

CIRCUIT INSPECTION

DTC	P0705	Transmission Range Sensor Circuit Malfunction (PRNDL Input)
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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 NSW, R, N, D, 3 and 2 positions. • 2 or more switches are ON simultaneously for NSW, R, D, 3 and 2 positions.	• Open or short in park/neutral position switch circuit • Park/neutral position switch • ECM

MONITOR DESCRIPTION

These DTCs indicate a problem with the park/neutral position switch and the wire harness in the park/neutral position switch circuit.

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 shift lever is in the P or N position.

The park/neutral position switch sends a signal to the ECM according to the shift position (NSW, R, D, 3 or 2).

The ECM determines that there is a problem with the switch or related parts if it receives more than 1 position signal simultaneously. The ECM will turn on the MIL and store the DTC.

MONITOR STRATEGY

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

TYPICAL ENABLING CONDITIONS

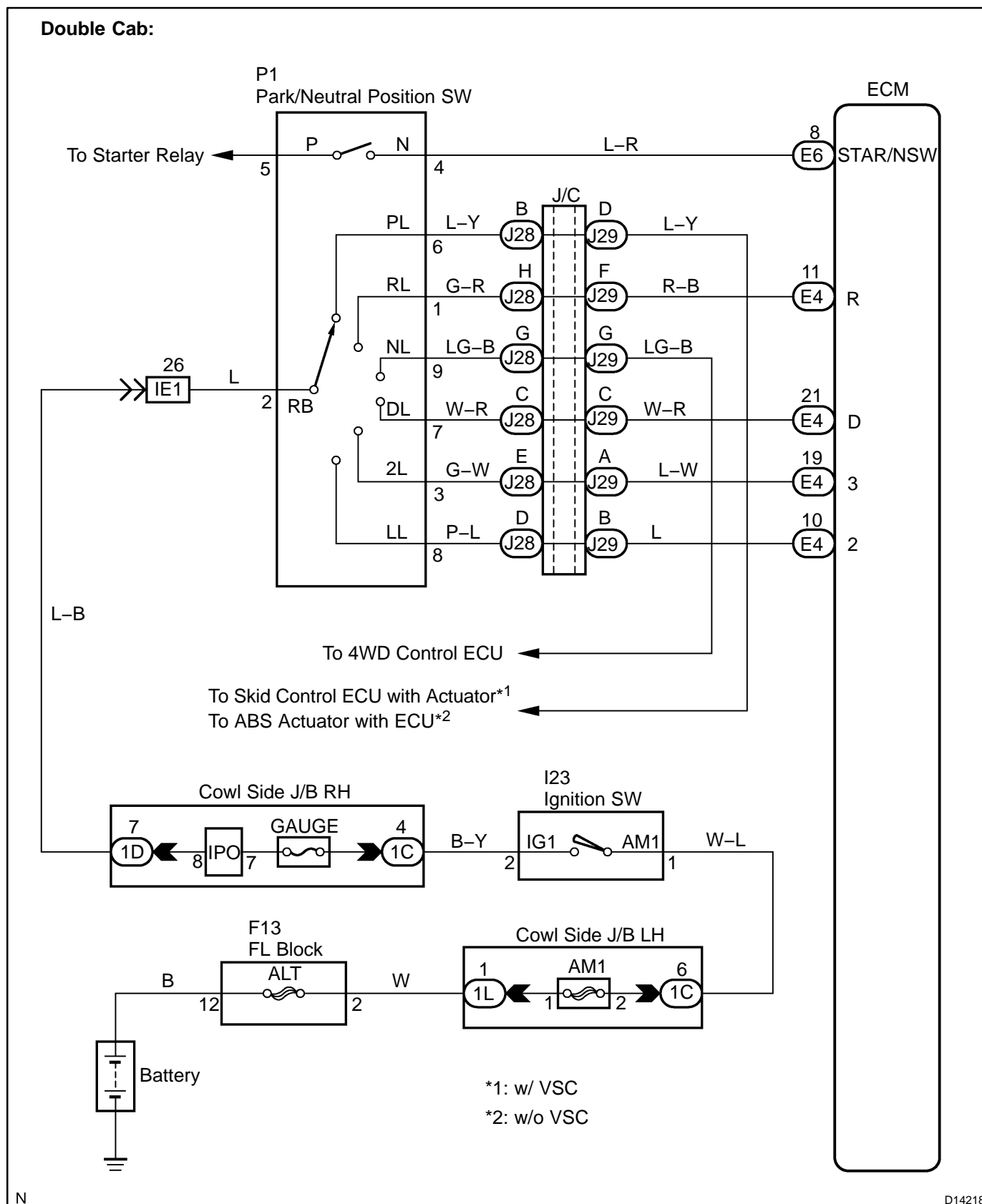
Item	Specification	
	Minimum	Maximum
The monitor will run whenever this DTC is not present.	See page DI-1128	
Ignition switch	ON	
Battery voltage	10.5 V or more	

