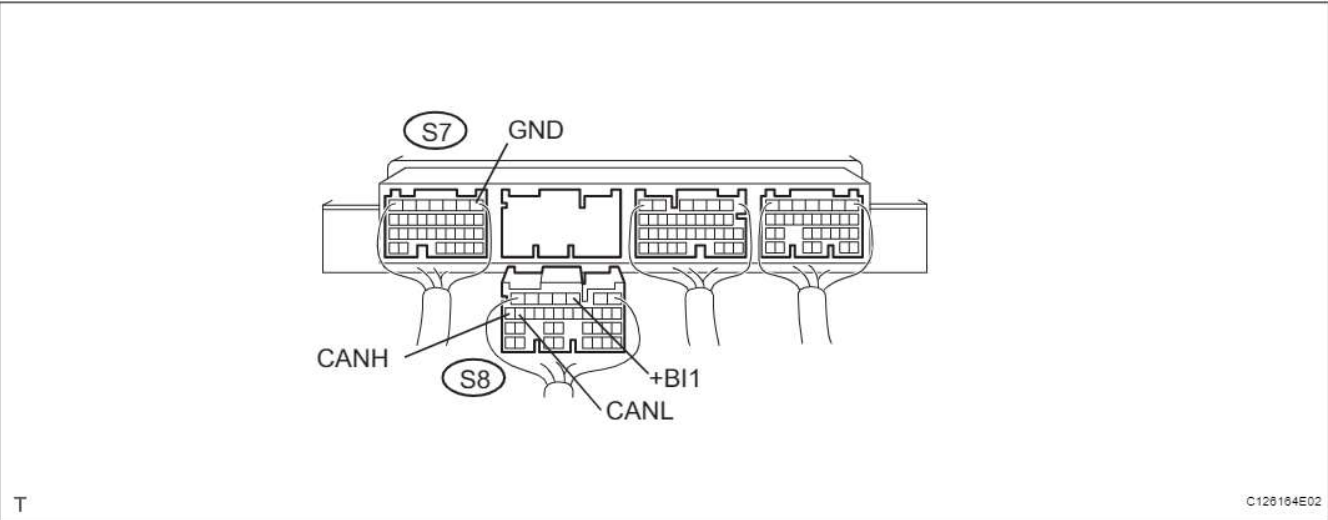
CAN COMMUNICATION – CAN COMMUNICATION SYSTEM

- (c) Measure the resistance of the wire harness side connectors.



Symbols (Terminal No.)	Wiring Color	Condition	Specified Condition
CANH (E6-31) - CANL (E6-30)	B - W	Power switch OFF	108 to 132 Ω
CANH (E6-31) - E01 (E4-7)	B - BR	Power switch OFF	1 kΩ or more
CANL (E6-30) - E01 (E4-7)	W - BR	Power switch OFF	1 kΩ or more
CANH (E6-31) - BATT (E7-6)	B - R	Power switch OFF	1 MΩ or more
CANL (E6-30) - BATT (E7-6)	W - R	Power switch OFF	1 MΩ or more

7. CHECK SKID CONTROL ECU

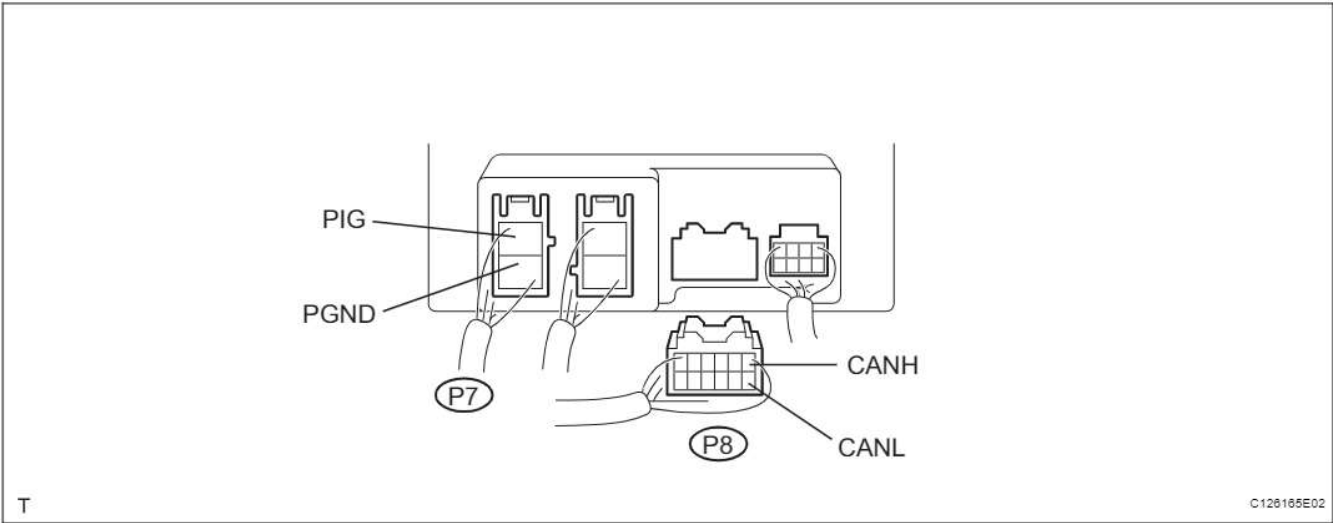


- (a) Disconnect the S8 ECU connector.
(b) Measure the resistance of the wire harness side connectors.

CA

Symbols (Terminal No.)	Wiring Color	Condition	Specified Condition
CANH (S8-19) - CANL (S8-18)	B - W	Power switch OFF	54 to 69 Ω
CANH (S8-19) - GND (S7-1)	B - W	Power switch OFF	1 kΩ or more
CANL (S8-18) - GND (S7-1)	W - W	Power switch OFF	1 kΩ or more
CANH (S8-19) - +BI1 (S8-3)	B - B	Power switch OFF	1 MΩ or more
CANL (S8-18) - +BI1 (S8-3)	W - B	Power switch OFF	1 MΩ or more

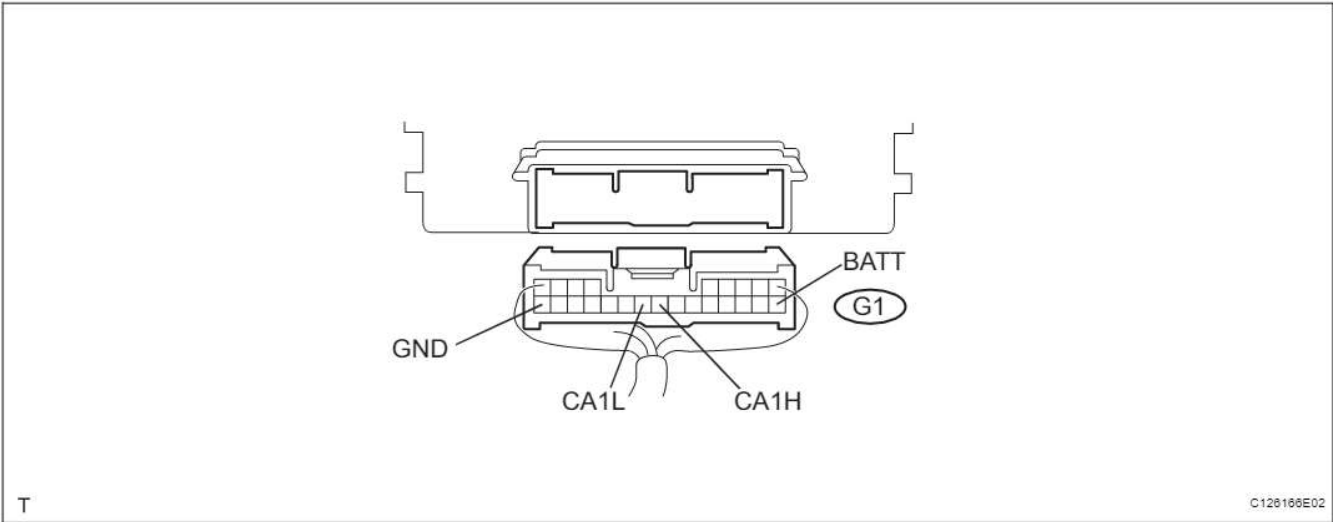
8. CHECK POWER STEERING ECU



- (a) Disconnect the P8 ECU connector.
- (b) Measure the resistance of the wire harness side connectors.

Symbols (Terminal No.)	Wiring Color	Condition	Specified Condition
CANH (P8-1) - CANL (P8-7)	B - W	Power switch OFF	54 to 69 Ω
CANH (P8-1) - PGND (P7-2)	B - W-B	Power switch OFF	1 kΩ or more
CANL (P8-7) - PGND (P7-2)	W - W-B	Power switch OFF	1 kΩ or more
CANH (P8-1) - PIG (P7-1)	B - W	Power switch OFF	1 MΩ or more
CANL (P8-7) - PIG (P7-1)	W - W	Power switch OFF	1 MΩ or more

9. CHECK GATEWAY ECU



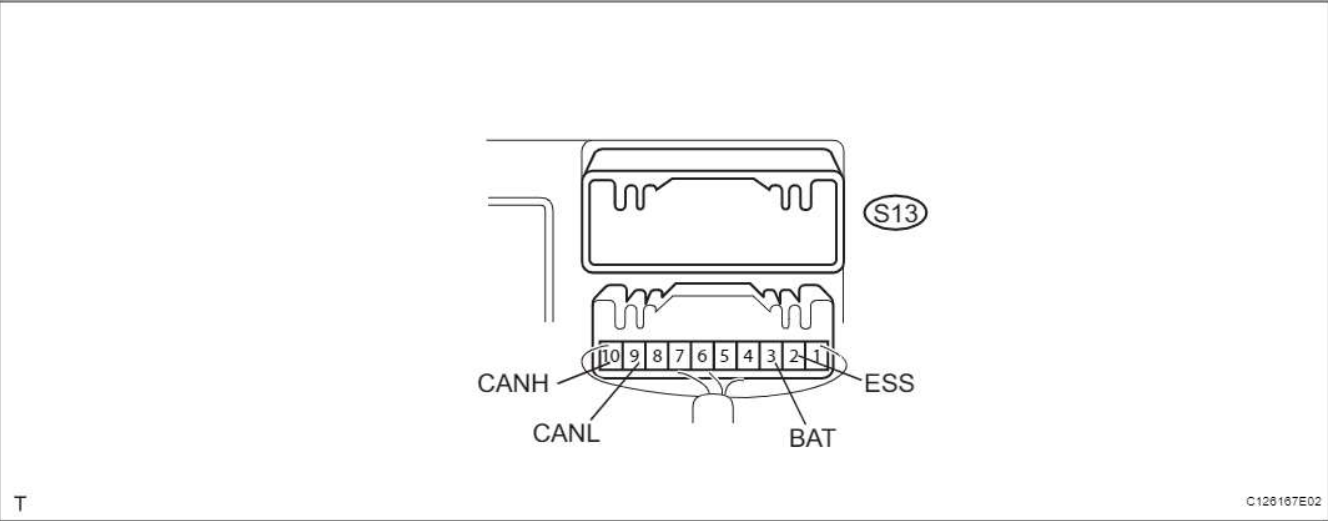
- (a) Disconnect the G1 ECU connector.
- (b) Measure the resistance of the wire harness side connector.

Symbols (Terminal No.)	Wiring Color	Condition	Specified Condition
CA1H (G1-17) - CA1L (G1-18)	B - W	Power switch OFF	54 to 69 Ω
CA1H (G1-17) - GND (G1-24)	B - W-B	Power switch OFF	1 kΩ or more
CA1L (G1-18) - GND (G1-24)	W - W-B	Power switch OFF	1 kΩ or more
CA1H (G1-17) - BATT (G1-10)	B - Y	Power switch OFF	1 MΩ or more
CA1L (G1-18) - BATT (G1-10)	W - Y	Power switch OFF	1 MΩ or more

CA-18

CAN COMMUNICATION – CAN COMMUNICATION SYSTEM

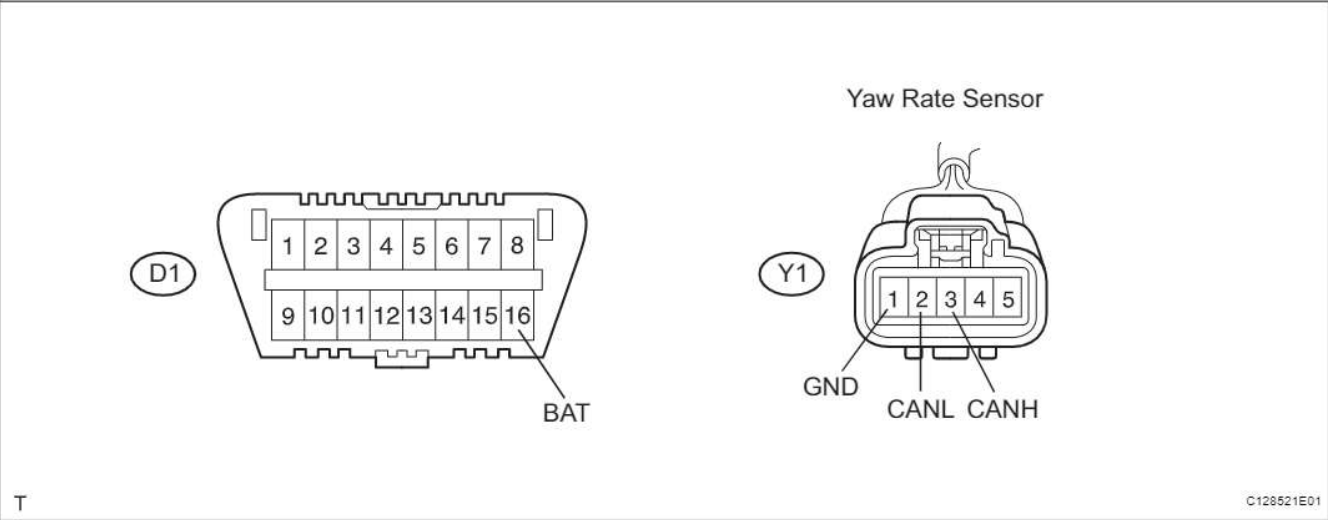
10. CHECK STEERING ANGLE SENSOR



- (a) Disconnect the S13 sensor connector.
- (b) Measure the resistance of the wire harness side connector.

Symbols (Terminal No.)	Wiring Color	Condition	Specified Condition
CANH (S13-10) - CANL (S13-9)	B - W	Power switch OFF	54 to 69 Ω
CANH (S13-10) - ESS (S13-2)	B - W-B	Power switch OFF	1 kΩ or more
CANL (S13-9) - ESS (S13-2)	W - W-B	Power switch OFF	1 kΩ or more
CANH (S13-10) - BAT (S13-3)	B - R	Power switch OFF	1 MΩ or more
CANL (S13-9) - BAT (S13-3)	W - R	Power switch OFF	1 MΩ or more

11. CHECK YAW RATE SENSOR



- (a) Disconnect the Y1 sensor connector.
- (b) Measure the resistance of the wire harness side connector.

Symbols (Terminal No.)	Wiring Color	Condition	Specified Condition
CANH (Y1-3) - CANL (Y1-2)	B - W	Power switch OFF	54 to 69 Ω
CANH (Y1-3) - GND (Y1-1)	B - W-B	Power switch OFF	1 kΩ or more
CANL (Y1-2) - GND (Y1-1)	W - W-B	Power switch OFF	1 kΩ or more
CANH (Y1-3) - BAT (D1-16)	B - G	Power switch OFF	1 MΩ or more
CANL (Y1-2) - BAT (D1-16)	W - G	Power switch OFF	1 MΩ or more

DIAGNOSIS SYSTEM

1. BUS CHECK

HINT:

The ECUs and sensors that are properly connected to the CAN communication system can be displayed using the intelligent tester via the CAN VIM.

(a) Select "BUS CHECK" from the "OBD / MOBD MENU" screen.

(b) Press "ENTER" on the intelligent tester via the CAN VIM.

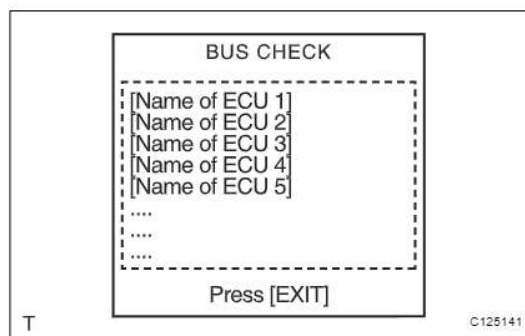
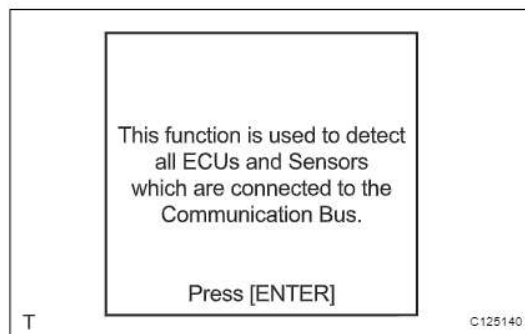
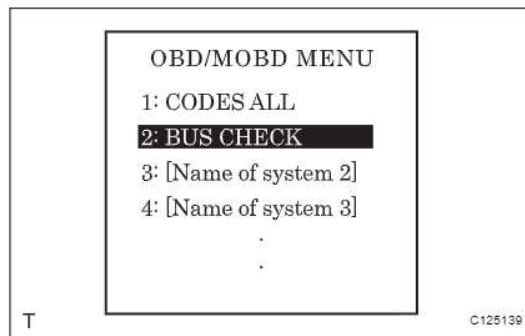
(c) The screen displays the ECUs and sensors that are properly connected to the CAN communication system.

HINT:

There is a communication stop in the system of any properly connected ECUs or sensors that are not displayed (see page CA-8).

2. CHECK FOR INSTALLED SYSTEMS (ECU & SENSOR) THAT USE CAN COMMUNICATION

(a) The systems (ECU, sensor) that use CAN communication vary depending on the vehicle's optional settings. Check which systems (ECU, sensor) are installed on the vehicle.



ECU / Sensor name	Installed to
Hybrid Vehicle Control ECU	All vehicles
Battery ECU	All vehicles
ECM	All vehicles
Skid Control ECU	All vehicles
Power Steering ECU	All vehicles
Gateway ECU	All vehicles
Steering Angle Sensor	Vehicle with enhanced VSC (VSC warning light is installed in combination meter)
Yaw Rate Sensor	Vehicle with enhanced VSC (VSC warning light is installed in combination meter)

HINT:

If enhanced VSC is not installed, neither the yaw rate sensor nor the steering angle sensor is used.

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CAN COMMUNICATION – CAN COMMUNICATION SYSTEM

3. DTC TABLE BY ECU

HINT:

If CAN communication system DTCs are output, trouble cannot be determined only by the DTCs. Perform troubleshooting according to "HOW TO PROCEED WITH TROUBLESHOOTING" (see page CA-6).

(a) HYBRID VEHICLE CONTROL ECU

HINT:

DTC communication uses the CAN communication system.

DTC No.	Information Code	Detection Item
U0100	211, 212, 530	Lost Communication With ECM / PCM "A"
U0111	208, 531	Lost Communication With Battery Energy Control Module "A"
U0129	220, 222, 528, 529	Lost Communication With Brake System Control Module
U0131	433, 434	Lost Communication With Power Steering Control Module
U0146	435	Lost Communication With Gateway "A"
P3108	594	Lost Communication With A/C System Control Module

(b) BATTERY ECU

HINT:

DTC communication uses the CAN communication system.

DTC No.	Detection Item
U0100	Lost Communication With ECM / PCM "A"
U0293	Lost Communication With Hybrid Vehicle Control System

(c) ECM

HINT:

DTC communication uses the CAN communication system.

DTC No.	Detection Item
U0293	Lost Communication With Hybrid Vehicle Control System

(d) SKID CONTROL ECU

HINT:

DTC communication uses the SIL line.

DTC No.	Information Code	Detection Item
U0293	152, 153, 154	Lost Communication With Hybrid Vehicle Control System
U0073	360	Control Module Communication Bus Off
U0123	-	Lost Communication With Yaw Rate Sensor Module
U0124	-	Lost Communication With Lateral Acceleration Sensor Module
U0126	-	Lost Communication With Steering Angle Sensor Module

w/ Enhanced VSC

CAN COMMUNICATION – CAN COMMUNICATION SYSTEM

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(e) GATEWAY ECU

HINT:

The gateway ECU is connected to the CAN communication system but CAN communication system DTCs are not output.

(f) POWER STEERING ECU

HINT:

DTC communication uses the SIL line.

DTC No.	Detection Item
U0073	Control Module Communication Bus Off
U0121	Lost Communication With Anti-Lock Brake System (ABS) Control Module

4. DTC COMBINATION TABLE

(a) Perform troubleshooting according to the combination of DTCs output.

DTC		Detected Communication Stop Mode							
Output from	Output DTC	HYBRID VEHICLE CONTROL ECU COMMUNICATION STOP MODE	ECM COMMUNICATION STOP MODE	BATTERY ECU COMMUNICATION STOP MODE	SKID CONTROL ECU COMMUNICATION STOP MODE	STEERING ANGLE SENSOR COMMUNICATION STOP MODE	YAW RATE SENSOR COMMUNICATION STOP MODE	POWER STEERING ECU COMMUNICATION STOP MODE	GATEWAY ECU COMMUNICATION STOP MODE
Hybrid Vehicle Control ECU	U0100	-	○	X	X	X	X	X	X
	U0111	-	X	○	X	X	X	X	X
	U0129	-	X	X	○	X	X	X	X
	U0146	-	X	X	X	X	X	X	○
	P3108-594	-	X	X	X	X	X	X	○
ECM	U0293	○	-	X	X	X	X	X	X
Battery ECU	U0100	X	○	-	X	X	X	X	X
	U0293	○	X	-	X	X	X	X	X
Skid Control ECU	U0123	X	X	X	-	X	○	X	X
	U0124	X	X	X	-	X	○	X	X
	U0126	X	X	X	-	○	X	X	X
	U0293	○	X	X	-	X	x	X	X
Power Steering ECU	U0121	X	X	X	○	X	X	-	X

HINT:

○: Outputs

x: Not output

-: Undetectable

NOTICE:

- If U0146 or P3108-594 is output, check the "MULTIPLEX COMMUNICATION SYSTEM" (see page [MP-7](#)) before proceeding to "GATEWAY ECU COMMUNICATION STOP MODE".

CA

CA-22

CAN COMMUNICATION – CAN COMMUNICATION SYSTEM

- If U0100-211 or U0111-208 is output separately by the hybrid control ECU, refer to "HYBRID CONTROL SYSTEM" (see page [HV-515](#)).

HINT:

- HYBRID VEHICLE CONTROL ECU COMMUNICATION STOP MODE (see page [CA-21](#)).
- ECM COMMUNICATION STOP MODE (see page [CA-34](#)).
- BATTERY ECU COMMUNICATION STOP MODE (see page [CA-36](#)).
- SKID CONTROL ECU COMMUNICATION STOP MODE (see page [CA-23](#)).
- STEERING ANGLE SENSOR COMMUNICATION STOP MODE (see page [CA-30](#)).
- YAW RATE SENSOR COMMUNICATION STOP MODE (see page [CA-32](#)).
- POWER STEERING ECU COMMUNICATION STOP MODE (see page [CA-26](#)).
- GATEWAY ECU COMMUNICATION STOP MODE (see page [CA-28](#)).

FAIL-SAFE CHART

1. FAIL-SAFE FUNCTION

- (a) The fail-safe function starts if any bus (communication line) fails due to a short or other type of circuit failure. The fail-safe function differs in each system and ensures the minimum required function for each system.
- (b) The table below shows the effects on each system when communication is impossible. For further details, refer to each system.

