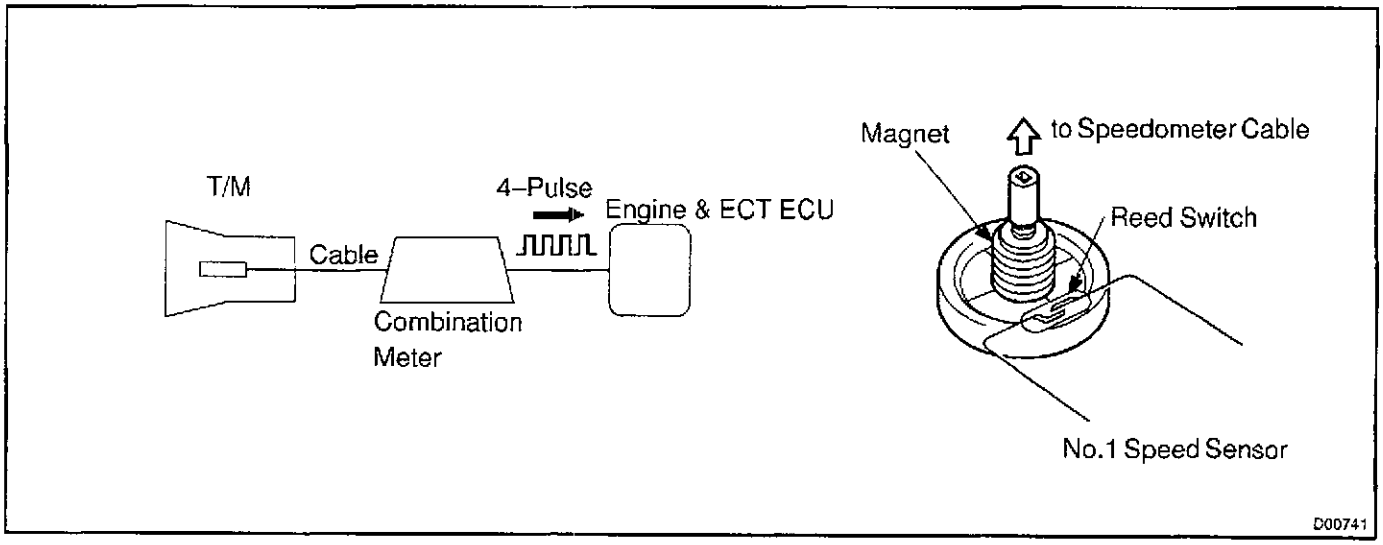
DI3I4-04

CIRCUIT INSPECTION

DTC	P0500/42	Vehicle Speed Sensor Malfunction

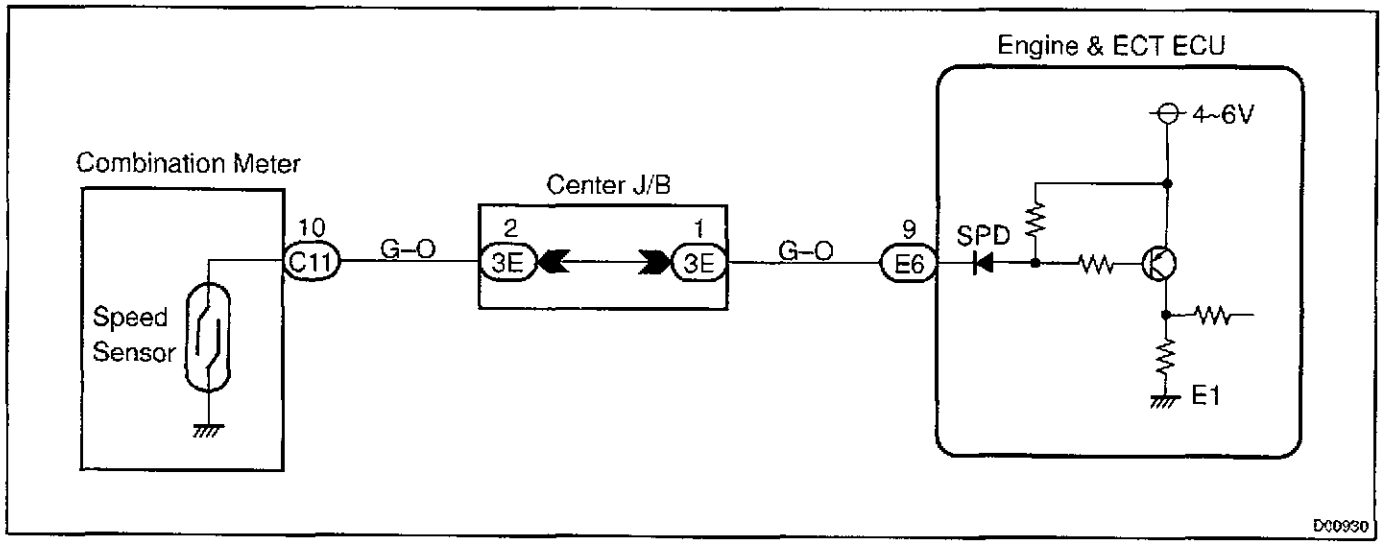
CIRCUIT DESCRIPTION

This sensor is mounted in the combination meter. It contains a magnet which is rotated by the speedometer cable.
Turning the reed switch ON and OFF 4 times for every revolution of the speedometer.
It is then transmitted to the Engine & ECT ECU. The Engine & ECT ECU determines the vehicle speed based on the frequency of these pulse signals.



DTC No.	DTC Detecting Condition	Trouble Area
P0500/42	No.1 speed sensor signal to Engine & ECT ECU under condition (2 trip detection logic) Vehicle is being driven	• Combination meter • Open or short in No.1 speed sensor circuit • Engine & ECT ECU • No.1 speed sensor • Speedometer cable

WIRING DIAGRAM



INSPECTION PROCEDURE

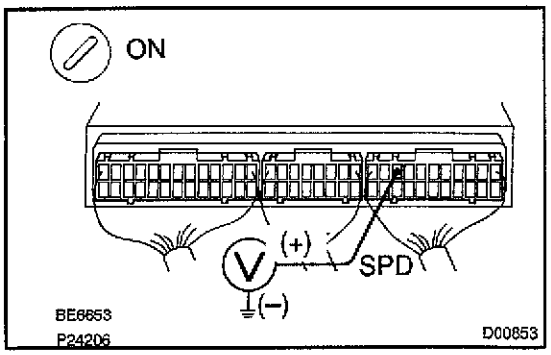
1	Check operation of speedometer.

CHECK:
Drive the vehicle and check if the operation of the speedometer in the combination meter is normal.
HINT:
The vehicle speed sensor is operating normally if the speedometer display is normal.

NG → **Check speedometer and cable (See page BE–50).**

OK

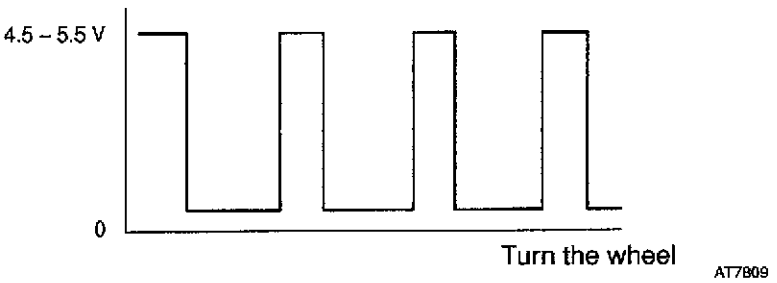
2	Check voltage between terminal SPD of Engine & ECT ECU connector and body ground.



PREPARATION:
(a) Remove the glove compartment.
(b) Shift the shift lever to neutral.
(c) Jack up rear wheels on one side.
(d) Turn ignition switch ON.

CHECK:
Measure voltage between terminal SPD of Engine & ECT ECU connector and body ground when the wheel is turned slowly.

OK:
Voltage is generated intermittently.



NG → **Check and repair harness and connector between combination meter and Engine & ECT ECU (See page IN–25).**

OK

Check and replace Engine & ECT ECU (See page IN–25).

