

# MULTIPLEX COMMUNICATION SYSTEM

## PRECAUTION

### 1. INITIALIZATION

**NOTICE:**

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

System Name	See procedure
Power Window Control	IN-29
Sliding Roof System	IN-29

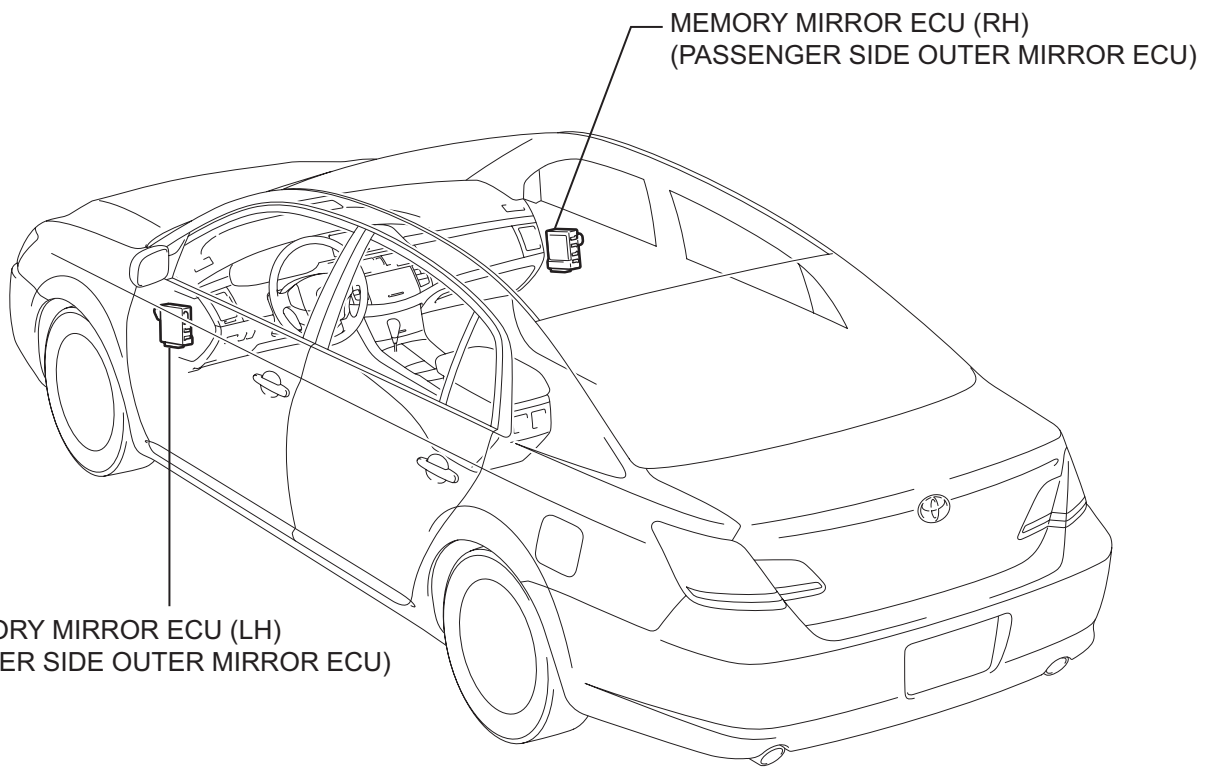
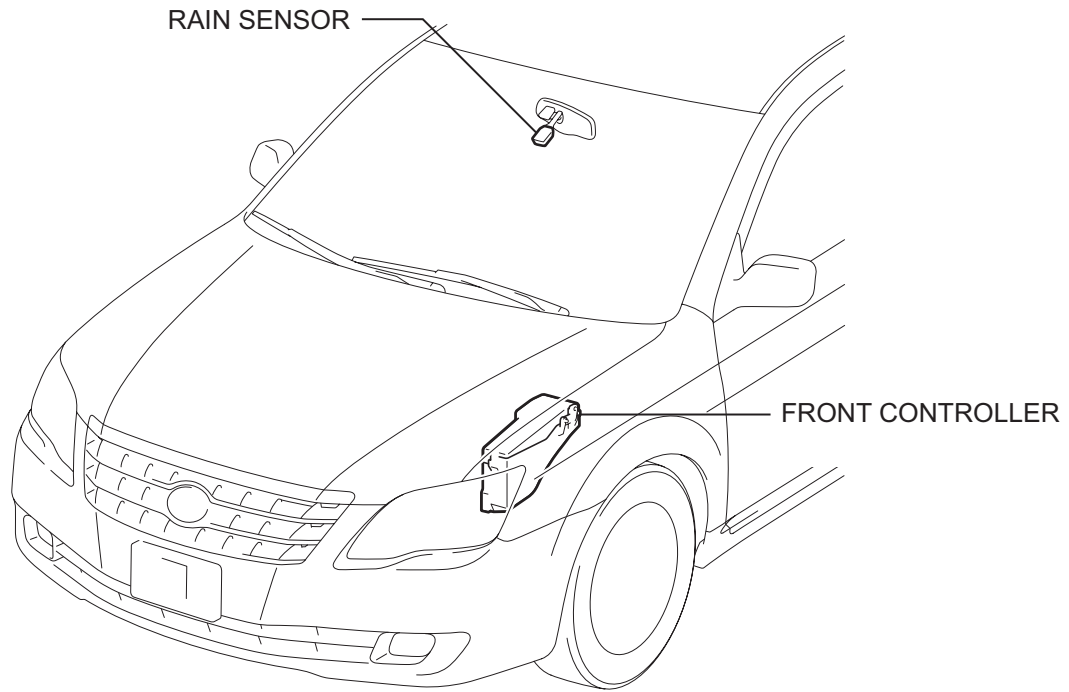
### 2. EXPRESSIONS OF IGNITION SWITCH

(a) The type of ignition switch used on this model differs according to the specifications of the vehicle. The expressions listed in the table below are used in this section.

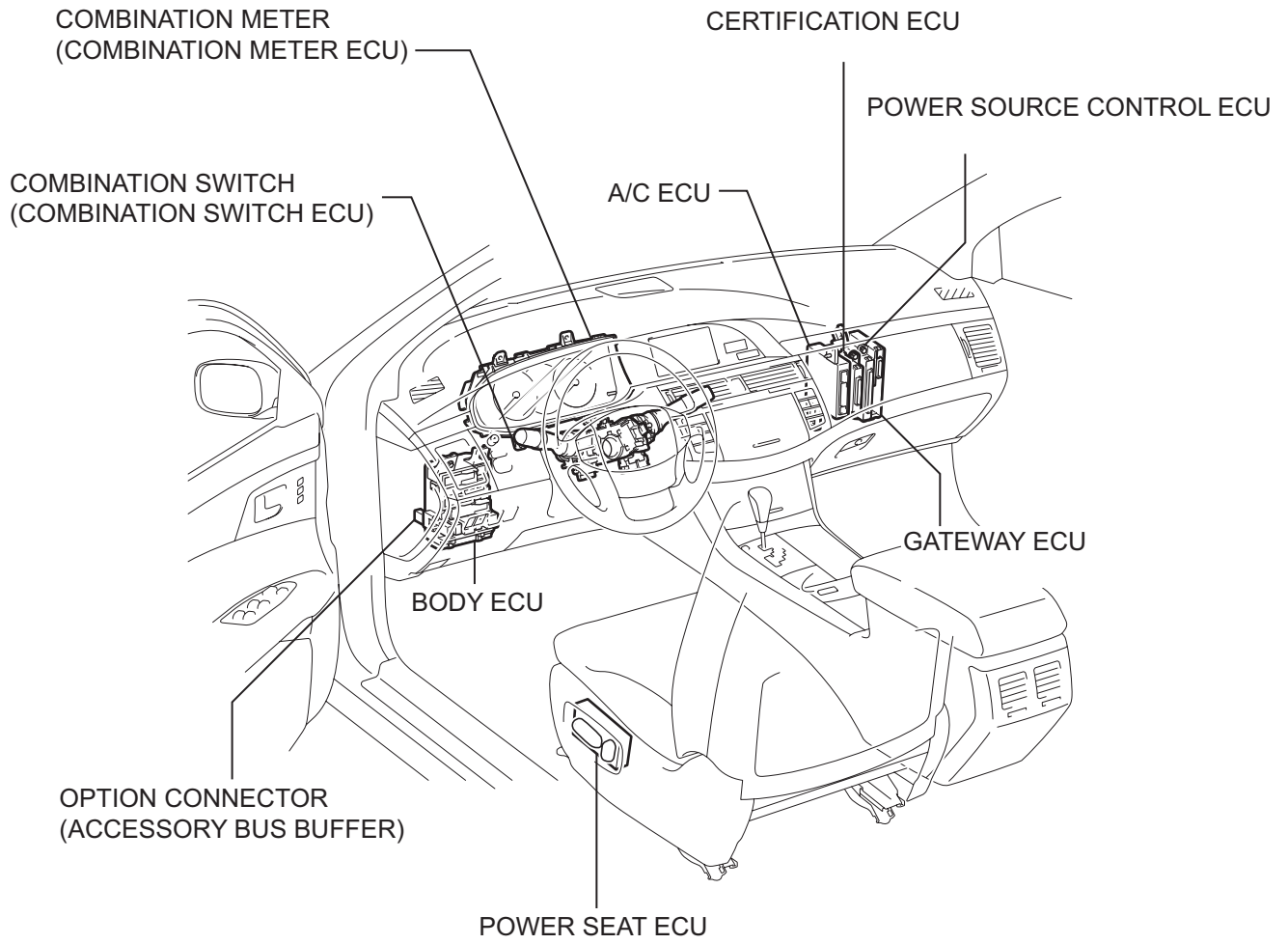
Expression \ Switch Type	Ignition Switch (position)	Engine Switch (condition)
Ignition Switch off	LOCK	Off
Ignition Switch on (IG)	ON	On (IG)
Ignition Switch on (ACC)	ACC	On (ACC)
Engine Start	START	Start

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# PARTS LOCATION



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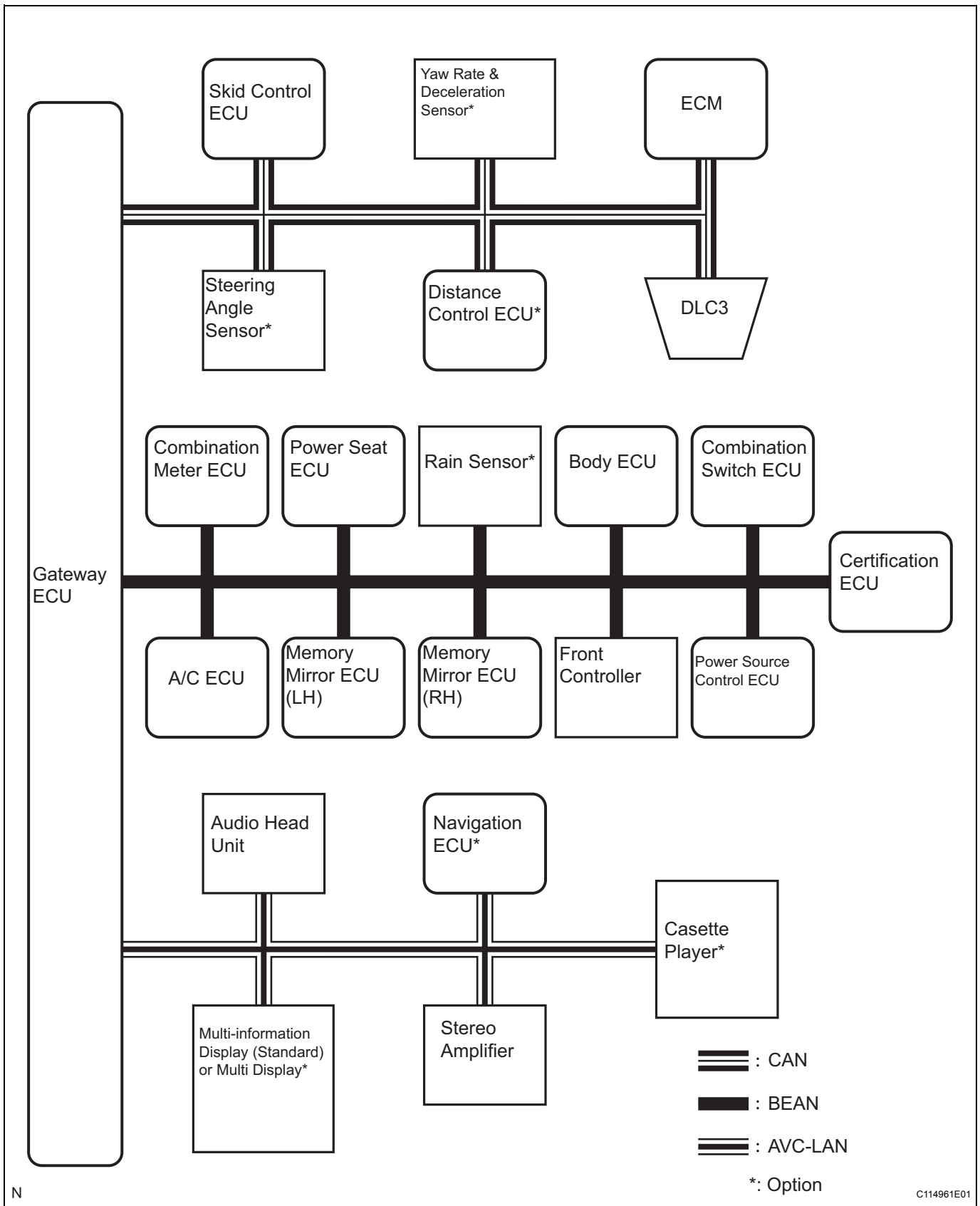


**SYSTEM DIAGRAM**

Item	Details
Number of BEAN connected ECUs*1	12
Number of CAN connected ECUs*1	7
Number of AVC-LAN connected ECUs*1	6
Gateway function between BEAN and diagnosis	Gateway ECU
Gateway function between BEAN and AVC-LAN	Gateway ECU
Gateway function between BEAN and CAN	Gateway ECU
ECU in charge of vehicle customization information	Gateway ECU
Protocol	CAN, BEAN and AVC-LAN

HINT:

\*1: Optional ECUs are also included.

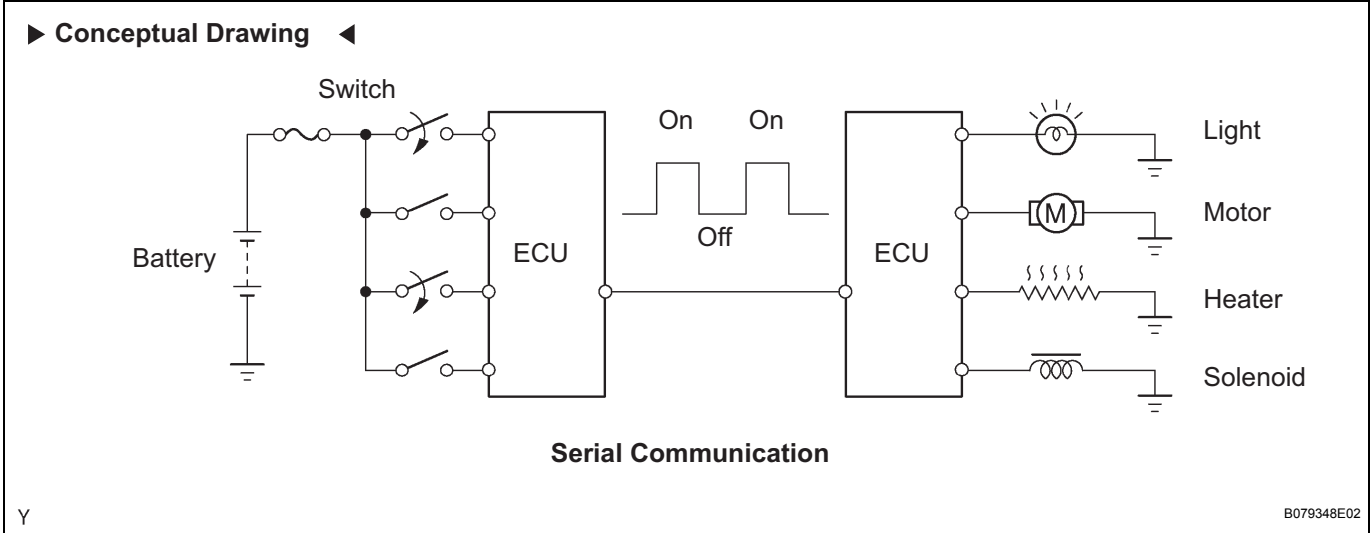


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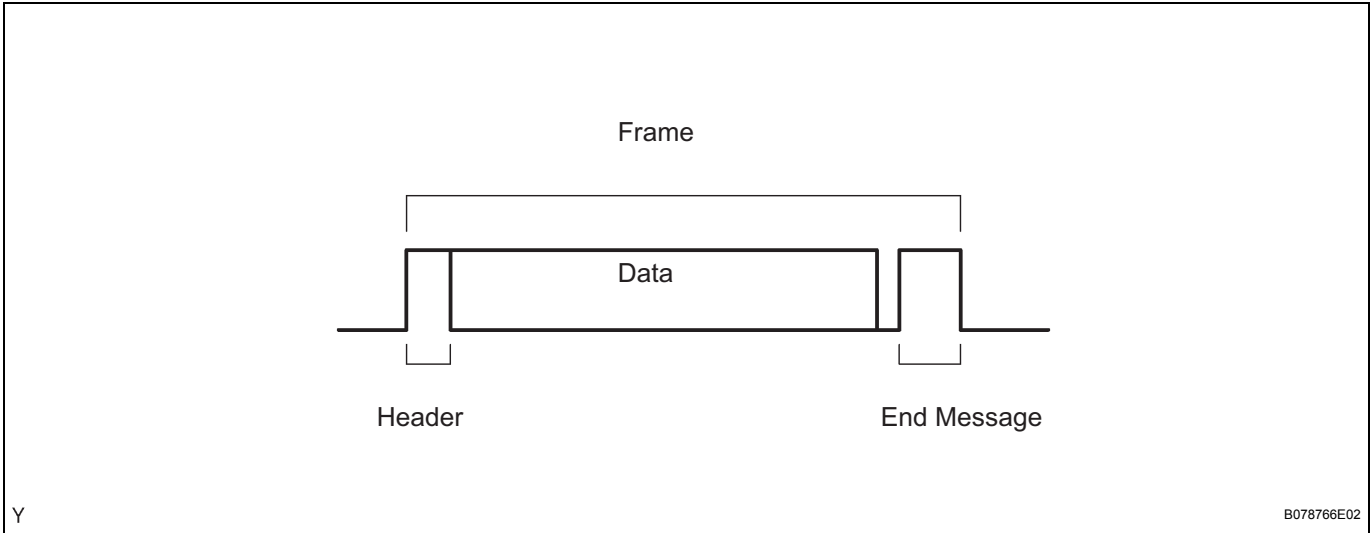
# SYSTEM DESCRIPTION

## 1. MULTIPLEX COMMUNICATION SYSTEM BASICS

(a) The AVALON multiplex communication uses serial communication, which converts multiple pieces of information into serial communication data. As a result, they can be transmitted through a single communication wire.

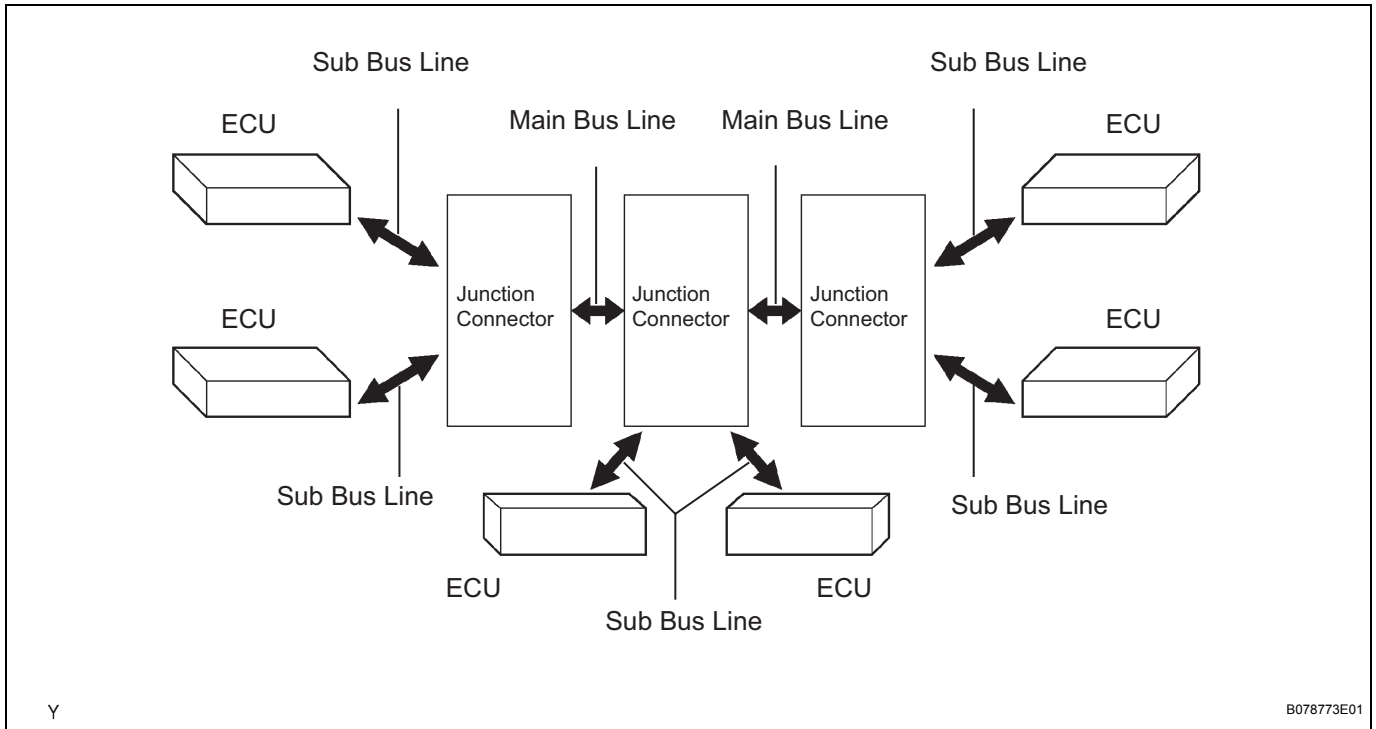


(b) Serial communication data consist of bits and frames. A bit is a basic unit that represents one piece of information. A bit is represented by the binary values "0" or "1". A frame is a body of data that is transmitted as a packet. A frame contains a "header" that indicates the beginning of the data and an "end" message that indicates the end of the data.

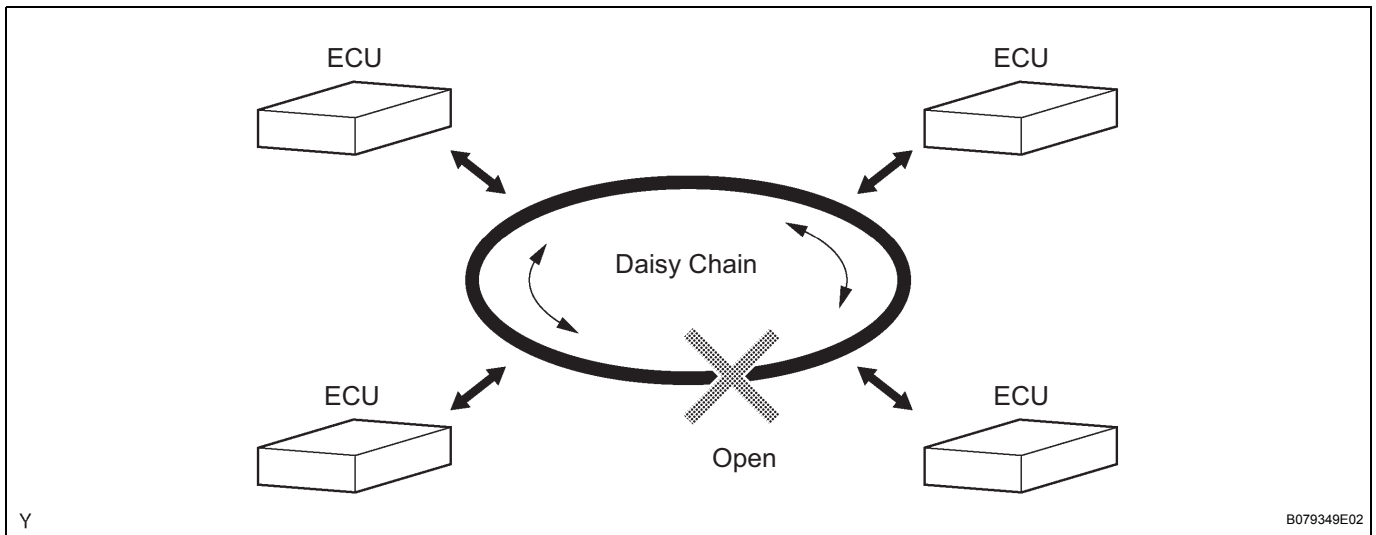


(c) Based on serial communication, various ECUs are connected on a network to exchange various pieces of information. Such a system is called a multiplex communication system.