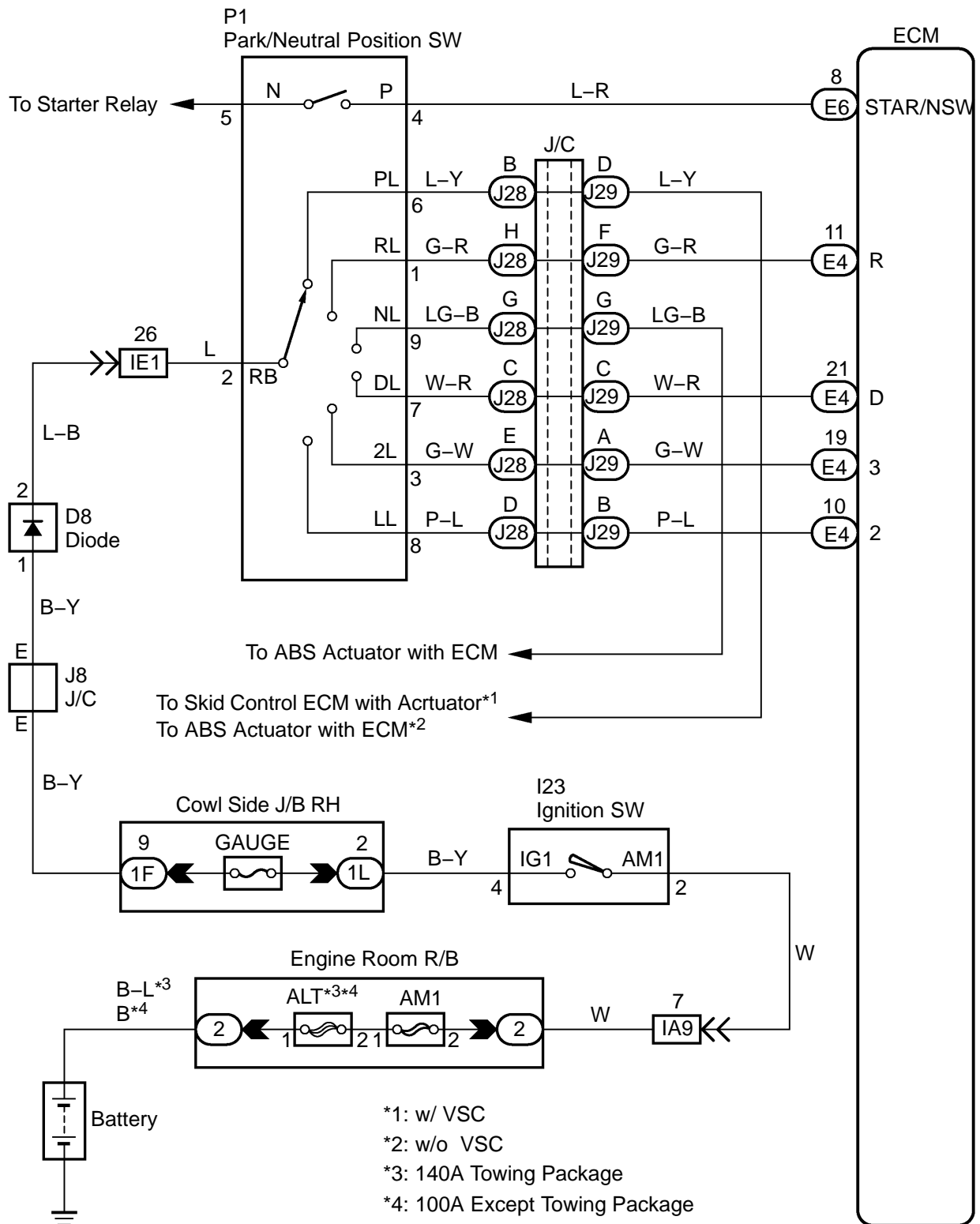
TYPICAL MALFUNCTION THRESHOLDS

Detection criteria	Threshold
One of the following conditions is met: Condition (A) or (B)	
Condition (A)	
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 (B)	
All of following conditions are met	
N switch	OFF
NSW switch	
R switch	
D switch	
3 switch	
2 switch	

COMPONENT OPERATING RANGE

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



Except Double Cab:

INSPECTION PROCEDURE

HINT:

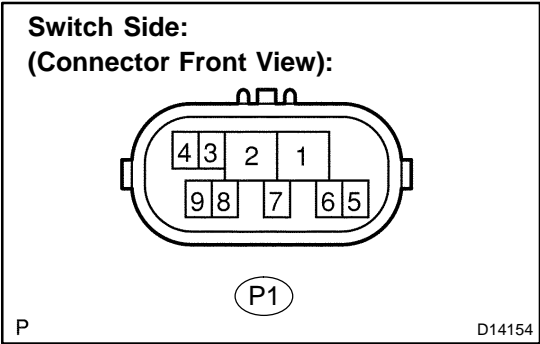
According to the DATA LIST displayed by the OBD II scan tool or hand-held tester, you can read the value of the switch, sensor, actuator and so on without parts removal. Reading the DATA LIST as the first step of troubleshooting is one method to shorten labor time.

