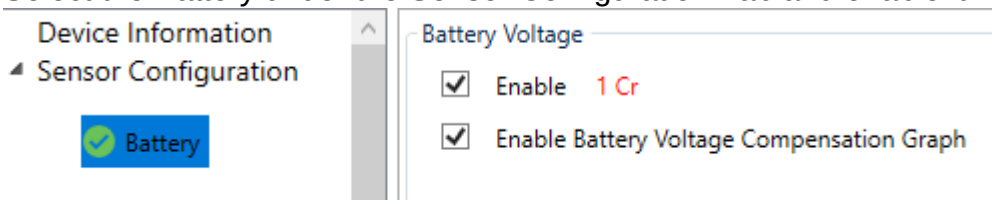
Battery Charge Volts

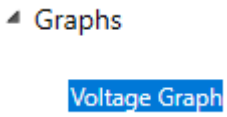
Battery and alternator voltage have a great influence on ECU systems. When an engine cranks, battery voltage can fall as far as 9 volts on cold days and when the engine is running, voltage can go up to 14.3 volts. This difference has a big influence in ignition coil energy and injector opening speeds. So, to compensate for that the ECU has 2 graphs. One graph is a fuel compensation graph which adds more fuel during cranking. The other is a charge time compensation graph that will act on the charge time of the coils. This will improve spark energy to help the engine start. It is not a clear-cut tune as you need to put a variable power supply in place of the battery.

Settings

Select the Battery under the Sensor Configuration Tab and enable it.



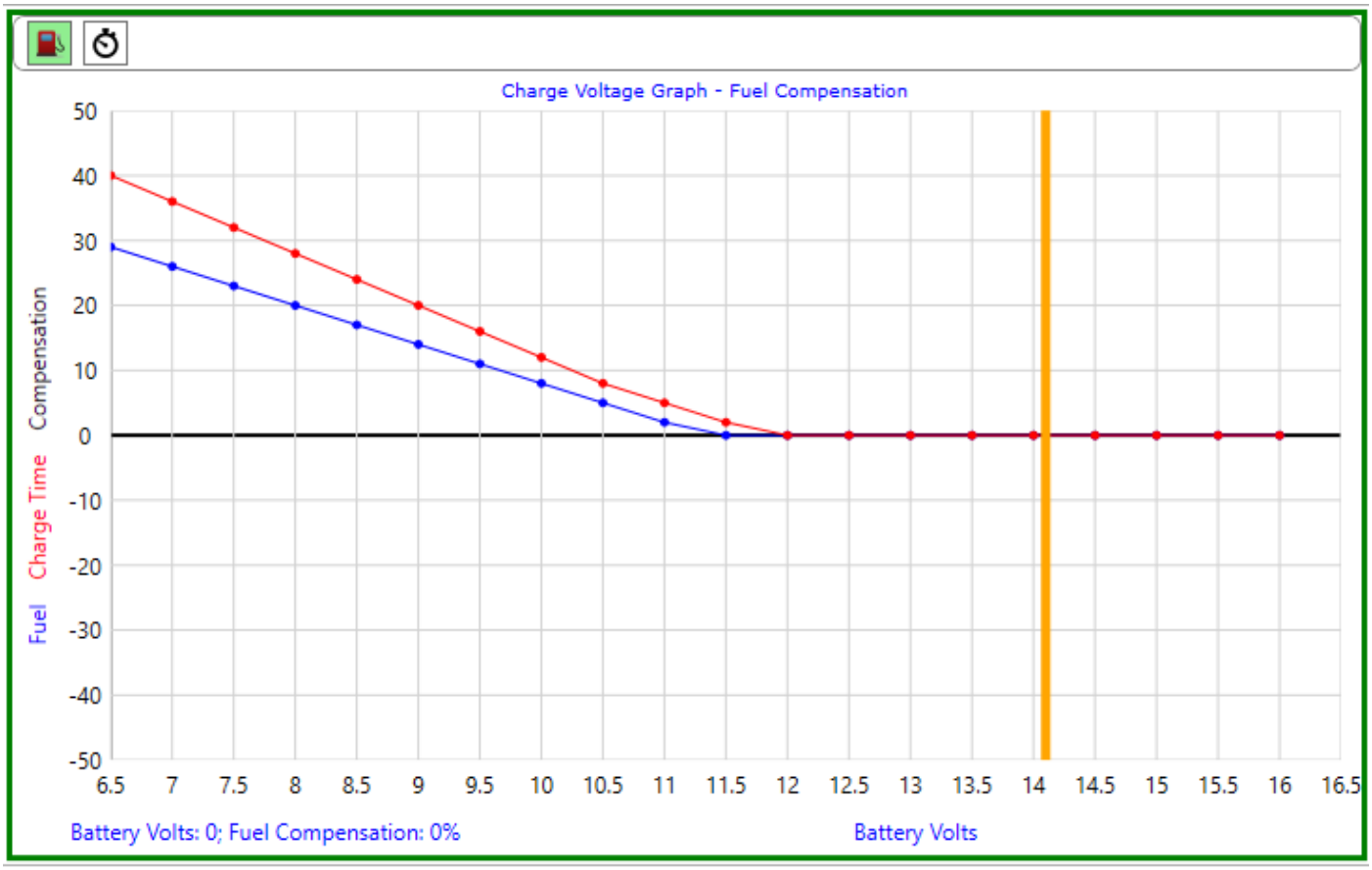
Now enable the Battery Voltage Compensation Graph. This will open a Voltage graph under the Graphs Tab.



Tuning

What you can do is look at spark quality when the engine is hot and compare it to spark when it is cold. Take care not to overcharge a coil as it may get damaged. Look on a cold morning at the ECU voltage during cranking. A healthy battery should crank no less than 11 volts. Below is an example of a typical voltage graph.

The blue graph adds a certain percentage to the injector time and the red graph adds a certain percentage to the charge time. This is not an easy one to tune but it is recommended to lower the values, and see if the results get worse has no influence in starting. Always go for the lowest values. You may also decrease the values with higher battery charge. This may help protecting the coil drivers. These graphs are interpolated.


Charge Voltage Graph - Fuel Compensation
Fuel Compensation
Charge Time
50
40
30
20
10
0
-10
-20
-30
-40
-50
6.5
7
7.5
8
8.5
9
9.5
10
10.5
11
11.5
12
12.5
13
13.5
14
14.5
15
15.5
16
16.5
Battery Volts: 0; Fuel Compensation: 0%
Battery Volts