Function	Hybrid Vehicle Control ECU	ECM	Battery ECU	Skid Control ECU	Steering Angle Sensor	Yaw Rate Sensor	Power Steering ECU	Gateway ECU	Action when unable to communicate	DTC detection (Driver detectable)
TOYOTA hybrid system control (Optimum mix of the electric motor and gas engine)	●	○	○						Restricted driving	Detectable (Light comes on)
Regenerative braking (Drives the motor as a generator using the electricity produced by the wheel's rotation. The electricity is stored in the HV battery)	○			●					Prohibits regeneration	Detectable (Light comes on)
Enhanced VSC control (Controls braking force when enhanced VSC is in operation)	○			●	○	○			Stops enhanced VSC	Detectable (Light comes on)

CA-24

CAN COMMUNICATION – CAN COMMUNICATION SYSTEM

Function	Hybrid Vehicle Control ECU	ECM	Battery ECU	Skid Control ECU	Steering Angle Sensor	Yaw Rate Sensor	Power Steering ECU	Gateway ECU	Action when unable to communicate	DTC detection (Driver detectable)
Electric power steering (Calculate assist current according to the torque sensor value and vehicle speed, then sends the data to the motor)	○			○			●		Maintains control by locking amount of power assist to 70 km/h (43 mph) level of power assist.	Detectable (Light comes on)
Display (Operating condition, shift position, DTC)	○	○		○			○	● Meter	Light does not come on or remains on	Detectable by illumination malfunction
A/C control	○	○						● A/C	Control of A/C to level set not possible	Detectable (Light does not come on)

HINT:

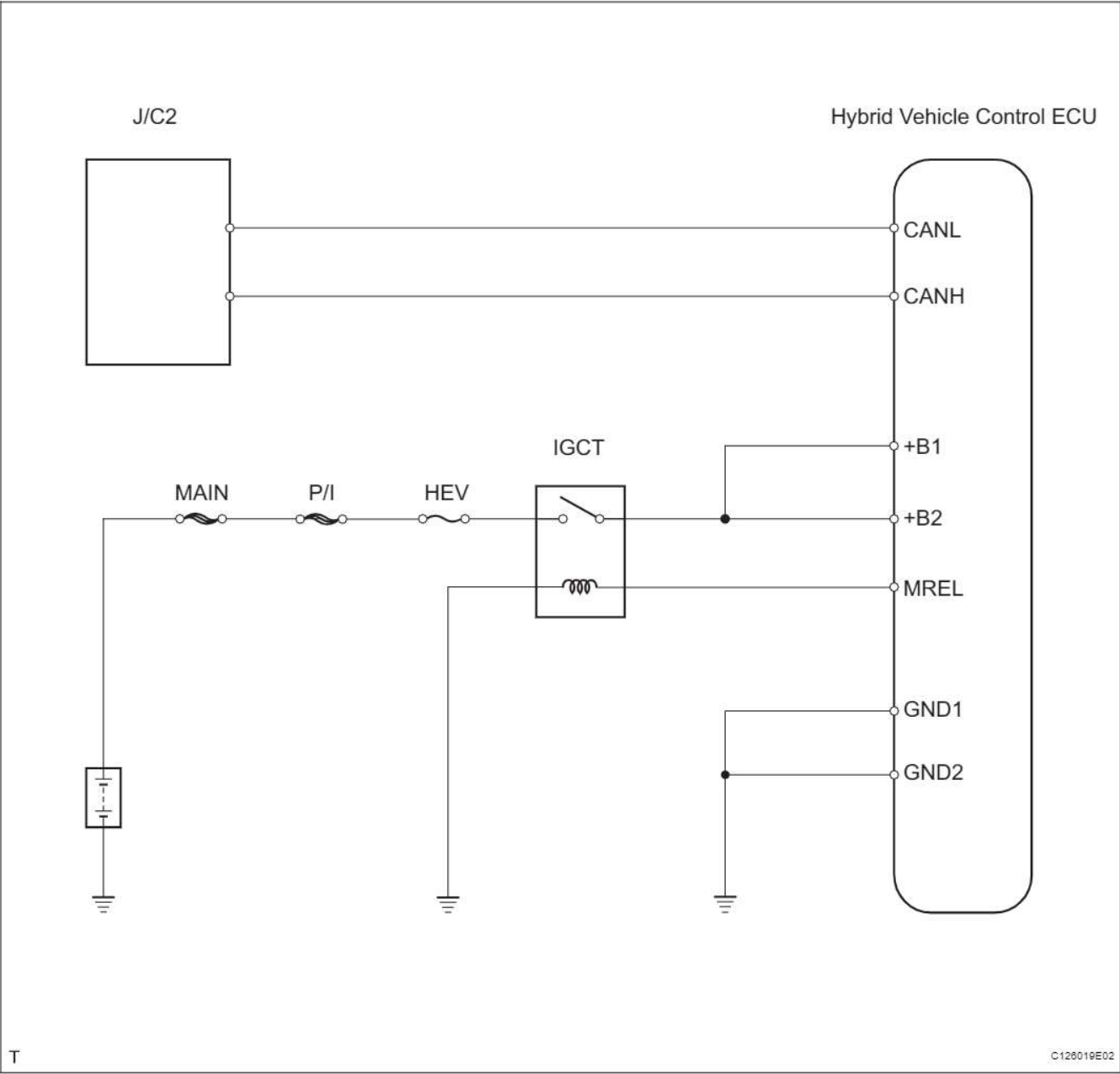
- : Control master ECU
- : Related ECU or sensor

Hybrid Vehicle Control ECU Communication Stop Mode

DESCRIPTION

Detection Item	Symptom	Trouble Area
HYBRID VEHICLE CONTROL ECU COMMUNICATION STOP MODE	• HYBRID CONTROL is not displayed on "BUS CHECK" screen of intelligent tester. • Applies to "HYBRID VEHICLE CONTROL ECU COMMUNICATION STOP MODE" in "DTC COMBINATION TABLE".	• Power source or inside hybrid vehicle control ECU • Hybrid vehicle control ECU branch wire and connector

WIRING DIAGRAM



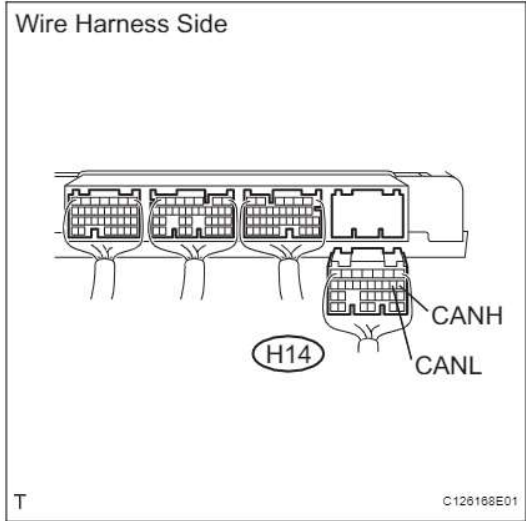
CA-26

CAN COMMUNICATION – CAN COMMUNICATION SYSTEM

INSPECTION PROCEDURE

1

CHECK CAN BUS LINE FOR DISCONNECTION (HYBRID VEHICLE CONTROL ECU BRANCH WIRE)



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

Standard resistance

Tester Connection	Condition	Specified Condition
H14-8 (CANH) - H14-9 (CANL)	Power switch OFF	54 to 69 Ω

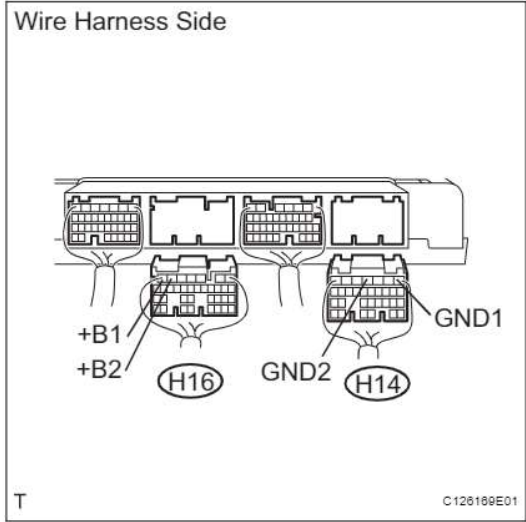
NG

REPLACE HYBRID VEHICLE CONTROL ECU BRANCH WIRE AND CONNECTOR (CANH, CANL)

OK

2

CHECK WIRE HARNESS (HYBRID VEHICLE CONTROL ECU - BATTERY AND BODY GROUND)



- (a) Disconnect the H16 hybrid vehicle control ECU connector.
- (b) Measure the resistance of the wire harness side connector.

Standard resistance

Tester Connection	Specified Condition
H14-1 (GND1) - Body ground	Below 1 Ω
H14-4 (GND2) - Body ground	Below 1 Ω

- (c) Measure the voltage of the wire harness side connectors.

Standard voltage

Tester Connection	Condition	Specified Condition
H16-7 (+B1) - Body ground	Power switch ON (IG)	10 to 14 V
H16-6 (+B2) - Body ground	Power switch ON (IG)	10 to 14 V

NG

REPAIR OR REPLACE HARNESS AND CONNECTOR

OK

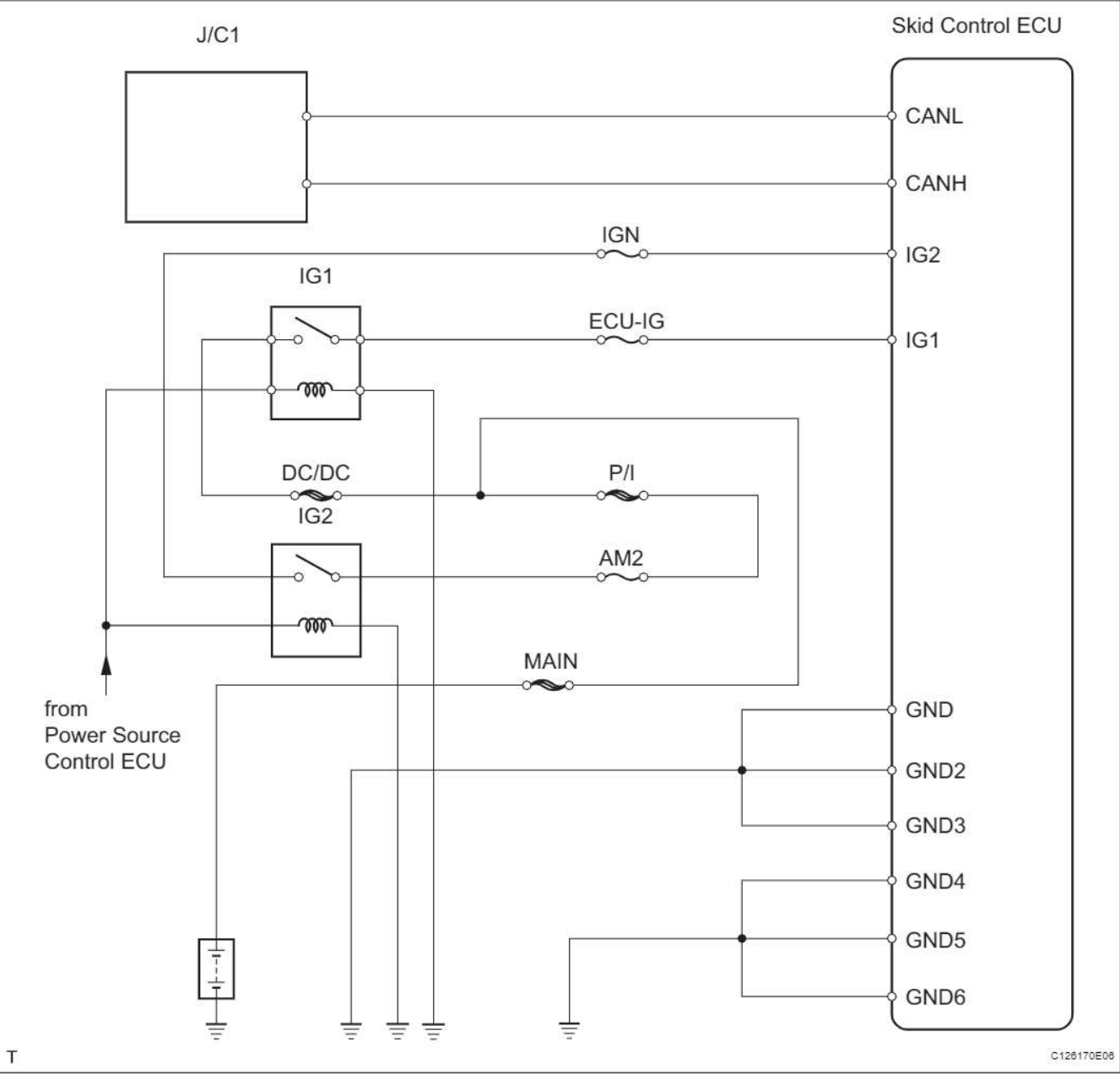
REPLACE HYBRID VEHICLE CONTROL ECU

Skid Control ECU Communication Stop Mode

DESCRIPTION

Detection Item	Symptom	Trouble Area
SKID CONTROL ECU COMMUNICATION STOP MODE	• ABS/VSC/TRAC is not displayed on "BUS CHECK" screen intelligent tester. • Applies to "SKID CONTROL ECU COMMUNICATION STOP MODE" in "DTC COMBINATION TABLE".	• Power source or inside skid control ECU • Skid control ECU branch wire and connector

WIRING DIAGRAM



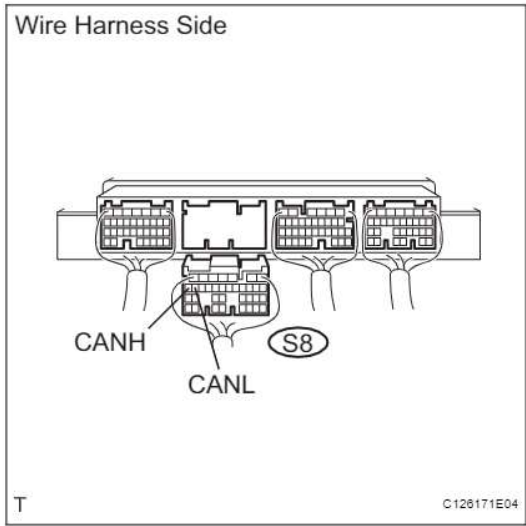
CA-28

CAN COMMUNICATION – CAN COMMUNICATION SYSTEM

INSPECTION PROCEDURE

1

CHECK CAN BUS LINE FOR DISCONNECTION (SKID CONTROL ECU BRANCH WIRE)



- (a) Disconnect the S8 skid control ECU connector.
(b) Measure the resistance of the wire harness side connector.

Standard resistance

Tester Connection	Condition	Specified Condition
S8-19 (CANH) - S8-18 (CANL)	Power switch OFF	54 to 69 Ω

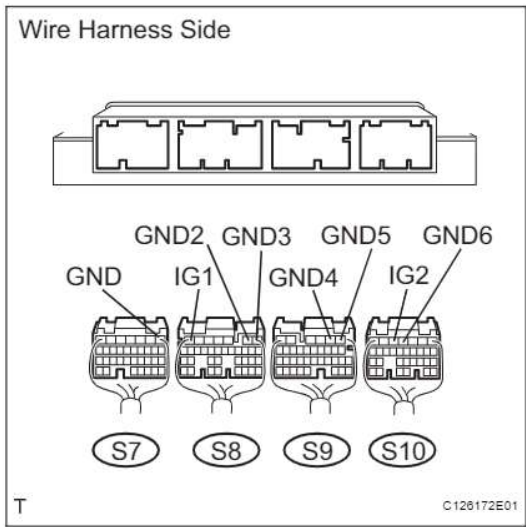
NG

REPLACE SKID CONTROL ECU BRANCH WIRE AND CONNECTOR (CANH, CANL)

OK

2

CHECK WIRE HARNESS (SKID CONTROL ECU - BATTERY AND BODY GROUND)



- (a) Disconnect the S7, S9 and S10 skid control ECU connectors.
(b) Measure the resistance of the wire harness side connectors.

Standard resistance

Tester Connection	Specified Condition
S7-1 (GND) - Body ground	Below 1 Ω
S8-1 (GND3) - Body ground	Below 1 Ω
S8-2 (GND2) - Body ground	Below 1 Ω
S9-1 (GND5) - Body ground	Below 1 Ω
S9-2 (GND4) - Body ground	Below 1 Ω
S10-4 (GND6) - Body ground	Below 1 Ω

- (c) Measure the voltage of the wire harness side connectors.

Standard voltage

Tester Connection	Condition	Specified Condition
S8-7 (IG1) - Body ground	Power switch ON (IG)	10 to 14 V
S10-5 (IG2) - Body ground	Power switch ON (IG)	10 to 14 V

NG

REPAIR OR REPLACE HARNESS AND CONNECTOR

CA

CAN COMMUNICATION – CAN COMMUNICATION SYSTEM

CA-29

OK

REPLACE SKID CONTROL ECU

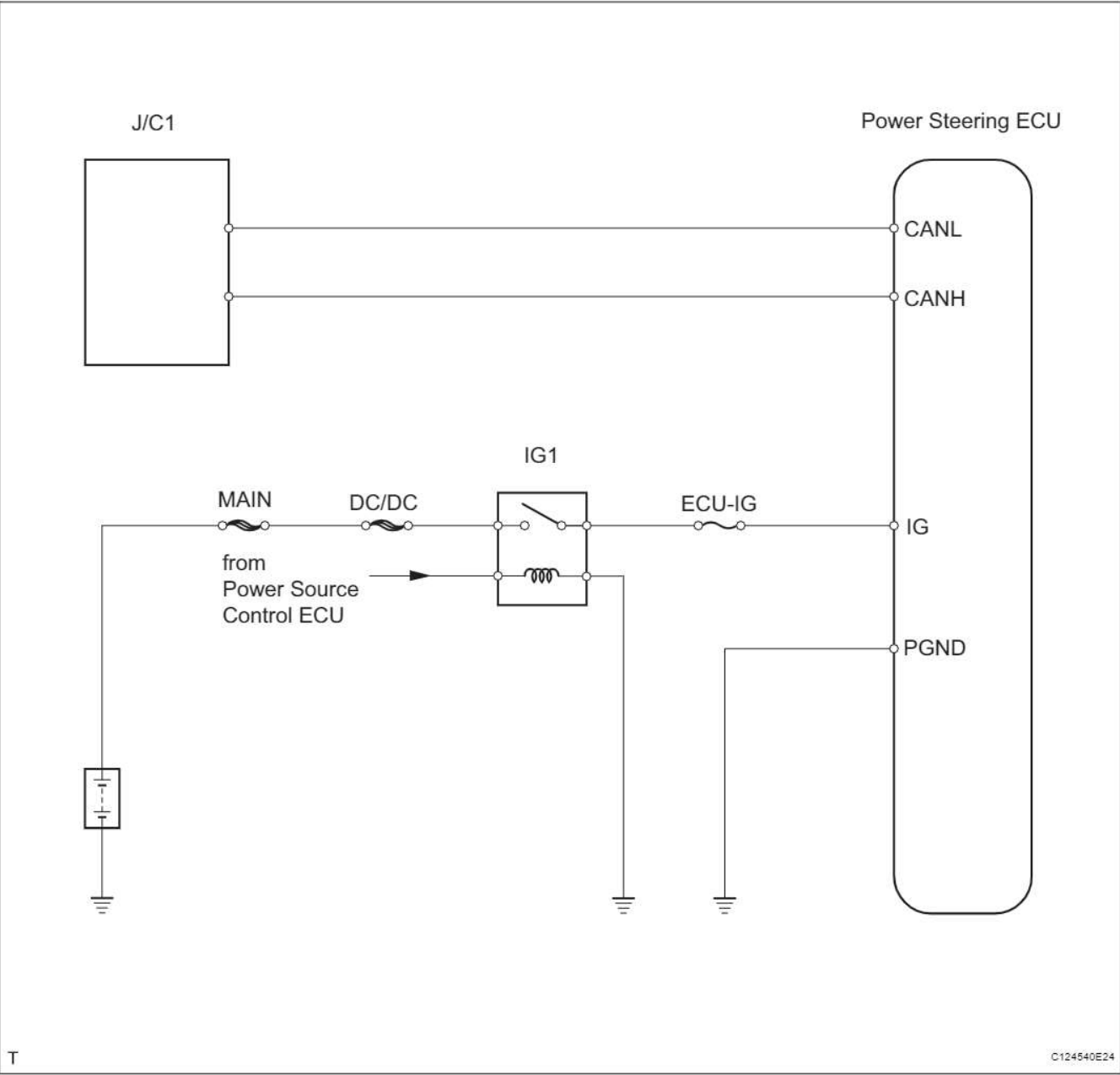
CA

Power Steering ECU Communication Stop Mode

DESCRIPTION

Detection Item	Symptom	Trouble Area
POWER STEERING ECU COMMUNICATION STOP MODE	• EPS is not displayed on "BUS CHECK" screen of intelligent tester. • Applies to "POWER STEERING ECU COMMUNICATION STOP MODE" in "DTC COMBINATION TABLE".	• Power source or inside power steering ECU • Power steering ECU branch wire and connector

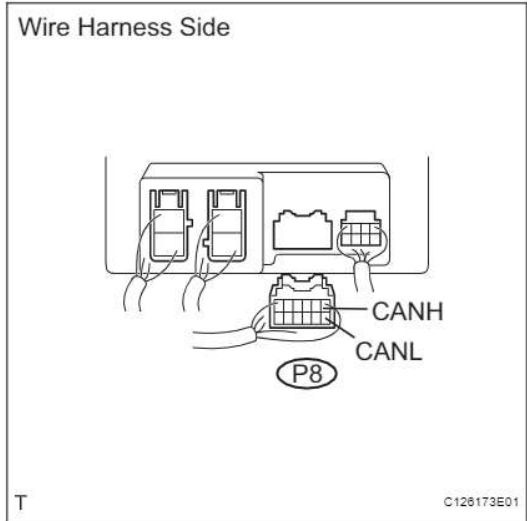
WIRING DIAGRAM



INSPECTION PROCEDURE

1

CHECK CAN BUS LINE FOR DISCONNECTION (POWER STEERING ECU BRANCH WIRE)



- (a) Disconnect the P8 power steering ECU connector.
(b) Measure the resistance of the wire harness side connector.

Standard resistance

Tester Connection	Condition	Specified Condition
P8-1 (CANH) - P8-7 (CANL)	Power switch OFF	54 to 69 Ω

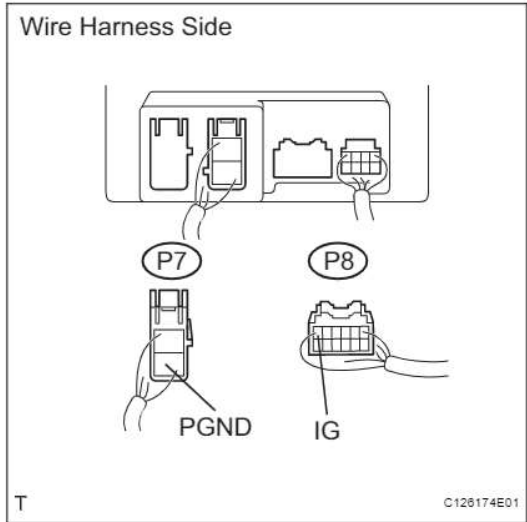
NG

REPLACE POWER STEERING ECU BRANCH WIRE AND CONNECTOR (CANH, CANL)

OK

2

CHECK WIRE HARNESS (POWER STEERING ECU - BATTERY AND BODY GROUND)



- (a) Disconnect the P7 power steering ECU connector.
(b) Measure the resistance of the wire harness side connector.

