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Settings and Checks Before Starting Engine

To-Do List Before Starting

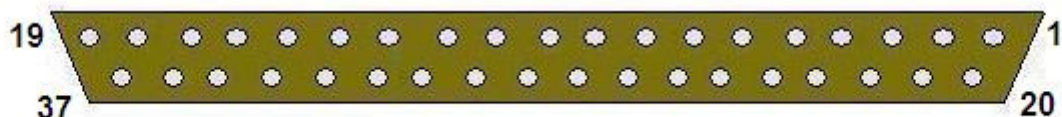
Before you go too far, I would strongly recommend unplugging any directly driven ignition coils whilst doing checks, etc. Simply plug them back in once you are ready to start the engine!!!

Once the ECU is wired up to the engine and the sensors are all connected there are a few things that need to be done to help you get running smoothly.

Wiring checks:

The first thing is to double check your wiring. Ensure the plug is disconnected from the MS ECU and the ignition is OFF. Using the resistance range of a multimeter check the resistance between the MS ECU ground point by connecting the black or -ve lead of the multimeter to ground and the red +ve lead of the meter to the following pins of the db37 connector that's on the wiring loom (female db37):
(you may need to use a small piece of single stranded wire to connect the meter to your db37 plug, be gentle with the pins!)

db37 pin plug on end of loom with plug facing you



- Pins 8 to 19 (Ground) resistance should be 0.0 - 0.1 Ohm (short circuit)
- Pins 20 and 21 (Air and Coolant sensors) should read somewhere between 50K and 5K Ohms depending on your

temperature sensors and the temperature of them.

- **Pin 22 (TPS Sensor)** should read around 0 - 300 Ohms with the throttle shut, slowly open the throttle and the resistance should increase to around 5-10K Ohms.

Next select DC Volts on your multimeter and leave the black -ve lead of the meter connected to ground, power the ignition on, still with the MS disconnected and check all pins for voltage.

- **Pin 28 (Ignition)** should measure 12V (11.5 - 13.8V) when the ignition is ON and 0V when the ignition is OFF
- **Pin 24 (Trigger Input)** if your using a hall sensor, you may have 0, 5V or 12V on it. *If your using a VR sensor it should have NO Volts on it.*
- **Pin 23 (Lambda)** if your oxygen sensor is powered up it may have 0 - 5V on it. *Any thing higher than 5V on pin 23 is a problem!!*
- **Pins 32 - 35 (Injectors)** should have 12V on them if the supply to the injectors is not switched through the fuel pump relay. Unplug all the injectors and re-check, you should have NO volts when all the injectors are unplugged.
- **Pin 36 (Spark)** may have 12V on it if your directly driving a coil or using an ignitor module. If you wired the coil so the supply to it comes on with the fuel pump relay then it will have ZERO volts on it.
- **Pin 37 (Fuel Pump Relay)** should have 12V on it as long as the fuel pump relay is in the wiring, unplug the relay and check it has ZERO volts on it.
- **Pin 30 (Idle)** should have 12V on it if the idle valve is in the circuit, unplug the valve and ensure it has ZERO volts on it.
- **Pins 3 - 6 (SPR1 - 4)** may have 12V to them, this depends on the extra's you have fitted to the ECU. *If you have a knock input ensure this only has 0 or 5V on it, anything higher than 5V will permanently damage the microprocessor!!*
- **All other pins** should read ZERO Volts, if not you have a problem!

Now you can turn the ignition OFF and plug in your MS ECU.

MegaTune (MT) Settings and Tuner Studio (TS) :

Important Note:

Adjustments made in MegaTune and Tuner Studio are only sent to the ECU if you press the "TAB Button" on your keyboard after making the change!! (This doesn't apply when tuning the maps in 3D mode)

In order to keep changes ensure you select BURN TO ECU, this then sends the adjustments into the permanent memory of the ECU!

I find the best method to make adjustments is to alter the value then press the TAB Button, this ensures they are sent. If the change is OK click BURN TO ECU.

You'll soon get the hang of it :o)

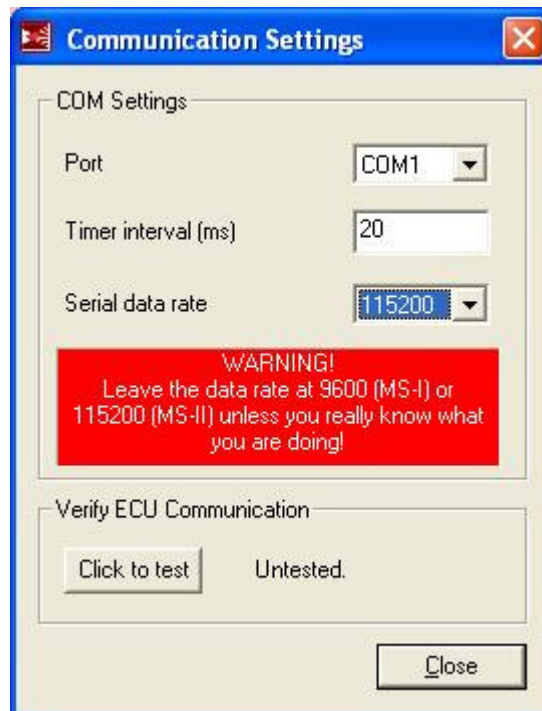
Before going too far, please ensure you have comms with the ECU.