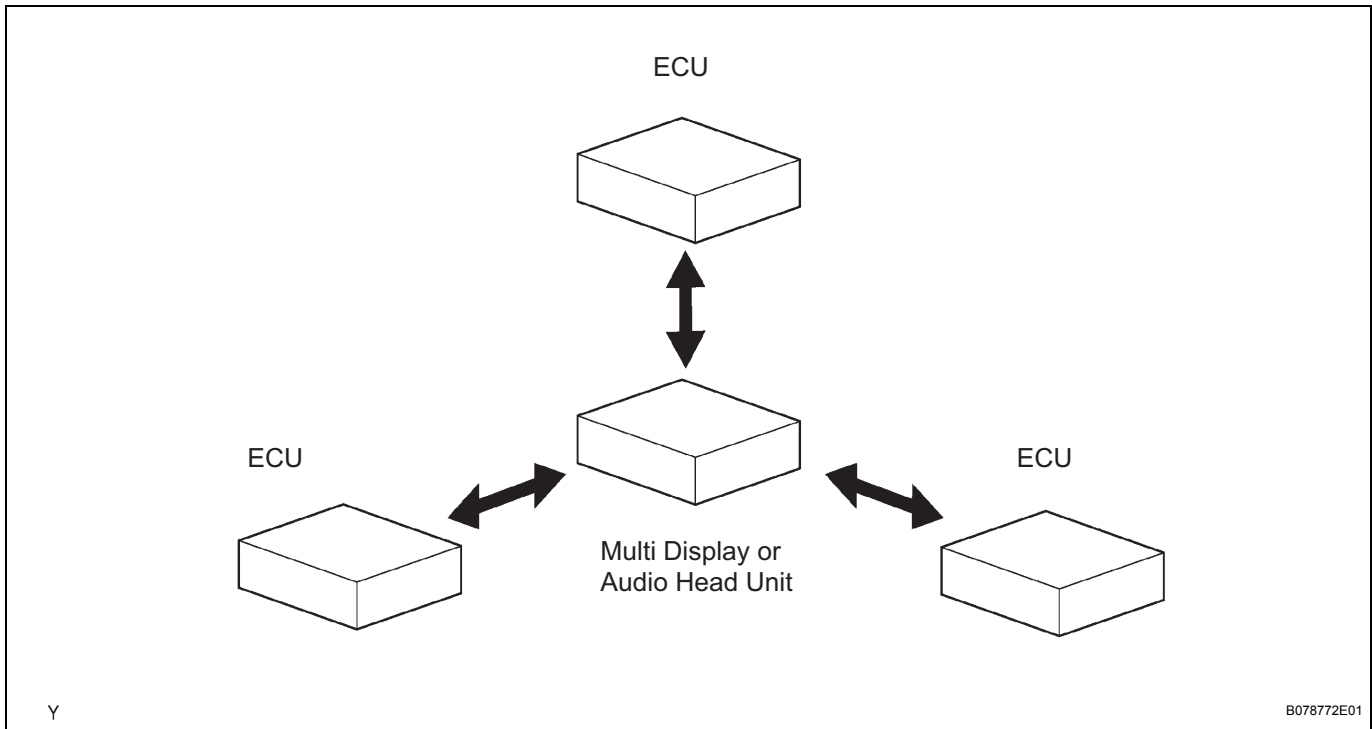
(1) The CAN uses a multi star style bus connection. The 3 junction connectors are connected by a main bus line. Junction connectors communicate with ECUs using a sub bus line.



(2) The BEAN uses ring and bus styles of networks to connect ECUs. This style of connection is called a daisy chain. In a daisy chain, communication can be maintained even if there is an area that has an open circuit.



(3) The AVC-LAN uses a star configuration, which is centered on the multi display or audio head unit.



(d) Differences between CAN, BEAN and AVC-LAN  
 (1) Protocols, which are rules for establishing data communication, differ between the CAN, BEAN and the AVC-LAN. If ECUs use different types of data such as communication speed, communication wire, and signals, they will be unable to communicate with each other. Therefore, protocols (rules) must be established among them.

Control	Driving Control System	Body Electrical Control System	Body Electrical Control System
Protocol	CAN (ISO Standard)	BEAN (TOYOTA Original)	AVC-LAN (TOYOTA Original)
Communication Speed	500 k bps* (Max. 1 M bps)	Max. 10 k bps*	Max. 17.8 k bps*
Communication Wire	Twisted-pair Wire	AV Single Wire	Twisted-pair Wire
Drive Type	Differential Voltage Drive	Single Wire Voltage Drive	Differential Voltage Drive
Data Length	1 to 8 Byte (Variable)	1 to 11 Byte (Variable)	0 to 32 Byte (Variable)

HINT:

\*: The abbreviation "bps" stands for "bits per second" (the number of bits that can be transmitted per second).

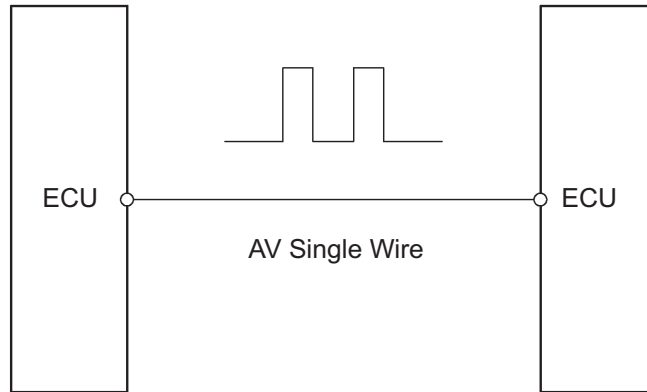
(2) A single, Automobile Vinyl (AV) wire is used for BEAN communication. A twisted-pair wire is used for CAN and AVC-LAN communication.

Communication Wire	Outline
AV Single Wire	Lightweight single communication wire that consists of single core line surrounded by insulation. Voltage is applied to this line in order to drive communication. This system is called a "Single Wire Voltage Drive".

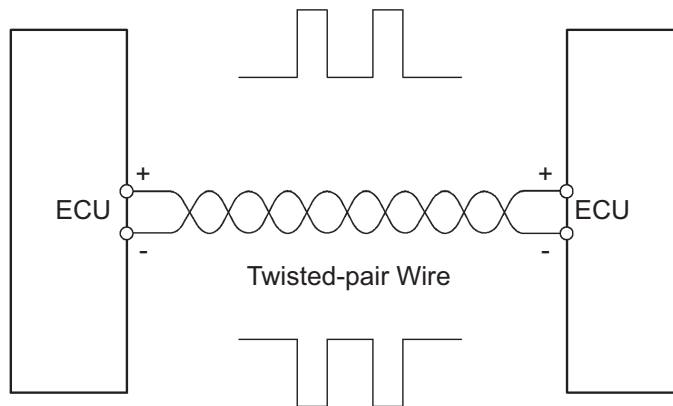


Communication Wire	Outline
<ul style="list-style-type: none"> <li>Twisted-pair Wire for AVC-LAN</li> <li>Twisted-pair Wire for CAN</li> </ul>	Pair of lines Twisted together and covered with insulation. Communication is driven by applying positive (+) and negative (-) voltage to the 2 lines in order to send a single signal. This system, which is called "Differential Voltage Drive", can reduce noise.

► Single Wire Voltage Drive ◀



► Differential Voltage Drive ◀



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2. NETWORK GATEWAY ECU

(a) The network gateway ECU of the AVALON has the following functions:

Function	Outline
Gateway	Data for respective protocols (CAN, BEAN and AVC-LAN) are arranged differently. Therefore, it is not possible to exchange data between different protocols. For this reason, data arrangement must be converted before transferring data to a communication bus (CAN, BEAN and AVC-LAN). This conversion is called a gateway function. It is preformed by a gateway ECU.

Function	Outline
Diagnosis (only for BEAN)	By connecting an intelligent tester (with CAN VIM) to DLC3 and operating the tester, technicians can access ECUs via the gateway ECU and BEAN communication bus. In this manner, DTCs for BEAN can be output, DATA LIST (for checking ECU data) can be displayed, and ACTIVE TEST (to actuate desired actuator) can be performed.
Customize (only for BEAN)	Customized body electronics system enables control function settings of ECUs to be changed through use of an intelligent tester. However, this system can change settings only of ECUs that belong to the bus in which communication is centered on gateway ECU.

# HOW TO PROCEED WITH TROUBLESHOOTING

HINT:  
Use this procedure to troubleshoot the multiplex communication system.

**1** VEHICLE BROUGHT TO WORKSHOP

NEXT

**2** CHECK FOR DTC

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

**Result**

Result	Proceed to
DTC does not reoccur	A
DTC reoccurs	B

**B** Go to step 4

A

**3** OVERALL ANALYSIS AND TROUBLESHOOTING

- (a) Terminals of ECU (See page [MP-11](#)).

NEXT

**4** ADJUST, REPAIR OR REPLACE

NEXT

**5** CONFIRMATION TEST

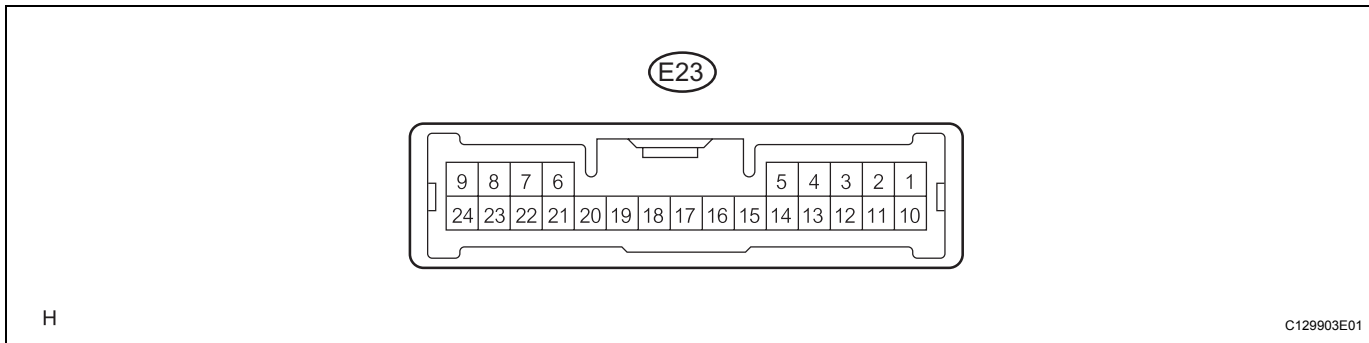
NEXT

END

## TERMINALS OF ECU

### 1. CHECK GATEWAY ECU

- (a) Disconnect the E23 ECU connector.



- (b) Measure the voltage between the specified terminals on the wire harness side connector.

#### Voltage:

Symbol (Terminal No.)	Wiring Color	Terminal Description	Condition	Specified Condition
BATT (E23-10) - Body ground	B - Body ground	Power supply (Back-up)	Always	10 to 14 V
IG (E23-1) - Body ground	W - Body ground	Power supply (IG)	Ignition switch: OFF → ON (IG)	Below 1 V → 10 to 14 V
ACC (E23-2) - Body ground	R - Body ground	Power supply (ACC)	Ignition switch: OFF → ON (ACC)	Below 1 V → 10 to 14 V

If the values do not conform to the conditions specified, there may be a malfunction on the wire harness side.

- (c) Measure the resistance between the specified terminals on the wire harness side connector.

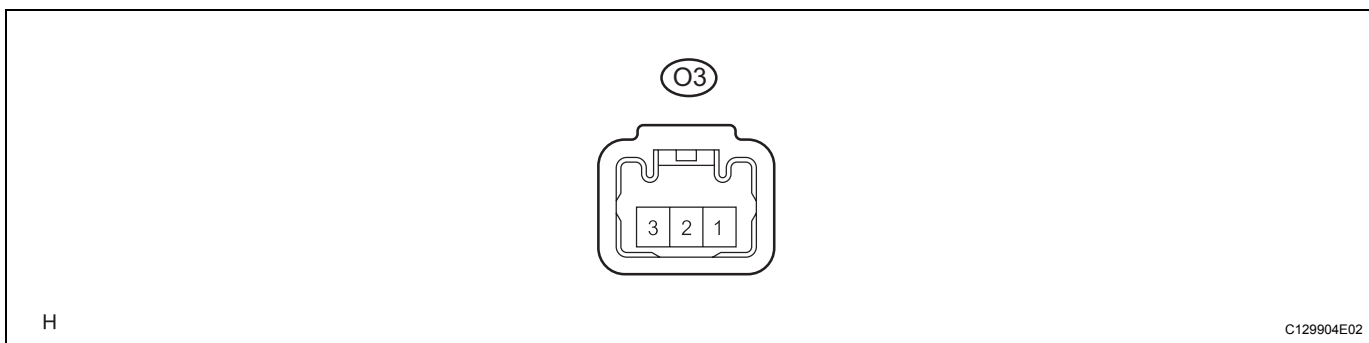
#### Resistance:

Symbol (Terminal No.)	Wiring Color	Terminal Description	Condition	Specified Condition
GND (E23-24) - Body ground	W-B - Body ground	Ground	Always	Below 1 $\Omega$
MPD1 (E23-3) - Body ground	G - Body ground	MPX line	Always	10 k $\Omega$ or higher
MPD2 (E23-12) - Body ground	P - Body ground	MPX line	Always	10 k $\Omega$ or higher

If the values do not conform to the conditions specified, there may be a malfunction on the wire harness side.

### 2. CHECK RAIN SENSOR

- (a) Disconnect the O3 ECU connector.



- (b) Measure the voltage between the specified terminals on the wire harness side connector.

**Voltage:**

Symbol (Terminal No.)	Wiring Color	Terminal Description	Condition	Specified Condition
SIG (O3-1) - Body ground	V - Body ground	Power supply (IG)	Ignition switch: OFF → ON (IG)	Below 1 V → 10 to 14 V

If the values do not conform to the conditions specified, there may be a malfunction on the wire harness side.

- (c) Measure the resistance between the specified terminals on the wire harness side connector.

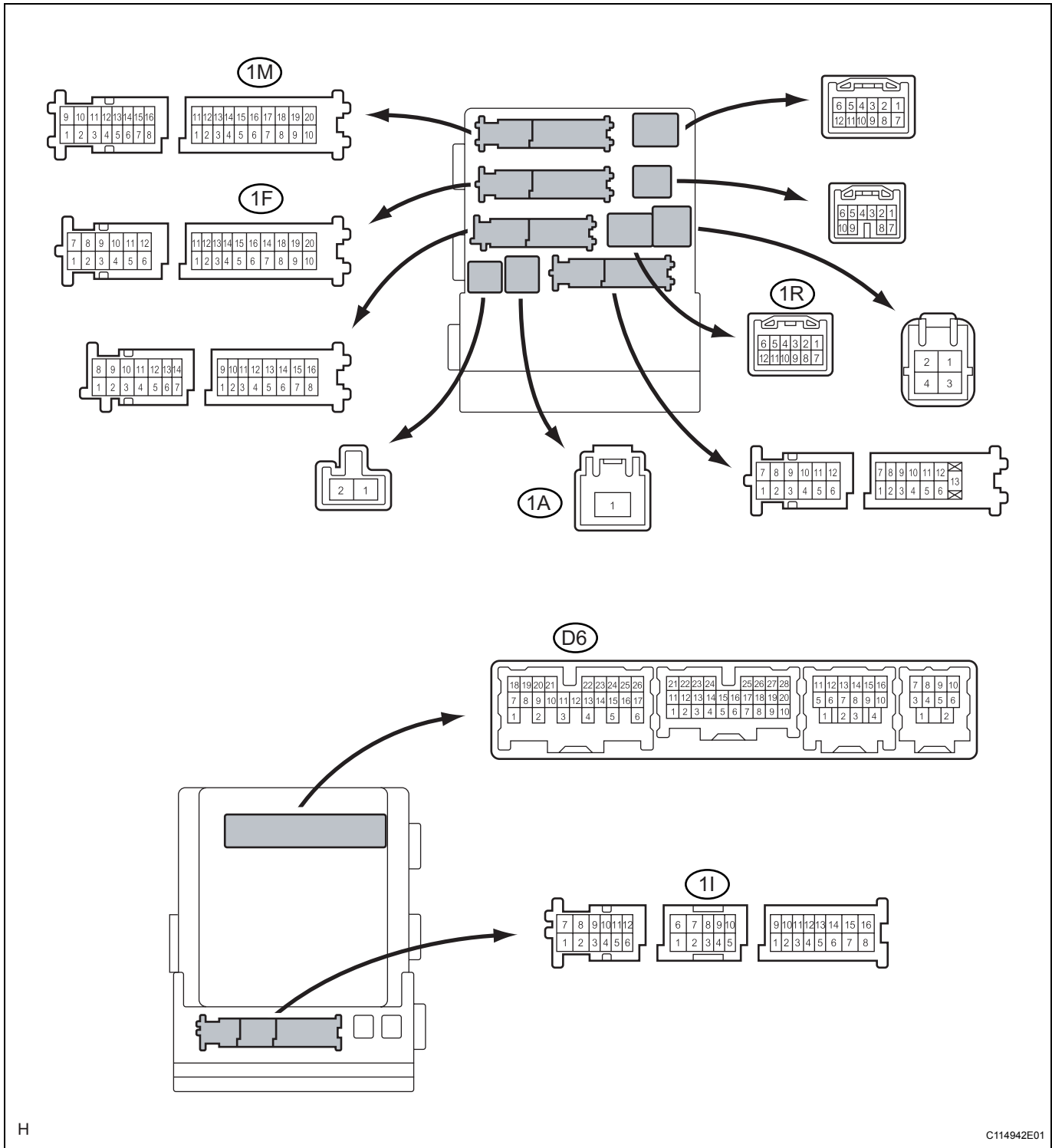
**Resistance:**

Symbol (Terminal No.)	Wiring Color	Terminal Description	Condition	Specified Condition
ES (O3-3) - Body ground	W-B - Body ground	Ground	Always	Below 1 Ω
MPX (O3-2) - Body ground	L - Body ground	MPX line	Always	10 kΩ or higher

If the values do not conform to the conditions specified, there may be a malfunction on the wire harness side.

3. CHECK BODY ECU

(a) Disconnect the 1I, 1A, 1F, 1M, 1R and D6 ECU connectors.



(b) Measure the voltage between the specified terminals on the wire harness side connector.

Voltage:

Symbol (Terminal No.)	Wiring Color	Terminal Description	Condition	Specified Condition
IG (1I-9) - Body ground	LG - Body ground (*1) G - Body ground (*2)	Power supply (IG)	Ignition switch: OFF → ON (IG)	Below 1 V → 10 to 14 V
ACC (1I-3) - Body ground	R - Body ground (*1) O - Body ground (*2)	Power supply (ACC)	Ignition switch: OFF → ON (ACC)	Below 1 V → 10 to 14 V

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Symbol (Terminal No.)	Wiring Color	Terminal Description	Condition	Specified Condition
BATB (1A-1) - Body ground	B - Body ground	Power supply (Back-up)	Always	10 to 14 V

(\*1): w/ Smart Key System

(\*2): w/o Smart Key System

If the values do not conform to the conditions specified, there may be a malfunction on the wire harness side.

- (c) Measure the resistance between the specified terminals on the wire harness side connector.

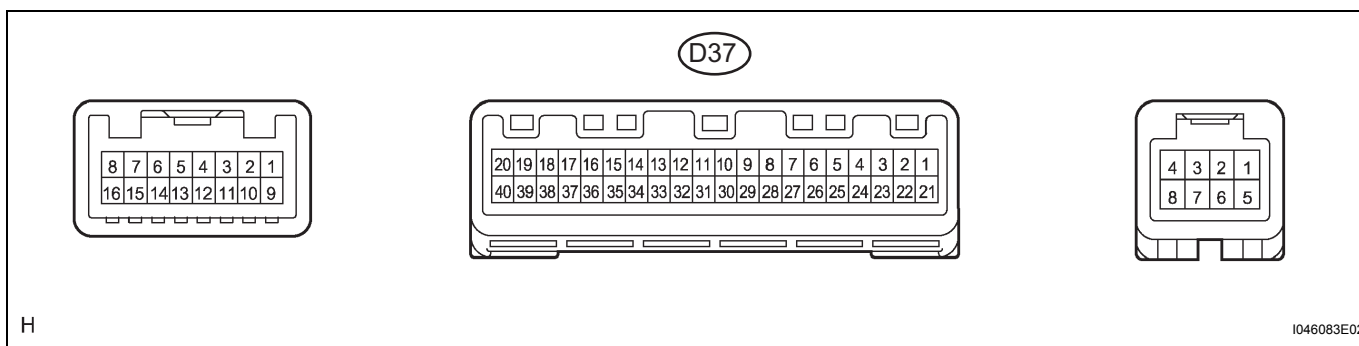
**Resistance:**

Symbol (Terminal No.)	Wiring Color	Terminal Description	Condition	Specified Condition
GND1 (1F-10) - Body ground	W-B - Body ground	Ground	Always	Below 1 Ω
GND2 (1M-9) - Body ground	W-B - Body ground	Ground	Always	Below 1 Ω
MPX1 (1R-9) - Body ground	B - Body ground	MPX line	Always	10 kΩ or higher
MPX2 (D6-21) - Body ground	BR - Body ground	MPX line	Always	10 kΩ or higher

If the values do not conform to the conditions specified, there may be a malfunction on the wire harness side.

**4. CHECK A/C ECU**

- (a) Disconnect the D37 ECU connector.



- (b) Measure the voltage between the specified terminals on the wire harness side connector.

**Voltage:**

Symbol (Terminal No.)	Wiring Color	Terminal Description	Condition	Specified Condition
IG+ (D37-21) - Body ground	G - Body ground	Power supply (IG)	Ignition switch: OFF → ON (IG)	Below 1 V → 10 to 14 V
B (D37-1) - Body ground	SB - Body ground	Power supply (Back-up)	Always	10 to 14 V

If the values do not conform to the conditions specified, there may be a malfunction on the wire harness side.

- (c) Measure the resistance between the specified terminals on the wire harness side connector.

**Resistance:**

Symbol (Terminal No.)	Wiring Color	Terminal Description	Condition	Specified Condition
GND (D37-20) - Body ground	W-B - Body ground	Ground	Always	Below 1 Ω
MPX+ (D37-30) - Body ground	LG - Body ground (*1) B - Body ground (*2)	MPX line	Always	10 kΩ or higher

Symbol (Terminal No.)	Wiring Color	Terminal Description	Condition	Specified Condition
MPX- (D37-31) - Body ground	L - Body ground	MPX line	Always	10 kΩ or higher

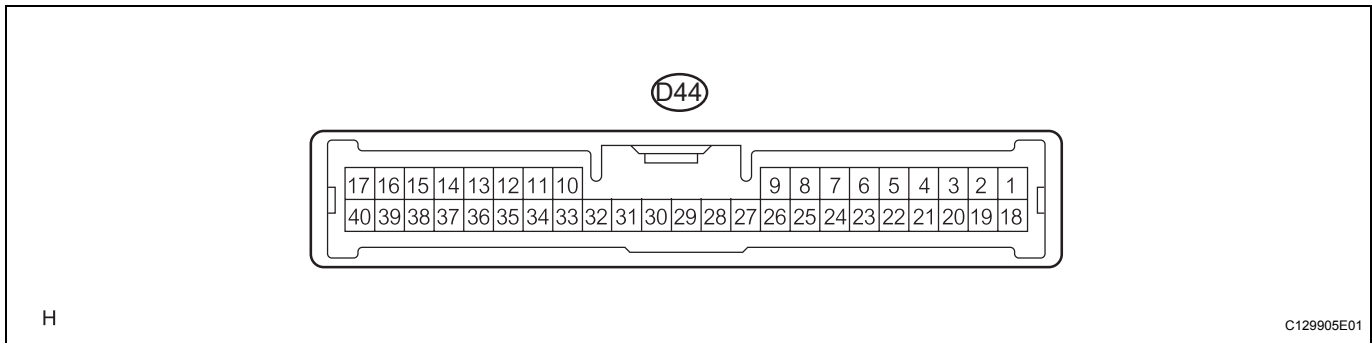
(\*1): w/ Smart Key System

(\*2): w/o Smart Key System

If the values do not conform to the conditions specified, there may be a malfunction on the wire harness side.