Standard resistance

Tester Connection	Specified Condition
P7-2 (PGND) - Body ground	Below 1 Ω

- (c) Measure the voltage of the wire harness side connector.
Standard voltage

Tester Connection	Condition	Specified Condition
P8-6 (IG) - Body ground	Power switch ON (IG)	10 to 14 V

NG

REPAIR OR REPLACE HARNESS AND CONNECTOR

OK

REPLACE POWER STEERING ECU

CA

CA-32

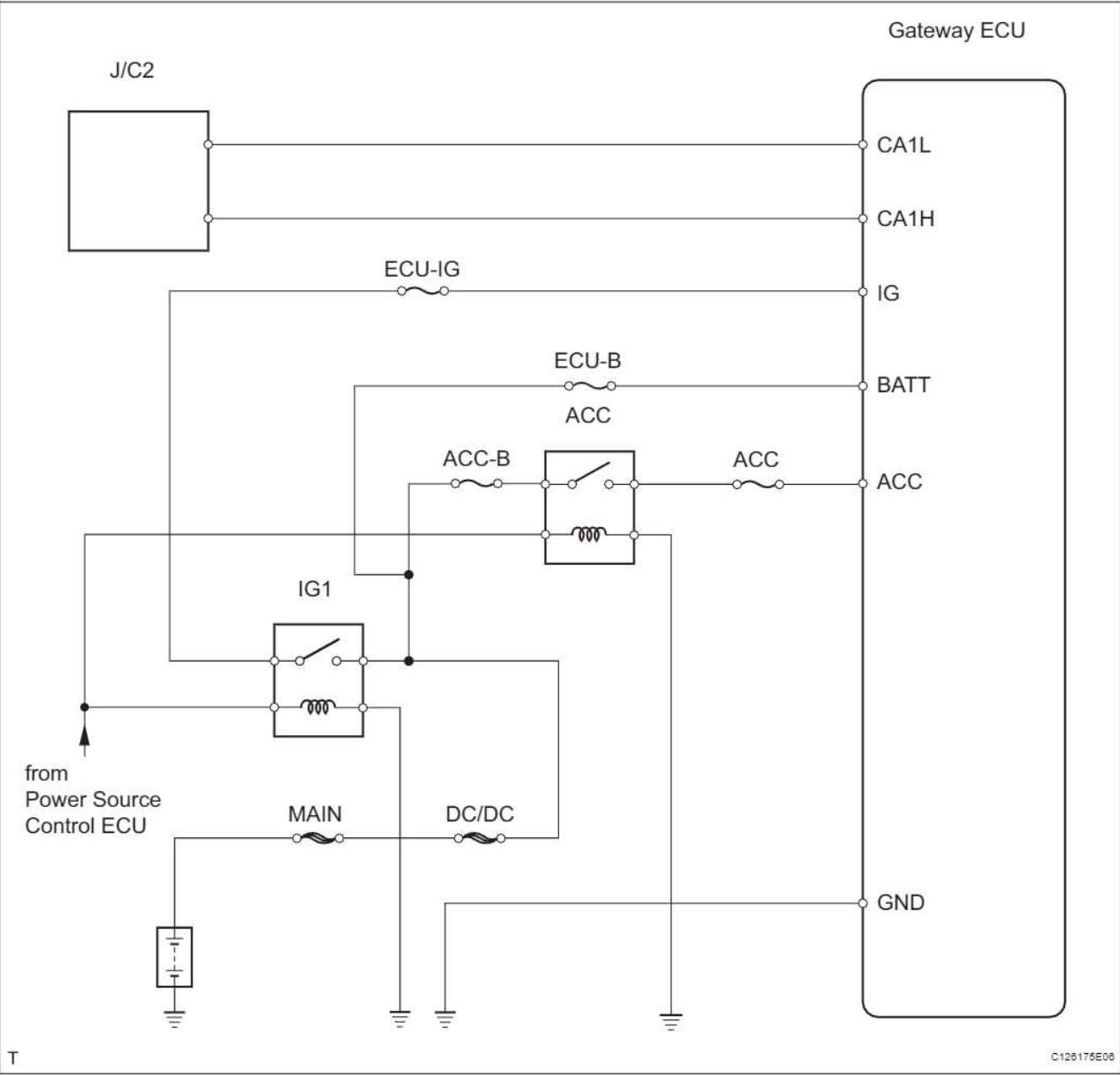
CAN COMMUNICATION – CAN COMMUNICATION SYSTEM

Gateway ECU Communication Stop Mode

DESCRIPTION

Detection Item	Symptom	Trouble Area
GATEWAY ECU COMMUNICATION STOP MODE	- BODY / GATEWAY is not displayed on "BUS CHECK" screen of intelligent tester. - Applies to "GATEWAY ECU COMMUNICATION STOP MODE" in "DTC COMBINATION TABLE".	- Power source or inside gateway ECU - Gateway ECU branch wire and connector

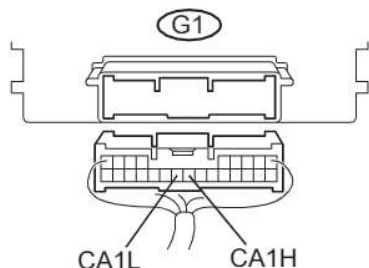
WIRING DIAGRAM



INSPECTION PROCEDURE

1 CHECK CAN BUS LINE FOR DISCONNECTION (GATEWAY ECU BRANCH WIRE)

Wire Harness Side



T

C126178E03

- (a) Disconnect the G1 gateway ECU connector.
 (b) Measure the resistance of the wire harness side connector.

Standard resistance

Tester Connection	Condition	Specified Condition
G1-17 (CA1H) - G1-18 (CA1L)	Power switch OFF	54 to 69 Ω

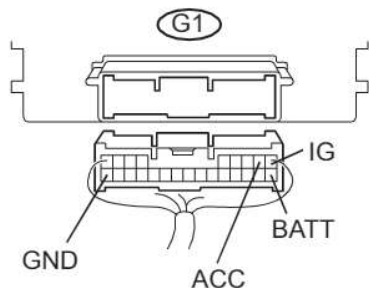
NG

REPLACE GATEWAY ECU BRANCH WIRE AND CONNECTOR (CA1H, CA1L)

OK

2 CHECK WIRE HARNESS (GATEWAY ECU - BATTERY AND BODY GROUND)

Wire Harness Side



T

C126178E04

- (a) Measure the resistance of the wire harness side connector.

Standard resistance

Tester Connection	Specified Condition
G1-24 (GND) - Body ground	Below 1 Ω

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

Standard voltage

Tester Connection	Condition	Specified Condition
G1-10 (BATT) - Body ground	Always	10 to 14 V
G1-2 (ACC) - Body ground	Power switch ON (ACC)	10 to 14 V
G1-1 (IG) - Body ground	Power switch ON (IG)	10 to 14 V

NG

REPAIR OR REPLACE HARNESS AND CONNECTOR

OK

REPLACE GATEWAY ECU

CA

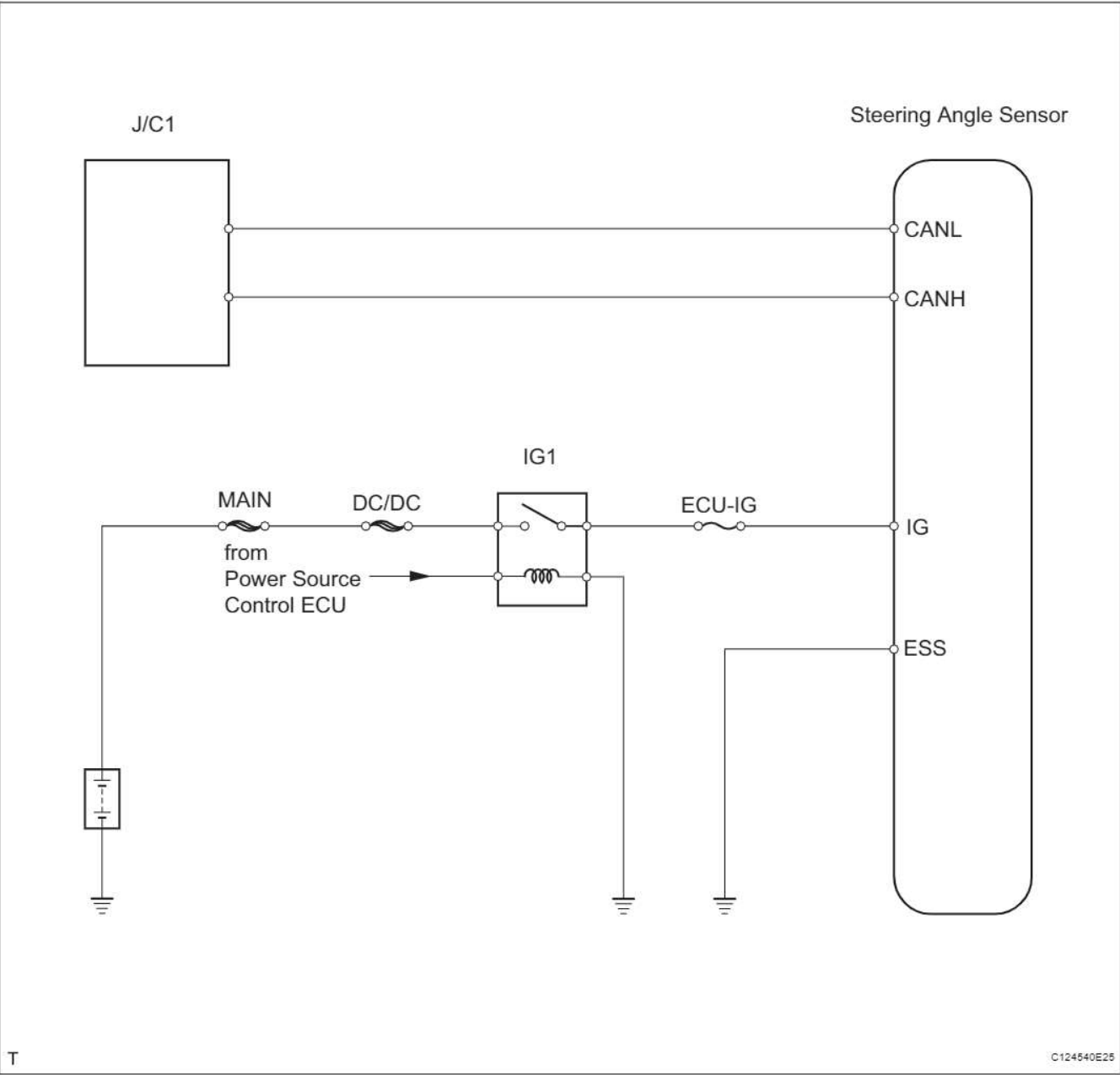
Steering Angle Sensor Communication Stop Mode

DESCRIPTION

Detection Item	Symptom	Trouble Area
STEERING ANGLE SENSOR COMMUNICATION STOP MODE	- STEERING SENSOR is not displayed on "BUS CHECK" screen of intelligent tester. - Applies to "STEERING ANGLE SENSOR COMMUNICATION STOP MODE" in "DTC COMBINATION TABLE".	- Power source or inside steering angle sensor - Steering angle sensor branch wire and connector

NOTICE:
This detection item is not applicable to a vehicle without enhanced VSC.

WIRING DIAGRAM



INSPECTION PROCEDURE

1

CHECK CAN BUS LINE FOR DISCONNECTION (STEERING ANGLE SENSOR BRANCH WIRE)



- (a) Disconnect the S13 steering angle sensor connector.
(b) Measure the resistance of the wire harness side connector.

Standard resistance

Tester Connection	Condition	Specified Condition
S13-10 (CANH) - S3-9 (CANL)	Power switch OFF	54 to 69 Ω

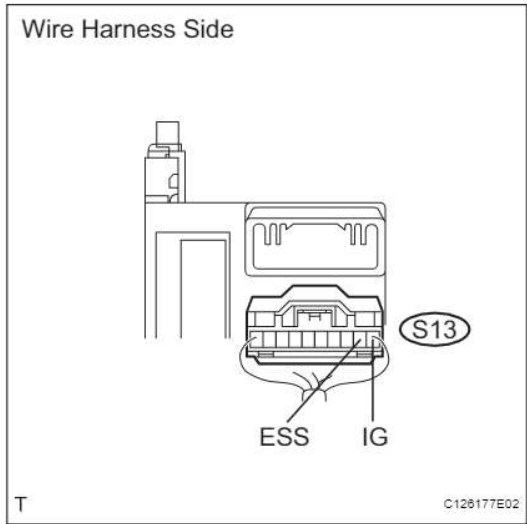
NG

REPLACE STEERING ANGLE SENSOR BRANCH WIRE AND CONNECTOR (CANH, CANL)

OK

2

CHECK WIRE HARNESS (STEERING ANGLE SENSOR - BATTERY AND BODY GROUND)



- (a) Measure the resistance of the wire harness side connector.

Standard resistance

Tester Connection	Specified Condition
S13-2 (ESS) - Body ground	Below 1 Ω

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

Standard voltage

Tester Connection	Condition	Specified Condition
S13-1 (IG) - Body ground	Power switch ON (IG)	10 to 14 V

NG

REPAIR OR REPLACE HARNESS AND CONNECTOR

OK

REPLACE STEERING ANGLE SENSOR

CA

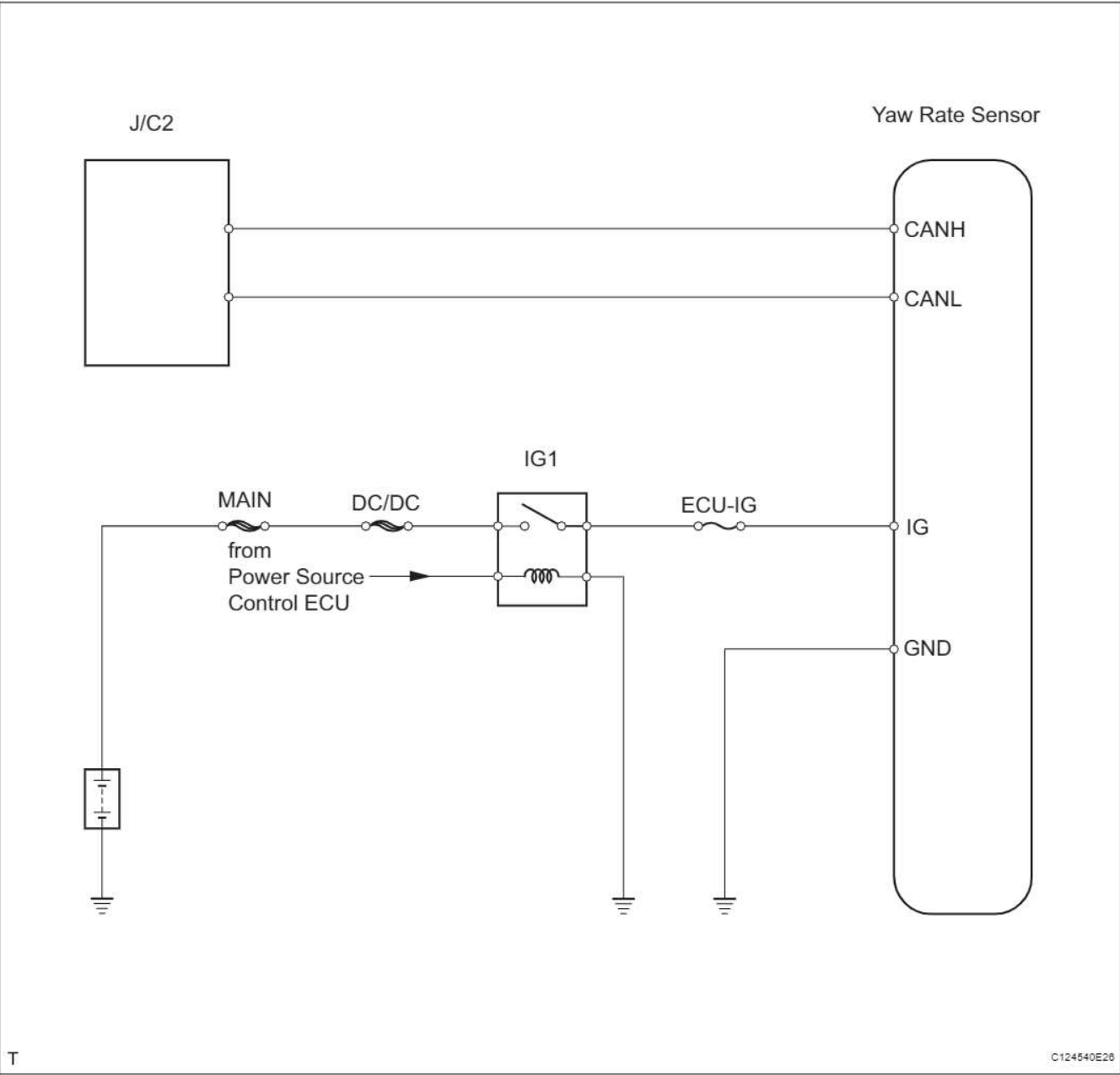
Yaw Rate Sensor Communication Stop Mode

DESCRIPTION

Detection Item	Symptom	Trouble Area
YAW RATE SENSOR COMMUNICATION STOP MODE	• YAW / DECELERAT is not displayed on "BUS CHECK" screen of intelligent tester. • Applies to "YAW RATE SENSOR COMMUNICATION STOP MODE" in "DTC COMBINATION TABLE".	• Power source or inside yaw rate sensor • Yaw rate sensor branch wire and connector

NOTICE:
This detection item is not applicable to a vehicle without enhanced VSC.

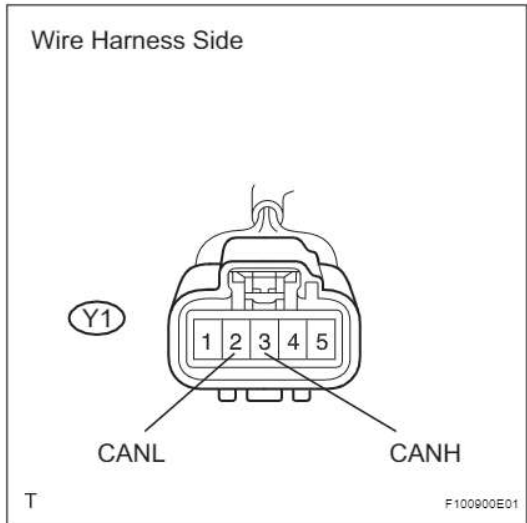
WIRING DIAGRAM



INSPECTION PROCEDURE

1

CHECK CAN BUS LINE FOR DISCONNECTION (YAW RATE SENSOR BRANCH WIRE)



- (a) Disconnect the Y1 yaw rate sensor connector.
(b) Measure the resistance of the wire harness side connector.

Standard resistance

Tester Connection	Condition	Specified Condition
Y1-2 (CANL) - Y1-3 (CANH)	Power switch OFF	54 to 69 Ω

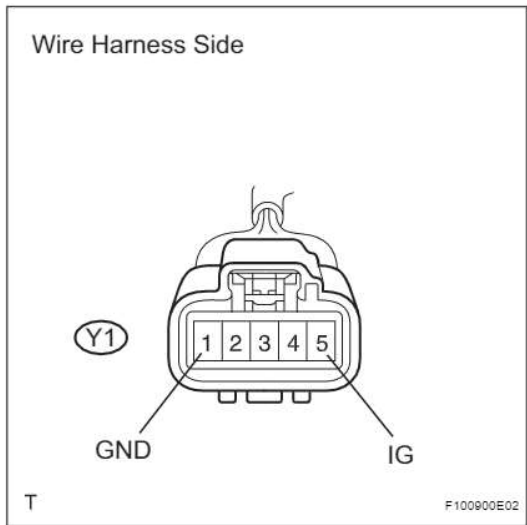
NG

REPLACE YAW RATE SENSOR BRANCH WIRE AND CONNECTOR (CANH, CANL)

OK

2

CHECK WIRE HARNESS (YAW RATE SENSOR - BATTERY AND BODY GROUND)



- (a) Measure the resistance of the wire harness side connector.

Standard resistance

Tester Connection	Specified Condition
Y1-1 (GND) - Body ground	Below 1 Ω

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

Standard voltage

Tester Connection	Condition	Specified Condition
Y1-5 (IG)- Body ground	Power switch ON (IG)	10 to 14 V

NG

REPAIR OR REPLACE HARNESS AND CONNECTOR

OK

REPLACE YAW RATE SENSOR

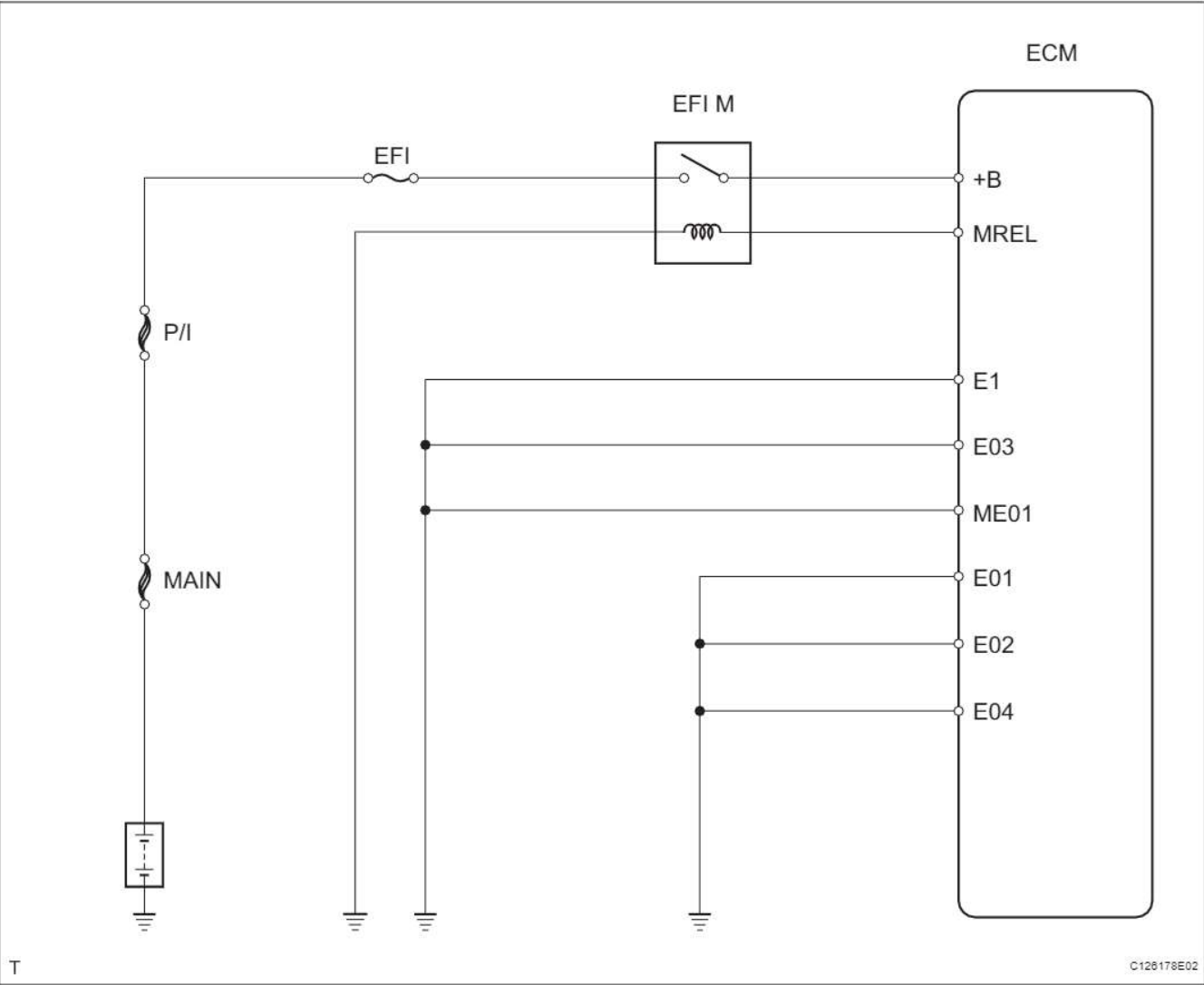
CA

ECM Communication Stop Mode

DESCRIPTION

Detection Item	Symptom	Trouble Area
ECM COMMUNICATION STOP MODE	- ENGINE is not displayed on "BUS CHECK" screen of intelligent tester. - Applies to "ECM COMMUNICATION STOP MODE" in "DTC COMBINATION TABLE".	Power source or inside ECM

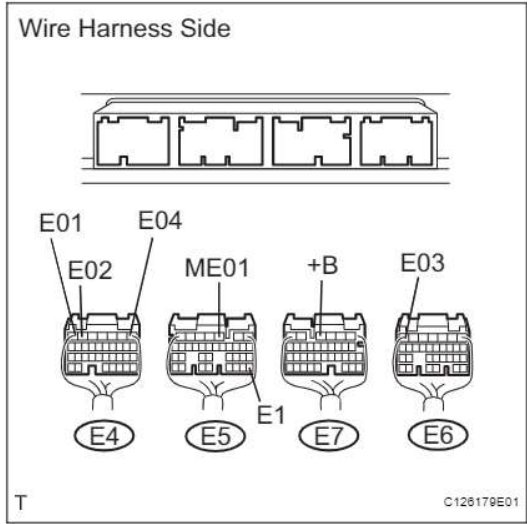
WIRING DIAGRAM



INSPECTION PROCEDURE

1

CHECK WIRE HARNESS (ECM - BATTERY AND BODY GROUND)



- (a) Disconnect the E4, E5, E6 and E7 ECM connectors.
(b) Measure the resistance of the wire harness side connectors.

