

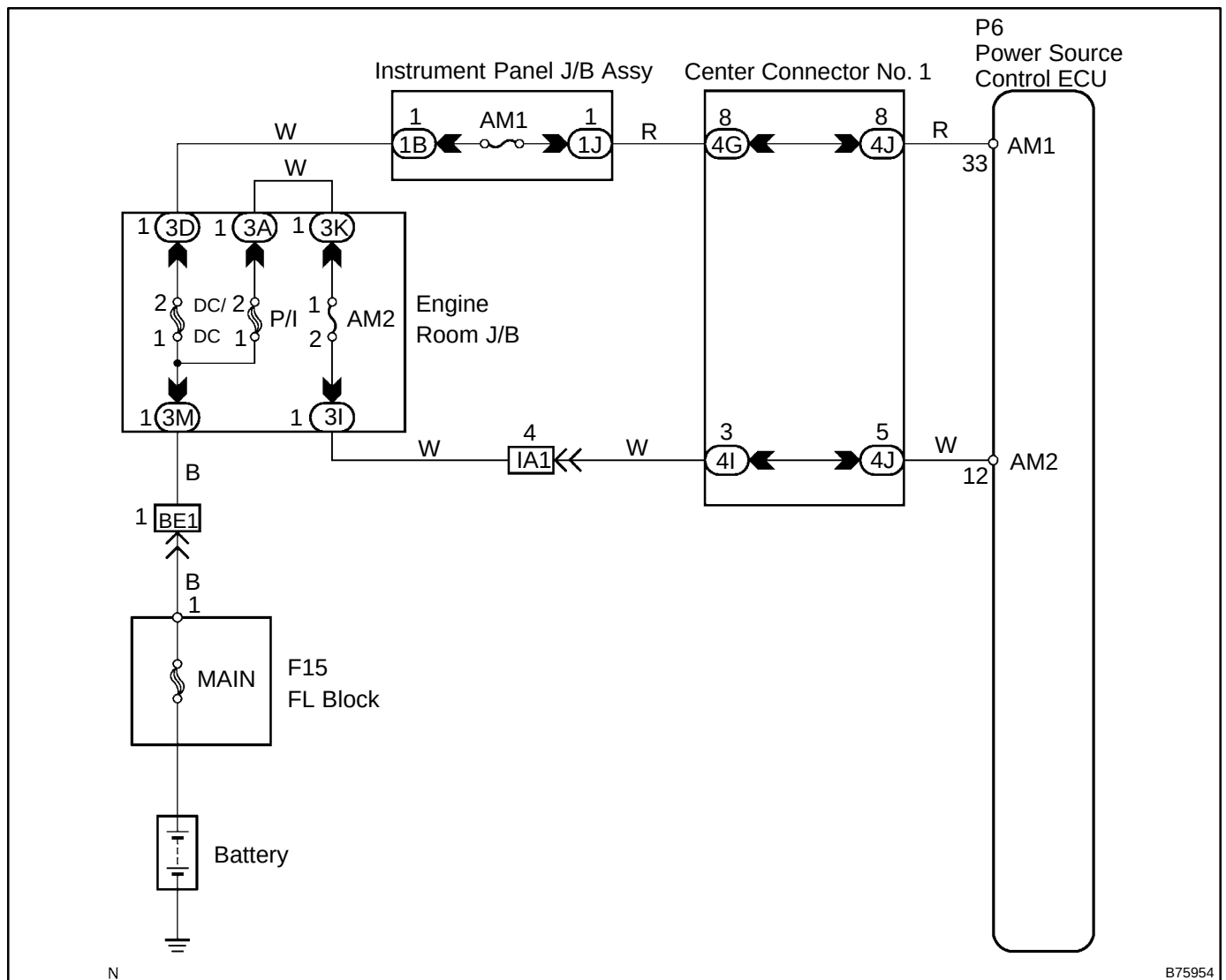
DTC	B2271	IGNITION HOLD MONITOR MALFUNCTION
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CIRCUIT DESCRIPTION

This DTC is output when the IG output circuits inside the power source control ECU are open or short.

DTC No.	DTC Detection ondition	Trouble Area
B2271	Hold circuit, IG1 relay actuation circuit or IG2 relay actuation circuit inside power source control ECU is open or short	- Power source control ECU - AM1 fuse - AM2 fuse - Wire harness

WIRING DIAGRAM



cardiagn.com

INSPECTION PROCEDURE

1 CHECK DTCS

- (a) Delete the DTC (see page 05-2438).
- (b) Check for DTCs again.

OK: No DTC is output.

NG Go to step 2

OK

END

2 INSPECT FUSE (AM1, AM2)

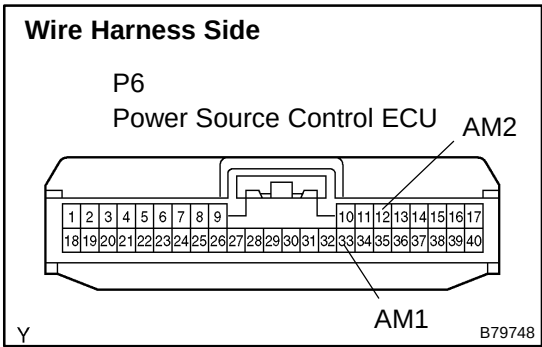
- (a) Remove the AM1 fuse from the instrument panel J/B assy.
- (b) Remove the AM2 fuse from the engine room J/B.
- (c) Measure the resistance.

Standard: Below 1 Ω

NG REPLACE FUSE

OK

3 CHECK WIRE HARNESS (POWER SOURCE CONTROL ECU – BODY GROUND)



- (a) Disconnect the P6 ECU connector.
- (b) Measure the voltage of the wire harness side connector.

Standard:

Tester Connection	Specified Condition
P6-33 (AM1) – Body ground	10 to 14 V
P6-12 (AM2) – Body ground	10 to 14 V

NG REPAIR OR REPLACE HARNESS AND CONNECTOR

OK

REPLACE POWER SOURCE CONTROL ECU

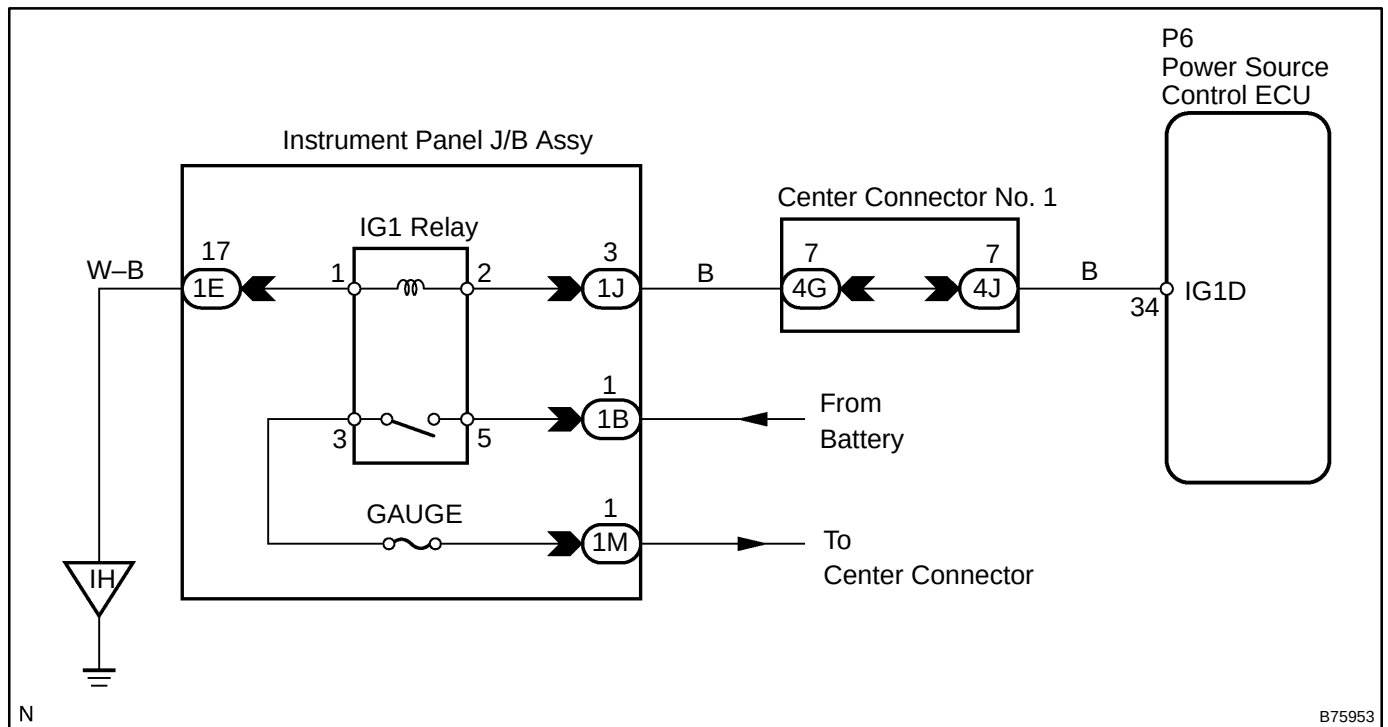
DTC	B2272	IGNITION 1 MONITOR MALFUNCTION
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CIRCUIT DESCRIPTION

This DTC is output when the IG output circuit from the inside of the power source control ECU to the IG1 relay is malfunctioning.

DTC No.	DTC Detection Condition	Trouble Area
B2272	IG1 relay actuation circuit inside power source control ECU or other related circuits is malfunctioning	- Power source control ECU - IG1 relay - Wire harness

WIRING DIAGRAM



INSPECTION PROCEDURE

1 READ VALUE OF HAND-HELD TESTER

- (a) Connect the hand-held tester (with CAN VIM) to the DLC3.
 (b) Turn the power switch ON (IG) and press the hand-held tester main switch ON.
 (c) Select the items below in the DATA LIST, and read the displays on the hand-held tester.

Standard (Power source control ECU):

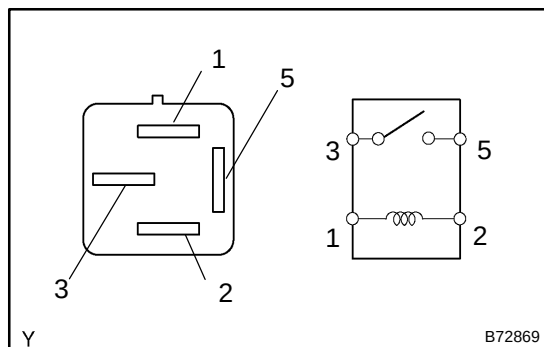
Item	Measurement Item/Range (Display)	Normal Condition	Diagnostic Note
IG1 RELAY MON 1	States of the IG1 Outer Relay Monitor/ ON or OFF	ON: Power switch ON (IG) OFF: Power switch OFF	–

OK: "ON" (power switch ON (IG)) appears on the screen.

NG

Go to step 2

OK

REPLACE POWER SOURCE CONTROL ECU**2 INSPECT RELAY (IG1)**

- (a) Remove the IG1 relay from the instrument panel J/B assy.
 (b) Measure the resistance.

Standard:

Tester Connection	Specified Condition
3 – 5	10 k Ω or higher
3 – 5	Below 1 Ω (when battery voltage is applied to terminals 1 and 2)

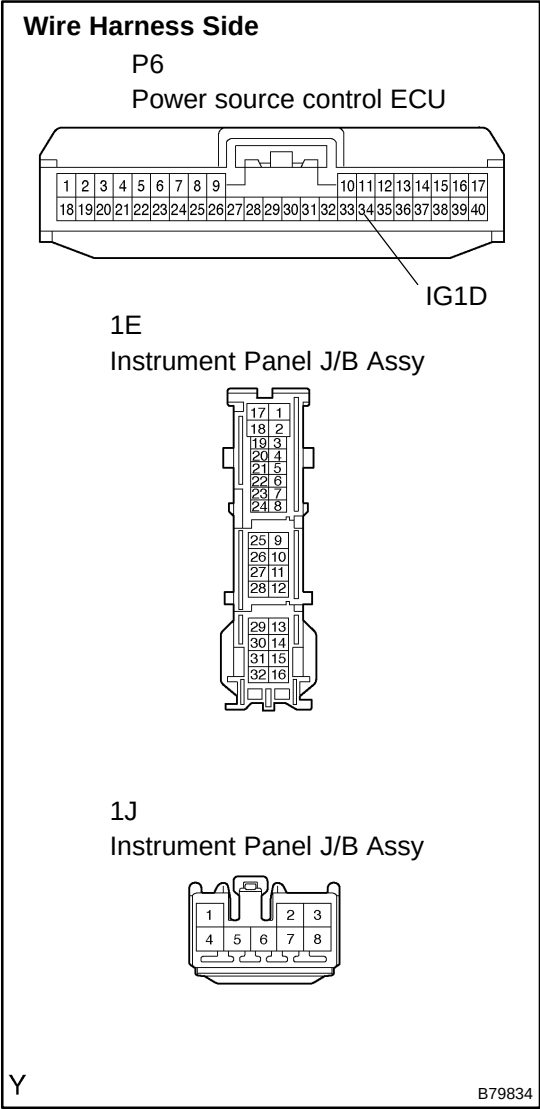
NG

REPLACE RELAY

OK

3

CHECK WIRE HARNESS (INSTRUMENT PANEL J/B ASSY – POWER SOURCE CONTROL ECU AND BODY GROUND)



- (a) Disconnect the 1J and 1E instrument panel J/B assy connectors.
- (b) Disconnect the P6 ECU connector.
- (c) Measure the resistance of the wire harness side connectors.

Standard:

Tester Connection	Specified Condition
1J-3 – P6-34 (IG1D)	Below 1 Ω
1J-3 or P6-34 – Body ground	10 kΩ or higher
1E-17 – Body ground	Below 1 Ω

OK

NG

REPAIR OR REPLACE HARNESS AND CON-
NECTOR

4 CHECK INSTRUMENT PANEL JUNCTION BLOCK ASSY

1E
Instrument Panel J/B Assy

1J
Instrument Panel J/B Assy

IG1 Relay

B79835

- (a) Remove the IG1 relay from the instrument panel J/B Assy.
- (b) Disconnect the 1J and 1E instrument panel J/B Assy connector.
- (c) Measure the resistance of the instrument panel J/B Assy.

Standard:

Tester Connection	Specified Condition
1J-3 – instrument panel J/B Assy IG1 relay terminal 2	Below 1 Ω
1E-17 – instrument panel J/B Assy IG1 relay terminal 1	Below 1 Ω

NG

REPLACE INSTRUMENT PANEL JUNCTION BLOCK ASSY

OK

REPLACE POWER SOURCE CONTROL ECU

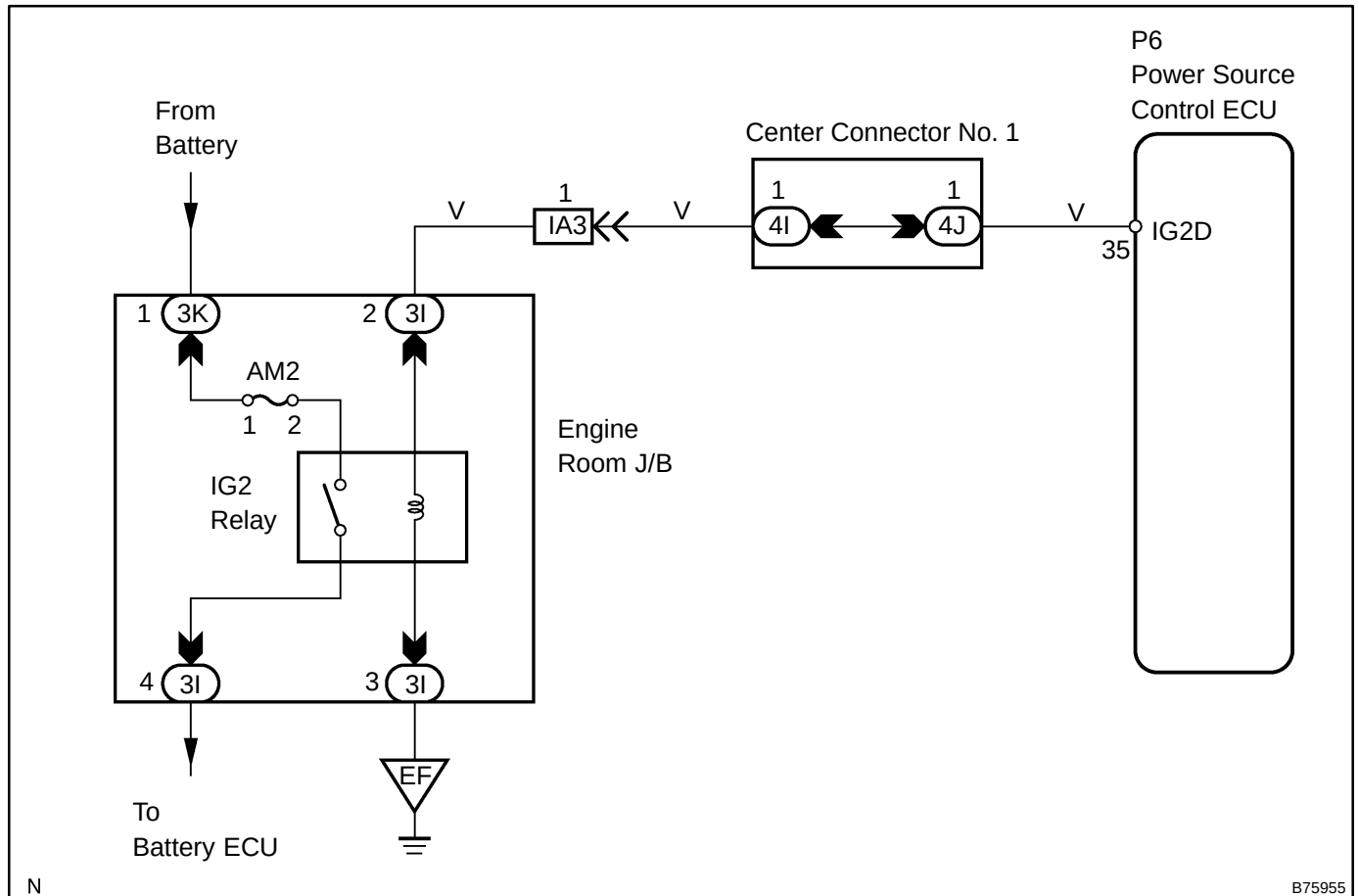
DTC	B2273	IGNITION 2 MONITOR MALFUNCTION
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CIRCUIT DESCRIPTION

This DTC is output when the IG output circuit from the inside of the power source control ECU to the IG2 relay is malfunctioning.

DTC No.	DTC Detection Condition	Trouble Area
B2273	IG2 relay actuation circuit inside power source control ECU or other related circuits is malfunctioning	- Power source control ECU - Wire harness

WIRING DIAGRAM



INSPECTION PROCEDURE

1 READ VALUE OF HAND-HELD TESTER

- Connect the hand-held tester (with CAN VIM) to the DLC3.
- Turn the power switch ON (IG) and press the hand-held tester main switch ON.
- Read the DATA LIST according to the displays on the tester.

Standard (Power source control ECU):

Item	Measurement Item/Range (Display)	Normal Condition	Diagnostic Note
IG2 RELAY MON 2	States of the IG2 Inner Relay Monitor/ ON or OFF	ON: Power switch ON (IG) OFF: Power switch OFF	–

OK: "ON" (power switch ON (IG)) appears on the screen.

