

# Spitronics - Throttle Position Sensor (TPS) - Guide

## 1. Overview

The Throttle Position Sensor (TPS) indicates driver demand to the ECU. It is used in multiple ECU functions, including:

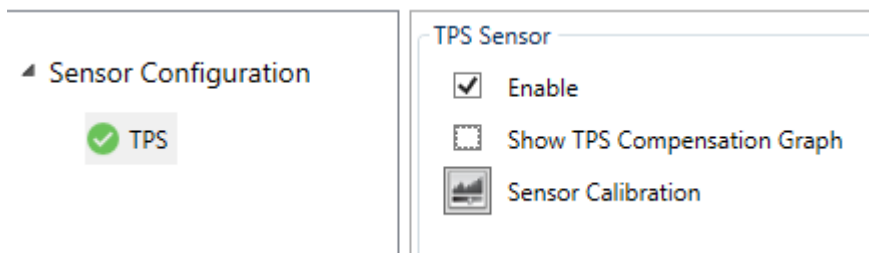
- Fueling
- Accelerator pump
- Idle control
- Fuel cut-off
- Cam control
- Automatic transmission control
- Throttle-by-wire control

👉 The engine can run without a TPS sensor, but drivability will be limited

👉 If a TPS sensor is available on the engine, it is strongly recommended to connect it

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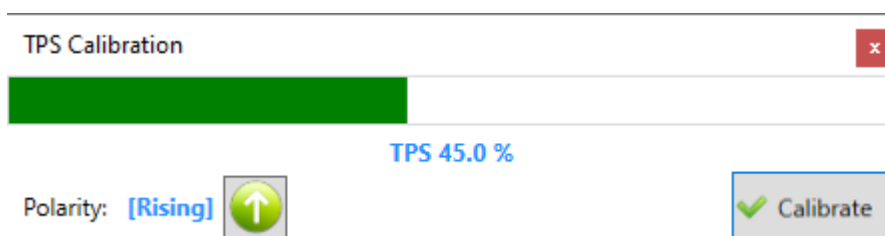
## 2. Enabling / Disabling the TPS



If no TPS sensor is used:

- Unselect the TPS checkbox
  - Isolate all TPS wiring to prevent short circuits
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## 3. Calibration



⚠ Calibration is required for correct operation

⚠ During calibration, the Fuel Prime function may inject fuel into the cylinders

👉 To prevent this:

- Disconnect P2 and P3 connectors before calibration
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## 4. Calibration Procedure

1. Click the **Calibrate** button next to the TPS checkbox
  2. Fully press and release the throttle pedal
  3. The ECU will automatically record the **Min** and **Max** values
  4. Click **Save**
  5. Press and release the throttle pedal to verify operation
  6. Confirm the TPS value moves from **0% to 100%**
  7. Click **Save to ECU** to store the settings permanently
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## 5. Polarity

👁️ The TPS value must increase when the throttle is pressed

Polarity: [Rising] 

If the value decreases:

- Click **Polarity**
  - Select **Negative**
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### **Special Case: OEM ECU Still Connected**

If the original ECU remains connected:

- Connect only the TPS signal wire
- Do NOT connect 5V or Ground
- Isolate unused wires

👉 This prevents electrical conflicts between ECUs

👉 Ensure both ECUs share a common ground

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## 6. Real-Time Display



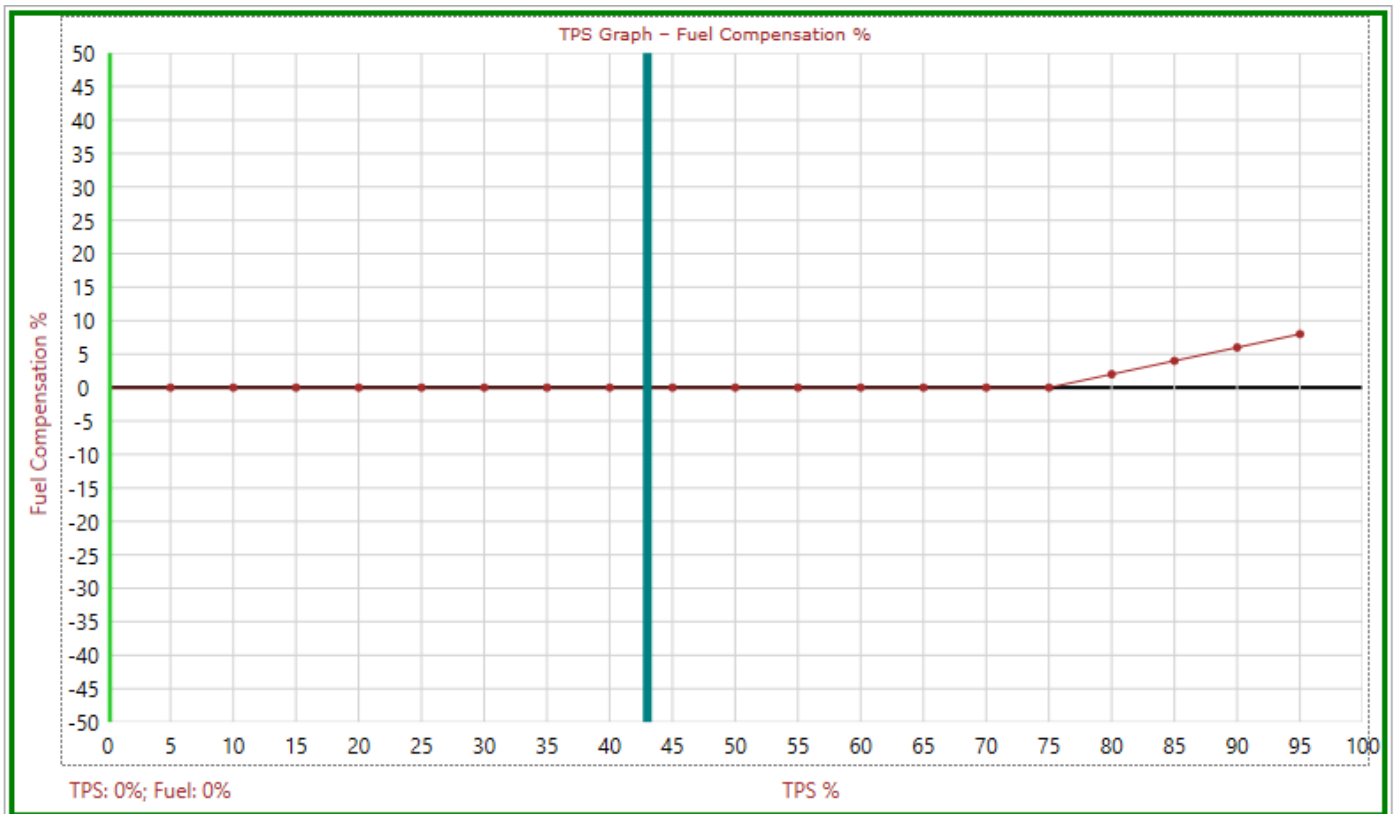
If the TPS is correctly calibrated, the value will indicate **0% to 100%** in sync with actual throttle movement.