Standard resistance

Tester Connection	Specified Condition
E4-1 (E04) - Body ground	Below 1 Ω
E4-6 (E02) - Body ground	Below 1 Ω
E4-7 (E01) - Body ground	Below 1 Ω
E5-3 (ME01) - Body ground	Below 1 Ω
E5-28 (E1) - Body ground	Below 1 Ω
E6-7 (E03) - Body ground	Below 1 Ω

- (c) Measure the voltage of the wire harness side connector.

Standard voltage

Tester Connection	Condition	Specified Condition
E7-4 (+B) - Body ground	Power switch OFF	10 to 14 V

NG

REPAIR OR REPLACE HARNESS AND CONNECTOR

OK

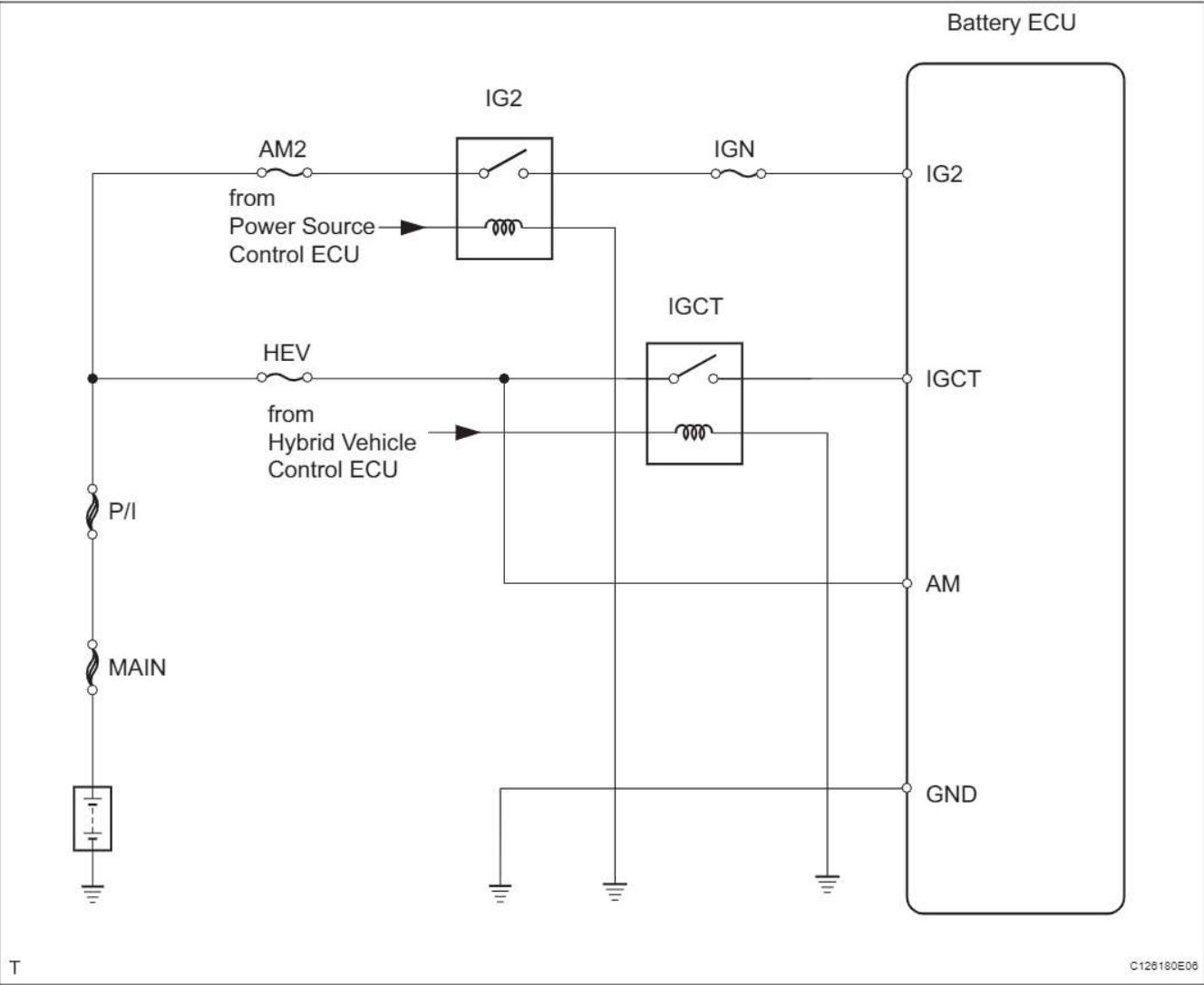
REPLACE ECM

Battery ECU Communication Stop Mode

DESCRIPTION

Detection Item	Symptom	Trouble Area
BATTERY ECU COMMUNICATION STOP MODE	- HV BATTERY is not displayed on "BUS CHECK" screen of intelligent tester. - Applies to "BATTERY ECU COMMUNICATION STOP MODE" in "DTC COMBINATION TABLE".	Power source or inside battery ECU

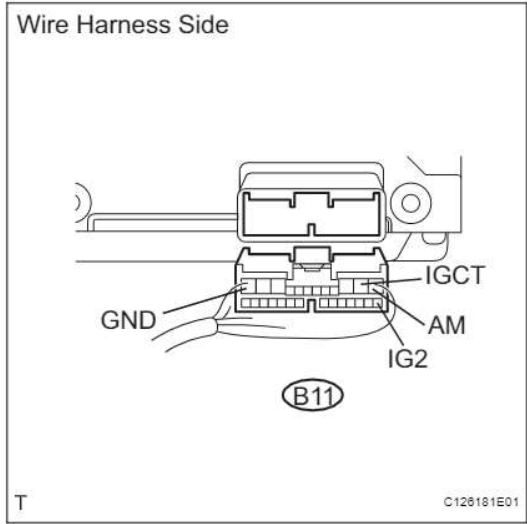
WIRING DIAGRAM



INSPECTION PROCEDURE

1

CHECK WIRE HARNESS (BATTERY ECU - BATTERY AND BODY GROUND)



(a) Measure the resistance of the wire harness side connector.

Standard resistance

Tester Connection	Specified Condition
B11-12 (GND) - Body ground	Below 1 Ω

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

Standard voltage

Tester Connection	Condition	Specified Condition
B11-1 (AM) - Body ground	Always	10 to 14 V
B11-2 (IGCT) - Body ground	Power switch ON (IG)	10 to 14 V
B11-13 (IG2) - Body ground	Power switch ON (IG)	10 to 14 V

NG

REPAIR OR REPLACE HARNESS AND CONNECTOR

OK

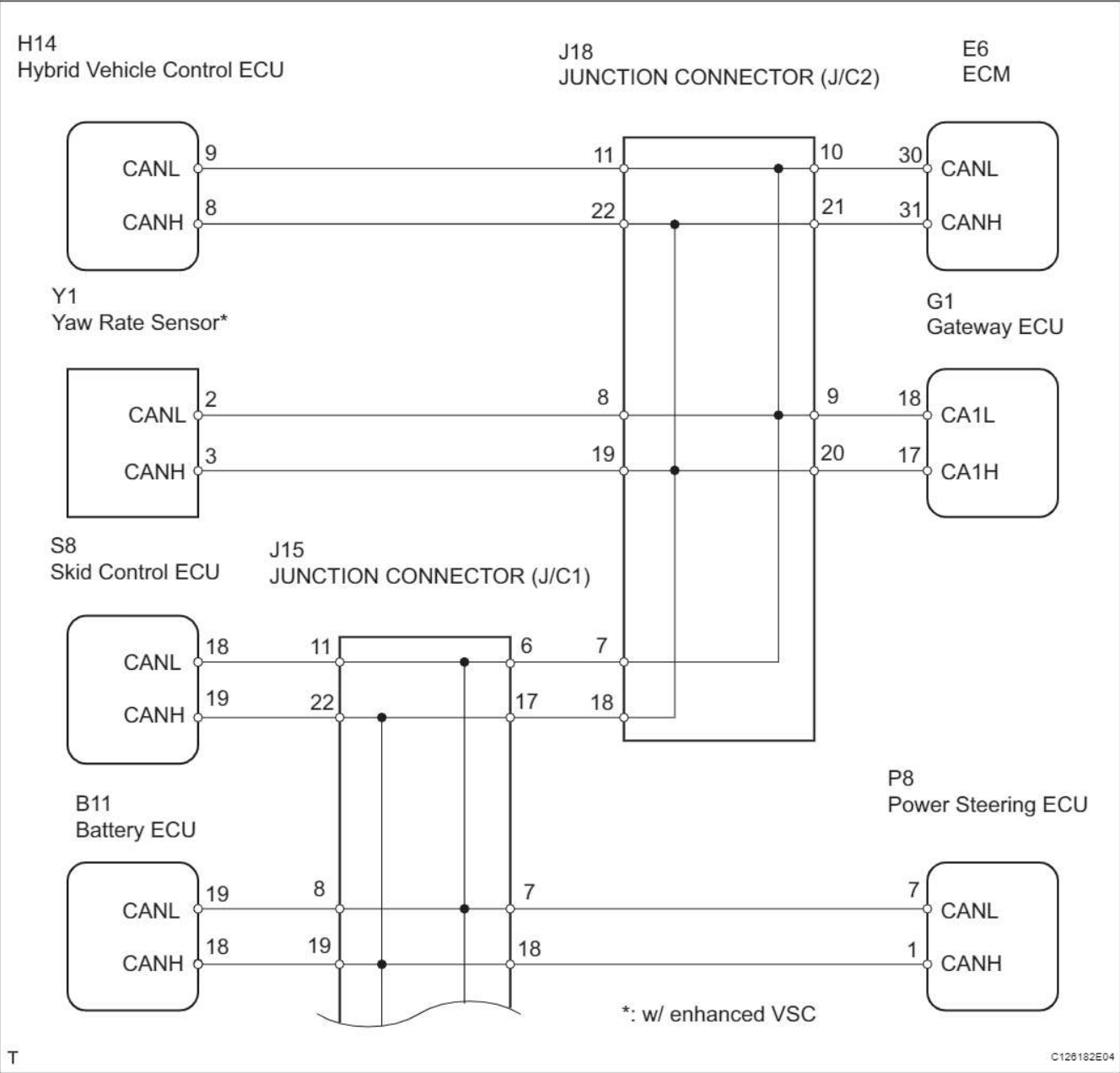
REPLACE BATTERY ECU

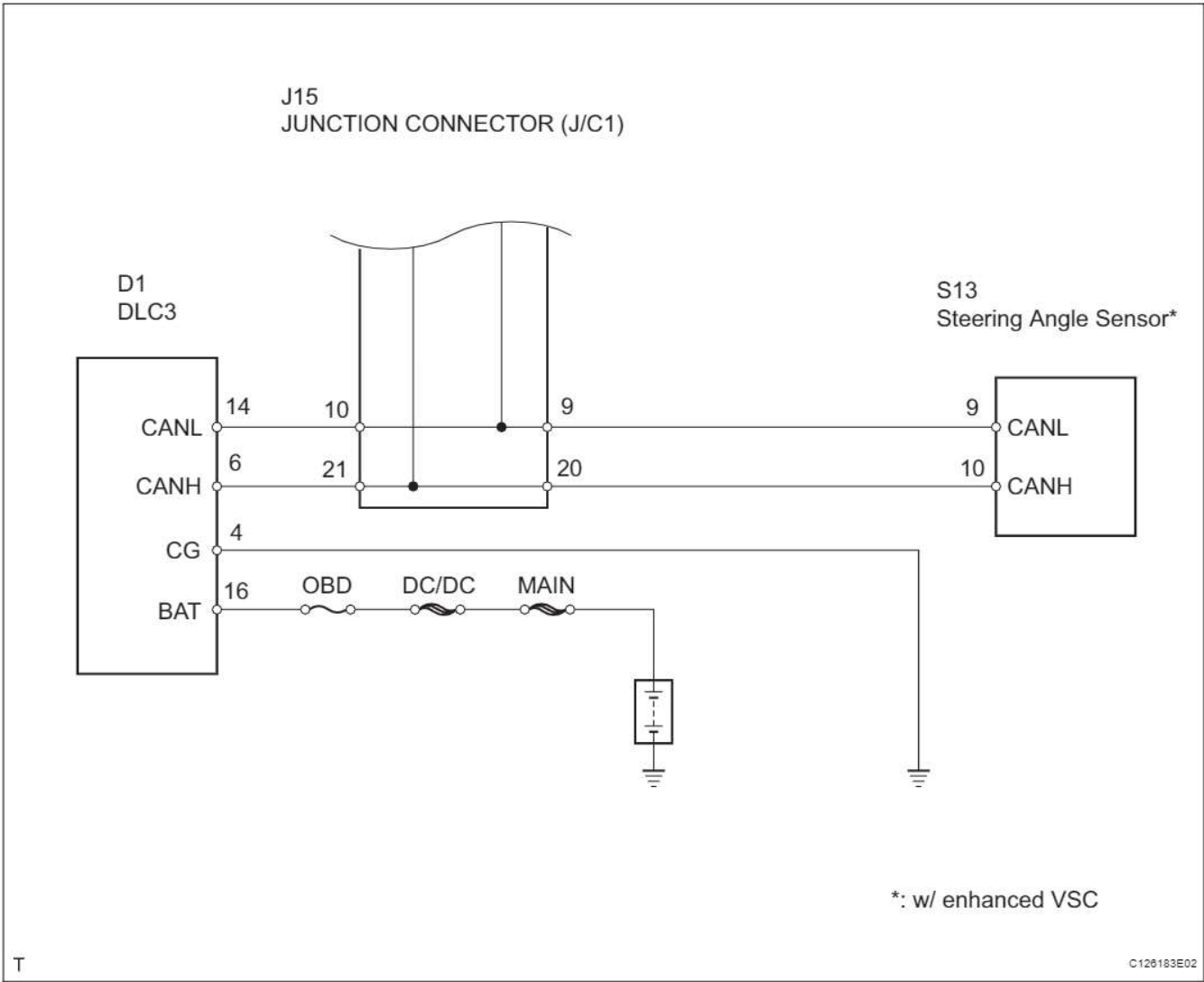
CAN Bus Line

DESCRIPTION

When any DTC for the CAN communication system is output, first measure the resistance between the terminals of the DLC3 to specify the trouble area, and check that there is not a short in the CAN main wire, between the CAN bus lines, to +B, or to GND.

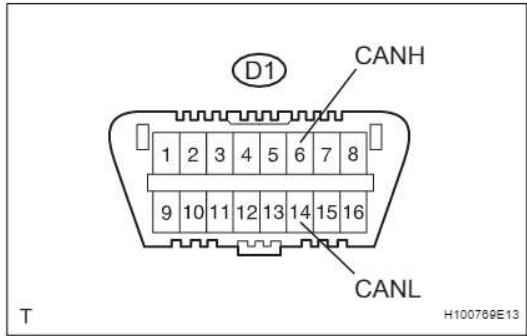
WIRING DIAGRAM





INSPECTION PROCEDURE

1 CHECK CAN BUS LINE (MAIN WIRE FOR OPEN, BUS LINES FOR SHORT CIRCUIT)



(a) Measure the resistance of the DLC3.
Standard resistance

Tester Connection	Condition	Specified Condition	Proceed to
D1-6 (CANH) - D1-14 (CANL)	Power switch OFF	54 to 69 Ω	OK
D1-6 (CANH) - D1-14 (CANL)	Power switch OFF	69 Ω or more	NG-A
D1-6 (CANH) - D1-14 (CANL)	Power switch OFF	54 Ω or less	NG-B

NG-A

CHECK CAN MAIN WIRE FOR OPEN

NG-B

CHECK CAN BUS LINES FOR SHORT CIRCUIT

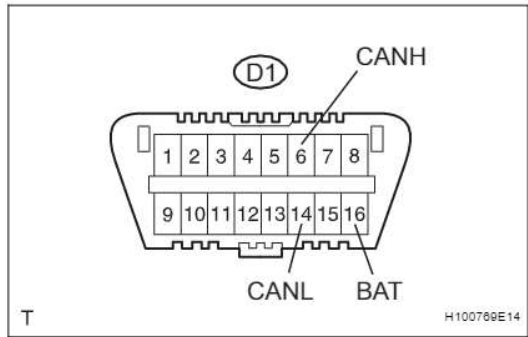
CA-44

CAN COMMUNICATION – CAN COMMUNICATION SYSTEM

OK

2

CHECK CAN BUS LINE FOR SHORT TO +B



(a) Measure the resistance of the DLC3.
Standard resistance

Tester Connection	Condition	Specified Condition
D1-6 (CANH) - D1-16 (BAT)	Power switch OFF	1 MΩ or more
D1-14 (CANL) - D1-16 (BAT)	Power switch OFF	1 MΩ or more

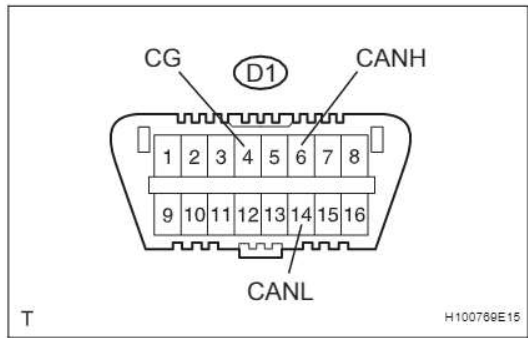
NG

CHECK CAN BUS LINE FOR SHORT TO +B

OK

3

CHECK CAN BUS LINE FOR SHORT TO GND



(a) Measure the resistance of the DLC3.
Standard resistance

Tester Connection	Condition	Specified Condition
D1-4 (CG) - D1-6 (CANH)	Power switch OFF	1 kΩ or more
D1-4 (CG) - D1-14 (CANL)	Power switch OFF	1 kΩ or more

NG

CHECK CAN BUS LINE FOR SHORT TO GND

OK

HOW TO PROCEED WITH TROUBLESHOOTING

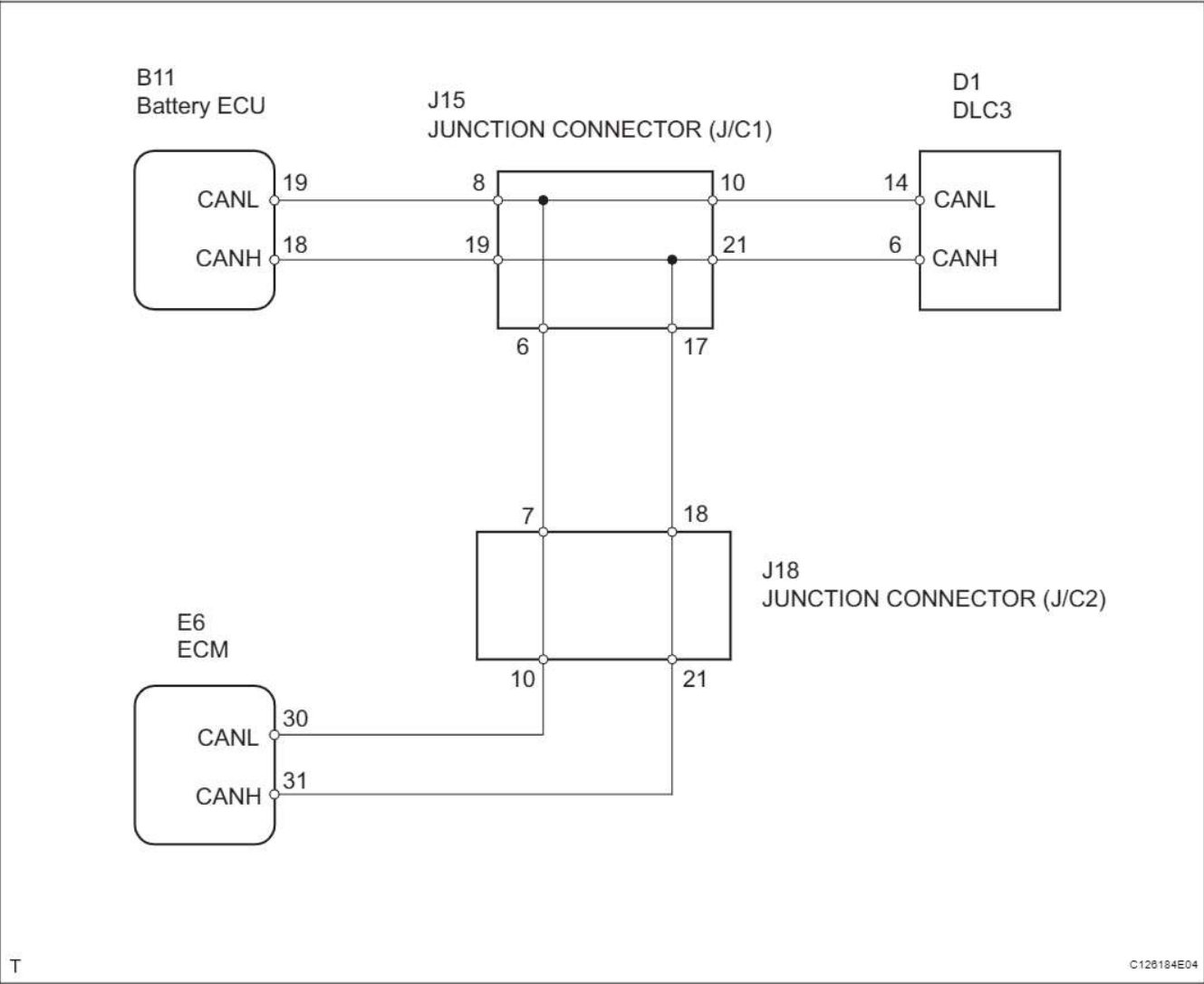
Open in CAN Main Wire

DESCRIPTION

There may be an open circuit in the CAN main wire and / or the DLC3 branch wire when the resistance between terminals 6 (CANH) and 14 (CANL) of the DLC3 is 69 Ω or more.

Symptom	Trouble Area
Resistance between terminals 6 (CANH) and 14 (CANL) of the DLC3 is 69 Ω or more.	- CAN main wire and connector - J/C1 (Junction connector) - J/C2 (Junction connector) - DLC3 branch wire and connector - ECM - Battery ECU

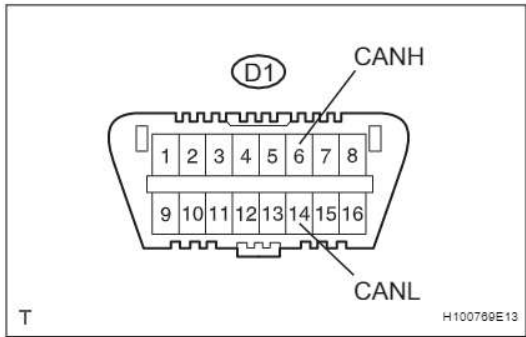
WIRING DIAGRAM



INSPECTION PROCEDURE

1

CHECK DLC3



(a) Measure the resistance of the DLC3.

Standard resistance

Tester Connection	Condition	Specified Condition	Proceed to
D1-6 (CANH) - D1-14 (CANL)	Power switch OFF	108 to 132 Ω	A
D1-6 (CANH) - D1-14 (CANL)	Power switch OFF	132 Ω or more	B

NOTICE:
When the measured value is 132 Ω or more and the CAN communication system DTC is output, there may be a fault besides disconnection of the DLC3 branch wire. For that reason, troubleshooting should be performed again from "HOW TO PROCEED WITH TROUBLESHOOTING" (see page CA-6) after repairing the trouble area.

B

REPLACE DLC3 BRANCH WIRE AND CONNECTOR (CANH, CANL)

A

2

CHECK CAN MAIN WIRE FOR DISCONNECTION (BUS CHECK)

(a) Perform "BUS CHECK" using the intelligent tester via the CAN VIM (see page CA-16).

Result

Result	Proceed to
Only "ENGINE" is not displayed	A
Only "HV BATTERY" is not displayed	B
Other ("ENGINE" and "HV BATTERY" are not displayed)	C

B

Go to step 4

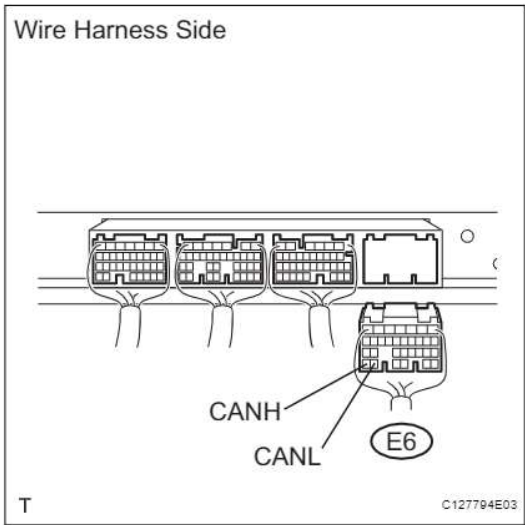
C

Go to step 5

A

3

CHECK CAN MAIN WIRE FOR DISCONNECTION (ECM - J/C2)



- (a) Disconnect the E6 ECM connector.
(b) Measure the resistance of the wire harness side connector.