NG

Go to step 2

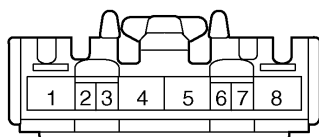
OK

REPLACE POWER SOURCE CONTROL ECU

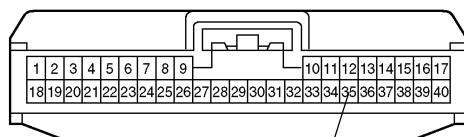
2 CHECK WIRE HARNESS (ENGINE ROOM J/B – POWER SOURCE CONTROL ECU AND BODY GROUND)

Wire Harness Side

3I
Engine Room J/B



P6
Power Source Control ECU



IG2D

Y

B80046

- Disconnect the 3I J/B connector.
- Disconnect the P6 ECU connector.
- Measure the resistance of the wire harness side connectors.

Standard:

Tester Connection	Specified Condition
3I-2 – P6-35 (IG2D)	Below 1 Ω
3I-3 – Body ground	Below 1 Ω

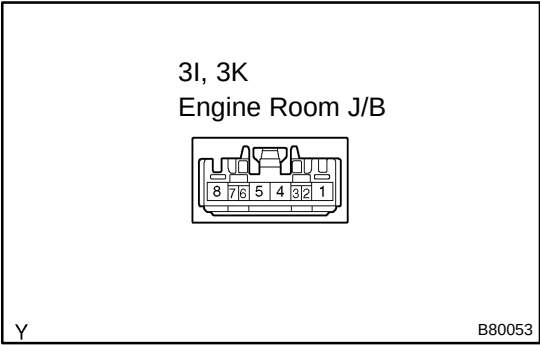
NG

REPAIR OR REPLACE HARNESS AND CONNECTOR

OK

3

CHECK ENGINE ROOM J/B



(a) Measure the resistance.

Standard:

Tester Connection	Condition	Specified Condition
3K-1 – 3I-4	When battery voltage is not applied to terminals 3I-2 and 3I-3	10 kΩ or higher
3K-1 – 3I-4	When battery voltage is applied to terminals 3I-2 and 3I-3	Below 1 Ω

NG

REPLACE ENGINE ROOM J/B

OK

REPLACE POWER SOURCE CONTROL ECU

INSPECTION PROCEDURE

1 READ VALUE OF HAND-HELD TESTER

- (a) Connect the hand-held tester (with CAN VIM) to the DLC3.
- (b) Turn the power switch ON (IG) and press the hand-held tester main switch ON.
- (c) Read the DATA LIST according to the displays on the tester.

Standard (Power source control ECU):

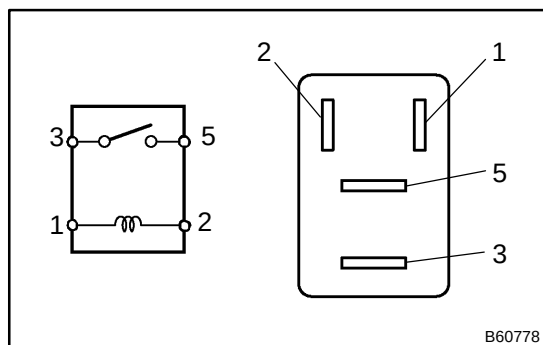
Item	Measurement Item/Range (Display)	Normal Condition	Diagnostic Note
ACC RELAY MON	States of the ACC Relay Monitor/ ON or OFF	ON: Power switch ON (ACC) OFF: Power switch OFF	–

OK: "ON" (power switch ON (ACC)) appears on the screen.

NG

Go to step 2

OK

REPLACE POWER SOURCE CONTROL ECU**2 INSPECT RELAY (ACC)**

- (a) Remove the ACC relay.
- (b) Measure the resistance.

Standard:

Tester Connection	Specified Condition
3 – 5	10 k Ω or higher
3 – 5	Below 1 Ω (when battery voltage is applied to terminals 1 and 2)

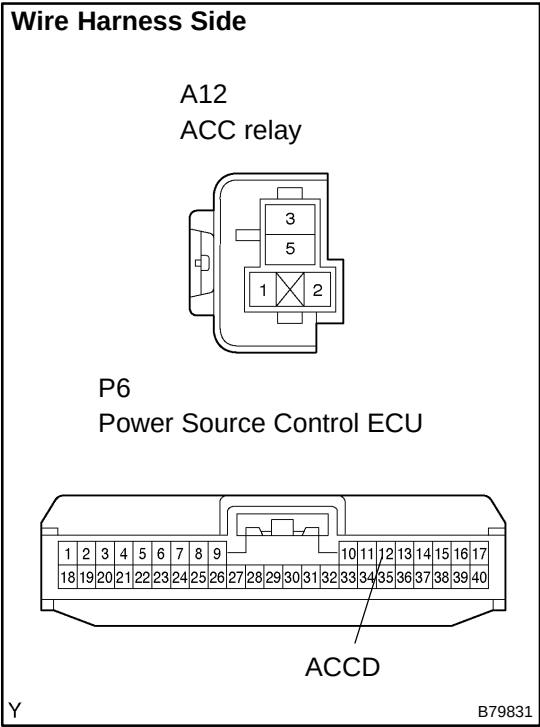
NG

REPLACE RELAY

OK

3

CHECK WIRE HARNESS (ACC RELAY – POWER SOURCE CONTROL ECU AND BODY GROUND)



- (a) Remove the ACC relay.
- (b) Disconnect the P6 connector.
- (c) Measure the resistance of the wire harness side connectors.

Standard:

Tester Connection	Specified Condition
A12-1 – P6-11 (ACCD)	Below 1 Ω
A12-2 – Body ground	Below 1 Ω
A12-1 or P6-11 (ACCD) – Body ground	10 k Ω or higher

NG

REPAIR OR REPLACE HARNESS AND CONNECTOR

OK

REPLACE POWER SOURCE CONTROL ECU

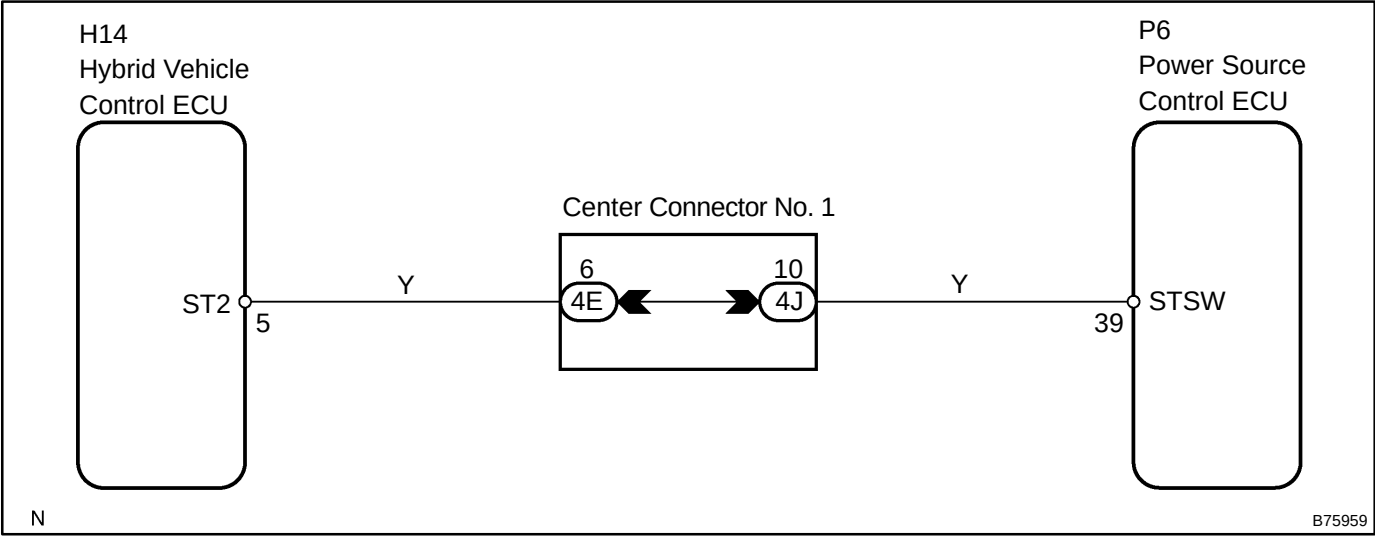
DTC	B2275	STSW MONITOR MALFUNCTION
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CIRCUIT DESCRIPTION

This DTC is output when the ST output circuits inside the power source control ECU is open or short.

DTC No.	DTC Detection Condition	Trouble Area
B2275	ST output circuit inside power source control ECU or other related circuit is malfunctioning	• Power source control ECU • Hybrid vehicle control ECU • Wire harness

WIRING DIAGRAM



INSPECTION PROCEDURE

1	CHECK DTCS
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- (a) Clear the DTC (see page 05-2438).
 - (b) Check for DTCs again.
- OK: No DTC is output.

NG

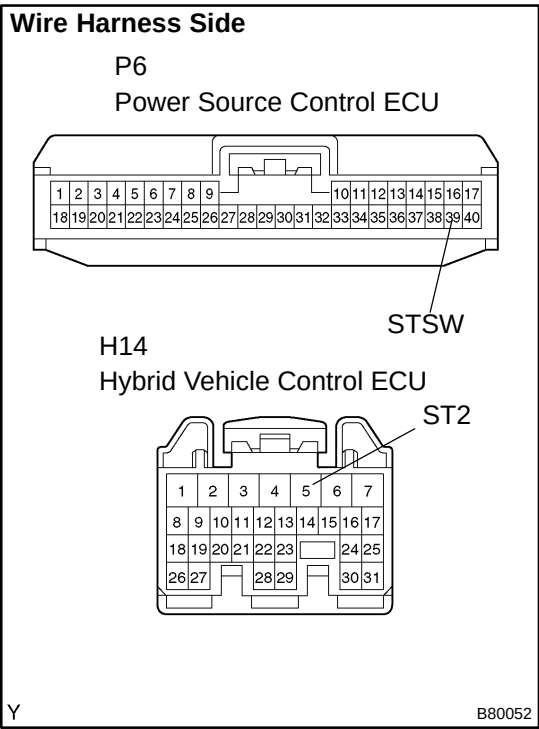
Go to step 2

OK

END

2

CHECK WIRE HARNESS (POWER SOURCE CONTROL ECU – HYBRID VEHICLE CONTROL ECU AND BODY GROUND)



- (a) Disconnect the P6 and H14 ECU connectors.
- (b) Measure the resistance of the wire harness side connectors.

Standard:

Tester Connection	Specified Condition
P6-39 (STSW) – H14-5 (ST2)	Below 1 Ω
P6-39 (STSW) – Body ground	10 kΩ or higher

NG

REPAIR OR REPLACE HARNESS AND CONNECTOR

OK

3

CHECK OPERATION OF POWER SOURCE CONTROL ECU

- (a) After replacing the power source control ECU with a normally functioning ECU, check that the hybrid control system can start normally.

OK: Hybrid control system can start normally.

NG

Go to **HYBRID CONTROL SYSTEM** (See page [05-385](#))

OK

NORMAL (POWER SOURCE CONTROL ECU DEFECTIVE)

DTC	B2277	DETECTING VEHICLE SUBMERSION
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CIRCUIT DESCRIPTION

This DTC is output when the submersion circuit monitor inside the power source control ECU detects that the vehicle is submerged in water.

DTC No.	DTC Detection Condition	Trouble Area
B2277	Submersion circuit monitor inside power source control ECU detects that vehicle is submerged in water	Power source control ECU

INSPECTION PROCEDURE

1	CHECK FOR DTCS
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- (a) Delete the DTC (see page [05-2438](#)).
- (b) Check for DTCs again.

OK: No DTC is output.

NG

REPLACE POWER SOURCE CONTROL ECU

OK

END

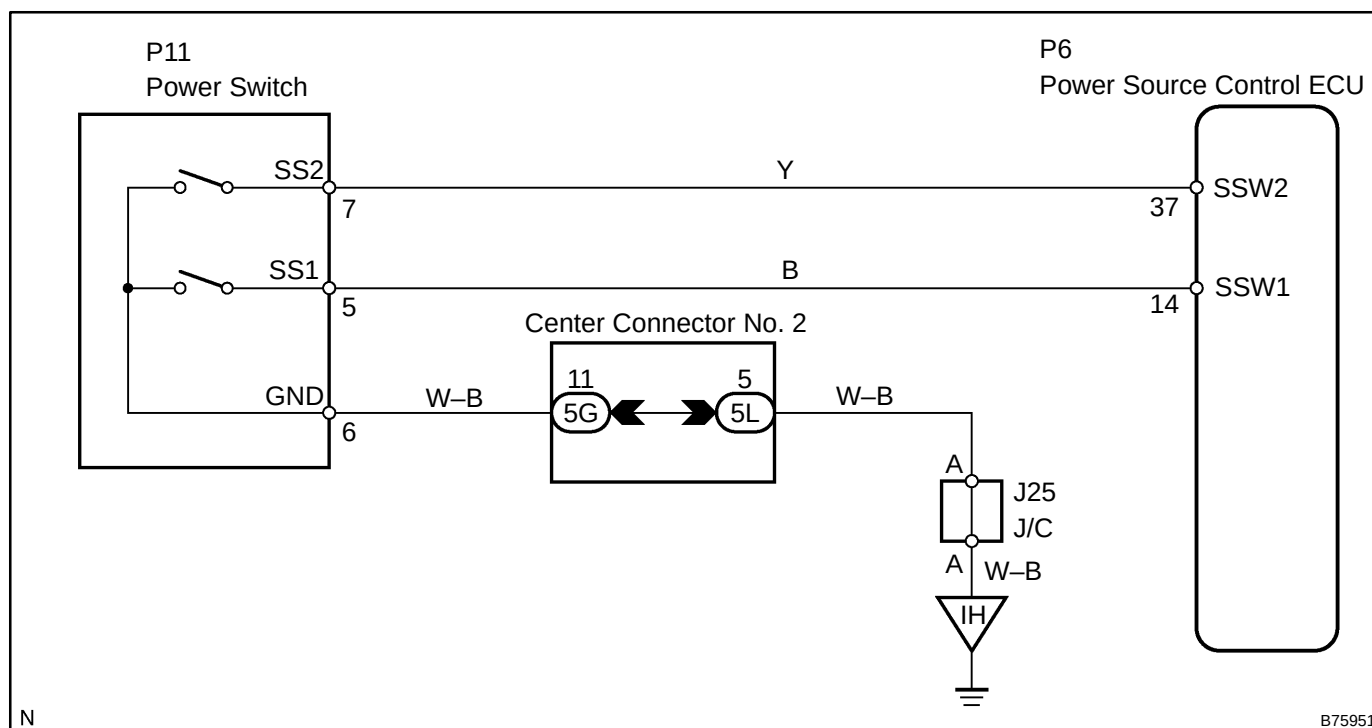
DTC	B2278	MAIN SWITCH (POWER SWITCH) MALFUNCTION
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CIRCUIT DESCRIPTION

This DTC is output when 1) a malfunction is detected between the power source control ECU and the power switch; or 2) either of the switches inside the power switch is malfunctioning.

DTC No.	DTC Detection Condition	Trouble Area
B2278	Communication is abnormal between power source control ECU and power switch; or power switch is defective	• Power source control ECU • Power switch • Wire harness

WIRING DIAGRAM



INSPECTION PROCEDURE

1 READ VALUE OF HAND-HELD TESTER

- Connect the hand-held tester (with CAN VIM) to the DLC3.
- Turn the power switch ON (IG) and press the hand-held tester main switch ON.
- Read the DATA LIST according to the displays on the tester.

Standard (Power source control ECU):

Item	Measurement Item/Range (Display)	Normal Condition	Diagnostic Note
ST SW1	States of the Start Switch 1/ ON or OFF	ON: Power switch ON (IG) OFF: Power switch OFF	–
ST SW2	States of the Start Switch 2/ ON or OFF	ON: Power switch ON (IG) OFF: Power switch OFF	–

OK: "ON" (power switches 1 and 2 are ON) appears on the screen

NG

Go to step 2

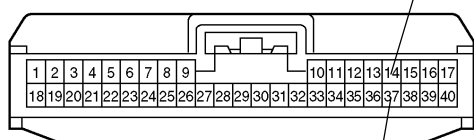
OK

REPLACE POWER SOURCE CONTROL ECU**2 CHECK WIRE HARNESS (POWER SWITCH – POWER SOURCE CONTROL ECU AND BODY GROUND)****Wire Harness Side**

P6

Power Source Control ECU

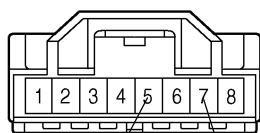
SSW1



SSW2

P11

Power Switch



SS1

SS2

Y

B79833

- Disconnect the P11 power switch connector.
- Disconnect the P6 ECU connector.
- Measure the resistance of the wire harness side connectors.

Standard:

Tester Connection	Specified Condition
P11-5 (SS1) – P6-14 (SSW1)	Below 1 Ω
P11-7 (SS2) – P6-37 (SSW2)	Below 1 Ω
P11-6 – Body ground	Below 1 Ω
P11-5 (SS2) or P6-14 (SSW1) – Body ground	10 k Ω higher
P11-7 (SS2) or P6-37 (SSW2) – Body ground	10 k Ω higher

NG

REPAIR OR REPLACE HARNESS AND CONNECTOR

OK

REPLACE POWER SOURCE CONTROL ECU

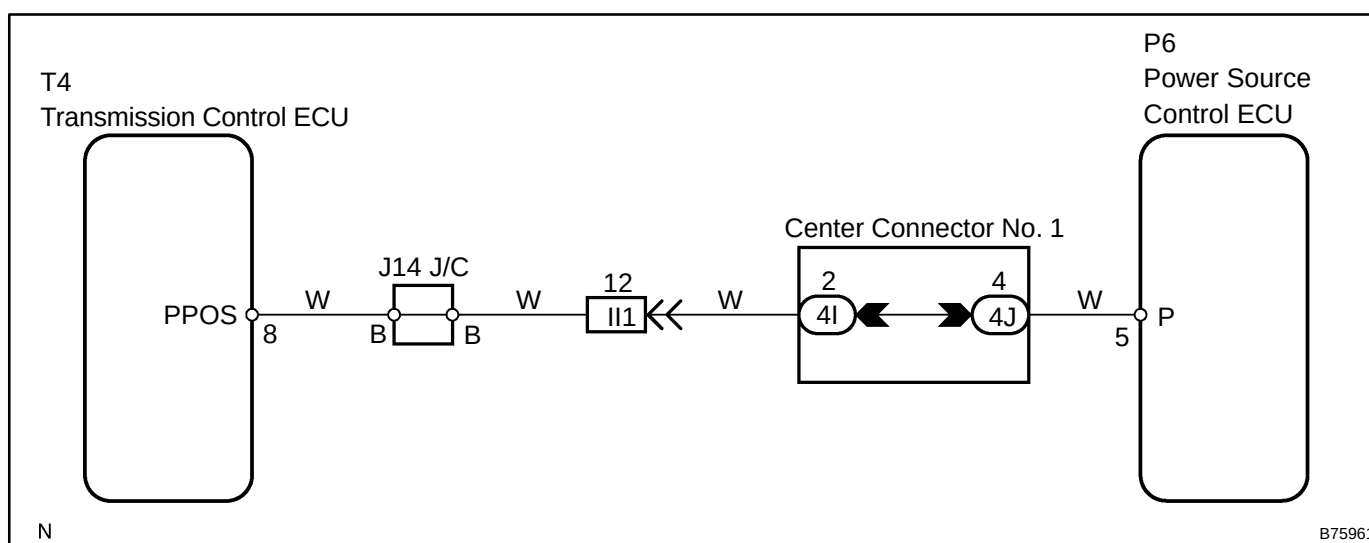
DTC	B2281	P SIGNAL MALFUNCTION (CABLE-INFORMATION DOES NOT MATCH TO BEAN-INFORMATION)
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CIRCUIT DESCRIPTION

The power source control ECU and the transmission control ECU are connected by a cable and BEAN. If the cable information and BEAN information are inconsistent, this DTC will be output.

