PROBLEM SYMPTOMS TABLE

RESULT LIST OF CHECK CAN BUS LINE

Symptom	Suspected Area	See page
All ECUs and sensors connected to the CAN communication system are not displayed on intelligent tester	CAN Bus Line	CA-35
The result of "CAN BUS WIRE CHECK" is "Open in CAN Main Bus Line".	Open in CAN Main Bus Line	CA-40
The result of "CAN BUS WIRE CHECK" is "Short in CAN Bus Lines".	Short in CAN Bus Lines	CA-46
The result of "CAN BUS WIRE CHECK" is "Short to B+ in CAN Bus Line".	Short to B+ in CAN Bus Line	CA-60
The result of "CAN BUS WIRE CHECK" is "Short to GND in CAN Bus Line".	Short to GND in CAN Bus Line	CA-75

COMMUNICATION STOP MODE TABLE

Symptom	Suspected Area	See page
Engine not displayed on intelligent tester.	1. ECM Communication Stop Mode	CA-32
Gateway not displayed on intelligent tester.	1. Gateway ECU Communication Stop Mode	CA-25
ABS/ VSC/ TRC not displayed on intelligent tester. *1	1. Skid control ECU Communication Stop Mode	CA-21
Yaw rate/ deceleration sensor not displayed intelligent tester. *1	1. Yaw Rate Sensor Communication Stop Mode	CA-30
Steering angle sensor not displayed on intelligent tester. *1	1. Steering Angle Sensor Communication Stop Mode	CA-27
Distance control not displayed on intelligent tester. *2	1. Distance Control ECU Communication Stop Mode	CA-23

HINT:

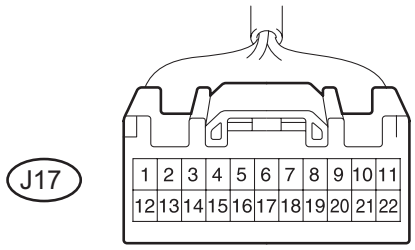
- *1: with VSC
- *2: with Dynamic radar cruise control

TERMINALS OF ECU

1. JUNCTION CONNECTOR

(a) Junction connector

Front view of wire harness connector:



T

C132298E18

with VSC

Junction Connector	Wiring Color	Connect to
J17-5 (CANH)	B	Distance control ECU(*1)
J17-16 (CANL)	W	Distance control ECU(*1)
J17-6 (CANH)	B	Network gateway ECU
J17-17 (CANL)	W	Network gateway ECU
J17-7 (CANH)	B	CAN Junction connector
J17-18 (CANL)	W	CAN Junction connector
J17-8 (CANH)	B	DLC3
J17-19 (CANL)	W	DLC3
J17-10 (CANH)	B	Skid control ECU
J17-21 (CANL)	W	Skid control ECU
J17-11 (CANH)	B	Steering angle sensor
J17-22 (CANL)	W	Steering angle sensor

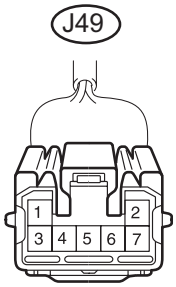
HINT:
*1: with Dynamic laser cruise control

without VSC

Junction Connector	Wiring Color	Connect to
J17-6 (CANH)	B	Network gateway ECU
J17-17 (CANL)	W	Network gateway ECU
J17-7 (CANH)	B	ECM
J17-18 (CANL)	W	ECM
J17-8 (CANH)	B	DLC3
J17-19 (CANL)	W	DLC3

(b) CAN junction connector (with VSC)

Front view of wire harnes connector:



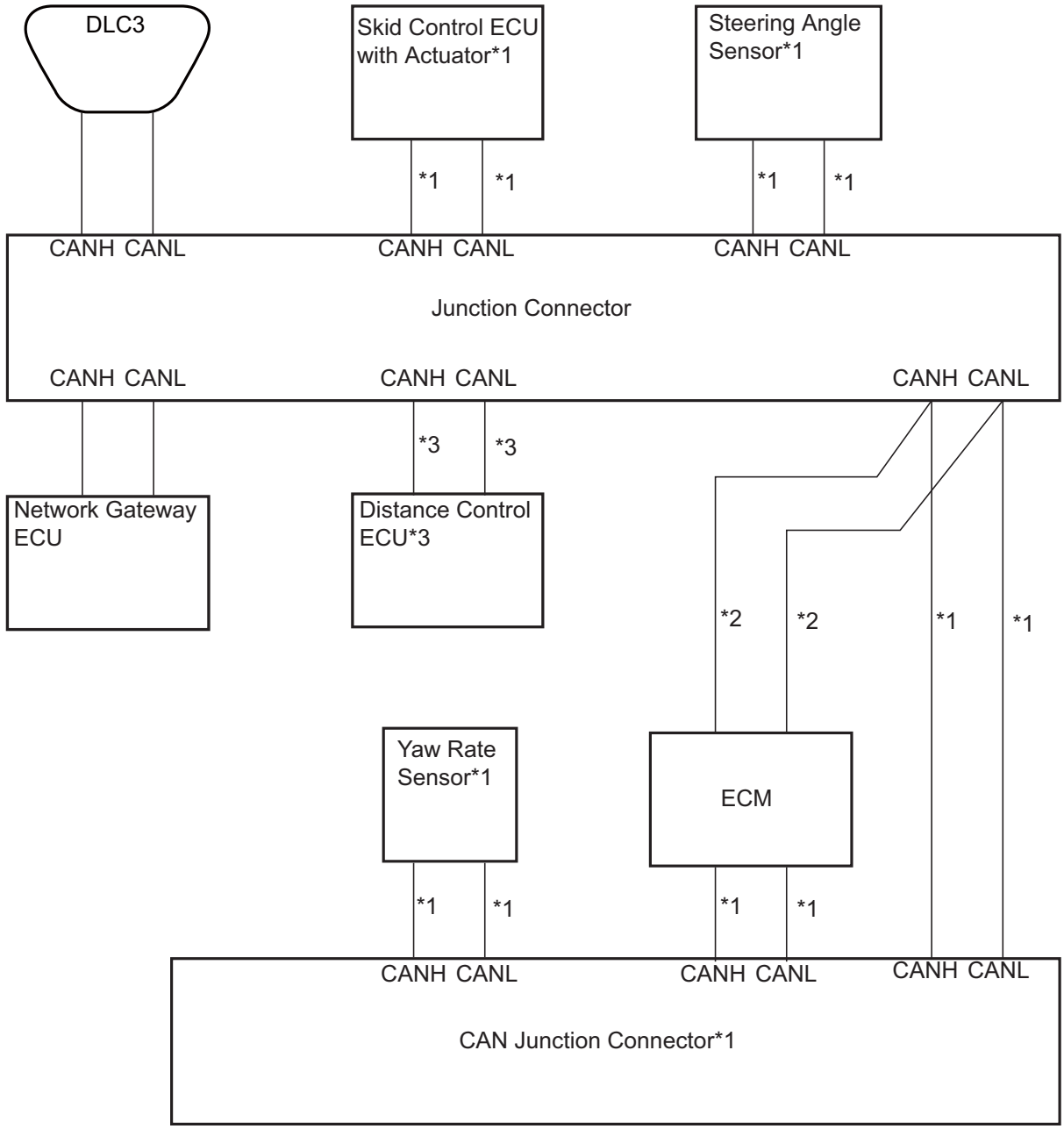
T

C136775E02

with VSC

CAN Junction Connector	Wiring Color	Connect to
J49-1 (CANH)	B	Yaw rate sensor
J49-2 (CANL)	W	Yaw rate sensor
J49-3 (CANH)	B	Junction connector
J49-7 (CANL)	W	Junction connector
J49-4 (CANH)	B	ECM
J49-6 (CANL)	W	ECM

(c) The connection diagram of the components which are connected to the CAN junction connector.



