DTC	P0753/62	S1 SOLENOIN VALVE ELECTRICAL MALFUNCTION

DTC	P0758/63	S2 SOLENOID VALVE ELECTRICAL MALFUNCTION

DTC	P0768/65	S4 SOLENOID VALVE ELECTRICAL MALFUNCTION

CIRCUIT DESCRIPTION

Shifting from 1st to O/D is performed in combination with ON and OFF operation of the shift solenoid valves SL1 and SL2 which is controlled by the ECM. If an open or short circuit occurs in either of the shift solenoid valves, the ECM controls the remaining normal shift solenoid valve to allow the vehicle to be operated smoothly (Fail safe function).

DTC No.	DTC Detection Condition	Trouble Area
P0753/62 P0758/63	ECM checks for an open or short circuit in shift solenoid valves SL1 and SL2: (a) When solenoid is energized, duty ratio exceed 75 % (b) When solenoid is not energized, duty ratio is less than 3 %	• Open or short in shift solenoid valve SL1, SL2 or S4 circuit • Shift solenoid valve SL1, SL2 or S4 • ECM
P0768/65	ECM checks for an open or short circuit in shift solenoid valve S4 circuit when it changes ECM records DTC P0768 if condition (a) or (b) is detected: (a) When solenoid is energized, solenoid resistance is 8 Ω or less and it is counted (b) When solenoid is not energized, solenoid resistance is 100 kΩ or more and it is counted	

HINT:

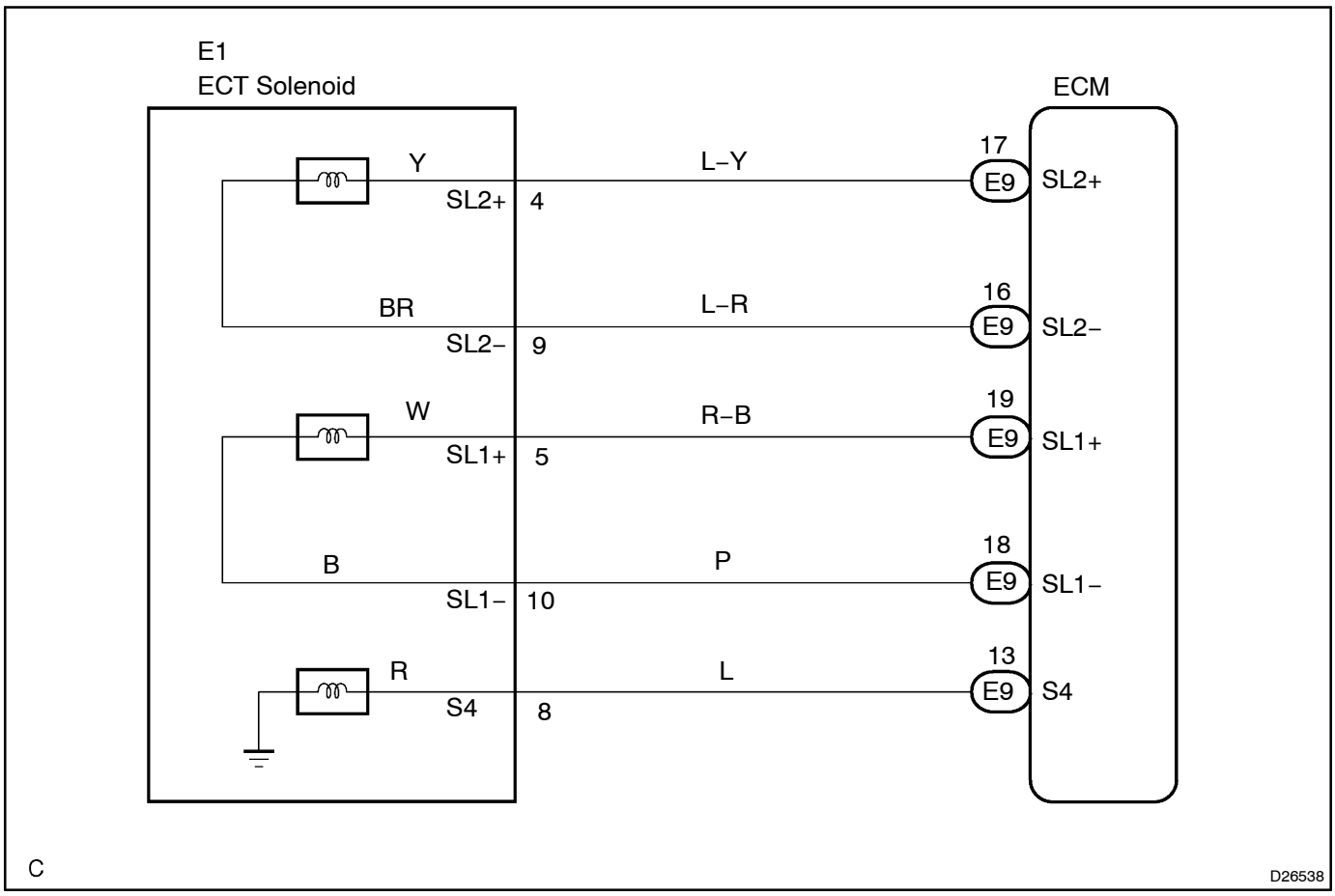
Check the shift solenoid valve SL1 when DTC P0753/62 is output, check the shift solenoid valve SL2 when DTC P0758/63 is output and check the shift solenoid valve S4 when DTC P0768/65 is output.