Standard resistance

Tester Connection	Condition	Specified Condition
E6-31 (CANH) - E6-30 (CANL)	Power switch OFF	108 to 132 Ω

NG

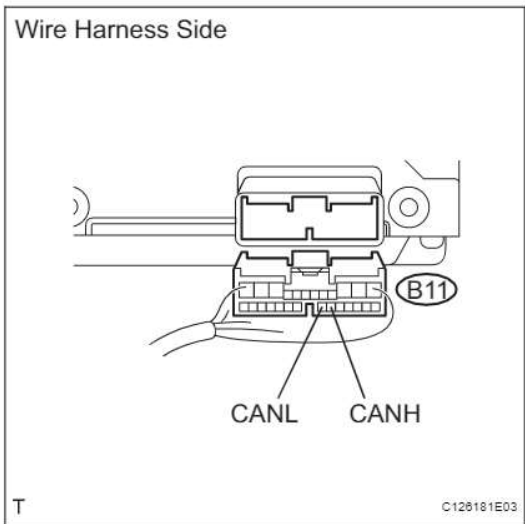
REPLACE CAN MAIN WIRE AND
CONNECTOR (ECM - J/C2)

OK

REPLACE ECM

4

CHECK CAN MAIN WIRE FOR DISCONNECTION (BATTERY ECU - J/C1)



- (a) Disconnect the B11 battery ECU connector.
(b) Measure the resistance of the wire harness side connector.

Standard resistance

Tester Connection	Condition	Specified Condition
B11-18 (CANH) - B11-19 (CANL)	Power switch OFF	108 to 132 Ω

NG

REPLACE CAN MAIN WIRE AND
CONNECTOR (BATTERY ECU - J/C1)

OK

REPLACE BATTERY ECU

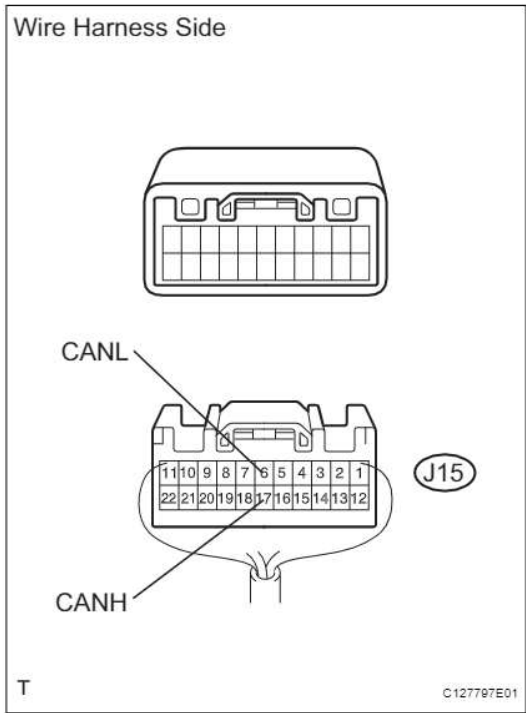
CA

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CAN COMMUNICATION – CAN COMMUNICATION SYSTEM

5

CHECK CAN MAIN WIRE FOR DISCONNECTION (J/C1 - ECM)



- (a) Disconnect the J15 J/C1 connector.
(b) Measure the resistance of the wire harness side connector.

Standard resistance

Tester Connection	Condition	Specified Condition
J15-17 (CANH) - J15-6 (CANL)	Power switch OFF	108 to 132 Ω

NG

Go to step 8

OK

6

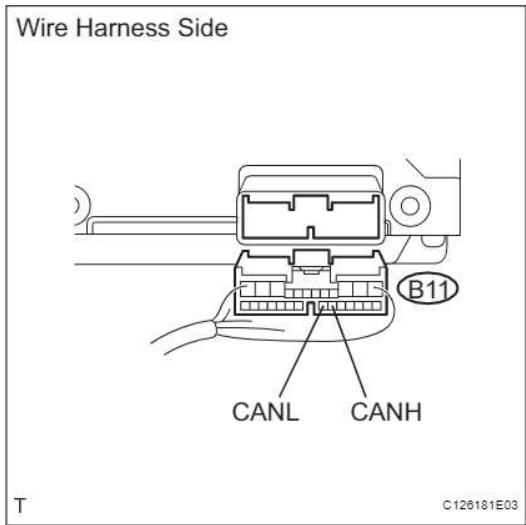
CONNECT CONNECTOR

- (a) Reconnect the J15 J/C1 connector.

NEXT

7

CHECK CAN MAIN WIRE FOR DISCONNECTION (BATTERY ECU - J/C1)



- (a) Disconnect the B11 battery ECU connector.
(b) Measure the resistance of the wire harness side connector.

Standard resistance

Tester Connection	Condition	Specified Condition
B11-18 (CANH) - B11-19 (CANL)	Power switch OFF	108 to 132 Ω

NG

REPLACE CAN MAIN WIRE AND CONNECTOR (BATTERY ECU - J/C1)

OK

REPLACE BATTERY ECU

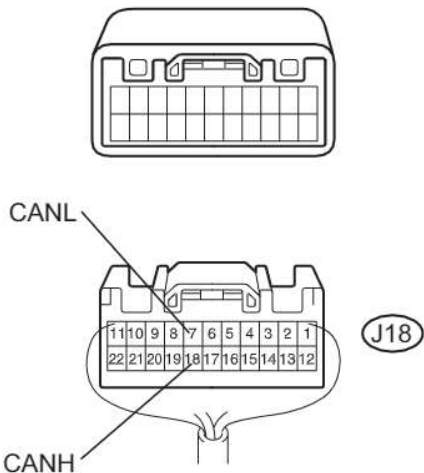
8CONNECT CONNECTOR

(a) Reconnect the J15 J/C1 connector.

NEXT

9CHECK CAN MAIN WIRE FOR DISCONNECTION (J/C2 - J/C1)

Wire Harness Side



- (a) Disconnect the J18 J/C2 connector.
(b) Measure the resistance of the wire harness side connector.

Standard resistance

Tester Connection	Condition	Specified Condition
J18-18 (CANH) - J18-7 (CANL)	Power switch OFF	108 to 132 Ω

NG

REPLACE CAN MAIN WIRE AND
CONNECTOR (J/C2 - J/C1)

OK

10CONNECT CONNECTOR

(a) Reconnect the J18 J/C2 connector.

NEXT

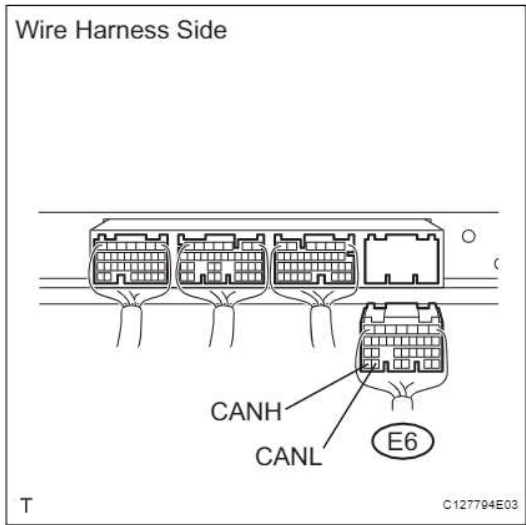
CA

CA-50

CAN COMMUNICATION – CAN COMMUNICATION SYSTEM

11

CHECK CAN MAIN WIRE FOR DISCONNECTION (ECM - J/C2)



- (a) Disconnect the E6 ECM connector.
(b) Measure the resistance of the wire harness side connector.

Standard resistance

Tester Connection	Condition	Specified Condition
E6-31 (CANH) - E6-30 (CANL)	Power switch OFF	108 to 132 Ω

NG

REPLACE CAN MAIN WIRE AND CONNECTOR

OK

REPLACE ECM

Short in CAN Bus Lines

DESCRIPTION

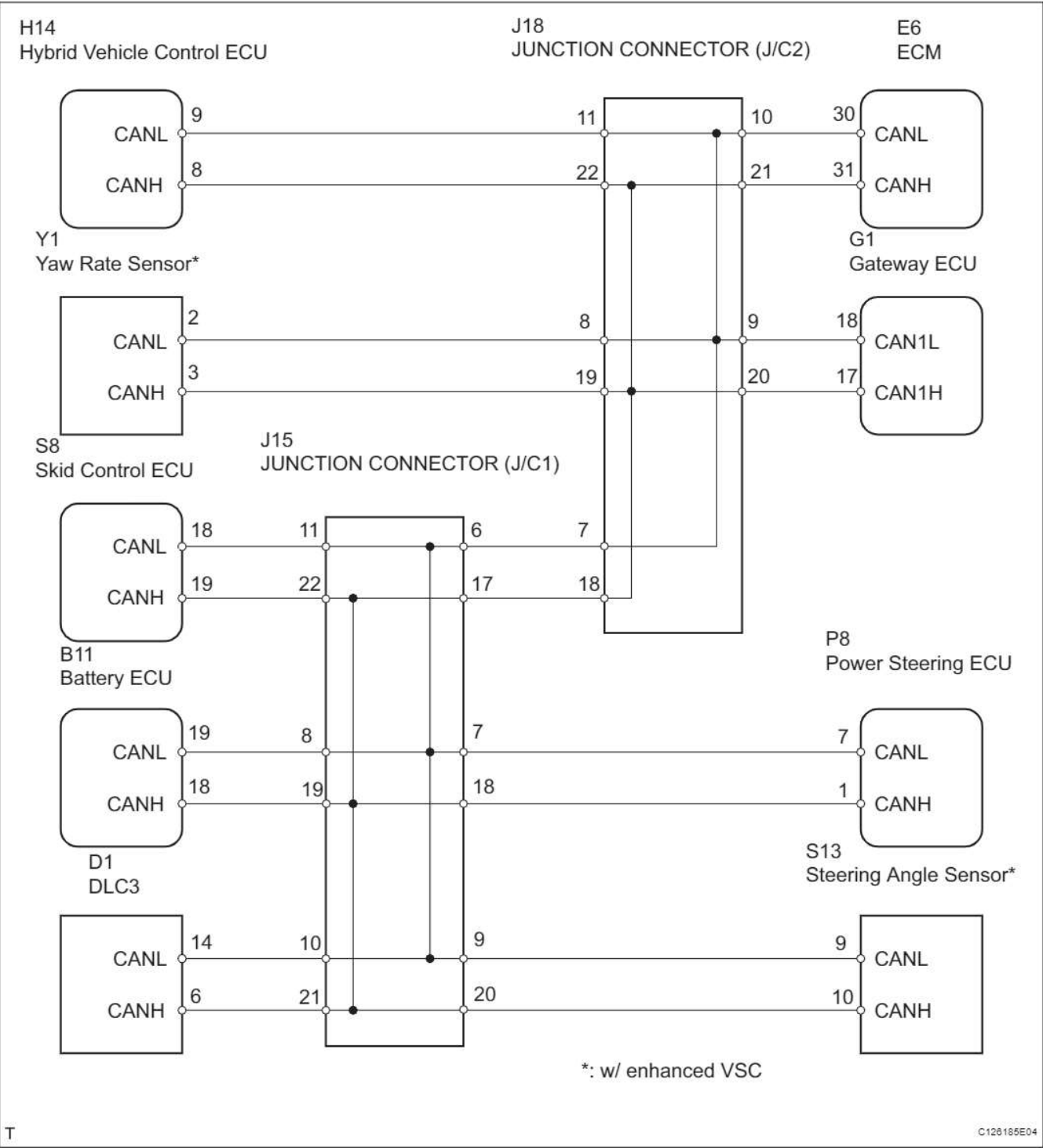
There may be a short circuit between the CAN bus lines when the resistance between terminals 6 (CANH) and 14 (CANL) of the DLC3 is below 54 Ω.

Symptom	Trouble Area
Resistance between terminals 6 (CANH) and 14 (CANL) of the DLC3 is below 54 Ω.	• Short between CAN bus lines • Hybrid vehicle control ECU • Battery ECU • ECM • Skid control ECU • Steering angle sensor • Yaw rate sensor • Power steering ECU • Gateway ECU • J/C1 (Junction connector) • J/C2 (Junction connector)

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CAN COMMUNICATION – CAN COMMUNICATION SYSTEM

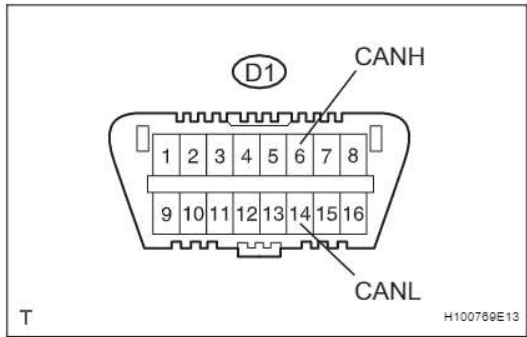
WIRING DIAGRAM



INSPECTION PROCEDURE

1

CHECK CAN BUS LINES FOR SHORT CIRCUIT (DLC3 BRANCH WIRE)



- (a) Disconnect the J15 J/C1 connector.
(b) Measure the resistance of the DLC3.

Standard resistance

Tester Connection	Condition	Specified Condition
D1-6 (CANH) - D1-14 (CANL)	Power switch OFF	1 MΩ or more

NG

REPLACE DLC3 BRANCH WIRE AND CONNECTOR (CANH, CANL)

OK

2

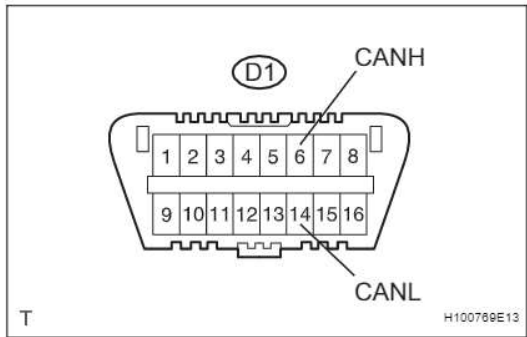
CONNECT CONNECTOR

- (a) Reconnect the J15 J/C1 connector.

NEXT

3

CHECK CAN BUS LINES FOR SHORT CIRCUIT (CAN BUSES TO J/C2)



- (a) Disconnect the J18 J/C2 connector.
(b) Measure the resistance of the DLC3.

Standard resistance

Tester Connection	Condition	Specified Condition
D1-6 (CANH) - D1-14 (CANL)	Power switch OFF	108 to 132 Ω

OK

Go to step 17

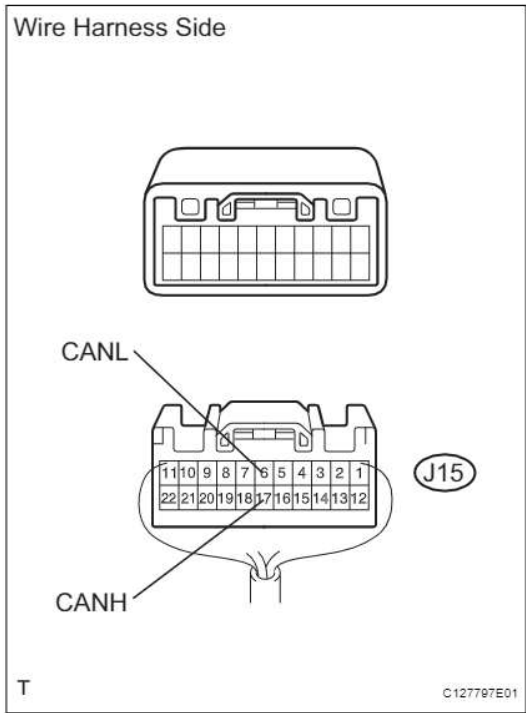
NG

CA-54

CAN COMMUNICATION – CAN COMMUNICATION SYSTEM

4

CHECK CAN BUS LINES FOR SHORT CIRCUIT (J/C1 - J/C2)



- (a) Disconnect the J15 J/C1 connector.
- (b) Measure the resistance of the wire harness side connector.

Standard resistance

Tester Connection	Condition	Specified Condition
J15-17 (CANH) - J15-6 (CANL)	Power switch OFF	1 MΩ or more

HINT:
Measure the resistance with the J18 J/C2 connector disconnected.

NG

REPLACE CAN MAIN WIRE AND CONNECTOR (J/C1 - J/C2)

OK

5

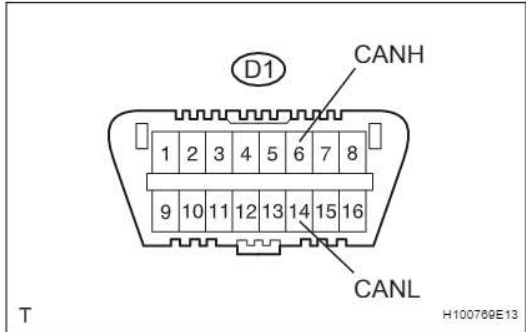
CONNECT CONNECTOR

- (a) Reconnect the J15 J/C1 connector and J18 J/C2 connector.

NEXT

6

CHECK CAN BUS LINES FOR SHORT CIRCUIT (BATTERY ECU)



- (a) Disconnect the B11 battery ECU connector.
- (b) Measure the resistance of the DLC3.

Standard resistance

Tester Connection	Condition	Specified Condition
D1-6 (CANH) - D1-14 (CANL)	Power switch OFF	108 to 132 Ω

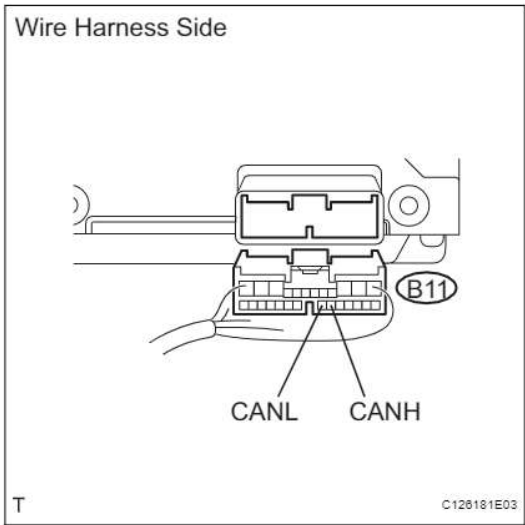
OK

REPLACE BATTERY ECU

NG

7

CHECK CAN BUS LINES FOR SHORT CIRCUIT (BATTERY ECU - J/C1)



- (a) Disconnect the J15 J/C1 connector.
(b) Measure the resistance of the wire harness side connector.

Standard resistance

Tester Connection	Condition	Specified Condition
B11-18 (CANH) - B11-19 (CANL)	Power switch OFF	1 MΩ or more

HINT:
Measure the resistance with the B11 battery ECU connector disconnected.

NG

REPLACE CAN MAIN WIRE AND
CONNECTOR (BATTERY ECU - J/C1)

OK

8

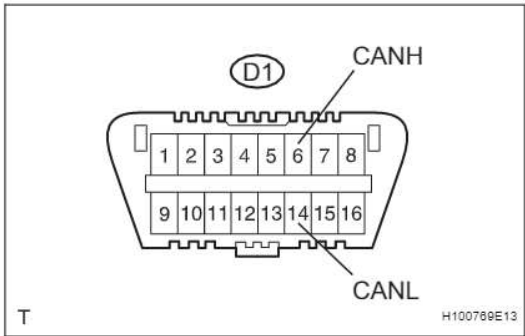
CONNECT CONNECTOR

- (a) Reconnect the B11 battery ECU connector and J15 J/C1 connector.

NEXT

9

CHECK CAN BUS LINES FOR SHORT CIRCUIT (POWER STEERING ECU)



- (a) Disconnect the P8 power steering ECU connector.
(b) Measure the resistance of the DLC3.

Standard resistance

Tester Connection	Condition	Specified Condition
D1-6 (CANH) - D1-14 (CANL)	Power switch OFF	54 to 69 Ω

OK

REPLACE POWER STEERING ECU

NG

CA-56

CAN COMMUNICATION – CAN COMMUNICATION SYSTEM

10

CHECK CAN BUS LINES FOR SHORT CIRCUIT (POWER STEERING ECU BRANCH WIRE)



(a) Disconnect the J15 J/C1 connector.

(b) Measure the resistance of the wire harness side connector.

Standard resistance

Tester Connection	Condition	Specified Condition
P8-1 (CANH) - P8-7 (CANL)	Power switch OFF	1 MΩ or more

HINT:
Measure the resistance with the P8 power steering ECU connector disconnected.

NG

REPLACE POWER STEERING ECU BRANCH WIRE AND CONNECTOR (CANH, CANL)

OK

11

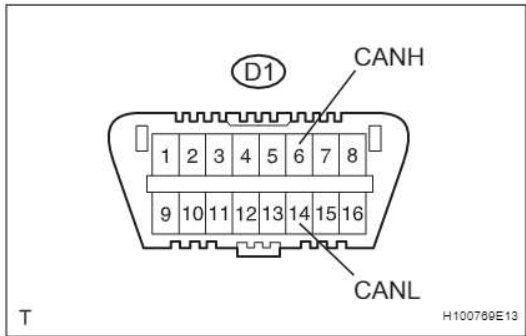
CONNECT CONNECTOR

- (a) Reconnect the P8 power steering ECU connector and J15 J/C1 connector.

NEXT

12

CHECK CAN BUS LINES FOR SHORT CIRCUIT (STEERING ANGLE SENSOR)



NOTICE:
For vehicles without enhanced VSC, go to "CHECK CAN BUS LINES FOR SHORT CIRCUIT (SKID CONTROL ECU)".

(a) Disconnect the S13 steering angle sensor connector.

(b) Measure the resistance of the DLC3.

Standard resistance

Tester Connection	Condition	Specified Condition
D1-6 (CANH) - D1-14 (CANL)	Power switch OFF	54 to 69 Ω

OK

REPLACE STEERING ANGLE SENSOR

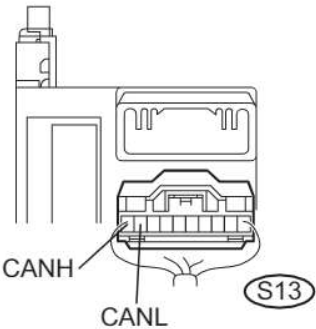
CA

NG

13

CHECK CAN BUS LINES FOR SHORT CIRCUIT (STEERING ANGLE SENSOR BRANCH WIRE)

Wire Harness Side



T

C126177E01

- (a) Disconnect the J15 J/C1 connector.
- (b) Measure the resistance of the wire harness side connector.

Standard resistance

Tester Connection	Condition	Specified Condition
S13-10 (CANH) - S13-9 (CANL)	Power switch OFF	1 MΩ or more

HINT:
Measure the resistance with the S13 steering angle sensor connector disconnected.

NG

REPLACE STEERING ANGLE SENSOR
BRANCH WIRE AND CONNECTOR (CANH,
CANL)

OK

14

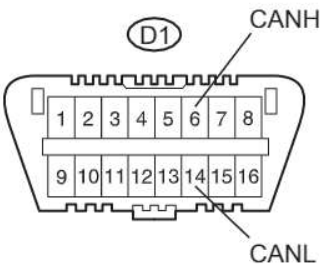
CONNECT CONNECTOR

- (a) Reconnect the S13 steering angle sensor connector and J15 J/C1 connector.

NEXT

15

CHECK CAN BUS LINES FOR SHORT CIRCUIT (SKID CONTROL ECU)



T

H100769E13

- (a) Disconnect the S8 skid control ECU connector.
- (b) Measure the resistance of the DLC3.