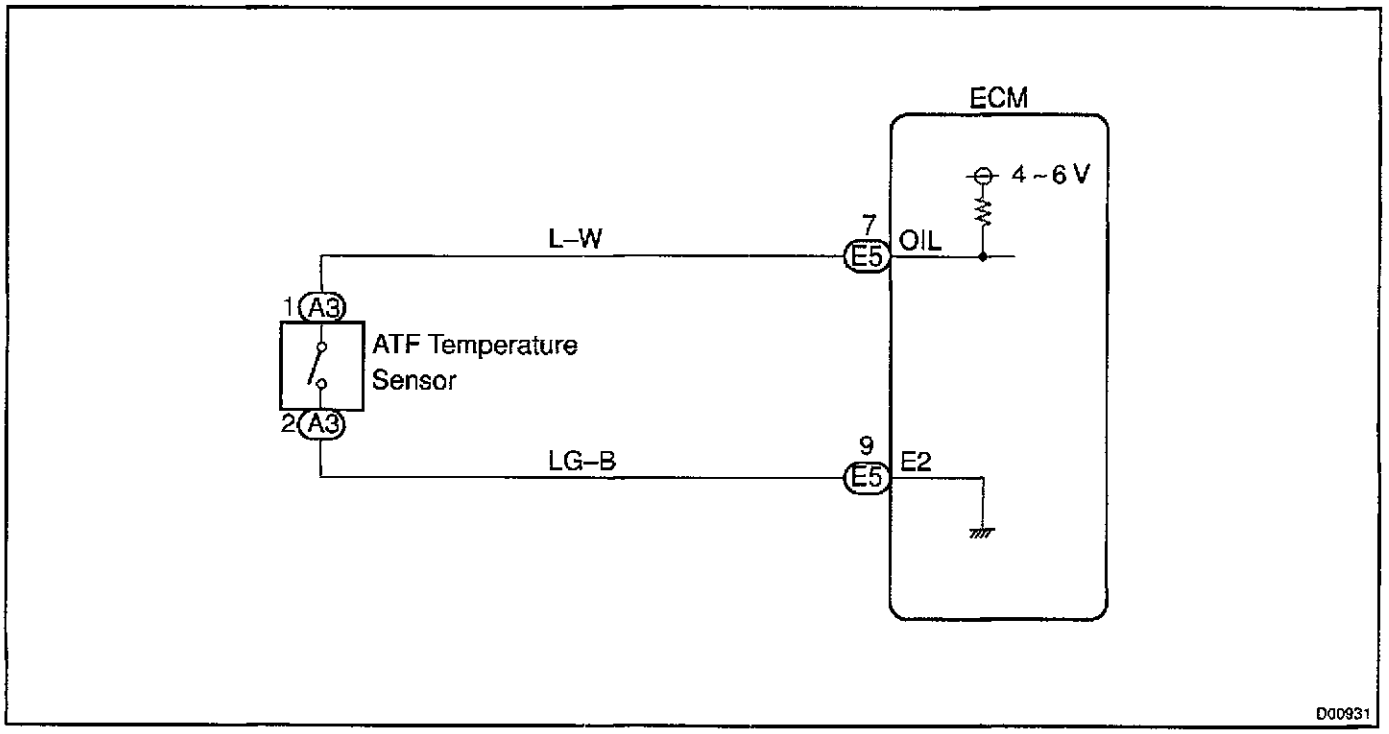
DTC	P0710/38	Transmission Fluid Temperature Sensor Malfunction (ATF Temperature Sensor)

CIRCUIT DESCRIPTION

The ATF temperature sensor converts fluid temperature into a resistance value which is input into the Engine & ECT ECU.

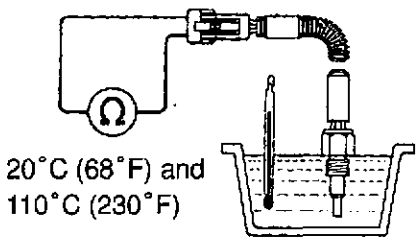
DTC No.	DTC Detecting Condition	Trouble Area
P0710/38	Either (a) or (b) is detected for 0.5 sec. or more. (2 trip detection logic) (a) Temp. sensor resistance is less than 79 Ω (b) After the engine has been operating for 15 minutes or more, the resistance at the temp. sensor is more than 156 kΩ	• Open or short in ATF temp. sensor • ATF temp. sensor • Engine & ECT ECU

WIRING DIAGRAM



INSPECTION PROCEDURE

1	Check ATF Temperature Sensor.



PREPARATION:
Remove the ATF temperature sensor.
CHECK:
Measure resistance between terminals of ATF temperature sensor at 20 °C (68 °F) and 110 °C (230 °F).
OK:
Resistance (Approx.):
20 °C (68 °F): 4.29 kΩ
110 °C (230 °F): 690 Ω

NG → **Replace the ATF temperature sensor**

OK

2	Check harness and connector between ATF temperature sensor and Engine & ECT ECU (See page IN–25).

NG → **Repair or replace the harness or connector.**

OK

Check and replace the Engine & ECT ECU (See page IN–25).

DTC	P0753/62,P0758/63	Shift Solenoid A/B Electrical Malfunction (No.1/No.2 Solenoid Valve)

CIRCUIT DESCRIPTION

Shifting from 1st to O/D is performed in combination with ON and OFF of the No.1 and No.2 solenoid valves controlled by Engine & ECT ECU. If an open or short circuit occurs in either of the solenoid valves, the Engine & ECT ECU controls the remaining normal solenoid valve to allow the vehicle to be operated smoothly (Fail safe function).

Range	NORMAL			NO.1 SOLENOID MALFUNCTIONING			NO.2 SOLENOID MALFUNCTIONING			BOTH SOLENOIDS MALFUNCTIONING
	Solenoid valve		Gear	Solenoid valve		Gear	Solenoid valve		Gear	Gear when shift selector is manually operated
	No.1	No.2		No.1	No.2		No.1	No.2		
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

HINT:

Check the No.1 solenoid valve when DTC P0753/62 is output and check the No.2 solenoid valve when DTC P0758/63 is output.

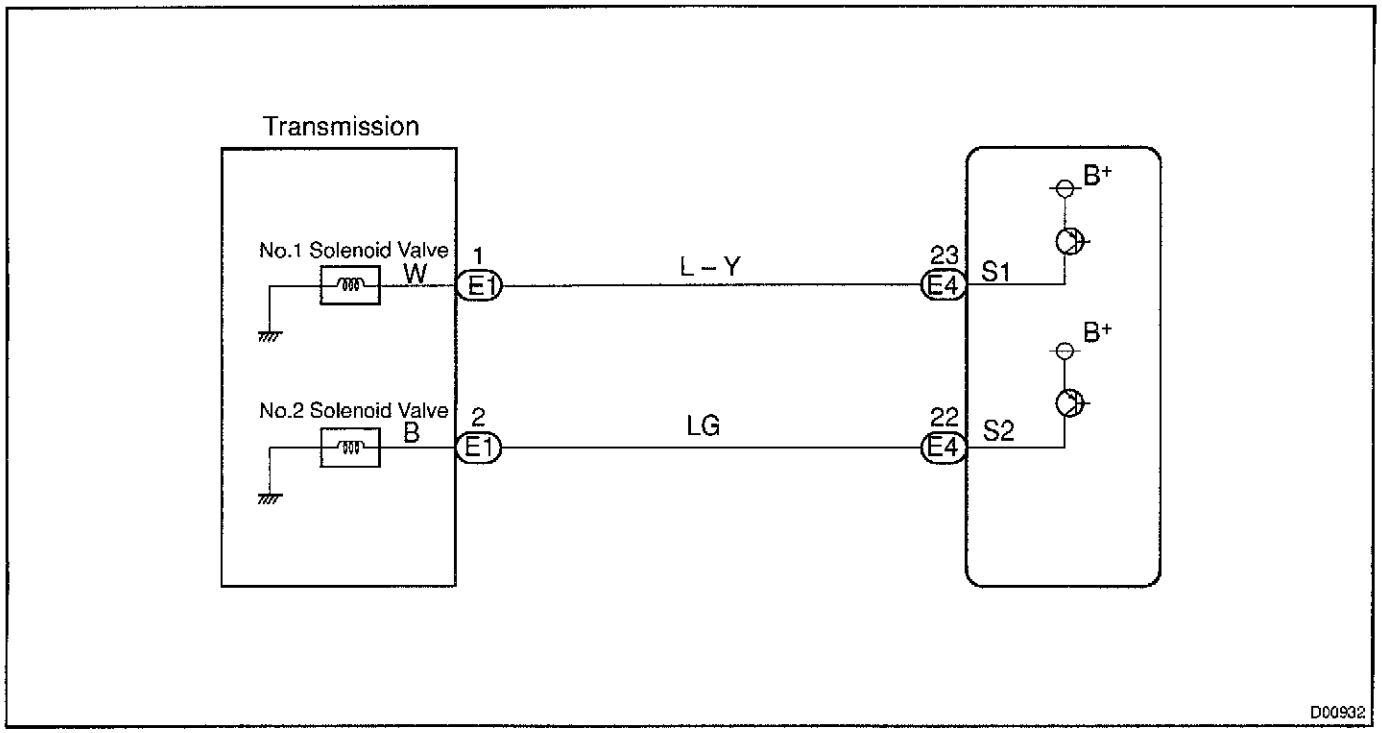
DTC No.	DTC Detecting Condition	Trouble Area
P0753/62 P0758/63	The Engine & ECT ECU checks for an open or short circuit in the No.1 or No.2 solenoid valve circuit when it changes. The Engine & ECT ECU records DTC P0753/62 or P0758/63 if condition (a) or (b) is detected once, but it does not blink the O/D OFF indicator light. After Engine & ECT ECU detects condition (a) or (b) continuously 8 times or more in one–trip, it causes the O/D OFF indicator light light up until condition (a) or (b) disappears. After that, if the Engine & ECT ECU detects condition (a) or (b) once, it starts lighting up O/D OFF indicator light again. (a) Solenoid resistance is 8 Ω or less (short circuit) when the solenoid is energized. (b) Solenoid resistance is 100 kΩ or more (open circuit) when the solenoid is not energized.	• Open or short in No.1/No.2 solenoid valve circuit • No.1/No.2 solenoid valve • Engine & ECT ECU