Fail safe function:
If either of the shift solenoid valve circuits develops an open or short, the ECM turns the other shift solenoid ON and OFF in order to shift into the gear ranges shown in the table below. The ECM also turns the shift solenoid valve SL OFF at the same time. If both solenoids malfunction, hydraulic control cannot be performed electronically, and so it must be done manually.
Manual shifting as shown in the following table must be done (In case of a short circuit, the ECM stops sending the current to the short circuit solenoid).

NORMAL				SHIFT SOLENOID SL1 MALFUNCTIONING				SHIFT SOLENOID SL2 MALFUNCTIONING				SHIFT SOLENOID S4 MALFUNCTIONING			
Solenoid Valve			Gear	Solenoid Valve			Gear	Solenoid Valve			Gear	Solenoid Valve			Gear
SL1	SL2	S4		SL1	SL2	S4		SL1	SL2	S4		SL1	SL2	S4	
ON	ON	OFF	1st	X	ON	OFF	2nd	ON ↓ OFF	X	OFF	3rd	ON	ON	X	1st
OFF	ON	OFF	2nd	X	ON	OFF	2nd	OFF	X	OFF	3rd	OFF	ON	X	2nd
OFF	OFF	OFF	3rd	X	OFF ↓ ON	OFF ↓ ON	3rd	OFF	X	OFF	3rd	OFF	OFF	X	3rd
OFF	OFF	ON	O/D	X	OFF ↓ ON	ON	3rd	OFF	X	ON	O/D	OFF	OFF	X	3rd

SHIFT SOLENOID SL1 AND SL2 MALFUNCTIONING				SHIFT SOLENOID SL1 AND S4 MALFUNCTIONING				SHIFT SOLENOID SL2 AND S4 MALFUNCTIONING				SHIFT SOLENOID SL1, SL2 AND S4 MALFUNCTIONING			
Solenoid Valve			Gear	Solenoid Valve			Gear	Solenoid Valve			Gear	Solenoid Valve			Gear
SL1	SL2	S4		SL1	SL2	S4		SL1	SL2	S4		SL1	SL2	S4	
X	X	OFF	3rd	X	ON	X	2nd	ON ↓ OFF	X	X	3rd	X	X	X	3rd
X	X	OFF	3rd	X	ON	X	2nd	OFF	X	X	3rd	X	X	X	3rd
X	X	OFF	3rd	X	OFF ↓ ON	X	2nd	OFF	X	X	3rd	X	X	X	3rd
X	X	ON	O/D	X	OFF ↓ ON	X	2nd	OFF	X	X	3rd	X	X	X	3rd

WIRING DIAGRAM



INSPECTION PROCEDURE

HINT:
Start the inspection from step 1 in case of using the hand–held tester and start from step 2 in case of not using hand–held tester.

1 PERFORM ACTIVE TEST BY HAND–HELD TESTER

(a) Warm up the engine.
(b) Turn the ignition switch OFF.
(c) Connect the Hand–held tester to the DLC3.
(d) Turn the ignition switch ON and push the Hand–held tester main SW ON.
(e) Select the item ”SHIFT” in the ACTIVE TEST and operate the shift solenoid valves on the Hand–held tester.

