DTC	P0973/62	SHIFT SOLENOID ”A” CONTROL CIRCUIT LOW (SHIFT SOLENOID VALVE S1)

DTC	P0974/62	SHIFT SOLENOID ”A” CONTROL CIRCUIT HIGH (SHIFT SOLENOID VALVE S1)

DTC	P0976/63	SHIFT SOLENOID ”B” CONTROL CIRCUIT LOW (SHIFT SOLENOID VALVE S2)

DTC	P0977/63	SHIFT SOLENOID ”B” CONTROL CIRCUIT HIGH (SHIFT SOLENOID VALVE S2)

CIRCUIT DESCRIPTION

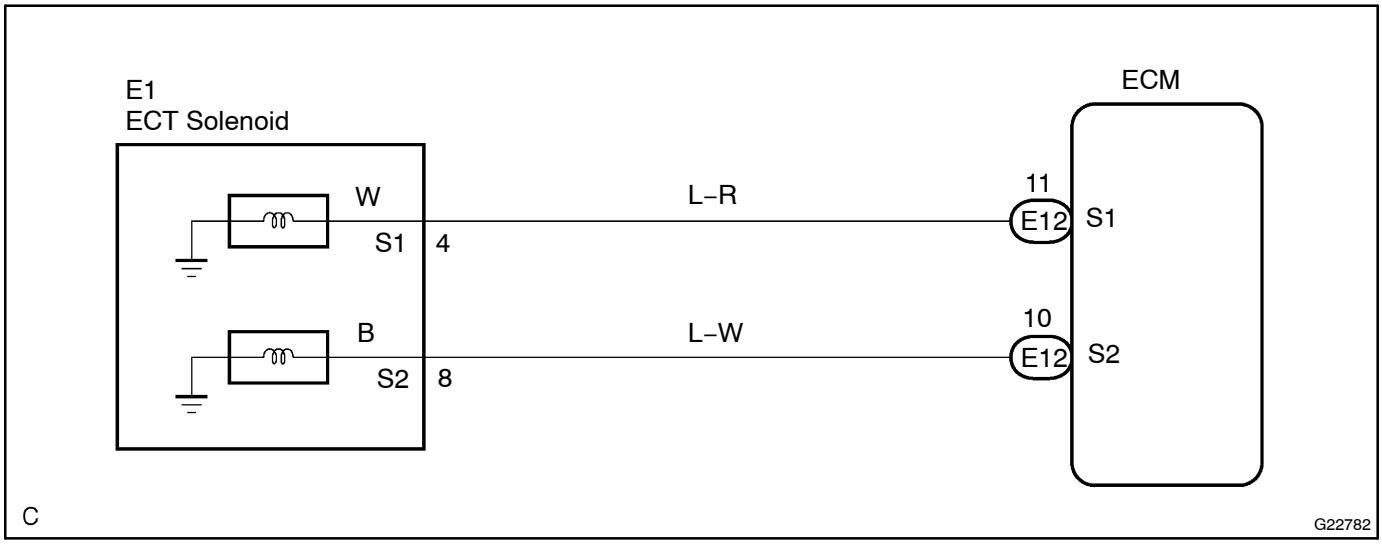
Shifting from 1st to O/D is done in combination with ON and OFF of the shift solenoid valves No. 1 and No. 2 controlled by ECM. If an open or short circuit occurs in either of the shift solenoid valves, the ECM controls the remaining normal shift solenoid valve to allow the vehicle to be operated safely (Fail safe function).
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 to shift to the gear positions shown in the table above. The ECM also turns the shift solenoid valve SL OFF at the same time. If both solenoids are malfunctioning, hydraulic control cannot be done electronically so it must be done manually. Manual shifting as shown in the following table must be done (In the case of a short circuit, the ECM stops sending current to the short circuited solenoid).

Position	NORMAL			SHIFT SOLENOID S1 MALFUNCTIONING			SHIFT SOLENOID S2 MALFUNCTIONING			BOTH SOLENOIDS MALFUNCTIONING
	Solenoid valve		Gear	Solenoid valve		Gear	Solenoid valve		Gear	Gear when shift selector is manually operated
	S1	S2		S1	S2		S1	S2		
D	ON	OFF	1st	X	ON	3rd	ON	X	1st	O/D
	ON	ON	2nd	X	ON	3rd	OFF	X	O/D	O/D
	OFF	ON	3rd	X	ON	3rd	OFF	X	O/D	O/D
	OFF	OFF	O/D	X	OFF	O/D	OFF	X	O/D	O/D
2	ON	OFF	1st	X	ON	3rd	ON	X	1st	3rd
	ON	ON	2nd	X	ON	3rd	OFF	X	3rd	3rd
	OFF	ON	3rd	X	ON	3rd	OFF	X	3rd	3rd
L	ON	OFF	1st	X	OFF	1st	ON	X	1st	1st
	ON	ON	2nd	X	ON	2nd	ON	X	1st	1st