Fail Safe Function:

If either of the solenoid valve circuits develops an open or short, the Engine & ECT ECU turns the other solenoid valve ON and OFF to shift to the gear positions shown in the table above. The Engine & ECT ECU also turns the SL solenoid valve OFF at the same time. If both solenoids malfunction, hydraulic control cannot be performed electronically and must be done manually.

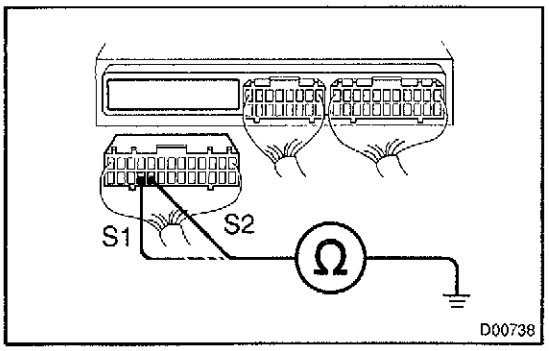
Manual shifting as shown in the above table must be done (In the case of a short circuit, the Engine & ECT ECU stops sending current to the short circuited solenoid).

WIRING DIAGRAM



INSPECTION PROCEDURE

1	**Measure resistance between terminal S1 or S2 of Engine & ECT ECU and body ground.**



PREPARATION:
Disconnect the connector from Engine & ECT ECU.

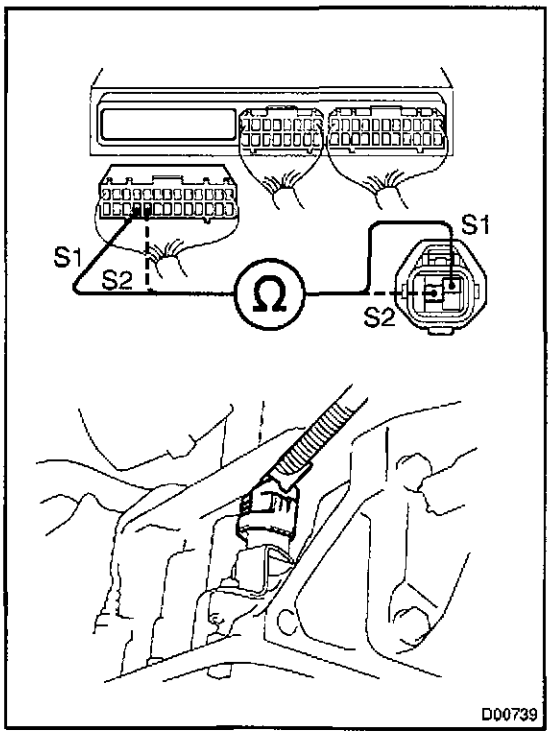
CHECK:
Measure resistance between terminal S1 or S2 of Engine & ECT ECU and body ground.

OK:
Resistance: 11 ~ 15 Ω at 20 °C (68 °F)

OK	**Check and replace the Engine & ECT ECU (See page IN–25).**

NG

2	**Check harness and connector between Engine & ECT ECU and automatic transmission solenoid connector.**



PREPARATION:

Disconnect the solenoid connector from the automatic transmission.

CHECK:

Check the harness and connector between terminal S1 or S2 of Engine & ECT ECU and terminal S1 or S2 of solenoid connector.

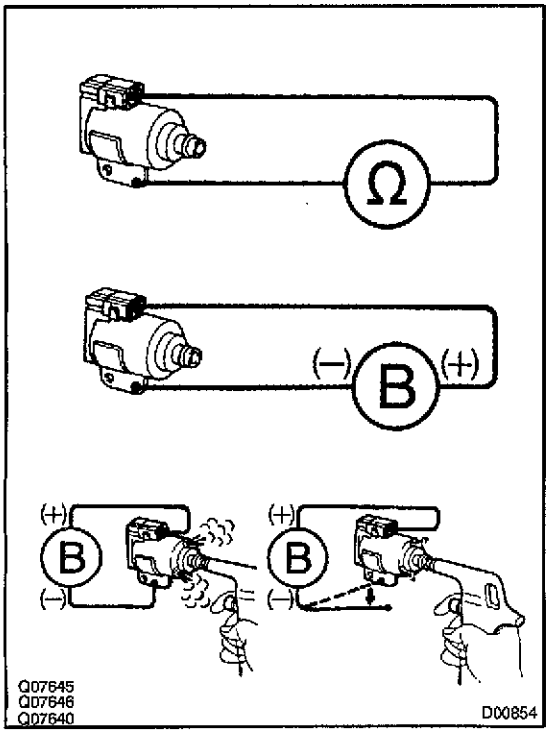
OK:

There is no open and short circuit.

NG → **Repair or replace the harness or connector (See page IN–25).**

OK

3	Check No.1 or No.2 solenoid valve.



Electrical Check:

PREPARATION:

(a) Jack up the vehicle.
(b) Remove the oil pan.
(c) Disconnect the solenoid connector.
(d) Remove the No.1 or No.2 solenoid valve.

CHECK:

Electrical Check:

(1) Measure resistance between solenoid connector and body ground.
(2) Connect positive ⊕ lead of the battery to terminal of solenoid connector, negative ⊖ lead of the battery to solenoid body.

OK:

(1) Resistance: 11 ~ 15 Ω at 20 °C (68 °F)
(2) The solenoid makes an operating noise

Mechanical Check:

PREPARATION:

(a) Jack up the vehicle.
(b) Remove the oil pan.
(c) Disconnect the solenoid connector.
(d) Remove the No.1 or No.2 solenoid valve.

CHECK:

Mechanical Check:

(1) Applying 490 kPa (5 kgf/cm^2, 71 psi) of compressed air, check that the solenoid valve does not leak air.
(2) When battery positive voltage is supplied to the solenoid valve, check that the valve opens.

OK:

(1) Solenoid valve does not leak air
(2) Solenoid valve opens

NG → **Replace the solenoid valve.**

OK

Repair or replace the solenoid wire.