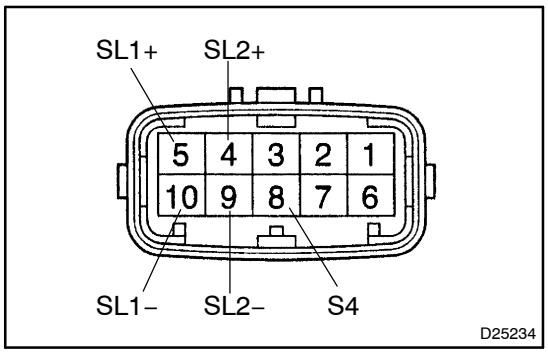
NOTICE:
The values given below for ”Normal Condition” are representative values, so a vehicle may still be normal even if its value differs from those listed here. Do not depend solely on the ”Normal Condition” here when deciding whether or not the part is faulty.

Item	Test Details	Diagnostic Note
SHIFT	[Test Details] Operate the shift solenoid valve and set the each shift range by yourself. [Vehicle Condition] Less than 50 km/h (31 mph) [Others] • Press → button: Shift up • Press ← button: Shift down	Possible to check the operation of the shift solenoid values.

OK → **CHECK AND REPLACE ECM(See age 01–31)**

NG

2 INSPECT TRANSMISSION WIRE(SL1/SL2/S4)



(a) Disconnect the solenoid connector from the transaxle.
(b) Measure the resistance between terminals 5 and 10.
OK:
Resistance: 5.0 – 5.6 Ω at 20 °C (68 °F)

NG(A) → **Go to step 4**

(c) Measure the resistance between terminals 4 and 9.
OK:
Resistance: 5.1 – 5.5 Ω at 20 °C (68 °F)

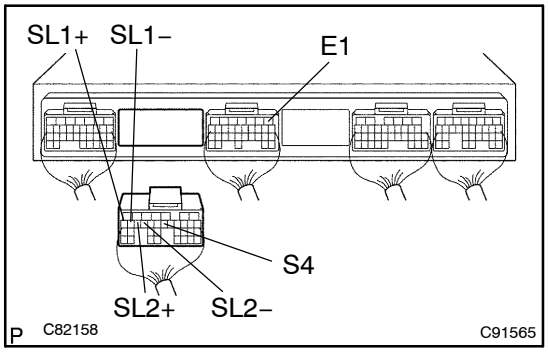
NG(B) → **Go to step 5**

(d) Measure resistance between terminal 8 and body ground.
OK:
Resistance: 11 – 15 Ω at 20 °C (68 °F)

NG(C) → **Go to step 6**

OK

3 CHECK HARNESS AND CONNECTOR(TRANSMISSION WIRE–ECM)



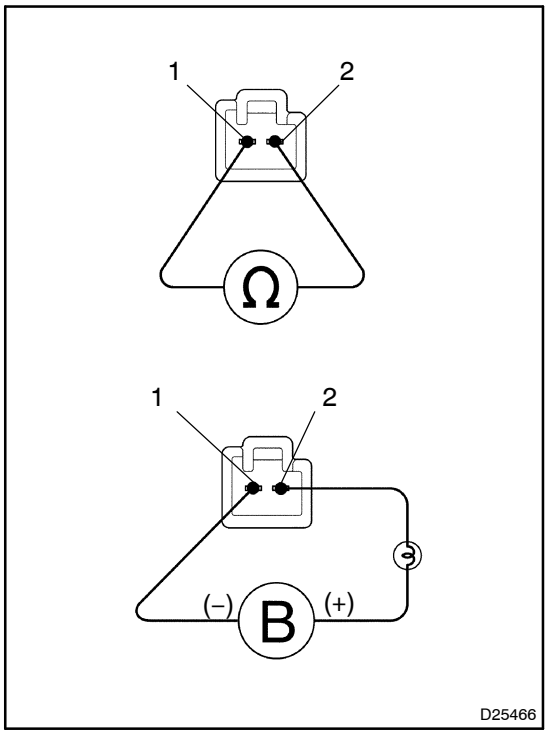
(a) Connect the solenoid connector to the transaxle.
(b) Disconnect the connector from the ECM.
(c) Measure the resistance between terminals.
OK:
Resistance:
SL1+ – SL1–: 5.0 – 5.6 Ω at 20 °C (68 °F)
SL2+ – SL2–: 5.1 – 5.5 Ω at 20 °C (68 °F)
S4 – E1: 11 – 15 Ω at 20 °C (68 °F)