X: Malfunctions

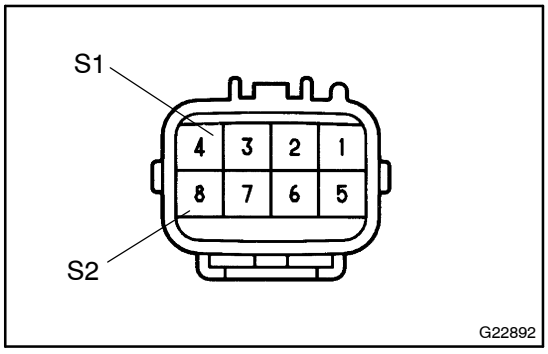
DTC No.	DTC Detection Condition	Trouble Area
P0973/62	ECM detects short in solenoid valve S1 circuit 4 times when solenoid valve S1 is operated (1–trip detection logic)	• Short in shift solenoid valve S1 circuit • Shift solenoid valve S1 • ECM
P0974/62	ECM detects open in solenoid valve S1 circuit 4 times when solenoid valve S1 is not operated (1–trip detection logic)	• Open in shift solenoid valve S1 circuit • Shift solenoid valve S1 • ECM
P0976/63	ECM detects short in solenoid valve S2 circuit 4 times when solenoid valve S2 is operated (1–trip detection logic)	• Short in shift solenoid valve S2 circuit • Shift solenoid valve S2 • ECM
P0977/63	ECM detects open in solenoid valve S2 circuit 4 times when solenoid valve S2 is not operated (1–trip detection logic)	• Open in shift solenoid valve S2 circuit • Shift solenoid valve S2 • ECM

WIRING DIAGRAM



INSPECTION PROCEDURE

1	INSPECT TRANSMISSION WIRE(S1/S2)



(a) Disconnect the transmission wire connector from the transmission.

(b) Measure resistance between terminal S1 or S2 of transmission wire connector and body ground.

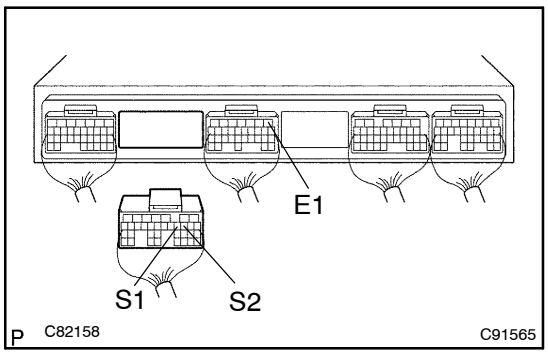
OK:

Resistance: 11 – 15 Ω at 20°C (68°F)

NG → **Go to step 3**

OK

2 CHECK HARNESS AND CONNECTOR (TRANSMISSION WIRE – ECM)



(a) Connect the transmission wire from the transmission.
(b) Disconnect the ECM connector.
(c) Measure resistance between terminals.

OK:

Resistance:

S1 – E1: 11 – 15 Ω at 20°C (68°F)

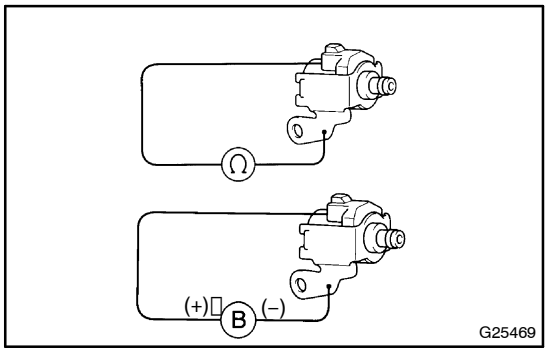
S2 – E1: 11 – 15 Ω at 20°C (68°F)

NG → **REPAIR OR REPLACE HARNESS OR CONNECTOR (See page 01–35)**

OK

CHECK AND REPLACE ECM (See page 01–35)

3 INSPECT SHIFT SOLENOID VALVE (S1/S2)



(a) Remove the shift solenoid valve S1 or S2.
(b) Measure the resistance between the solenoid connector and the solenoid body.

OK:

Resistance: 11 – 15 Ω at 20°C (68°F)

(c) Connect 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 (S1/S2) (See page 40–20)**

OK

REPAIR OR REPLACE TRANSMISSION WIRE (See page 40–17)