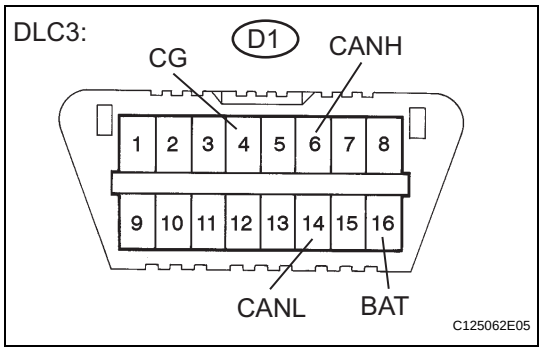
*1: with VSC

*2: without VSC

*3: with Dynamic Laser Cruise Control

C

C161434E01



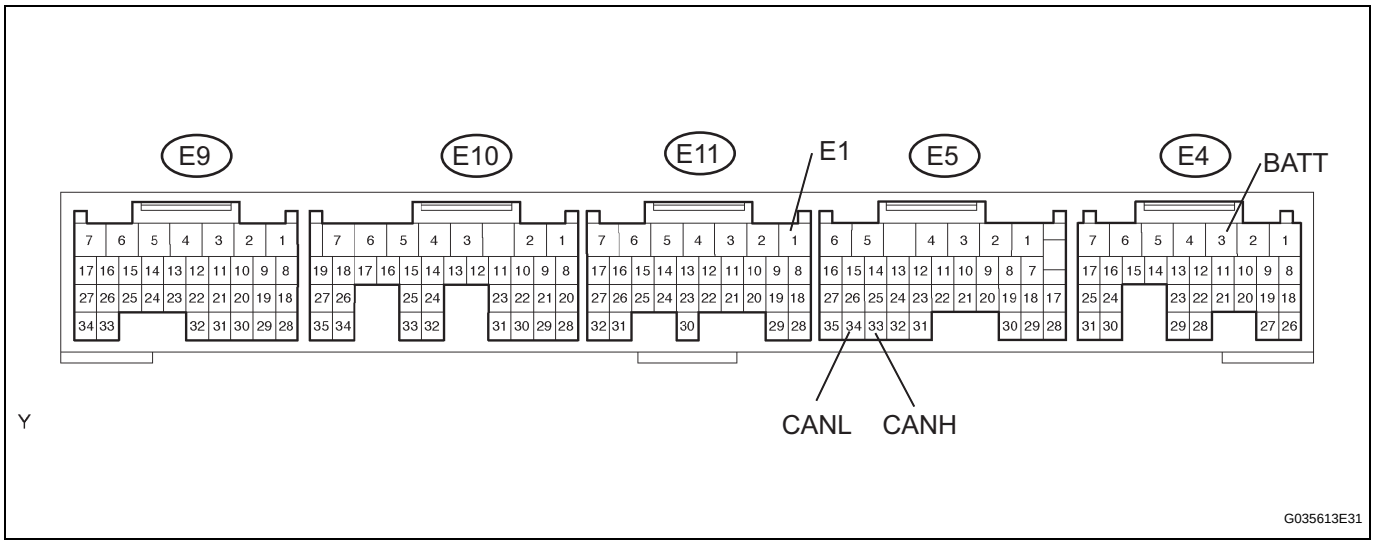
2. DLC3

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

Standard resistance

Terminals	Wiring Color	Condition	Specified Condition
D1-6 (CANH) - D1-14 (CANL)	B - W	Ignition switch off	54 to 69 Ω
D1-14 (CANL) - D1-4 (CG)	W - W-B	Ignition switch off	200 Ω or higher
D1-6 (CANH) - D1-4 (CG)	B - W-B	Ignition switch off	200 Ω or higher
D1-14 (CANL) - D1-16 (BAT)	W - B-O	Ignition switch off	6 kΩ or higher
D1-6 (CANH) - D1-16 (BAT)	B - B-O	Ignition switch off	6 kΩ or higher

3. ECM



(a) Disconnect the connector from the ECM.