Once in MegaTune or Tuner Studio select **Communications -- Settings..**
Port set to the same as you have in the **Advanced Settings - COM Port Number**

Timer interval set to **20mS.**

If using MS1 then set the Serial Data Rate to 9600

If using MS2 or MS3 then set the Serial Data Rate to 115200



Now click on "Click to Test" and ensure it says "SUCCESS!"

Ensure MT or TS is connected by closing the comms setting screen and ensure the dials (8 on the front page) all have figures in them that mean something. Also ensure the RPM is 00, not 69000 or ----

Next save the configuration that I have installed onto the ECU. To do this select File - Save (*Save Tune As* if using Tuner Studio) and name it "original" or something similar.

• PWM settings for Hi-Lo Impedance Injectors. (Constants Page in MegaTune)

You need to measure the resistance of the injectors your engine is using. Pop the connector off the injector and measure the resistance across the 2 pins on the injector in ohms using a multimeter.

If the resistance is greater than 10 Ohms then you have **Hi-Impedance** injectors.

If the resistance is lower than 4 Ohms you have **Lo-Impedance** injectors.

Reconnect the injectors and turn on the ignition with the laptop connected.

If you are running high-impedance injectors (greater than 10 Ohms), then set the:

PWM Time Threshold = 25.4 mS

PWM Current Limit (%) = 100%.

If you are running lo-impedance injectors (less than 4 Ohms), then start with:

PWM Time Threshold = 1.0 mS

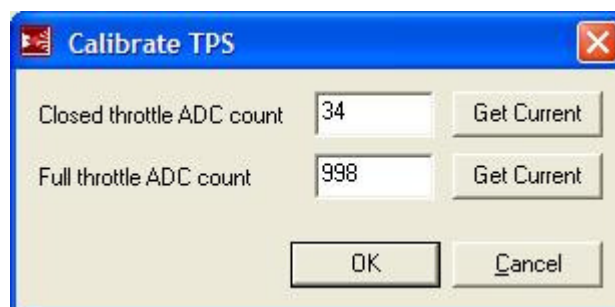
PWM Current Limit (%) = 30%

• Throttle Position Sensor Calibration:

With the ignition on, and the laptop connected and the engine not running go into Tools - Calibrate TPS. With the throttle fully shut click on the top "GET CURRENT" then with the throttle fully open (foot on throttle pedal) click the lower "GET CURRENT"

The values are in raw ADC (MS1...0 - 255 = 0 - 5V MS2 and MS30 - 1025 = 0 - 5V)

The closed value MUST be lower than the fully open value, if not you have the throttle position sensors 5V and ground round the wrong way.



Note: The setting changes wont take place untill MegaTune and the MS ECU is restarted. So power down the ECU and restart MegaTune.