**5. CHECK POWER SOURCE CONTROL ECU**

(a) Disconnect the D44 ECU connector.



(b) Measure the voltage between the specified terminals on the wire harness side connector.

**Voltage:**

Symbol (Terminal No.)	Wiring Color	Terminal Description	Condition	Specified Condition
ACCD (D44-11) - Body ground	R - Body ground	Power supply (ACC)	Ignition switch: OFF → ON (ACC)	Below 1 V → 10 to 14 V
AM1 (D44-33) - Body ground	W - Body ground	Power supply (Back-up)	Always	10 to 14 V
AM2 (D44-12) - Body ground	L - Body ground	Power supply (Back-up)	Always	10 to 14 V

If the values do not conform to the conditions specified, there may be a malfunction on the wire harness side.

(c) Measure the resistance between the specified terminals on the wire harness side connector.

**Resistance:**

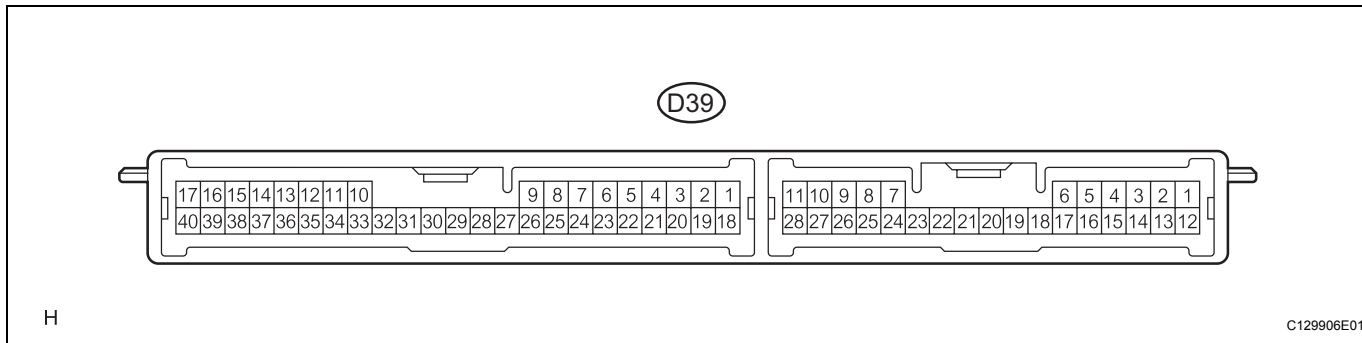
Symbol (Terminal No.)	Wiring Color	Terminal Description	Condition	Specified Condition
GND2 (D44-6) - Body ground	W-B - Body ground	Ground	Always	Below 1 Ω
MPX1 (D44-7) - Body ground	B - Body ground	MPX line	Always	10 kΩ or higher
MPX2 (D44-24) - Body ground	LG - Body ground	MPX line	Always	10 kΩ or higher

If the values do not conform to the conditions specified, there may be a malfunction on the wire harness side.



**6. CHECK CERTIFICATION ECU**

(a) Disconnect the D39 ECU connectors.



(b) Measure the voltage between the specified terminals on the wire harness side connector.

**Voltage:**

Symbol (Terminal No.)	Wiring Color	Terminal Description	Condition	Specified Condition
IG (D39-18) - Body ground	Y - Body ground	Power supply (IG)	Ignition switch: OFF → ON (IG)	Below 1 V → 10 to 14 V
ACC (D39-19) - Body ground	SB - Body ground	Power supply (ACC)	Ignition switch: OFF → ON (ACC)	Below 1 V → 10 to 14 V
+B1 (D39-1) - Body ground	R - Body ground	Power supply (Back-up)	Always	10 to 14 V

If the values do not conform to the conditions specified, there may be a malfunction on the wire harness side.

(c) Measure the resistance between the specified terminals on the wire harness side connector.

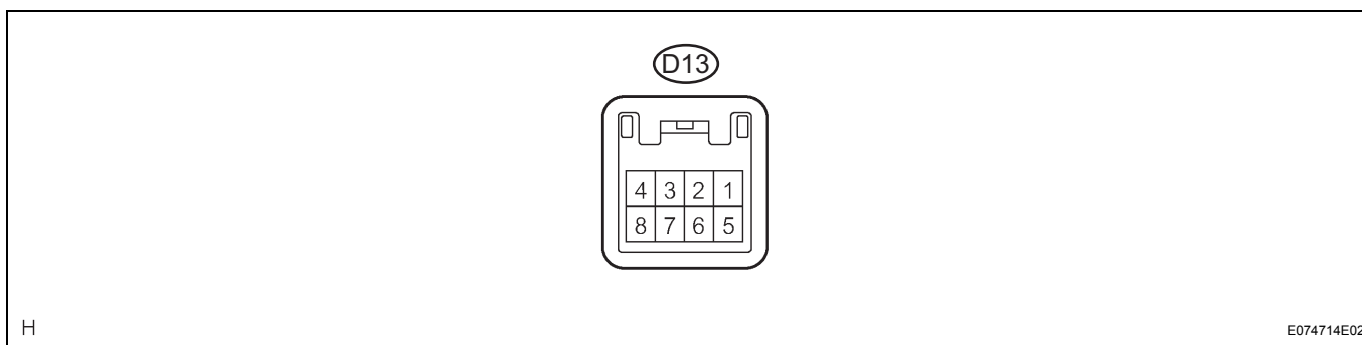
**Resistance:**

Symbol (Terminal No.)	Wiring Color	Terminal Description	Condition	Specified Condition
E (D39-17) - Body ground	W-B - Body ground	Ground	Always	Below 1 Ω
MPX1 (D39-27) - Body ground	R - Body ground	MPX line	Always	10 kΩ or higher
MPX2 (D39-28) - Body ground	B - Body ground	MPX line	Always	10 kΩ or higher

If the values do not conform to the conditions specified, there may be a malfunction on the wire harness side.

**7. CHECK COMBINATION SWITCH ECU**

(a) Disconnect the D13 ECU connector.



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- (b) Measure the voltage between the specified terminals on the wire harness side connector.

**Voltage:**

Symbol (Terminal No.)	Wiring Color	Terminal Description	Condition	Specified Condition
IG (D13-2) - Body ground	L - Body ground	Power supply (IG)	Ignition switch: OFF → ON (IG)	Below 1 V → 10 to 14 V
B (D13-1) - Body ground	W - Body ground	Power supply (Back-up)	Always	10 to 14 V

If the values do not conform to the conditions specified, there may be a malfunction on the wire harness side.

- (c) Measure the resistance between the specified terminals on the wire harness side connector.

**Resistance:**

Symbol (Terminal No.)	Wiring Color	Terminal Description	Condition	Specified Condition
E (D13-5) - Body ground	W-B - Body ground	Ground	Always	Below 1 Ω
MPX1 (D13-6) - Body ground	BR - Body ground	MPX line	Always	10 kΩ or higher
MPX2 (D13-7) - Body ground	R - Body ground (*1) B - Body ground (*2)	MPX line	Always	10 kΩ or higher

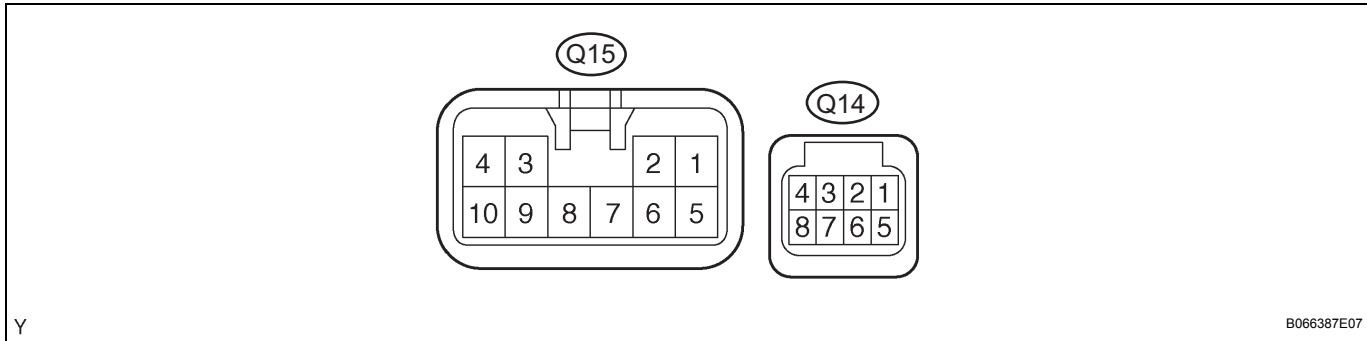
(\*1): w/ Smart Key System

(\*2): w/o Smart Key System

If the values do not conform to the conditions specified, there may be a malfunction on the wire harness side.

**8. CHECK POWER SEAT ECU**

- (a) Disconnect the Q14 and Q15 ECU connectors.



- (b) Measure the voltage between the specified terminals on the wire harness side connector.

**Voltage:**

Symbol (Terminal No.)	Wiring Color	Terminal Description	Condition	Specified Condition
IG (Q14-4) - Body ground	Y - Body ground	Power supply (IG)	Ignition switch: OFF → ON (IG)	Below 1 V → 10 to 14 V
+B (Q15-5) - Body ground	LG - Body ground	Power supply (Back-up)	Always	10 to 14 V

If the values do not conform to the conditions specified, there may be a malfunction on the wire harness side.

- (c) Measure the resistance between the specified terminals on the wire harness side connector.

**Resistance:**

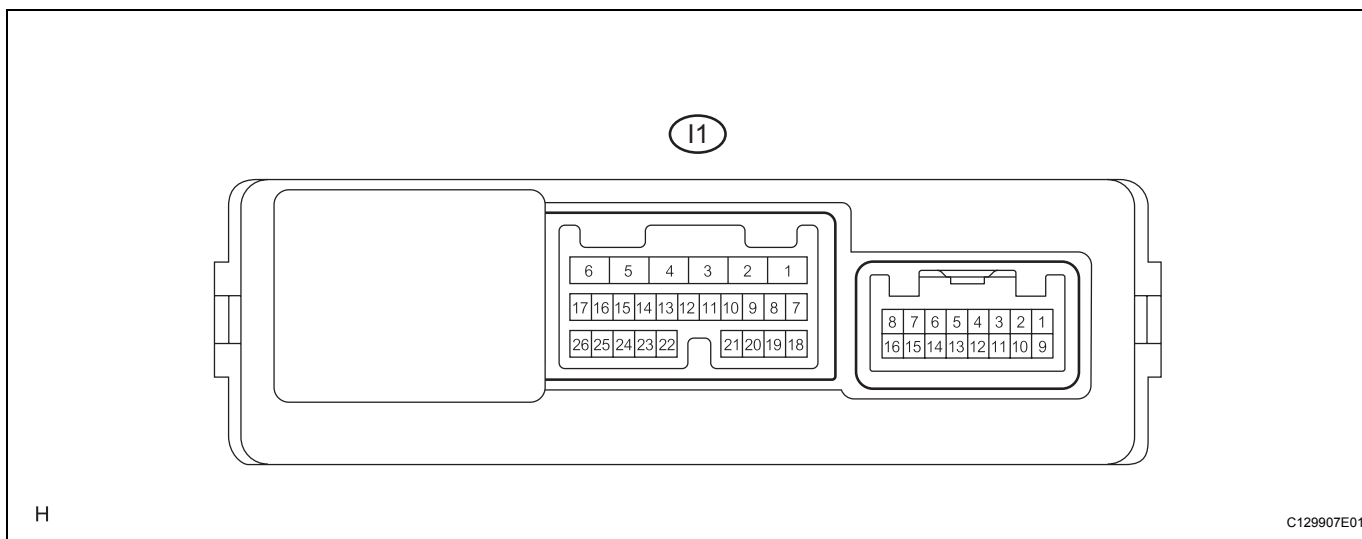
Symbol (Terminal No.)	Wiring Color	Terminal Description	Condition	Specified Condition
GND (Q15-1) - Body ground	W-B - Body ground	Ground	Always	Below 1 Ω

Symbol (Terminal No.)	Wiring Color	Terminal Description	Condition	Specified Condition
MPX1 (Q14-1) - Body ground	O - Body ground	MPX line	Always	10 kΩ or higher

If the values do not conform to the conditions specified, there may be a malfunction on the wire harness side.

**9. CHECK MEMORY MIRROR ECU (LH)**

- (a) Disconnect the I1 ECU connector.



- (b) Measure the voltage between the specified terminals on the wire harness side connector.

**Voltage:**

Symbol (Terminal No.)	Wiring Color	Terminal Description	Condition	Specified Condition
SIG (I1-3) - Body ground	GR - Body ground	Power supply (IG)	Ignition switch: OFF → ON (IG)	Below 1 V → 10 to 14 V
CPUB (I1-4) - Body ground	W - Body ground	Power supply (Back-up)	Always	10 to 14 V
BDR (I1-6) - Body ground	W - Body ground	Power supply (Back-up)	Always	10 to 14 V

If the values do not conform to the conditions specified, there may be a malfunction on the wire harness side.

- (c) Measure the resistance between the specified terminals on the wire harness side connector.

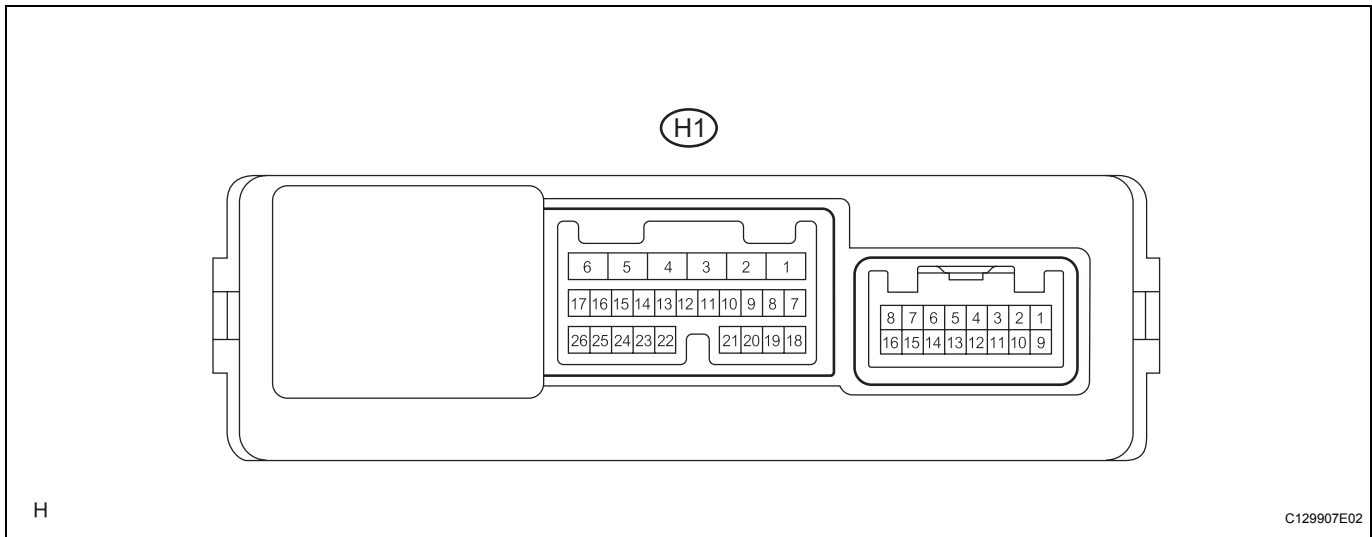
**Resistance:**

Symbol (Terminal No.)	Wiring Color	Terminal Description	Condition	Specified Condition
GND (I1-1) - Body ground	W-B - Body ground	Ground	Always	Below 1 Ω
MPX1 (I1-8) - Body ground	BR - Body ground	MPX line	Always	10 kΩ or higher

If the values do not conform to the conditions specified, there may be a malfunction on the wire harness side.

**10. CHECK MEMORY MIRROR ECU (RH)**

(a) Disconnect the H1 ECU connector.



(b) Measure the voltage between the specified terminals on the wire harness side connector.

**Voltage:**

Symbol (Terminal No.)	Wiring Color	Terminal Description	Condition	Specified Condition
SIG (H1-3) - Body ground	GR - Body ground	Power supply (IG)	Ignition switch: OFF → ON (IG)	Below 1 V → 10 to 14 V
CPUB (H1-4) - Body ground	W - Body ground	Power supply (Back-up)	Always	10 to 14 V
BDR (H1-6) - Body ground	V - Body ground	Power supply (Back-up)	Always	10 to 14 V

If the values do not conform to the conditions specified, there may be a malfunction on the wire harness side.

(c) Measure the resistance between the specified terminals on the wire harness side connector.

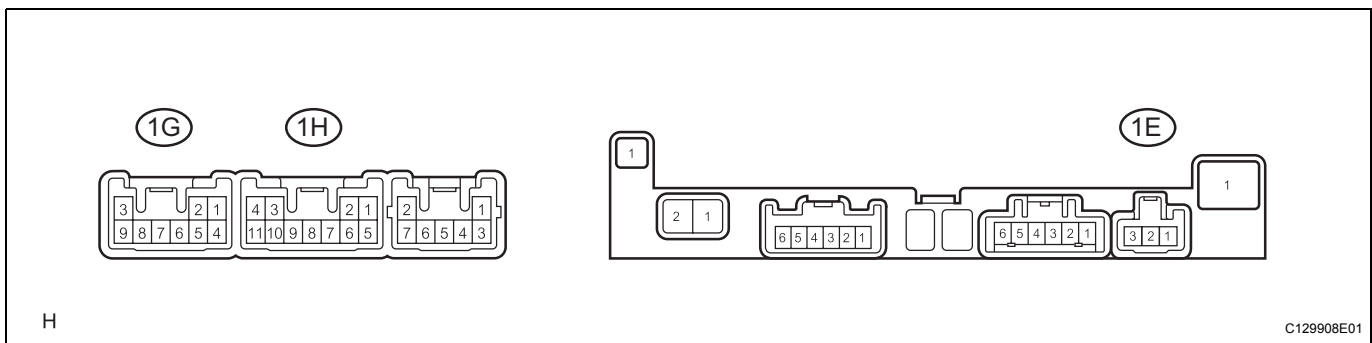
**Resistance:**

Symbol (Terminal No.)	Wiring Color	Terminal Description	Condition	Specified Condition
GND (H1-1) - Body ground	W-B - Body ground	Ground	Always	Below 1 Ω
MPX1 (H1-8) - Body ground	B - Body ground	MPX line	Always	10 kΩ or higher

If the values do not conform to the conditions specified, there may be a malfunction on the wire harness side.

**11. CHECK FRONT CONTROLLER**

(a) Disconnect the 1E, 1H and 1G ECU connectors.



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- (b) Measure the voltage between the specified terminals on the wire harness side connector.

**Voltage:**

Symbol (Terminal No.)	Wiring Color	Terminal Description	Condition	Specified Condition
1E-2 - Body ground	Y - Body ground	Power supply (IG)	Ignition switch: OFF → ON (IG)	Below 1 V → 10 to 14 V
1H-4 - Body ground	LG - Body ground	Power supply (Back-up)	Always	10 to 14 V

If the values do not conform to the conditions specified, there may be a malfunction on the wire harness side.

- (c) Measure the resistance between the specified terminals on the wire harness side connector.

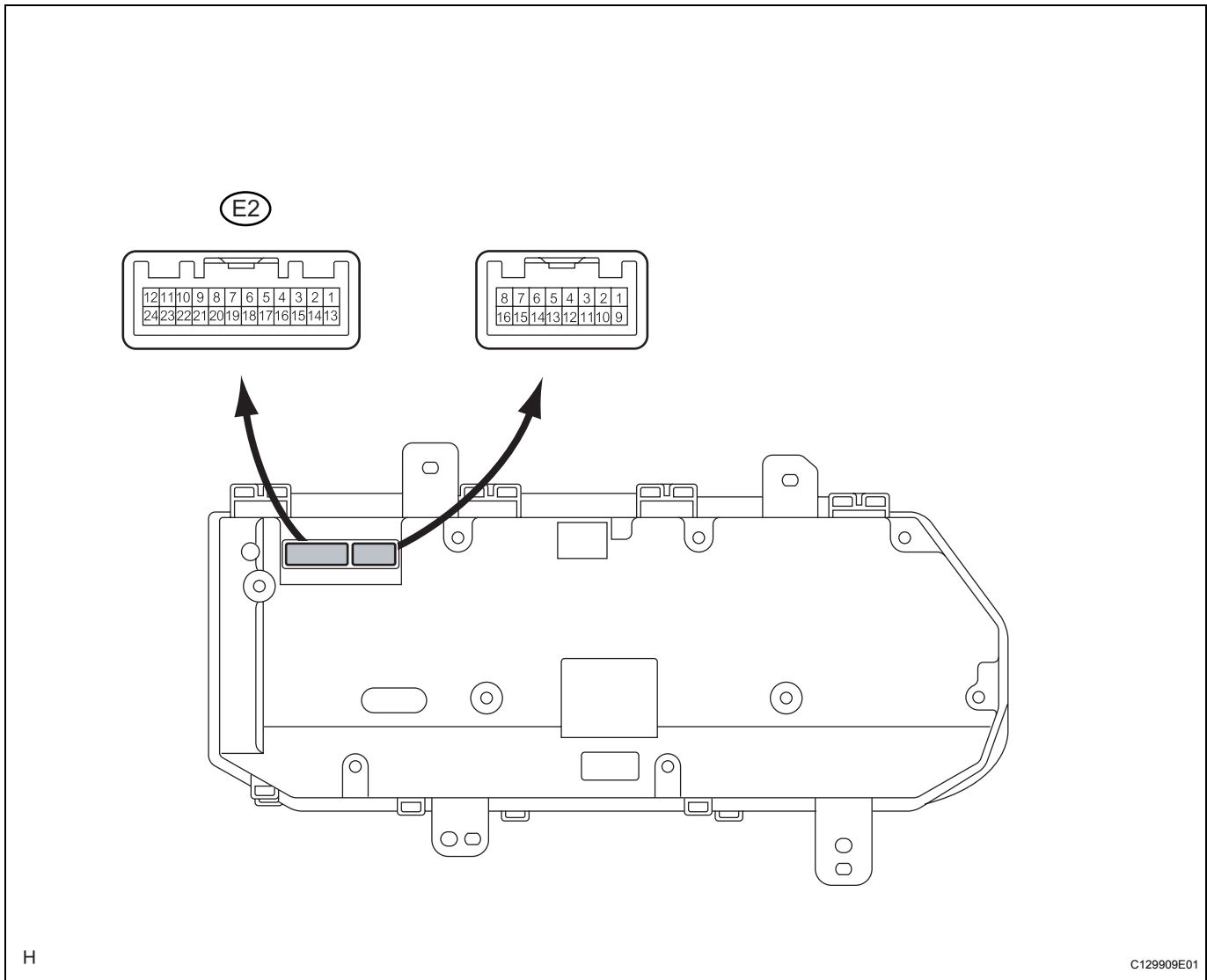
**Resistance:**

Symbol (Terminal No.)	Wiring Color	Terminal Description	Condition	Specified Condition
1G-7 - Body ground	Y - Body ground	MPX line	Always	10 kΩ or higher
1G-8 - Body ground	B - Body ground	MPX line	Always	10 kΩ or higher

If the values do not conform to the conditions specified, there may be a malfunction on the wire harness side.

**12. CHECK COMBINATION METER ECU**

(a) Disconnect the E2 ECU connectors.



(b) Measure the voltage between the specified terminals on the wire harness side connector.

