

Throttle Position Sensor TCU

The Throttle Position Sensor is also used by the TCU to determine what the driver's intent is. The TCU will use the TPS, engine RPM and road speed to calculate a shift pattern to use. It is also used for features such as kick down, lockup control and smooth shifting. It is not possible to control the transmission without this sensor. This sensor is very important and must be a stable signal. Most of the time the TCU will operate side by side to the ECU. The TCU can tap into the signal from the existing TPS or as with Spitronics ECU's there is a yellow wire that is installed in the harness for this signal. Do not connect any supply or earth to existing TPS connections. Just the signal wire is connected. See the drawings on this. There are also stand-alone versions of the TCU harnesses to supply the power and earth wires for TPS and RPM sensors if the engine has a carburetor. See the wiring drawings for each product.

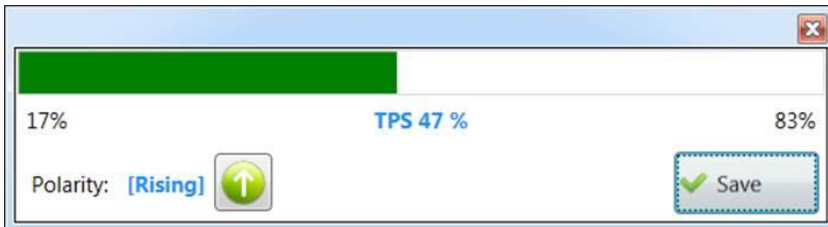
Settings



This signal is a critical setting which means it is saved separate from the 4 maps. It can only be calibrated in MAP 1 and does not change when other maps are loaded in the TCU. The Clone function will alter this calibration to the Clone map.

For the TCU to operate correctly this sensor needs to be calibrated. **Note:** When pressing the throttle while calibrating, the Fuel Prime function may squirt some petrol on the cylinders. You may disconnect the ECU output connectors first so that these functions will have no effect.

Click on the *Calibrate*  button left of the TPS check box and do the following procedure:



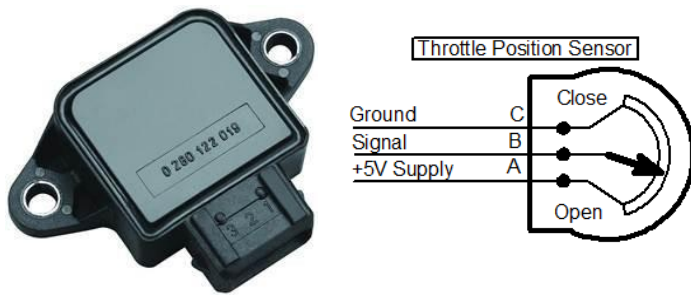
The TPS value must increase with throttle depression. If it is decreasing, click on *Polarity* to select *Negative*. This feature is normally used where the original ECU is still connected and wiring cannot be altered. In this case you connect only the TCU TPS signal wire to the OEM signal wire. Now click the *Calibrate* button. The current TPS value will be written into the two blocks *Min* and *Max*.

Press the fuel pedal in completely and release the pedal completely. The *Min* and *Max* values will be indicating the range of the TPS. Click the *Save* button. You may now test the TPS signal by pressing the pedal in and releasing it. The TPS real time value should operate from 0 to 100%. Then click on



the 'Save to ECU' button to make the changes permanent.

Sensor Hardware Description



Operation

The TPS is a variable resistor normally around 5K ohms. The signal voltage varies as the wiper moves. It is connected to 5 volts from the ECU and then the wiper signal will produce a voltage between 0 and 5 volts, proportional to the angle of the throttle plate.

Which Pin is which?

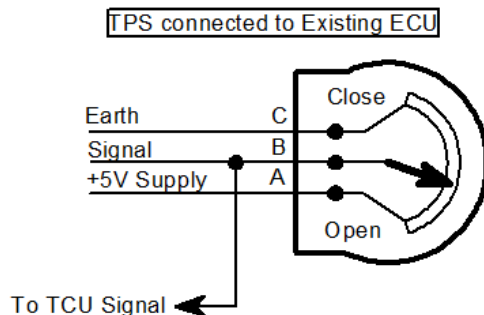
Use a multi-meter set to the 20,000 ohm (20 K) range.

1. With throttle closed, find the two pins with the lowest resistance between them. They are C & 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 moves. This is the Signal pin B.
3. The remaining pin is the earth pin C.

This same route can be used on a four pin throttle position sensor, note that only three of the four pins will be connected or one pin may be a switch to ground or 5 Volt as an idle activation switch. The Spitronics ECU does not require this pin.

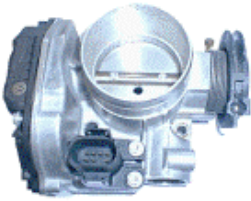
Pre-load the Sensor

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



Connecting the TCU TPS to an existing ECU TPS sensor.

TPS Sample Pin outs:



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