Standard resistance

Tester Connection	Condition	Specified Condition
D1-6 (CANH) - D1-14 (CANL)	Power switch OFF	54 to 69 Ω

OK

REPLACE SKID CONTROL ECU

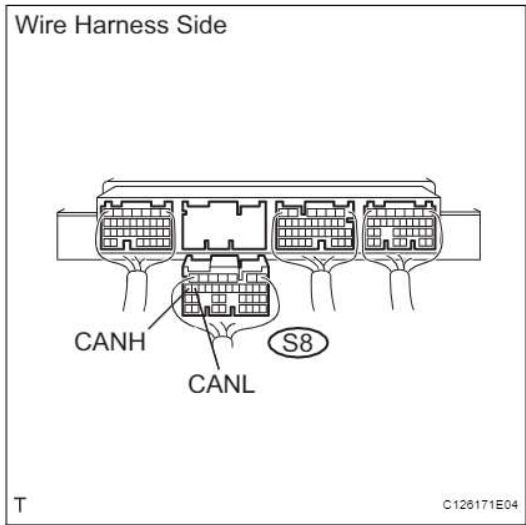
NG

CA-58

CAN COMMUNICATION – CAN COMMUNICATION SYSTEM

16

CHECK CAN BUS LINES FOR SHORT CIRCUIT (SKID CONTROL ECU BRANCH WIRE)



- (a) Disconnect the J15 J/C1 connector.
(b) Measure the resistance of the wire harness side connector.

Standard resistance

Tester Connection	Condition	Specified Condition
S8-19 (CANH) - S8-18 (CANL)	Power switch OFF	1 MΩ or more

HINT:
Measure the resistance with the S8 skid control ECU connector disconnected.

NG

REPLACE SKID CONTROL ECU BRANCH WIRE AND CONNECTOR

OK

REPLACE JUNCTION CONNECTOR (J/C1)

17

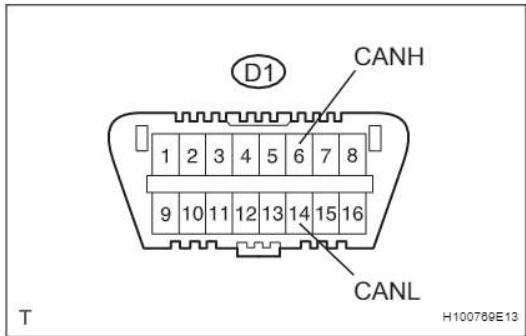
CONNECT CONNECTOR

- (a) Reconnect the J18 J/C2 connector.

NEXT

18

CHECK CAN BUS LINES FOR SHORT CIRCUIT (ECM)



- (a) Disconnect the E6 ECM connector.
(b) Measure the resistance of the DLC3.

Standard resistance

Tester Connection	Condition	Specified Condition
D1-6 (CANH) - D1-14 (CANL)	Power switch OFF	108 to 132 Ω

OK

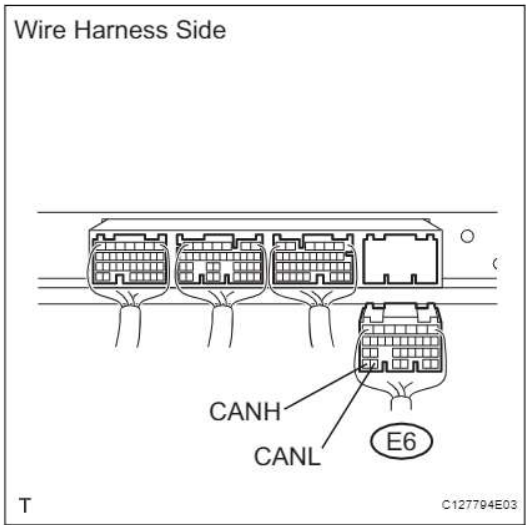
REPLACE ECM

CA

NG

19

CHECK CAN BUS LINES FOR SHORT CIRCUIT (ECM - J/C2)



- (a) Disconnect the J18 J/C2 connector.
(b) Measure the resistance of the wire harness side connector.

Standard resistance

Tester Connection	Condition	Specified Condition
E6-31 (CANH) - E6-30 (CANL)	Power switch OFF	1 MΩ or more

HINT:
Measure the resistance with the E6 ECM connector disconnected.

NG

REPLACE CAN MAIN WIRE AND CONNECTOR (ECM - J/C2)

OK

20

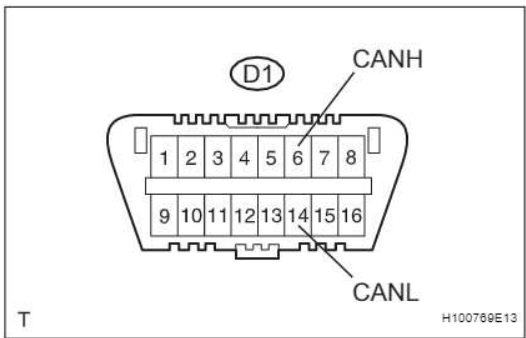
CONNECT CONNECTOR

- (a) Reconnect the E6 ECM connector and J18 J/C2 connector.

NEXT

21

CHECK CAN BUS LINES FOR SHORT CIRCUIT (YAW RATE SENSOR)



NOTICE:
For vehicles without enhanced VSC, go to "CHECK CAN BUS LINES FOR SHORT CIRCUIT (HYBRID VEHICLE CONTROL ECU)".

- (a) Disconnect the Y1 yaw rate sensor connector.
(b) Measure the resistance of the DLC3.

Standard resistance

Tester Connection	Condition	Specified Condition
D1-6 (CANH) - D1-14 (CANL)	Power switch OFF	54 to 69 Ω

OK

REPLACE YAW RATE SENSOR

NG

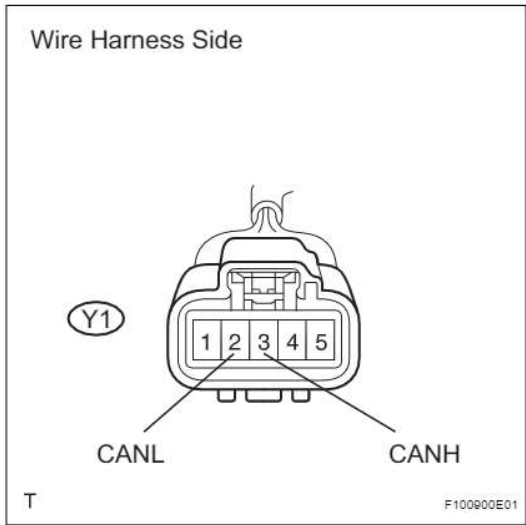
CA

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CAN COMMUNICATION – CAN COMMUNICATION SYSTEM

22

CHECK CAN BUS LINES FOR SHORT CIRCUIT (YAW RATE SENSOR BRANCH WIRE)



- (a) Disconnect the J18 J/C2 connector.
(b) Measure the resistance of the wire harness side connector.

Standard resistance

Tester Connection	Condition	Specified Condition
Y1-3 (CANH) - Y1-2 (CANL)	Power switch OFF	1 MΩ or more

HINT:
Measure the resistance with the Y1 yaw rate sensor connector disconnected.

NG

REPLACE YAW RATE SENSOR BRANCH WIRE AND CONNECTOR (CANH, CANL)

OK

23

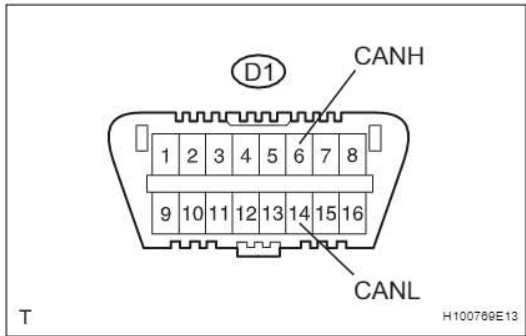
CONNECT CONNECTOR

- (a) Reconnect the Y1 yaw rate sensor connector and J18 J/C2 connector.

NEXT

24

CHECK CAN BUS LINES FOR SHORT CIRCUIT (HYBRID VEHICLE CONTROL ECU)



- (a) Disconnect the H14 hybrid vehicle control ECU connector.
(b) Measure the resistance of the DLC3.

Standard resistance

Tester Connection	Condition	Specified Condition
D1-6 (CANH) - D1-14 (CANL)	Power switch OFF	54 to 69 Ω

OK

REPLACE HYBRID VEHICLE CONTROL ECU

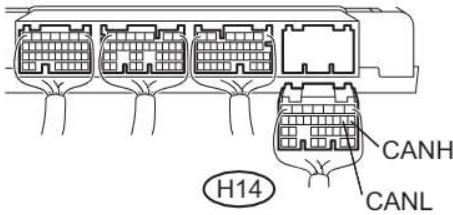
NG

CA

25

CHECK CAN BUS LINES FOR SHORT CIRCUIT (HYBRID VEHICLE CONTROL ECU BRANCH WIRE)

Wire Harness Side



- (a) Disconnect the J18 J/C2 connector.
- (b) Measure the resistance of the wire harness side connector.

Standard resistance

Tester Connection	Condition	Specified Condition
H14-8 (CANH) - H14-9 (CANL)	Power switch OFF	1 MΩ or more

HINT:
Measure the resistance with the H14 hybrid vehicle control ECU connector disconnected.

NG

REPLACE HYBRID VEHICLE CONTROL ECU BRANCH WIRE AND CONNECTOR (CANH, CANL)

OK

26

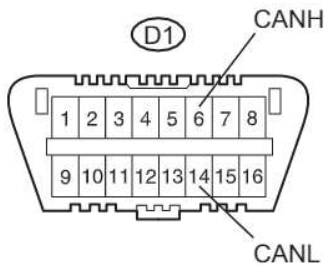
CONNECT CONNECTOR

- (a) Reconnect the H14 hybrid vehicle control ECU connector and J18 J/C2 connector.

NEXT

27

CHECK CAN BUS LINES FOR SHORT CIRCUIT (GATEWAY ECU)



- (a) Disconnect the G1 gateway ECU connector.
- (b) Measure the resistance of the DLC3.

Standard resistance

Tester Connection	Condition	Specified Condition
D1-6 (CANH) - D1-14 (CANL)	Power switch OFF	54 to 69 Ω

OK

REPLACE GATEWAY ECU

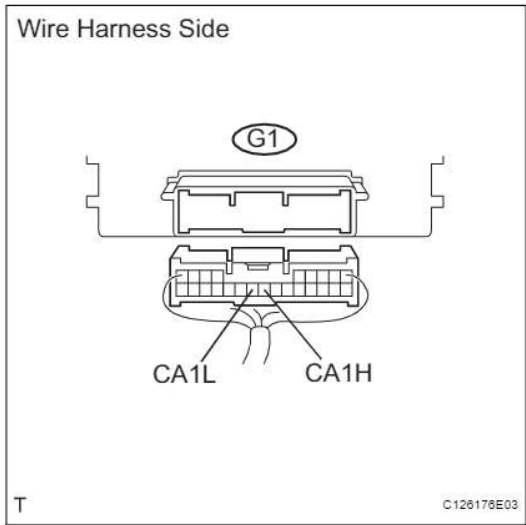
NG

CA-62

CAN COMMUNICATION – CAN COMMUNICATION SYSTEM

28

CHECK CAN BUS LINES FOR SHORT CIRCUIT (GATEWAY ECU BRANCH WIRE)



- (a) Disconnect the J18 J/C2 connector.
(b) Measure the resistance of the wire harness side connector.

Standard resistance

Tester Connection	Condition	Specified Condition
G1-17 (CA1H) - G1-18 (CA1L)	Power switch OFF	1 MΩ or more

HINT:
Measure the resistance with the G1 gateway ECU connector disconnected.

NG **REPLACE GATEWAY ECU BRANCH WIRE AND CONNECTOR (CA1H, CA1L)**

OK

REPLACE JUNCTION CONNECTOR (J/C2)

Short to B+ in CAN Bus Line

DESCRIPTION

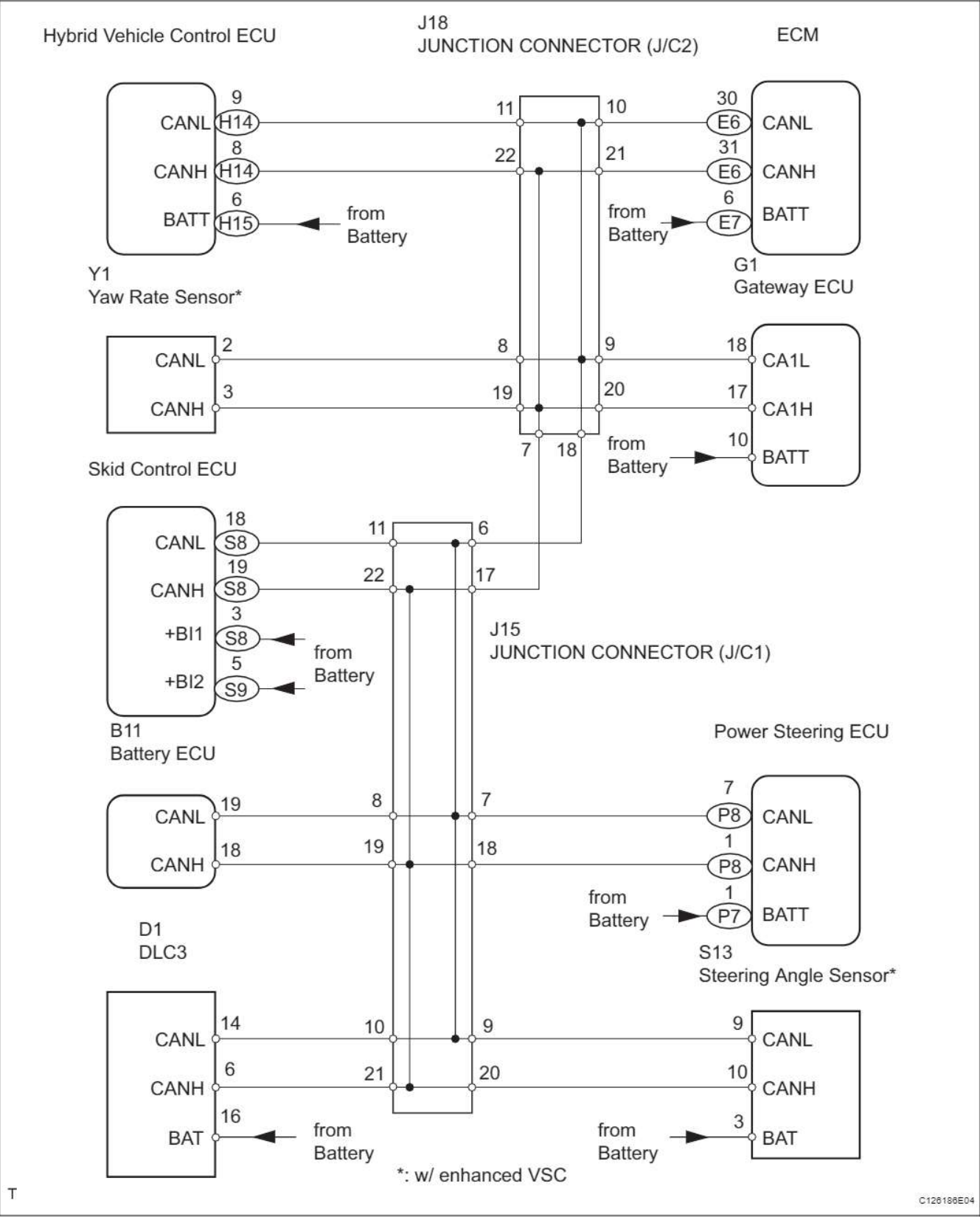
There may be a short circuit between the CAN bus line and +B when there is resistance between terminals 6 (CANH) and 16 (BAT) or terminals 14 (CANL) and 16 (BAT) of the DLC3.

Symptom	Trouble Area
There is resistance between terminals 6 (CANH) and 16 (BAT) or terminals 14 (CANL) and 16 (BAT) of the DLC3.	• Short to +B • Hybrid vehicle control ECU • Battery ECU • ECM • Skid control ECU • Steering angle sensor • Yaw rate sensor • Power steering ECU

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CAN COMMUNICATION – CAN COMMUNICATION SYSTEM

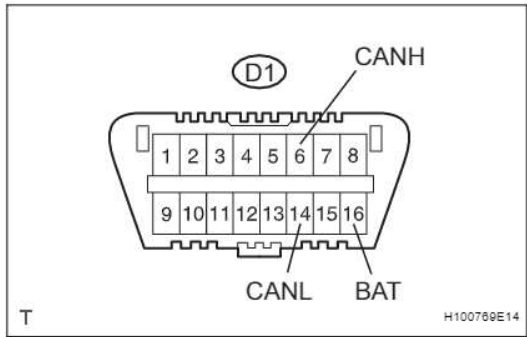
WIRING DIAGRAM



INSPECTION PROCEDURE

1

CHECK CAN BUS LINE FOR SHORT TO +B (DLC3 BRANCH WIRE)



- (a) Disconnect the J15 J/C1 connector.
(b) Measure the resistance of the DLC3.
Standard resistance

Tester Connection	Condition	Specified Condition
D1-6 (CANH) - D1-16 (BAT)	Power switch OFF	1 MΩ or more
D1-14 (CANL) - D1-16 (BAT)	Power switch OFF	1 MΩ or more

NG

REPLACE DLC3 BRANCH WIRE AND CONNECTOR (CANH, CANL)

OK

2

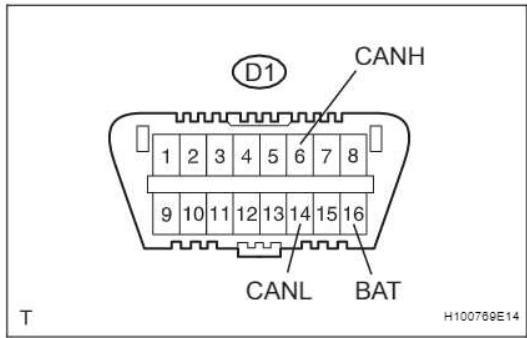
CONNECT CONNECTOR

- (a) Reconnect the J15 J/C1 connector.

NEXT

3

CHECK CAN BUS LINE FOR SHORT TO +B (CAN BUSES TO J/C2)



- (a) Disconnect the J18 J/C2 connector.
(b) Measure the resistance of the DLC3.
Standard resistance

Tester Connection	Condition	Specified Condition
D1-6 (CANH) - D1-16 (BAT)	Power switch OFF	1 MΩ or more
D1-14 (CANL) - D1-16 (BAT)	Power switch OFF	1 MΩ or more

OK

Go to step 16

NG

4

CONNECT CONNECTOR

- (a) Reconnect the J18 J/C2 connector.

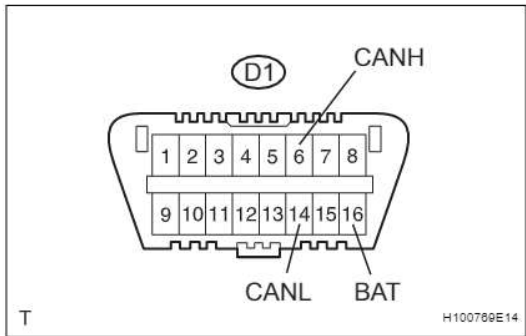
NEXT

CA-66

CAN COMMUNICATION – CAN COMMUNICATION SYSTEM

5

CHECK CAN BUS LINE FOR SHORT TO +B (BATTERY ECU)



- (a) Disconnect the B11 battery ECU connector.
(b) Measure the resistance of the DLC3.

Standard resistance

Tester Connection	Condition	Specified Condition
D1-6 (CANH) - D1-16 (BAT)	Power switch OFF	1 MΩ or more
D1-14 (CANL) - D1-16 (BAT)	Power switch OFF	1 MΩ or more

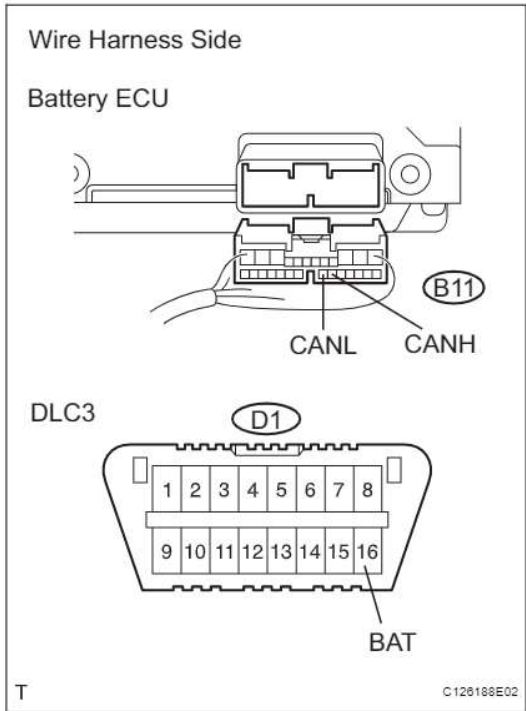
OK

REPLACE BATTERY ECU

NG

6

CHECK CAN BUS LINE FOR SHORT TO +B (BATTERY ECU - J/C1)



- (a) Disconnect the J15 J/C1 connector.
(b) Measure the resistance of the wire harness side connectors.

Standard resistance

Tester Connection	Condition	Specified Condition
B11-18 (CANH) - D1-16 (BAT)	Power switch OFF	1 MΩ or more
B11-19 (CANL) - D1-16 (BAT)	Power switch OFF	1 MΩ or more

HINT:
Measure the resistance with the B11 battery ECU connector disconnected.

NG

REPLACE CAN MAIN WIRE AND CONNECTOR (BATTERY ECU - J/C1)

OK

7

CONNECT CONNECTOR

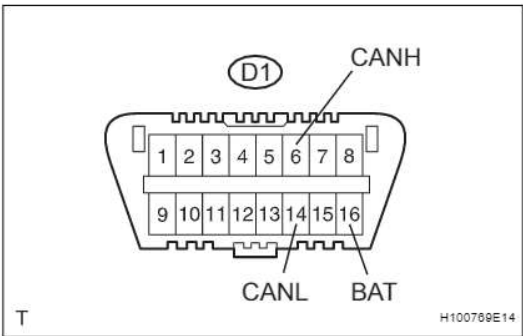
- (a) Reconnect the B11 battery ECU connector and J15 J/C1 connector.

NEXT

CA

8

CHECK CAN BUS LINE FOR SHORT TO +B (POWER STEERING ECU)



- (a) Disconnect the P8 power steering ECU connector.
(b) Measure the resistance of the DLC3.

Standard resistance

Tester Connection	Condition	Specified Condition
D1-6 (CANH) - D1-16 (BAT)	Power switch OFF	1 MΩ or more
D1-14 (CANL) - D1-16 (BAT)	Power switch OFF	1 MΩ or more

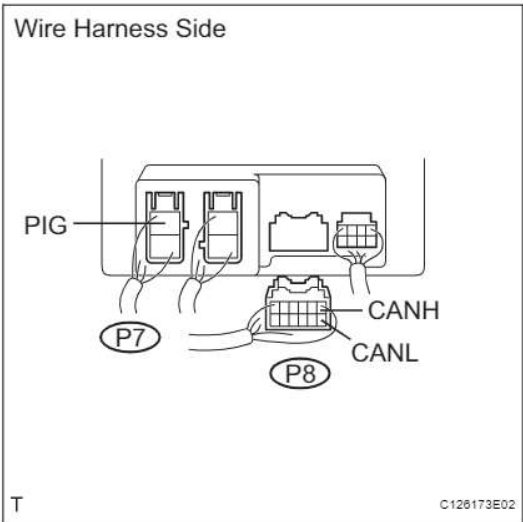
OK

REPLACE POWER STEERING ECU

NG

9

CHECK CAN BUS LINE FOR SHORT TO +B (POWER STEERING ECU BRANCH WIRE)



- (a) Disconnect the J15 J/C1 connector.
(b) Measure the resistance of the wire harness side connectors.

Standard resistance

Tester Connection	Condition	Specified Condition
P8-1 (CANH) - P7-1 (PIG)	Power switch OFF	1 MΩ or more
P8-1 (CANL) - P7-1 (PIG)	Power switch OFF	1 MΩ or more

HINT:

Measure the resistance with the P8 power steering ECU connector disconnected.

NG

REPLACE POWER STEERING ECU BRANCH WIRE AND CONNECTOR (CANH, CANL)

OK

10

CONNECT CONNECTOR

- (a) Reconnect the P8 power steering ECU and J15 J/C1 connector.

