DTC	P0973	Shift Solenoid "A" Control Circuit Low (Shift Solenoid Valve S1)

DTC	P0974	Shift Solenoid "A" Control Circuit High (Shift Solenoid Valve S1)

DTC	P0976	Shift Solenoid "B" Control Circuit Low (Shift Solenoid Valve S2)

DTC	P0977	Shift Solenoid "B" Control Circuit High (Shift Solenoid Valve S2)

DESCRIPTION

Shifting from 1st to 4th is performed in combination with the ON and OFF operation of the shift solenoid valves No. 1 and No. 2 which are 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 driven smoothly. (In case of an open or short circuit, the ECM stops sending current to the circuit.)
Fail-safe functions (See page AT-27)

DTC No.	DTC Detection Conditions	Trouble Areas
P0973	ECM detects short in solenoid valve S1 circuit 2 times when solenoid valve S1 is operated. (1-detection logic)	• Short in shift solenoid valve S1 circuit • Shift solenoid valve S1 • ECM
P0974	ECM detects open in solenoid valve S1 circuit 2 times when solenoid valve S1 is not operated. (1-detection logic)	• Open in shift solenoid valve S1 circuit • Shift solenoid valve S1 • ECM
P0976	ECM detects short in solenoid valve S2 circuit 2 times when solenoid valve S2 is operated. (1-trip detection logic)	• Short in shift solenoid valve S2 circuit • Shift solenoid valve S2 • ECM
P0977	ECM detects open in solenoid valve S2 circuit 2 times when solenoid valve S2 is not operated. (1-trip detection logic)	• Open in shift solenoid valve S2 circuit • Shift solenoid valve S2 • ECM

MONITOR DESCRIPTION

The ECM controls the gearshift by turning the shift solenoid valves "ON/OFF". When there is an open or short circuit in either shift solenoid valve circuit, the ECM detects the problem and illuminates the MIL and stores a DTC. And the ECM performs the fail-safe function and turns the other shift solenoid valves in good condition "ON/OFF". (In case of an open or short circuit, the ECM stops sending current to the circuit.)

MONITOR STRATEGY

P0973, P0974:

Related DTCs	P0973: Shift solenoid valve S1/Range check (Low resistance) P0974: Shift solenoid valve S1/Range check (High resistance)
Required sensors/Components	Shift solenoid valve S1
Frequency of operation	Continuous
Duration	0.1 seconds x 2 (times) or more
MIL operation	Immediate
Sequence of operation	None

P0976, P0977:

Related DTCs	P0976: Shift solenoid valve S2/Range check (Low resistance) P0977: Shift solenoid valve S2/Range check (High resistance)
Required sensors/Components	Shift solenoid valve S2
Frequency of operation	Continuous
Duration	0.1 seconds x 2 (times) or more
MIL operation	1 driving cycle
Sequence of operation	None

TYPICAL ENABLING CONDITIONS

P0973: Range check (Low resistance)

Range check (Low resistance)

The monitor will run whenever the following DTCs are not present.	None
Solenoid	ON

P0974: Range check (High resistance)

The monitor will run whenever the following DTCs are not present.	None
Solenoid	OFF

P0976: Range check (Low resistance)

The monitor will run whenever the following DTCs are not present.	None
Solenoid	ON

P0977: Range check (High resistance)

The monitor will run whenever the following DTCs are not present.	None
Solenoid	OFF

TYPICAL MALFUNCTION THRESHOLDS

P0973: Range check (Low resistance)

Intelligent power MOS diagnosis fail signals detected while the solenoid is operated	Fail: Solenoid resistance 8 Ω or less

P0974: Range check (High resistance)

Intelligent power MOS diagnosis fail signals detected while the solenoid is not operated	Fail: Solenoid resistance 100 kΩ or more

P0976: Range check (Low resistance)

Intelligent power MOS diagnosis fail signals detected while the solenoid is operated	Fail: Solenoid resistance 8 Ω or less

P0977: Range check (High resistance)

Intelligent power MOS diagnosis fail signals detected while the solenoid is not operated	Fail: Solenoid resistance 100 kΩ or more

COMPONENT OPERATING RANGE

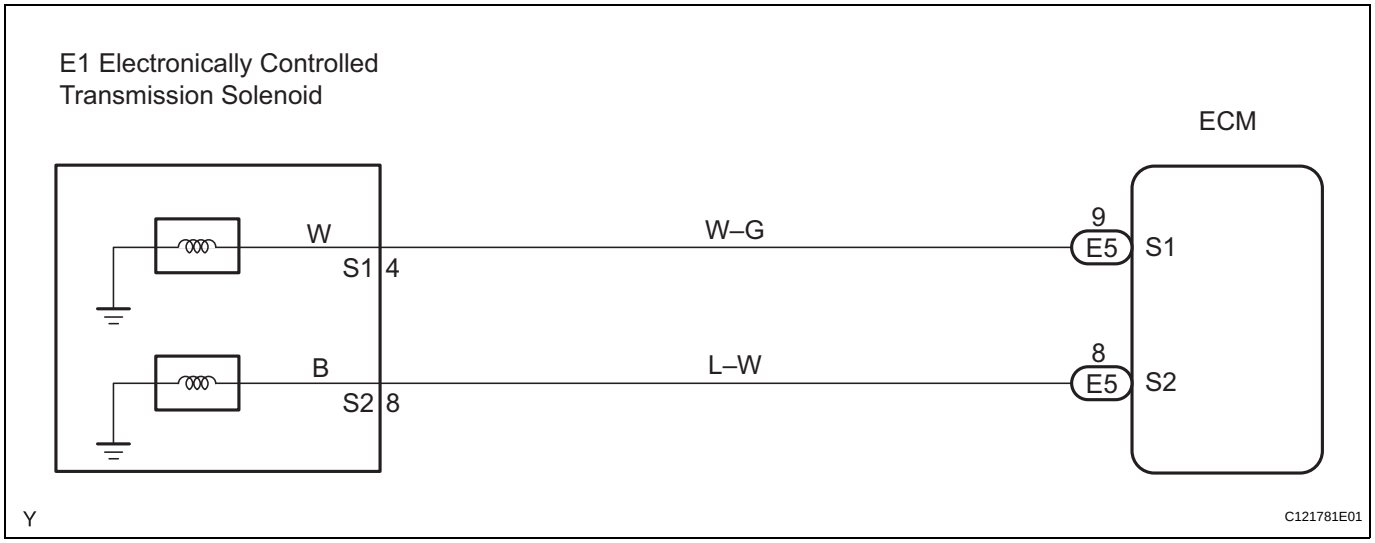
P0973, P0974:

Shift solenoid valve S1 resistance	11 to 15 Ω at 20°C (68°F)

P0976, P0977:

Shift solenoid valve S2 resistance	11 to 15 Ω at 20°C (68°F)

WIRING DIAGRAM

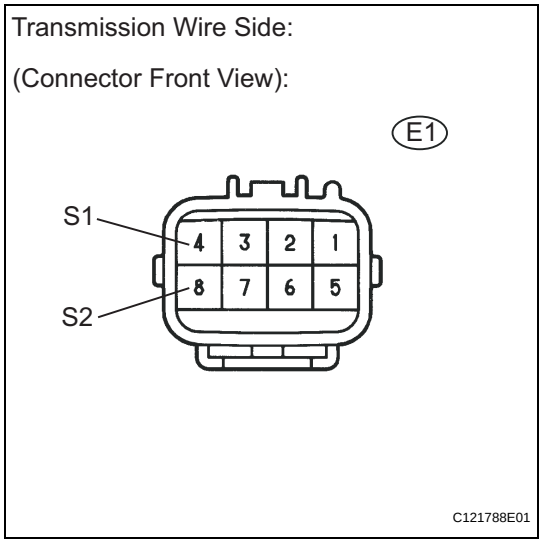


HINT:

- The shift solenoid valve S1 or S2 is turned on/off normally when the shift lever is in the D position:

Gearshift controlled by ECM	1st	2nd	3rd	4th
Shift solenoid valve S1	ON	ON	OFF	OFF
Shift solenoid valve S2	OFF	ON	ON	OFF

1	INSPECT TRANSMISSION WIRE (S1/S2)



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

(b) Measure the resistance.

Standard resistance

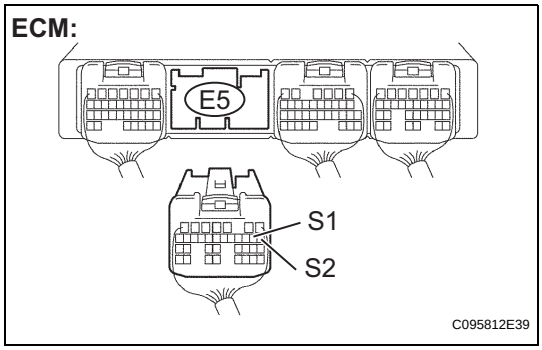
Tester Connection	Specified Condition
4 - Body ground	11 to 15 Ω at 20°C (68°F)
8 - Body ground	11 to 15 Ω at 20°C (68°F)

NG → **Go to step 3**

OK

AT

2	CHECK HARNESS AND CONNECTOR (TRANSMISSION WIRE - ECM)



(a) Connect the transmission connector to the transmission.
(b) Disconnect the ECM connector.
(c) Measure the resistance.
Standard resistance

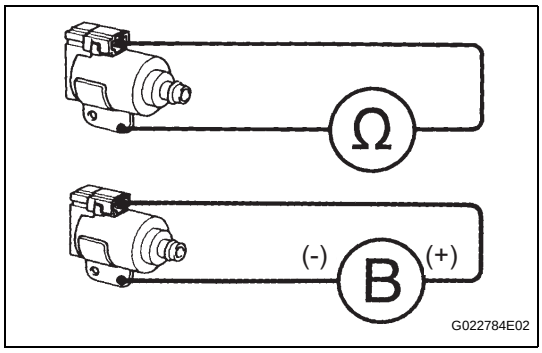
Tester Connection	Specified Condition
E5-9 (S1) - Body ground	11 to 15 Ω at 20°C (68°F)
E5-8 (S2) - Body ground	11 to 15 Ω at 20°C (68°F)

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

OK

REPLACE ECM

3	INSPECT SHIFT SOLENOID VALVE (S1/S2)



(a) Remove the shift solenoid valve S1 or S2.
(b) Measure the resistance.
Standard resistance

Tester Connection	Specified Condition
Solenoid Connector (S1) - Solenoid Body (S1)	11 to 15 Ω at 20°C (68°F)
Solenoid Connector (S2) - Solenoid Body (S2)	11 to 15 Ω at 20°C (68°F)

(c) Connect positive (+) lead to the terminal of the solenoid connector, negative (-) lead to the solenoid body.
OK:
The solenoid makes an operating sound.

NG → **REPLACE SHIFT SOLENOID VALVE (S1/S2)**

OK

REPAIR OR REPLACE TRANSMISSION WIRE