

# P0850-P0852 Park/Neutral Position (PNP) Switch Circuit

## Diagnostic Instructions

- Perform the Diagnostic System Check – Vehicle on page 6-60 prior to using this diagnostic procedure.
- Review Strategy Based Diagnosis on page 6-57 for an overview of the diagnostic approach.
- Diagnostic Procedure Instructions on page 6-58 provides an overview of each diagnostic category.

## DTC Descriptors

**DTC P0850:** Park/Neutral Position (PNP) Switch Circuit

**DTC P0851:** Park/Neutral Position (PNP) Switch Circuit Low Voltage

**DTC P0852:** Park/Neutral Position (PNP) Switch Circuit High Voltage

## Diagnostic Fault Information

Circuit	Short to Ground	Open/High Resistance	Short to Voltage	Signal Performance
Park/Neutral Signal	P0850/P0851	P0850/P0852	P0850/P0852	—

## PNP Switch

Circuit	Short to Ground	Open/High Resistance	Short to Voltage
<b>Operating Conditions:</b> Engine running, normal operating temperature			
<b>Parameter Normal Range:</b> 12 Volts = In-Gear, 0 Volts = Park/Neutral			
Park/Neutral Signal	Park/Neutral	In-Gear	In-Gear

## Circuit/System Description

The transmission manual shift shaft switch assembly, also known as the

Internal Mode Switch (IMS), is a sliding contact switch attached to the manual shift shaft inside the transmission case. The Park/Neutral Position (PNP) Switch is integrated into the IMS and connects to the Transmission Control Module (TCM) lead-frame through a short wire harness. The 5 inputs to the TCM from the transmission manual shift shaft switch assembly indicate the transmission gear selector lever position. This information is used for engine start enable, engine controls as well as determining the transmission shift patterns. The state of each input is available for display on the scan tool. The five input parameters represented are Signal A, Signal B, Signal C, Signal P (Parity), and Signal N (Park/Neutral Start Signal). Park/Neutral Signal is sent from the Park/Neutral switch directly to the Engine Control Module (ECM) and is used for engine start enable. The Park/Neutral Signal circuit is not connected to the TCM internally. The circuit uses the TCM as a pass-through connector only. The ECM Park/Neutral diagnostic monitors the Park/Neutral signal circuit to detect low voltage when the ECM expects high voltage and high voltage when the ECM expects low voltage.

## Conditions for Running the DTC

- Ignition voltage is between 8–18 volts.
- Engine speed is greater than 1000 RPM.

## Conditions for Setting the DTC

### P0850 and P0851

- The ECM detects the Park/Neutral switch signal equals 0 volts (Park/Neutral) when the IMS reports a Drive range for 0.2 second.
- TP is equal to or greater than 10 percent.
- Engine torque is equal to or greater than 75 N·m (55 lb ft).
- Vehicle speed is equal or greater than 10 km/h (6 mph).

### P0852

The ECM detects the Park/Neutral switch signal equals 12 volts (In-Gear) when the IMS reports a Park/Neutral range for 0.2 second.

## Action Taken When the DTC Sets

- DTCs P0850, P0851, and P0852 are Type C DTCs.
- The ECM uses IMS Range for engine start-up.

## Conditions for Clearing the DTC

DTCs P0850, P0851, and P0852 are Type C DTCs.

## Reference Information

### Schematic Reference

Automatic Transmission Controls Schematics on page 17-8

## Connector End View Reference

Component Connector End Views on page 11-211

### Description and Operation

Electronic Component Description on page 17-279

### Electrical Information Reference

- Circuit Testing on page 11-456
- Connector Repairs on page 11-478
- Testing for Intermittent Conditions and Poor Connections on page 11-460
- Wiring Repairs on page 11-465

### DTC Type Reference

Powertrain Diagnostic Trouble Code (DTC) Type Definitions on page 6-61

### Scan Tool Reference

Control Module References on page 6-1 for scan tool information

## Special Tools

DT-47825-20 Adapter Harness

## Circuit/System Verification

If there are any other transmission DTCs set, diagnose those DTCs first. Refer to Diagnostic Trouble Code (DTC) List - Vehicle on page 6-62.

- 1). Ignition ON, observe the scan tool ECM Park/Neutral switch parameter while moving the gear shift lever from Park and through all ranges. The parameter should display Park/Neutral when in Park or Neutral and

In-Gear when in Reverse or Drive.

- 2). Observe the scan tool TCM IMS parameter while slowly moving the gear shift lever from Park through all ranges. Verify the gear position matches the scan tool parameter.

If not the specified value, refer to Range Selector Lever Cable Adjustment on page 17-149.

- 3). Operate the vehicle within the Conditions for Running the DTC to verify the DTC does not reset. You may also operate the vehicle within the conditions that you observed from the Freeze Frame/Failure Records data.

## Circuit/System Testing

- 4). Ignition OFF, disconnect the 20-way harness connector at the transmission.
- 5). Install the DT-47825-20 to the 20-way harness connector to the engine harness.
- 6). Test for less than 10 ohms between the ground circuit terminal 18 and ground.

If greater than the specified range, test the ground circuit for an open/high resistance.

- 7). Ignition ON, test for B+ between the adapter harness terminal 20 and ground.

If not within the specified range, test the park/neutral signal circuit for a short to ground or an open/high resistance. If the circuit tests normal, replace the ECM.

- 8). Ignition OFF, install the DT-47825-20 to the 20-way harness connector at the transmission.
- 9). Gear shift lever in Park, test for less than 1 ohm between the adapter harness pins 18 and 20.

If greater than the specified range, test the shaft position switch assembly. Refer to Component Testing. If the shaft position switch assembly tests normal, replace the control solenoid (w/body and TCM) valve assembly.

- 10). Gear shift lever in D (drive), test for infinite resistance between the adapter harness pins 18 and 20.

If not the specified value, test the shaft position switch assembly, refer to Component Testing. If the switch assembly test normal, replace the control solenoid (w/body and TCM) valve assembly.

If all circuits test normal, replace the ECM.

## Component Testing

- 11). Remove the control valve body cover. Refer to Control Valve Body Cover Replacement on page 17-160.
- 12). Gear shift lever in park (P), disconnect the shaft position switch assembly harness connector.
- 13). Test for less than 1 ohm between the shaft position switch assembly harness connector pin F and pin A.  
If greater than the specified range, replace the shaft position switch assembly.
- 14). Ignition ON, engine OFF, gear shift lever in reverse, test for infinite resistance between the shaft position switch assembly harness connector pin F and pin A.

If not the specified value, replace the shaft position switch assembly.

## Repair Instructions

### Important:

- Perform the Service Fast Learn Adapts on page 17-102 following all transmission related repairs.
- Before replacing the TCM, perform the Control Solenoid Valve and Transmission Control Module Assembly Inspection on page 17-98. Perform the Diagnostic Repair Verification on page 6-86 after completing the diagnostic procedure.
- Control Module References on page 6-1 for ECM or control solenoid (w/body and TCM) valve assembly replacement, setup, and programming
- Range Selector Lever Cable Adjustment on page 17-149
- Control Valve Body Cover Replacement on page 17-160
- Manual Shift Detent Lever with Shaft Position Switch Assembly Replacement on page 17-130