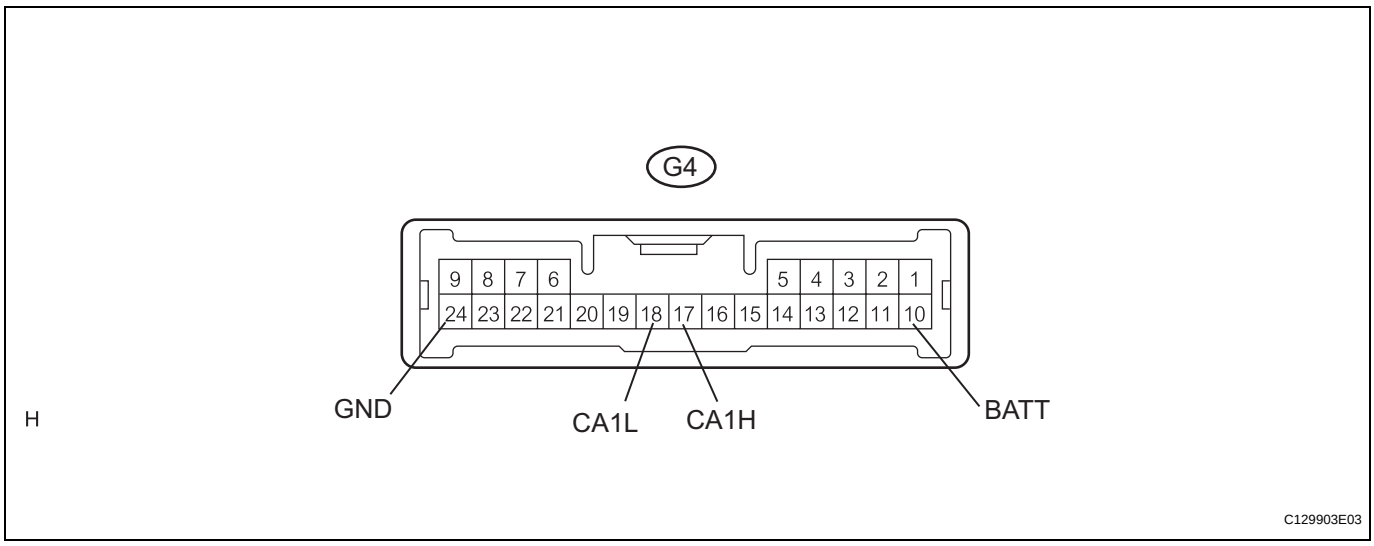
(b) Measure the resistance according to the value(s) in the table below.

Standard resistance

Terminals	Wiring Color	Condition	Specified Condition
E5-33 (CANH) - E5-34 (CANL)	B - W	Ignition switch off	108 to 132 Ω
E5-34 (CANL) - E11-1 (E1)	W - BR	Ignition switch off	200 Ω or higher
E5-33 (CANH) - E11-1 (E1)	B - BR	Ignition switch off	200 Ω or higher
E5-34 (CANL) - E4-3 (BATT)	W - B-W	Ignition switch off	6 kΩ or higher
E5-33 (CANH) - E4-3 (BATT)	B - B-W	Ignition switch off	6 kΩ or higher

CA

4. NETWORK GATEWAY ECU

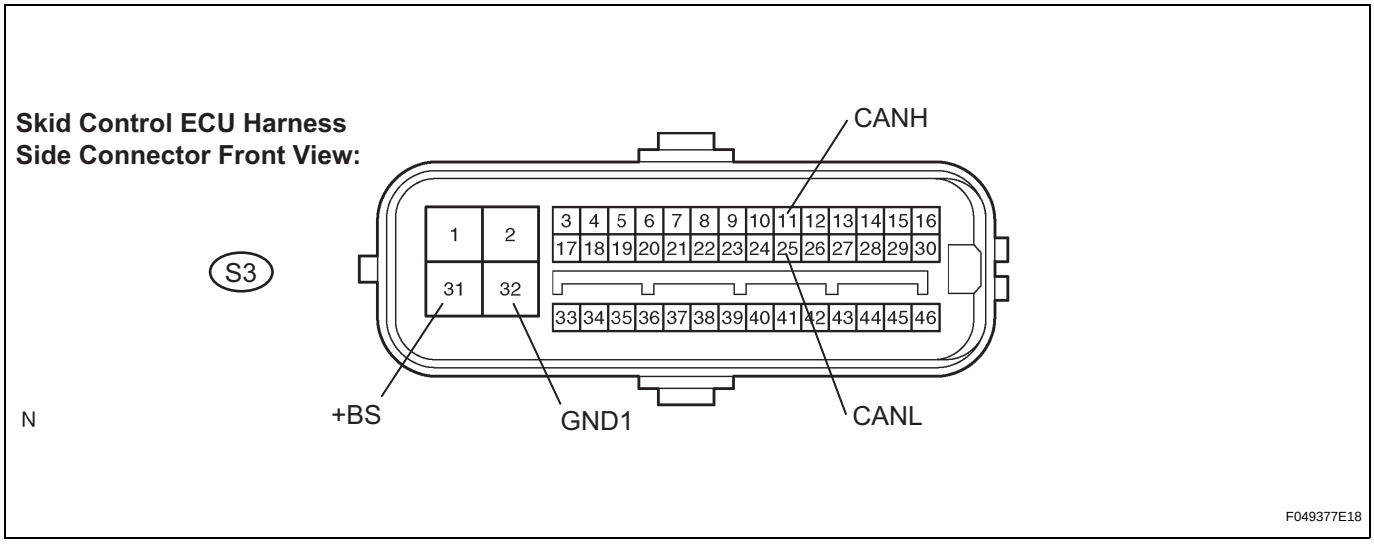


(a) Disconnect the connector from the netwark gateway ECU.
(b) Measure the resistance according to the value(s) in the table below.