NEXT

11

CHECK CAN BUS LINE FOR SHORT TO +B (STEERING ANGLE SENSOR)

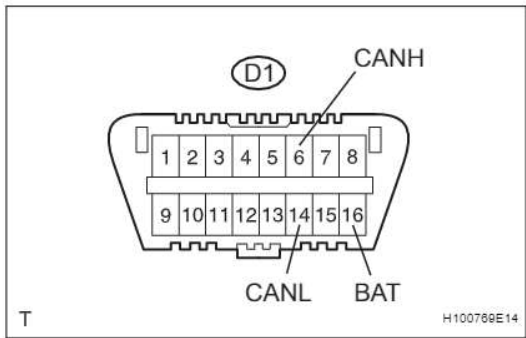
NOTICE:

For vehicles without enhanced VSC, go to "CHECK CAN BUS LINE FOR SHORT TO +B (SKID CONTROL ECU)".

CA

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CAN COMMUNICATION – CAN COMMUNICATION SYSTEM



- (a) Disconnect the S13 steering angle sensor connector.
(b) Measure the resistance of the DLC3.

Standard resistance

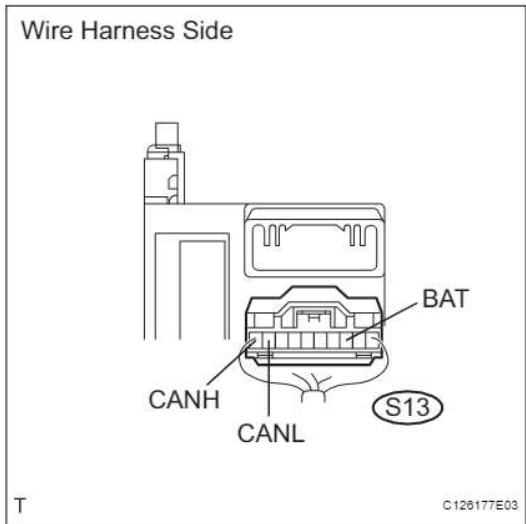
Tester Connection	Condition	Specified Condition
D1-6 (CANH) - D1-16 (BAT)	Power switch OFF	1 MΩ or more
D1-14 (CANL) - D1-16 (BAT)	Power switch OFF	1 MΩ or more

OK → REPLACE STEERING ANGLE SENSOR

NG

12

CHECK CAN BUS LINE FOR SHORT TO +B (STEERING ANGLE SENSOR BRANCH WIRE)



- (a) Disconnect the J15 J/C1 connector.
(b) Measure the resistance of the wire harness side connector.

Standard resistance

Tester Connection	Condition	Specified Condition
S13-10 (CANH) - S13-3 (BAT)	Power switch OFF	1 MΩ or more
S13-9 (CANL) - S13-3 (BAT)	Power switch OFF	1 MΩ or more

HINT:
Measure the resistance with the S13 steering angle sensor connector disconnected.

NG → REPLACE STEERING ANGLE SENSOR BRANCH WIRE AND CONNECTOR (CANH, CANL)

OK

13

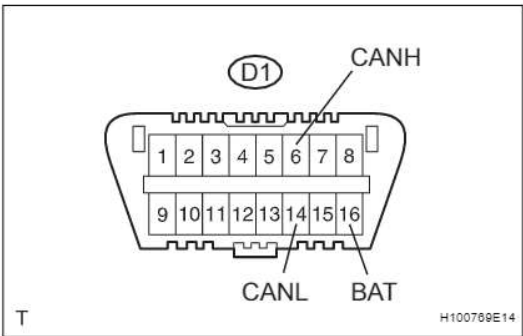
CONNECT CONNECTOR

- (a) Reconnect the S13 steering angle sensor connector and J15 J/C1 connector.

NEXT

14

CHECK CAN BUS LINE FOR SHORT TO +B (SKID CONTROL ECU)



- (a) Disconnect the A8 skid control ECU connector.
(b) Measure the resistance of the DLC3.

Standard resistance

Tester Connection	Condition	Specified Condition
D1-6 (CANH) - D1-16 (BAT)	Power switch OFF	1 MΩ or more
D1-14 (CANL) - D1-16 (BAT)	Power switch OFF	1 MΩ or more

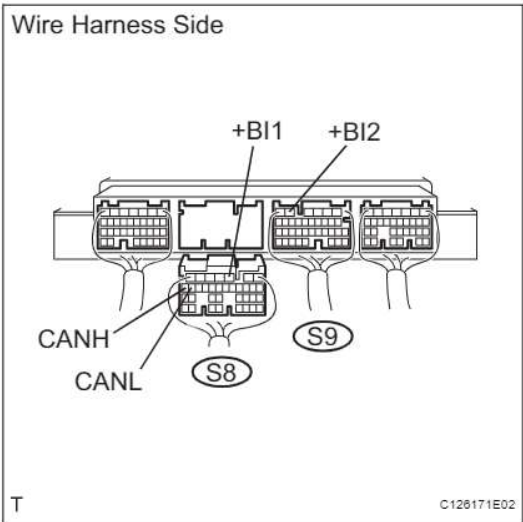
OK

REPLACE SKID CONTROL ECU

NG

15

CHECK CAN BUS LINE FOR SHORT TO +B (SKID CONTROL ECU BRANCH WIRE)



- (a) Disconnect the J15 J/C1 connector.
(b) Measure the resistance of the wire harness side connectors.

Standard resistance

Tester Connection	Condition	Specified Condition
S8-19 (CANH) - S8-3 (+BI1)	Power switch OFF	1 MΩ or more
S8-19 (CANH) - S9-5 (+BI2)		
S8-18 (CANL) - S8-3 (+BI1)	Power switch OFF	1 MΩ or more
S8-18 (CANL) - S9-5 (+BI2)		

HINT:

Measure the resistance with the S8 skid control ECU connector disconnected.

NG

REPLACE SKID CONTROL ECU BRANCH WIRE AND CONNECTOR (CANH, CANL)

OK

REPLACE CAN MAIN WIRE AND CONNECTOR (J/C1 - J/C2)

16

CONNECT CONNECTOR

- (a) Reconnect the J18 J/C2 connector.

NEXT

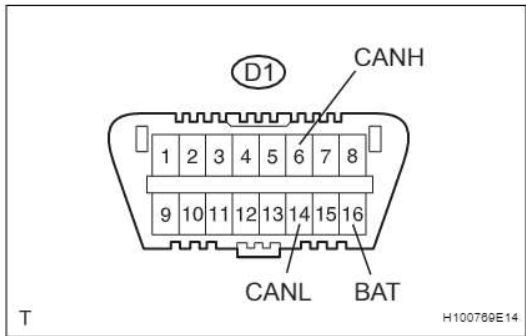
CA

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CAN COMMUNICATION – CAN COMMUNICATION SYSTEM

17

CHECK CAN BUS LINE FOR SHORT TO +B (ECM)



- (a) Disconnect the E6 ECM connector.
(b) Measure the resistance of the DLC3.

Standard resistance

Tester Connection	Condition	Specified Condition
D1-6 (CANH) - D1-16 (BAT)	Power switch OFF	1 MΩ or more
D1-14 (CANL) - D1-16 (BAT)	Power switch OFF	1 MΩ or more

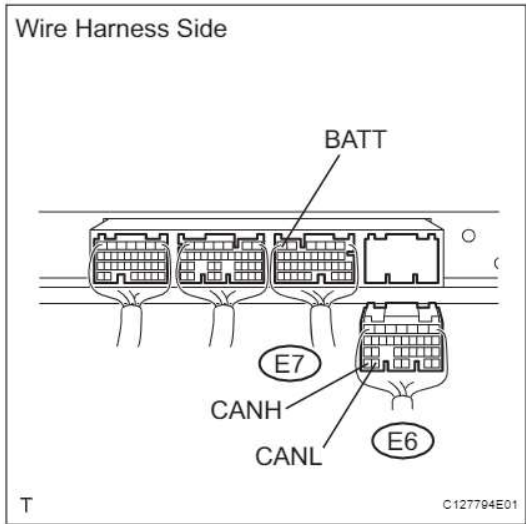
OK

REPLACE ECM

NG

18

CHECK CAN BUS LINE FOR SHORT TO +B (ECM - J/C2)



- (a) Disconnect the J18 J/C2 connector.
(b) Measure the resistance of the wire harness side connectors.

Standard resistance

Tester Connection	Condition	Specified Condition
E6-31 (CANH) - E7-6 (BATT)	Power switch OFF	1 MΩ or more
E6-30 (CANL) - E7-6 (BATT)	Power switch OFF	1 MΩ or more

HINT:
Measure the resistance with the E6 ECM connector disconnected.

NG

REPLACE CAN MAIN WIRE AND CONNECTOR (ECM - J/C2)

OK

19

CONNECT CONNECTOR

- (a) Reconnect the E6 ECM connector and J18 J/C2 connector.

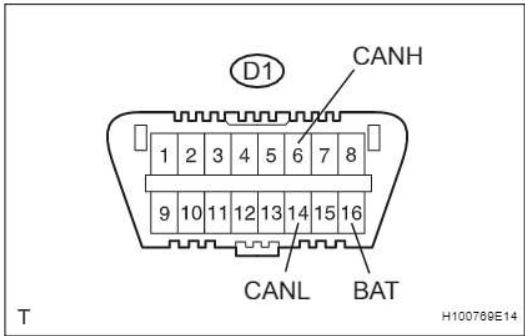
NEXT

CA

20

CHECK CAN BUS LINE FOR SHORT TO +B (YAW RATE SENSOR)

NOTICE:
For vehicles without enhanced VSC, go to "CHECK CAN BUS LINE FOR SHORT TO +B (HYBRID VEHICLE CONTROL ECU)".



- (a) Disconnect the Y1 yaw rate sensor connector.
(b) Measure the resistance of the DLC3.

Standard resistance

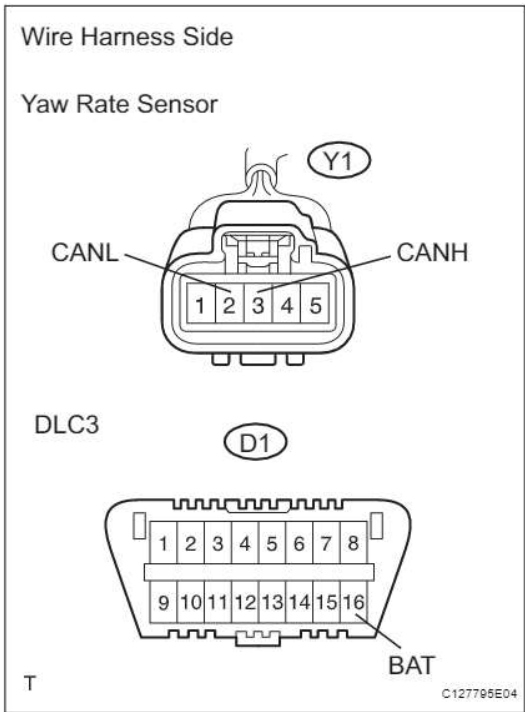
Tester Connection	Condition	Specified Condition
D1-6 (CANH) - D1-16 (BAT)	Power switch OFF	1 MΩ or more
D1-14 (CANL) - D1-16 (BAT)	Power switch OFF	1 MΩ or more

OK

REPLACE YAW RATE SENSOR

NG

21 CHECK CAN BUS LINE FOR SHORT TO +B (YAW RATE SENSOR BRANCH WIRE)



- (a) Disconnect the J18 J/C2 connector.
(b) Measure the resistance of the wire harness side connector.

Standard resistance

Tester Connection	Condition	Specified Condition
Y1-3 (CANH) - D1-16 (BAT)	Power switch OFF	1 MΩ or more
Y1-2 (CANL) - D1-16 (BAT)	Power switch OFF	1 MΩ or more

HINT:
Measure the resistance with the Y1 yaw rate sensor connector disconnected.

NG

REPLACE YAW RATE SENSOR BRANCH WIRE AND CONNECTOR

OK

22 CONNECT CONNECTOR

- (a) Reconnect the Y1 yaw rate sensor connector and J18 J/ C2 connector.

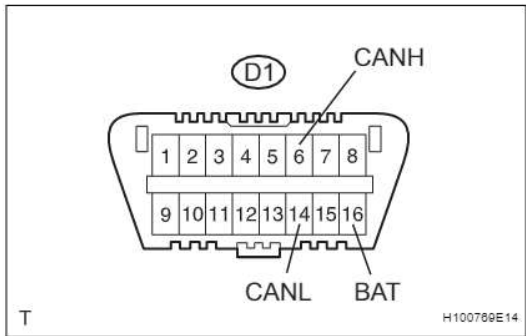
NEXT

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CAN COMMUNICATION – CAN COMMUNICATION SYSTEM

23

CHECK CAN BUS LINE FOR SHORT TO +B (HYBRID VEHICLE CONTROL ECU)



- (a) Disconnect the H14 hybrid vehicle control ECU connector.
- (b) Measure the resistance of the DLC3.

Standard resistance

Tester Connection	Condition	Specified Condition
D1-6 (CANH) - D1-16 (BAT)	Power switch OFF	1 MΩ or more
D1-14 (CANL) - D1-16 (BAT)	Power switch OFF	1 MΩ or more

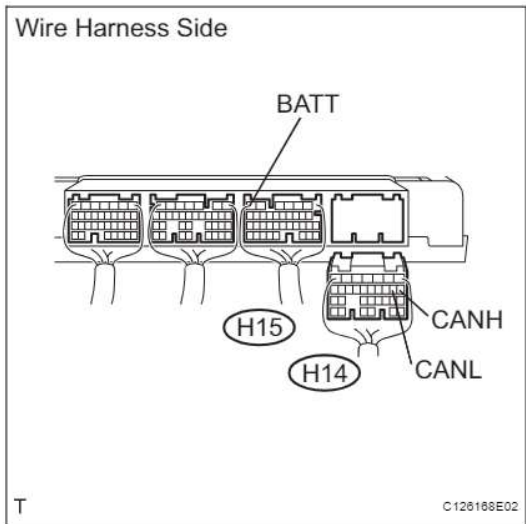
OK

REPLACE HYBRID VEHICLE CONTROL ECU

NG

24

CHECK CAN BUS LINE FOR SHORT TO +B (HYBRID VEHICLE CONTROL ECU BRANCH WIRE)



- (a) Disconnect the J18 J/C2 connector.
- (b) Measure the resistance of the wire harness side connectors.

Standard resistance

Tester Connection	Condition	Specified Condition
H14-8 (CANH) - H15-6 (BATT)	Power switch OFF	1 MΩ or more
H14-9 (CANL) - H15-6 (BATT)	Power switch OFF	1 MΩ or more

HINT:
Measure the resistance with the H14 hybrid vehicle control ECU connector disconnected.

NG

REPLACE HYBRID VEHICLE CONTROL ECU BRANCH WIRE AND CONNECTOR (CANH, CANL)

OK

25

CONNECT CONNECTOR

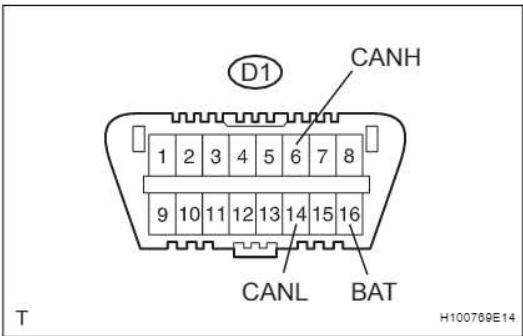
- (a) Reconnect the H14 hybrid vehicle control ECU connector and J18 J/C2 connector.

CA

NEXT

26

CHECK CAN BUS LINE FOR SHORT TO +B (GATEWAY ECU)



- (a) Disconnect the G1 gateway ECU connector.
(b) Measure the resistance of the DLC3.

Standard resistance

Tester Connection	Condition	Specified Condition
D1-6 (CANH) - D1-16 (BAT)	Power switch OFF	1 MΩ or more
D1-14 (CANL) - D1-16 (BAT)	Power switch OFF	1 MΩ or more

OK

REPLACE GATEWAY ECU

NG

REPLACE GATEWAY ECU BRANCH WIRE AND CONNECTOR

Short to GND in CAN Bus Line

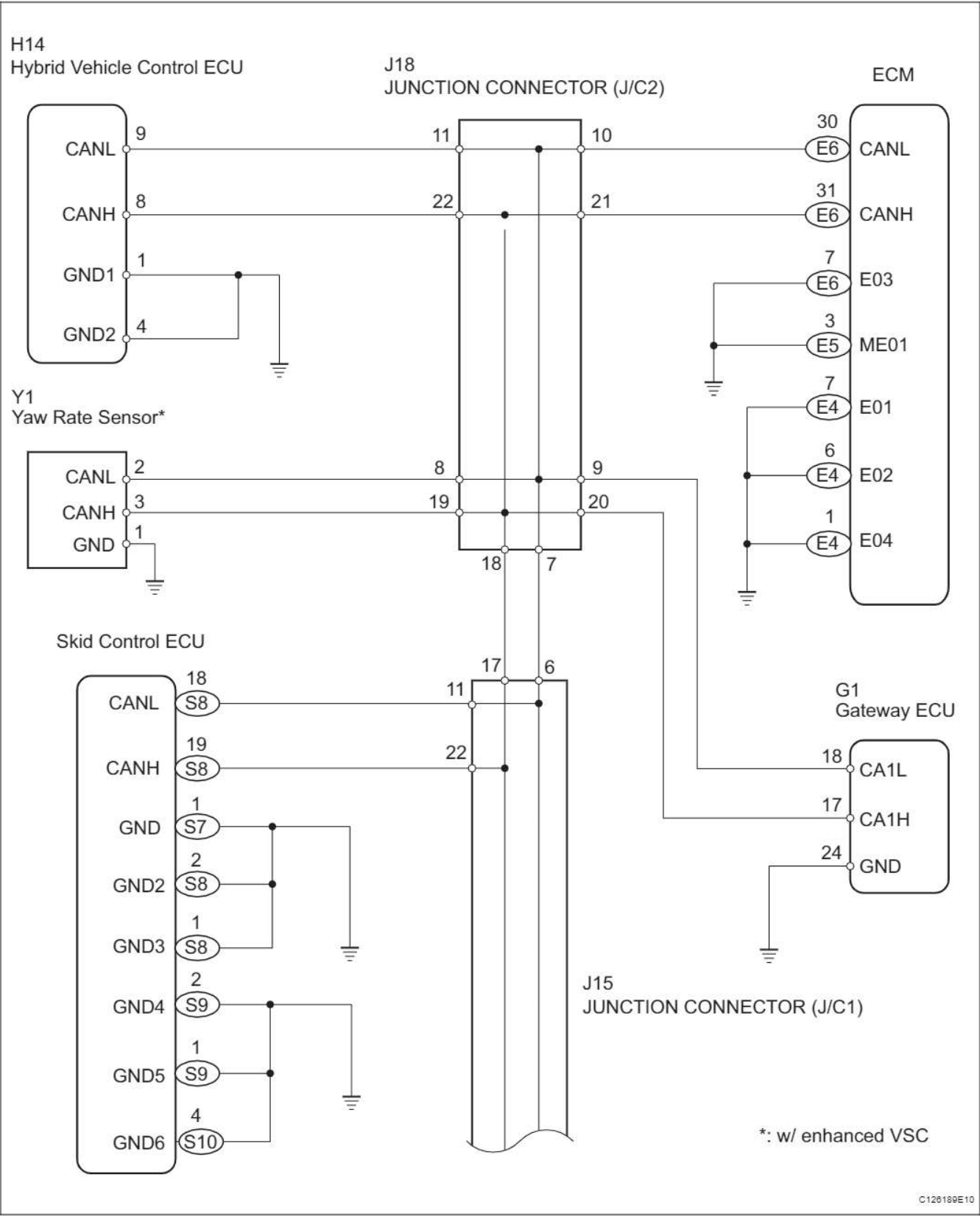
DESCRIPTION

There may be a short circuit between the CAN bus line and GND when there is resistance between terminals 6 (CANH) and 4 (CG) or terminals 14 (CANL) and 4 (CG) of the DLC3.

Symptom	Trouble Area
There is resistance between terminals 6 (CANH) and 4 (CG) or terminals 14 (CANL) and 4 (CG) of the DLC3.	• Short to GND • Hybrid vehicle control ECU • Battery ECU • ECM • Skid control ECU • Steering angle sensor • Yaw rate sensor • Power steering ECU

CAN COMMUNICATION – CAN COMMUNICATION SYSTEM

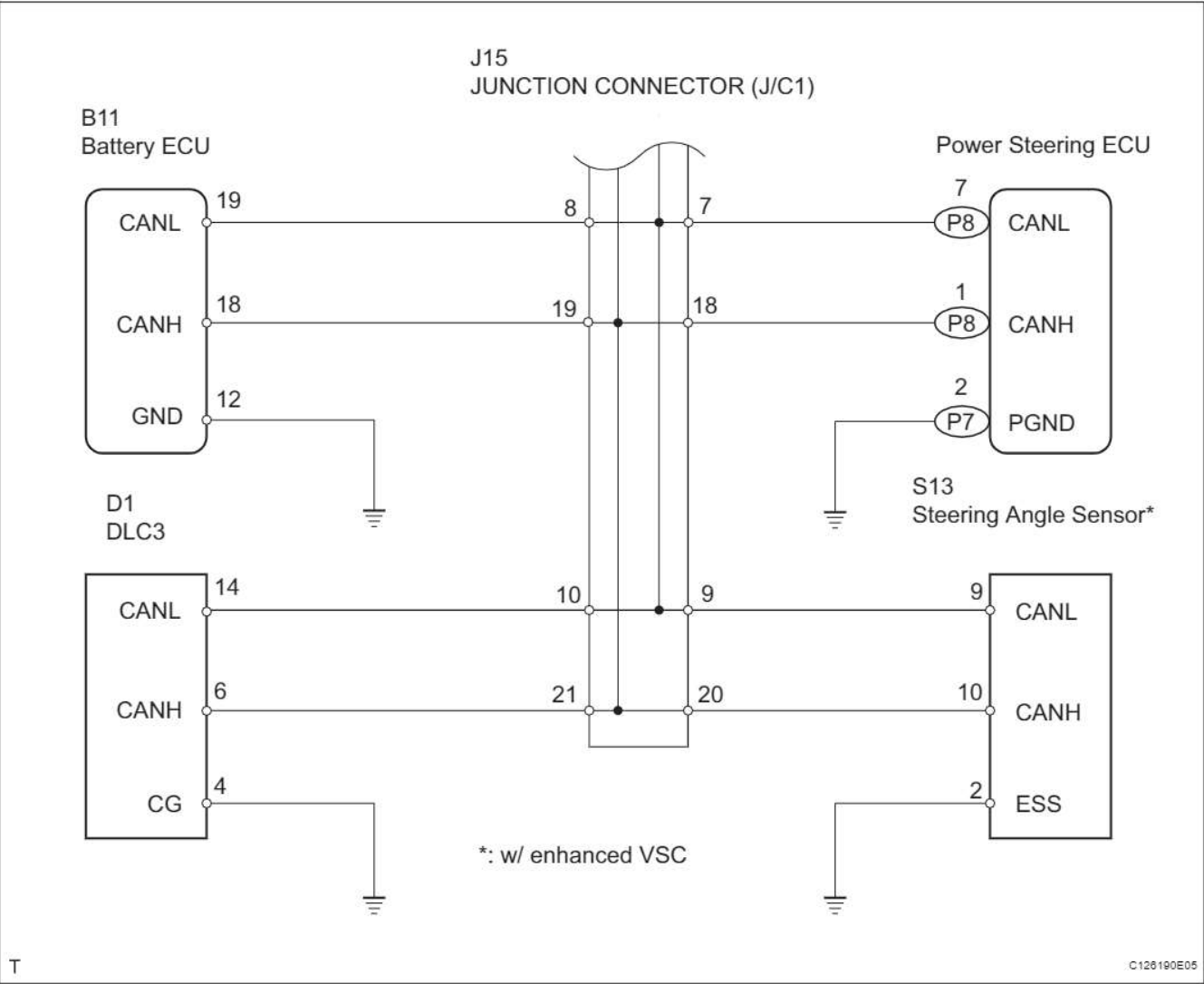
WIRING DIAGRAM



CA

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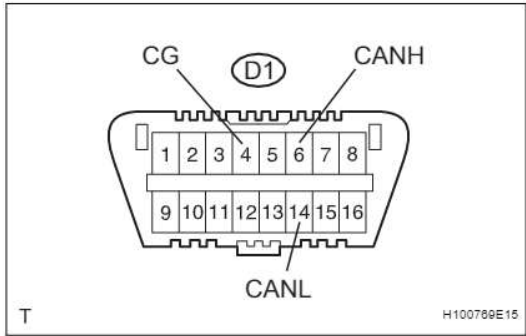
CAN COMMUNICATION – CAN COMMUNICATION SYSTEM



INSPECTION PROCEDURE

1

CHECK CAN BUS LINE FOR SHORT TO GND (DLC3 BRANCH WIRE)



- (a) Disconnect the J15 J/C1 connector.
- (b) Measure the resistance of the DLC3.