**Voltage:**

Symbol (Terminal No.)	Wiring Color	Terminal Description	Condition	Specified Condition
E2-13 - Body ground	R - Body ground	Power supply (IG)	Ignition switch: OFF → ON (IG)	Below 1 V → 10 to 14 V
E2-2 - Body ground	B - Body ground	Power supply (Back-up)	Always	10 to 14 V

If the values do not conform to the conditions specified, there may be a malfunction on the wire harness side.

(c) Measure the resistance between the specified terminals on the wire harness side connector.

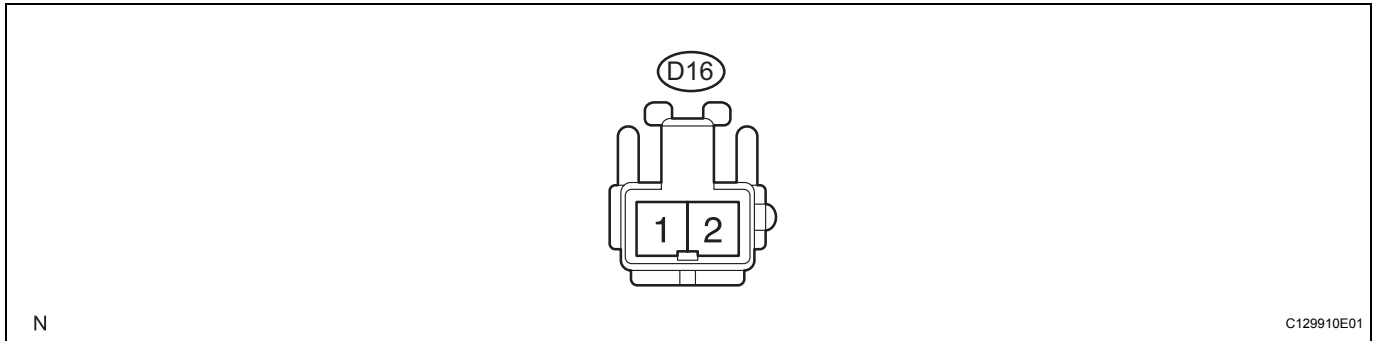
**Resistance:**

Symbol (Terminal No.)	Wiring Color	Terminal Description	Condition	Specified Condition
E2-10 - Body ground	W-B - Body ground	Ground	Always	Below 1 Ω
E2-4 - Body ground	P - Body ground	MPX line	Always	10 kΩ or higher
E2-16 - Body ground	LG - Body ground	MPX line	Always	10 kΩ or higher

If the values do not conform to the conditions specified, there may be a malfunction on the wire harness side.

**13. CHECK OPTION CONNECTOR**

- (a) Disconnect the D16 ECU connector.



- (b) Measure the resistance between the specified terminals on the wire harness side connector.

**Resistance:**

Symbol (Terminal No.)	Wiring Color	Terminal Description	Condition	Specified Condition
D16-1 (MPX+) - Body ground	W - Body ground	MPX line	Always	10 kΩ or higher

If the values do not conform to the conditions specified, there may be a malfunction on the wire harness side.

# DIAGNOSIS SYSTEM

## 1. DESCRIPTION

- (a) Multiplex communication system data can be read in the Data Link Connector 3 (DLC3) of the vehicle. When the system seems to be malfunctioning, use the intelligent tester to check for malfunctions and make necessary repairs.

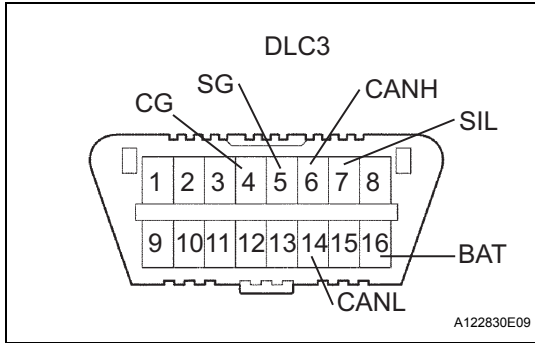
## 2. CHECK DLC3

- (a) The vehicle's ECU uses the ISO 15765-4 communication protocol. The terminal arrangement of the DLC3 complies with SAE J1962 and matches the ISO 15765-4 format.

**HINT:**

Connect the cable of the intelligent tester (with CAN VIM) to the DLC3, turn the ignition switch on (IG) and attempt to use the intelligent tester. If the screen displays a communication error message, a problem exists on the vehicle side or the tester side. If the communication is normal when the tester is connected to another vehicle, inspect the DLC3 on the original vehicle.

If the communication is still impossible when the tester is connected to another vehicle, the problem is probably in the tester itself. Consult the Service Department listed in the tester's instruction manual.



Symbol (Terminals No.)	Terminal Description	Condition	Specified Condition
SIL (7) - SG (5)	Bus "+" line	During transmission	Pulse generation
CG (4) - Body ground	Chassis ground	Always	Below 1 Ω
SG (5) - Body ground	Signal ground	Always	Below 1 Ω
BAT (16) - Body ground	Battery positive	Always	11 to 14 V

## 3. INSPECT BATTERY VOLTAGE

**Standard:**

**11 to 14 V**

If the voltage is below 11 V, recharge or replace the battery before proceeding.

## DTC CHECK / CLEAR

### 1. CHECK DTC

- (a) Connect the intelligent tester to the DLC3.
- (b) Turn the ignition switch on (IG).
- (c) Read DTCs on the tester screen.

**HINT:**

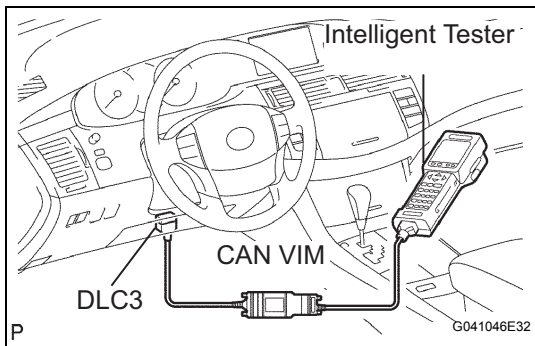
Refer to the intelligent tester operator's manual for further details.

### 2. CLEAR DTC

- (a) Connect the intelligent tester to the DLC3.
- (b) Turn the ignition switch on (IG).
- (c) Clear the DTCs following the prompts on the tester screen.

**HINT:**

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





## DIAGNOSTIC TROUBLE CODE CHART

If a trouble code is displayed during DTC check, check the circuit corresponding to the code in the table below. Proceed to the page given for the circuit.

### MULTIPLEX COMMUNICATION SYSTEM

DTC No.	Detection Item	Trouble Area	See page
B1200	MPX Body ECU Stop	1. Body ECU 2. Wire harness	<a href="#">MP-25</a>
B1207	Certification ECU Communication Malfunction	1. Certification ECU 2. Wire harness	<a href="#">MP-29</a>
B1208	Passenger Side Outer Mirror ECU	1. Memory mirror ECU (RH) 2. Wire harness	<a href="#">MP-32</a>
B1209	Driver Side Outer Mirror	1. Memory mirror ECU (LH) 2. Wire harness	<a href="#">MP-34</a>
B1210	Power ECU Stop	1. Power source control ECU 2. Wire harness	<a href="#">MP-36</a>
B1214	Short to B+ in Door System Communication Bus Malfunction	1. ECUs 2. Wire harness	<a href="#">MP-39</a>
B1215	Short to GND in Door System Communication Bus Malfunction	1. ECUs 2. Wire harness	<a href="#">MP-39</a>
B1248	AVC-LAN Communication Impossible	1. AVC-LAN (radio receiver assembly or multi-display assembly) 2. Wire harness	<a href="#">MP-47</a>
B1262	A/C ECU Communication Stop	1. A/C ECU 2. Wire harness	<a href="#">MP-48</a>
B1271	Combination Meter ECU Communication Stop	1. Combination meter ECU 2. Wire harness	<a href="#">MP-51</a>
B1272	Power Seat ECU Communication Stop	1. Driver seat ECU (Power seat ECU) 2. Wire harness	<a href="#">MP-55</a>
B1275	Accessory Bus Buffer Communication Stop	1. Option connector (BEAN bus buffer) 2. Wire harness	<a href="#">MP-58</a>
B1278	Combination Switch ECU Communication Stop	1. Combination switch 2. Wire harness	<a href="#">MP-60</a>
B1279	Rain Sensor Communication Stop	1. Rain sensor 2. Wire harness	<a href="#">MP-63</a>
B1296	Front Light ECU Communication Stop	1. Front controller 2. Wire harness	<a href="#">MP-65</a>

When DTCs indicating "+B or GND short malfunction of communication bus" (B1214, B1215, etc.) are detected at the same time as DTCs indicating "communication stop" (B1200, B1207, etc.), repair DTCs indicating "+B or GND short malfunction of communication bus" first.

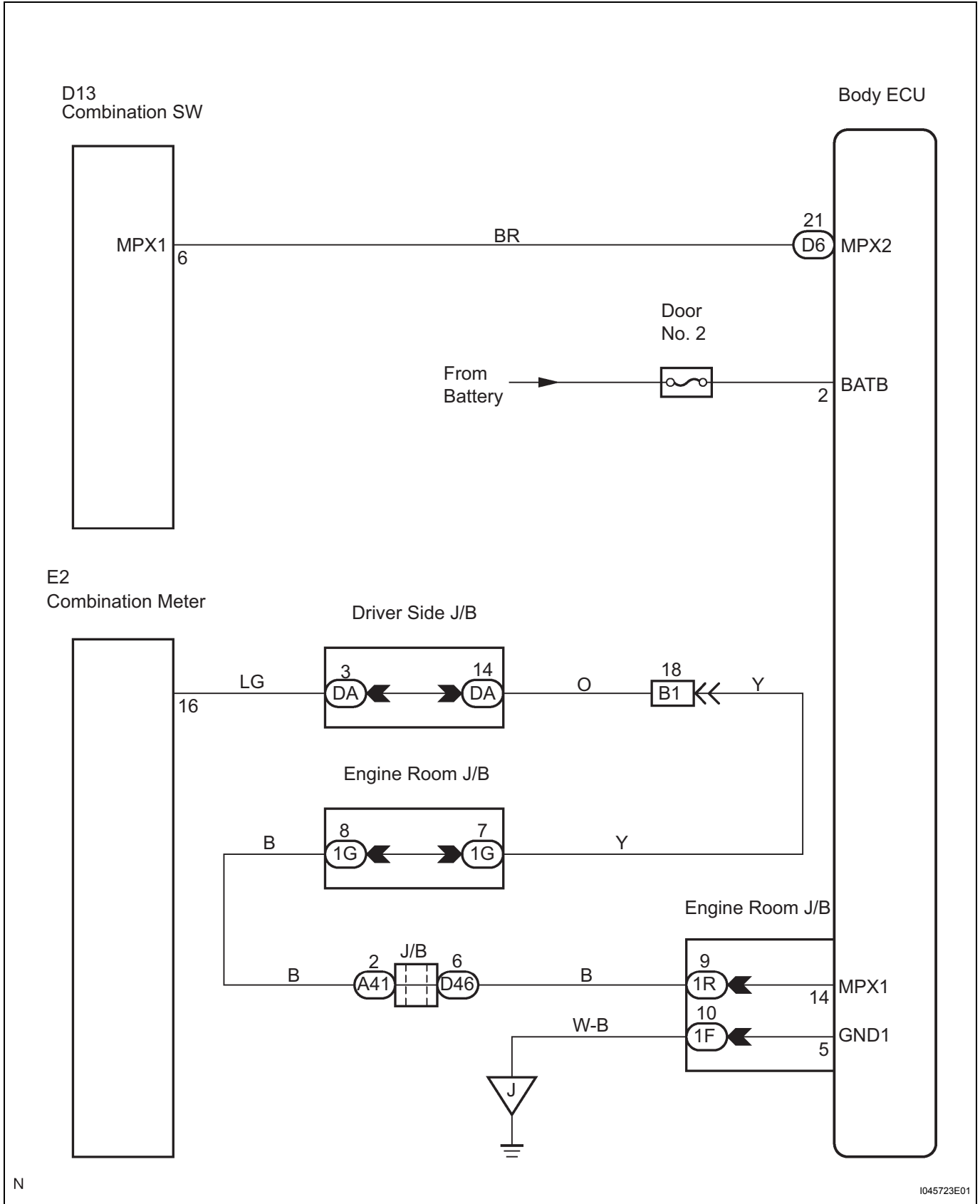
<b>DTC</b>	<b>B1200</b>	<b>MPX Body ECU Stop</b>
------------	--------------	--------------------------

**DESCRIPTION**

This DTC is detected when communication between the body ECU and the gateway ECU stops for more than 10 seconds.

<b>DTC No.</b>	<b>DTC Detection Condition</b>	<b>Trouble Area</b>
B1200	Body ECU Communication stops	<ul style="list-style-type: none"><li>• Body ECU</li><li>• Wire harness</li></ul>

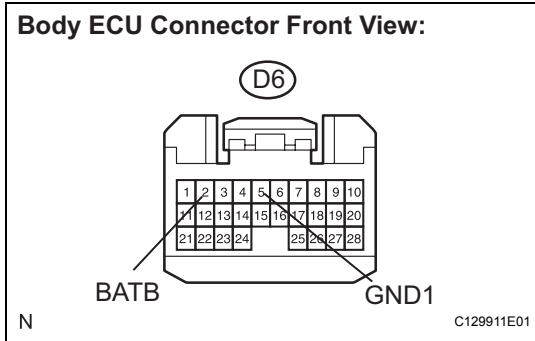
WIRING DIAGRAM



MP

**INSPECTION PROCEDURE**

**1 CHECK HARNESS AND CONNECTOR (BODY ECU - BATTERY AND BODY GROUND)**



- (a) Disconnect the D6 ECU connector.
- (b) Measure the voltage between the specified terminals on the wire harness side connector.

**Voltage**

Tester Connection	Condition	Specified Condition
D6-2 (BATB) - Body ground	Always	10 to 14 V

- (c) Measure the resistance between the specified terminals on the wire harness side connector.

**Resistance**

Tester Connection	Condition	Specified Condition
D6-5 (GND1) - Body ground	Always	Below 1 Ω

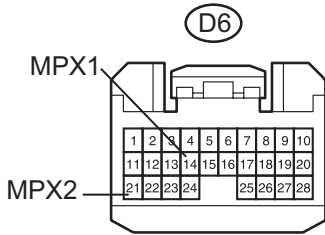
**NG** → **REPAIR OR REPLACE HARNESS OR CONNECTOR**

**OK**

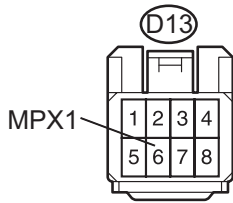
**2 CHECK RESISTANCE OF COMMUNICATION LINE**

- (a) Disconnect the D6, D13 and E2 ECU connectors.

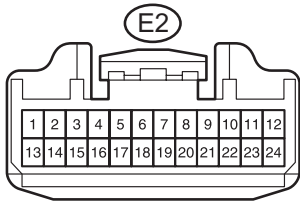
Body ECU Connector Front View:



Combination Switch Connector Front View:



Combination Meter Connector Front View:



N

C129912E01

(b) Measure the resistance between the specified terminals on the wire harness side connectors.

**Resistance**

Tester Connection	Specified Condition
D6-14 (MPX1) - E2-16	Below 1 Ω
D6-21 (MPX2) - D13-6 (MPX1)	Below 1 Ω

**Result**

Result	Proceed to
Both are OK	A
One is OK	B
Both are NG	C

**B** → REPLACE BODY ECU AND REPAIR OR REPLACE HARNESS OR CONNECTOR

**C** → REPAIR OR REPLACE HARNESS OR CONNECTOR

**A**

REPLACE BODY ECU

DTC

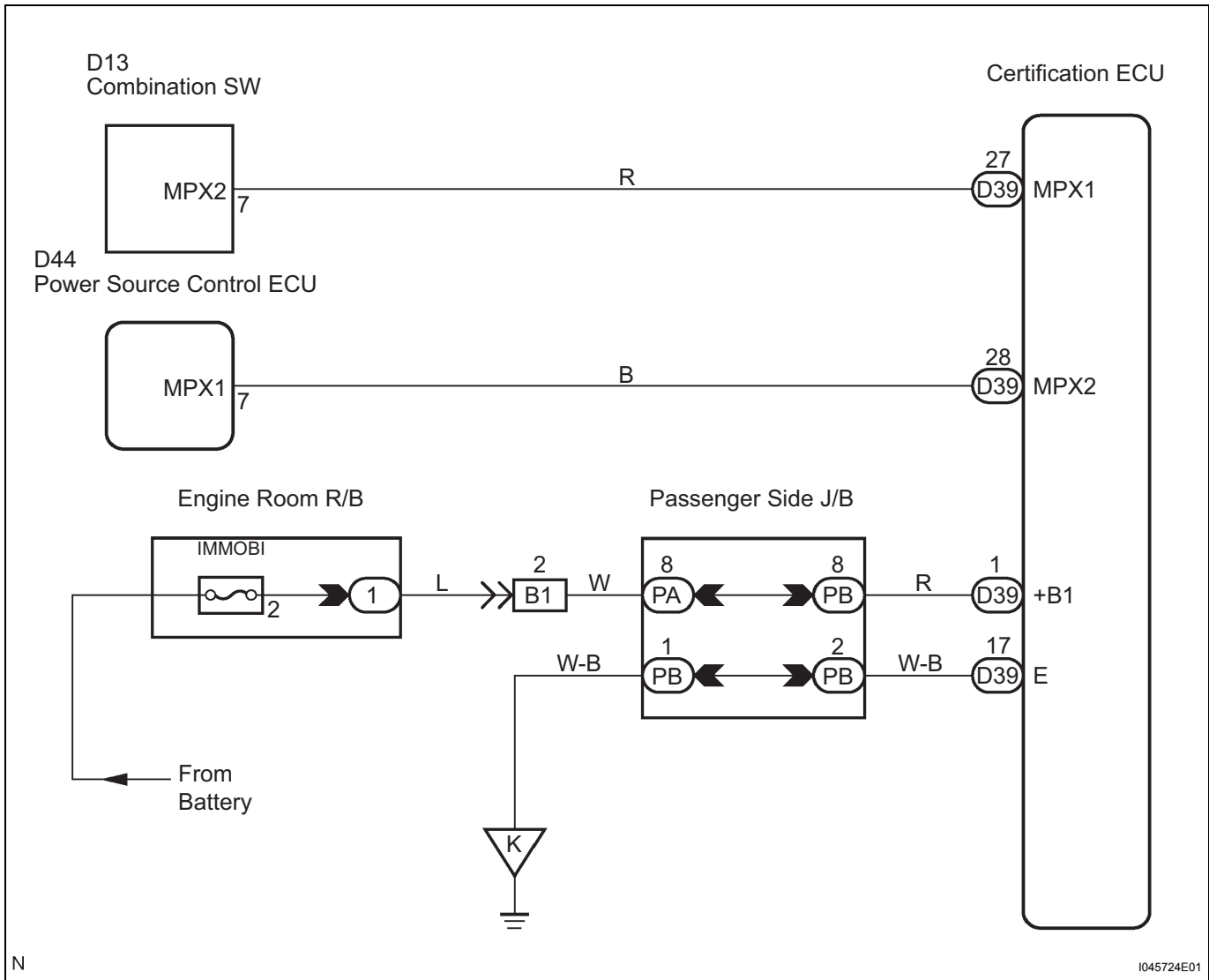
B1207

Certification ECU Communication Malfunction

**DESCRIPTION**

This DTC is detected when communication between the certification ECU and gateway ECU stops for more than 10 seconds.

DTC No.	DTC Detection Condition	Trouble Area
B1207	Certification ECU communication stops	<ul style="list-style-type: none"> <li>• Certification ECU</li> <li>• Wire harness</li> </ul>

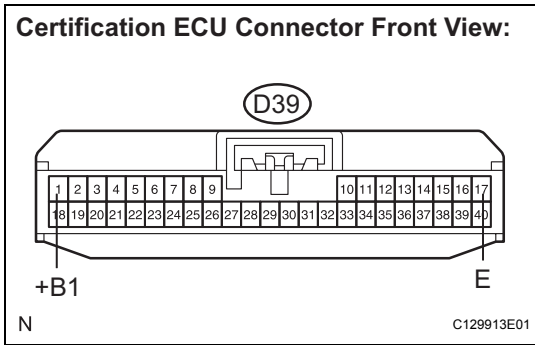
**WIRING DIAGRAM****INSPECTION PROCEDURE**

1

**CHECK HARNESS AND CONNECTOR (CERTIFICATION ECU - BATTERY AND BODY GROUND)**

(a) Disconnect the D39 ECU connector.

Certification ECU Connector Front View:



- (b) Measure the voltage between the specified terminals on the wire harness side connector.

**Voltage**

Tester Connection	Specified Condition
D39-1 (+B1) - Body ground	10 to 14 V

- (c) Measure the resistance between the specified terminals on the wire harness side connector.

**Resistance**

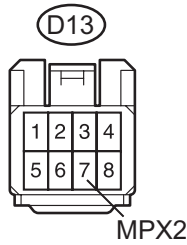
Tester Connection	Specified Condition
D39-17 (E) - Body ground	Below 1 Ω

**NG** → **REPAIR OR REPLACE HARNESS OR CONNECTOR**

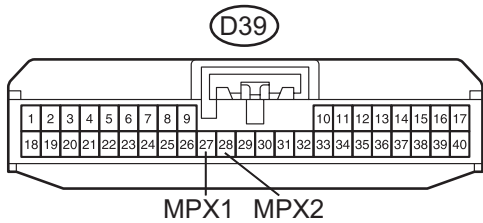
**OK**

**2 CHECK RESISTANCE OF COMMUNICATION LINE**

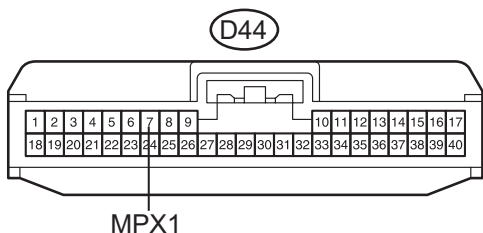
Combination Switch Connector Front View:



Certification ECU Connector Front View:



Power Source Control ECU Connector Front View:



- (a) Disconnect the D13, D39 and D44 ECU connectors.
- (b) Measure the resistance between the specified terminals on the wire harness side connector.

