

CIRCUIT INSPECTION

DTC	P0705	Transmission Range Sensor Circuit Malfunction (PRNDL Input)
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DTC	P0850	Park/Neutral Switch Input Circuit
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CIRCUIT DESCRIPTION

The park/neutral position switch detects the shift lever position and sends signals to the ECM.

DTC No.	DTC Detection Condition	Trouble Area
P0705	(2-trip detection logic) • All switches are OFF simultaneously for P, R, N, D, 3 and 2 positions. • 2 or more switches are ON simultaneously for P, R, N, (D 4), 3 and (2 L) positions.	• Short in park/neutral position switch circuit • Park/neutral position switch • ECM
P0850	Park/neutral position switch remains ON (P, N position) during driving under conditions (a) and (b) for 30 sec. (2-trip detection logic) (a) Vehicle speed: 70 km/h (44 mph) or more (b) Engine speed: 1,500 – 2,500 rpm	

MONITOR DESCRIPTION

The park/neutral position switch detects the shift lever position and sends a signal to the ECM.

For security, the park/neutral position switch detects the shift lever position so that engine can be started only when the vehicle is in P or N shift position.

When the park/neutral position switch sends more than one signal at a time from switch positions P, R, N or D, the ECM interprets this as a fault in the switch. The ECM will turn on the MIL and store the DTC.

MONITOR STRATEGY

P0705:

Related DTCs	P0705	Park/neutral position switch/Verify switch input
Required sensors/Components	Park/neutral position switch	
Frequency of operation	Continuous	
Duration	Condition (A), (B) and (D)	2 sec.
	Condition (C)	60 sec.
MIL operation	2 driving cycle	
Sequence of operation	None	

P0850:

Related DTCs	P0850	Park/neutral position switch/Verify switch cycling
Required sensors/Components	Main	Park/neutral position switch
	Sub	Crankshaft position sensor (NE), MAF meter
Frequency of operation	Continuous	
Duration	30 sec.	
MIL operation	2 driving cycles	
Sequence of operation	None	

TYPICAL ENABLING CONDITIONS**P0705:**

Item	Specification	
	Minimum	Maximum
The monitor will run whenever the following DTCs are not present.	See page DI-361	
Ignition switch	ON	
Battery voltage	10.5 V or more	

P0850:

Item	Specification	
	Minimum	Maximum
The monitor will run whenever the following DTCs are not present.	See page DI-361	
Vehicle speed	70 km/h (43 mph) or more	–
Engine speed	1,500 rpm or more	2,500 rpm or less
Intake air amount per revolution	0.9 g/rev. or more	–

TYPICAL MALFUNCTION THRESHOLDS

P0705:

Detection criteria	Threshold
One of the following conditions is met: Condition (A), (B), (C) or (D)	
Condition (A)	
Number of the following signal input at the same time	2 or more
P switch	ON
N switch	
R switch	
D switch	
3 switch	
2 switch	
Condition (B)	
Number of the following signal input at the same time	2 or more
NSW switch	ON
R switch	
D switch	
3 switch	
2 switch	
Condition (C)	
All of following conditions are met	
P switch	OFF
N switch	
NSW switch	
R switch	
D switch	
3 switch	
2 switch	
Condition (D)	
Both (i) and (ii) are met	
(i) One of followings is met	
NSW switch	ON
P switch	
N switch	
R switch	
(ii) One of followings is met	
4 switch	ON
L switch	

P0850:

Detection criteria	Threshold
NSW signal	ON

COMPONENT OPERATING RANGE

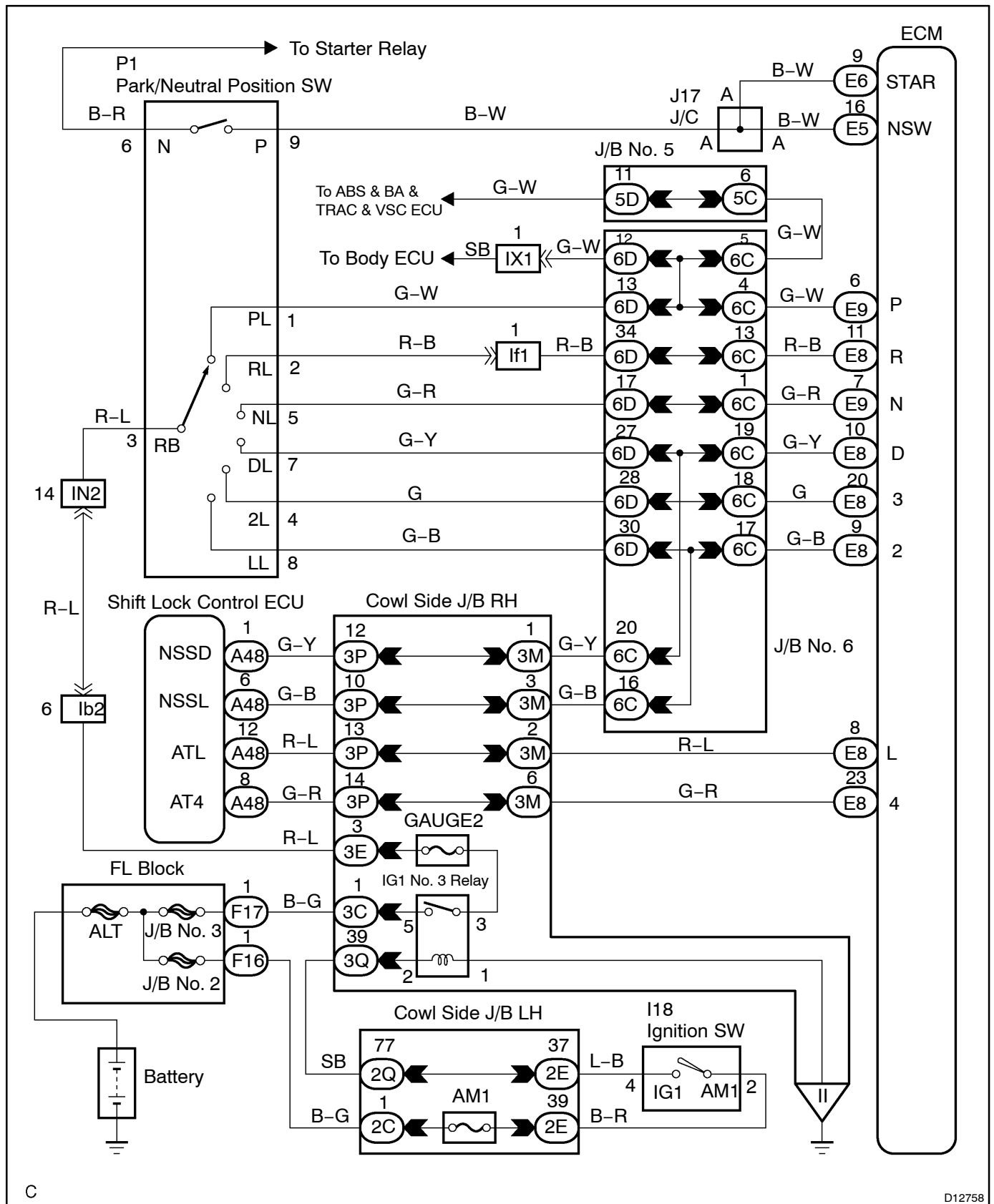
P0705:

Parameter	Standard value
Park/neutral position switch	The park/neutral position switch sends only one signal to the ECM.

P0850:

Parameter	Standard value
Park/neutral position switch	The park/neutral position switch is OFF when above condition.

WIRING DIAGRAM



C

D12758

INSPECTION PROCEDURE

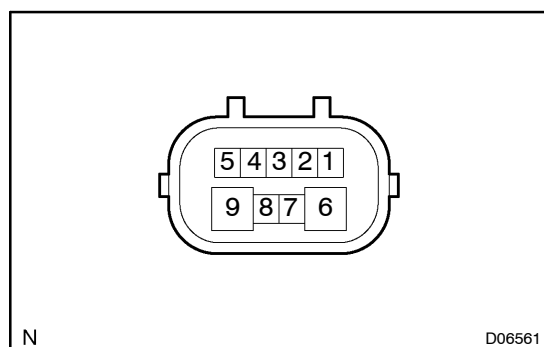
HINT:

According to the DATA LIST displayed by the OBD II scan tool or Hand-held tester, you can read the value of the switch, sensor, actuator and so on without parts removal. Reading the DATA LIST as a first step of troubleshooting is one method to shorten labor time.