Standard resistance

Terminals	Wiring Color	Condition	Specified Condition
G4-17 (CA1H) - G4-18 (CA1L)	B - W	Ignition switch off	108 to 132 Ω
G4-18 (CA1L) - G4-24 (GND)	W - B-W	Ignition switch off	200 Ω or higher
G4-17 (CA1H) - G4-24 (GND)	B - B-W	Ignition switch off	200 Ω or higher
G4-18 (CA1L) - G4-10 (BATT)	W - W-L	Ignition switch off	6 kΩ or higher
G4-17 (CA1H) - G4-10 (BATT)	B - W-L	Ignition switch off	6 kΩ or higher

5. SKID CONTROL ECU WITH ACTUATOR



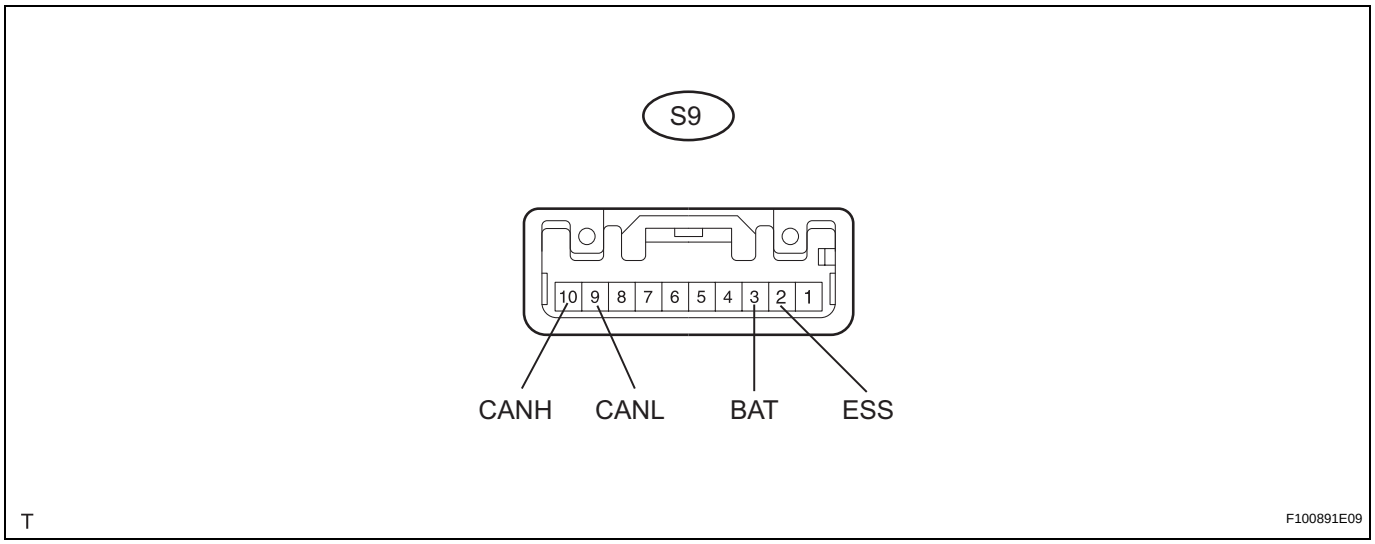
(a) Disconnect the connector from the skid control ECU with actuator.
(b) Measure the resistance according to the value(s) in the table below.

Standard resistance

Terminals	Wiring Color	Condition	Specified Condition
S3-11 (CANH) - S3-25 (CANL)	B - W	Ignition switch off	54 to 69 Ω

Terminals	Wiring Color	Condition	Specified Condition
S3-25 (CANL) - S3-32 (GND1)	W - W-B	Ignition switch off	200 Ω or higher
S3-11 (CANH) - S3-32 (GND1)	B - W-B	Ignition switch off	200 Ω or higher
S3-25 (CANL) - S3-31 (+BS)	W - W	Ignition switch off	6 kΩ or higher
S3-11 (CANH) - S3-31 (+BS)	B - W	Ignition switch off	6 kΩ or higher