DTC No.	DTC Detection Condition	Trouble Area
B2281	Cable and BEAN between power source control ECU and transmission control ECU are inconsistent	• Power source control ECU • Transmission control ECU • Wire harness

WIRING DIAGRAM



INSPECTION PROCEDURE

1 READ VALUE OF HAND-HELD TESTER

- Connect the hand-held tester (with CAN VIM) to the DLC3.
- Turn the power switch ON (IG) and press the hand-held tester main switch ON.
- Read the DATA LIST according to the displays on the tester.

Standard (Power source control ECU):

Item	Measurement Item/Range (Display)	Normal Condition	Diagnostic Note
SHIFT P SIG	States of the Shift P Signal / ON or OFF	ON: Shift P signal ON (Shift position is "P") OFF: Shift P signal OFF (Shift position is except "P" position)"	–

OK: "ON" (P signal is ON) appears on the screen.

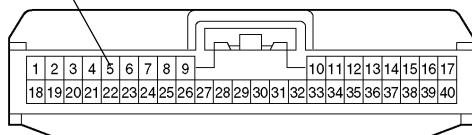
NG

Go to step 2

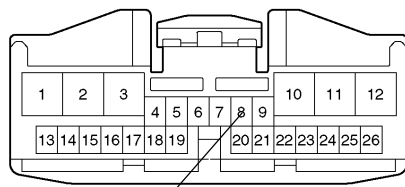
OK

REPLACE POWER SOURCE CONTROL ECU**2 CHECK WIRE HARNESS (POWER SOURCE CONTROL ECU – TRANSMISSION CONTROL ECU AND BODY GROUND)****Wire Harness Side**

P6
P Power Source Control ECU



T4
Transmission Control ECU



PPOS

Y

B80050

- Disconnect the P6 and T4 ECU connectors.
- Measure the resistance of the wire harness side connectors.

Standard:

Tester Connection	Specified Condition
P6-5 (P) – T4-8 (PPOS)	Below 1 Ω
P6-5 (P) – Body ground	10 k Ω or higher

NG

REPAIR OR REPLACE HARNESS AND CONNECTOR

OK

3 CHECK OPERATION OF POWER SOURCE CONTROL ECU

- (a) After replacing the power source control ECU with a normally functioning ECU, check that the hybrid control system can start normally.

OK: Hybrid control system can start normally.

NG

Go to SHIFT CONTROL SYSTEM
(See page [05-1139](#))

OK

NORMAL (POWER SOURCE CONTROL ECU DEFECTIVE)

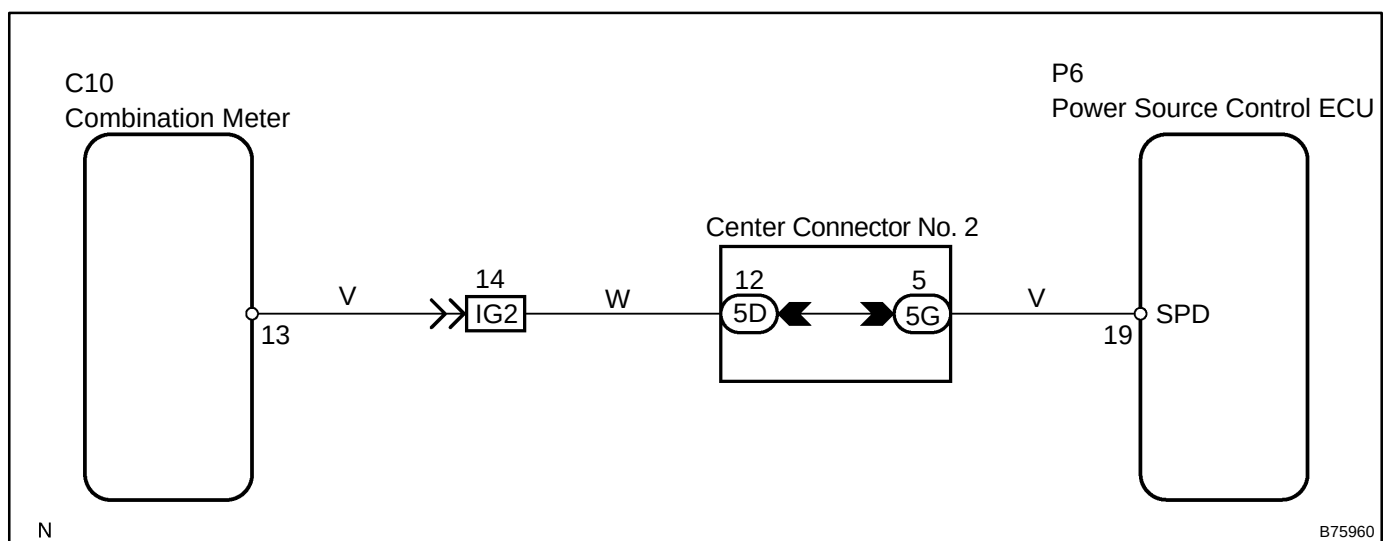
DTC	B2282	VEHICLE SPEED SIGNAL MALFUNCTION (CABLE-INFORMATION DOES NOT MATCH TO BEAN-INFORMATION)
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CIRCUIT DESCRIPTION

The power source control ECU and the combination meter are connected by a cable and BEAN. This DTC is output when: 1) the cable information and BEAN information are inconsistent; and 2) a malfunction is detected between the vehicle speed sensor and the combination meter.

DTC No.	DTC Detection Condition	Trouble Area
B2282	Cable and BEAN information between power source control ECU and combination meter are inconsistent	• Power source control ECU • Combination meter • Wire harness

WIRING DIAGRAM



INSPECTION PROCEDURE

1 READ VALUE OF HAND-HELD TESTER

- Connect the hand-held tester (with CAN VIM) to the DLC3.
- Turn the power switch ON (IG) and press the hand-held tester main switch ON.
- Read the DATA LIST according to the displays on the tester.

Standard (Power source control ECU):

Item	Measurement Item/Range (Display)	Normal Condition	Diagnostic Note
VEHICLE SPD SIG	States of the Vehicle Speed Signal / Stop or Run	Stop: Vehicle condition is "Stop" Run: Vehicle condition is "Run"	–

OK: "STOP" (vehicle condition is stop) appears on the screen.

NG

Go to step 2

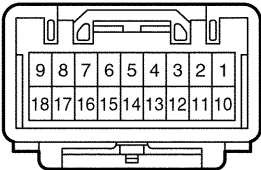
OK

REPLACE POWER SOURCE CONTROL ECU

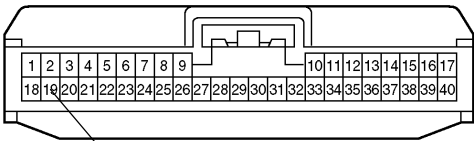
2 CHECK WIRE HARNESS (POWER SOURCE CONTROL ECU – IG2 CONNECTOR)

Wire Harness Side

IG2
Connector



P6
Power Source Control ECU



SPD

B81038

- Disconnect the P6 connector.
- Disconnect the IG2 connector.
- Measure the resistance of the wire harness side connectors.

Standard:

Tester Connection	Specified Condition
P6-19 (SPD) – IG2-14	Below 1 Ω
P6-19 (SPD) – Body ground	10 k Ω or higher

NG

REPAIR OR REPLACE HARNESS AND CONNECTOR

OK

3 CHECK OPERATION OF POWER SOURCE CONTROL ECU

- (a) After replacing the power source control ECU with a normally functioning ECU, check that the hybrid control system can start normally.

OK: Hybrid control system can start normally.

NG

Go to COMBINATION METER SYSTEM
(See page [05-1975](#))

OK

NORMAL (POWER SOURCE CONTROL ECU DEFECTIVE)

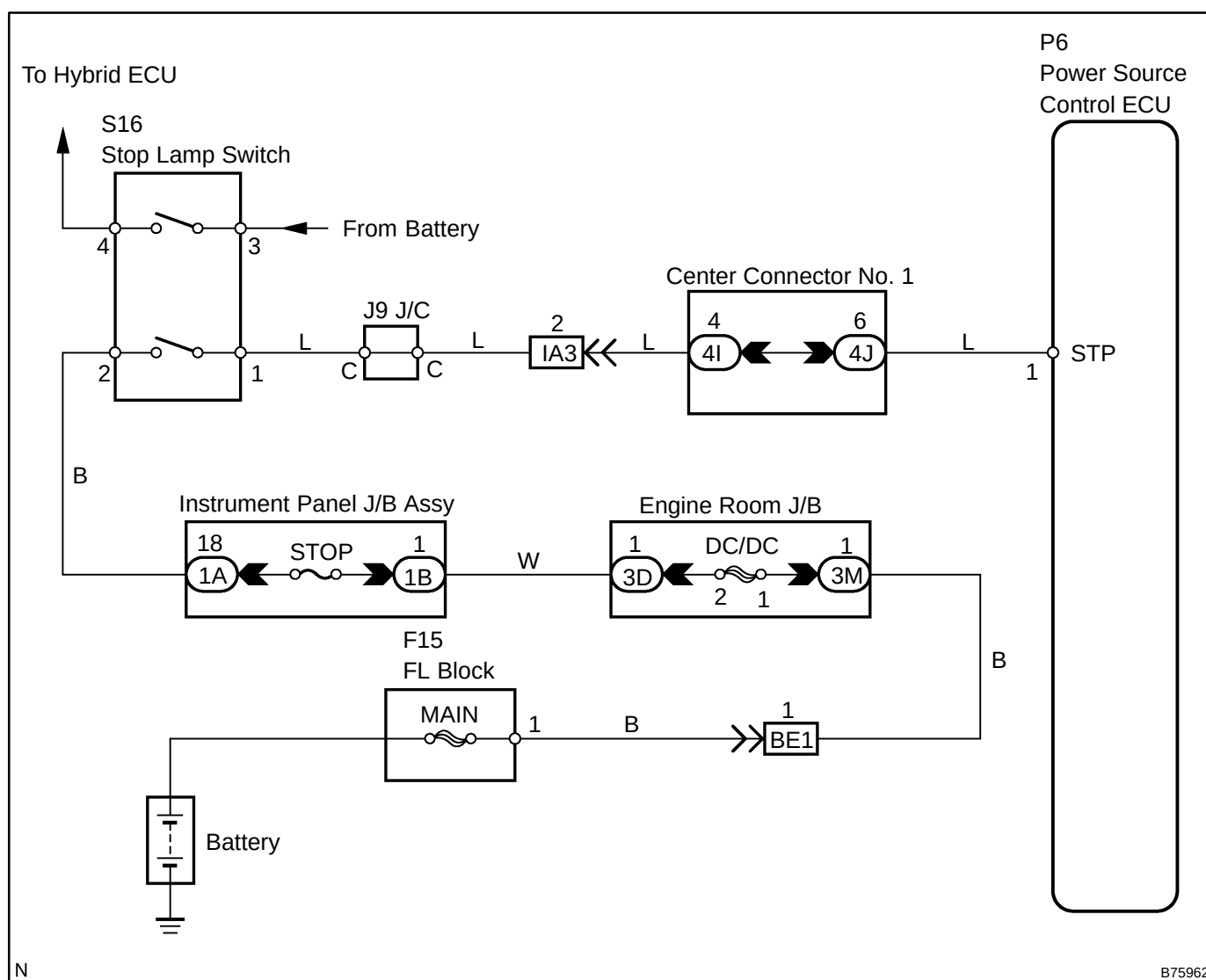
DTC	B2284	BRAKE SIGNAL MALFUNCTION (CABLE-INFORMATION DOES NOT MATCH TO BEAN-INFORMATION)
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CIRCUIT DESCRIPTION

This DTC is output when: 1) the brake signal circuit between the power source control ECU and the stop light switch is malfunctioning; and 2) the BEAN information is inconsistent.

DTC No.	DTC Detection Condition	Trouble Area
B2284	Communication or communication line is abnormal between power source control ECU and stop light switch	• Power source control ECU • Stop light switch • Wire harness

WIRING DIAGRAM



N

B75962

INSPECTION PROCEDURE

1 READ VALUE OF HAND-HELD TESTER

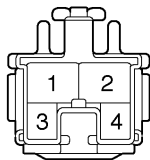
- (a) Connect the hand-held tester (with CAN VIM) to the DLC3.
- (b) Turn the power switch ON (IG) and press the hand-held tester main switch ON.
- (c) Read the DATA LIST according to the displays on the tester.

Standard (Power source control ECU):

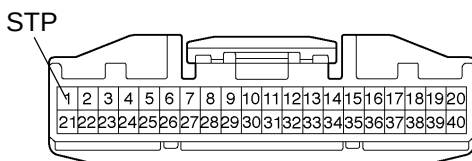
Item	Measurement Item/Range (Display)	Normal Condition	Diagnostic Note
STOP LAMP SW1	States of the Stop Lamp Switch 1/ ON or OFF	ON: Brake pedal pressed OFF: Brake pedal released	–

OK: "ON" (brake pedal depressed) appears on the screen.**NG****Go to step 2****OK****REPLACE POWER SOURCE CONTROL ECU****2 CHECK WIRE HARNESS (STOP LAMP SWITCH ASSY – POWER SOURCE CONTROL ECU)****Wire Harness Side**

S16
Stop Lamp Switch



P6
Power Source Control ECU



Y

B80047

- (a) Disconnect the S16 stop lamp switch connector.
- (b) Disconnect the P6 ECU connector.
- (c) Measure the resistance of the wire harness side connectors.

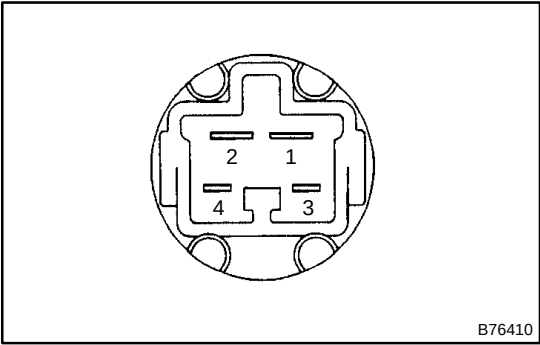
Standard:

Tester Connection	Specified Condition
S16-1 – P6-1 (STP)	Below 1 Ω
S16-2 – Body ground	10 to 14 V

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

3

CHECK STOP LAMP SWITCH ASSY



- (a) Remove the stop lamp switch.
- (b) Measure the switch resistance when the shaft is operated.

Standard:

Tester Connection	Condition	Specified Condition
S16-1 – S16-2	Pressed	Below 1 Ω
S16-1 – S16-2	Released	10 kΩ or higher
S16-3 – S16-4	Pressed	10 kΩ or higher
S16-3 – S16-4	Released	Below 1 Ω

NG

REPLACE STOP LAMP SWITCH ASSY

OK

REPLACE POWER SOURCE CONTROL ECU

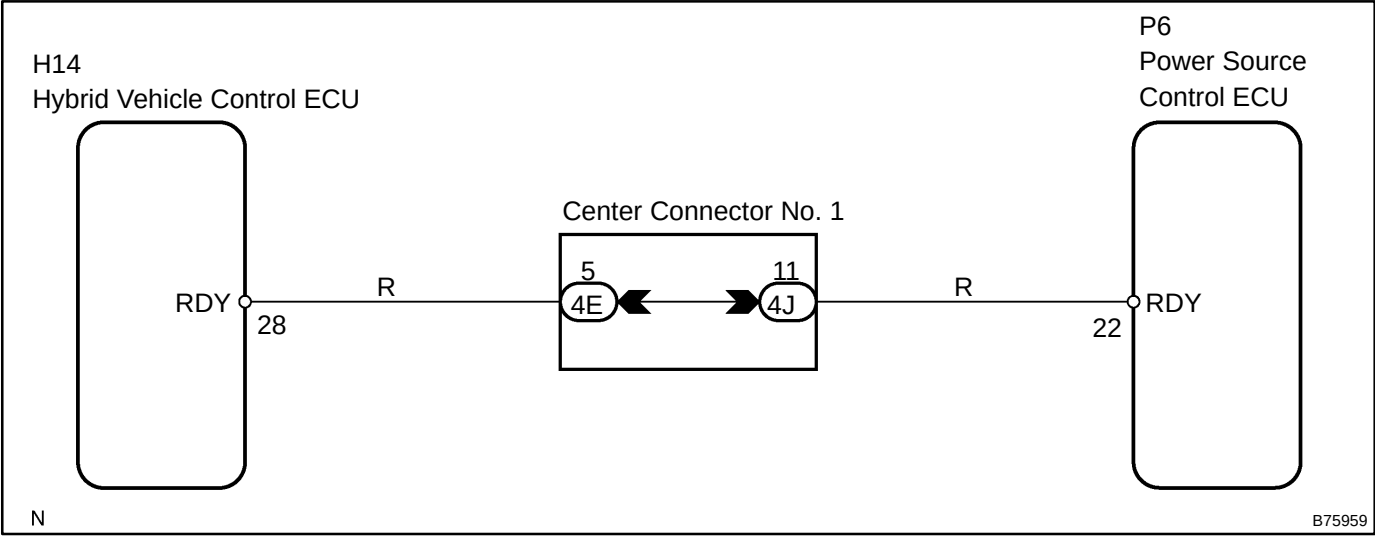
DTC	B2286	READY SIGNAL MALFUNCTION
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CIRCUIT DESCRIPTION

The power source control ECU and the hybrid vehicle control ECU are connected by the cable and BEAN. If the cable information and BEAN information are inconsistent, this DTC will be output.

DTC No.	DTC Detection Condition	Trouble Area
B2286	Cable and BEAN information between power source control ECU and hybrid vehicle control ECU are inconsistent	• Power source control ECU • Hybrid vehicle control ECU • Wire harness

WIRING DIAGRAM



INSPECTION PROCEDURE

1 READ VALUE OF HAND-HELD TESTER

- Connect the hand-held tester (with CAN VIM) to the DLC3.
- Turn the power switch ON (IG) and press the hand-held tester main switch ON.
- Read the DATA LIST according to the displays on the tester.

Standard (Power source control ECU):

Item	Measurement Item/Range (Display)	Normal Condition	Diagnostic Note
READY SIG	States of the Ready signal / ON or OFF	ON: Power switch ON (Ready) OFF Power switch OFF or ON (IG) or ON (ACC)	–

OK: "ON" (power switch is ON) appears on the screen.

NG

Go to step 2

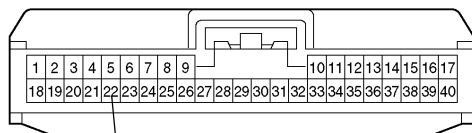
OK

REPLACE POWER SOURCE CONTROL ECU

2 CHECK WIRE HARNESS (POWER SOURCE CONTROL ECU – HYBRID VEHICLE CONTROL ECU)

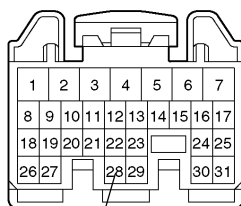
Wire Harness Side

P6
Power Source Control ECU



RDY

H14
ECU



RDY

Y

B80052

- Disconnect the P6 and H14 ECU connectors.
- Measure the resistance of the wire harness side connectors.

Standard:

Tester Connection	Specified Condition
P6-22 (RDY) – H14-28 (RDY)	Below 1 Ω
P6-22 (RDY) – Body ground	10 k Ω or higher

NG

REPAIR OR REPLACE HARNESS AND CONNECTOR

OK

3 CHECK OPERATION OF POWER SOURCE CONTROL ECU

- (a) After replacing the power source control ECU with a normally functioning ECU, check that the hybrid vehicle control system can start normally.

OK: Hybrid vehicle control system can start normally.