DTC	P0773/64	Shift Solenoid E Electrical Malfunction (SL Solenoid Valve)

CIRCUIT DESCRIPTION

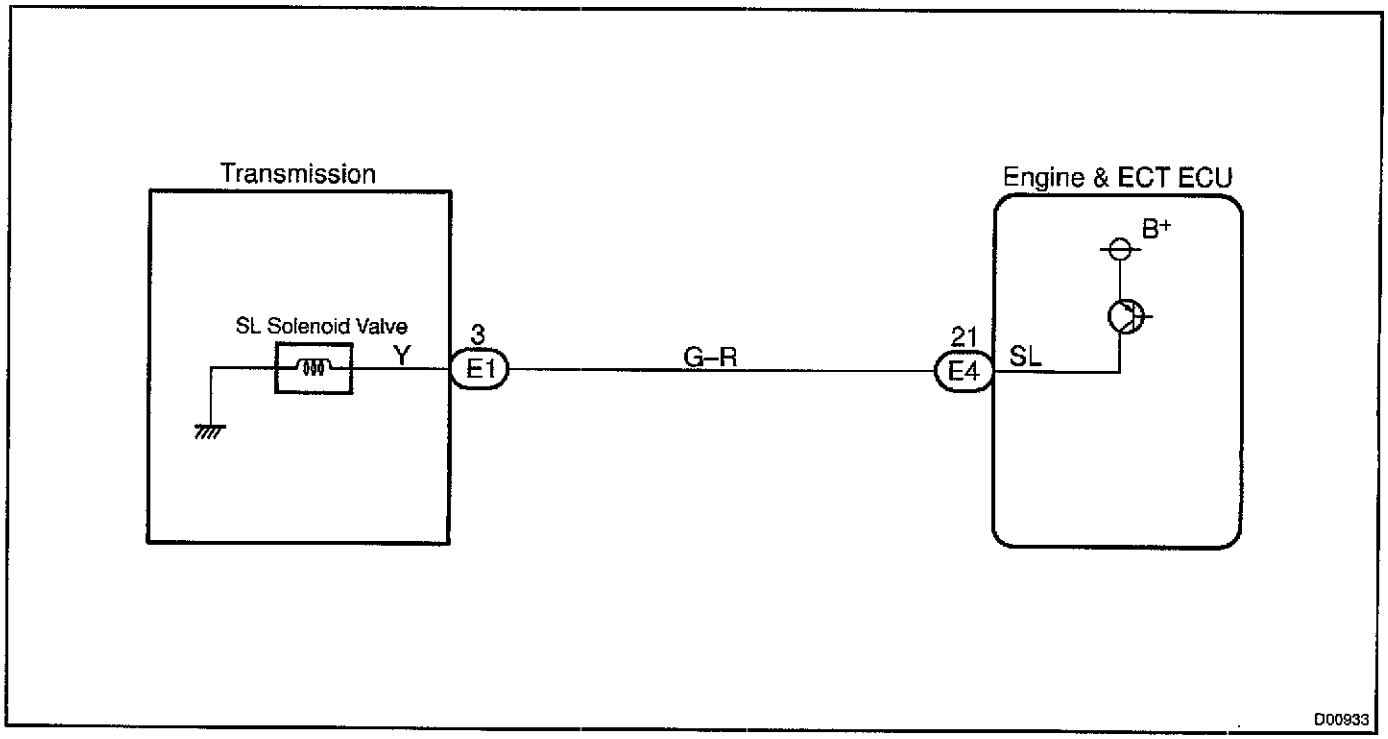
The SL solenoid valve is turned ON and OFF by signals from the Engine & ECT ECU to control the hydraulic pressure acting on the lock–up relay valve, which then controls operation of the lock–up clutch.

DTC No.	DTC Detecting Condition	Trouble Area
P0773/64	Either (a) or (b) is detected for 1 time. (a) Solenoid resistance is 8 Ω or less (short circuit) when the solenoid is energized. (b) Solenoid resistance is 100 kΩ or more (open circuit) when the solenoid is not energized.	•Open or short in SL solenoid valve circuit •SL solenoid valve •Engine & ECT ECU

Fail safe function

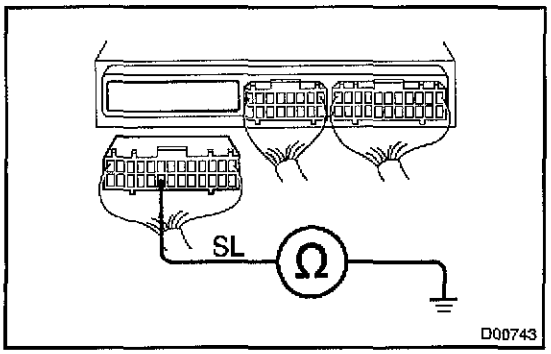
If the Engine & ECT ECU detects a malfunction, it turns the SL solenoid valve OFF.

WIRING DIAGRAM



INSPECTION PROCEDURE

1	**Measure resistance between terminal SL of Engine & ECT ECU and body ground.**

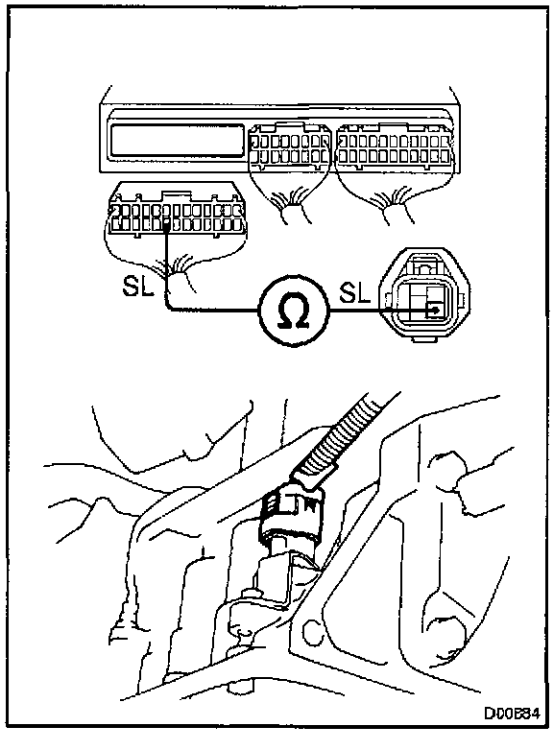


PREPARATION:
Disconnect the connector from Engine & ECT ECU.
CHECK:
Measure resistance between terminal SL of Engine & ECT ECU and body ground.
OK:
Resistance: 11 ~ 15 Ω at 20 °C (68 °F)

OK → **Check and replace the Engine & ECT ECU (See page IN–25).**

NG

2	**Check harness and connector between Engine & ECT ECU and automatic transmission solenoid connector.**

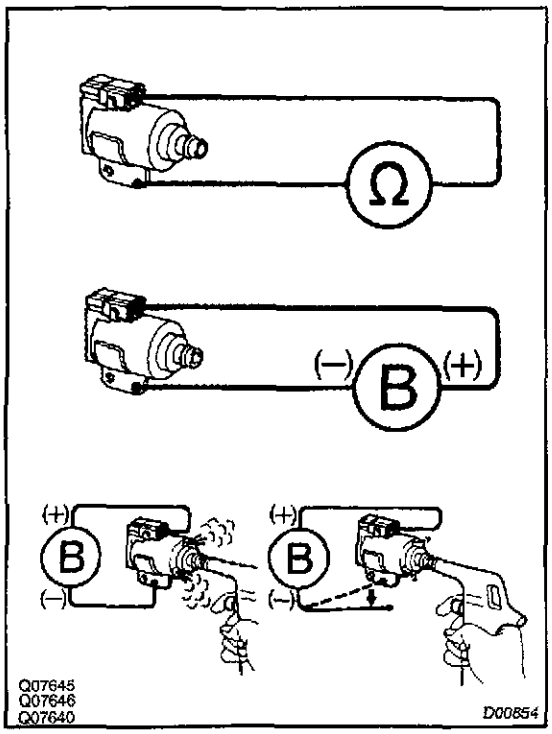


PREPARATION:
Disconnect the solenoid connector from the transmission.
CHECK:
Check the harness between terminal SL of Engine & ECT ECU and terminal SL of transmission solenoid connector.
OK:
There is no open or short circuit.

NG → **Repair or replace the harness or connector.**

OK

3	Check SL solenoid valve.



Electrical Check:

PREPARATION:

(a) Jack up the vehicle.
(b) Remove the oil pan.
(c) Disconnect the solenoid connector.
(d) Remove the SL solenoid valve.

CHECK:

(1) Measure resistance between terminal SL of solenoid valve and solenoid body.
(2) Connect positive ⊕ lead of the battery to terminal of solenoid connector, negative ⊖ lead of the battery to solenoid body.