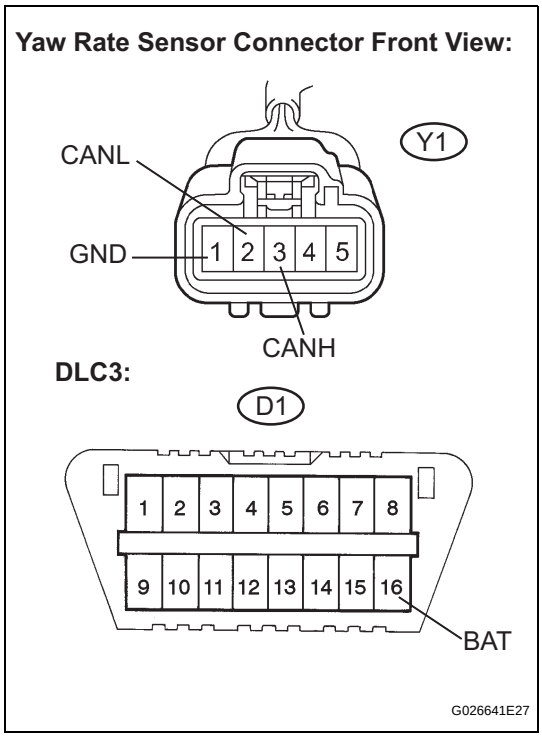
6. STEERING ANGLE SENSOR



(a) Disconnect the connector from the steering angle sensor.
(b) Measure the resistance according to the value(s) in the table below.

Standard resistance

Terminals	Wiring Color	Condition	Specified Condition
S9-10 (CANH) - S9-9 (CANL)	B - W	Ignition switch off	54 to 69 Ω
S9-9 (CANL) - S9-2 (ESS)	W - W-B	Ignition switch off	200 Ω or higher
S9-10 (CANH) - S9-2 (ESS)	B - W-B	Ignition switch off	200 Ω or higher
S9-9 (CANL) - S9-3 (BAT)	W - W-L	Ignition switch off	6 kΩ or higher
S9-10 (CANH) - S9-3 (BAT)	B - W-L	Ignition switch off	6 kΩ or higher



7. YAW RATE SENSOR

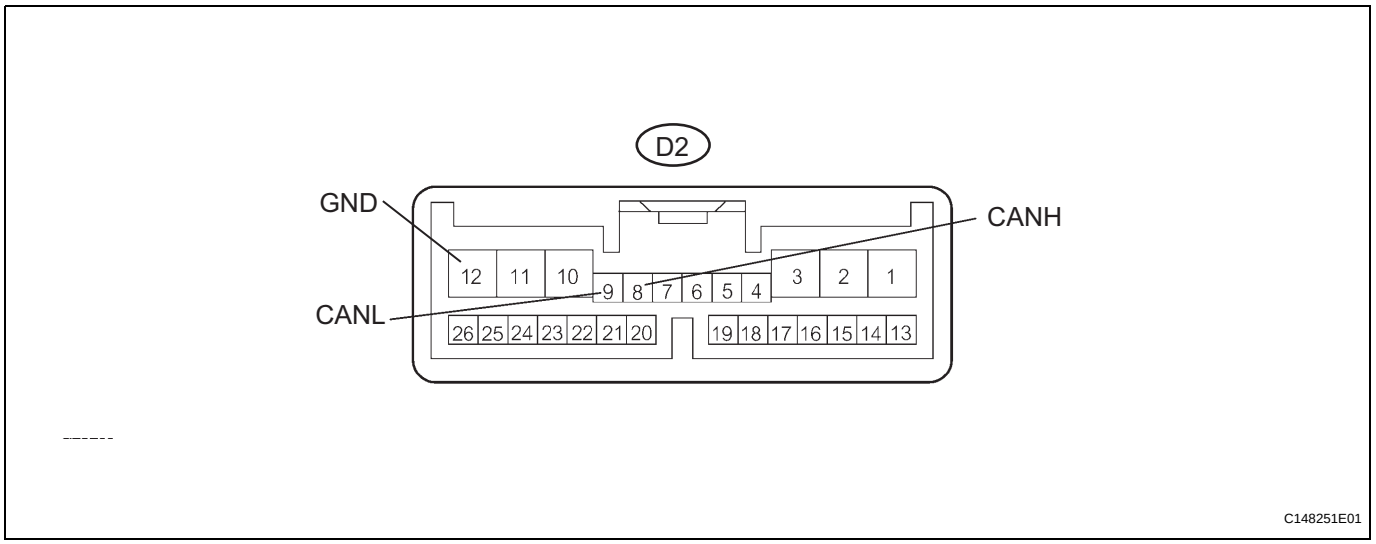
(a) Disconnect the connector from the yaw rate sensor.