Standard resistance

Tester Connection	Condition	Specified Condition
D1-6 (CANH) - D1-4 (CG)	Power switch OFF	1 MΩ or more
D1-14 (CANL) - D1-4 (CG)	Power switch OFF	1 MΩ or more

NG

REPLACE DLC3 BRANCH WIRE AND CONNECTOR (CANH, CANL)

OK

2

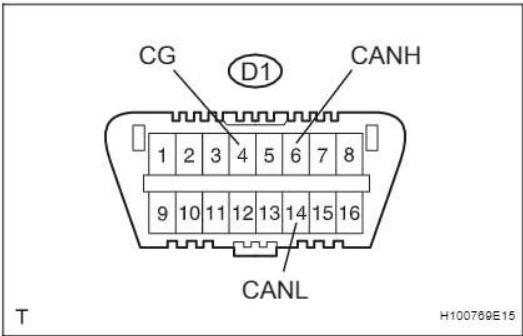
CONNECT CONNECTOR

(a) Reconnect the J15 J/C1 connector.

NEXT

3

CHECK CAN BUS LINE FOR SHORT TO GND (CAN BUSES TO J/C2)



- (a) Disconnect the J18 J/C2 connector.
(b) Measure the resistance of the DLC3.

Standard resistance

Tester Connection	Condition	Specified Condition
D1-6 (CANH) - D1-4 (CG)	Power switch OFF	1 kΩ or more
D1-14 (CANL) - D1-4 (CG)	Power switch OFF	1 kΩ or more

OK

Go to step 16

NG

4

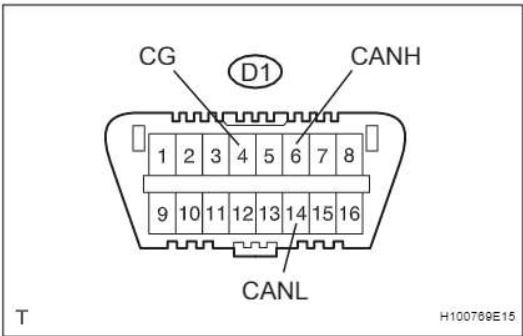
CONNECT CONNECTOR

(a) Reconnect the J18 J/C2 connector.

NEXT

5

CHECK CAN BUS LINE FOR SHORT TO GND (BATTERY ECU)



- (a) Disconnect the B11 battery ECU connector.
(b) Measure the resistance of the DLC3.

Standard resistance

Tester Connection	Condition	Specified Condition
D1-6 (CANH) - D1-4 (CG)	Power switch OFF	1 kΩ or more
D1-14 (CANL) - D1-4 (CG)	Power switch OFF	1 kΩ or more

OK

REPLACE BATTERY ECU

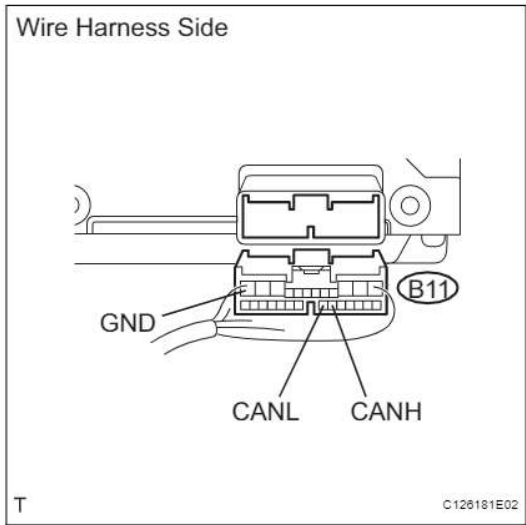
NG

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CAN COMMUNICATION – CAN COMMUNICATION SYSTEM

6

CHECK CAN BUS LINE FOR SHORT TO GND (BATTERY ECU - J/C1)



- (a) Disconnect the J15 J/C1 connector.
- (b) Measure the resistance of the wire harness side connector.

Standard resistance

Tester Connection	Condition	Specified Condition
B11-18 (CANH) - B11-12 (GND)	Power switch OFF	1 MΩ or more
B11-19 (CANL) - B11-12 (GND)	Power switch OFF	1 MΩ or more

HINT:
Measure the resistance with the B11 battery ECU connector disconnected.

NG

REPLACE CAN MAIN WIRE AND CONNECTOR (BATTERY ECU - J/C1)

OK

7

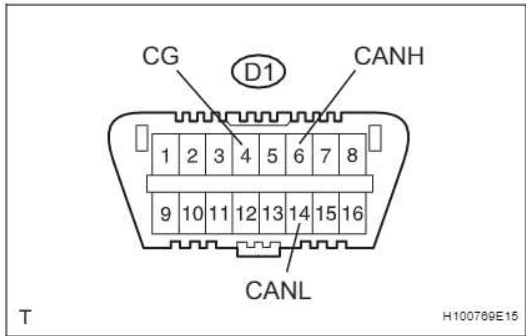
CONNECT CONNECTOR

- (a) Reconnect the B11 battery ECU connector and J15 J/C1 connector.

NEXT

8

CHECK CAN BUS LINE FOR SHORT TO GND (POWER STEERING ECU)



- (a) Disconnect the P8 power steering ECU connector.
- (b) Measure the resistance of the DLC3.

Standard resistance

Tester Connection	Condition	Specified Condition
D1-6 (CANH) - D1-4 (CG)	Power switch OFF	1 kΩ or more
D1-14 (CANL) - D1-4 (CG)	Power switch OFF	1 kΩ or more

OK

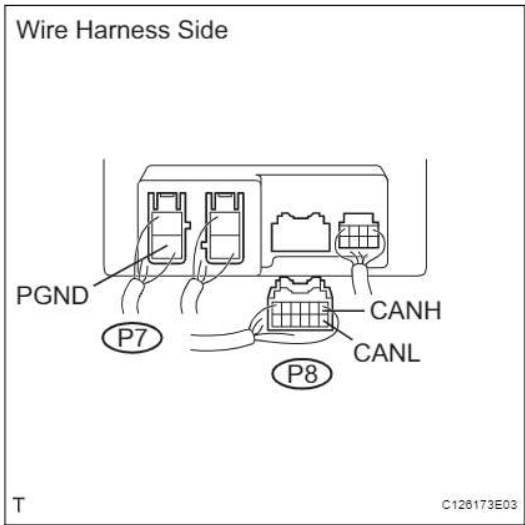
REPLACE POWER STEERING ECU

NG

CA

9

CHECK CAN BUS LINE FOR SHORT TO GND (POWER STEERING ECU BRANCH WIRE)



- (a) Disconnect the J15 J/C1 connector.
(b) Measure the resistance of the wire harness side connectors.

Standard resistance

Tester Connection	Condition	Specified Condition
P8-1 (CANH) - P7-2 (PGND)	Power switch OFF	1 MΩ or more
P8-7 (CANL) - P7-2 (PGND)	Power switch OFF	1 MΩ or more

HINT:
Measure the resistance with the P8 power steering ECU connector disconnected.

NG ➞ REPLACE POWER STEERING ECU BRANCH WIRE AND CONNECTOR (CANH, CANL)

OK

10

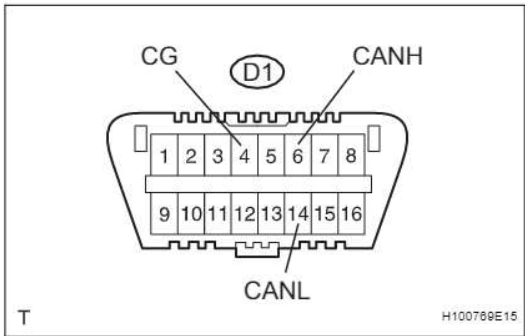
CONNECT CONNECTOR

- (a) Reconnect the P8 power steering ECU connector and J15 J/C1 connector.

NEXT

11

CHECK CAN BUS LINE FOR SHORT TO GND (STEERING ANGLE SENSOR)



- NOTICE:
For vehicles without enhanced VSC, go to "CHECK CAN BUS LINE FOR SHORT TO GND (SKID CONTROL ECU)".
- (a) Disconnect the S13 steering angle sensor connector.
(b) Measure the resistance of the DLC3.

Standard resistance

Tester Connection	Condition	Specified Condition
D1-6 (CANH) - D1-4 (CG)	Power switch OFF	1 kΩ or more
D1-14 (CANL) - D1-4 (CG)	Power switch OFF	1 kΩ or more

OK ➞ REPLACE STEERING ANGLE SENSOR

NG

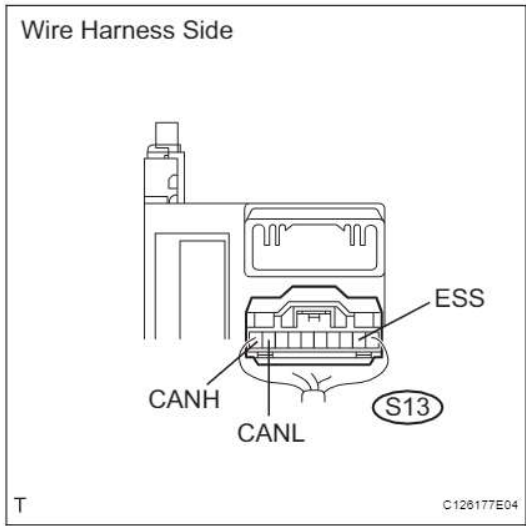
CA

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CAN COMMUNICATION – CAN COMMUNICATION SYSTEM

12

CHECK CAN BUS LINE FOR SHORT TO GND (STEERING ANGLE SENSOR BRANCH WIRE)



- (a) Disconnect the J15 J/C1 connector.
(b) Measure the resistance of the wire harness side connector.

Standard resistance

Tester Connection	Condition	Specified Condition
S13-10 (CANH) - S13-2 (ESS)	Power switch OFF	1 MΩ or more
S13-9 (CANL) - S13-2 (ESS)	Power switch OFF	1 MΩ or more

HINT:
Measure the resistance with the S13 steering angle sensor connector disconnected.

NG

REPLACE STEERING ANGLE SENSOR BRANCH WIRE AND CONNECTOR (CANH, CANL)

OK

13

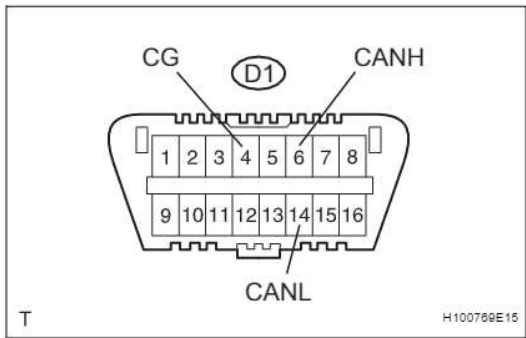
CONNECT CONNECTOR

- (a) Reconnect the S13 steering angle sensor connector and J15 J/C1 connector.

NEXT

14

CHECK CAN BUS LINE FOR SHORT TO GND (SKID CONTROL ECU)



- (a) Disconnect the S8 skid control ECU connector.
(b) Measure the resistance of the DLC3.

Standard resistance

Tester Connection	Condition	Specified Condition
D1-6 (CANH) - D1-4 (CG)	Power switch OFF	1 kΩ or more
D1-14 (CANL) - D1-4 (CG)	Power switch OFF	1 kΩ or more

OK

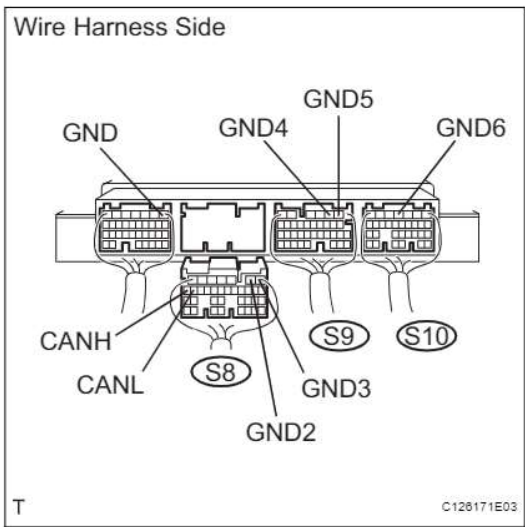
REPLACE SKID CONTROL ECU

NG

CA

15

CHECK CAN BUS LINE FOR SHORT TO GND (SKID CONTROL ECU BRANCH WIRE)



- (a) Disconnect the J15 J/C1 connector.
(b) Measure the resistance of the wire harness side connectors.

Standard resistance

Tester Connection	Condition	Specified Condition
S8-19 (CANH) - S7-1 (GND)	Power switch OFF	1 MΩ or more
S8-19 (CANH) - S8-2 (GND2)		
S8-19 (CANH) - S8-1 (GND3)		
S8-19 (CANH) - S9-2 (GND4)		
S8-19 (CANH) - S9-1 (GND5)		
S8-19 (CANH) - S10-4 (GND6)		
S8-18 (CANL) - S7-1 (GND)	Power switch OFF	1 MΩ or more
S8-18 (CANL) - S8-2 (GND2)		
S8-18 (CANL) - S8-1 (GND3)		
S8-18 (CANL) - S9-2 (GND4)		
S8-18 (CANL) - S9-1 (GND5)		
S8-18 (CANL) - S10-4 (GND6)		

HINT:
Measure the resistance with the S8 skid control ECU connector disconnected.

NG

REPLACE SKID CONTROL ECU BRANCH WIRE AND CONNECTOR (CANH, CANL)

OK

REPLACE CAN MAIN WIRE AND CONNECTOR (J/C1 - J/C2)

16

CONNECT CONNECTOR

- (a) Reconnect the J18 J/C2 connector.

NEXT

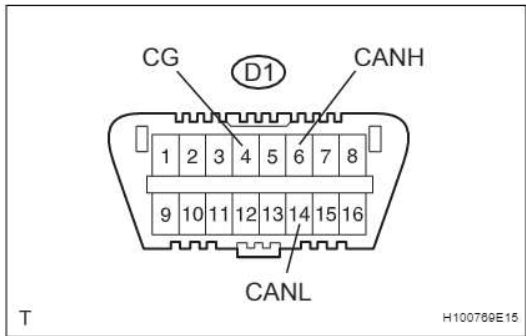
CA

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CAN COMMUNICATION – CAN COMMUNICATION SYSTEM

17

CHECK CAN BUS LINE FOR SHORT TO GND (ECM)



- (a) Disconnect the E6 ECM connector.
- (b) Measure the resistance of the DLC3.

Standard resistance

Tester Connection	Condition	Specified Condition
D1-6 (CANH) - D1-4 (CG)	Power switch OFF	1 kΩ or more
D1-14 (CANL) - D1-4 (CG)	Power switch OFF	1 kΩ or more

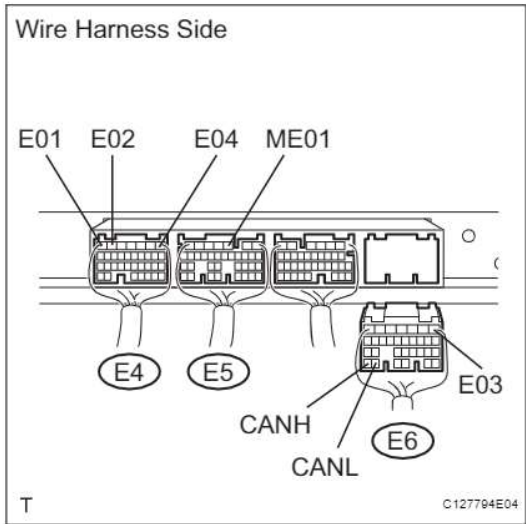
OK

REPLACE ECM

NG

18

CHECK CAN BUS LINE FOR SHORT TO GND (ECM - J/C2)



- (a) Disconnect the J18 J/C2 connector.
- (b) Measure the resistance of the wire harness side connectors.

Standard resistance

Tester Connection	Condition	Specified Condition
E6-31 (CANH) - E4-7 (E01)	Power switch OFF	1 MΩ or more
E6-31 (CANH) - E4-6 (E02)		
E6-31 (CANH) - E6-7 (E03)		
E6-31 (CANH) - E4-1 (E04)		
E6-31 (CANH) - E5-3 (ME01)	Power switch OFF	1 MΩ or more
E6-30 (CANL) - E4-7 (E01)		
E6-30 (CANL) - E4-6 (E02)		
E6-30 (CANL) - E6-7 (E03)		
E6-30 (CANL) - E4-1 (E04)		
E6-30 (CANL) - E5-3 (ME01)		

HINT:
Measure the resistance with the E6 ECM connector disconnected.

NG

REPLACE CAN MAIN WIRE AND CONNECTOR (ECM - J/C2)

OK

19

CONNECT CONNECTOR

- (a) Reconnect the E6 ECM connector and J18 J/C2 connector.

NEXT

20

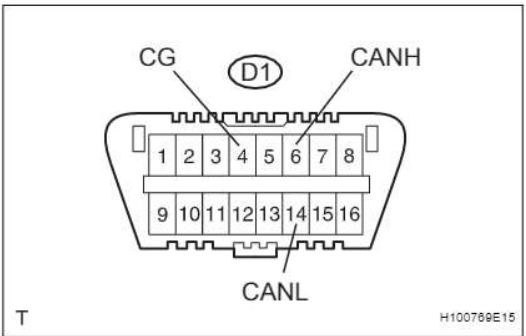
CHECK CAN BUS LINE FOR SHORT TO GND (YAW RATE SENSOR)

NOTICE:
For vehicles without enhanced VSC, go to "CHECK CAN BUS LINE FOR SHORT TO GND (HYBRID VEHICLE CONTROL ECU)".

- (a) Disconnect the Y1 yaw rate sensor connector.
(b) Measure the resistance of the DLC3.

Standard resistance

Tester Connection	Condition	Specified Condition
D1-6 (CANH) - D1-4 (CG)	Power switch OFF	1 kΩ or more
D1-14 (CANL) - D1-4 (CG)	Power switch OFF	1 kΩ or more



OK

REPLACE YAW RATE SENSOR

NG

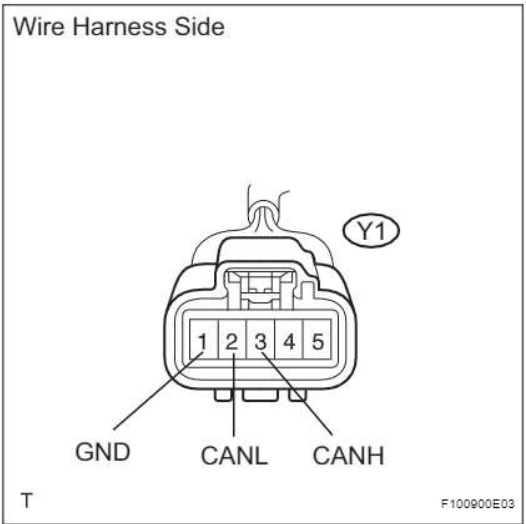
21

CHECK CAN BUS LINE FOR SHORT TO GND (YAW RATE SENSOR BRANCH WIRE)

- (a) Disconnect the J18 J/C2 connector.
(b) Measure the resistance of the wire harness side connector.

Standard resistance

Tester Connection	Condition	Specified Condition
Y1-3 (CANH) - Y1-1 (GND)	Power switch OFF	1 MΩ or more
Y1-2 (CANL) - Y1-1 (GND)	Power switch OFF	1 MΩ or more



HINT:
Measure the resistance with the Y1 yaw rate sensor connector disconnected.

NG

REPLACE YAW RATE SENSOR BRANCH WIRE AND CONNECTOR (CANH, CANL)

OK

22

CONNECT CONNECTOR

- (a) Reconnect the Y1 yaw rate sensor connector and J18 J/C2 connector.

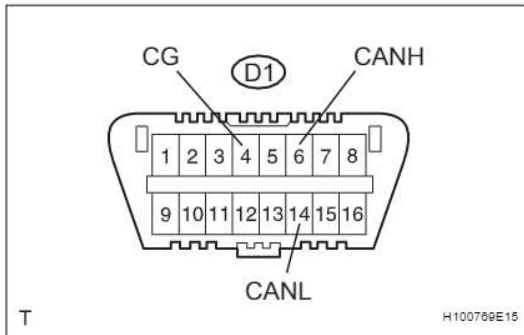
CA-84

CAN COMMUNICATION – CAN COMMUNICATION SYSTEM

NEXT

23

CHECK CAN BUS LINE FOR SHORT TO GND (HYBRID VEHICLE CONTROL ECU)



- (a) Disconnect the H14 hybrid vehicle control ECU connector.
- (b) Measure the resistance of the DLC3.

Standard resistance

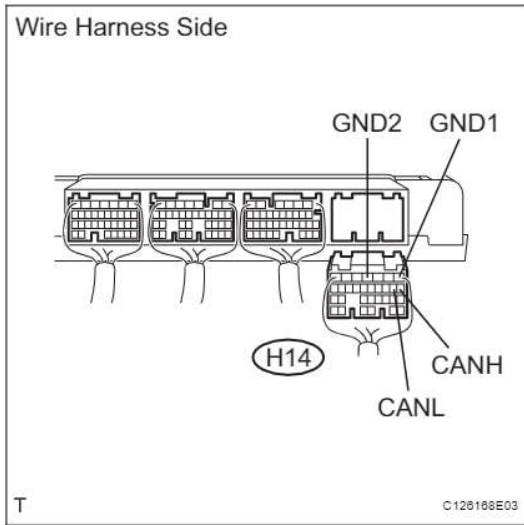
Tester Connection	Condition	Specified Condition
D1-6 (CANH) - D1-4 (CG)	Power switch OFF	1 kΩ or more
D11-14 (CANL) - D1-4 (CG)	Power switch OFF	1 kΩ or more

OK → REPLACE HYBRID VEHICLE CONTROL ECU

NG

24

CHECK CAN BUS LINE FOR SHORT TO GND (HYBRID VEHICLE CONTROL ECU BRANCH WIRE)



- (a) Disconnect the J18 J/C2 connector.
- (b) Measure the resistance of the wire harness side connector.

Standard resistance

Tester Connection	Condition	Specified Condition
H14-8 (CANH) - H14-1 (GND1)	Power switch OFF	1 MΩ or more
H14-8 (CANH) - H14-4 (GND2)		
14-9 (CANL) - H14-1 (GND1)	Power switch OFF	1 MΩ or more
14-9 (CANL) - H14-4 (GND2)		

HINT:
Measure the resistance with the H14 hybrid vehicle control ECU connector disconnected.

NG → REPLACE HYBRID VEHICLE CONTROL ECU BRANCH WIRE AND CONNECTOR (CANH, CANL)

OK

CA 25

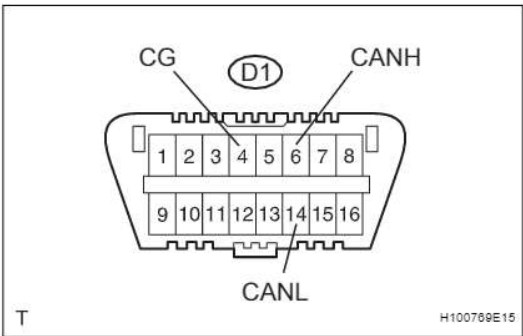
CONNECT CONNECTOR

- (a) Reconnect the H14 hybrid vehicle control ECU connector and J18 J/C2 connector.

NEXT

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CHECK CAN BUS LINE FOR SHORT TO GND (GATEWAY ECU)



- (a) Disconnect the G1 gateway ECU connector.
(b) Measure the resistance of the DLC3.

Standard resistance

Tester Connection	Condition	Specified Condition
D1-6 (CANH) - D1-4 (CG)	Power switch OFF	1 kΩ or more
D1-14 (CANL) - D1-4 (CG)	Power switch OFF	1 kΩ or more

OK

REPLACE GATEWAY ECU

NG

REPLACE GATEWAY ECU BRANCH WIRE AND CONNECTOR (CA1H, CA1L)