OK:

(1) Resistance: 11 ~ 15 Ω at 20 °C (68 °F)
(2) The SL solenoid valve makes operating noise.

Mechanical Check:

PREPARATION:

(a) Jack up the vehicle.
(b) Remove the oil pan.
(c) Disconnect the solenoid connector.
(d) Remove the SL solenoid valve.

CHECK:

(1) Applying 490 kPa (5 kgf/cm^2, 71 psi) of compressed air, check that the solenoid valve does not leak air.
(2) When battery positive voltage is supplied to the solenoid valve, check that the solenoid valve opens.

OK:

(1) Solenoid valve does not leak air
(2) Solenoid valve opens

NG → **Replace the SL solenoid valve.**

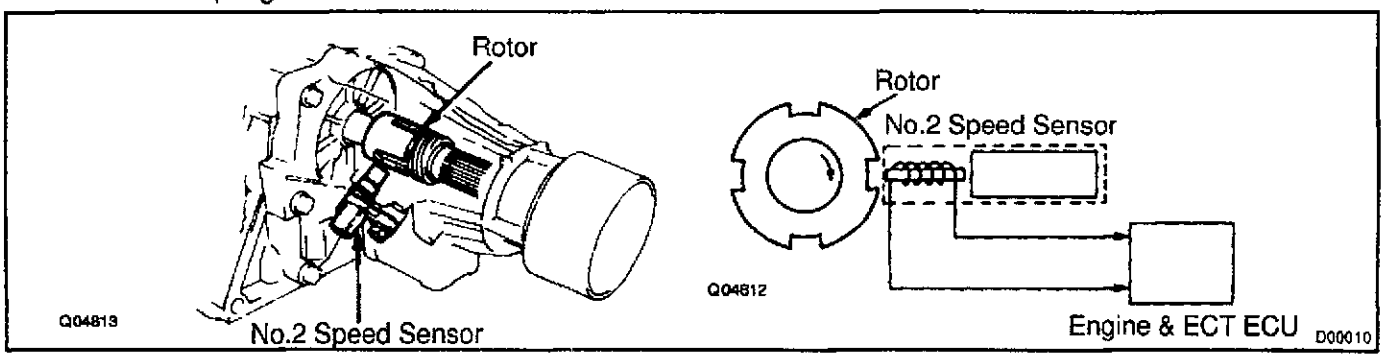
OK

Repair or replace the solenoid wire.

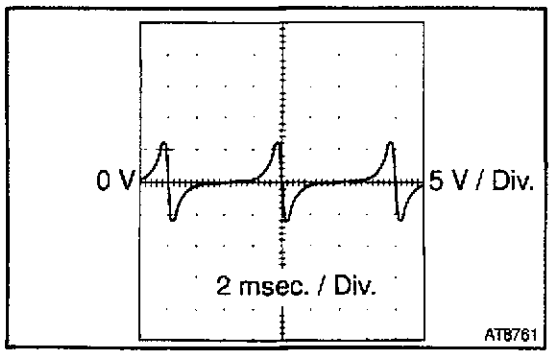
DTC	P1700/61	Speed Sensor No.2 Circuit Malfunction (No.2 Speed Sensor)

CIRCUIT DESCRIPTION

The No.2 speed sensor detects the rotation speed of the transmission output shaft and sends signals to the Engine & ECT ECU. The Engine & ECT ECU determines the vehicle speed based on these signals.
An AC voltage is generated in the No.2 speed sensor coil as the rotor mounted on the output shaft rotates, and this voltage is sent to the Engine & ECT ECU.
The gear shift point and lock–up timing are controlled by the Engine & ECT ECU based on the signals from this speed sensor and the throttle position sensor signal.
If the No.2 speed sensor malfunctions, the Engine & ECT ECU uses input signals from the No.1 speed sensor as a back–up signal.

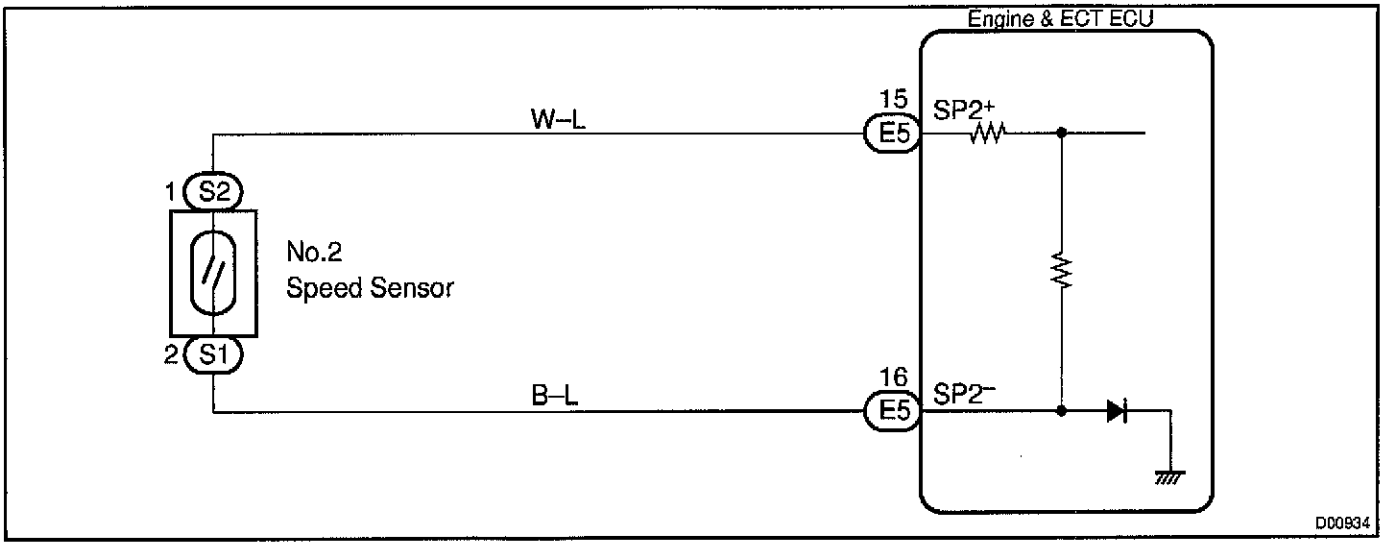


DTC No.	DTC Detecting Condition	Trouble Area
P1700/61	All conditions below are detected 500 times or more continuously. (2 trip detection logic) (a) No signal from No.2 speed sensor is input to Engine & ECT while 4 pulses of No.1 speed sensor signal are sent. (b) Vehicle speed: 9 km/h (5.6 mph) or more for at least 4 seconds (c) Neutral start switch: OFF (Other than P or N)	• Open or short in No.2 speed sensor circuit • No.2 speed sensor • Engine & ECT ECU



HINT:
Refer to the chart for the wave from between terminals $SP2^+$ and $SP2^-$ when vehicle speed is approx. 60 km/h (37 mph).

WIRING DIAGRAM



INSPECTION PROCEDURE

1	**Check vehicle speed value or resistance between terminals SP2+ and SP2– of Engine & ECT ECU.**

When using hand–held tester:

PREPARATION:

(a) Remove the DLC3 cover.

(b) Connect a hand–held tester to the DLC3.

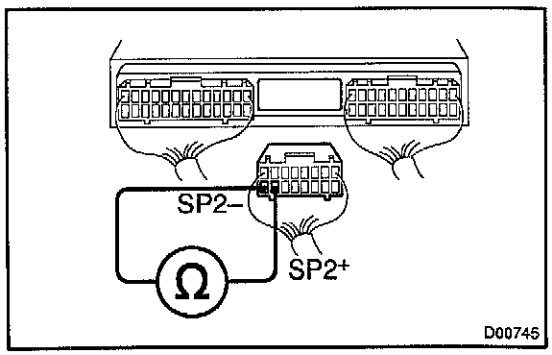
(c) Start the engine and turn the hand–held tester main switch ON.

CHECK:

Drive the vehicle and read vehicle speed value.

OK:

Vehicle speed matches tester speed value.



When not using hand–held tester:

PREPARATION:

Disconnect the connector from Engine & ECT ECU.

CHECK:

Check resistance between terminals SP2+ and SP2– of Engine & ECT ECU.