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## 7. Show Graph

Show TPS Compensation Graph

Enable **Show Graph** to display the TPS compensation graph.



## **8. Tuning (TPS Compensation)**

The TPS compensation graph allows additional fuel to be added based on throttle position.

Use this to:

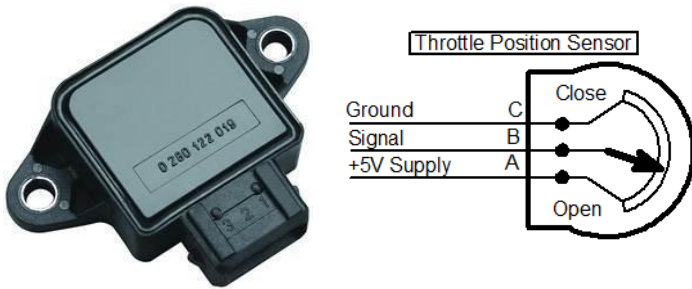
- Enrich fuel at high throttle positions
- Improve performance under load
- Compensate for altitude variations

### **Important Notes**

- No ignition timing compensation is applied in this graph
- Primary fueling should still be done using MAP-based tuning
- TPS compensation is used for fine adjustment at WOT

## 9. Sensor Hardware Description

The throttle position sensor (TPS) is used by the ECU, TCU and TxW to determine the driver's intent.



This sensor is very important and must provide a stable signal.

In most cases, the TCU and TxW operates alongside the ECU. The TCU can tap into the signal from the existing TPS, or, with Spitronics ECUs, a yellow wire is provided in the harness for this signal.

👉 Refer to the drawings for correct wiring.

### Operation

The TPS is a variable resistor, typically around 5 k $\Omega$ . The signal voltage varies as the wiper moves.

It is connected to a 5 V supply from the ECU, and the wiper produces a signal between 0 and 5 V, proportional to the throttle angle.

### Which Pin is Which?

Use a multimeter set to the 20 k $\Omega$  range.

1. With the throttle closed, find the two pins with the lowest resistance between them. These are pins C and B. The remaining pin is the 5 V pin (A).
2. With one probe on the 5 V pin (A), find the pin whose resistance changes when the throttle is moved. This is the signal pin (B).
3. The remaining pin is the earth pin (C).

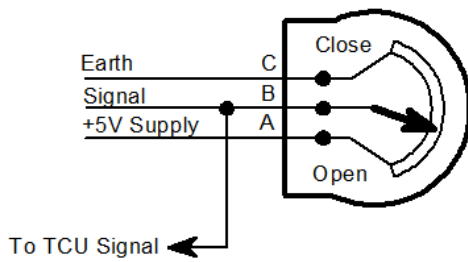
This same method can be used on a four-pin TPS. Note that only three of the four pins will be connected, or one pin may act as a switch to ground or 5 V as an idle activation switch.

👉 The Spitronics ECU does not require this additional pin.

### Pre-load the Sensor

The sensor has a dead band at either end, so it must be rotated slightly to move the wiper into the operating range.

### TPS connected to Existing ECU



## **Connecting the TCU TPS to an Existing ECU TPS Sensor**

The TCU TPS can be connected by tapping into the existing ECU TPS signal.

👉 Only the signal wire must be connected. Do not connect power or ground.

## **TPS Sample Pinouts**



VW Golf mp9

Pin 1 - Idle Control  
Pin 2 - Idle Control  
Pin 4 - TPS Negative  
Pin 5 - TPS Signal  
Pin 7 - TPS Positive



VW 3 Pin

Pin 1 - Negative  
Pin 2 - Signal  
Pin 3 - Positive



Toyota 4 Pin

Pin 1 - Negative  
Pin 2 - Not used  
Pin 3 - Signal  
Pin 4 - Positive

## **i More Info:**

Hardware Manuals → Sensors → Throttle Position Sensor