NG → **REPAIR OR REPLACE HARNESS OR CONNECTOR(See page 01–31)**

OK

CHECK AND REPLACE ECM(See page 01–31)

4 INSPECT SHIFT SOLENOID VALVE SL1



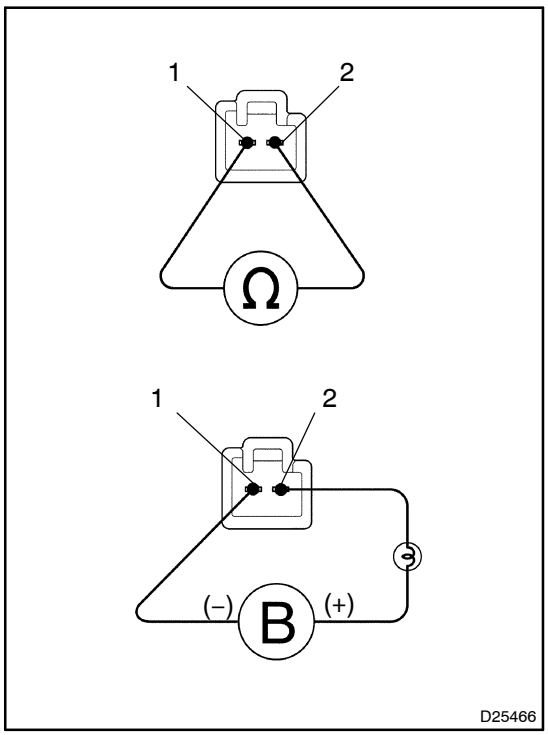
(a) Remove the shift solenoid valve SL1.
(b) Measure the resistance between terminals.
OK:
Resistance: 5.0 – 5.6 Ω at 20°C (68°F)
(c) Connect the positive (+) lead with a 21 W bulb to terminal 2 and the negative (–) lead to terminal 1 of the solenoid valve connector, then check the movement of the valve.
OK:
The solenoid makes an operating noise.

NG → **REPLACE SHIFT SOLENOID VALVE SL1**

OK

REPAIR OR REPLACE TRANSMISSION WIRE(See page 01–31)

5 INSPECT SHIFT SOLENOID VALVE SL2



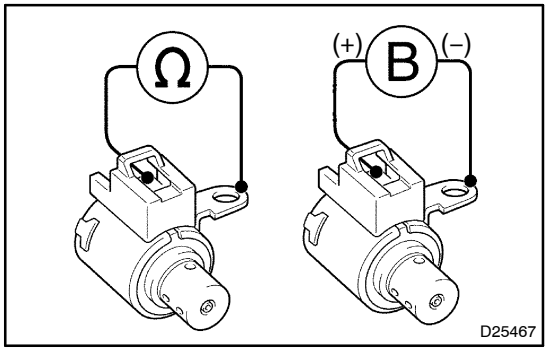
(a) Remove the shift solenoid valve SL2.
(b) Measure the resistance between terminals.
OK:
Resistance: 5.1 – 5.5 Ω at 20°C (68°F)
(c) Connect the positive (+) lead with a 21 W bulb to terminal 2 and the negative (–) lead to terminal 1 of the solenoid valve connector, then check the movement of the valve.
OK:
The solenoid makes an operating noise.

NG → **REPLACE SHIFT SOLENOID VALVE SL2**

OK

REPAIR OR REPLACE TRANSMISSION WIRE(See page 01–31)

6 INSPECT SHIFT SOLENOID VALVE S4



(a) Remove the shift solenoid valve S4.
(b) Measure the resistance between the solenoid connector and the solenoid body.
OK:
Resistance: 11 – 15 Ω at 20°C (68°F)
(c) Connector positive (+) lead to the terminal of solenoid connector, negative (–) lead to the solenoid body.
OK:
The solenoid makes an operating noise.

NG → **REPLACE SHIFT SOLENOID VALVE S4**

OK

REPAIR OR REPLACE TRANSMISSION WIRE(See page 01–31)