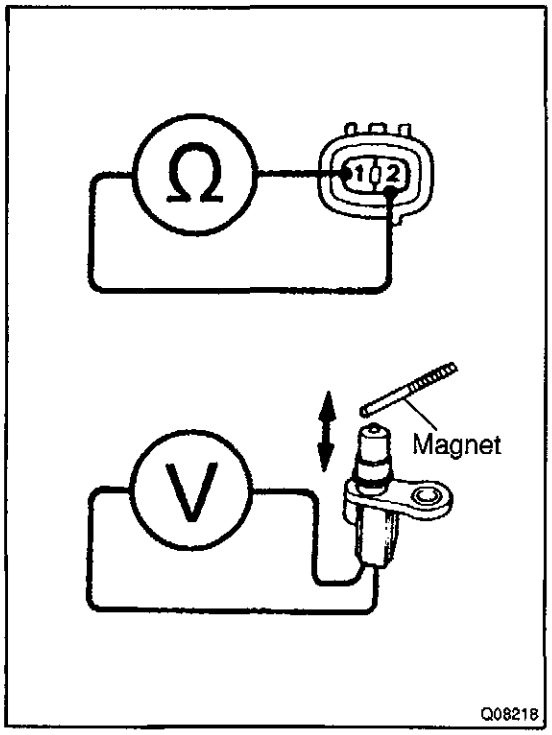
OK:

Resistance: 560 ~ 680 Ω at 20 °C (68 °F)

OK → **Check and replace the Engine & ECT ECU (See page IN–25).**

NG

2	Check No.2 speed sensor.



PREPARATION:

Remove the No.2 speed sensor from the transmission.

CHECK:

(a) Measure resistance between terminals 1 and 2 of No.2 speed sensor.

(b) Check voltage between terminals 1 and 2 of No.2 speed sensor when a magnet is put close to the front end of the No.2 speed sensor then taken away quickly.

OK:

(a) Resistance: 560 – 680 Ω at 20 °C (68 °F)

(b) Voltage is generated intermittently.

HINT:

The voltage generated is extremely low.

NG → **Replace the No.2 speed sensor.**

OK →

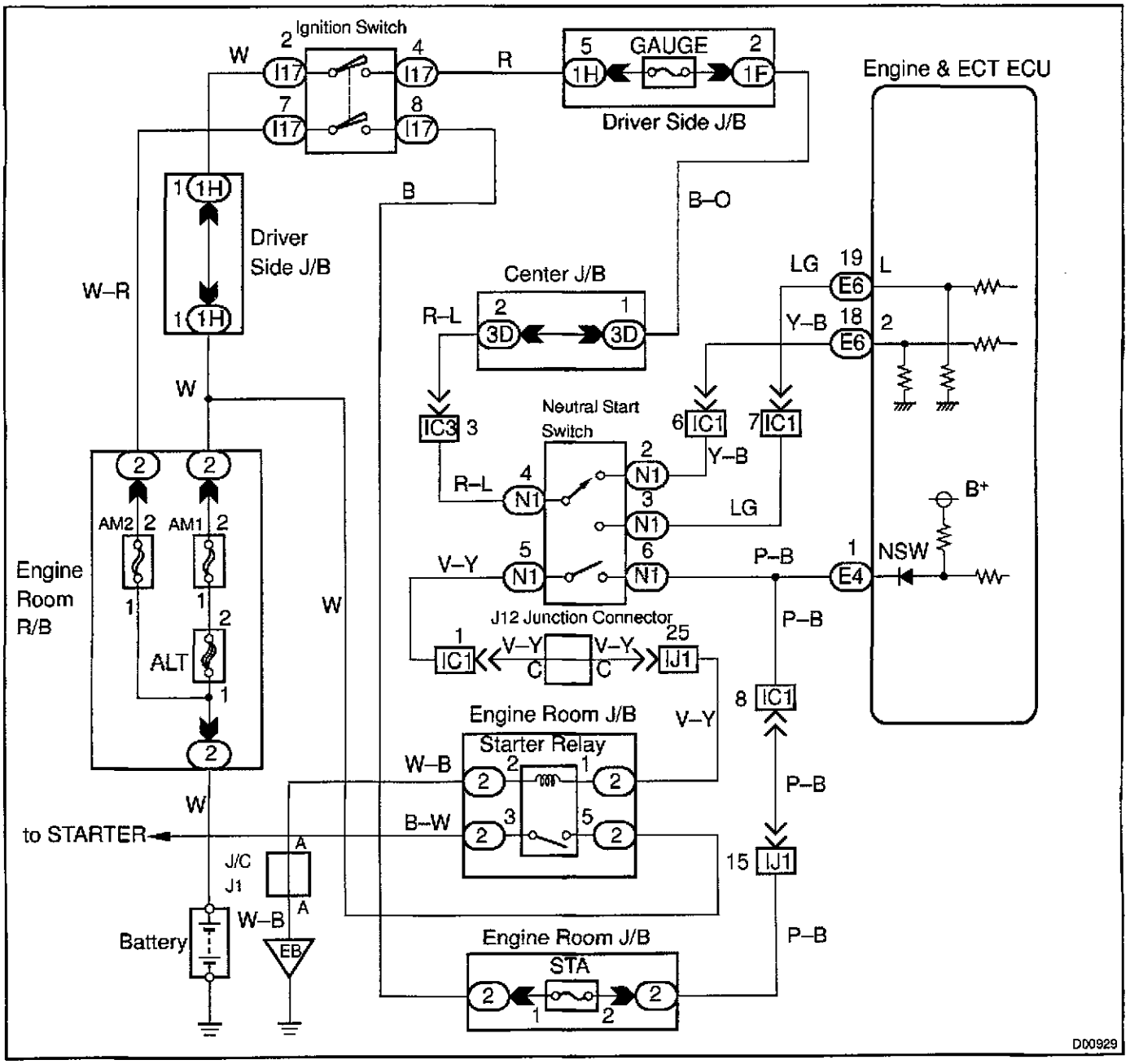
Check and repair the harness and connector between Engine & ECT ECU and No.2 speed sensor (See page IN–25).

Neutral Start Switch Malfunction

CIRCUIT DESCRIPTION

The neutral start switch detects the shift lever position and sends signals to the Engine & ECT ECU.
The Engine & ECT ECU receives signals (NSW, R, 2 and L) from the neutral start switch. When the signal is not sent to the Engine & ECT ECU from the neutral start switch, the Engine & ECT ECU judges that the shift lever is in D range.

WIRING DIAGRAM



INSPECTION PROCEDURE

1	**Read PNP, REVERSE, 2ND and LOW signals.**

When using hand–held tester:

PREPARATION:

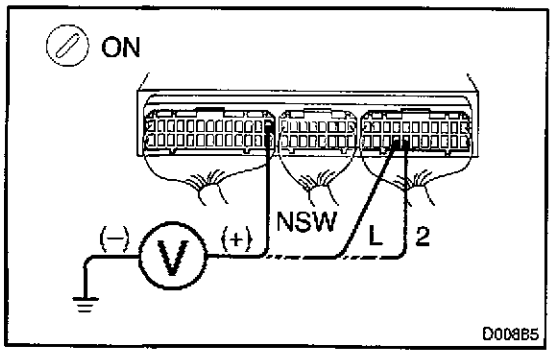
(a) Remove the DLC3 cover.
(b) Connect hand–held tester to the DLC3.
(c) Turn the ignition switch ON and hand–held tester main switch ON.

CHECK:

Shift lever into the P, R, N, 2 and L ranges, and read the PNP, REVERSE, 2ND and LOW signals on the hand–held tester.

OK:

Shift Range	Signal
2	2ND OFF → ON
L	LOW OFF → ON
R	REVERSE OFF → ON
P, N	NSW OFF → ON



When not using hand–held tester:

PREPARATION:

Turn the ignition switch ON.

CHECK:

Measure voltage between terminals NSW, 2, L and R of Engine & ECT ECU and body ground when the shift lever is shifted to the following ranges.