NG

Go to HYBRID CONTROL SYSTEM
(See page [05-385](#))

OK

NORMAL (POWER SOURCE CONTROL ECU DEFECTIVE)

DTC	B2287	LIN COMMUNICATION MASTER MALFUNCTION
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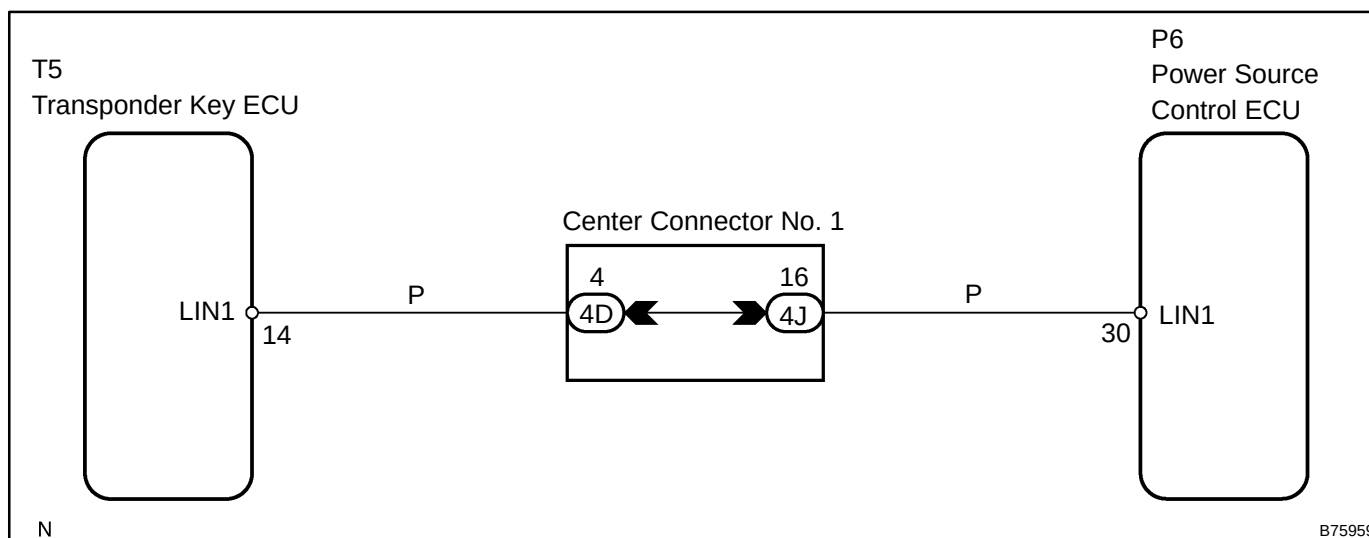
DTC	B2289	KEY COLLATION WAITING TIME OVER
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CIRCUIT DESCRIPTION

This DTC is output when: 1) any other DTC is set in the power source control ECU; or 2) the wire harness between the power source control ECU and the transponder key ECU is open or short.

DTC No.	DTC Detection Condition	Trouble Area
B2287	Communication or communication line is abnormal between power source control ECU and transponder key ECU	• Power source control ECU • Transponder key ECU • Wire harness
B2289	Cable and BEAN are abnormal between power source control ECU and immobilizer system; or immobilizer system is malfunctioning	• Power source control ECU • Engine immobilizer system • Wire harness

WIRING DIAGRAM

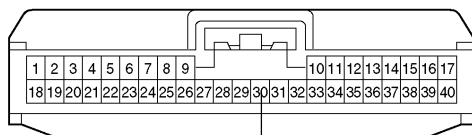


INSPECTION PROCEDURE

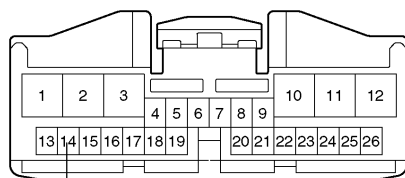
1 CHECK WIRE HARNESS (POWER SOURCE CONTROL ECU – TRANSPONDER KEY ECU)**Wire Harness Side**

P6

Power Source Control ECU



LIN1

T5
ECU

LIN1

Y

B80050

- (a) Disconnect the P6 and T5 ECU connectors.
 (b) Measure the resistance of the wire harness side connectors.

Standard:

Tester Connection	Specified Condition
P6-30 (LIN1) – T5-14 (LIN1)	Below 1 Ω
P6-30 (LIN1) – Body ground	10 k Ω or higher

NG

REPAIR OR REPLACE HARNESS AND CONNECTOR

OK

2 CHECK OPERATION OF POWER SOURCE CONTROL ECU

- (a) After replacing power source control ECU with a normally functioning ECU, check that the hybrid control system can start normally.

Result	Proceed to
Hybrid system can start normally	A
Hybrid system cannot start (w/ smart entry system)	B
Hybrid system cannot start (w/o smart entry system)	C

OK: Hybrid vehicle control system can start normally.

B

Go to ENGINE IMMOBILIZER SYSTEM (w/ SMART ENTRY SYSTEM) (See page 05-2325)

C

Go to ENGINE IMMOBILIZER SYSTEM (w/o SMART ENTRY SYSTEM) (See page 05-2375)

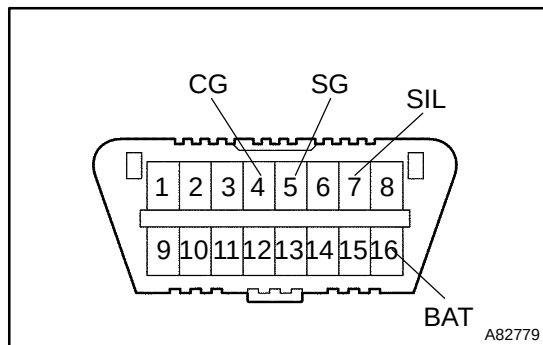
A

NORMAL (POWER SOURCE CONTROL ECU DEFECTIVE)

DIAGNOSIS SYSTEM

1. DESCRIPTION

- (a) Push button start system control system data and its Diagnosis Trouble Codes (DTCs) can be read in the Data Link Connector 3 (DLC3). When the system seems to be malfunctioning, use the hand-held tester to check for malfunctions and perform repairs.



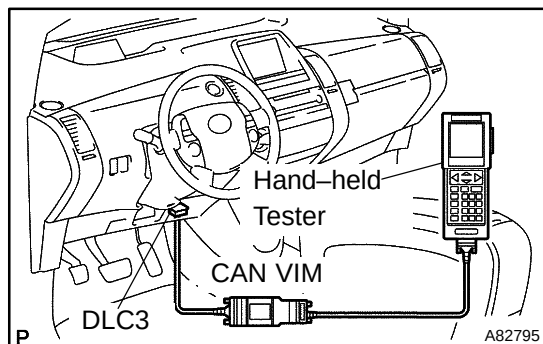
2. CHECK DLC3

HINT:

The vehicle uses the ISO 9141-2 for communication protocol. The terminal arrangement of the DLC3 complies with SAE J1962 and matches the ISO 9141-2 format.

Symbol	Terminal No.	Name	Reference terminal	Result	Condition
SIL	7	Bus "+" line	5 – Signal ground	Pulse generation	During transmission
CG	4	Chassis ground	Body ground	Below 1 Ω	Constant
SG	5	Signal ground	Body ground	Below 1 Ω	Constant
BAT	16	Battery positive	Body ground	11 to 14 V	Constant

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



HINT:

Connect the cable of the hand-held tester (with CAN VIM) to the DLC3, turn the power switch ON (IG) and attempt to use the hand-held tester. If the screen displays UNABLE TO CONNECT TO VEHICLE, a problem exists in the vehicle side or tester side.

- If communication is normal when the tester is connected to another vehicle, inspect the DLC3 of the original vehicle.
- If 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.

3. CHECK BATTERY VOLTAGE

Standard: 11 to 14 V

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

DATA LIST/ACTIVE TEST

1. DATA LIST

HINT:

Using the hand-held tester DATA LIST allows switch, sensor, actuator and other item values to be read without removing any parts. Reading the DATA LIST early in troubleshooting is one way to shorten labor time.

- Connect the hand-held tester to the Controller Area Network Vehicle Interface Module (CAN VIM). Then connect the CAN VIM to the DLC3.
- Turn the power switch ON (IG).
- Read the DATA LIST according to the display on the tester.

Power source control ECU:

Item	Measurement Item/Range (Display)	Normal Condition	Diagnostic Note
STR UNLK SW	States of the Steering Unlock Switch / ON or OFF	ON: Key is in key slot OFF* No key is in key slot	–
READY SIG	States of the Ready signal / ON or OFF	ON: Power switch ON (READY) OFF Power switch OFF or ON (IG) or ON (ACC)	–
VEHICLE SPD SIG	States of the Vehicle Speed Signal / Stop or Run	Stop: Vehicle condition is "Stop" Run: Vehicle condition is "Run"	–
SHIFT P SIG	States of the Shift P Signal / ON or OFF	ON: Shift P signal ON (Shift position is P) OFF: Shift P signal OFF (Shift position is except P position)"	–
ST READY MON	State of the Sterter Relay Monitor	ON: Sterter relay signal ON OFF Sterter relay signal OFF	–
ACC CUT SIG	State of the Relay Monitor	ON: ACC relay signal ON OFF ACC relay signal OFF	–
E/G COND	States of the Engine Condition / Stop or Run	Stop: Engine is stop Run: Engine does not running	–
SHIFT P PULSE	States of the shift P Signal Pluse/ Unkown, Error2, Normal2, Error1, Normal3, Error3 or Normal1	111: Unkown 101: Error2 001: Normal2 100: Error1 010: Normal3 110: Error 3 000: Normal1	–
CARD H-INS SW	States of the Card Half-Insert Detection SW/ ON or OFF	ON: Key is half-inserted OFF: Key is not half-inserted	–
CARD F-INS SW	States of the Card Full-Insert Detection SW/ ON or OFF	ON: Key is fully-inserted OFF: Key is not fully-inserted	–
STOP LAMP SW1	States of the Stop Lamp Switch 1/ ON or OFF	ON: Brake pedal depressed OFF: Brake pedal released	–
STOP LAMP SW2	States of the Stop Lamp Switch 2/ ON or OFF	ON: Brake pedal released OFF: Brake pedal depressed	–
ST SW1	States of the Start Switch 1/ ON or OFF	ON: Power switch ON (IG) OFF: Power switch OFF	–
ST SW2	States of the Start Switch 2/ ON or OFF	ON: Power switch ON (IG) OFF: Power switch OFF	–
RATCH CIRCUIT	States of the Ratch Circuit/ ON or OFF	ON: Power switch ON (IG) OFF: Power switch OFF or ON (ACC) or ON (READY)	–
IG1 RELAY MON 1	States of the IG1 Outer Relay Monitor/ ON or OFF	ON: Power switch ON (IG) OFF: Power switch OFF	–
IG1 RELAY MON 2	States of the IG1 Inner Relay Monitor/ ON or OFF	ON: Power switch ON (IG) OFF: Power switch OFF	–

Item	Measurement Item/Range (Display)	Normal Condition	Diagnostic Note
IG2 RELAY MON 1	States of the IG2 Outer Relay Monitor/ ON or OFF	ON: Power switch ON (IG) OFF: Power switch OFF	–
IG2 RELAY MON 2	States of the IG2 Inner Relay Monitor/ ON or OFF	ON: Power switch ON (IG) OFF: Power switch OFF	–
ACC RELAY MON	States of the ACC Relay Monitor/ ON or OFF	ON: Power switch ON (ACC) OFF: Power switch OFF	–
PWR COND	States of the Power Supply Condi- tion/ IG2 ON, ST ON, All OFF, IG1 ON or ACC ON	01110000: IG2 ON 11110000: ST ON 00000000: All OFF 00110000: IG1 ON 00010000: ACC ON	–

2. ACTIVE TEST

HINT:

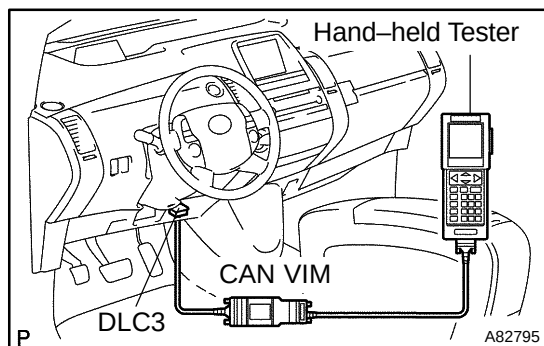
Performing the hand-held tester ACTIVE TEST allows relay, VSV, actuator and other items to be operated without removing any parts. Performing the ACTIVE TEST early in troubleshooting is one way to shorten the labor time. The DATA LIST can be displayed during the ACTIVE TEST.

- Connect the hand-held tester (with CAN VIM) to the DLC3.
- Turn the power switch ON (IG).
- Perform the ACTIVE TEST according to the display on the tester.

Power source control ECU :

Item	Test Details	Diagnostic Note
KEY LOCK	Key Lock (IG OFF during the test, Turn the power switch ON (IG) again after the test.) ON/OFF	–
LIGHTING IND	Indicator for Lighting ON/OFF	–
IND CONDITION	Indicator Green/Red/No Sig	–

DTC CHECK/CLEAR



1. CHECK DTC

- (a) Connect the hand-held tester to the Controller Area Network Vehicle Interface Module (CAN VIM). Then connect the CAN VIM to the DLC3.
- (b) Turn the power switch ON (IG).
- (c) Read the DTCs by following the directions on the tester screen.

HINT:

Refer to the hand-held tester operator's manual for further details.

2. CLEAR DTC

- (a) Connect the hand-held tester (with CAN VIM) to the DLC3.
- (b) Turn the power switch ON (IG).
- (c) Erase the DTCs by following the directions on the tester screen.

HINT:

Refer to the hand-held tester operator's manual for further details.

ON-VEHICLE INSPECTION

1. CHECK POWER SWITCH MODE CHANGE FUNCTION

(a) Check the function of the power switch.

- (1) Check that power switch mode changes in accordance with the conditions of the shift position and brake pedal.

HINT:

For the vehicles with the smart entry system, the power switch functions not only when the key is inserted in to the key slot but also when the driver carries the key.

Shift Position	Brake Pedal	Change of Power Switch Mode (Arrow "→" means 1 press of power switch)
P	Released	OFF → ON (ACC) → ON (IG) → OFF (Repeated)
P	Depressed	OFF → Hybrid system starts
P	Depressed	ON (ACC) → Hybrid system starts
P	Depressed	ON (IG) → Hybrid system starts
P	Depressed	Hybrid system operating → OFF
P	Released	Hybrid system operating → OFF
Any position other than P	Released	ON (ACC) → ON (IG)
Any position other than P	Depressed	ON (ACC) → ON (IG)
Any position other than P	Released	ON (IG) → OFF after shift position switched to P (shift-linked-OFF function)
Any position other than P	Released	Hybrid system operating → OFF after shift position switched to P (Auto P control function)
Any position other than P	Depressed	Hybrid system operating → OFF after shift position switched to P (Auto P control function)

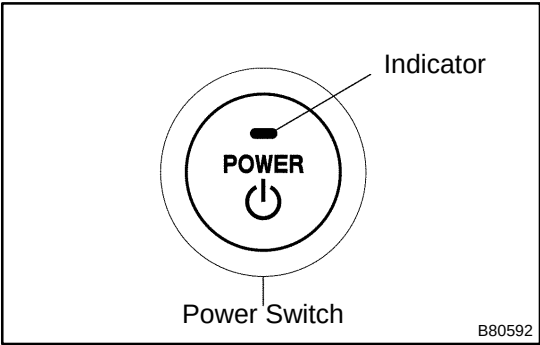
(b) Check if power switch mode changes without pressing the power switch.

- (1) With power switch mode ON (ACC) and the shift position in P, pull out the key. Check that power switch mode changes from ON (ACC) to OFF automatically.
- (2) With power switch mode ON (ACC) and the shift position in P, wait for at least 1 hour. Check that power switch mode changes from ON (ACC) to OFF automatically.

2. CHECK KEY INTERLOCK FUNCTION

(a) Insert the key into key slot, and change power switch modes and shift position according to the table below. Check whether or not the key is locked in the key slot.

Power Switch Mode	Shift Position	Key Status
OFF	P	Not locked in
OFF	Any position except P	–
ON (ACC)	P	Not locked in
ON (ACC)	Any position except P	Locked in
ON (IG)	P	Locked in
ON (IG)	Any position except P	Locked in
READY (hybrid system ON)	P	Locked in
READY (hybrid system ON)	Any position except P	Locked in



3. CHECK INDICATOR LIGHT CONDITION

- (a) Check the power indicator on the power switch.
- (1) Check that the power indicator illuminates and changes its color according to the table below.

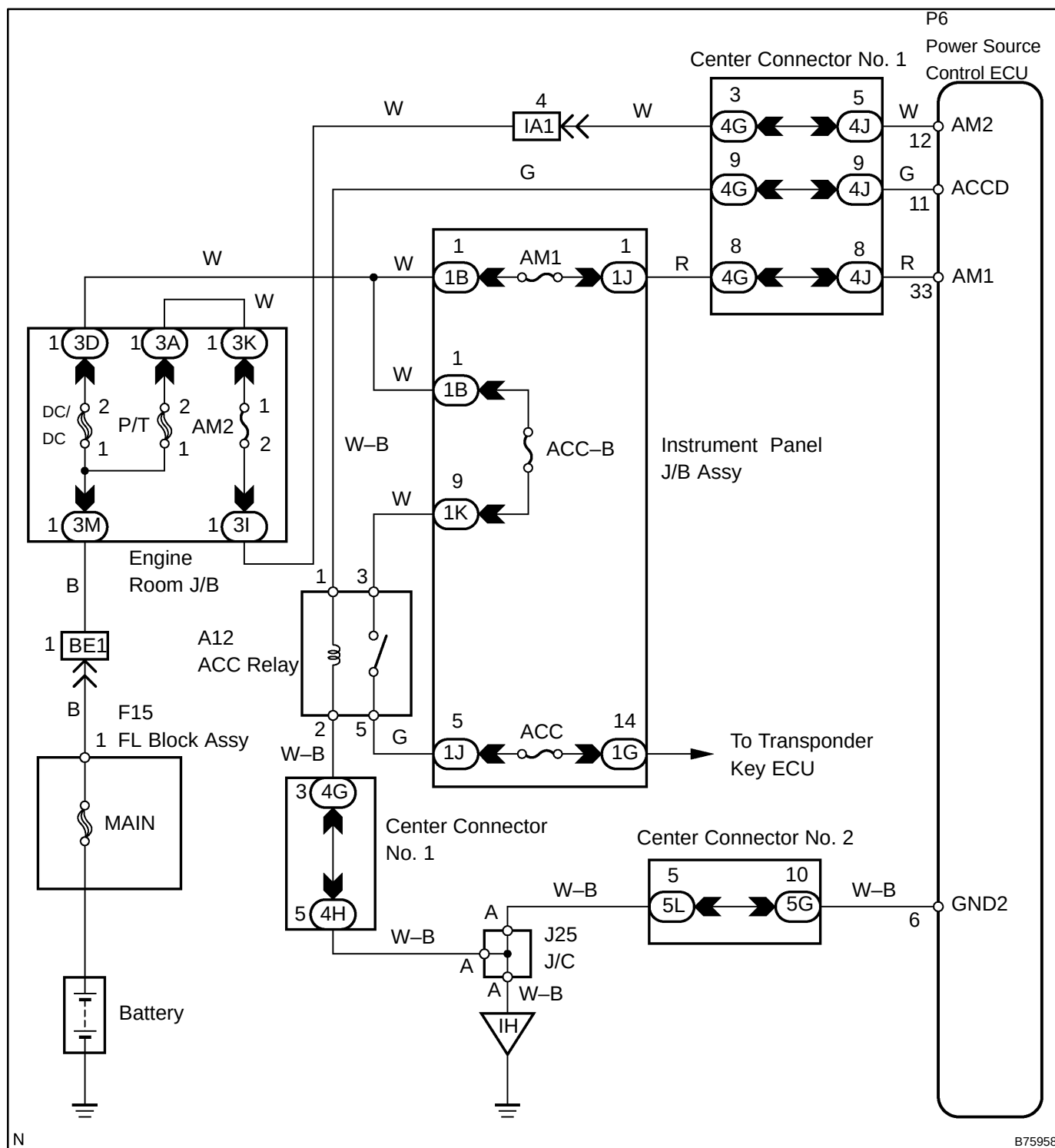
Power Switch Mode	Indicator Status
OFF	OFF
ACC	Green illumination
IG (ON)	Amber illumination
Hybrid System ON	OFF
Push button start system malfunctioning	Flashes continuously in amber

POWER MODE DOES NOT CHANGE TO ON (ACC)

CIRCUIT DESCRIPTION

When the key is inserted into the key slot and the power switch is pressed, signals are input to the power source control ECU and power switch mode changes to OFF, ON(IG) or ON (ACC) according to the inputs.

