P2800: TRANSMISSION RANGE SENSOR "B" CIRCUIT MALFUNCTION (PRNDL INPUT)

OVERVIEW

Severity	:	High
DIY Difficulty Level	:	Intermediate
Repair Cost	:	**$35-$350**
Can I Still Drive?	:	No

What Does The P2800 Code Mean?

The P2800 diagnostic trouble code (DTC) refers to a switch either external or internal on the transmission whose function is to signal the Powertrain Control Module (PCM) or the Transmission Control Module (TCM) as to the gear shift position — P, R,N and D positions (park, reverse, neutral, and drive). The backup lights may also function through the Transmission Range Sensor (TRS) if it is an external component.

The code is telling you that the computer has recognized a failure in the “B” TRS sensor. The sensor is either sending an erroneous or no signal at all to the computer identifying the gear position. The computer receives signals from the vehicle speed sensor as well as the TRS.

When the vehicle is moving and there are contradictory signals being received by the computer, such as the TRS signal indicates that the vehicle is in park, however the speed sensor indicates that it is moving, the code P2800 is set.

External TRS failure is common as age and mileage accumulates. It’s exposed to the weather and elements, and as with any printed circuit tends to corrode over time. The upside to this is they are not an expensive repair and easy to replace with little automotive repair experience.

Later models with the transmission range sensor located in the valve body are a different ball game. The range sensor is separate from the neutral safety switch and reverse backup light switch.

Its mission is the same, but it's replacement has now become a more serious matter both in difficulty and expense. The easiest method for determining which type is used on your vehicle is to look up the part on your local auto parts website. If it is not listed it's internal.

What Are The Symptoms Of The P2800 Code?

Symptoms of a P2800 DTC may include:

- Malfunction Indicator Lamp (MIL) illumination with P2800 DTC code set
- The backup lights may fail to function
- It may be necessary to move the gearshift lever up and down slightly for a better contact to allow the starter to actuate and start the engine
- It may be impossible to actuate the starter
- In some cases, the engine will only start in neutral
- May start in any gear
- Irregular shift RPMs
- Drop in fuel economy
- The transmission may display a delayed engagement
- Toyota vehicles to include trucks may display erratic instrument readings

What Are The Potential Causes Of The P2800 Code?

The causes for this DTC may include:

- TRS "B" is loose and mal-adjusted
- Transmission range sensor "B" is defective
- Bad connector at the external TRS "B", either loose, corroded or bent pins
- Shorted wiring harness on the external sensor as a result of rubbing on the transmission linkage
- Blockage in the internal valve body TRS port or defective sensor

How Can You Fix The P2800 Code?

Replacement of an internal TRS requires using a Tech II for diagnosis, followed by draining the transmission and removing the pan.

The sensor is located in the bottom of the valve body, which is responsible for all the functions of the transmission. The sensor is submerged in hydraulic fluid continuously which causes case problems. Many times hydraulic flow is restricted or O ring sealing has initiated the problem.

In any event, this is a complicated process better left to a transmission specialist.

Replacing external transmission range sensors:

- Block the wheels and apply the parking brake.
- Place the transmission in neutral
- Locate the transmission shift linkage. On front wheel drive vehicles it will be located on the top of the transaxle. On rear wheel drive vehicles it will be on the driver's side
- Pull the electrical connector out of the TRS sensor and inspect it closely. Look for corroded, bent or pushed out (missing) pins in the sensor. Check the connector on the harness for the same thing, but in this case there are female ends that must be in place. The harness connector can be replaced separately if it can't be saved with cleaning or straightening the female connectors. Place a small amount of dielectric grease in the connector before reconnecting
- Look at the wiring harness location and make sure it's not rubbing on the shift linkage. Check for broken or shorted wires do to lack of insulation
- Check the sensor for looseness. If it is loose, place the parking brake on and the transmission in neutral. Turn the key on and swivel the TRS until the back up lights come on. At this point tighten the two bolts on the TRS. If the vehicle is a Toyota, you must rotate the TRS until a 5mm drillbit fits into the hole in the case before tightening it down
- Remove the nut retaining the gearshift lever and lift the lever off
- Pull the electrical connector from the sensor
- Remove the two bolts securing the sensor to the transmission. Unless you want to practice magic and turn this ten-minute job into several hours, don't drop the two bolts into no man's land
- Lift the sensor off the transmission
- Look at the new sensor and make sure the tick marks on the shaft and the case, where it's marked "neutral" are in alignment
- Install the sensor over the shift lever shaft and install and tighten the two bolts
- Plug in the electrical connector
- Re-install the shift lever and tighten the nut

Additional Note: The external TR sensor found on some Fords may be refered to a MLPS or manual lever position sensor.

Related Transmission Range Sensor codes: P2801, P2802, P2803, and P2804.

Reference Sources

P2800 Transmission Range Sensor TRS B Circuit Malfunction, OBD-Codes.