Graph MAP with TPS tuning

This tuning is the same as MAP graph tuning with the added adjustment to get the engine to idle on TPS calculations. It is still easy to tune without going to TPS matrix. So first tune according to this method. The same principles will apply to the timing graph but it is not as critical as fuel. Now do these adjustments.

Idle Tuning for an engine with a hot or long duration Cam

When a cam has valve overlap, the manifold vacuum at idling is very erratic or none existing due to exhaust gasses that backflow into the cylinder and sometimes also into the intake manifold. As a result, the ECU cannot use the MAP signal effectively because it is no longer a representation of how much air is going into the cylinders. To correct this there are two ways to tune the ECU to compensate for these out of balance situations.

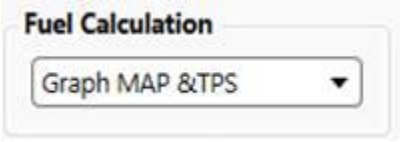
Option 1, RPM Compensation

In the example below the engine loses vacuum at 1500 RPM and lower. Then the vacuum bar on the top graph moves to the right. This means that the Low cruise and cruise Map below is active. Now, lower the graph below 1500 RPM to compensate for the over fuel condition. This option works well with mild cams. It is used for fuel calculation Maps only.

Option 2, TPS Blending

In this option we use the TPS signal for the fueling signal at low RPM's and the MAP signal for high RPM's. First determine at which RPM's the engine looses the vacuum signal. Put the engine in neutral and increase the RPM's till it has a good vacuum signal. Now reduce the RPM's while

looking at the green bar on the Fuel Load Graph. The bar should move to the left until vacuum becomes a problem. It will then move to the right again. If it happens, let's say at 1600 RPM adjust the following settings on the Setup Fuel setting.



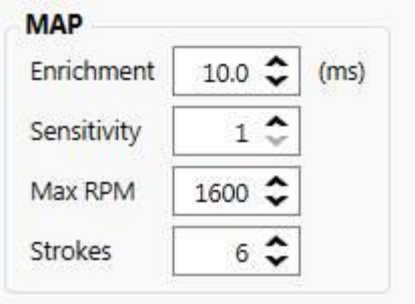
Put the Fuel Calculation on Map + TPS.

Put the critical RPM value in the RPM Fuel Cut-off block. Put the Vacuum Fuel Cut-off on 0.1 Bar. Start with the TPS Gain at 100. Now if the RPM signal falls below 1600 RPM, the TPS signal will be calculated as a MAP signal for the vacuum graph. When the TPS is at 0%. the MAP signal will stand on the 0.1 Bar position and move from there. If the RPM goes higher than 1600 RPM, the map signal will be used for fueling again. Should the actual MAP signal be lower than the calculated MAP signal at RPM's lower than 1600, then the actual MAP signal would be used. This will prevent the TPS signal from over fueling the engine.

Now adjust the fuel to increase as the TPS is increased so that the flat spot is corrected. If you don't find a sweet spot between the TPS fuel and MAP crossover, then you may need to move the Vacuum Fuel Cut-off higher to 0.2 Bar. This will have a higher value on the Fuel economy cut and result in harsh control on that feature.

Now press the throttle at different opening speeds with your foot. The vacuum bar will move from the 0.1Bar position to the right side of the graph. The speed of movement is adjusted by the TPS Gain value. If the bar moves to slow you will have a flat spot under acceleration. Increase the Gain value till a smooth acceleration is achieved. Start with a lower value to ensure that the mixture is not too rich.

Another tip to tune flat spots: Set the MAP accelerator pump to only work in the calculated range, and then make it sensitive and enough fuel. Note the 1600 RPM setting.



This is not a black and white setup but merely a guideline so you understand what you can do in the firmware. Trial and error will find a sweet spot.