WIRING DIAGRAM



INSPECTION PROCEDURE

1 INSPECT FUSE (AM1, AM2)

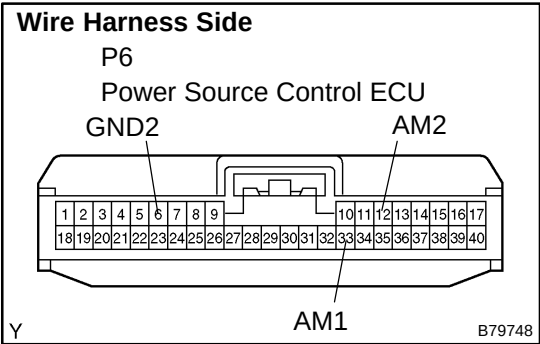
- (a) Remove the the AM1 fuse from the instrument panel J/B assy.
- (b) Remove the the AM2 fuse from the engine room J/B.
- (c) Measure the resistance.

Standard: Below 1 Ω

NG REPLACE FUSE

OK

2 CHECK WIRE HARNESS (POWER SOURCE CONTROL ECU – BODY GROUND)



- (a) Disconnect the P6 ECU connector.
- (b) Measure the resistance and voltage of the wire harness side connectors.

Standard:

Tester Connection	Specified Condition
P6-33 (AM1) – Body ground	10 to 14 V
P6-12 (AM2) – Body ground	10 to 14 V
P6-6 (GND2) – Body ground	Below 1 Ω

NG REPAIR OR REPLACE HARNESS AND CONNECTOR

OK

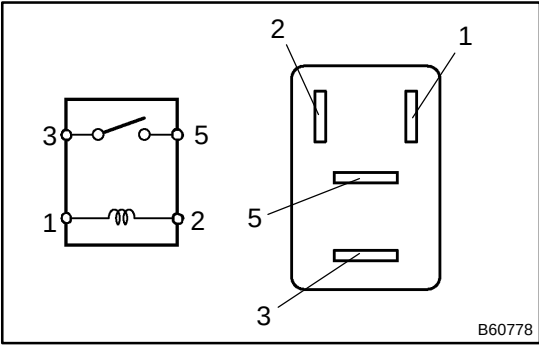
3 CHECK FOR DTCS

- (a) Check for DTCS of the power source control ECU.
OK: DTCS of the power source control ECU are not output.

NG Go to DIAGNOSIS TROUBLE CODE CHART
(See page 05-2441)

OK

4 INSPECT RELAY (ACC)



- (a) Remove the ACC relay.
- (b) Measure the resistance.

Standard:

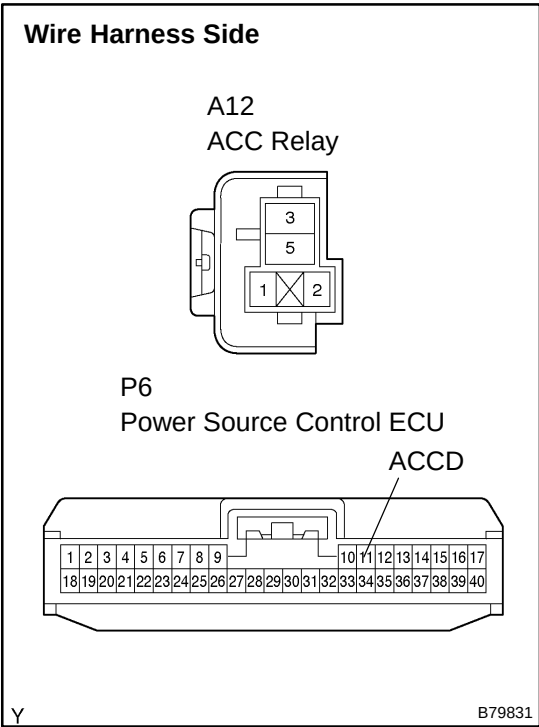
Tester Connection	Specified Condition
3 – 5	10 kΩ or higher
3 – 5	Below 1 Ω (when battery voltage is applied to terminals 1 and 2)

NG

REPLACE RELAY

OK

5 CHECK WIRE HARNESS (ACC RELAY – POWER SOURCE CONTROL ECU AND BODY GROUND)



- (a) Remove the ACC relay.
- (b) Disconnect the P6 ECU connector.
- (c) Measure the resistance of the wire harness side connectors.

Standard:

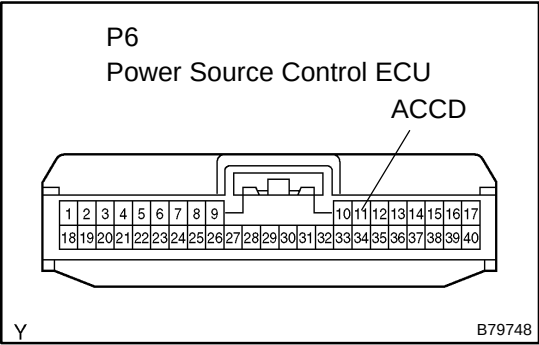
Tester Connection	Specified Condition
A12-1 – P6-11 (ACCD)	Below 1 Ω
A12-2 – Body ground	Below 1 Ω
A12-1 – Body ground	10 kΩ or higher

NG

REPAIR OR REPLACE HARNESS AND CONNECTOR

OK

6 INSPECT POWER SOURCE CONTROL ECU



- (a) Remove the power source control ECU.
- (b) Measure the voltage between the terminal of the connector and body ground.

Standard:

Tester Connection	Condition	Specified Condition
P6-11 (ACCD) – Body ground	Power switch ON (ACC)	10 to 14 V
P6-11 (ACCD) – Body ground	Power switch OFF	0 V

NG REPLACE POWER SOURCE CONTROL ECU

OK

7 CHECK OPERATION OF POWER SOURCE CONTROL ECU

- (a) After replacing the power source control ECU with a normally functioning ECU, check that the power switch can be set to ON (ACC).

Result	Proceed to
Power switch can be set to ON (ACC)	A
Power switch cannot be set to ON (ACC) (w/ smart entry system)	B
Power switch cannot be set to ON (ACC) (w/o smart entry system)	C

B Go to ENGINE IMMOBILIZER SYSTEM (w/ SMART ENTRY SYSTEM) (See page 05-2325)

C Go to ENGINE IMMOBILIZER SYSTEM (w/o SMART ENTRY SYSTEM) (See page 05-2375)

A

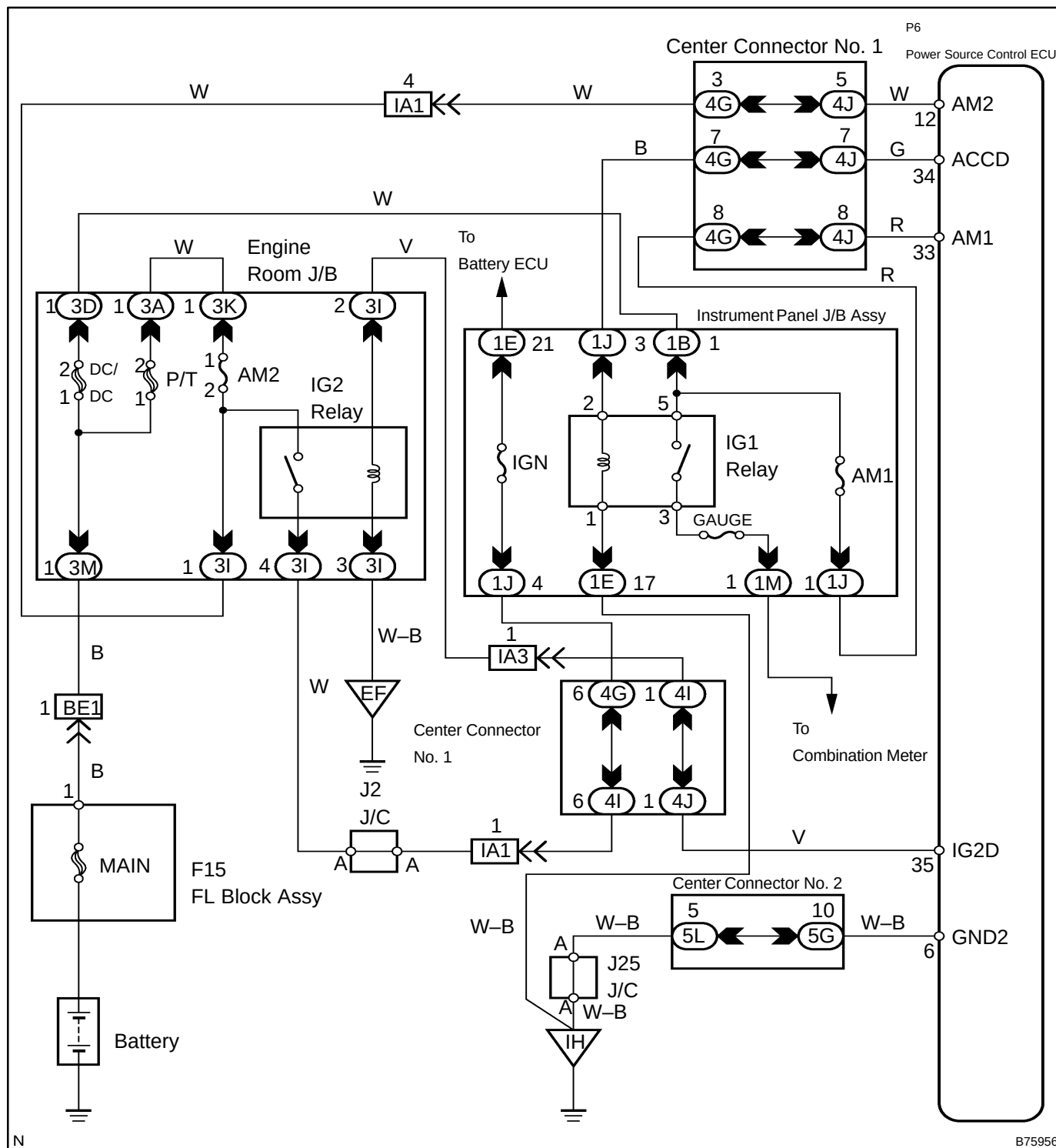
NORMAL (POWER SOURCE CONTROL ECU DEFECTIVE)

POWER MODE DOES NOT CHANGE TO ON (IG)

CIRCUIT DESCRIPTION

When the key is inserted into the key slot and the power switch is pressed, signals are input to the power source control ECU and power switch mode changes to OFF, ON (IG) or ON (ACC) according to the inputs.

WIRING DIAGRAM



INSPECTION PROCEDURE

1 INSPECT FUSE (AM1, AM2)

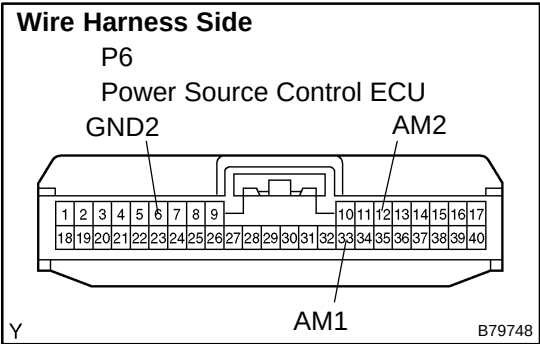
- (a) Remove the the AM1 fuse from the instrument panel J/B assy.
- (b) Remove the the AM2 fuse from the engine room J/B.
- (c) Measure the resistance.

Standard: Below 1 Ω

NG REPLACE FUSE

OK

2 CHECK WIRE HARNESS (POWER SOURCE CONTROL ECU – BODY GROUND)



- (a) Disconnect the P6 ECU connector.
- (b) Measure the resistance and voltage of the wire harness side connectors.

Standard:

Tester Connection	Specified Condition
P6-33 (AM1) – Body ground	10 to 14 V
P6-12 (AM2) – Body ground	10 to 14 V
P6-6 (GND2) – Body ground	Below 1 Ω

NG REPAIR OR REPLACE HARNESS AND CONNECTOR

OK

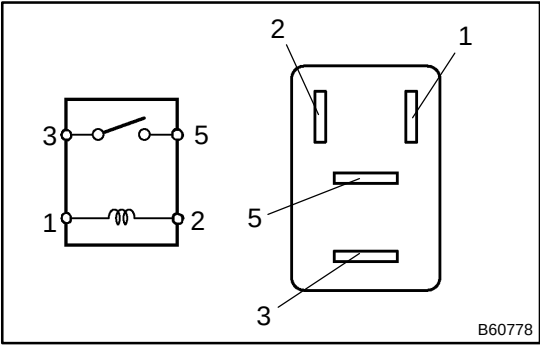
3 CHECK FOR DTCS

- (a) Check for DTCS of the power source control ECU.
OK: DTCS of the power source control ECU are not output.

NG Go to DIAGNOSIS TROUBLE CODE CHART (See page 05-2441)

OK

4 INSPECT RELAY (IG1)



- (a) Remove the IG1 relay from the instrument panel J/B.
- (b) Measure the resistance.

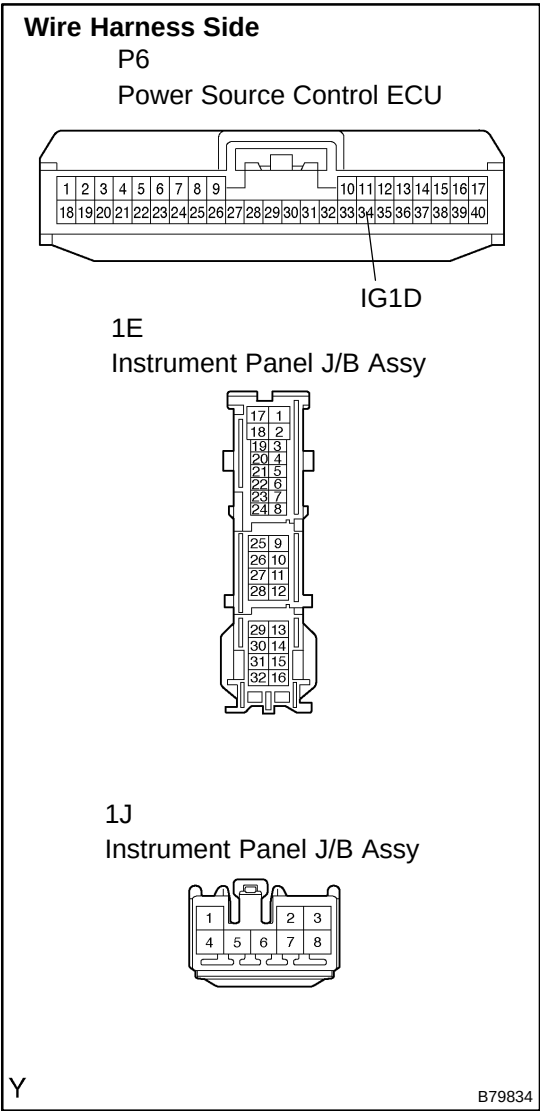
Standard:

Tester Connection	Specified Condition
3 – 5	10 kΩ or higher
3 – 5	Below 1 Ω (when battery voltage is applied to terminals 1 and 2)

NG REPLACE RELAY

OK

5 CHECK WIRE HARNESS (DRIVER SIDE J/B ASSY – POWER SOURCE CONTROL ECU AND BODY GROUND)



- (a) Disconnect the 1J and 1E J/B connectors.
- (b) Disconnect the P6 ECU connector.
- (c) Measure the resistance of the wire harness side connectors.

Standard:

Tester Connection	Specified Condition
1J-3 – P6-34 (IG1D)	Below 1 Ω
1E-17 – Body ground	Below 1 Ω
1J-3 or P6-34 (IG1D) – Body ground	10 kΩ or higher

NG REPAIR OR REPLACE HARNESS AND CONNECTOR

OK

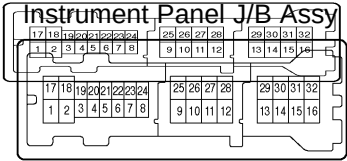
6

CHECK DRIVER SIDE J/B

Wire Harness Side

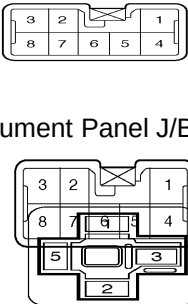
1E

Instrument Panel J/B Assy



1J

Instrument Panel J/B Assy



Y

B79835

- (a) Disconnect the 1J and 1E instrument panel J/B assy connector.
- (b) Remove IG1 relay from driver side J/B.

Standard:

Tester Connection	Specified Condition
1J-3 –Instrument panel J/B assy IG1 relay terminal 2	Below 1 Ω
Instrument panel J/B assy IG1 relay terminal 2 – Body ground	10 kΩ or higher
1E-17 –Instrument panel J/B assy IG1 relay terminal 2	Below 1 Ω

NG

REPLACE DRIVER SIDE J/B

OK

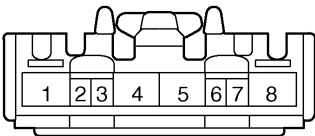
7

CHECK WIRE HARNESS (ENGINE ROOM J/B ASSY – POWER SOURCE CONTROL ECU AND BODY GROUND)

Wire Harness Side

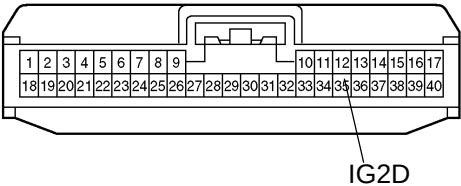
3I

Engine Room J/B



P6

Power Source Control ECU



Y

B80046

- (a) Disconnect the 3I J/B connectors.
- (b) Disconnect the P6 ECU connector.
- (c) Measure the resistance of the wire harness side connectors.

Standard:

Tester Connection	Specified Condition
3I-2 – P6-35 (IG2D)	Below 1 Ω
3I-3 – Body ground	Below 1 Ω
3I-2 or P6-35 (IG2D) – Body ground	Below 1 Ω

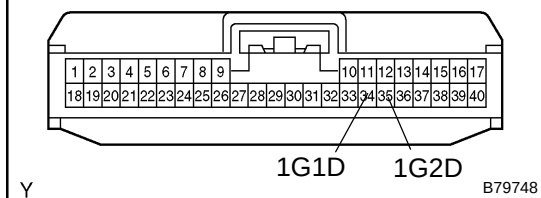
NG

REPAIR OR REPLACE HARNESS AND CONNECTOR

OK

8 CHECK POWER SOURCE CONTROL ECU**Wire Harness Side**

P6
Power Source Control ECU

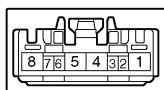


- (a) Measure the voltage when the power switch is pushed.
Standard:

Tester Connection	Switch Condition	Specified Condition
P6-34 (1G1D) – Body ground	ON (ACC)	0 V
P6-35 (1G2D) – Body ground	ON (ACC)	0 V
P6-34 (1G1D) – Body ground	ON (IG)	10 to 14 V
P6-35 (1G2D) – Body ground	ON (IG)	10 to 14 V

NG**REPLACE POWER SOURCE CONTROL ECU****OK****9 CHECK ENGINE ROOM J/B**

3I
Engine Room J/B



- (a) Measure the voltage when the power switch is operated.
Standard:

Tester Connection	Condition	Specified Condition
3I-4 – Body ground	ON (IG)	10 to 14 V

NG**REPLACE ENGINE ROOM J/B****OK****10 CHECK OPERATION OF POWER SOURCE CONTROL ECU**

- (a) After replacing the power source control ECU with a normally functioning ECU, check that the power switch can be set to ON (IG).