- Warm up the engine.
- Turn the ignition switch OFF.
- Connect the OBD II scan tool or Hand-held tester to the DLC3.
- Turn the ignition switch ON.
- Push the "ON" button of OBD II scan tool or Hand-held tester.
- Select the item "/DIAGNOSIS/ENHANCED OBD II/DATA LIST/ALL (or ATM)".
- According to the display on tester, read the "DATA LIST".

Item	Measurement Item/ Display (Range)	Normal Condition	Diagnostic Note
PNP SW [NSW]	PNP SW Status/ ON or OFF	Shift lever position is; P or N: ON Except P or N: OFF	The shift lever position and these values are different, there are failures of the PNP switch or shift cable adjustment.
REVERSE	PNP SW Status/ ON or OFF	Shift lever position is; R: ON Except R: OFF	
DRIVE	PNP SW Status/ ON or OFF	Shift lever position is; D and 4: ON Except D and 4: OFF	

1 Check park/neutral position switch.



PREPARATION:

- Jack up the vehicle.
- Disconnect the park/neutral position switch connector.

CHECK:

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

OK:

Shift position	Terminal No. to continuity	Terminal No. to continuity
P	1 – 3	6 – 9
R	2 – 3	–
N	3 – 5	6 – 9
D, 4	3 – 7	–
3	3 – 4	–
2, L	3 – 8	–

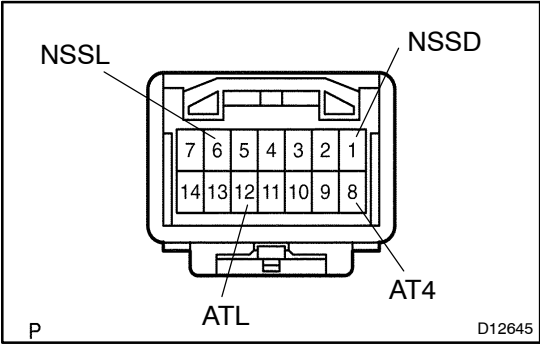
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Replace park/neutral position switch
(See page [AT-7](#)).

OK

2

Check transmission control switch.



PREPARATION:

- (a) Connect the park/neutral position switch connector.
- (b) Disconnect the shift lock control computer connector (transmission control switch).

CHECK:

Check continuity between each terminal of shift lock control computer (transmission control switch).

OK:

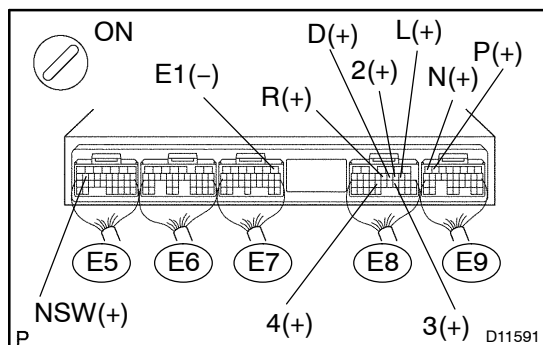
Shift position	Tester connection	Specified valve
D	1 – 8 (NSSD – AT4)	No continuity
4		Continuity
2	6 – 12 (NSSL – ATL)	No continuity
L		Continuity

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Replace the transmission control switch
(See page [AT-20](#)).

OK

3 Measure voltage between each terminals of NSW, P, R, N, D, 4, 3, 2, L and E1 of ECM.



PREPARATION:

- Connect the shift lock control computer connector (transmission control switch).
- Turn the ignition switch ON.

CHECK:

Measure voltage between each terminals NSW, P, R, N, D, 4, 3, 2, L and E1 of ECM when the shift lever is shifted to the following positions.

OK:

Tester connection	Condition	Specified condition
NSW – Body ground	Shift lever position: P and N	Below 1 V
	Shift lever position: Except P and N	Battery voltage
P – Body ground	Shift lever position: P	Battery voltage
R – Body ground	Shift lever position: R	Battery voltage*
N – Body ground	Shift lever position: N	Battery voltage
D – Body ground	Shift lever position: D and 4	Battery voltage
4 – Body ground	Shift lever position: 4	Battery voltage
3 – Body ground	Shift lever position: 3	Battery voltage
2 – Body ground	Shift lever position: 2 and L	Battery voltage
L – Body ground	Shift lever position: L	Battery voltage

HINT:

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

OK

Check and replace the ECM (See page [IN-36](#)).

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Repair or replace the harness or connector
(See page [IN-36](#)).