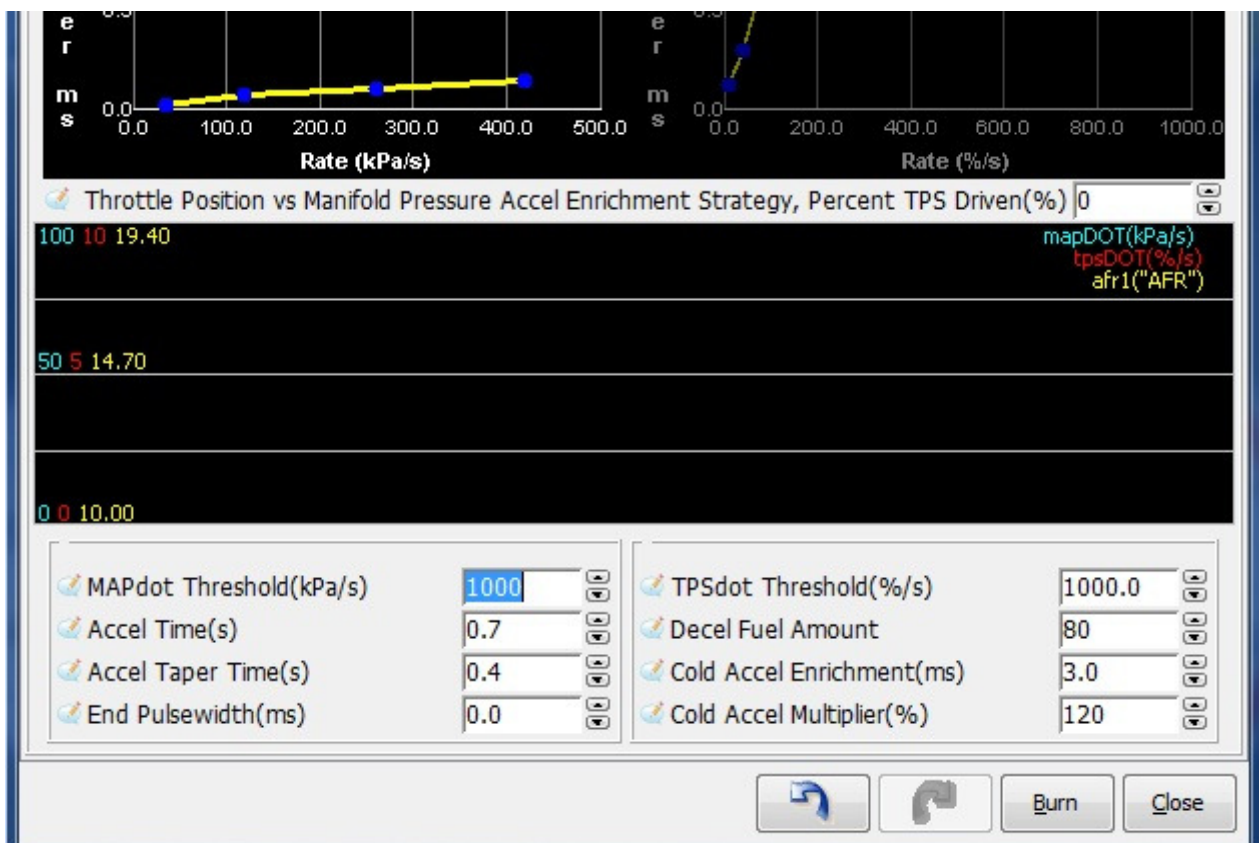
• **Calibrate the Air and Coolant Sensors:**

If you haven't done so already then have a read on how to calibrate OEM sensors, if you have told me what sensors you are using I should have done this for you, there will be files on the CD I provided. Remember that in MS1-Extra MegaTune and Tuner Studio needs to have 3 ini files saved in the correct directory, where as MS2-Extra and MS3 simply needs to be calibrated using the TOOLS functions. See [HERE](#) for MS1 and [HERE](#) for MS2/MS3.

To check the sensors are roughly correct, check that the readings in MegaTune for Coolant and Air are around the same temperature reading before starting the engine. If they are > 10deg or so apart from each other then you should check your sensors resistances again.

• **Acceleration Enrichments:**

The **Thresholds** are better turned so high that they don't cut in whilst tuning the VE table, this ensures you are not trying to compensate in the tuning for anything other than the VE table. To do this go into the **Acceleration Wizard** and set the TPSdot Threshold and the MAPdot Threshold to 1000, this means the AE will not react:



- **CodeBase, Spark Settings and Wheel Decoder Settings:**

Please Note, if you have told me about your setup when purchasing then I will have done all this for you, this is only necessary if you fitted your own wheel without letting me know which tooth is at the sensor at TDC. For standard setups, e.g. Ford, BMW, etc, then this will have been done. If you had something odd that I wasn't sure about then you will need to check these settings.

If you are using a distributor and ignition control then you'll need to set the trigger input from the hall sensor/points so it switches at approx. 60deg BTDC. See my web page <http://www.extraefi.co.uk/dizzy.htm> or the **Distributor_Setup.pdf** file on the CD for more info on that.

If you have a crank signal (e.g. Ford Zetec 36-1, VW 60-2 or a self fitted 36-1, etc) you will need to check your wheel decoder settings:

MS1-Extra:

You need to know either the angle that the first missing tooth passes the crank sensor at or what tooth aligns with the sensor when the engine is at Top Dead Centre for cy#1. Armed with this information you can use the [wheel decoder excel file](#) and it will generate the figures for you to enter into the Wheel Decoder Settings page. See my webpage http://www.extraefi.co.uk/wheel_fitting.htm#ms1 or the **Crank_Setup.pdf** file on the CD for more info on how to set up the wheel decoder settings.

MS2-Extra and MS3:

Note, this is for missing tooth wheel decoders, not for known signals that are in the Spark Mode drop down menu in "Ignition Options". If your engine is in that drop down menu then your home and dry :o)
In MS2-Extra and MS3 you need to know what angle the engine is at when the first tooth passes the sensor. See my web page http://www.extraefi.co.uk/wheel_fitting.htm#ms2 or the **Crank_Setup.pdf** file on the CD for more info on how to set up the wheel decoder settings.



NOW READ the SpeedDen or Alpha_N and lastly the Starting+Tuning PDF files on the CD (Also available on my website!)