OK:

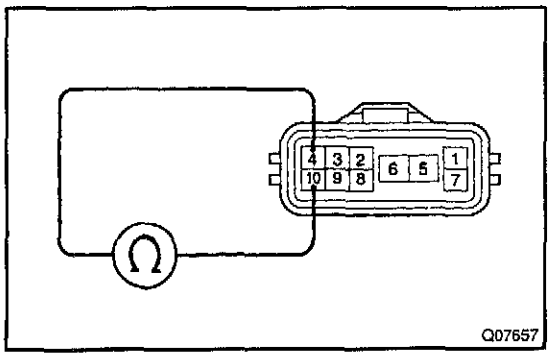
Range	NSW–Body ground	R–Body ground	2–Body ground	L–Body ground
P, N	0 V	0 V	0 V	0 V
R	9 ~ 14 V*	9 ~ 14 V*	0 V	0 V
D	9 ~ 14 V	0 V	0 V	0 V
2	9 ~ 14 V	0 V	9 ~ 14 V	0 V
L	9 ~ 14 V	0 V	0 V	9 ~ 14 V

HINT: The voltage will drop slightly due to lighting up the back up light.

OK → **Check and replace the Engine & ECT ECU (See page IN–25).**

NG

2	**Check neutral start switch.**



PREPARATION:

(a) Jack up the vehicle.

(b) Disconnect the neutral start switch connector.

CHECK:

Check continuity between each terminal shown below when the shift lever is moved to each position.

OK:

Shift Range	Terminal No. to continuity	Terminal No. to continuity
P	4 – 7	5 – 6
R	4 – 8	–
N	4 – 10	5 – 6
D	4 – 9	–
2	2 – 4	–
L	3 – 4	–

NG → **Replace the neutral start switch.**

OK →

Repair or replace harness and connector between battery and neutral start switch, neutral start switch and Engine & ECT ECU (See page IN–25).

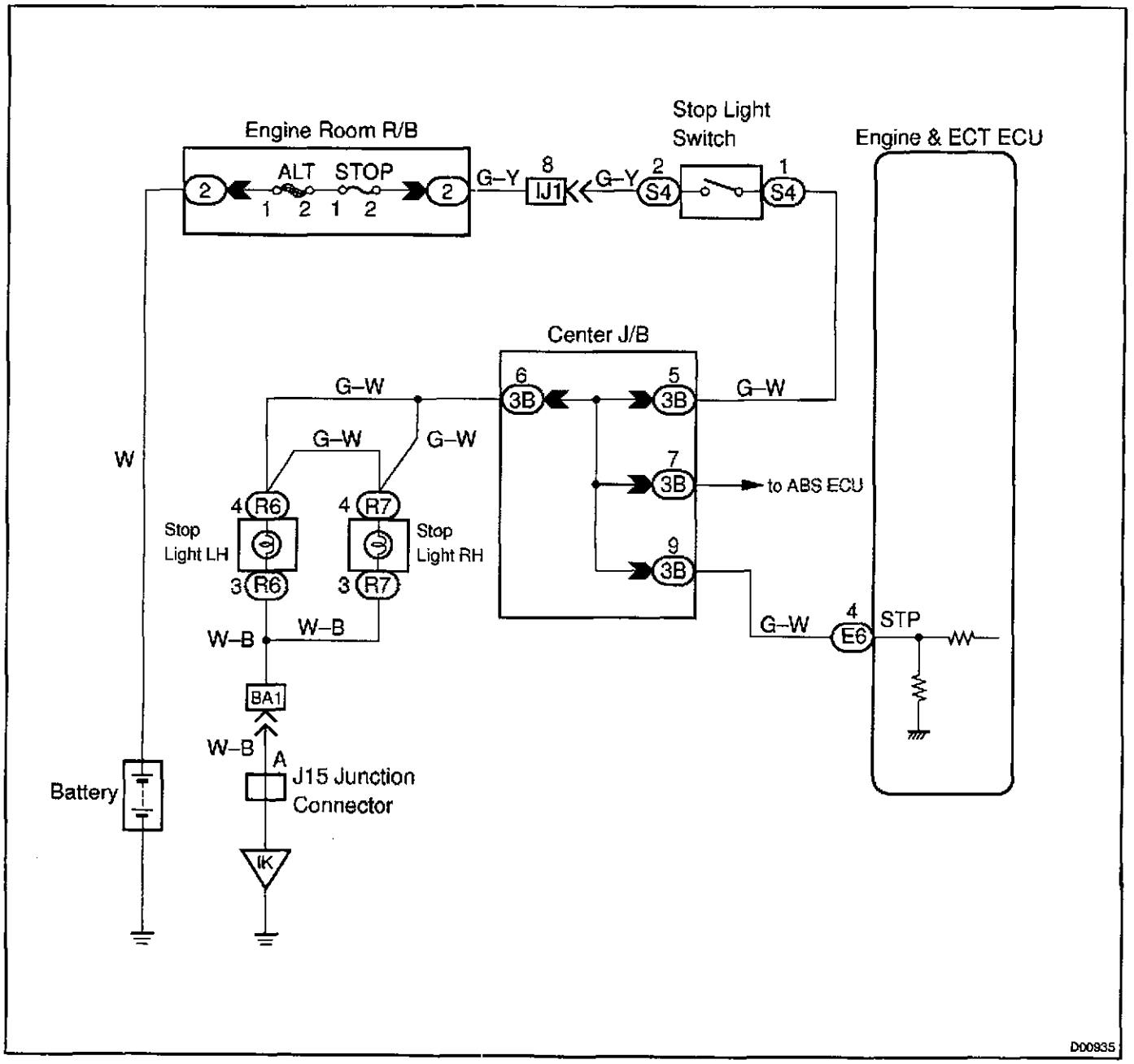
DI017-02

Stop Light Switch Signal Malfunction

CIRCUIT DESCRIPTION

The object of this circuit is to prevent the engine from stalling, while driving in lock–up condition, when brakes are suddenly applied.
When the brake pedal is operated, this switch sends a signal to Engine & ECT ECU. Then the Engine & ECT ECU cancels operation of the lock–up clutch while braking is in progress.

WIRING DIAGRAM



INSPECTION PROCEDURE

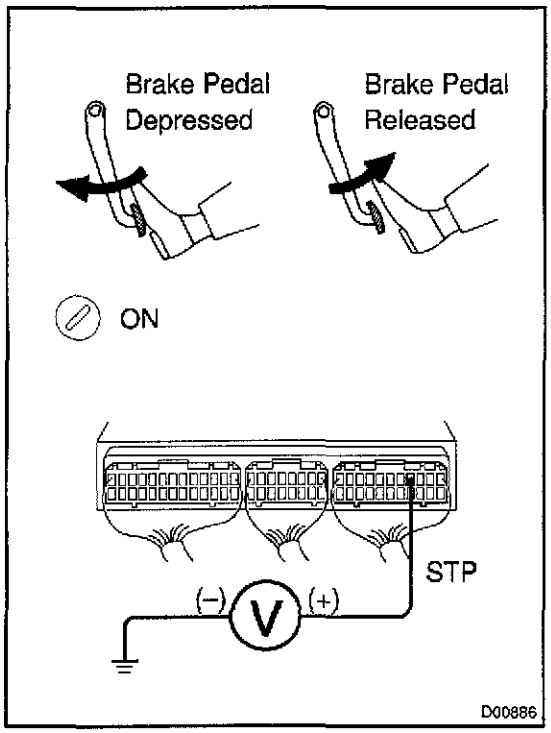
1	**Check operation of stop light.**

CHECK:
Check if the stop lights go on and off normally when the brake pedal is operated and released.

NG → **Check and repair stop light circuit.**

OK

2	**Check STP signal.**



When using hand –held tester:

PREPARATION:

(a) Connect the hand–held tester to the DLC3.
(b) Turn the ignition switch ON and turn the hand–held tester main switch ON.

CHECK:

Read the STP signal on the hand–held tester.

OK:

Brake pedal is depressed: STP....ON
Brake pedal is released: ***STP....OFF***

When not using hand –held tester:

PREPARATION:

Turn the ignition switch ON.

CHECK:

Check voltage between terminal STP of Engine & ECT ECU and body ground.

OK:

Brake pedal	Voltage
Depressed	7.5~14 V
Released	Below 1.5 V

OK → **Proceed to next circuit inspection shown on problem symptoms table (See page DI–20).**

NG

3	Check harness and connector between Engine & ECT ECU and stop light switch (See page IN–25).

NG → Repair or replace harness or connector.

OK →

Check and replace Engine & ECT ECU (See page IN–25).