Result	Proceed to
Power switch cannot be set to ON (IG) (w/ smart entry system)	A
Power switch cannot be set to ON (IG) (w/o smart entry system)	B

B

Go to HYBRID CONTROL SYSTEM
(See page 05-385)

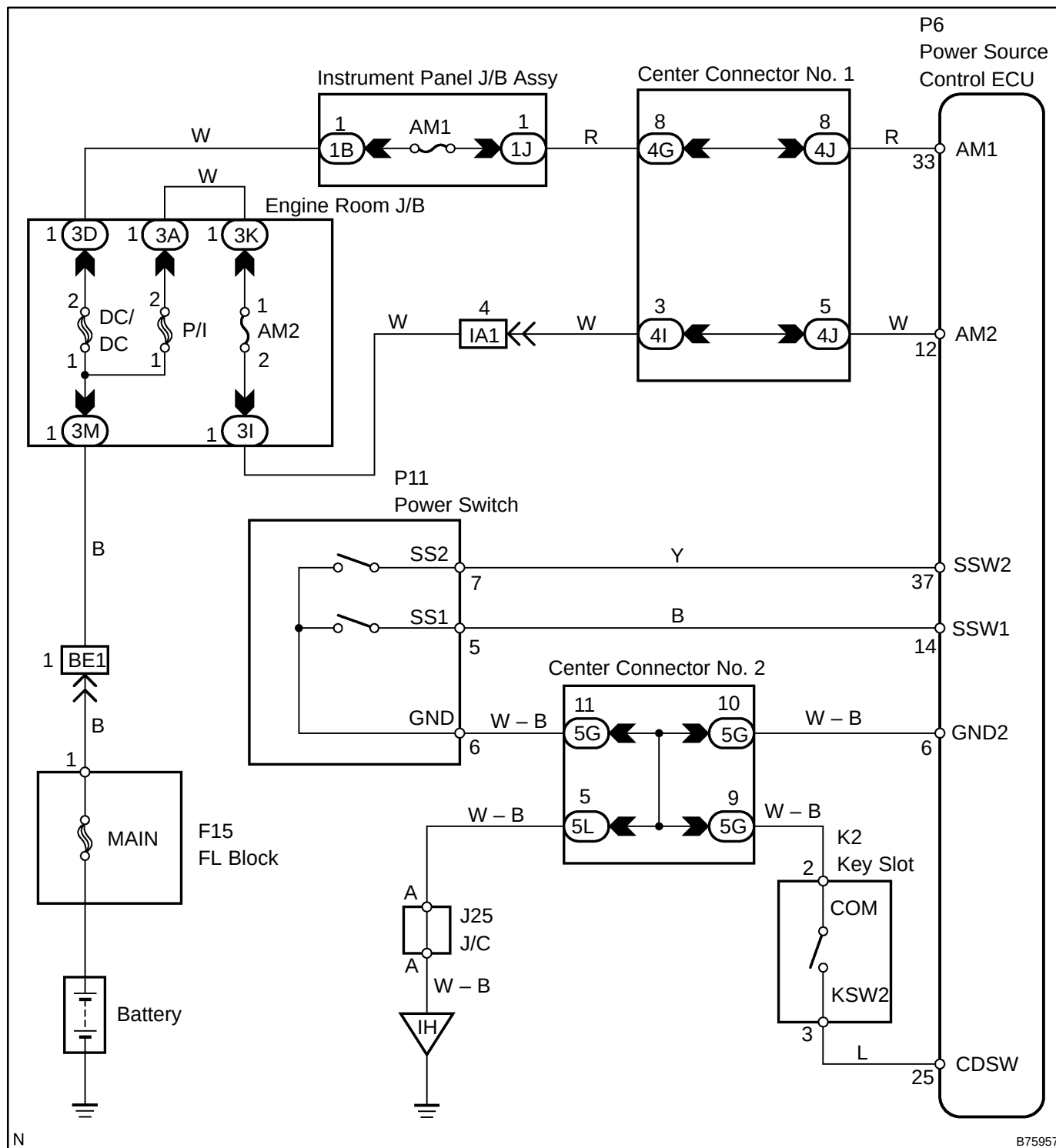
A**NORMAL (POWER SOURCE CONTROL ECU DEFECTIVE)**

POWER MODE DOES NOT CHANGE TO ON (IG AND ACC)

CIRCUIT DESCRIPTION

When the key is inserted into the key slot and the power switch is pressed, signals are input to the power source control ECU and power switch mode changes to OFF, ON(IG) or ON (ACC) according to the inputs.

WIRING DIAGRAM



N

B75957

INSPECTION PROCEDURE

1 INSPECT FUSE (AM1, AM2)

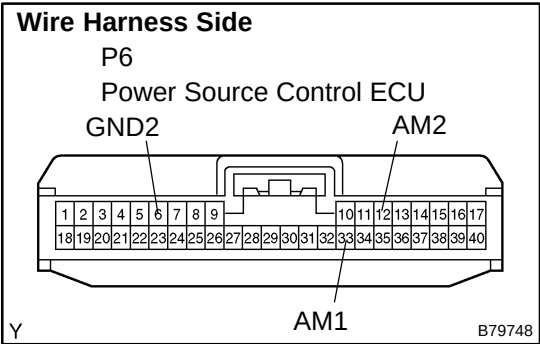
- (a) Remove the AM1 fuse from the instrument panel J/B.
- (b) Remove the AM2 fuse from the engine room J/B.
- (c) Measure the resistance.

Standard: Below 1 Ω

NG REPLACE FUSE

OK

2 CHECK WIRE HARNESS (POWER SOURCE CONTROL ECU – BODY GROUND)



- (a) Disconnect the P6 ECU connector.
- (b) Measure the resistance and voltage of the wire harness side connectors.

Standard:

Tester Connection	Specified Condition
P6-33 (AM1) – Body ground	10 to 14 V
P6-12 (AM2) – Body ground	10 to 14 V
P6-6 (GND2) – Body ground	Below 1 Ω

NG REPAIR OR REPLACE HARNESS AND CONNECTOR

OK

3 CHECK FOR DTCS (POWER SOURCE CONTROL ECU)

- (a) Check for DTCS of the power source control ECU.
- OK: DTCS of the power source control ECU are not output.

NG Go to DIAGNOSIS TROUBLE CODE CHART (See page 05-2441)

OK

4 CHECK FOR DTCS (TRANSPONDER KEY ECU)

(a) Check for DTCS of the transponder key ECU.

Result	Proceed to
DTCs of transponder key ECU are not output	A
DTCs of transponder key ECU are output (w/ smart entry system)	B
DTCs of transponder key ECU are output (w/o smart entry system)	C

OK: DTCs of the transponder key ECU are not output.

B

Go to ENGINE IMMOBILIZER SYSTEM (w/ SMART ENTRY SYSTEM) (See page 05-2325)

C

Go to ENGINE IMMOBILIZER SYSTEM (w/o SMART ENTRY SYSTEM) (See page 05-2375)

A

5 READ VALUE OF HAND-HELD TESTER

- (a) Connect the hand-held tester to (with CAN VIM) the DLC3.
 (b) Turn the power switch ON (IG) and press the hand-held tester main switch ON.
 (c) Read the DATA LIST according to the displays on the tester.

Standard (Power source control ECU):

Item	Measurement Item/Range (Display)	Normal Condition	Diagnostic Note
STR UNLK SW	States of the Steering Unlock Switch / ON or OFF	ON: Key is in key slot OFF: No key is in key slot	–

OK: "ON" (key is in key slot) appears on the screen.

NG

Go to step 6

OK

Go to step 8

6

CHECK WIRE HARNESS (KEY SLOT – POWER SOURCE CONTROL ECU AND BODY GROUND)

Wire Harness Side

P6
Power Source Control ECU

CDSW

K2
Key Slot

COM KSW2

Y B79832

- (a)

Disconnect the K2 key slot connector.
- (b)

Disconnect the P6 ECU connector.
- (c)

Measure the resistance and voltage of the wire harness side connectorss.
- Standard:

Tester Connection	Specified Condition
K2-3 (KSW2) – P6-25 (CDSW)	Below 1 Ω
K2-2 (COM) – Body ground	Below 1 Ω
K2-3 (KSW2) or P6-25 (CDSW) – Body ground	10 kΩ or higher

NG

REPAIR OR REPLACE HARNESS AND CON-NECTOR

OK

7

INSPECT KEY SLOT

Y B80048

- (a)

Remove the key slot.
- (b)

Measure the resistance of the terminals.
- Standard:

Tester Connection	Condition	Specified Condition
K2-3 (KSW2) – K2-2 (COM)	Key is in key slot	10 kΩ or higher

NG

REPLACE KEY SLOT

OK

REPLACE POWER SOURCE CONTROL ECU

8 READ VALUE OF HAND-HELD TESTER

- Connect the hand-held tester (with CAN VIM) to the DLC3.
- Turn the power switch ON (IG) and press the hand-held tester main switch ON.
- Read the DATA LIST according to the displays on the tester.

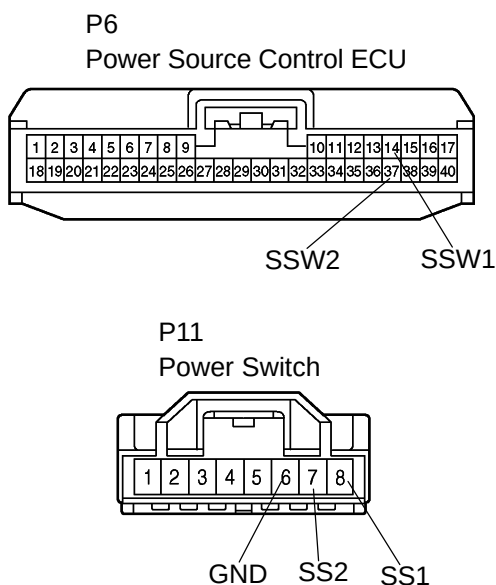
Standard (Power source control ECU):

Item	Measurement Item / Display (Range)	Normal Condition	Diagnostic Note
ST SW1	States of the Start Switch 1 / ON or OFF	ON: Power switch ON (IG) (Push power switch) OFF: Power switch OFF (Release power switch)	–
ST SW2	States of the Start Switch2 / ON or OFF	ON: Power switch ON (IG) (Push power switch) OFF: Power switch OFF (Release power switch)	–

OK: "ON" (power switch ON) appears on the screen.

NG Go to step 9

OK

REPLACE POWER SOURCE CONTROL ECU**9 CHECK WIRE HARNESS (POWER SWITCH – POWER SOURCE CONTROL ECU)****Wire Harness Side**

- Disconnect the P11 power switch connector.
- Disconnect the P6 ECU connector.
- Measure the resistance between the wire harness side connectors and body ground.

Standard:

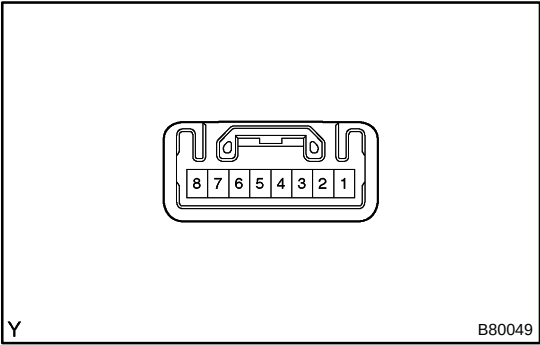
Tester Connection	Specified Condition
P11-8 (SS1) – P6-14 (SSW1)	Below 1 Ω
P11-7 (SS2) – P6-37 (SSW2)	Below 1 Ω
P11-6 (GND) – Body ground	Below 1 Ω
P11-8 (SS1) or P6-14 (SSW1) – Body ground	10 k Ω or higher
P11-7 (SS2) or P6-37 (SSW2) – Body ground	10 k Ω or higher

NG REPAIR OR REPLACE HARNESS AND CONNECTOR

OK

10

INSPECT POWER SWITCH



- (a) Remove the P11 power switch.
- (b) Measure the resistance between the terminals of the connectors.

Standard:

Tester Connection	Switch Condition	Specified Condition
P11-7 (SSW2) – P11-6 (GND)	Pushed	Below 1 Ω
P11-8 (SSW1) – P11-6 (GND)	Pushed	Below 1 Ω
P11-7 (SSW2) – P11-6 (GND)	Release	10 kΩ or higher
P11-8 (SSW1) – P11-6 (GND)	Release	10 kΩ or higher

NG

REPLACE POWER SWITCH

OK

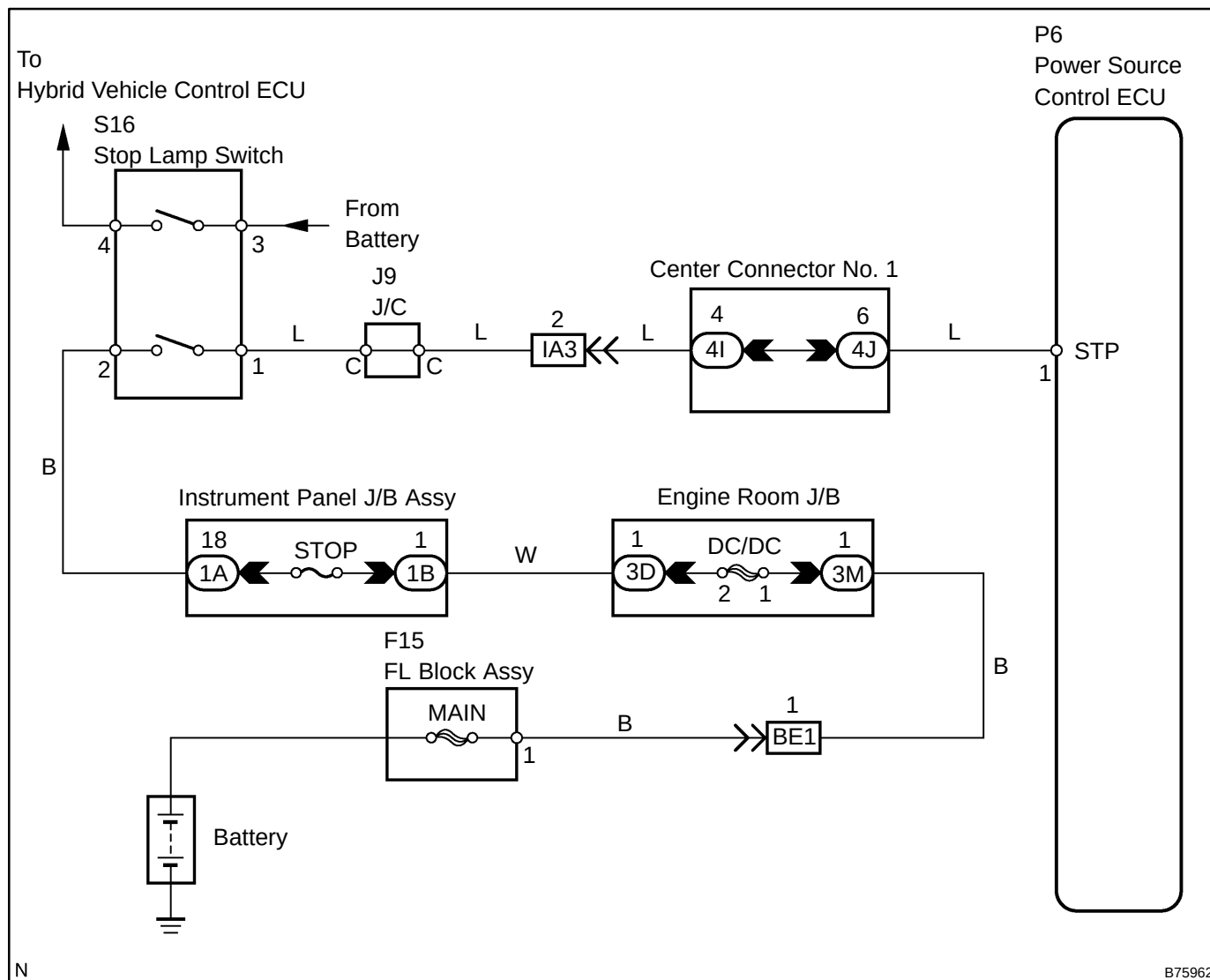
REPLACE POWER SOURCE CONTROL ECU

POWER MODE DOES NOT CHANGE TO ON (READY)

CIRCUIT DESCRIPTION

When the key is inserted into the key slot and the power switch is pressed, signals are input to the power source control ECU and power switch mode changes to OFF, ON (IG) or ON (ACC) or according to the inputs. When the shift position is in P, the brake pedal is depressed and held, and the power switch is pressed, the power switch mode changes to ON (READY), signifying that the hybrid system starts operating.

WIRING DIAGRAM



INSPECTION PROCEDURE

1 INSPECT BASIC OPERATION

- (a) Check that the shift position switch is ON.
(b) Turn the power switch ON (READY) and check that the hybrid control system starts normally. Make sure the brake pedal is not depressed at this time.

OK: Hybrid vehicle control system starts normally (power switch can be set to ON (READY)).

NG

Go to step 2

OK

END

2 CHECK OPERATION OF POWER SWITCH

- (a) Check that the power mode can be changed by pushing the power switch.

HINT:

Without depressing the brake pedal, push the power switch repeatedly. Power mode should change as follows: OFF, ON (ACC), ON (IG) and OFF.

With the brake pedal depressed, push the power switch repeatedly. Power mode should change as follows: OFF, ON (ACC), ON (IG), ON (READY) and OFF.

NG

OTHER PROBLEM (See page [05-2432](#))

OK

3 CHECK FOR DTCS

- (a) Check for DTCs of the power source control ECU.

OK: DTCs of the power source control ECU are not out put

NG

Go to DIAGNOSIS TROUBLE CODE CHART
(See page [05-2441](#))

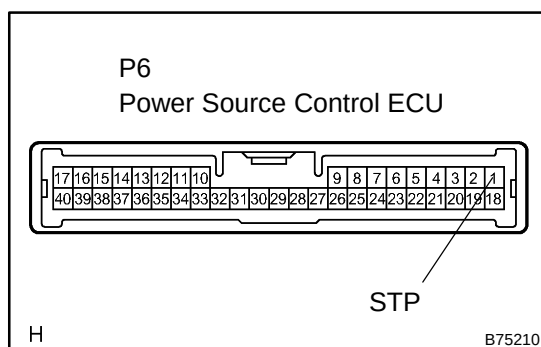
OK

4 READ VALUE OF HAND-HELD TESTER

- Connect the hand-held tester (with CAN VIM) to the DLC3.
- Turn the power switch ON (IG) and push the hand-held tester main switch ON.
- Read the DATA LIST according to the display on the tester.

Standard (Power source control ECU):

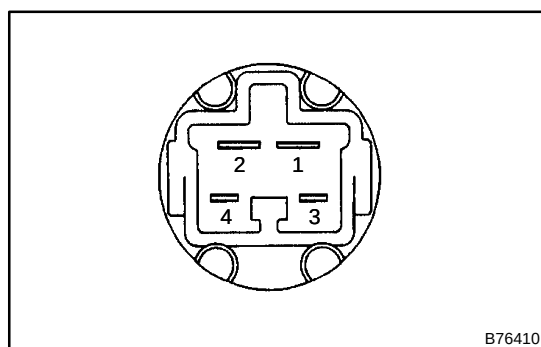
Item	Measurement Item/Range (Display)	Normal Condition	Diagnostic Note
STOP LAMP SW1	States of the Stop Lamp Switch 1/ ON or OFF	ON: Brake pedal pressed OFF: Brake pedal released	–
STOP LAMP SW2	States of the Stop Lamp Switch 2/ ON or OFF	ON: Brake pedal pressed OFF: Brake pedal released	–

OK: "ON" (stop lamp switch ON) appears on the screen.**NG****Go to step 5****OK****Go to step 8****5 CHECK POWER SOURCE CONTROL ECU**

- Measure the voltage when the brake pedal is operated.

