Throttle Position Sensor

Settings


This sensor indicates to the ECU what the driver wants to do. It is also used for many features in the ECU, such as fueling, accelerator pump, idling control, fuel cutoff, cam control, automatic transmission control, etc. It is possible to control the engine without this sensor but with limited drivability. If there is a TPS sensor on the engine, rather connect it. If not, un-select the check box and isolate the wiring.

For the ECU 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 P2 and P3 connectors so that these functions will have no effect.

Click on the *Calibrate* button left of the TPS check box and do the following procedure:
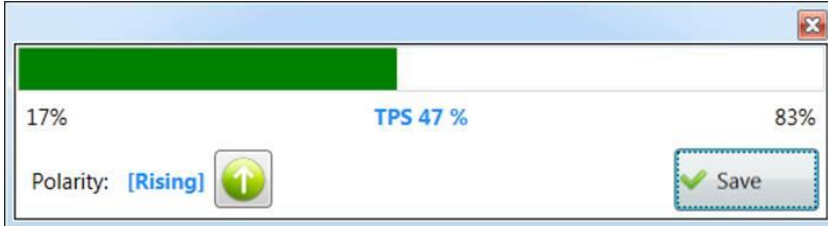
The TPS value must increase with throttle depression. If it is decreasing, click on *Polarity* to select *Negative*. This feature is normally used where the original ECU is still connected and wiring cannot be altered. In this case you connect only the ECU TPS signal wire to the OEM signal wire. Do not connect the ground or 5-volt signal wires but isolate them to prevent shorts. 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

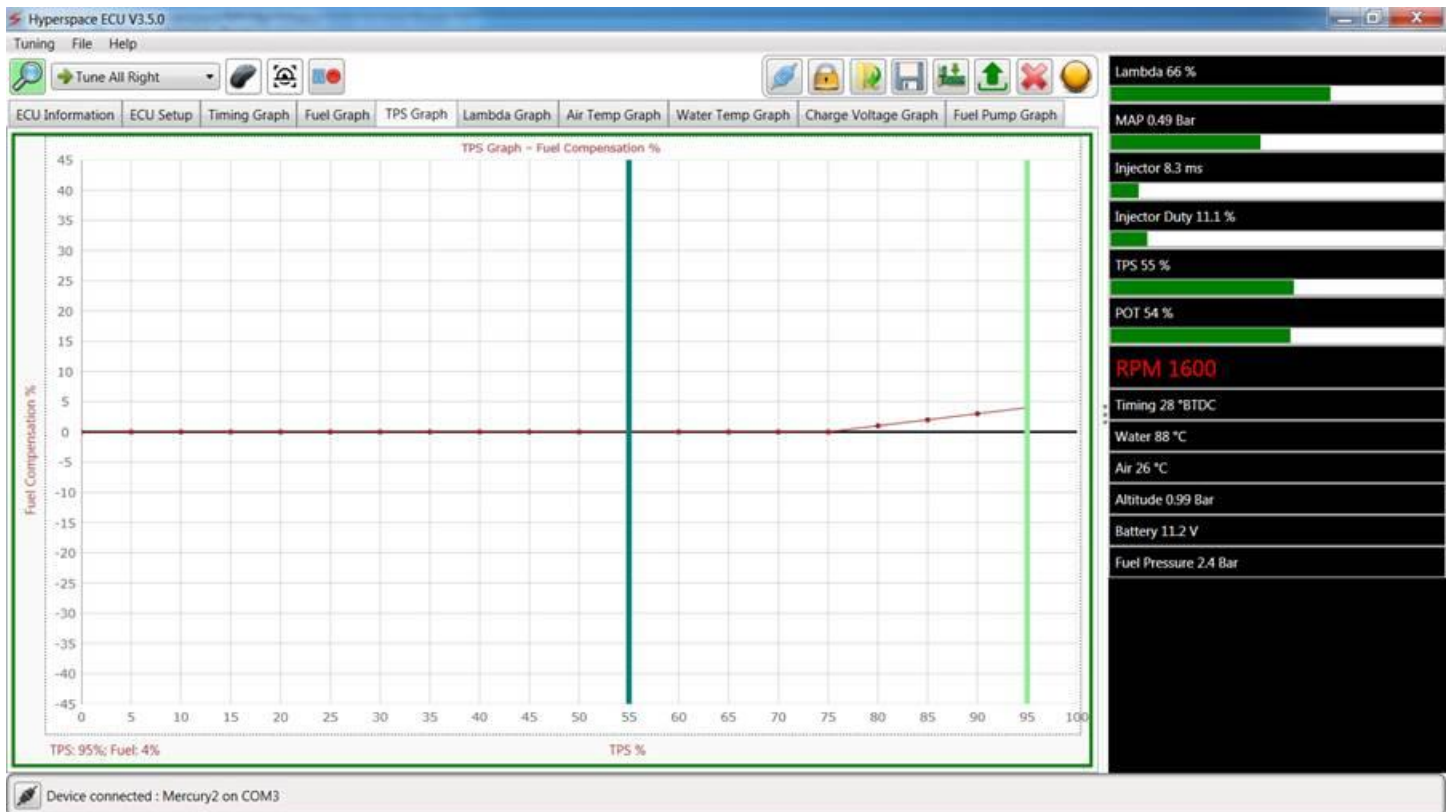the '*Save to ECU*' button to make the changes permanent.

Show Graph

This checkbox will enable the TPS compensation graph .

Tuning

With this graph it is possible to add fuel % with the TPS position. It is handy to enrich the fuel mixture at full throttle conditions. This helps with altitude variations. Normally on Graph Map tuning you will enrich the mixture at full throttle. Rather add the fuel on the TPS compensation graph. There is no timing compensation for this graph.

Sensor Hardware Description

The throttle position sensor is 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. 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.
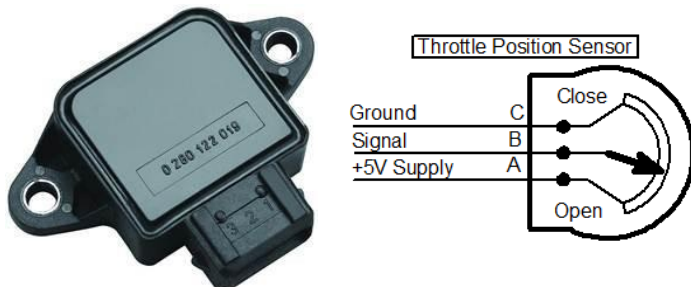
Operation

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
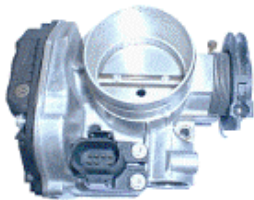Spitronics ECU does not require this pin.

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.
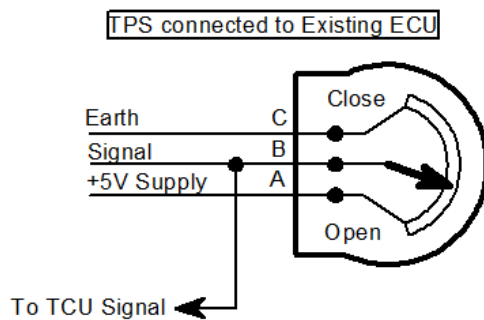
Connecting the TCU TPS to an existing ECU TPS sensor.

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