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

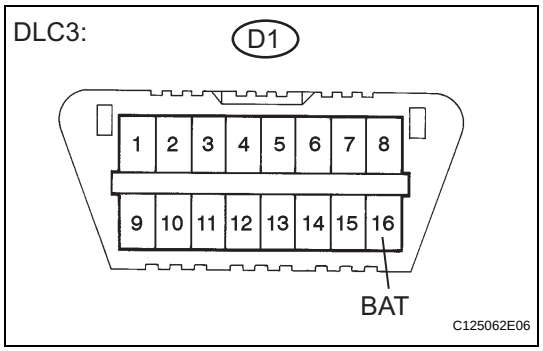
Standard resistance

Terminals	Wiring Color	Condition	Specified Condition
Y1-3 (CANH) - Y1-2 (CANL)	B - W	Ignition switch off	54 to 69 Ω
Y1-2 (CANL) - Y1-1 (GND)	W - W-B	Ignition switch off	200 Ω or higher
Y1-3 (CANH) - Y1-1 (GND)	B - W-B	Ignition switch off	200 Ω or higher
Y1-2 (CANL) - D1-16 (BAT)	W - B-O	Ignition switch off	6 kΩ or higher
Y1-3 (CANH) - D1-16 (BAT)	B - B-O	Ignition switch off	6 kΩ or higher

8. DISTANCE CONTROL ECU



(a) Disconnect the connector from the distance control ECU.



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

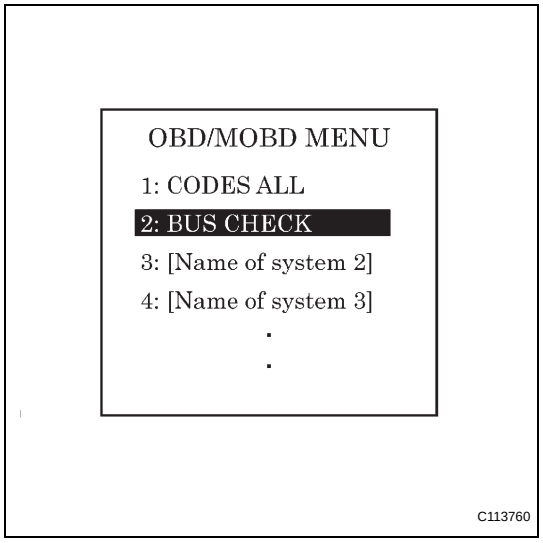
Standard resistance

Terminals	Wiring Color	Condition	Specified Condition
D2-8 (CANH) - D2-9 (CANL)	B - W	Ignition switch off	54 to 69 Ω
D2-9 (CANL) - D2-12 (GND)	W - BR	Ignition switch off	200 Ω or higher
D2-8 (CANH) - D2-12 (GND)	B - BR	Ignition switch off	200 Ω or higher
D2-9 (CANL) - D1-16 (BAT)	W - B-O	Ignition switch off	6 kΩ or higher
D2-8 (CANH) - D1-16 (BAT)	B - B-O	Ignition switch off	6 kΩ or higher