Standard:

Tester Connection	Condition	Specified Condition
P6-1 (STP) – Body ground	Brake pedal released	10 to 14 V
P6-1 (STP) – Body ground	Brake pedal pressed	0 V

NG**GO TO STEP 6****OK****REPLACE POWER SOURCE CONTROL ECU****6 CHECK STOP LAMP SWITCH ASSY**

- Remove the stop lamp assy.
- Measure the switch resistance when the shaft is operated.

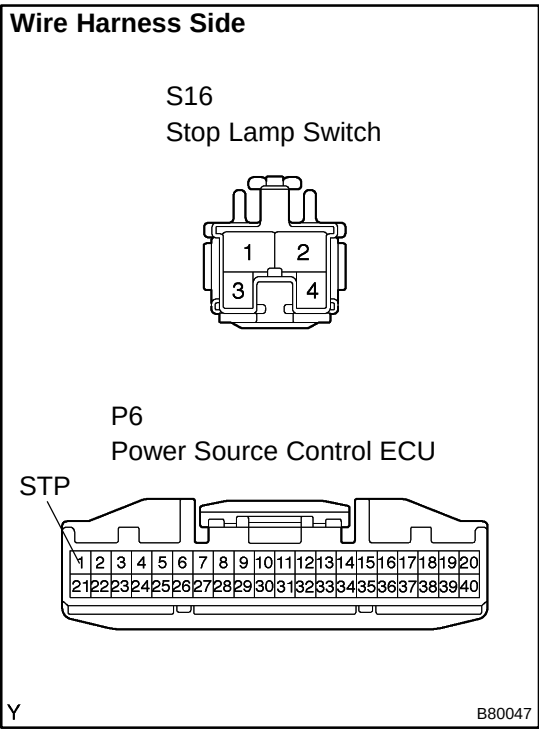
Standard:

Tester Connection	Condition	Specified Condition
S16-1 – S16-2	Brake pedal pressed	Below 1Ω
S16-1 – S16-2	Brake pedal released	10 kΩ or higher
S16-3 – S16-4	Brake pedal pressed	10 kΩ or higher
S16-3 – S16-4	Brake pedal released	Below 1Ω

NG**REPLACE STOP LAMP SWITCH ASSY****OK**

7

CHECK WIRE HARNESS (STOP LAMP SWITCH ASSY – POWER SOURCE CONTROL ECU)



- (a) Disconnect the S16 switch connector.
- (b) Disconnect the P6 ECU connector.
- (c) Measure the resistance of the wire harness side connectors.

Standard:

Tester Connection	Specified Condition
S16-1 – P6-1 (STP)	Below 1 Ω
S16-1 or P6-1 (STP) – Body ground	10 k Ω or higher

NG

REPAIR OR REPLACE HARNESS AND CONNECTOR

OK

REPLACE POWER SOURCE CONTROL ECU

8

CHECK FOR DTCS

- (a) Check for DTCs of the hybrid control ECU.
OK: DTCs of the hybrid control ECU are not output

NG

Go to HYBRID CONTROL SYSTEM
(See page [05-385](#))

OK

REPLACE POWER SOURCE CONTROL ECU

PROBLEM SYMPTOMS TABLE

Symptoms	Suspected Area	See Page
Power mode does not change to ON (IG and ACC)	• Power source control ECU • AM1 fuse • AM2 fuse • Power switch • Key slot • Wire harness	05-2473
Power mode does not change to ON (ACC)	• Power source control ECU • AM1 fuse • AM2 fuse • ACC Relay • Wire harness	05-2479
Power mode does not change to ON (IG)	• Power source control ECU • AM1 fuse • AM2 fuse • IG1 relay • IG2 relay • Wire harness	05-2483
Power mode does not change to ON (READY)	• Power source control ECU • Stop lamp switch assy • Wire harness	05-2488

SYSTEM DESCRIPTION

1. CHECK PUSH BUTTON START SYSTEM DESCRIPTION

- (a) The push button start system uses a push-type power switch, which the driver operates by inserting a key into the key slot or by merely carrying the key*. This system consists primarily of a power source control ECU, power switch, key slot, key, ACC relay, IG1 relay, IG2 relay and transponder key ECU. The power source control ECU controls the system. This system operates in cooperation with the engine immobilizer system and the smart entry system*.

The table below shows the transition of the power switch, which depends on whether the brake pedal is depressed or released.

*: w/ Smart entry system

Brake Pedal	Power Switch Operation
Released	Power mode changes OFF, ON (ACC), ON (IG) and OFF, every time power switch is pressed
Depressed	Power mode changes to ON (READY) from any power mode

2. FUNCTION OF COMPONENT

Components	Function
Key	- When driver inserts key into key slot, built-in transponder chip transmits ID code signal to transponder key amplifier, which is provided in key slot. - For models with smart entry system, if driver operates power switch with key in driver's possession, key receives signals from oscillators and transmits ID code to wireless door lock receiver.
Key slot	- Halfway switch: Detects whether key is inserted and outputs signal to transponder key ECU. - Full switch: Detects whether key is inserted and outputs signal to power source control ECU. - Transponder key amplifier and coil: Receives ID code signal from transponder chip, which is built into key, and outputs it to transponder key ECU. - Key interlock solenoid: Power source control ECU operates this solenoid in accordance with power switch mode and shift position to keep key locked in key slot.
Power switch	- In accordance with shift position and stop light switch's condition, changes power modes in 4 stages as follows: OFF, ON (ACC), ON (IG) and ON (READY). - Power mode or abnormal condition of push button start system can be discerned from illuminating condition of indicator on power switch.
- IG1 relay - IG2 relay - ACC relay	Operates in accordance with power source control ECU to supply power to respective system.
Stop light switch	Outputs brake pedal's state to power source control ECU.
Parking lock actuator	- Operates in accordance with signals from transmission control ECU to actuate parking lock mechanism. - Detects actuation state of parking lock (whether shift position is in P or other position) and outputs it to transmission control ECU.
Power source control ECU	Controls push button start system in accordance with signals received from switches and ECUs.
Transponder key ECU	- Controls engine immobilizer system by recognizing key ID code transmitted by transponder key amplifier. - Receives ID code check results from smart ECU*. - Transmits key ID code check results to power source control ECU. - Transmits hybrid control system start authorization signal to hybrid vehicle control ECU.
Transmission control ECU	- Actuates parking lock actuator upon receiving power switch OFF signal from power source control ECU. - Transmits actuation state of parking lock (whether shift position is in P or other position) to power source control ECU.
Hybrid vehicle control ECU	- Starts hybrid control system in accordance with system start signal received from power source control ECU. - Receives hybrid control system start authorization signal from transponder key ECU.
Smart ECU*	Checks ID code received from wireless door lock receiver and transmits check results to transponder key ECU.

*: w/ Smart entry system

3. SYSTEM FUNCTION

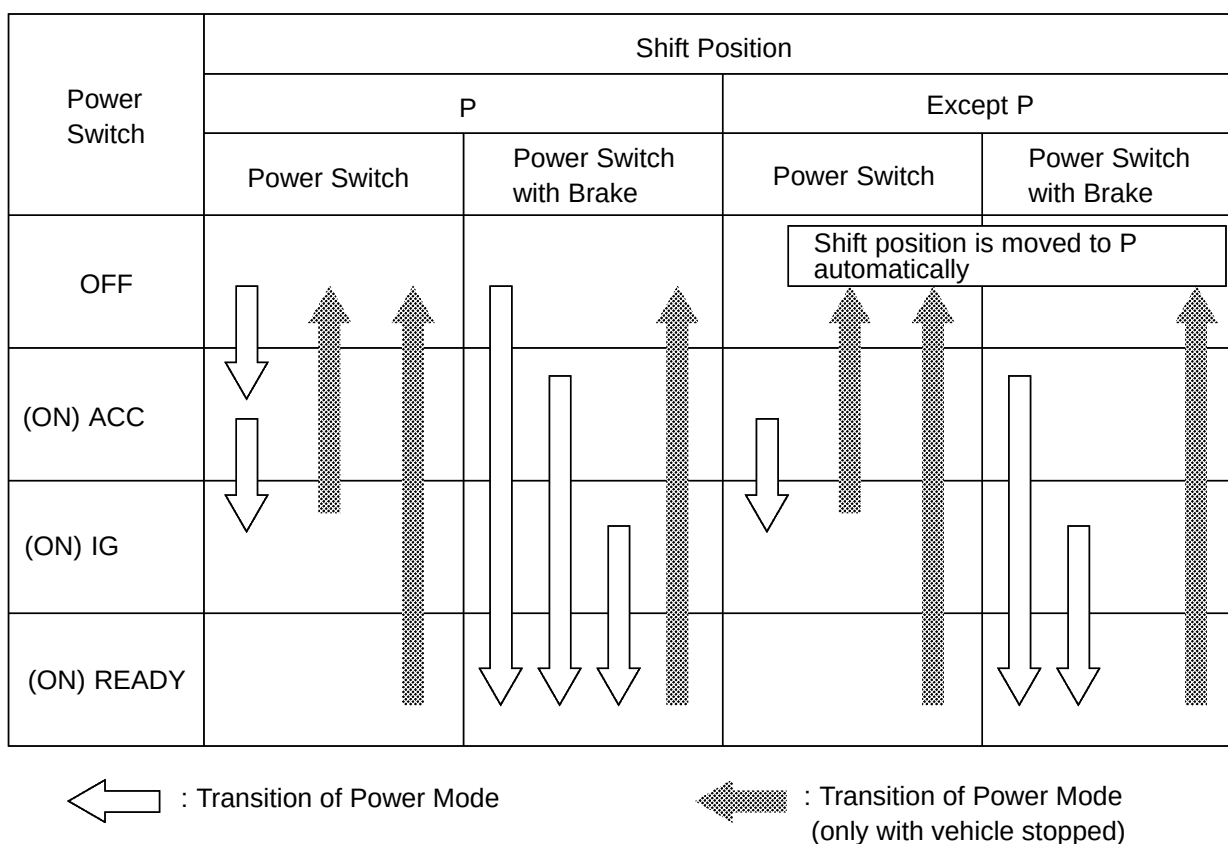
The electric controls of the push button start system are described below:

Control	Outline
Power switch control (w/o smart entry system)	Transponder key ECU checks ID code when key is inserted into key slot. Power source control ECU verifies check results and authorizes operation of switch.
Power switch control (w/ smart entry system)	• When driver operates power switch with key in driver's possession, power source control ECU starts room oscillator, which transmits request signal to key. Upon receiving this signal, key transmits ID code signal to smart ECU. • Transponder key ECU verifies check results received from smart ECU via BEAN and sends them to power source control ECU. Based on these results, power source control ECU authorizes operation of power switch.
Auto P control	If power switch is set to OFF when shift position is in position other than P, transmission control ECU activates parking lock actuator on command from hybrid vehicle control ECU in order to change shift position to P.
Diagnosis	When power source control ECU detects malfunction, power source control ECU diagnoses and memorizes failed section.

4. POWER SWITCH CONTROL (WITH KEY)

- When a key is inserted into the key slot and the transponder key ECU recognizes the ID code of the key, the power source control ECU authorizes operation of the power switch. As a result, the power mode changes to the mode selected by power switch operation.
- Every time the power switch is pushed, the power mode changes between stages in this order: OFF, ON (ACC), ON (IG) and OFF. If the driver pushes the power switch while depressing the brake pedal (the stop light switch turns ON), power mode will change to ON (READY) regardless of the previous power mode.
- After approximately 1 hour has passed with the power switch at ON (ACC) and the shift position in P, the power source control ECU will automatically turn off the power (the power mode changes to OFF).
- The illustration below shows the transition of power modes.

Transition of power mode:



Y

B80057

HINT:

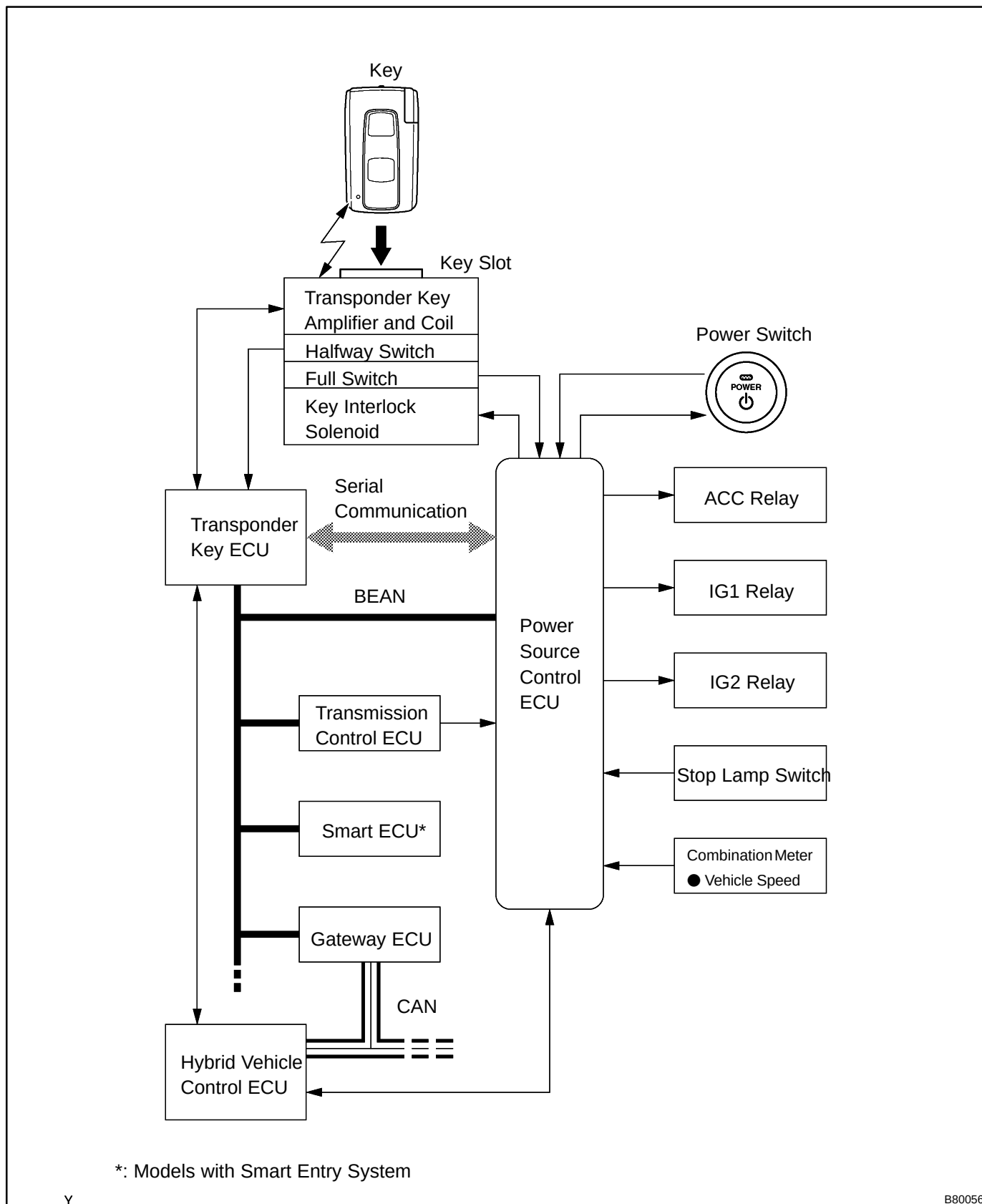
While the vehicle is being driven normally, operation of the power switch is disabled. However, if the hybrid control system must be stopped in an emergency while the vehicle is being driven, pressing the power switch for at least 3 seconds can stop the hybrid control system. Power mode changes from ON (READY) to ON (ACC).

5. DIAGNOSIS

If a malfunction occurs in the IG circuit, the power source control ECU will perform the controls listed in the table below and record a DTC.

IG Circuit Malfunction	Details
Malfunction occurs during ON (IG) mode	• Hold circuit in power source control ECU continues to supply power to IG1 and IG2 relays. At this time, power source control ECU begins flashing amber-colored indicator on power switch. • After power switch is set to OFF, power source control ECU continues flashing indicator on power switch for 15 seconds. • Hybrid system cannot be restarted.
Malfunction occurs during ON (ACC) or OFF mode	• When power switch is set to ON (IG) and malfunction is detected, power switch automatically turns OFF. • If same malfunction is detected as above continuously 3 times, power source control ECU begins flashing amber-colored indicator on power switch for 15 seconds. • Hybrid system cannot be restarted.

SYSTEM DIAGRAM



DIAGNOSTICS – PUSH BUTTON START SYSTEM

Sender	Receiver	Signal	Lile
Hybrid vehicle control ECU	Power source control ECU	• Shift position signal (power source control) • Drive OK signal (power stop control) • Stop switch signal (power source control)	BEAN
Meter	Power source control ECU	Vehicle speed signal (power source control)	BEAN
Body ECU	Power source control ECU	• Diagnosis erasure • Diagnostic tool request • Door lock position signal (driver, passenger and rear doors) (power switch illumination control) • Courtesy switch signal (driver, passenger and rear doors) (power switch illumination control) • Vehicle model signal (power source control switch) • IG switch signal (power source control) • ACC switch signal (power source control) • Key switch signal (key lock control) • Fading dome lamp illumination request signal (power switch illumination control) • Taillamp illumination signal (power switch illumination control) • All doors courtesy switch signal (power switch illumination control)	BEAN
Steering lock ECU	Power source control ECU	Immobilizer information signal (power source control)	BEAN
Power source control ECU	Body ECU	Power switch signal (for security cancel)	BEAN
Power source control ECU	Steering lock ECU	• Immobilizer ID match request signal (ID match start at power on) • Key insertion status signal (for immobilizer control)	BEAN
Transmission control ECU	Power source control ECU	• P status signal (key interlock control) • P control ECU malfunctioning status signal (power source control, key lock control) • Auto P cancel signal (power source control, key lock control) • NP status signal (power source control, key lock control) • Auto P OK signal (power source control, key lock control)	BEAN
Smart ECU	Power source control ECU	• Immobilizer ID match request signal (smart ignition control) • Key insertion status signal (smart ignition control) • Key code confirmation signal (wireless control)	BEAN
Theft warning ECU	Power source control ECU	Power switch signal (for security set and cancel)	BEAN
Power source control ECU	Transmission control ECU	Power source OFF ready signal (power source AUTO OFF control)	BEAN

CUSTOMER PROBLEM ANALYSIS CHECK

PUSH BUTTON START SYSTEM Check Sheet

Inspector's name: _____

Customer's Name		VIN	
		Production Date	
		License Plate No.	
Date Vehicle Brought in	/ /	Odometer Reading	km miles

Date Problem First Occurred		/ /
Frequency Problem Occurs		☐ Constant ☐ Sometimes (times per day, month) ☐ Once only
Weather Conditions When Problem Occurred	Weather	☐ Fine ☐ Cloudy ☐ Rainy ☐ Snowy ☐ Various/Others
	Outdoor Temperature	☐ Hot ☐ Warm ☐ Cool ☐ Cold (°C [°F])
Malfunction Symptoms	☐ Power mode does not change	
	☐ Transmitter holding function does not operate	
DTC	1st time	☐ Normal Code ☐ Malfunction Code
	2nd time	☐ Normal Code ☐ Malfunction Code

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DIAGNOSTIC TROUBLE CODE CHART

1. DTC CHECK

If a malfunction code is displayed during the DTC check, check the suspected area listed for that code in the table below, and proceed to the appropriate page.