**Resistance**

Tester Connection	Specified Condition
D39-27 (MPX1) - D13-7 (MPX2)	Below 1 Ω
D39-28 (MPX2) - D44-7 (MPX1)	Below 1 Ω

**Result**

Result	Proceed to
Both are OK	A
One is OK	B
Both are NG	C

**B** → **REPLACE CERTIFICATION ECU AND REPAIR OR REPLACE HARNESS OR CONNECTOR**

**C** → **REPAIR OR REPLACE HARNESS OR CONNECTOR**



REPLACE CERTIFICATION ECU



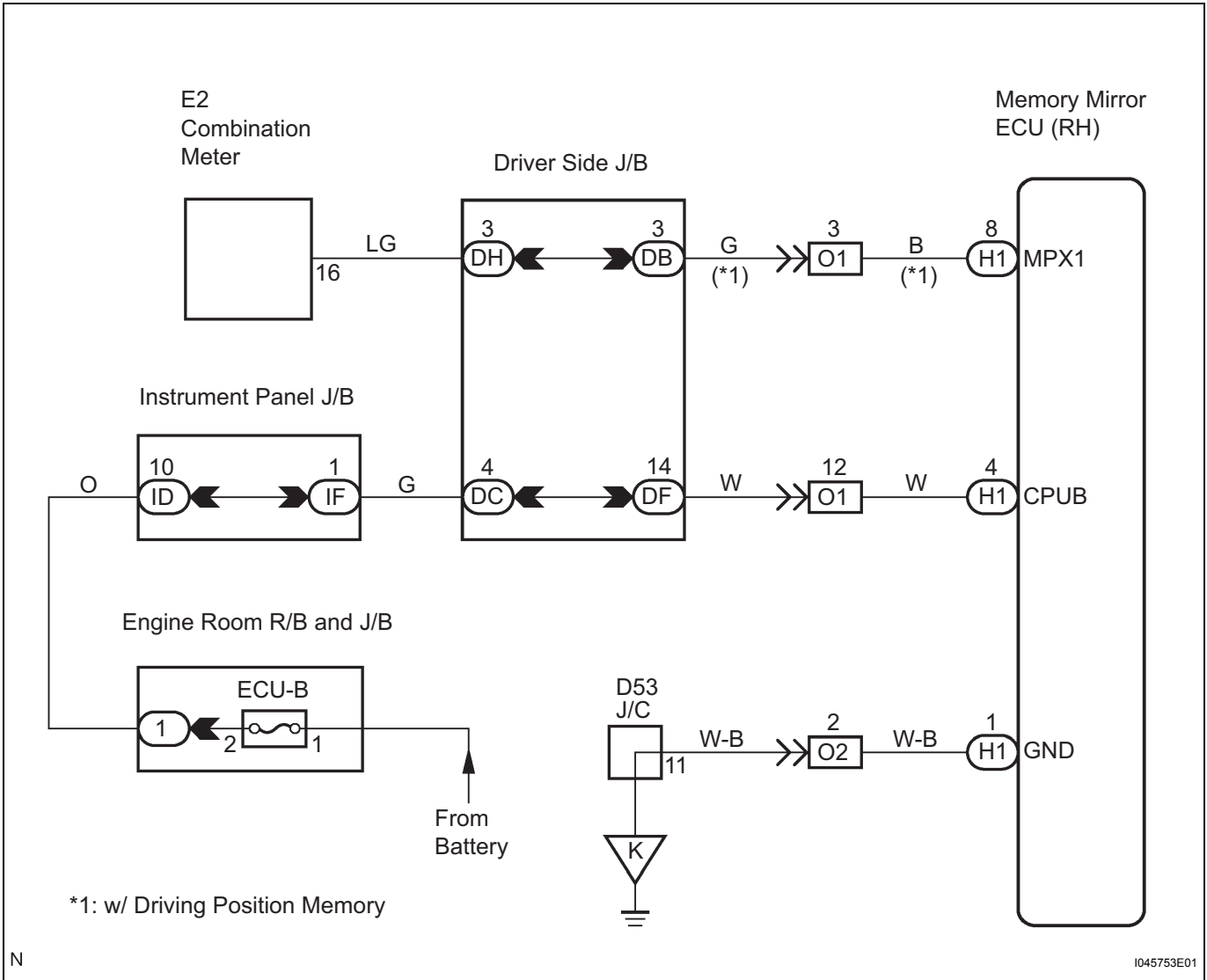
<b>DTC</b>	<b>B1208</b>	<b>Passenger Side Outer Mirror ECU</b>
------------	--------------	--

**DESCRIPTION**

This DTC is detected when communication between the passenger side outer mirror ECU (memory mirror ECU) and gateway ECU stops for more than 10 seconds.

DTC No.	DTC Detecting Condition	Trouble Area
B1208	Passenger side outer mirror ECU communication stops	<ul style="list-style-type: none"> <li>• Memory mirror ECU (RH)</li> <li>• Wire harness</li> </ul>

**WIRING DIAGRAM**

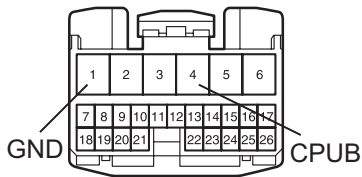


**INSPECTION PROCEDURE**

<b>1</b>	<b>CHECK HARNESS AND CONNECTOR (MEMORY MIRROR ECU - BATTERY AND BODY GROUND)</b>
----------	--

(a) Disconnect the H1 ECU connector.

Memory Mirror ECU Connector  
Front View:



N

C129915E01

- (b) Measure the voltage between the specified terminals on the wire harness side connector.

**Voltage**

Tester Connection	Specified Connection
H1-4 (CPUB) - Body ground	10 to 14 V

- (c) Measure the resistance between the specified terminals on the wire harness side connector.

**Resistance**

Tester Connection	Specified Connection
H1-1 (GND) - Body ground	Below 1 Ω

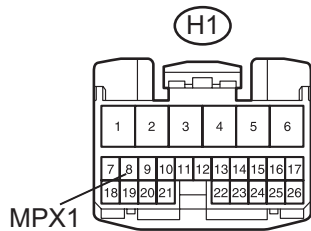
NG

**REPAIR OR REPLACE HARNESS OR CONNECTOR**

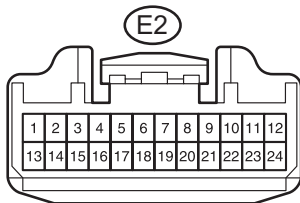
OK

**2 CHECK RESISTANCE OF COMMUNICATION LINE**

Memory Mirror ECU Connector  
Front View:



Combination Meter Connector  
Front View:



N

C129916E01

- (a) Disconnect the H1 and E2 ECU connectors.  
(b) Measure the resistance between the specified terminals on the wire harness side connector.

**Resistance**

Tester Connection	Specified Connection
H1-8 (MPX1) - E2-16	Below 1 Ω

NG

**REPAIR OR REPLACE HARNESS OR CONNECTOR**

OK

**REPLACE MEMORY MIRROR ECU**

MP

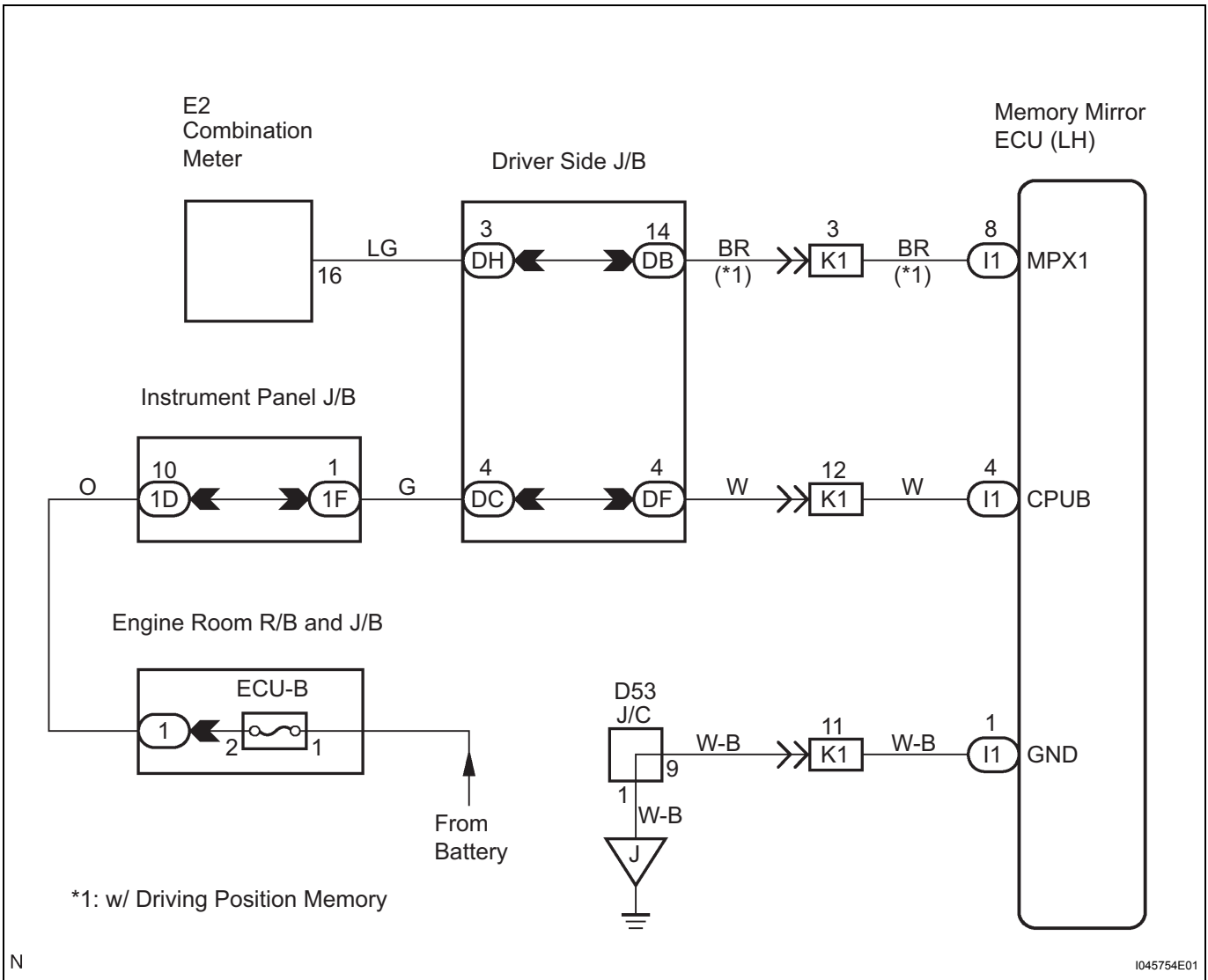
<b>DTC</b>	<b>B1209</b>	<b>Driver Side Outer Mirror</b>
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**DESCRIPTION**

This DTC is detected when communication between the driver side outer mirror ECU (memory mirror ECU) and gateway ECU stops for more than 10 seconds.

DTC No.	DTC Detection Condition	Trouble Area
B1209	Driver side outer mirror ECU Communication stops	<ul style="list-style-type: none"> <li>Memory mirror ECU (LH)</li> <li>Wire harness</li> </ul>

**WIRING DIAGRAM**

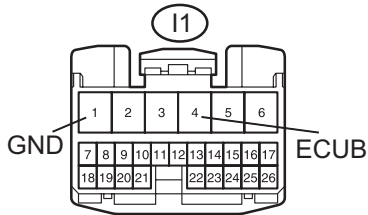


**INSPECTION PROCEDURE**

<b>1</b>	<b>CHECK HARNESS AND CONNECTOR (MEMORY MIRROR ECU - BATTERY AND BODY GROUND)</b>
----------	--

(a) Disconnect the I1 ECU connector.

Memory Mirror ECU Connector  
Front View:



N

C129917E01

- (b) Measure the voltage between the specified terminals on the wire harness side connector.

**Voltage**

Tester Connection	Specified Connection
I1-4 (ECUB) - Body ground	10 to 14 V

- (c) Measure the resistance between the specified terminals on the wire harness side connector.

**Resistance**

Tester Connection	Specified Connection
I1-1 (GND) - Body ground	Below 1 Ω

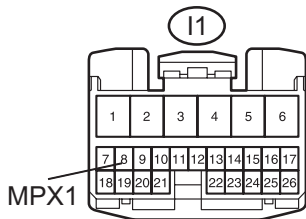
NG

**REPAIR OR REPLACE HARNESS OR CONNECTOR**

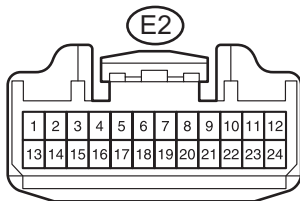
OK

**2 CHECK RESISTANCE OF COMMUNICATION LINE**

Memory Mirror ECU Connector  
Front View:



Combination Meter Connector  
Front View:



N

C129918E01

- (a) Disconnect the I1 and E2 ECU connectors.  
(b) Measure the resistance between the specified terminals on the wire harness side connector.

**Resistance**

Tester Connection	Specified Connection
I1-8 (MPX1) - E2-16	Below 1 Ω

NG

**REPAIR OR REPLACE HARNESS OR CONNECTOR**

OK

**REPLACE MEMORY MIRROR ECU**

MP

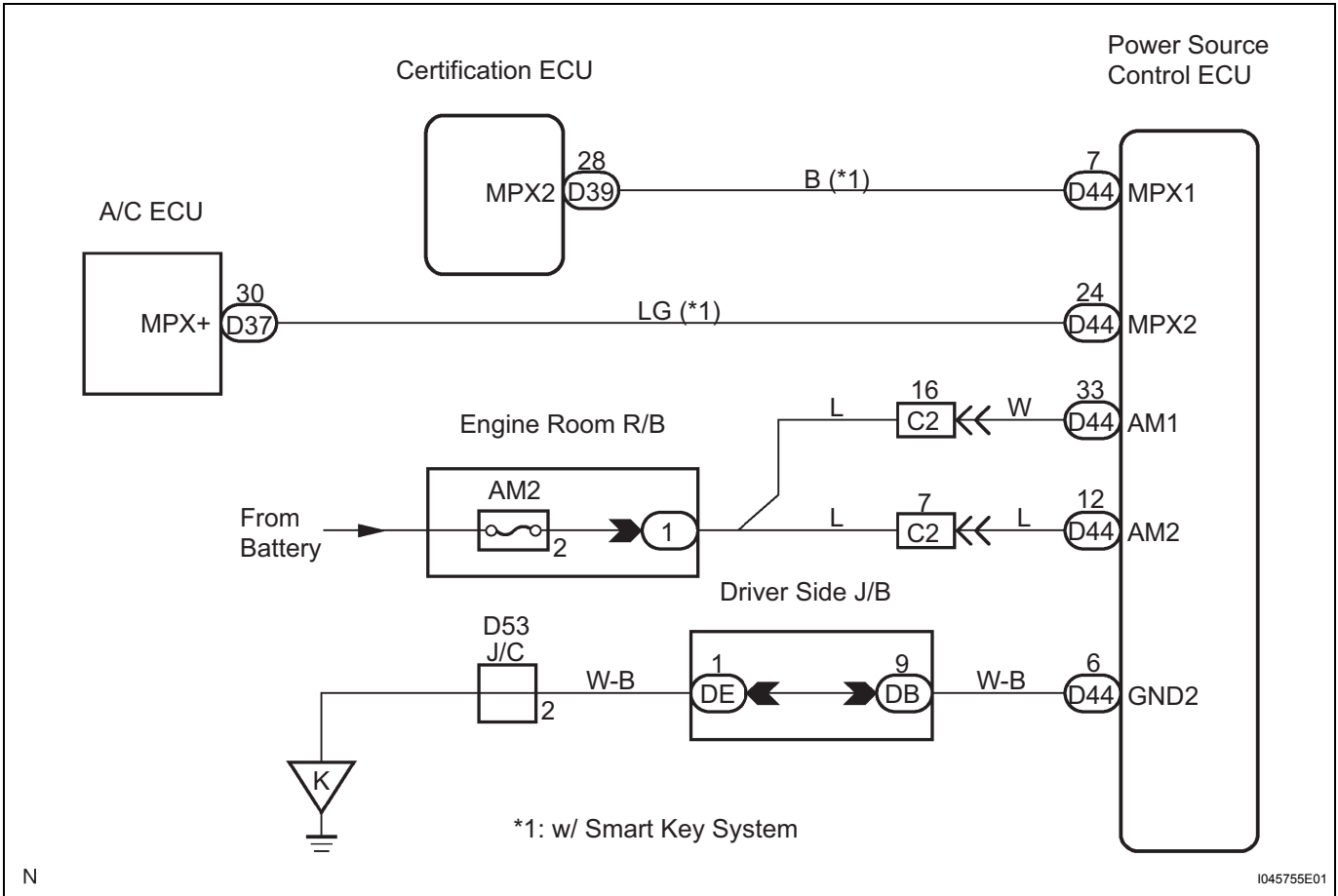
<b>DTC</b>	<b>B1210</b>	<b>Power ECU Stop</b>
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**DESCRIPTION**

This DTC is detected when communication between the power source control ECU and gateway ECU stops for more than 10 seconds.

DTC No.	DTC Detection Condition	Trouble Area
B1210	Power source control ECU communication stops	<ul style="list-style-type: none"> <li>• Power source control ECU</li> <li>• Wire harness</li> </ul>

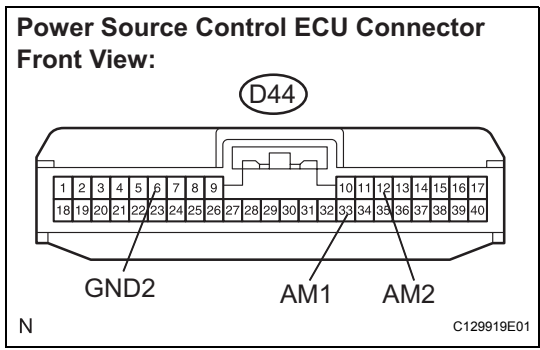
**WIRING DIAGRAM**



**INSPECTION PROCEDURE**

<b>1</b>	<b>CHECK HARNESS AND CONNECTOR (POWER SOURCE CONTROL ECU - BATTERY AND BODY GROUND)</b>
----------	---

(a) Disconnect the D44 ECU connector.



(b) Measure the voltage between the specified terminals on the wire harness side connector.

**Voltage**

Tester Connection	Specified Condition
D44-33 (AM1) - Body ground	10 to 14 V
D44-12 (AM2) - Body ground	10 to 14 V

(c) Measure the resistance between the specified terminals on the wire harness side connector.

**Resistance**

Tester Connection	Specified Condition
D44-6 (GND2) - Body ground	Below 1 Ω

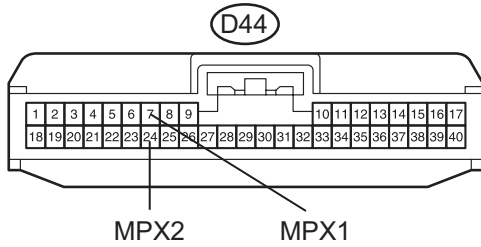
**NG** → **REPAIR OR REPLACE HARNESS OR CONNECTOR**

**OK**

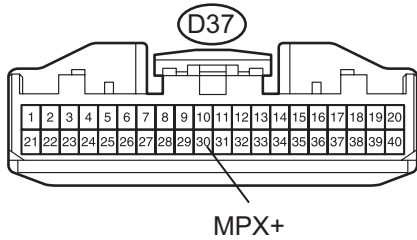
**2 CHECK RESISTANCE OF COMMUNICATION LINE**

(a) Disconnect the D44, D37 and D39 ECU connectors.

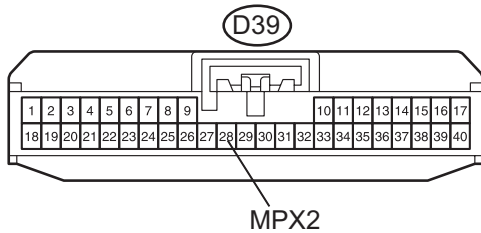
**Power Source Control ECU Connector Front View:**



**A/C ECU Connector Front View:**



**Certification ECU Connector Front View:**



N C129920E01

(b) Measure the resistance between the specified terminals on the wire harness side connectors.

**Resistance**

Tester Connection	Specified Condition
D44-7 (MPX1) - D39-28 (MPX2)	Below 1 Ω
D44-24 (MPX2) - D37-30 (MPX+)	Below 1 Ω

**Result**

Result	Proceed to
Both are OK	A
One is OK	B
Both are NG	C

**B** → REPLACE POWER SOURCE CONTROL ECU AND REPAIR OR REPLACE HARNESS OR CONNECTOR

**C** → REPAIR OR REPLACE HARNESS OR CONNECTOR

**A**

**REPLACE POWER SOURCE CONTROL ECU**

<b>DTC</b>	<b>B1214</b>	<b>Short to B+ in Door System Communication Bus Malfunction</b>
<b>DTC</b>	<b>B1215</b>	<b>Short to GND in Door System Communication Bus Malfunction</b>

**DESCRIPTION**

DTC B1214 is detected when the door system communication circuit and +B battery are shorted. DTC B1215 is detected when the communication circuit and body ground are shorted. When this condition is detected, the door system communication bus (BEAN) will be disabled and some diagnosis codes will be output.

<b>DTC No.</b>	<b>DTC Detection Condition</b>	<b>Trouble Area</b>
B1214	Door system communication circuit and +B battery system are shorted	<ul style="list-style-type: none"> <li>• A/C ECU</li> <li>• Power source ECU *1</li> <li>• Certification ECU</li> <li>• Combination switch ECU</li> <li>• Body ECU</li> <li>• Option connector *1, *3</li> <li>• Front controller</li> <li>• Power seat ECU *2</li> <li>• Memory mirror ECU (RH) *2</li> <li>• Memory mirror ECU (LH) *2</li> <li>• Wire harness</li> </ul>
B1215	Door system communication circuit and body ground are shorted	<ul style="list-style-type: none"> <li>• A/C ECU</li> <li>• Power source ECU *1</li> <li>• Certification ECU</li> <li>• Combination switch ECU</li> <li>• Body ECU</li> <li>• Option connector *1, *3</li> <li>• Front controller</li> <li>• Power seat ECU *2</li> <li>• Memory mirror ECU (RH) *2</li> <li>• Memory mirror ECU (LH) *2</li> <li>• Wire harness</li> </ul>

**HINT:**

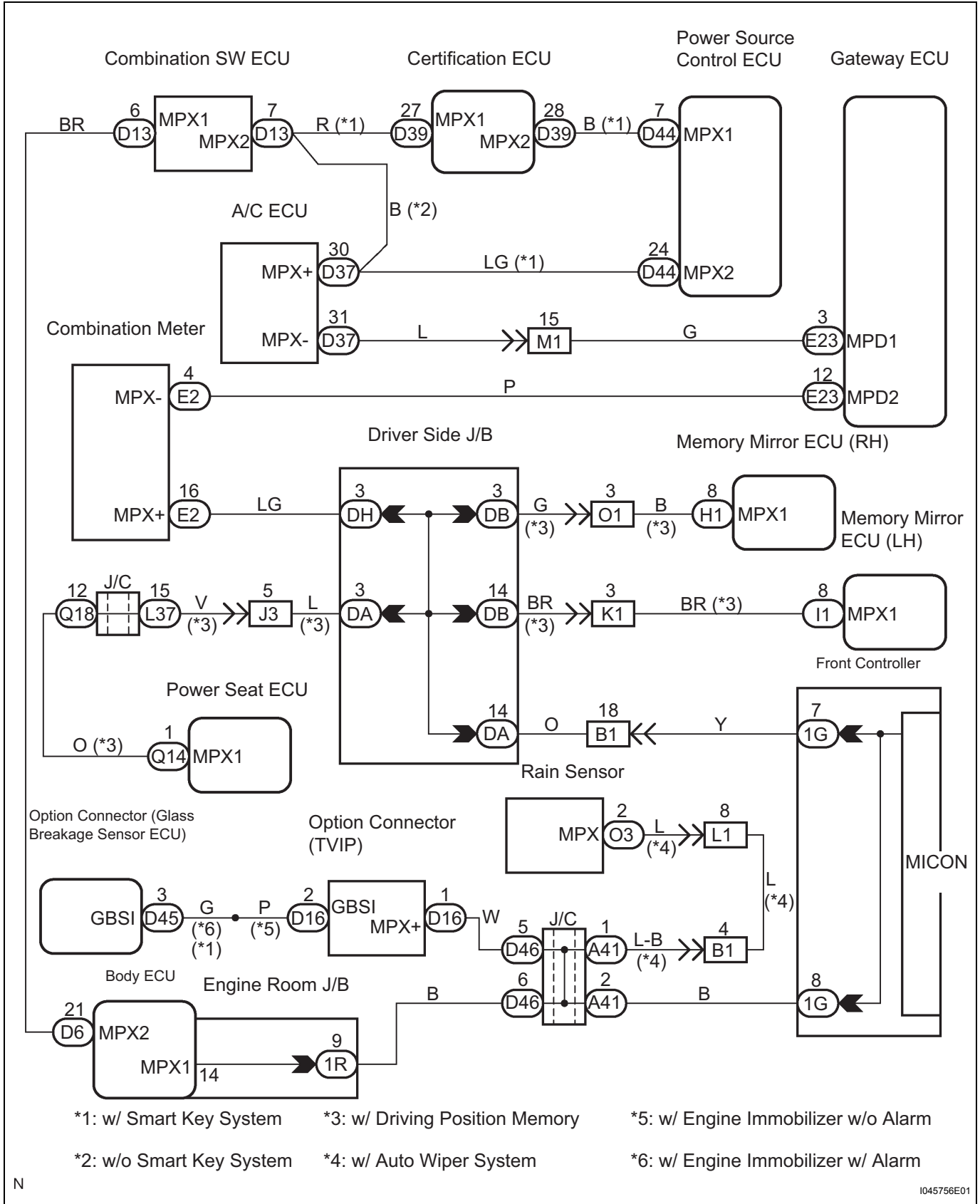
\*1: w/ Smart key system

\*2: w/ Driving position memory

\*3: w/ Engine immobilizer w/ alarm



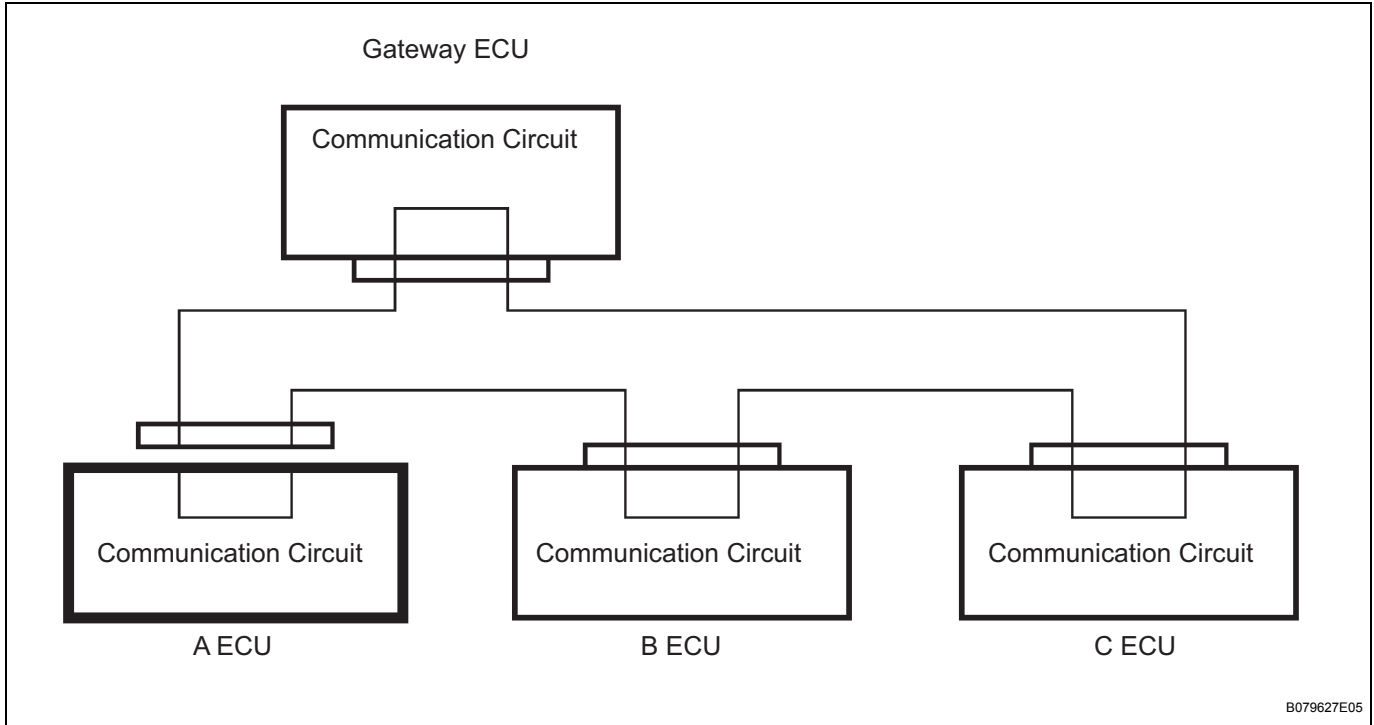
WIRING DIAGRAM



## INSPECTION PROCEDURE

## 1 CHECK DIAGNOSTIC TROUBLE CODE (A ECU)

- (a) Disconnect the A ECU connector and check for DTCs B1214 and B1215.