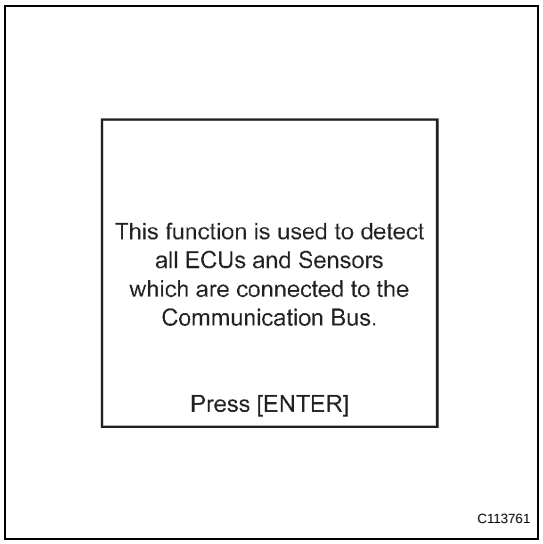
DIAGNOSIS SYSTEM

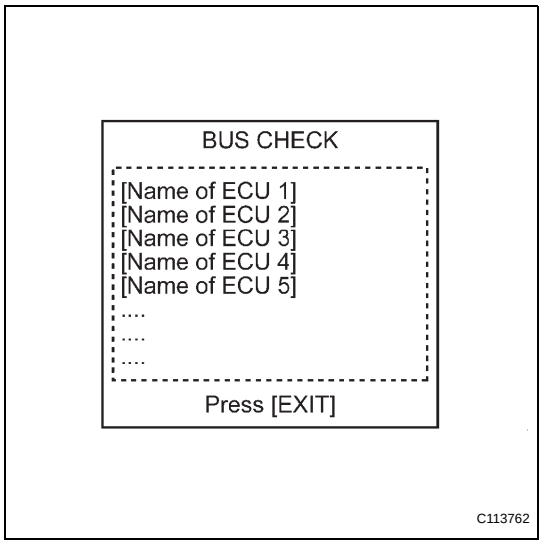
1. BUS CHECK

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



(b) Press "ENTER" on the intelligent tester.





(c) The screen displays the ECUs and sensors that are properly connected to the CAN communication system.
HINT:
Properly connected ECUs or sensors that are not displayed on the screen indicate that a communication stop is occuring in the system, sensor, or ECU which is not displayed.

2. CHECK FOR INSTALLED SYSTEMS (ECUS AND SENSORS) THAT USE CAN COMMUNICATION

(a) Systems (ECUs, sensors) that use CAN communication vary depending on the vehicle's optional equipment. Check which systems (ECUs, sensors) are installed on the vehicle.

ECU/Sensor name	Check method
ENGINE	Installed on all vehicles
GATEWAY	Installed on all vehicles
ABS/VSC/TRC*1	With VSC system
STEERING ANGLE SENSOR*1	With VSC system
YAW RATE/ DECELERATION SENSOR*1	With VSC system
DISTANCE CONTROL*2	With dynamic laser cruise control system

HINT:
- *1: with VSC
- *2: with Dynamic laser cruise control

3. DTC TABLE BY ECU

HINT:
- For the CAN communication system, CAN communication system DTCs stored in certain ECUs can be displayed using the intelligent tester.
- If CAN communication system DTCs are output, trouble cannot be determined only by the DTCs. Perform troubleshooting according to "CHECK CAN BUS LINE" (See page CA-35).

(a) Skid control ECU (with VSC)
HINT:
DTC communication uses the CAN communication system.

DTC No.	Detection Item
U0073	Control Module Communication Bus OFF
U0100	Lost Communication with ECM
U0123	Lost Communication with Yaw Rate Sensor Module
U0124	Lost Communication with Yaw Rate Sensor Module
U0126	Lost Communication with Steering Angle Sensor Module

(b) ECM (with Dynamic laser cruise control)
HINT:
- DTC communication uses the CAN communication system.
- Distance control ECU data is output.

- Displayed on the "communication malfunction DTCs" screen of the intelligent tester. If U0235 or U1102 is output alone, the CAN communication is normal (See page CC-88 for U0235, See page CC-91 for U1102).

DTC No.	Detection Item
U0100	• Lost Communication from ECM to Distance Control ECU • Lost Communication from ECM to Skid Control ECU
U0122	Lost Communication from Skid Control ECU to ECM
U0123	Lost Communication with Yaw Rate Sensor Module
U0126	Lost Communication with Steering Angle Sensor Module
U1101	Lost Communication with Driving Support ECU

(c) Gateway ECU

HINT:

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

4. DTCS COMBINATION TABLE

DTC		Trouble Mode				
Output from	Output DTC	ECM Communication Stop Mode	Skid Control ECU Communication Stop Mode	Steering Angle Sensor Communication Stop Mode	Yaw Rate Sensor Communication Stop Mode	Distance Control ECU Communication Stop Mode
Skid Control ECU	U0073	-	○	-	-	-
	U0100	○	○	-	-	-
	U0123	-	○	-	○	-
	U0124	-	○	-	○	-
	U0126	-	○	○	-	-
ECM*1	U0100	○	-	-	-	○
	U0122	-	○	-	-	○
	U0123	-	-	-	○	○
	U0126	-	-	○	-	○
	U1101	-	-	-	-	○

HINT:

*1: with Dynamic laser cruise control