DTC No. (See Page)	Detection Item	Trouble Area
B2271 (05-2442)	Ignition Hold Monitor Malfunction	• Power source control ECU • AM1 fuse • AM2 fuse • Wire harness
B2272 (05-2444)	Ignition 1 Monitor Malfunction	• Power source control ECU • IG1 relay • Wire harness
B2273 (05-2448)	Ignition 2 Monitor Malfunction	• Power source control ECU • Wire harness
B2274 (05-2451)	ACC Monitor Malfunction	• Power source control ECU • ACC relay • Wire harness
B2275 (05-2454)	STSW Monitor Malfunction	• Power source control ECU • Hybrid vehicle control ECU • Wire harness
B2277 (05-2456)	Detection Vehicle Submersion	• Power source control ECU
B2278 (05-2457)	Main Switch (Power switch) Malfunction (starter switch 1 signal does not match to starter switch 2 signal)	• Power source control ECU • Power switch • Wire harness
B2281 (05-2459)	P Signal Malfunction (cable information does not match BEAN information)	• Power source control ECU • Transmission control ECU • Wire harness
B2282 (05-2462)	Vehicle Speed Signal Malfunction (cable information does not match BEAN information)	• Power source control ECU • Combination meter • Wire harness
B2284 (05-2465)	Brake Signal Malfunction (cable information does not match BEAN information)	• Power source control ECU • Stop lamp switch • Wire harness
B2286 (05-2468)	READY Signal Malfunction	• Power source control ECU • Hybrid vehicle control ECU • Wire harness
B2287 (05-2471)	LIN Communication Master Malfunction	• Power source control ECU • Transponder key ECU • Wire harness
B2289 (05-2471)	Key Collation Waiting Time Over	• Power source control ECU • Engine immobilizer system • Wire harness

HOW TO PROCEED WITH TROUBLESHOOTING

HINT:

- Use this procedure to troubleshoot the push button start system.
- The hand-held tester should be used in steps 3, 4 and 6.

1 VEHICLE BROUGHT TO WORKSHOP

2 CUSTOMER PROBLEM ANALYSIS CHECK AND SYMPTOM CHECK (See page 05-2431)

3 INSPECT COMMUNICATION FUNCTION OF LARGE-SCALE MULTIPLEX COMMUNICATION SYSTEM (BEAN)

- (a) Use the hand-held tester to check for normal function of the multiplex communication system.
- (1) (ECU unconnected, communication line malfunctioning) Without code outputs, proceed to A.
 - (2) (ECU unconnected, communication line malfunctioning) With code outputs, proceed to B.

B

Go to MULTIPLEX COMMUNICATION SECTION
(See page 05-2558)

A

4 DTC CHECK (See page 05-2438)

- (a) Check for DTC 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.
- (1) If the DTC does not reoccur, proceed to A.
 - (2) If the DTC reoccurs, proceed to B.

B

Go to step 6

A

5 PROBLEM SYMPTOMS TABLE (See page 05-2432)

- (a) If the fault is not listed on the problem symptoms table, proceed to A.
- (b) If the fault is listed on the problem symptoms table, proceed to B.

B

Go to step 7

A

6	OVERALL ANALYSIS AND TROUBLESHOOTING
----------	---

- (a) DATA LIST/ACTIVE TEST (see page [05-2439](#)).
- (1) Inspection with the hand-held tester (DATA LIST).
 - (2) Inspection with the hand-held tester (ACTIVE TEST).
- (b) On-vehicle inspection (see page [05-2492](#)).
- (c) Terminal of ECU (see page [05-2433](#)).



7	ADJUST, REPAIR OR REPLACE
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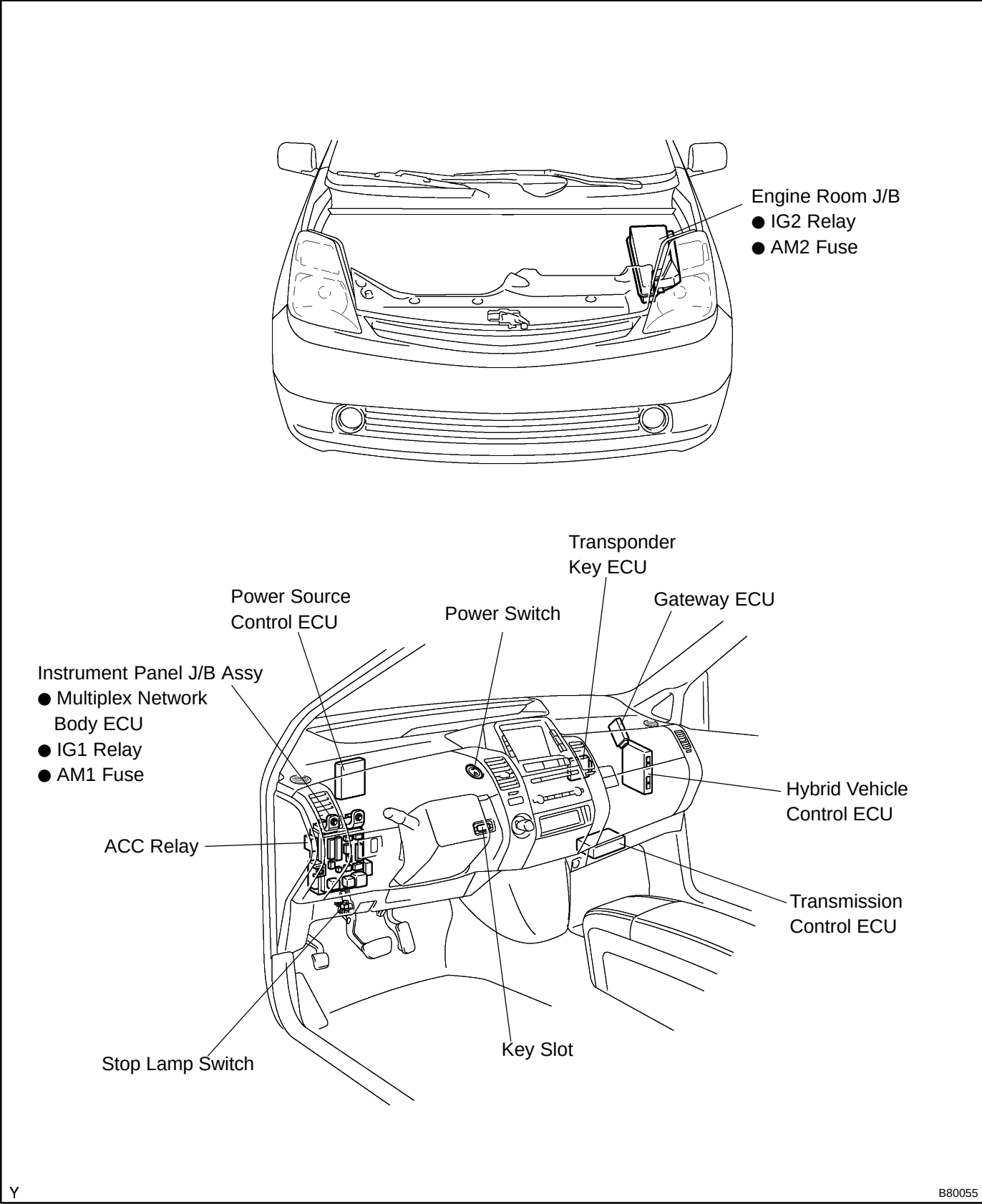


8	CONFIRMATION TEST
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END

LOCATION



Y

B80055

PUSH BUTTON START SYSTEM

05J21-01

PRECAUTION

NOTICE FOR INITIALIZATION:

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

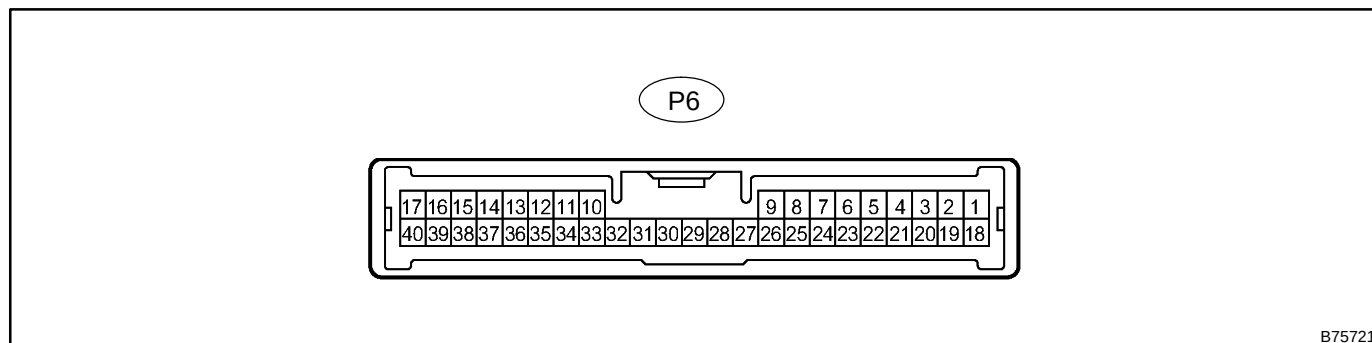
System Name	See Page
Power Window Control System	05-2028

NOTICE FOR HYBRID SYSTEM ACTIVATION:

- When the warning lamp is illuminated or the battery has been disconnected and reconnected, pressing the power switch may not start the system on the first try. If so, press the power switch again.
- When the power source control ECU is replaced with a new ECU and the battery's negative terminal is reconnected, the power switch automatically turns ON (IG). However, when the power source control ECU is removed and then reinstalled, the power switch remains in the same mode as when the ECU was removed.

TERMINALS OF ECU

1. CHECK POWER SOURCE CONTROL ECU



B75721

- Disconnect the P6 ECU connector.
- Measure the resistance and voltage of each terminal of the wire harness side connector.

Standard:

Symbols (Terminal No.)	Wiring Color	Terminal Description	Condition	Specified Condition
AM1 (P6-33) – Body ground	R – Body ground	+B power supply	Constant	10 to 14 V
AM2 (P6-12) – Body ground	W – Body ground	+B power supply	Constant	10 to 14 V
CDSW (P6-25) – Body ground	L – Body ground	Key condition	No key in key slot → Key inserted	Below 1 Ω → 10 k Ω or higher
SSW1 (P6-14) – Body ground	B – Body ground	Power switch signal	Power switch pushed → Not pushed	Below 1 Ω → 10 k Ω or higher
SSW2 (P6-37) – Body ground	Y – Body ground	Power switch signal	Power switch pushed → Not pushed	Below 1 Ω → 10 k Ω or higher
GND2 (P6-6) – Body ground	W-B – Body ground	Ground	Constant	Below 1 Ω

If the result is not as specified, there may be a malfunction on the wire harness side.

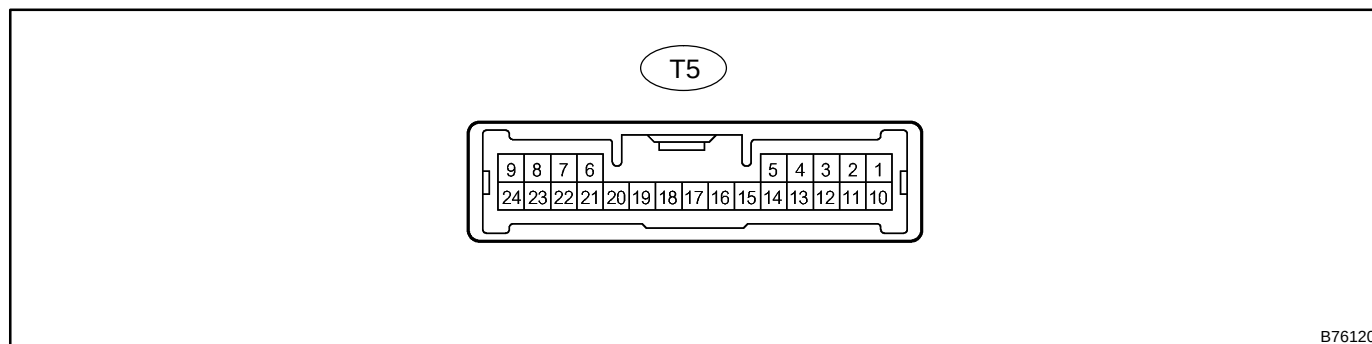
- Reconnect the P6 ECU connector.
- Measure the resistance and voltage of each terminal of the connector.

Standard:

Symbols (Terminal No.)	Wiring Color	Terminal Description	Condition	Specified Condition
SOL1 (P6-3) – GND (P6-6)	P – W-B	Power switch signal	Power switch ON and brake pedal is not pushed, Power switch ON (ACC) → Power switch ON (IG)	0 V → 10 to 14 V
SOL2 (P6-20) – GND (P6-6)	GR – W-B	Power switch signal	Constant	Below 1 Ω
ACCD (P6-11) – GND (P6-6)	G – W-B	ACC signal	Power switch OFF → Power switch ON (ACC)	0 V → 10 to 14 V
IG1D (P6-34) – GND (P6-6)	B – W-B	IG1 signal	Power switch ON (ACC) → Power switch ON (IG)	0 V → 10 to 14 V
IG2D (P6-35) – GND (P6-6)	V – W-B	IG2 signal	Power switch ON (ACC) → Power switch ON (IG)	0 V → 10 to 14 V
STP (P6-1) – GND (P6-6)	L – W-B	Stop lamp signal	Brake pedal depressed → released	10 to 14 V → 0 V

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

2. CHECK TRANSPONDER KEY ECU ASSY



- (a) Disconnect the T5 ECU connector.
 (b) Measure the resistance and voltage between each terminal of the wire harness side connector.

Standard:

Symbols (Terminal No.)	Wiring Color	Terminal Description	Condition	Specified Condition
CPUB (T5-3) – GND (T5-22)	L – W-B	Battery	Constant	10 to 14 V
IG (T5-4) – GND (T5-22)	O – W-B	Power switch (IG)	Power switch OFF → ON (IG)	0 V → 10 to 14 V
ACC (T5-12) – GND (T5-22)	P – W-B	Power switch (ACC)	Power switch OFF → ON (ACC)	0 V → 10 to 14 V
CUWS (T5-5) – GND (T5-22)	B – W-B	Unlock warning switch	No key in key slot → Key inserted	10 kΩ or higher → Below 1 Ω
AGND (T5-7) – GND (T5-22)	P – W-B	Ground	Constant	Below 1 Ω
GND (T5-22) – Body ground	W-B – Body ground	Ground	Constant	Below 1 Ω

If the result is not as specified, there may be a malfunction on the wire harness side.

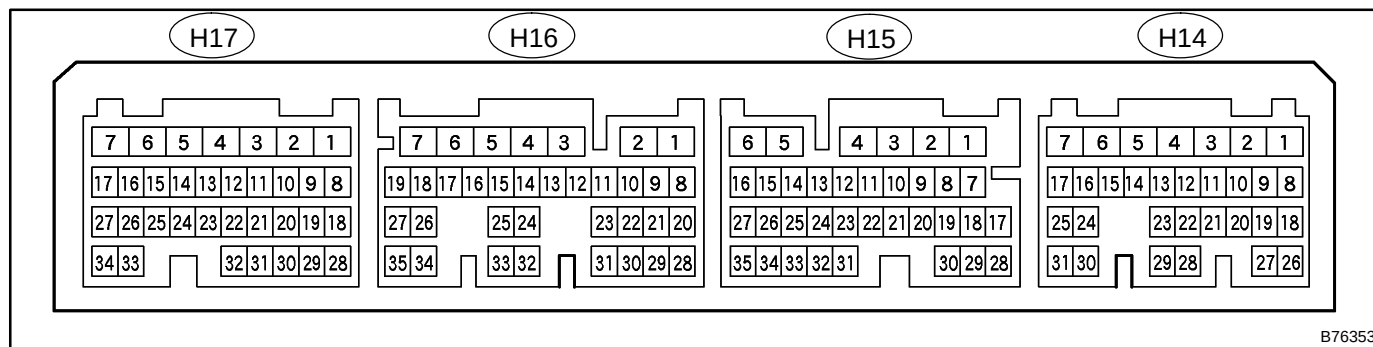
- (c) Reconnect the T5 ECU connector.
 (d) Measure the voltage of each terminal of the connector.

Standard:

Symbols (Terminal No.)	Wiring Color	Terminal Description	Condition	Specified Condition
CUWS (T5-5) – GND (T5-22)	B – W-B	Unlock warning switch	No key in key slot → Key inserted	10 to 14 V → Below 1 Ω
VC5 (T5-20) – GND (T5-22)	Y – W-B	Power source	No key in key slot → Key inserted	0 V → 4.6 to 5.4 V

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

3. CHECK HYBRID VEHICLE CONTROL ECU



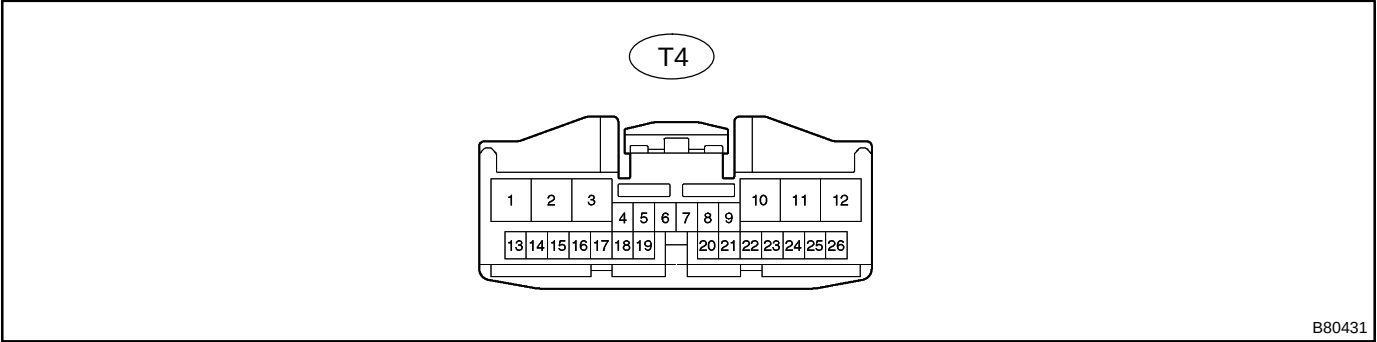
- Disconnect the H14, H15, H16 and H17 ECU connectors.
- Measure the resistance and voltage between each terminal of the connectors.

Standard:

Symbols (Terminal No.)	Wiring Color	Terminal Description	Condition	Specified Condition
ST2 (H14-5) – GND1 (H14-1)	Y-W-B	Ignition start control signal input	Power switch (READY)	10 to 14 V
IGSW (H14-7) – GND1 (H14-1)	O-W-B	Ignition ready control signal input	Power switch ON (IG)	10 to 14 V
BATT (H15-6) – GND1 (H14-1)	Y-W-B	Battery	Constant	10 to 14 V
+B1 (H16-7) – GND1 (H14-1)	L-W-B	Ignition power supply	Power switch ON (IG)	10 to 14 V
+B2 (H16-6) – GND1 (H14-1)	L-W-B	Ignition power supply	Power switch ON (IG)	10 to 14 V
GND1 (H14-1) – Body ground	W-B – Body ground	Ground	Constant	Below 1 Ω
GND2 (H14-4) – Body ground	W-B – Body ground	Ground	Constant	Below 1 Ω

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

4. CHECK TRANSMISSION CONTROL ECU



- (a) Disconnect the T4 ECU connector.
- (b) Measure the resistance and voltage of each terminal of the wire harness side connector.

Standard:

Symbols (Terminal No.)	Wiring Color	Terminal Description	Condition	Specified Condition
BATT (T4-13) – Body ground	L – Body ground	+B power supply	Constant	10 to 14 V
+B (T4-1) – Body ground	L – Body ground	Ignition power supply	Power switch ON (IG)	10 to 14 V
E1 (T4-15) – Body ground	W-B – Body ground	Ground	Constant	Below 1 Ω
E01 (T4-3) – Body ground	W-B – Body ground	Ground	Constant	Below 1 Ω
E02 (T4-2) – Body ground	W-B – Body ground	Ground	Constant	Below 1 Ω

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