**OK:**

Neither DTC B1214 nor DTC B1215 is output.

**NOTICE:**

Disconnect the connectors one by one. Reconnect the connectors before starting the next check.

**HINT:**

- The A ECU represents the A/C ECU.
- If any of the stated DTCs are not output, the disconnected A ECU (A/C ECU) is malfunctioning.

NG

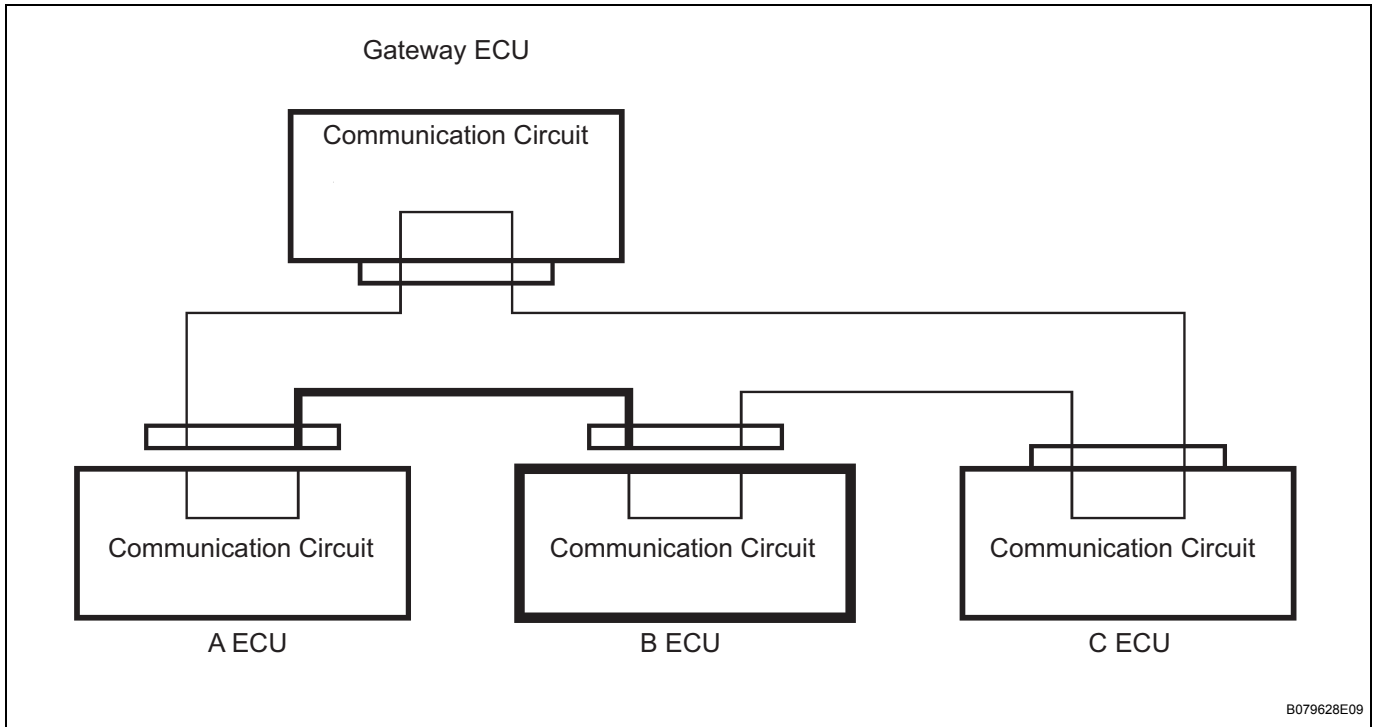
Go to step 2

OK

## MP REPLACE A ECU

## 2 CHECK DIAGNOSTIC TROUBLE CODE (B ECU)

- (a) Disconnect the A ECU and B ECU connectors and check for DTCs B1214 and B1215.



B079628E09

**OK:**

**Neither DTC B1214 nor DTC B1215 is output.**

**NOTICE:**

**Disconnect the connectors one by one. Reconnect the connectors before starting the next check.**

**HINT:**

- Remove the B ECUs in the following order:
  - Power source ECU
  - Certification ECU
  - Combination switch ECU
  - Body ECU
  - Option connector
  - Front controller
  - Rain sensor
  - Front controller
  - Power seat ECU
  - Memory mirror ECU (LH)
  - Memory mirror ECU (RH)
- If any of the stated DTCs are not output, the disconnected B ECU (one of the ECUs from the above list) or the wire harness between the A ECU and B ECU is malfunctioning.
- After the DTC is cleared, proceed to the next step.

**MP**

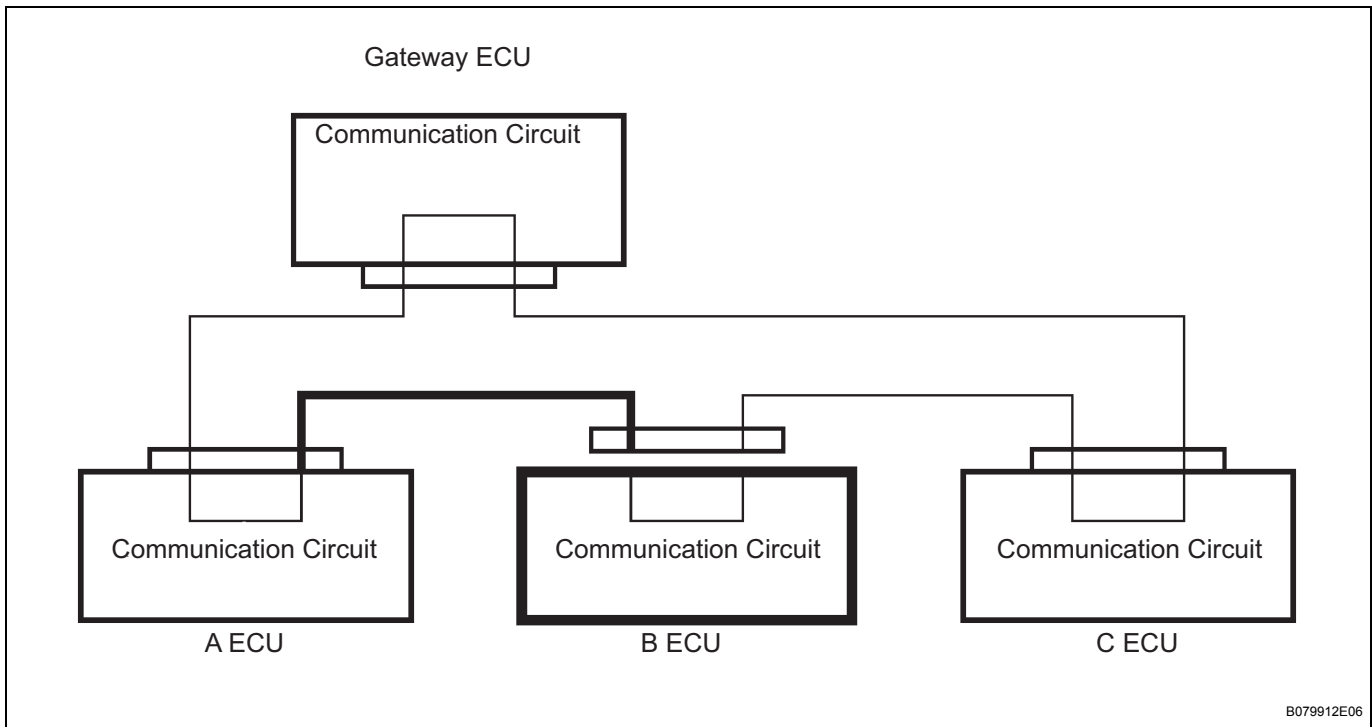
**NG** →

**Go to step 4**

**OK**

**3 CHECK WIRE HARNESS BETWEEN A ECU AND B ECU**

- (a) Disconnect the B ECU connectors and check for DTCs B1214 and B1215.

**OK:**

Neither DTC B1214 nor DTC B1215 is output.

**NOTICE:**

Disconnect the connectors one by one. Reconnect the connectors before starting the next check.

**HINT:**

If any of the stated DTCs are not output, the wire harness between the A ECU and B ECU is functioning normally but the disconnected B ECU is malfunctioning.

**NG**

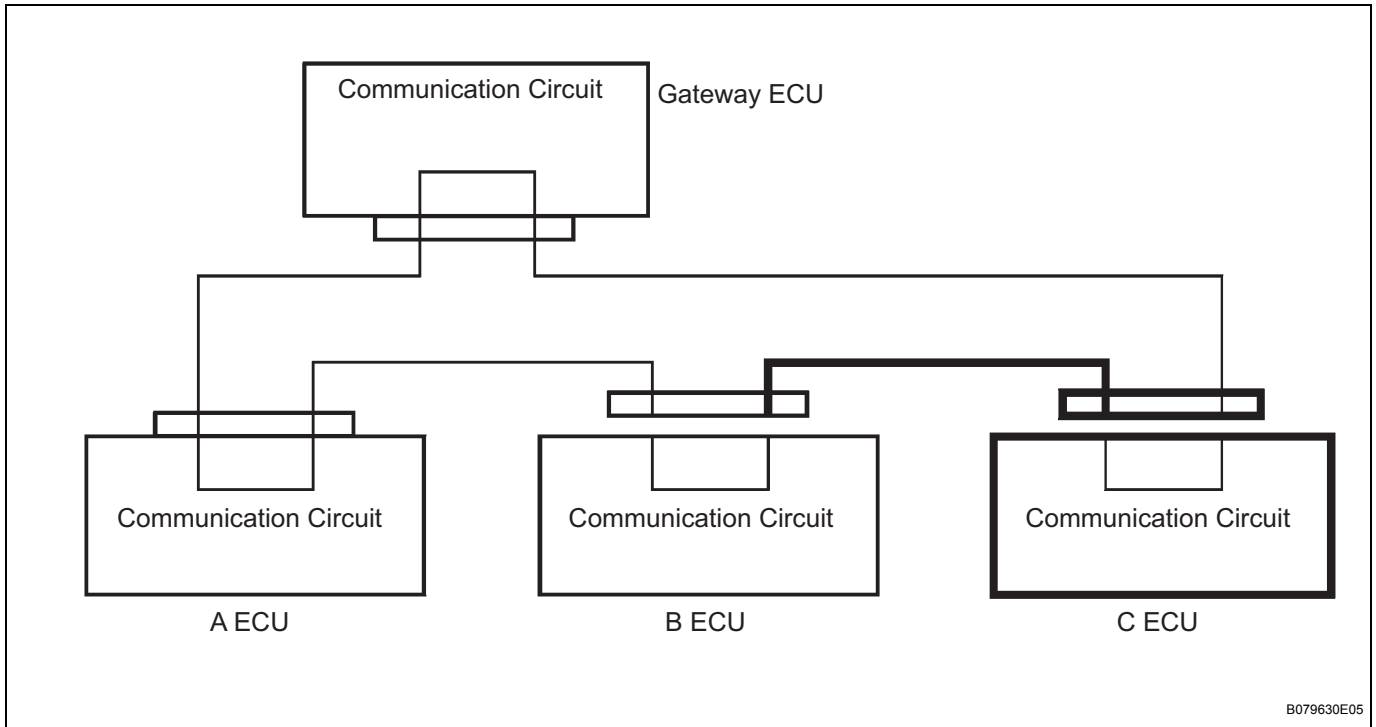
**REPAIR OR REPLACE WIRE HARNESS  
BETWEEN A ECU AND B ECU**

**OK**

**REPLACE B ECU**

**4 CHECK DIAGNOSTIC TROUBLE CODE (C ECU)**

- (a) Disconnect the B ECU and C ECU connectors and check for DTCs B1214 and B1215.



**OK:**

**Neither DTC B1214 nor DTC B1215 is output.**

**NOTICE:**

**Disconnect the connectors one by one. Reconnect the connectors before starting the next check.**

**HINT:**

- The C ECU represents the combination meter ECU.
- If any of the stated DTCs are not output, the disconnected C ECU (combination meter ECU) or the wire harness between the B ECU and C ECU is malfunctioning.

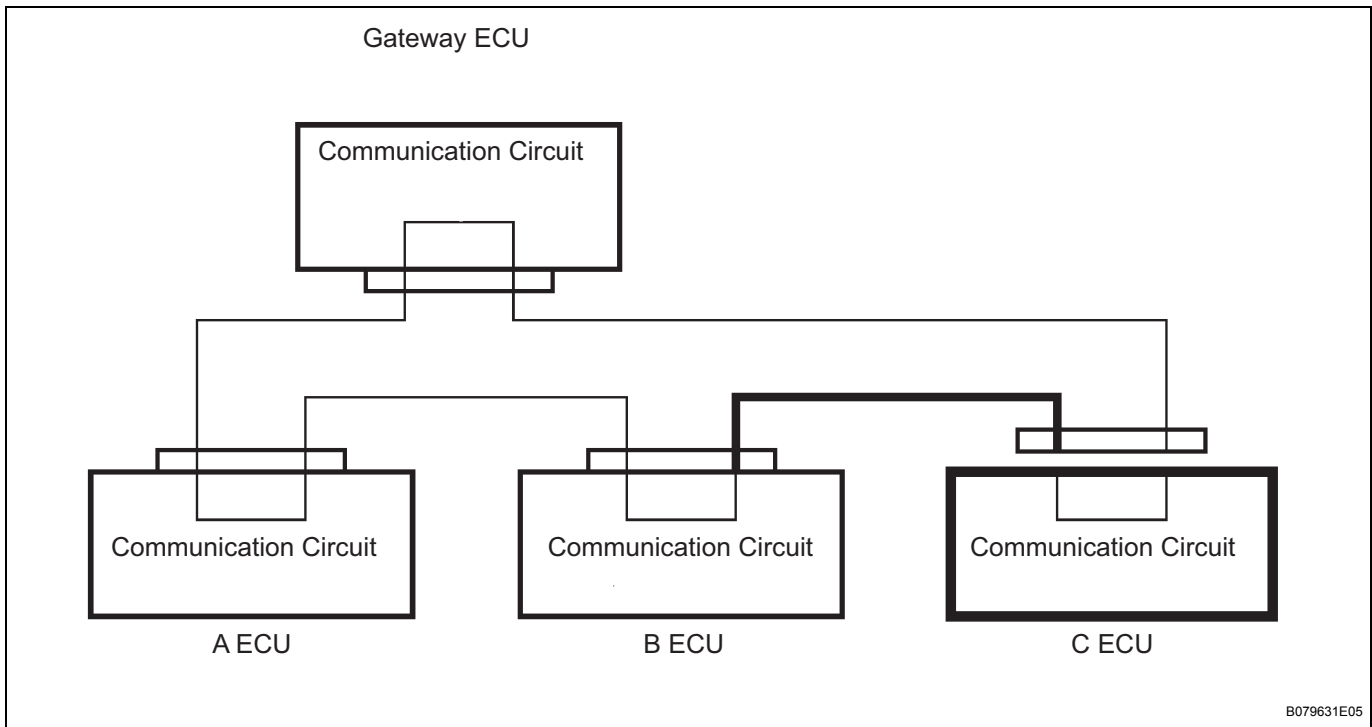
**NG**

**Go to step 6**

**OK**

**5 CHECK WIRE HARNESS BETWEEN B ECU AND C ECU**

- (a) Disconnect the C ECU connector and check for DTCs B1214 and B1215.

**OK:**

Neither DTC B1214 nor DTC B1215 is output.

**NOTICE:**

Disconnect the connectors one by one. Reconnect the connectors before starting the next check.

**HINT:**

If any of the stated DTCs are not output, the wire harness between the B ECU and C ECU is functioning normally but the disconnected C ECU is malfunctioning.

**NG**

**REPAIR OR REPLACE WIRE HARNESS  
BETWEEN B ECU AND C ECU**

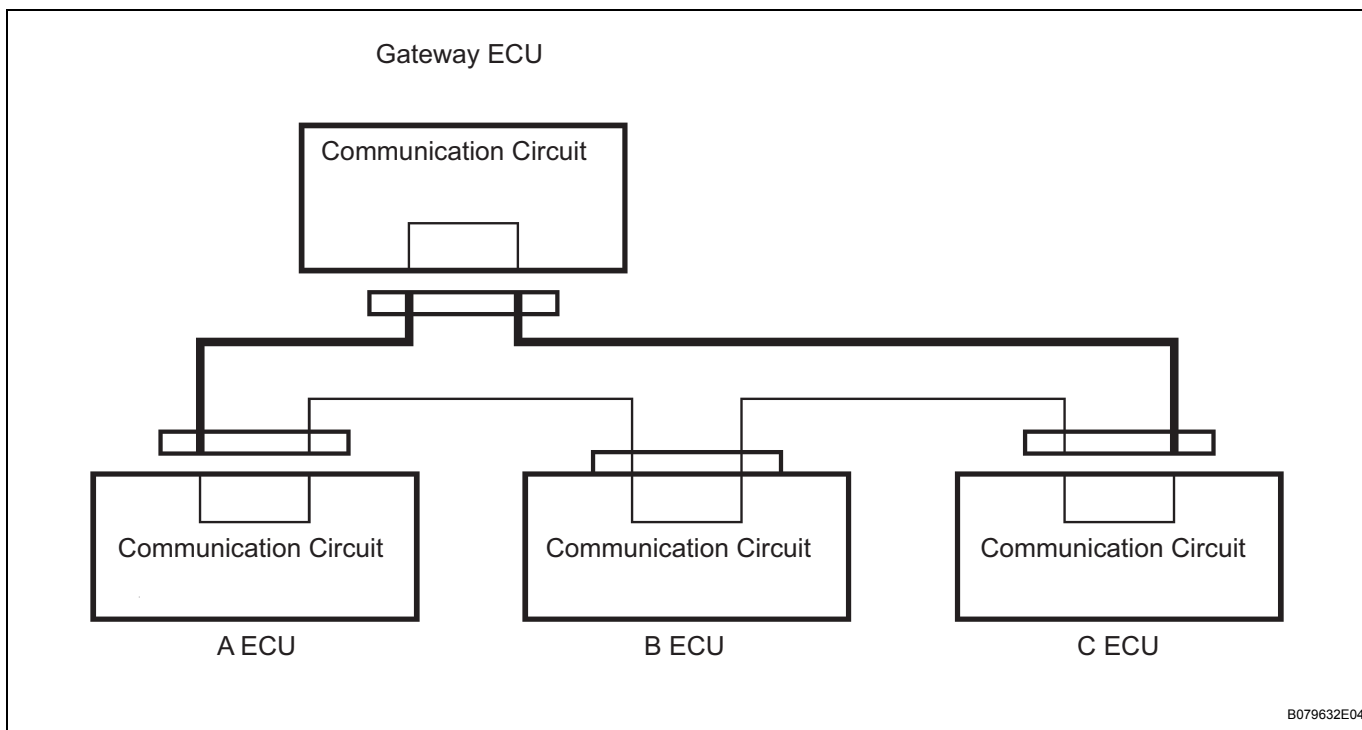
**OK**

**REPLACE C ECU**

**6**

**CHECK WIRE HARNESS BETWEEN GATEWAY ECU AND A ECU OR C ECU**

(a) Check for a short-circuit in B+ or body ground.



B079632E04

- (1) Disconnect the A ECU, C ECU and gateway ECU connectors.
- (2) Measure the voltage between the specified terminals on the wire harness side connectors.

**Voltage**

Tester Connection	Specified Condition
A ECU connector / gateway ECU connector - Body ground	0 V
C ECU connector / gateway ECU connector - Body ground	0 V

- (3) Measure the resistance between the specified terminals on the wire harness side connectors.

**Resistance**

Tester Connection	Specified Condition
A ECU connector / gateway ECU connector - Body ground	10 kΩ or higher
C ECU connector / gateway ECU connector - Body ground	10 kΩ or higher

**HINT:**

- The A ECU represents the A/C ECU.
- The C ECU represents the combination meter ECU.

**NG**

**REPAIR OR REPLACE WIRE HARNESS BETWEEN GATEWAY ECU AND A ECU OR C ECU**

**MP**

**OK**

**REPLACE MULTIPLEX NETWORK GATEWAY ECU**

**DTC****B1248****AVC-LAN Communication Impossible****DESCRIPTION**

This DTC is detected when communication between the AVC-LAN (radio receiver assembly or multi-display assembly) and multiplex network gateway ECU stops for more than 10 seconds.

DTC No.	DTC Detection Condition	Trouble Area
B1248	AVC-LAN communication is impossible	<ul style="list-style-type: none"> <li>AVC-LAN (radio receiver assembly or multi-display assembly)</li> <li>Wire harness</li> </ul>

**INSPECTION PROCEDURE****1****CHECK OPERATION**

(a) Check for AVC-LAN communication DTCs.

**OK:**

AVC-LAN communication DTCs are not output.