- (a) Warm up the engine.
- (b) Turn the ignition switch off.
- (c) Connect the OBD II scan tool or hand-held tester to the DLC3.
- (d) Turn the ignition switch to the ON position.
- (e) Push the "ON" button of the OBD II scan tool or the hand-held tester.
- (f) When you use the hand-held tester:
Select the item "DIAGNOSIS / ENHANCED OBD II / DATA LIST".
- (g) According to the display on the tester, read the "DATA LIST".

Item	Measurement Item/ Range (display)	Normal Condition	Diagnostic Note
PNP SW [NSW]	PNP SW Status/ ON or OFF	Shift lever position is; P and N: ON Except P and N: OFF	When the shift lever position displayed on the hand-held tester differs from the actual position, adjustment of the PNP switch or the shift cable may be incorrect.
LOW	PNP SW Status/ ON or OFF	<ul style="list-style-type: none"> • Shift lever position is 2: OFF <li style="text-align: center;">↓ • Shift position L switch Push: ON <li style="text-align: center;">↓ • Shift position L switch Push: OFF 	↑
2ND	PNP SW Status/ ON or OFF	Shift lever position is; 2 and L: ON Except 2 and L: OFF	↑
3RD	PNP SW Status/ ON or OFF	Shift lever position is; 3: ON Except 3: OFF	↑
DRIVE	PNP SW Status/ ON or OFF	Shift lever position is; D: ON Except D: OFF	↑
REVERSE	PNP SW Status/ ON or OFF	Shift lever position is; R: ON Except R: OFF	↑

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Inspect park/neutral position switch.



PREPARATION:

- (a) Jack up the vehicle.
- (b) Disconnect the park/neutral position switch connector.

CHECK:

Measure the resistance according to the value(s) in the table below when the shift lever is moved to each position.

OK:

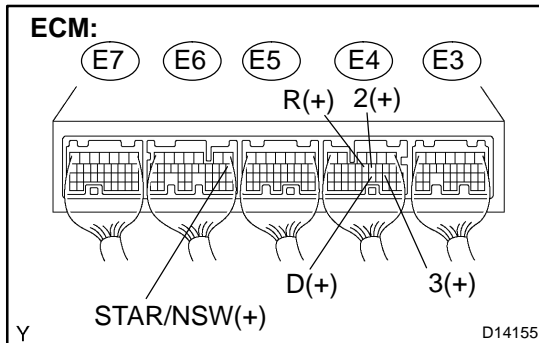
Shift Position	Tester Connection	Specified Condition
P	2 – 6 and 4 – 5	Below 1 Ω
Except P	↑	10 kΩ or higher
R	2 – 1	Below 1 Ω
Except R	↑	10 kΩ or higher
N	2 – 9 and 4 – 5	Below 1 Ω
Except N	↑	10 kΩ or higher
D	2 – 7	Below 1 Ω
Except D	↑	10 kΩ or higher
3	2 – 3	Below 1 Ω
Except 3	↑	10 kΩ or higher
2	2 – 8	Below 1 Ω
Except 2	↑	10 kΩ or higher

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Replace park/neutral position switch
(See page AT-11).

OK

2 Check harness and connector (Park/neutral position switch – ECM).



PREPARATION:

- Connect the park/neutral position switch connector.
- Turn the ignition switch ON.

CHECK:

Measure the voltage according to the value(s) in the table below when the shift lever is moved to each position.

OK:

Shift Position	Tester connection	Specified condition
P and N	E6 – 8 (STAR/NSW) – Body ground	Below 2 V
Except P and N	↑	10 to 14 V
R	E4 – 11 (R) – Body ground	10 to 14 V*
Except R	↑	Below 1 V
D	E4 – 21 (D) – Body ground	10 to 14 V
Except D	↑	Below 1 V
3	E4 – 19 (3) – Body ground	10 to 14 V
Except 3	↑	Below 1 V
2 and L	E4 – 10 (2) – Body ground	10 to 14 V
Except 2 and L	↑	Below 1 V

HINT:

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

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Repair or replace the harness or connector (See page IN-30).

OK

Replace the ECM (See page SF-82).