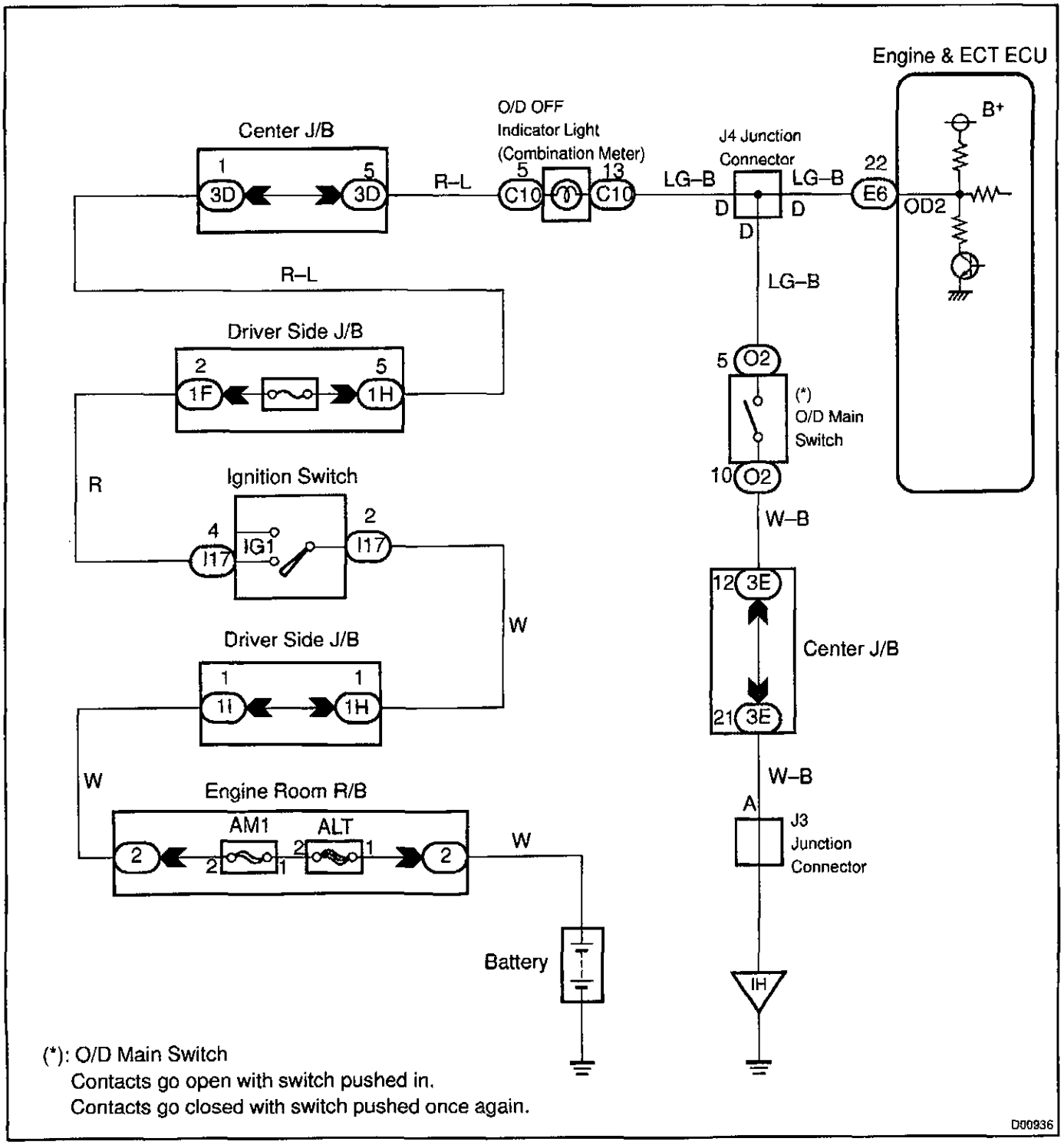
DI1GE-01

O/D Main Switch & O/D OFF Indicator Light Circuit

CIRCUIT DESCRIPTION

The O/D main switch contacts go open when the switch is pushed in and go closed when it is pushed out. In O/D main switch at OFF position, the O/D OFF indicator light lights up, and the Engine & ECT ECU prohibits shifting O/D.

WIRING DIAGRAM



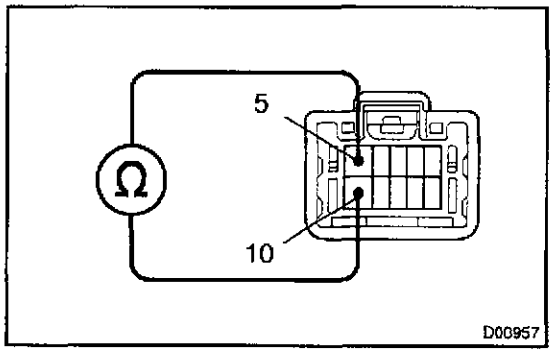
(*): O/D Main Switch
Contacts go open with switch pushed in.
Contacts go closed with switch pushed once again.

D00936

INSPECTION PROCEDURE

O/D OFF indicator light does not light up

1	Check O/D main switch.



PREPARATION:
Disconnect the O/D main switch connector.
CHECK:
Check continuity at each terminal of O/D main switch connector.
OK:

O/D main switch	Specified condition
ON	No continuity
OFF	Continuity

NG → **Replace the O/D main switch.**

OK

2	Check and replace combination meter (See page BE–50).

NG → **Replace the combination meter.**

OK

3	Check OVRDRIVE CUT SW2 signal.

When using hand–held tester:

PREPARATION:

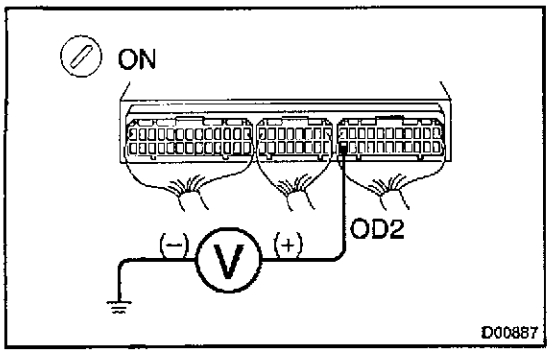
(a) Remove the DLC3 cover.
(b) Connect hand–held tester to the DLC3.
(c) Turn the ignition switch ON and hand–held tester main switch ON.

CHECK:

Read the OVRDRIVE CUT SW2 signal on the hand–held tester.

OK:

O/D main switch condition	OVRDRIVE CUT SW2 signal
O/D ON (Pushed in)	OFF
O/D OFF (Pushed once again)	ON



When not using hand–held tester:

PREPARATION:

Turn the ignition switch ON.

CHECK:

Check voltage between terminal OD2 of Engine & ECT ECU and body ground.

OK:

O/D main switch condition	Voltage
O/D ON (Pushed in)	9 ~ 14
O/D OFF (Pushed once again)	Below 3 V

OK → **Check and replace the Engine & ECT ECU (See page IN–25).**

NG

4	Check harness and connector between O/D OFF indicator light and Engine & ECT ECU (See page IN–25).

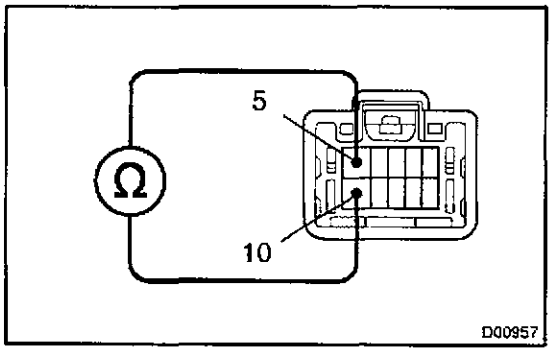
NG → **Repair or replace the harness or connector.**

OK

Check and replace the Engine & ECT ECU (See page IN–25).

O/D OFF indicator light remains ON

1	**Check O/D main switch.**



PREPARATION:
Disconnect the O/D main switch connector.
CHECK:
Check continuity at each terminal of O/D main switch connector.
OK:

O/D main switch	Specified condition
ON	∞ Ω (No continuity)
OFF	0 Ω (Continuity)

NG → **Replace the O/D main switch.**

OK

2	**Check harness and connector between O/D OFF indicator light and O/D main switch, O/D OFF indicator light and Engine & ECT ECU (See page IN–25).**

NG → **Repair or replace the harness or connector.**

OK

Check and replace the Engine & ECT ECU (See page IN–25).