**NG**

**GO TO "DIAGNOSTICS TROUBLE CODE CHART" OF AUDIO SYSTEM OR NAVIGATION SYSTEM**

**OK**

**GO TO "PROBLEM SYMPTOMS TABLE" OF AUDIO SYSTEM OR NAVIGATION SYSTEM**



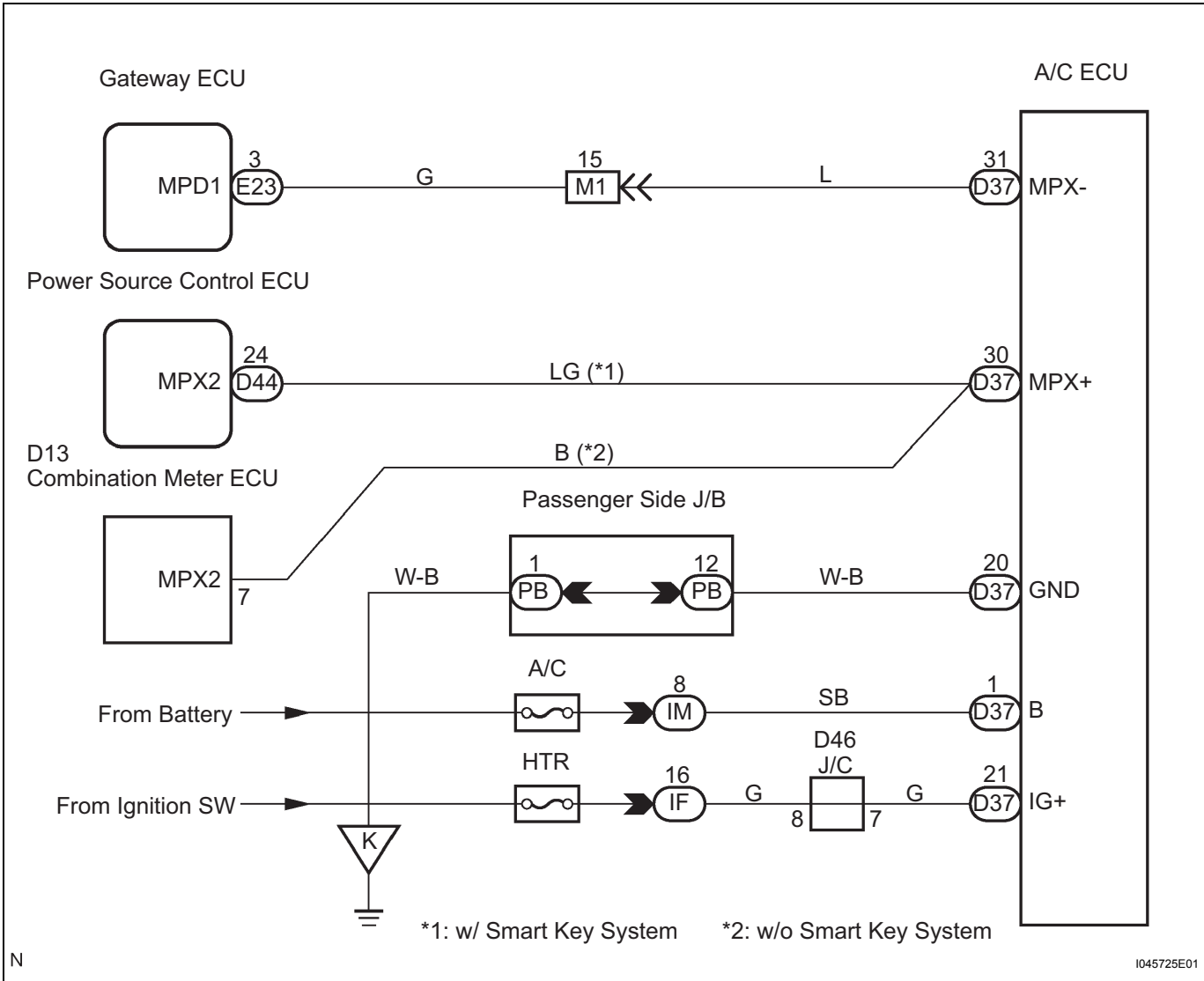
<b>DTC</b>	<b>B1262</b>	<b>A/C ECU Communication Stop</b>
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**DESCRIPTION**

This DTC is detected when communication between the A/C control (A/C ECU) and gateway ECU stops for more than 10 seconds.

DTC No.	DTC Detection Condition	Trouble Area
B1262	A/C ECU communication stops	<ul style="list-style-type: none"> <li>A/C ECU</li> <li>Wire harness</li> </ul>

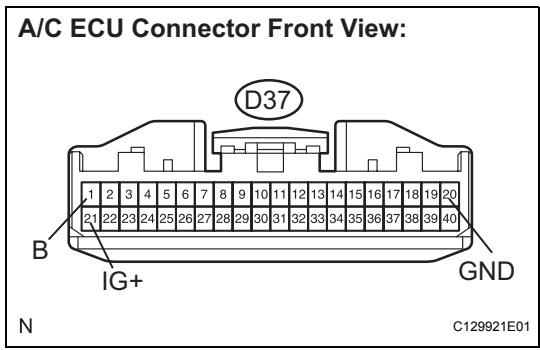
**WIRING DIAGRAM**



**INSPECTION PROCEDURE**

<b>1</b>	<b>CHECK HARNESS AND CONNECTOR (A/C ECU - BATTERY AND BODY GROUND)</b>
----------	--

(a) Disconnect the D37 ECU connector.



(b) Measure the voltage between the specified terminals on the wire harness side connector.

**Voltage**

Tester Connection	Condition	Specified Condition
D37-21 (IG+) - Body ground	Ignition switch OFF → ON (IG)	0 V → 10 to 14 V
D37-1 (B) - Body ground	Always	10 to 14 V

(c) Measure the resistance between the specified terminals on the wire harness side connector.

**Resistance**

Tester Connection	Condition	Specified Condition
D37-20 (GND) - Body ground	Always	Below 1 Ω

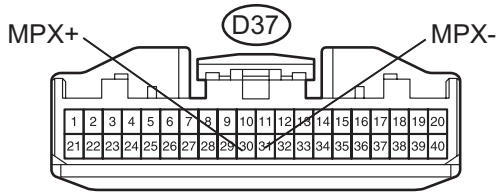
**NG** → **REPAIR OR REPLACE HARNESS OR CONNECTOR**

**OK**

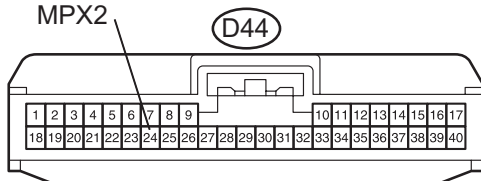
**2 CHECK RESISTANCE OF COMMUNICATION LINE**

(a) Disconnect the D37, E23, and D44<sup>\*1</sup> or D13<sup>\*2</sup> ECU connectors.

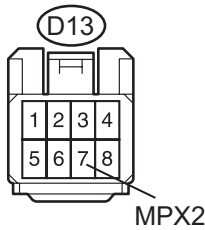
A/C ECU Connector Front View:



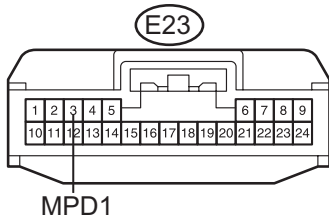
Power Source Control ECU Connector Front View:



Combination Meter ECU Connector Front View:



Gateway ECU Connector Front View:



N

C129922E01

(b) Measure the resistance between the specified terminals on the wire harness side connectors.

**Resistance**

Tester Connection	Specified Condition
D37-30 (MPX+) - D44-24 (MPX2) *1	Below 1 Ω
D37-30 (MPX+) - D13-7 (MPX2) *2	Below 1 Ω
D37-31 (MPX-) - E23-3 (MPD1)	Below 1 Ω

**HINT:**

\*1: w/ Smart key system

\*2: w/o Smart key system

**Result**

Result	Proceed to
Both are OK	A
One is OK	B
Both are NG	C

**B** → REPLACE A/C ECU AND REPAIR OR REPLACE HARNESS OR CONNECTOR

**C** → REPAIR OR REPLACE HARNESS OR CONNECTOR

**A**

REPLACE A/C ECU

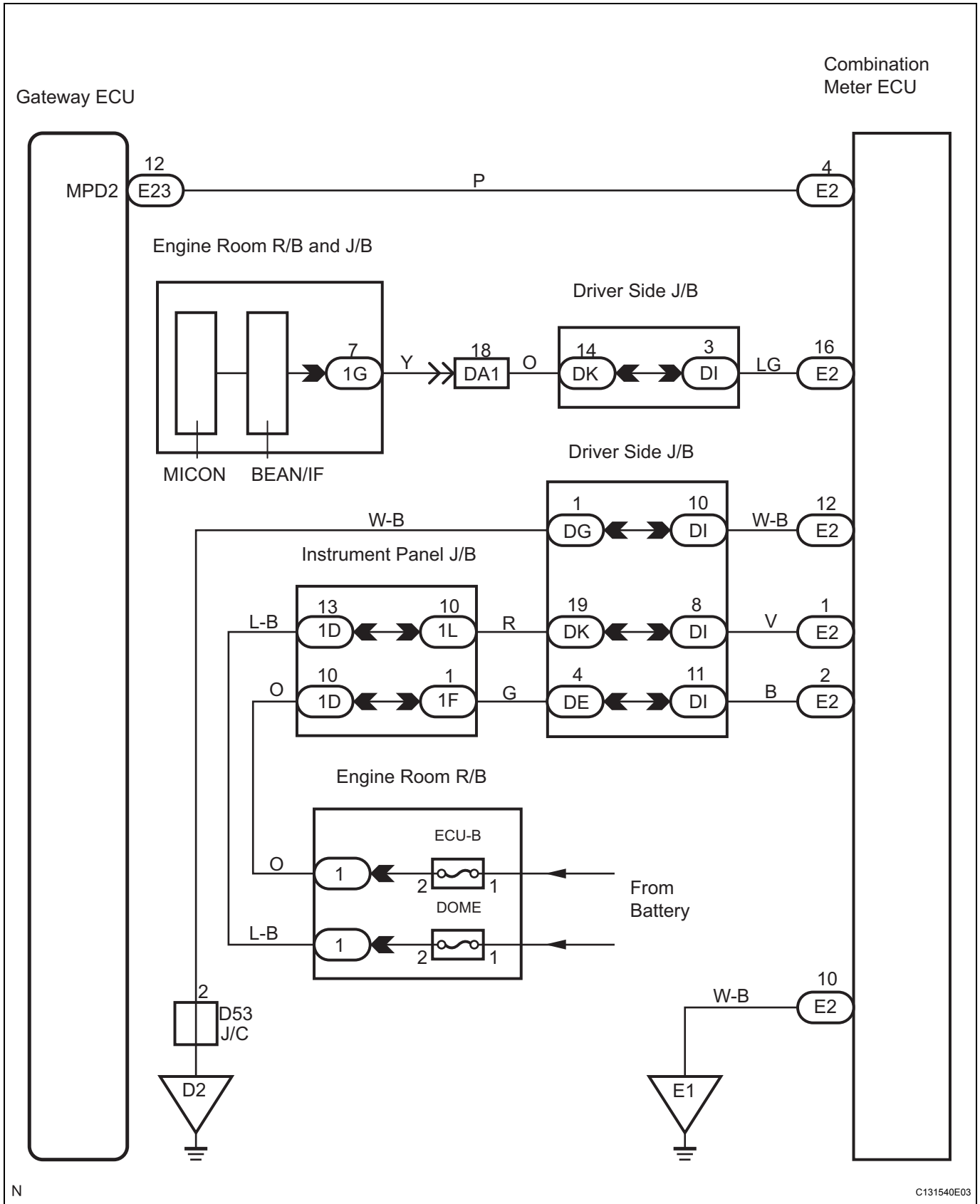
<b>DTC</b>	<b>B1271</b>	<b>Combination Meter ECU Communication Stop</b>
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**DESCRIPTION**

This DTC is detected when communication between the combination meter (combination meter ECU) and gateway ECU stops for more than 10 seconds.

<b>DTC No.</b>	<b>DTC Detection Condition</b>	<b>Trouble Area</b>
B1271	Combination meter ECU communication stops	<ul style="list-style-type: none"><li>• Combination meter ECU</li><li>• Wire harness</li></ul>

WIRING DIAGRAM



N

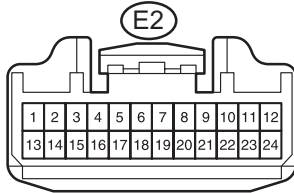
C131540E03

MP

## INSPECTION PROCEDURE

**1 CHECK WIRE HARNESS (COMBINATION METER ECU - BATTERY AND BODY GROUND)**

Combination Meter ECU Connector  
Front View:



N

C129923E01

- (a) Disconnect the E2 meter connector.  
 (b) Measure the voltage between the specified terminals on the wire harness side connectors.

**Voltage**

Tester Connection	Specified Condition
E2-1 - Body ground	10 to 14 V
E2-2 - Body ground	10 to 14 V

- (c) Measure the resistance between the specified terminals on the wire harness side connectors.

**Resistance**

Tester Connection	Specified Condition
E2-10 - Body ground	Below 1 $\Omega$
E2-12 - Body ground	Below 1 $\Omega$

NG

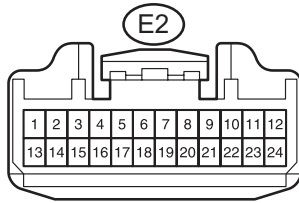
**REPAIR OR REPLACE HARNESS OR CONNECTOR**

OK

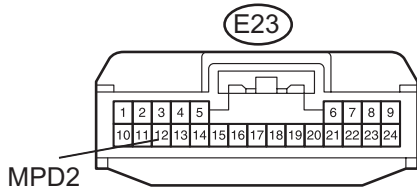
**2 CHECK RESISTANCE OF COMMUNICATION LINE**

- (a) Disconnect the E2, E23 and 1G ECU connectors.

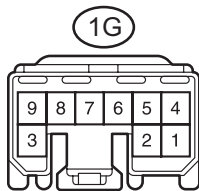
**Combination Meter ECU Connector Front View:**



**Gateway ECU Connector Front View:**



**Engine Room R/B & J/B Connector Front View:**



N

C129924E01

(b) Measure the resistance between the specified terminals on the wire harness side connectors.

**Resistance**

Tester Condition	Specified Condition
E2-4 - E23-12 (MDP2)	Below 1 Ω
E2-16 - 1G-7	Below 1 Ω

**Result**

Result	Proceed to
Both are OK	A
One is OK	B
Both are NG	C

**B** → REPLACE COMBINATION METER ECU AND REPAIR OR REPLACE HARNESS OR CONNECTOR

**C** → REPAIR OR REPLACE HARNESS OR CONNECTOR

**A**

REPLACE COMBINATION METER ECU

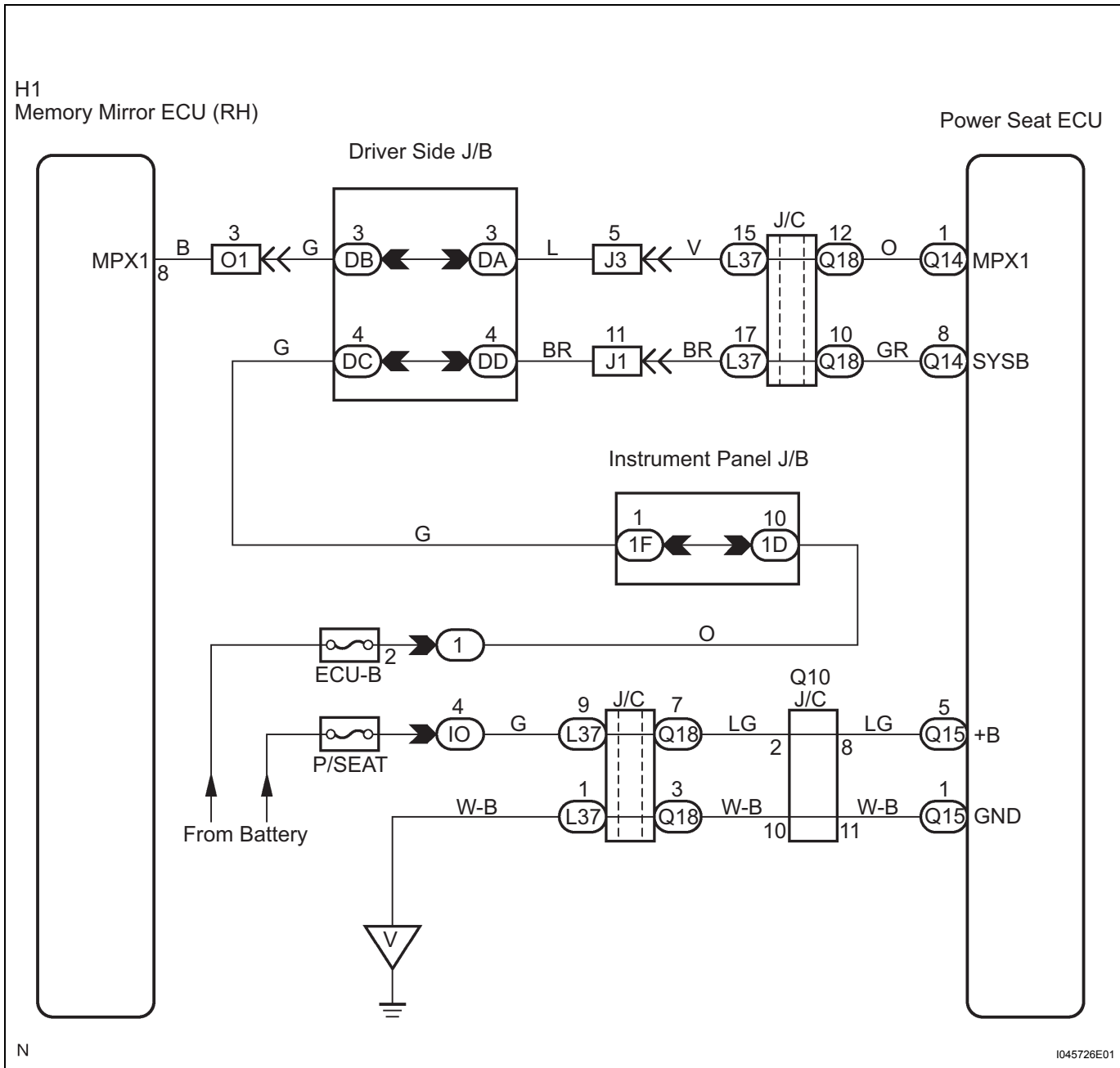
<b>DTC</b>	<b>B1272</b>	<b>Power Seat ECU Communication Stop</b>
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**DESCRIPTION**

This DTC is detected when communication between the power seat ECU and gateway ECU stops for more than 10 seconds.

DTC No.	DTC Detection Condition	Trouble Area
B1272	Power seat ECU communication stops	<ul style="list-style-type: none"> <li>• Driver seat ECU (Power seat ECU)</li> <li>• Wire harness</li> </ul>

**WIRING DIAGRAM**

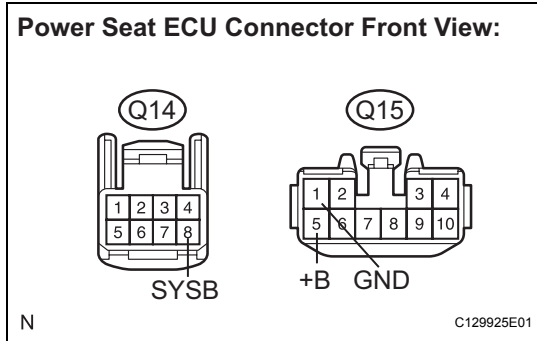


MP



**INSPECTION PROCEDURE**

**1 CHECK HARNESS AND CONNECTOR (POWER SEAT ECU - BATTERY AND BODY GROUND)**



- (a) Disconnect the Q14 and Q15 ECU connectors.
- (b) Measure the voltage between the specified terminals on the wire harness side connector.

**Voltage**

Tester Connection	Specified Condition
Q14-8 (SYSB) - Body ground	10 to 14 V
Q15-5 (+B) - Body ground	10 to 14 V

- (c) Measure the resistance between the specified terminals on the wire harness side connector.

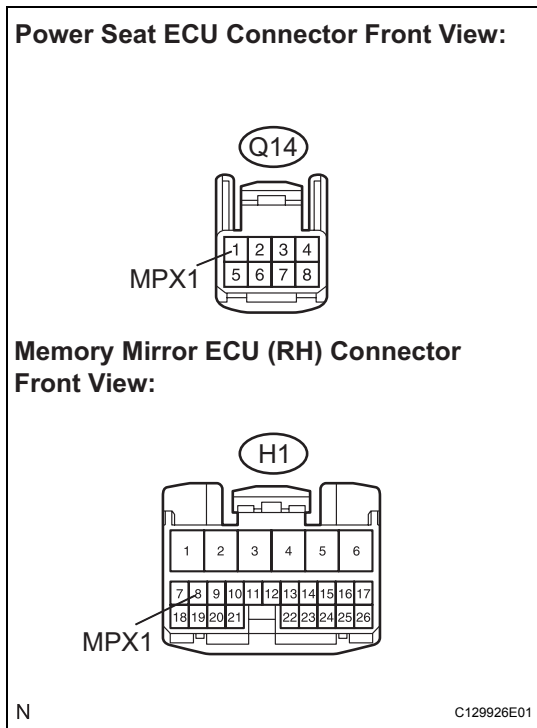
**Resistance**

Tester Connection	Specified Condition
Q15-1 (GND) - Body ground	Below 1 Ω

**NG** → **REPAIR OR REPLACE HARNESS OR CONNECTOR**

**OK**

**2 CHECK RESISTANCE OF COMMUNICATION LINE**



- (a) Disconnect the Q14 and H1 ECU connectors.
- (b) Measure the resistance between the specified terminals on the wire harness side connector.

**Resistance**

Tester Connection	Specified Condition
Q14-1 (MPX1) - H1-8 (MPX1)	Below 1 Ω

**NG** → **REPAIR OR REPLACE HARNESS OR CONNECTOR**

OK

REPLACE POWER SEAT ECU

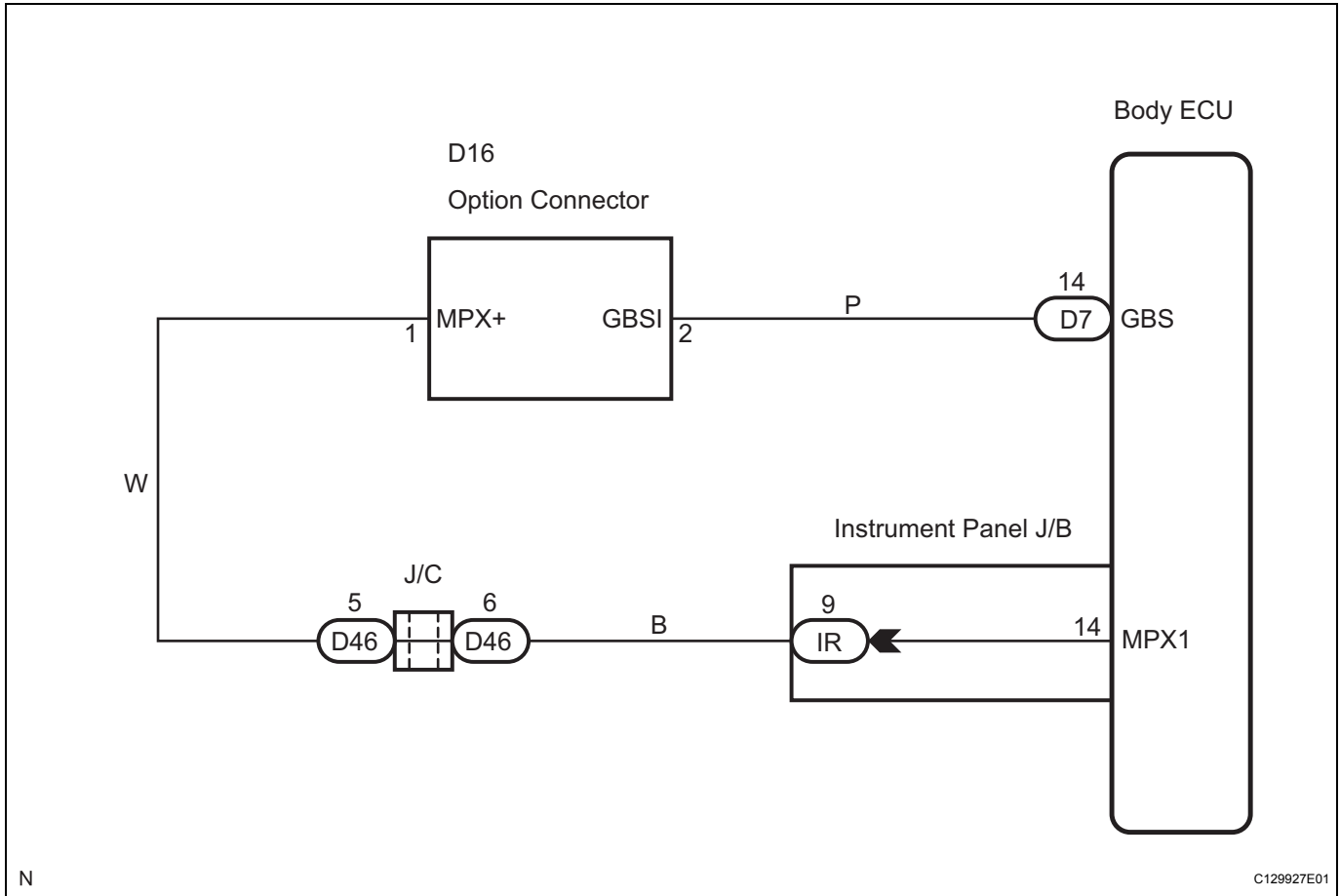
<b>DTC</b>	<b>B1275</b>	<b>Accessory Bus Buffer Communication Stop</b>
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**DESCRIPTION**

This DTC is detected when communication between the BEAN bus buffer and the gateway ECU stops for more than 10 seconds.

DTC No.	DTC Detection Condition	Trouble Area
B1275	BEAN bus buffer communication stops	<ul style="list-style-type: none"> <li>Option connector (BEAN bus buffer)</li> <li>Wire harness</li> </ul>

**WIRING DIAGRAM**



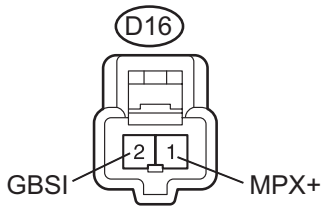
**INSPECTION PROCEDURE**

<b>1</b>	<b>CHECK RESISTANCE OF COMMUNICATION LINE</b>
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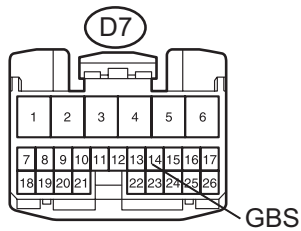
**MP**

(a) Disconnect the D16, D7 and IR connectors.

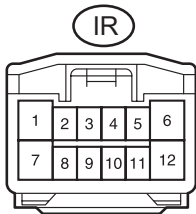
Option Connector Front View:



Body ECU Connector Front View:



Instrument Panel J/B Connector Front View:



N

C129988E01

(b) Measure the resistance between the specified terminals on the wire harness side connectors.

**Resistance**

Tester Connection	Specified Condition
D16-1 (MPX+) - IR-9	Below 1 Ω
D16-2 (GBSI) - D7-14 (GBS)	Below 1 Ω

**Result**

Result	Proceed to
Both are OK	A
One is OK	B
Both are NG	C

**B** REPLACE OPTION CONNECTOR AND REPAIR OR REPLACE HARNESS OR CONNECTOR

**C** REPAIR OR REPLACE HARNESS OR CONNECTOR

**A**

**REPLACE OPTION CONNECTOR**

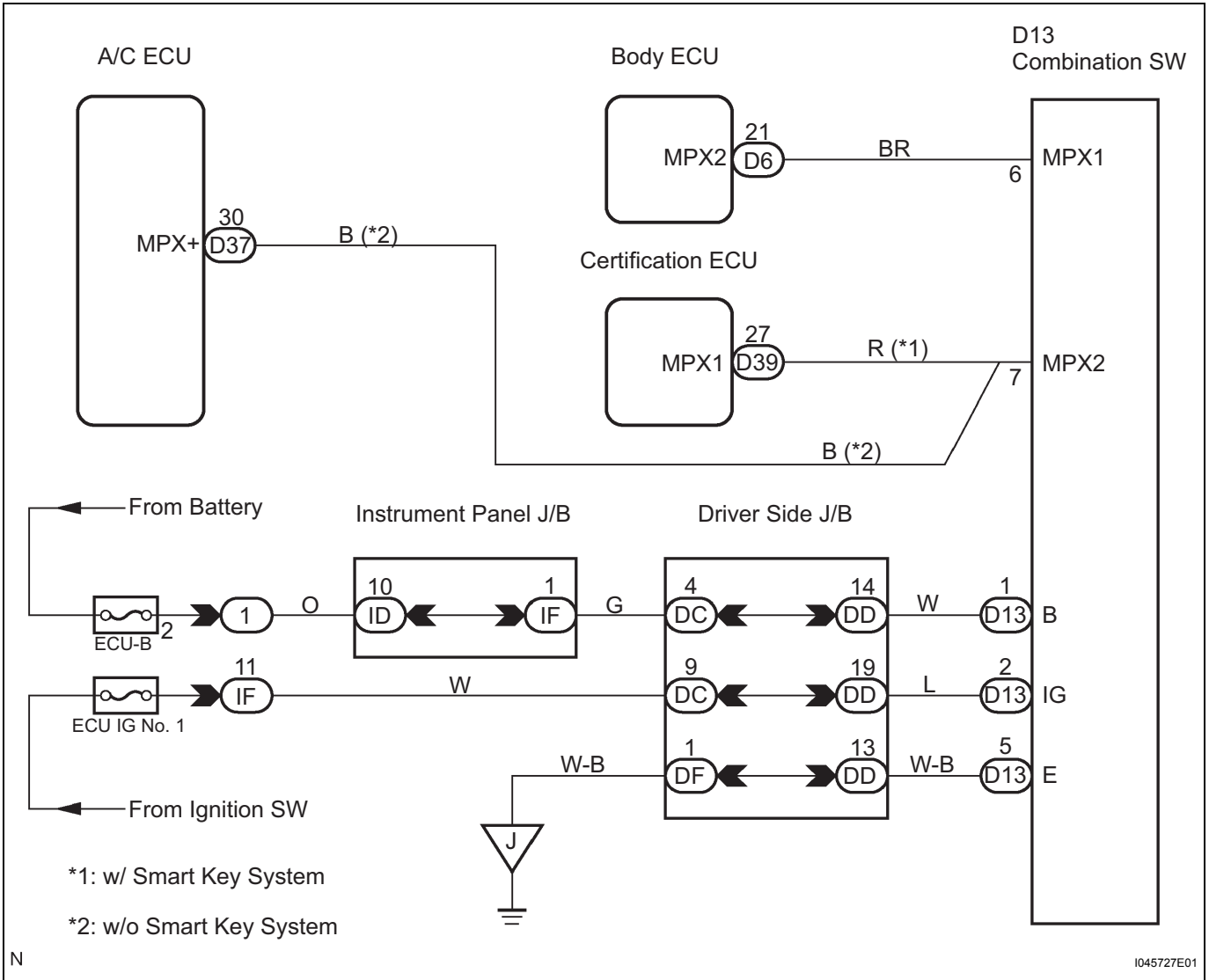
<b>DTC</b>	<b>B1278</b>	<b>Combination Switch ECU Communication Stop</b>
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**DESCRIPTION**

This DTC is detected when communication between the combination switch (combination switch ECU) and gateway ECU stops for more than 10 seconds.

DTC No.	DTC Detection Condition	Trouble Area
B1278	Combination switch ECU communication stops	<ul style="list-style-type: none"> <li>Combination switch</li> <li>Wire harness</li> </ul>

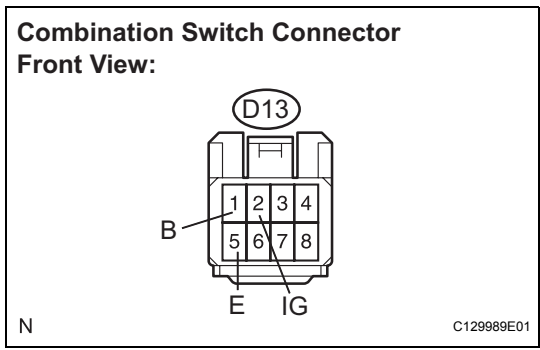
**WIRING DIAGRAM**



**INSPECTION PROCEDURE**

<b>1</b>	<b>CHECK HARNESS AND CONNECTOR (COMBINATION SWITCH - BATTERY AND BODY GROUND)</b>
----------	---

(a) Disconnect the D13 combination switch connector.



(b) Measure the voltage between the specified terminals on the wire harness side connector.

**Voltage**

Tester Connection	Condition	Specified Condition
D13-1 (B) - Body ground	Always	10 to 14 V
D13-2 (IG) - Body ground	Ignition switch OFF → ON (IG)	0 V → 10 to 14 V

(c) Measure the resistance between the specified terminals on the wire harness side connector.

**Resistance**

Tester Connection	Condition	Specified Condition
D13-5 (E) - Body ground	Always	Below 1 Ω

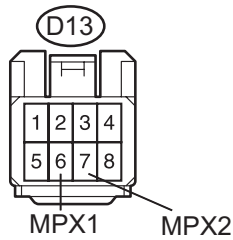
**NG** → **REPAIR OR REPLACE HARNESS OR CONNECTOR**

**OK**

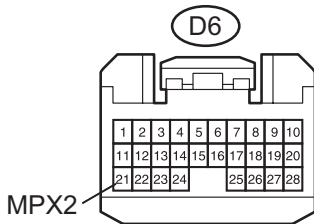
**2 CHECK RESISTANCE OF COMMUNICATION LINE**

(a) Disconnect the D13, D6, and D39<sup>\*1</sup> or D37<sup>\*2</sup> ECU connectors.

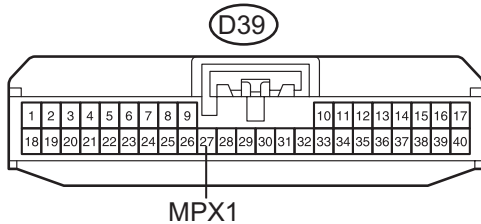
**Combination Switch ECU Connector Front View:**



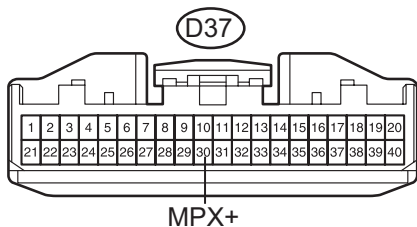
**Body ECU Connector Front View:**



**Certification ECU Connector Front View:**



**A/C ECU Connector Front View:**



N

C129990E01

(b) Measure the resistance between the specified terminals on the wire harness side connectors.

**Resistance**

Tester Connection	Specified Condition
D13-6 (MPX1) - D6-21 (MPX2)	Below 1 Ω
D13-7 (MPX2) - D39-27 (MPX1) *1	Below 1 Ω
D13-7 (MPX2) - D37-30 (MPX+) *2	Below 1 Ω

**HINT:**

\*1: w/ Smart key system

\*2: w/o Smart key system

**Result**

Result	Proceed to
Both are OK	A
One is OK	B
Both are NG	C

**B** → REPLACE COMBINATION SWITCH AND REPAIR OR REPLACE HARNESS OR CONNECTOR

**C** → REPAIR OR REPLACE HARNESS OR CONNECTOR

**A**

**REPLACE COMBINATION SWITCH ECU**

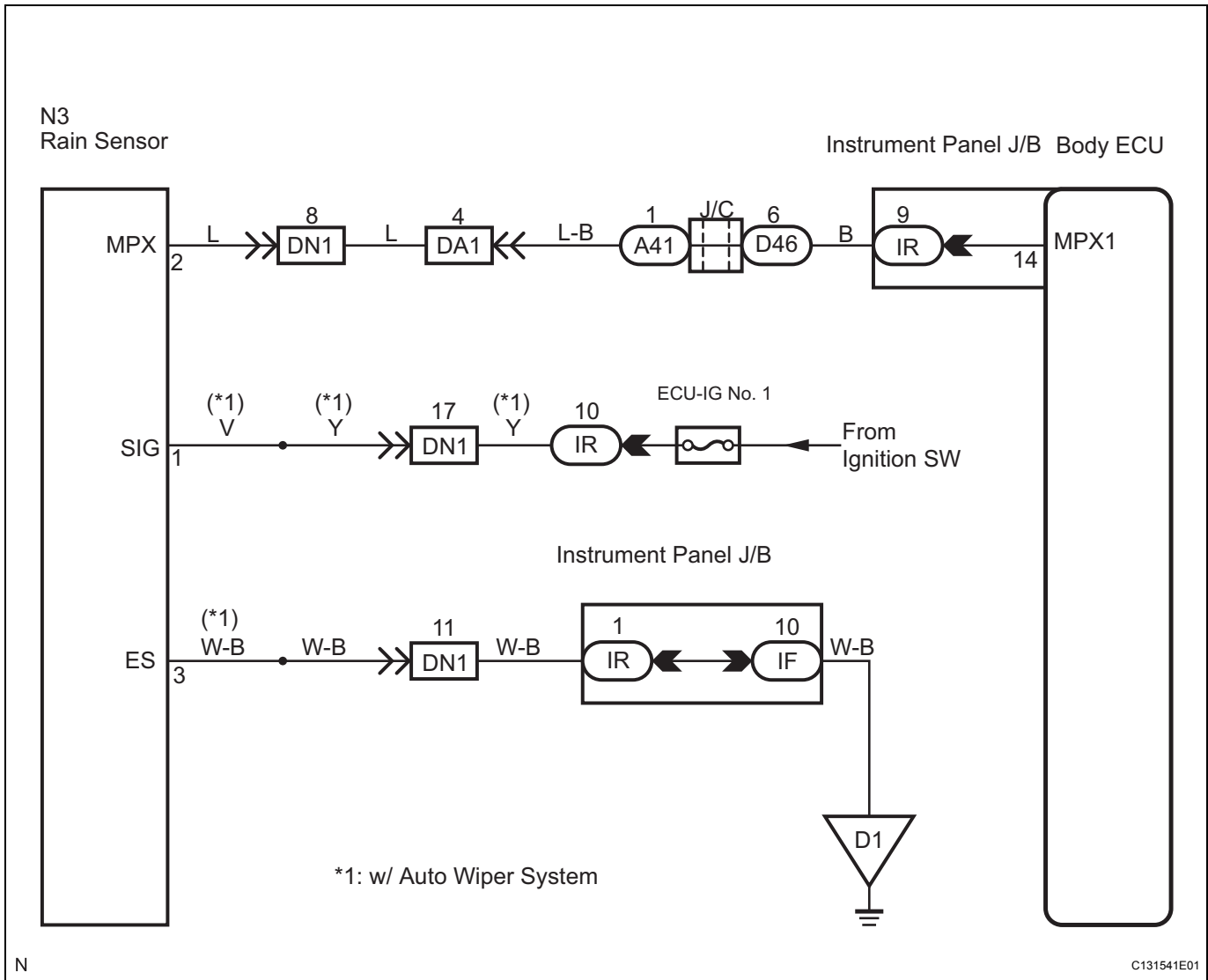
<b>DTC</b>	<b>B1279</b>	<b>Rain Sensor Communication Stop</b>
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**DESCRIPTION**

This DTC is detected when communication between the rain sensor and overhead J/B stops for more than 10 seconds.

DTC No.	DTC Detection Condition	Trouble Area
B1279	Rain sensor communication stops	<ul style="list-style-type: none"> <li>Rain sensor</li> <li>Wire harness</li> </ul>

**WIRING DIAGRAM**



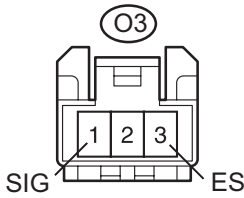
**INSPECTION PROCEDURE**

<b>1</b>	<b>CHECK WIRE HARNESS (RAIN SENSOR - BATTERY AND BODY GROUND)</b>
----------	---

(a) Disconnect the O3 sensor connector.



Rain Sensor Connector Front View:



N

C129991E01

- (b) Measure the voltage between the specified terminals on the wire harness side connector.

**Voltage**

Tester Connection	Condition	Specified Condition
O3-1 (SIG) - Body ground	Always	10 to 14 V

- (c) Measure the resistance between the specified terminals on the wire harness side connector.

**Resistance**

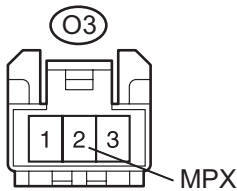
Tester Connection	Condition	Specified Condition
O3-3 (ES) - Body ground	Always	Below 1 Ω

**NG** REPAIR OR REPLACE HARNESS OR CONNECTOR

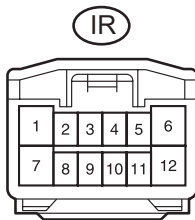
**OK**

**2 CHECK RESISTANCE OF COMMUNICATION LINE**

Rain Sensor Connector Front View:



Instrument Panel J/B Connector Front View:



N

C129992E01

- (a) Disconnect the O3 and IR ECU connectors.
- (b) Measure the resistance between the specified terminals on the wire harness side connector.

**Resistance**

Tester Connection	Specified Condition
O3-2 (MPX) - IR-9	Below 1 Ω

**NG** REPAIR OR REPLACE HARNESS OR CONNECTOR

**OK**

**REPLACE RAIN SENSOR**

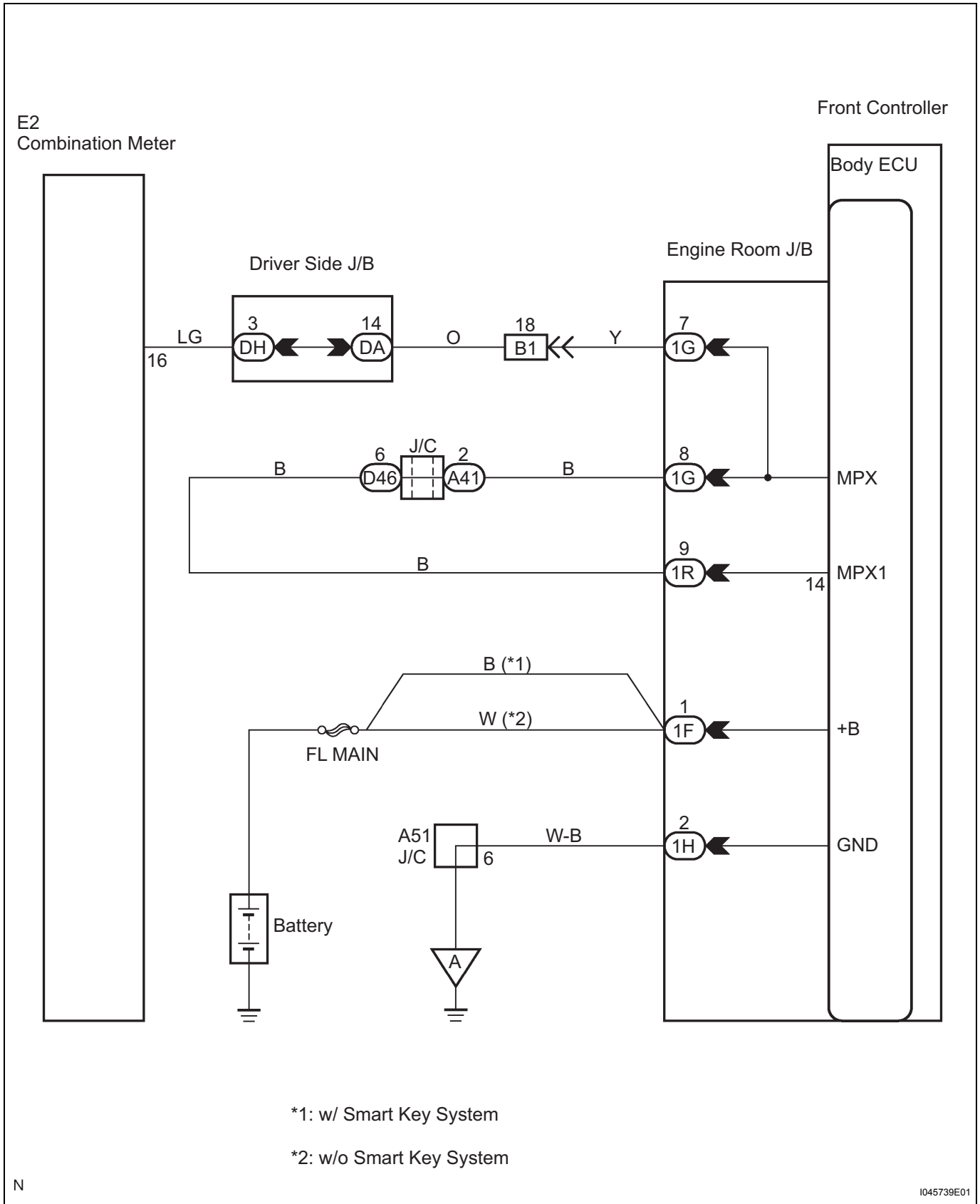
<b>DTC</b>	<b>B1296</b>	<b>Front Light ECU Communication Stop</b>
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**DESCRIPTION**

This DTC is detected when communication between the front controller and gateway ECU stops for more than 10 seconds.

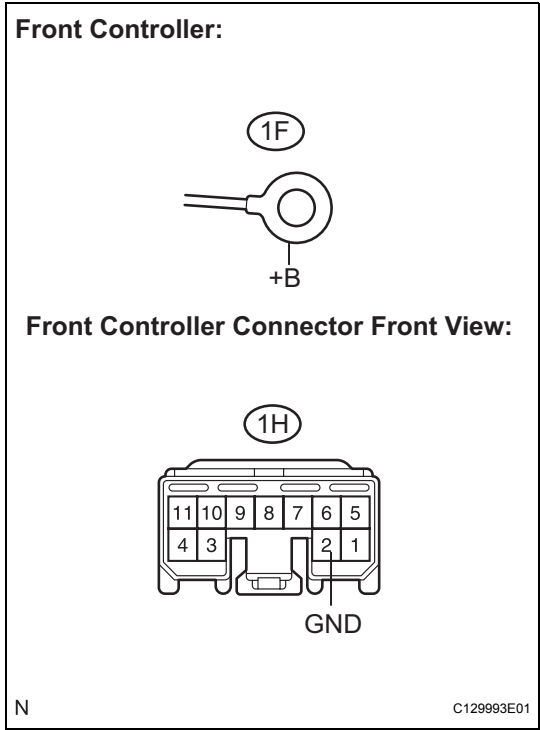
<b>DTC No.</b>	<b>DTC Detection Condition</b>	<b>Trouble Area</b>
B1296	Front controller communication stops	<ul style="list-style-type: none"><li>• Front controller</li><li>• Wire harness</li></ul>

WIRING DIAGRAM



**INSPECTION PROCEDURE**

**1 CHECK HARNESS AND CONNECTOR (FRONT CONTROLLER - BATTERY AND BODY GROUND)**



- (a) Disconnect the 1F and 1H front controller connectors.
- (b) Measure the voltage between the specified terminals on the wire harness side connector.

**Voltage**

Tester Connection	Condition	Specified Condition
1F-1 (+B) - Body ground	Always	10 to 14 V

- (c) Measure the resistance between the specified terminals on the wire harness side connector.

**Resistance**

Tester Connection	Condition	Specified Condition
1H-2 (GND) - Body ground	Always	Below 1 Ω

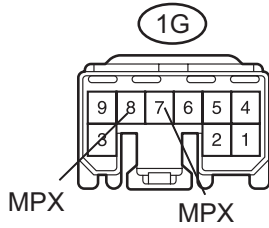
**NG** **REPAIR OR REPLACE HARNESS OR CONNECTOR**

**OK**

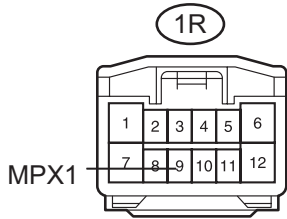
**2 CHECK RESISTANCE OF COMMUNICATION LINE**

- (a) Disconnect the 1G, 1R, and E2 connectors.

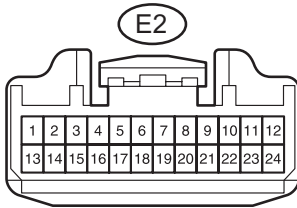
**Body ECU Connector Front View:**



**Front Controller Connector Front View:**



**Combination Meter Connector Front View:**



N

C129994E01

- (b) Measure the resistance between the specified terminals on the wire harness side connector.

**Resistance**

Tester Connection	Specified Condition
1G-7 (MPX) - E2-16	Below 1 Ω
1G-8 (MPX) - 1R-9 (MPX1)	Below 1 Ω

**NG** REPAIR OR REPLACE HARNESS OR CONNECTOR

**OK**

**REPLACE FRONT CONTROLLER**